Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

MANUFACTURERS RECORD BOOK (FINAL DOSSIER)

Document Number: 1724000979-QC-DB-00006

Document Class: 2

03	17/02/2025	Accepted for Construction (AFC)	MZ	GA	GO
02	13/12/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	15/11/2024	Issue for Review (IFR)	MZ	GA	GO
00	23/10/2024	Issue for Review (IFR)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted for Construction (AFC)
03	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
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Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX

Document Number: 1724000979-QC-LIS-00007

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
ROSETTI MARINO S.p.A. Technical Dept. Quality Control Dept.	19/10/2024

Document Class: 2

03	02/10/2024	Accepted for Construction (AFC)	MZ	GA	GO
02	06/08/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	21/06/2024	Issue for Review (IFR)	MZ	GA	GO
00	07/06/2024	Issue for Review (IFR)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

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GENERAL:

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
0	1724000979-QC-LIS-00007	03	RSM-SPR-4718-MRB-001	03	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX

PART 1 - DESIGN DOSSIER:

LIST:

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
1.1	1724000979-MD-LIS-00001	01	RSM-SPR-4718-VDL-001	01	SUPPLIER MASTER INDEX REGISTER (SMIR)

DIAGRAMS (N/A)

DRAWINGS:

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
1.2	1724000979-IN-DA-00003	03	RSM-SPR-4718-DWG-001	03	GENERAL ARRANGEMENT DRAWINGS

PROJECT PROCEDURES AND SPECIFICATION:

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
1.3	1724000979-IN-MAN-00008	03	RSM-SPR-4718-MAN-001	03	INSTALLATION, OPERATION AND MAINTENANCE MANUAL
1.4	1724000979-COM-LIS-0001 1	01	RSM-SPR-4718-LST-001	01	SPARE PART INDEX REGISTER
1.5	1724000979-QC-PRO-00012	01	RSM-SPR-4718-PRC-002	01	PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES

PIPING CLASSES (N/A)

CALCULATION NOTES (N/A)

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EQUIPMENT REQUISITIONS (N/A)

DATASHEETS:

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
1.6	1724000979-IN-DS-00004	03	RSM-SPR-4718-DSH-001	03	INSTRUMENT DATA SHEETS (INCLUDING TW CALCULATIONS)

PART 2 - CERTIFICATION DOSSIER:

ACCEPTANCE (N/A)

CERTIFICATES MANUFACTURING RECORD AND PROCEDURES:

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
2.1	-	-	RSM-SPR-4718-CER-001	-	MATERIAL 3.1 & HYDROTEST CERTIFICATES
2.2	-	-	RSM-SPR-4718-CER-002	-	CALIBRATION CERTIFICATES

MANUFACTURING RECORD AND PROCEDURES:

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
2.3	1724000979-QC-ITP-00002	01	RSM-SPR-4718-ITP-001	01	INSPECTION AND TEST PLAN
2.4	1724000979-QC-PRO-00005	04	RSM-SPR-4718-PRC-001	04	FACTORY ACCEPTANCE TEST PROCEDURE
2.5	-	-	RSM-SPR-4718-CER-003	-	DYE PENETRANTS CERTIFICATES

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TEST RECORD

Pos.	Document nr. Client	Doc Client Rev.	Document nr. Supplier	Doc Supplier Rev.	Document Title
2.6	-	-	RSM-SPR-4718-CER-004	-	ATEX CERTIFICATE
2.7	-	-	RSM-SPR-4718-CER-005	-	IP GRADE CERTIFICATE
2.8	-	-	RSM-SPR-4718-CER-006	-	WPS & PQR
2.9	-	-	RSM-SPR-4718-CER-007	-	FAT REPORT
2.10	1724000979-IN-LIS-00009	02	-	02	ATEX REGISTER
2.11	1724000979-IN-LIS-00010	01	-	01	VENDOR ASSET AND TAG REGISTER

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PART 1
DESIGN DOSSIER

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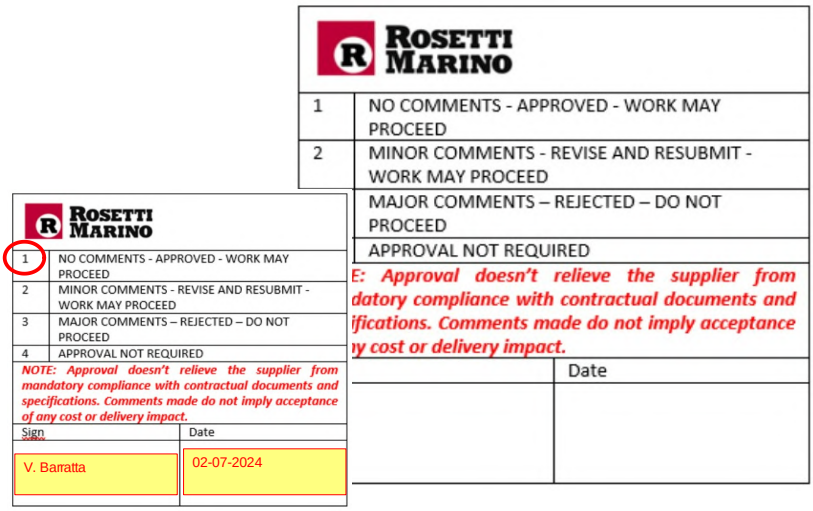
Base Load Power Hub (BLPH)

PT,PDT,TT,LT RADAR

SUPPLIER MASTER INFORMATION REGISTER

Document Number: 1724000979-MD-LIS-00001

Document Class: 3



01	13/06/2024	Issue for Information (IFI)	MZ	GA	GO
00	27/05/2024	Issue for Information (IFI)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

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SH.	DESCRIPTION	REVISIONS							
		00	01						
1	Cover	X	X						
2	Table of Contents	X	X						
3	Revision / Change Log / Hold List	X	X						
4	References	X	X						
5	SMIR	X	X						

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)

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SMIR - REGISTRO DOCUMENTI / *SMIR - SUPPLIER MASTER INFORMATION REGISTER*

	Ordine n°/ *order nr.*	1724000979		Fornitore/ *Supplier* :	TERRANOVA SRL									
	data / *dated:*			Codice F./ *S. Code:*										
	Commessa / *Job:*			Indirizzo/ *address* :	Via Gramsci 1 , 26827 Terranova dei Passerini (LO)									
	Descrizione / *Description*	PT,PDT,TT,LT RADAR		Persona di riferim./ *contact person:*	tech@terranova-instruments.com									
	Macrofase / *Phase*													

Pos.	Document nr. Client (1)	Doc Client Rev. (1)	Document nr. Internal	Document nr. Internal Rev. (2)	Document nr. Supplier (3)	Doc Supplier Rev. (3)	Titolo Documento / *Documenttitle* (4)	Disciplina / *Discipline* (5)	Blocco Classe / *Class Block* (6)	Docum. Format (7)	first issue date (8)	Third Party Approval (I/A)	KEY Document Ingegneria	Documents subject to liquidated damages	Document Approval (I/A)
1	1724000979-MD-LIS-00001	01	1724000979-MD-LIS-00001	01	RSM-SPR-4718-VDL-001	01	SUPPLIER MASTER INDEX REGISTER (SMIR)	INS		A3	30/05/2024				I
							QUALITYDOCUMENTS								
2	1724000979-QC-ITP-00002	01	1724000979-QC-ITP-00002	01	RSM-SPR-4718-ITP-001	01	INSPECTION AND TEST PLAN	QUA		A4	30/05/2024				A
							ENGINEERING DOCUMENTS								
3	1724000979-IN-DA-00003	01	1724000979-IN-DA-00003	01	RSM-SPR-4718-DWG-001	01	GENERAL ARRANGEMENT DRAWINGS	INS		A4	30/05/2024		X		A
4	1724000979-IN-DS-00004	00	1724000979-IN-DS-00004	00	RSM-SPR-4718-DSH-001	00	INSTRUMENT DATA SHEETS (INCLUDING TW CALCULATIONS)	INS		A4	30/05/2024		X		A
5	1724000979-QC-PRO-00005	00	1724000979-QC-PRO-00005	00	RSM-SPR-4718-PRC-001	00	FACTORY ACCEPTANCE TEST PROCEDURE	QUA		A4	20/06/2024				A
							CERTIFICATES								
6	1724000979-QC-DB-00006	00	1724000979-QC-DB-00006	00	RSM-SPR-4718-MBI-001	00	MANUFACTURERS RECORD BOOK (FINAL DOSSIER)	CERT		A4	30/09/2024				A
7	1724000979-QC-LIS-00007	00	1724000979-QC-LIS-00007	00	RSM-SPR-4718-MRB-001	00	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	QUA		A4	20/06/2024				A
							SPARES & MAINTENANCE DATA								
8	1724000979-IN-MAN-00008	00	1724000979-IN-MAN-00008	00	RSM-SPR-4718-MAN-001	00	INSTALLATION, OPERATION AND MAINTENANCE MANUAL	INS		A4	15/07/2024				I
9	1724000979-IN-LIS-00009	00	1724000979-IN-LIS-00009	00	-	00	ATEX REGISTER	INS			08/08/2024				A
10	1724000979-IN-LIS-00010	00	1724000979-IN-LIS-00010	00	-	00	VENDOR ASSET AND TAG REGISTER	DATA		A4	30/08/2024				A
11	1724000979-COM-LIS-00011	00	1724000979-COM-LIS-00011	00	RSM-SPR-4718-LST-001	00	SPARE PART INDEX REGISTER	COMM		A4	08/08/2024				A
12	1724000979-QC-PRO-00012	00	1724000979-QC-PRO-00012	00	RSM-SPR-4718-PRC-002	00	PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES	EXP		A4	08/08/2024				I

Notes:

(1) Numero documento Cliente
Document number assigned by final Client

(2) Numero documento interno
Document number internal

(3) Numero documento Fornitore (assegnato dal Fornitore)
Document number assigned by Supplier

(4) Assegnare il Titolo del documento (assegnato dal Fornitore)
Fill in the document title (to be assigned by Vendor)

(5) Specific are la disciplina (compilato da Rosetti)
Quality dep., Expediting. Dep., Commissioning dep., Engineering dep.

(6) Blocco Classe: Specifica, Disegno, Report, Data Sheet, etc. (compilato da Rosetti)
Procedure, list, drawing, data sheet, etc. (to be filled by Rosetti)

(7) A4, A3, A1 (compilato dal Fornitore)
A4, A3, A1 (Supplier)

(8) Data prevista per l'emissione del documento (compilato dal Fornitore)
Foreseen date for the first issue (Supplier)

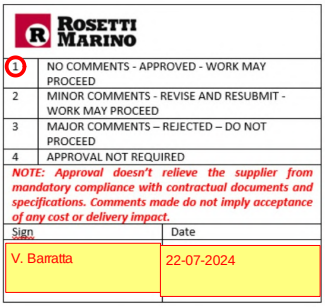
Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

GENERAL ARRANGEMENT DRAWINGS

Document Number: 1724000979-IN-DA-00003

Document Class: 2



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1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

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Sign	Date
V. Barratta	22-07-2024

03	18/07/2024	Accepted for Construction (AFC)	MZ	GA	GO
02	02/07/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	13/06/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	27/05/2024	Issue for Review (IFR)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

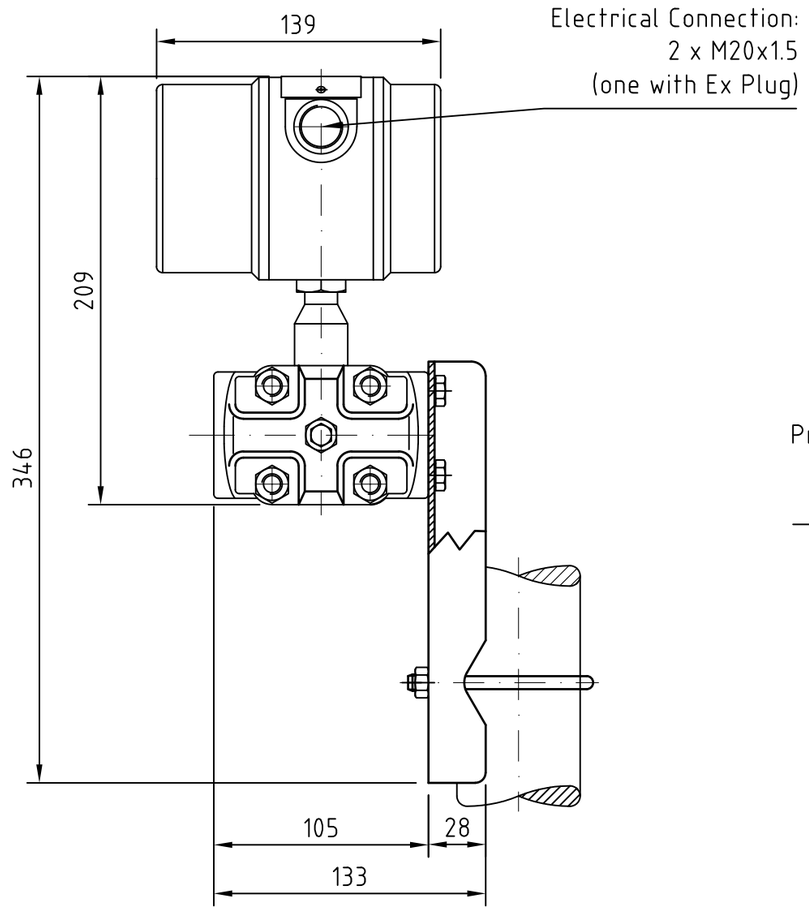
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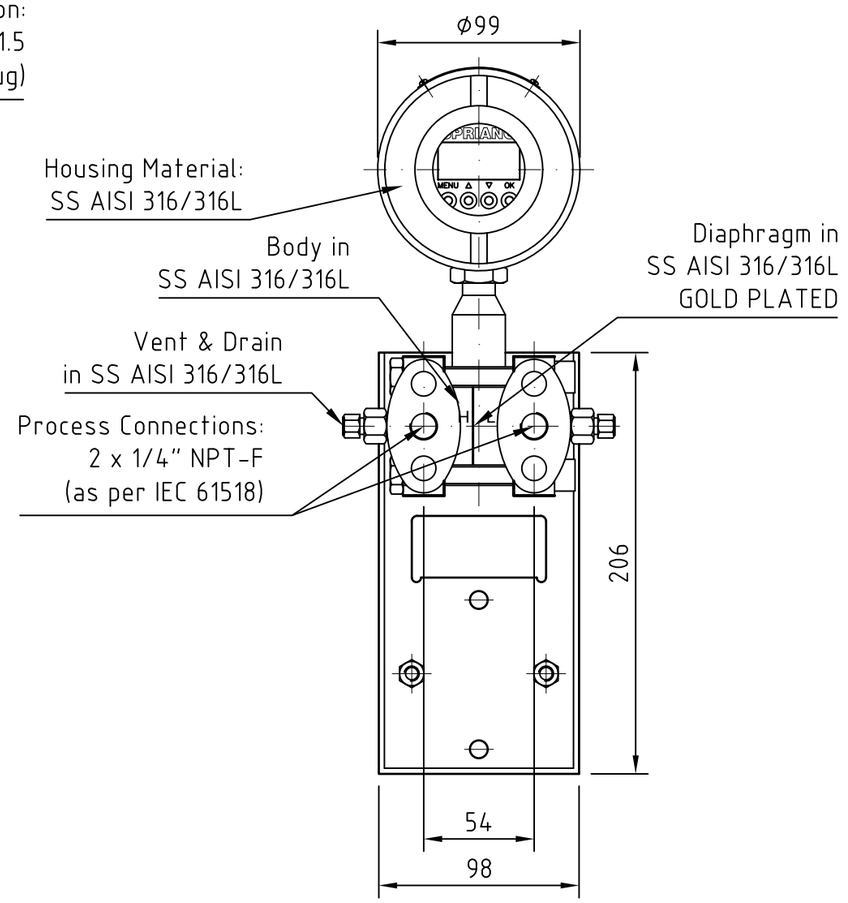
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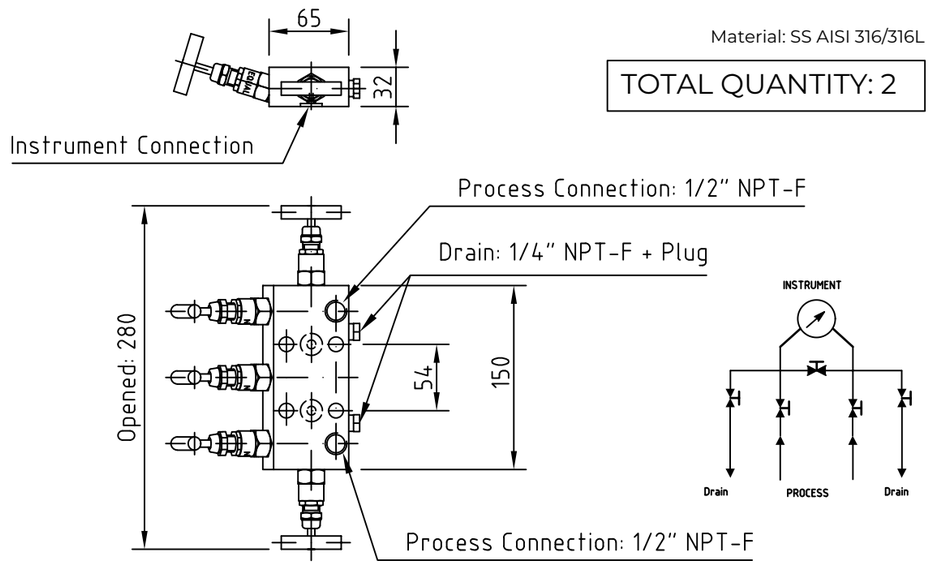
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SST77B DIFFERENTIAL PRESSURE TRANSMITTERS





MAN5-D1 FIVE WAYS AND FIVE VALVES MANIFOLD



TAG LIST

#	TAG	RANGE	CALIBRATION
1	43-LT-001	0 ÷ 350 mbar	0 ÷ 560 mmH_2O
2	43-LT-003	0 ÷ 350 mbar	0 ÷ 1000 mmH_2O

TOTAL QUANTITY: 2

NOTES

SST77B DIFFERENTIAL PRESSURE TRANSMITTERS
SST77B-H-9-D-2-3-0-0-4 + MAN5-D1

H - OUTPUT: 4-20 mA + HART
9 - EXTERNAL PARTS IN SS AISI 316 & DIAPHRAGM IN SS AISI 316 + GOLD PLATING
D - NOMINAL RANGE: 0 ÷ 350 mbar
2 - CALIBRATION: refer to TAG LIST TABLE
3 - OPTIONS: HOUSING MATERIAL STAINLESS STEEL WITH ELECTRICAL CONNECTIONS 2 x M20x1,5 (ONE WITH EXD PLUG)
0 - OPTIONS: WITHOUT
0 - PROCESS CONNECTIONS: STAINLESS STEEL 1/4" NPT-F (TO FIT TO THE MANIFOLD - IEC 61518 STANDARD)
4 - EXPLOSION PROTECTION 2014/34/EU: ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb

to be coupled with:
1. MAN5-D1 FIVE VALVES AND THREE WAYS MANIFOLD IN SS AISI 316/316L, INSTRUMENT CONNECTIONS FLANGED / PROCESS CONNECTION 1/2" NPT-F.

NOTES:
1. OVERALL ACCURACY (COMPREHENSIVE OF HYSTERESIS, NON-LINEARITY, REPEATABILITY) IS WITHIN +/-0,1% FS;
2. ALL ITEMS ARE EQUIPPED WITH SS NAMEPLATE;
3. ALL ITEMS HAVE INGRESS PROTECTION EN 60529: IP66;
4. HOUSING MATERIAL STAINLESS STEEL;
5. FILLING OF ELEMENT IS FORESEEN WITH DOW CORNING SILICONIC OIL;
6. ELECTRICAL CONNECTIONS ARE 2 x M20x1,5 (ONE PLUGGED);
7. MOUNTING BRACKET INCLUDED AS STANDARD;
8. INTEGRAL LCD DISPLAY;
9. STATIC PRESSURE 100 BAR;
10. HART 6;
11. MANIFOLD WITH INSTRUMENT CONNECTIONS FLANGED SUITABLE TO BE CONNECTED TO INSTRUMENT PROCESS CONNECTION 2 x 1/4" NPT-F.

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. IP66 GRADE (EN/IEC 60529)
3. MATERIAL 3.1 (EN 10204) & HYDROTEST CERTIFICATES
4. CALIBRATION CERTIFICATES (IEC 60770)

REV	DATE	STATUS	PURPOSE OF ISSUE	PRE'D.	CHC'D.	APP'D.	AUTH'D.
03	18/JULY/24	FOURTH ISSUE	FOR CONSTRUCTION	M.Soni	G.Amendola	G.Molini	S.Valletti
02	02/JULY/24	THIRD ISSUE	FOR CONSTRUCTION	M.Soni	G.Amendola	G.Molini	S.Valletti
01	13/JUN/24	SECOND ISSUE	FOR CONSTRUCTION	M.Soni	G.Amendola	G.Molini	S.Valletti
00	24/MAY/24	FIRST ISSUE	FOR APPROVAL	M.Soni	G.Amendola	G.Molini	S.Valletti

CROSSWIND ROSETTI MARINO

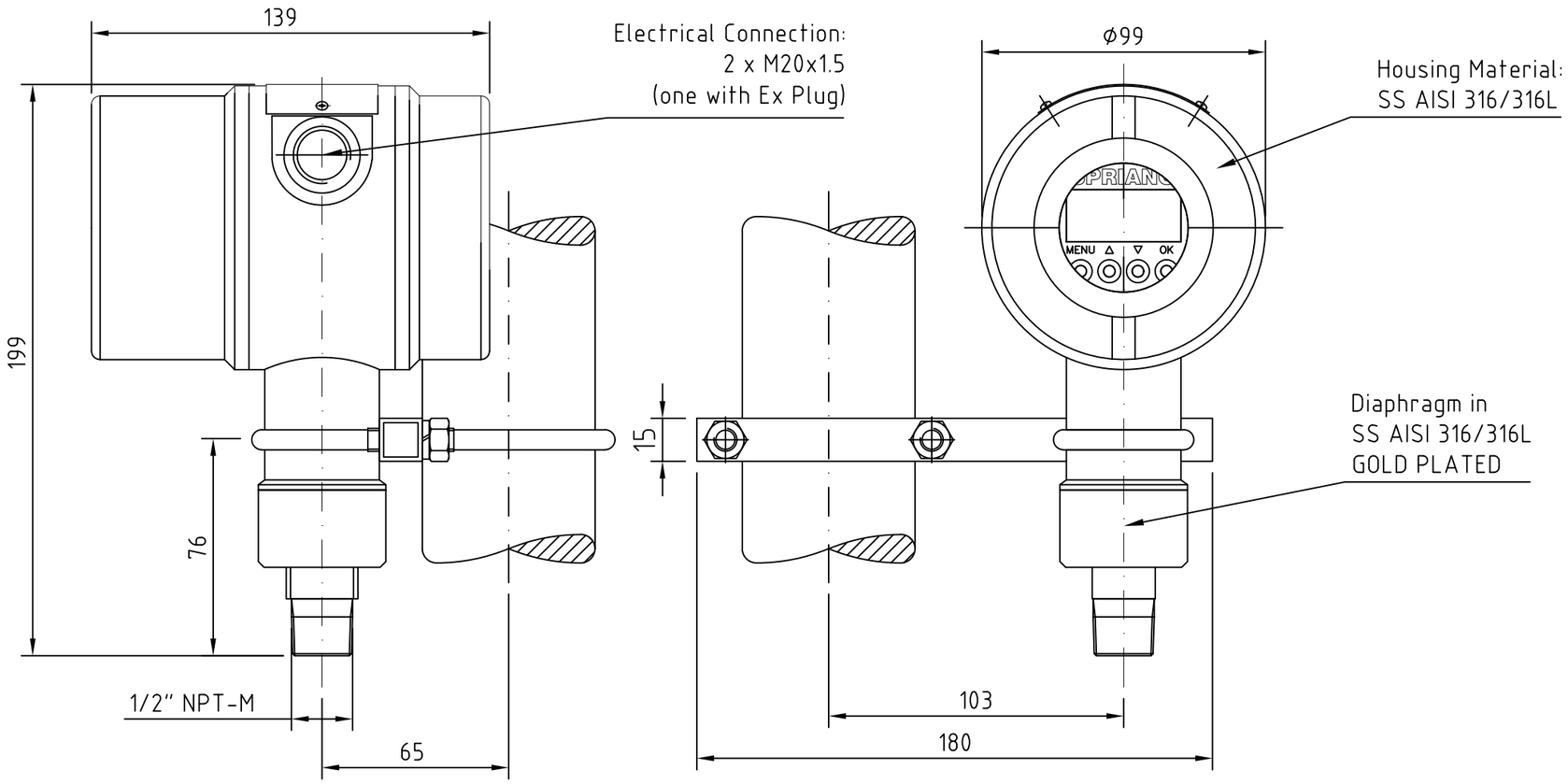
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DRAWING TITLE: DIMENSIONAL DRAWINGS

JOB: 4718_OS | SHEET No. 3 OF 10 | REV. 03

SST76 PRESSURE TRANSMITTERS

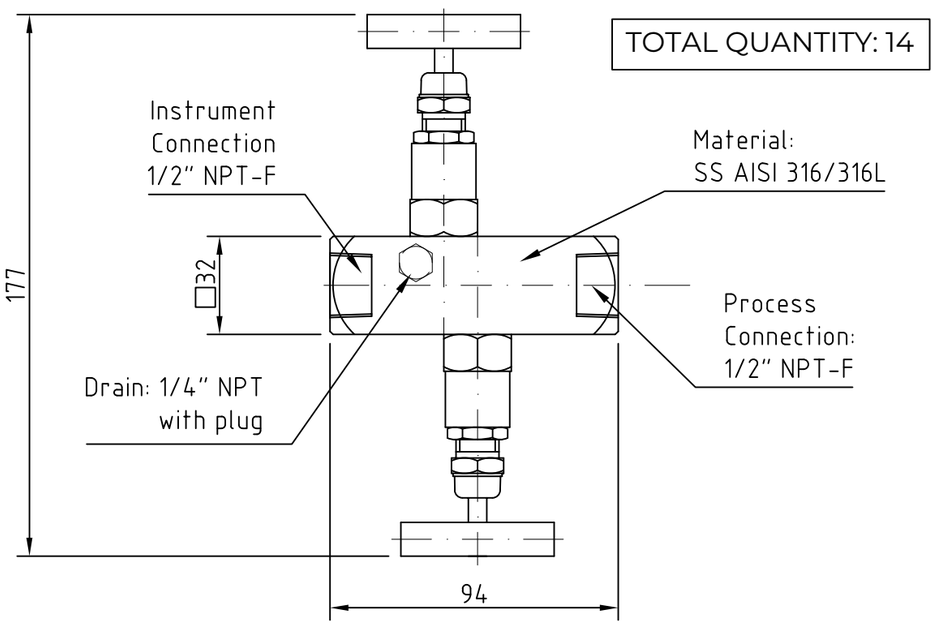


TAG LIST

#	TAG	RANGE	CALIBRATION
1	25-PT-001	0 ÷ 100 barg	0 ÷ 40 barg
2	25-PT-002	0 ÷ 100 barg	0 ÷ 40 barg
3	25-PT-004	0 ÷ 100 barg	0 ÷ 40 barg
4	25-PT-035	0 ÷ 100 barg	0 ÷ 40 barg
5	25-PT-006	0 ÷ 100 barg	0 ÷ 40 barg
6	25-PT-037	0 ÷ 100 barg	0 ÷ 40 barg
7	25-PT-008	0 ÷ 100 barg	0 ÷ 40 barg
8	25-PT-040	0 ÷ 100 barg	0 ÷ 40 barg
9	25-PT-009	0 ÷ 100 barg	0 ÷ 40 barg
10	25-PT-043	0 ÷ 100 barg	0 ÷ 40 barg
11	25-PT-011	0 ÷ 100 barg	0 ÷ 40 barg
12	25-PT-046	0 ÷ 100 barg	0 ÷ 40 barg
13	25-PT-012	0 ÷ 100 barg	0 ÷ 40 barg
14	25-PT-049	0 ÷ 100 barg	0 ÷ 40 barg

TOTAL QUANTITY: 14

MAN2-R6 TWO WAYS AND TWO VALVES MANIFOLD



NOTES

SST76 PRESSURE TRANSMITTERS
SST76-H-7-L-2-9-2-1-4 + MAN2-R6

H - OUTPUT: 4-20 mA + HART
7 - PROCESS CONNECTION: 1/2" NPT M;
L - NOMINAL RANGE: 0 ÷ 100 barg
2 - CALIBRATION: 0 ÷ 40 barg
9 - DIAPHRAGM MATERIAL: SS AISI 316/316L GOLD PLATED
2 - OPTIONS: HOUSING MATERIAL STAINLESS STEEL WITH ELECTRICAL CONNECTIONS 2 x 1/2" NPT-F
1 - OPTIONS: MOUNTING BRACKET FOR 2" PIPE MOUNTING
4 - EXPLOSION PROTECTION 2014/34/EU: ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1G Ex ia IIC T6/T5/T4 Ga

to be coupled with:
1. MAN2-R6 TWO VALVES AND TWO WAYS MANIFOLD, MATERIAL SS AISI 316/316L, CONNECTION TO INSTRUMENT 1/2" NPT-F, PROCESS CONNECTION 1/2" NPT-F.

NOTES:
1. OVERALL ACCURACY OF PT (COMPREHENSIVE OF HYSTERESIS, NON-LINEARITY, REPEATABILITY) IS WITHIN +/- 0,07% FS;
2. ALL ITEMS ARE EQUIPPED WITH SS NAMEPLATE;
3. FILLING OF ELEMENT IS FORESEEN WITH DOW CORNING SILICONIC OIL;
4. ELECTRICAL CONNECTION ARE: 2 X 1/2" NPT-F (ONE PLUGGED);
5. INTEGRAL LCD /CONFIGURABLE ENGINEERING UNITS;
6. INGRESS PROTECTION EN 60529: IP66;
7. HOUSING MATERIAL STAINLESS STEEL;
8. ALL INSTRUMENT ARE SIL2/SIL3 CERTIFIED;
9. HART 6.

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. IP66 GRADE (EN/IEC 60529)
3. MATERIAL 3.1 (EN 10204) & HYDROTEST CERTIFICATES
4. CALIBRATION CERTIFICATES (IEC 60770)

REV	DATE	STATUS	PURPOSE OF ISSUE	PRE'D.	CHC'D.	APP'D.	AUTH'D.
03	18/JULY/24	FOURTH ISSUE	FOR CONSTRUCTION	M.Sani	G.Amendo	G.Molini	S.Valletti
02	02/JULY/24	THIRD ISSUE	FOR CONSTRUCTION	M.Sani	G.Amendo	G.Molini	S.Valletti
01	13/JUN/24	SECOND ISSUE	FOR CONSTRUCTION	M.Sani	G.Amendo	G.Molini	S.Valletti
00	24/MAY/24	FIRST ISSUE	FOR APPROVAL	M.Sani	G.Amendo	G.Molini	S.Valletti

CROSSWIND ROSETTI MARINO

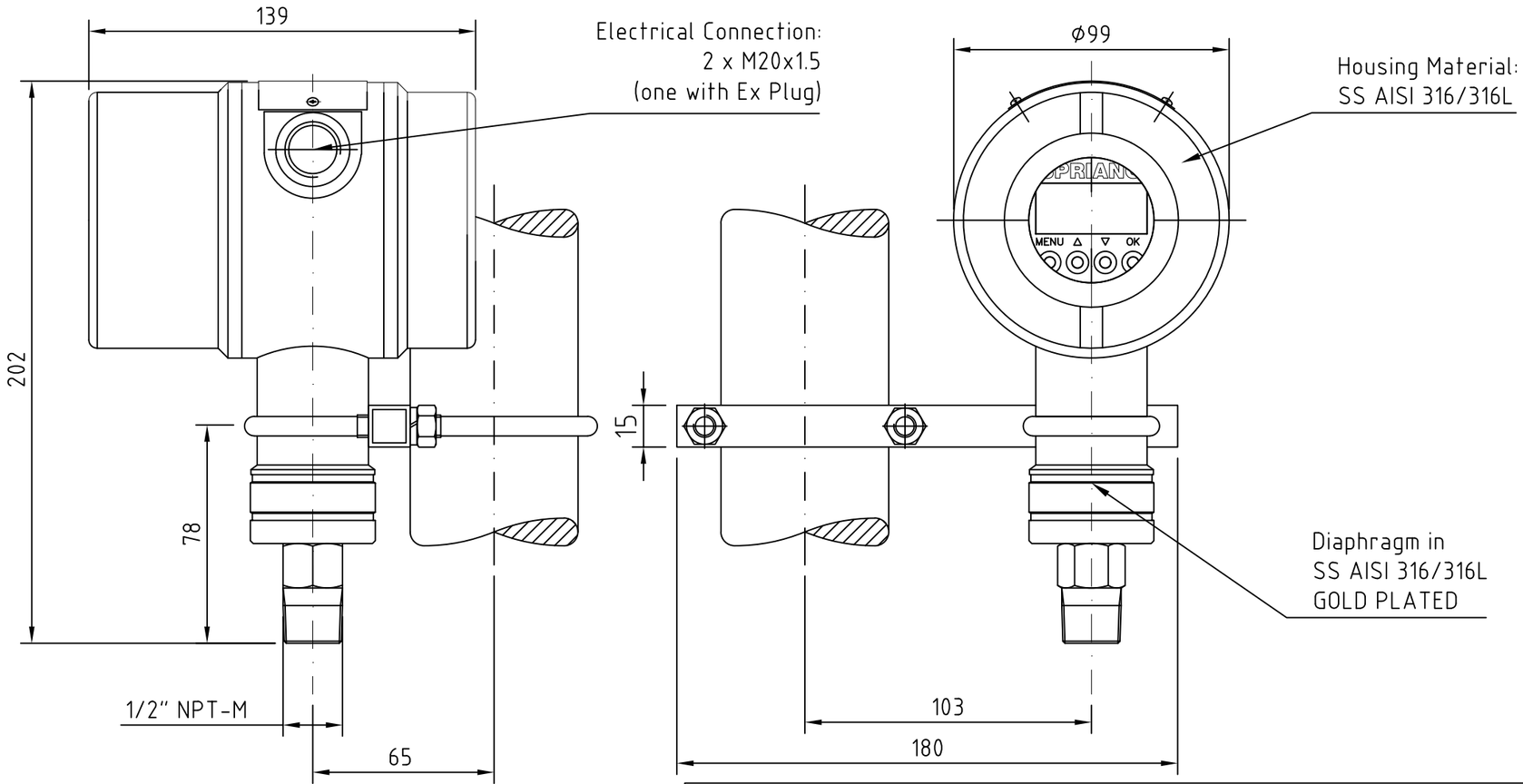
P.O. No.: 24/01611/PO | Mod_CAR_Rev17-01 | SCALE – 1:2

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DRAWING TITLE: DIMENSIONAL DRAWINGS

JOB: 4718_OS | SHEET No. 4 OF 10 | REV. 03

SST76 PRESSURE TRANSMITTERS

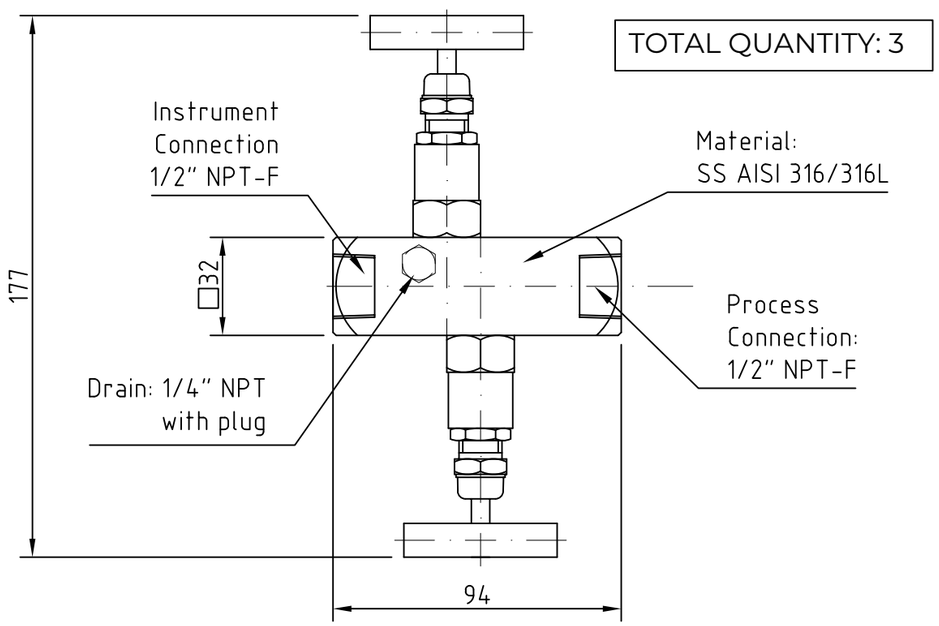


TAG LIST

#	TAG	RANGE	CALIBRATION
15	25-PT-055A	0 ÷ 30 barg	0 ÷ 10 barg
16	25-PT-055B	0 ÷ 30 barg	0 ÷ 10 barg
17	43-PT-001	0 ÷ 5 barg	0 ÷ 3,5 barg

TOTAL QUANTITY: 3

MAN2-R6 TWO WAYS AND TWO VALVES MANIFOLD



NOTES

SST76 PRESSURE TRANSMITTERS
SST76-H-7-...-2-9-2-1-4 + MAN2-R6

H - OUTPUT: 4-20 mA + HART
7 - PROCESS CONNECTION: 1/2" NPT M;
... - NOMINAL RANGE: refer to TAG LIST TABLE
2 - CALIBRATION: refer to TAG LIST TABLE
9 - DIAPHRAGM MATERIAL: SS AISI 316/316L GOLD PLATED
2 - OPTIONS: HOUSING MATERIAL STAINLESS STEEL WITH ELECTRICAL CONNECTIONS 2 x 1/2" NPT-F
1 - OPTIONS: MOUNTING BRACKET FOR 2" PIPE MOUNTING
4 - EXPLOSION PROTECTION 2014/34/EU: ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1G Ex ia IIC T6/T5/T4 Ga

to be coupled with:
1. MAN2-R6 TWO VALVES AND TWO WAYS MANIFOLD, MATERIAL SS AISI 316/316L, CONNECTION TO INSTRUMENT 1/2" NPT-F, PROCESS CONNECTION 1/2" NPT-F.

NOTES:
1. OVERALL ACCURACY OF PT (COMPREHENSIVE OF HYSTERESIS, NON-LINEARITY, REPEATABILITY) IS WITHIN +/- 0,07% FS;
2. ALL ITEMS ARE EQUIPPED WITH SS NAMEPLATE;
3. FILLING OF ELEMENT IS FORESEEN WITH DOW CORNING SILICONIC OIL;
4. ELECTRICAL CONNECTION ARE: 2 X 1/2" NPT-F (ONE PLUGGED);
5. INTEGRAL LCD /CONFIGURABLE ENGINEERING UNITS;
6. INGRESS PROTECTION EN 60529: IP66;
7. HOUSING MATERIAL STAINLESS STEEL;
8. ALL INSTRUMENT ARE SIL2/SIL3 CERTIFIED;
9. HART 6.

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. IP66 GRADE (EN/IEC 60529)
3. MATERIAL 3.1 (EN 10204) & HYDROTEST CERTIFICATES
4. CALIBRATION CERTIFICATES (IEC 60770)

REV	DATE	STATUS	PURPOSE OF ISSUE	PRE'D.	CHC'D.	APP'D.	AUTH'D.
03	18/JULY/24	FOURTH ISSUE	FOR CONSTRUCTION	M.Sani	G.Alaimo	G.Alaimo	S.Valletti
02	02/JULY/24	THIRD ISSUE	FOR CONSTRUCTION	M.Sani	G.Alaimo	G.Alaimo	S.Valletti
01	13/JUN/24	SECOND ISSUE	FOR CONSTRUCTION	M.Sani	G.Alaimo	G.Alaimo	S.Valletti
00	24/MAY/24	FIRST ISSUE	FOR APPROVAL	M.Sani	G.Alaimo	G.Alaimo	S.Valletti

CROSSWIND — ROSETTI MARINO

P.O. No.: 24/01611/PO | Mod_CAR_Rev17-01 | SCALE – 1:2

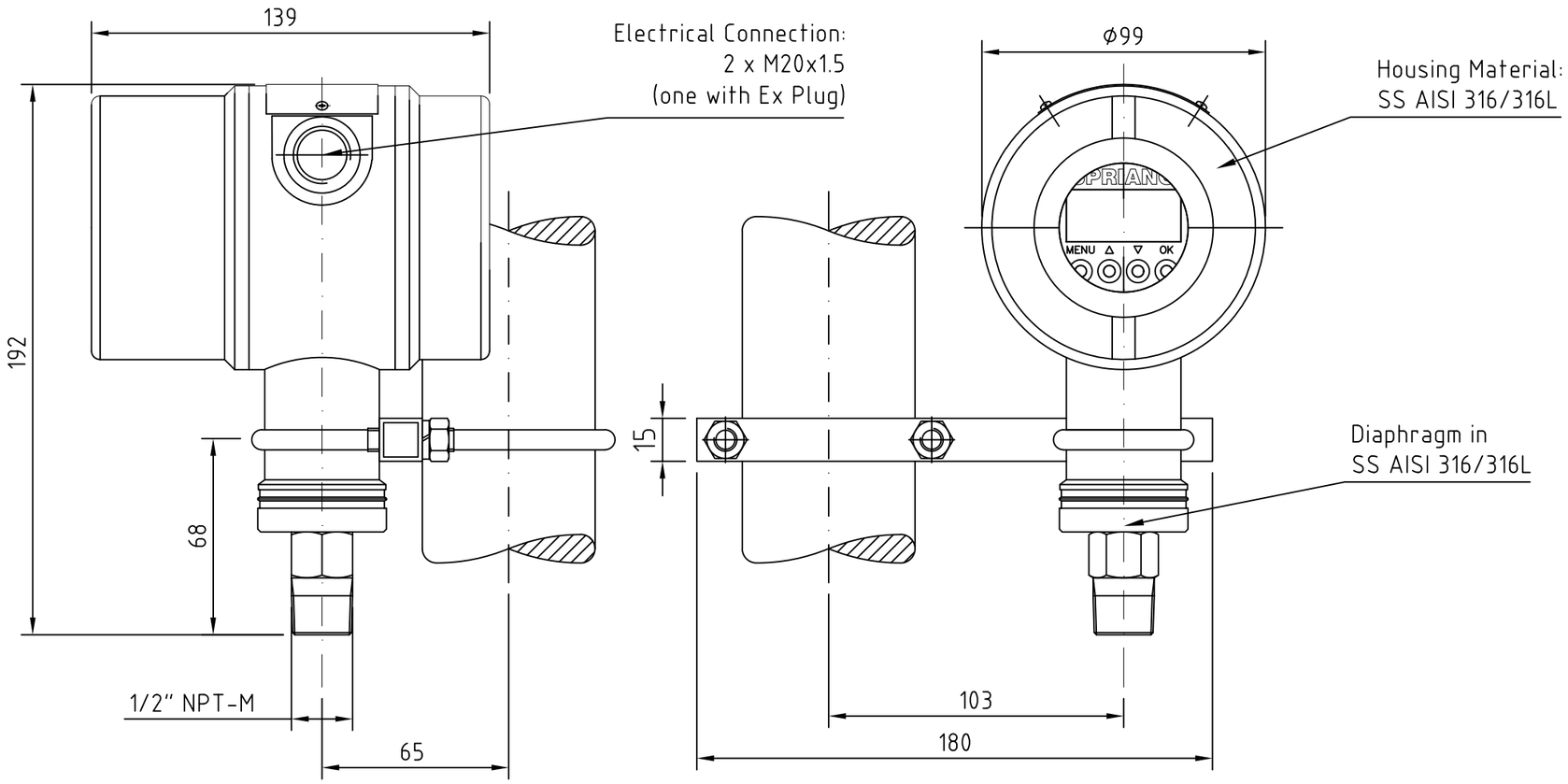
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TERRANOVA SRL

DRAWING TITLE: DIMENSIONAL DRAWINGS

JOB:	4718_OS	SHEET No.	5 OF 10	REV. 03

SST76 PRESSURE TRANSMITTERS

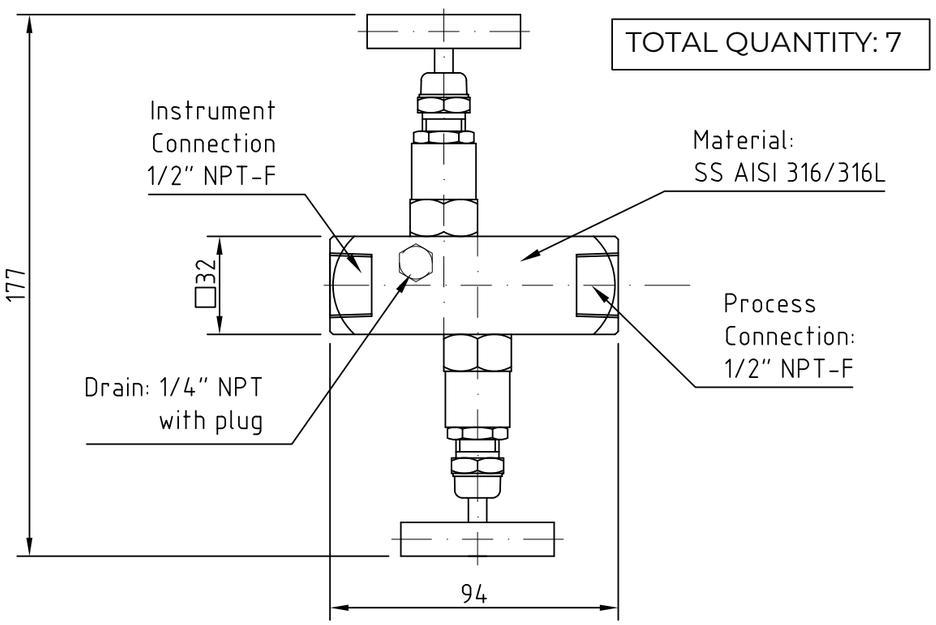


TAG LIST

#	TAG	RANGE	CALIBRATION
18	50-PT-014	0 ÷ 30 barg	0 ÷ 18 barg
19	63-PT-003	0 ÷ 30 barg	0 ÷ 11 barg
20	63-PT-004	0 ÷ 30 barg	0 ÷ 11 barg
21	64-PT-031A	0 ÷ 30 barg	0 ÷ 10 barg
22	64-PT-031B	0 ÷ 30 barg	0 ÷ 10 barg
23	64-PT-002	0 ÷ 30 barg	0 ÷ 10 barg
24	80-PT-002	0 ÷ 30 barg	0 ÷ 10 barg

TOTAL QUANTITY: 7

MAN2-R6 TWO WAYS AND TWO VALVES MANIFOLD



TOTAL QUANTITY: 7

NOTES

SST76 PRESSURE TRANSMITTERS
SST76-H-7-K-2-0-2-1-4 + MAN2-R6

H - OUTPUT: 4-20 mA + HART
7 - PROCESS CONNECTION: 1/2" NPT M;
K - NOMINAL RANGE: 0 ÷ 30 barg
2 - CALIBRATION: refer to TAG LIST TABLE
0 - DIAPHRAGM MATERIAL: SS AISI 316/316L
2 - OPTIONS: HOUSING MATERIAL STAINLESS STEEL WITH ELECTRICAL CONNECTIONS 2 x 1/2" NPT-F
1 - OPTIONS: MOUNTING BRACKET FOR 2" PIPE MOUNTING
4 - EXPLOSION PROTECTION 2014/34/EU: ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1G Ex ia IIC T6/T5/T4 Ga

to be coupled with:
1. MAN2-R6 TWO VALVES AND TWO WAYS MANIFOLD, MATERIAL SS AISI 316/316L, CONNECTION TO INSTRUMENT 1/2" NPT-F, PROCESS CONNECTION 1/2" NPT-F.

NOTES:
1. OVERALL ACCURACY OF PT (COMPREHENSIVE OF HYSTERESIS, NON-LINEARITY, REPEATABILITY) IS WITHIN +/- 0,07% FS;
2. ALL ITEMS ARE EQUIPPED WITH SS NAMEPLATE;
3. FILLING OF ELEMENT IS FORESEEN WITH DOW CORNING SILICONIC OIL;
4. ELECTRICAL CONNECTION ARE: 2 X 1/2" NPT-F (ONE PLUGGED);
5. INTEGRAL LCD /CONFIGURABLE ENGINEERING UNITS;
6. INGRESS PROTECTION EN 60529: IP66;
7. HOUSING MATERIAL STAINLESS STEEL;
8. ALL INSTRUMENT ARE SIL2/SIL3 CERTIFIED;
9. HART 6.

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. IP66 GRADE (EN/IEC 60529)
3. MATERIAL 3.1 (EN 10204) & HYDROTEST CERTIFICATES
4. CALIBRATION CERTIFICATES (IEC 60770)

REV	DATE	STATUS	PURPOSE OF ISSUE	PRE'D.	CHC'D.	APP'D.	AUTH'D.
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02	02/JULY/24	THIRD ISSUE	FOR CONSTRUCTION	M.Sani	G.Amendo	G.Molini	S.Valletti
01	13/JUN/24	SECOND ISSUE	FOR CONSTRUCTION	M.Sani	G.Amendo	G.Molini	S.Valletti
00	24/MAY/24	FIRST ISSUE	FOR APPROVAL	M.Sani	G.Amendo	G.Molini	S.Valletti

CROSSWIND ROSETTI MARINO

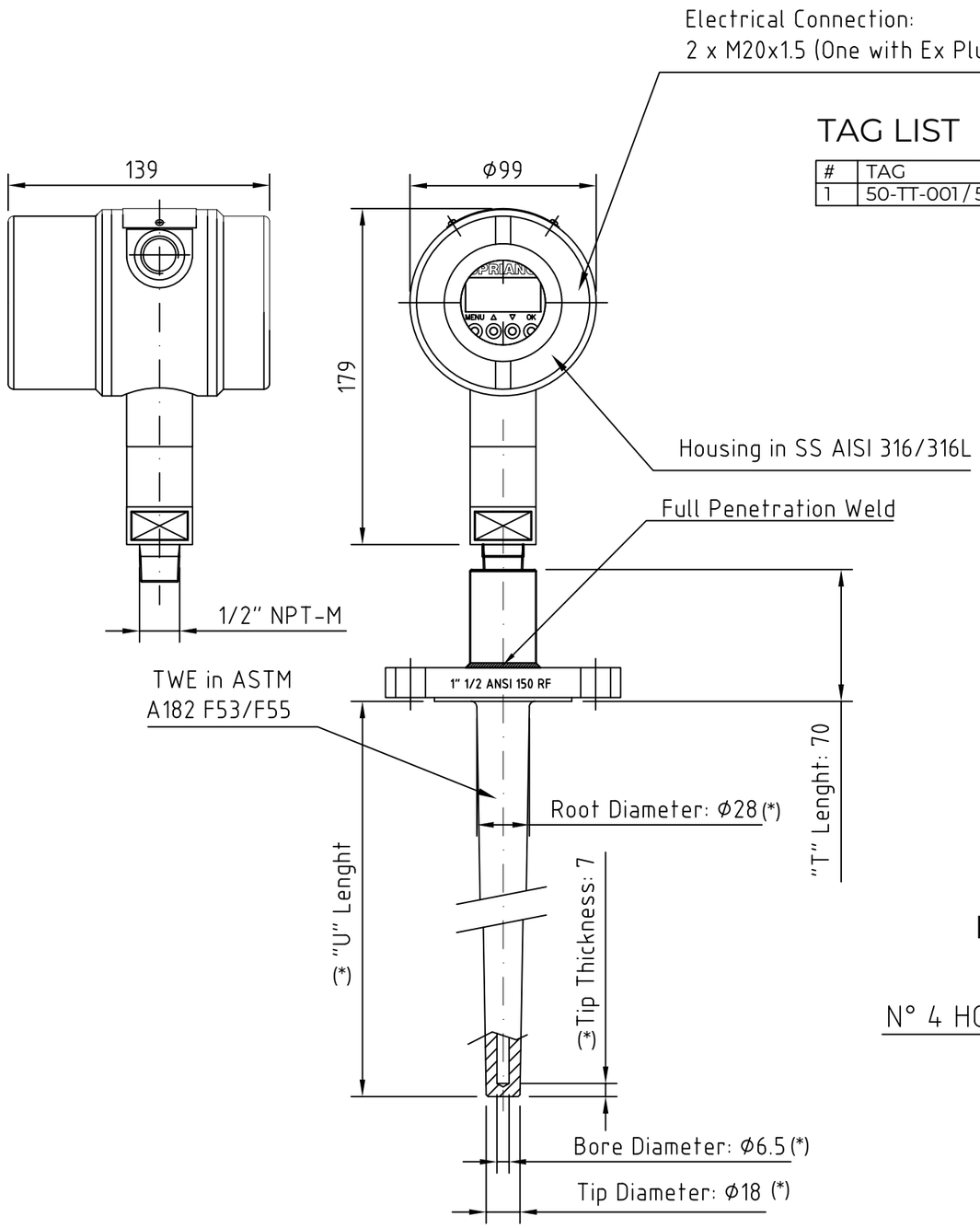
P.O. No.: 24/01611/PO | Mod_CAR_Rev17-01 | SCALE – 1:2

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DRAWING TITLE: DIMENSIONAL DRAWINGS

JOB: 4718_OS | SHEET No. 6 OF 10 | REV. 03

SST72 TEMPERATURE TRANSMITTERS

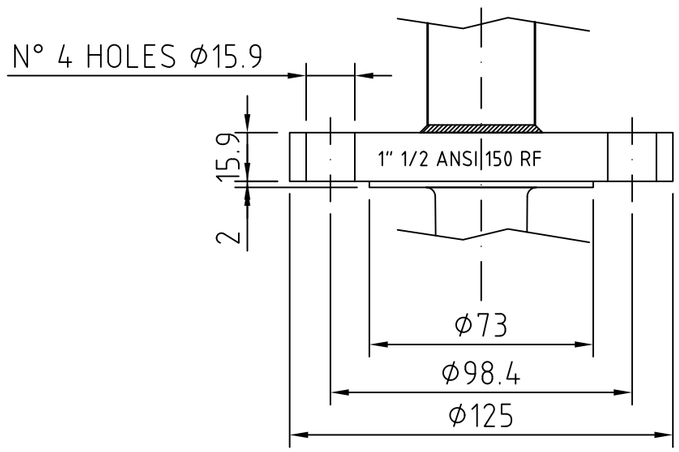


TAG LIST

#	TAG	CALIBRATION RANGE	"U" LENGHT
1	50-TT-001 / 50-TE-001 / 50-TW-001	0 ÷ 50 °C	220 mm

TOTAL QUANTITY: 1

PROCESS CONNECTION: 1" 1/2 ANSI 150 RF



(*) TWE dimensions will be confirmed after Wake Frequencies Calculation approval

NOTES

SST72 TEMPERATURE TRANSMITTER
SST72-TH-1-C-9-1-B-4-3 + TWE

TH - OUTPUT: 4-20 mA + HART
1 - PROCESS CONNECTION: 1/2" NPT-M, SPRING LOADED (PROBE Ø6mm)
C - TYPE OF SENSOR (EXTENSION PROBE): RIGID INOX MGO Ø6mm AISI 316
9 - CALIBRATION RANGE: 0 ÷ 50 °C
1 - RTD TYPE: CLASS A (SINGLE ELEMENT, 3 WIRES)
B - HOUSING TYPE/MATERIAL: BOTTOM CONNECTION, STAINLESS STEEL
4 - EXPLOSION PROTECTION 2014/34/EU: ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb
3 - LOCAL MOUNTING WITH ELECTRICAL CONNECTIONS 2x M20x1.5

COMPLETE WITH:
1. TWE, BARSTOCK THERMOWELL, MATERIAL: ASTM A182 F53/F55, FLANGED 1" 1/2 ANSI 150 RF.

NOTES:
1. OVERALL ACCURACY IS WITHIN +/-0,1% FS;
2. ALL ITEMS ARE EQUIPPED WITH SS 316 NAMEPLATE;
3. ALL ITEMS HAVE INGRESS PROTECTION EN 60529: IP66;
4. HOUSING MATERIAL: STAINLESS STEEL;
5. ELECTRICAL CONNECTIONS ARE 2 x M20x1.5 (ONE PLUGGED);
6. INTEGRAL LCD DISPLAY FOR ALL ITEMS, as PER SPRIANO STD;
7. SHEAT MATERIAL SS AISI 316;
8. HART 6.

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. IP66 GRADE (EN/IEC 60529)
3. MATERIAL 3.1 (EN 10204) & HYDRAULIC TEST CERTIFICATES
4. CALIBRATION CERTIFICATES (IEC 60770)
5. WAKE FREQUENCIES CALCULATIONS
6. DYE PENETRANT TEST ON THERMOWELLS

REV	DATE	STATUS	PURPOSE OF ISSUE	PRE'D.	CHC'D.	APP'D.	AUTH'D.
03	18/JULY/24	FOURTH ISSUE	FOR CONSTRUCTION	M. Soni	G. Amanti	G. Molini	S. Valletti
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01	13/JUN/24	SECOND ISSUE	FOR CONSTRUCTION	M. Soni	G. Amanti	G. Molini	S. Valletti
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CROSSWIND ROSETTI MARINO

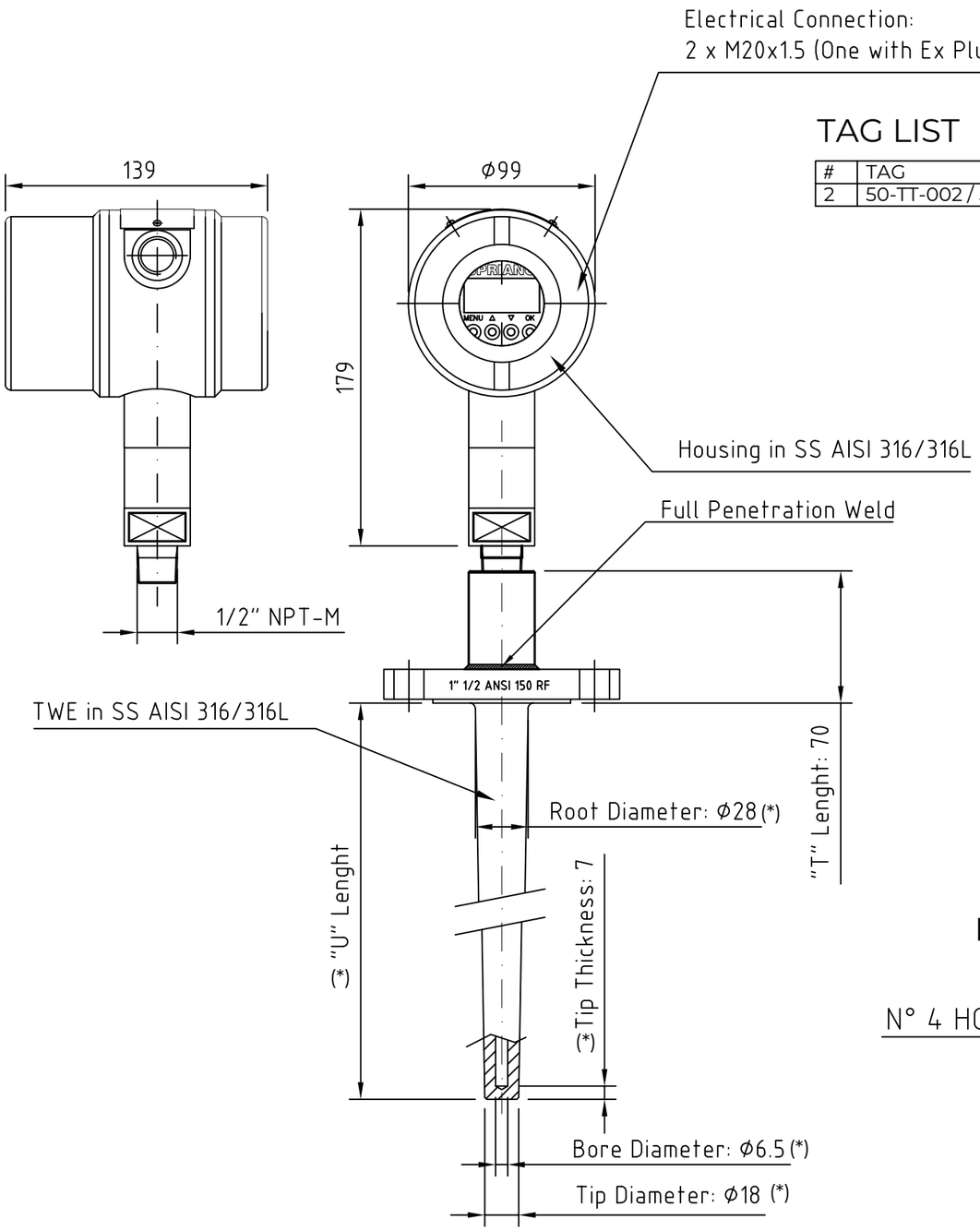
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DRAWING TITLE: DIMENSIONAL DRAWINGS

JOB:	4718_OS	SHEET No.	7 OF 10	REV. 03

SST72 TEMPERATURE TRANSMITTERS

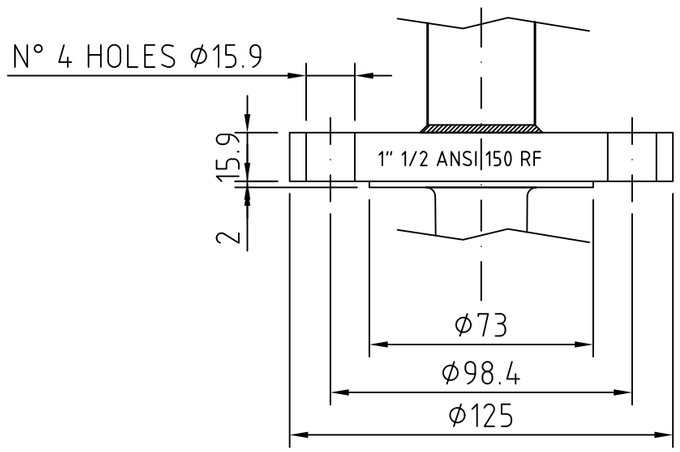


TAG LIST

#	TAG	CALIBRATION RANGE	"U" LENGHT
2	50-TT-002 / 50-TE-002 / 50-TW-002	0 ÷ 80 °C	220 mm

TOTAL QUANTITY: 1

PROCESS CONNECTION: 1" 1/2 ANSI 150 RF



(*) TWE dimensions will be confirmed after Wake Frequencies Calculation approval

NOTES

SST72 TEMPERATURE TRANSMITTER
SST72-TH-1-C-9-1-B-4-3 + TWE

TH - OUTPUT: 4-20 mA + HART
1 - PROCESS CONNECTION: 1/2" NPT-M, SPRING LOADED (PROBE Ø6mm)
C - TYPE OF SENSOR (EXTENSION PROBE): RIGID INOX MGO Ø6mm AISI 316
9 - CALIBRATION RANGE: 0 ÷ 80 °C
1 - RTD TYPE: CLASS A (SINGLE ELEMENT, 3 WIRES)
B - HOUSING TYPE/MATERIAL: BOTTOM CONNECTION, STAINLESS STEEL
4 - EXPLOSION PROTECTION 2014/34/EU: ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb
3 - LOCAL MOUNTING WITH ELECTRICAL CONNECTIONS 2x M20x1.5

COMPLETE WITH:
1. TWE, BARSTOCK THERMOWELL, MATERIAL: SS AISI 316L, FLANGED 1" 1/2 ANSI 150 RF.

NOTES:
1. OVERALL ACCURACY IS WITHIN +/-0,1% FS;
2. ALL ITEMS ARE EQUIPPED WITH SS 316 NAMEPLATE;
3. ALL ITEMS HAVE INGRESS PROTECTION EN 60529: IP66;
4. HOUSING MATERIAL: STAINLESS STEEL;
5. ELECTRICAL CONNECTIONS ARE 2 x M20x1.5 (ONE PLUGGED);
6. INTEGRAL LCD DISPLAY FOR ALL ITEMS, as PER SPRIANO STD;
7. SHEAT MATERIAL SS AISI 316;
8. HART 6.

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. IP66 GRADE (EN/IEC 60529)
3. MATERIAL 3.1 (EN 10204) & HYDRAULIC TEST CERTIFICATES
4. CALIBRATION CERTIFICATES (IEC 60770)
5. WAKE FREQUENCIES CALCULATIONS
6. DYE PENETRANT TEST ON THERMOWELLS

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P.O. No.: 24/01611/PO | Mod_CAR_Rev17-01 | SCALE – 1:3

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SPRIANO YorkCenter MEC-RELA
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DRAWING TITLE: DIMENSIONAL DRAWINGS

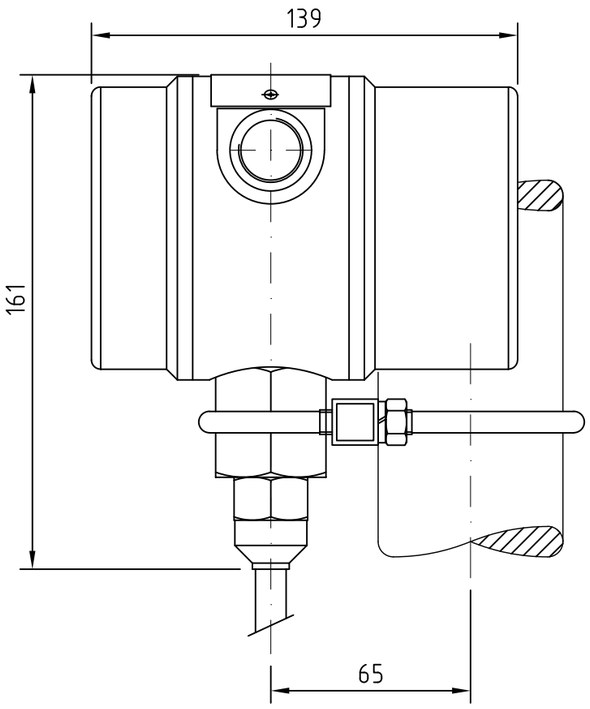
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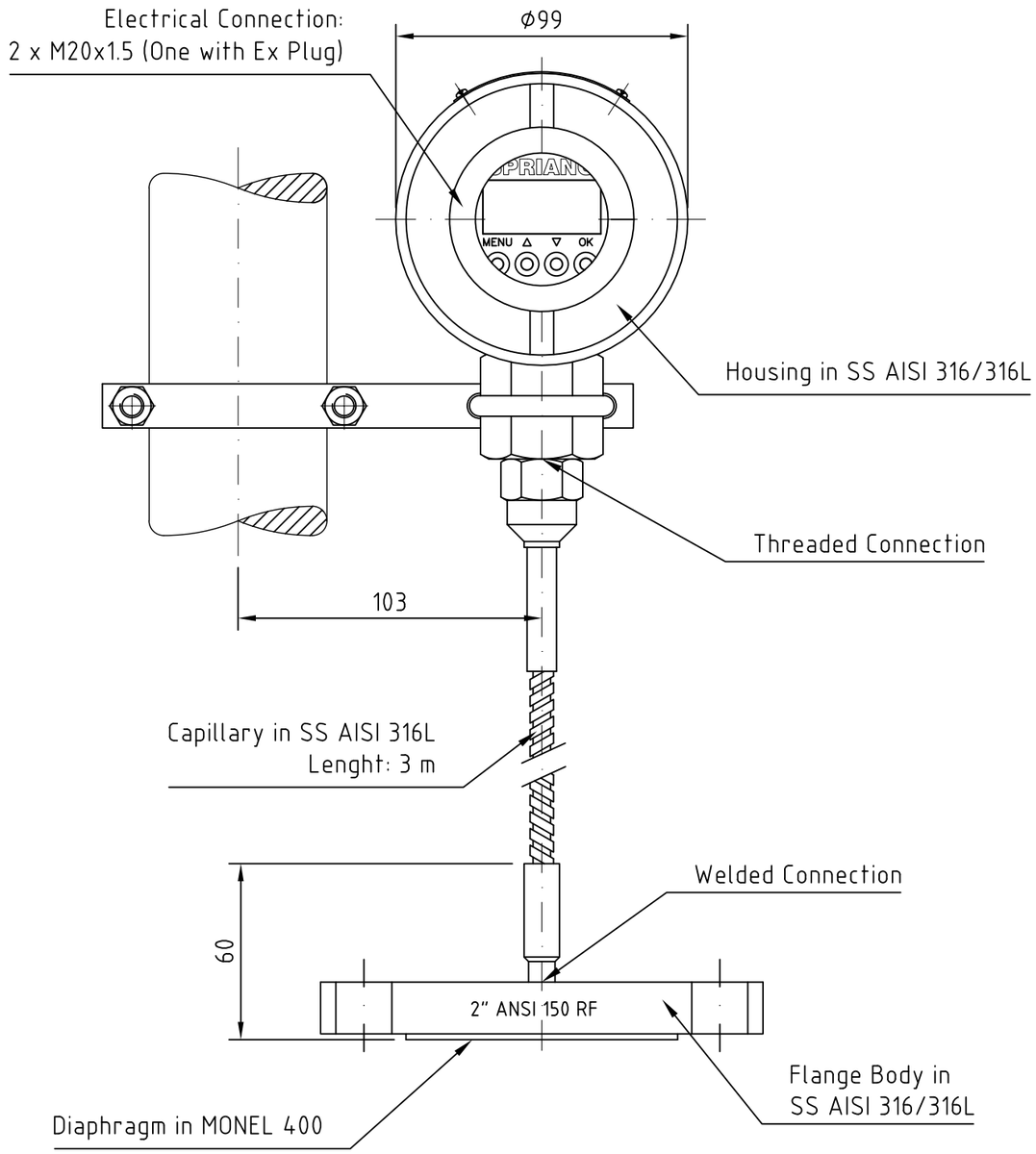
SST76 PRESSURE TRANSMITTERS

TAG LIST

#	TAG NUMBER	NOMINAL RANGE	CALIBRATION RANGE
1	50-PT-001	0 ÷ 30 bar	0 ÷ 18 barg
2	50-PT-002	0 ÷ 30 bar	0 ÷ 18 barg

TOTAL QUANTITY: 2





NOTES

SST76 PRESSURE TRANSMITTERS
SST76-H-7-K-2-9-2-1-4 + SEA03 + CAP-2-03

H - OUTPUT: 4-20 mA + HART
7 - PROCESS CONNECTION: FLUSH DIAPHRAGM SEAL 2" ANSI 150RF (SEA03);
K - NOMINAL RANGE: 0 ÷ 30 bar
2 - CALIBRATION: 0 ÷ 18 barg
9 - DIAPHRAGM MATERIAL: MONEL 400, BODY IN SS AISI 316/316L
2 - OPTIONS: HOUSING MATERIAL STAINLESS STEEL WITH ELECTRICAL CONNECTIONS 2 x 1/2" NPT-F
1 - OPTIONS: MOUNTING BRACKET FOR 2" PIPE MOUNTING
4 - EXPLOSION PROTECTION 2014/34/EU: ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1G Ex ia IIC T6/T5/T4 Ga

OPTIONS/ACCESSORIES:
1. SEA03 - FLUSH DIAPHRAGM SEAL 2" ANSI 150RF, DIAPHRAGM IN MONEL, BODY AND FLANGE RING IN SS AISI 316
2. CAP-2-03 - STAINLESS STEEL ARMOURED CAPILLARY, LENGTH 3m

NOTES:
1. OVERALL ACCURACY OF PT (COMPREHENSIVE OF HYSTERESIS, NON-LINEARITY, REPEATABILITY) IS WITHIN +/- 0,07% FS;
2. ALL ITEMS ARE EQUIPPED WITH SS NAMEPLATE;
3. FILLING OF ELEMENT IS FORESEEN WITH DOW CORNING SILICONIC OIL;
4. ELECTRICAL CONNECTION ARE: 2 X 1/2" NPT-F (ONE PLUGGED);
5. INTEGRAL LCD /CONFIGURABLE ENGINEERING UNITS;
6. INGRESS PROTECTION EN 60529: IP66;
7. HOUSING MATERIAL STAINLESS STEEL;
8. ALL INSTRUMENT ARE SIL2 CERTIFIED;
9. HART 6;
10. CAPILLARY IS WELDED TO INSTRUMENT PROCESS CONNECTION.

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. IP66 GRADE (EN/IEC 60529)
3. MATERIAL 3.1 (EN 10204) & HYDROSTATIC TEST CERTIFICATES
4. CALIBRATION CERTIFICATES (IEC 60770)

REV	DATE	STATUS	PURPOSE OF ISSUE	PRE'D.	CHC'D.	APP'D.	AUTH'D.
03	18/JULY/24	FOURTH ISSUE	FOR CONSTRUCTION	M.Soni	G.Aranda	G.Molini	S.Valletti
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DRAWING TITLE: DIMENSIONAL DRAWINGS

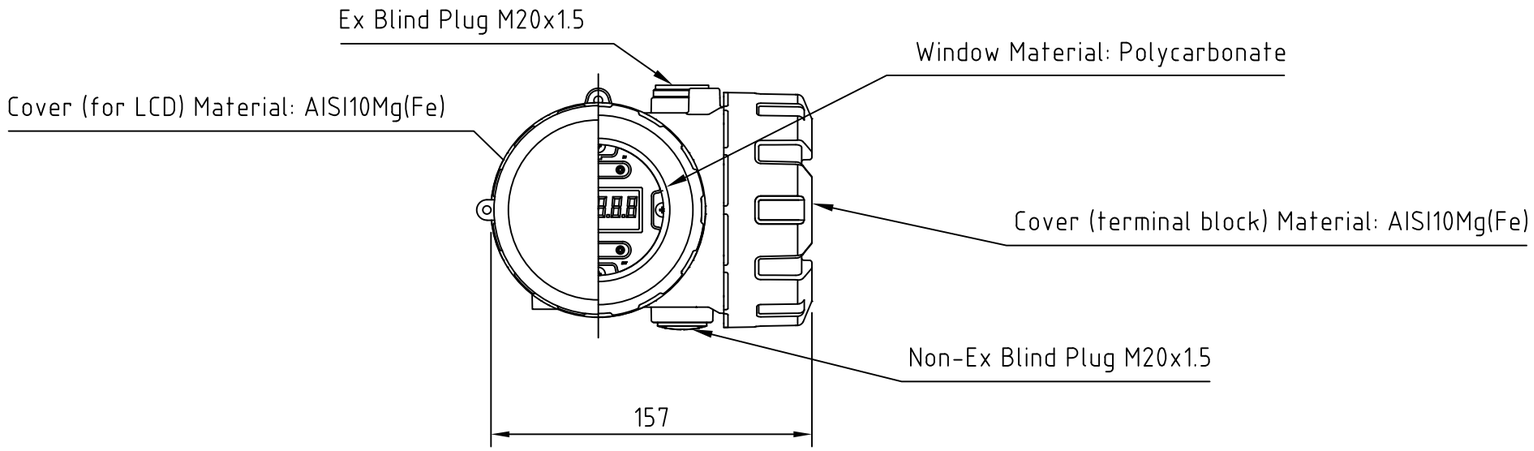
JOB:	4718_OS	SHEET No.	9 OF 10	REV. 03

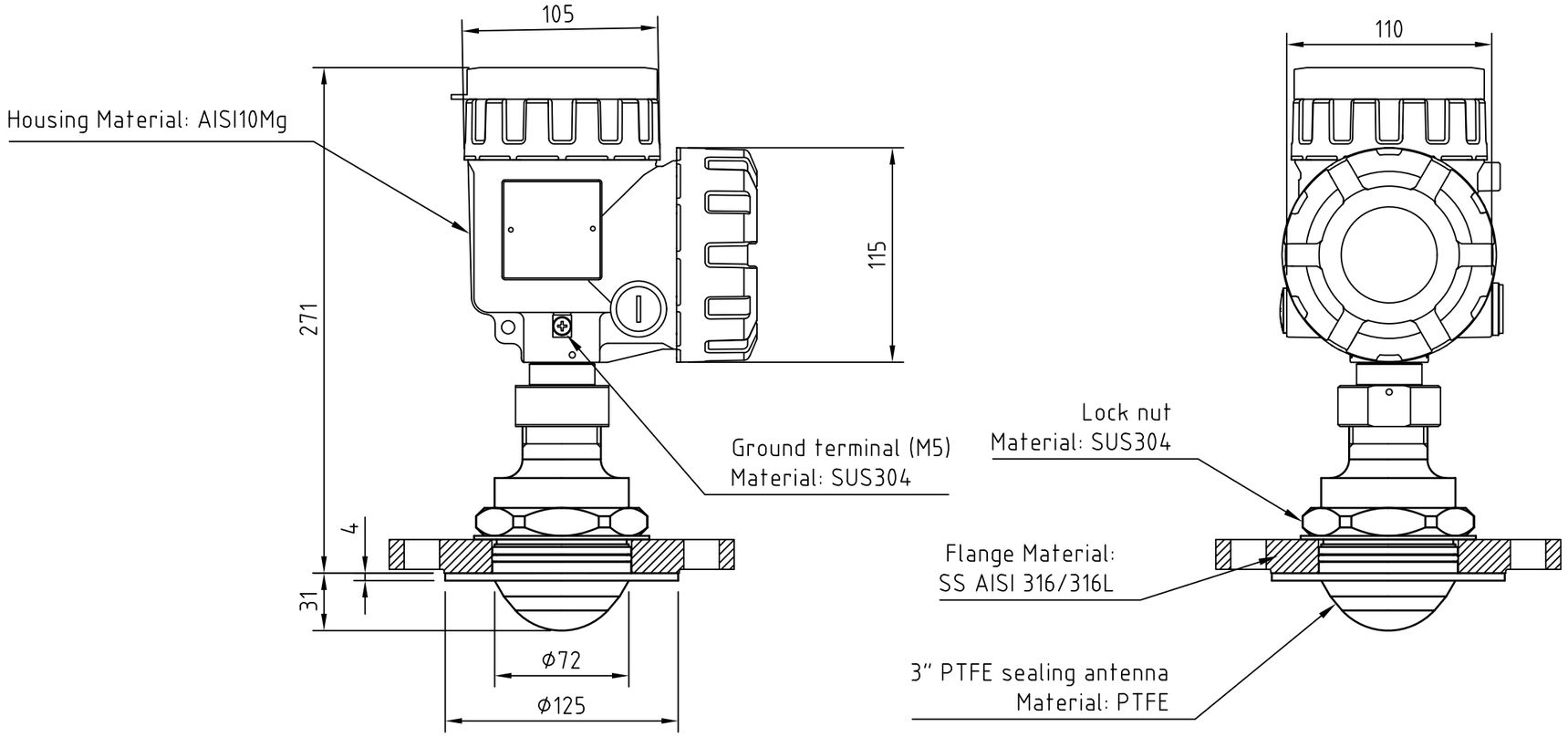
KRG RADAR LEVEL TRANSMITTER

TAG LIST

#	TAG	MEASURING RANGE	CALIBRATION RANGE
1	55-LIT-001	0 ÷ 5000 mm	0 ÷ 4660 mm

TOTAL QUANTITY: 1





NOTES

KRG RADAR LEVEL TRANSMITTERS
KRG-E-P3-R01-N-L-D08-F79-N00-N-D-V-81-A-R2-Z6

E = TYPE OF MEAUSURE: Level
P3 = TYPE OF SENSOR: 3" flush radar antenna (process connection 3" ANSI 150 RF)
R01 = MEASURING RANGE: 0 ÷ 5000 mm
N = OIL FILLING: No filling
L = TEMPERATURE: -40 ÷ 200° C
D08 = TYPE OF HOUSING: Aluminum painted Ø 105 mm
F79 = PROCESS CONNECTION: Flange DN 3" ANSI 150 RF
N00 = EXTENSION LENGHT: No extension
N = SENSOR MATERIAL: PTFE (Flange Material SS AISI 316/316L)
D = GASKET MATERIAL: FKM Viton (-15/+200 °C)
V = WETTED PARTS: PTFE Coating
81 = ELECTRICAL CONNECTION: Screwed 2 x M20
A = CURRENT 4÷20 mA 2 WIRES + HART (std 0,25% FS)
R2 = EX CERTIFICATION: ATEX Approval Ex-d
Z6 = 1 OPTIONS / ACCESSORIES: Display

CERTIFICATES

1. ATEX Ex-d CERTIFICATE (2014/34/EU)
2. MATERIAL CERTIFICATES 3.1 (EN 10204)
3. CALIBRATION CERTIFICATES (IEC 60770)

REV	DATE	STATUS	PURPOSE OF ISSUE	PRE'D.	CHC'D.	APP'D.	AUTH'D.
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P.O. No.: 24/01611/PO | Mod_CAR_Rev17-01 | SCALE – 1:3

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DRAWING TITLE: DIMENSIONAL DRAWINGS

JOB:	4718_OS	SHEET No.	10 OF 10	REV. 03

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Document Number: 1724000979-IN-MAN-00008

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
V. Barratta	04-09-2024

Document Class: 3

03	29/08/2024	Issue for Information (IFI)	MZ	GA	GO
02	29/07/2024	Issue for Information (IFI)	MZ	GA	GO
01	10/07/2024	Issue for Information (IFI)	MZ	GA	GO
00	07/06/2024	Issue for Information (IFI)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)
03	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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OPERATING and MAINTENANCE MANUAL for SST77B DIFFERENTIAL PRESSURE TRANSMITTERS

SST77B DIFFERENTIAL PRESSURE TRANSMITTER



ORIGINAL INSTRUCTIONS

SPRIANO®
TECHNOLOGIES

CE 1354

EU Declaration of Conformity

TERRANOVA® Srl

Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
declares on his sole responsibility that the product:

SPRIANO® Electronic Transmitters series

SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B, SST70-REM

(device controlling or regulating the limits of an industrial process, like pressure, level and vacuum)
satisfies the essential requirements and conformity assessment procedures of the following legislation:

Directive 2014/34/EU (ATEX)

EU TYPE CERTIFICATE: TI 17 ATEX 304 X

Equipment for use in potentially explosive atmospheres, suitable for Zones 0, 1, 2 (process side and external side)

II 1/2G Ex db IIC T6 Ga/Gb for use in the ambient temperature range –40°C to 60°C
II 1/2G Ex db IIC T5 Ga/Gb for use in the ambient temperature range –40°C to 80°C

Presumption of conformity provided by the application of the harmonised standards:
EN 60079-0:2012+A11:2013 - EN 60079-1:2014

The Notified Body NB 1354 Technicka inspekcia a.s. performed Module D, Annex IV, Directive 2014/34/EU and issued the Production Quality Assurance Notification. Periodical Surveillance is provided according to Annex IV, Point 4, Directive 2014/34/EU by the same Notified Body.

Directive 2014/68/EU (PED)

EU DESIGN EXAMINATION CERTIFICATE: 1292/1/2017-2÷8

Pressure equipment, up to Category IV, for fluids (gases, liquids and vapours) in Group 1.

Conformity provided by the application of the harmonised standard:
EN 13445-1:2015, EN 13445-2:2015, EN 13445-5:2015

The Notified Body NB 1354 Technicka inspekcia a.s. performed Module H1, Directive 2014/68/EU and issued the Production Examination Certificate. Periodical Surveillance is provided according to Directive 2014/68/EU by the same Notified Body.

Directive 2014/30/EU (EMC)

Equipment with an adequate level of electromagnetic compatibility.

Presumption of conformity provided by the application of the harmonised standard:
EN 61326-1:2006

Terranova dei Passerini, 04/08/2017

Mr Sergio Valletti,
General Manager

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WARNING!
Exclusively follow the instructions indicated in this document. Failure to comply with this document may cause injury to health or may damage the equipment.

SPRIANO® TECHNOLOGIES do not takes any kind of responsibility for damages due to failure to comply with this document.

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1 → INTRODUCTION

1.1 → PRODUCT OVERVIEW

Electronic transmitters series SST7X are apparatus which use a piezoresistive sensor for pressure, level and temperature measurement and transmit a current signal (4 ÷ 20mA) proportional to the variable measured. The series SST7X is composed by the following types:

SST77B	Differential pressure transmitter
SST70	Displacer level transmitter
SST71	Smart Float Level Transmitter
SST72	Electronic temperature transmitter
SST75	Absolute or relative pressure transmitter
SST76	Absolute or relative pressure transmitter with diaphragm
SST77BL	Level transmitter
SST79B	Immersion level transmitter
SST70-REM	4÷20mA loop powered field digital indicators (External local indicator)



MANDATORY!
The accessories used for the cable entries and to close unused shall be certificated according to the standards EN 60079-0 and EN 60079-1 for the gas groups IIC or IIB, according to the type of protection implemented.

1.2 → ATTENTION!

This manual does not contain information concerning all type of Transmitter or all different installation and/or working and mounting solutions. For more information or for particular problems not considered in this manual, please address to our technical office.
The warranty period is the one contemplated in our general servicing conditions. This warranty is neither increased nor restricted by the contents of this manual.
This Transmitter has to be installed and used only by qualified persons who have first checked the correctness of supply voltage so that both in standard working conditions and in presence of damages of the plant or of any part of it, no dangerous voltage can reach the Transmitter. As the Transmitter can be utilized both with high pressure values and with aggressive media it must be considered that an incorrect use of it could bring even serious damages to people and things. A correct and safe working needs an adequate transport, stock and mounting other than an appropriate maintenance service. So it is necessary for the people handling these Transmitter to have knowledge and experience in mounting, servicing and working and to have title to do their job with reference to “Safety Standards“.

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1.3 → DEFINITIONS AND SYMBOLS

In this manual are used the following symbols and labels:

	Equipment for use in potentially explosive atmospheres
II 1/2G	Equipment Group II Category 1/2G, suitable for potentially explosive area (gases, vapours or mists); to be installed in a separation wall between Zone 0 (process side) and Zone 1 (external side)
Ex d	Device with Explosion Proof Enclosure
IIC	Group IIC apparatus, fit for substances of group IIC, IIB and IIA (only when used in the ambient temperature range –40°C to 60°C)
IIB	Group IIB apparatus, fit for substances of group IIB and IIA (when used in the ambient temperature range –40°C to 80°C)
T6, T5	Temperature Class of the transmitter (maximum surface temperature) ➢ only when used in the ambient temperature range –40°C to 60°C ➢ only when used in the ambient temperature range –40°C to 80°C
Ga/Gb	Equipment to be installed in the boundary wall between an area requiring EPL Ga and the less hazardous area



WARNING!
Warning label, used to warn about hazardous materials, locations, or objects, including electric currents, poisons, and other things.



PROHIBITION!
Prohibition label, used to indicate something is not permitted.



MANDATORY!
Mandatory label, used to set obligation tasks to be performed by the user.



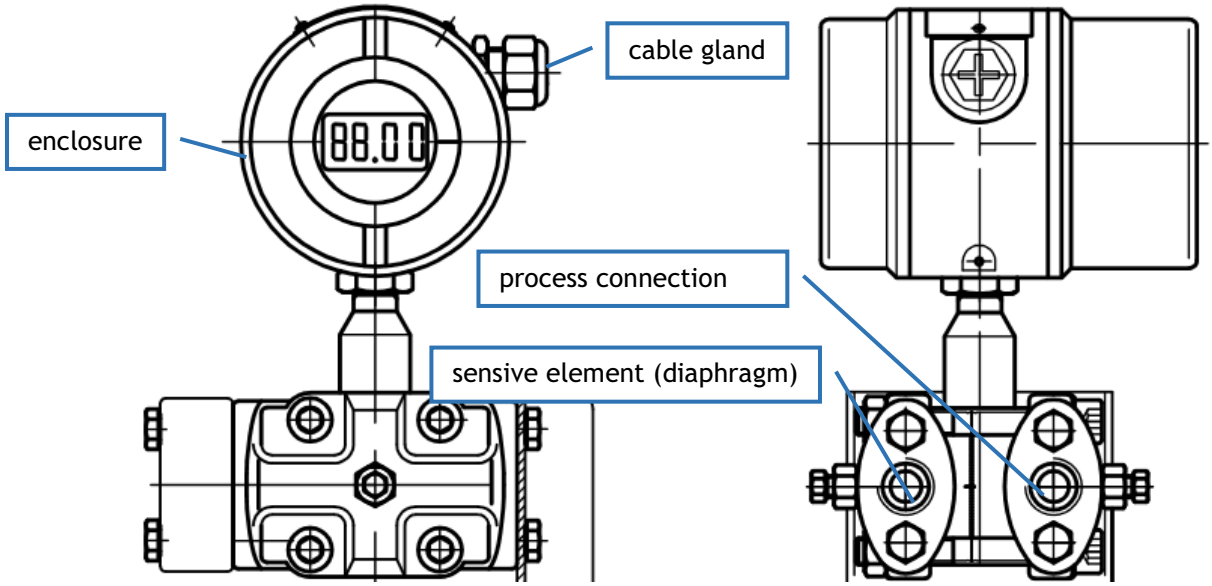
INFORMATION!
Information label, used to set general information for the user or warn about hazards for the equipment.

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2 → DESCRIPTION

SST77B series SMART differential pressure transmitters are microprocessor-based instruments that combine the analog signal advantages (4 - 20mA) together with the flexibility of digital communication using HART® protocol. They can be remotely configured by a universal hand held terminal (HHT) or by a PC with a dedicated interface.
Moreover, it is possible to locally configure the instruments (zero and span) by means of 4 push buttons and to display the data on the wide LCD display. The SST77B transmitters measure differential pressure with spans from 1,2 to 20000 mbar with a static pressure up to 200 bar. The pressure measuring element is a piezoresistive sensor. It is possible to choose a variety of sensors to satisfy all process conditions.
The **SPRIANO®** measuring cell contains the sensor and transmits pressure to the electronics. Thermal drift is compensated using the temperature signal generated by a PTC thermistor integrated in the sensor itself. Based on these readings the microprocessor generates the 4-20 mA analog output two wires system and displays the pressure measurement on the LCD.
Some of the main characteristics of this microprocessor-based transmitter, are:

- Wide rangeability;
- Automatic temperature compensation;
- Digital communication using HART® protocol.



NOM RANGE [mbar]	SPAN MIN/MAX [mbar]	RANGE LIMITS MIN/MAX [mbar]
0/18	1.2 / 36	-18 / +18
0/50	3.3 / 100	-50 / +50
0/350	23.3 / 700	-350 / +350
0/1000	66.7 / 2000	-1000 / +1000
0/2500	166.7 / 5000	-2500 / +2500
0/5000	333.3 / 10000	-5000 / +5000
0/10000	666.7 / 20000	-10000 / +10000
NOTE: Whenever an adjustment <10bar would be necessary, check if it is possible to do and create the atmospheric reference with a dedicated tube passing inside the supply cable.		

Figure 1: differential pressure transmitter SST77B

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3 → INSTALLATION

3.1 → TRANSMITTER IDENTIFICATION

Transmitter data can be found on the nameplate fixed on the top of transmitter enclosure (see 6 → MARKING). The Serial Number must be quoted at the occurrence of a specific request to the manufacturer.

3.2 → GENERAL MOUNTING REQUIREMENTS

Prior installation shall be observed following considerations:

- Check whether Transmitter's operating conditions are within the limits as reported in the nameplate, technical specifications sheets and/or label.
- Make sure that the operating conditions are compatible with the specification given to the manufacturer.



MANDATORY!

- For measurement in the presence of particularly hot liquids (e.g. steam) make sure that the Transmitter is supplied with a suitable finned arm.
- For viscous liquids or those containing solid particles in suspension make sure that the connection to the process is a suitable one in order to avoid clogs.



WARNING!

Direct sunlight may cause serious damages to the instrument.
Never install standard Transmitter under the sun or in any other location which could cause direct overheating through radiation.

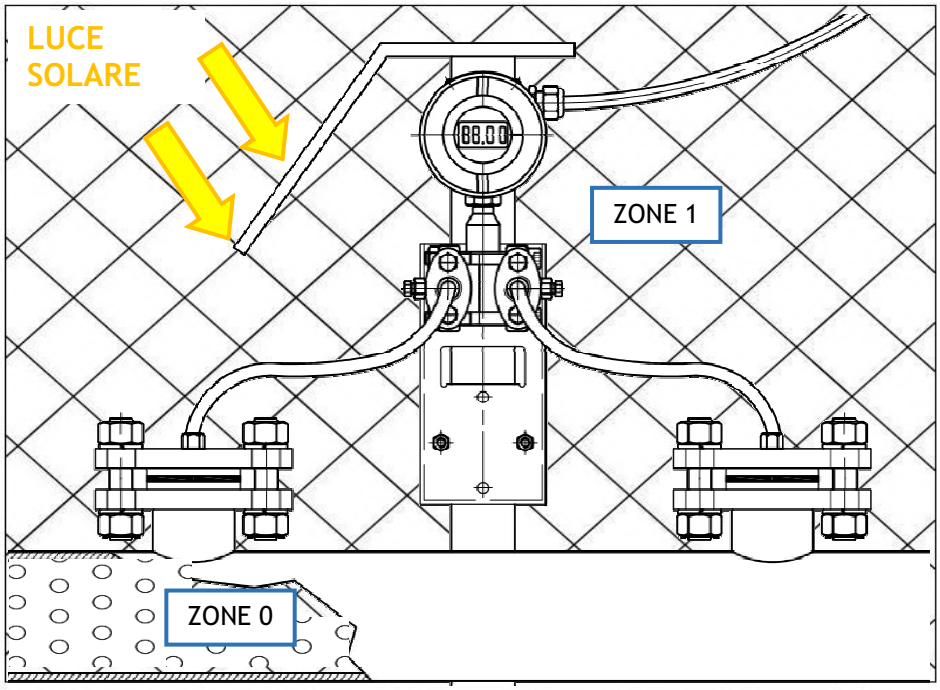


Figure 2: mounting requirements

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3.3 → MECHANICAL INSTALLATION

The Transmitter should be located, if possible, at some easily accessible, well lighted place on the vessel or pipe, in order to allow putting in operations and maintenance work. Location should also be such that ambient temperature at the Transmitter enclosure be not excessive (see 6 → MARKING).

INFORMATION!
- Plant overpressure / over-temperature: observe rating plate
- Installation on seismic areas: inform technical department
- In case of unstable fluids: inform technical department
- In case of damages: inform technical department
- Inspection frequency: consideration should be given to applicable national legislation.

WARNING!
- The process connection must be realized in such a way that guarantees the hold at the maximum working pressure and temperature.
- Do not overcome the maximum pressure and temperatures indicated in the technical data sheet of the selected model.
- When the device is connected to the process it can be submitted to high pressures and temperatures. To avoid accidents subsequent to sudden discharge of pressure and/or to contact with dangerous or flammable fluids it is necessary to take the maximum attention when the Transmitter is taken off, heated or repaired, verifying that it is isolated from the process and is not submitted to pressure and/or temperature.

3.4 → INSTALLATION FOR RELATIVE PRESSURE MEASUREMENT

The transmitters SST77B may be used for relative pressure measurements or level measurements in tanks or piping. In **Figure 3** the simplest mounting, direct on piping, is illustrated.

WARNING!
- Remember to introduce always a security valve in order to put in maintenance operations when necessary.
- When the connections are located on a vertical process line, the flow should be upward.

INFORMATION!
Figure 3, **Figure 4**, **Figure 5** and **Figure 6** show some of the installations recommended by ISO 2186 Standards. Refer to this Standard for more information.

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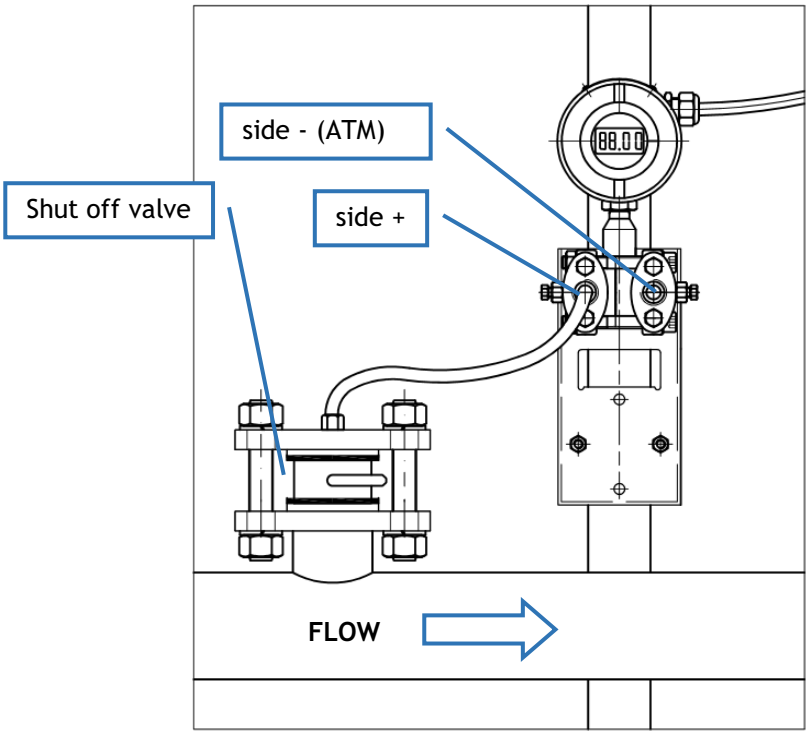


Figure 3: relative pressure measurements in piping lines

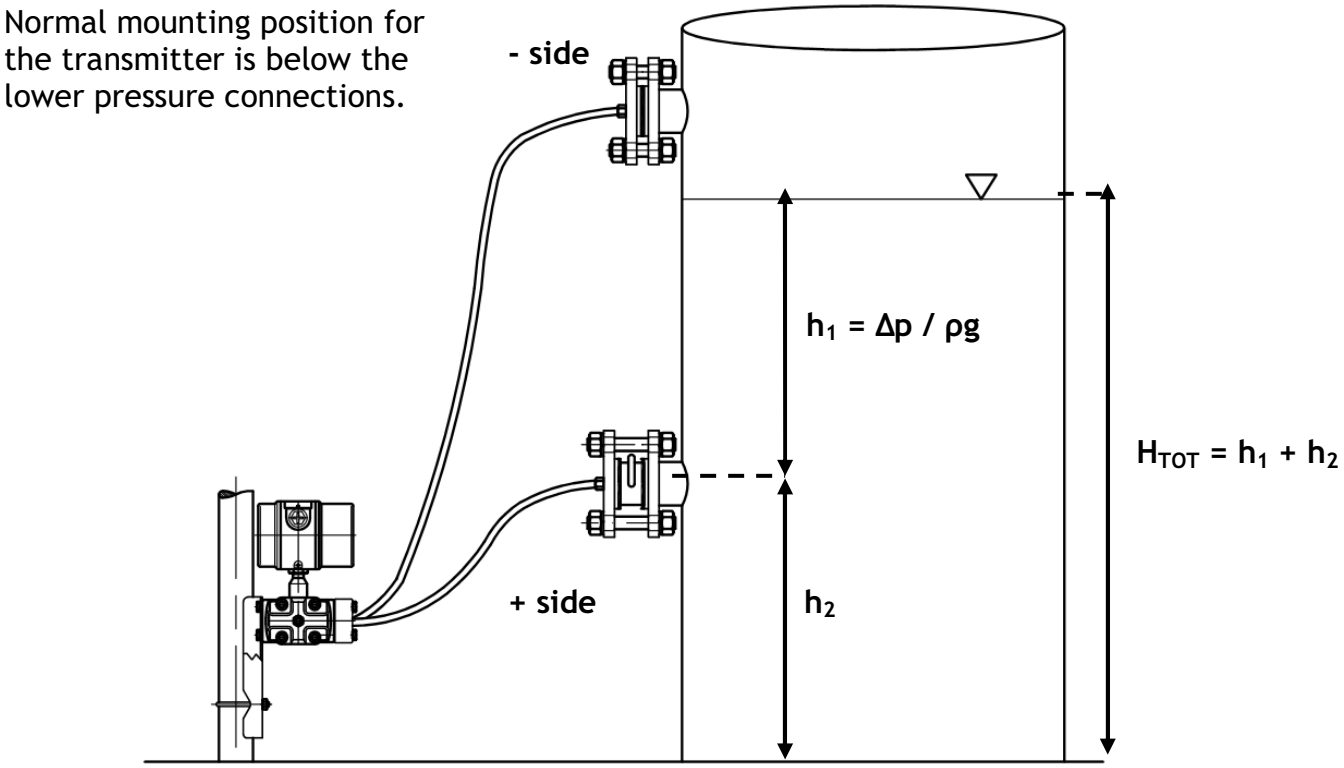


Figure 4: level measurements in open vessels

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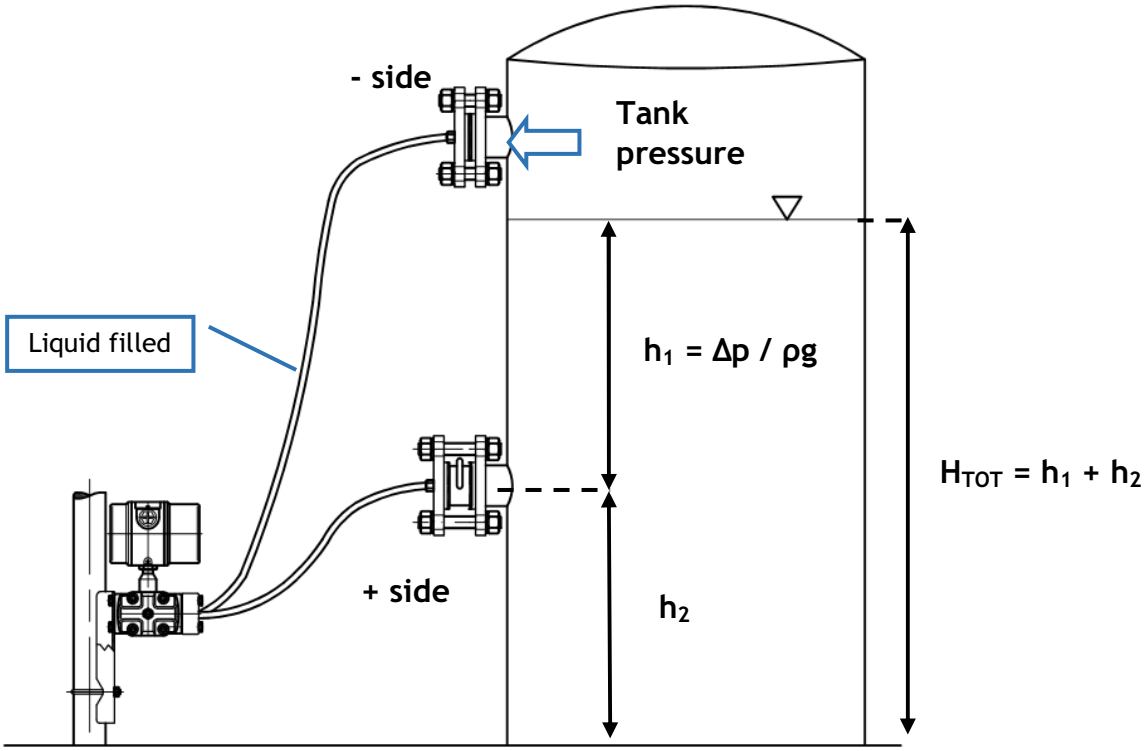


Figure 5: level measurements in closed vessels with corrosive vapors

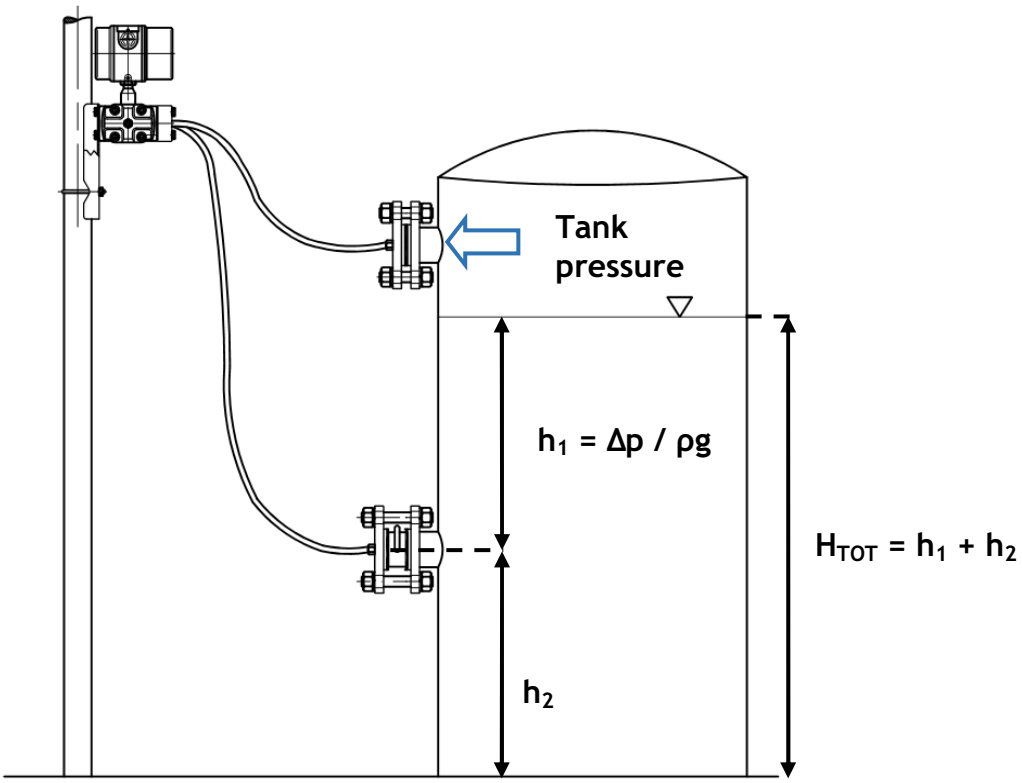


Figure 6: level measurements in closed vessels with dry and clean vapors

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INFORMATION!
- Referring to **Figure 5**: the descending pipes can be filled with condensate vapors of the process fluid or with suitable inert liquid to prevent direct contact with the transmitter diaphragm.
- Referring to **Figure 6**: the transmitter can be mounted above the process connections only when in service with dry and clean gas vapors without seal liquid.

MANDATORY!
- Pressure connections on model SST77 are marked with "H" ("+") and "L" ("-"); the higher pressure will be applied to "+" side.
- Always check carefully all manifolds, reducers if any, vents and drain plugs for leaks.

3.5 → INSTALLATION FOR DIFFERENTIAL PRESSURE MEASUREMENT

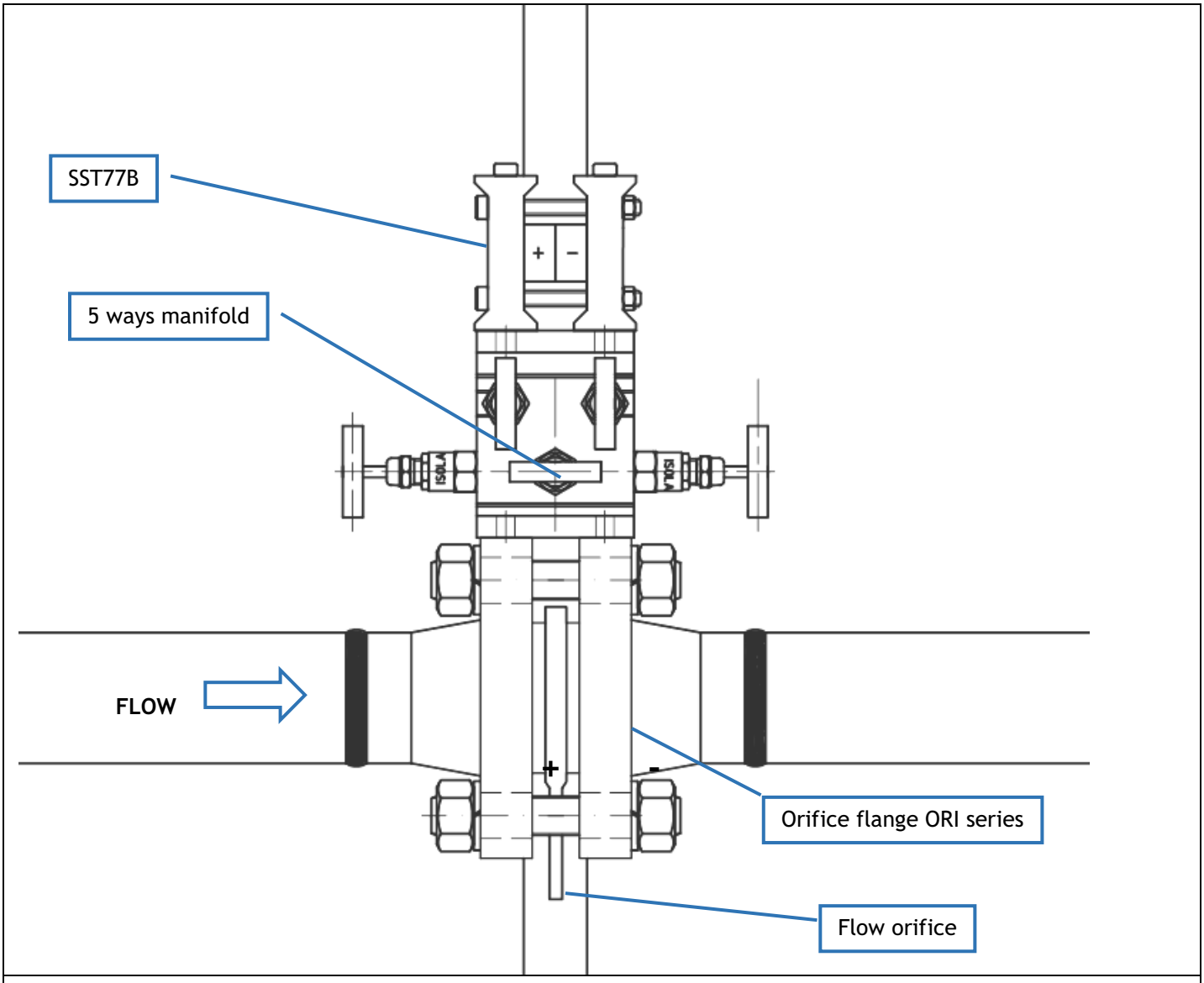


Figure 7: differential pressure measurements in piping

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MANDATORY!
- Always check carefully all manifolds, reducers if any, vents and drain plugs for leaks.

3.6 → ELECTRONIC HEAD ORIENTATION

In order to rotate the electronic head in the desired position you must follow these passages (**Figure 8**):

- unscrew the nut (A) with key CH.24;
- by hand gently rotate the enclosure (B) in the desired position;
- once the desired position is reached fix the nut (A) again with the same key.

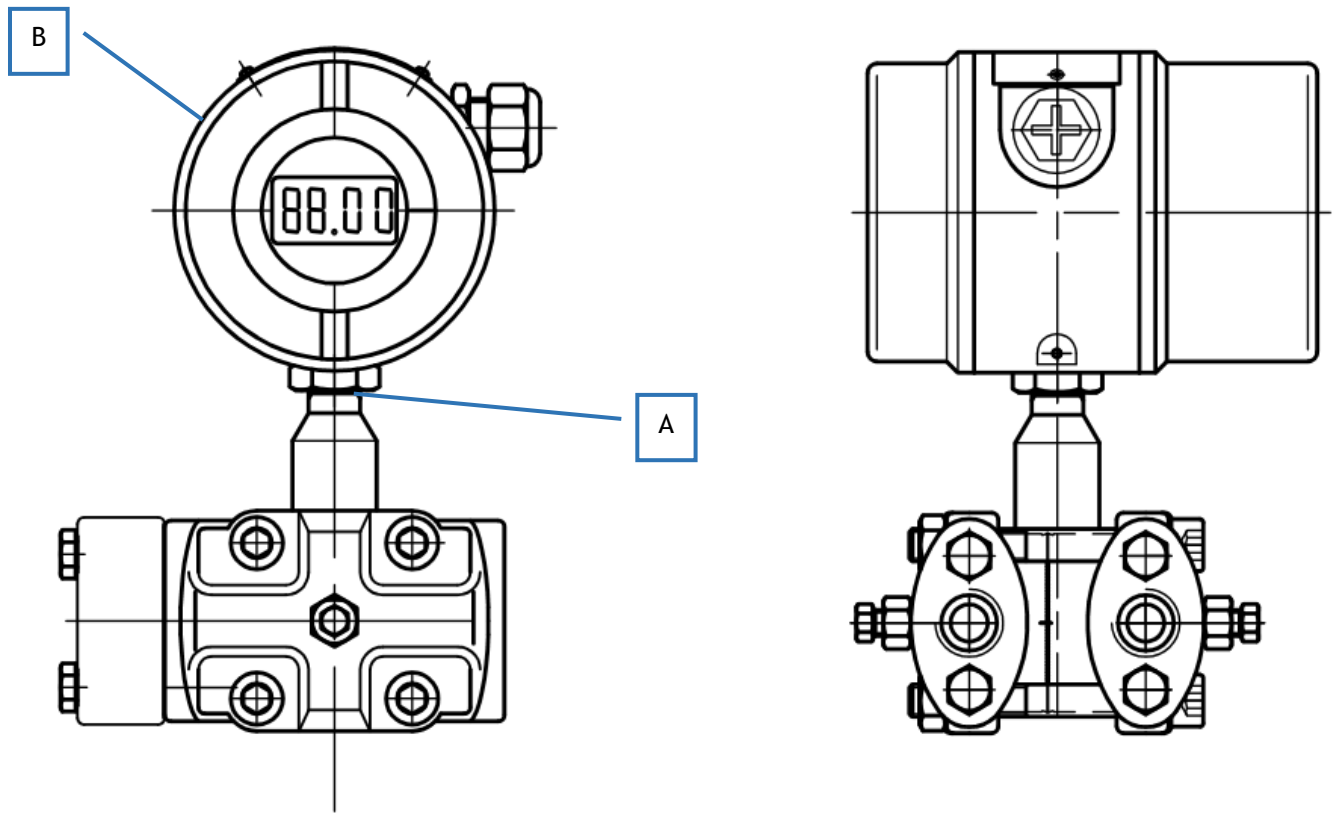


Figure 8: Rotating The Transmitter Head

INFORMATION!
It is not necessary to turn off the supply.

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3.7 → ELECTRICAL CONNECTION

Under the rear cap are placed the terminals reporting the electric polarity (**Figure 9**).
Insert the power supply cable into the enclosure through one of the two threaded openings. Transmitter is protected from accidental inversion of polarity. For a better use is recommended a twisted pair cable (22 AWG min). Avoid placing Transmitter near devices powered in AC or Switching. Connect ground-tap of the Transmitter to the local common earth (PE) as indicated in paragraph → Earthing .

WARNING!
The threaded opening that is not used must be sealed using a suitable cap. The caps included in the delivery are only for protection during transport.

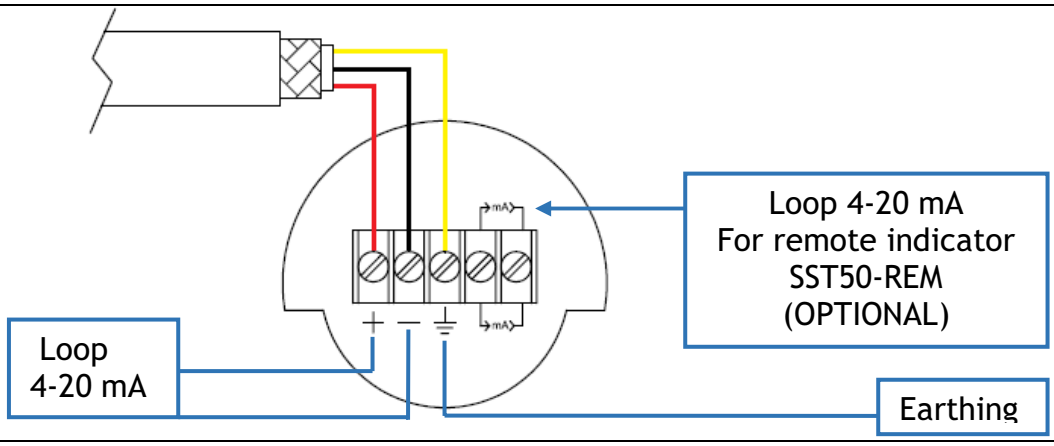


Figure 9: electrical connection of the power cable to the terminal block

INFORMATION!
Impedance of the cables defines the possible maximum length for digital communication. It's recommended using cable with a low impedance. The maximum length of the point to point connection, with a load of 250 ohm and single twisted cable 22 AWG-207 pF/m it's about 1000 meters.
The maximum connection length for the analog signal only is limited by the loads (connected devices and cable) present in the current loop.

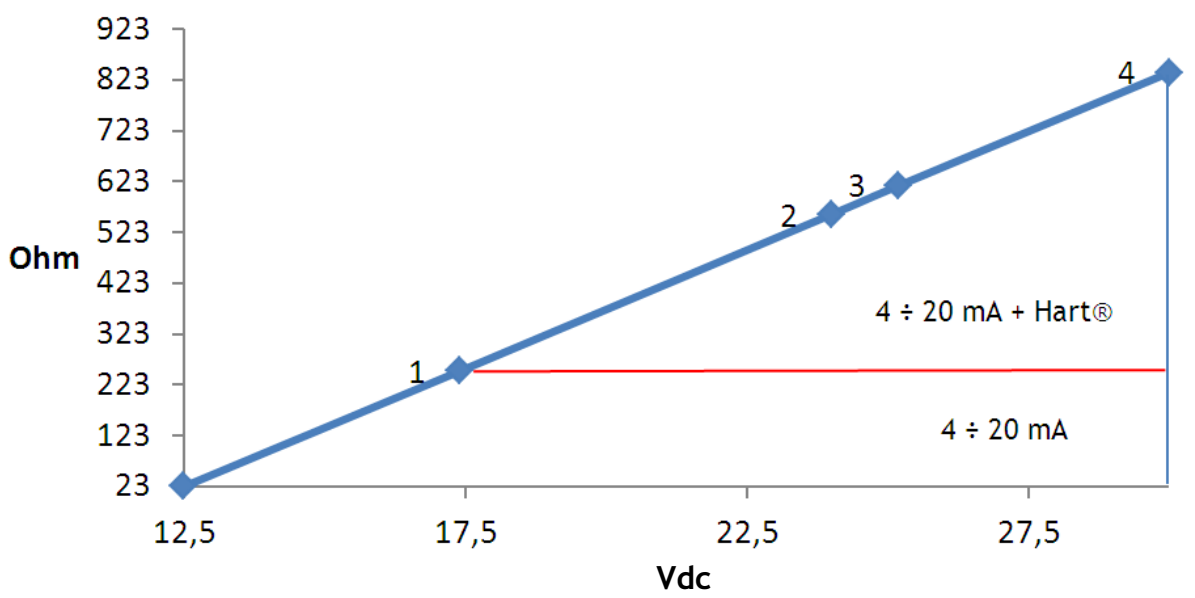
To obtain output signal of 4-20 mA, you have to determine the minimum supply voltage as a function of the load relation: see **Figure 10**. From the following formula you can achieve the right minimum value of supply voltage:

$$V_{dc} = 0.0215 \times R_L + 12$$

Where: R_L = output load [Ohm].
The power supply source must assure a minimum current value of 24 mA.

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MANDATORY!
In order to obtain a 4÷20 mA + Hart® output a minimum load of 250 Ohm is required.



TAG	-	1	2	3	4
Vcc	12.5	17.4	24	25.2	30
Ohm	23	250	558	615	837

Figure 10: operating area for Ex d protection

The electronic transmitters series SST77B are fully comply with the HART® protocol specification Revision 6.0, so they include remote process variable interrogation, parameter setting and diagnostics. The device is a 4÷20mA 2-wire transmitter, with FSK communication.
It is possible to read via HART® the following variables:

- **PV**: transmitter main measure;
- **SV**: % of the span;
- **TV**: analog output;
- **FV**: sensor temperature.

Please refer to **Figure 11** for the Hart® modem connection on transmitter's 4÷20mA loop.
In **Figure 12** the multidrop connection type is shown.
It is possible to purchase the Hart Server as an additional product; this is a software including all the interrogation, configuration and diagnostics functions required by the Hart® specifications.

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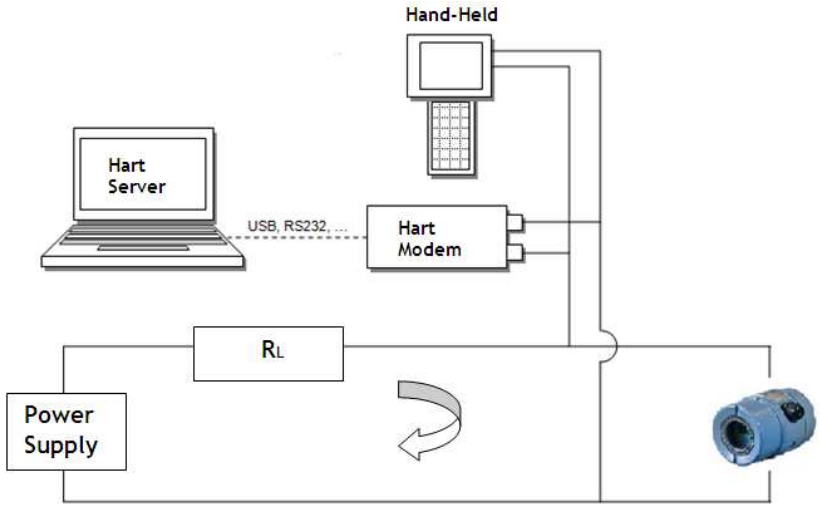


Figure 11: 4÷20 mA + Hart® modem connection

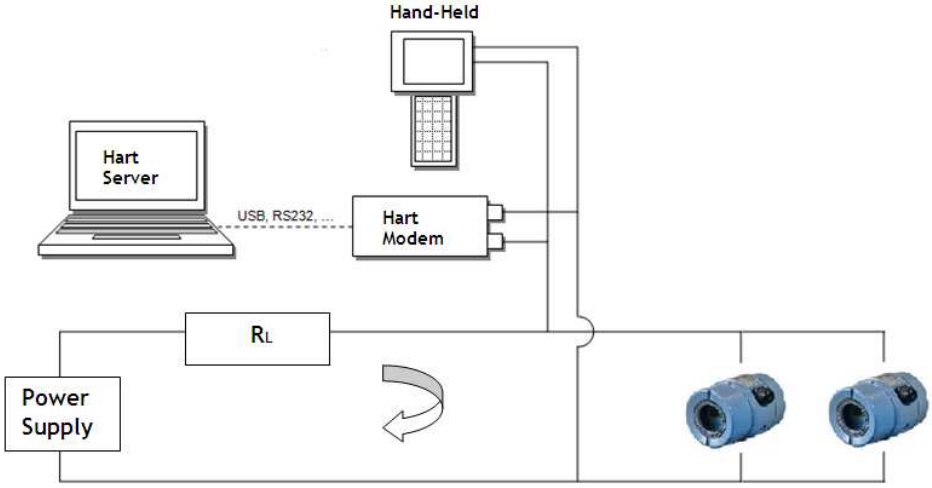


Figure 12: Only HART® multidrop connection

INFORMATION!
At maximum 15 transmitters could be connected in parallel on the same line.
Attention: when more transmitters are connected on the same line the current standing on the resistor (250 Ω) is equal to

4mA x N of connected instruments.

This could cause a high electric potential. Be sure power supply is sufficient.

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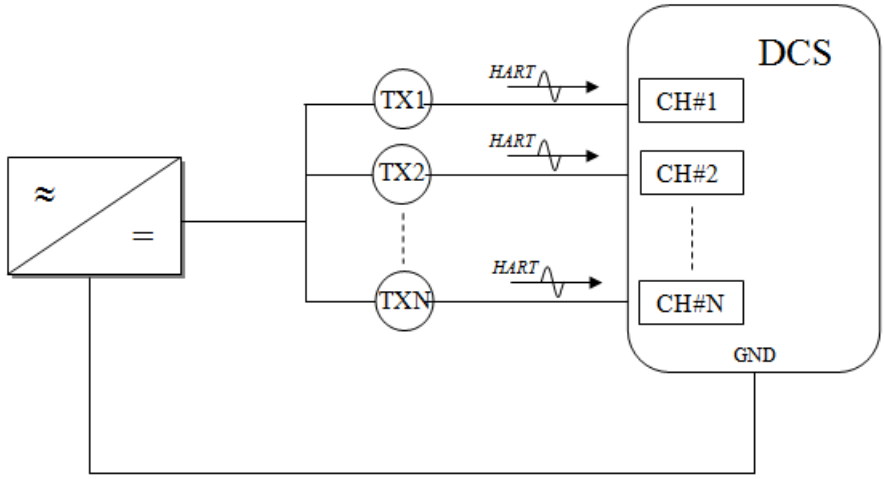


Figure 13: DCS connection

MANDATORY!
Transmitter response time is <256ms.
DCS POLLING time must be set approximately at 800ms in order to avoid updating problems both in analog and digital measurement.
On request the transmitter can be supplied in order to support a Polling time of 500ms but with a minimal consumption of 5 mA.

3.8 → EXPLOSION PROOF PROTECTION

In case of use in areas with danger of explosion, it must be verified that the identified type of transmitter fits for the classification of the zone and for the presence of flammable substances in the plant (see 6 → MARKING).
The safety essential requisite against the risk of explosion in the classified areas are fixed from the European Directives 2014/34/EU of 26 February 2014 (as far as it concerns the 'Equipment') and 1999/92/EC of December 16th 1999 (as far as it concerns the 'Working Environment').

WARNING!
For the electrical connections please follow the instructions brought in this operator manuals taking care that for the use in classified areas it is necessary to foresee the standard EN 60079-14.
The accessories for cable entry (which must be threaded ½" NPT) must be certified following the Standards EN 60079-Series (for Tamb >70°C must be certified for T > 90°C).

PROHIBITION!
Do not open the covers or any part of the device in dangerous area when circuit alive.
For explosion proof safety installation, it is mandatory to disconnect the electric supply before opening the device.

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3.9 → EARTHING

WARNING!
The earth connection is required to prevent damage to people and malfunction of the instrument.

- **Case 1: Installing the instrument in a plant devoid of earthing systems**

In the case where the plant devoid of earthing, it is necessary to connect the earth wire to the terminal block through the cable that carries the signal and the power supply (**Figure 9**).

- **Case 2: Installing the instrument in a plant provided with earthing systems**

Make sure the earthing (GND) of the system has the least resistance possible.
You can add an additional earth wire with section not less than 4 mm^2 to ensure such connection.

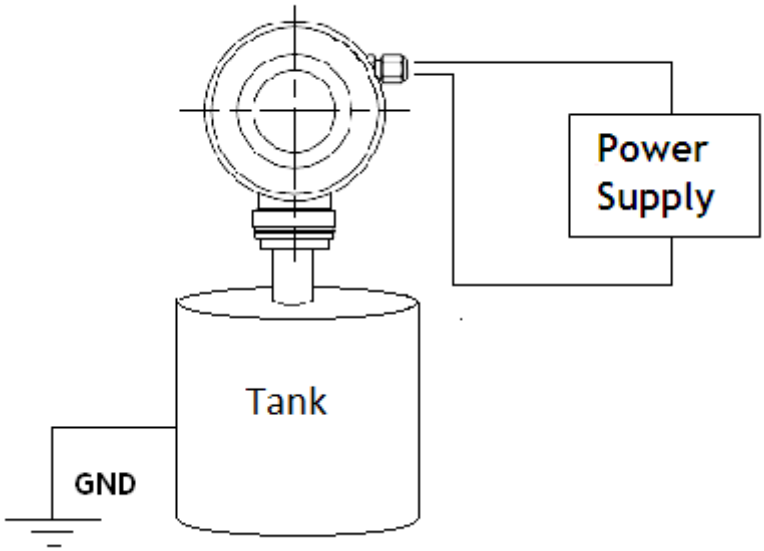


Figure 14: 4 ÷ 20 mA loop connection with plant provided with earthing systems

WARNING!
In the case represented in **Figure 15**, within the earth wire may also scroll through the current protection of other instruments where the earthing of the system (GND) had not been carried out in an optimal manner.

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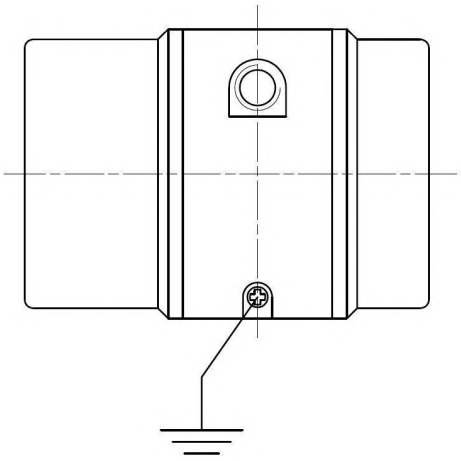


Figure 15: earthing in the housing

WARNING!
The hose must not be considered as a protection against electric shock for the protection of security, but as protection against electromagnetic interference of the instrument. Therefore, in the case of long distance cable (L> 20 m), both ends of the braid must be connected to the chassis or to the connectors. In the case of cables L <20 meters, will be sufficient to connect the braid only from the side "Power Supply".

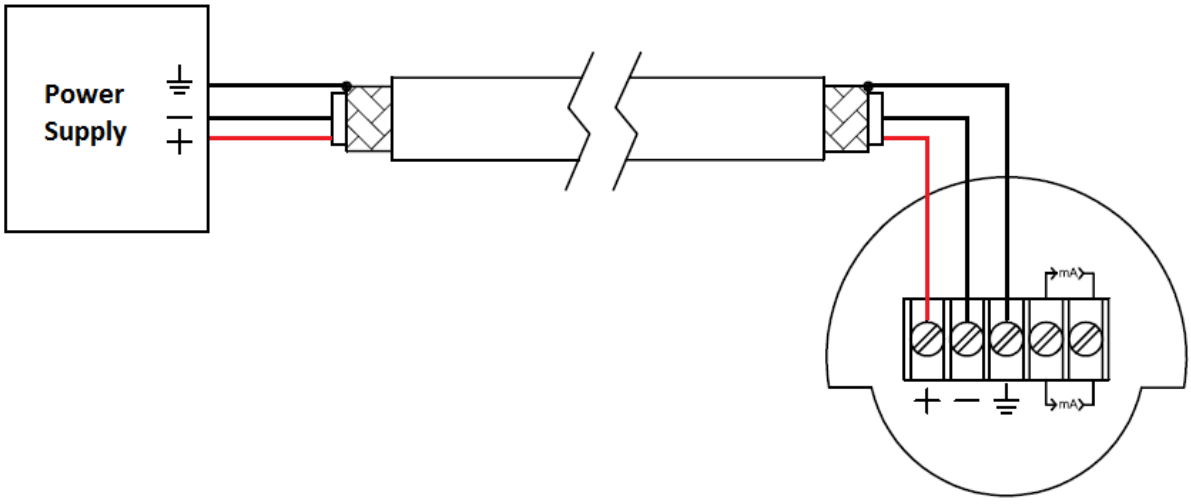


Figure 16: earthing of the sock for cables longer than 20 meters

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4 → OPERATIONS

Each transmitter is calibrated in factory and has on the nameplate the configuration data. If not differently stated in the purchase order the transmitter is configured as follow:

Upper Range Value (Highest pressure value): refer to the data sheet of unit
Lower Range Value (Lower pressure value)**:** refer to the data sheet of unit
Damping **0 sec**.

4.1 → CONFIGURATION

The transmitter shows the status and the measure on the dot matrix LCD (**Figure 17**). The span is from -99999 to 999999.
The input signal to the transmitter can be related to the output signal in the following ways:

Direct mode = 4 ÷ 20mA output
Reverse mode = 20 ÷ 4mA output

The direct mode is obtained by setting the lower range point with the lowest value of the range (e.g. 0.1 bar) and by setting the upper range point with the highest value (e.g. 0.5 bar). The reverse mode is obtained by setting the lower range point with the highest value of the range (e.g. 0.5 bar) and by setting the upper range point with the lowest value (e.g. 0.1 bar).
The instrument can calculate different variables. From the main screen (where the current measure is shown), you can select, using the buttons ⇩ **Next Page** and ⇧ **Previous Page**, the desired variable to keep on the display. There are available the following variables:

- PV;
- Flow Measure (based on PV);
- Percentage;
- Current
- Sensor temperature;

The selected variable is saved and retained even after the instrument is restarted. So, if you want a different variable, then you have to select it again.

SECTION LEAVED INTENTIONALLY BLANK

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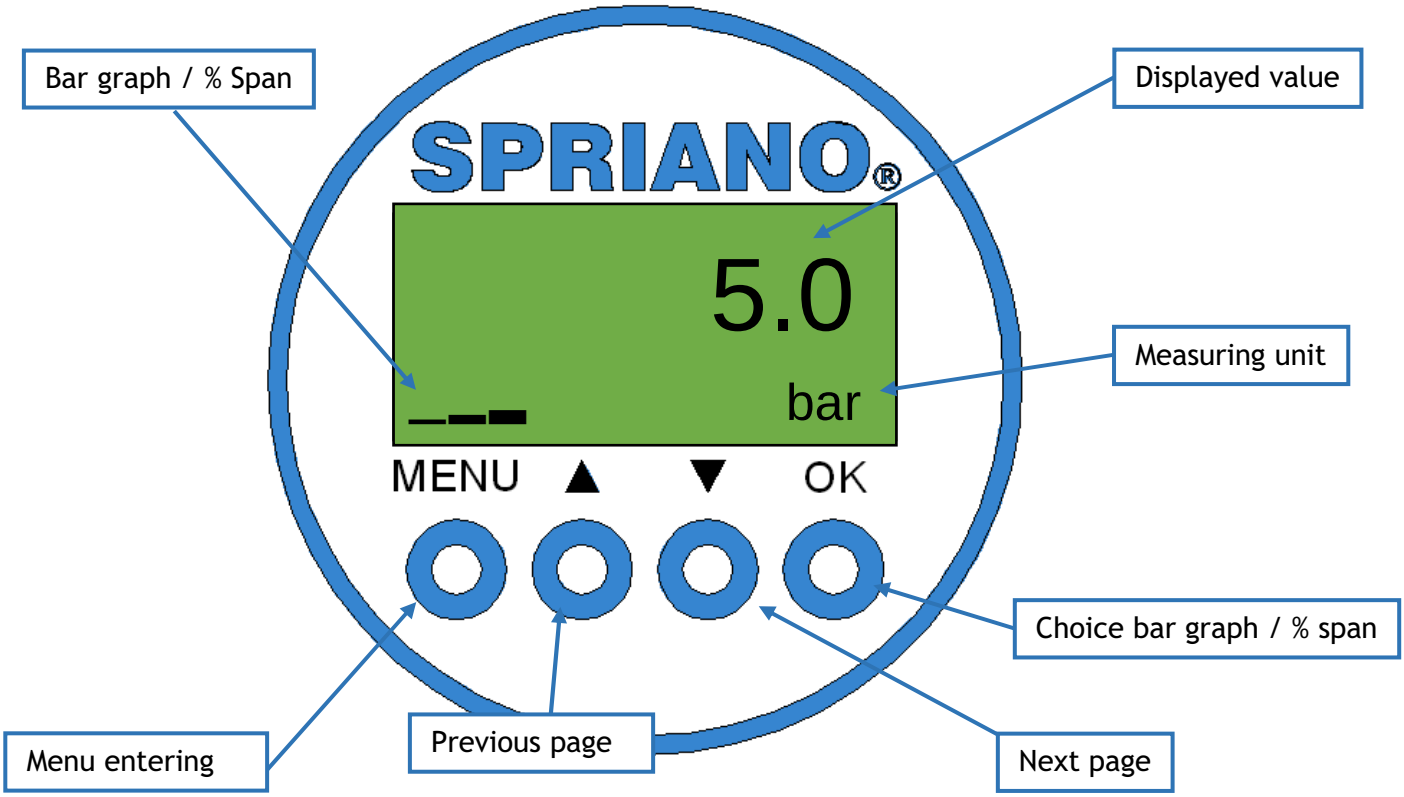


Figure 17: SST77B display

It will be possible to display one of the following variables on the screen:

PRESSURE (PV) 234 mbar	FLOW MEASURE 2.83 m3/h
PERCENTAGE (SV) 74.73 %	CURRENT (TV) 14.290 mA
SENSOR TEMPERATURE (FV) 24.2 °C	

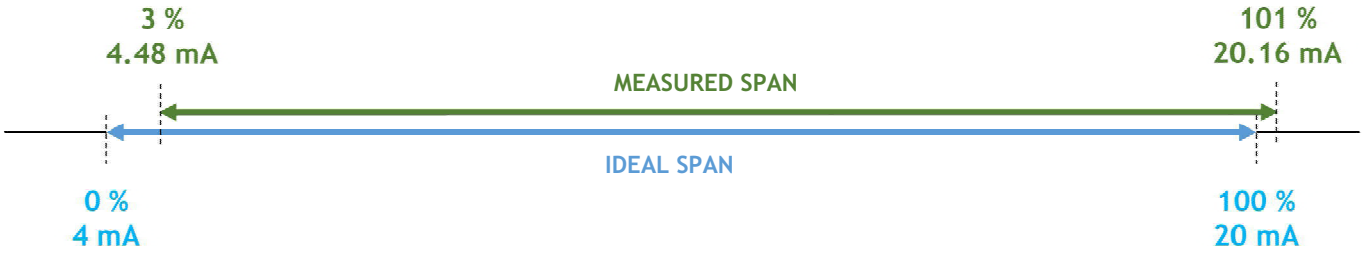
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4.2 → SPAN ADJUSTMENT

It is possible to setup, using the configuration menu (Keyboard Configuration), the zero value. Afterwards, it will be possible to adjust the translated span, by setting the measurement at URV value using SET S. URV command.

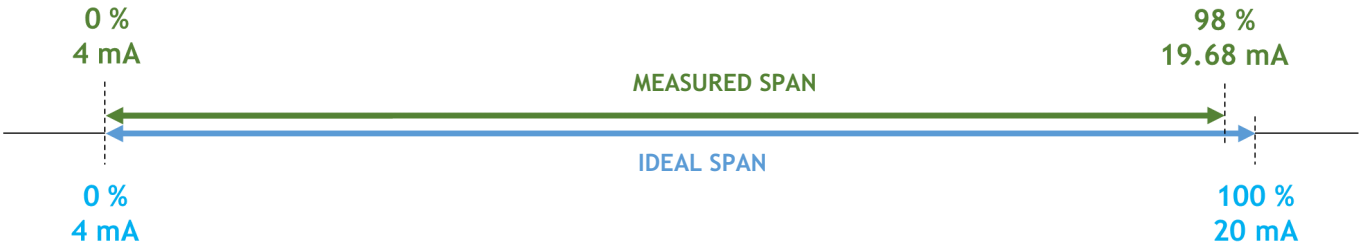
Initial measurement

The entire span is moved and resized.



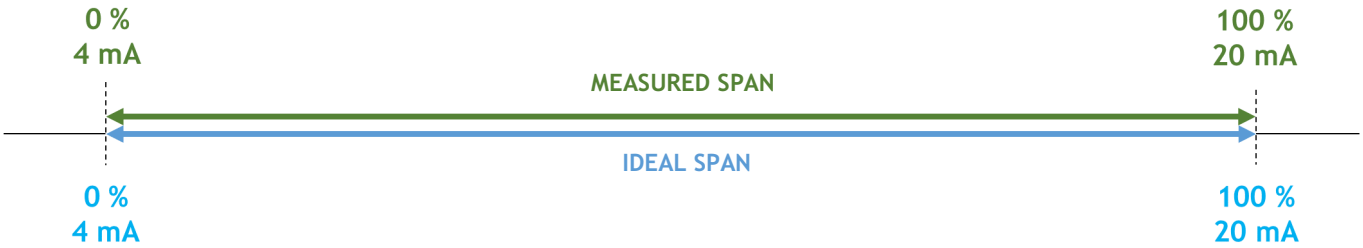
With measure at Zero

Perform an **OFFSET** operation. The zero value is adjusted correctly, but the span must be resized:



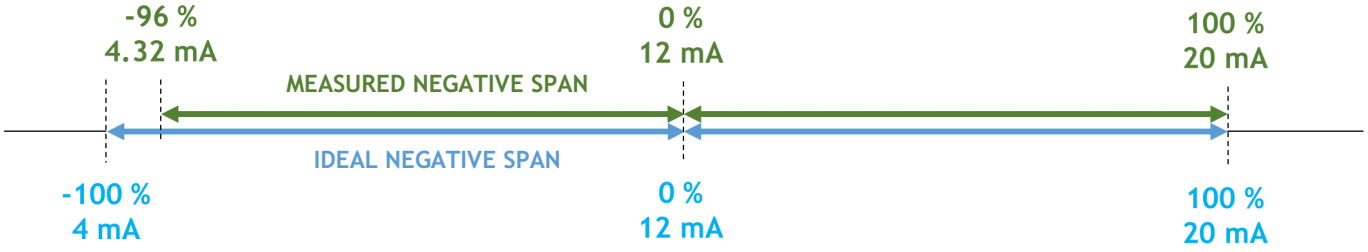
With measure at Maximum

By performing a **SET S. URV** (Set Span URV) operation, you can scale the span so that the current value is resized to be identical to the URV value.



OPTIONAL: Negative side Span Adjustment

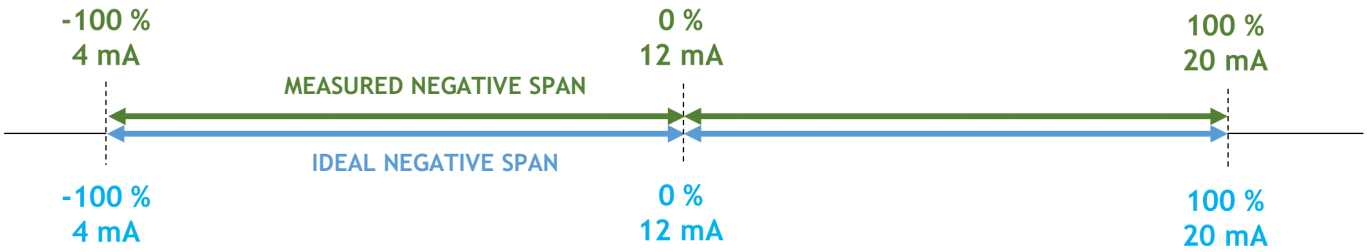
As an advanced feature, it will be possible to adjust the translated span of the negative span (when LRV is below zero). First configure the positive span side, as described above. Then you can experience a negative span side as below:



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With measure at Minimum

It is possible to set the measure at LRV value using the SET S. LRV command:



INFORMATION!
To restore any unwanted change it is possible to select the RESTORE function in the menu or simply reset the SPAN URV and SPAN LRV value to the default value of 1.0.

4.3 → KEYBOARD CONFIGURATION

The electronic transmitters have some configuration functions available via keyboard and LCD display, provided with the transmitters themselves.

- Press the [MENU] button to enter the password entering dialog (the default password is 0000). Confirm by [OK] to enter the configuration menu.
- The display will allow to choose from the different functions described in the table below. Use the ⇧ and ⇩ buttons to show the sequence of the available functions and press [OK] to confirm the selected function.
- When the display is in numerical entering mode, the cursor will blink.
- To move the cursor press the ⇩ button; to raise the value of the digit press the ⇧ button. Press the [OK] button to confirm; use instead the [MENU] button to cancel the modifications and to go back to the standard display.

Function	Display name	Use	Choice span
Maximum FS flow rate	**FMAX**	Represents the maximum flow rate associated with the pressure set by the client in the URV	-
Lower Range Value setting	**LRV**	Indicates and allows you to manually enter the initial value of the interval (the value corresponding to the 4 mA output). The unit of measurement is displayed at the bottom right of the screen.	Between the sensor limits

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Function	Display name	Use	Choice span
Upper Range Value setting	**URV**	Indicates and allows you to manually enter the final value of the interval (the value corresponding to the 20 mA value). The unit of measurement is displayed at the bottom right of the screen.	Between the sensor limits
Measuring unit selection	**PV UNIT** (disabled in volumetric flow meters mode)	Measuring unit selection from the available ones. Press ⇧ o ⇩ to scroll.	**Pressure:** bar, mbar, Pa, hPa, kPa, MPa, mmH_2O, cmH_2O, Kg/cm^2, mmHg, psi, Torr, inHg, Atm, FtH_2O, g/cm^2, inH_2O **Level:** m, mm, cm, in
Sensor Temperature unit	**TEMP UNIT**	Temperature unit selection from the available ones. Press ⇧ o ⇩ to scroll.	°C, °K, °F
Configuration of the measuring unit typology	**XFR FUNC**	Not configurable in this series	LIN SQRT = volumetric flow meter
Fault configuration	**ALARM TYPE**	Fault condition analog output selection.	NONE = no action 21mA 3.85mA LAST = last read value
Damping setting	**DAMP VALUE**	Insert the signal averaging time constant.	0 ÷ 60s

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Function	Display name	Use	Choice span
4mA input automatic setting (zero)	**SET LRV**	At button pushing, the instrument modifies the value of LRV and places it equal to the currently measured value. In this way, the analog output is 4 mA.	-
20mA output Entrant setting (span)	**SET URV**	At button pushing, the instrument modifies the value of URV and places it equal to the currently measured value. In this way, the analog output is 20 mA.	-
Analog output test	**LOOP TEST**	It is possible to fix the analog output of the transmitter to a required mA value.	3.85 ÷ 21mA
Analog output calibration	**CAL 4-20mA**	The transmitter fixes the output to 4mA and asks by display to check the value (OK? YES/NO). Choose NO if the output is incorrect and insert the value read on an external Ammeter. Do it again until necessary. The same procedure for 20mA follows.	-
Hart® polling address	**ADDRESS**	Hart® polling address modification.	0 ÷ 15
Transmitter information	**INFO**	The polling address, the lower sensor limit (LSL), the upper sensor limit (USL) and the firmware revision are shown.	-
Password setting	**PASSWORD**	Allows to insert a new password for the transmitter. To be used with care.	0000 ÷ 9999

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Function	Display name	Use	Choice span
Set Span for URV	**SET S. URV**	Set the current measurement to the URV value, automatically calculating the required Span URV.	-
Expert command: Span Value URV	**SPAN URV**	Indicates and allows the manual entering of linear correction for URV value.	0.500 – 2.000 Three decimal places
Zero re-setting	**OFFSET**	Set the current measurement to zero, automatically calculating the required zero elevation.	-
Expert command: Manual zero elevation	**ZERO ELEV.** (disabled in volumetric flow meters mode)	Indicates and allows manual entry of zero elevation value.	6 digits, including "-" sign and decimal point
Set Span for LRV	**SET S. LRV**	Set the current measurement to the LRV value, automatically calculating the required Span LRV.	-
Expert command: Span Value LRV	**SPAN LRV**	Indicates and allows the manual entering of linear correction for LRV value.	0.500 – 2.000 Three decimal places
Expert command: Specific Gravity	**SPEC.GRAV.**	Indicates and allows manual entry of the specific gravity value.	0.1 ÷ 3.0
Factory setting restore	**RESTORE**	Select and confirm using buttons ⇧ and [OK].	-

INFORMATION!
The password is in 4 digits format and spans from 0000 to 9999. If you can't remember or find the password you set, please contact our technical department.

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5 → MAINTENANCE AND TROUBLESHOOTING

Although transmitters SST7X do not require a maintenance on periodical basis, it is good practice to regularly check the general transmitter status, the possible presence of rust or damage on the case or on the measuring diaphragm and the presence of clogging in the process connection.



PROHIBITION!
Repair, maintenance and/or overhaul of the equipment shall only be conducted by the manufacturer himself, or by a repairer he has qualified or authorized.

Is forbidden during the maintenance operation to use the tool as a handle or step.



Please refer to the following pages scheme for troubleshooting.
In any case contact our technical department for help.

Condition	Potential source	Solution
The transmitter doesn't turn on	Supply	Check the supply voltage to be 12,5Vdc<V_{supply}<30Vdc.
	Polarity	Check the transmitter connection polarity.
	Electrical load	Check that the load is less than the maximum allowed.
Measure is incorrect	Process	Accurately verify the compatibility between the process and the connection type.
	Sensor drift	Apply zero input conditions to the transmitter and use the OFFSET command.
	EMC interference	Accurately verify the possible presence of electromagnetic interference on the supply line. Check the PE connection.

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Condition	Potential source	Solution
Erratic analog output	Wrong span limits	1) Verify that LRV and URV values are the ones you want; 2) In the start-scale process condition, use OFFSET command to correct the measure to zero; 3) In the full scale process condition, use SET S. URV (set span URV) command to correct the URV value; It is possible to correct only the analogical output, by changing the LRV or URV values (alternatively editing SET LRV and SET URV) to set the instrument measure at 4 mA or 20 mA.
	Uncalibrated analog output	Use the LOOP TEST command to verify the analog output calibration. If it is not correct, use the CAL4-20mA command to calibrate the output.
	Incorrect HART® settings	Use the ADDRESS command to verify that the polling address is set to 0.
Analog output <4mA or >20mA	Transmitter in fault mode	Check if the output isn't out of the allowed span or check the presence of a failure (e1, e2, … on display).
	Wrong fault settings	Check the settings using the ALARM TYPE command.
Unstable measure	Measuring disturbs	Set an input average using the DAMP VALUE command (i.e. 10 seconds).
Impossible to access the menu	Wrong / forgotten password	Contact us for help

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5.1 → DISPLAY ERROR CODES

Type of error	Description
ALARM HIGH	OVER RANGE: this message is shown if PV is greater than URV by 10% of the span.
ALARM LOW	UNDER RANGE: this message is shown if PV is lower than LRV by 5% of the span.
LCD OV	LCD OV: this message is shown if PV < -99999 or PV >99999.
EE CHK ERR	This message depends by an error configuration of the EEPROM memory
EE ADC ERR	This message is shown if there are PV calculus error in primary ADC input. If it persist contact Spriano® for help
T EX AD ER	This message is shown if there are on external temperature signal calculus error in secondary ADC input. If it persist contact Spriano® for help
T IN AD ER	This message is shown if there are on internal temperature signal calculus error in secondary ADC input. If it persist contact Spriano® for help
PR ADC ER	This message is shown if there is an error in calculating the input of primary ADC pressure signal. If persist contact Spriano® for help.
NaN	Indicates a sensor damage.

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5.2 → SPARE PARTS

Below is the list of the spare parts available for SST77B instrument.
Together with the request of spare parts it is required to indicate Serial Number of the Transmitter to control that the correct components will be delivered.

Item	Product Code	Description	Quantity
01	DISPLAY COVER	Cover with display glass	1
02	BLIND COVER	Blind cover terminals side	1
03	COVER O-RINGS	Gaskets for enclosure covers	2

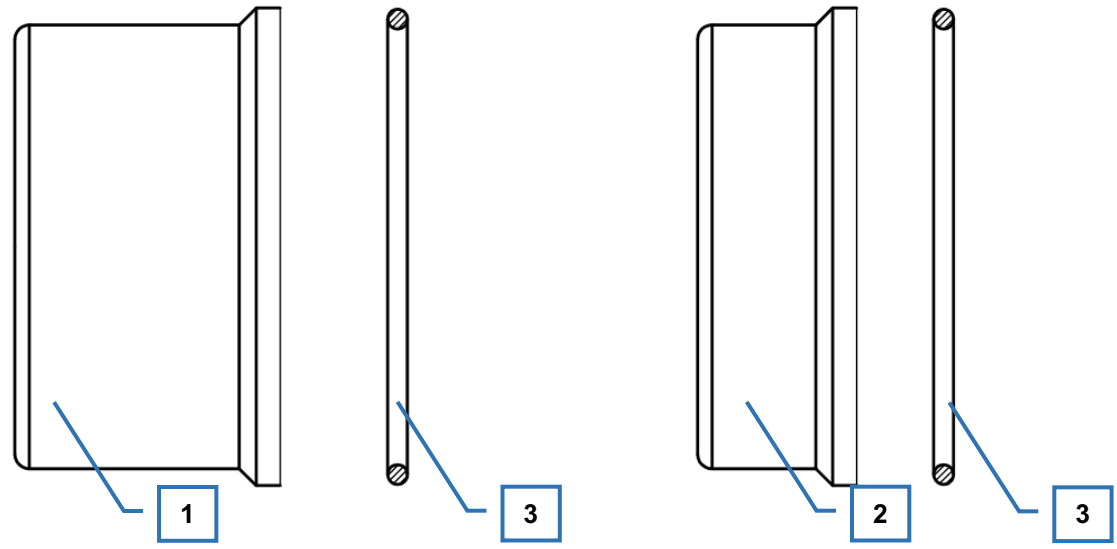


Figure 18: spare parts

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6 → MARKING

On the transmitter enclosure is fixed an identification plate with inscriptions showing the characteristic data of the instrument.
Refer to **Figure 19**, the Transmitter is provided with the following information:

1. Name and address of the manufacturer
2. CE marking followed by the identification number of the notified body involved in the production phase
3. Designation of series or type
4. Serial number (with the Year of construction)
5. ATEX marking for equipment-group II, followed by the specific marking of explosion protection (see 1.3 → Definitions And Symbols)
6. PED essential allowable limits: allowable Fluids, Maximum working pressure (PS), Nominal size (DN), etc.

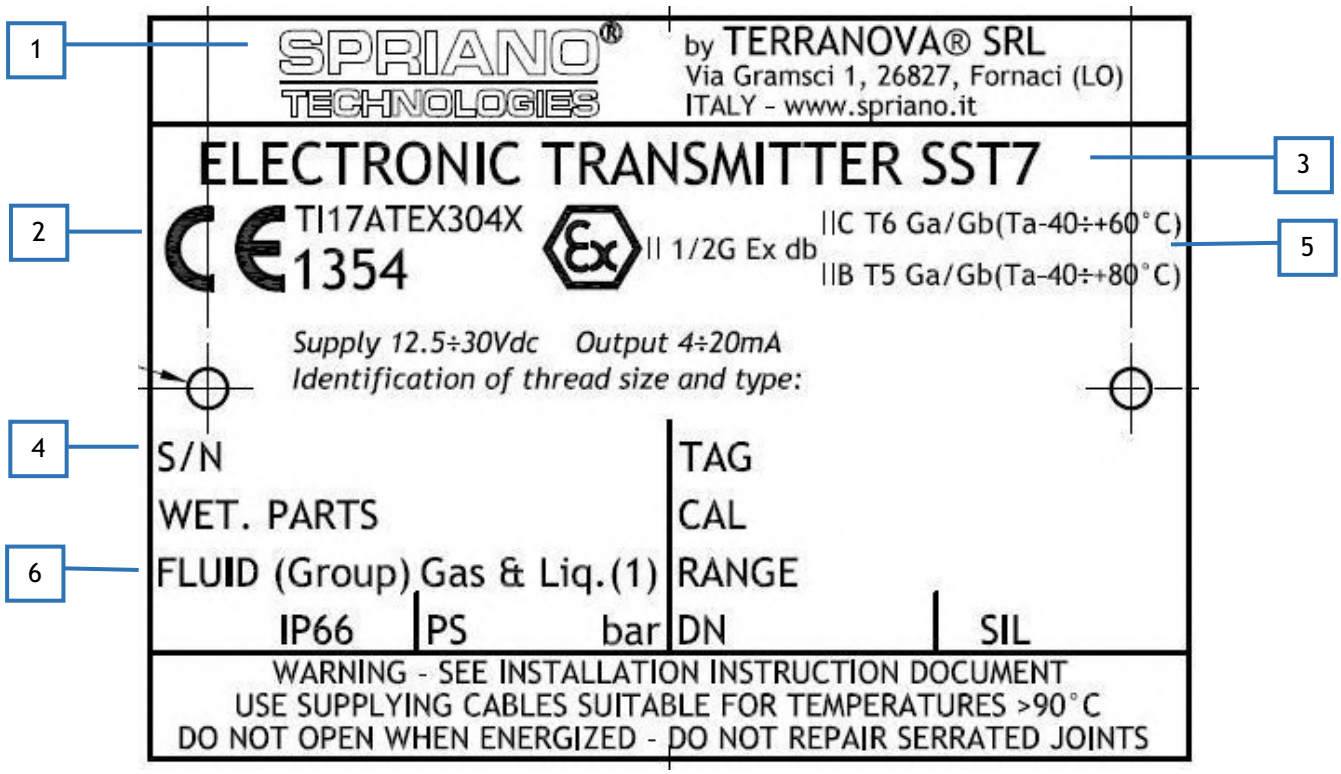


Figure 19: marking plate

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7 → DATA SHEET

FUNCTIONAL DATA
With reference to the following, please note these definitions:
Nominal range: (referred to the sensor mounted in the instrument) the measured pressure range for which the sensor has been designed. Defined as a minimum and maximum value.
Nominal span: the interval between the minimum and maximum values of the sensor nominal range. The span is a single number.
Measuring range: the minimum and maximum range values for which the transmitter is to be calibrated.
Measuring span: the interval between minimum and maximum values of the measuring range.
Input scale initial value or zero input: minimum pressure value within in the measuring range.
Input full scale value: maximum pressure value within in the measuring range.

TRANSMITTER PARAMETERS
The parameters that are available for display and setting are:
Measuring span: possibility to change from 3.33% to 200% of the nominal span.
Zero adjustment: digital calibration ± 15%.
Low/upper range values: they can be set within the nominal range provided that the span > minimum span.
Damping: digitally adjustable from 0 to 60 sec. (minimum response time ~ 0,1 sec.).
Reverse output: automatically obtained via software.
Transfer function: linear/square root via software.
Self-test: in case of malfunction the analog output is forced to the fail-safe state of 3.85mA or 21mA.
Measuring units: 18 different pressure units or % of the measuring span, selectable via software.

PHYSICAL CHARACTERISTICS
Power supply: 12,5 - 30 Vdc
Output signal:
Analog 4-20 mA, 2 wires.
Digital using HART® protocol
Response time: <256 ms (Std Hart®)
Measured value update frequency:
4-20 mA + Hart® output: ~1s
Hart® output only: ~500 ms (on request)
Polling time:
4-20 mA + Hart® output: ~800 ms
Hart® output only: ~500 ms (on request)
Nominal range 18-50 mbar:
Max static pressure: 50bar.
Overpressure limits: 50bar on either side.
Nominal range 350-10000 mbar:
Max static pressure: 100bar.
Overpressure limits: 100bar on either side.

AMBIENT CONDITIONS
Temperature:
Process fluid: -40 ÷ +80°C (with capillary: up to 283°C)
Housing: -40 ÷ +80°C
Handling and storage: -40 ÷ +90°C
Relative Humidity: 0 a 100% R.H.
LCD display reading: -10 ÷ +65°C

PERFORMANCES
Total accuracy[1]**:** <0.1%FS
Dead band: negligible.
Display resolution: 0.1

[1]Including hysteresis, non-linearity, non-conformity and non-repeatability (IEC 60770).
Accuracy and drifts are given for instruments with integral sensor and diaphragm; they may vary according to sensor type and diameter, thickness and material of the diaphragm.

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INFLUENCE OF OPERATING CONDITIONS
Thermal drift: It is referred to -10 ÷ +80°C range.
Zero: ± 0,1%/10°C.
Span: ± 0,1%/10°C at nominal range.

Static pressure effect
Nominal range 18-50 mbar:
Zero: ± 0,4% / 10bar. **Span:** 0,4% / 10bar.
Nominal range 350-2500 mbar:
Zero: ± 0,1% / 10bar. **Span:** 0,1% / 10bar.
Nominal range 5000-10000 mbar:
Zero: ± 0,2% / 10bar. **Span:** 0,2% / 10bar.

Over range effect
Nominal range 18-50 mbar:
Zero: on either side ± 1% at 50bar.
Nominal range 350-2500mbar:
Zero: on either side ± 0,1% at 100bar.
Nominal range 5000-10000mbar:
Zero: on either side ± 1% at 100bar.

Power supply effect:
Negligible between 12.5 and 30 Vdc.

PHYSICAL SPECIFICATIONS
Housing: die cast aluminum alloy EN AW-6082 finished with epoxy resin (RAL 5014). It is dust and sand tight and protected against sea wave effects as defined by IEC IP66. Suitable for tropical climate operation as defined by DIN 50015.
Covers O-ring: EPDM.
Filling fluid: silicone oil.
Nameplate: stainless steel, fixed on housing.
Bracket: for 2 inch pipe mounting.
Calibration
Standard: at nominal range, direct action, linear.
Optional: at the conditions specified with the order.
Electrical connections: two entries on electronic housing, 1/2" NPT and cable gland PG 13,5 for 7 to 12mm diameter cable.
Terminal board: 2 terminals for signal wiring up to 1,5 mm^2 (14 AWG). Connection for ground and cable shield.
Mounting position: any position.
Net weight: 6 kg approx.

PROCESS WETTED PARTS
Process connections: see ordering information table.
Diaphragm: see ordering information table.

OPTIONS
Remote mounting with capillary: for working temperature higher than 80°C up to 283°C.
Static pressure: 200 bar.
Degreasing for oxygen service.
Stainless Steel Housing: AISI 316 (IP66).

7.1 → FUNCTIONAL SAFETY ACCORDING TO IEC 61508 / IEC 61511

According to IEC 61508 / IEC 61511, the assessment of the safety critical and dangerous random errors results, in case of an annual function test and the present safety instructions are observed, in the following parameters:

Transmitter Type	λ_{DD}	λ_{DU}	λ_S	λ_{TOT}	SFF	SIL
SST77B	7.5072×10^{-8}	1.0725×10^{-8}	8.0434×10^{-8}	1.6623×10^{-7}	91.67%	2

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a TERRANOVA® Srl brand - www.terranova-instruments.com - VAT IT07848810151
Factory & Sales: Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
Head Office: Via Rosso Medardo 16 – 20159 Milano – Italy Ph: +39 0377 919119 – Fax: +39 0377 855720

7.2 → MAIN DIMENSIONS

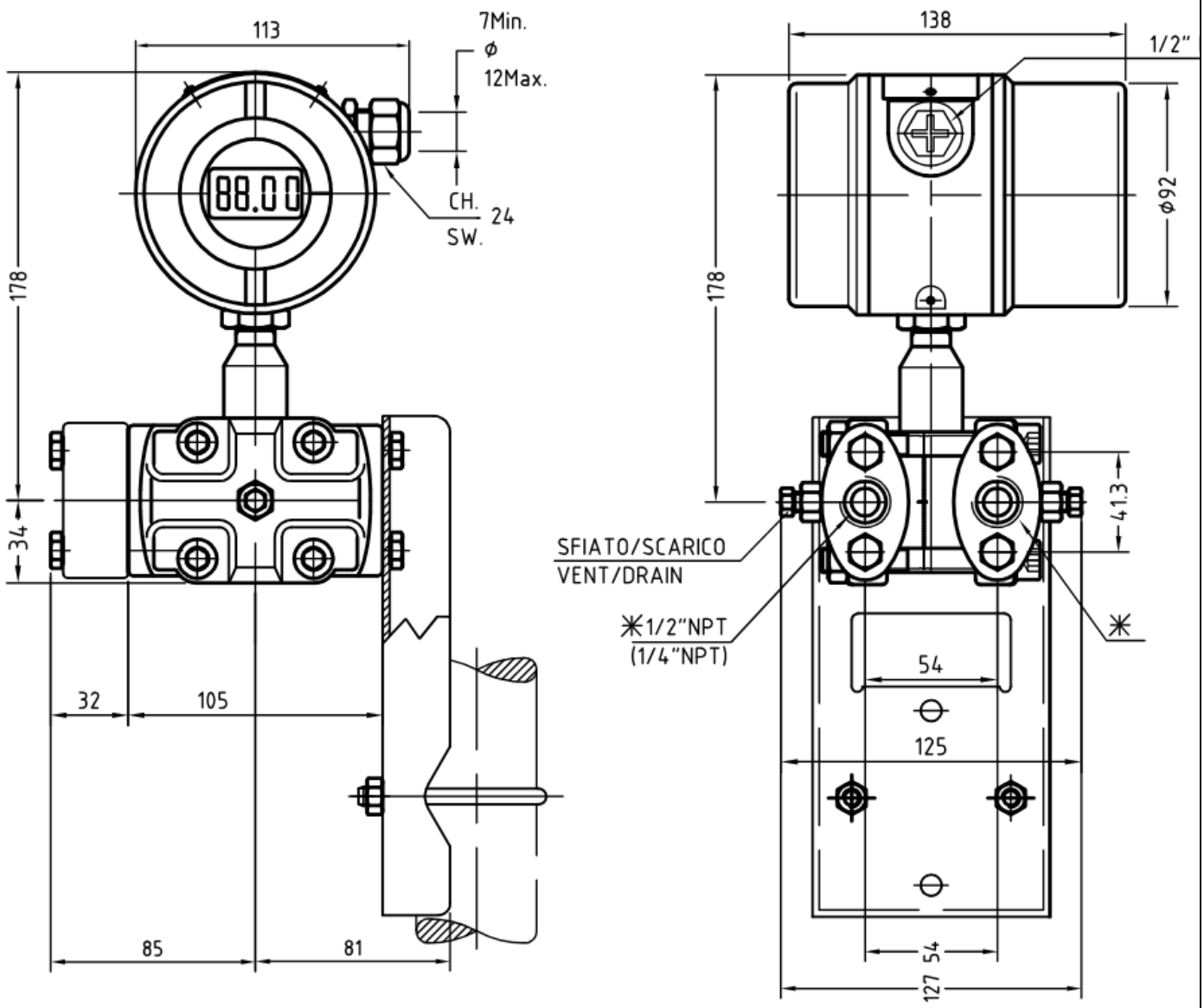


Figure 20: main dimensions (mm)

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OPERATING and MAINTENANCE MANUAL for SST76 PRESSURE TRANSMITTERS

SST76 PRESSURE TRANSMITTER



ORIGINAL INSTRUCTIONS

SPRIANO®
TECHNOLOGIES

CE 1354

EU Declaration of Conformity

TERRANOVA® Srl

Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
declares on his sole responsibility that the product:

SPRIANO® Electronic Transmitters series

SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B, SST70-REM

(device controlling or regulating the limits of an industrial process, like pressure, level and vacuum)
satisfies the essential requirements and conformity assessment procedures of the following legislation:

Directive 2014/34/EU (ATEX)

EU TYPE CERTIFICATE: TI 17 ATEX 304 X

Equipment for use in potentially explosive atmospheres, suitable for Zones 0, 1, 2 (process side and external side)



II 1/2G Ex db IIC T6 Ga/Gb for use in the ambient temperature range –40°C to 60°C
II 1/2G Ex db IIC T5 Ga/Gb for use in the ambient temperature range –40°C to 80°C

Presumption of conformity provided by the application of the harmonised standards:
EN 60079-0:2012+A11:2013 - EN 60079-1:2014

The Notified Body NB 1354 Technicka inspekcia a.s. performed Module D, Annex IV, Directive 2014/34/EU and issued the Production Quality Assurance Notification. Periodical Surveillance is provided according to Annex IV, Point 4, Directive 2014/34/EU by the same Notified Body.

Directive 2014/68/EU (PED)

EU DESIGN EXAMINATION CERTIFICATE: 1292/1/2017-2÷8

Pressure equipment, up to Category IV, for fluids (gases, liquids and vapours) in Group 1.

Conformity provided by the application of the harmonised standard:
EN 13445-1:2015, EN 13445-2:2015, EN 13445-5:2015

The Notified Body NB 1354 Technicka inspekcia a.s. performed Module H1, Directive 2014/68/EU and issued the Production Examination Certificate. Periodical Surveillance is provided according to Directive 2014/68/EU by the same Notified Body.

Directive 2014/30/EU (EMC)

Equipment with an adequate level of electromagnetic compatibility.

Presumption of conformity provided by the application of the harmonised standard:
EN 61326-1:2006

Terranova dei Passerini, 04/08/2017

Mr Sergio Valletti,
General Manager

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WARNING!
Exclusively follow the instructions indicated in this document. Failure to comply with this document may cause injury to health or may damage the equipment.

SPRIANO® TECHNOLOGIES do not takes any kind of responsibility for damages due to failure to comply with this document.

1 → INTRODUCTION

1.1 → PRODUCT OVERVIEW

Electronic transmitters series SST7X are apparatus which use a piezoresistive sensor for pressure, level and temperature measurement, and transmit a current signal (4 ÷ 20mA) proportional to the variable measured. The series SST7X is composed by the following types:

SST76	Absolute or relative pressure transmitter with diaphragm
SST70	Displacer level transmitter
SST71	Smart Float Level Transmitter
SST72	Electronic temperature transmitter
SST75	Absolute or relative pressure transmitter
SST77B	Differential pressure transmitter
SST77BL	Level transmitter
SST79B	Immersion level transmitter
SST70-REM	4÷20mA loop powered field digital indicators (External local indicator)



MANDATORY!
The accessories used for the cable entries and to close unused shall be certificated according to the standards EN 60079-0 and EN 60079-1 for the gas groups IIC or IIB, according to the type of protection implemented.

1.2 → ATTENTION!

This manual does not contain information concerning all type of Transmitter or all different installation and/or working and mounting solutions. For more information or for particular problems not considered in this manual, please address to our technical office.
The warranty period is the one contemplated in our general servicing conditions. This warranty is neither increased nor restricted by the contents of this manual.
This Transmitter has to be installed and used only by qualified persons who have first checked the correctness of supply voltage so that both in standard working conditions and in presence of damages of the plant or of any part of it, no dangerous voltage can reach the Transmitter. As the Transmitter can be utilized both with high pressure values and with aggressive media it must be considered that an incorrect use of it could bring even serious damages to people and things. A correct and safe working needs an adequate transport, stock and mounting other than an appropriate maintenance service. So it is necessary for the people handling these Transmitter to have knowledge and experience in mounting, servicing and working and to have title to do their job with reference to “Safety Standards“.

1.3 → DEFINITIONS AND SYMBOLS

In this manual are used the following symbols and labels

	Equipment for use in potentially explosive atmospheres
II 1/2G	Equipment Group II Category 1/2G, suitable for potentially explosive area (gases, vapours or mists); to be installed in a separation wall between Zone 0 (process side) and Zone 1 (external side)
Ex d	Device with Explosion Proof Enclosure
IIC	Group IIC apparatus, fit for substances of group IIC, IIB and IIA (only when used in the ambient temperature range –40°C to 60°C)
IIB	Group IIB apparatus, fit for substances of group IIB and IIA (when used in the ambient temperature range –40°C to 80°C)
T6, T5	Temperature Class of the transmitter (maximum surface temperature) ➢ only when used in the ambient temperature range –40°C to 60°C ➢ only when used in the ambient temperature range –40°C to 80°C
Ga/Gb	Equipment to be installed in the boundary wall between an area requiring EPL Ga and the less hazardous area



WARNING!
Warning label, used to warn about hazardous materials, locations, or objects, including electric currents, poisons, and other things.



PROHIBITION!
Prohibition label, used to indicate something is not permitted.



MANDATORY!
Mandatory label, used to set obligation tasks to be performed by the user.

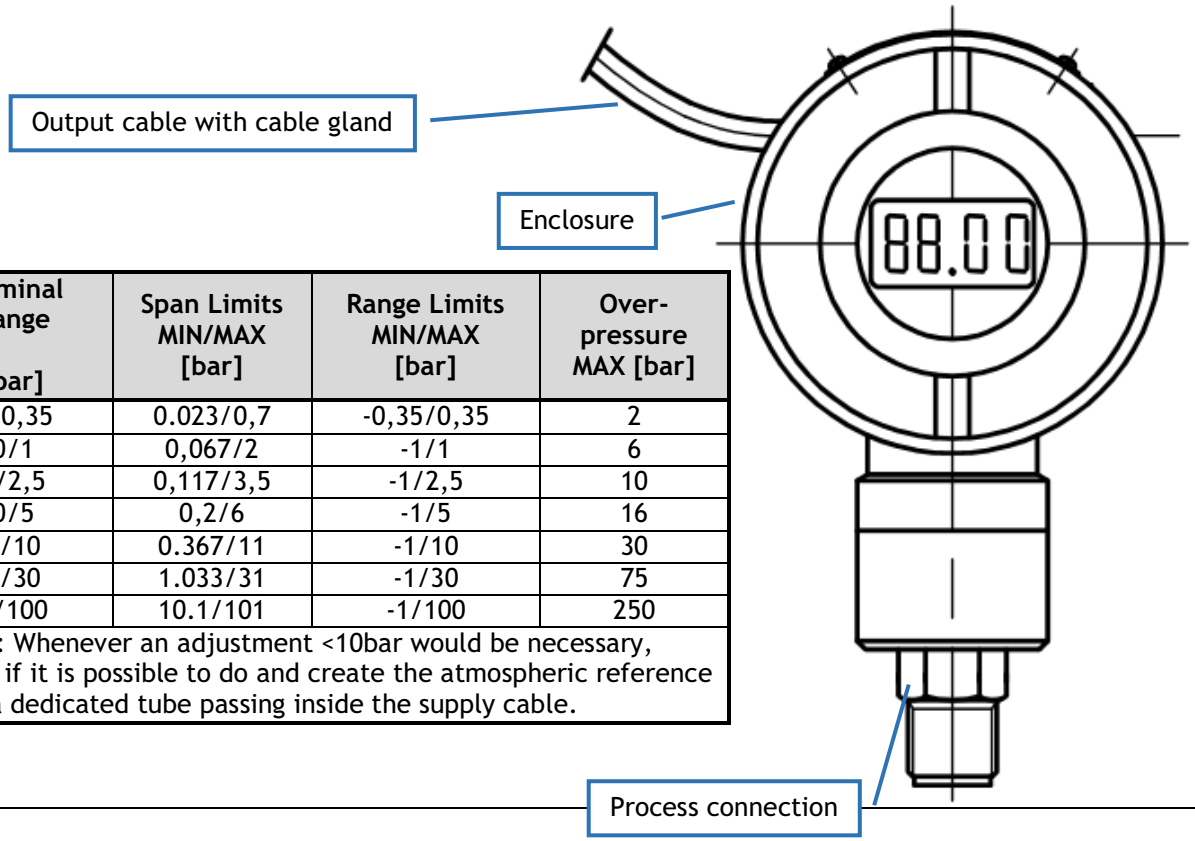


INFORMATION!
Information label, used to set general information for the user or warn about hazards for the equipment.

2 → DESCRIPTION

The SST76 series SMART pressure transmitters are microprocessor based instruments that combine the analog signal advantages (4-20mA) together with the flexibility of digital communication using HART® protocol. They can be remotely configured by a universal hand held terminal (HHT) or by a PC with a dedicated interface.
Moreover, it is possible to locally configure the instruments (zero and span) by means of push buttons and to display the data on the wide LCD display. The SST76 transmitters, complete with AISI 316 diaphragm, measure relative pressure with spans from 0,023 to 101 bar. The pressure measuring element is a piezoresistive sensor. It is possible to choose a variety of sensors to satisfy all process conditions.
The **SPRIANO®** measuring cell contains the sensor and transmits pressure to the electronics. Thermal drift is compensated using the temperature signal generated by a PTC thermistor integrated in the sensor itself. Based on these readings the microprocessor generates the 4-20mA analog output "two wires system" and displays the pressure measurement on the LCD.
Some of the main characteristics of this microprocessor-based transmitter, are:

- Wide rangeability;
- Automatic temperature compensation;
- Digital communication using HART® protocol.



Nominal Range [bar]	Span Limits MIN/MAX [bar]	Range Limits MIN/MAX [bar]	Over-pressure MAX [bar]
0/0,35	0.023/0,7	-0,35/0,35	2
0/1	0,067/2	-1/1	6
0/2,5	0,117/3,5	-1/2,5	10
0/5	0,2/6	-1/5	16
0/10	0.367/11	-1/10	30
0/30	1.033/31	-1/30	75
0/100	10.1/101	-1/100	250

NOTE: Whenever an adjustment <10bar would be necessary, check if it is possible to do and create the atmospheric reference with a dedicated tube passing inside the supply cable.

Figure 1: SST76 electronic pressure transmitter

3 → INSTALLATION

3.1 → TRANSMITTER IDENTIFICATION

Transmitter data can be found on the nameplate fixed on the top of transmitter enclosure (see MARKING). The Serial Number must be quoted at the occurrence of a specific request to the manufacturer.

3.2 → GENERAL MOUNTING REQUIREMENTS

Prior installation shall be observed following considerations:

- Check whether Transmitter's operating conditions are within the limits as reported in the nameplate, technical specifications sheets and/or label.
- Make sure that the operating conditions are compatible with the specification given to the manufacturer.



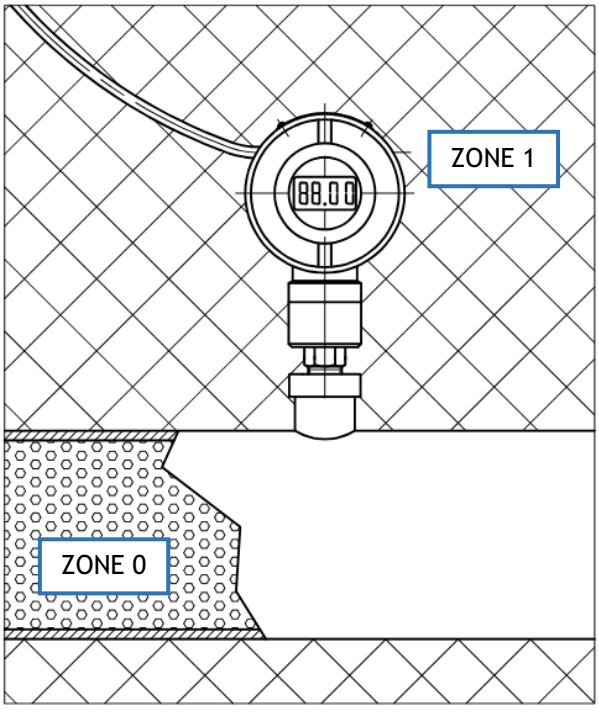
MANDATORY!

- For measurement in the presence of particularly hot liquids (e.g. steam) make sure that the Transmitter is supplied with a suitable finned arm.
- For viscous liquids or those containing solid particles in suspension make sure that the connection to the process is a suitable one in order to avoid clogs.



WARNING!

Direct sunlight may cause serious damages to the instrument.
Never install standard Transmitter under the sun or in any other location which could cause direct overheating through radiation.



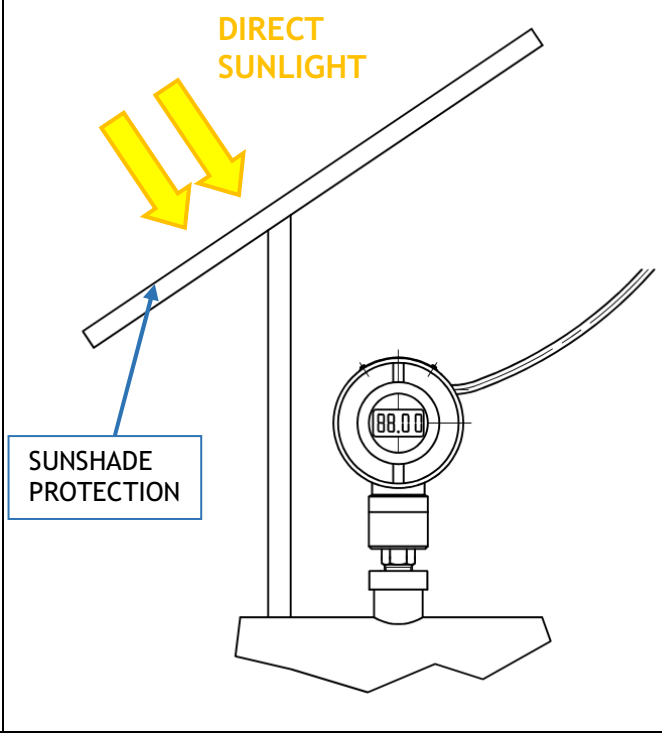


Figure 2: mounting requirements

3.3 → MECHANICAL INSTALLATION

The Transmitter should be located, if possible, at some easily accessible, well lighted place on the vessel or pipe, in order to allow putting in operations and maintenance work. Location should also be such that ambient temperature at the Transmitter enclosure be not excessive (see MARKING).



INFORMATION!
- Plant overpressure / over-temperature: observe rating plate
- Installation on seismic areas: inform technical department
- In case of unstable fluids: inform technical department
- In case of damages: inform technical department
- Inspection frequency: consideration should be given to applicable national legislation.



WARNING!
- The process connection must be realized in such a way that guarantees the hold at the maximum working pressure and temperature.
- Do not overcome the maximum pressure and temperatures indicated in the technical data sheet of the selected model.
- When the device is connected to the process it can be submitted to high pressures and temperatures. To avoid accidents subsequent to sudden discharge of pressure and/or to contact with dangerous or flammable fluids it is necessary to take the maximum attention when the Transmitter is taken off, heated or repaired, verifying that it is isolated from the process and is not submitted to pressure and/or temperature.

3.4 → ELECTRICAL CONNECTION

Under the rear cap is placed the terminal block reporting the electric polarity (**Figure 3**).
Insert the power supply cable into the enclosure through one of the two screwed openings. Transmitter is protected from accidental inversion of polarity. For a better use is recommended a twisted pair cable (22 AWG min). Avoid placing Transmitter near devices powered in AC or Switching. Connect ground-tap of the Transmitter to the local common earth (PE) as indicated in paragraph 3.6 → Earthing .

WARNING!
The threaded opening that is not used must be sealed using a suitable cap.
The caps included in the delivery are only for protection during transport.

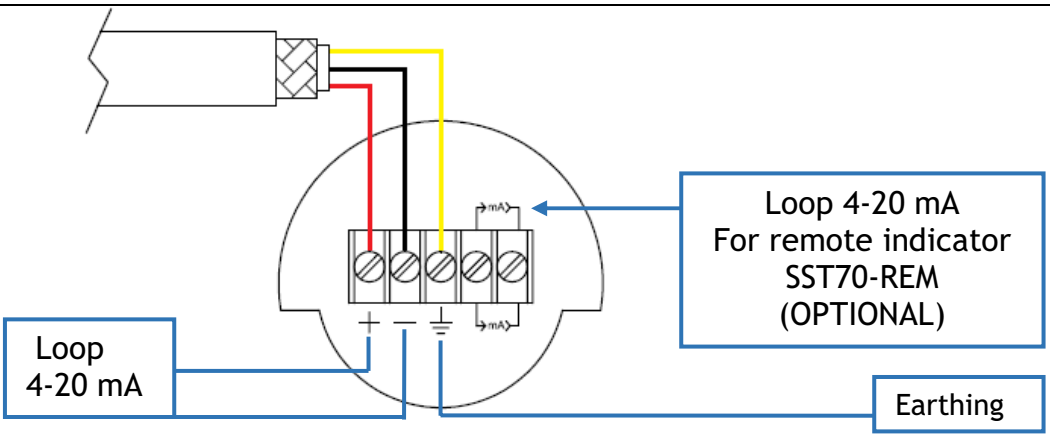


Figure 3: electrical connection of the power cable to the terminal block

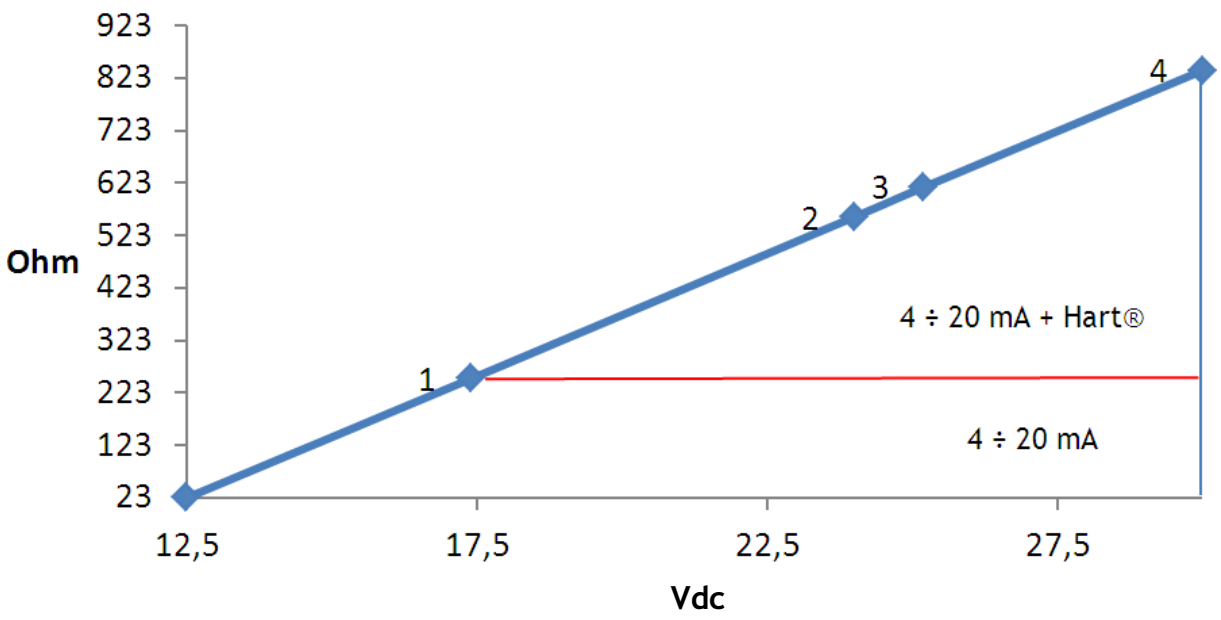
INFORMATION!
Impedance of the cables defines the possible maximum length for digital communication. It's recommended using cable with a low impedance. The maximum length of the point to point connection, with a load of 250 ohm and single twisted cable 22 AWG-207 pF/m it's about 1000 meters.
The maximum connection length for the analog signal only is limited by the loads (connected devices and cable) present in the current loop.

To obtain output signal of 4-20 mA, you have to determine the minimum supply voltage as a function of the load relation: see **Figure 4**. From the following formula you can achieve the right minimum value of supply voltage:

$$V_{dc} = 0.0215 \times R_L + 12$$

Where: R_L = output load [Ohm].
The power supply source must assure a minimum current value of 24 mA.

MANDATORY!
In order to obtain a 4÷20 mA + Hart® output a minimum load of 250 Ohm is required.



TAG	-	1	2	3	4
Vcc	12.5	17.4	24	25.2	30
Ohm	23	250	558	615	837

Figure 4: operating area for Ex d protection

The electronic transmitters series SST76 are fully comply with the HART® protocol specification Revision 6.0, so they include remote process variable interrogation, parameter setting and diagnostics. The device is a 4÷20mA 2-wire transmitter, with FSK communication.
It is possible to read via HART® the following variables:

- **PV**: transmitter main measure;
- **SV**: % of the span;
- **TV**: analog output;
- **FV**: sensor temperature.

Please refer to **Figure 5** for the Hart® modem connection on transmitter's 4÷20mA loop.
In **Figure 6** the Hart® connection type is shown. It is possible to purchase the Hart Server as an additional product; this is a software including all the interrogation, configuration and diagnostics functions required by the Hart® 6.0 specifications.

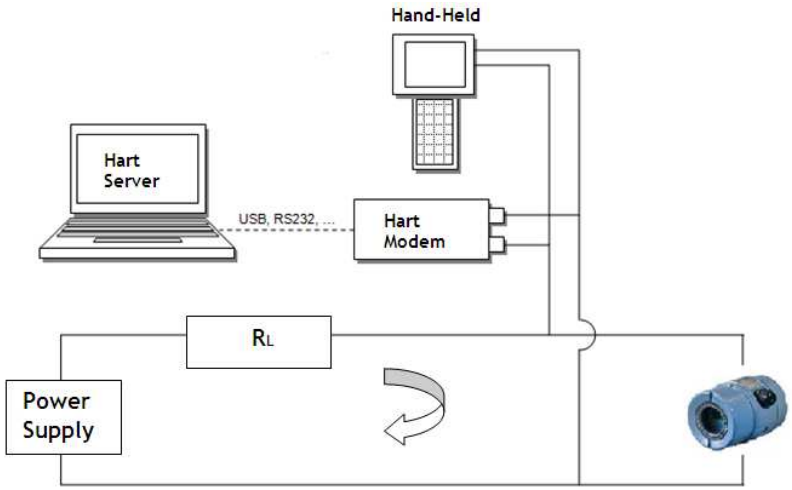


Figure 5: 4÷20 mA + Hart® modem connection

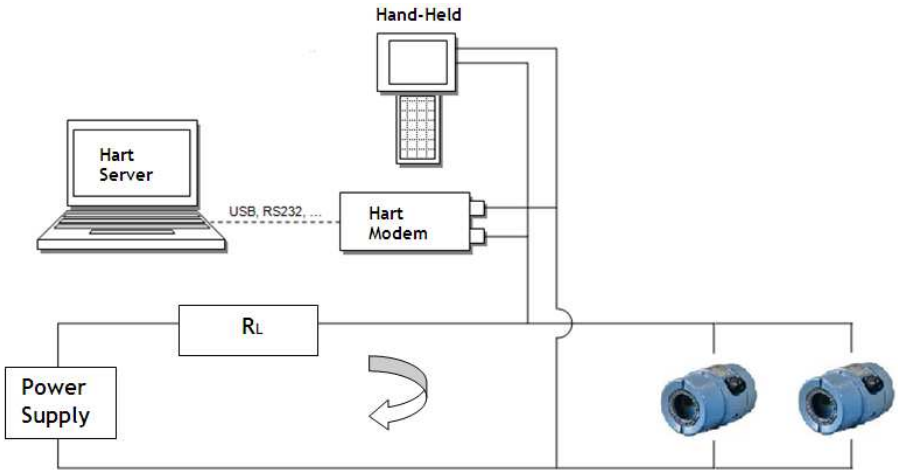


Figure 6: only Hart® multidrop connection

INFORMATION!
At maximum 15 transmitters could be connected in parallel on the same line.
Attention: when more transmitters are connected on the same line the current standing on the resistor (250-ohm) is equal to

4mA x N of connected instruments.

This could cause a high electric potential. Be sure power supply is sufficient.

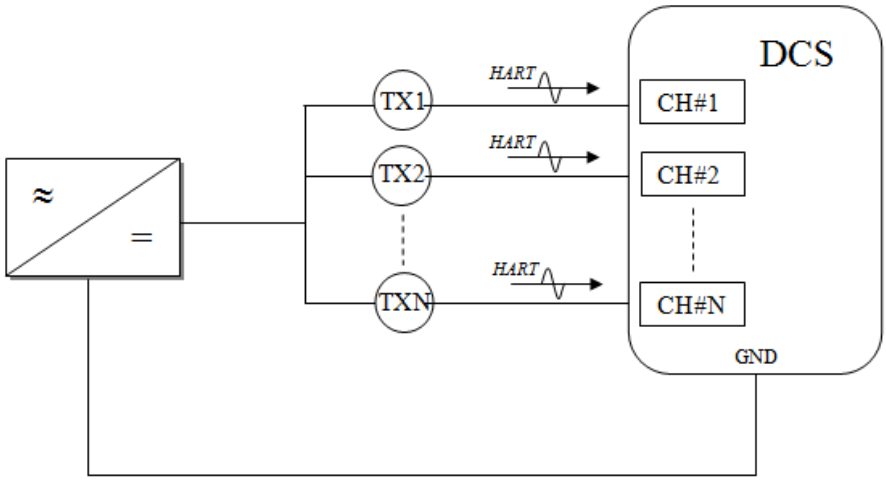


Figure 7: DCS connection

MANDATORY!
Transmitter response time is <256ms.
DCS POLLING time must be set approximately at 800ms in order to avoid updating problems both in analog and digital measurement.
On request the transmitter can be supplied in order to support a Polling time of 500ms but with a minimal consumption of 5 mA.

3.5 → EXPLOSION PROOF PROTECTION

In case of use in areas with danger of explosion, it must be verified that the identified type of transmitter fits for the classification of the zone and for the presence of flammable substances in the plant (see MARKING).
The safety essential requisite against the risk of explosion in the classified areas are fixed from the European Directives 2014/34/EU of 26 February 2014 (as far as it concerns the 'Equipment') and 1999/92/EC of December 16th 1999 (as far as it concerns the 'Working Environment').

WARNING!
For the electrical connections please follow the instructions brought in this operator manuals taking care that for the use in classified areas it is necessary to foresee the standard EN 60079-14.
The accessories for cable entry (which must be threaded ½" NPT) must be certified following the Standards EN 60079-Series (for Tamb >70°C must be certified for T > 90°C).

PROHIBITION!
Do not open the covers or any part of the device in dangerous area when circuit alive.
For explosion proof safety installation, it is mandatory to disconnect the electric supply before opening the device.

3.6 → EARTHING

WARNING!
The earth connection is required to prevent damage to people and malfunction of the instrument.

- **Case 1: Installing the instrument in a plant devoid of earthing systems**

In the case where the plant devoid of earthing, it is necessary to connect the earth wire to the terminal block through the cable that carries the signal and the power supply (**Figure 3**).

- **Case 2: Installing the instrument in a plant provided with earthing systems**

Make sure the earthing (GND) of the system has the least resistance possible.
You can add an additional earth wire with section not less than 4 mm^2 to ensure such connection.

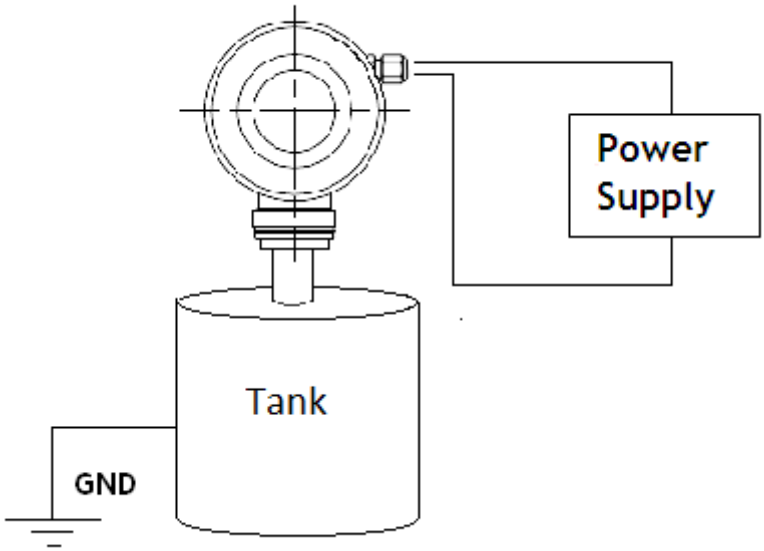


Figure 8: 4 ÷ 20 mA loop connection with plant provided with earthing systems

WARNING!
In the case represented in **Figure 9**, within the earth wire may also scroll through the current protection of other instruments where the earthing of the system (GND) had not been carried out in an optimal manner.

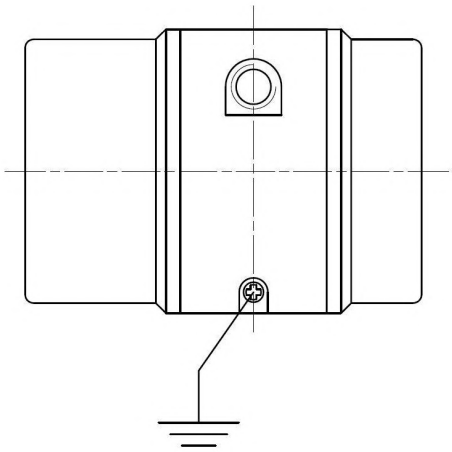


Figure 9: earthing in the housing

WARNING!
The hose must not be considered as a protection against electric shock for the protection of security, but as protection against electromagnetic interference of the instrument. Therefore, in the case of long distance cable (L> 20 m), both ends of the braid must be connected to the chassis or to the connectors. In the case of cables L <20 meters, will be sufficient to connect the braid only from the side "Power Supply".

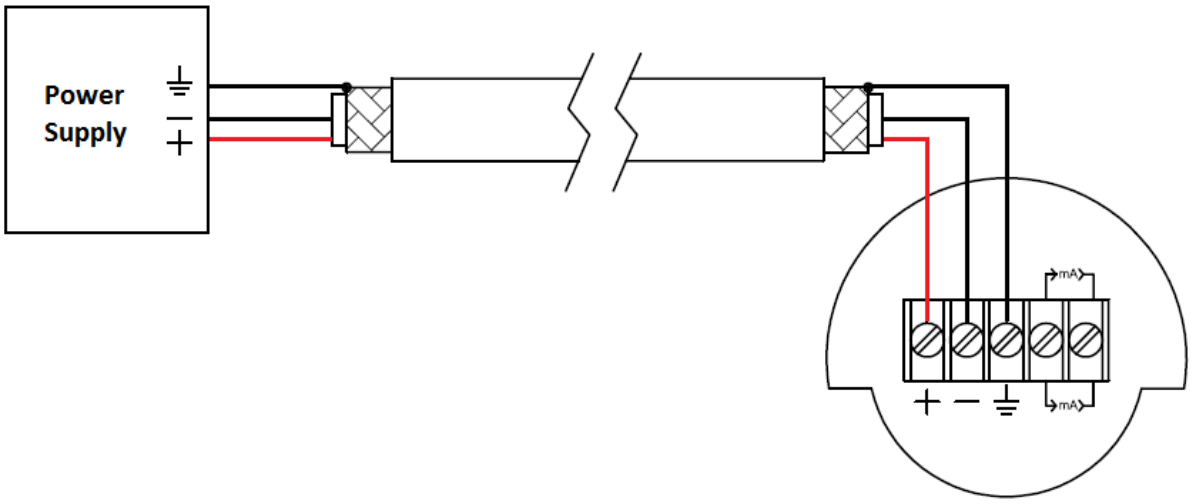


Figure 10: earthing of the sock for cables longer than 20 meters

4 → OPERATIONS

Each transmitter is calibrated in factory and has on the nameplate the configuration data. If not differently stated in the purchase order the transmitter is configured as follow:

Upper Range Value (Highest pressure value): refer to the data sheet of unit
Lower Range Value (Lower pressure value)**:** refer to the data sheet of unit
Damping **0 sec**.

4.1 → CONFIGURATION

The transmitter shows the status and the measure on the dot matrix LCD (**Figure 11**). The span is from -99999 to 999999.
The input signal to the transmitter can be related to the output signal in the following ways:

- **Direct mode** = 4 ÷ 20mA output
- **Reverse mode** = 20 ÷ 4mA output

The direct mode is obtained by setting the lower range point with the lowest value of the range (e.g. 0 bar) and by setting the upper range point with the highest value (e.g. 5 bar). The reverse mode is obtained by setting the lower range point with the highest value of the range (e.g. 5 bar) and by setting the upper range point with the lowest value (e.g. 0 bar).
The instrument can calculate different variables. From the main screen (where the current measure is shown), you can select, using the buttons ⇩ **Next Page** and ⇧ **Previous Page**, the desired variable to keep on the display. There are available the following variables:

- PV;
- Percentage;
- Current
- Sensor temperature;

The selected variable is saved and retained even after the instrument is restarted. So, if you want a different variable, then you have to select it again.

SECTION LEAVED INTENTIONALLY BLANK

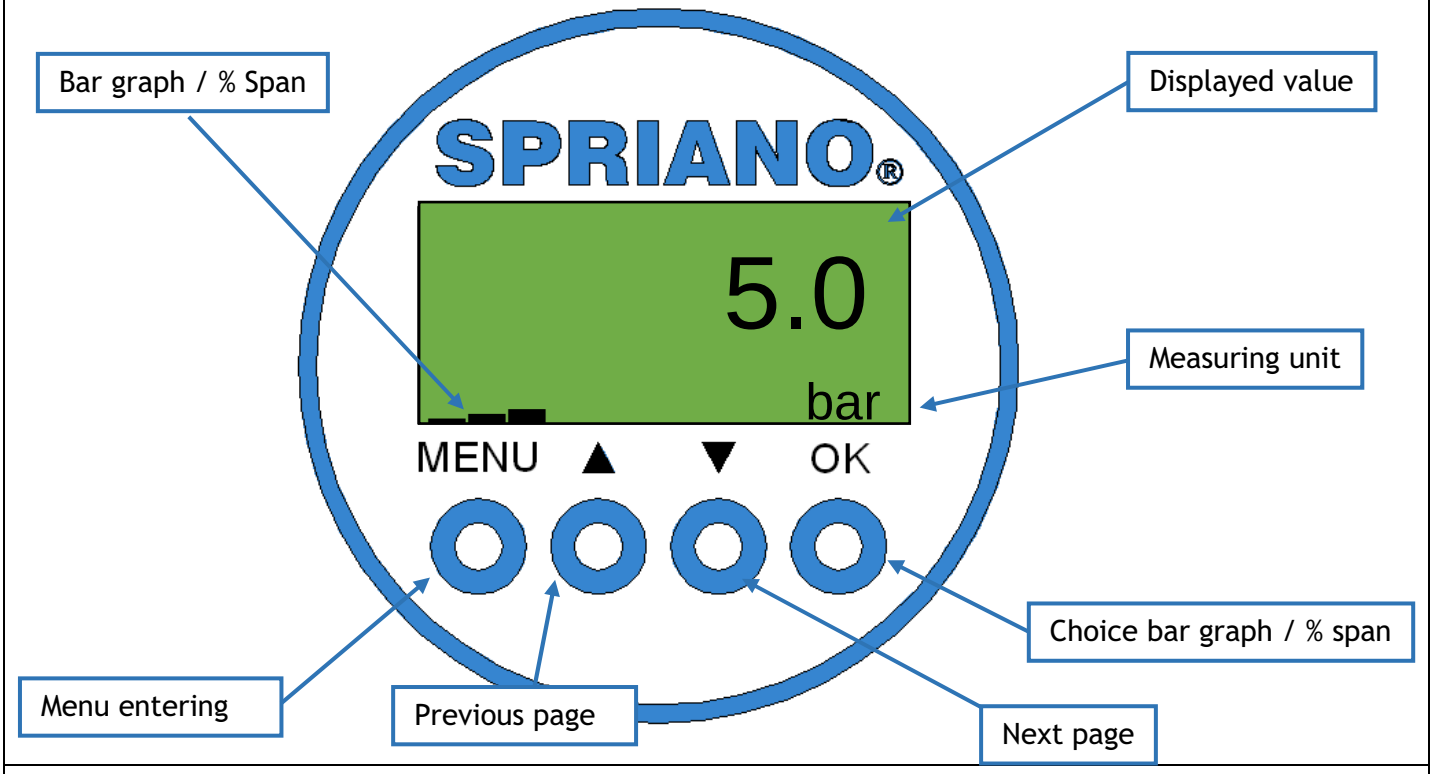


Figure 11: SST76 display

It will be possible to display one of the following variables on the screen:

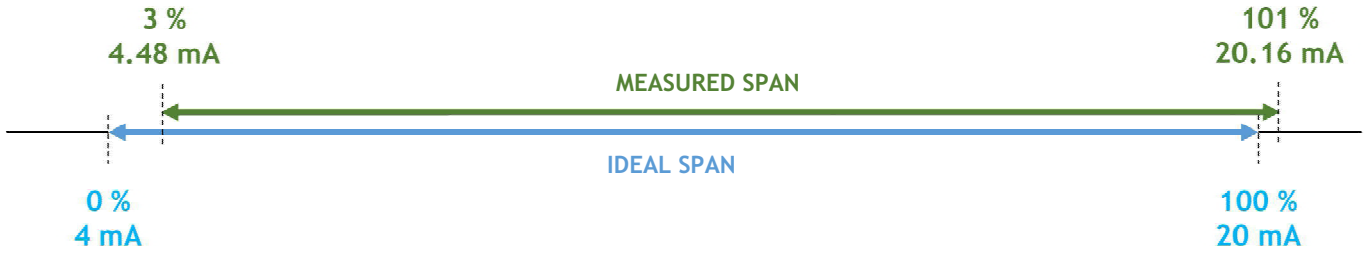
PRESSURE (PV) 1.270 bar	CURRENT (TV) 4.220 mA
PERCENTAGE (SV) 34.73 %	SENSOR TEMPERATURE (FV) 24.2 °C

4.2 → SPAN ADJUSTMENT

It is possible to setup, using the configuration menu (Keyboard Configuration), the zero value. Afterwards, it will be possible to adjust the translated span, by setting the measurement at URV value using SET S. URV command:

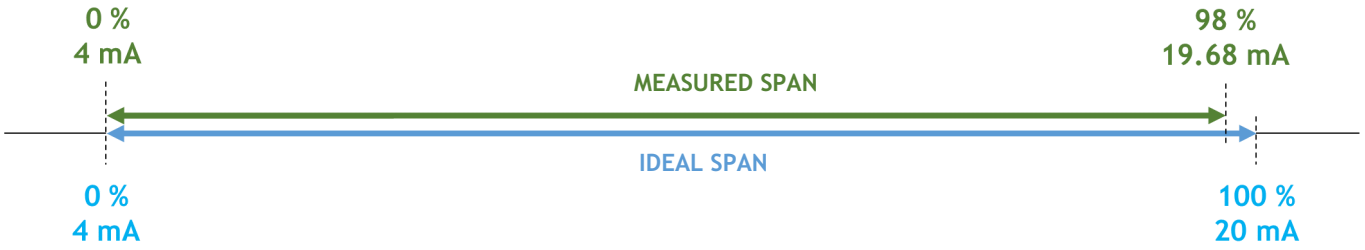
Initial measurement

The entire span is moved and resized.



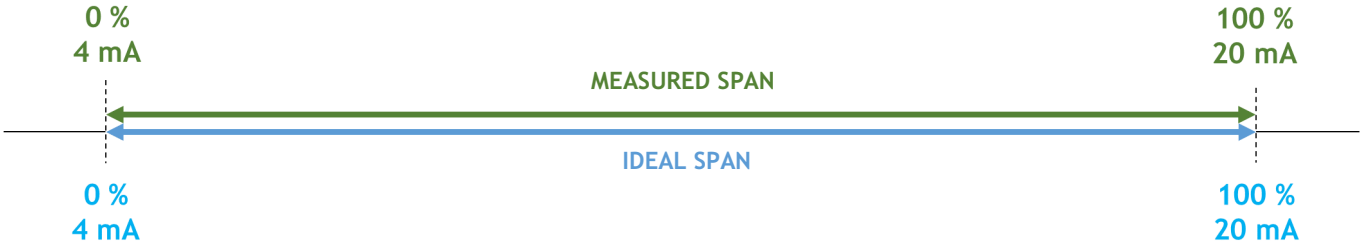
With measure at Zero

Perform an **OFFSET** operation. The zero value is adjusted correctly, but the span must be resized:



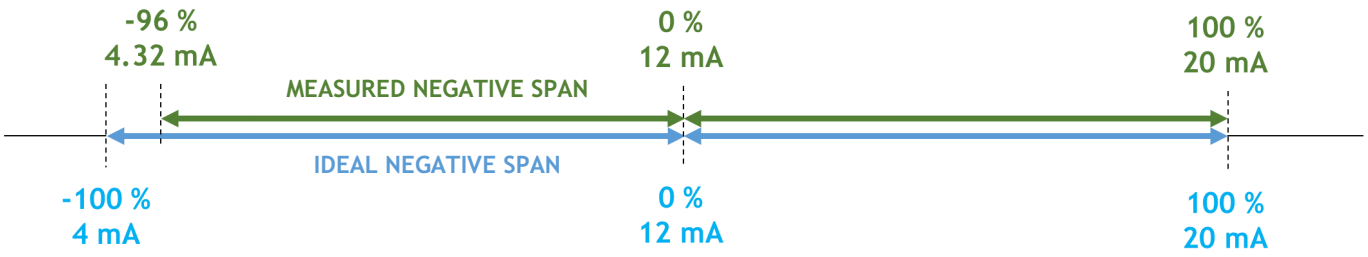
With measure at Maximum

By performing a **SET S. URV** (Set Span URV) operation, you can scale the span so that the current value is resized to be identical to the URV value.



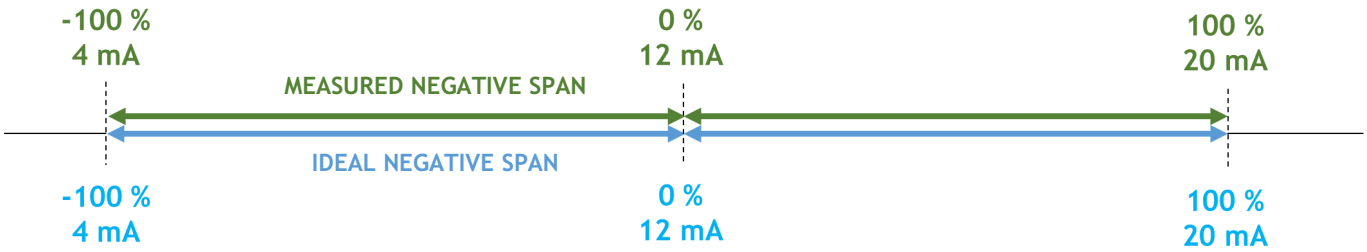
OPTIONAL: Negative side Span Adjustment

As an advanced feature, it will be possible to adjust the translated span of the negative span (when LRV is below zero). First configure the positive span side, as described above. Then you can experience a negative span side as below:



With measure at Minimum

It is possible to set the measure at LRV value using the SET S. LRV command:



INFORMATION!
To restore any unwanted change it is possible to select the RESTORE function in the menu or simply reset the SPAN URV and SPAN LRV value to the default value of 1.0.

4.3 → KEYBOARD CONFIGURATION

The electronic transmitters have some configuration functions available via keyboard and LCD display, provided with the transmitters themselves.

- Press the [MENU] button to enter the password entering dialog (the default password is 0000). Confirm by [OK] to enter the configuration menu.
- The display will allow to choose from the different functions described in the table below. Use the ⇧ and ⇩ buttons to show the sequence of the available functions and press [OK] to confirm the selected function.
- When the display is in numerical entering mode, the cursor will blink.
- To move the cursor press the ⇩ button; to raise the value of the digit press the ⇧ button. Press the [OK] button to confirm; use instead the [MENU] button to cancel the modifications and to go back to the standard display.

Function	Display name	Use	Choice span
Lower Range Value setting	**LRV**	Indicates and allows you to manually enter the initial value of the interval (the value corresponding to the 4 mA output). The unit of measurement is displayed at the bottom right of the screen.	Between the sensor limits
Upper Range Value setting	**URV**	Indicates and allows you to manually enter the final value of the interval (the value corresponding to the 20 mA value). The unit of measurement is displayed at the bottom right of the screen.	Between the sensor limits

Function	Display name	Use	Choice span
Measuring unit selection	**PV UNIT** (disabled in volumetric flow meters mode)	Measuring unit selection from the available ones. Press ⇧ o ⇩ to scroll.	**Pressure:** bar, mbar, Pa, hPa, kPa, MPa, mmH_2O, cmH_2O, Kg/cm^2, mmHg, psi, Torr, inHg, Atm, FtH_2O, g/cm^2, inH_2O **Level:** m, mm, cm, in
Sensor Temperature unit	**TEMP UNIT**	Temperature unit selection from the available ones. Press ⇧ o ⇩ to scroll.	°C, °K, °F
Configuration of the measuring unit typology	**XFR FUNC**	Not configurable in this series	LIN
Fault configuration	**ALARM TYPE**	Fault condition analog output selection.	NONE = no action 21mA 3.85mA LAST = last read value
Damping setting	**DAMP VALUE**	Insert the signal averaging time constant.	0 ÷ 60s
4mA input automatic setting (zero)	**SET LRV**	At button pushing, the instrument modifies the value of LRV and places it equal to the currently measured value. In this way, the analog output is 4 mA.	-

Function	Display name	Use	Choice span
20mA output Entrant setting (span)	**SET URV**	At button pushing, the instrument modifies the value of URV and places it equal to the currently measured value. In this way, the analog output is 20 mA.	-
Analog output test	**LOOP TEST**	It is possible to fix the analog output of the transmitter to a required mA value.	3.85 ÷ 21mA
Analog output calibration	**CAL 4-20mA**	The transmitter fixes the output to 4mA and asks by display to check the value (OK? YES/NO). Choose NO if the output is incorrect and insert the value read on an external Ammeter. Do it again until necessary. The same procedure for 20mA follows.	-
Hart® polling address	**ADDRESS**	Hart® polling address modification.	0 ÷ 15
Transmitter information	**INFO**	The polling address, the lower sensor limit (LSL), the upper sensor limit (USL) and the firmware revision are shown.	-
Password setting	**PASSWORD**	Allows to insert a new password for the transmitter. To be used with care.	0000 ÷ 9999
Set Span for URV	**SET S. URV**	Set the current measurement to the URV value, automatically calculating the required Span URV.	-
Expert command: Span Value URV	**SPAN URV**	Indicates and allows the manual entering of linear correction for URV value.	0.500 – 2.000 Three decimal places

Function	Display name	Use	Choice span
Zero re-setting	**OFFSET**	Set the current measurement to zero, automatically calculating the required zero elevation.	-
Expert command: Manual zero elevation	**ZERO ELEV.** (disabled in volumetric flow meters mode)	Indicates and allows manual entry of zero elevation value.	6 digits, including "-" sign and decimal point
Set Span for LRV	**SET S. LRV**	Set the current measurement to the LRV value, automatically calculating the required Span LRV.	-
Expert command: Span Value LRV	**SPAN LRV**	Indicates and allows the manual entering of linear correction for LRV value.	0.500 – 2.000 Three decimal places
Expert command: Specific Gravity	**SPEC.GRAV.**	Indicates and allows manual entry of the specific gravity value.	0.1 ÷ 3.0
Factory setting restore	**RESTORE**	Select and confirm using buttons ⇧ and [OK].	-

INFORMATION!
The password is in 4 digits format and spans from 0000 to 9999. If you can't remember or find the password you set, please contact our technical department.

5 → MAINTENANCE AND TROUBLESHOOTING

Although transmitters SST7X do not require a maintenance on periodical basis, it is good practice to regularly check the general transmitter status, the possible presence of rust or damage on the case or on the measuring diaphragm and the presence of clogging in the process connection.



PROHIBITION!
Repair, maintenance and/or overhaul of the equipment shall only be conducted by the manufacturer himself, or by a repairer he has qualified or authorized.

Is forbidden during the maintenance operation to use the tool as a handle or step.



Please refer to the following pages scheme for troubleshooting.
In any case contact our technical department for help.

Condition	Potential source	Solution
The transmitter doesn't turn on	Supply	Check the supply voltage to be 12,5Vdc<V_{supply}<30Vdc.
	Polarity	Check the transmitter connection polarity.
	Electrical load	Check that the load is less than the maximum allowed.
Measure is incorrect	Process	Accurately verify the compatibility between the process and the connection type.
	Sensor drift	Apply zero input conditions to the transmitter and use the OFFSET command.
	EMC interference	Accurately verify the possible presence of electromagnetic interference on the supply line. Check the PE connection.

Condition	Potential source	Solution
Wrong Analog Output	Wrong span limits	1) Verify that LRV and URV values are the ones you want; 2) In the start-scale process condition, use OFFSET command to correct the measure to zero; 3) In the full scale process condition, use SET S. URV (set span URV) command to correct the URV value; It is possible to correct only the analogical output, by changing the LRV or URV values (alternatively editing SET LRV and SET URV) to set the instrument measure at 4 mA or 20 mA.
	Uncalibrated analog output	Use the LOOP TEST command to verify the analog output calibration. If it is not correct, use the CAL4 - 20mA command to calibrate the output.
	Incorrect HART® settings	Use the ADDRESS command to verify that the polling address is set to 0.
Analog output <4mA or >20mA	Transmitter in fault mode	Check if the output isn't out of the allowed span or check the presence of a failure (e1, e2, … on display).
	Wrong fault settings	Check the settings using the ALARM TYPE command.
Unstable measure	Measuring disturbs	Set an input average using the DAMP VALUE command (i.e. 10 seconds).
Impossible to access the menu	Wrong / forgotten password	Contact us for help

5.1 → DISPLAY ERROR CODES

Type of error	Description
ALARM HIGH	OVER RANGE: this message is shown if PV is greater than URV by 10% of the span.
ALARM LOW	UNDER RANGE: this message is shown if PV is lower than LRV by 5% of the span.
LCD OV	LCD OV: this message is shown if PV < -99999 or PV >99999.
EE CHK ERR	This message depends by an error configuration of the EEPROM memory
EE ADC ERR	This message is shown if there are PV calculus error in primary ADC input. If it persist contact Spriano® for help
T EX AD ER	This message is shown if there are on external temperature signal calculus error in secondary ADC input. If it persist contact Spriano® for help
T IN AD ER	This message is shown if there are on internal temperature signal calculus error in secondary ADC input. If it persist contact Spriano® for help
PR ADC ER	This message is shown if there is an error in calculating the input of primary ADC pressure signal. If persist contact Spriano® for help.
NaN	Indicates a sensor damage.

5.2 → SPARE PARTS

Below is the list of spare parts available for SST76 instrument.
Together with the request of spare parts it is required to indicate Serial Number of the Transmitter to control that the correct components will be delivered.

Item	Product Code	Description	Quantity
01	DISPLAY COVER	Cover with display glass	1
02	BLIND COVER	Blind cover terminals side	1
03	COVER O-RINGS	Gaskets for enclosure covers	2

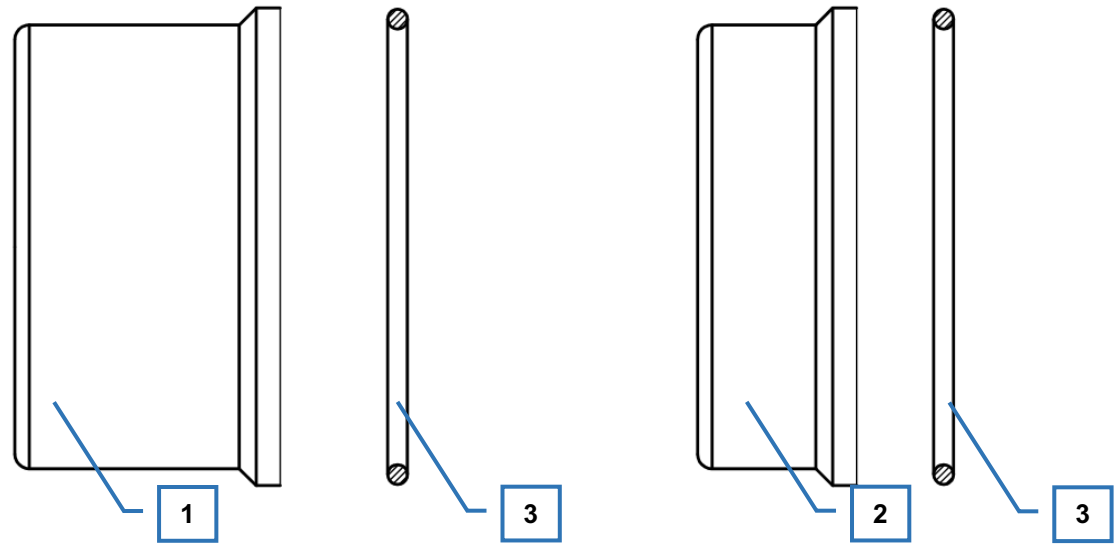


Figure 12: spare parts

6 → MARKING

On the transmitter enclosure is fixed an identification plate with inscriptions showing the characteristic data of the instrument.
Refer to **Figure 13**, the Transmitter is provided with the following information:

1. Name and address of the manufacturer
2. CE marking followed by the identification number of the notified body involved in the production phase
3. Designation of series or type
4. Serial number (with the Year of construction)
5. ATEX marking for equipment-group II, followed by the specific marking of explosion protection (see 1.3 → Definitions And Symbols)
6. PED essential allowable limits: allowable Fluids, Maximum working pressure (PS), Nominal size (DN), etc.

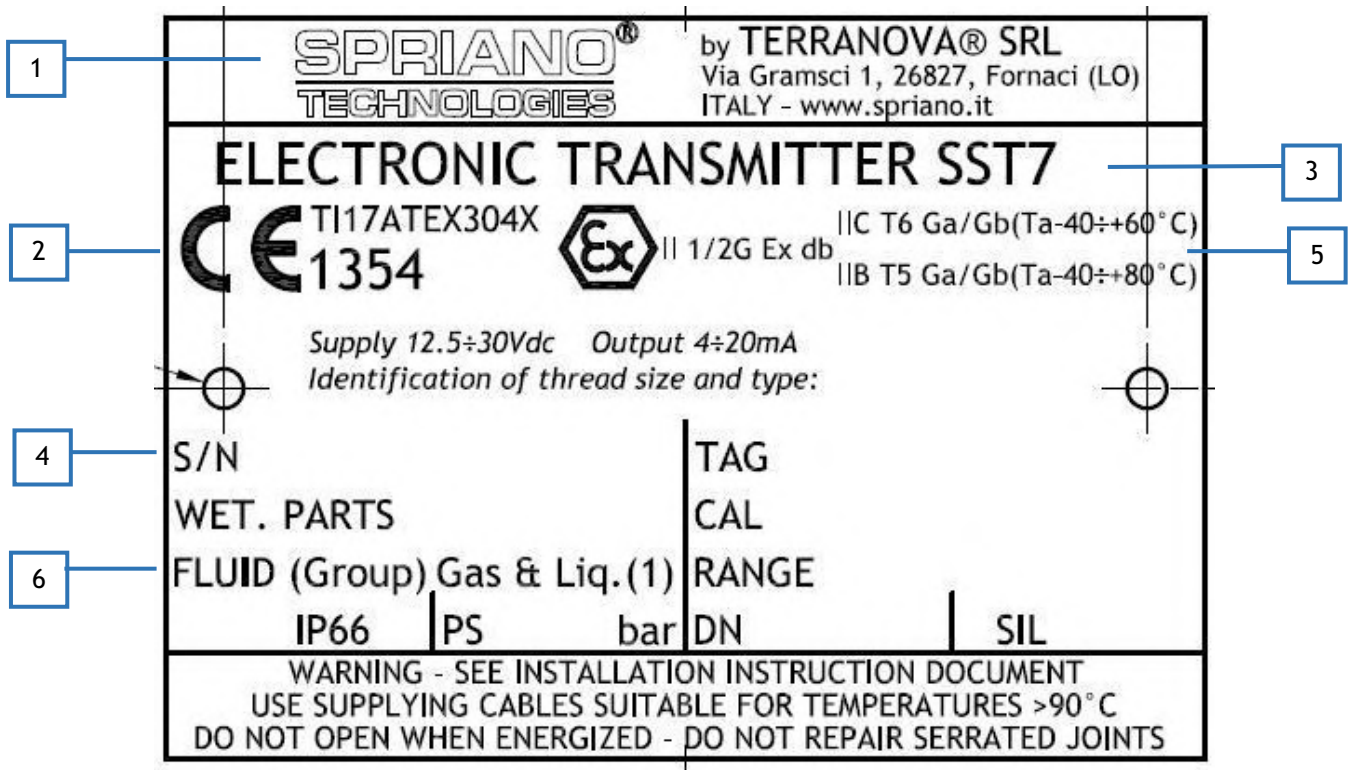


Figure 13: marking plate

7 → DATA SHEET

FUNCTIONAL DATA
With reference to the following, please note these definitions:
Nominal range: (referred to the sensor mounted in the
instrument) the measured pressure range for which the sensor has been designed. Defined as a minimum and maximum value.
Nominal span: the interval between the minimum and maximum values of the sensor nominal range. The span is a single number.
Measuring range: the minimum and maximum range values for which the transmitter is to be calibrated.
Measuring span: the interval between minimum and maximum values of the measuring range.
Input scale initial value or zero input: minimum pressure value within in the measuring range.
Input full scale value: maximum pressure value within in the measuring range.

TRANSMITTER PARAMETERS
The parameters that are available for display and setting are:
Measuring span: possibility to change from 3,3% to 100% of the nominal span.
Zero adjustment: digital calibration ± 15%.
Low/upper range values: they can be set within the nominal range provided that the span > minimum span.
Damping: digitally adjustable from 0 to 60 sec. (minimum response time ~ 0,1 sec.).
Reverse output: automatically obtained via software.
Transfer function: linear/square root via software.
Self-test: in case of malfunction the analog output is forced to the fail-safe state 3.85 mA or 21 mA.
Measuring units: 18 different pressure units or % of the
measuring span, selectable via software.

PHYSICAL CHARACTERISTICS
Power supply: 12,5-30 Vdc
Output signal:
Analog 4-20mA, 2 wires.
Digital using HART® protocol
Response time: <256 ms (Std Hart®)
Measured value update frequency:
4-20 mA + Hart® output: ~1s
Hart® output only: ~500 ms (on request)
Polling time:
4-20 mA + Hart® output: ~800 ms
Hart® output only: ~500 ms (on request)

AMBIENT CONDITIONS
Temperature:
Process fluid: -40 ÷ +80°C (with finned arm: up to 150°C; with syphon: up to 235°C; with capillary: up to 283°C)
Housing: -40 ÷ +80°C
Handling and storage: -40 ÷ +90°C
Relative Humidity: 0 a 100% R.H.
LCD display reading: -10 ÷ +65°C

PERFORMANCES
Output resolution: < 0,01% nominal range (at 20°C)
Total accuracy[1]: up to <0.07%FS (0 ÷ 80°C)
<0.2%FS (0 ÷ -40°C)
Dead band: negligible
Display resolution: 0.1

INFLUENCE OF OPERATING CONDITIONS
Thermal drift: referred to -10 ÷ +80°C range.
- **Zero:** ± 0,1%/10°C.
- **Span:** ± 0,1%/10°C at nominal range.

Long term stability: <0.1%FS/year
Power supply effect:
Negligible between 12.5 and 30 Vdc.

[1] Including hysteresis, non-linearity and repeatability (IEC 60770)

PHYSICAL SPECIFICATIONS
Housing: die cast aluminum alloy EN AW-6082 finished with epoxy resin (RAL 5014). It is dust and sand tight and protected against sea wave effects as defined by IEC IP66. Suitable for tropical climate operation as defined by DIN 50015.
Covers O-ring: EPDM.
Filling fluid: silicone oil.
Nameplate: stainless steel, fixed on housing.
Calibration
Standard: at nominal range, direct action, linear.
Optional: at the conditions specified with the order.
Electrical connections: two cable entries on electronic housing: 1/2" NPT and cable gland PG 13.5 for 7 to 12mm diameter cable.
Terminal board: 2 terminals for signal wiring up to 1.5mm^2 (14 AWG). Connection for ground and cable shield.
Mounting position: any position.
Net weight: 2.4kg approx.

PROCESS WETTED PARTS
Process connections: AISI 316.
Diaphragm: see ordering information table.

OPTIONS
Finned extension, siphon or remote mounting with capillary: for working temperature higher than 80°C up to 283°C.
Bracket: for 2 inch pipe mounting.
Degreasing for oxygen service.
Stainless Steel Housing: AISI 316 (IP66).

7.1 → FUNCTIONAL SAFETY ACCORDING TO IEC 61508 / IEC 61511

The assessment of the safety critical and dangerous random errors results, provided that the attached safety instructions are observed and an annual function test is performed, in the following parameters:

Transmitter Type	λ_{DD}	λ_{DU}	λ_S	λ_{TOT}	SFF	SIL
SST76	7.5072×10^{-8}	1.0725×10^{-8}	8.0434×10^{-8}	1.6623×10^{-7}	91.67%	2

7.2 → MAIN DIMENSIONS

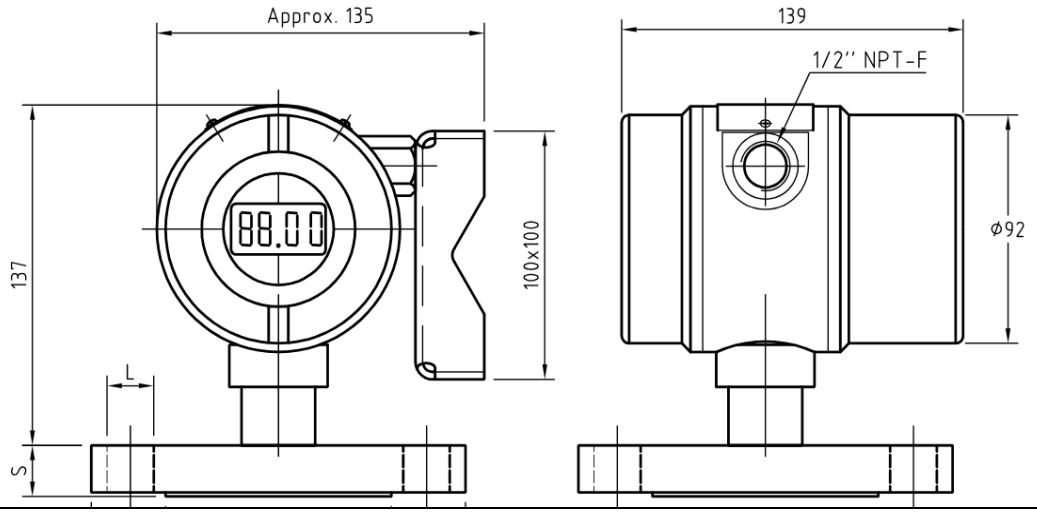


Figure 14 – flanged connections UNI, ASME etc.

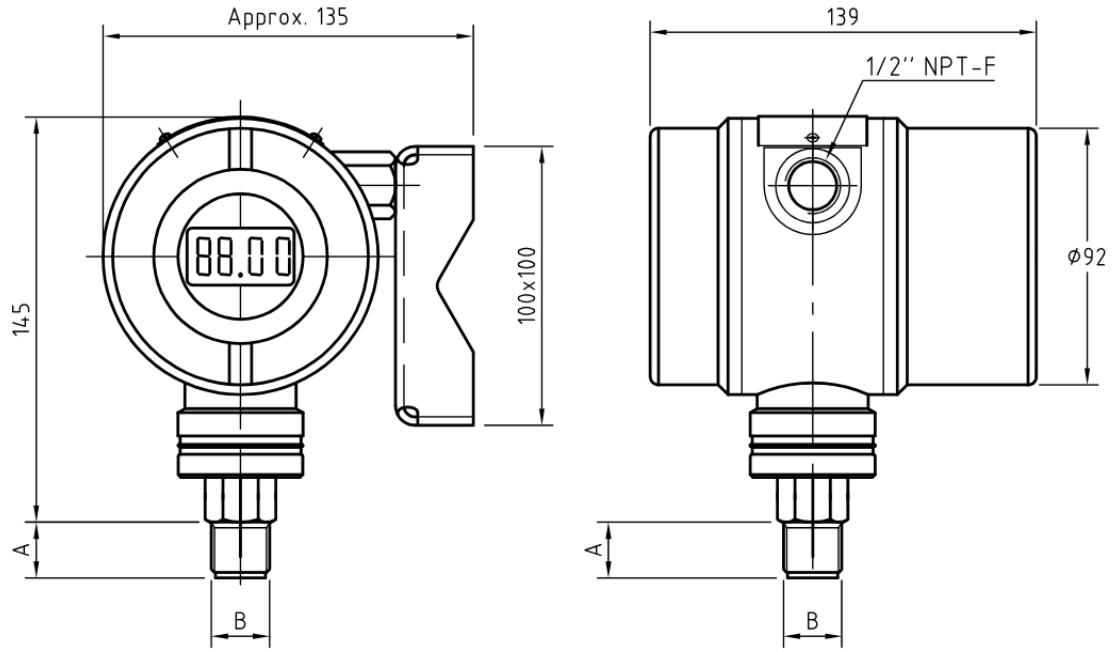


Figure 15 – male screwed connections for Nominal Range up to 30 bar

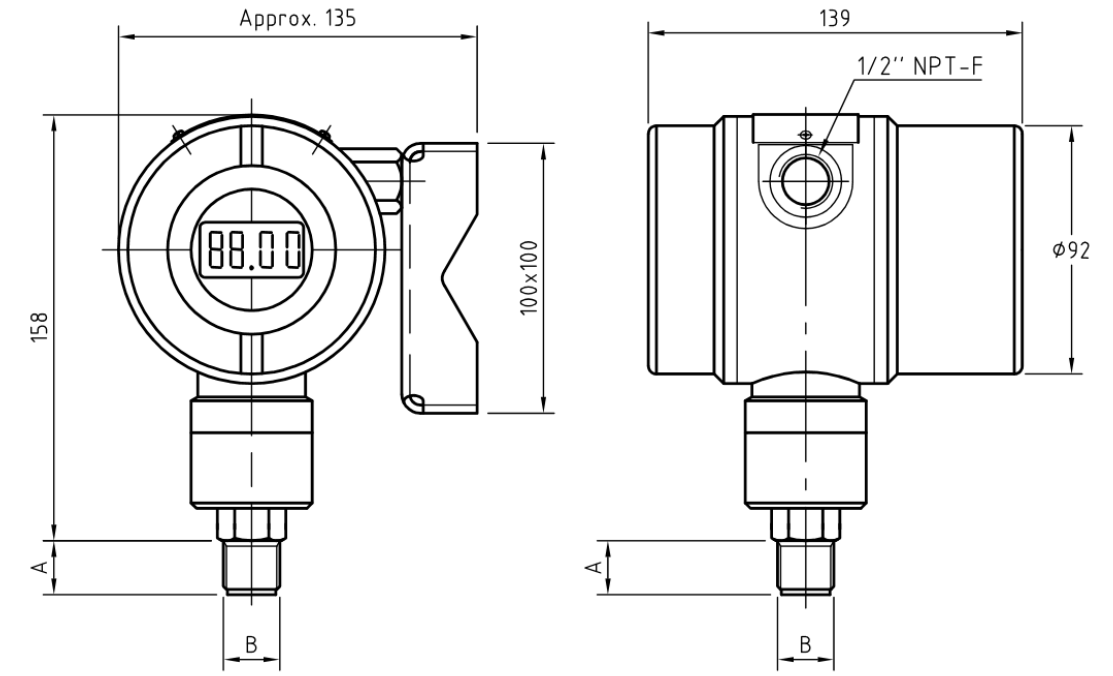


Figure 16 – male screwed connections for Nominal Range up to 100 bar

	1/4''		3/8''		1/2''		3/4''	
A	13	13	16	-	20	18	20	14
B	G	NPT	G	NPT	G	NPT	G	NPT

Note: 1/4'', 3/8'' and 1/2'' follows standard UNI EN 837

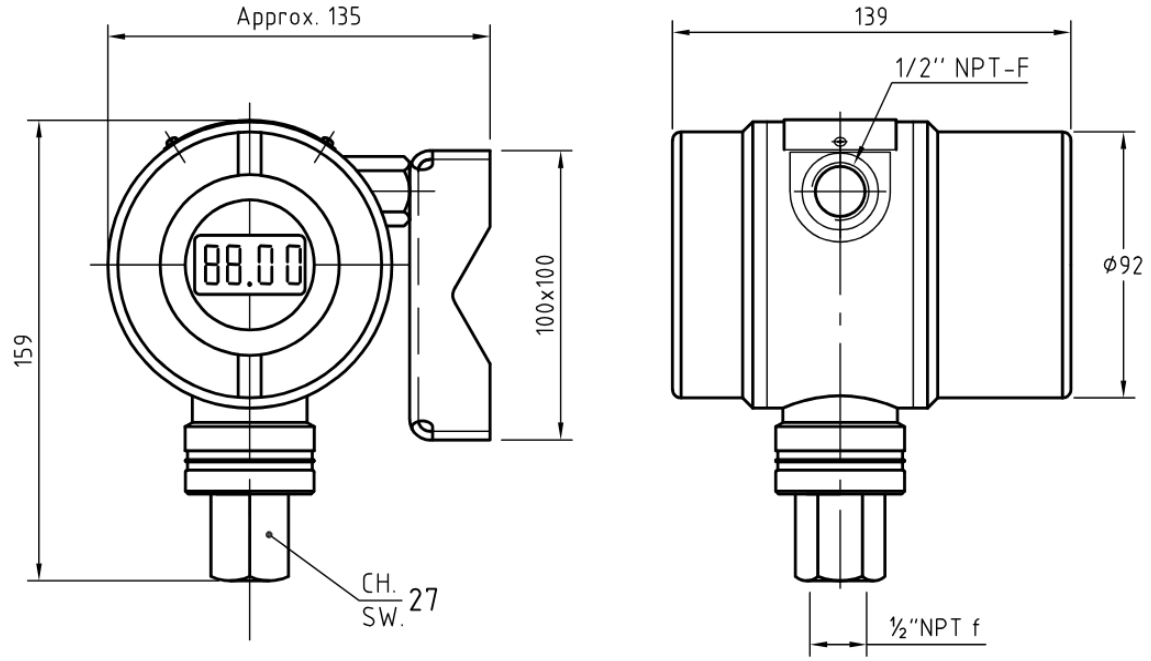


Figure 17 – female screwed connections for Nominal Range up to 30 bar

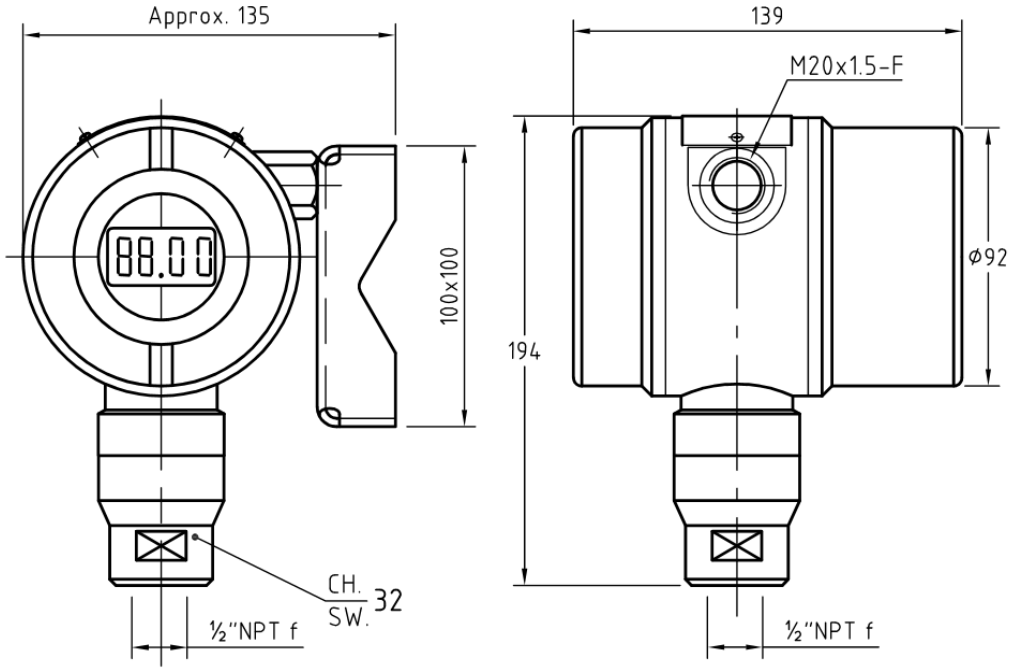


Figure 18 – female screwed connections for Nominal Range up to 100 bar

	1/4''		3/8''		1/2''		3/4''	
A	13	13	16	-	20	18	20	14
B	G	NPT	G	NPT	G	NPT	G	NPT

Note: 1/4'', 3/8'' and 1/2'' follows standard UNI EN 837

NOTES



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OPERATING and MAINTENANCE MANUAL for SST72 TEMPERATURE TRANSMITTERS

SST72 TEMPERATURE TRANSMITTER



PED

SIL
IEC 61508 / IEC 61511

FIELDCOMM GROUP
MEMBER

HART
COMMUNICATION PROTOCOL

ORIGINAL INSTRUCTIONS

SPRIANO®
TECHNOLOGIES

CE 1354

EU Declaration of Conformity

TERRANOVA® Srl

Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
declares on his sole responsibility that the product:

SPRIANO® Electronic Transmitters series

SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B, SST70-REM

(device controlling or regulating the limits of an industrial process, like pressure, level and vacuum)
satisfies the essential requirements and conformity assessment procedures of the following legislation:

Directive 2014/34/EU (ATEX)

EU TYPE CERTIFICATE: TI 17 ATEX 304 X

Equipment for use in potentially explosive atmospheres, suitable for Zones 0, 1, 2 (process side and external side)

II 1/2G Ex db IIC T6 Ga/Gb for use in the ambient temperature range –40°C to 60°C
II 1/2G Ex db IIC T5 Ga/Gb for use in the ambient temperature range –40°C to 80°C

Presumption of conformity provided by the application of the harmonised standards:
EN 60079-0:2012+A11:2013 - EN 60079-1:2014

The Notified Body NB 1354 Technicka inspekcia a.s. performed Module D, Annex IV, Directive 2014/34/EU and issued the Production Quality Assurance Notification. Periodical Surveillance is provided according to Annex IV, Point 4, Directive 2014/34/EU by the same Notified Body.

Directive 2014/68/EU (PED)

EU DESIGN EXAMINATION CERTIFICATE: 1292/1/2017-2÷8

Pressure equipment, up to Category IV, for fluids (gases, liquids and vapours) in Group 1.

Conformity provided by the application of the harmonised standard:
EN 13445-1:2015, EN 13445-2:2015, EN 13445-5:2015

The Notified Body NB 1354 Technicka inspekcia a.s. performed Module H1, Directive 2014/68/EU and issued the Production Examination Certificate. Periodical Surveillance is provided according to Directive 2014/68/EU by the same Notified Body.

Directive 2014/30/EU (EMC)

Equipment with an adequate level of electromagnetic compatibility.

Presumption of conformity provided by the application of the harmonised standard:
EN 61326-1:2006

Terranova dei Passerini, 04/08/2017

Mr Sergio Valletti,
General Manager

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WARNING!
Exclusively follow the instructions indicated in this document. Failure to comply with this document may cause injury to health or may damage the equipment.

SPRIANO® TECHNOLOGIES do not takes any kind of responsibility for damages due to failure to comply with this document.

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1 → INTRODUCTION

1.1 → PRODUCT OVERVIEW

Electronic transmitters series SST7X are apparatus which use a piezoresistive sensor for pressure, level and temperature measurement, and transmit a current signal (4 ÷ 20mA) proportional to the variable measured. The series SST7X is composed by the following types:

SST70	Displacer level transmitter
SST71	Smart Float Level Transmitter
SST72	Electronic temperature transmitter
SST75	Absolute or relative pressure transmitter
SST76	Absolute or relative pressure transmitter with diaphragm
SST77B	Differential pressure transmitter
SST77BL	Level transmitter
SST79B	Immersion level transmitter
SST70-REM	4÷20mA loop powered field digital indicators (External local indicator)



MANDATORY!
The accessories used for the cable entries and to close unused shall be certificated according to the standards EN 60079-0 and EN 60079-1 for the gas groups IIC or IIB, according to the type of protection implemented.

1.2 → ATTENTION!

This manual does not contain information concerning all type of Transmitter or all different installation and/or working and mounting solutions. For more information or for particular problems not considered in this manual, please address to our technical office.
The warranty period is the one contemplated in our general servicing conditions. This warranty is neither increased nor restricted by the contents of this manual.
This Transmitter has to be installed and used only by qualified persons who have first checked the correctness of supply voltage so that both in standard working conditions and in presence of damages of the plant or of any part of it, no dangerous voltage can reach the Transmitter. As the Transmitter can be utilized both with high pressure values and with aggressive media it must be considered that an incorrect use of it could bring even serious damages to people and things. A correct and safe working needs an adequate transport, stock and mounting other than an appropriate maintenance service. So it is necessary for the people handling these Transmitter to have knowledge and experience in mounting, servicing and working and to have title to do their job with reference to “Safety Standards”.

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1.3 → DEFINITIONS AND SYMBOLS

In this manual are used the following symbols and labels

	Equipment for use in potentially explosive atmospheres
II 1/2G	Equipment Group II Category 1/2G, suitable for potentially explosive area (gases, vapours or mists); to be installed in a separation wall between Zone 0 (process side) and Zone 1 (external side)
Ex d	Device with Explosion Proof Enclosure
IIC	Group IIC apparatus, fit for substances of group IIC, IIB and IIA (only when used in the ambient temperature range –40°C to 60°C)
IIB	Group IIB apparatus, fit for substances of group IIB and IIA (when used in the ambient temperature range –40°C to 80°C)
T6, T5	Temperature Class of the transmitter (maximum surface temperature) ➢ only when used in the ambient temperature range –40°C to 60°C ➢ only when used in the ambient temperature range –40°C to 80°C
Ga/Gb	Equipment to be installed in the boundary wall between an area requiring EPL Ga and the less hazardous area



WARNING!
Warning label, used to warn about hazardous materials, locations, or objects, including electric currents, poisons, and other things.



PROHIBITION!
Prohibition label, used to indicate something is not permitted.



MANDATORY!
Mandatory label, used to set obligation tasks to be performed by the user.



INFORMATION!
Information label, used to set general information for the user or warn about hazards for the equipment.

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2 → DESCRIPTION

The SST72 series SMART temperature transmitters are microprocessor based instruments that combine the analog signal advantages (4 - 20mA) together with the flexibility of digital communication using HART® protocol. They can be remotely configured by a universal hand held terminal (HHT) or by a PC with a dedicated interface.
Moreover, it is possible to configure locally the instruments (zero and span) by means of push buttons and to display the data on the wide LCD display. The SST72 transmitters are able to accept 3 wires PT 100 Ohm resistance thermometers and total accuracy is depending on class of the sensors utilized such as DIN A, DIN B, 1/3 DIN, 1/5 DIN,1/10 DIN etc.
Based on these readings the microprocessor generates the 4-20mA analog output "two wires system" and displays the measurement on the LCD. Some of the main characteristics of this microprocessor based transmitter are:

- Wide Rangeability;
- Automatic temperature compensation;
- Digital communication using HART® protocol.

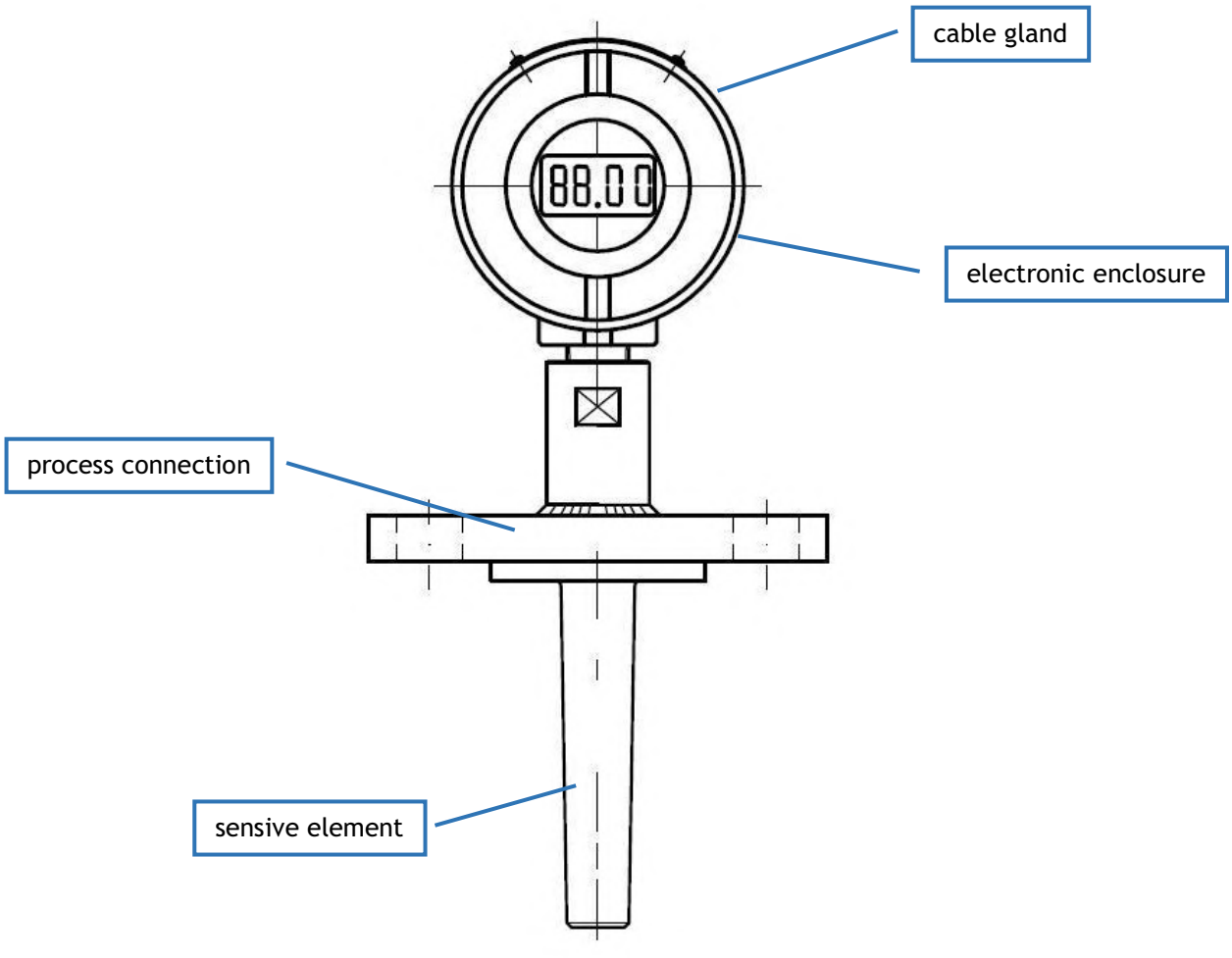


Figure 1: SST72 electronic temperature transmitter

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3 → INSTALLATION

3.1 → TRANSMITTER IDENTIFICATION

Transmitter data can be found on the nameplate fixed on the top of transmitter enclosure (see 6 → MARKING). The Serial Number must be quoted at the occurrence of a specific request to the manufacturer.

3.2 → GENERAL MOUNTING REQUIREMENTS

Prior installation shall be observed following considerations:

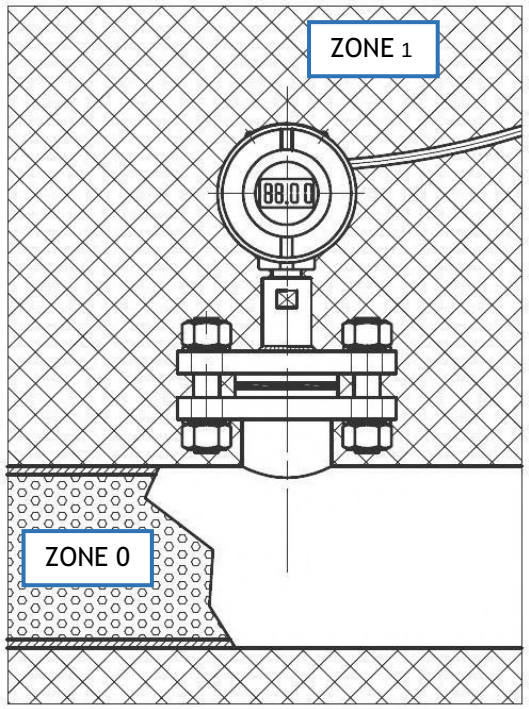
- Check whether Transmitter's operating conditions are within the limits as reported in the nameplate, technical specifications sheets and/or label.
- Make sure that the operating conditions are compatible with the specification given to the manufacturer.

MANDATORY!

- For measurement in the presence of particularly hot liquids (e.g. steam) make sure that the Transmitter is supplied with a suitable finned arm or siphon.
- For viscous liquids or those containing solid particles in suspension make sure that the connection to the process is a suitable one in order to avoid clogs.

WARNING!

Direct sunlight may cause serious damages to the instrument.
Never install standard Transmitter under the sun or in any other location which could cause direct overheating through radiation.



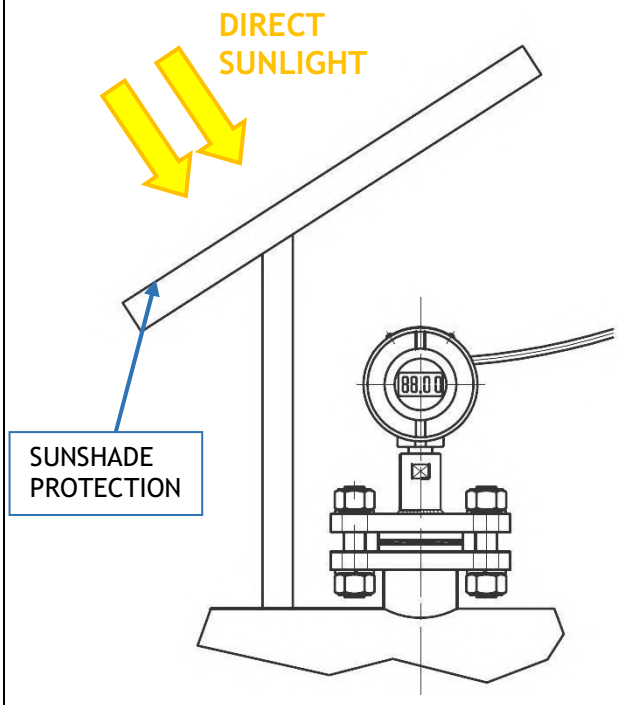


Figure 2: mounting requirements

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3.3 → MECHANICAL INSTALLATION

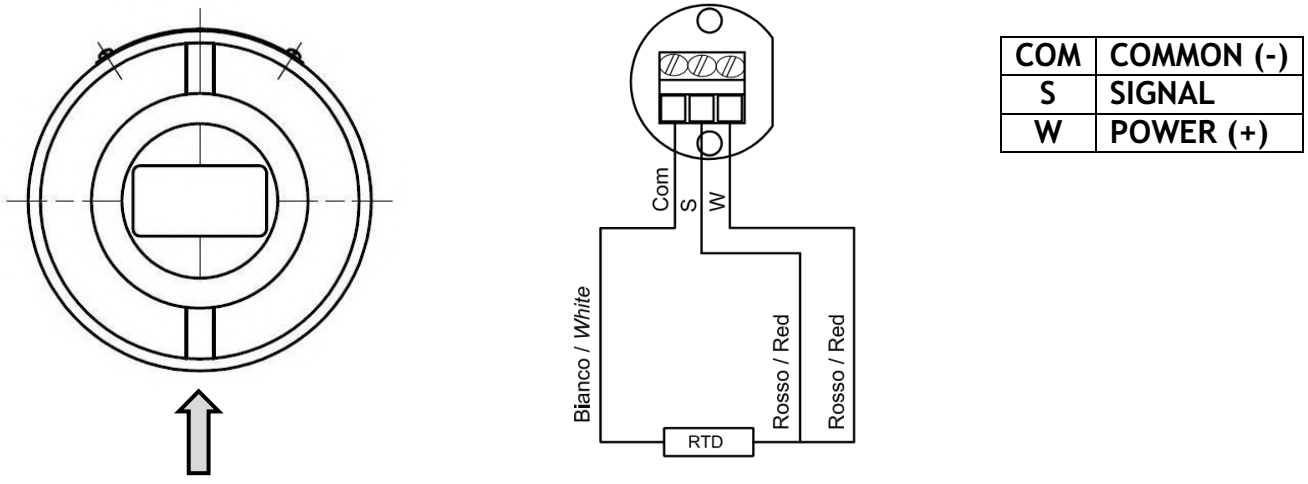
The Transmitter should be located, if possible, at some easily accessible, well lighted place on the vessel or pipe, in order to allow putting in operations and maintenance work. Location should also be such that ambient temperature at the Transmitter enclosure be not excessive (see 6 → MARKING).

INFORMATION!
- Plant overpressure / over-temperature: observe rating plate
- Installation on seismic areas: inform technical department
- In case of unstable fluids: inform technical department
- In case of damages: inform technical department
- Inspection frequency: consideration should be given to applicable national legislation.

WARNING!
- The process connection must be realized in such a way that guarantees the hold at the maximum working pressure and temperature.
- Do not overcome the maximum pressure and temperatures indicated in the technical data sheet of the selected model.
- When the device is connected to the process it can be submitted to high pressures and temperatures. To avoid accidents subsequent to sudden discharge of pressure and/or to contact with dangerous or flammable fluids it is necessary to take the maximum attention when the Transmitter is taken off, heated or repaired, verifying that it is isolated from the process and is not submitted to pressure and/or temperature.

3.4 → SENSIVE ELEMENT CONNECTION

The transmitters SST72 allow to measure the temperature by means of PT100 (3 wire), within industrial processes and in different operating conditions.



COM	COMMON (-)
S	SIGNAL
W	POWER (+)

Figure 3: connection PT100 head transmitter

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3.5 → ELECTRICAL CONNECTION

Under the rear cap is placed the terminal block reporting the electric polarity (**Figure 4**).
Insert the power supply cable into the enclosure through one of the two threaded openings. Transmitter is protected from accidental inversion of polarity. For a better use is recommended a twisted pair cable (22 AWG min). Avoid placing Transmitter near devices powered in AC or Switching. Connect ground-tap of the Transmitter to the local common earth (PE) as indicated in paragraph 3.7 → Earthing .

WARNING!
The threaded opening that is not used must be sealed using a suitable cap. The caps included in the delivery are only for protection during transport.

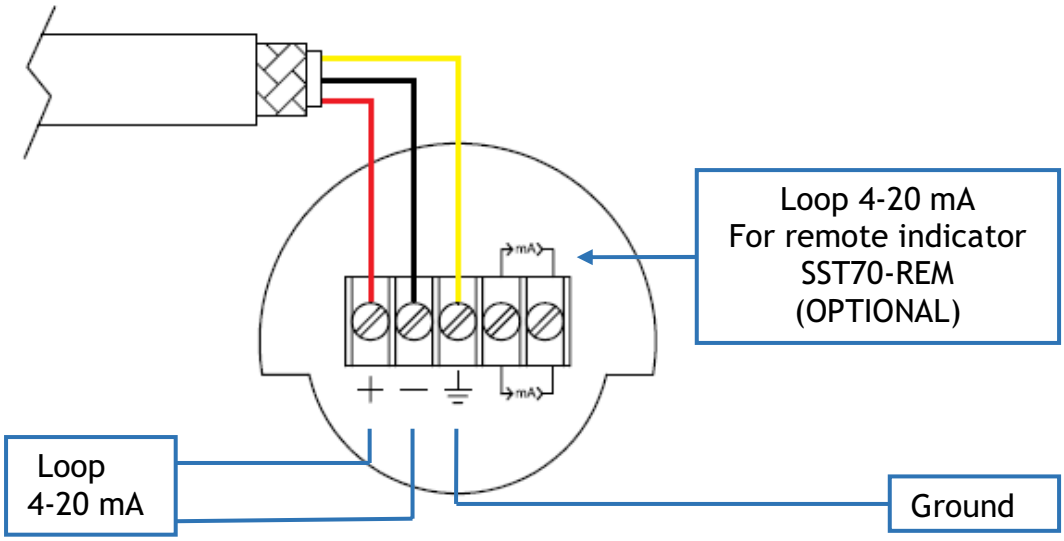


Figure 4: electrical connection of the power cable to the terminal block

INFORMATION!
Impedance of the cables defines the possible maximum length for digital communication. It's recommended using cable with a low impedance. The maximum length of the point to point connection, with a load of 250 ohm and single twisted cable 22 AWG-207 pF/m it's about 1000 meters.
The maximum connection length for the analog signal only is limited by the loads (connected devices and cable) present in the current loop.

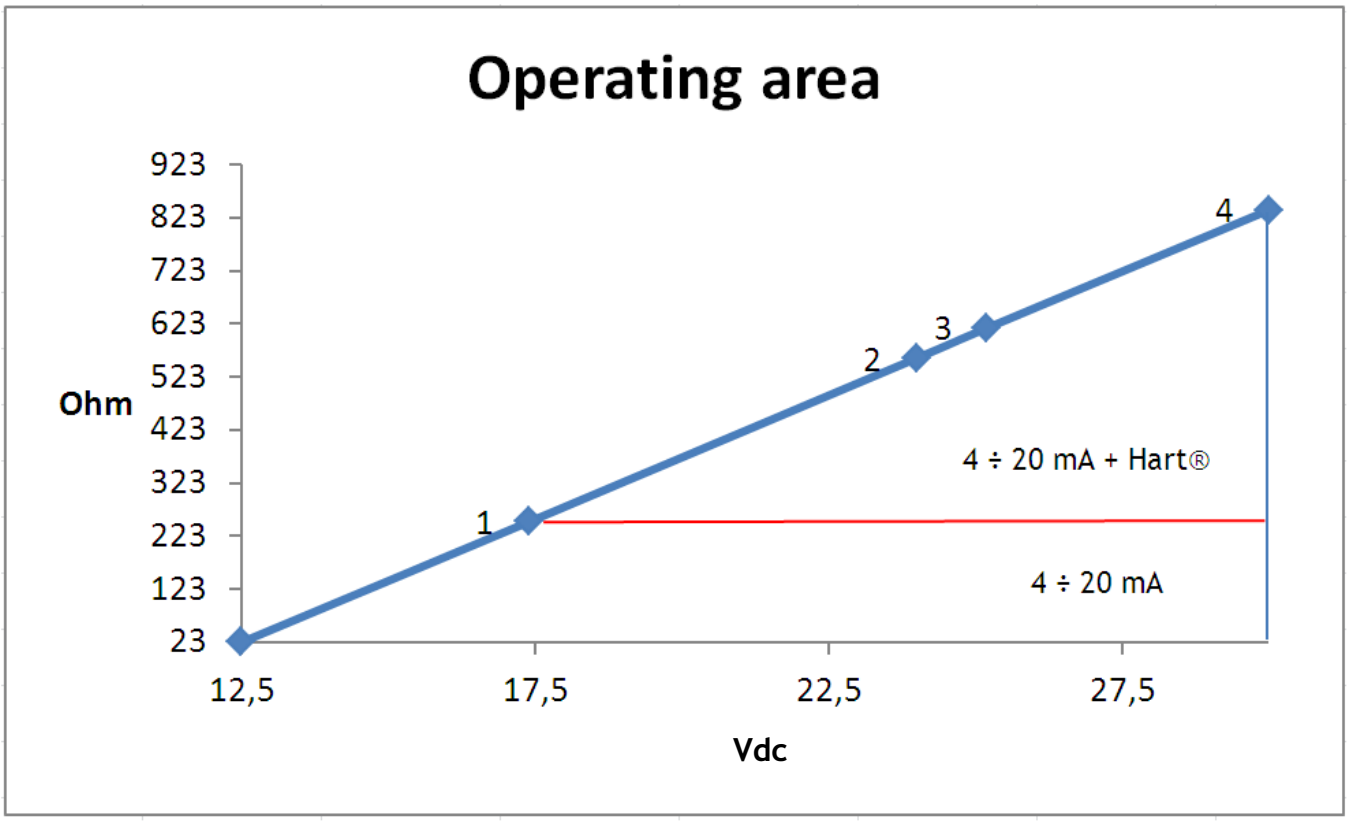
To obtain output signal of 4-20 mA, you have to determine the minimum supply voltage as a function of the load relation: see **Figure 5**. From the following formula you can achieve the right minimum value of supply voltage:

$$V_{dc} = 0.0215 \times R_L + 12$$

Where: R_L = output load [Ohm].
The power supply source must assure a minimum current value of 24 mA.

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MANDATORY!
In order to obtain a 4÷20 mA + Hart® output a minimum load of 250 Ohm is required.



TAG	-	1	2	3	4
Vdc	12.5	17.4	24	25.2	30
Ohm	23	250	558	615	837

Figure 5: operating area for Ex ia protection

The electronic transmitters totally comply with the HART® protocol specification Revision 6.0, so they include remote process variable interrogation, parameter setting and diagnostics.
The device is a 4÷20mA 2-wire transmitter, with FSK communication.
It is possible to read via HART® the following variables:

- **PV**: transmitter main measure;
- **SV**: % of the span;
- **TV**: analog output;
- **QV:** electronic board temperature.

Please refer to **Figure 6** for the Hart® modem connection on transmitter's 4÷20mA loop.
In **Figure 7** the multidrop connection type is shown.

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It is possible to purchase the Hart Server as an additional product; this is a software including all the interrogation, configuration and diagnostics functions required by the Hart® specifications.

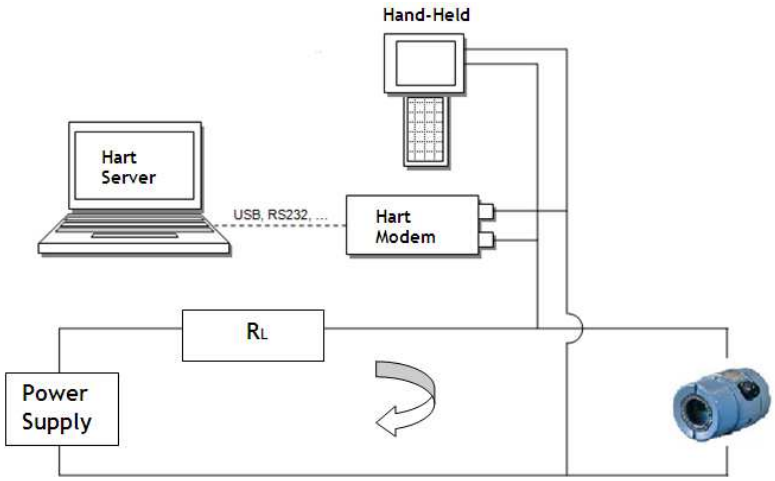


Figure 6: 4÷20 mA + Hart® modem connection

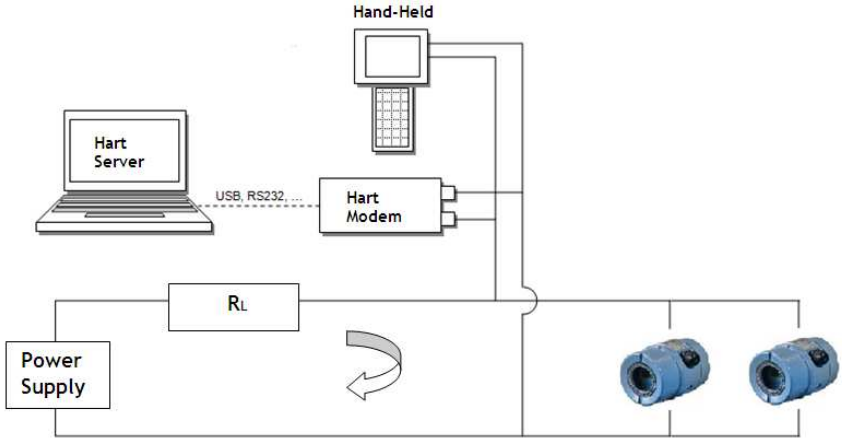


Figure 7: only Hart® multidrop connection

INFORMATION!
At maximum 15 transmitters could be connected in parallel on the same line.
Attention: when more transmitters are connected on the same line the current standing on the resistor (250-ohm) is equal to

4mA x N of connected instruments.

This could cause a high electric potential. Be sure power supply is sufficient.

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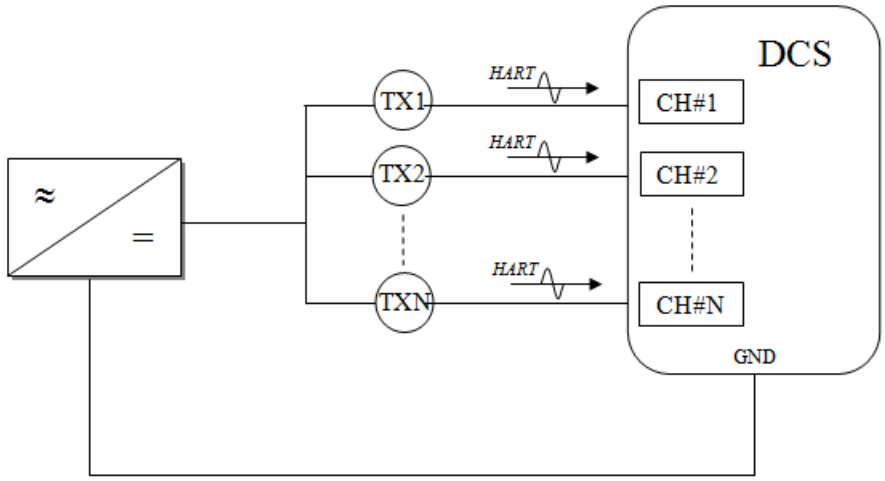


Figure 8: DCS connection

MANDATORY!
Transmitter response time is <256ms.
DCS POLLING time must be set approximately at 800ms in order to avoid updating problems both in analog and digital measurement.
On request the transmitter can be supplied in order to support a Polling time of 500ms but with a minimal consumption of 5 mA.

3.6 → EXPLOSION PROOF PROTECTION

In case of use in areas with danger of explosion, it must be verified that the identified type of transmitter fits for the classification of the zone and for the presence of flammable substances in the plant (see 6 → MARKING).
The safety essential requisite against the risk of explosion in the classified areas are fixed from the European Directives 2014/34/EU of 26 February 2014 (as far as it concerns the 'Equipment') and 1999/92/EC of December 16th 1999 (as far as it concerns the 'Working Environment').

WARNING!
For the electrical connections please follow the instructions brought in this operator manuals taking care that for the use in classified areas it is necessary to foresee the standard EN 60079-14.
The accessories for cable entry (which must be threaded ½" NPT) must be certified following the Standards EN 60079-Series (for Tamb >70°C must be certified for T > 90°C).

PROHIBITION!
Do not open the covers or any part of the device in dangerous area when circuit alive.
For explosion proof safety installation, it is mandatory to disconnect the electric supply before opening the device.

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3.7 → EARTHING

WARNING!
The earth connection is required to prevent damage to people and malfunction of the instrument.

- **Case 1: Installing the instrument in a plant devoid of earthing systems**

In the case where the plant devoid of earthing, it is necessary to connect the earth wire to the terminal block through the cable that carries the signal and the power supply (**Figure 4**).

- **Case 2: Installing the instrument in a plant provided with earthing systems**

Make sure the earthing (GND) of the system has the least resistance possible.
You can add an additional earth wire with section not less than 4 mm^2 to ensure such connection.

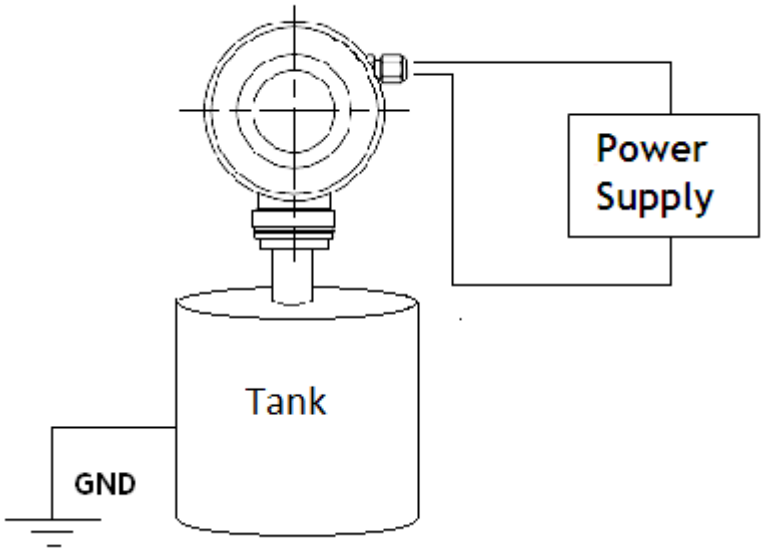


Figure 9: 4 ÷ 20 mA loop connection with plant provided with earthing systems

WARNING!
In the case represented in **Figure 10**, within the earth wire may also scroll through the current protection of other instruments where the earthing of the system (GND) had not been carried out in an optimal manner.

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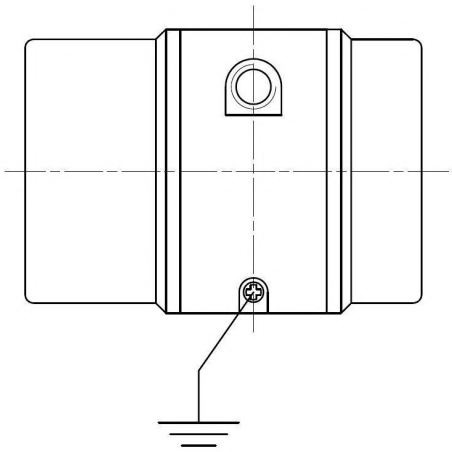


Figure 10: earthing in the housing

WARNING!
The hose must not be considered as a protection against electric shock for the protection of security, but as protection against electromagnetic interference of the instrument. Therefore, in the case of long distance cable (L> 20 m), both ends of the braid must be connected to the chassis or to the connectors. In the case of cables L <20 meters, will be sufficient to connect the braid only from the side "Power Supply".

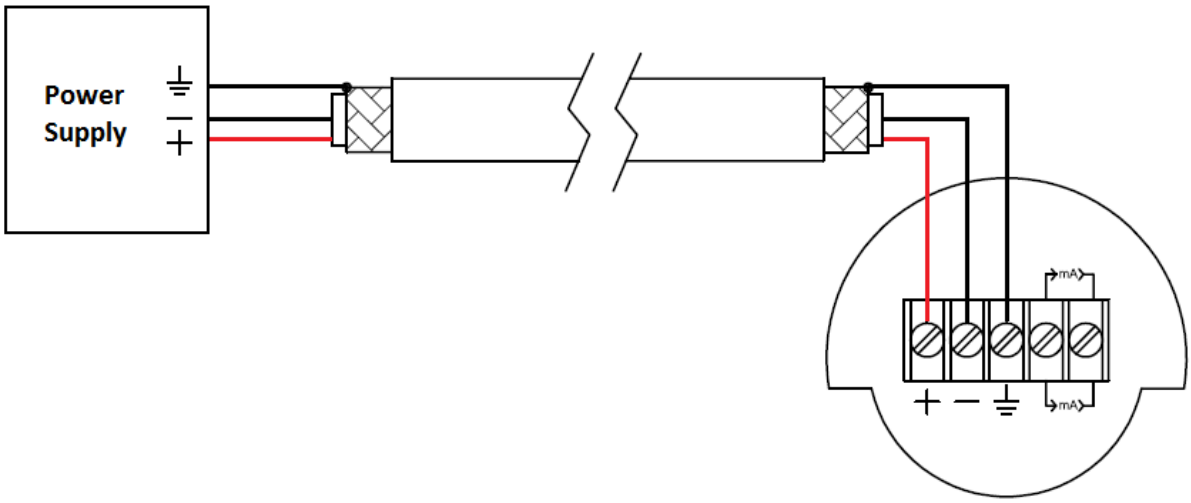


Figure 11: earthing of the sock for cables longer than 20 meters

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4 → OPERATIONS

Each transmitter is calibrated in factory and has on the nameplate the configuration data. If not differently stated in the purchase order the transmitter is configured as follow:

Upper Range Value (Highest temperature value): refer to the data sheet of unit
Lower Range Value (Lower temperature value)**:** refer to the data sheet of unit
Damping **0 sec**.

4.1 → CONFIGURATION

The transmitter shows the status and the measure on the dot matrix LCD (**Figure 12**). The span is from -99999 to 999999.
The input signal to the transmitter can be related to the output signal in the following ways:

- **Direct mode** = 4 ÷ 20mA output
- **Reverse mode** = 20 ÷ 4mA output

The direct mode is obtained by setting the lower range point with the lowest value of the range (e.g. 0 °C) and by setting the upper range point with the highest value (e.g. 5 °C). The reverse mode is obtained by setting the lower range point with the highest value of the range (e.g. 5 °C) and by setting the upper range point with the lowest value (e.g. 0 °C).
The instrument can calculate different variables. From the main screen (where the current measure is shown), you can select, using the buttons ⇩ **Next Page** and ⇧ **Previous Page**, the desired variable to keep on the display. There are available the following variables:

- PV;
- Percentage;
- Current
- Ambient temperature (after 10 seconds the PV measure is restored on the screen)

The selected variable is saved and retained even after the instrument is restarted. So, if you want a different variable, then you have to select it again.

SECTION LEAVED INTENTIONALLY BLANK

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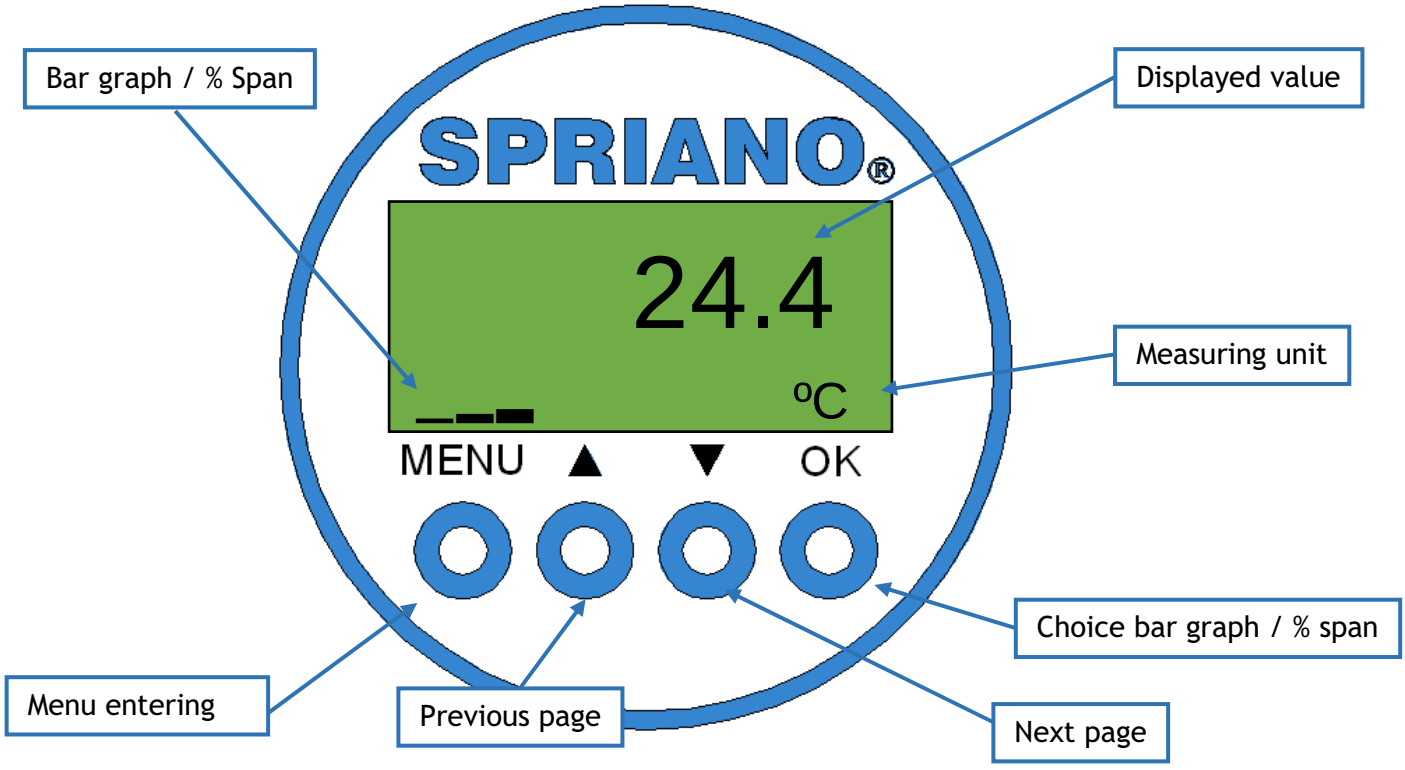


Figure 12: SST72 display

It will be possible to display one of the following variables on the screen:

TEMPERATURE (PV) 23.27 °C	CURRENT (TV) 4.220 mA
PERCENTAGE (SV) 34.73 %	AMBIENT TEMPERATURE (FV) 24.2 (A) °C After 10 seconds the PV measure is restored on the screen.

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4.2 → KEYBOARD CONFIGURATION

The electronic transmitters have some configuration functions available via keyboard and LCD display, provided with the transmitters themselves.

- Press the [MENU] button to enter the password entering dialog (the default password is 0000). Confirm by [OK] to enter the configuration menu.
- The display will allow to choose from the different functions described in the table below. Use the ⇧ and ⇩ buttons to show the sequence of the available functions and press [OK] to confirm the selected function.
- When the display is in numerical entering mode, the cursor will blink.
- To move the cursor press the ⇩ button; to raise the value of the digit press the ⇧ button. Press the [OK] button to confirm; use instead the [MENU] button to cancel the modifications and to go back to the standard display.

Function	Display name	Use	Choice span
Zero setting	**LRV**	Measure linked to the zero and to the 4mA output. The measuring unit is shown in the lower right corner of the display	Between the sensor limits
Full span setting	**URV**	Measure linked to the full span and to the 20mA output. The measuring unit is shown in the lower right corner of the display	Between the sensor limits
Measuring unit selection	**PV UNIT**	Measuring unit selection from the available ones. Press ⇧ o ⇩ to scroll.	°C °F °K
Fault configuration	**ALARM TYPE**	Fault condition analog output selection.	NONE = no action 21mA 3.85mA LAST = last read value
Damping setting	**DAMP VALUE**	Insert the signal averaging time constant.	0 ÷ 60s
Zero re-setting	**OFFSET**	Enter the offset value to be applied to the measure.	±10°C ±18°F ±10°K

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Function	Display name	Use	Choice span
4mA input automatic setting (zero)	**SET LRV**	At button pushing the transmitter will automatically link the 4mA output to the actual reference input.	-
20mA output Entrant setting	**SET URV**	At button pushing the transmitter will automatically link the 20mA output to the actual reference output.	-
Analog output test	**LOOP TEST**	It is possible to fix the analog output of the transmitter to a required mA value.	3.85 ÷ 21mA
Analog output calibration	**CAL 4-20mA**	The transmitter fixes the output to 4mA and asks by display to check the value (OK? YES/NO). Choose NO if the output is incorrect and insert the value read on an external Ammeter. Do it again until necessary. The same procedure for 20mA follows.	-
Hart® polling address	**ADDRESS**	Hart® polling address modification.	0 ÷ 15
Transmitter information	**INFO**	The polling address, the lower sensor limit (LSL), the upper sensor limit (USL) and the firmware revision are shown.	-
Password setting	**PASSWORD**	Allows to insert a new password for the transmitter. To be used with care.	0000 ÷ 9999

INFORMATION!
The password is in 4 digits format and spans from 0000 to 9999. If you can't remember or find the password you set, please contact our technical department.

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5 → MAINTENANCE AND TROUBLESHOOTING

Although transmitters SST7X do not require a maintenance on periodical basis, it is good practice to regularly check the general transmitter status, the possible presence of rust or damage on the case or on the measuring element and the presence of clogging in the process connection.



PROHIBITION!
Repair, maintenance and/or overhaul of the equipment shall only be conducted by the manufacturer himself, or by a repairer he has qualified or authorized.

Is forbidden during the maintenance operation to use the tool as a handle or step.



Please refer to the following pages scheme for troubleshooting.
In any case contact our technical department for help.

Condition	Potential source	Solution
The transmitter doesn't turn on	Supply	Check the supply voltage to be 12,5Vdc<V_{supply}<30Vdc.
	Polarity	Check the transmitter connection polarity.
	Electrical load	Check that the load is less than the maximum allowed.
Measure is incorrect	Process	Accurately verify the compatibility between the process and the connection type.
	Sensor drift	Apply zero input conditions to the transmitter and use the OFFSET command.
	EMC interference	Accurately verify the possible presence of electromagnetic interference on the supply line. Check the PE connection.
Erratic analog output	Wrong span limits	Use the LRV and URV commando (or SET LRV and SET URV) to correct the output.
	Uncalibrated analog output	Use the LOOP TEST command to verify the analog output calibration. If it is not correct, use the CAL4-20mA command to calibrate the output.
	Incorrect HART® settings	Use the ADDRESS command to verify that the polling address is set to 0.

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Condizione	Causa potenziale	Soluzione
Analog output <4mA or >20mA	Transmitter in fault mode	Check if the output isn't out of the allowed span or check the presence of a failure (e1, e2, … on display).
	Wrong fault settings	Check the settings using the ALARM TYPE command.
Unstable measure	Measuring disturbs	Set an input average using the DAMP VALUE command (i.e. 10 seconds).
Impossible to access the menu	Wrong / forgotten password	Contact us for help

5.1 → DISPLAY ERROR CODES

Type of error	Description
OVR	OVER RANGE: this message is shown if PV is greater than URV by 20% of the span
UDR	UNDER RANGE: this message is shown if PV is lower than LRV by 20% of the span
LCD OV	LCD OV: this message is shown if PV < -99999 or PV >99999. In this case could depends by damage of sensor or display
EE CHK ERR	This message depends by an error configuration of the EEPROM memory
EE ADC ERR	This message is shown if there are PV calculus error in primary ADC input. If it persist contact Spriano® for help
T EX AD ER	This message is shown if there are on external temperature signal calculus error in secondary ADC input. If it persist contact Spriano® for help
T IN AD ER	This message is shown if there are on internal temperature signal calculus error in secondary ADC input. If it persist contact Spriano® for help

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5.2 → SPARE PARTS

Together with the request of spare parts it is required to indicate Serial Number of the Transmitter to control that the correct components will be delivered.

Item	Product Code	Description	Quantity
01	DISPLAY COVER	Cover with display glass	1
02	BLIND COVER	Blind cover terminals side	1
03	COVER O-RINGS	Gaskets for housing covers	2

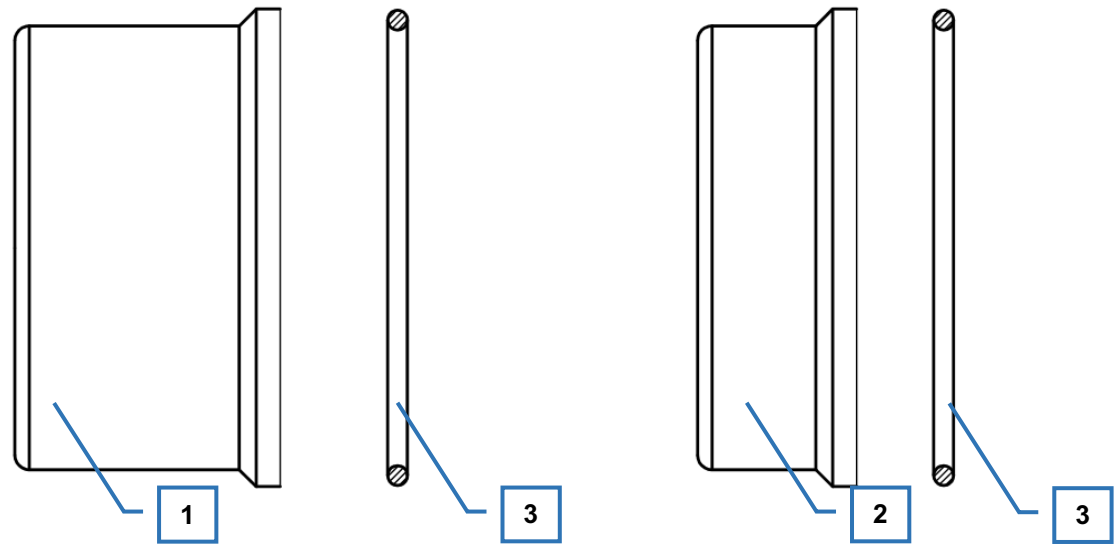


Figura 13: spare parts

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6 → MARKING

On the transmitter enclosure is fixed an identification plate with inscriptions showing the characteristic data of the instrument.
Refer to **Figure 14**, the Transmitter is provided with the following information:

1. Name and address of the manufacturer
2. CE marking followed by the identification number of the notified body involved in the production phase
3. Designation of series or type
4. Serial number (with the Year of construction)
5. ATEX marking for equipment-group II, followed by the specific marking of explosion protection (see 1.3 → Definitions And Symbols)
6. PED essential allowable limits: allowable Fluids, Maximum working pressure (PS), Nominal size (DN), etc.

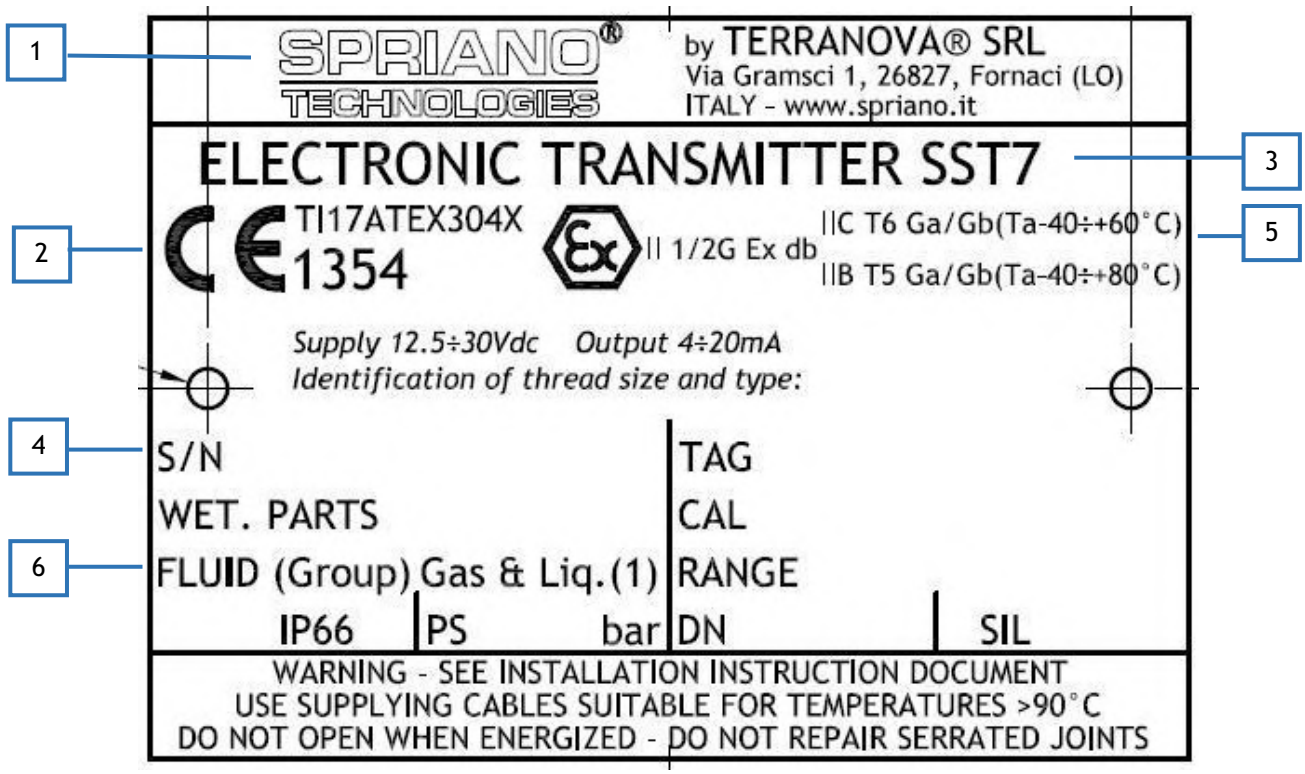


Figure 14: marking plate

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7 → DATA SHEET

FUNCTIONAL DATA
With reference to the following, please note these definitions:
Nominal range: (referred to the sensor mounted in the instrument) the measured temperature range for which the sensor has been designed. Defined as a minimum and maximum value.
Nominal span: the interval between the minimum and maximum values of the sensor nominal range. The span is a single number.
Measuring range: the minimum and maximum range values for which the transmitter is to be calibrated.
Measuring span: the interval between minimum and maximum values of the measuring range.
Input scale initial value or zero input: minimum temperature value within in the measuring range.
Input full scale value: maximum temperature value within in the measuring range.

TRANSMITTER PARAMETERS
The parameters that are available for display and setting are:
Measuring span: possibility to change from 3.33% to 100% of the nominal span.
Zero adjustment: digital calibration ± 15%.
Low/upper range values: they can be set within the nominal range provided that the span > minimum span.
Damping: digitally adjustable from 0 to 60 sec. (minimum response time ~ 0,1 sec.).
Reverse output: automatically obtained via software.
Transfer function: linear/square root via software.
Self test: in case of malfunction the analog output is forced to the fail-safe state 3.85 mA or 21 mA.
Measuring units: 3 different temperature units or % of the measuring span, selectable via software.

PHYSICAL CHARACTERISTICS.
Power supply: 12,5-30 Vdc
Output signal:
Analog 4-20mA, 2 wires.
Digital using HART® protocol
Response time: <256 ms (Std Hart®)
Measured value update frequency:
4-20 mA + Hart® output: ~1s
Hart® output only: ~500 ms (on request)
Polling time:
4-20 mA + Hart® output: ~800 ms
Hart® output only: ~500 ms (on request)

AMBIENT CONDITIONS
Temperature:
Process fluid: -40 ÷ +80°C (remote mounting: up to 350°C; remote mounting and thermowell: up to 500°C)
Housing: -40 ÷ +80°C
Handling and storage: -40 ÷ +90°C
Relative Humidity: 0 a 100% R.H.
LCD display reading: -10 ÷ +65°C

PERFORMANCES
Digital accuracy (εDGT): 0.1%FS / 100°C
Thermoelement accuracy (εPT100): see "Tolerance classes for PT100 thermocouples (IEC751)"
Output resolution: < 0,01% nominal range (at 20°C)
Total accuracy[1] (εTOT): εDGT + εPT100
Dead band: negligible
Display resolution: 0.1

INFLUENCE OF OPERATING CONDITIONS
Power supply effect:
Negligible between 12,5 and 30 V d.c.

[1] Including hysteresis, non-linearity and repeatability (IEC 60770)

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PHYSICAL SPECIFICATIONS
Housing: die cast aluminum alloy EN AW-6082 finished with epoxy resin (RAL 5014). It is dust and sand tight and protected against sea wave effects as defined by IEC IP66. Suitable for tropical climate operation as defined by DIN 50015.
Covers O-ring: EPDM.
Nameplate: stainless steel, fixed on housing.
Calibration
Standard: at nominal range, direct action, linear.
Optional: at the conditions specified with the order.
Electrical connections: two cable entries on electronic housing, 1/2" NPT and cable gland PG 13,5 for 7 to 12mm diameter cable.
Terminal board: 2 terminals for signal wiring up to 1.5 mm2 (14 AWG). Connection for ground and cable shield.
Mounting position: any position.
Net weight: 2kg approx.

PROCESS WETTED PARTS
Thermowell: AISI 316.

OPTIONS
Bracket: for 2 inch pipe mounting.
Stainless Steel Housing: AISI 316 (IP66).

7.1 → FUNCTIONAL SAFETY ACCORDING TO IEC 61508 / IEC 61511

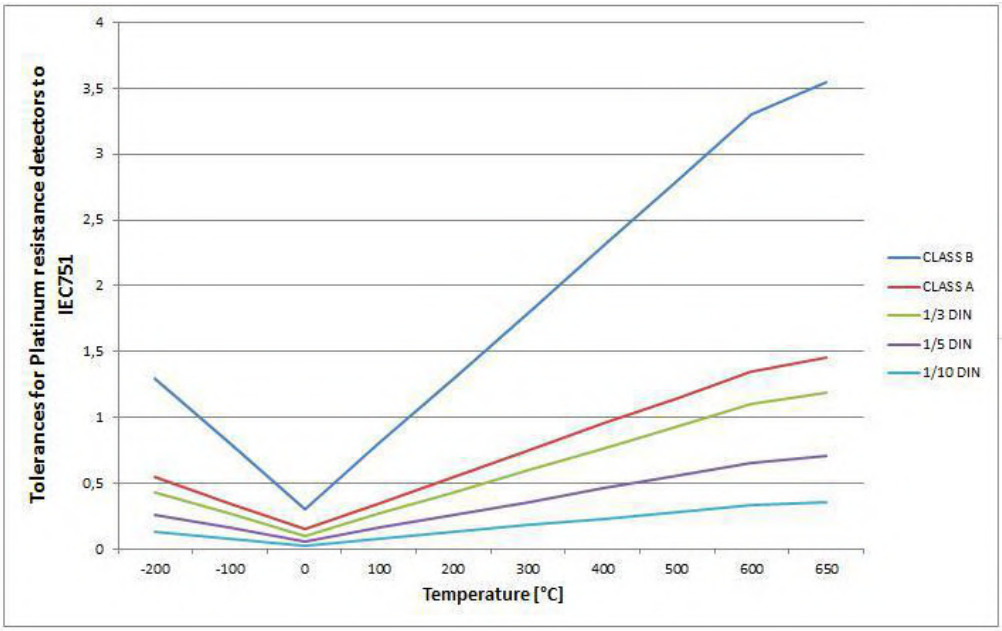
The assessment of the safety critical and dangerous random errors results, provided that the attached safety instructions are observed and an annual function test is performed, in the following parameters:

Transmitter Type	λ_{DD}	λ_{DU}	λ_{S}	λ_{TOT}	SFF	SIL
SST72	7.5072×10^{-8}	1.0725×10^{-8}	8.0434×10^{-8}	1.6623×10^{-7}	91.67%	2

7.2 → TOLERANCE CLASSES FOR PT100 THERMOCOUPLES (EPT100)

Temp. [°C]	CLASS B [± °C]	CLASS A [± °C]	1/3 DIN [± °C]	1/5 DIN [± °C]	1/10 DIN [± °C]
-200	1.3	0.55	0.44	0.26	0.13
-100	0.8	0.35	0.27	0.16	0.08
0	0.3	0.15	0.1	0.06	0.03
100	0.8	0.35	0.27	0.16	0.08
200	1.3	0.55	0.44	0.26	0.13
300	1.8	0.75	0.6	0.36	0.18
400	2.3	0.95	0.77	0.46	0.23
500	2.8	1.15	0.94	0.56	0.28
600	3.3	1.35	1.1	0.66	0.33
650	3.6	1.45	1.2	0.72	0.36

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The total instrument accuracy ε_{TOT} is given by the formula:

$\varepsilon_{TOT} = \varepsilon_{PT100} + \varepsilon_{DGT}$ [±°C]

where ε_{PT100} is the thermoelement accuracy (see table) and ε_{DGT} is the digital accuracy (see performances).

7.3 → MAIN DIMENSIONS

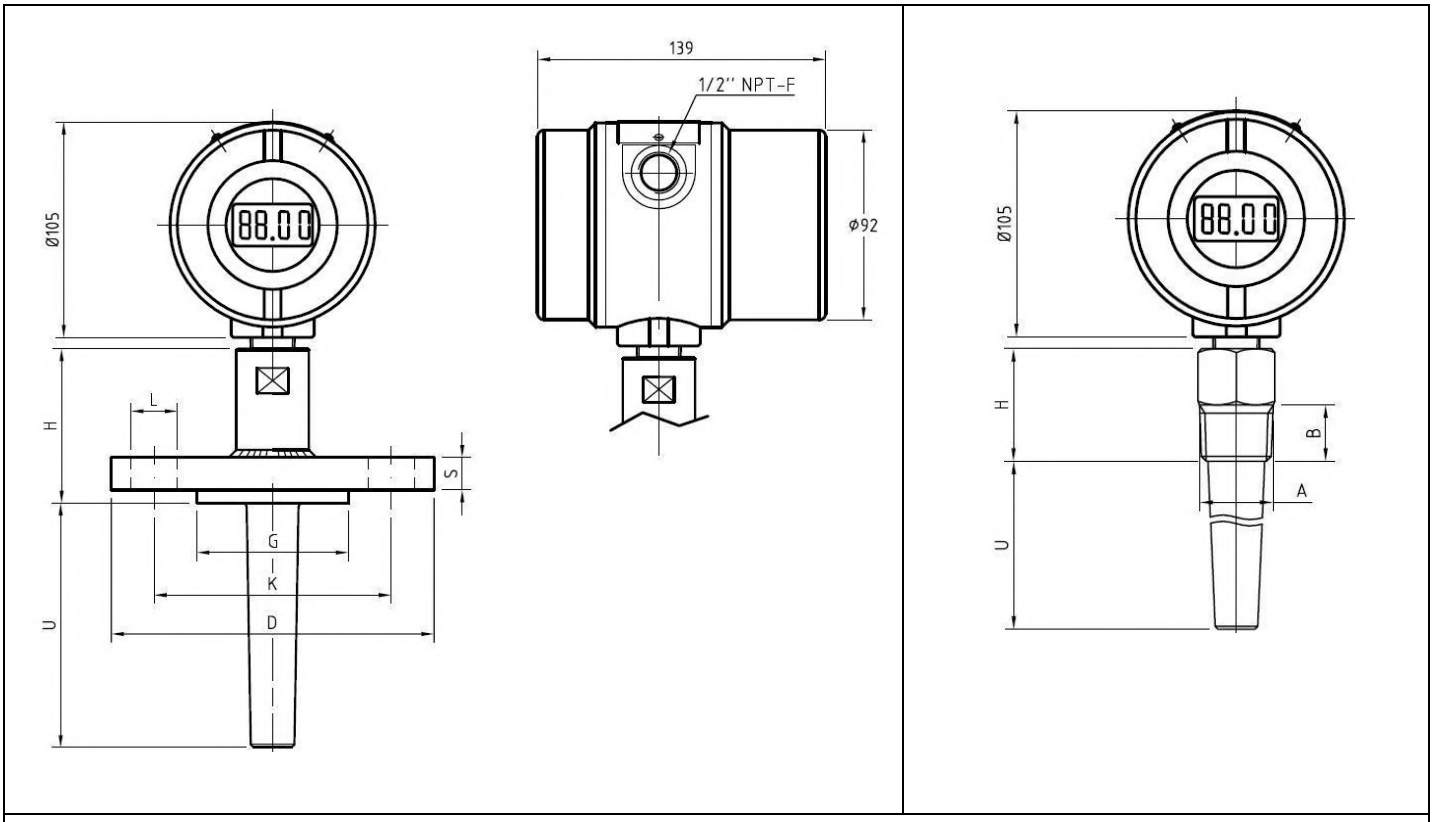


Figure 15: main dimensions and process connections (UNI, ASME…)

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OPERATING and MAINTENANCE MANUAL for KRG RADAR LEVEL TRANSMITTER

KRG Transmitters



Introduction

This manual does not contain all information about each type of equipment, nor does it take into account all possible cases of assembly, operation and maintenance.
For more information or to particular problems not covered in the manual, please contact our technical department.
The guarantee is that provided for in ns. General conditions of assistance. This guarantee is neither expanded nor limited by the information contained in this manual.

Attention!

This equipment must be installed and used only by qualified personnel who have previously verified the correctness of the power supply so that it is in normal operation and in case of failure of the system or its parts no dangerous voltage can reach the equipment. As the instrument can be used with high pressure and with aggressive substances should be kept in mind that improper use can lead to serious damage to people and things. A proper and safe operation requires an adequate transportation, storage and installation as well as maintenance. And 'therefore necessary to give the equipment to people who have experience with the installation, commissioning and operation and who are in possession of qualifications to carry out their tasks with regard to "Safety Standards".

The Company reserves the right
To change the contents of
This manual without notice.

Note:

For instruments in ATEX version, the instructions in this manual must be integrated with the requirements contained in the additional safety notices.

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Notes on the manual ..... (3)
Warranty of the apparatus after delivery ..... (4)
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Before reading this manual

Read this manual carefully and make sure to fully understand its contents before installing and operating this equipment. When handling the equipment, always follow directions in this manual. **VALCOM SRL.** is not at all liable for an injury and/or a damage resulting from misuse of this equipment by the user that is contrary to these cautionary notes.

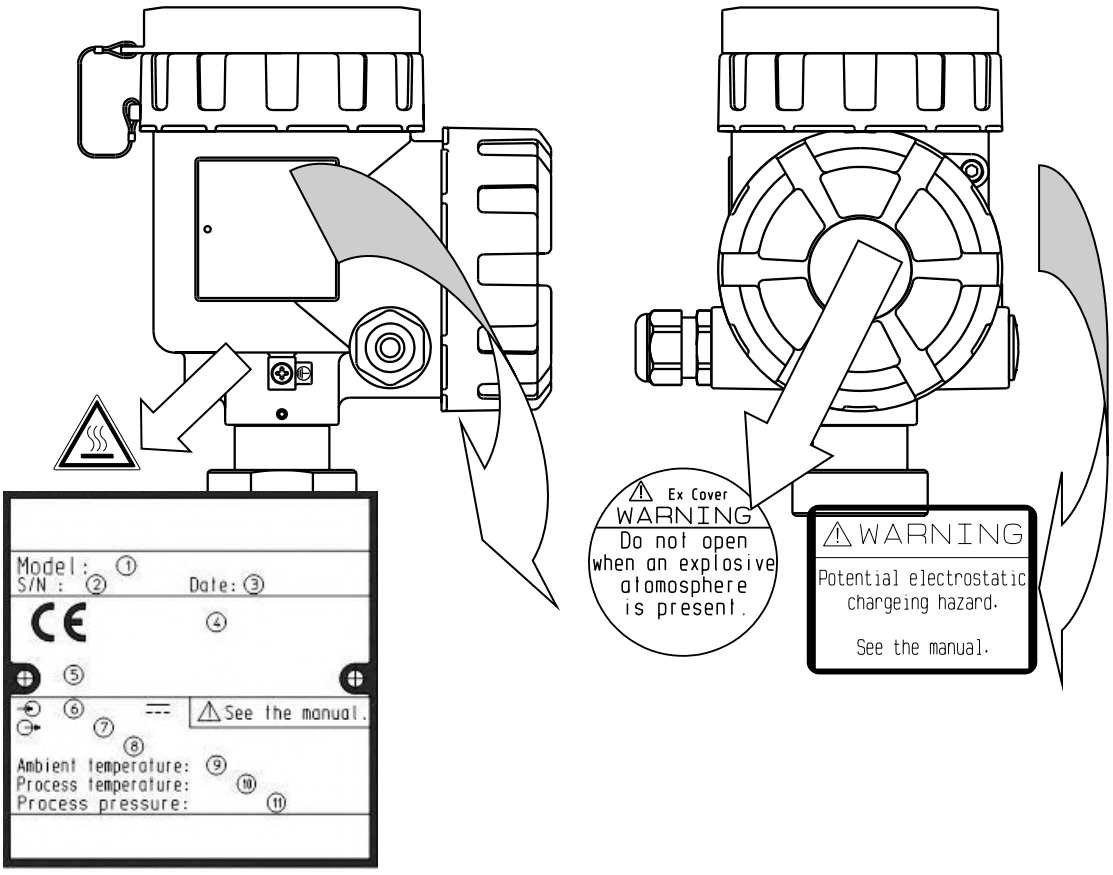
In this manual and on the equipment, the following safety symbols are used to ensure the equipment is used safety and to protect operators and property from possible hazards or damage. Read the explanations below carefully and familiarize yourself with the symbols.

Safety symbols

DANGER	Indicates that incorrect usage can result directly in death or serious injury to the operator.
WARNING	Indicates that incorrect usage may result in loss of life or serious injury to the operator.
CAUTION	Indicates that incorrect usage may result in injury to the operator or damage to the equipment.
	Indicates referring to information for usage of the function or features. (Put on the equipment)
NOTE	Indicates attention to information for usage of the function or features.
	Indicates Protective conductor terminal.
	Indicates Earth terminal. (Functional earth terminal)
	Indicates that close to the power line.
⎓	Indicates Direct current, "DC".
HOT CAUTION	Indicates that close to the high temperature part.

Labels and attached place

The type label contains the most important data for identification and use of the equipment.



NOTE : Ex only

Product code (Refer to Chapter 1.)
② Serial number
③ Date of manufacture
④ Ex certification No.(Ex only)
⑤ Ex approval classes (Ex) or IP code (Non-Ex)
⑥ Power supply
⑦ Signal output
⑧ Ex parameters (Ex only)
⑨ Ambient temperature
⑩ Process temperature
⑪ Process pressure

Fig. 1 Labels

Introduction

Thank you very much for purchasing **Valcom SRL** Microwave Level gauge KRG-10.This manual provides safety precautions for the Microwave Level gauge KRG-10 and explains specifications, functions, structure, installation, operations and troubleshooting in detail. Please be sure to read this manual thoroughly to ensure proper use of the equipment.

Attention

1. Deliver this manual to the user of the equipment.
2. Read this manual well.
   Be sure to read the manual thoroughly to figure out important information.
3. Keep this manual with care.
   The equipment needs to be handled with reference to this manual. Assign a person to take charge and prepare a storage place where the manual will be kept safely and available for immediate use when necessary.
4. If you lose this manual, obtain a new copy immediately.
   If you lose this manual, contact the seller and obtain a new copy. Note that the new copy is not free.
5. Check that the warning label is not damaged.
   If the warning label on the equipment is unreadable, contact the seller.
6. This manual is protected by copyright laws and all rights are reserved.
   No part of this document may be transmitted or distributed without the prior consent of VALCOM SRL.

Notes on the manual

1. This manual is based on the standard specifications of the equipment. If your approved drawing of specifications is different from this manual, the approval specification takes precedence over this manual.
2. This manual describes the operation, features, and performance details of the equipment. But it cannot be valid in particular situations.
3. The contents of this manual may be changed in the future without advanced notice.
4. This manual has been carefully prepared. However, if there were questions, errors, and omissions, then please inform seller or manufacturer.
5. If the change (e.g. specification changes, structural changes, change parts etc.) does not affect functionality and performance, the manual may not be revised or updated. We appreciate your understanding.
6. Company and product names (trade name) used in this manual are trademarks or registered trademarks of their respective owners. And in this manual, TM, R marks are not indicated.

Warranty of the equipment after delivery

1. The warranty period of the equipment is described in product specifications. The equipment will be repaired free of charge during the warranty period if failure due to design deficiencies or defective of workmanship has occurred. However, if the case corresponds to any of the following items (a to f), seller and manufacturer disclaims implied warranties.
   a) Failure based on the force majeure (e.g. typhoons, earthquakes, lightning, war, rebellion, revolution etc.)
   b) Failure due to equipment or parts that is not provided by the manufacturer (e.g. power supply, cable, etc.)
   c) Failure resulting from repair or modification by anyone other than the manufacturer.

d) Failure due to the harsh conditions that exceed predetermined environmental conditions for transport or storage, which is indicated by the manufacturer in this manual.
e) Failure caused by use or storage in a corrosive atmosphere.
f) Failure caused by improper handling or operation by user.

2. Warranty set forth in this paragraph, is only guaranteed by the manufacturer. In any case, the manufacturer will not be responsible for secondary damage, due to delivery equipment malfunction, or poor performance.
3. When the equipment has failed, please contact the seller.
4. If there is a problem with the equipment, please contact the seller and inform specifically about the description of the problem, model name, and serial number. If you have a schematic or data, please also send them.
5. Failed equipment may or may not be repaired for free. We will judge based on the results of our investigation.

Safety instructions and warnings

For safety, please follow the following items.

WARNING

·Please follow the safety instructions in this manual. When dealing with the equipment contrary to instructions, seller and manufacturer cannot guarantee safety.
·Unauthorized modification of this equipment is strictly prohibited. For such damage or defect caused by unauthorized modification, seller and manufacturer do not assume any responsibility.

WARNING

If the measurement object is toxic, please handle with caution even after removing and maintenance of this equipment. For residual material on the equipment, please note as well, inhalation or contact with the material may be harmful.

WARNING

For seal O-ring material, please carefully check the characteristics of the process material. Leakage of process fluids caused by improper material selection, it can harm to the human body or the equipment. For the structure of the parts of the equipment, please be sure to contact if you have any questions.

WARNING

Gases and vapors may pass through resin material such as PTFE and PVDF. With increasing pressure and temperature, the rate of leakage is increased. For the environment, please check the selection of antenna and seal O-ring material.

WARNING

For process connection, flange and bolts are optional. If you need a flange with hole, please check details of modification described in this manual. (Refer to Chapter 10.) If the flange does not satisfy the modification conditions, then the gas or vapor, such as used in the process, may leak.

CAUTION

- When transferring the equipment, please be careful not to damage the human body by dropping it.

CAUTION

- For Ex application, in order to guarantee the Ex performance, there are severe restrictions for structure, location, external wiring, maintenance, and repair. There is a risk of explosion, if you do not adhere to the restrictions.

Prohibitions and precautions for equipment protection

For equipment protection, adhere to the following precautions.

CAUTION

·Do not apply a shock to the equipment body such as by dropping.
·Do not use the equipment outside the specified environment condition (ambient temperature and humidity).
·Do not use the equipment outside the specified voltage.
·Do not use a scratched or bare wire (power, coaxial, or signal cable).
·For equipment operations, open the cover at the top of the body and use the display and keyboard on the panel. Do not modify the electronic circuits inside the panel. Operations also can be performed in dedicated software on a PC.
·Never disassemble or modify the equipment. If an equipment failure occurs, contact the seller.
·For transport, please follow the following items of equipment.
a) Please follow the temperature range specifications.
b) Please use the original packaging for delivery.
•For equipment storage, please follow the following items.
a) Please follow the temperature range of the specification.
b) Please avoid direct sunlight.
c) Please avoid places where there is vibration or shock.
d) Please do not leave in the presence of corrosive gases.
e) Please do not leave in humid place.
•Please follow the conditions of use in order to guarantee the performance of Ex equipment.

HOT CAUTION

There is a case, the antenna is a high temperature by the process. Do not touched carelessly, because of there is a risk of burns.

CAUTION

Please follow the following items. If any of these conditions are not satisfied, incorrect measurement value might be displayed or outputted, or may not be measured.

- Please check the installation condition described in this manual.
- Please use the equipment under predetermined power supply voltage range, in the range of ambient temperature and humidity, which are described in this manual.
- Please do not apply Impact or vibration to the equipment.
- If the equipment is in a high noise area, it may not work properly or may be broken.
- If signal for measurement cannot be detected, the warning mark flashes on the LCD. Also, when an abnormal measurement is detected, a predetermined alarm is outputted. Please take appropriate action in such a case.
- Before you change equipment parameters, see appropriate section in this manual. And please set the parameter correctly. If you set wrong parameter, the measurement may not to be accurate or may be impossible.

Precautions on using

- Before using the product, please check the model name and corresponding specifications.
- The following accessory has been attached to this equipment. Please confirm that there is no shortage.
  a) CD-ROM (User's guide (this manual), Configuration software)
  b) Cable grand (only Non-Ex type)
  c) O-ring (for fixing the flange : The material is due to specification)

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VAT IT07848810151

Chapter 1 Configuration

1.1 Product overview

KRG-10 is microwave level gauge measuring distance between the equipment and product surface by time-of-flight principle.

1.2 Product construction

KRG-10 consists of transmitter head and antenna.
LCD module can be attached in the transmitter head, which is an optional item. The LCD module is used to enter instrument parameters and displays measuring data.
The cable gland is another option.

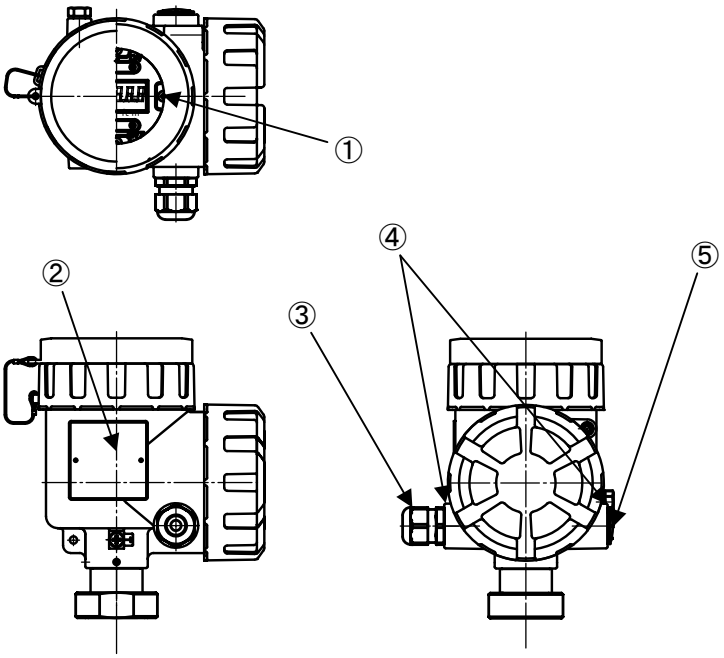


Fig. 1.2.1 Configuration of transmitter head

1. LCD module (option)
2. Label
3. Cable gland (option)
4. Wiring port
5. Blind plug

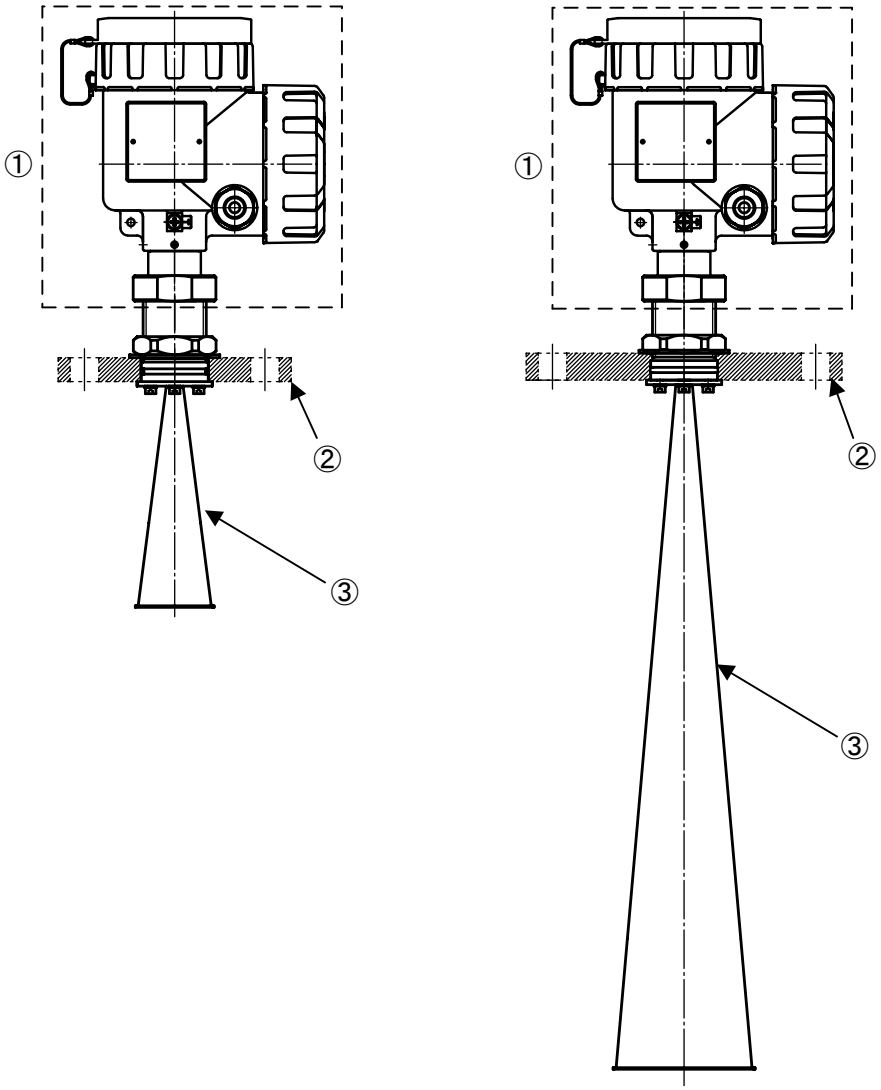


Fig. 1.2.2 Transmitter head with cone antenna

1. Transmitter head
2. Flange (option)
3. 2" cone antenna

1. Transmitter head
2. Flange (option)
3. 4" cone antenna

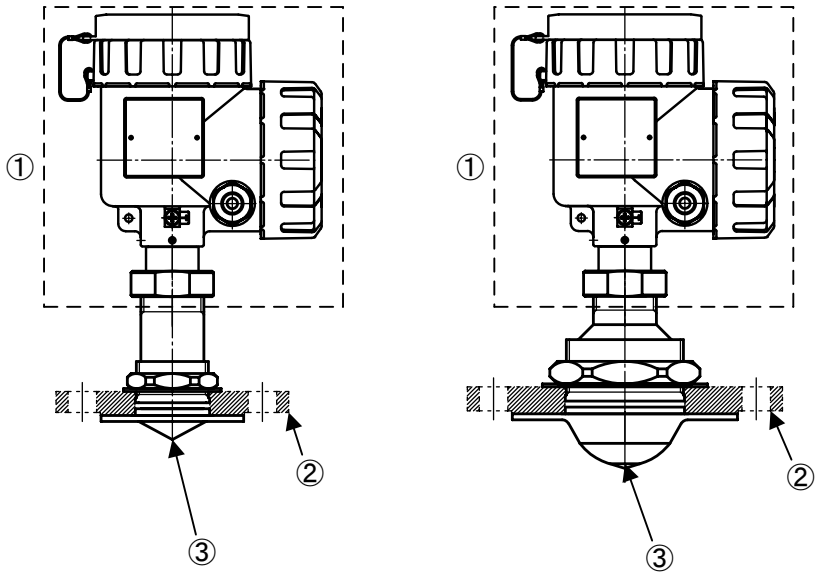


Fig. 1.2.3 Transmitter head with PTFE sealing antenna

1. Transmitter head
2. Flange (option)
3. 2" PTFE sealing antenna

1. Transmitter head
2. Flange (option)
3. 4" PTFE sealing antenna

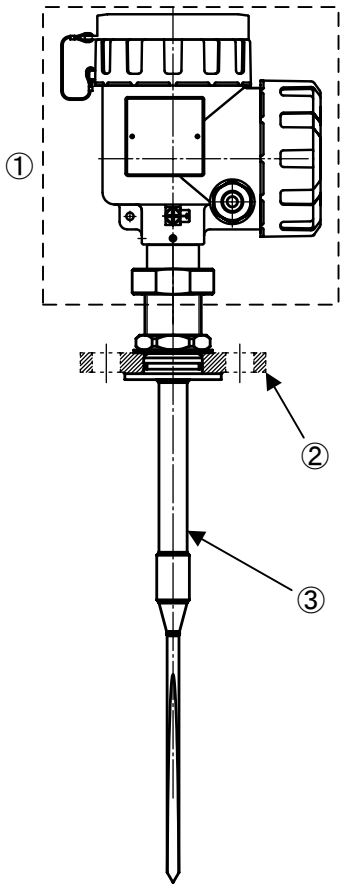


Fig. 1.2.4 Transmitter head with rod antenna

1. Transmitter head
2. Flange (option)
3. 1" rod antenna

Chapter 2 Installation

2.1 Note

CAUTION

- Installation at inappropriate location or improper installation procedure may cause incorrect measurement. Please refer to this manual for proper installation.
- Please arrange installation in accordance with local radio regulation.

2.2 Appropriate location for installation

For stable measurement, please keep following conditions,

(1) Non-centered position: Installed at center of the tank may cause of noise as symmetrical disturbance.

(2) 200mm from tank wall: Antenna center should be better to keep more than 200mm from the tank wall to propagate enough microwaves.

(3) +/- 1deg horizontal balance: Please keep less than 1 deg against nozzle flange surface to get better signal strength to liquid surface.

2.2.1 Cone antenna

Please keep antenna tip exposed to tank inside over 10mm for stable measurement.

NOTE: In case that antenna tip is buried inside nozzle, it may cause noise reflection.

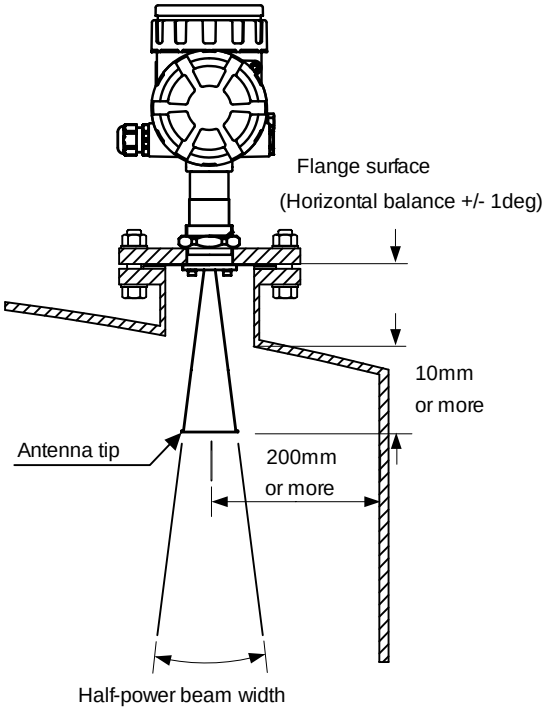


Fig. 2.2.1 Installation example of cone antenna

2.2.2 PTFE sealing antenna

The process connection nozzle inside diameter must be smaller than sealing plate to keep inside tank pressure.
Maximum height of nozzle will be limited antenna size accordingly as below.

Table 2.2.1 Maximum height of nozzle

2" (50mm) PTFE Sealing antenna	150 mm
4" (100mm) PTFE Sealing antenna	500 mm

NOTE: In case that maximum height of nozzle is not satisfied limitation in accordance with above definition, it may cause noise reflection.

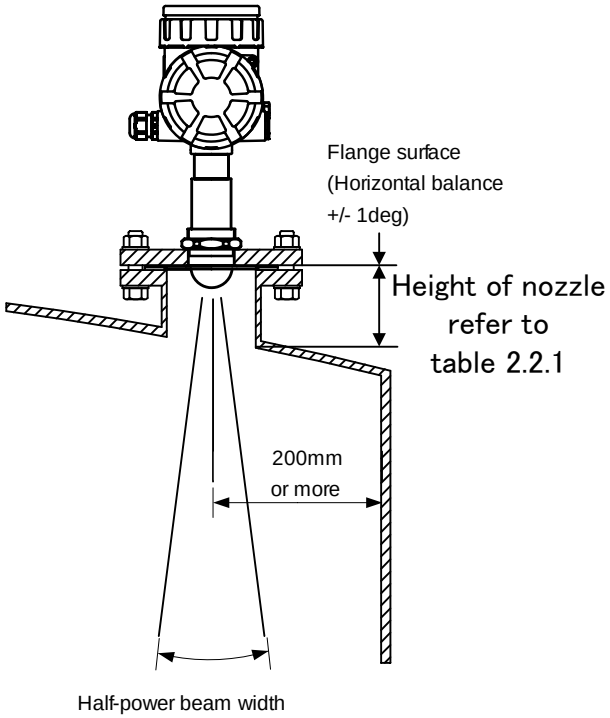


Fig. 2.2.2 Installation example of PTFE sealing antenna

2.2.3 Rod antenna

The end of inactive zone must be exposed to inside tank more than 10mm for stable measurement. Standard length of inactive zone is 150mm.

NOTE: In case that maximum height of nozzle is exceed 150mm, enough microwave can not get into the tank inside. It may affect stable measurement.

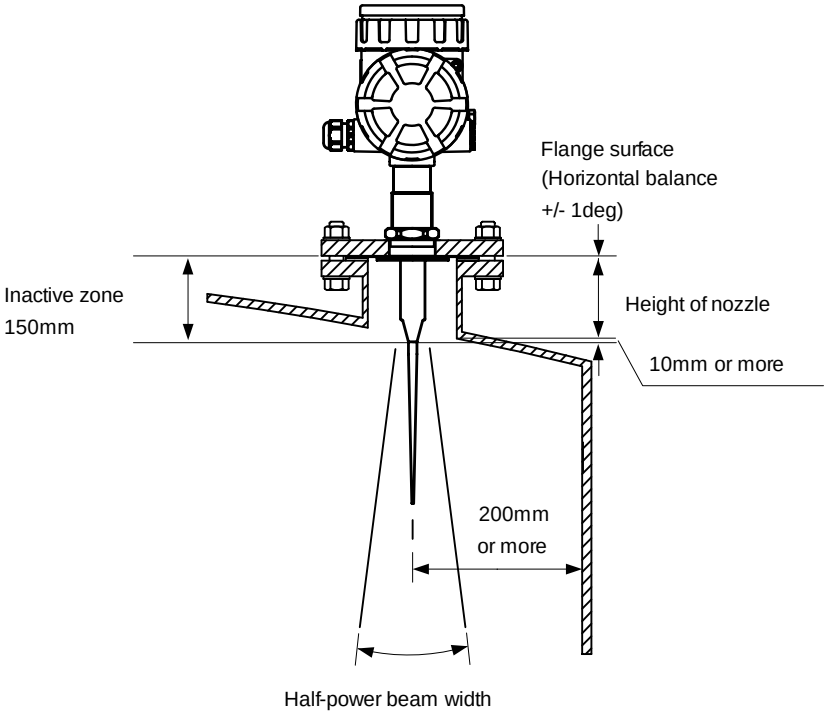


Fig. 2.2.3 Installation example of rod antenna

2.3 Beam area

Please install level gauge avoiding any obstructions in the following beam area, which may any cause of disturbance reflection.

Table 2.3.1 Beam angle, Distance, and Beam area

Antenna		Cono / *Cone*		Affacciata / *Flush antenna*		A punta da 1‘‘ *1‘‘ rod*
		2‘‘	4‘‘	2‘‘	4‘‘	
Angolo di emissione (α) *Beam angle (a)*		18°	8°	18°	8°	25°
Distanza [m] *Distance [m]*	5	1.6	0.7	1.6	0.7	2.2
	10	3.2	1.4	3.2	1.4	
	15		2.1		2.1	
	20		2.8		2.8	
	25		3.5			
	30		4.2			

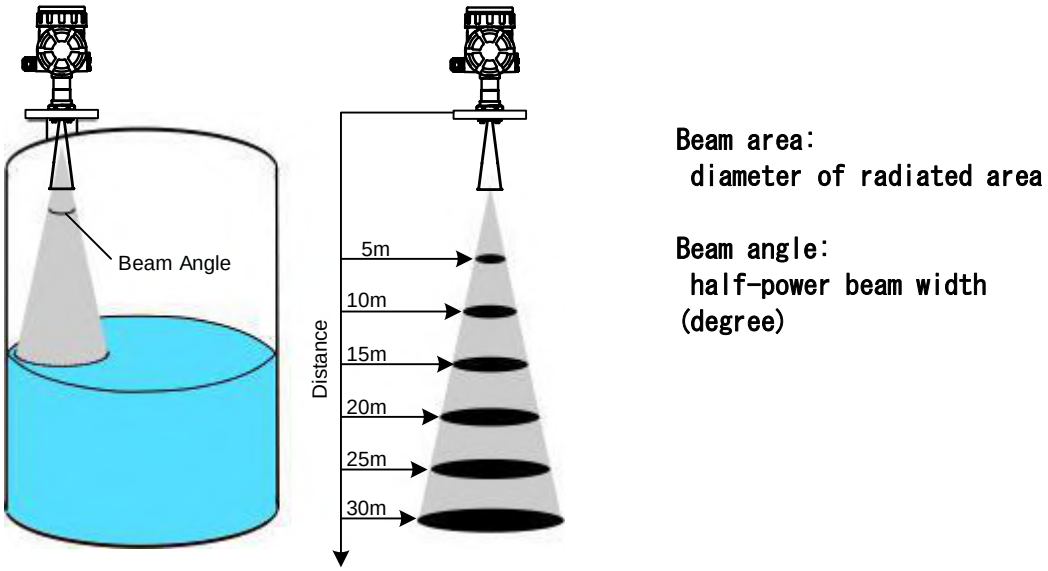


Fig. 2.2.4 Beam area and distance

2.4 Tilt of antenna

The antenna keep attaches a horizontal, for microwave to be irradiated perpendicular to the liquid surface.

2.5 Cable connection

The level gauge may be rotated its direction to get better reflection echo strength. Thus keep approximately 1m as extra length.

2.6 Measuring range

(1) Higher dielectric constant provides higher reflection and longer measurable range.
(2) Larger antenna can have larger reflection for stable measurement and longer measuring range.
(3) Turbulent or foamy surface decrease reflection signal strength which may let measurable range be shorter.
(4) Contamination to antenna inside or dusty air layer may decrease reflection signal strength which may let measurable range be shorter.
Contamination to antenna can cause reduced sensitivity, please remove contamination.
(5) Any of obstructions may cause disturbance echo (noise) which affects stable measurement.
(6) In case target surface is smaller than beam area, enough reflection may not return. It may let measurable range be shorter.
(7) If the measurement atmosphere in absorbing gases such as ammonia or some fluorocarbons, contact with the seller.

2.7 Tips for stable measurement

Level gauge should be installed away from any obstacle inside tank which may cause of disturbance as basic. In case some of them are unavoidable, following tips may be solution for stable measurement.
The rod antenna have deflection direction, attach the antenna in the direction that has been set. (Refer to **2.10.3 Rod antenna**)

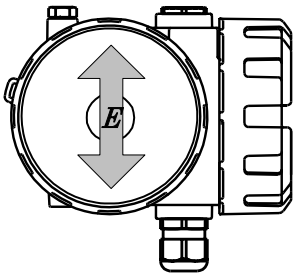


Fig. 2.7.1 Oscillation

NOTE: "*E*" means plane of polarization of the microwave.

2.7.1 Against pipe structure or ladder

Microwave reflections from elongated metal objects such as thin pipes or ladders rungs are largest when the axis of such objects are in parallel with the electric field. The orientation of the electric field generated by transmitter head is as shown in the Fig.2.7.1.1
In case mounting the transmitter head as this electric field is not in parallel with the axis of the obstacle, it will reduce or emit affection of the false echo.
(In certain circumstances, such as size, shape, and position of the pipe, there is also that there is no effect)

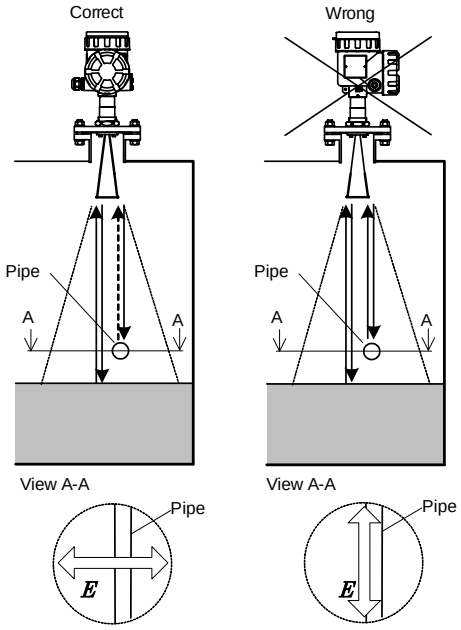


Fig. 2.7.1.1 Installation method when the pipe is present in the space

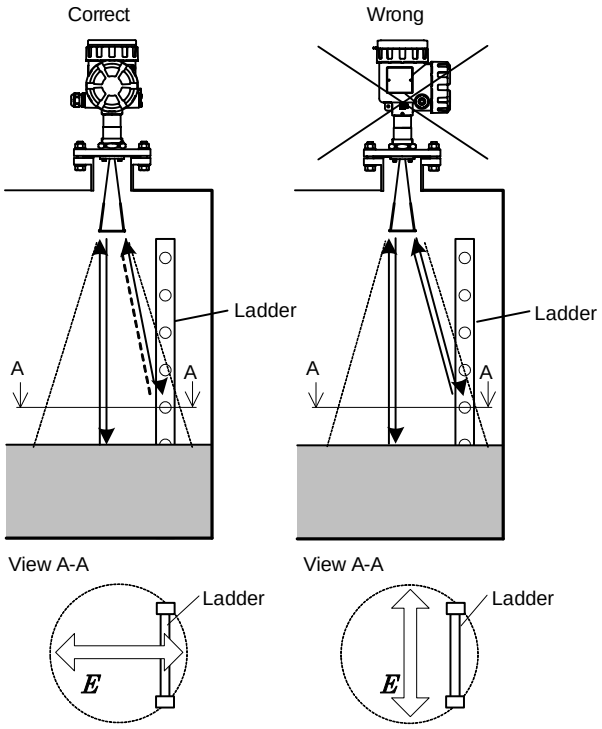


Fig. 2.7.1.2 Installation method when the ladder rungs are present in the space

.7.2 Shoulders and struts

Install a reflector (flat metal plate) above the obstacle as shown in the Fig. 2.7.2.

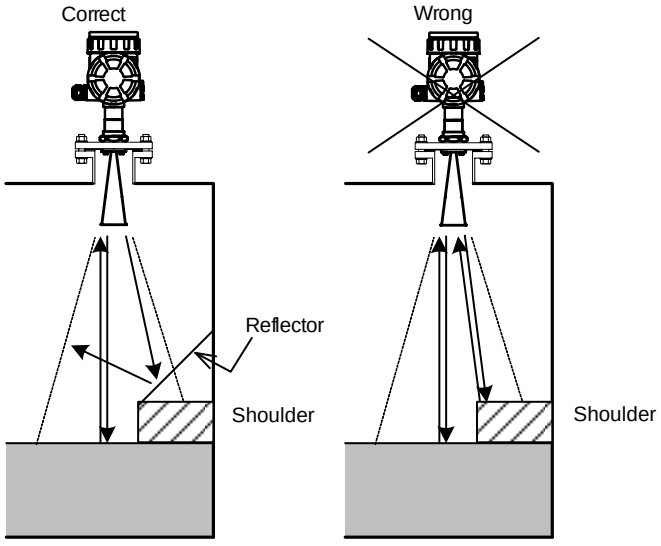


Fig. 2.7.2 Installation method when the shoulders and support struts are present in the space

2.7.3 Near tank inlet

Nearby tank inlet may have turbulent, foam or splash which decrease reflection echo strength. Level gauge should be installed avoiding such location.

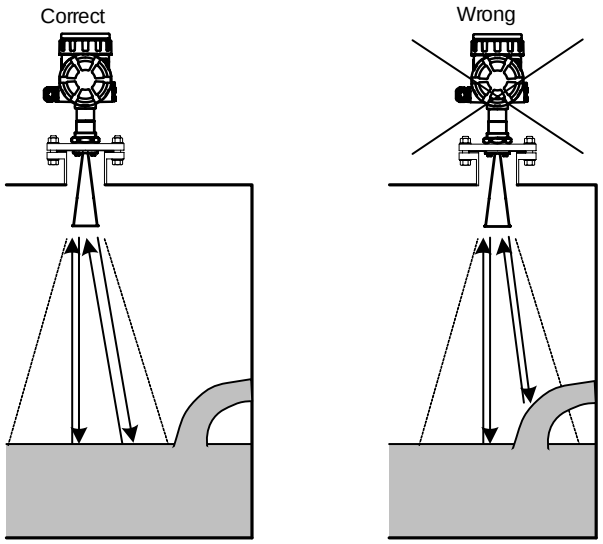


Fig. 2.7.3 Installation method for near the tank inlet

2.7.4 Narrow channel

With conditions such as the distance to the water surface width of the channel, from the level meter, edge effects and the liquid surface and the walls are different. By changing the polarization of the microwave, you may be able to reduce the influence of the edge.

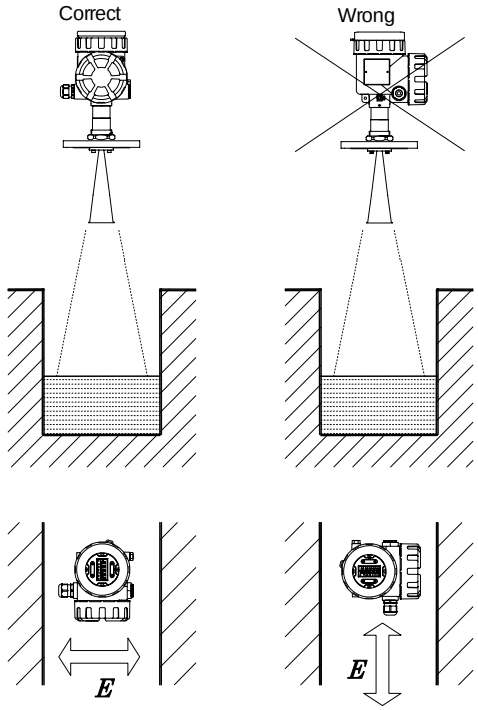


Fig. 2.7.4 Installation method for the narrow channel

2.7.5 Tank installation

For round tank applications, install level gauge as the axis of the electric field is oriented 45 degrees to the tank wall to avoid influences from edge reflections off channel walls and the liquid surface.
For flat wall tank applications, install level gauge as the axis of the electric field is oriented 45 degrees to the tank wall.

However, the distance from the wall and level meter ,and wall materials, depending on the range of the measured distance, in some cases, who have a horizontal or vertical on the wall, the wall electric field is measurably better.

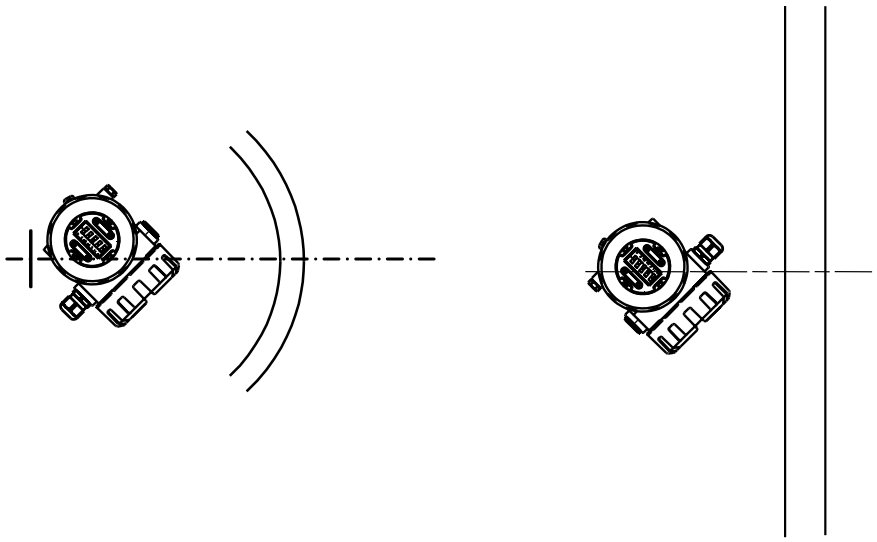


Fig. 2.7.5 Installation method for the tank wall

2.8 Pipe installation

Microwave can propagate only inside of metal pipe. Following features are for the application for pipe installation.

- It can use existing metal pipe without replacement.
- It will not be affected by any obstacle reflection disturbance outside of the pipe.
- The deterioration of the signal is much smaller than free space propagation. Thus even low dielectric constant liquid may have longer measurable range.
- Pipe can be used as stilling well against turbulence.

NOTE:

- Antenna should be selected 4" or 2" cone antenna type.
- Pipe material should be metal.
- Pipe length should cover all measuring range.
- The gap between antenna outer diameter and pipe inner diameter should be less than 2 mm.
- Air vent hole (approx. 5mm-10mm) must be positioned above maximum liquid level.
- Low dielectric constant liquid may require to attach bottom reflection plate as Fig. 2.2.12.
- In case target liquid is non-homogeneous characteristic or has multiple layer, some of slits may be required for mixing each in and outside liquid. Those slits should be less than 5mm and positioned right-angled against "*E*".
- In case target liquid has high viscosity, periodical cleaning maintenance may be required.
- In case the pipe will have strong stress, pipe should be fixed to wall or protection arm.
- Inside pipe, between flange connections or welding requires smooth finish.

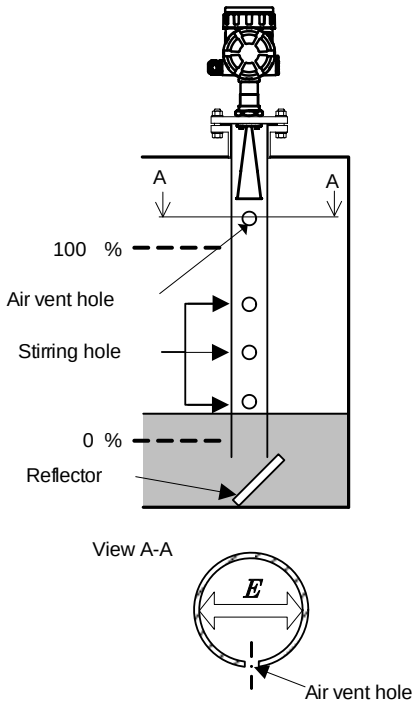


Fig. 2.8.1 Pipe installation

- In case of installing to bypass pipe, to retain defined accuracy, keep enough length as high dead zone more than 500mm from maximum liquid surface and also low dead zone approximately 300~800mm to minimum liquid surface from pipe end.
- To minimize the effects of reflected waves from the connection pipe connecting the tank and the bypass pipe, please note the following points.
- "*E*" of Level gauge should be positioned right-angled against connection pipe.
- Inside pipe, between pipe connections, flange connections or welding requires smooth finish.
- Diameter of Connection pipe should be smaller 1/3 of bypass pipe.

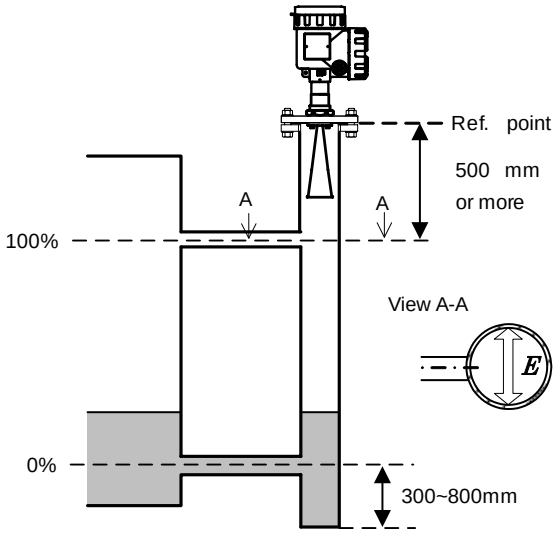


Fig. 2.8.2 Bypass pipe installation

2.9 Required tools

Following tool will be required to install this level gauge.
·Monkey wrench
·Hexagon wrench (3mm)

2.10 Installation

WARNING

Do not damage antenna sealing parts.
Keep gasket and flange surface clean to retain inside tank pressure.
Damaged seals, non-clean gasket or non-flat flange surface may cause gas leakage when the level gauge will be installed on pressurized tanks.

2.10.1 Cone antenna

(1) Required parts for cone antenna installation are as follows.
· Flange is optional item.
· Sealing gasket, bolts or nuts are out of scope for standard items.

NOTE: Please treat not to bend on be damaged the point of “A”. In case of this place is bent or damaged, it may cause noise reflection.

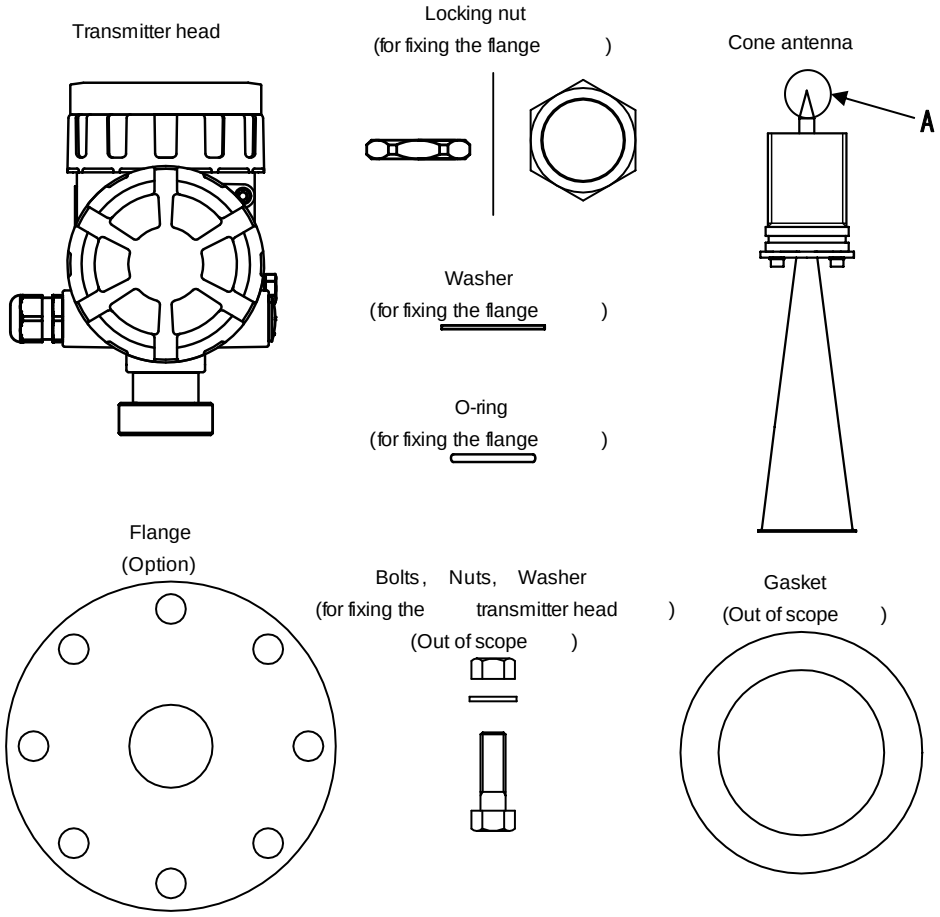


Fig. 2.10.1.1 Required item for cone antenna installation

(2) Fasten cone antenna with O-ring. Pass through flange and washer, then secured with locking nut. Let transmitter head fix to cone antenna unit by locking nut.

NOTE:
· Please apply the grease lubricating for O-ring.
· Please be careful there is no adhesion of dirt for O-ring through assembling.

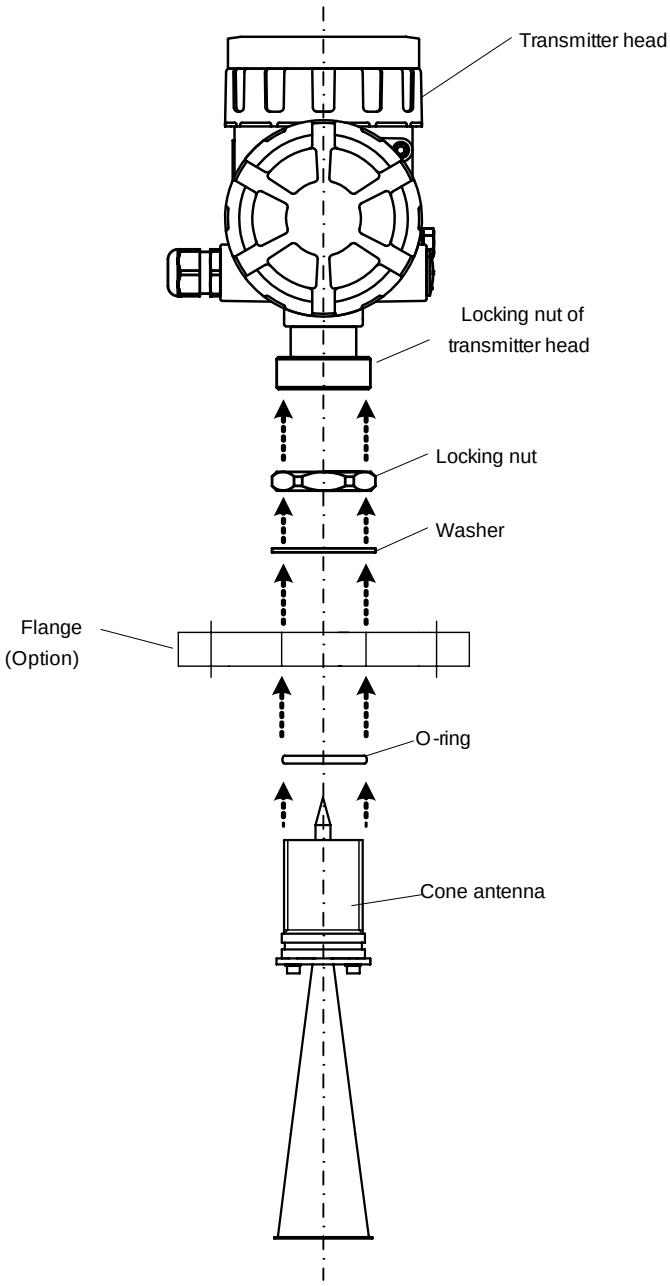


Fig. 2.10.1.2 Antenna assembling

(3) Tighten locking nuts as below, then fixing transmitter head and antenna unit with flange.

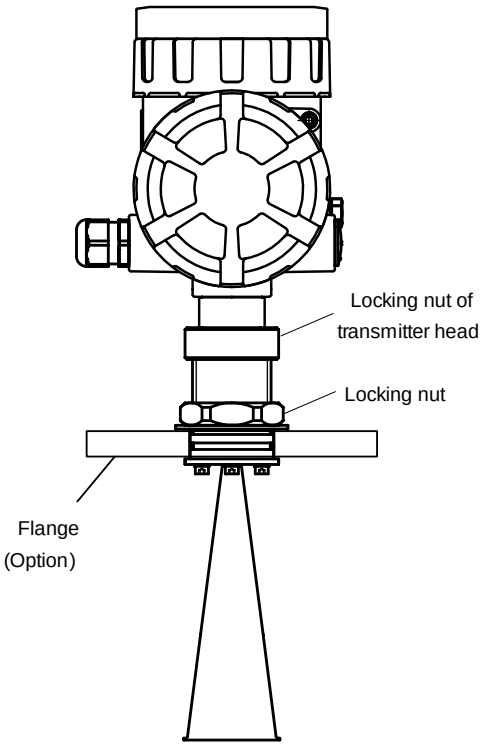


Fig. 2.10.1.3 Transmitter head fixing

(4) Place the gasket on the tank nozzle. Carefully fit the flange and the cone antenna on the tank nozzle. Tighten the assembled unit by the bolts and nuts as below.

⚠ CAUTION
Tighten the assembly to retain the internal gas without any leakage.

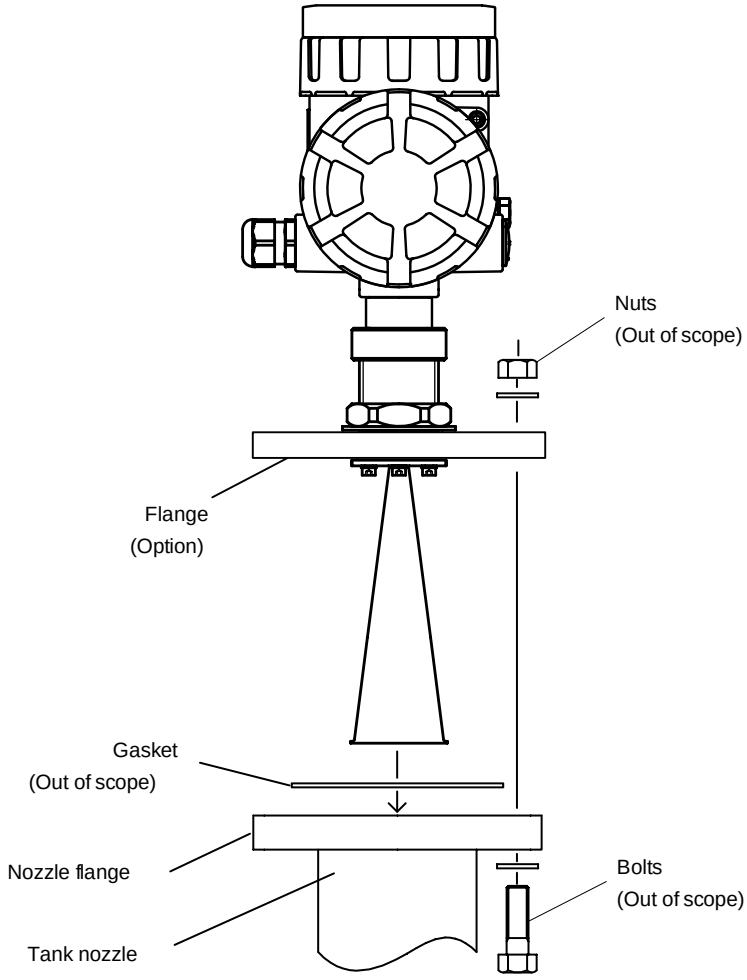


Fig. 2.10.1.4 Installing onto the tank nozzle

2.10.2 PTFE sealing antenna

(1) Required parts for PTFE sealing antenna installation are as follows.
- Flange is optional item.
- Sealing gasket, bolts or nuts are out of scope for standard items.

NOTE:
- Please treat not to bend on be damaged the point of “A”. In case of this place is bent or damaged, it may cause noise reflection.
- Do not use metal gasket which may disturb proper microwave propagation.

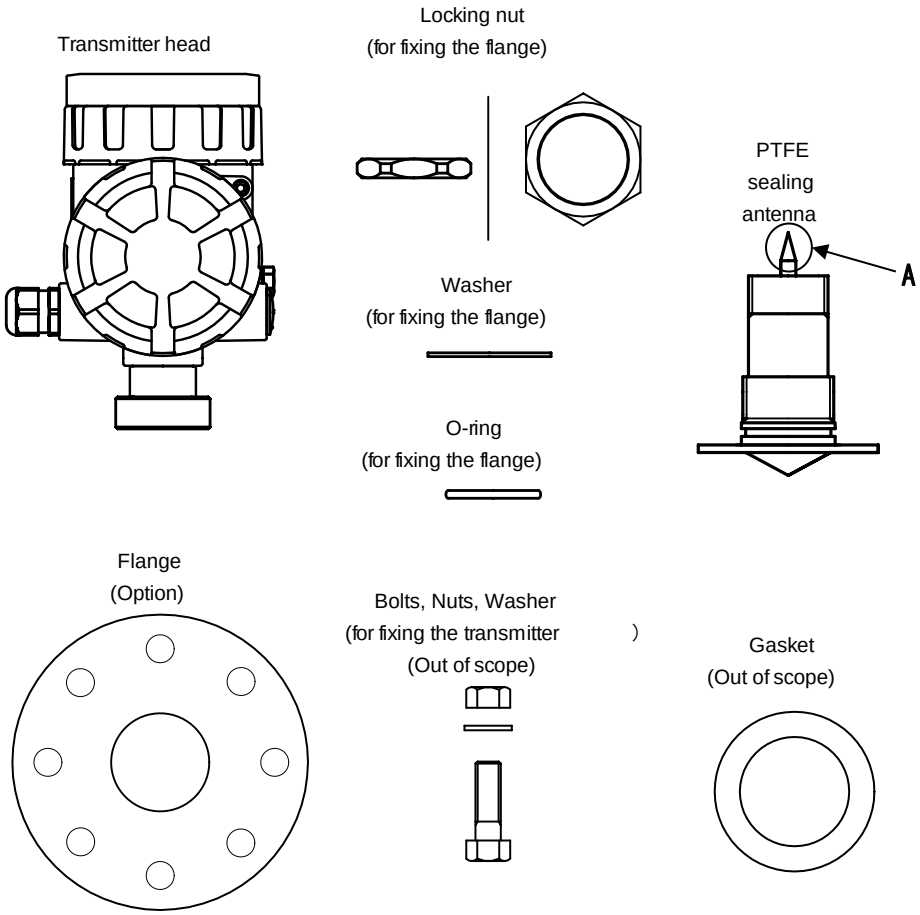


Fig. 2.10.2.1 Required item for cone antenna installation

(2) Fasten PTFE sealing antenna with O-ring. Pass through flange and washer, then secured with locking nut. Let transmitter head fix to PTFE sealing antenna unit by locking nut.

NOTE:

- Please apply the grease lubricating for O-ring.
- Please be careful there is no adhesion of dirt for O-ring through assembling.

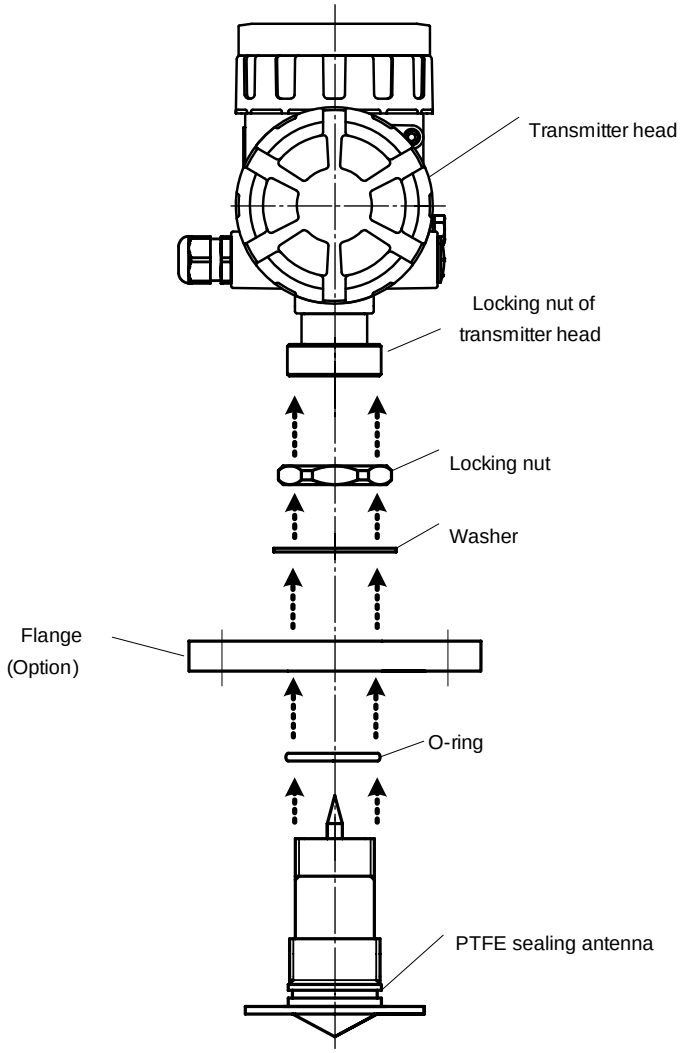


Fig. 2.10.2.2 Antenna assembling

(3) Tighten locking nuts as below, then fixing transmitter head and antenna unit with flange.

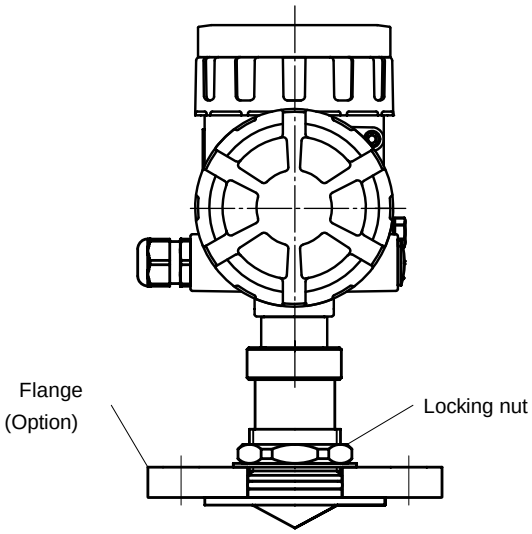


Fig. 2.10.2.3 Transmitter head fixing

(4) Place the gasket on the tank nozzle. Carefully fit the flange and the PTFE sealing antenna on the tank nozzle. Tighten the assembled unit by the bolts and nuts as below.

CAUTION
Tighten the assembly to retain the internal gas without any leakage.

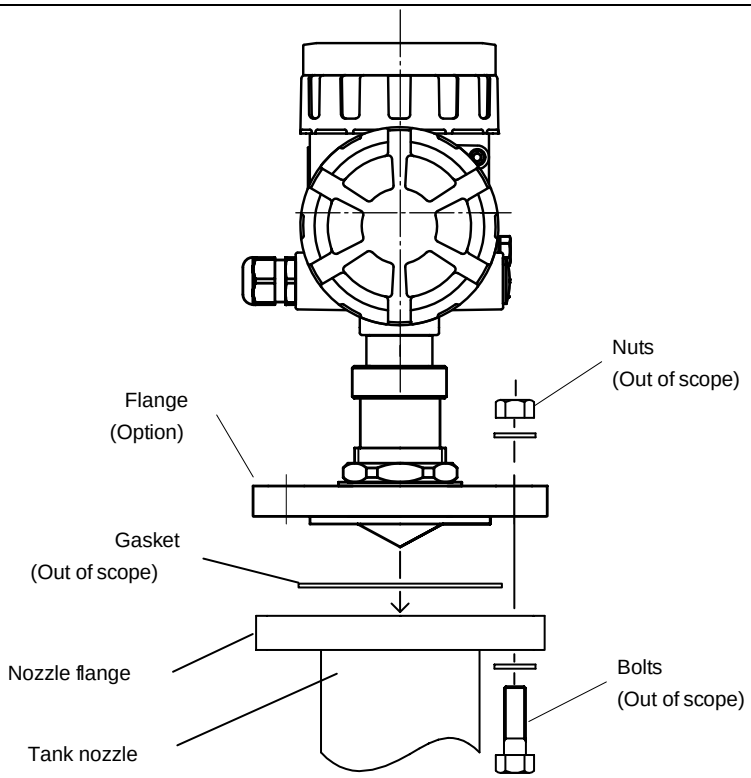


Fig. 2.10.2.4 Installing onto the tank nozzle

2.10.3 Rod antenna

(1)Required parts for rod antenna installation are as follows.
· Flange is optional item.
· Sealing gasket, bolts or nuts are out of scope for standard items.

NOTE:
· Please treat not to bend on be damaged the point of "A". In case of this place is bent or damaged, it may cause noise reflection.
· Do not use metal gasket which may disturb proper microwave propagation.

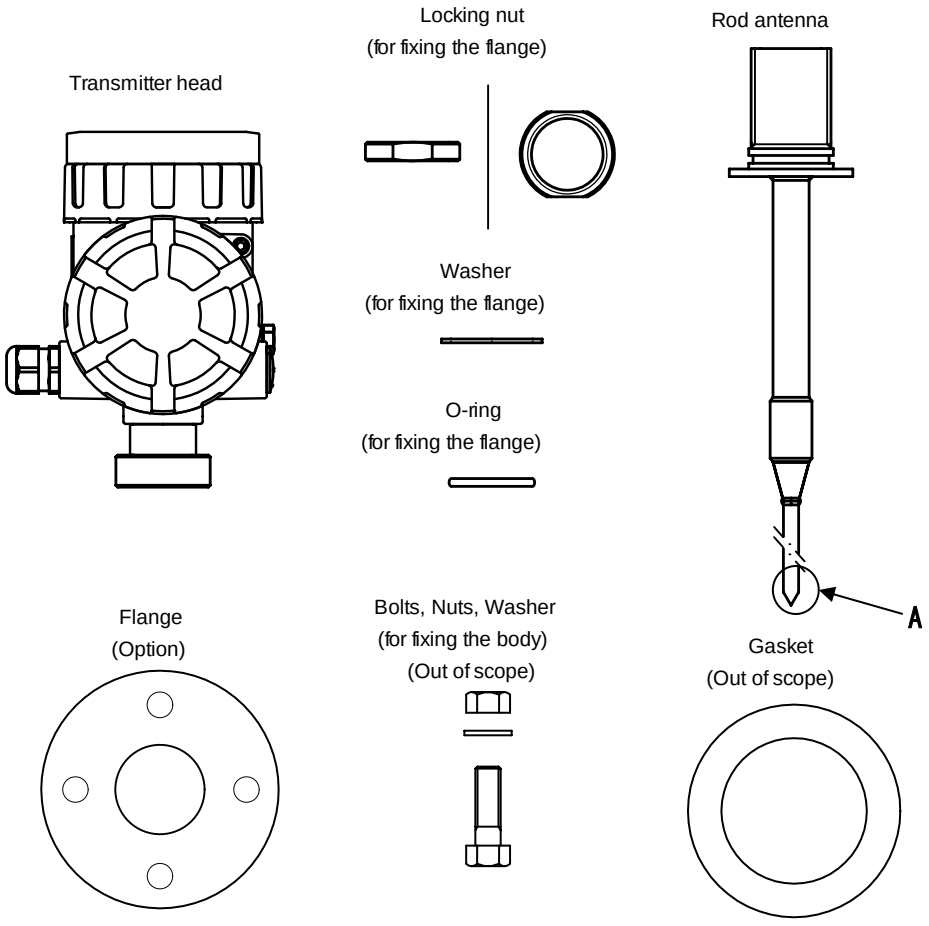


Fig. 2.10.3.1 Required item for cone antenna installation

(2) Fasten rod antenna with O-ring. Pass through flange and washer, then secured with locking nut. Let transmitter head fix to rod antenna unit by locking nut.

NOTE:

·Please apply the grease lubricating for O-ring.

·Please be careful there is no adhesion of dirt for O-ring through assembling.

·Please note direction of the rod antenna. (Please let orthogonal oscillation direction and the mounting section marker)

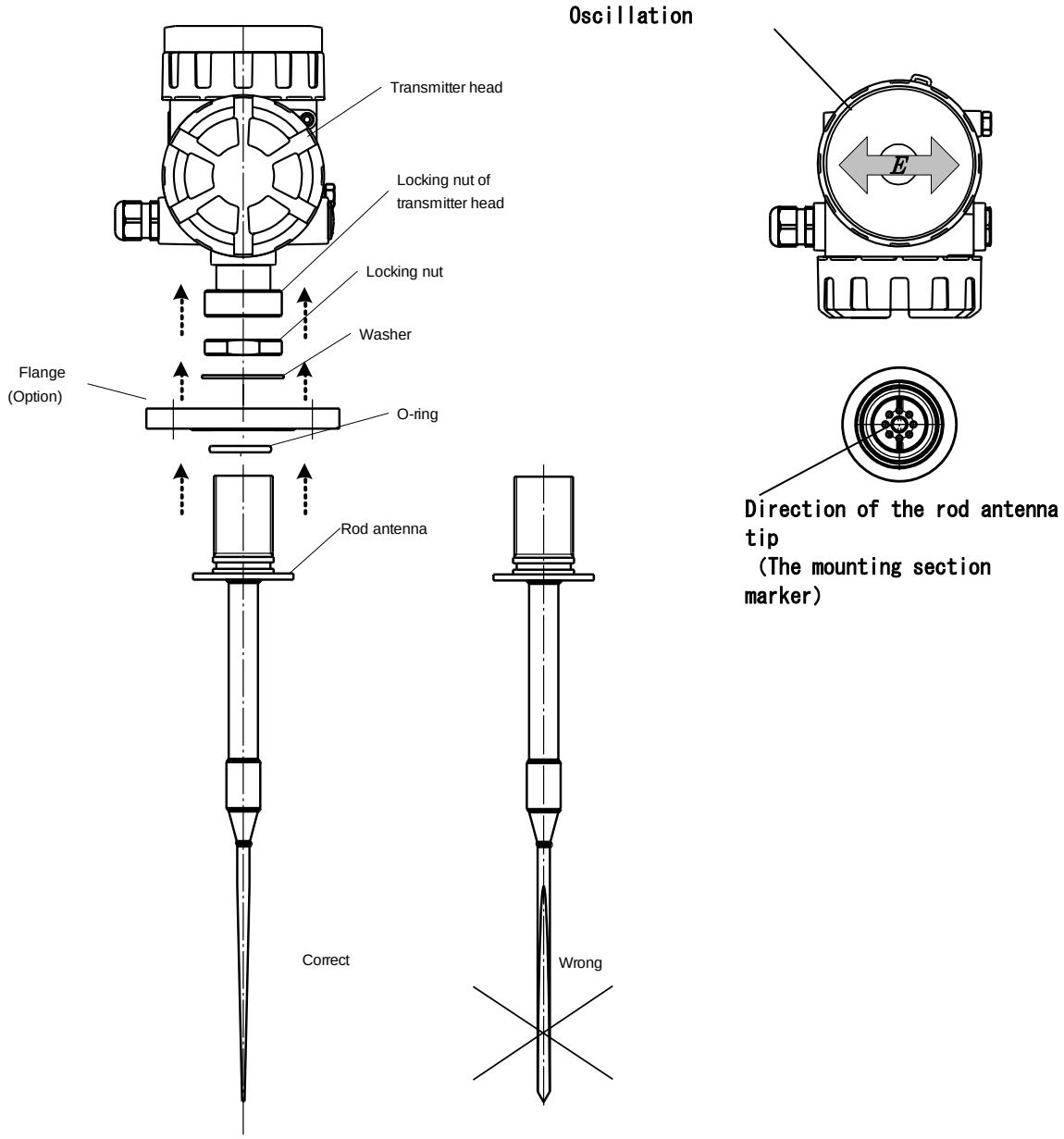


Fig. 2.4.10 Antenna assembling

(3) Tighten locking nuts as below, then fixing transmitter head and antenna unit with flange.

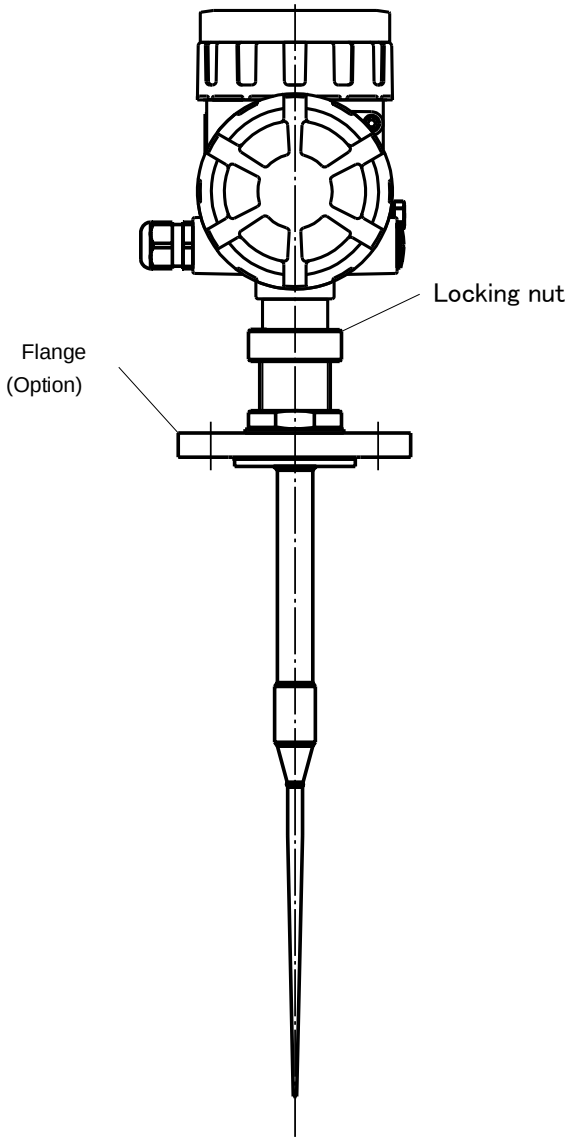


Fig. 2.4.11 Transmitter head fixing

(4) Place the gasket on the tank nozzle.
Carefully fit the flange and the PTFE sealing antenna on the tank nozzle.
Tighten the assembled unit by the bolts and nuts as below.

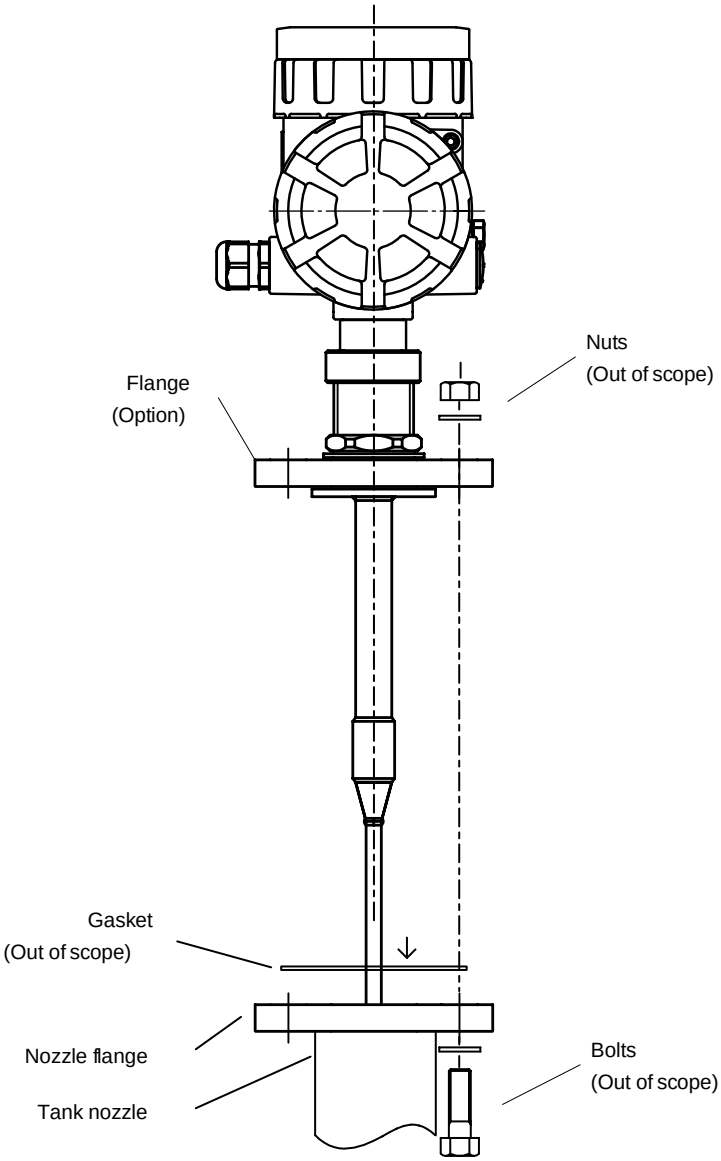


Fig. 2.4.12 Installing onto the tank nozzle

Chapter 3 Electrical installation

3.1 Connection to transducer

⚠ CAUTION
·Wiring work must be done non-hazardous area. ·Be sure to stop the power supply to the transducer or any of accessories during wiring work to prevent electrical shock. ·Make sure that wire polarity is made correctly as incorrect wiring may result in damage to the transducer and its connected accessories. ·The cable gland should be attached properly.

3.1.1 Wiring procedure

Wiring procedures are as follows,
(1) Ensure the power supply is turned off on the line.
(2) Remove the cover of the terminal box.
(3) Put the cable into the box through the cable gland.
(4) Strip approx. 1cm of insulation from the end of the cable and connect with proper polarity. Place the cable core into the connector by pushing connector button with a slot screw driver.
(5) Cable shield should be connected to the internal ground terminal.
(6) Cable gland should be tightened properly.
Once tighten the cable gland until the cable fixed, then add extra 1 round as finish.
(7) Fix the cover of the terminal box back.
(8) Connect external ground terminal.

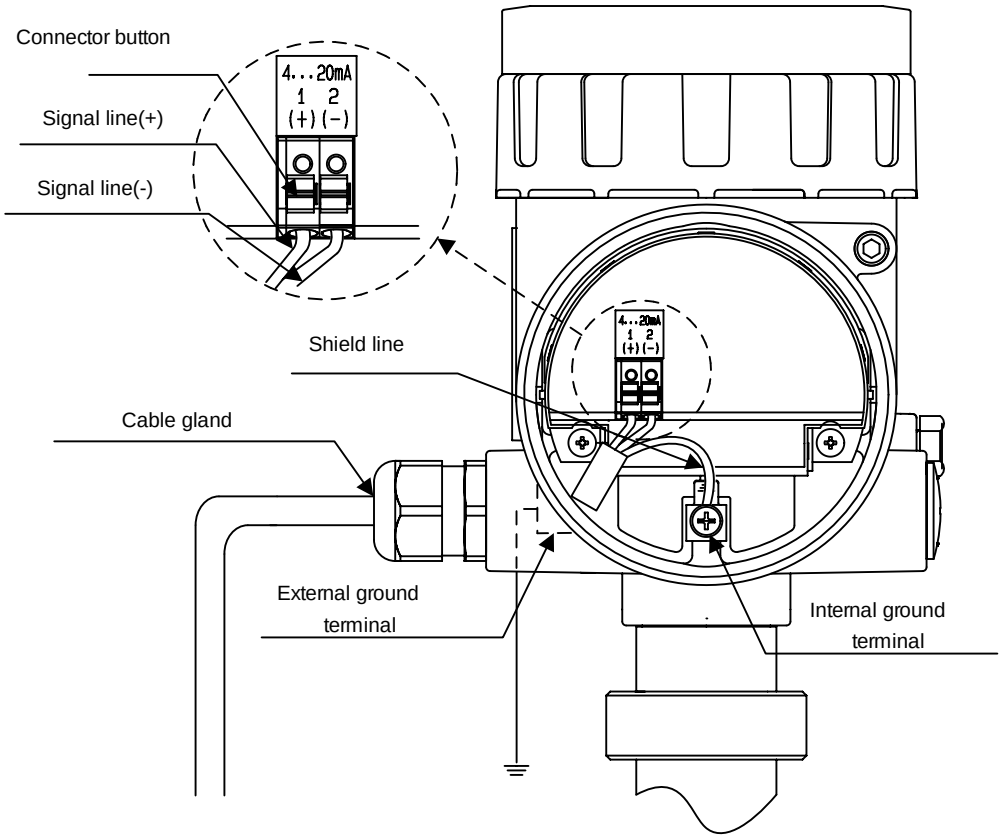


Fig. 3.1.1 Connecting diagram

Installation of accessories

After wiring of transmitter head side, then proceed confection of accessories.
Followings are example of wiring.

(1) Non-Ex connection example

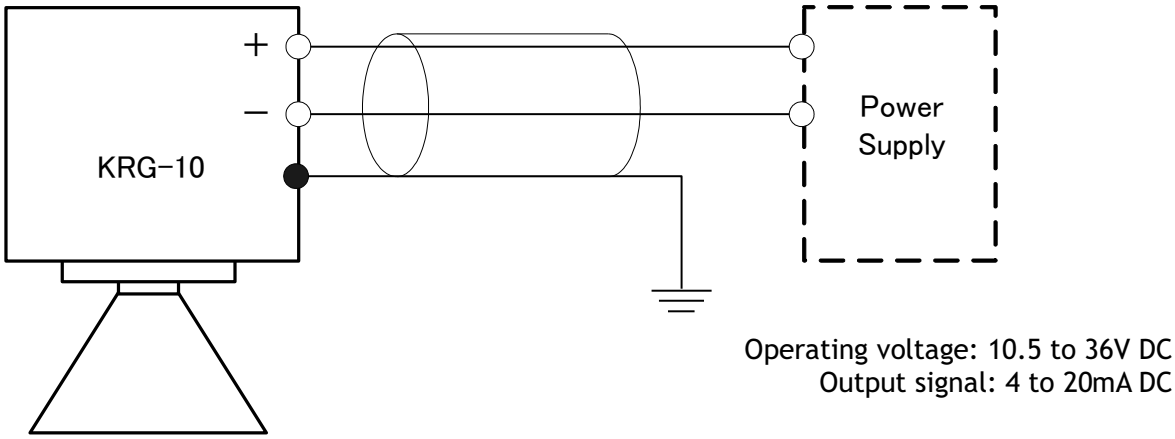
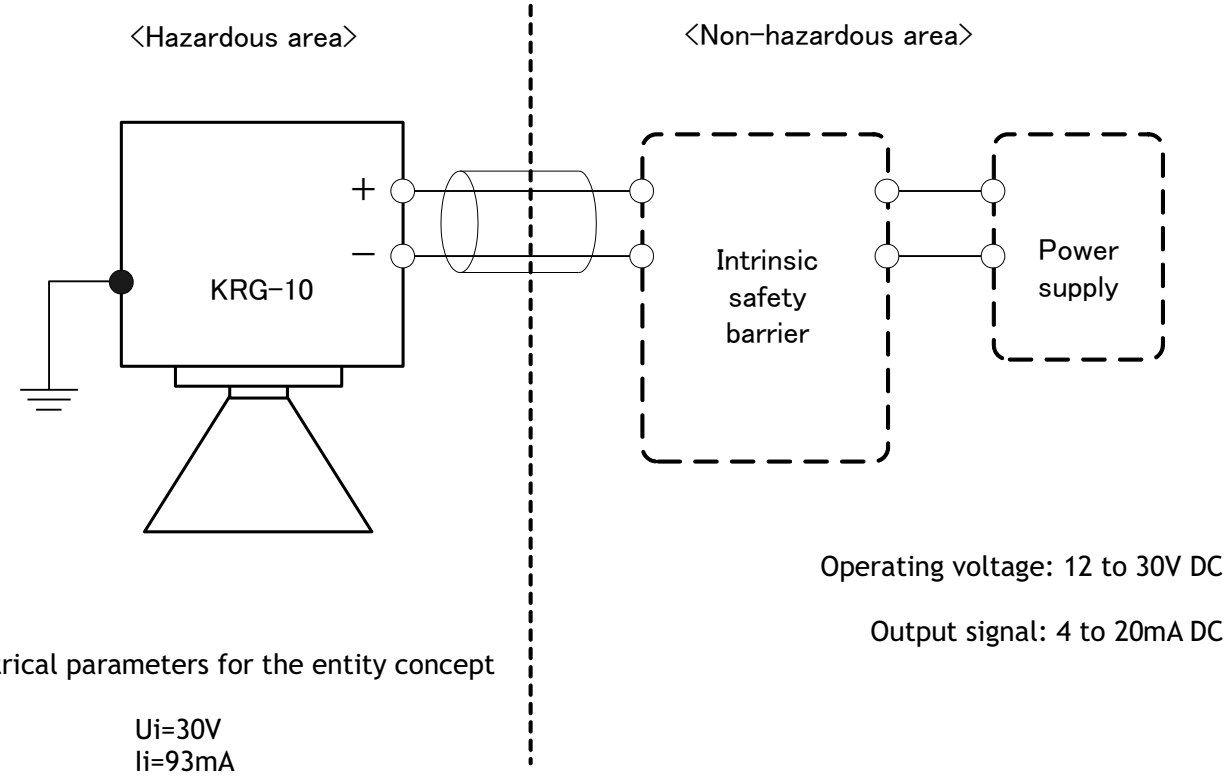


Fig. 3.1.2 Non-Ex connection example

(2) Ex-i connection example.

CAUTION



Operating voltage: 12 to 30V DC

Output signal: 4 to 20mA DC

Electrical parameters for the entity concept

Ui=30V
Ii=93mA
Pi=0.7W
Ci≈0
Li≈0

Fig. 3.1.3 Ex-i connection example.

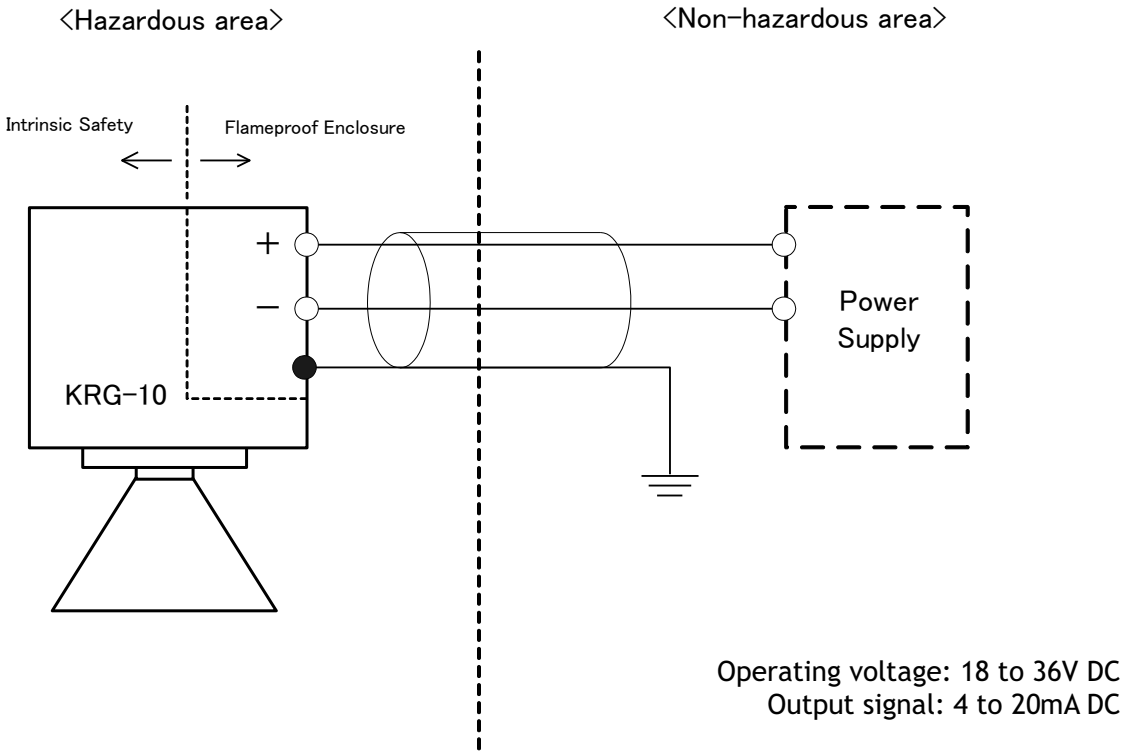
NOTE:
・Select appropriate ATEX/IECEx classified product to satisfy the Ex requirement.
・Grounding must be connected.
・Do not open either of lids, while the power is supplied or in the explosive gas and dust atmosphere.
・Do not make static electricity.
・Do not modify any of construction.
・Following requirements must be kept in accordance with ATEX/IECEx regulation.

Ambient temperature	-40 to 60°C
Target temperature	< 130°C
Cable max. rated temperature	> 60°C

・Intrinsic safety barrier must satisfy the rating of electrical parameters for the entity concept.
・Distribution cable inductance (=Lw) and capacitance (=Cw) should be chosen so as to lower the rating of Intrinsic safety barrier allowable inductance (=Lo) and capacitance (=Lo).
・Perform grounding construction.

(3) Ex-d+i connection example.

⚠ CAUTION
Ensure the requirement of wiring with Ex product must be satisfied.



Electrical parameters for the entity concept

Um = 250V AC 50/60Hz

Fig. 3.1.4 Ex-d+i connection example

NOTE:
・Select appropriate ATEX / IECEx classified product to satisfy the Ex requirement.
・Do not open either of lids, while the power is supplied or in the explosive gas and dust atmosphere.
・Do not make static electricity.
・Do not modify any of construction.
・Following requirements must be kept in accordance with ATEX/IECEx regulation.

Ambient temperature	-40 to 60˚C
Target temperature	< 130˚C
Cable max. rated temperature	> 60˚C

・Perform grounding construction (grounding resistance<10Ω).

3.2 Cable requirement

Required specification: Twisted pair 2 core shielded cable (0.2 to 2.5mm-sq / AWG 24 to 14)
Cable entry: 2 ports / M20 x 1.5 (Cable dia; 6.5 to 9mm)

3.3 Allowable resistance

Refer to the Fig 3.1.5 for details.
The maximum load resistance at the maximum supply voltage used in each equipment specification is shown in ② and ③ in Fig 3.1.5. (for example : maximum supply voltage in the Non-Ex specification so 36V DC, maximum load resistance is 1159Ω)
NOTE: Resistors used in HART communication is 250Ω. It shows the power supply voltage of 250Ω ① in Fig 3.1.5. (23.5V DC)

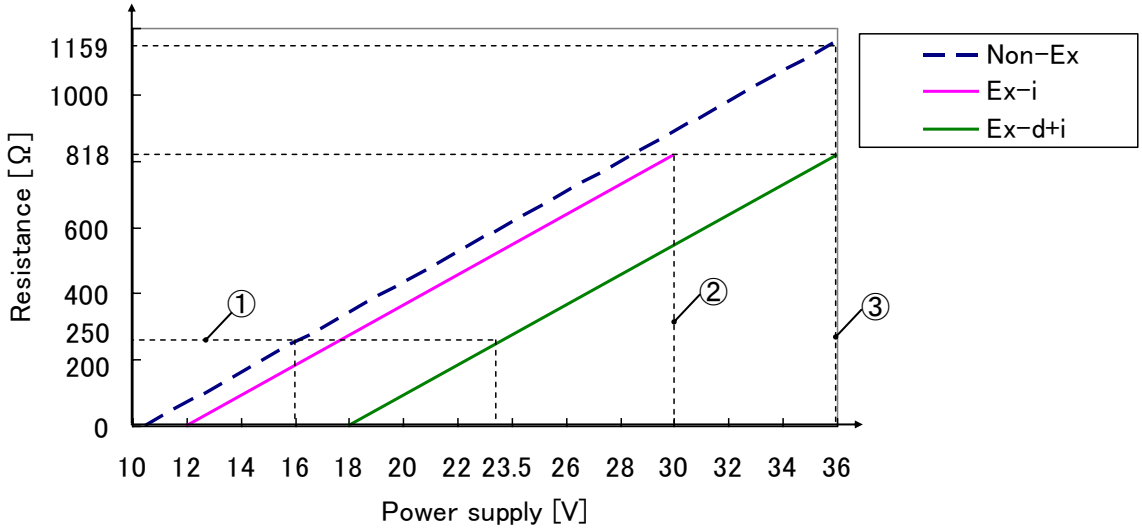


Fig 3.1.5 Allowable resistance

①: HART load
②: Power supply voltage limit Ex-i equipment
③: Power supply voltage limit Non-Ex and Ex-d equipment

3.4 Power

Power Supply: 10.5 to 36V DC (Non-Ex),12 to 30V DC (Ex-i),18 to 36V DC (Ex-d+i),
Max. Current: 22mA

3.5 Cable screening and grounding

In case of Non-Ex and Ex-i, perform grounding construction.(grounding resistance<100Ω) In case of Ex-d+I, perform grounding construction.(grounding resistance<10Ω)
Grounding terminal is outside of the transmitter head and inside of the terminal box, respectively. May use which grounding terminal.
If screened cable is necessary, connect the cable screen on both ends to ground potential. In the terminal box, the screen must be connected directly to the internal ground terminal.

⚠ **WARNING**
Ex equipment installation requires connection with the earth line.

Chapter 4 Commissioning

4.1 Step for starting measurement

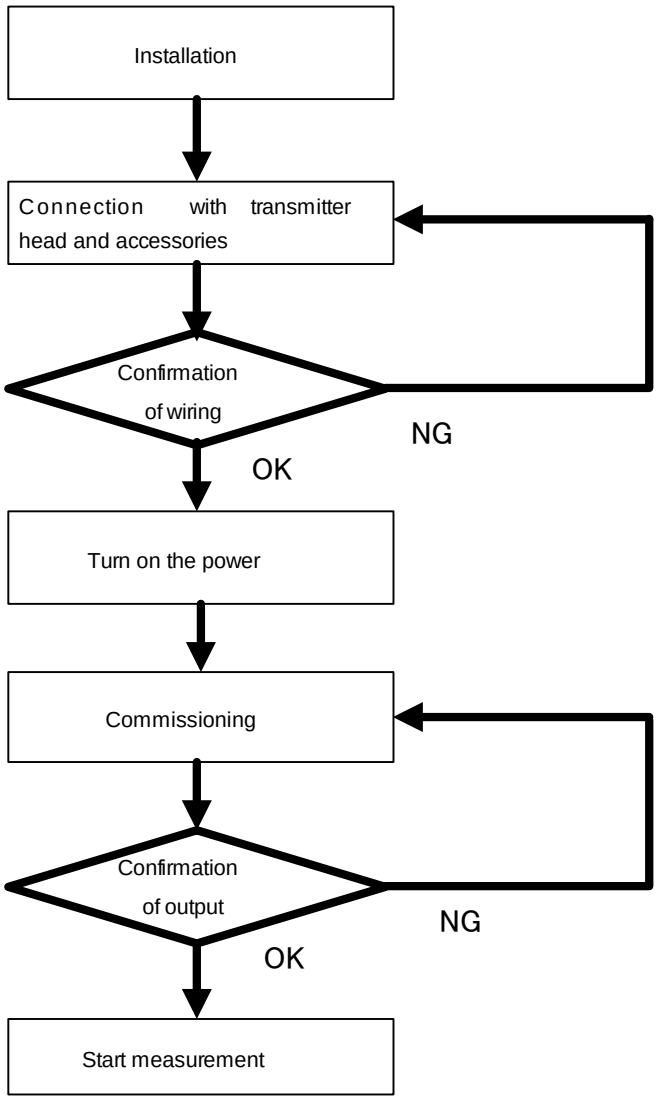


Fig. 4.1.1 Step for starting measurement

NOTE:
·Connection procedure should be referred **Chapter 3 Electrical installation**.
·This level gauge can be configured through the keys (and display) or HART communication.
- in case of using the keys (and display) : refer to **Chapter 5 LCD and 4-Keys operation**.
- in case of using HART communication : refer to **Chapter 6 Operation by configuration software**.

4.2 Installation

Please refer to **Chapter 2 Installation**.
Installation instructions are described in the chapter.

4.3 Connection

To connect the equipment to external devices (e.g. power supply), please refer to **Chapter 3 Electrical installation**.
If error exists, the equipment do not work properly. Including connection of grounding, please check the connection.
If you use the configuration software on PC, you must prepare a HART modem for communication and operation. For method of connection, please refer to **Chapter 6 Operation by configuration software**.

4.4 Turn on/off

The equipment has no switch for turning on and off.
The measurement operation starts automatically when power is applied.
If a LCD module is mounted in the transmitter head, the LCD displays measurement data or information of the equipment while turning on.

4.5 Setup measurement parameters

After commissioning you must set parameters in the equipment for proper measurement.
The parameter setting can be carried out by 2 means.

- LCD and 4-key.
  Please refer to **Chapter 5 LCD and 4-Keys operation**.

- Configuration software on PC
  Please refer to **Chapter 6 Operation by configuration software**.
  To set the parameter by configuration software, you must establish the connection between the software and the equipment before communication operation. Please refer to **6.2 Connecting to the instrument**.

By any method above, you can change measurement parameters in the equipment. But you can easily set complicating parameters by the configuration software. The configuration software is recommended for setup.
For proper measurement, at least, please set the parameters listed below.

1) Base setting
Parameters of operating condition must be set properly before starting measurement.
Please set LCD output parameter, G,R,C,H. About the base setting parameters, please refer to Fig 4.5.1. About meaning of parameters, please refer to **Chapter 5 LCD and 4-Keys operation**, **Chapter 6 Operation by configuration software** and **Chapter 7 Precautions on equipment settings**.
For operation by LCD and 4-key, please refer to table 5.3.1. in **5.3 Key parameter list.**
For operation by configuration software, please refer to **6.3.1 Basic Settings**.

If you utilize Calc Volume or Calc Flow features, you must set corresponding parameters.

2) Analog out (in the case of use)
Please set analog output parameter, minimum output, maximum output.
For operation by LCD and 4-key, please refer to table 5.3.1 in **5.3 Key parameter list**.

In usual case, other parameters are not to be set. However, in particular case, you need to change parameters. please refer to **Chapter 7 Precautions on equipment settings**.
Non-volatile memory stores parameter data while power off, so parameters are need to be set once.

If the measurement is not accurate or is impossible, please check the parameter and installation(**Chapter 2 Installation**) and connection(**Chapter 3 Electrical installation**).

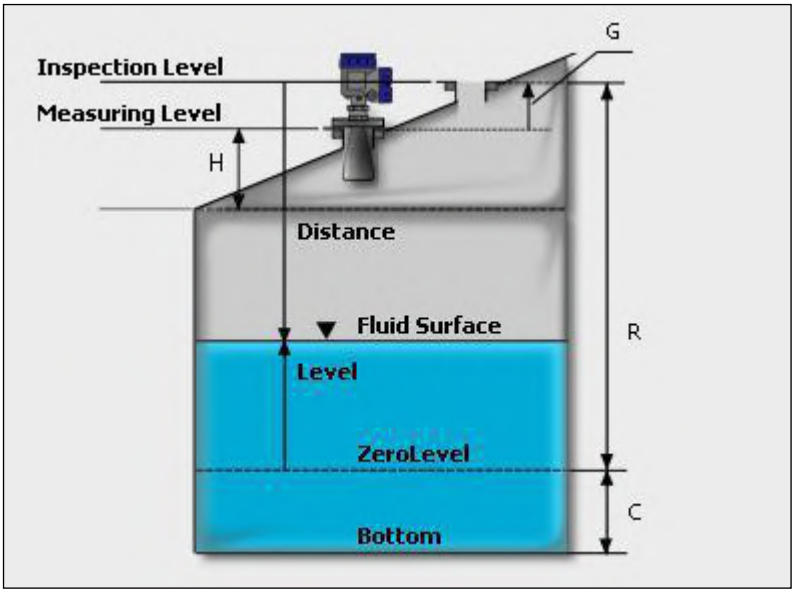


Fig. 4.5.1 Basic setting parameters diagram

Chapter 5 LCD and 4-Keys operation

5.1 LCD

LCD module connection and direction

CAUTION

·Commissioning work should be done in non-hazardous area atmosphere.
·Be sure to stop power supply to the transducer or any of accessories while wiring work to prevent electrical shock.

LCD module is removable and it can place 4 pattern directions.
Turn off the power when LCD direction is changed.

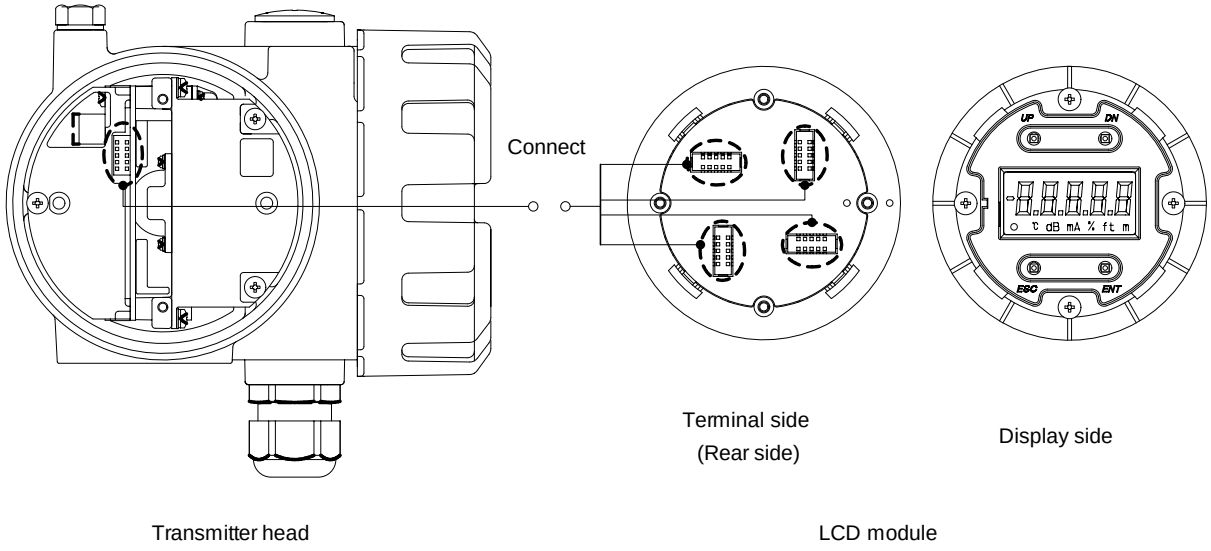


Fig. 5.1.1 LCD module connection

Name for LCD & operational 4-Keys

Measured data and units are displayed during normal operation. Blinking display of the last measured value indicates that level gauge is in alarm mode.
If the measurement is failure, “No surface echo status” flashes.
When the keys are used in configuration mode, the menu number or configuration data is displayed.

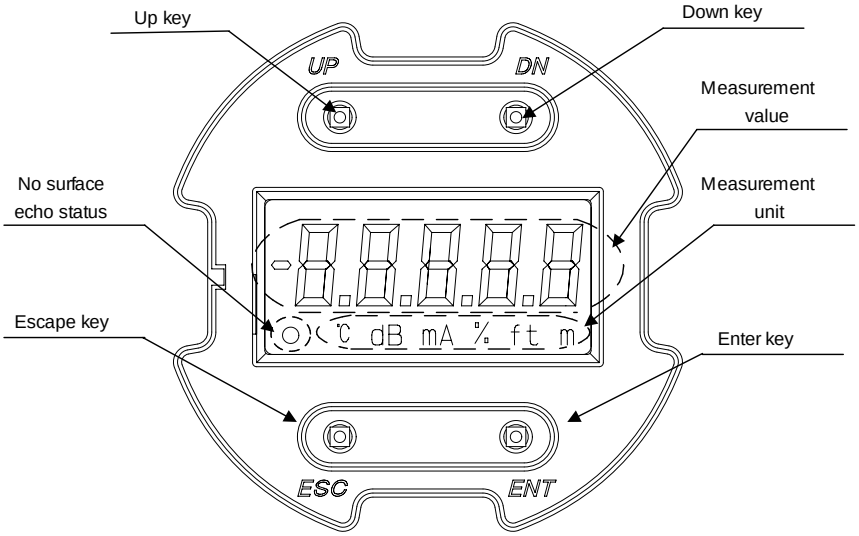


Fig. 5.1.2 LCD

Measured value

Table. 5.1.1 Measured value

LCD Output Parameter	Unit	sign	Digit
Level	m or Ft	±	5 digits max. (Integral + Decimal number)
Distance	M or Ft	±	5 digits max. (Integral + Decimal number)
Volume	-	+	5 digits max. (Integral + Decimal number)
Flow	-	+	5 digits max. (Integral + Decimal number)
Current	mA	+	5 digits max. (Integral 2+ Decimal 3)
Signal Amplitude	dB	+	3 digits max. (Integral number)
Temperature	˚C	±	4 digits max. (Integral 3+ Decimal 1)
Max Volume	-	+	5 digits max. (Integral + Decimal number)
Max Flow	-	+	5 digits max. (Integral + Decimal number)
Volume (%)	%	+	5 digits max. (Integral 3+ Decimal 2)
Flow (%)	%	+	5 digits max. (Integral 3+ Decimal 2)

5.2 4-Keys

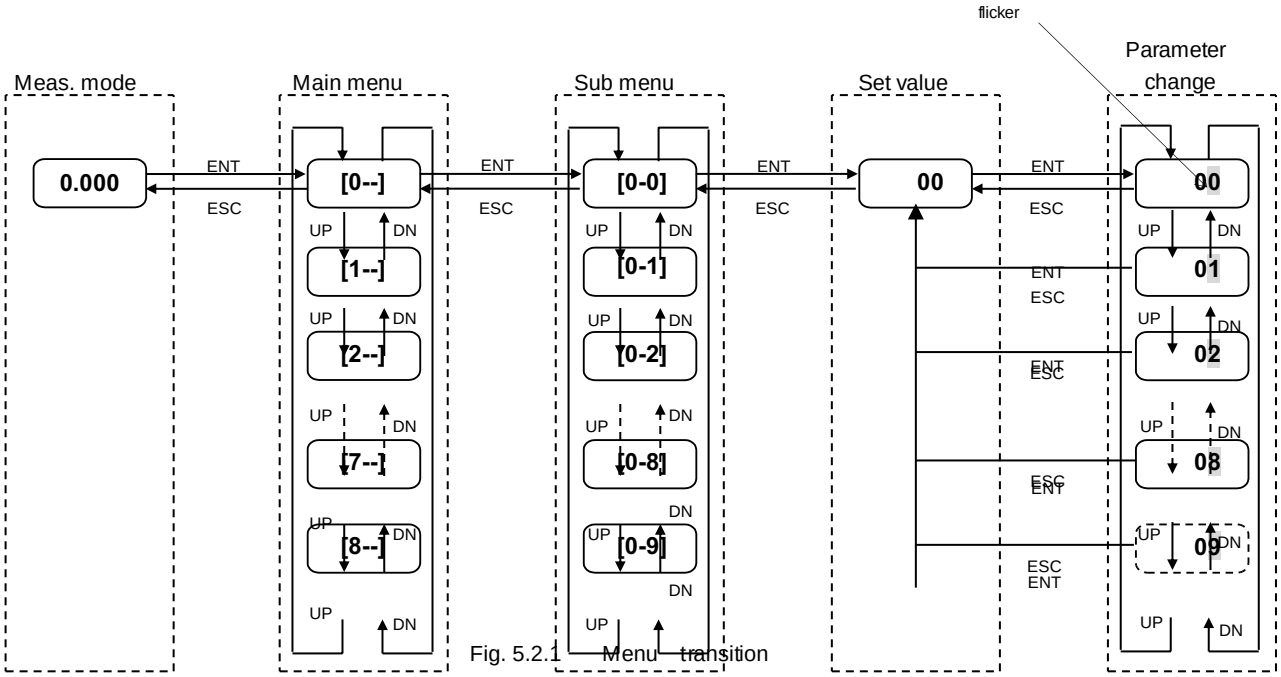


Fig. 5.2.1 Menu transition

4-Keys operation

(1) Measurement value will be shown when the power is supplied.



Fig. 5.2.2 LCD measurement value

(2) Proceed into setting mode when “ENT” key clicked. Main menu No. will be shown as below. Below example shows “Menu-0”.

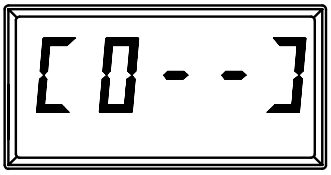


Fig. 5.2.3 LCD main menu No.

(3) Main menu can be change from 0 to 8 by “UP” or “DN” key.

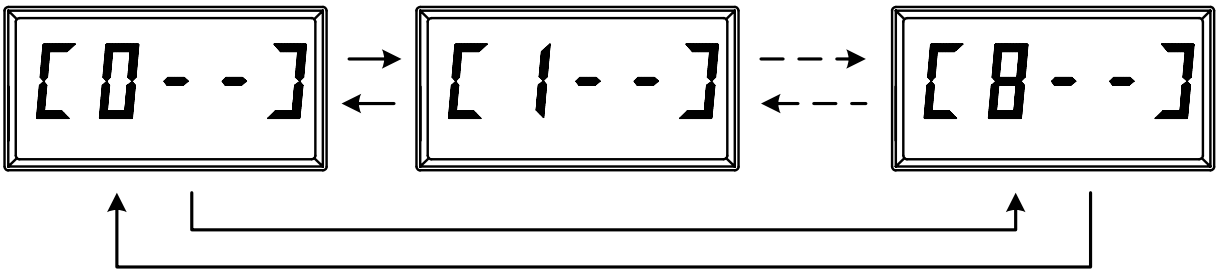


Fig. 5.2.4 Change main menu No.

(4) When “ENT” key is clicked in main menu, sub menu will be shown as below. Below example shows “main menu-0” + “sub menu-0”.

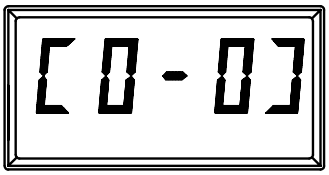


Fig. 5.2.5 LCD sub menu No.

(5) Sub menu can be changed from 0 to 9 by “UP” or “DN” key.

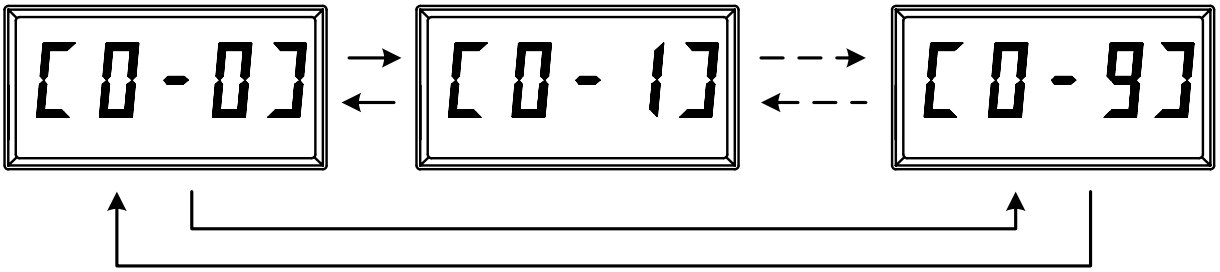


Fig. 5.2.6 Change sub menu No.

(6) When “ENT” key is clicked after sub menu number is decided, set value will be shown as below.



Fig. 5.2.7 LCD set value

(7) In case of change the set value, click “ENT” key again, the lowest digit of set value will flicker.



Fig. 5.2.8 Input set value

(8) Flickered value can be changed by “UP” or “DN” key. When “ENT” key is clicked, the flickered value will be decided and changed to next digit.

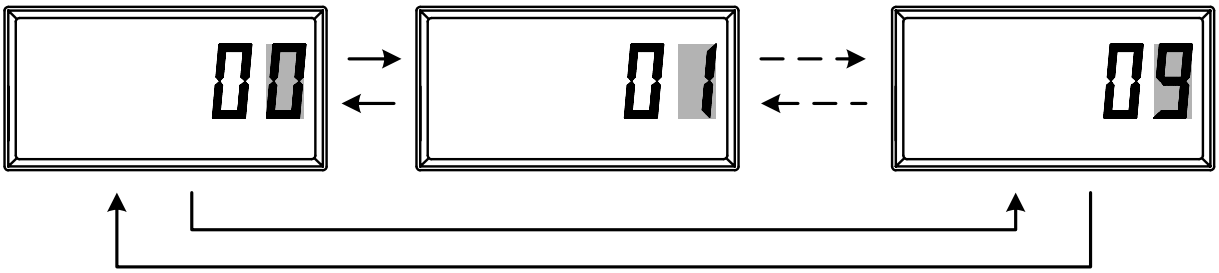


Fig. 5.2.9 Change flickered value

(9) Changed parameter can be canceled by “ESC” key until final digit is confirmed.

(10) By click of “ESC” key, display mode will move to upper menu such as setting mode -> Sub menu -> Main menu -> Meas. Mode.

Example

When "R" parameter is set to 6.555 m from 10 m.

Table 5.2.1 Example

Step	Key	Display	Description
1	-	7.555 m	Measuring level (Meas. mode)
2	ENT	[0 - -]	Main menu
3	ENT	[0 - 0]	Sub menu
4	UP	[0 - 1]	
5	UP	[0 - 2]	
6	UP	[0 - 3]	
7	UP	[0 - 4]	
8	UP	[0 - 5]	
9	ENT	10.000	
10	ENT	10.000	"0" flickers
11	UP x 5	10.005	x 5: push 5 times
12	ENT	10.005	
13	UP x 5	10.055	
14	ENT	10.055	
15	UP x 5	10.555	
16	ENT	10.555	
17	DN x 4	16.555	
18	ENT	16.555	
19	DN	06.555	
20	ENT	06.555	
21	ESC	[0 - 5]	Sub menu
22	ESC	[0 - -]	Main menu
23	ESC	4.110 m	Measuring level (Meas. mode)

5.3 Key parameter list

Table 5.3.1 Key parameter list

Main menu	Sub menu	Parameters	Default	Unit	Range
[0--] Base Setting	[0-0]	LCD output Parameter	0	-	0 ~ 10
	[0-1]	Measurement Unit	0	-	0, 1
	[0-2]	Antenna Type	0	-	0 ~ 12
	[0-3]	Bore	0	m or Ft	0.000 ~ 99.999
	[0-4]	G	0	m or Ft	-99.999 ~ 99.999
	[0-5]	R	30	m or Ft	0.000 ~ 99.999
	[0-6]	C	0	m or Ft	0.000 ~ 99.999
	[0-7]	H	0	m or Ft	0.000 ~ 99.999
	[0-8]	Number of decimal places for Display Offset	3	-	0 ~ 3
	[0-9]	Display Offset	0	m or Ft	-99999 ~ 99999
[1--] Calc Volume	[1-0]	Volume Type	0	-	0 ~ 4
	[1-1]	D (Diameter)	1	m or Ft	0.000 ~ 99.999
	[1-2]	L (Length)	1	m or Ft	0.000 ~ 99.999
	[1-3]	O (Offset)	0	m or Ft	-99.999 ~ 99.999
	[1-4]	A (Distance To Full Level)	0	m or Ft	-99.999 ~ 99.999
	[1-5]	Volume Unit	0	-	0 ~ 3
[2--] Calc Flow	[2-0]	Flow Type	0	-	0 ~ 3
	[2-1]	Weir Type	0	-	0 ~ 3
	[2-2]	Nominal (PF)	0	-	0 ~ 13
	[2-3]	B (Water Way Width)	0.5	m or Ft	0.000 ~ 99.999
	[2-4]	b (Weir Width)	0.15	m or Ft	0.000 ~ 99.999
	[2-5]	D (Height To Notch)	0.3	m or Ft	0.000 ~ 99.999
	[2-6]	v (Kinematic Viscosity)	1	-	0.000 ~ 99.999
	[2-7]	Flow Unit	0	-	0 ~ 15
[3--] Analog Out	[3-0]	Analog Output Parameter	0	-	0 ~ 4
	[3-1]	Minimum Output	0	m or Ft	-99.999 ~ 99.999
			0	-	0 ~ 99999
			0	dB	0.00 ~ 200.00
	[3-2]	Maximum Output	30	m or Ft	-99.999 ~ 99.999
			100	-	0 ~ 99999
			100	dB	0.00 ~ 200.00
	[3-3]	Alarm Selection	0	-	0 ~ 2

[4--] Measure Support	[4-0]	Averaging Time	60	-	1 ~ 120
	[4-1]	Median Filter	0	-	0 ~ 120
	[4-2]	Research Delay	30	-	1 ~ 120
	[4-3]	Alarm Delay	30	-	1 ~ 120
	[4-4]	Echo Detect	0	-	0, 1
	[4-5]	Zero Minus Value	0	-	0, 1
	[4-6]	Noise Margin	15	dB	0 ~ 255
[5--] Outlier Removal	[5-0]	Valid Window Width	0.8	m or Ft	0.000 ~ 99.999
	[5-1]	Double Bounce - Double Bounce	0	-	0, 1
	[5-2]	Double Bounce - Double Bounce Offset	0	m or Ft	-99.999 ~ 99.999
	[5-3]	Bottom - Bottom Visible	0	-	0, 1
	[5-4]	Bottom - Window Width	0.3	m or Ft	0.000 ~ 99.999

[6--] Valule Hold	[6-0]	Level Tracking	0	-	0, 1
	[6-1]	Output Prediction	0	-	0, 1
	[6-2]	Slow Search - Slow Search	0	-	0, 1
	[6-3]	Slow Search - Window Exp-Width	0	m or Ft	0.000 ~ 99.999
	[6-4]	Zero Cut - Zero Cut	0	-	0, 1
	[6-5]	Zero Cut - Position	0	m or Ft	0.000 ~ 99.999
[7--] Calibration	[7-0]	Fixed Current Output	0	mA	0, 3.600 ~ 22.000
	[7-1]	Calibration - 4mA Calibration	4	mA	3.500 ~ 4.500
	[7-2]	Calibration - 20mA Calibration	20	mA	15.000 ~ 25.000
	[7-3]	Offset Calibration	0	m or Ft	-1.000 ~ 1.000
	[7-4]	Span Calibration	1	-	0.500 ~ 1.500
[8--] Tools	[8-0]	Research	0	-	0, 1
	[8-1]	Parameter Initialize	0	-	0, 1
	[8-2]	Reboot	0	-	0, 1
	[8-3]	Error	-	-	-
	[8-4]	Firmware Version	-	-	-

5.4 Parameter instructions

[0-0] LCD Output Parameter

0: Level	Level of target
1: Distance	Distance between gauging reference point and target
2: Volume	Volume
3: Flow	Flow rate
4: Current	Current value (mA) (4-20 mA)
5: Sig-Amp	Signal strength amplitude (dB)
6: Temperature	Internal Temperature (°C)
7: Max Volume	Max. value of volume settings
8: Max Flow	Max. value of flow rate settings
9: Volume (%)	Volume (%)
10: Flow (%)	Flow rate (%)

[0-1] Measuring Unit

0: m	Sets display in Metric units
1: Ft	Sets display in Feet units

Note: When 'Measuring Unit' is changed, units of other parameters also change.

[0-2] Antenna Type

0: 2”Cone	2" cone antenna
1: 4”Cone	4" cone antenna
2: 2”PTFE Seal	2" PTFE sealing antenna
3: 4”PTFE Seal	4" PTFE sealing antenna
4: 1”Rod	1" rod antenna
11: 2”Pipe	2" pipe + 2” cone antenna
12: 4”Pipe	4" pipe + 4” cone antenna

[0-3] Bore
Enter the inner diameter of the antenna pipe.

[0-4] G
Enter the parameter G, distance between reference point and gauging reference point.

[0-5] R
Enter the parameter R, measurement range.

[0-6] H
Enter the parameter H, dead zone.

[0-7] C
Enter the parameter C, below measurement range.

[0-8] number of decimal places for Display Offset
Enter the number of digits displayed after the decimal point of Display Offset.

[0-9] Display Offset
Enter the offset parameter for level and distance values on LCD.

[1-0] Volume Type
Volume converter.
Selectable a formula of volume conversion from following 5 ways.
0: Unknown : Select if volume conversion is not used.
1: Vertical Cylinder : Select if Vertical Cylinder conversion is used.
2: Spherical : Select if Spherical conversion is used.
3: Horizontal Cylinder : Select if Horizontal Cylinder conversion is used.
4: User Defined : Select if user defined table conversion is used.

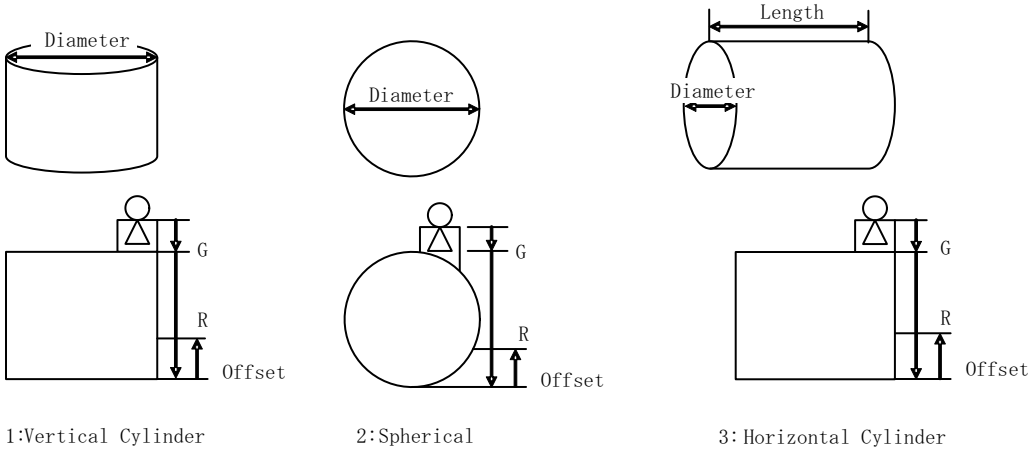


Fig. 5.4.1 Volume type

[1-1] D (Diameter)
Enter the parameter D, diameter of the tank.

[1-2] L (Length)
Enter the parameter L, length of the tank.

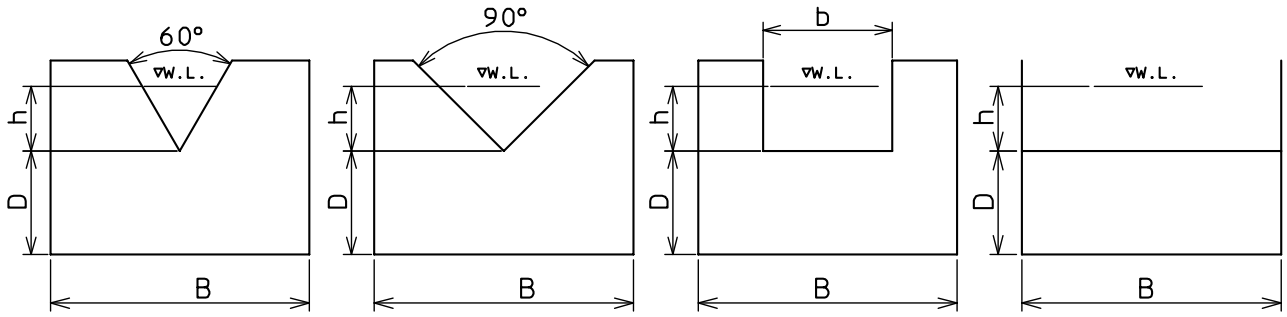
[1-3] O (Offset)
Enter the parameter O, offset of the tank.

[1-4] A (Distance To Full Level)
Enter the parameter A, distance to full level of the tank.

[1-5] Volume Unit
Select unit for Volume.
0: m^3
1: US Gallons
2: Barrels
3: Ft^3

[2-0] Flow Type
Flow rate converter.
Selectable formula of flow rate conversion from following 4 way.
0: Unknown : Select if flow conversion is not used.
1: Weir_JIS : Select if weir conversion is used.
2: Flume_JIS : Select if flume conversion is used.
3: User Defined : Select if user defined table conversion is used.

[2-1] Weir Type
Weir formula. (JIS B 8302)
0: Edged 60Deg Triangle
1: Edged 90Deg Triangle
2: Edged Square
3: Overall Width



0: Edged 60Deg Triangle 1: Edged 90Deg Triangle 2: Edged Square 3: Overall Width

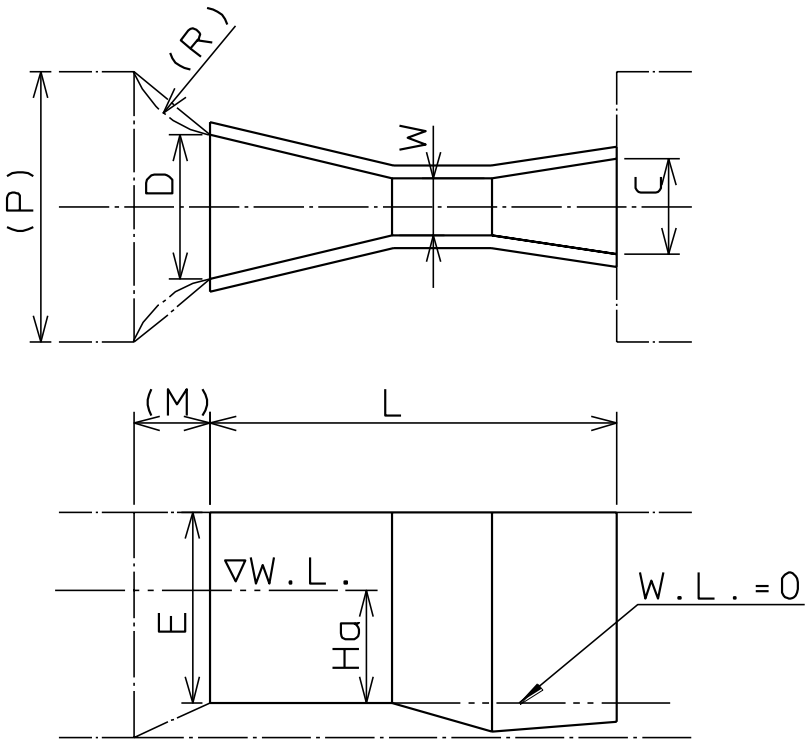
Fig. 5.4.2 Weir type

[2-2] Nominal (PF)
Parshall Flume Formula. (JIS B 7553)
Select size of parshall flume.

0: PF-01	Flume for PF-01
1: PF-02	Flume for PF-02
2: PF-03	Flume for PF-03
3: PF-06	Flume for PF-06
4: PF-09	Flume for PF-09
5: PF-10	Flume for PF-10
6: PF-15	Flume for PF-15
7: PF-20	Flume for PF-20
8: PF-30	Flume for PF-30
9: PF-40	Flume for PF-40
10: PF-50	Flume for PF-50
11: PF-60	Flume for PF-60
12: PF-70	Flume for PF-70
13: PF-80	Flume for PF-80

Table 5.4.1 Parshall Flume dimensions Unit : mm

PF size	Flow range [m^3/h]	W	C	D	E	L	Reference (min.)		
							(M)	(P)	(R)
PF-01	1～30	25.4	93	167	450	635	200	600	300
PF-02	2～63	50.8	135	214	450	774	250	724	350
PF-03	3～193	76.2	178	259	610	914	305	768	406
PF-06	5～398	152.4	394	397	610	1525	305	902	406
PF-09	9～907	228.6	381	575	762	1626	305	1080	406
PF-10	11～1641	304.8	610	845	914	2867	381	1492	508
PF-15	15～2508	457.2	762	1026	914	2943	381	1676	508
PF-20	43～3374	609.6	914	1207	914	3019	381	1854	508
PF-30	62～5138	914.4	1219	1572	914	3169	457	2223	508
PF-40	133～6922	1219.2	1524	1937	914	3318	457	2711	610
PF-50	163～8726	1524.0	1829	2302	914	3467	457	3080	610
PF-60	265～10551	1828.8	2134	2667	914	3616	457	3442	610
PF-70	306～12376	2133.6	2438	3032	914	3765	457	3810	610
PF-80	357～14221	2438.4	2743	3397	914	3915	457	4172	610



NOTE : Ha = Measurement level

Fig. 5.4.3 Parshall Flume

[2-3] B (Water Way Width)
Channel width. (Please refer Fig 5.4.2 Weir type)

[2-4] b (Weir Width)
Weir width. (Please refer 2: Edged Square of Fig 5.4.2 Weir type)

[2-5] D (Height To Notch)
Liquid height from notch end. (Please refer Fig 5.4.2 Weir type)

[2-6] v (Kinematic Viscosity)
Input a value of kinematic viscosity coefficient.

[2-7] Flow Unit
Flow rate unit.
Select unit for flow rate.
0: m^3/D
1: m^3/h
2: m^3/min
3: m^3/sec
4: US Gallons/D
5: US Gallons/h
6: US Gallons/min
7: US Gallons/sec
8: Barrels/D
9: Barrels/h
10: Barrels/min
11: Barrels/sec
12: Ft^3/D
13: Ft^3/h
14: Ft^3/min
15: Ft^3/sec

[3-0] Analog Output Parameter

0: Level	Level value converted to 4-20 mA
1: Distance	Distance value converted to 4-20 mA
2: Volume	Volume value converted to 4-20 mA
3: Flow	Flow rate value converted to 4-20 mA
4: Sig-Amp	Signal strength amplitude value converted to 4-20 mA

[3-1] Minimum Output
Enter the measured value corresponding to 4 mA.

[3-2] Maximum Output
Enter the measured value corresponding to 20 mA.

[3-3] Alarm Selection

0: High	22 mA alarm output
1: Low	3.6 mA alarm output
2: Hold	Hold last value

[4-0] Averaging Time
Measuring value is averaged in accordance with [sec] setting.

[4-1] Median Filter
Set allowable value using calculation to get accurate measured value.

[4-2] Research Delay
Time delay after loss of surface echo until research in accordance with [sec] setting.

[4-3] Alarm Delay
Time delay after loss of surface echo until alarm signals in accordance with [sec] setting.

[4-4] Echo Detect
0: Max Echo Max strength echo defined as surface echo
1: First Echo First echo defined as surface echo

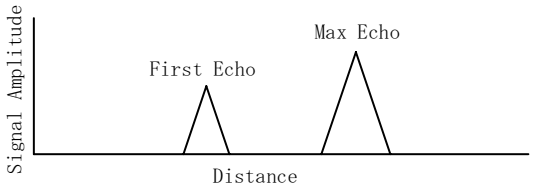


Fig. 5.4.4 Echo detect

[4-5] Zero Minus Value
While this function is "On", zero level will be outputted instead of negative level.
0: Off
1: On

[4-6] Noise Margin
Noise is eliminated in accordance with [dB] setting.

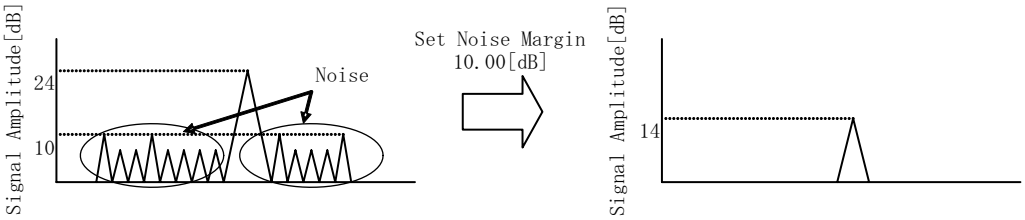


Fig. 5.4.5 Noise margin

[5-0] Valid Window Width
Enter the valid window width for detecting echo.

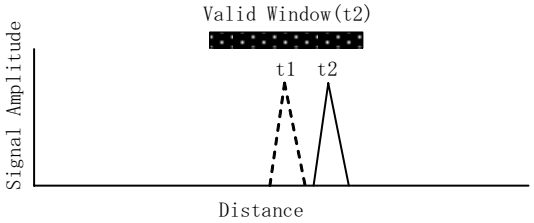


Fig. 5.4.6 Valid window width

[5-1] Double Bounce
While this function is "On", detected multi-bounce echoes (double bounce, triple bounce etc.) will be ignored.
0: Off
1: On

[5-2] Double Bounce Offset
Enter the offset value from gauging reference point to top surface of tank.

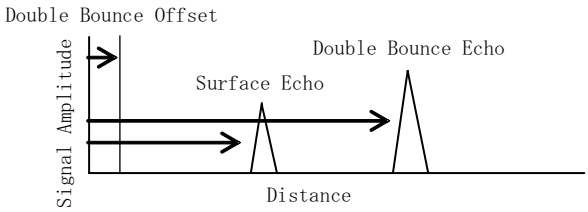


Fig. 5.4.7 Double bounce

[5-3] Bottom Visible
While this function is "On", a detected bottom echo will be ignored.
0: Off When tank bottom echo is smaller than surface echo (such as with water), setting "0" invalidates this function.
1: On When tank bottom echo is larger than surface echo (such as with oil fluids) setting "1" will be effective against echo misdetection.

[5-4] Bottom Window Width
Enter the window width for bottom echo recognition.

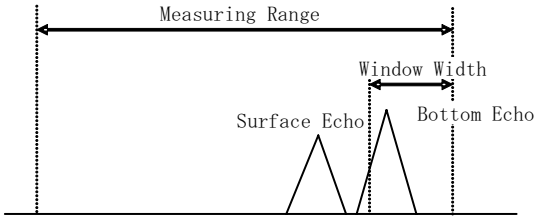


Fig. 5.4.8 Bottom echo & Bottom window

[6-0] Level Tracking
While this function is "On", the valid window shall be shifted in accordance with change of liquid level, if echo was lost.
0: Off /
1: On

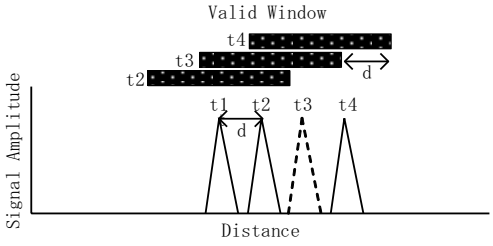


Fig. 5.4.9 Level tracking

[6-1] Output Prediction
While this function is "On", predicted value will be outputted according to change of liquid level, if echo was lost.
0: Off
1: On

[6-2] Slow Search
While this function is "On", width of valid window will be expanded at the last position of echo from liquid surface, if echo was lost.
0: Off
1: On

[6-3] Window Exp-Width
Enter a rate of width expansion of the valid window for slow search.

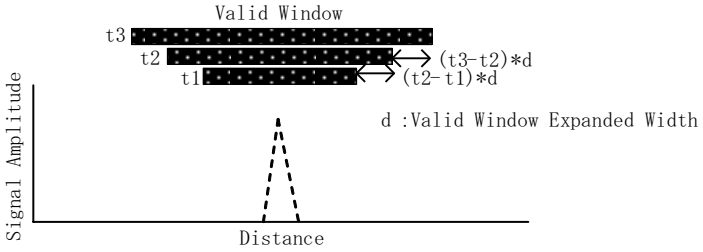


Fig. 5.4.10 Slow search

[6-4] Zero Cut
While this function is "On", liquid level “0” will be outputted if the last position of surface echo was lower than zero cut position when echo was lost.
0: Off
1: On

[6-5] Zero Cut Position
Enter a threshold value (distance from bottom) as Zero cut position to recognize measured level as empty level (Parameter [R]+[C]) if measured level is lower than the threshold value.

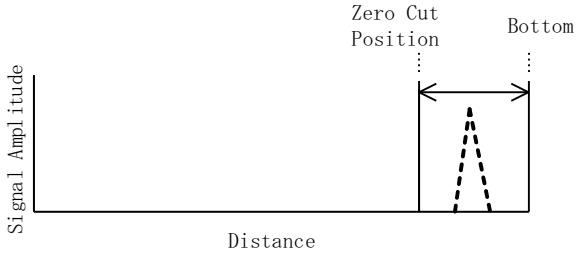


Fig. 5.4.10 Zero cut

[7-0] Fixed Current Output
Enter a current value to fix output current from the transmitter for output calibration.

[7-1] Calibration - 4 mA Calibration
In fixed current output mode with current set at 4 mA, input ammeter reading.

[7-2] Calibration - 20 mA Calibration
In fixed current output mode with current set at 20 mA, input ammeter reading.

[7-3] Offset Calibration
Enter an offset value to be adjusted.

[7-4] Span Calibration
Enter a span value to be adjusted.

[8-0] Research
Mandatory surface echo is researched.
0: Default.
1: Research Researched by "1" setting.

[8-1] Parameter Initialize
Inputted parameters in the device are initialized. All parameters will revert to factory default values.
0: Default.
1: Initialization Initialized by "1" setting.

[8-2] Reboot
The device is rebooted.
0: Default.
1: Reboot Rebooted by "1" setting.

[8-3] Error
Error code will be shown on LCD. Detail meanings are as below.

Table. 5.4.2 Error code

Code	Description	Possible Cause	Counter-measure
E-00	Normal	-	-
E-01	ROM (ROM Error)	ROM failure	Even if the transmitter head could not be recovered by rebooting, please contact your representative.
E-02	RAM (RAM Error)	RAM failure	
E-03	Transmitter (Transmit/Receiving circuit error)	Not detected transmitting wave during measurement	
E-04	Volume Table, Flow Table (Input parameter error in the tables)	Inputted inconsistent data in volume table or flow rate Table, otherwise deviation between Point number and data	Check volume table or flow rate table's data.
E-05	Flow Type (Flow rate conversion error)	Out of limit for weir formula	Check weir construction and input parameters.

Note: In case that multiple error detected, error code will be shown in following order.
E-01 > E-02 > E-03 > E-04 > E-05

[8-4] Firmware Version
Firmware version of the device will be shown LCD.

Chapter 6 Operations by configuration software

6.1 Overview

6.1.1 System configuration

You can adjust the instrument by connecting a HART modem to the computer and using the specialized configuration software “Level Config”. Power can be supplied from the Power Unit, PLC, DCS, etc.
A connection example is shown in the following Fig.6.1.1

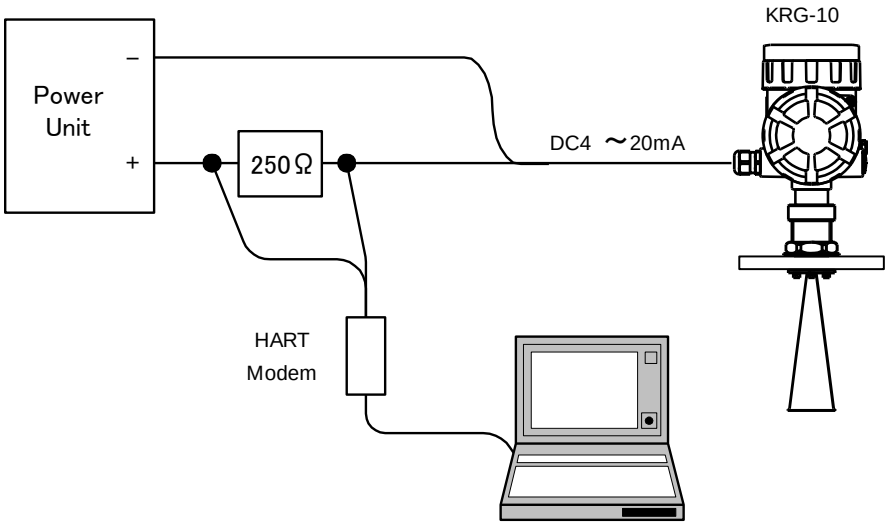


Fig. 6.1.1 System configuration

6.1.2 What is Level Config?

Level Config is the configuration software for KRG-10 that enables to adjust the instrument by using a PC. Using HART for communication, it is possible to set parameters for the instrument and to monitor measurement values, states, etc.
You must establish the connection between the software and the equipment before communication operation. Please refer to **Section 6.2**.

6.1.3 Software operating environment

Supported OS:	Microsoft Windows XP / Vista / 7
Communication conditions:	Operation on a PC that can use a HART modem
Screen resolution:	SVGA(800×600[dot]) or higher
Required software:	Adobe Acrobat Reader

*** In case of using Adobe Acrobat Reader 10.0 or later, the following environment setting must be implemented for Adobe Acrobat Reader.**

Setting for Adobe Acrobat Reader: Uncheck "Enable Protected Mode at startup".

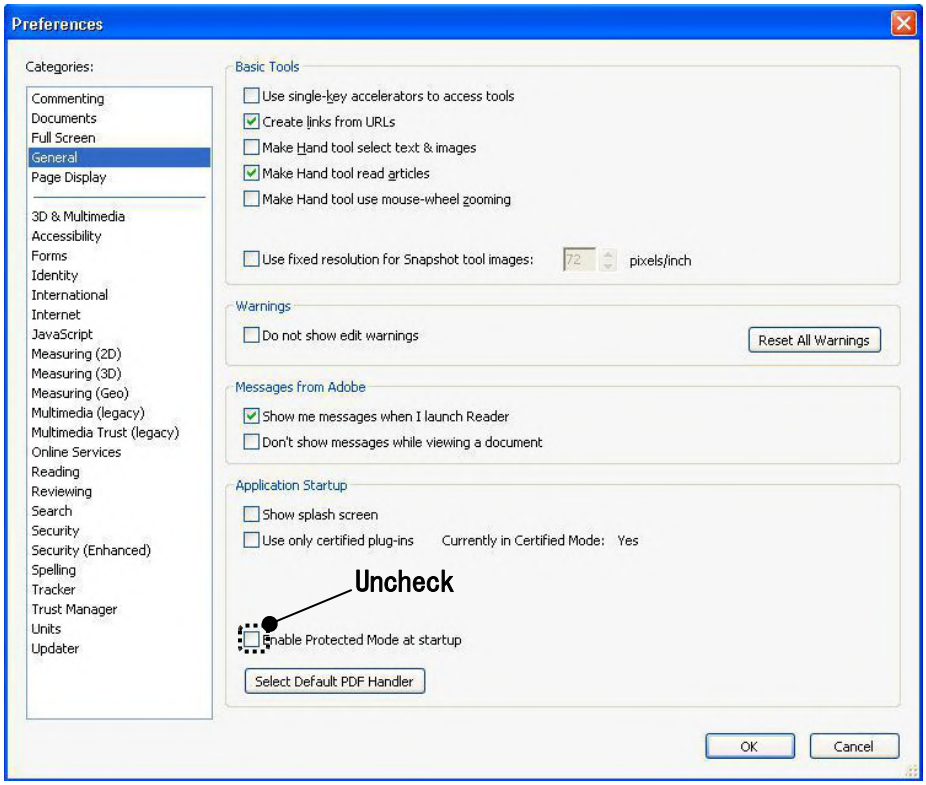


Fig. 6.1.2 Setting for Adobe Acrobat Reader

Display setting: Select smaller (100%) for the size of text and other items on the screen.
*** In case of using Windows 7, the following display setting is required.**

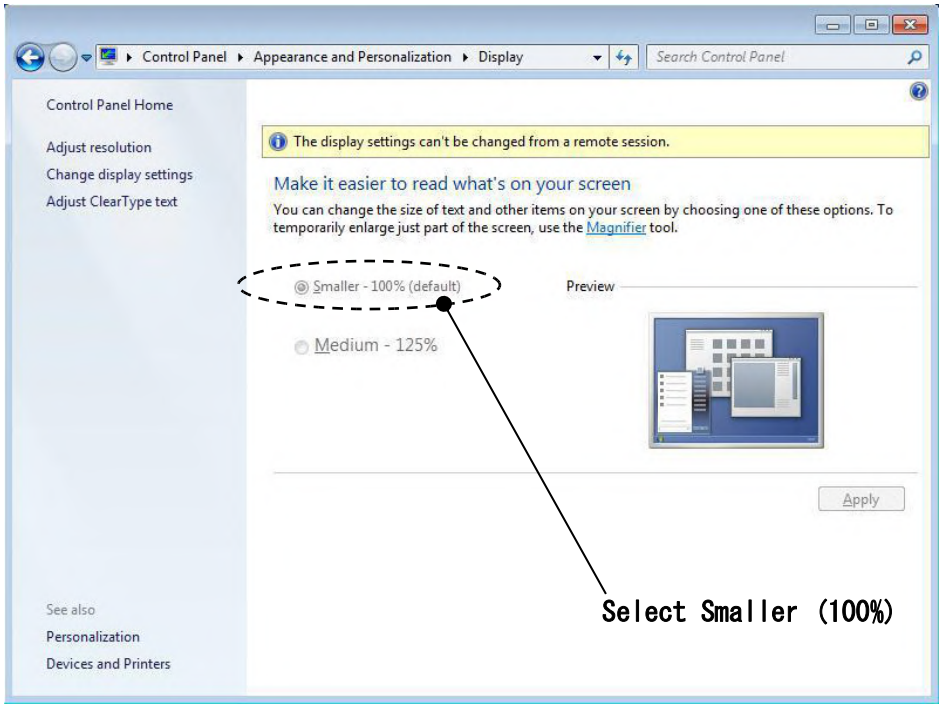


Fig. 6.1.3 Display setting in Windows 7

COM port settings: In case of using a HART modem of a serial interface type, you must set "1" for the receive buffer and transmit buffer of the COM port according to the following procedure:

1. Open the "Control Panel" from the "Start" tab.
2. Select the "Hardware" tab in "System", and click "Device Manager". (In Windows 7, click "Device Manager" directly.)
3. In the tree view, expand the "Ports (COM & LPT)" node.
4. Select the "Communications Port" tab. Click the right mouse button, and select "Properties".
5. Select the "Port Settings" tab and click "Advanced".
6. Set the receive buffer and transmit buffer to "1".
7. Click "OK".
8. Restart the computer.

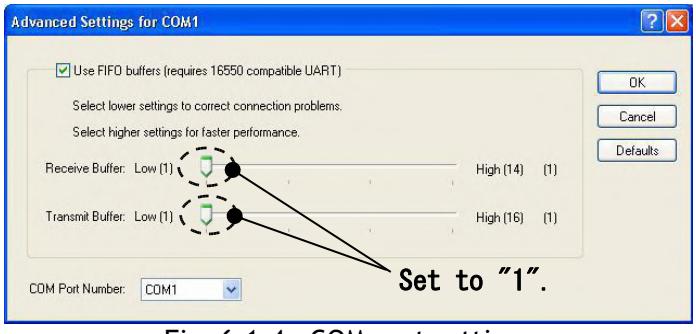


Fig. 6.1.4 COM port settings

6.1.4 Installing the configuration software

Copy the distributed library and unzip it in a desired location.
The folder "KRG-10" (hereinafter "main folder") is created.

Distributed file

Document: Manual folder ..①
Level Config_V***: Configuration software folder ..②
README: Quick instruction document ..③
(in the folder of LevelConfig_V***)
HelpPage.txt: Settings file for calling the Help file ...④
Language.csv: Display language settings file ...⑤
Level Config.exe: Program body of the configuration software ..⑥

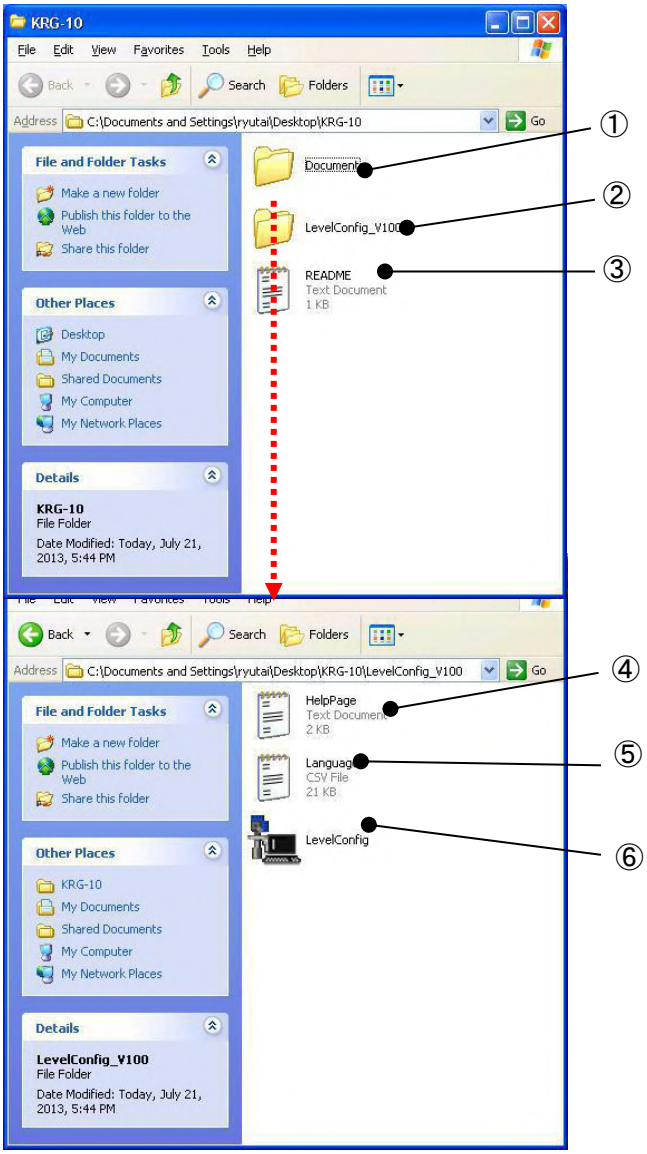


Fig. 6.1.5 Distributed files

6.1.5 Uninstalling the configuration software

Delete the main folder from the PC.

6.1.6 Starting the configuration software

To start the configuration software, double click "Level Config.exe", the program body of the configuration software, in the configuration software folder.

6.1.7 Closing the configuration software

You can select the following two methods to close the configuration software.

●Select "Exit" in "File" on the menu bar.

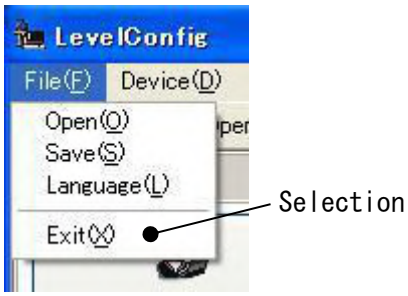


Fig. 6.1.6 Menu bar exit button

● Click the "x" button (close button) in the upper right of the window.

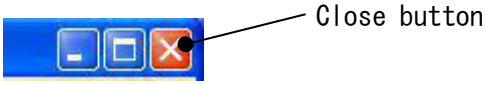


Fig. 6.1.7 Window close button

*** Initial settings file**

If you start the configuration software, an initial settings file "LevelConfig.ini" is automatically created in the configuration software folder at the next time that the program is closed. The basic settings of the configuration software are saved in the initial settings file. To reset the basic settings and return to default values, delete the initial settings file from the configuration software folder.

[Basic settings of the configuration software]

- Window position
- Window size
- Display language operation method (automatic / manual)
- Display language (English / Japanese / a third language)
- Communication protocol
- Communication port number
- Communication device number
- Preamble number
- Instrument type number

6.1.8 Window

The configuration of the basic window is shown below.

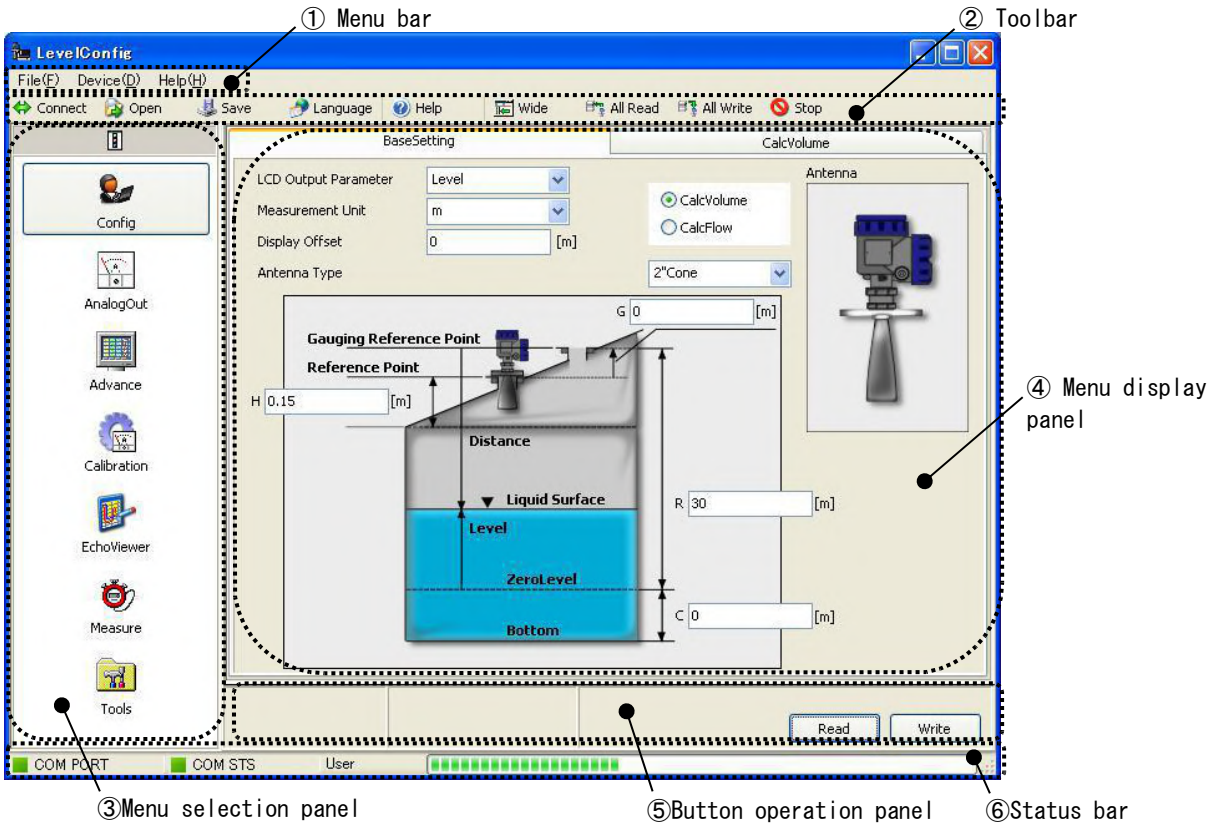


Fig. 6.1.8 Basic window configuration

Name / function of each panel:

① Menu bar
In the Menu bar, you can switch menus and select functions from the pull down menus.

② Toolbar
In the toolbar, you can select functions that are used relatively frequently using button operations.

③ Menu selection panel
In the menu selection panel, you can switch menus using button or tree hierarchy display operations.

④ Menu display panel
In the menu display panel, menus such as those for setting the instrument parameters, monitoring the instrument status, analyzing echoes and measuring are displayed.

⑤ Button operation panel
The area where button operations in each menu are performed.

⑥ Status bar
In the status bar, the status of the connection to the instrument and the communication progress are displayed.

6.1.9 Menus

It is possible to switch menus using the menu bar, menu selection panel (button / tree), or tab operations. The menu structure and the contents of each menu are shown in the following table.

Table 6 1.1 Structure and content of the basic menu

Basic menu

[Menu]	[Tab]	[Content]
Config		Basic settings, volume calculation settings and flow rate calculation settings.
	Base Setting	Reading basic setting parameters from the instrument and writing basic parameters to the instrument.
	Calc Volume	Reading volume calculation parameters from the instrument and writing volume calculation parameters to the instrument.
	Calc Flow	Reading flow rate calculation parameters from the instrument and writing flow rate calculation parameters to the instrument.
Analog Out		Reading analog output parameters from the instrument and writing analog output parameters to the instrument.
Advance		Measurement support settings, outlier removal settings, and measurement value hold settings.
	Measure Support	Reading measurement support parameters from the instrument and writing measurement support parameters to the instrument.
	Outlier Removal	Reading outlier removal parameters from the instrument and writing outlier removal parameters to the instrument.
	Value Hold	Reading measurement value hold parameters from the instrument and writing measurement value hold parameters to the instrument.
Calibration		Analog settings, level settings and checks.
	Analog	Reading analog parameters from the instrument and writing analog parameters to the instrument.
	Level	Reading level parameters from the instrument and writing level parameters to the instrument.
	Check	Loop check and table check.
Echo Viewer		Reading the fixed echo from the instrument, writing the fixed echo to the instrument and general operations of the echo curve.
Measure		Reading the echo list from the instrument, reading the maximum value from the instrument and general operations of measurement.
Tools		Reset and errors.
	Reset	Executing the instrument reset.
	Error	Reading the instrument status.

Table 6 1.2 Structure and content of other menus

Other menus

[Menu]	[Content]
Device Connection	Connecting to the equipment and disconnecting from the equipment.
Language Setting	Setting the display language.
Help	Referencing Help.

6.1.10 Explanation of the menu bar

The menu bar is used to call general functions except option functions. Menu bar items are shown below.

<File menu>
① Reads the saved parameter, echo curve, and other values from a file.
② Saves the current parameter values, and the read echo curve and other values to a file.
③ Use this to set up languages. The language setting menu will open according to click operation.
④ Closes the configuration software.

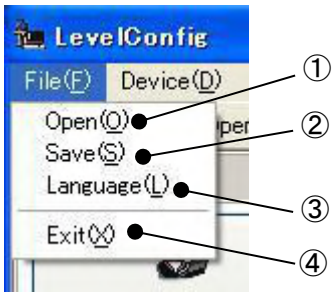


Fig. 6.1.9 Menu bar "File"

<Device menu>
① Use this to connect to the instrument.
The device connections menu will open according to click operation.
② Use this to switch menus.
The configuration menu will open according to click operation.
③ Use this to switch menus.
The analog output menu will open according to click operation.
④ Use this to switch menus.
The advanced settings menu will open according to click operation.
⑤ Use this to switch menus.
The calibration menu will open according to click operation.
⑥ Use this to switch menus.
The Echo Viewer menu will open according to click operation.
⑦ Use this to switch menus.
The measurement menu will open according to click operation.
⑧ Use this to switch menus.
The tool menu will open according to click operation.

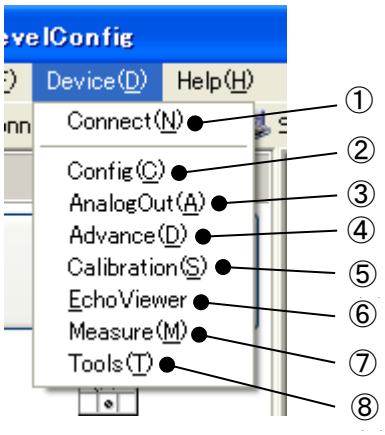


Fig. 6.1.10 Menu bar "Device"

<Help menu>
① Use this to reference Help.
The help menu will open according to click operation.
② Displays the version information of the configuration software.



Fig. 6.1.11 Menu bar "Help"

6.1.11 Explanation of the tool bar

The tool bar is used to call functions that are used relatively infrequently, such as option functions. Tool bar items are shown in the following table.

Table 6 1.3 Toolbar

Connect	-------	Use to connect to the instrument. The device connections menu will open according to click operation.
Open	-------	Reads from a file the saved parameter, echo curve, and other values.
Save	-------	Saves the current parameter values, and the read echo curve and other values to a file.
Language	-------	Use this to set up languages. The language settings menu will open according to click operation.
Help	-------	Use to reference Help. The Help menu will open according to click operation.
Wide	-------	Enlarges the menu display panel and button operation panel areas. The menu selection panel becomes unusable.
Short	-------	Reduces the menu display panel and button operation panel areas. The menu selection panel becomes usable.
All Read	-------	Reads all current parameter values of the instrument.
All Write	-------	Writes all parameter values of the configuration software to the instrument.
Stop	-------	Forcibly stops communication with the instrument.

6.1.12 Explanation of the status bar

The status bar displays the Action status of the configuration software; for example, the status of communication with the instrument. Status bar items are shown below.



Fig. 6.1.12 Status bar

① Communication Port: Displays the status of the communication port. (Normal: Green / Error: Red)
② Communication Status: Displays the status of communication. (Normal: Green / Error: Red)
③ Progress Bar: Displays the processing progress.

6.1.13 Saving settings

This section explains how to save settings.
If you click "Save" in the menu bar or tool bar, the following window is displayed.

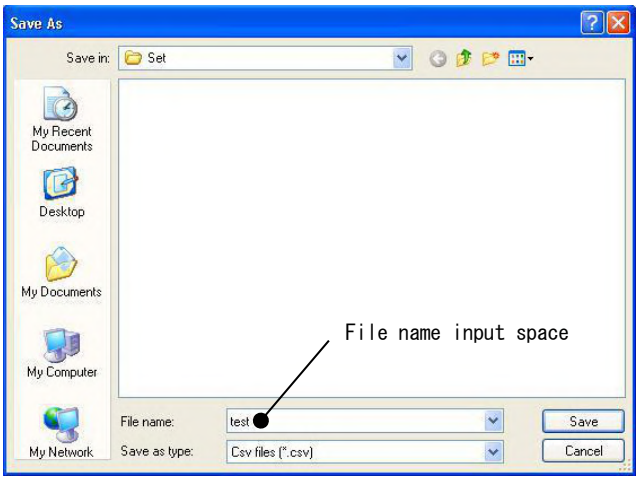


Fig. 6.1.13 File save dialog box

If you click the "Save" button after inputting the file name in “file name input space” , the current parameter values as well as echo curve and other values that were read are saved to a file. The file is saved in .csv format, so it is possible to check it in Microsoft Excel, etc.

6.1.14 Restoring settings

This section explains how to restore settings.
If you click "Open" in the menu bar or tool bar, the following window is displayed.

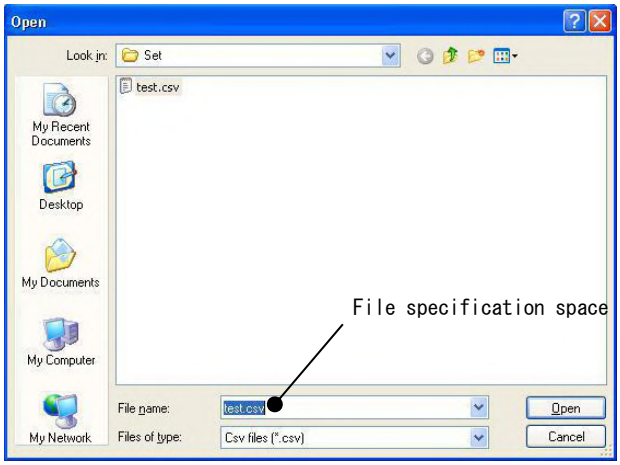


Fig. 6.1.14 File open dialog box

If you click the "Open" button after specifying the file that you would like to restore in “file specification space”, the parameter values and echo curve and other values saved in the specified files are restored.

6.1.15 Language settings

This section explains how to set up display languages.
If you click "Language" in the menu bar or tool bar, the following window is displayed.

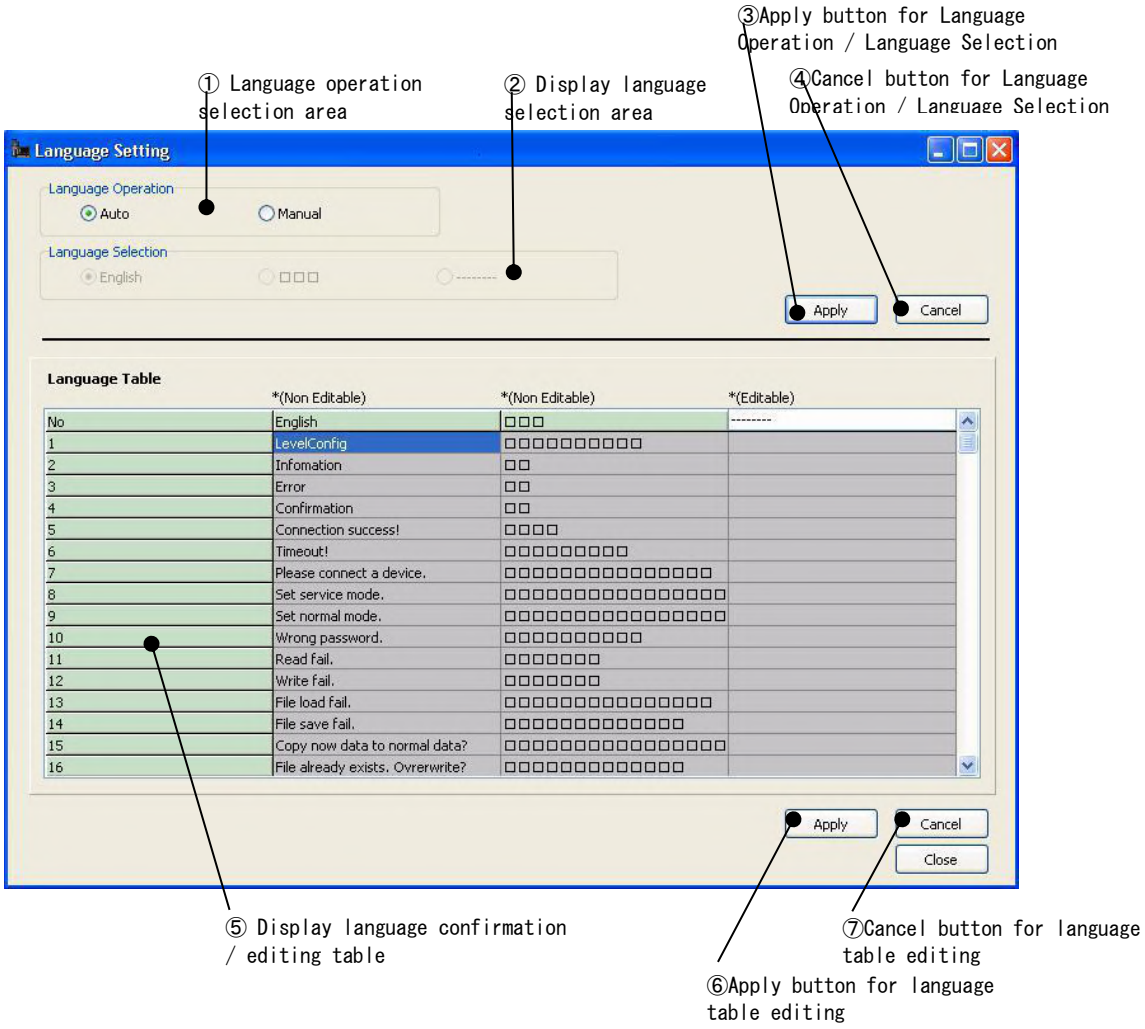


Fig. 6.1.15 Language settings menu

The settings items of the language menu are shown below.
(1) Switching language operations
(2) Switching the display language
(3) Language table settings

Refer to the following page for details on each item.

(1) Switching language operations

The language operation method can be selected to be automatic or manual.

- [Auto] If the default language of the user (PC language setting) is "Japanese," the display language will be Japanese. Otherwise, the display language will be English.
- [Manual] The display language will be the language specified in display language setting area ②.

If you click the "Apply" button ③of Language Operation / Language Selection after selecting the language operation method in language operation selection area ①, the language operation method will be saved internally. The language operation method that was set is also reflected from the next restart. To cancel the settings, click the "Cancel" button ④ for Language Operation / Language Selection. To close the language setting menu after settings are finished, click the "Close" button.

(2) Switching the display language

The display languages that can be selected are English / Japanese / or a third language.

- [English] The display language will be English.
- [Japanese] The display language will be Japanese.
- [Third language] The display language will be a third language set in the language table.

If you click the "Apply" button ③ for Language Operation / Language Selection after selecting the display language in display language selection area ②, the display language will be saved internally and changed set language. To cancel the settings, click the "Cancel" button ④ for Language Operation / Language Selection. To close the language setting menu after settings are finished, click the "Close" button.

(3) Language table settings

Using the language table, [Third language] settings can be performed. (Note that [English] and [Japanese] cannot be set.)

Enter the display language name and display language in the editable space of the display language confirmation / editing table ⑤. The edit space becomes editable by double-clicking it. If you click the "Apply" button ⑥ for language table editing, the settings will be saved internally. The display language that was set is also reflected from the next restart. To cancel the settings, click the "Cancel" button ⑦ for language table editing. To close the language setting menu after settings are finished, click the "Close" button.

6.1.16 Icon / Tree display

The following two display methods are used to display the menu selection panel.

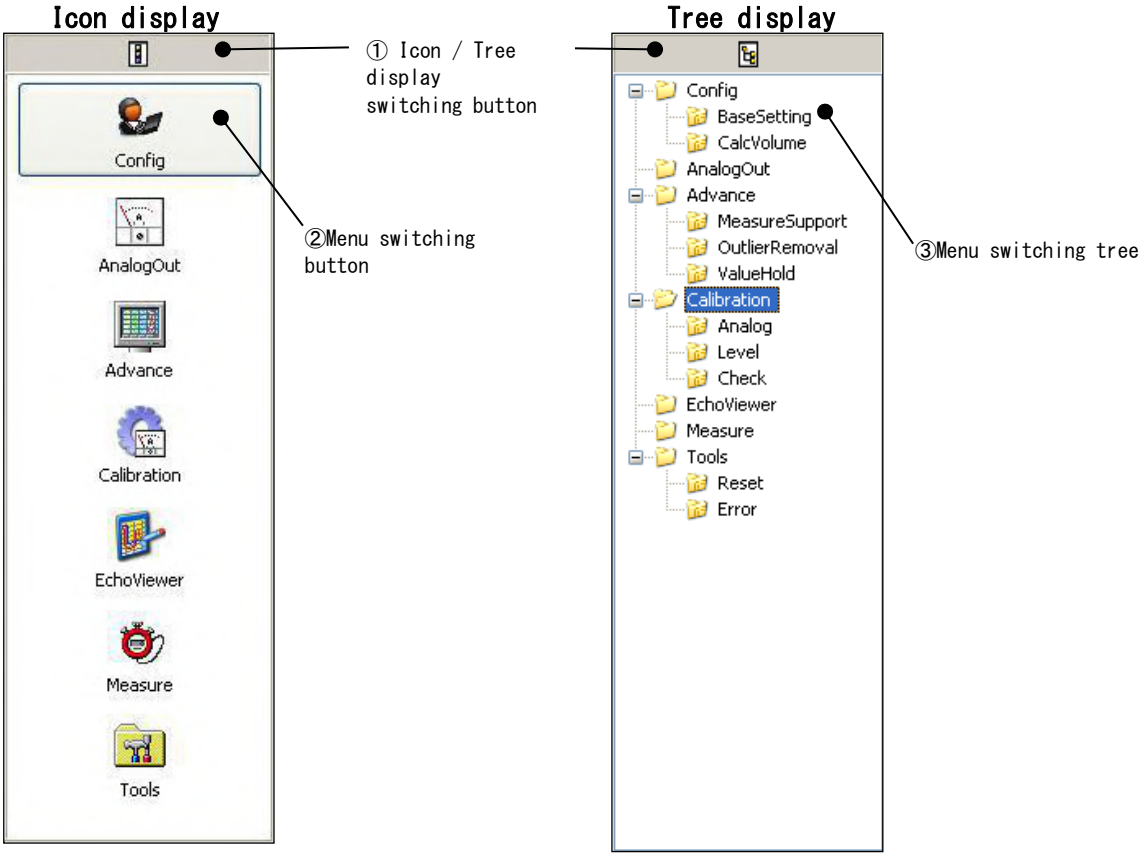


Fig. 6.1.16 Displaying the menu selection panel

It is possible to switch the menu selection panel display by clicking the icon / tree display switching button ①. If the menu selection panel display is icon display, it is possible to switch the menu by using the menu switching button ②. If the menu selection panel display is tree display, it is possible to switch the menu by using the menu switching tree ③.

6.1.17 Enlarging / Reducing the window

It is possible to enlarge or reduce the menu display panel and button operation panel areas by clicking the "Wide" or "Short" buttons on the tool bar. When enlarged, the menu selection panel cannot be used, but the menu can be switched by using the menu bar.

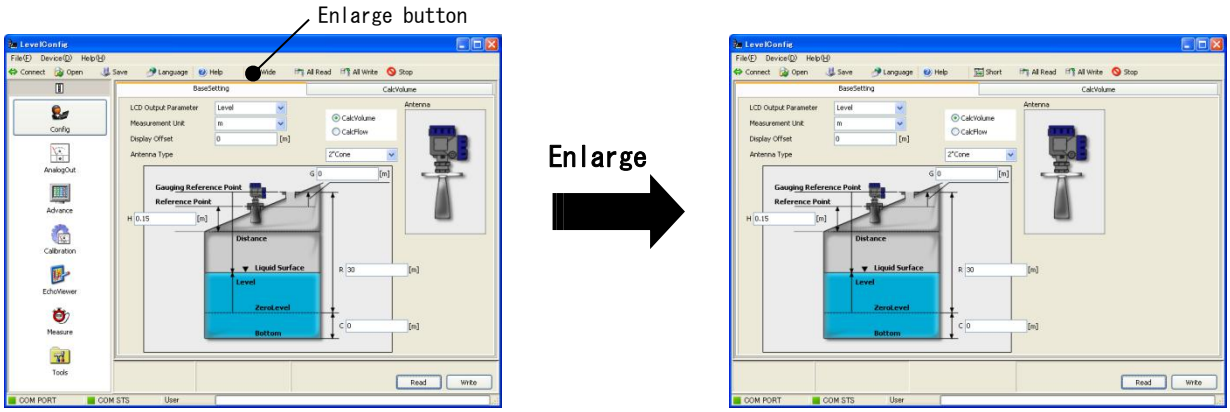


Fig. 6.1.17 Enlarging the menu

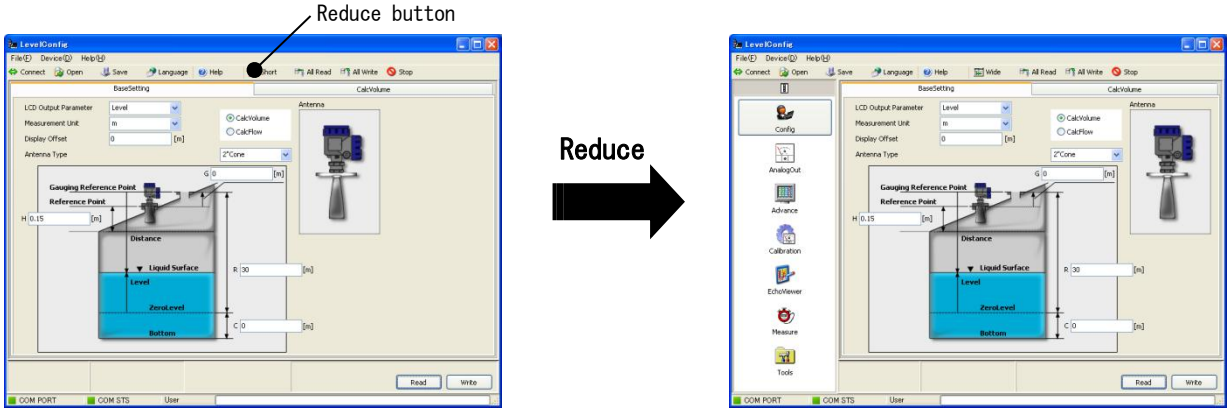


Fig. 6.1.18 Reducing the menu

6.1.18 Read all settings

It is possible to read all of the setting parameters of the instrument together on the configuration software. To start reading all of the parameters, click "All Read" on the tool bar. Then the following window will be displayed, so click "OK" to begin reading all of the parameters.



Fig. 6.1.19 Read all confirmation dialog box

6.1.19 Write all settings

It is possible to write all of the setting parameters of the configuration software together to the instrument. To start writing all of the parameters, click "All Write" on the tool bar. Then the following window will be displayed, so click "OK" to begin writing all of the parameters.



Fig. 6.1.20 Write all confirmation dialog box

6.1.20 Stop communication

If you cause another communication event while communicating with the instrument, the following dialog box will appear.



Fig. 6.1.21 Write all confirmation dialog box

If you want to interrupt current communication while communication with the instrument is occurring, it is possible to forcibly stop communication. To stop communication, click "Stop" on the tool bar.

6.1.21 Referencing help

This section explains how to reference Help.
If you click "Level Config Help" in the menu bar or "Help" in the tool bar, the following window is displayed.

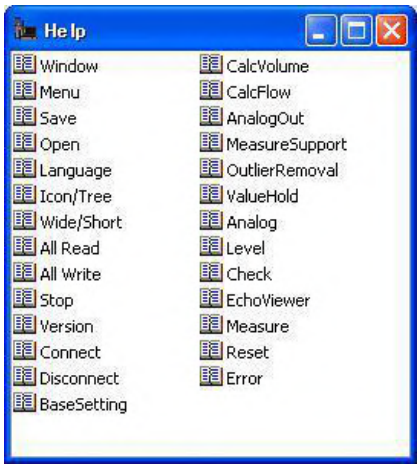


Fig. 6.1.22 Help menu

If you select and double click a keyword to reference in Help from the keywords displayed in the window, pages related to the keyword of the Help file (this manual) will be displayed. Note that if there is no .pdf format Help file (this Manual) in the Manual folder, or if the file is damaged, it will not be displayed correctly.

6.1.22 Checking version information

This section explains how to check version information.
If you click "Level Config Version" in the menu bar, the following window is displayed.

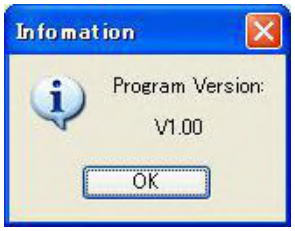


Fig. 6.1.23 Version information

To close the window, click "OK".

6.2 Connecting to the instrument

This section explains how to connect to or disconnect from the instrument.
To connect to or disconnect from the instrument, click "Connect" on the menu bar or tool bar. Then the following window is displayed. (The following window is automatically displayed when the configuration software is initially started.)

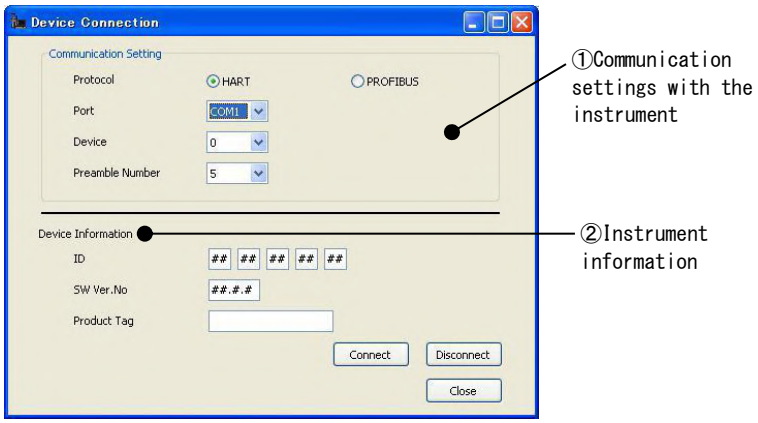


Fig. 6.2.1 Device connection menu

6.2.1 Connection

To connect the configuration software to the instrument, first perform communication settings with the instrument.

- Protocol Select HART or PROFIBUS (Pending)

The instrument of the selected interface must be correctly connected.

- Port Specify the COM port for communication
- Device Specify the device number (0 to 63)
- Preamble Number Specify the preamble number (5 to 20)

After finishing communication settings, click "Connect". The following window is displayed according to the communication status with the instrument.



Fig. 6.2.2 Connection response dialog box

If connection is successful, the instrument information ② of the connection destination is displayed as shown in the following example. If you want to confirm the connection, do so by re-opening the window. If connection failed, confirm the connection pathway.

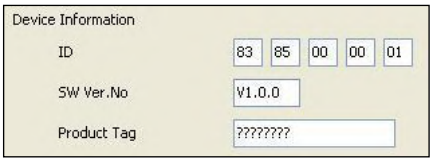


Fig. 6.2.3 Instrument information when connection is successful (example)

6.2.2 Disconnection

To disconnect the configuration software from the instrument, click "Disconnect". After disconnecting, the instrument information is reset.

6.3 Settings

This section explains the functions of the settings menu.
To open the settings menu, click "Config" on the menu bar or menu selection panel.

6.3.1 Basic Settings

On the basic settings menu, it is possible to read / write the basic settings data (parameters) for the instrument. If you click "Base Setting" tab or "Base Setting" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

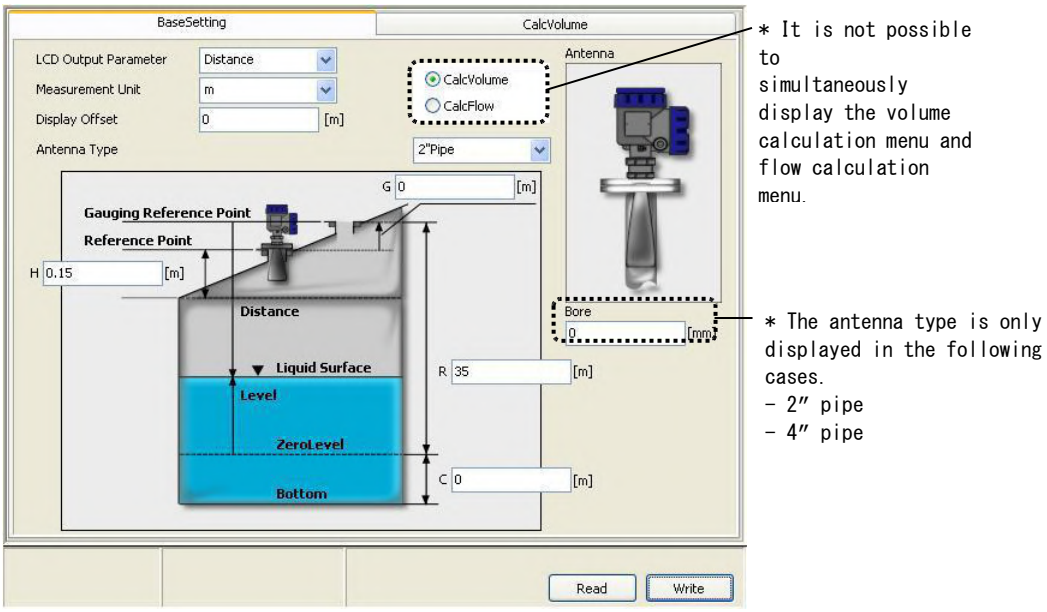


Fig. 6.3.1 Basic settings menu

(1) Reading basic settings data

To read the basic settings data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing basic settings data

To write the basic settings data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Basic Settings data

- LCD Output Parameter Content displayed on the LCD (Level / distance / volume / flow / output current / signal amplitude / internal temperature / maximum volume / maximum flow)
- Measurement Unit Measurement units (m/Ft) *The distance unit in a sentence is indicated as a case of “m” setup.
- Display Offset Offset of level / distance displayed on the LCD (-99999.0m to 99999.0m)
- Antenna Type Antenna type
  ● High Power (use only)
  (2” cone / 4” cone / 2”PTFE Sealing / 4” PTFE Seal ing 1” rod / 2” pipe / 4” pipe)
- Bore Internal diameter of the pipe (valid only when 2” pipe / 4” pipe is selected) (0.0m to 99999.0m)
- G Distance from the reference point to the gauging reference point (-99.999m to 99.999m)
- R Measurement range (0.0m to 99.999m)
- C Measurement range at or below the zero level (0.0m to 99.999m)
- H Dead band (0.0m to 99.999m)

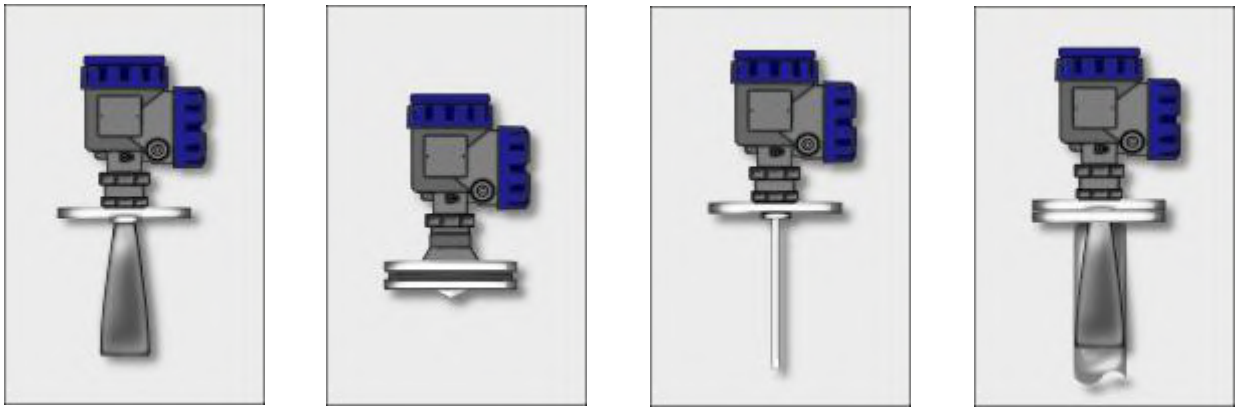


Fig. 6.3.2 Antenna type

6.3.2 Calc Volume

On the calc volume menu, it is possible to read / write volume calculation data (parameters) for the instrument. If you click "Calc Volume" tab or "Calc Volume" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

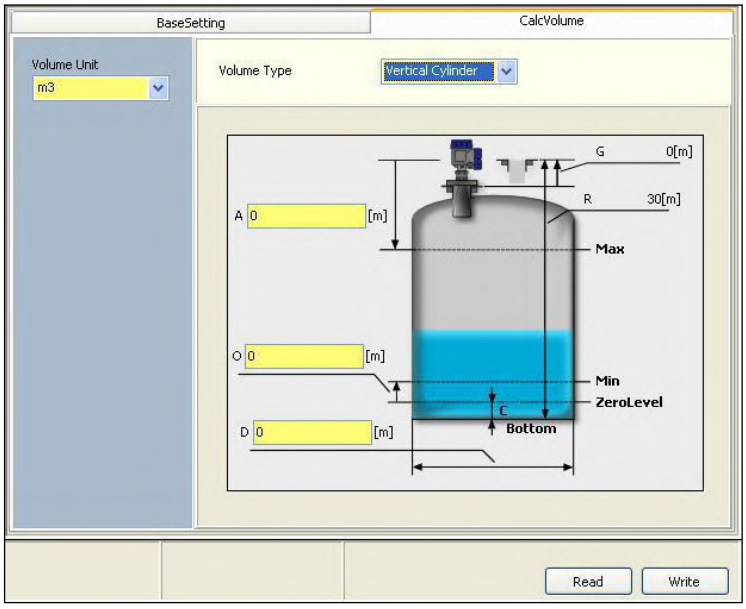


Fig. 6.3.3 Volume calculation menu

(1) Reading volume calculation data

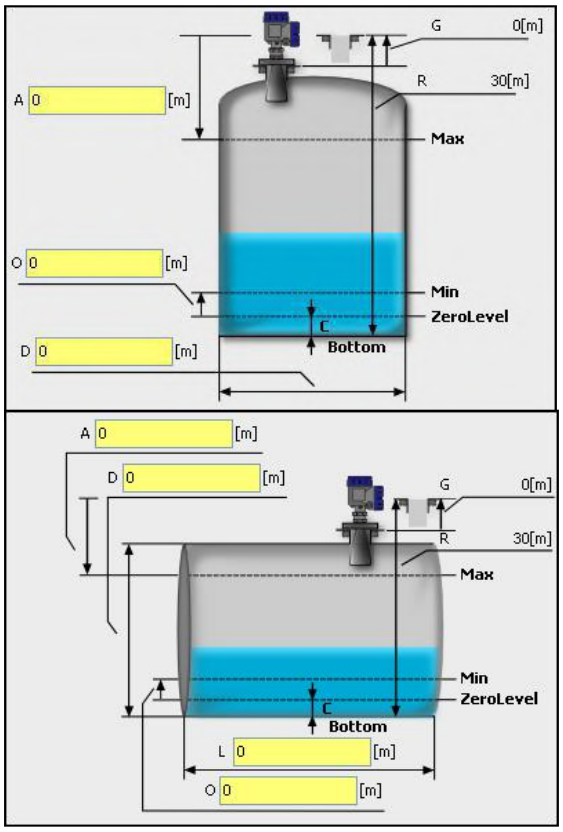
To read the volume calculation data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing volume calculation data

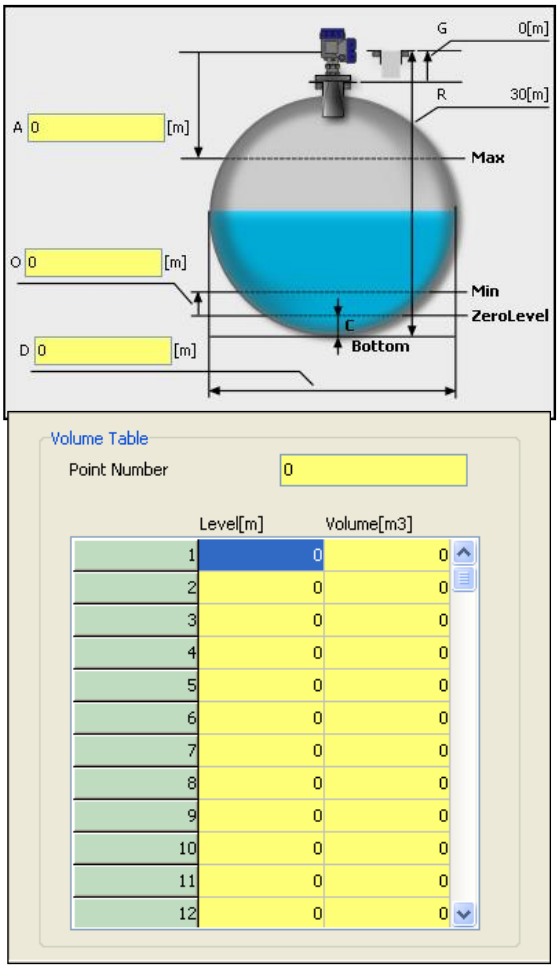
To write the volume calculation data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Calc Volume data

- Volume Type — Tank shape (Unknown / Vertical Cylinder / Spherical / Horizontal Cylinder / User Defined (Volume Table))
- A — Distance to the full level of the measured tank (-99.999m to 99.999m)
- O — Measured tank offset (-99.999m to 99.999m)
- D — Measured tank diameter (0.0m to 99.999m)
- L — Measured tank length (0.0m to 99.999m)
- Point Number — Number of points of volume table (0 to 100)
- Volume Table — Volume table (Level value (-99.999m to 99.999m), volume value (0.0m^3 to 99999.0m^3))
- Volume Unit — Measured volume units (m^3/US Gallons/Barrels/Ft^3) *The volume unit in a sentence is indicated as a case of "m^3" setup.



Horizontal Cylinder



User Defined (Volume Table)

Fig. 6.3.4 Volume Type

6.3.3 Calc Flow

On the calc flow menu, it is possible to read / write flow rate calculation data (parameters) for the instrument. If you click "Calc Flow" tab or "Calc Flow" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

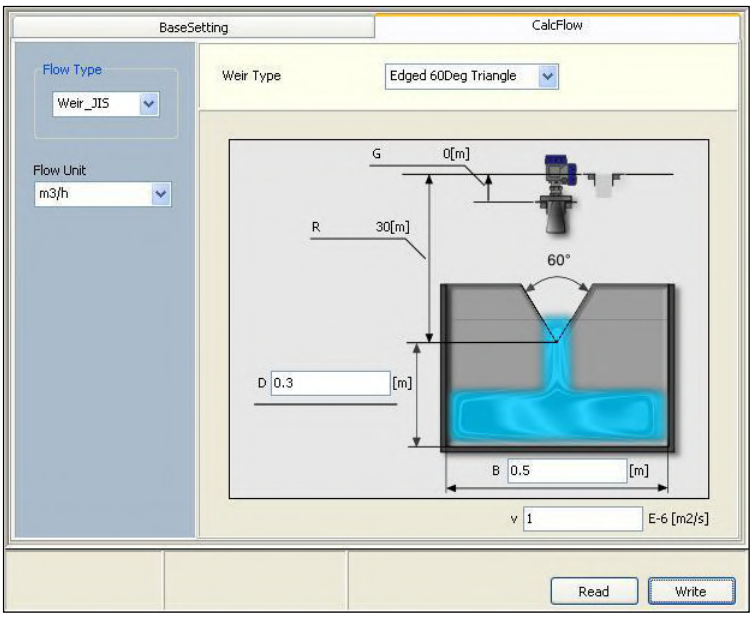


Fig. 6.3.5 Flow rate calculation menu

(1) Reading flow rate calculation data

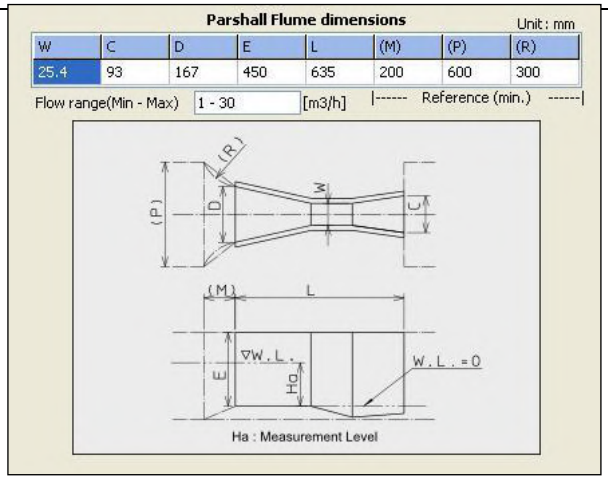
To read the flow rate calculation data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing flow rate calculation data

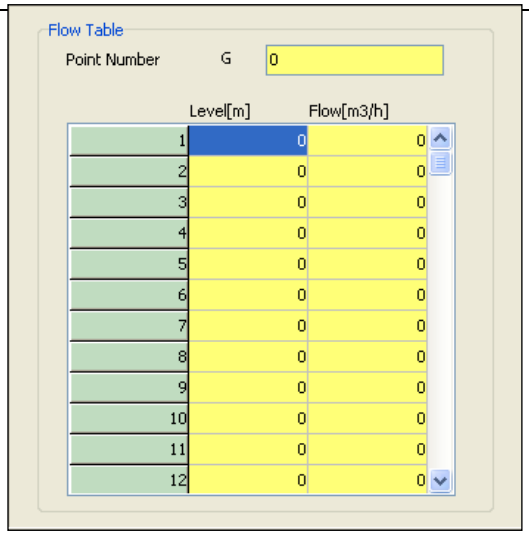
To write the flow rate calculation data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Calc Flow data

- Flow Type Shape of flowmeter
(Unknown / Weir_JIS / Flume_JIS / User Defined (Flow Table))
- Weir Type Weir type
(Edged 60Deg Triangle / Edged 90Deg Triangle / Edged Square / Overall Width)
- B Width of the water path of the measured weir
(0.0m to 99.999m)
- b Width of the measured weir
(0.0m to 99.999m)
- v Kinematic viscosity coefficient of fluid
($0.0\times10^{-6}m^2$/sec to $99.999\times10^{-6}m^2$/sec)
- D Height to the notch of the measured weir
(0.0m to 99.999m)
- Nominal diameter of partial flume
(PF-01/PF-02/PF-03/PF-06/PF-09/PF-10/PF-15/PF-20/PF-30/PF-40/PF-50/PF-60/PF-70/PF-80)
- Point No. Number of points of flow rate table
(0.0 to 100)
- Flow Table Flow rate table
(Level value (-99.999m to 99.999m),
flow rate value ($0.0m^3$ to $99999.0m^3$))
- Flow Unit Measured flow rate unit
(m^3/US Gallons/Barrels/Ft^3 per D, h, min, sec) *The flow rate unit in a sentence is indicated as a case of "m^3/sec" setup.

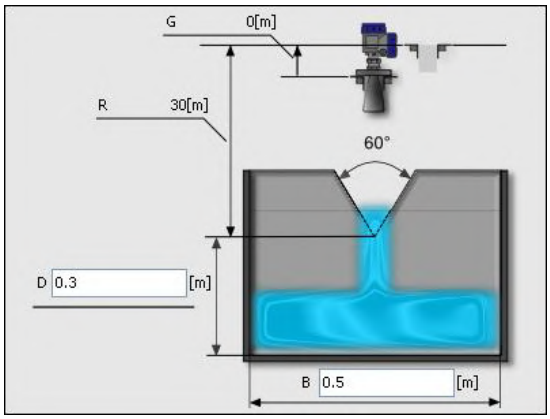


Flume_JIS

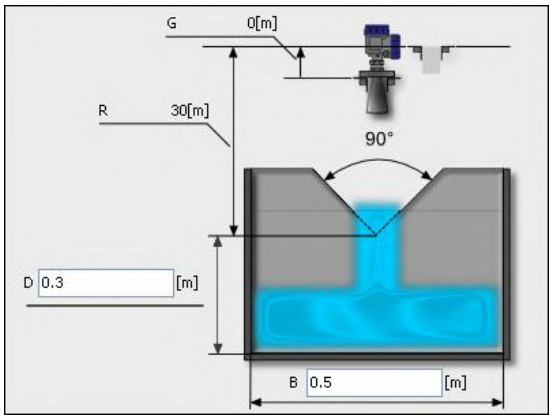


User Defined (Flow Table)

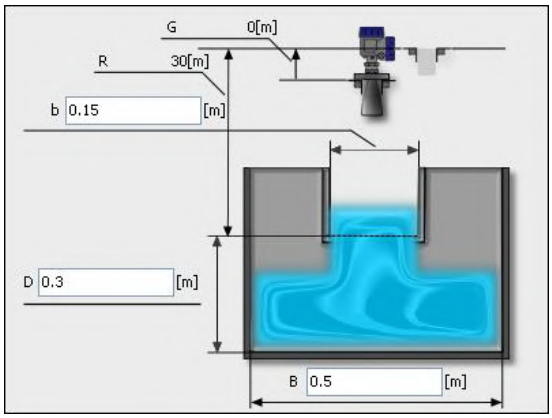
Fig. 6.3.6 Flow Type



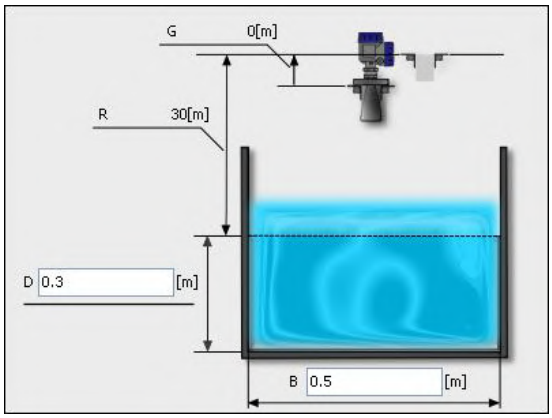
Edged 60Deg Triangle



Edged 90Deg Triangle



Edged Square



Overall Width

Fig. 6.3.7 Weir Type

6.4 Analog Output

This section explains the functions of the analog output menu.
In the analog output menu, it is possible to read / write analog output data (parameters) for the instrument. If you click "Analog Out" in the menu bar or menu selection panel, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

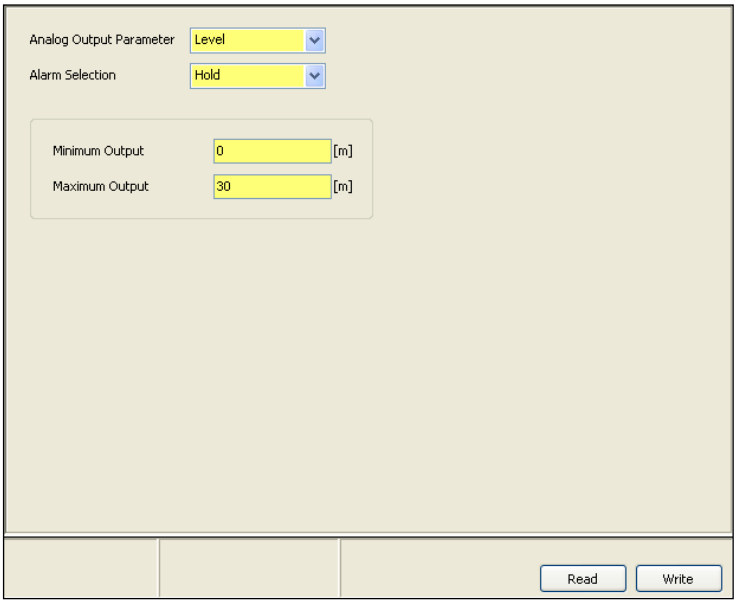


Fig. 6.4.1 Analog output menu

(1) Reading analog output data
To read analog output data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing analog output data
To write analog output data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Analog Output data

- Analog Output Parameter — Content of parameters output at 4-20mA
(Level / Distance / Volume / Flow / Sig-Amp)
- Alarm Selection — Content of alarm output
(High (22.0mA)/Low (3.6mA)/Hold)
- Minimum Output — Setting value of analog output parameter of 4mA
(Level / Distance (-99.999m to 99.999m),
Volume (0.0m3 to 99999.0m^3),
Flow (0.0m3/sec to 99999.0m3/sec),
Sig-Amp (0dB to 200dB))
- Maximum Output — Setting value of analog output parameter of 20mA
(Level / Distance (-99.999m to 99.999m),
Volume (0.0m^3 to 99999.0m3),
Flow (0.0m^3/sec to 99999.0m^3/sec),
Sig-Amp (0dB to 200dB))

6.5 Advanced settings

This section explains the functions of the advanced settings menu.
To open the advanced settings menu, click "Advance" on the menu bar or menu selection panel.

6.5.1 Measure Support

On the measure support menu, it is possible to read / write measure support data (parameters) for the instrument. If you click "Measure Support" tab or "Measure Support" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

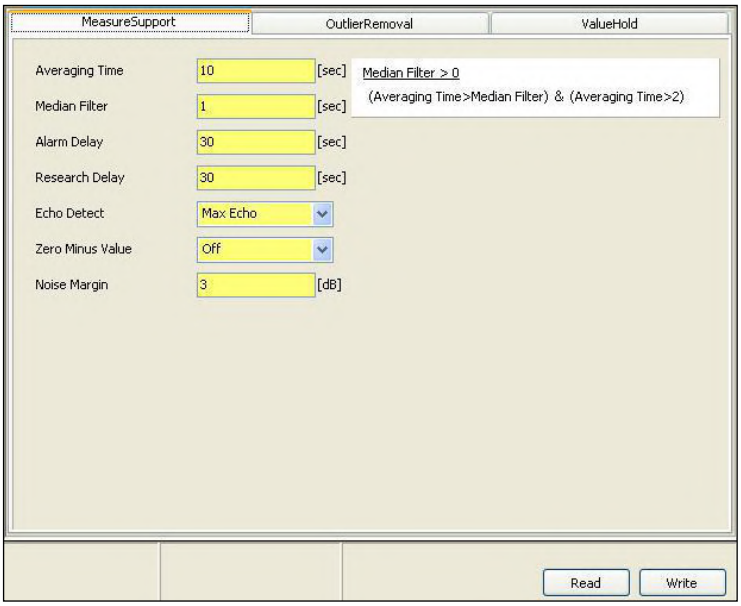


Fig. 6.5.1 Measure support menu

(1) Reading measure support data
To read the measure support data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing measure support data
To write the measure support data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Measure Support data

- Averaging Time — Mean movement time for measurement value (1sec to 120sec)
- Median Filter — Number of excluding deviations in the measurement values within the mean movement time. (0sec to 120sec)
- Alarm Delay — Time until alarm is output after data was missed (1sec to 120sec)
- Research Delay — Time until searching the liquid level echo after data was missed (1sec to 120sec)
- Echo Detect — Echo detected as the liquid level echo (Max Echo / first Echo)

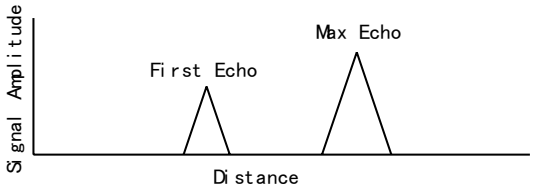


Fig. 6.5.2 Echo Detect

- Zero Minus Value — Function that forcibly sets the negative value of the liquid level to zero (ON/OFF)
- Noise Margin — The amount of the signal level decreased to mask the noise when the noise level is loud (0dB to 255dB)

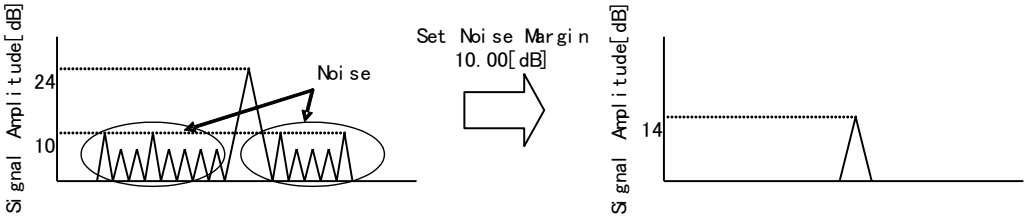


Fig. 6.5.3 Noise Margin

6.5.2 Outlier Removal

On the outlier removal menu, it is possible to read / write outlier removal data (parameters) for the instrument. If you click "Outlier Removal" tab or "Outlier Removal" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white
(0).

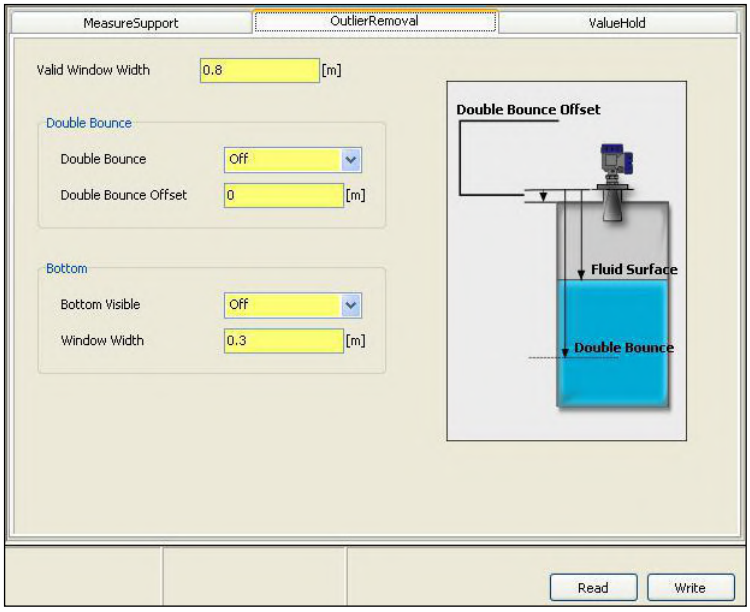


Fig. 6.5.4 Outlier removal menu

(1) Reading outlier removal data

To read outlier removal data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing outlier removal data

To write outlier removal data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Outlier Removal data

- Valid Window Width Window width for determining valid values / outliers with respect to the detected echo

(0.0m to 99.999m)

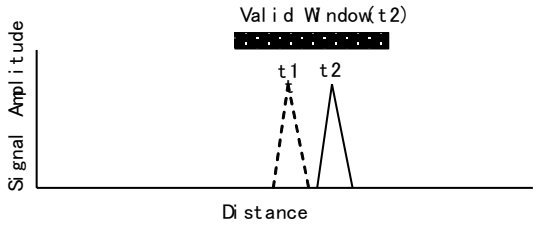


Fig. 6.5.5 Valid window width

- Double Bounce (ON/OFF) Function for removal as an outlier when multiple echoes are detected
- Double Bounce Offset Offset value from the flange surface to the upper surface of the tank (-99.999m to 99.999m)

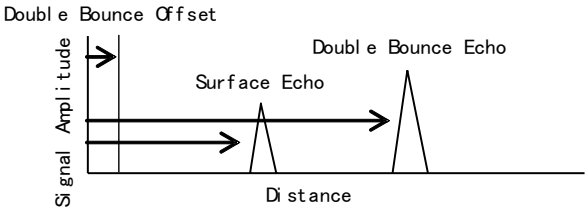


Fig. 6.5.6 Double bounce

- Bottom Visible surface position (ON/OFF) Function for removal as an outlier when the detected echo is in the bottom
- Window Width Bottom surface position width (0.0m to 99.999m)

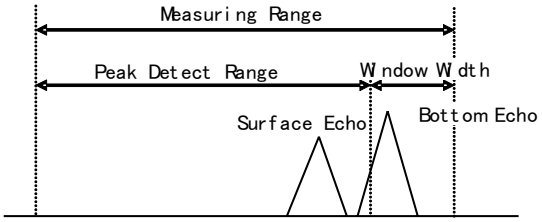


Fig. 6.5.7 Bottom Visible

6.5.3 Value Hold

On the value hold menu, it is possible to read / write measurement value hold data (parameters) for the instrument. If you click "Value Hold" tab or "Value Hold" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

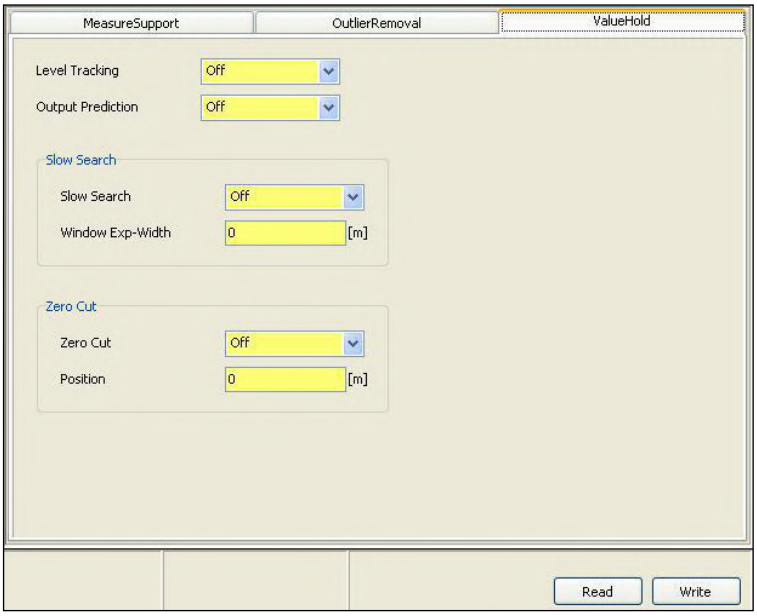


Fig. 6.5.8 Measurement value hold menu

(1) Reading measurement value hold data

To read the measurement value hold data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing measurement value hold data

To write the measurement value hold data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Value Hold data

- Level Tracking Function for moving the valid window from immediately prior liquid level variation if valid echo detection could not be performed
(ON/OFF)

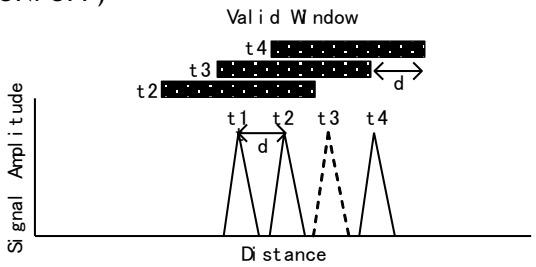


Fig. 6.5.9 Level tracking

- Output Prediction Function that outputs the liquid level predicted from the immediately prior liquid level variation, if valid echo detection could not be performed
(ON/OFF)
- Slow Search Function that enlarges the valid window width, using as reference the position where the immediately prior echo disappeared, if valid echo detection could not be performed
(ON/OFF)
- Window Exp-Width Valid window enlargement width of slow search
(0.0m to 99.999m)

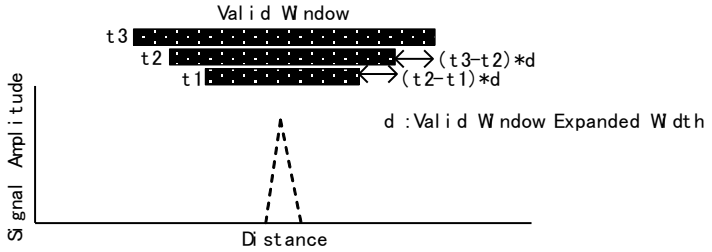


Fig. 6.5.10 Slow search

- Zero Cut Function that considers the liquid level to be zero if the level of the immediately prior liquid surface echo is at or less than the zero cut position, if valid echo detection could not be performed.
(ON/OFF)
- Position Zero cut position
(0.0m to 99.999m)

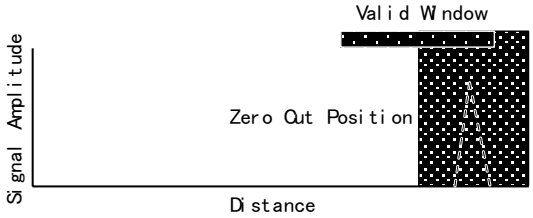


Fig. 6.5.11 Zero cut

6.6 Calibration

This section explains the functions of the calibration menu.
To open the calibration menu, click "Calibration" on the menu bar or menu selection panel.

6.6.1 Analog

In the analog menu, it is possible to read / write analog data (parameters) for the instrument. If you click "Analog" tab or "Analog" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

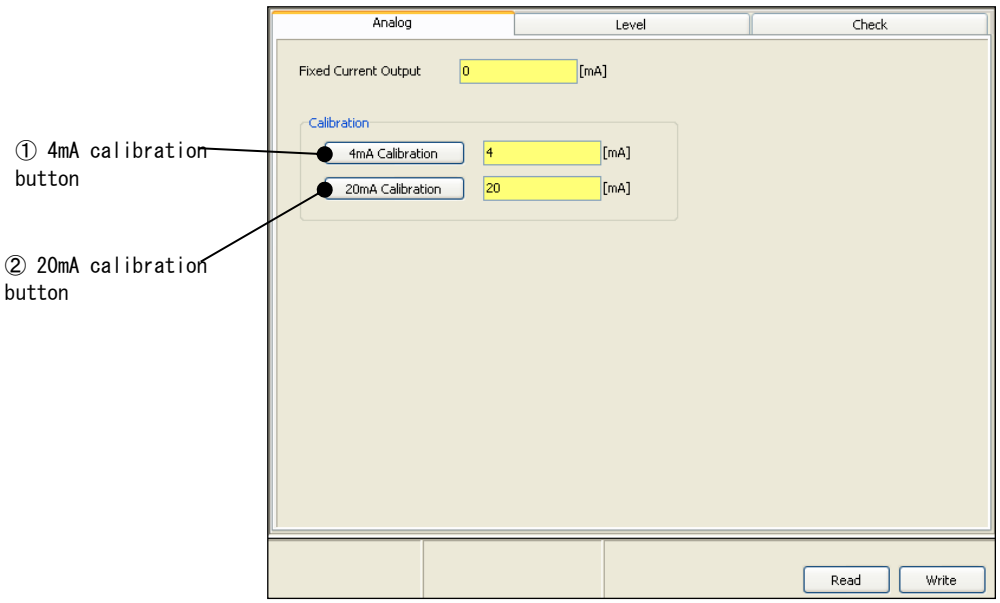


Fig. 6.6.1 Analog menu

(1) Reading analog data
To read the analog data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing analog data
To write the analog data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

(3) 4mA calibration

To perform a 4mA calibration on the instrument, click the "4mA Calibration" button ①. The following window will be displayed, so then click "OK" to output a fixed current of 4mA.



Fig. 6.6.2 4mA calibration confirmation dialog box



Fig. 6.6.3 4mA output

Then the following window will be displayed, so follow the window display to measure the output current. After clicking "OK" once measurement has finished, input the calibration value (present current value) and click the "Write" button to write the calibration value to the instrument.

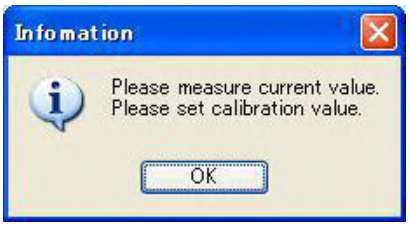


Fig. 6.6.4 Measurement / calibration value setting instructions dialog box

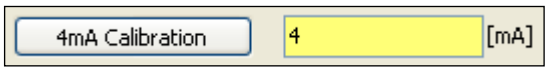


Fig. 6.6.5 Input 4mA calibration value

The 4mA calibration is now finished.

(4) 20mA calibration

To perform a 20mA calibration on the instrument, click the "20mA Calibration" button ②. The following window will be displayed, so then click "OK" to output a fixed current of 20mA.



Fig. 6.6.6 20mA calibration confirmation dialog box



Fig. 6.6.7 20mA output

Then the following window will be displayed, so follow the window display to measure the output current. After clicking "OK" once measurement has finished, input the calibration value (present current value) and click the "Write" button to write the calibration value to the instrument.

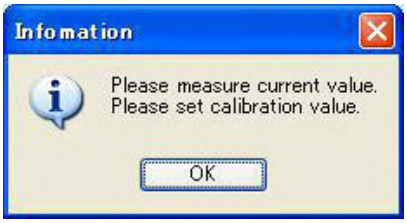


Fig. 6.6.8 Measurement / calibration value setting instructions dialog box

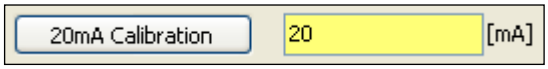


Fig. 6.6.9 Input 20mA calibration value

The 20mA calibration is now finished.

Analog data

- Fixed Current Output Fixed current that is output (ON (3.6mA to 22.0mA)/OFF (0mA))
- 4mA Calibration 4mA calibration value of analog output (3.5mA to 4.5mA)
- 20mA Calibration 20mA calibration value of analog output (15.0mA to 25.0mA)

6.6.2 Level

In the level menu, it is possible to read / write level data (parameters) for the instrument. If you click "Level" tab or "Level" in the tree display, the following window is displayed. Data that does not match the status of the instrument will be displayed with a yellow (0) and data that matches the status of the instrument will be displayed with a white (0).

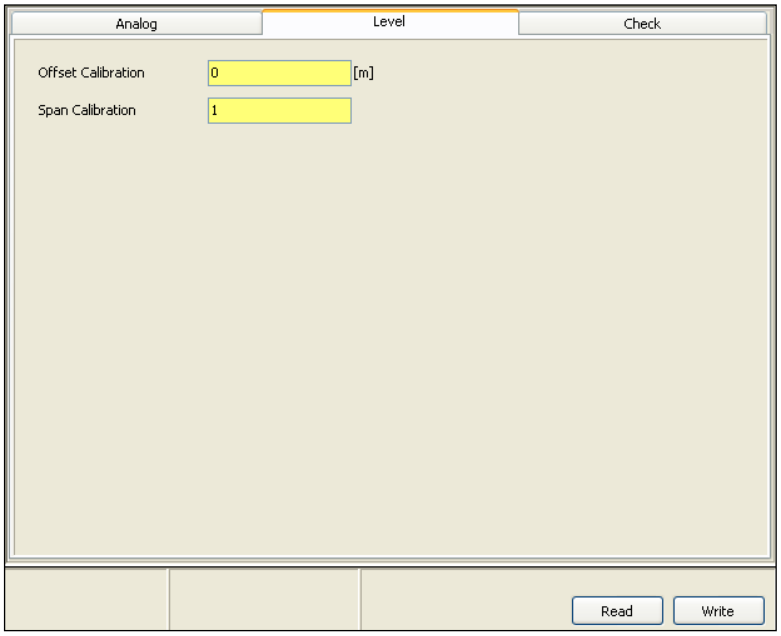


Fig. 6.6.10 Level menu

(1) Reading level data

To read the level data from the instrument, click the "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(2) Writing level data

To write the level data to the instrument, input the data to write and then click the "Write" button. After writing starts, wait momentarily until the processing progress on the status bar stops.

Level data

- Offset Calibration	Zero point adjustment value (-1.0m to 1.0m)
- Span Calibration	Span calibration value (0.5 to 1.5)

6.6.3 Check

In the check menu, it is possible to perform an analog output loop check and an output check after setting the volume / flow table. If you click "Check" tab or "Check" in the tree display, the following window is displayed.

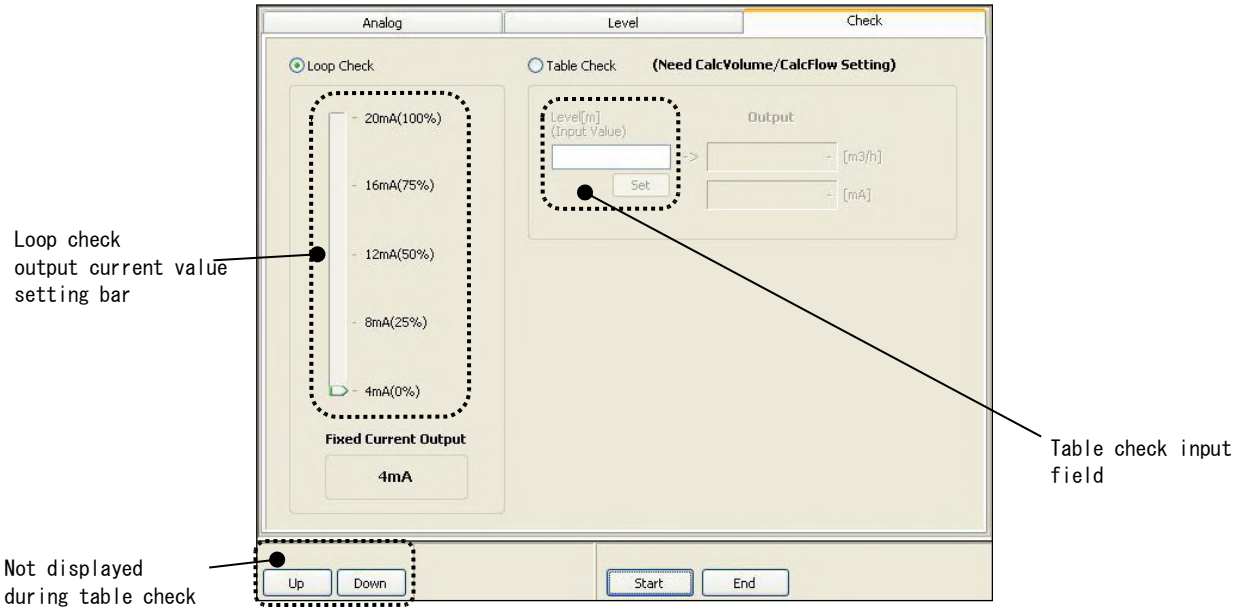


Fig. 6.6.11 Check menu

* NOTE: That to perform a table check, you must have set the volume calculation or flow rate calculation in advance.

(1) Loop Check

To perform a loop check, select loop check ( ) and then use the "Up" and "Down" buttons to select the output current value.

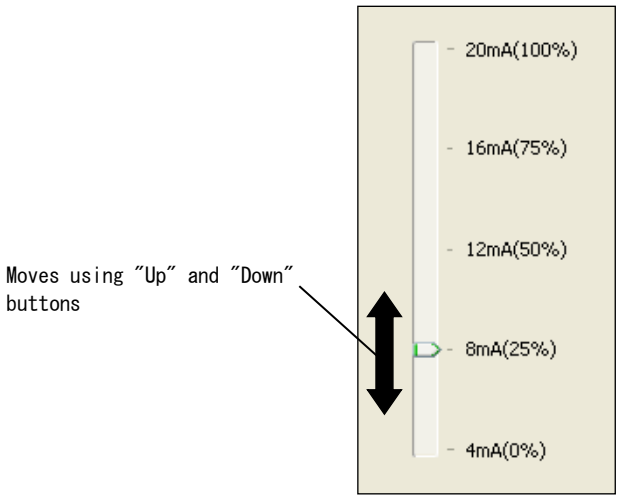


Fig. 6.6.12 Output current value setting bar

Then, if you click the "Start" button, the following window will be displayed, so click "OK", and loop check will begin.



Fig. 6.6.13 Fixed current output confirmation dialog box

Then the following window will be displayed, so follow the window display to measure the output current. When measurement has finished, click "OK".

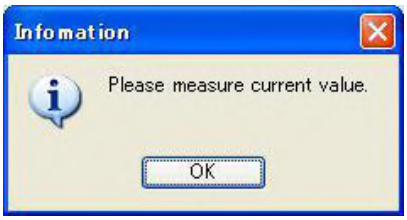


Fig. 6.6.14 Current value measurement instructions dialog box

It is then possible to repeat the next current value measurement in a similar manner by using the "Up" and "Down" buttons. To finish loop check, click the "End" button. The current output value after loop check has finished returns to the measurement value.

(2) Table Check

To perform a table check, select table check ( ) and then click the "Start" button. Then the following window will be displayed, so click "OK" to transition to table check mode, and table check will begin.



Fig. 6.6.15 Table check start confirmation dialog box

Next, input level values and click the "Set" button in the table check input area. The following window will be displayed, so follow the window display to measure the output current. When measurement has finished, click "OK".

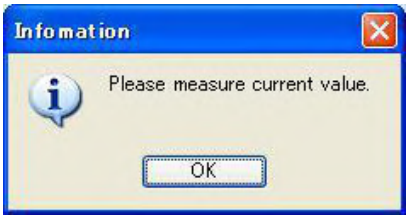


Fig. 6.6.16 Current value measurement instructions dialog box

The following output results are displayed.

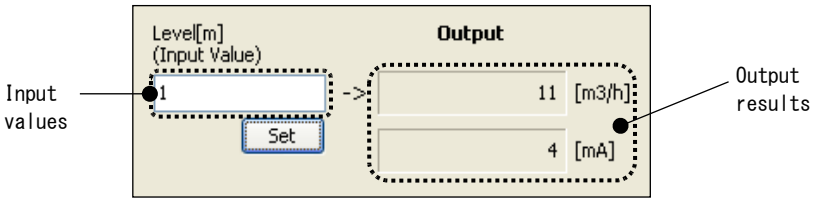


Fig. 6.6.17 Table check output results

It is possible to repeatedly check the table by performing similar operations in table check mode. To finish table check, click the "End" button. After table check is finished, the following window is displayed, so click "OK".

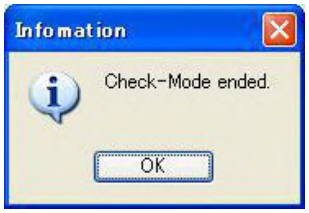


Fig. 6.6.18 Table check finish confirmation dialog box

6.7 Echo Viewer

This section explains the functions of the Echo Viewer menu.
In the Echo Viewer menu, it is possible to read fixed disturbance echo data (parameters) from the instrument and write such data to the instrument. In the Echo Viewer, it is also possible to display and analyze signal amplitude within the measurement range. If you click "Echo Viewer" in the menu bar or menu selection panel, the following window is displayed. When data does not match the status of the instrument, the fixed disturbance echo value display area will be displayed with a yellow (0). And when data matches the status of the instrument, the fixed disturbance echo value display area will be displayed with a white (0).

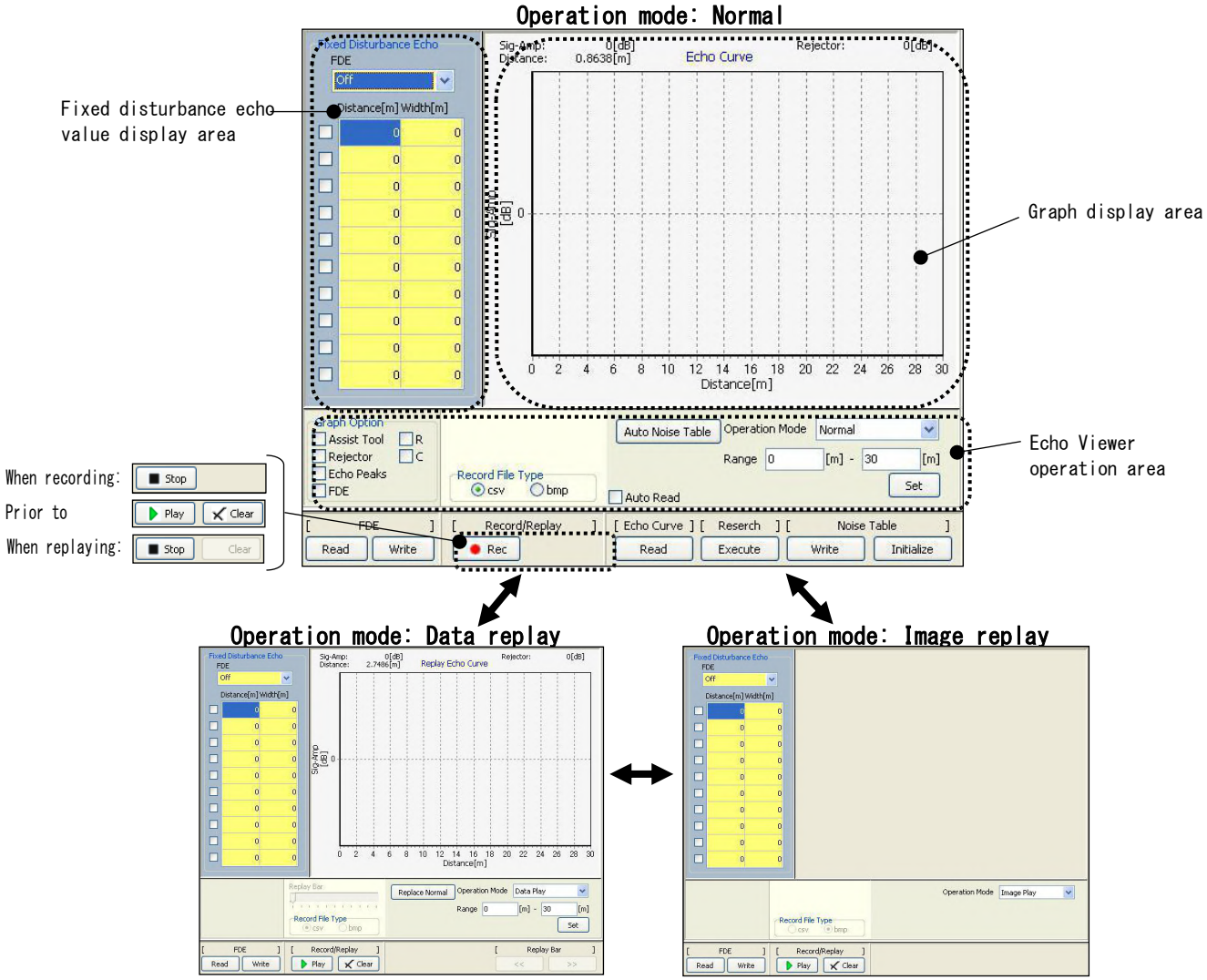


Fig. 6.7.1 Echo Viewer Menu

(1) Display range settings

To set the display range, input the range and click the "Set" button in the Echo Viewer operation area. The echo curve data is read from the instrument in the set range and displayed in the graph.

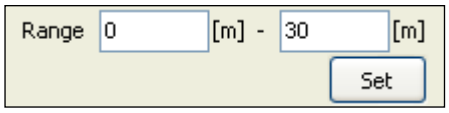


Fig. 6.7.2 Display range settings

(2) Reading echo curve data

To read echo curve data, click [Echo Curve] --> "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops. If the echo curve data is read normally, The Echo Curve similar to that in the following window (example) and the Noise Table that was simultaneously read will be displayed in the graph. At this time, if you set the Echo Peaks display in Graph Option in the Echo Viewer operation area to ON (Echo Peaks), the Echo List that was simultaneously read will be superimposed on the graph. If you want to continuously read echo curve data, once echo curve data begins to be read in a state of setting Auto Read in the Echo Viewer operation area to ON (Auto Read), the echo curve data will be continuously read during the period that Auto Read is ON. If you want to stop Auto Read, set it to OFF (Auto Read). After final reading is complete, Auto Read will stop. If you want to display range of R in the graph, set the R display in Graph Option in the Echo Viewer operation area to ON (R), Also, If you want to display range of C in the graph, set the C display in Graph Option in the Echo Viewer operation area to ON (C),

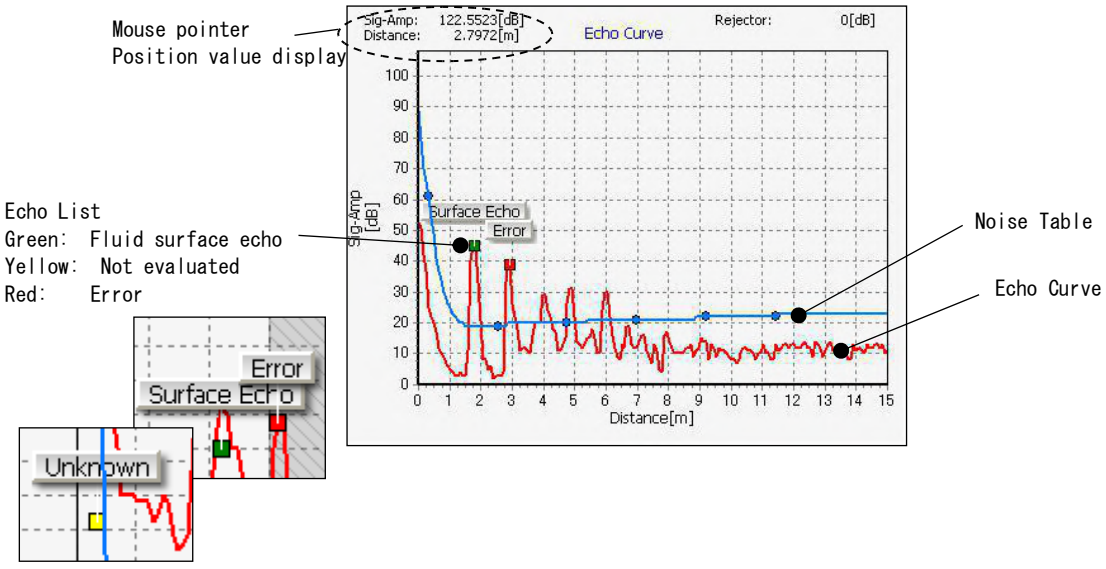


Fig. 6.7.3 Echo curve graph

It is possible to change the display range of the graph by right clicking on the graph and then dragging. Also, it is possible to perform Zoom Up and Zoom Reset by dragging downward to the bottom right on the graph and by dragging upward to the left on the graph, respectively.

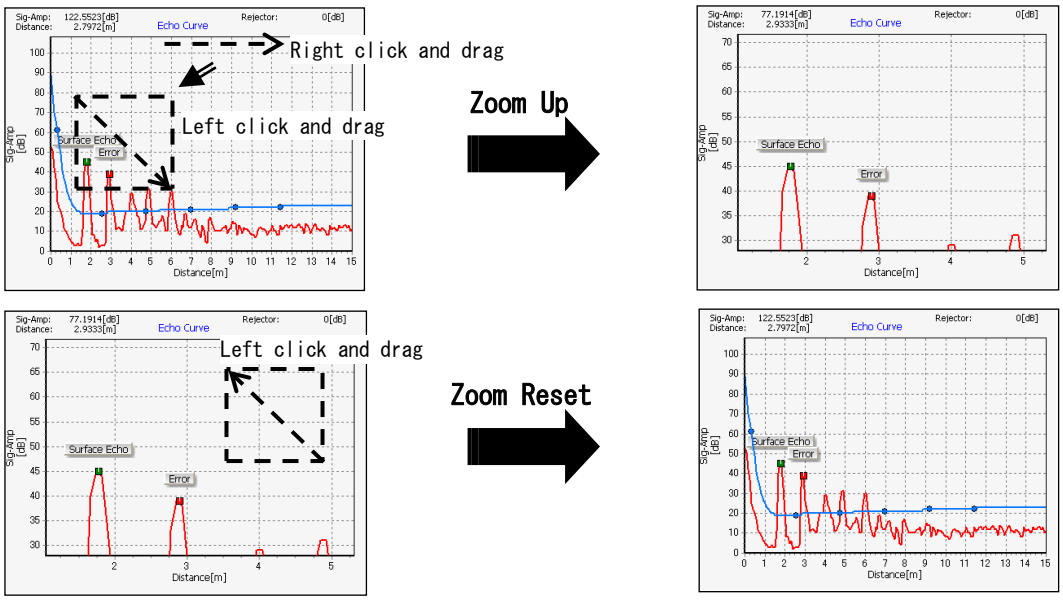


Fig. 6.7.4 Graph Zoom Up and Zoom Reset

(3) Noise table operations

It is possible to edit the read noise table on the graph. There are 6 editing methods, which are as follows:

- Directly editing the noise table points
- Reverting the edited noise table to its state prior to editing
- Using the Assist Tool to gather together a two-point interval of noise table points to make a linear plot
- Using the rejector to set the minimum value of the noise table
- Automatically setting the noise table in the echo curve data
- Initializing the noise table

(3-1) Directly editing the noise table points

The mouse can be used to directly specify noise table points on the graph to edit. Use the mouse to directly click the noise table point to edit and then simply drag it upward or downward to change the value. The edited noise table will be displayed in the update color.

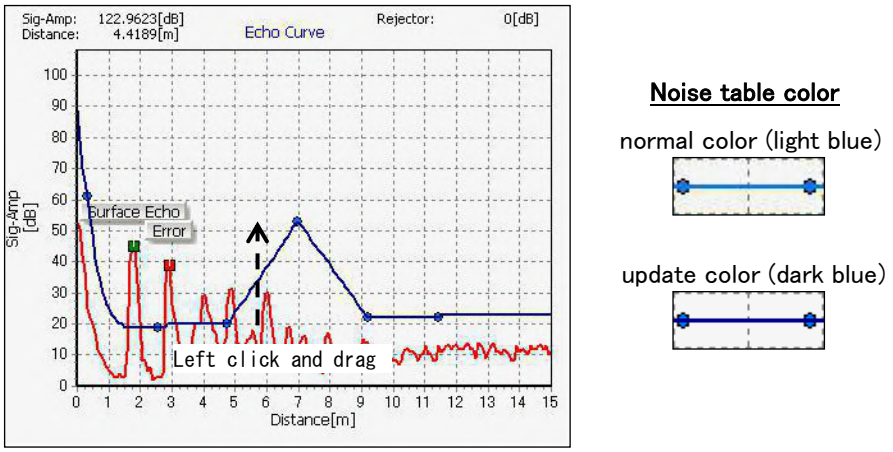


Fig. 6.7.5 Direct editing of the noise table points

To write the noise table to the instrument, click [Noise Table] --> "Write" button. The updated points are written to the instrument.

(3-2) Reverting the edited noise table to its state prior to editing

If you want to revert an edited noise table to its state prior to editing, it is possible to return it to its state immediately after it was read from the instrument by double clicking on the graph. At this time, you can check that the noise table has returned to its previous state, because the display color of the noise table will have changed from the update color to the normal color.

(3-3) Using the Assist Tool to gather together a two-point interval of noise table points to make a linear plot

It is possible to use the Assist Tool to gather together a two-point interval of noise table points to make a linear plot. To operate the Assist Tool, set the Assist Tool display in Graph Option on the Echo Viewer operation area to ON (☑ Assist Tool). Use the mouse to directly click on the displayed Assist Tool, and simply drag left and right to match the reference point. Next, use the mouse to directly click the edit point and simply drag up and down. This will make the interval between the reference point and edit point linear, and all of the point values in that range will change. The Assist Tool will move in the distance direction in agreement with the noise table points. The edited noise table will be displayed in the update color.

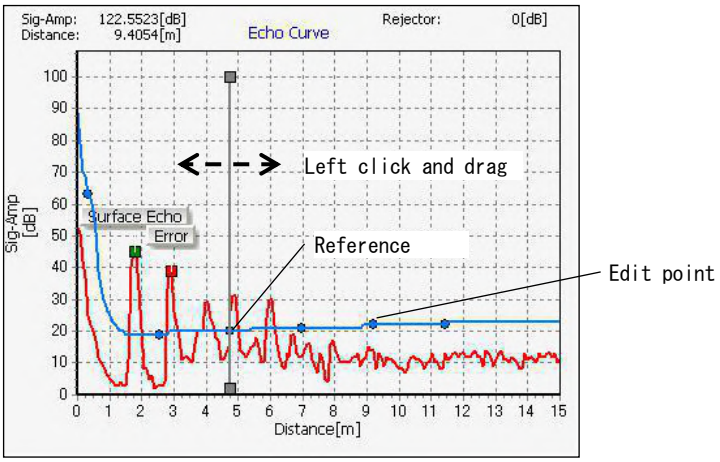


Fig. 6.7.6 Setting the reference point using the Assist Tool

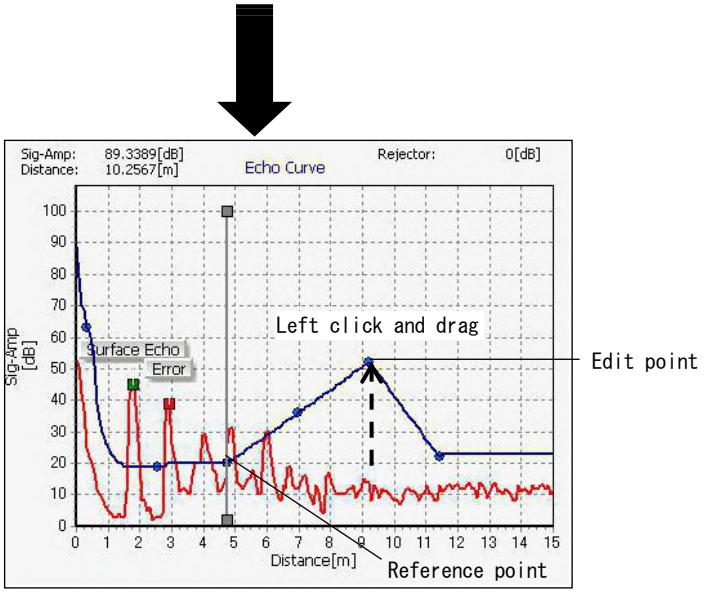


Fig. 6.7.7 Making the interval between the reference point and edit point linear by using the Assist Tool

To write the noise table to the instrument, click [Noise Table] --> "Write" button. The updated points are written to the instrument.

(3-4) Using the rejector to set the minimum value of the noise table.

The minimum value of the noise table can be set by using the rejector. To operate the Rejector, set the Rejector display in Graph Option on the Echo Viewer operation area to ON (Rejector). Use the mouse to directly click the displayed rejector, and then simply drag it upward or downward to change the value. When the rejector is applied to the noise table, the noise table will be considered edited and will be displayed in the update color.

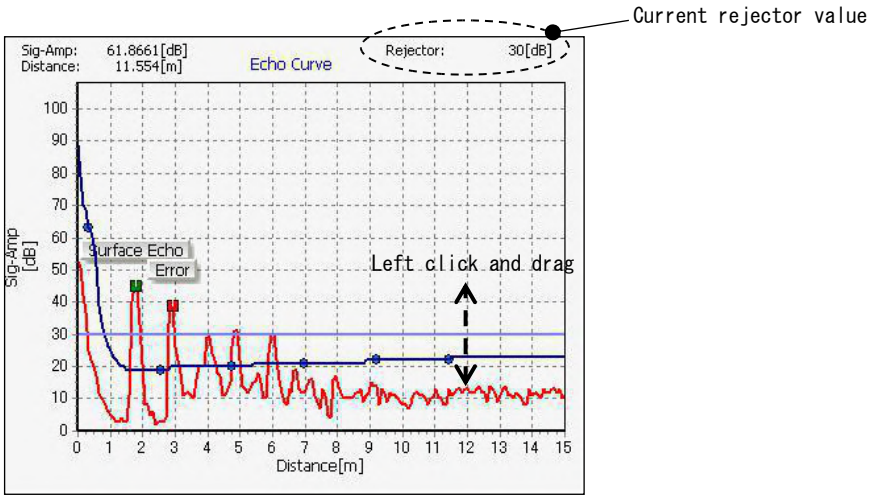


Fig. 6.7.8 Setting the minimum value of the noise table using the Rejector

To write the noise table to the instrument, click [Noise Table] --> "Write" button. The updated points are written to the instrument. If the noise table point values are smaller than the rejector values, rejector values are written.

(3-5) Automatically setting the noise table in the echo curve data

The noise table can be automatically set in the echo curve data. If you click the "Auto Noise Table" button in the Echo Viewer operation area, the following window is displayed.

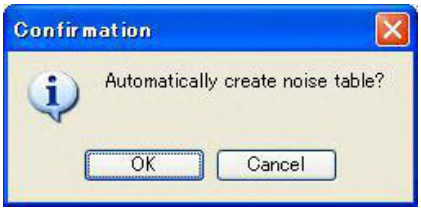


Fig. 6.7.9 Noise table automatic creation confirmation dialog box

If you click "OK", the noise table will be automatically set in the echo curve data that is displayed. When the Noise Table cover the surface echo, adjust again so that the Noise Table do not cover the surface echo.

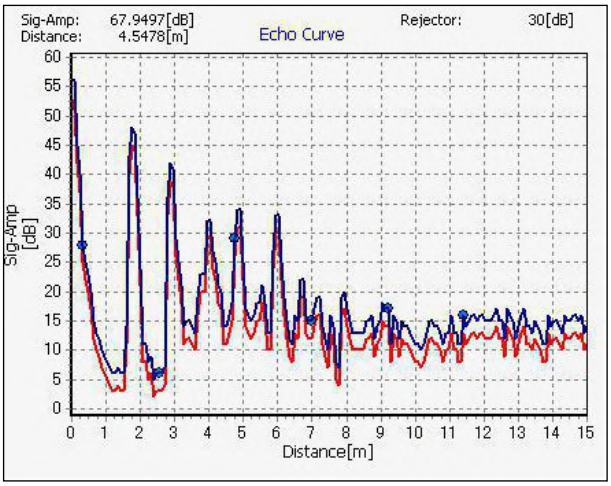


Fig. 6.7.10 Noise table automatic creation

To write the noise table to the instrument, click [Noise Table] --> "Write" button. All points are written to the instrument.

(3-6) Initializing the noise table

To initialize the noise table, click [Noise Table] --> "Initialize" button. The following window will be displayed, so then click "OK" to initialize the noise table.

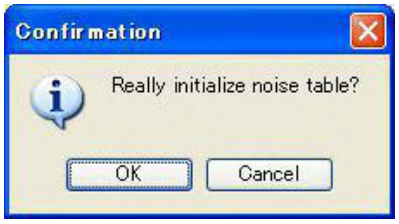


Fig. 6.7.11 Noise table initialization confirmation dialog box

(4) Reading fixed disturbance echo data

To read the fixed disturbance echo data from the instrument, click [FDE] --> "Read" button. After reading starts, wait momentarily until the processing progress on the status bar stops.

(5) Writing fixed disturbance echo data

To write the fixed disturbance echo data to the instrument, input the data to write and then click [FDE] --> "Write" button. After starting writing, wait momentarily until the processing progress on the status bar stops. When writing, only the valid data (☑ data marked with a check) in the fixed disturbance echo value display area will be written. Be aware that invalid data (☐ data that is not marked with a check) will not be written.

(6) Displaying fixed disturbance echo data

To display fixed disturbance echo data, set the FDE display in Graph Option on the Echo Viewer operation area to ON (☑ FDE). If the FDE parameter is ON, the fixed disturbance echo data is superimposed on the graph as shown in the following window (example). Valid data (☑ data marked with a check) and invalid data (☐ data that is not marked with a check) are displayed in black and red, respectively.

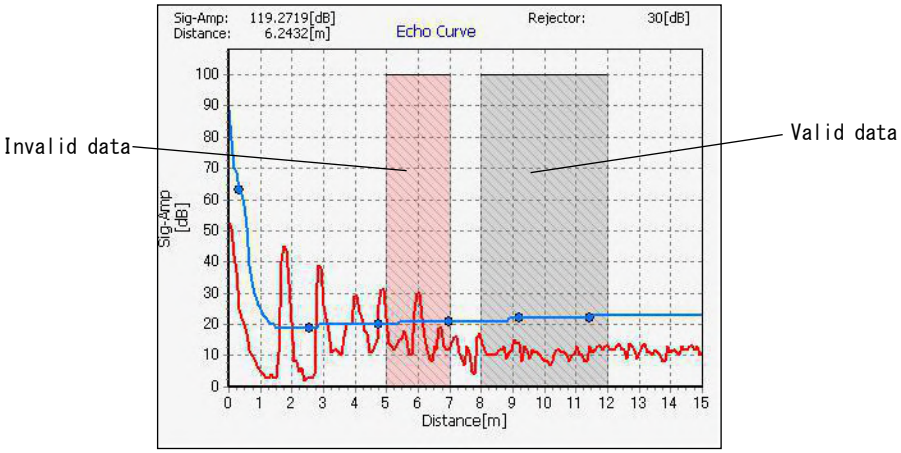


Fig. 6.7.12 Displaying fixed disturbance echo data

(7) Executing research

To start instrument research, click [Research] --> "Execute" button. Then the following window will be displayed, so then click "OK" to start research.

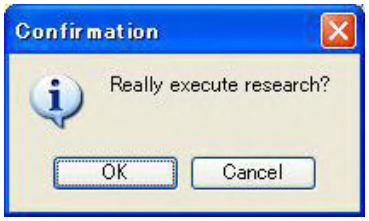


Fig. 6.7.13 Research execution confirmation dialog box

(8) Recording echo curve data

The read echo curve data can be internally recorded. There are two record formats, which are as follows:

- csv format (comma separated)
- bmp format (bit map image)

Before starting to record, first select the record format from the Record File Type in the Echo Viewer operation area.



Fig. 6.7.14 Selecting a record format

(8-1) Recording echo curve data in csv format

To record echo curve data in csv format, select "csv" () from the Record File Type in the Echo Viewer operation area. To start recording, first click the "Rec" button, and then specify the record file. The following window is displayed, so after inputting the file name in the file name input field, click the "Save" button.

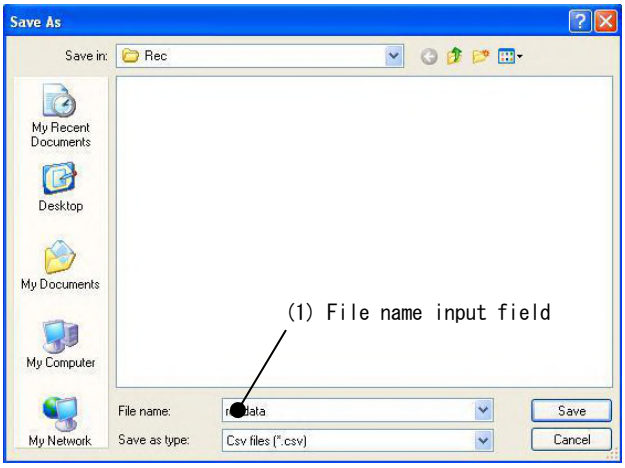


Fig. 6.7.15 File save dialog box

After specifying the record file, start csv recording of the echo curve data. The echo curve data that is then read is internally recorded to the specified file. To finish recording, click the "Stop" button. Then the following window will be displayed, so then click "OK" to finish recording.

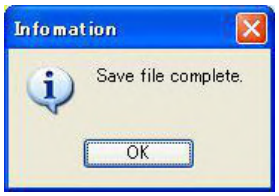


Fig. 6.7.16 Echo curve data recording complete confirmation dialog box

(8-2) Recording echo curve data in bmp format

To record echo curve data in bmp format, select "bmp" (bmp) from the Record File Type in the Echo Viewer operation area. To start recording, first click the "Rec" button, and then specify the record file. The following window is displayed, so after inputting the file name in the file name input field, click the "Save" button.

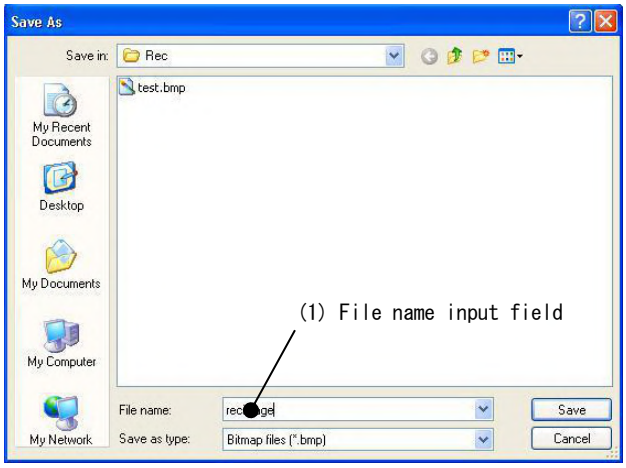


Fig. 6.7.17 File save dialog box

After specifying the record file, start bmp recording of the echo curve data. Then the following window will be displayed, so then click "OK" to finish recording.

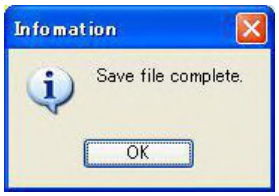


Fig. 6.7.18 Echo curve data recording complete confirmation dialog box

(9) Replaying echo curve data

The internally recorded echo curve data can be replayed. There are two replay methods, which are as follows:

- Data replay (replays record file in csv format)
- Image replay (replays record file in bmp format)

(9-1) Replaying data

To replay data, switch the operation mode in the Echo Viewer operation area to "Data Replay". To start replaying, first click the "Play" button, and then specify the replay file. The following window is displayed, so after specifying the file that you want to replay in the file specification field, click the "Open" button.

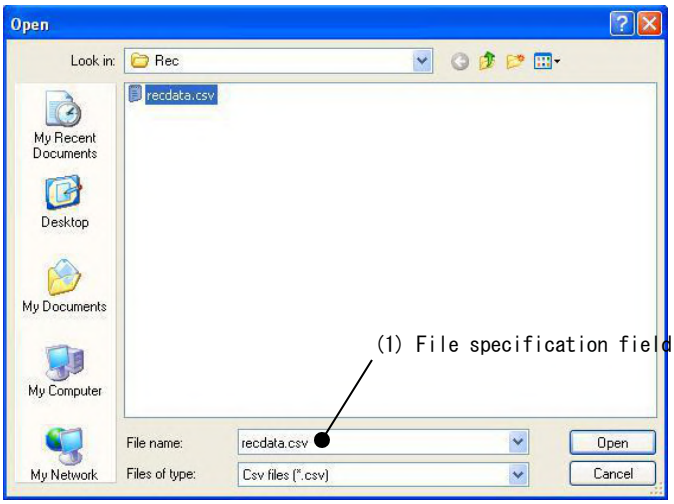


Fig. 6.7.19 File open dialog box

After specifying the replay file, the replay data will be expanded internally. Use the mouse to directly click on the slider of the replay bar, and by simply dragging left and right or clicking [Replay Bar] --> "<<" and ">>" buttons, the graph display of the replay data can be switched. The display range during replay can be set and Zoom Up and Zoom Reset operations on the graph can be performed, as is the case in normal mode. To finish replaying, click the "Stop" button. If you want to clear the displayed graph, click the "Clear" button.

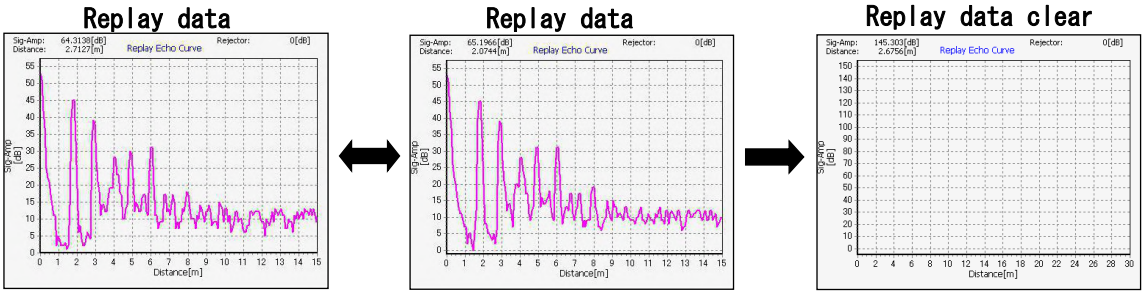


Fig. 6.7.20 Replaying echo curve data

- Normal data conversion

In the data replay function, replay data that is displayed in the graph during data replay can be copied to normal data. To copy replay data to normal data, click the "Replace Normal" button in the Echo Viewer operation area while the replay data is displayed on the graph. Then the following window will be displayed, so click "OK".

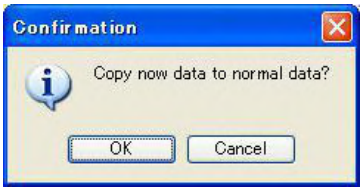


Fig. 6.7.21 Normal data conversion confirmation dialog box

When copying from the replay data to the normal data is complete, the following window is displayed, so click "OK".

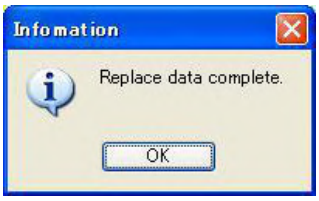


Fig. 6.7.22 Normal data conversion complete dialog box

After conversion to normal data, switch the operation mode to "Normal" to check that normal data is displayed on the graph. If normal data has been normally converted to replay data, data conversion is complete.

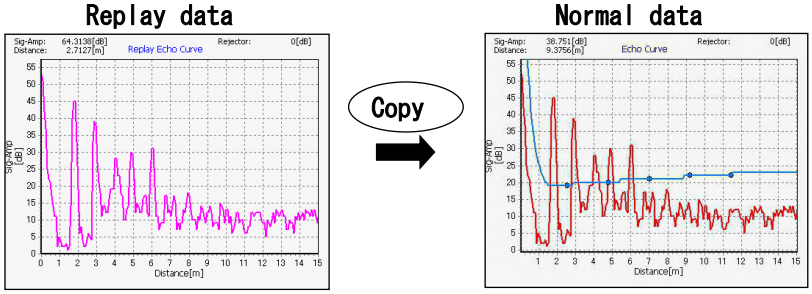


Fig. 6.7.23 Normal data conversion

(9-2) Replaying images

To replay images, switch the operation mode in the Echo Viewer operation area to "Image Play". To start replaying, first click the "Play" button, and then specify the replay file. The following window is displayed, so after specifying the file that you want to replay in the file specification field, click the "Open" button.

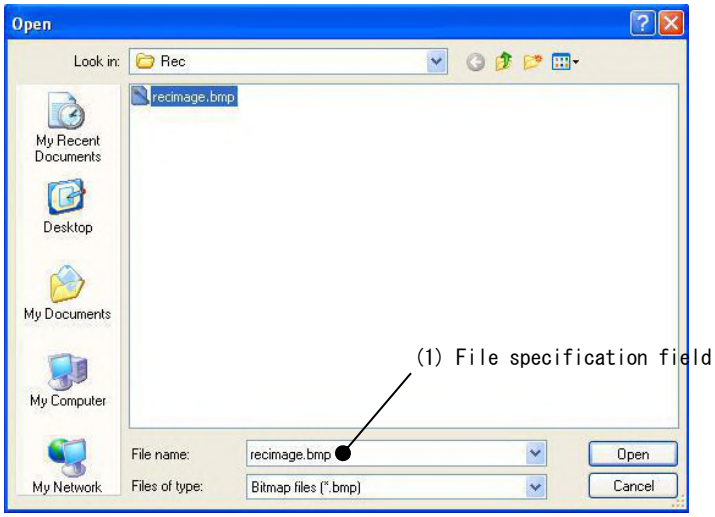


Fig. 6.7.24 File open dialog box

After specifying the replay file, the replay data will be displayed. If you want to clear the displayed graph, click the "Clear" button.

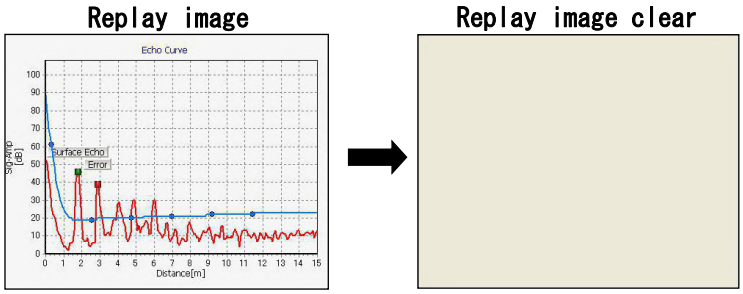


Fig. 6.7.25 Replaying echo curve images

6.8 Measuring

This section explains the functions of the measure menu.
In the measure menu, measurement parameters of the instrument can be displayed / analyzed and Echo List data / maximum values of the instrument can be read. If you click "Measure" in the menu bar or menu selection panel, the following window is displayed.

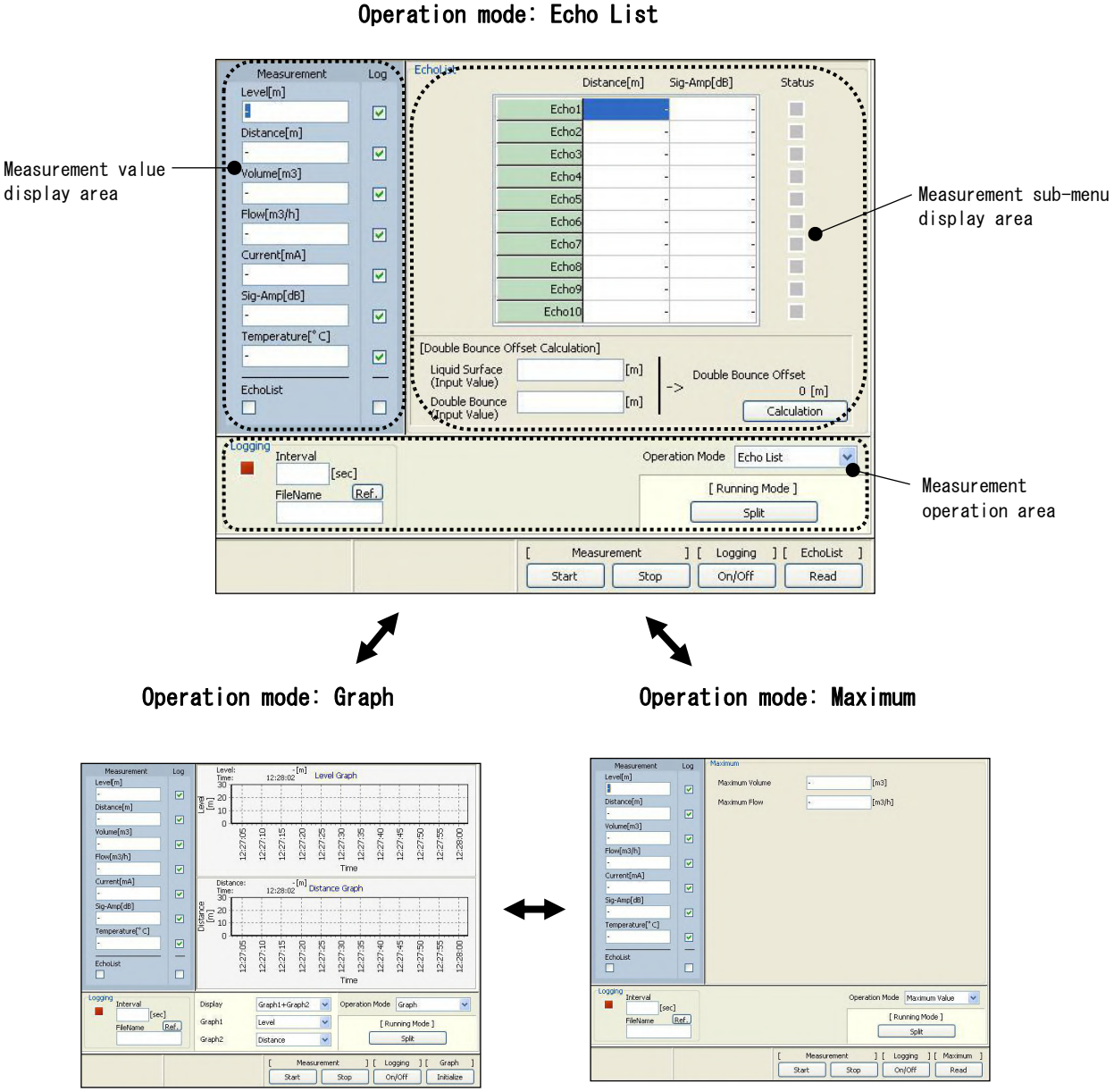


Fig. 6.8.1 Measure menu

(1) Starting measurement

To start instrument measurement, click [Measurement] --> "Start" button. Measurement is started in the period indicated below.

Measurement period
1 sec: When Echo List measurement / log is not included
5 sec: When Echo List measurement / log is included

Although the normal measurement interval is 1 second, if there is a check mark for either the Echo List measurement or log in the measurement value display area, an Echo List measurement is added, so the measurement interval changes to 5 seconds.

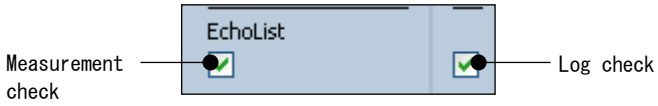


Fig. 6.8.2 Changing the measurement period

After measurement has started, the measurement mode display changes as follows. Details on switching the measurement mode are described later.

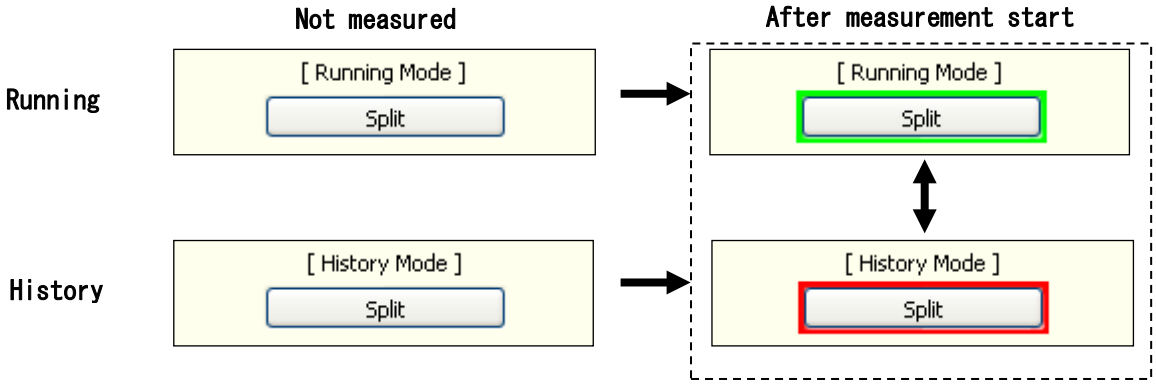


Fig. 6.8.3 Measurement mode transition 1 (Not measured -> Measurement start)

(2) Checking measurement values

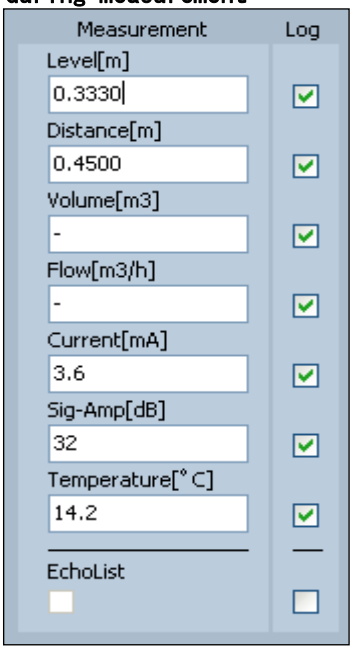
The following two methods are used to check instrument measurement values.

- Checking each measurement parameter by value
- Checking each measurement parameter by graph

(2-1) Checking each measurement parameter by value

Using the measurement value display area, instrument measurement values can be checked by value for each parameter. The most recent measurement parameter values are displayed in the measurement value display area. The display is a bar display when measurement is not yet performed.

Measurement value display during measurement



Bar display when measurement is not yet performed

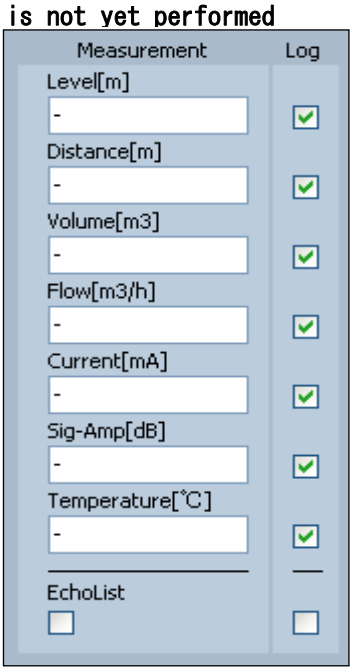


Fig. 6.8.4 Checking measurement parameters by value

(2-2) Checking each measurement parameter by graph

To confirm instrument measurement values by graph for each parameter, switch the operation mode in the measurement operation area to "Graph". A maximum of two graphs can be displayed simultaneously in the measurement sub-menu display area. The graphs to display can be selected from those in "Display" in the measurement operation area.

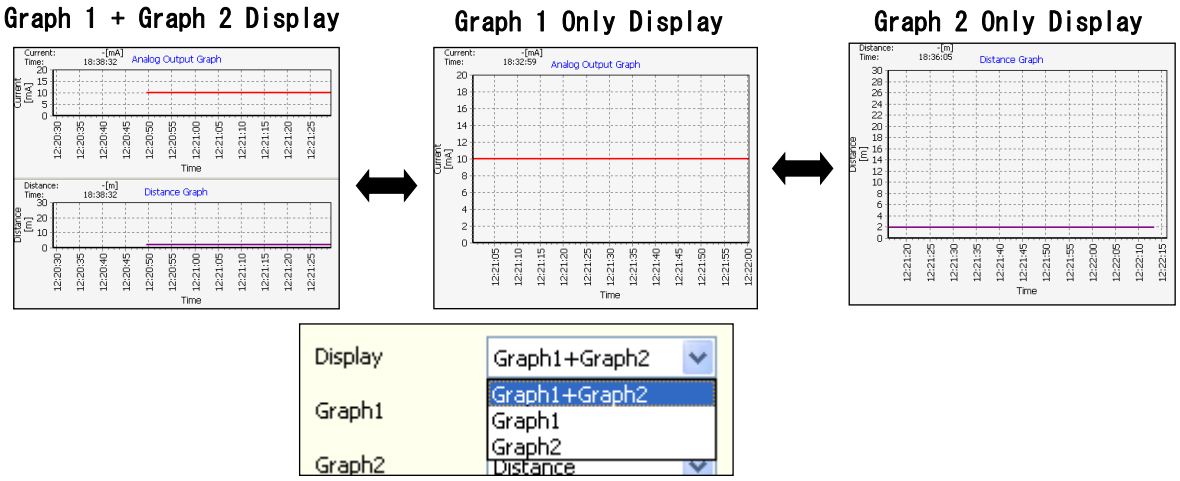


Fig. 6.8.5 Selecting a display graph

Each type of graph 1 / graph 2 display parameters can be changed by selecting "Graph 1" or "Graph 2" in the measurement operation area. It is not possible to select the same parameters in graphs 1 and 2 simultaneously.

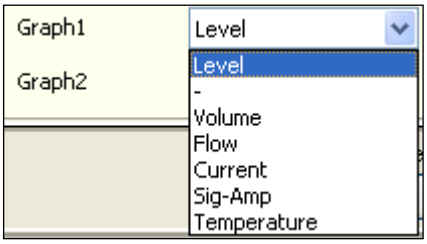


Fig. 6.8.6 Switching graph 1 display parameters

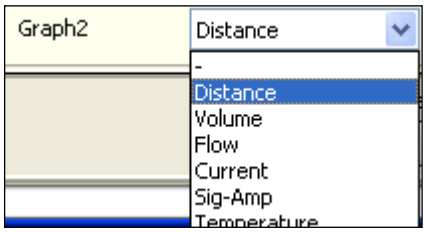


Fig. 6.8.7 Switching graph 2 display parameters

To initialize all measurement data, click [Graph] --> "Initialize" button. This clears the history and graph display of all measurement parameters. Be aware that once data has been initialized it cannot be restored to its original state thereafter.

(3) Stopping measurement

To stop instrument measurement, click [Measurement] --> "Stop" button. This stops measurement. After measurement has stopped, the measurement mode display changes as follows. Details on switching the measurement mode are described later.

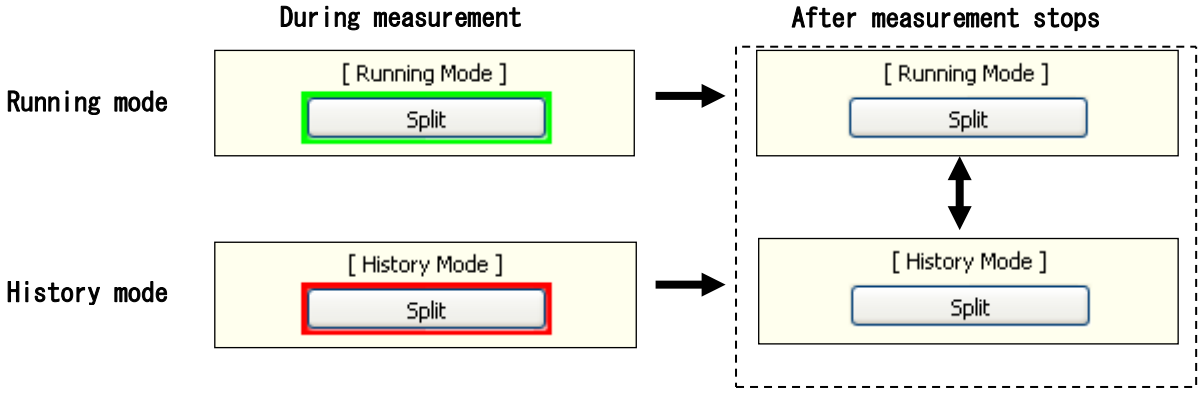


Fig. 6.8.8 Measurement mode transition 2 (During measurement -> Measurement stop)

(4) Logging measurement values

Instrument measurement data can be saved to a file. To save measurement data to a file, place a check mark for the log of the parameter that you want to save that is in the measurement value display area ①, and set the logging interval ② and log file ③. During logging, the logging status ④ is displayed in green, and when logging is stopped, the logging status is displayed in red.

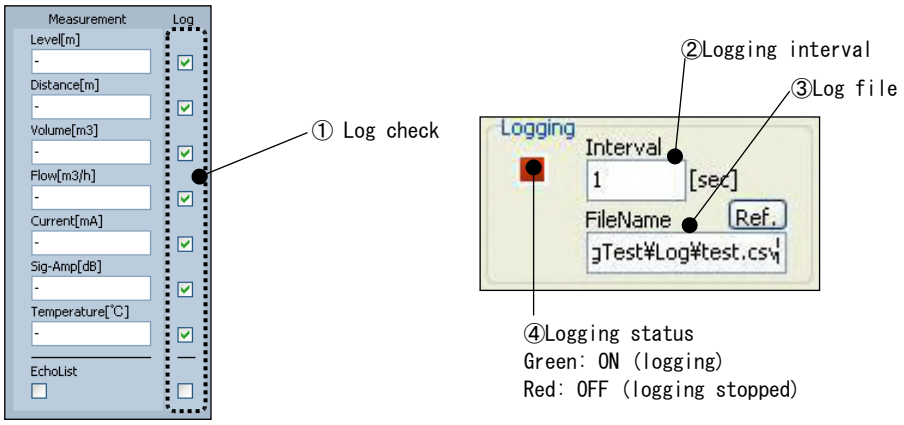


Fig. 6.8.9 Logging settings

Be aware that when logging the Echo List (when there is a check mark for the Echo List log), a logging interval less than 5 seconds cannot be specified. To set the file name and save location for the log file, click the "Ref." button of the log file setting in the measurement operation area. Then the following window is displayed.

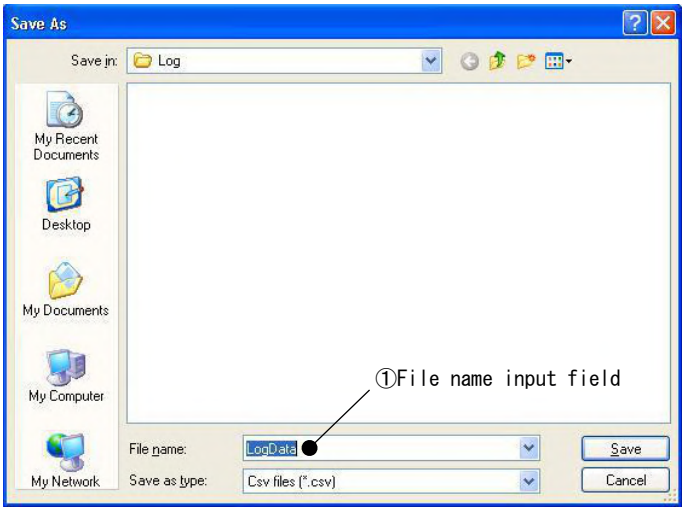
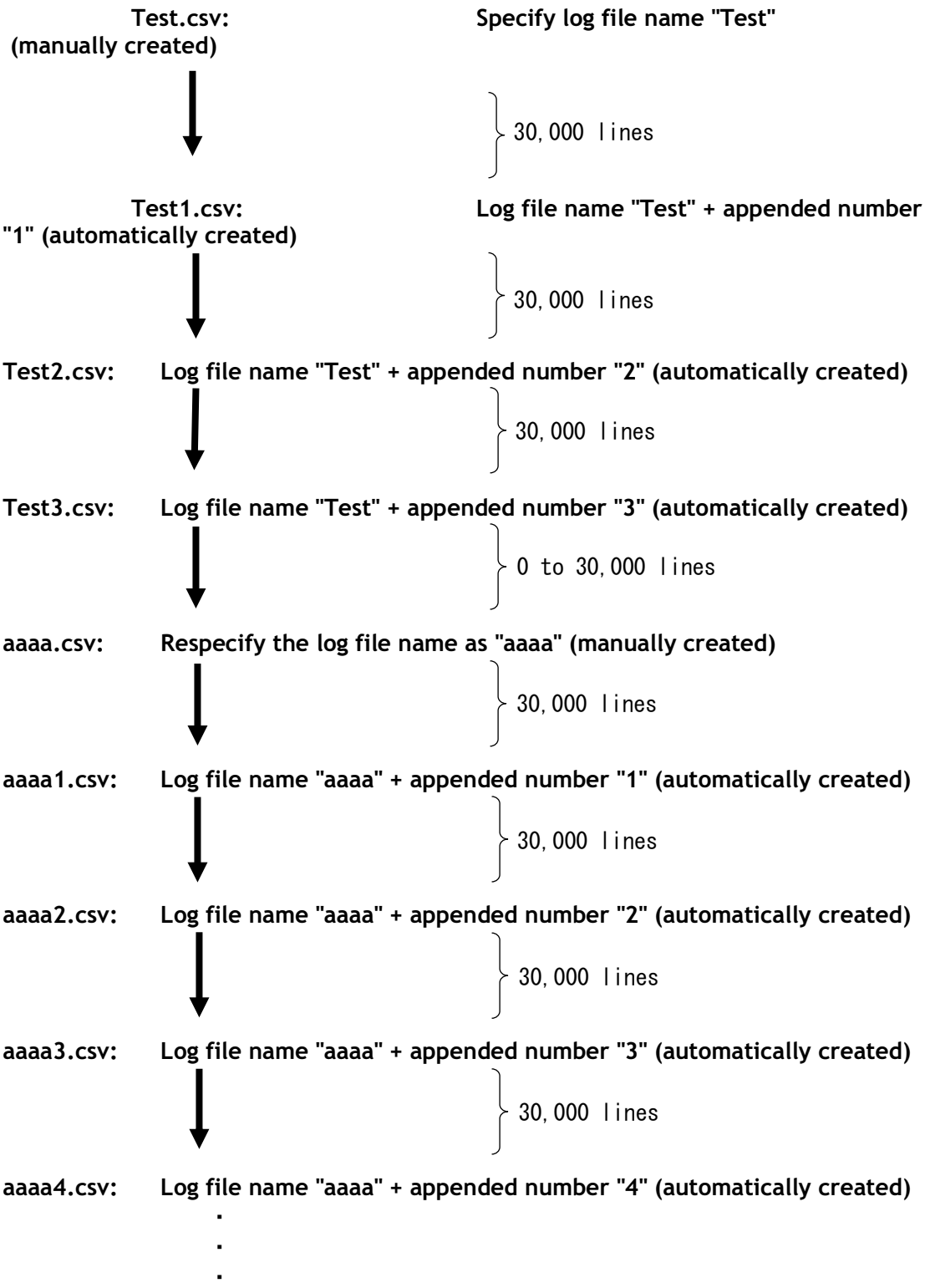


Fig. 6.8.10 Log file specification dialog box

After inputting the log file name in the file name input field ①, click the "Save" button to specify the log file. The log file is saved in csv format. To enable logging during measurement, click [Logging] --> "On/Off" button to turn the logging status ON (green). If you start measurement when the logging status is green, the measurement values will be saved in the log file. To finish logging after stopping measurement, click [Logging] --> "On/Off" button to turn the logging status OFF (red). If you repeat logging continuously without resetting the log file, measurement values will be added to the current settings file. If there are more than 30,000 lines in the log file during logging, a file with an "appended number" appended to the end of the "specified log file name" is automatically created, and data is continuously saved. Be aware that unless a new log file is specified, the "appended number" continues to increase by 1 for every 30,000 lines. An operation example of automatic file creation is shown below.

● Operation example of automatic file creation



(5) Switching the measurement mode

There are two measurement modes, which are as follows: The measurement mode can be switched by clicking the "Split" button in the measurement operation area.

- Running mode (the measurement graph is being updated and measurement graph operations cannot be performed)
- History mode (the measurement graph has been stopped and measurement graph operations can be performed)

(5-1) Running mode

Running mode is the mode in which the graph is regularly updated. Current measurement values can be monitored in real time using the graph, but graph operations cannot be performed.

(5-2) History mode

History mode is the mode in which graph updating has been stopped. Although current measurement values cannot be monitored in real time using the graph, the displayed graph can be analyzed using operations such as Drag / Zoom Up / Zoom Reset. Also, during history mode, the display range of the graph can be changed according to the range settings.

●Graph Drag / Zoom Up / Zoom Reset

It is possible to change the display range of the graph by right clicking on the graph and then dragging. Also, Zoom Up and Zoom Reset can be performed by dragging to the bottom right and top left, respectively.

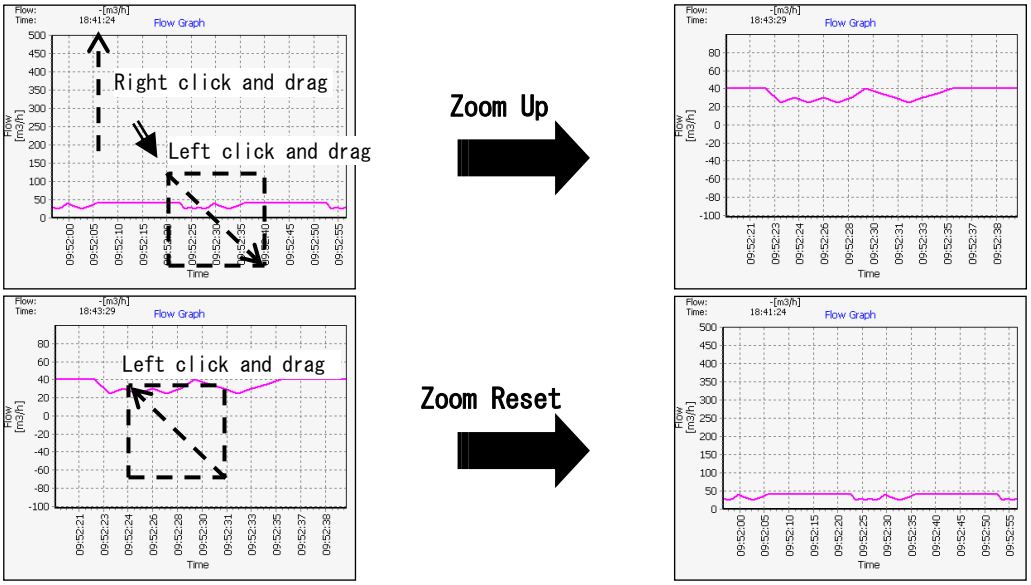


Fig. 6.8.11 Graph Drag / Zoom Up / Zoom Reset

● Range settings

To use range settings to change the display range of the graph, click near a graph scale line.

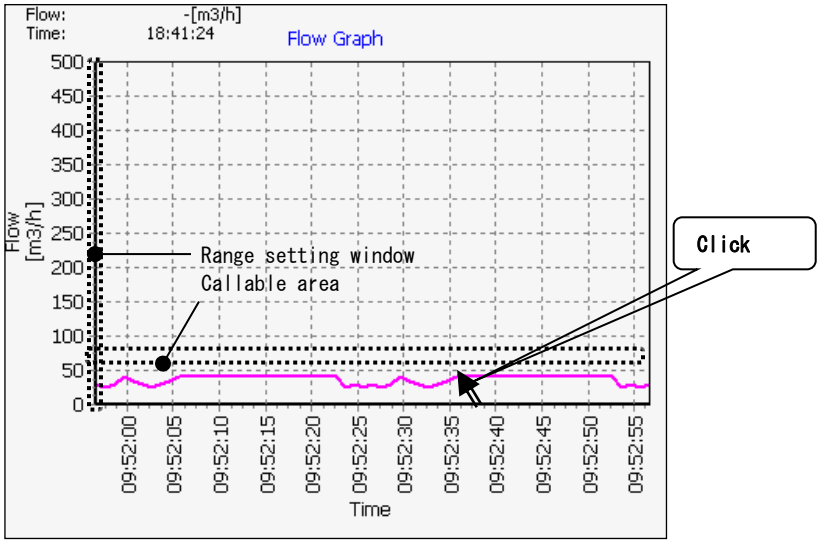


Fig. 6.8.12 Calling the range setting window

Then the following window is displayed. Input setting values ①, and click the "Apply" button ② to change the display range of the graph according to setting values. To cancel the settings, click the "Cancel" button ③.

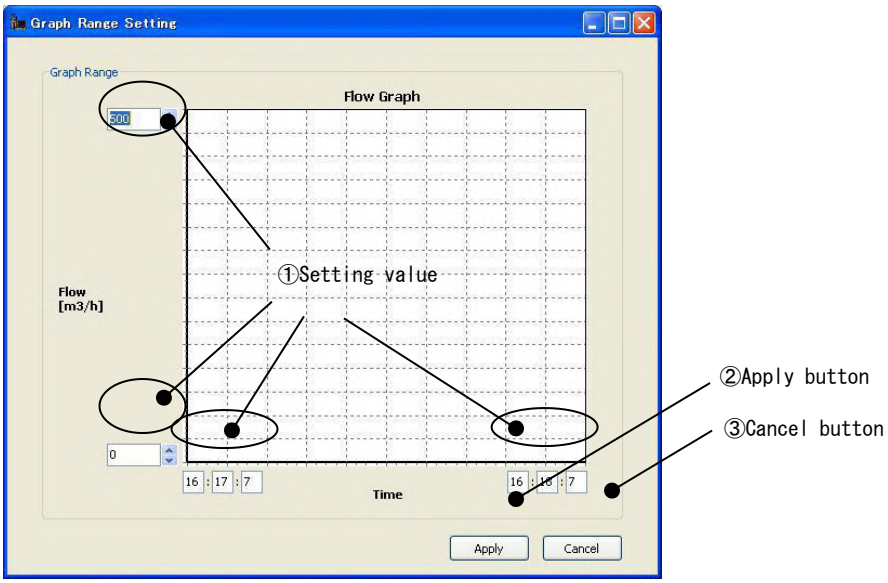


Fig. 6.8.13 Range setting window

(6) Reading Echo List data

The Echo List table (distance / signal Amplitude list) can be read from the instrument. To read the Echo List, switch the operation mode in the measurement operation area to "Echo List". Then, click [Echo List] --> "Read" button to read the Echo List from the instrument.

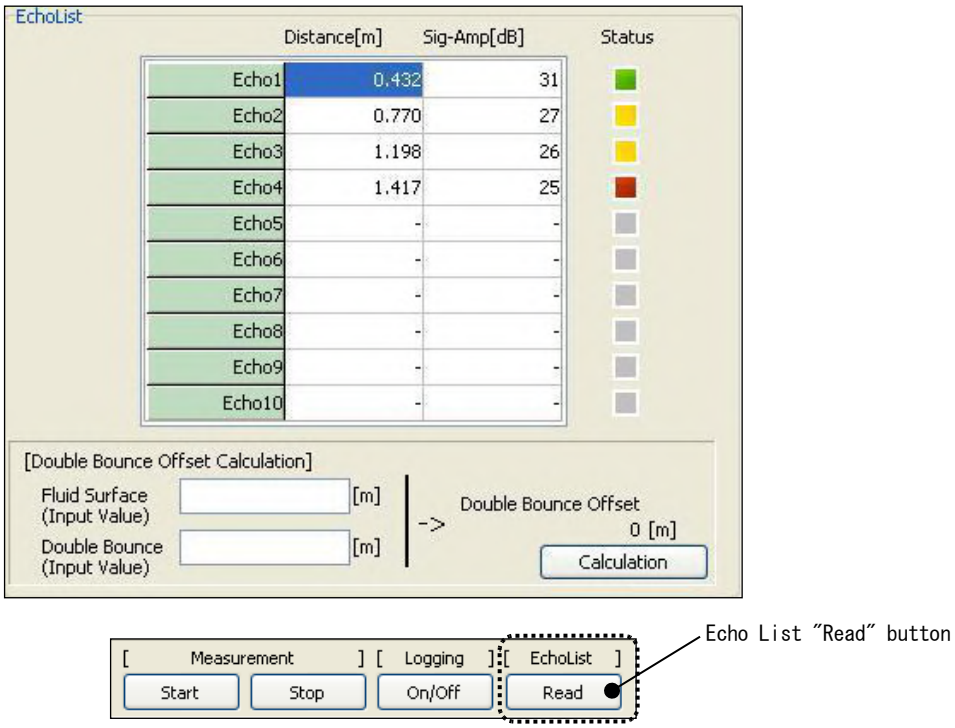


Fig. 6.8.14 Reading the Echo List

The echo list data is displayed with a maximum of 10 points. The displayed echo list data can be confirmed on the echo curve graph. (For details on the status, refer to Fig. 4.2.7.3 Echo curve graph.)
Double bounce offset calculation can be performed based on the results of the echo list data that was read from the instrument.

- Double bounce offset calculation

To calculate the double bounce offset, input the liquid surface and the double bounce value in an input area ((1)), and then click the "Calculation" button ((2)). The calculation result ((3)) is displayed.

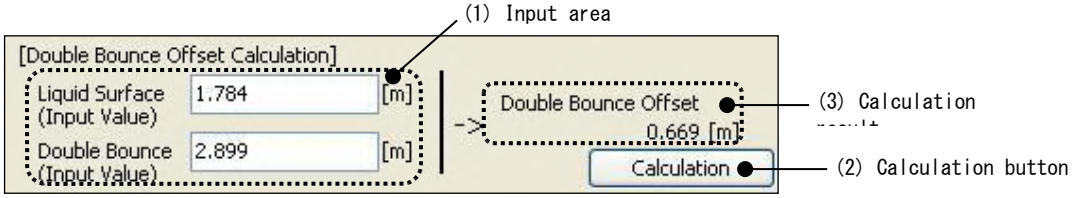


Fig. 6.8.15 Double bounce offset calculation

The following confirmation window will be shown with the calculation result display, so click "OK". The calculation result is written in the instrument as double bounce offset value.

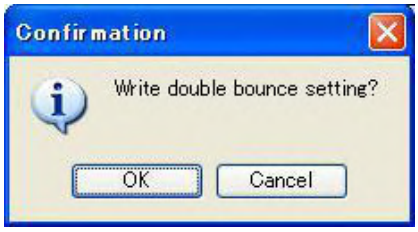


Fig. 6.8.16 Double bounce offset confirmation instructions dialog box

Confirm that the calculation result is reflected in the double bounce offset value in Outlier Removal menu.

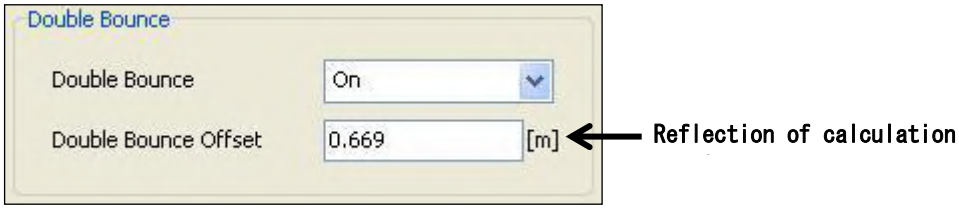


Fig. 6.8.17 Double bounce offset value

(7) Reading maximum values

To read maximum values from the instrument, switch the operation mode in the measurement operation area to "Maximum". Then, click [Maximum] --> "Read" button to read the maximum value from the instrument.

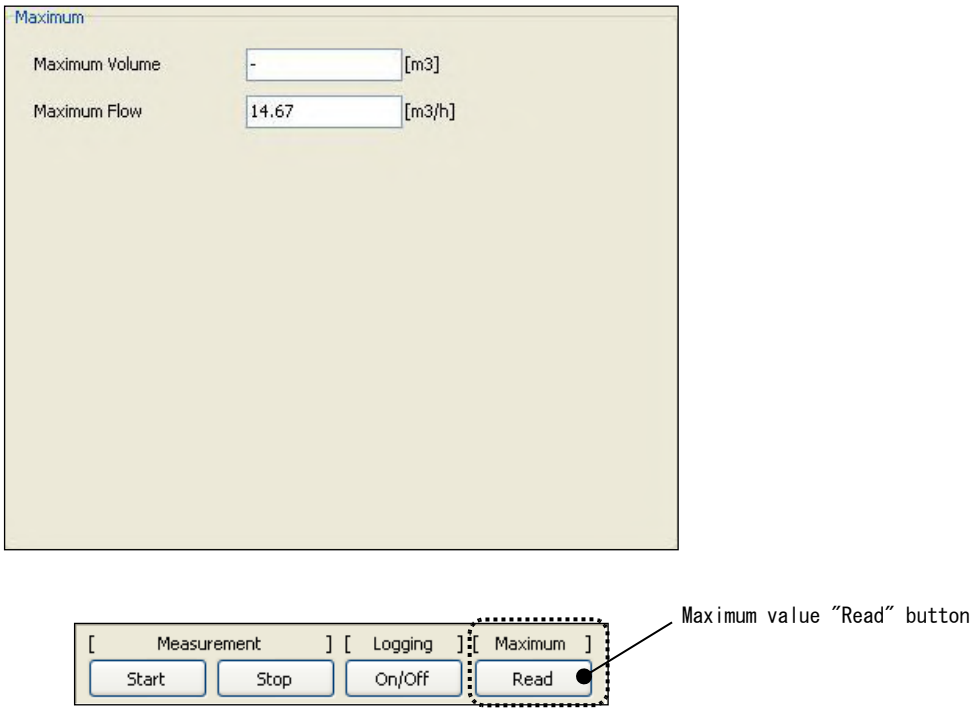


Fig. 6.8.18 Reading maximum values

Maximum value

- Maximum Volume: The maximum volume value calculated from the volume type (If the volume type settings are "No Calculation", the maximum volume value will not be displayed.)
- Maximum Flow: The maximum flow rate value calculated from the flow rate type (If the Flow Type settings are "No Calculation", the maximum flow rate value will not be displayed.)

6.9 Tools

This section explains the functions of the tool menu.
To open the tool menu, click "Tools" on the menu bar or menu selection panel.

6.9.1 Reset

In the Reset menu, instrument reset operations can be performed. There are two types of resets, which are Parameter Initialize and Reboot. If you click "Reset" tab or "Reset" in the tree display, the following window is displayed.

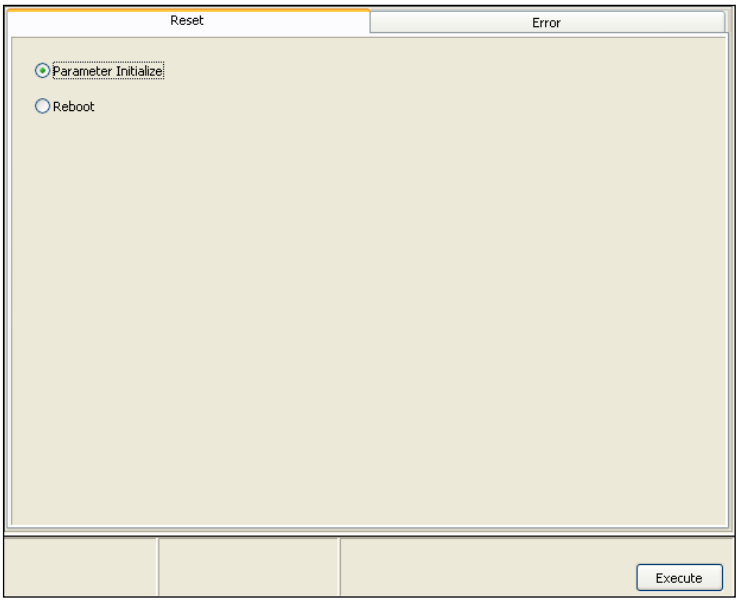


Fig. 6.9.1 Reset menu

(1) Executing Parameter Initialize

To initialize instrument parameters, select "Parameter Initialize"( ), and then click the "Execute" button. The following window will be displayed, so then click "OK" to initialize the instrument parameters.

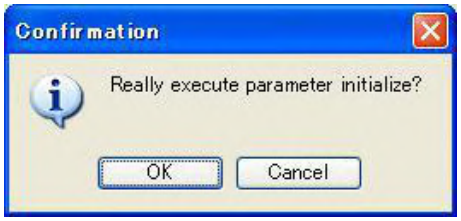


Fig. 6.9.2 Parameter initialize confirmation dialog box

(2) Executing Reboot

To perform instrument reboot, select "Reboot"( ), and then click the "Execute" button. Then the following window will be displayed, so click "OK" to reboot the instrument.



Fig. 6.9.3 Reboot confirmation dialog box

6.9.2 Error

In the Error menu, the status of the instrument can be read and checked. If you click "Error" tab or "Error" in the tree display, the following window is displayed.

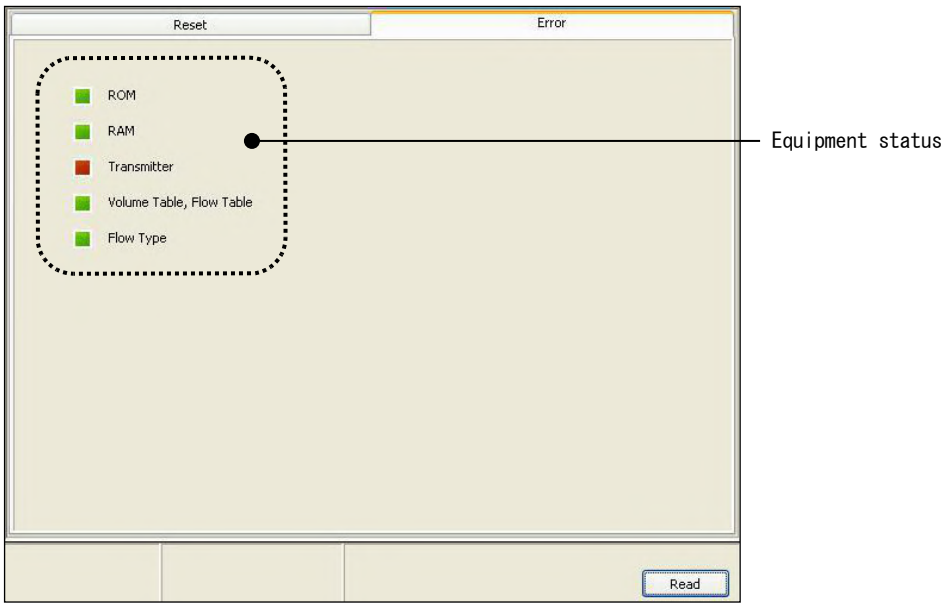


Fig. 6.9.4 Error menu

(1) Reading the instrument status

To read the instrument status from the instrument, click the "Read" button.

Instrument status

Details on the instrument status are shown in the following table.

Table 6 9.1. Instrument status

Display	Description	Status	Conceivable cause	Action
ROM	ROM status	Green	Normal	—
		Red	ROM poor	If power cycling does not fix the problem, replace the electronic components.
RAM	RAM status	Green	Normal	—
		Red	RAM poor	If power cycling does not fix the problem, replace the electronic components.
Transmitter	Transmitter status	Green	Normal	—
		Red	A sending omission has not been detected during measurement	If power cycling does not fix the problem, replace the electronic components.
Volume Table, Flow Table	Volume Table, Flow Table input values	Green	Normal	—
		Red	- Error in size of level value setting in Volume Table or Flow Table - Point Number error in the Volume Table or Flow Table	Check the settings in the volume table or flow table
Flow type	Weir settings	Green	Within the applicability range of JIS B 8302	—
		Red	Outside the applicability range of JIS B 8302	Check the weir settings.

Chapter 7 Precautions on equipment settings

7.1 Basic setting parameters diagram

Basic setting parameters are shown in the following diagram.

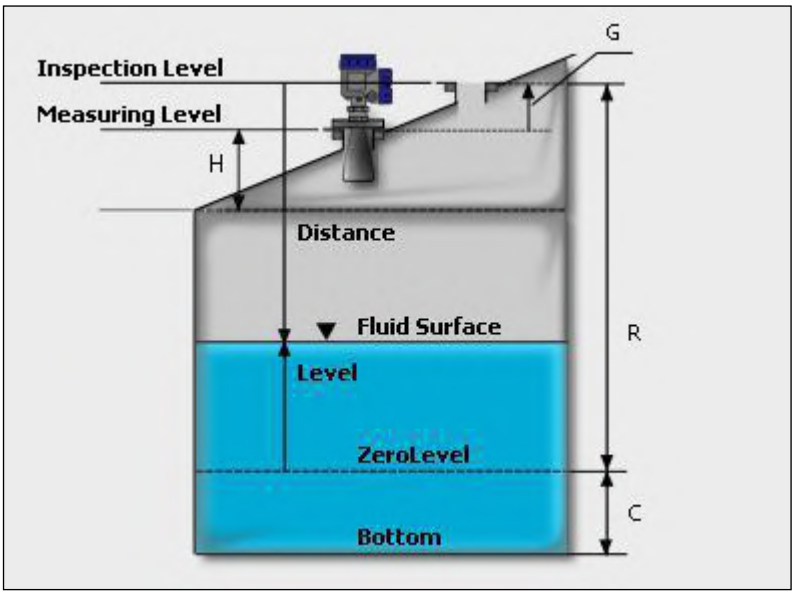


Fig. 7.1.1 Basic setting parameters diagram

7.2 Measuring negative levels

If you set the basic setting parameter "C" to a non-zero number, surfaces at or below the Zero Level, which is the reference level, can be measured. However, be aware that if the Zero Level has been set in the analog output settings to a current value of 4 mA, current at or below 4 mA will not be output. The measurement value can be confirmed using the LCD and configuration software.

7.3 Avoiding noise echo

(1) Masking near antenna

Depending on the shape of the tank, there is sometimes a strong noise echo due to intense multiple reflection between the tank and the surface near the antenna. If affected by this, the surface level might not be able to be measured properly. In this case, you can set the setting parameter "H" to avoid that effect.

(2) Masking due to the noise table

If the reflection echo cannot be recognized normally due to the strong noise level, you can use the noise table or rejector to set the threshold value for recognizing the signal to a value greater than the noise level. Doing so will allow stable measurement to be performed. The threshold value according to the noise table or rejector can be set using the configuration software. The noise table consists of a line graph connecting a maximum of 513 points. The rejector is the straight line that indicates the minimum value of the signal amplitude of the noise table. A threshold value can be set for each point by using the noise table. Use the setting software to read the signal amplitude in the tank before setting the noise table. For information on how to set the threshold value, refer to **6.7 Echo Viewer**.

A setting example of the threshold value is shown in the following figure. Signals smaller than the threshold level of the noise table shown in the figure are ignored.

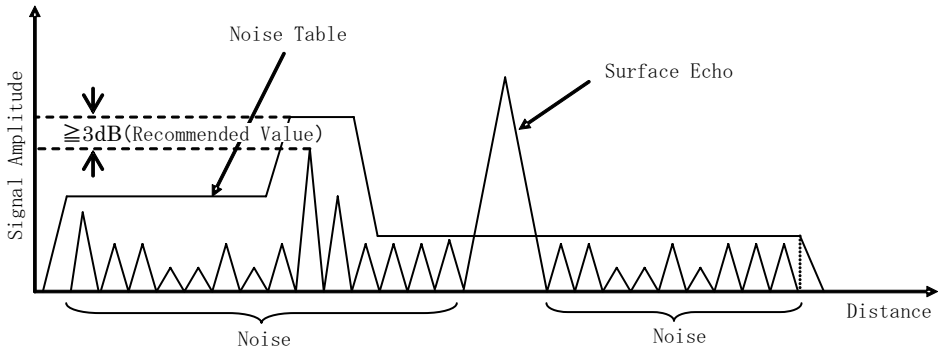


Fig. 7.3.1 Setting example of threshold value

7.4 Setting volume calculation / flow calculation

(1) Volume calculation

To calculate volume, select a standard tank shape from among those in the "Volume Type" setting parameter (vertical cylindrical shape / spherical shape / horizontal cylindrical shape) or select a user definition. If you select a standard tank shape, set each of the required parameters. The standard tank setting parameters are shown in the following table.

Table 7.4.1 Standard tank shape setting parameters

Setting parameter / tank shape	Vertical cylinder shape	Sphere shape	Horizontal cylinder shape
A (Maximum Position)	●	●	●
O (Tank offset)	●	●	●
D (Tank diameter)	●	●	●
L (Tank length)	-	-	●

If you select a user definition, you must set the volume table.

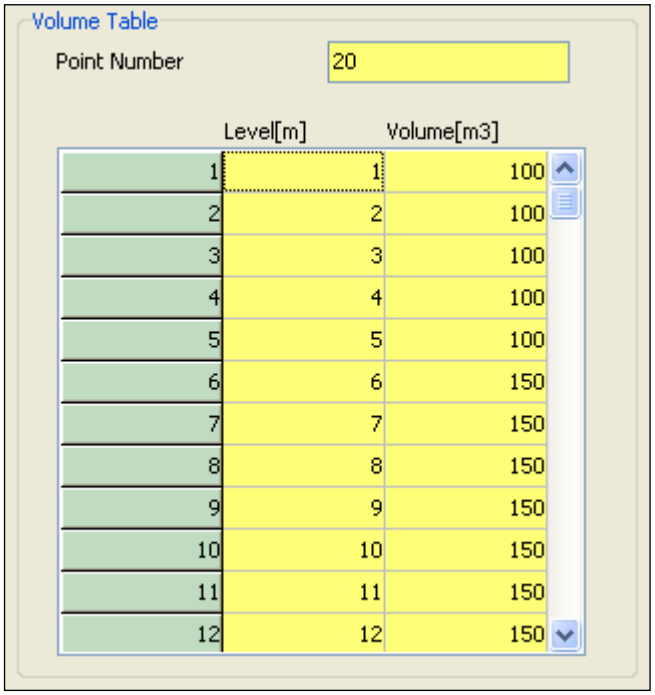


Figure 7.4.1 Setting the volume table

The volume table can be set using the configuration software. Between 2 (minimum) and 100 (maximum) calibration points can be set. If the size of the setting level values is wrong (not in order of smallest [value]), an equipment status table error occurs, and functions will not operate. For details on equipment status, refer to **5.4 Parameter description --> [8-3] Error** or **6.9 Tools --> Error**.

(2) Flow calculation

To calculate flow, select a standard channel shape (weir or flume) from among those in the "Flow Type" setting parameter or select a user definition. If you select a standard flow type, set each of the required parameters. The standard channel setting parameters are shown in the following table.

Table 7.4.2 Standard flow type setting parameters

Setting parameters / tank shape	Weir (JIS B 8302)				Flume (JIS B 7553)
	60°triangular weir	90°triangular weir	Rectangular weir	Suppressed weir	
B (Water path width)	●	●	●	●	-
b (Weir width)	-	-	●	-	-
v (Kinematic viscosity coefficient)	●	-	-	-	-
D (Height to the notch)	●	●	●	●	-
Flume shape (Nominal)	-	-	-	-	●

If you select a user definition, you must set the flow table.

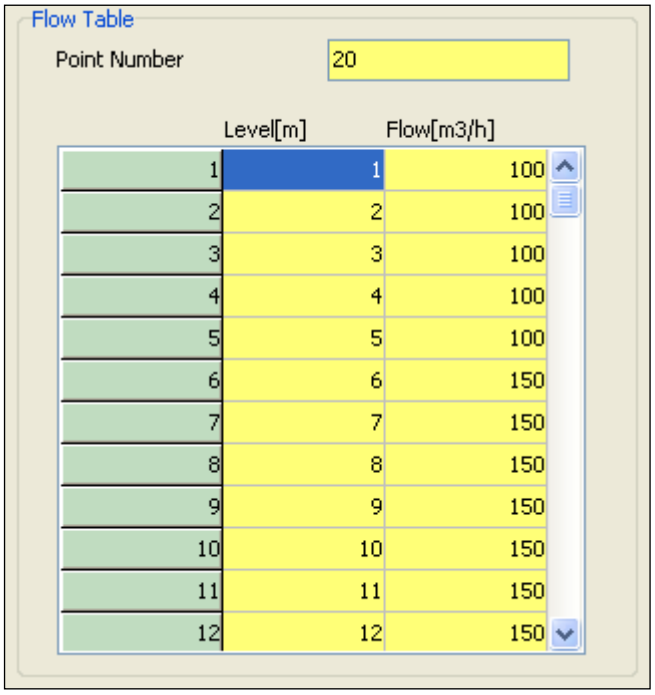


Figure 7.4.2 Setting the flow table

The flow table can be set using the configuration software. Between 2 (minimum) and 100 (maximum) calibration points can be set. If the size of the setting level values is wrong (not in order of smallest [value]), an equipment status table error occurs, and functions will not operate. For details on equipment status, refer to **5.4 Parameter description --> [8-3] Error** or **6.9 Tools --> Error**.

7.5 Measurement near the bottom surface of the tank.

When the liquid to be measured has low permittivity, such as oil, microwaves pass through the liquid and there is a very intense reflection echo of the bottom surface. If the fluid level of such a liquid decreases, a surface echo cannot be distinguished from a bottom echo. Therefore, bottom echoes must be set to be ignored. For liquids with low permittivity, set the setting parameter "Bottom Recognition" to "ON". For liquids with high permittivity, such as water, there is no reflection echo from the bottom, because few microwaves pass through the liquid. Therefore, no considerations need to be made regarding the bottom echo, and thus, the setting parameter "Bottom Recognition" can be set to "OFF".

7.6 Calibrating analog output

If you are calibrating the analog output using the LCD and operation keys, first set the "Fixed Current Output" parameter to current value 4 mA / 20 mA. After setting this, measure the value of the actual output current. If the output current value is different from the setting value, set the measured current value to "4-mA calibration" / "20-mA calibration". After setting this, the output is calibrated.
If you are calibrating the analog output using the configuration software, directly select "4-mA calibration" / "20-mA calibration", and then follow the instructions in the window.

7.7 Calibrating measurement values

If the measured value has shifted, it is possible to perform the corresponding offset adjustment. To perform offset adjustment, set the adjustment value in the "Zero-point Calibration" parameter. Also, in situations such as when the equipment was slanted when it was installed, the corresponding span calibration must be performed. To perform span calibration, set the adjustment value in the "Span Calibration" parameter. Normally, this value is set to "1". For example, if the equipment was slanted when it was installed, the actual distance is longer. By setting a value smaller than "1", that can be corrected.

7.8 Averaging time and Median filter

The averaging time make average for the measurement data group within the set time moving average time. In the casef of waving small liquid level change, it is possible to set a large average time is valid. If the large average time set, follow-up of the liquid level will be bad in the case of fast liquid level change.
Median filter is the ability to remove the minimum value and maximum value from measurement data group when performing a moving average.
The averaging time set 8[sec] and the median filter set 2[sec],
In the case of, Measurement data (8) - Removal data (2) = Valid data (6), it makes an average of 6 data processing.
Please set the valid data of greater than 1, refer to **6.5.1 Measure support**.

7.9 Dabble Bounce removal

There is a case where the reflected wave from the liquid surface not only is received by the antenna but that received by the antenna is reflected by the liquid surface back reflection in (ceiling) the tank upper surface, for antenna mounting position and tank shape. It calls Dabble Bounce. In the case of flat tank top in particular, there is a possibility to recognize signal strength error is larger than the reflected wave from the liquid surface. It is possible to remove the abnormal value by performing the Double Bounce configuration, refer to **6.5.2 Outlier removal**.
And there is a function to calculate the offset to the tank top from the flange end necessary to double bounce removal, refer to **6.8 Measuring Double bounce offset caliculation**.

7.10 Effect of structure such as a ladder

If the structure and the antenna mounting position is close, the reflection from the structure is received in the antenna, there is a case to make a false recognition. If that is possible, recommended to remove the structure or change the antenna mounting position.
As the next measure, it may become smaller reflected wave from the structure by changing the polarization direction of the microwave, refer to **2.7 Tips for stable measurement**.
As the next measure, it is possible to mask the unwanted reflected wave by changing the noise table, refer to **6.7 Echo Viewer**.

Chapter 8 Maintenance and inspection

Preventative maintenance and periodic inspection is important to ensure long life and proper functioning of the level gauge.

8.1 Maintenance and inspection

WARNING
When performing maintenance or inspections, stop the power supply to the equipment. If these measures are not taken, electrical shocks may occur.

Although maintenance of transmitter head is generally not required, be aware of the following.
(1) Wipe away any dirt on the transmitter head with a soft cloth. Do not use paint thinner or other chemical products.
(2) Inspect and clean the warning labels to ensure readability. Contact the nearest distributors in your area when warning labels have dirtied or peeled off.
(3) Do not subject the transmitter to shocks and impacts.

8.2 Maintenance and inspection for Ex parts

WARNING
When performing maintenance or inspections, stop the power supply to the equipment. If these measures are not taken, electrical shocks or explosion may occur.

(1) Maintenance and inspection should be done by well-trained person who has knowledge of explosion protection.
(2) Maintenance and inspection should be done at non-hazardous area where no explosive gas atmosphere.
(3) Do not subject the transmitter to shocks and impacts.

8.3 Maintenance and inspection for peripheral

Note the following.
(1) Do not handle the wire roughly. It may cause the loose connection or breaking wire.
(2) As to the maintenance and inspection of the peripherals, please refer their operating manuals.

8.4 Lifetime of components

The equipment has components with operational life expectancies. Periodic inspection of these components is recommended. Please contact the nearest distributors in your area of the manufacturer when any component replacement is required.

(1) LCD

The LCD, which displays measurement value or other information, has an operational lifetime of approximately 5 year at room temperature. The contrast of the LCD may darken when this lifetime is exceeded, but the operational and measurement functions of the transmitter head are not affected.

Generally LCD lifetime may be shortened if it is exposed to direct sunlight or high temperature.

(2) Sealing parts

The types of the packing which is equipped on the transmitter are as follows. The lifetime of these packing differ depending on the operational condition.

Periodic inspection of these components is recommended. In case that any of crack or cutoff found, please contact the nearest distributors in your area of the manufacturer to replace the parts.

Table 8.4.1 Sealing parts

Used part	Material
Transmitter head : LCD cover , Terminal cover	Silicone rubber
LCD cover : Window	Silicone rubber
Transmitter head : Blind volt	Silicone rubber
Transmitter head : Antenna wave guide	Silicone rubber
Transmitter head : Cable Gland, Blind plug (Optional)	EPDM
Cable gland : Inside gasket (Optional)	EPDM / Chloroprene rubber (According to spec.)
Cone antenna : Inside gasket	VMQ / FKM / Karlez (According to spec.)
Antennas : Flange connection gasket	VMQ / FKM / Karlez (According to spec.)

(3) Built-in arrester

Arrester is built into the terminal module to suppress indirect lightning surge due to lightning strikes and protect the internal electronic circuits. Direct lightning strikes and surge that exceed the rating may damage or degrade the arrestor. In addition to lightning damage, the arrester may also be degraded in an environment that superposes the high-voltage surge generated from large power equipment onto the power supply line.

Destruction can be checked on the exterior, it is difficult to determine the deterioration in appearance. Periodical replacement or inspection by qualified service engineer is recommended.

8.5 Replacement of terminal module

Exchange procedure is as follows,
(1) Turn-off the power supply and open the cover of the terminal box.
(2) Pull connected cables out.
(3) Loosen 2 screws as below indicated.
(4) Remove module connector on the rear side
(5) Exchange terminal module (built-in arrester)
(6) Connect module connector on the rear side
(7) Tighten it with 2 screws, and connect cable as returned
(8) Close the cover of terminal box, and then turn on the power.
(9) Turn-on the power supply and check the 4-20mA signal. Please calibrate 4-20mA signal as necessary. ('Calibration 4-20mA signals' is described in **Chapter 6.6 Calibration**)

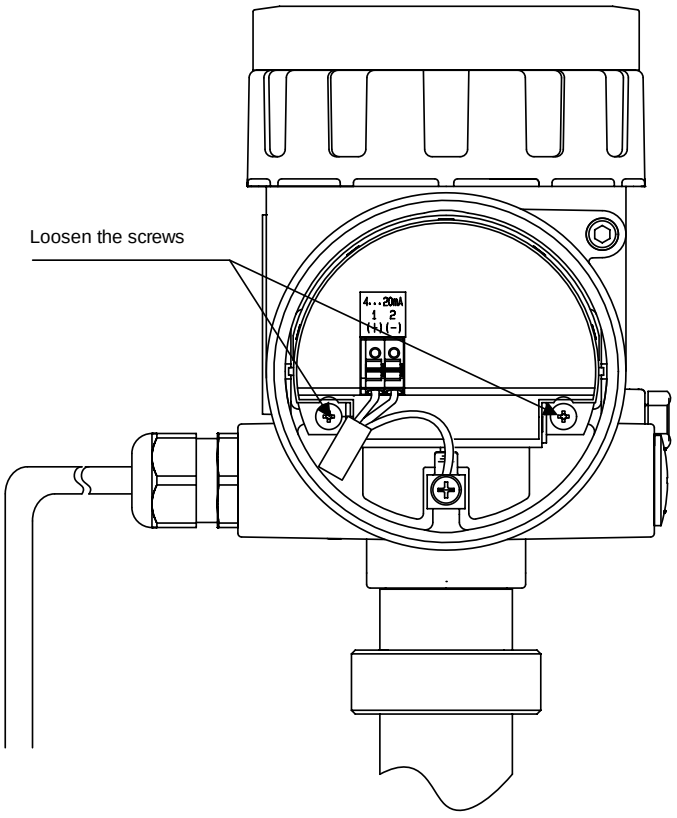


Fig. 8.5.1 Dismounting the terminal module

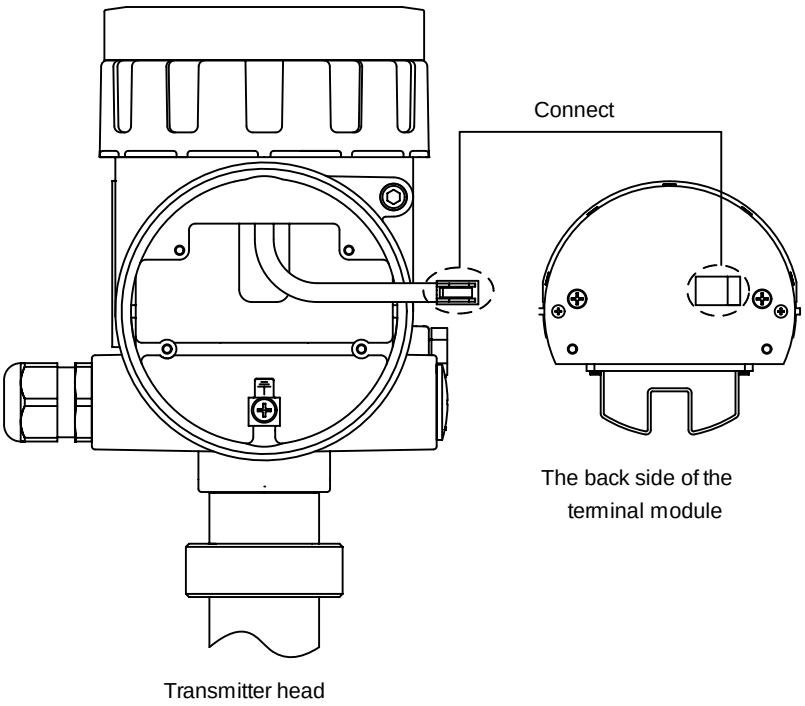


Fig. 8.5.2 Connection of the module

8.6 Calibration

The level gauge has been shipped after calibrated in factory. Periodical verification can be done at the same facility in Japan. Please contact the seller, if you necessary.

Chapter 9 Dismounting

9.1 Dismounting step

WARNING
Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

Take note of chapters **Chapter 2 Installation** and **Chapter 3 Electrical Installation** and carry out the listed reserve order.

9.2 Disposal

In EU area, do not dispose this equipment as household waste, please contact with the nearest representatives. (WEEE directive 2002/96/EG)

Materials: Refer to **Chapter 10 Technical data.**

Chapter 10 Technical data

10.1 General specifications

Table 10.1.1 General specifications

Measurement principle	The time-of-flight measurement principle with microwave pulses		
Application area	Measurement object	Liquid	
	Relative permittivity	$\varepsilon_r \geq 1.8$	
	Process temperature	4"/2" cone antenna	-40 to +150 °C
		4"/2" PTFE sealing antenna	-40 to +200 °C
		1" rod antenna	-40 to +150 °C
	Process pressure	4"/2" cone antenna	-0.1 to +1.5 MPa
		4"/2" PTFE sealing antenna	-0.1 to +1.5 MPa
		1" rod antenna	-0.1 to +1.5 MPa
Max. measuring range	4" cone antenna	30m	
	2" cone antenna	10m	
	4" PTFE sealing antenna	20m	
	2" PTFE sealing antenna	10m	
	1" rod antenna	5m	
	NOTE: It is a consequence in our environment. It may vary depending on the installation environment and the measurement object.		
Measuring cycle time	1s		
Tracking rate for Level change	Max. 2m/s (R > 3.0m)		
Maximum measured error	4"/2" cone antenna 4"/2" PTFE sealing antenna	±2mm	
	1" rod antenna	±3mm	
	NOTE: ·If the measurement distance is below 0.5m, the measured error is ±10mm. ·It is a consequence in our environment. It may vary depending on the installation environment and the measurement object. ·Deviation by strong, high frequency electromagnetic fields within EN 61326 ≦±50mm		
Type of explosion proof	Non-Ex, Ex-i, Ex-d+i		
	Ex-i parameters : Ui=30V, Ii=93mA, Pi=700mW, Ci=negligible, Li=negligible		

Ex approval (Pending)	ATEX	EN60079-0:2012 EN60079-1:2007 EN60079-11:2012 EN60079-26:2007 EN60079-31:2009	Ex-i	II 1G Ex ia IIC T4 Ga / II 1D Ex ia IIIC 135°C Da IP66
			Ex-d+i	II 2G Ex d ia IIC T4 Gb / II 2D Ex tb IIIC 135°C Db IP66
	IECEx	IEC 60079-0:2011 IEC 60079-1:2006 IEC 60079-11:2011 IEC 60079-26:2006 IEC 60079-31:2008	Ex-i	Ex ia IIC T4 Ga / Ex ia IIIC 135°C Da IP66
			Ex-d+i	Ex d ia IIC T4 Gb / Ex tb IIIC 135°C Db IP66
	TIIS		Ex-i	Ex ia IIC T4
			Ex-d+i	Ex d ia IIC T4
EMC directive	EN61326-1:2006 Class A			
Low voltage directive	EN61010-1:2010			
R & TTE directive	EN302372-1, -2			

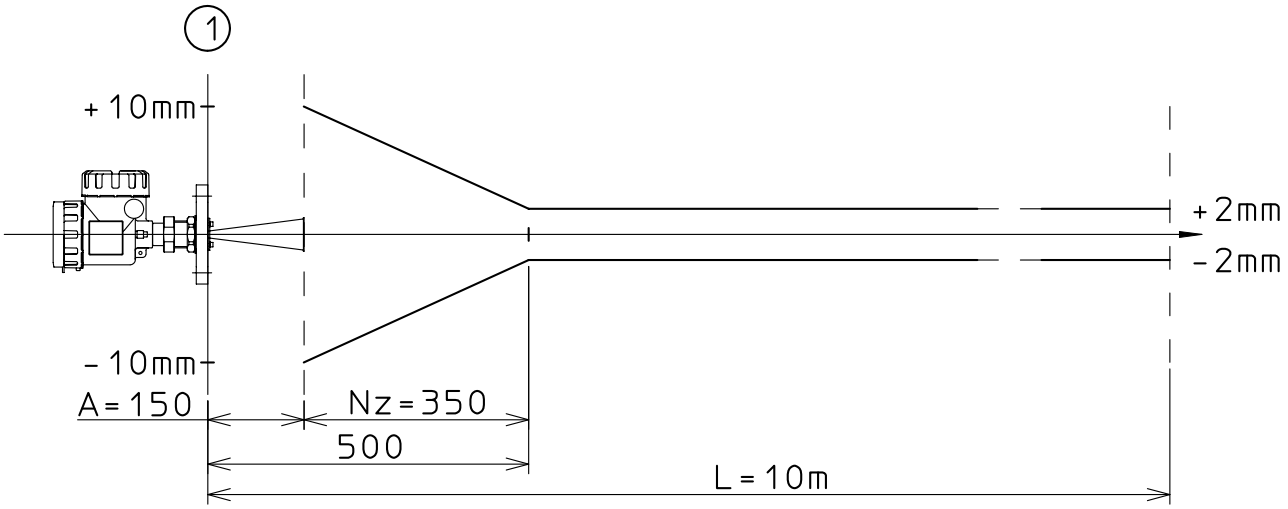


Fig. 10.1.1 Maximum measured error of 2" cone antenna

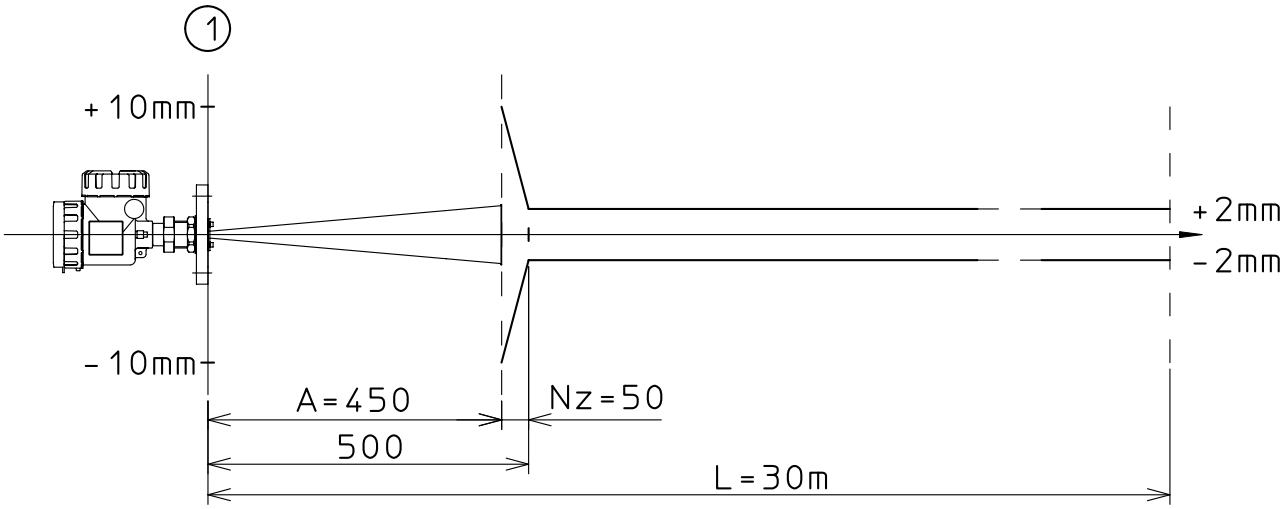


Fig. 10.1.2 Maximum measured error of 4" cone antenna

NOTE: ①=Reference plane, A=Antenna length, H=Dead zone, Nz=Proximity zone

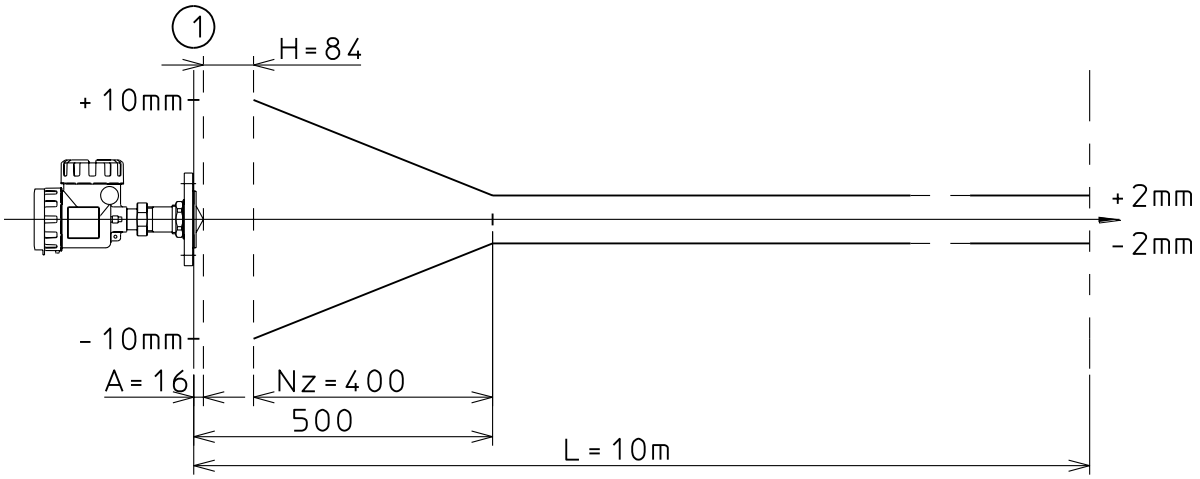


Fig. 10.1.3 Maximum measured error of 2" PTFE sealing antenna

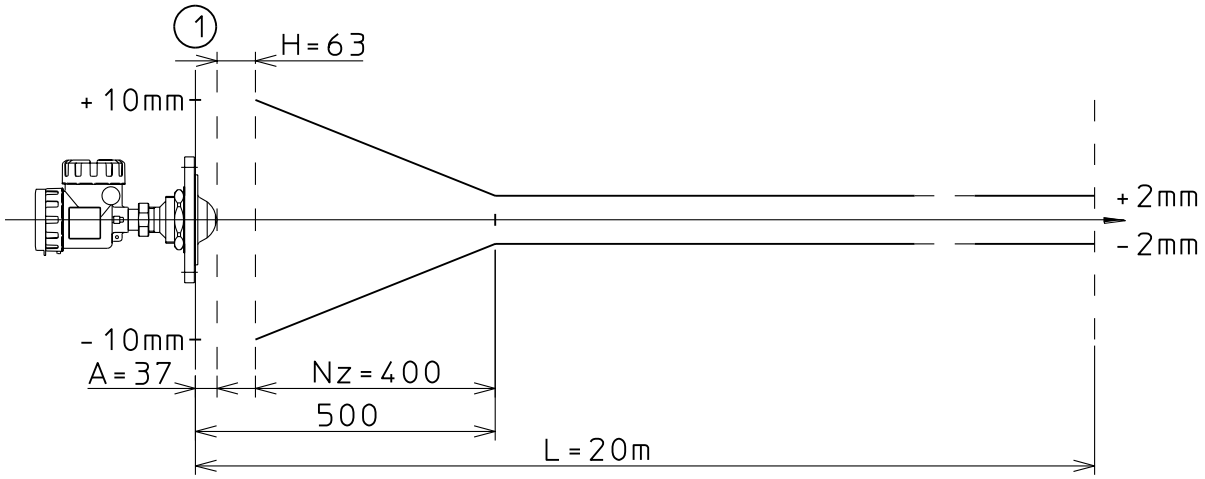
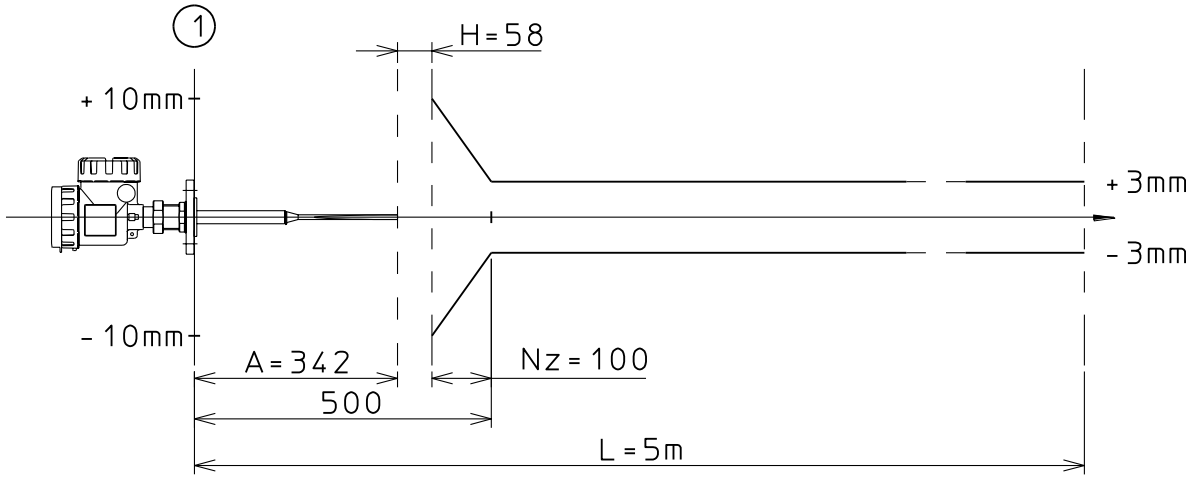


Fig. 10.1.4 Maximum measured error of 4" PTFE sealing antenna



- Fig. 10.1.5 Maximum measured error of 1" rod antenna

NOTE: ①=Reference plane, A=Antenna length, H=Dead zone, Nz=Proximity zone

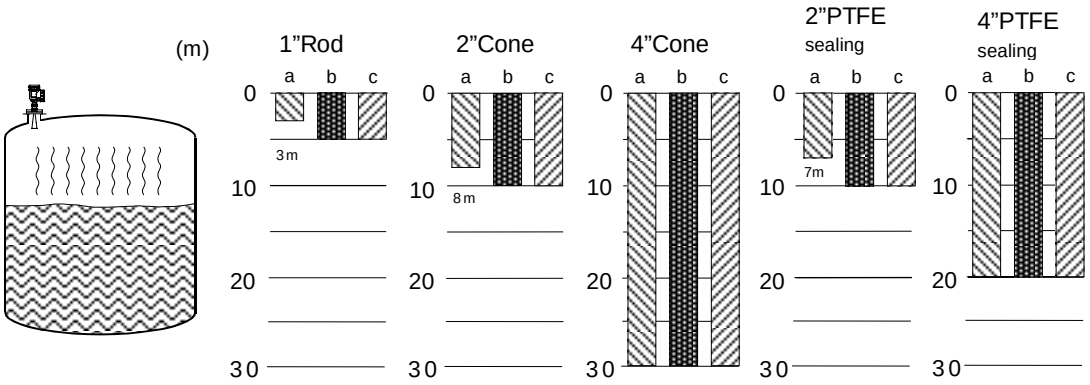


Fig. 10.1.6 Antenna measuring distance of calm surface (reference)

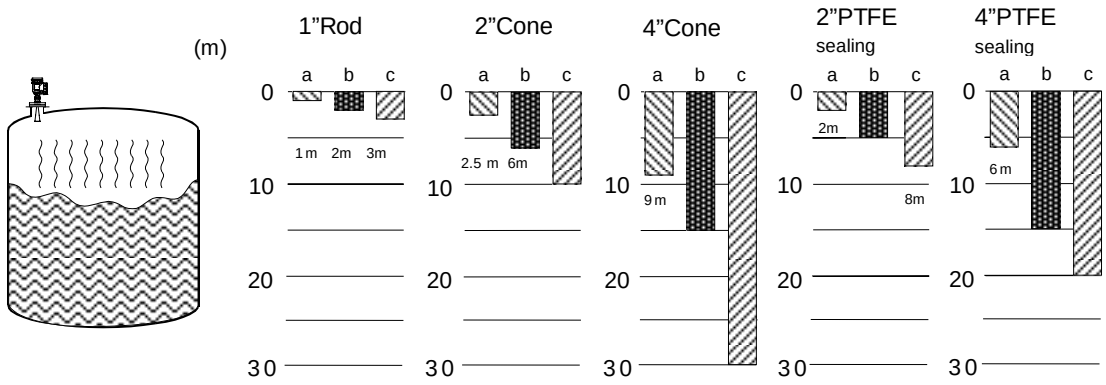


Fig. 10.1.7 Antenna measuring distance of turbulent surface (reference)

a : Oil, Hydraulic carbon, Mainly petroleum industry (ε_r = 1.8 ~ 4.0)

b : Alcohol, Acid (ε_r = 4.0 ~ 10)

c : Water base liquid (ε_r > 10)

NOTE1: In generally, the liquid, which has higher dielectric constant number (= ε_r) such as water, is easily to measure, and calm surface liquid is the same.
NOTE2: On the contrary, low dielectric constant liquid, turbulence surface or forming surface and dirty antenna conditions are relatively difficult to measure.
NOTE3: In the case of measurement the liquid small dielectric constant number or turbulent surface, that case recommend the use of still pipe.

10.2 Transmitter specifications

Table 10.2.1 Transmitter specifications

Microwave	Operating frequency	26GHz	
	Transmitting power	< 5μW	
Power supply	Non-Ex	DC 10.5 to 36V	
	Ex-i	DC 12.0 to 30V	
	Ex-d+i	DC 18.0 to 36V	
Analog output	Current output	4-20mA	
	Resolution	0.4μA	
	Alarm output	Hold, 3.6mA, 22mA	
	Temperature drift	±0.05%FS / 10K (16mA) or ±0.5%FS	
	Response Time	3sec. until statically determinate	
Digital output	HART specification	HART 7	
	Resolution	1mm	
	Fastest output cycle	Every second	
	Repeatability	≤±1mm	
	Temperature drift	less than ±3mm/10K or $10mm_{p-p}$	
Operating and display module (option)	Display	5 digits LCD <Displayed parameters> (Alternative) Level (m or Ft) Distance (m or Ft) Volume (value or %) Flow rate (value or %) Current (mA) Signal strength (dB) Max. volume Max. flow rate Internal temperature (˚C)	
	Method of adjustment	4 keys operation	
Surge immunity	Non-Ex	COM 4kV / Dif 2kV (IEC61000-4-5 level-4)	
	Ex-i	- (30V)	
	Ex-d+i	COM / Dif 250V	
Ambient temperature	Non-Ex (Without display)	-40 to +70 ˚C	
	Non-Ex (With display)	-20 to +70 ˚C	
	Ex-i, Ex-d+i (Without display)	-40 to +60 ˚C	
	Ex-i, Ex-d+i (With display)	-20 to +60 ˚C	
Storage and transport temperature		-40 to +85 ˚C	
Vibration resistance (Resonance Point)		1G at 9 to 200 Hz	
Wiring port	Standard of screw (number of screw holes)	M20 x 1.5 (x 2)	
	Plug and cable gland	Non-Ex	Blind plug[1], cable gland[1]
		Ex-i	Blind plug[1]
		Ex-d+i	Blind plug[1]
	Connection cable outer diameter	Φ7 - 13mm (in case of standard cable gland for Non-Ex)	
	Connection cable core	Stranded wire	0.5 to $2.5mm^2$ (AWG20-12)
		Single wire	0.8 to $2.0mm^2$ (AWG20-12)
Material	Housing	Die-cast aluminum (powder coating)	
	Stainless steel parts	SUS304	
	Seal	VMQ (silicone rubber)	
	Window	Polycarbonate Note: Only with display type	
Structure	Aluminum housing consisting 2 rooms		

Waterproof standard	IP66	
Dimensions	Without display type	180 x 110 x 152 / H x W x L
	With display type	190 x 110 x 152 / H x W x L
Weight	Transmitter head	about 3kg (with LCD module) about 2.9kg (without LCD module)
	2" cone antenna	about 1kg
	4" cone antenna	about 1.4kg
	2" PTFE sealing antenna	about 1.2kg
	4" PTFE sealing antenna	about 2.5kg
	1" rod antenna	about 1kg

NOTE1: Required cable gland and blind plug depends on type of Non-Ex or Ex types (ATEX, IECEx and TIIS).

10.3 Antenna specifications

Table 10.3.1 Cone antenna

Antenna type	Cone	Diameter	·2": (half-power beam width: 18°) ·4": (half-power beam width: 8°)
		Material	SUS316L, PTFE
Operating conditions	Process temperature	-40 to 150 °C NOTE:The maximum temperature of Ex-types is due to temperature class and ambient temperature of explosion proof.	
	Process pressure	-0.1 to 1.5 MPa	
Process fitting	Flange[1)] (JIS B2220, DIN 1092-1, ANSI B16.5 etc)		

1) Option

Table 10.3.2 PTFE sealing antenna

Antenna type	PTFE sealing	Diameter	·2": (half-power beam width: 18°) ·4": (half-power beam width: 8°)
		Material	SUS304, PTFE
Operating conditions	Process temperature	-40 to 200 °C NOTE:The maximum temperature of Ex-types is due to temperature class and ambient temperature of explosion proof.	
	Process pressure	-0.1 to 1.5 MPa	
Process fitting	Flange[1)] (JIS B2220, DIN 1092-1, ANSI B16.5 etc)		

1) Option

Table 10.3.3 Rod antenna

Antenna type	Rod	Diameter	·1": (half-power beam width: 25°)
		Material	SUS304, PTFE(or PFA)
Operating conditions	Process temperature	-40 to 150 °C NOTE:The maximum temperature of Ex-types is due to temperature class and ambient temperature of explosion proof.	
	Process pressure	-0.1 to 1.5 MPa	
Process fitting	Flange[1)] (JIS B2220, DIN 1092-1, ANSI B16.5 etc)		

1) Option

10.4 Digital specifications

Table 10.4.1 HART specifications

Communication protocol	HART protocol
Ver.	7

Table 10.4.2 Accessories Specifications

CD-R	·Configuration software ·User's guide (pdf)

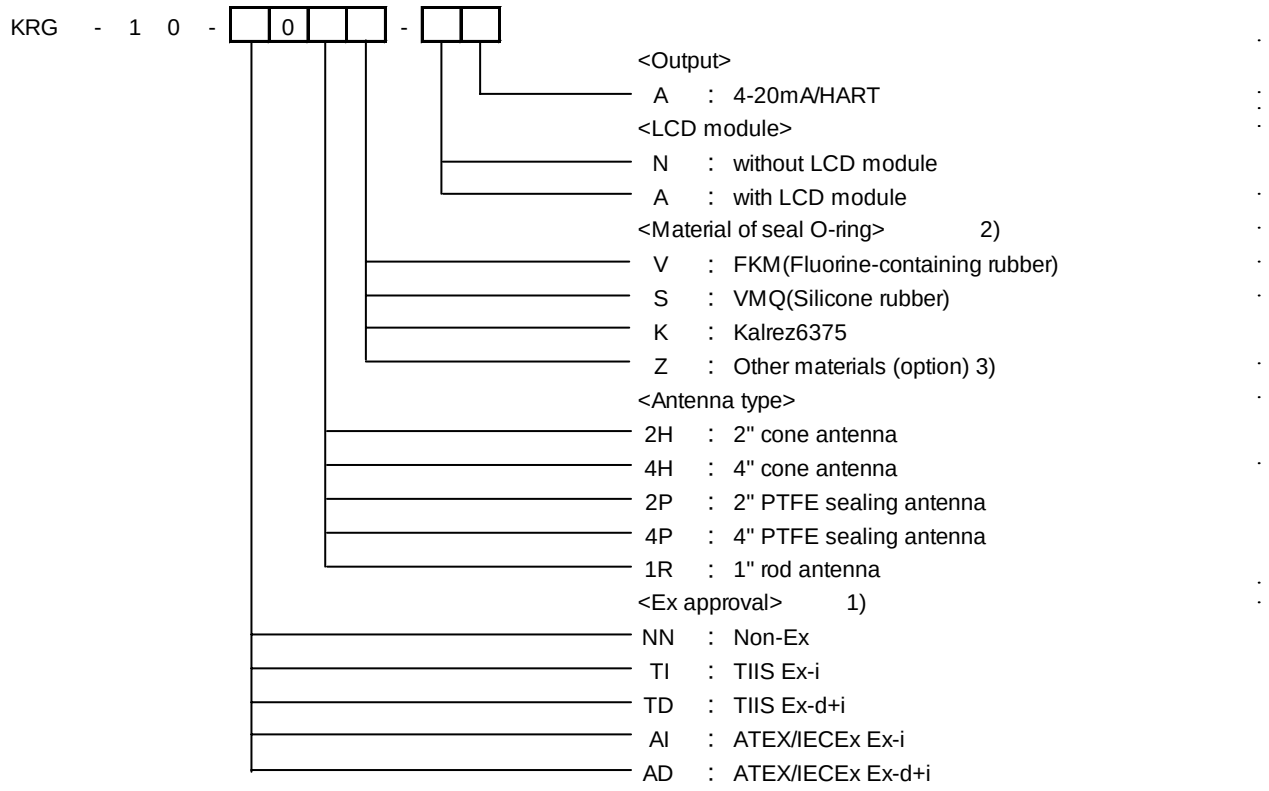
10.5 Function

Table 10.5.1 Function (summary)

Function			Description
Basic action	Distance measurement		Measure distance between liquid surface and reference point
Basic settings	Measurement parameters	G	Set distance between reference point and gauging reference point
		R	Set measuring range
		C	Set distance below zero point of level
		H	Set dead zone
	Measurement unit		Select unit from [m] or [ft]
	Antenna type		Set signal sensitivity automatically according to antenna
	Diameter of pipe		Set diameter of pipe
	Display	Digit number	5-digits
		Value displayed	Select from level, distance, signal strength, current value, volume, flow rate and temperature
		Offset	Set offset of level or distance on display
	Analog output	Parameter	One output from level, distance, signal strength, volume and flow rate
		Alarm selection	Choose one from 3.6mA, 22mA and Hold for echo losing alarm
		Alarm delay	Set delay time from losing surface echo until alarm
		Fixed current output	Output a fixed current for adjustment
Volumetric calculation	Tank geometry	Selection	Select tank geometry from vertical cylinder, horizontal cylinder and spherical tank
		Table of volume	Read data table of volume at each level of liquid. Output volume depending on level of liquid.

Flow rate calculation	Channel shape	Selection	Select channel shape from flume or weir
		Table of flow rate	Read data table of flow rate at each level of liquid. Output flow rate depending on level of liquid.
Calibration	Analog output		Two-point calibration at 4mA and 20mA
	Offset calibration, span calibration		Adjust zero and span
Smoothing	Averaging time		Take the average of measuring values depending on [sec] setting (1 to 120 s)
	Median filter		Smooth output values by median filter
Processing after losing surface echo	Level tracking		Move the valid window depending on liquid level
	Slow search		Expand the valid window if surface echo is Lost
	Zero cut		Fix the valid window if liquid level shall be lower down to this value
	Predict output		Output expected level
	Search		Search surface echo
	Alarm		-
Noise table			Set signal threshold for each measurement distance
Outlier removal	Double bounce handler		Ignore multiple reflected echoes
	Valid window width		Set the valid window width for echo detecting
	Bottom echo handler		Ignore the bottom echo
	Disturbance noise elimination		Ignore the echo from the obstacle by registering it
Temperature correction			Correct echo position and level once a minute or every time
Self-diagnosis			Detect internal failure
Viewing internal temperature of the transmitter			-
Echo list			-
Reset	Reboot		Reboot the device
	Parameter initialization		Initialize all parameters

10.6 Product code



NOTE1: Required cable gland depends on type of explosion proof ATEX, IECEx and TIIS. Each Ex-i & Ex-d+i transmitter head (ATEX and IECEx) should use proper cable gland for explosion proof usage and the attached blind plug.The cable gland for explosion proof shall be prepared as local portion in accordance with safety regulation in each region.And then, The described code of explosion-proof on name plate is different depending on this selection.
NOTE2: If you select the PTFE sealing antenna or the rod antenna, standard material is FKM.
NOTE3: If you need to apply other material for the seal, please consult us.
NOTE4: Flange is an option. Please refer to **Chapter 10.8 Required flange dimensions.**

10.7 Dimensions and material

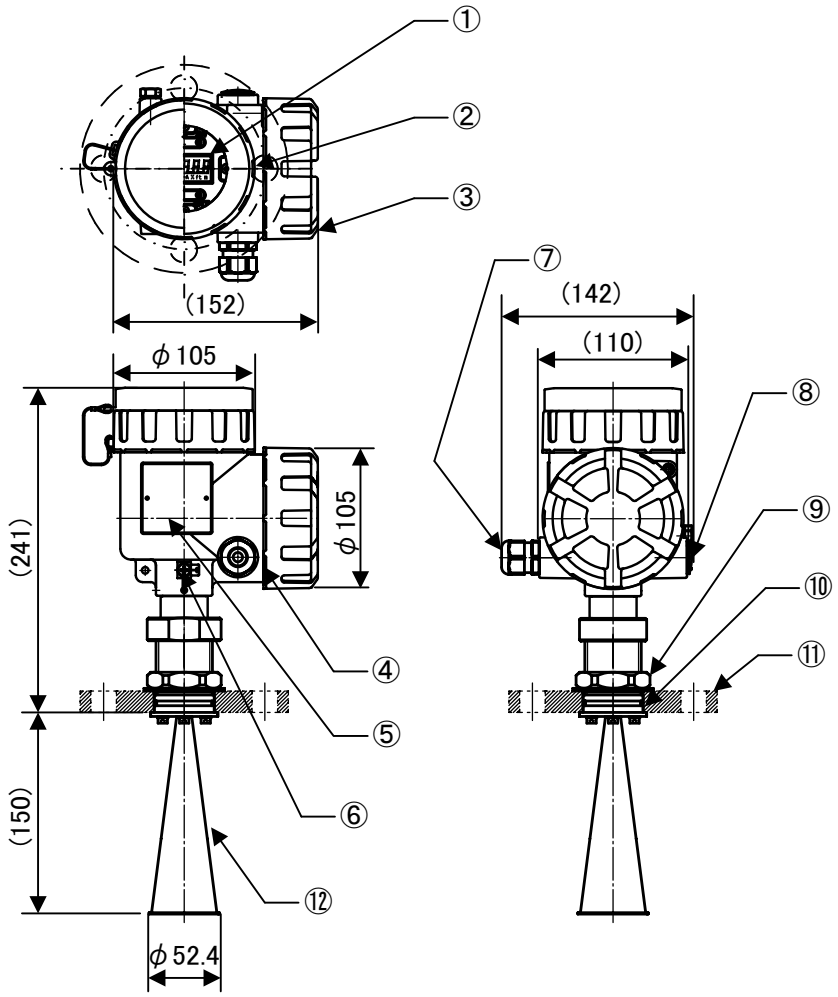


Fig. 10.7.1 KRG-10, 2" cone antenna

1. Window / Polycarbonate
2. Cover (display) / Aluminum
3. Cover (terminal block) / Aluminum
4. Housing / Aluminum
5. Label
6. Ground terminal (M5) / SUS304
7. Cable gland (option)
8. Blind plug
9. Flange lock nut / SUS304
10. O-ring
11. Flange (option)
12. 2" cone antenna / SUS316L

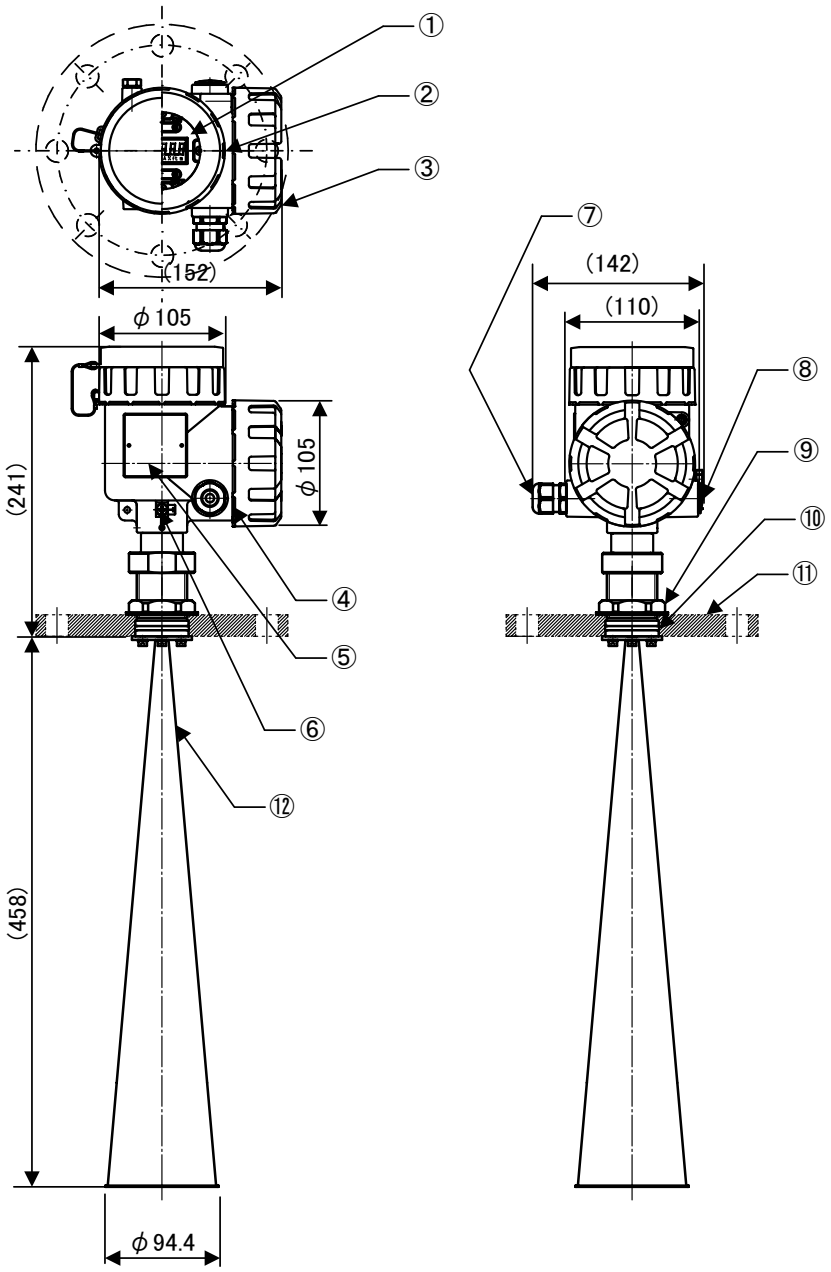


Fig. 10.7.2 KRG-10, 4" cone antenna

1. Window / Polycarbonate
2. Cover (display) / Aluminum
3. Cover (terminal block) / Aluminum
4. Housing / Aluminum
5. Label
6. Ground terminal (M5) / SUS304
7. Cable gland (option)
8. Blind plug
9. Flange lock nut / SUS304
10. O-ring
11. Flange (option)
12. 4" cone antenna / SUS316L

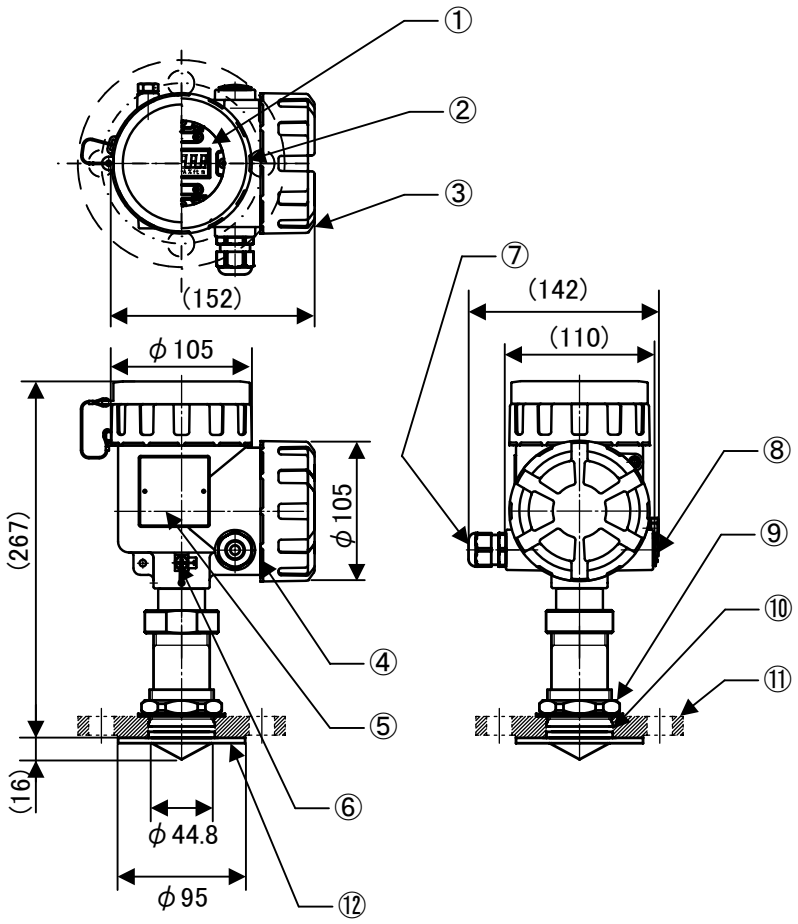


Fig. 10.7.3 KRG-10, 2" PTFE sealing antenna

1. Window / Polycarbonate
2. Cover (display) / Aluminum
3. Cover (terminal block) / Aluminum
4. Housing / Aluminum
5. Label
6. Ground terminal (M5) / SUS304
7. Cable gland (option)
8. Blind plug
9. Flange lock nut / SUS304
10. O-ring
11. Flange (option)
12. 2" PTFE sealing antenna / PTEE

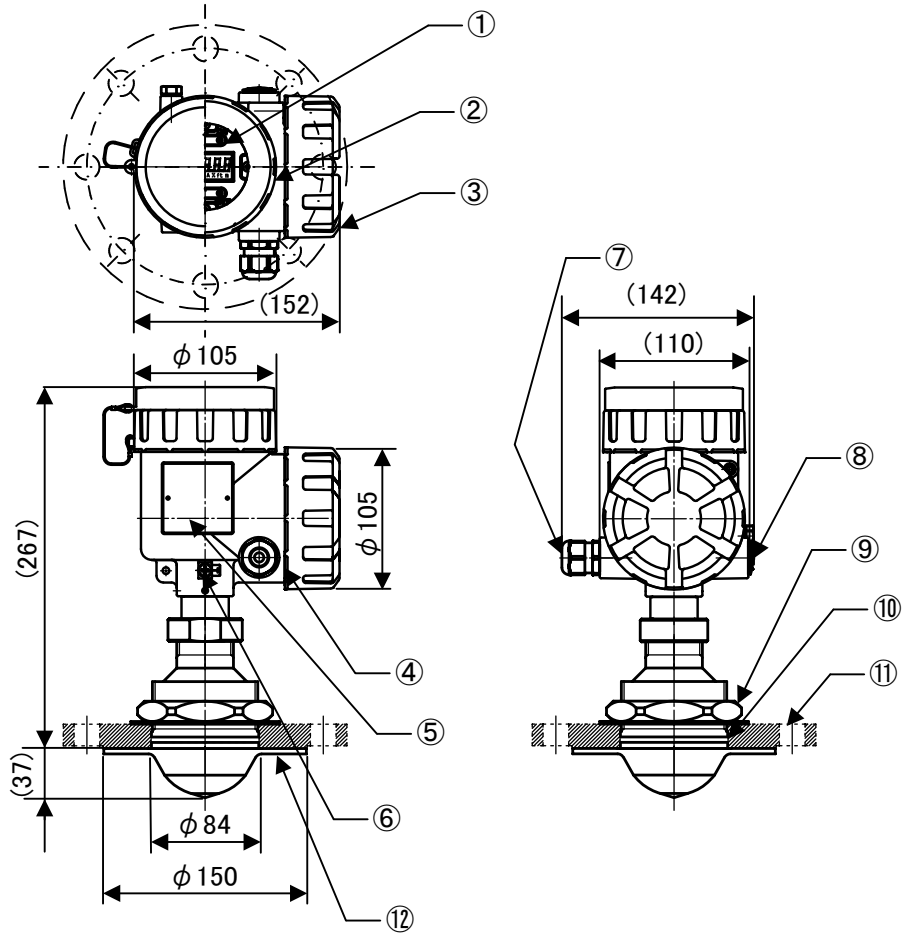


Fig. 10.7.4 KRG-10, 4" PTFE sealing antenna

1. Window / Polycarbonate
2. Cover (display) / Aluminum
3. Cover (terminal block) / Aluminum
4. Housing / Aluminum
5. Label
6. Ground terminal (M5) / SUS304
7. Cable gland (option)
8. Blind plug
9. Flange lock nut / SUS304
10. O-ring
11. Flange (option)
12. 4" PTFE sealing antenna / PTEE

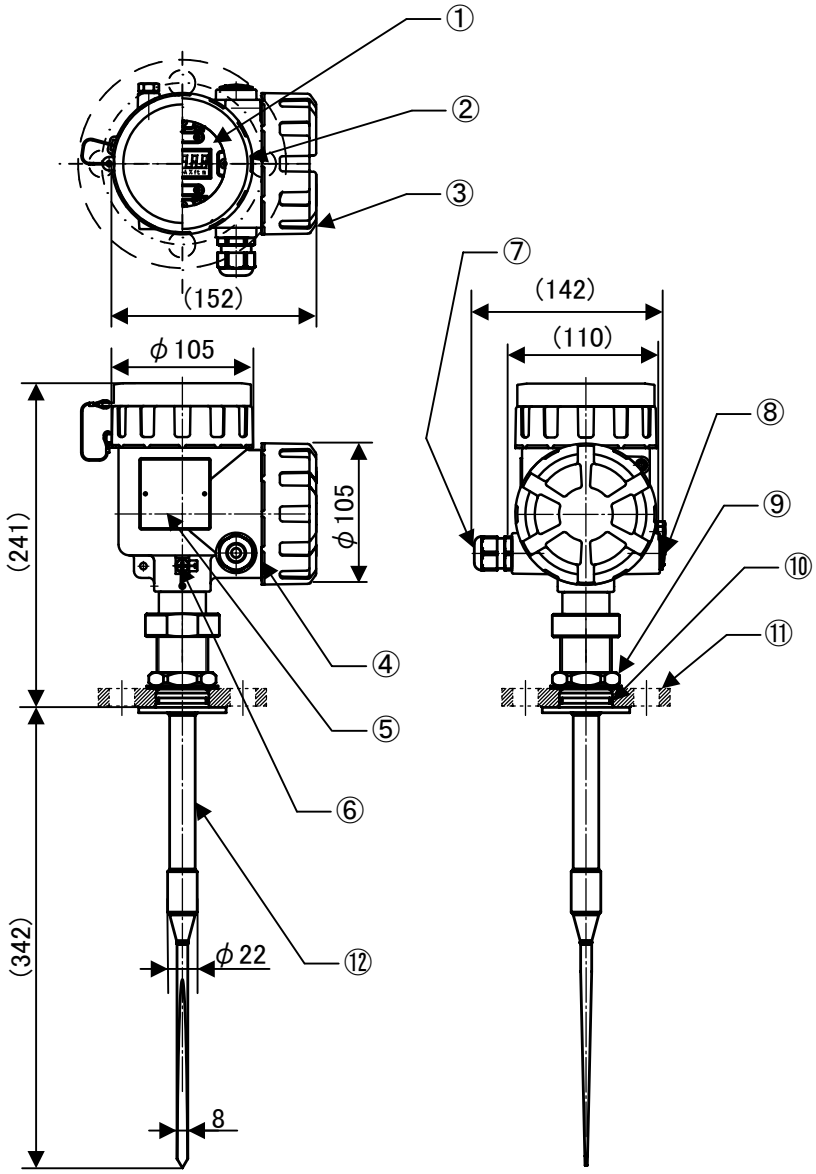


Fig. 10.7.5 KRG-10, 1" rod antenna

1. Window / Polycarbonate
2. Cover (display) / Aluminum
3. Cover (terminal block) / Aluminum
4. Housing / Aluminum
5. Label
6. Ground terminal (M5) / SUS304
7. Cable gland (option)
8. Blind plug
9. Flange lock nut / SUS304
10. O-ring
11. Flange (option)
12. 1" rod antenna / PFA

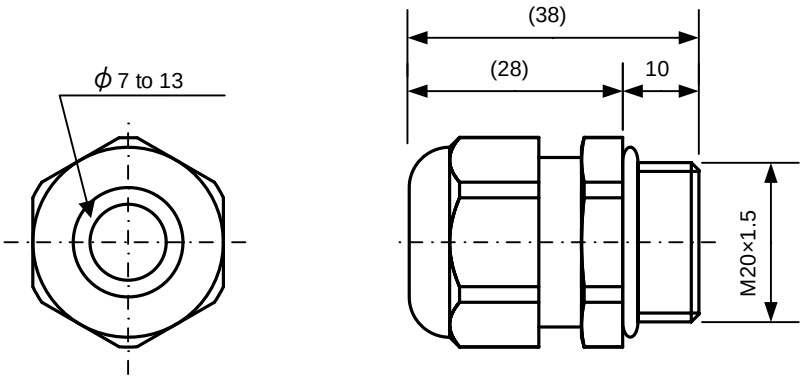
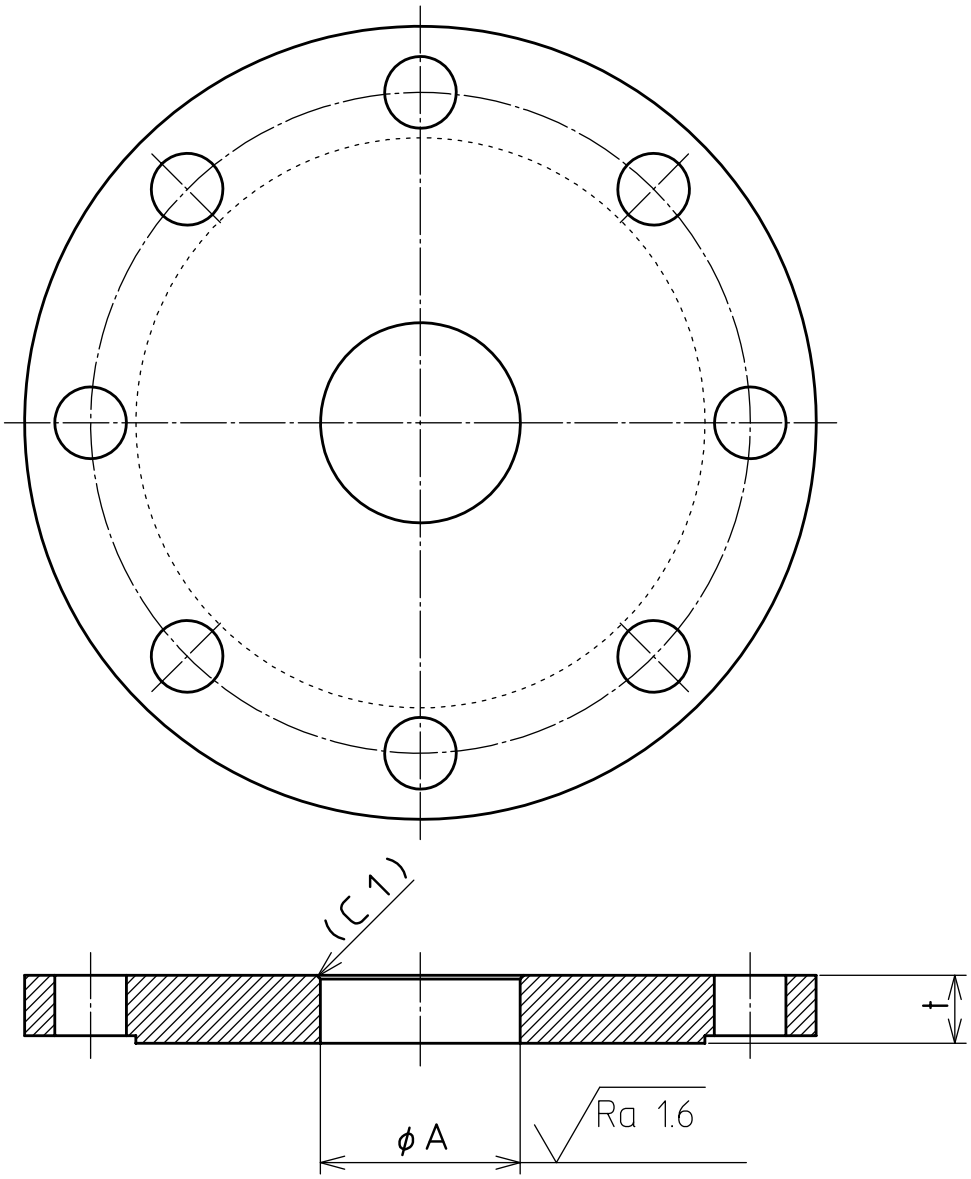


Fig. 10.7.6 Cable gland (Only Non-Ex type)

10.8 Required flange dimensions



Antenna type	ΦA [mm]		t [mm]
		Tolerance	
2" & 4" cone	45	+0.1 0	13 - 35
2" PTFE sealing	50		12 - 25
4" PTFE sealing	80		13 - 35
1" rod	45		10 - 35

Fig. 10.8.1 Required flange dimensions

Chapter 11 Measurement principle

11.1 Measurement principle

KRG-10 takes advantage of the time-of-flight measurement principle with microwave pulses which have central frequency of 26GHz. Placed on the top of tanks, KRG-10 emits microwave pulses toward liquids or pastes in the tank. Microwave pulses reflected from the liquid surface are received by the antenna. The propagation time t is converted into the distance between the transmitter and the liquid surface. Using t and the speed of light c, the distance D is expressed by the following equation.

$D = c \times (t / 2)$ ····· (1)

Using D and the tank height H, the level L is expressed by the following equation.

$L = H - D$ ····· (2)

KRG-10 has a function to remove unwanted echo. By using this function, the user can prevent the erroneous recognition of the reflected wave by unwanted echo. For more information, please refer to **Chapter 5 LCD and 4-Keys operation** and **6 Operation by configuration software**.

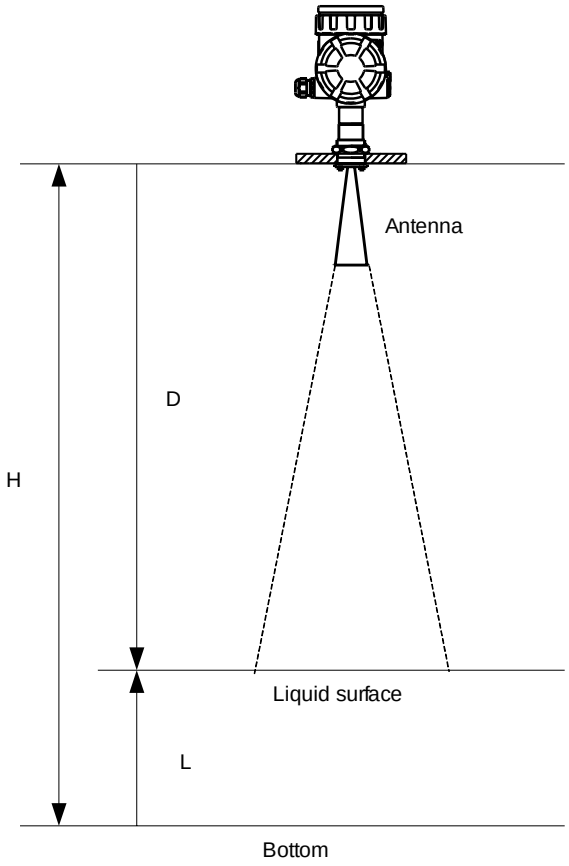


Fig. 11.1.1 Measurement principle

Chapter 12 Trouble shooting

12.1 Tips for solution

When any of trouble concerned with systems happens, please refer to following check points.

Table 12.1.1 Trouble shooting

Trouble	Check Point
No indication on LCD	·Check power line turned on and connected. ·Check LCD connector inserted properly.
Not connectable through HART communicated configuration software	·Check power line turned on and connected. ·Check proper size resistance attached in the line for HART communication. ·Check driver software installed correctly. ·Check correct COM port selected. ·Check correct device number selected. ·Check cable connection.
Parameter setting failure	·Check the value within input-able range. ·Check communication status is OK. In case of communication error, please check connection.
Inaccurate measurement value	·Check input parameter is correct. ·Check measurement status. Left down side dot indication is measuring error (not detected or track proper surface echo).
Analog output does not change	·Check analog lock mode in-activated. ·Check table check mode in-activated. ·Check measurement status. Left down side dot indication is measuring error (not detected or track proper surface echo) ·Check alarm mode in-activated. In case of alarm mode, LCD indication will be flickering.

12.2 Error status

Measuring status can be confirmed by LCD indication. Detail description can be referred on **Chapter 5.4 - [8-3].**
The status can be referred through configuration software as well. Confirmation procedure and detail status description can be referred **Chapter 6.9 Tools** - unexpected state.

12.3 Application errors

When the problem about application happens, please confirm that is shown in the following table and take measures. If the problem does not improve, please contact us.

Table 12.3.1 Application errors

Trouble	Factor	Measure
Measurement value is incorrect.	Settings for the installation is incorrect.	• Please check setting G, R, C, H, the tank shape and so on are correct. (Refer to **6.3 Settings**) • If correction values (the offset value slope) are set, please check that are correct. (Refer to **6.3 Settings**) • Please check the using antenna shape is equal to the configuring antenna shape.
	May have to measure the reflected waves due to noise..	• Please make the appropriate adjustment, refer to the echo curve. (Refer to **6.5 Advanced settings** and **6.7 Echo Viewer**) • There is a possibility of the reflected wave from the antenna contaminations. Please wash of the antenna. • There is a possibility of the reflected wave from the surrounding structure. Please take change oscillation direction or mounting position. (Refer to **2.2 Appropriate location for installation** or **2.7 Tips for stable measurement**) • Please try to set the outlier removal. (Refer to **6.5.2 Outlier Removal**)
	May have to measure the reflected wave by double bounce.	• Please make the appropriate adjustment, refer to the echo curve. (Refer to **6.5 Advanced settings** and **6.7 Echo Viewer**) • Please try to set the outlier removal. (Refer to **6.5.2 Outlier Removal**)
It does not follow the variation of the level.	May have to measure the reflected waves due to noise.	• Please make the appropriate adjustment, refer to the echo curve. (Refer to **6.5 Advanced settings** and **6.7 Echo Viewer**) • There is a possibility of the reflected wave from the antenna contaminations. Please wash of the antenna. • Please try to set the outlier removal. (Refer to **6.5.2 Outlier Removal**)

If the liquid surface is rough, measurement value shows a high value instantaneous.	Since the microwave signal is weakened temporarily for the rough surface, noise reflection becomes stronger.	• Please make the appropriate adjustment, refer to the echo curve. (Refer to **6.5 Advanced settings** and **6.7 Echo Viewer**) • Please optimize the mounting position and oscillation direction. (**2.2 Appropriate location for installation**) • Please change to a large size antenna. (Because of a large antenna in a high sensitivity, tend to noise is small relative to the microwave signal.) • Please try to set the outlier removal. (Refer to **6.5.2 Outlier Removal**)
Measurement indicates a low value momentarily.	May have to measure the reflected waves due to noise.	• There is a possibility of the reflected wave from the surrounding structure. Please take change oscillation direction or mounting position. (Refer to **2.2 Appropriate location for installation** or **2.7 Tips for stable measurement**) • There is a possibility of measuring the short-range noise. Please try widening the dead band or the setting of the outlier removal and so on. (Refer to **6.5 Advanced settings** and **6.7 Echo Viewer**)

Note / Notes

Note / Notes



VALCOM®
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a TERRANOVA® Srl brand - www.terranova-instruments.com -
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Ph: +39 0377 919119 – Fax: +39 0377 855720

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

SPARE PART INDEX REGISTER

Document Number: 1724000979-COM-LIS-00011

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1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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Sign	Date
V. Barratta	15-07-2024

s: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
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00	07/06/2024	Issue for Review (IFR)	MZ	GA	GO

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G. Luca Vergazzoli
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Inspector
RMC

CROSSWIND
05/08/24

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1724000979-QC-DB-00006_03

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SPARE PARTS LIST

CROSSWIND

Document Title	SPARE PART INDEX REGISTER					
The document relates to	HOLLANDSE KUST NOORD WIND PARK Project - Base Load Power Hub (BLPH)					Contract: CW-I-WP4-2023-05
Project ID	123A90	Doc. n°	1724000979-COM-LIS-00011	Rev. Issued for Review (IFR)	Rev. Date: 28-Jun-24	Status: IFR / Class: 2

The equipment consists of the following units/components

Supplier: TERRANOVA SRL	PO Number: 1721002632	PO description: Pressure, Temperature And Diff. Pressure Level Transmitters	Contact name: MR. GIORGIO DOSIO
Address: VIA GRAMSCI 1 TERRANGVA DEI PASSERINI, LO ITALY		Supplier telephone no: +39 0377 911066	Contact mobile no: N/A
		E-mail: SALES@TERRANOVA-FOXTWIN.COM	WEBSITE: WWW.TERRANOVA-INSTRUMENTS.COM
General Information:			

1	2	3	4	5	6	Item Number	Total number of identical spares installed	MATERIALS DATA: Description of recommended spare parts	Parts/drawing ref.: Project Datasheet no.	Project Detail dwg. no.	Item ref.	Material	Container Type (if applicable)	Container Reference (if applicable)	Shelf life (years)	Weight (net)	Weight (gross)	Volume	HS Code	ECCN Code	% US Content	Country of origin	Supplier part no.	Manufacturer part no.	Manufacturer name	Commissioning spares: Quantity ordered	2 Years spares: Quantity ordered	Remarks
Tag no.	Tag description	Manufacturer model/type no.	Manufacturer serial no.	No. of units	Quantity of parts FITTED / INSTALLED per unit/component	7		8	9	10	11	12	19	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
43-11 001 / 43-11 003	SST778 PRESSURE/DIFFERENTIAL PRESSURE TRANSMITTER	SST778-M-5-2-1-A-0-0-0-4 + MANS 01		2	2	1	30	SET OF GASKETS AND LCD DISPLAY	1724000979-IN-DS-00004	1724000979-IN-DA-00003	-	-	-	-	-	-	-	-	-	-	-	IT	-	-	TERRANOVA SRL	2	4	-
25-PT-001 / 25-PT-002 / 25-PT-004 / 25-PT-005 / 25-PT-006 / 25-PT-007 / 25-PT-008 / 25-PT-009 / 25-PT-010 / 25-PT-011 / 043 / 25-PT-012 / 25-PT-044 / 25-PT-012 / 25-PT-045	SST776 PRESS./DIFF. TRANSMITTERS	SST776-M-7-L-2-5-3-1-A + MANS R6		14	14																							
25-PT-015A / 25-PT-0158	SST776 PRESS./DIFF. TRANSMITTERS	SST776-M-7-L-2-5-3-1-A + MANS R6		2	2																							
43-PT-001	SST776 PRESS./DIFF. TRANSMITTERS	SST776-M-7-L-2-5-3-1-A + MANS R6		1	1																							
50-PT-014 / 50-PT-015 / 43-PT-004 / 44-PT-001A / 44-PT-001B / 44-PT-002 / 44-PT-003	SST776 PRESS./DIFF. TRANSMITTERS	SST776-M-7-L-2-C-2-1-A + MANS R6		7	7																							
50-TT-001 / 50-TT-002	SST772 TEMPERATURE TRANSMITTERS	SST772 TH-1-C-5-1-B-4-3 + MR1		2	2																							
50-PT-001 / 50-TT-002	SST776 PRESS./DIFF. TRANSMITTERS	SST776-M-7-L-2-5-3-1-A + 2E-A03 + QA-7-03		2	2																							
-	XRG RADAR LEVEL TRANSMITTER	KRG-E-P3-NG1-N-L-D68-FT+ NOVA-D-V-01-A-R2-26		1	-																							

Prepared by: G. Luca Vergazzoli (W / R) Inspector	Approved by: CROSSWINDS C/W	Approved by: TERRANOVA SPRIANO .com MEC-RELA

SPIR_FORM_Filled

LIST OF SPARE PARTS:

Commissioning Spare Parts:
No. 2 Set of gaskets and LCD Display

Two Years Spare Parts:
No. 4 Set of gaskets and LCD Display

Terranova dei Passerini, 05/08/2024

G. Luca Vergazzoli
W R
Inspector

× Crosimini
R/W

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

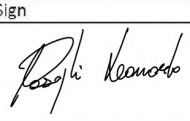
PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES

Document Number: 1724000979-QC-PRO-00012

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INDEX:

Page No.	Description
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4	2 Packing
5	3 Marking
6	4 Inspection
6	5 Packing Number
7	6 Packing Style
7	7 Packing List Format

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1 GENERAL

This procedure covers the requirements of packing, marking and long-term Preservation for the instrumentation destined to the project "Hollandse Kust Noord Wind Park Project".

2 PACKING

2.1 All equipment & materials shall be protected, packed & marked to suit the mode of transportation, & the worst climatic conditions, which may be encountered. Equipment shall be protected to withstand at least 12 months storage at the plant site of which temperature is not exceeding 60°C prior to installation.

2.2 All materials shall be dry, clean and free from all defect and painted prior to packing.

2.3 All threaded areas and test holes shall be adequately greased and protected with gum tape.

2.4 Flanged openings shall be covered with plates or caps, attached with at least one fourth of all bolts (minimum 4 bolts) or with water resistant tape. For metal covers, rubber gasket shall be used between the flange face and the cover.

2.5 Small loose parts, tools, etc… shall be packed in separate boxes inside the main package.

2.6 Due to climatically extremes encountered during transportation (extreme heat, high humidity and fine drifting sand) and the complex transport operation (truck, sea or air), it is essential that protection and packing is of the highest standard. Terranova® will ensure that material will be adequately protected during the total transport operation from factory to Job-Site including time storage on site. The protection will be effective for a 12 months period after delivery on Job-Site.

2.7 High quality wooden cases and/or crates will be used and constructed of top-quality softwood or rigid plywood and be solid and robust. Ends should be screwed or nailed in a manner where no sharp pieces are exposed. Under no circumstances will fiberboard, cardboard or similar cartons be used as outside packing

2.8 All items of fragile nature will be suitably packed with special precaution against risk of breakage. Where material is encased or otherwise completely enclosed, Terranova® will use suitable inter packing, protection and wrapping of any items subject to damage from moisture and/or corrosion.

2.9 Hay, straw or similar vegetable fibers subject to disease or fungus shall not be used in packing.

2.10 All heavy equipment shall be securely fastened to the bottom of the case with coach bolts and wing nuts and shall be blocked and braced to prevent movement. All exposed ends and open flanges shall be protected and covered against damage, using caps sealed with waterproof tape and blanks bolted over each flange face using a suitable gasket material to ensure a watertight joint. Large equipment, which does not require to be completely enclosed by packing, shall be palletized or skidded.

2.11 Cases weighing more than 150 KGs will have raised skid platform or pallet base, to permit sling or forklift truck handling.

2.12 All piping fittings and flanges 4" and below are to be packed in cases in accordance with Paragraph 2.7. For items above 4", these may be fixed securely to pallet base and enclosed with an open boarded crate for protection.

2.13 Vendor shall not consolidate any two or more orders in any one package before prior agreement with CONTRACTOR' s Shipping coordinator.

2.14 All hazardous material must be prepared in adherence to the detailed requirements relating to packing, marking and labeling set out in the most recent report of the Board's Standard Advisory

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Committee on the Carriage of Dangerous Goods in ships (The Blue Book), for sea freight and the restricted articles regulations, laid down by the International Air Transport Association, for airfreight.

2.15 Two packing lists detailing actual contents and listing of all rust prevention agents removal solutions, should be enclosed in each package. A master list detailing all packages, listing Purchase Order and Item Nos. for each item listed in the complete consignment should be included in package number 1.

2.16 The preparation for export shipping (including packing) may be subjected to inspection by CONTRACTOR or appointed representative at Vendor's workshop prior to shipment, and at dockside prior to loading aboard ship. Inspection shall not relieve Vendor of any responsibilities or obligations under the terms and conditions of the Purchase Order.

2.17 All spare parts (such as capital, pre-commissioning or commissioning spares or two years operational spares) when available at time of shipment of main equipment, must be either packed and clearly marked and included in main packing case attached to base boards, or, if size and dimensions deem separate shipment then shall be properly protected for short term storage in accordance with relevant Purchase Order Specification and then packed in accordance with Paragraphs 2.7 or 2.8 (above).

3 MARKING

3.1 Stamp on two sides and one end in clear characters (where case size permits, otherwise use optimum size for each package dimension) the marks set out in Paragraph 3.9 (if goods are to be shipped in shipping line containers, then marking may be stencilled on one end only. However, packages must be stowed in a manner, which exposes these marks).

3.2 Packages containing fragile articles must be packed with special precaution against risk of breakage. Such containers must be stencilled "Fragile Handle with Care". This marking must be in English. Where cases are not to be overturned Vendor must show on the cases clear and readily visible identification to ensure they are kept in the correct position.

3.3 Packages/equipment of five tons or more must be marked with slinging points and also clearly show on all sides the centre of gravity. This is of paramount importance for Pressure Vessels and Heat Exchangers.

3.4 For hazardous/dangerous or restricted material, mark as specified by relevant regulations as per Paragraph 2.14 of Packing Instructions.

3.5 All spare orders must be clearly marked as spares and shall not be simply included unmarked with main equipment (See Art. 2.17 above).

3.6 Metal tags or labels must be stamped or indelibly marked with full shipping marks and must be securely attached using 6 twists of stainless steel wire to all loose bundles or uncrated items, alternatively marking boards can be securely strapped to bundles.

3.7 Each package and contents must clearly show the country of origin of GOODS.

3.8 Number of packages will be consecutive as per following nomenclature:

SPR (Abbreviated Vendor's Name) – **001 of XXX** (Serial Number for package)

Abbreviated Vendor's name will be used after confirmation from contractor. The first number being that of the order in the batch, then after oblique, the last number being the total in the batch. For example, for a batch of 100 package: First package no.: 001 of 100 & Last package no.: 100 of 100.

3.9 All materials must also bear the following shipping information:

- **GROSS WEIGHT** Kg
- **NET WEIGHT** Kg
- **PACKAGE / BOX** Nos.
- **DIMENSIONS OF PACKAGE / BOX (L x W x H)** Cm
- **TOTAL VOLUME** m^3
- **PACKAGE STACKABLE** YES / NO

The following International Standard Symbols must be used:



- "HANDLE WITH CARE";
- "KEEP DRY";
- "RIGHT SIDE UP".

All boxes and crates shall also be marked with the appropriate international standard symbols for handling (if present).

3.10 Marking Tags will be performed through 1 nameplate securely fastened to the instrument with permanent fixing tools. For nameplates format, please refer to the Operating manual – Marking section.

4 INSPECTION

If scheduled in the ITP, all packing & crates shall be subjected to inspection of company inspector of the third part inspection agent for their approval or certification prior to their shipment to the plant site. The manufacturer shall submit to the company the copy of packing list & schedule of inspection. The packing inspection will be confirmed by contractor in due time. It shall take place at supplier's designated premises, as per the following procedure:

- cases and/or crates shall be left open.
- packing lists and packing notes to be handed over to entitled inspector.
  - for marking control.
  - for compliance examination of cases contents.

5 PACKING NUMBER

The package number of each CARGO shall consist of consecutive number shown as below mentioned. Total number of packages shall be indicated in each package.

Example: Package **No.001** (Serial Number of outer Box) **of XXX** (Total Number of packages)

6 PACKING STYLE

Unless being impossible, impractical or interfering prefabrication, the package shall not exceed the following dimension and weight:

- Gross Weight: 24.0 Tons
- Length: 12.0 Meters
- Width: 2.5 Meters
- Height: 2.5 Meters

7 PACKING LIST FORMAT

A separate packing list will be issued for each package. For packing list format, see example below:

ROSETTI MARINO SPA

CLIENT: CROSSWIND

PACKING-LIST REF: PO NUMBER - VENDOR NAME -122A10 JOB No.: 123A90 CROSSWIND BLPH
DATE: XX/XX/2023

DATE OF TRANSPORT:	NA	CONTAINER TARE	NA	KG
KIND OF TRANSPORT:	NA	CONTAINER TYPE/NUMBER/SEAL N.	NA	
TRUCK PLATE NUMER:	NA	TOTAL NET WEIGHT	0,00	KG
TERMS OF DELIVERY:		TOTAL GROSS WEIGHT	0,00	KG
		TOTAL PACKAGES	0,00	PC
		TOTAL VALUE	0,00	EUR

SHIPPER: VENDOR BUSINESS ADDRESS

CONSIGNEE: ROSETTI MARINO SPA
VIA TRIESTE 230
48122 RAVENNA
ITALY

NOTIFY: ROSETTI MARINO SPA
VIA TRIESTE 230
48122 RAVENNA
ITALY
KAO SONIA PAZZI/AURELIO PENSERINO
MAIL: LOGISTIC@ROSETTI.IT
PHONE: +39 0544878075

DELIVERY ADDRESS: ROSETTI MARINO SPA
VIA DEL MARCHESATO 37
48023 MARINA DI RAVENNA
ITALY

ITEM	KIND AND NUMBER OF PACKAGE	PACKAGE DIMENSION [MM]			PO REF.	PO ITEM	MATERIAL DESCRIPTION	Q.TY [PC]	METER	TAG No.	CODE NUMBER	HEAT	UNIT WEIGHT [KG/PZ]	TOTAL NET WEIGHT [KG]	TOTAL GROSS WEIGHT [KG]	UNIT PRICE EURO	TOTAL PRICE EURO	COUNTRY OF ORIGIN	HS CODE
		LENGTH	WIDTH	HEIGHT															
1														0,00		0,00	0,00		
2														0,00		0,00	0,00		
3														0,00		0,00	0,00		
4														0,00		0,00	0,00		
5														0,00		0,00	0,00		
6														0,00		0,00	0,00		
7														0,00		0,00	0,00		
8														0,00		0,00	0,00		
9														0,00		0,00	0,00		
10														0,00		0,00	0,00		
11														0,00		0,00	0,00		
12														0,00		0,00	0,00		
13														0,00		0,00	0,00		
14														0,00		0,00	0,00		
15														0,00		0,00	0,00		
16														0,00		0,00	0,00		
17														0,00		0,00	0,00		
18														0,00		0,00	0,00		
19														0,00		0,00	0,00		
20														0,00		0,00	0,00		
TOTAL PACKAGES				0				0	0,00				TOTAL WEIGHT KG:	0,00	0,00	EUR	0,00		
COST OF TRANSPORT																EUR			
TOTAL VALUE																EUR	0,00		

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

INSTRUMENT DATA SHEETS

Document Number: 1724000979-IN-DS-00004

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00	03/06/2024	Issue for Review (IFR)	MZ	GA	GO

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INDEX:

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6	Datasheet for PT
32	Datasheet for TT
34	Datasheet for Radar
36	Attachment: Wake Frequencies Calculation for Thermowells

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GENERAL	1	Tag Number						43-LT-001		
	2	Service						HYDROGEN VENT KO DRUM (V-43001)		
	3	P&ID Number						123A90-DDL-PR-PID-80029		
	4	Equipment Number		Line Number				V-43001	-	
	5	Area Classification						ATEX Zone2 - IIC (IIB+H2) T1		
	6	Mounting						REMOTE		
PROCESS CONDITIONS	7	Fluid		State				WATER	LIQUID	
	8	Pressure	Unit	Min.	Oper.	Max.			Atm (op.)	
	9	Temperature	Unit	Min.	Oper.	Max.			Amb. (op)	
	10	Design Pressure		Min.		Max.		3.5 barg		
	11	Design Temperature		Min.		Max.		-10 / + 80 °C		
	12	Lower Oper. S.G.		Lower Oper. Visc.				1	1 cP	
	13	Vacuum		Over Pressure				-		
	14	Ambient Temperature						Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.		
TRANSMITTER	15	Application						LEVEL MEASUREMENT		
	16	Type						Diaphragm		
	17	ATEX Certification		Ingress Protection				ATEX Ex II 2G Ex db IIC T5	IP66	
	18	Housing		Paint				SS AISI 316/316L	N/A	
	19	Power Supply						24 Vdc		
	20	Process Connection		Electrical Connection				2 x 1/4" NPT-F	2 x M20x1.5	
	21	Accuracy						0.07% of Nominal Range		
	22	Max. Static Pressure		Element Material				100 bar	SS AISI 316/316L Gold Plated	
	23	Fill Fluid						Dow Corning Siliconic Oil		
	24	Instrument Range		Min.		Max.		0 mbar	350 mbar	
	25	Calibration Range		Min.		Max.		0 mmH_2O	560 mmH_2O	
	26	Elevation		Suppression				-	-	
	27	Allow. Oper. Pressure		Allow. Oper. Temp.				Static Pressure 100 bar	85 °C	
	28	SIL Certification		PED Certification				-	Required	
DIAPHRAGM SEAL	29	Process Conn. & Rating		Diaphragm Material				-	-	
	30	Capillary Material		Fill Fluid				-	-	
	31	Housing Material		Allow.Oper.Temp.				-	-	
COMMUNICATION AND SOFTWARE	32	Communication Type		Signal Type				HART 6	4-20mA Loop Powered 24 Vdc	
	33	DD Revision		CFF Revision				-	-	
	34	Hart Descriptor		Hart Tag				-	-	
	35	Internal Diagnostics		Capacitance				-	-	
	36	Segment		Device Address				-	-	
	37	Device Class		Simulate				-	-	
	38	Nominal Current		Operating Voltage				-	-	
OPTIONS	39	Manifold Supplied		Manifold Rating				Required (5-valves)	6000 psi	
	40	Process Connection		Manifold Model				1/2" NPT-F	MAN5-D1	
	41	Integral Meter		Scale				Required	-	
	42	Lightning Protection		Hydrostatic Testing				-	Required	
	43	Mounting Brackets						Required		
	44	Barrier - Manufacturer / Model						-		
PURCHASE	45	Manufacturer						TERRANOVA SRL		
	46	Model						SST77B-H-9-D-2-3-0-0-4 + MAN5-D1		
	47	Purchase Order Number						4718_OS		

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GENERAL	1	Tag Number						43-LT-003			
	2	Service						HYDROGEN VENT (Q-43004)			
	3	P&ID Number						123A90-DDL-PR-PID-80029			
	4	Equipment Number		Line Number				Q-43004		-	
	5	Area Classification						ATEX Zone2 - IIC (IIB+H2) T1			
	6	Mounting						REMOTE			
PROCESS CONDITIONS	7	Fluid		State				Mono Ethylene Glyco (50%vol) + water		LIQUID	
	8	Pressure	Unit	Min.	Oper.	Max.				Atm (op.)	
	9	Temperature	Unit	Min.	Oper.	Max.				Amb. (op)	
	10	Design Pressure		Min.		Max.		3.5 barg			
	11	Design Temperature		Min.		Max.		-10 / + 80 °C			
	12	Lower Oper. S.G.		Lower Oper. Visc.				1.063		1 - 2 cP	
	13	Vacuum		Over Pressure				-			
	14	Ambient Temperature						Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.			
TRANSMITTER	15	Application						LEVEL MEASUREMENT			
	16	Type						Diaphragm			
	17	ATEX Certification		Ingress Protection				ATEX Ex II 2G Ex db IIC T5		IP66	
	18	Housing		Paint				SS AISI 316/316L		N/A	
	19	Power Supply						24 Vdc			
	20	Process Connection		Electrical Connection				2 x 1/4" NPT-F		2 x M20x1.5	
	21	Accuracy						0.07% of Nominal Range			
	22	Max. Static Pressure		Element Material				100 bar		SS AISI 316/316L Gold Plated	
	23	Wetted O - Ring Material		Fill Fluid				Dow Corning Siliconic Oil			
	24	Instrument Range		Min.		0 mbar		0 mbar		350 mbar	
	25	Calibration Range		Min.		0		0 mmH_2O		1000 mmH_2O	
	26	Elevation		Suppression				-		-	
	27	Allow.Oper. Pressure		Allow.Oper.Temp.				Static Pressure 100 bar		85 °C	
	28	SIL Certification		PED Certification				-		Required	
DIAPHRAGM SEAL	29	Process Conn. & Rating		Diaphragm Material				-		-	
	30	Capillary Material		Fill Fluid				-		-	
	31	Housing Material		Allow.Oper.Temp.				-		-	
COMMUNICATION AND SOFTWARE	32	Communication Type		Signal Type				HART 6		4-20mA Loop Powered 24 Vdc	
	33	D D Revision		CFF Revision				-		-	
	34	Hart Descriptor		Hart Tag				-		-	
	35	Internal Diagnostics		Capacitance				-		-	
	36	Segment		Device Address				-		-	
	37	Device Class		Simulate				-		-	
	38	Nominal Current		Operating Voltage				-		-	
OPTIONS	39	Manifold Supplied		Manifold Rating				Required (5-valves)		6000 psi	
	40	Process Connection		Manifold Model				1/2" NPT-F		MAN5-D1	
	41	Integral Meter		Scale				Required		-	
	42	Lightning Protection		Hydrostatic Testing				-		Required	
	43	Mounting Brackets						Required			
	44	Barrier - Manufacturer / Model						-			
PURCHASE	45	Manufacturer						TERRANOVA SRL			
	46	Model						SST77B-H-9-D-2-3-0-0-4 + MAN5-D1			
	47	Purchase Order Number						4718_OS			

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GENERAL	1	Tag Number		25-PT-001	
	2	Service		H2 FROM ELECTR. (A-20000) TO H2 STORAGE VESSELS	
	3	P&ID Number	Location	123A90-DDL-PR-PID-80013	1"-HY-007-03HSS-N
	4	Function		PRESSURE MEASUREMENT	
	5	Mounting		DIRECT ON-LINE	
	6	Area Classification		ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature		Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid		HYDROGEN	
	9	Pressure Des.	Oper. [barg]	40	4(Min.) / 30(Max)
	10	Temperature Des.	Oper. [°C]	-10 / + 80 °C	5(Min.) / 65(Max.)
	11	Oper. Spec. Gravity	Oper. Viscosity	-	-
	12	Flow Rate	Allowable Temp.	-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]	0	100
	14	Calibration Range Min.	Max. [barg]	0	40
	15	Elevation	Suppression	-	-
	16	Element Type		Diaphragm	
	17	Element Material		SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating	SS AISI 316/316L	200 bar
	19	Process Connection		1/2" NPT-M	
	20	Wetted O-Rings Material		-	
	21	Fill Fluid		-	
	22	Bolts	Housing	Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint		N/A	
	24	ATEX Certification	Ingress Protection	ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection	1/2" NPT-M	2 X M20X1.5
	26	Accuracy		0.07% of Nominal Range	
	27	SIL Certification	PED Certification	-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating		-	
	29	Diaphragm Material	Housing Material	-	-
	30	Fill Fluid	Capillary Material	-	-
	31	Capillary Type	Capillary Length	-	-
	32	Flushing Connection		-	
OPTIONS	33	Integral Meter	Scale	Required	-
	34	Hydrostatic Testing	Cleaning	Required	-
	35	Mounting Brackets	Manifold Model No	Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model	-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type	HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision	-	-
	39	Device Tag	Hart Tag	-	-
	40	Internal Diagnostics	Capacitance	-	-
	41	Segment	Device Address	-	-
	42	Device Class	Simulate	-	-
	43	Nominal Current	Operating Voltage	-	-
PURCHASE	44	Manufacturer		TERRANOVA SRL	
	45	Model		SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number		4718_OS	

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GENERAL	1	Tag Number			25-PT-002	
	2	Service			H2 FROM ELECTR. (A-20000) TO H2 STORAGE VESSELS	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80013	1"-HY-007-03HSS-N
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	4(Min.) / 30(Max)
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	5(Min.) / 65(Max.)
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-004	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001A)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80015	V-25001A
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-035	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001A)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80015	V-25001A
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-006	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001B)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80016	V-25001B
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-037	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001B)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80016	V-25001B
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-008	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001C)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80017	V-25001C
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-040	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001C)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80017	V-25001C
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-009	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001D)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80018	V-25001D
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-043	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001D)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80018	V-25001D
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-011	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001E)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80019	V-25001E
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-046	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001E)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80019	V-25001E
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-012	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001F)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80020	V-25001F
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			25-PT-049	
	2	Service			HYDROGEN STORAGE VESSEL (V-25001F)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80020	V-25001F
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	40	30
	10	Temperature Des.	Oper.	[°C]	-10 / + 80 °C	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	100
	14	Calibration Range Min.	Max.	[barg]	0	40
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	200 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-L-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number		25-PT-055A	
	2	Service		HYDROGEN FROM STORAGE VESSEL HEADER TO FUEL CELL (A-80000)	
	3	P&ID Number	Location	123A90-DDL-PR-PID-80014	2"-HY-023-01HSS-N
	4	Function		PRESSURE MEASUREMENT	
	5	Mounting		DIRECT ON-LINE	
	6	Area Classification		ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature		Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid		HYDROGEN	
	9	Pressure Des.	Oper. [barg]	10	4(Min.) / 6.5(Max)
	10	Temperature Des.	Oper. [°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity	-	-
	12	Flow Rate	Allowable Temp.	-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]	0	30
	14	Calibration Range Min.	Max. [barg]	0	10
	15	Elevation	Suppression	-	-
	16	Element Type		Diaphragm	
	17	Element Material		SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating	AISI 316 SS	150 bar
	19	Process Connection		1/2" NPT-M	
	20	Wetted O-Rings Material		-	
	21	Fill Fluid		-	
	22	Bolts	Housing	Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint		N/A	
	24	ATEX Certification	Ingress Protection	ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection	1/2" NPT-M	2 X M20X1.5
	26	Accuracy		0.07% of Nominal Range	
	27	SIL Certification	PED Certification	-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating		-	
	29	Diaphragm Material	Housing Material	-	-
	30	Fill Fluid	Capillary Material	-	-
	31	Capillary Type	Capillary Length	-	-
	32	Flushing Connection		-	
OPTIONS	33	Integral Meter	Scale	Required	-
	34	Hydrostatic Testing	Cleaning	Required	-
	35	Mounting Brackets	Manifold Model No	Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model	-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type	HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision	-	-
	39	Device Tag	Hart Tag	-	-
	40	Internal Diagnostics	Capacitance	-	-
	41	Segment	Device Address	-	-
	42	Device Class	Simulate	-	-
	43	Nominal Current	Operating Voltage	-	-
PURCHASE	44	Manufacturer		TERRANOVA SRL	
	45	Model		SST76-H-7-K-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number		4718_OS	

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GENERAL	1	Tag Number		25-PT-055B	
	2	Service		HYDROGEN FROM STORAGE VESSEL HEADER TO FUEL CELL (A-80000)	
	3	P&ID Number	Location	123A90-DDL-PR-PID-80014	2"-HY-023-01HSS-N
	4	Function		PRESSURE MEASUREMENT	
	5	Mounting		DIRECT ON-LINE	
	6	Area Classification		ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature		Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid		HYDROGEN	
	9	Pressure Des.	Oper. [barg]	10	4(Min.) / 6.5(Max)
	10	Temperature Des.	Oper. [°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity	-	-
	12	Flow Rate	Allowable Temp.	-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]	0	30
	14	Calibration Range Min.	Max. [barg]	0	10
	15	Elevation	Suppression	-	-
	16	Element Type		Diaphragm	
	17	Element Material		SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating	AISI 316 SS	150 bar
	19	Process Connection		1/2" NPT-M	
	20	Wetted O-Rings Material		-	
	21	Fill Fluid		-	
	22	Bolts	Housing	Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint		N/A	
	24	ATEX Certification	Ingress Protection	ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection	1/2" NPT-M	2 X M20X1.5
	26	Accuracy		0.07% of Nominal Range	
	27	SIL Certification	PED Certification	-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating		-	
	29	Diaphragm Material	Housing Material	-	-
	30	Fill Fluid	Capillary Material	-	-
	31	Capillary Type	Capillary Length	-	-
	32	Flushing Connection		-	
OPTIONS	33	Integral Meter	Scale	Required	-
	34	Hydrostatic Testing	Cleaning	Required	-
	35	Mounting Brackets	Manifold Model No	Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model	-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type	HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision	-	-
	39	Device Tag	Hart Tag	-	-
	40	Internal Diagnostics	Capacitance	-	-
	41	Segment	Device Address	-	-
	42	Device Class	Simulate	-	-
	43	Nominal Current	Operating Voltage	-	-
PURCHASE	44	Manufacturer		TERRANOVA SRL	
	45	Model		SST76-H-7-K-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number		4718_OS	

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GENERAL	1	Tag Number			43-PT-001	
	2	Service			HYDROGEN VENT KO DRUM (V-43001)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80029	V-43001
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper. [barg]		3.5	Atm
	10	Temperature Des.	Oper. [°C]		-10 / + 80	Amb.
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]		0	5
	14	Calibration Range Min.	Max. [barg]		0	3.5
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	50 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-G-2-9-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			50-PT-001	
	2	Service			SEA WATER FROM PUMP P-50001A TO SEA WATER TREAT.	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80021	1-1/2"-SWS-031-01SD-E
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			SEA WATER	
	9	Pressure Des.	Oper. [barg]		17.7	15
	10	Temperature Des.	Oper. [°C]		100	+1.3 / +20.2
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]		0	30
	14	Calibration Range Min.	Max. [barg]		0	18
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			MONEL 400	
	18	Body Material	Body Rating		AISI 316 SS	20 bar
	19	Process Connection			-	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		-	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		Inner Diaphragm Seal	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			2"	150# RF
	29	Diaphragm Material	Housing Material		MONEL 400	SS AISI 316/316L
	30	Fill Fluid	Capillary Material		Siliconic Oil	S.S. Capillary
	31	Capillary Type	Capillary Length		Required in Option	3 m
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	N/A
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-K-2-9-2-1-4 + SEA03 + CAP-2-03	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			50-PT-002	
	2	Service			SEA WATER FROM PUMP P-50001B TO SEA WATER TREAT.	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80021	1-1/2"-SWS-033-01SD-E
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			SEA WATER	
	9	Pressure Des.	Oper.	[barg]	17.7	15
	10	Temperature Des.	Oper.	[°C]	100	+1.3 / +20.2
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	30
	14	Calibration Range Min.	Max.	[barg]	0	18
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			MONEL 400	
	18	Body Material	Body Rating		AISI 316 SS	20 bar
	19	Process Connection			-	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		-	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		Inner Diaphragm Seal	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			2"	150# RF
	29	Diaphragm Material	Housing Material		MONEL 400	SS AISI 316/316L
	30	Fill Fluid	Capillary Material		Siliconic Oil	S.S. Capillary
	31	Capillary Type	Capillary Length		Required in Option	3 m
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	N/A
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-K-2-9-2-1-4 + SEA03 + CAP-2-03	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			50-PT-014	
	2	Service			WASTE WATER FROM HEADER TO BRINE DISCHARGE CAISSON (B-50014)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80025	1-1/2"-WW-073-01CS-H
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			WASTE WATER	
	9	Pressure Des.	Oper.	[barg]	17.7	ATM
	10	Temperature Des.	Oper.	[°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	30
	14	Calibration Range Min.	Max.	[barg]	0	18
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L	
	18	Body Material	Body Rating		AISI 316 SS	20 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-K-2-0-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number		63-PT-003	
	2	Service		IA FROM PACKAGE A-63000 TO AIR DISTR.HEADER	
	3	P&ID Number	Location	123A90-DDL-PR-PID-80027	1-1/2"-IA-108-01SS-N
	4	Function		PRESSURE MEASUREMENT	
	5	Mounting		DIRECT ON-LINE	
	6	Area Classification		ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature		Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid		INSTRUMENT AIR	
	9	Pressure Des.	Oper. [barg]	11	4(Min.) / 10(Max)
	10	Temperature Des.	Oper. [°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity	-	-
	12	Flow Rate	Allowable Temp.	-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]	0	30
	14	Calibration Range Min.	Max. [barg]	0	11
	15	Elevation	Suppression	-	-
	16	Element Type		Diaphragm	
	17	Element Material		SS AISI 316/316L	
	18	Body Material	Body Rating	AISI 316 SS	150 bar
	19	Process Connection		1/2" NPT-M	
	20	Wetted O-Rings Material		-	
	21	Fill Fluid		-	
	22	Bolts	Housing	Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint		N/A	
	24	ATEX Certification	Ingress Protection	ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection	1/2" NPT-M	2 X M20X1.5
	26	Accuracy		0.07% of Nominal Range	
	27	SIL Certification	PED Certification	-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating		-	
	29	Diaphragm Material	Housing Material	-	-
	30	Fill Fluid	Capillary Material	-	-
	31	Capillary Type	Capillary Length	-	-
	32	Flushing Connection		-	
OPTIONS	33	Integral Meter	Scale	Required	-
	34	Hydrostatic Testing	Cleaning	Required	-
	35	Mounting Brackets	Manifold Model No	Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model	-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type	HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision	-	-
	39	Device Tag	Hart Tag	-	-
	40	Internal Diagnostics	Capacitance	-	-
	41	Segment	Device Address	-	-
	42	Device Class	Simulate	-	-
	43	Nominal Current	Operating Voltage	-	-
PURCHASE	44	Manufacturer		TERRANOVA SRL	
	45	Model		SST76-H-7-K-2-0-2-1-4 + MAN2-R6	
	46	Purchase Order Number		4718_OS	

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GENERAL	1	Tag Number		63-PT-004	
	2	Service		IA FROM PACKAGE A-63000 TO AIR DISTR.HEADER	
	3	P&ID Number	Location	123A90-DDL-PR-PID-80027	1-1/2"-IA-108-01SS-N
	4	Function		PRESSURE MEASUREMENT	
	5	Mounting		DIRECT ON-LINE	
	6	Area Classification		ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature		Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid		INSTRUMENT AIR	
	9	Pressure Des.	Oper. [barg]	11	4(Min.) / 10(Max)
	10	Temperature Des.	Oper. [°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity	-	-
	12	Flow Rate	Allowable Temp.	-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]	0	30
	14	Calibration Range Min.	Max. [barg]	0	11
	15	Elevation	Suppression	-	-
	16	Element Type		Diaphragm	
	17	Element Material		SS AISI 316/316L	
	18	Body Material	Body Rating	AISI 316 SS	150 bar
	19	Process Connection		1/2" NPT-M	
	20	Wetted O-Rings Material		-	
	21	Fill Fluid		-	
	22	Bolts	Housing	Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint		N/A	
	24	ATEX Certification	Ingress Protection	ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection	1/2" NPT-M	2 X M20X1.5
	26	Accuracy		0.07% of Nominal Range	
	27	SIL Certification	PED Certification	SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating		-	
	29	Diaphragm Material	Housing Material	-	-
	30	Fill Fluid	Capillary Material	-	-
	31	Capillary Type	Capillary Length	-	-
	32	Flushing Connection		-	
OPTIONS	33	Integral Meter	Scale	Required	-
	34	Hydrostatic Testing	Cleaning	Required	-
	35	Mounting Brackets	Manifold Model No	Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model	-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type	HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision	-	-
	39	Device Tag	Hart Tag	-	-
	40	Internal Diagnostics	Capacitance	-	-
	41	Segment	Device Address	-	-
	42	Device Class	Simulate	-	-
	43	Nominal Current	Operating Voltage	-	-
PURCHASE	44	Manufacturer		TERRANOVA SRL	
	45	Model		SST76-H-7-K-2-0-2-1-4 + MAN2-R6	
	46	Purchase Order Number		4718_OS	

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GENERAL	1	Tag Number		64-PT-031A	
	2	Service		NITROGEN FROM A-64000 TO NITROGEN DISTRIBUTION HEADER	
	3	P&ID Number	Location	123A90-DDL-PR-PID-80027	1"-N-100-01CS-N
	4	Function		PRESSURE MEASUREMENT	
	5	Mounting		DIRECT ON-LINE	
	6	Area Classification		ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature		Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid		NITROGEN	
	9	Pressure Des.	Oper. [barg]	10	7(Max.)
	10	Temperature Des.	Oper. [°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity	-	-
	12	Flow Rate	Allowable Temp.	-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]	0	30
	14	Calibration Range Min.	Max. [barg]	0	10
	15	Elevation	Suppression	-	-
	16	Element Type		Diaphragm	
	17	Element Material		SS AISI 316/316L	
	18	Body Material	Body Rating	AISI 316 SS	150 bar
	19	Process Connection		1/2" NPT-M	
	20	Wetted O-Rings Material		-	
	21	Fill Fluid		-	
	22	Bolts	Housing	Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint		N/A	
	24	ATEX Certification	Ingress Protection	ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection	1/2" NPT-M	2 X M20X1.5
	26	Accuracy		0.07% of Nominal Range	
	27	SIL Certification	PED Certification	-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating		-	
	29	Diaphragm Material	Housing Material	-	-
	30	Fill Fluid	Capillary Material	-	-
	31	Capillary Type	Capillary Length	-	-
	32	Flushing Connection		-	
OPTIONS	33	Integral Meter	Scale	Required	-
	34	Hydrostatic Testing	Cleaning	Required	-
	35	Mounting Brackets	Manifold Model No	Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model	-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type	HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision	-	-
	39	Device Tag	Hart Tag	-	-
	40	Internal Diagnostics	Capacitance	-	-
	41	Segment	Device Address	-	-
	42	Device Class	Simulate	-	-
	43	Nominal Current	Operating Voltage	-	-
PURCHASE	44	Manufacturer		TERRANOVA SRL	
	45	Model		SST76-H-7-K-2-0-2-1-4 + MAN2-R6	
	46	Purchase Order Number		4718_OS	

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GENERAL	1	Tag Number		64-PT-031B	
	2	Service		NITROGEN FROM U-64000 TO NITROGEN DISTRIBUTION HEADER	
	3	P&ID Number	Location	123A90-DDL-PR-PID-80027	1"-N-100-01CS-N
	4	Function		PRESSURE MEASUREMENT	
	5	Mounting		DIRECT ON-LINE	
	6	Area Classification		ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature		Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid		NITROGEN	
	9	Pressure Des.	Oper. [barg]	10	7(Max.)
	10	Temperature Des.	Oper. [°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity	-	-
	12	Flow Rate	Allowable Temp.	-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]	0	30
	14	Calibration Range Min.	Max. [barg]	0	10
	15	Elevation	Suppression	-	-
	16	Element Type		Diaphragm	
	17	Element Material		SS AISI 316/316L	
	18	Body Material	Body Rating	AISI 316 SS	150 bar
	19	Process Connection		1/2" NPT-M	
	20	Wetted O-Rings Material		-	
	21	Fill Fluid		-	
	22	Bolts	Housing	Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint		N/A	
	24	ATEX Certification	Ingress Protection	ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection	1/2" NPT-M	2 X M20X1.5
	26	Accuracy		0.07% of Nominal Range	
	27	SIL Certification	PED Certification	-	Required
DIAPHRAGM SEAL	28	Process Connection & Rating		-	
	29	Diaphragm Material	Housing Material	-	-
	30	Fill Fluid	Capillary Material	-	-
	31	Capillary Type	Capillary Length	-	-
	32	Flushing Connection		-	
OPTIONS	33	Integral Meter	Scale	Required	-
	34	Hydrostatic Testing	Cleaning	Required	-
	35	Mounting Brackets	Manifold Model No	Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model	-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type	HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision	-	-
	39	Device Tag	Hart Tag	-	-
	40	Internal Diagnostics	Capacitance	-	-
	41	Segment	Device Address	-	-
	42	Device Class	Simulate	-	-
	43	Nominal Current	Operating Voltage	-	-
PURCHASE	44	Manufacturer		TERRANOVA SRL	
	45	Model		SST76-H-7-K-2-0-2-1-4 + MAN2-R6	
	46	Purchase Order Number		4718_OS	

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GENERAL	1	Tag Number			64-PT-002	
	2	Service			NITROGEN FROM U-64000 TO NITROGEN DISTRIBUTION HEADER	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80027	1"-N-100-01CS-N
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			NITROGEN	
	9	Pressure Des.	Oper. [barg]		10	7(Max.)
	10	Temperature Des.	Oper. [°C]		100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max. [barg]		0	30
	14	Calibration Range Min.	Max. [barg]		0	10
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L	
	18	Body Material	Body Rating		AISI 316 SS	150 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-K-2-0-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number			80-PT-002	
	2	Service			H2 FROM STORAGE VESSEL TO FUEL CELL (A-80000)	
	3	P&ID Number	Location		123A90-DDL-PR-PID-80012	2"-HY-023-01HSS-N
	4	Function			PRESSURE MEASUREMENT	
	5	Mounting			DIRECT ON-LINE	
	6	Area Classification			ATEX Zone2 - IIC (IIB+H2) T1	
	7	Ambient Temperature			Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.	
PROCESS CONDITIONS	8	Fluid			HYDROGEN	
	9	Pressure Des.	Oper.	[barg]	10	4(Min.)/6.5(Max.)
	10	Temperature Des.	Oper.	[°C]	100	AMB
	11	Oper. Spec. Gravity	Oper. Viscosity		-	-
	12	Flow Rate	Allowable Temp.		-	-
TRANSMITTER	13	Instrument Range Min.	Max.	[barg]	0	30
	14	Calibration Range Min.	Max.	[barg]	0	10
	15	Elevation	Suppression		-	-
	16	Element Type			Diaphragm	
	17	Element Material			SS AISI 316/316L GOLD PLATED	
	18	Body Material	Body Rating		AISI 316 SS	150 bar
	19	Process Connection			1/2" NPT-M	
	20	Wetted O-Rings Material			-	
	21	Fill Fluid			-	
	22	Bolts	Housing		Manifold/Instrument assembly	SS AISI 316/316L
	23	Paint			N/A	
	24	ATEX Certification	Ingress Protection		ATEX Ex II 2G Ex db IIC T5	IP66
	25	Process Connection	Electrical Connection		1/2" NPT-M	2 X M20X1.5
	26	Accuracy			0.07% of Nominal Range	
	27	SIL Certification	PED Certification		SIL2	Required
DIAPHRAGM SEAL	28	Process Connection & Rating			-	
	29	Diaphragm Material	Housing Material		-	-
	30	Fill Fluid	Capillary Material		-	-
	31	Capillary Type	Capillary Length		-	-
	32	Flushing Connection			-	
OPTIONS	33	Integral Meter	Scale		Required	-
	34	Hydrostatic Testing	Cleaning		Required	-
	35	Mounting Brackets	Manifold Model No		Required	MAN2-R6
	36	Lightning Protection	Barrier Manuf./Model		-	-
COMMUNICATION AND SOFTWARE	37	Communication Type	Signal Type		HART 6	4-20mA Loop Powered 24 Vdc
	38	D D Revision	CFF Revision		-	-
	39	Device Tag	Hart Tag		-	-
	40	Internal Diagnostics	Capacitance		-	-
	41	Segment	Device Address		-	-
	42	Device Class	Simulate		-	-
	43	Nominal Current	Operating Voltage		-	-
PURCHASE	44	Manufacturer			TERRANOVA SRL	
	45	Model			SST76-H-7-K-2-0-2-1-4 + MAN2-R6	
	46	Purchase Order Number			4718_OS	

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GENERAL	1	Tag Number					50-TT-001 / 50-TE-001 / 50-TW-001			
	2	Service					SEA WATER LIFT PUMP(B-50013A&B) DISCHARGE			
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80022	ATEX Zone2-IIC(IIB+H2) T1		
PIPE LINE	4	Line Number	Equipment Numbrer				1-1/2"-SWS-035-01SD-E	-		
	5	Line Size	Schedule				4"	3.05 Thk (mm)		
	6	Pipe Material	Pipe Insulation				ASTM A790 UNS S32760	ELECTRICALLY HEAT TRACED		
PROCESS CONDITIONS	7	Fluid	Phase				SEA WATER SUPPLY	LIQUID		
	8	Temperature	Min.	Oper.	Max.		1.3 °C	-	20.2 °C	
	9	Pressure	Min.	Oper.	Max.			5 barg		
	10	Design Temperature	Min.		Max.		-29 °C	100 °C		
	11	Design Pressure	Min.		Max.		7.6 barg			
	12	Vibrations					ASME PTC 19.3			
	13	Erosion	Corrosion				-	-		
	14	Flow Rate Max.	Velocity Max.				2500 kg/h	0.08 m/s		
	15	Density					1000 kg/m^3			
	16	Viscosity					1 cP			
	17	Ambient Temperature					Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.			
ELEMENT	18	T/C	Type				-			
	19		Epoxy.	Ground		Unground	-	-	-	
	20		Sheath Material							
	21	RTD	Type				RTD, 3 wire PT100			
	22		Sensor Material		Insulator Material		Platinum	MgO		
	23		Tollerance Class		Resistance		Class A according IEC 60751	100 Ω at 0°C/138.5 at 100°C		
	24	Single/Duplex/Other	2/3/4 Wire				Single	3 Wire		
	25	Diameter	Length				6 mm	to be assembled with TWE		
TRANSMITTER	26	Type	Mounting				4-20 mA - HART/Smart	Integral, head mounted		
	27	Input	Head Material				-	N/A		
	28	ATEX Certification	Ingress Protection				ATEX Ex II 2G Ex db IIC T5	IP-66		
	29	Housing	Painting				SS AISI 316/316L	N/A		
	30	Power Supply	Load Resistance				24 Vdc	220 ÷ 640 Ω (for HART)		
	31	Electrical Connection	Input		Output		-	2 X M20X1.5		
	32	Accuracy					As Per IEC 60751 Class A			
	33	Linearization					As Per IEC 60751 Class A			
	34	Instrument Range	Min.		Max.		-50 °C	450 °C		
	35	Calibration Range	Min.		Max.		0 °C	50 °C		
	36	SIL Certification					-			
	37	PED Certification					Required			
COMMUNICATION AND SOFTWARE	38	Communication Type	Signal Type				HART 6	4-20mA Loop Powered24 Vdc		
	39	D D Revision	CFF Revision				-	-		
	40	Hart Descriptor	Hart Tag				-	-		
	41	Internal Diagnostics	Capacitance				-	-		
	42	Segment	Device Address				-	-		
	43	Device Class	Simulate				-	-		
	44	Nominal Current	Operating Volage				-	-		
WELL	45	Process Connection	Rating				1-1/2" Flanged	150# RF ASME B31.3		
	46	Material	Type				ASTM A182 F53/F55	Tapered Type		
	47	Construction Type	Internal Connection				Barstock Tapered	1/2" NPT-F		
	48	Immersion Length ("U")	Head Length ("T")				220 mm	70 mm		
	49	Treatments	Finish				-	-		
	50	Tip Thickness	Bore Diameter				7 mm	6.5 mm		
	51	Insertion Diam. Min.	Max.				28 mm	18 mm		
PURCHASE	52	Manufacturer					TERRANOVA SRL			
	53	Model					SST72-TH-1-C-9-1-B-4-3 + TWE			
	54	Purchase Order Number					4718_OS			

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GENERAL	1	Tag Number					50-TT-002 / 50-TE-002 / 50-TW-002			
	2	Service					WASTE WATER FROM HEADER TO BRINE DISCHARGE CAISSON (B-50014)			
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80025			ATEX Zone2-IIC(IIB+H2) T1
PIPE LINE	4	Line Number	Equipment Numbrer				1-1/2"-WW-073-01CS-H			-
	5	Line Size	Schedule				4"			6.02 Thk (mm)
	6	Pipe Material	Pipe Insulation				ASTM A350 LF2			ELECTRICALLY HEAT TRACED
PROCESS CONDITIONS	7	Fluid	Phase				SEA WATER SUPPLY			LIQUID
	8	Temperature	Min.	Oper.	Max.			AMB		
	9	Pressure	Min.	Oper.	Max.			ATM		
	10	Design Temperature	Min.		Max.		-46 °C			100 °C
	11	Design Pressure	Min.		Max.		3.5 barg			
	12	Vibrations					ASME PTC 19.3			
	13	Erosion	Corrosion				-			-
	14	Flow Rate Max.	Velocity Max.				10000 kg/h			0.34 m/s
	15	Density					1000 kg/m^3			
	16	Viscosity					1 cP			
	17	Ambient Temperature					Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.			
ELEMENT	18	T/C	Type				-			
	19		Epoxy.	Ground		Unground	-	-		-
	20		Sheath Material							
	21	RTD	Type				RTD, 3 wire PT100			
	22		Sensor Material			Insulator Material	Platinum			MgO
	23		Tollerance Class			Resistance	Class A according IEC 60751			100 Ω at 0°C/138.5 at 100°C
	24	Single/Duplex/Other	2/3/4 Wire				Single			3 Wire
	25	Diameter	Length				6 mm			to be assembled with TWE
TRANSMITTER	26	Type	Mounting				4-20 mA - HART/Smart			Integral, head mounted
	27	Input	Head Material				-			N/A
	28	ATEX Certification	Ingress Protection				ATEX Ex II 2G Ex db IIC T5			IP-66
	29	Housing	Painting				SS AISI 316/316L			N/A
	30	Power Supply	Load Resistance				24 Vdc			220 ÷ 640 Ω (for HART)
	31	Electrical Connection	Input		Output		-			2 X M20X1.5
	32	Accuracy					As Per IEC 60751 Class A			
	33	Linearization					As Per IEC 60751 Class A			
	34	Instrument Range	Min.		Max.		-50 °C			450 °C
	35	Calibration Range	Min.		Max.		0 °C			80 °C
	36	SIL Certification					-			
	37	PED Certification					Required			
COMMUNICATION AND SOFTWARE	38	Communication Type	Signal Type				HART 6			4-20mA Loop Powered24 Vdc
	39	D D Revision	CFF Revision				-			-
	40	Hart Descriptor	Hart Tag				-			-
	41	Internal Diagnostics	Capacitance				-			-
	42	Segment	Device Address				-			-
	43	Device Class	Simulate				-			-
	44	Nominal Current	Operating Volage				-			-
WELL	45	Process Connection	Rating				1-1/2" Flanged			150# RF ASME B31.3
	46	Material	Type				SS AISI 316/316L			Tapered Type
	47	Construction Type	Internal Connection				Barstock Tapered			1/2" NPT-F
	48	Immersion Length ("U")	Head Length ("T")				220 mm			70 mm
	49	Treatments	Finish				-			-
	50	Tip Thickness	Bore Diameter				7 mm			6.5 mm
	51	Insertion Diam. Min.	Max.				28 mm			18 mm
PURCHASE	52	Manufacturer					TERRANOVA SRL			
	53	Model					SST72-TH-1-C-9-1-B-4-3 + TWE			
	54	Purchase Order Number					4718_OS			

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REFERENCE DOCUMENTS:

1. Project Datasheets 123A90-DDL-IN-DS-40039;
2. General Arrangement Drawings (including Thermowell Calculations) 1724000979-IN-DA-00003.

GENERAL NOTES:

1. Material test certificates MTCs shall be provided by Manufacturer for all valves, tubing & fittings. MTCs shall include EN 10204 3.1 certification for all metallic materials;
2. PED 2014/68/EU Pressure Equipment Directive 2014/68/EU shall apply;
3. The SS nameplate shall indicate the tag number, manufacture name, model number, serial number, size, rating and other items as required;
4. Gold plating (5 μ m - 30 μ m) of the diaphragm or ceramic sensor shall be used in hydrogen service above a hydrogen partial pressure of 35 bara (500 psia);
5. Transmitters shall be equipped with local span and zero capability for convenient re-ranging of the transmitter at site;
6. Pressure instruments operating high pressure alarms shall have upscale element burnout. Those on low pressure alarms shall fail to down scale position;
7. Each Thermowell will be provided with hydrotest certificates (included in material certificates 3.1).

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GENERAL	1	Tag Number					55-LIT-001			
	2	Service					WASTE WATER TANK (T-55001)			
	3	P&ID Number					123A90-DDL-PR-PID-80026			
	4	Equipment Number		Vessel Trim Number			T-55001		1"-WW-200-01CS-H	
	5	Area Classification					ATEX Zone2 - IIC (IIB+H2) T1			
PROCESS CONDITIONS	6	Fluid					WASTE WATER			
	7	Pressure	Unit	Min.	Oper.	Max.	barg		ATM	
	8	Temperature	Unit	Min.	Oper.	Max.	°C	5	AMB	35
	9	Ambient Temperature		Min.		Max.	-8.4		25	
	10	Design Pressure		Min.		Max.			ATM	
	11	Design Temperature		Min.		Max.			80	
	12	Density (Liquid)					1000			
	13	Oper. Vapour Density					N/A			
	14	Viscosity					1			
	15	Fluid Dielectric Constant					80.2 @20°C			
BODY / GAUGE	16	Body or Gauge Material					AISI 316			
	17	Rating					#150			
	18	Connection Size & Type					FLANGED 3" 150# RF1, TOP MOUNTED			
	19	Cooling Extension					-			
	20	Stilling Well Required					-			
ANTENNA	21	Type					NON CONTACTING RADAR			
	22	Material					SS 316			
	23	Insertion Depth		Diameter			31 mm		72 mm	
	24	Operating Frequency					26 GHz			
	25	Distance (Adapter Plate to Tank Bottom)					High of Tank = 4660 mm			
TRANSMITTER	26	Function					LEVEL MEASUREMENT			
	27	Output		Power Supply			4-20mA		24 Vdc (Loop powered)	
	28	Calibration Range Min.		Max.			0 mm		4660 mm	
	29	Nominal Range Min.		Max.			0 mm		5000 mm	
	30	Mounting					DIRECT ON LINE			
	31	Certification		Ingress Protection			Ex-d IIC (IIB+H2) T1		IP66	
	32	Electrical Class		Electrical Connection			-		2 x M20	
	33	Accuracy		Repeatability			Better then +/-0.5% of SPAN		≤ 0.25% of SPAN	
COMMUNICATION AND SOFTWARE	34	Communication Type		Signal Type			Conventional + Hart		4-20mA Loop powered	
	35	DD Revision		CFF Revision			-		-	
	36	Device Tag		Hart Tag			-		-	
	37	Internal Diagnostics		Capacitance			-		-	
	38	Segment		Device Address			-		-	
	39	Device Class		Simulate			-		-	
	40	Nominal Current		Operating Voltage			-		-	
OPTIONS	41	Interface Card					-			
	42	Cable (Antenna to Transmitter)					-			
	43	Integral Meter					Digital LCD indicator			
PURCHASE	44	Manufacturer					TERRANOVA SRL			
	45	Model					KRG-E-P3-R01-N-L-D08-F79-N00-N-D-V-81-A-R2-Z6			
	46	Purchase Order Number					4718_OS			

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ATTACHMENT:
WAKE FREQUENCIES CALCULATION for THERMOWELLS

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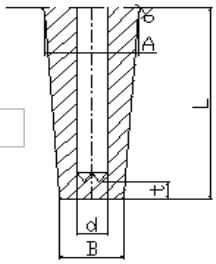
TERRANOVA® SPRIANO Valcom MEC-RELA	CUSTOMER	ROSETTI MARINO
	SPRIANO JOB No.	4718_OS
	TECHNICIAN	M. ZANI

THERMOWELL STRESS AND VIBRATION ANALISYS ACCORDING TO ASME PTC 19.3 TW-2016 "Thermowell Test Codes"

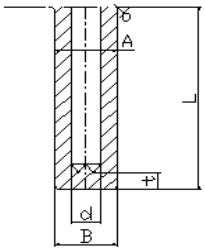
TAG	50-TT-001 / 50-TE-001 / 50-TW-001	FLUID/STATE
		LIQUID

THERMOWELL DETAIL / REFERENCE DRAWING

TAPERED TW



STRAIGHT TW



PROCESS CONDITIONS

FLOW RATE	Qm	-	m3/h	INTERNAL DIAMETER OF PIPE	I.D.	-	mm

FLUID PROPERTIES				THERMOWELL DIMENSIONS			
FLUID OPERATING PRESSURE	P	17,7	barg	ROOT DIAMETER	A	28	mm
		256,65	psig			1,102362	inch
FLUID OPERATING TEMPERATURE	T	100,0	°C	TIP DIAMETER	B	18	mm
		212	°F			0,708661	inch
FLUID OPERATING DENSITY	ρ	1000	kg/m^3	FILLET RADIUS AT BASE	b	3	mm
		62,430	lb/ft^3			0,11811	inch
FLUID OPERATING VISCOSITY	μ	1,0000	cP	BORE DIAMETER	d	6,5	mm
		0	lb/(ft.sec)			0,255906	inch
FLOW AVERAGE VELOCITY	v	0,080	m/s	UNSUPPORTED LENGTH	L	220	mm
		0,3	ft/s			8,661417	inch
TYPE OF THERMOWELL		TAPERED		MINIMUM WALL THICKNESS	t	7	mm
TYPE OF MANUFACTURING		WELDED THEN MACHINED				0,275591	inch

THERMOWELL MATERIAL PROPERTIES				REYNOLDS/STROUAL NUMBER CALCULATIONS			
THERMOWELL MATERIAL		SUPERDUPLEX		MATERIAL CLASS		B	
YOUNG MODULUS @T	E(T)	26911200	psi	REYNOLDS NUMBER	Re	1440	/
REF YOUNG MODULUS	E_{ref}	28300000	psi	STROUAL NUMBER	N_s	0,212952	/
MAX ALLOWABLE STRESS	S	37714	psi	FORCE COEFFICIENTS			
FATIGUE ENDURANCE LIMIT	S_f	9100	psi	CONVENTIONAL DRAG COEFFICIENT	C_D	1,4	
MATERIAL DENSITY	ρ_m	0,289	lb/in^3	OSCILLATING DRAG COEFFICIENT	C_d	0,1	
SENSOR MASS DENSITY	ρ_s	169	lb/ft^3	OSCILLATING LIFT PRESSURE COEFFICIENT	Cl	1	

THERMOWELL SHAPE FACTORS

B/A	0,6429	d/D_a	0,2826	d/A	0,2321	b/A	0,1071		
D_a/L	0,1045	A/L	0,1273	A/b		d/B	0,3611		

FREQUENCY ANALYSIS CALCULATION

AVERAGE THERMOWELL OD	D_a	0,9055118	inch	NATURAL FREQUENCY OF TW (approximate value)	fa	336	Hz
SECOND MOMENT OF INERTIA	I	0,0328	$inch^4$	FREQUENCY CORRECTION FACTOR	H_f	1,461	/
MASS PER UNIT LENGTH OF THERMOWELL	m	0,1712	lb/inch	FLUID MASS CORRECTION FACTOR	$H_{a,f}$	0,9375	/
DUMPING FACTOR	ξ	0,0005	/	SENSOR MASS CORRECTION FACTOR	$H_{a,s}$	0,9853	/
SCRUTON NUMBER	N_{SC}	0,034	/	NATURAL FREQUENCY OF TW (EXACT value)	f_n	454	Hz
STROUHAL FREQUENCY CALCULATION	f_s	0,95	Hz	CORRECTION FACTOR FOR	H_C	0,9424	/
MOUNTED TW FREQUENCY LIMIT	0,4fcn	171,2	Hz	NATURAL FREQUENCY OF TW (SITU EXACT value)	f^c_n	428	Hz
FREQUENCY ANALYSIS		fs<0,4fcn		FREQUENCY ANALYSIS RESULT		PASS	

Date	Document No.	Revision
06/09/2024	1724000979-IN-DS-00004	03

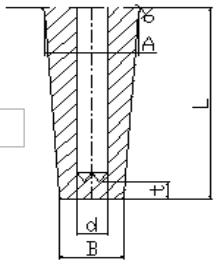
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	TECHNICIAN	M. ZANI

THERMOWELL STRESS AND VIBRATION ANALISYS ACCORDING TO ASME PTC 19.3 TW-2016 "Thermowell Test Codes"

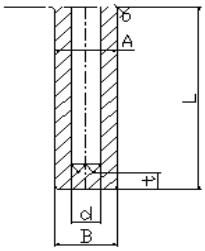
TAG	50-TT-002 / 50-TE-002 / 50-TW-002	FLUID/STATE
		LIQUID

THERMOWELL DETAIL / REFERENCE DRAWING

TAPERED TW



STRAIGHT TW



PROCESS CONDITIONS

FLOW RATE	Qm	-	m3/h	INTERNAL DIAMETER OF PIPE	I.D.	-	mm

FLUID PROPERTIES				THERMOWELL DIMENSIONS			
FLUID OPERATING PRESSURE	P	17,7	barg	ROOT DIAMETER	A	28	mm
		256,65	psig			1,102362	inch
FLUID OPERATING TEMPERATURE	T	100,0	°C	TIP DIAMETER	B	18	mm
		212	°F			0,708661	inch
FLUID OPERATING DENSITY	ρ	1000	kg/m^3	FILLET RADIUS AT BASE	b	3	mm
		62,430	lb/ft^3			0,11811	inch
FLUID OPERATING VISCOSITY	μ	1,0000	cP	BORE DIAMETER	d	6,5	mm
		0	lb/(ft.sec)			0,255906	inch
FLOW AVERAGE VELOCITY	v	0,340	m/s	UNSUPPORTED LENGTH	L	220	mm
		1,1	ft/s			8,661417	inch
TYPE OF THERMOWELL		TAPERED		MINIMUM WALL THICKNESS	t	7	mm
TYPE OF MANUFACTURING		WELDED THEN MACHINED				0,275591	inch

THERMOWELL MATERIAL PROPERTIES				REYNOLDS/STROUAL NUMBER CALCULATIONS			
THERMOWELL MATERIAL		SS 316/316L		MATERIAL CLASS		B	
YOUNG MODULUS @T	E(T)	27569053	psi	REYNOLDS NUMBER	Re	6119	/
REF YOUNG MODULUS	E_{ref}	28300000	psi	STROUAL NUMBER	N_s	0,204669	/
MAX ALLOWABLE STRESS	S	18915	psi	FORCE COEFFICIENTS			
FATIGUE ENDURANCE LIMIT	S_f	9100	psi	CONVENTIONAL DRAG COEFFICIENT	C_D	1,4	
MATERIAL DENSITY	ρ_m	0,285	lb/in^3	OSCILLATING DRAG COEFFICIENT	C_d	0,1	
SENSOR MASS DENSITY	ρ_s	169	lb/ft^3	OSCILLATING LIFT PRESSURE COEFFICIENT	Cl	1	

THERMOWELL SHAPE FACTORS

B/A	0,6429	d/D_a	0,2826	d/A	0,2321	b/A	0,1071		
D_a/L	0,1045	A/L	0,1273	A/b		d/B	0,3611		

FREQUENCY ANALYSIS CALCULATION

AVERAGE THERMOWELL OD	D_a	0,9055118	inch	NATURAL FREQUENCY OF TW (approximate value)	fa	339	Hz
SECOND MOMENT OF INERTIA	I	0,0328	$inch^4$	FREQUENCY CORRECTION FACTOR	H_f	1,461	/
MASS PER UNIT LENGTH OF THERMOWELL	m	0,1690	lb/inch	FLUID MASS CORRECTION FACTOR	$H_{a,f}$	0,9367	/
DUMPING FACTOR	ξ	0,0005	/	SENSOR MASS CORRECTION FACTOR	$H_{a,s}$	0,9851	/
SCRUTON NUMBER	N_{SC}	0,034	/	NATURAL FREQUENCY OF TW (EXACT value)	f_n	457	Hz
STROUHAL FREQUENCY CALCULATION	f_s	3,86	Hz	CORRECTION FACTOR FOR	H_C	0,9424	/
MOUNTED TW FREQUENCY LIMIT	0,4fcn	172,1	Hz	NATURAL FREQUENCY OF TW (SITU EXACT value)	f^c_n	430	Hz
FREQUENCY ANALYSIS		fs<0,4fcn		FREQUENCY ANALYSIS RESULT		PASS	

Date	Document No.	Revision
06/09/2024	1724000979-IN-DS-00004	03

PART 2
CERTIFICATION DOSSIER

TERRANOVA®
WE DO PROCESS INSTRUMENTATION PRECISELY
SPRIANO Valcom MEC-RELA

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

MATERIAL 3.1 & HYDROTEST CERTIFICATES

Document Number: -

Document Class: 3

TERRANOVA

SPRIANO Vatcom MEC-RELA

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

MATERIAL 3.1 & HYDROTEST CERTIFICATES for SST77B DIFFERENTIAL PRESSURE TRANSMITTERS

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT**
		REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST77B SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/4" NPT-F		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	8	mm
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
43-LT-001
SERIAL NUMBER
SE240632

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,0	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-06 PRESSURE GAUGE RANGE 0/250bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	SIDE FLANGES	From Molding	20180109	TER-2018-012	CF3M
C	DRAIN	Ø 17 mm	G61237	33583	AISI 316L
D	PLUG	Ø 12 mm	1TEB	2022/009568	AISI 316/316L
E	HOUSING	Ø 100 mm	3LTN	2024/004769	AISI 316/316L
F	COVER SIDE	Ø 100 mm	3LTN	2024/004769	AISI 316/316L
G	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

SPRIANO® TECHNOLOGIES
a TERRANOVA® Srl brand
Via Gramsci 1, 26827, Terranova Passerini (LO), ITALY
Tel & Fax +39 0377 919119
www.spriano.it
spriano@terranova-instruments.com

OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

G. Luca Vergazzoli
Inspector

TERRANOVA® SPRIANO Valcom MEC-RELA

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST77B SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/4" NPT-F		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	8	mm
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
43-LT-003
SERIAL NUMBER
SE240633

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,0	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-06 PRESSURE GAUGE RANGE 0/250bar			

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NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

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FINAL TEST 100%
OK

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OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

TERRANOVA® SPRIANO Valcom MEC-RELA

Ing. Luca Vergazzoli Inspector

LAMINERIES MATTHEY
NOTZ group advanced metal solutions

Lamineries MATTHEY,
branch of Notz Metall AG
Montagu 38
CH-2520 La Neuveville

Tél. +41 32 752 32 32
www.matthey.ch

Métaux laminés à froid
Kaltgewalzte Metalle
Cold rolled metals

Cuivre au béryllium
Berylliumkupfer
Beryllium Copper

Inspection Certificate according to EN 10204-3.1

Batch No. : 1024100-01 **Certificate No. : 1**

La Neuveville, 19.01.2024

Customer :	**010833**	
Y/Order :	**8965/OF**	
O/Confirmation :	**CC-29931-004**	dated 28.09.2023
O/Delivery Note :	**BL-31108**	dated 07.11.2023
Delivered Qty :	**11.3 kg**	

Ship-to
TERRANOVA SRL
Via Gramsci, 1
IT - 26827 Terranova dei Passerini (LO)

O/Part No. : **D320A150.0X0.050AG** **1.4404 - Stainless steel / X2CrNiMo17-12-2 / ~ AISI 316L / ~ AISI 316 / 1.4401**

Y/Part No. : CME04168

Heat No. : 0541290 **Chemical composition**

Element / *Unit* / *Limit*	Fe	C	Si	Mn	P	S	Cr	Mo
	% Rem.	% <= 0.03	% <= 1	% <= 2	% <= 0.045	% <= 0.015	% 16.5 - 18.5	% 2 - 2.5
Value	Rem.	= 0.019	= 0.31	= 1.16	= 0.028	= 0.001	= 16.73	= 2.03
Element / *Unit* / *Limit*	N	Ni	Cu					
	% <= 0.11	% 10 - 13	%					
Value	= 0.051	= 10.06	= 0.34					

Dimensional attributes	Unit	Result	Min.	Max.
Thickness	mm	**0.0500**	0.0460	0.0540
Width	mm	**150.25**	148.00	152.00

Mechanical properties	Unit	Result	Min.	Max.
Tensile Strength, Rm	N/mm2	**995**	800	1000

Additional information

According to NACE MR0175/ISO15156

Remarks

The material is resistant to intercrystalline corrosion in accordance with DIN EN 3651-2 and ASTM A262 p.E

We hereby confirm that the shipment corresponds to the stipulations of the order acknowledgment.

Lamineries MATTHEY
branch of Notz Metall AG
Giovanni Rizzolo
Inspector / Expert

G. Rizzolo Vergazzoli
Inspector

Rizzolo Giovanni

TERRANOVA
SPRIANO Valcom MEC-RELA

TERRANOVA

TEST & INSPECTION CERTIFICATE ACCORDING TO EN 10204 - TYPE 3.1	Certificate number:	TER-2018-012	Page 1 of 1
	Date:	09/01/2018	
TERRANOVA Srl Via Gramsci 1, Terranova dei Passerini (LO)	Heat Number		
	20180109		
	Description		
	Lateral Flange of DPT		

GENERAL FEATURES:

Heat	Type	Material Specification
20180109	Casting	ASTM A351 Gr. CF3M

CHEMICAL ANALYSIS:

Heat	Material		C (%)	Si (%)	Mn (%)	S (%)	P (%)
20180109	ASTM A351 Gr. CF3M	Limits	≤ 0.030	≤ 1.50	≤ 1.50	≤ 0.040	≤ 0.040
		Percent	0.017	0.616	0.878	0.001	0.033

PHYSICAL PROPERTIES:

Heat	Test	Acceptance Criteria	Test Value	Result
20180109	Tensile Strenght	> 205 MPa	285	Accepted
	Hardness	135 HBW ≤ x ≤ 185 HBW	152	Accepted

CONFORMITY:

- NACE MR0175 / ISO 15156 compliance
- IGC test according to ASTM A262 practice "E"

GENERAL NOTES:

- We certified that material is in compliance with purchase order and this certificate is in compliance with the original.

TERRANOVA® Quality Department

Luca Vergazzoli

TERRANOVA® MEC-RELA

gieffeacciai s.r.l.

9001 GLOBE CERTIFICAZIONI

ATTESTATO DI CONTROLLO - Test Report 3.1

CERTIFICATO N° 33583 Data/Date 09/05/2022

SECONDO - According to **UNI EN 10204 - 2005**

CLIENTE - Customer

MI-METAL BRAMATI S.R.L.
VIA DEI CREDERI 459
24045 FARA GERA D'ADDA BG

DDT n° 3569 **DATA/Date 12/07/2022** **ORDINE/Order 220667 30/06/2022**

PESO - Weight	Kg 71
COLATA - Cast	G61237
QUALITA' - Grade	AISI 316L
NORMA DI RIFERIMENTO - Reference Standard	EN 10088-3:2005
PROFILO - Shape	TONDO
DIMENSIONE - Size mm	17,00
TRATTAMENTO TERMICO - Heat Treatment	SOLUBILIZZATO
ESECUZIONE - Form of delivery/Sigla - Reference sign	+C TRAF.
TOLLERANZA - Tolerance	h9

ANALISI CHIMICA DI COLATA - Cast analysis

C	Mn	Si	P	S	Cr	Ni	Mo	Al	Cu	W	Fe	B	Bi
0,017	1,560	0,559	0,0330	0,0280	16,74	10,06	2,020		0,432				
Max 0,03	Max 2	Max 1	Max 0,045	Max 0,03	Min. 16,5 Max 18,5	Min. 10 Max 13	Min. 2 Max 2,5						
Sn	**V**	**Ti**	**Ca**	**Nb**	**As**	**Sb**	**Co**	**N**	**Pb**	**Al;Ti;V;Nb**	**Cr;Ni;Mo;Cu**	**Cr;Ni;Mo**	**C.E.**
							0,1700	0,0460					
								Max 0,11					

CARATTERISTICHE MECCANICHE DI PRODOTTO - Mechanical properties on the product

ALLUNGAMENTO A ROTTURA - Elongation	A	%	38,2
CARICO DI ROTTURA - Tensile Strength	Rm	MPa	680
CARICO DI SNERVAMENTO - Yield Strength	Rp0,2%	MPa	529
DUREZZA - Hardness	HBW	Brinell	210

CONTROLLI NON DISTRUTTIVI NDT Control

☐ INTEGRITA' SUPERFICIALE A CORRENTI INDOTTE - Eddy current control

Norma/Standard:

Classe/Class: 1 ☐ 2 ☐ 3 ☐ 4 ☐

☐ ULTRASOUND - Ultrasound

Norma/Standard:

Classe/Class: 1 ☐ 2 ☐ 3 ☐ 4 ☐

☑ ANTIMESCOLAMENTO - Antimix

Norma/Standard:

Classe/Class: 1 ☐ 2 ☐ 3 ☐ 4 ☐

ACC TO NACE MR 0175

G. Luca Bergazzoli

TERRANOVA
SPRIANO Valcom MEC-RELA

Certificato conforme all'originale archiviato presso la ns. sede.
Test report in accordance to the original files in our company.

Materiale conforme alle direttive europee metalli pesanti
according to european directive heavy metals

2002/95/CE e successive modifiche 2002/96/CE 2003/108/CE 2000/53/CE e 2005/525/CE
2006/117 contaminazione radioattiva - Conforme a Dodd-Frank Act relativo a minerali provenienti dalle zone dei conflitti
EC 1907/2006 e successivi aggiornamenti – e lista SVHC ultimo aggiornamento (Reach)
Direttiva Europea 2011/65/EU (RoHS) e successive modifiche

NOTE - Notes
1MPa=1/mm²

Si attesta che il materiale della presente fornitura è conforme alla prescrizione d'ordine concordata con il cliente
We certify hereby, that the above mentioned products are consistent with the order requirement agreed with the customer.
Certificato generato da un sistema informatico secondo la norma EN 10204, valido senza firma.

GIEFFEACCIAI S.r.l.
Largo Roggia Brembilla, 11 - 24047 Treviglio (BG) - Tel. 0363.879394 - Fax 0363.870742 - info@gieffeacciai.it
Capitale Sociale € 10.000,00 - Reg. Imp. BG - R.E.A. BG 355813 - Partita IVA e Codice fiscale IT03172070165

gieffeacciai s.r.l.

9001 GLOBE CERTIFICAZIONI

ATTESTATO DI CONTROLLO - Test Report	3.1
CERTIFICATO N° 33583 Data/Date	09/05/2022

SECONDO - According to UNI EN 10204 - 2005

CLIENTE - Customer

MI-METAL BRAMATI S.R.L.
VIA DEI CREDERI 459
24045 FARA GERA D'ADDA BG

TERRANOVA
SORIANO Valcim MEC-RELA

Responsabile S.G.Q:
Grassi Mattia

GIEFFEACCIAI S.r.l.
Largo Roggia Brembilla, 11 - 24047 Treviglio (BG) - Tel. 0363.879394 - Fax 0363.870742 - info@gieffeacciai.it
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MI-METAL BRAMATI

Mi-Metal Bramati S.r.l.

DICHIARAZIONE DI CONFORMITÁ

TERRANOVA SRL

VIA A. **GRAMSCI, 1**

TERRANOVA DEI **PASSERINI**

Con la presente si dichiara che gli articoli consegnati con :

DDT N° 221561 del 19/07/2022 ,

a fronte dei vostri ordini :

N. 7634/OF Del 4/3/2022

sono conformi ai disegni/specifiche tecniche e alla revisione indicata negli ordini sopra citati.

In fede.

Data

19/07/2022

Timbro e firma del Fornitore

MI-METAL BRAMATI SRL

TERRANOVA

ROLDAN, S.A. - Acciai Inossidabili

ACCIAIERIA
Santo Tomás de las Ollas, S/N
Apdo. de Correos 11
PONFERRADA (LEÓN)
TEL.: +34 987 44 61 00
FAX: +34 987 44 61 01
E-MAIL: rdn_fabrica@acerinox.com

SEDE CENTRALE
Santiago de Compostela, 100-3ª
28035 MADRID (ESPAÑA)
TEL.: +34 913 98 52 57
FAX: +34 913 98 51 93
E-MAIL: roldan@acerinox.com

CERTIFICATO D'ISPEZIONE EN 10204 3.1

MADE IN SPAIN - EUROPEAN UNION

Sistema de Gestión ISO 9001:2015
TÜVRheinland CERTIFICADO
www.tuv.com ID 0091008143

CE 0432 11 0432-CPR-00190-01

ROLDAN S.A. Z-30.3-6 MPA NRW
EN 10.088:5

CERTIFICATO Nº	2022/009568	DATA	25/03/2022	FOGLIO	1
Nº DOCUMENTO DI TRASPOSTO	2022/001651				

MATERIALE ROLDAMAX-339 EN10088:3 (1.4404.)

CLIENTE S.INOX SPA

DIMENSIONI 12,00 mm. | Surface finish according EN10088-3 Table 7:2B

LUNGHEZZA 3.050 mm. TOLLERANZA ISO h9

PRODOTTO [243] Barra trafilata, rettificata, pulita, bisellata 45º

SPECIFICHE EN10088:3 ORDINE DEL CLIENTE OA21-0003113

PROVE DI TRAZIONE EN ISO 6892-1

CORRISPONDENTE EN 10272 EDIZIONE AD-2000 W2 AD-2000 W10

CORROSIONE INTERGRANULARE EN ISO 3651-2 method A: SATISFACTORY WITHOUT OBJETIONS

CONTROLLO DIMENSIONALE E VISIVO WITHOUT OBJECTIONS Spektrometrical Identity Test: O.K.

PROVA DI RESILIENZA EN ISO 148-1 MATERIAL FREE FROM RADIOACTIVITY

Nº ORDINE	LAVORO Nº	CASSA / BULTO	NUMERO COLATA	CAMPIONE	PESO
MA02721 41	MA02721 41 1	21081 / JK93372	1TEB	1TEB	504

PROCESSO DI FABBRICAZIONE
EAF + AOD +CC

MARCHIO DEL FORNITORE
RDN

MARCHIO
HEAT NUMBER
GRADE (ACX-339)

TIMBRO DI RICEZIONE
R3

ISPETTORE DI QUALITA
JUAN JOSE ALVAREZ RODRIGUEZ
QUALITY CONTROL REPRESENTATIVE

CARATTERISTICHE MECCANICHE

COLATA	CAMPIONE	DIMENSIONI DEL CAMPIONE mm.	Osserv. Tª.	Rm MPa	Rp 0,2% MPa	Rp 1% MPa	Z %	A % L=5d	A % L=4d	Agt %	RESILIENZA ISO-V (J) 20ºC	RESILIENZA ISO-V (J) -196ºC		DUREZZA HB	PROVA DI FATICA	PROVA DI TORSIONE	AREA DELLA SEZIONE mm²	Kg / m
1TEB	1TEB	12,00	20ºC	693	560	642	70	35	36					222				
REQUISITI DELLA NORMA		EN ISO 377		500 900	200	235		20			100			315				

COMPOSIZIONE CHIMICA %

COLATA	C	P	S	Si	Mn	Cr	Ni	Mo	Ti	N	Cu	Co			
1TEB	0,0250	0,0290	0,0250	0,4450	1,5150	16,9250	10,3550	2,0440	0,0040	0,0410	0,3890	0,2120			
REQUISITI DELLA NORMA	0,0300	0,0450	0,0300	1,0000	2,0000	16,5000 18,5000	10,0000 13,0000	2,0000 2,5000		0,1000					

OSSERVACIONI

AISI 316/316L. UNS S31600/S31603. ASTM/ASME A/SA-182 grade F316/F316L, A/SA-193 class 1 grade B8M, A/SA-276 condition A, A/SA-320 class 1 grade B8M, A/SA-479 condition A. AMS 5648. AMS 5653. AMS QQ-S-763 condition A. NACE MR0175 & MR0103. ASME BVPC section II partA. ASTM A-262 practice E: OK.

Si dichiara che tutta la materia prima utilizzata per la ns produzione di acciaio inox é esente da conta minazione radioattiva grazie alle nostre procedure di controllo interne.

CER_IT2

ALTRE PROVE REQUISITI DELLA NORMA TRD100 TRB100,AD-2000-W2-W10,2014/68/EU (PED)

TRATTAMENTO TERMICO 1.050 ºC AND WATERCOOLED | Crack tested acc. to EN10277 table 3 class 3

TERRANOVA SERIANO Valcom MEC RELA

MI-METAL BRAMATI

Mi-Metal Bramati S.r.l.

DICHIARAZIONE DI CONFORMITÁ

TERRANOVA SRL

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In fede.

Data

19/07/2022

Timbro e firma del Fornitore

MI-METAL BRAMATI SRL

TERRANOVA

CER_IT4

ROLDAN, S.A. - Acciai Inossidabili

ACCIAIERIA

Santo Tomás de las Ollas, S/N
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Santiago de Compostela, 100-3ª
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CERTIFICATO D'ISPEZIONE EN 10204 3.1

MADE IN SPAIN - EUROPEAN UNION

TÜVRheinland CERTIFICADO — Sistema de Gestión ISO 9001:2015 ISO 14001:2015 ISO 50001:2018 — www.tuv.com ID 0091003143

CE 0432 11 0432-CPR-00190-01

CERTIFICATO Nº 2024/004769	DATA 30/04/2024	FOGLIO 1	Nº DOCUMENTO DI TRASPOSTO 2024/001506
MATERIALE ROLDAMAX-339	EN10088:3 (1.4404.)		
CLIENTE S.INOX SPA			
DIMENSIONI 100,00 mm.	Surface finish according EN10088-3 Table 7:1X		
LUNGHEZZA 6.100 mm.	TOLLERANZA ISO k12		
PRODOTTO [330] Barra pelata, bisellata 2 lati 45º			
SPECIFICHE EN10088:3	ORDINE DEL CLIENTE 0A24-0001433		
PROVE DI TRAZIONE EN ISO 6892-1			
CORRISPONDENTE EN 10272	EDIZIONE AD2000 W0, W2 & W10		
CORROSIONE INTERGRANULARE EN ISO 3651-2 method A: SATISFACTORY	WITHOUT OBJETIONS		
CONTROLLO DIMENSIONALE E VISIVO WITHOUT OBJECTIONS	Spektrometrical Identity Test: O.K.		
PROVA DI RESILIENZA EN ISO 148-1	MATERIAL FREE FROM RADIOACTIVITY		EN 10.088:5

PROCESSO DI FABBRICAZIONE	MARCHIO DEL FORNITORE	MARCHIO	TIMBRO DI RICEZIONE	ISPETTORE DI QUALITA
EAF + AOD +CC	**RDN**	HEAT NUMBER GRADE (ACX-339)	**R3**	JUAN JOSE ALVAREZ RODRIGUEZ QUALITY CONTROL REPRESENTATIVE

CARATTERISTICHE MECCANICHE

COLATA	CAMPIONE	DIMENSIONI DEL CAMPIONE mm.	Osserv. Tª.	Rm MPa	Rp 0,2% MPa	Rp 1% MPa	Z %	A % L-5Ø	A % L-4Ø	Agt %	RESILIENZA ISO-V (J) 20ºC	RESILIENZA ISO-V (J) -196ºC		DUREZZA HB	PROVA DI FATICA	PROVA DI TORSIONE	AREA DELLA SEZIONE mm²	Kg / m
3LTN	3LTN	20,00	20ºC	543	231	300	69	57	59		271			151				
REQUISITI DELLA NORMA		EN ISO 377		500 700	200	235		40			100			215				

COMPOSIZIONE CHIMICA %

COLATA	C	P	S	Si	Mn	Cr	Ni	Mo	Ti	N	Cu	Co			
3LTN	0,0240	0,0270	0,0290	0,4420	1,5020	16,6750	10,3200	2,0270	0,0040	0,0370	0,4450	0,1750			
REQUISITI DELLA NORMA	0,0300	0,0450	0,0300	1,0000	2,0000	16,5000 18,5000	10,0000 13,0000	2,0000 3,0000		0,1000					

OSSERVAZIONI

ASTM A-182. ASTM A-193 Class 1 Grade B8M. ASTM A-276 Condition A. ASTM A-320 Class 1 Grade B8M. ASTM A-479 Condition A. ASME SA-182. ASME SA-193 Class 1 Grade B8M. ASME SA-320 Class 1 Grade B8M. ASME SA-479 Condition A. AMS 5648. AMS 5653. AMS QQ-S-763. AISI 316/316L. UNS S31600/S31603. NACE MR0175 & MR0103. MADE IN SPAIN.

G. Luca Vergazzoli

ALTRE PROVE	REQUISITI DELLA NORMA	AD2000 W0,W2,W10|2014/68/EU(PED)|UKCA PER 2016/1105
TRATTAMENTO TERMICO 1.050 ºC AND WATERCOOLED	Crack tested acc. to EN10277 table 3 class 2 (Eddy current)	

TERRANOVA® SPRIANO Valcom MEC-RELA

ROLDAN, S.A. - Acciai Inossidabili

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E-MAIL: roldan@acerinox.com

CERTIFICATO D'ISPEZIONE EN 10204 3.1

MADE IN SPAIN - EUROPEAN UNION

Sistema de Gestión ISO 9001:2015 ISO 14001:2015 ISO 50001:2018
TÜVRheinland CERTIFICADO
www.tuv.com ID 0091003143

CE 0432 11 0432-CPR-00190-01

CERTIFICATO Nº 2024/004769	DATA 30/04/2024	FOGLIO 1	Nº DOCUMENTO DI TRASPOSTO 2024/001506
MATERIALE ROLDAMAX-339	EN10088:3 (1.4404.)		
CLIENTE S.INOX SPA			
DIMENSIONI 100,00 mm.	Surface finish according EN10088-3 Table 7:1X		
LUNGHEZZA 6.100 mm.	TOLLERANZA ISO k12		
PRODOTTO [330] Barra pelata, bisellata 2 lati 45º			
SPECIFICHE EN10088:3	ORDINE DEL CLIENTE 0A24-0001433		
PROVE DI TRAZIONE EN ISO 6892-1			
CORRISPONDENTE EN 10272	EDIZIONE AD2000 W0, W2 & W10		
CORROSIONE INTERGRANULARE EN ISO 3651-2 method A: SATISFACTORY	WITHOUT OBJETIONS		
CONTROLLO DIMENSIONALE E VISIVO WITHOUT OBJECTIONS	Spektrometrical Identity Test: O.K.		
PROVA DI RESILIENZA EN ISO 148-1	MATERIAL FREE FROM RADIOACTIVITY		EN 10.088:5

PROCESSO DI FABBRICAZIONE	MARCHIO DEL FORNITORE	MARCHIO	TIMBRO DI RICEZIONE	ISPETTORE DI QUALITA
EAF + AOD +CC	RDN	HEAT NUMBER GRADE (ACX-339)	R3	JUAN JOSE ALVAREZ RODRIGUEZ QUALITY CONTROL REPRESENTATIVE

Nº ORDINE	LAVORO Nº	CASSA / BULTO	NUMERO COLATA	CAMPIONE	PESO
SE24001741 1		79094 / RK54111-	3LTN		389
24001741		79095 / RK54112-	3LTN		777
24001741		79096 / RK54118-	3LTN		385

TERRANOVA SPRIANO Valcom MEC-RELA

External Provider's Declaration of Conformity for Ex-d Mode of Protection as per ATEX Directive & IECEx Scheme.

1) Issuer
TIEMMETI DI TUROTTI STEFANO

2) Object of the declaration
COD. 12-19-42-X
CUSTODIA SST7X-SSWX-M20X1.5
N. 27 PZ
CERTIFICATO N. 2024/004769
COLATA N. 3LNT

COD. 17/93/X
COPERCHIO FORATO SST7X-SSWX
N. 47 PZ
CERTIFICATO N. 2024/004769
COLATA N. 3LNT

3) TERRANOVA purchase order
ORDINE N. 10503 DEL 04/06/2024

4) Declaration

We *TIEMMETI DI TUROTTI STEFANO* herewith declare that the information provided in this "External Provider's Declaration of Conformity" is accurate and confirm that the products supplied are in conformity to the requirements stated in above Points (2) and (3).
We confirm also that no part of the production of the object described in Points (2) above has been subcontracted to third parties without the written consent of TERRANOVA Srl.

5) Signature of Issuer (Name & Function)

TIEMMETI
di TUROTTI STEFANO
Via M. Pagano, 23
Tel. 02.445.38.91 - Fax 02.484.670.78
20090 TREZZANO S/NAV. (MI)
Partita IVA 11055590159

Date: *16/07/2024*
Place: TREZZANO S/N, VIA M. PAGANO 23

TERRANOVA®
SPRIANO Valcom MEC-RELA

G. Luca Mergazzoli
W R
Director

CONTARDI

50 100 3910

CONTARDI. s.r.l. unipersonale
Via Milano, 19 23886 Colle Brianza (LC)
Tel 039 / 92 76 089 – Fax 039 / 92 60 329
CCIAA 03489730139
Codice Fiscale e Partita IVA 03489730139
Capitale Sociale int. vers. €. 100.000,00
Sito web: www.contardi.it
e-mail: info@contardi.it - pec: contardi@legalmail.it

ATTESTATO DI CONTROLLO

TEST REPORT
RELEVÉ DE CONTRÔLE
WERKSZEUGNIS

2.2 - UNI EN 10204

cliente customer	SPRIANO TECHNOLOGIES SRL
ordine n° purchase order n°	2605/OF DEL 26.01.2015
conferma d'ordine n° copy order n°	183 DEL 26.01.2015

posizione position	quantità quantity	descrizione description
01	405	Dischi diametro mm. 69 spessore mm. 10

Si attesta che i materiali sopra indicati :presentano le seguenti caratteristiche tecniche (1)
We certify that all above indicated products meet the following technical specifications (1)

materiale material	vetro calciosodico temprato sodalime tempered glass
sforzo di compressione indotto (σ_{BG}-σ_{BU}) induced compressive stress	≥ 100 Nmm^{-2}
temperatura normale di esercizio allowable continuous working temperature	≤ 150°C (423.15 K) (fino a 100° C se in contatto con fluidi alcalini)
temperatura massima di esercizio max. allowable working temperature	≤ 150°C (423.15 K) (fino a 100° C se in contatto con fluidi alcalini)
resistenza a shock termico (ISO 718) thermal shock resistance (ISO 718)	≥ 120 °C
resistenza idrolitica (ISO 719) hydrolytic resistance (ISO 719)	class HGB 4
resistenza agli acidi (ISO 1776) acid resistance (ISO 1776)	≤ 100 µg Na_2O per 100 cm^2
resistenza agli alcali (ISO 695) alkaline resistance (ISO 695)	class A1
coefficiente di dilatazione termica lineare linear thermal expansion coefficient	$\alpha = 9.5 \pm 0.1 \cdot 10^{-6}$ K^{-1} (20 ÷ 300 °C -- 293.15 ÷ 573.15 K)

(1) valutate in controlli non specifici / evaluated during non-specific tests

Contardi S.r.l.
Responsabile area tecnica,
Engineering activities Manager
Franco Contardi

TERRANOVA
SPRIANO MEC-RELA

MATERIAL 3.1 & HYDROTEST CERTIFICATES for SST76 PRESSURE TRANSMITTERS

PROCESS CONNECTION: 1/2" NPT-M

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-001
SERIAL NUMBER
SE240634

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

TERRANOVA® SPRIANO Valcom MEC-RELA

G. Luca Ventazzoli

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

SPRIANO® TECHNOLOGIES
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www.spriano.it
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OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-002
SERIAL NUMBER
SE240635

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-004
SERIAL NUMBER
SE240636

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

TERRANOVA® SPRIANO Valcom MEC-RELA

G. Luca Verg...zzoli

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-035
SERIAL NUMBER
SE240637

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

TERRANOVA® SPRIANO VALCIM MEC-RELA

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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OPERATO DA *OPERATED BY*	OP8
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DATA / DATE
25/07/2024

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-006
SERIAL NUMBER
SE240638

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

TERRANOVA® SPRIANO MEC-RELA

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-037
SERIAL NUMBER
SE240639

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-008
SERIAL NUMBER
SE240640

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*		
NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-040
SERIAL NUMBER
SE240641

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-009
SERIAL NUMBER
SE240642

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-043
SERIAL NUMBER
SE240643

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-011
SERIAL NUMBER
SE240644

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

TERRANOVA® SPRIANO MEC-RELA

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

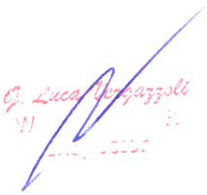
TAG
25-PT-046
SERIAL NUMBER
SE240645

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS







DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-012
SERIAL NUMBER
SE240646

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 100 bar	100	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-049
SERIAL NUMBER
SE240647

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	143,00	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk.0,1 mm	0508613	1002202-01	AISI 316L
B	PROCESS CONNECTION	Ø 45 mm	901823	2257996	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-055A
SERIAL NUMBER
SE240648

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L

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DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT**
		REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
25-PT-055B
SERIAL NUMBER
SE240649

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

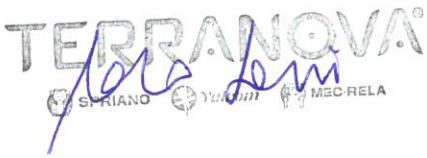
TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 5 bar	5	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
43-PT-001
SERIAL NUMBER
SE240650

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	7,15	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L



DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
50-PT-014
SERIAL NUMBER
SE240651

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
63-PT-003
SERIAL NUMBER
SE240652

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
63-PT-004
SERIAL NUMBER
SE240653

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
64-PT-031A
SERIAL NUMBER
SE240654

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
64-PT-031B
SERIAL NUMBER
SE240655

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L



DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
64-PT-002
SERIAL NUMBER
SE240656

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L



DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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DATA / DATE
25/07/2024

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1/2"NPT-M		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 25 (1")	15	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 30 bar	30	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
80-PT-002
SERIAL NUMBER
SE240657

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	42,90	10	SATISFACTORY
CALIBRATION INSTRUMENT	GPA03 - AUTOMATIC PRESSURE GENERATOR			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,05 mm	0541290	1024100-01	AISI 316/316L
B	PROCESS CONNECTION	Key 22 mm	2CMP	2023/001327	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	GLASS
F	SEAL	Ø 50 mm	2JCZ	2022/012274	AISI 316/316L



DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*		
NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

SPRIANO® TECHNOLOGIES
a TERRANOVA® Srl brand
Via Gramsci 1, 26827, Terranova Passerini (LO), ITALY
Tel & Fax +39 0377 919119
www.spriano.it
spriano@terranova-instruments.com

OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

Lamineries MATTHEY SA

Montagu 38
Case postale
CH-2520 La Neuveville

Tél. +41 32 752 32 32
Fax +41 32 752 32 00
www.matthey.ch

Métaux laminés à froid
Kaltgewalzte Metalle
Cold rolled metals

Cuivre au béryllium
Berylliumkupfer
Beryllium Copper

Certificat de réception selon EN 10204-3.1

Lot No : 1002202-01 **Certificat No : 1**

La Neuveville, le 07.03.2016

Client :	**010833**	
V/Commande :	**3355/OF**	
N/Confirm. de cde :	**CC-03302**	du 29.02.2016
N/BL :	**BL-03651**	du 14.03.2016
Qté livrée :	**32.3 kg**	

Adresse de livraison
SPRIANO TECHNOLOGIES
gramsci, 1
IT - 26824 Terranova dei Passerini (Lodi)

N/article : **D310A190.0X0.100AB** **1.4435 - Acier Inox / X2CrNiMo18-14-3 / ~ AISI 316L**

V/article : 00372635471

Coulée No : 0508613	**Composition chimique**							
Elément	Fe	C	Si	Mn	P	S	Cr	Mo
Unité	%	%	%	%	%	%	%	%
Limite	Reste	<= 0.03	<= 1	<= 2	<= 0.045	<= 0.015	17 - 19	2.5 - 3
Valeur	Reste	= 0.023	= 0.56	= 0.98	= 0.031	= 0.001	= 17.39	= 2.75
Elément	N	Ni						
Unité	%	%						
Limite	<= 0.11	12.5 - 15						
Valeur	= 0.044	= 12.86						

Caractéristiques dimensionnelles	Unité	Résultat	Min.	Max.
Epaisseur	mm	**0.0986**	0.0920	0.1080
Largeur	mm	**190.13**	190.00	190.25

Caractéristiques mécaniques	Unité	Résultat	Min.	Max.
Dureté	HV	**176**	150	200
Rm	N/mm2	**694**	550	700
Rp 0.2%	N/mm2	**353**	220	
Allongement A50mm	%	**36.1**	30.0	

Informations additionnelles
Selon NACE MR0 175
Selon NACE MR0 103

Nous certifions que la livraison est conforme aux stipulations de la confirmation de commande.

Lamineries MATTHEY SA
Sophie Krust

TERRANOVA
SPRIANO Yorcan MEC-RELA

LAMINERIES MATTHEY
NOTZ group advanced metal solutions

Lamineries MATTHEY,
branch of Notz Metall AG
Montagu 38
CH-2520 La Neuveville

Tél. +41 32 752 32 32
www.matthey.ch

Métaux laminés à froid
Kaltgewalzte Metalle
Cold rolled metals

Cuivre au béryllium
Berylliumkupfer
Beryllium Copper

Inspection Certificate according to EN 10204-3.1

Batch No. : 1024100-01 **Certificate No. : 1**

La Neuveville, 19.01.2024

Customer :	**010833**	
Y/Order :	**8965/OF**	
O/Confirmation :	**CC-29931-004**	dated 28.09.2023
O/Delivery Note :	**BL-31108**	dated 07.11.2023
Delivered Qty :	**11.3 kg**	

Ship-to
TERRANOVA SRL
Via Gramsci, 1
IT - 26827 Terranova dei Passerini (LO)

O/Part No. : **D320A150.0X0.050AG** **1.4404 - Stainless steel / X2CrNiMo17-12-2 / ~ AISI 316L / ~ AISI 316 / 1.4401**

Y/Part No. : CME04168

Heat No. : 0541290 **Chemical composition**

Element / *Unit* / *Limit*	Fe	C	Si	Mn	P	S	Cr	Mo
	%	%	%	%	%	%	%	%
	Rem.	<= 0.03	<= 1	<= 2	<= 0.045	<= 0.015	16.5 - 18.5	2 - 2.5
Value	Rem.	= 0.019	= 0.31	= 1.16	= 0.028	= 0.001	= 16.73	= 2.03

Element / *Unit* / *Limit*	N	Ni	Cu
	%	%	%
	<= 0.11	10 - 13	
Value	= 0.051	= 10.06	= 0.34

Dimensional attributes	Unit	Result	Min.	Max.
Thickness	mm	**0.0500**	0.0460	0.0540
Width	mm	**150.25**	148.00	152.00

Mechanical properties	Unit	Result	Min.	Max.
Tensile Strength, Rm	N/mm2	**995**	800	1000

Additional information
According to NACE MR0175/ISO15156

Remarks
The material is resistant to intercrystalline corrosion in accordance with DIN EN 3651-2 and ASTM A262 p.E

We hereby confirm that the shipment corresponds to the stipulations of the order acknowledgment.

Lamineries MATTHEY
branch of Notz Metall AG
Giovanni Rizzolo
Inspector / Expert

Rizzolo Giovanni

TERRANOVA
RIANO Vulcan MEC-RELA

sidenor

MILL TEST CERTIFICATE

ISO 9001; IATF 16949; ISO 14001; ISO 45001; ISO 50001; ISO 27001 Y TISAX

Basauri Plant

Product Made in Spain

CUSTOMER:TAD LONG PRODUCTS S.P.A.		WORKS REFERENCE:2257996
REFERENCE:214617	SALES ORDER:353330-7	HEAT NUMBER:901823
PRODUCT NR:	MASTER REFERENCE:253361	ROLLED:13.01.2023

REQUIRED PRODUCT

AISI316/316L ROUND BARS TURNED SOLUTION ANNEALED 45+0/+0,39mm ISO k13 5.800/6.200mm NORMAL

EXPEDITION DELIVERY:0080788101 WEIGHT (KG):4.614 BUNDLES:4 UNITS:60

MADE ACCORDING TO

AD 2000-MERKBLATT W10 - MAYO 2016; AD 2000-MERKBLATT W2 - SEPT. 2016; AISI STAINLESS STEELS - 01.03.1999
ANSI/NACE MR0103/ISO 17945:2015 - 23.11.2015; ANSI/NACE MR0175/ISO 15156-1 3ª EDICION 23.11.2015
ANSI/NACE MR0175/ISO 15156-3 3ª EDICION 23.11.2015; ASME SA182-SA182M BPVC SECTION II PART A - 2021
ASME SA193-SA193M BPVC SECTION II PART A - 2021; ASME SA320-SA320M BPVC SECTION II PART A - 2021
ASME SA479-SA479M BPVC SECTION II PART A - 2021; ASTM A182-A182M -21 01.05.2021
ASTM A276-A276M 17 15.03.2017; ASTM A479-A479M -20 01.07.2020; EN 10088-3 - 01.10.2014
EN 10204 - OCT. 2004 3.1; EN 10272 - 2016; EN DIRECTIVA 2014/68/UE - 15.05.2014
SAE AMS 5648 M . .09.2016; SAE AMS 5653 J 01.2019; SAE AMS-QQ-S-763 D 03.2015
TRADE & LONG PROD. SPA FICHA TECNICA ED1 1 21.07.2017

CHEMICAL ANALYSIS OF HEAT U:% HEAT NUMBER:901823

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	N
Min.		1,250			0,015	16,500	10,000	2,000		
Max.	0,030	2,000	0,750	0,040	0,030	18,000	13,000	2,500	1,000	0,1000
Cer.	0,030	1,840	0,440	0,037	0,022	17,740	10,140	2,050	0,460	0,0772

MECHANICAL PROPERTIES AS SUPPLIED (CONDITIONS)

Heat treatment:Solution Annealing
Temperature of:(1):Solution annealing 1.100°C

MECHANICAL PROPERTIES AS SUPPLIED (TEST)

Specimen Test location:At 12,5 mm from the surface
Tensile std.(EN ISO 6892-1-DIC. 2019); Tensile dir.:Longitudinal
Ts(500/700MPA):645MPa; Ys(1)(Rp(0,2%) >=200MPA):Rp(0,2%) 306MPa; Ys(2)(1% >=235MPA):1% 363MPa
El.(5d >=40%):5d 49,4%
Notch Impact Standard(EN ISO 148-1 - NOV. 2016)
Notch Impact dir.:Longitudinal; N. Impact sample type(KV2):KV2; Notch Impact Temp.(20°C):20°C
K(1)(>=100J):302J; K(2):308J; K(3):309J; Hardness(<= 215HB):164HB

Specimen Test location:At 1/4 of the diameter; Tensile dir.:Longitudinal
Ts(>=515MPA):641MPa; Ys(Rp(0,2%) >=205MPA):Rp(0,2%) 308MPa; El.(4d >=40%):4d 50,8%; Z(>=50%):73,6%

ADDITIONAL TESTS (SUPPLY CONDITIONS)

Grain size std.(ASTM E112 2013 01.10.2013); Grain size:Austenitic 6; Corrosion std.(1)(ISO 3651-2 - 1998.)
Type/Method(1)(Practice A):Practice A OK; Corrosion std.(2)(ASTM A262-15(R2021)01.09.2021)
Type/Method(2)(Practice E):Practice E OK; Intercrystalline Corrosion:OK

NON DESTRUCTIVE TESTS

U.T. standard(EN 10308 - 2001); U.T. type/method(quality class 3); ULTRASONIC INSPECTION 100% : O.K.

Material manufactured through the Electric Arc Furnace (EAF) and AOD.
Steel not exposed to Mercury, or to any other metal alloy that is liquid, at ambient temperatures during processing or while in Sidenor's possession.
Material dimensionally controlled, visually inspected, and free radioactivity (<0,1Bq/g concerning a Co-60).
Steel products were not repaired by welding.
100% anti mix test performed.

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER'S SPECIFICATION

APPROVED BY:Tamar Agustin Martinez SIGN:

DATE:15.02.2023

REF.:1003292270000

Analyst of quality certificates

sidenor BASAURI

TERRANOVA S.P.A. SPRIANO Valcom MEC-RELA

TD100358081 Azienda:TLP Pozzo d'Adda

Barra Inox Tonda Caldo pelato/a ricotto/a A 316L 45,00 Client Order: 515/23 Your Code: Your Item: Your Job:
HEAT 901823 OUR ORDER: 2023 SC 69921/ 100 QTY: NR 1,00 MT KG 76,00

ROLDAN, S.A. - Stainless Steels

FACTORY
Santo Tomás de las Ollas, S/N
Apdo. de Correos 11
PONFERRADA (LEÓN)
TEL.: +34 987 44 61 00
FAX: +34 987 44 61 01
E-MAIL: rdn_fabricaFacerinox.com

HEAD OFFICE
Santiago de Compostela, 100-3º
28035 MADRID (ESPAÑA)
TEL.: +34 913 98 52 57
FAX: +34 913 98 51 93
E-MAIL: roldanFacerinox.com

INSPECTION CERTIFICATE EN 10204 3.1

re: Declaration: the Product is in compliance with the order

MADE IN SPAIN - EUROPEAN UNION

Sistema de Gestión ISO 9001:2015 ISO 14001:2015 www.tuv.com ID 9105003140

0432
11
0432-CPR-00190-11

ROLDAN S.A. Z-30.3-8 MPA NRW

EN 10.088:5

CERTIFICATE Nº 2023/001327	DATE 9/02/2023	SHEET 1	DELIVERY NOTE Nº 2023/000407

GRADE ROLDAMAX-339 EN10088:3 (1.4404.)

CUSTOMER T.L.P. SPA

DIMENSIONS 22,00 mm. | Surface finish according EN10088-3 Table 7:2B

LENGTH 3.025 mm. TOLERANCE ISO h11

PRODUCT [341] Hexagonal cold drawn bar both ends chamfered 45º

REQUIREMENTS EN10088:3 CUSTOMER ORDER 214962

TENSILE TEST EN ISO 6892-1

ACCORDING TO EN 10272 EDITION AD2000 W0, W2 & W10

INTERGRANULAR CORROSION EN ISO 3651-2 method A: SATISFACTORY WITHOUT OBJETIONS

SURFACE AND DIMENSIONS CONTROL WITHOUT OBJECTIONS | Spektrometrical Identity Test: O.K.

IMPACT TEST, SAMPLE DIMENSIONS EN ISO 148-1 MATERIAL FREE FROM RADIOACTIVITY

ORDER Nº	WORKS Nº	MARKS / BOX	HEAT NUMBER	SAMPLE	WEIGHT
SE00360 7		2024 / JL20201	2CMP	2CMP	260
		2027 / JL20204	2CMP		289

TD100358498
Azienda:TLP Pozzo d'Adda
Tipo:Certificati di origine

PRODUCTION PROCESS
EAF + AOD +CC

TRADE MARK
RDN

MARKING
HEAT NUMBER
GRADE (ACX-339)

INSPECTOR STAMP
R3

QUALITY INSPECTOR
JUAN JOSE ALVAREZ RODRIGUEZ
QUALITY CONTROL REPRESENTATIVE

MECHANICAL PROPERTIES

CAST	SAMPLE	SAMPLE DIMENSIONS mm.	Observ. T°.	Rm MPa	Rp 0,2% MPa	Rp 1% MPa		A % L=5D	A % L=4D	Agt %	IMPACT STRENGHT ISO-V (J) 20°C	IMPACT STRENGHT ISO-V (J) -196°C		HARDNESS HB	FATIGUE TEST	BEND TEST	CROSS SECTIONAL AREA mm²	Kg / m
2CMP	2CMP	22,00	20°C	679	502	625		37	38					205				
REQUIREMENTS		EN ISO 377		500 900	200	235		20			100			315				

CHEMICAL COMPOSITION %

CAST	C	P	S	Si	Mn	Cr	Ni	Mo	Ti	N	Cu	Co			
2CMP	0,0200	0,0300	0,0290	0,3140	1,3580	16,7250	10,2850	2,0500	0,0050	0,0460	0,3900	0,1690			
						16,5000	10,0000	2,0000							
	0,0300	0,0450	0,0300	1,0000	2,0000	18,5000	13,0000	2,5000		0,1000					

OBSERVATIONS
ASTM A-182. ASTM A-193 Class 1 Grade B8M. ASTM A-276 Condition A. ASTM A-320 Class 1 Grade B8M.
ASTM A-479 Condition A. ASME SA-182. ASME SA-193 Class 1 Grade B8M. ASME SA-320 Class 1 Grade B8M.
ASME SA-479 Condition A. AMS 5648. AMS 5653. AMS QQ-S-763. AISI 316/316L. UNS S31600/S31603.
NACE MR0175 & MR0103.
MADE IN SPAIN.

OTHER TEST RESULTS | REQUIREMENTS AD2000 W0,W2,W10|2014/68/EU(PED)|UKCA PER 2016/1105

HEAT TREATMENT 1.050 °C AND WATERCOOLED | Crack tested acc. to EN10277 table 3 class 2

TERRANOVA METALLURGIA MECCANICA

Barra Inox Esagonale trafilato/a H11 A 316L 22,00 Client Order: 155/23 Your Code: Your Item: Your Job:
HEAT 2CMP OUR ORDER: 2023 SC 67855/ 100 QTY: NR 3,00 MT KG 30,00

CUNEO INOX SRL - Responsabile Qualità Sylvie Serale - Tel. 0171/346165 - Email certificati@cuneoinox.com

Certificato EN 10204 3.1 valido in riferimento al ns. DDT nr. 16993/2 del 11-11-2022
Per l'acquisto di KG 949,000
TONDO LAMINATO AISI 316L DIAM. 100
Vostro riferimento ordine nr. MAIL del 09-11-2022

Colata\Lotto: 534560

ACEROS INOXIDABLES OLARRA S.A.
Cm. Larrabarri, Elotxelerri, 1
48180 Loiu, Bizkaia
España
www.olarra.com

Management Systems Certified by LRQA
ISO 9001 / SGI 6000360
ISO 14001 / SGI 1870678

ACEROS INOXIDABLES
OLARRA

CUNEO INOX, S.R.L.
VIA MOROZZO 8
12040 CASTELLETTO STURA (CN) - ITALIA

Trade Mark - Zeichen des Lieferwerkes / Anagrama del suministrador

Works Inspector Stamp - Werkssachverständiger / Sello del Inspector: 3

Certificate type - APZ Nach / Certificado tipo	Certificate nº - Prüf-Nr / Certificado nº	Date-Datum-Fecha
EN 10204/3.1	485628	07 - 03 - 2022

Our order Nº / Werks - Nr / Nº de Referencia	Heat / Schmelze / Colada	Your order Nº / Bestell - Nr / Pedido Nº
757774	534560	2663/21

Steel Grade / Werkstoff / Calidad	According to / Entsprechend / Corresponde
X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX	EN 10272-2016.

Shape and Size - Gegenstad / Perfil y dimensión	Tolerance - Toleranz / Tolerancia	Bundles / Bunde / Bultos	Bars / Stäbe / Barras	Weight / Gewitcht / Peso
ROUND 100 mm	k 13 /ISO 286-1 /EN 10060	3		2288 Kg

Requirements - Anforderungen - Exigencias

EN 10088-3 2014.
ASTM A 479 / A 479M-21.
ASTM A 276/A 276M-17.
NACE MR-0175/ISO 15156-3 2015.
AD-2000-W2/W10.
ASME SA 479 / SA 479M-21.
Type 316-Type 316L-UNS.S.31603.
Conformity letter/Zustimmungsschreiben TUV BADEN 28.01.1969
Waiving of Countersign/Gegenzeichnungsverzicht:01.03.1977
PED 2014/68/EU, Annex I, Parag.4.3/DGR 2014/68/EU

Anhang I Absatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

Melting process / Erschmelzungsart / Proceso de Fusión	Heat treatment / Wärmebehandlung / Tratamiento térmico
E.A.F. / A.O.D.	1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Turned/Drehen/Torneado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Reference standard / Bezugsnorm / Norma de referencia		Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kerbschlagzaehigkeit / Resiliencia ISO V Jules
ISO6892,ASTMA370	Min.	200	235	500	40				100
	Max.			700				215	
Temperature ºC 20	Spec. Nº. 1	249	275	564	54	57	74	149	245/241/244
	Probe Nr. 2	251	277	566	53	56	73	149	243/239/242
	Pro Nº.								

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co	
Min.						16,50	2,00	10,00			
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000		
	0,027	0,31	1,53	0,039	0,030	16,51	2,03	10,03	0,0340	0,17	

Visual and dimensional inspection / Besichtigung und Ausmessung / Control visual y dimensional	Radioactivity inspection / Radioaktivitätskontrolle / Control de Radioactividad	Antimixing test / Spektrosk Verwechslungspr / Antimezcla	Grain Size / Korngrösse / Tamaño de grano
O.K.	O.K.	O.K.	

Remarks - Bemerkungen - Observaciones

IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK

EDV / EDP
Acc. EN 10204
Marian Tejedo
Quality Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica

We hereby certify that material described herein complies with the requirements agreed on the order.

Firmado digitalmente por / Signed digitally by:
ACEROS INOXIDABLES OLARRA SA - CIF A48663546
Fecha / Date:07-03-2022 08:52

External Provider's Declaration of Conformity for Ex-d Mode of Protection as per ATEX Directive & IECEx Scheme.

1) **Issuer**
TIEMMETI di TUROTTI STEFANO

2) **Object of the declaration**
CODICE DEL PEZZO: 12-19/39/X
12-19/42/X
17/94/X
17/93/X
DESCRIZIONE DEL PEZZO: CUSTODIA PER TRASMET.ELETTR. SERIE SMART
SS AISI316 ENCLOSURE
COPERCHIO CIECO X SST7X INOX REV.0
COPERCHIO ANTERIORE X SST7X INOX REV.0
QUANTITÀ PRODOTTA: 52-20-72-72
CERTIFICATO 3.1 N. 485628
NUMERO DI COLATA del 3.1: 534560

3) **TERRANOVA purchase order**
ORDINE N. 8627 rev. 1 DEL 03/11/2022

4) **Declaration**

We *TIEMMETI di TUROTTI STEFANO* herewith declare that the information provided in this "External Provider's Declaration of Conformity" is accurate and confirm that the products supplied are in conformity to the requirements stated in above Points (2) and (3).
We confirm also that no part of the production of the object described in Points (2) above has been subcontracted to third parties without the written consent of TERRANOVA Srl.

5) **Signature of Issuer (Name & Function)**

TUROTTI STEFANO, TITOLARE
TIEMMETI di TUROTTI STEFANO

Date: *01/03/2023*
Place: VIA M. PAGANO, 23
20090 TREZZANO S/N (MI)

TERRANOVA®

CUNEO INOX SRL - Responsabile Qualità Sylvie Serale - Tel. 0171/346165 - Email certificati@cuneoinox.com

Certificato EN 10204 3.1 valido in riferimento al ns. DDT nr. 16993/2 del 11-11-2022
Per l'acquisto di KG 949,000
TONDO LAMINATO AISI 316L DIAM. 100
Vostro riferimento ordine nr. MAIL del 09-11-2022

Colata\Lotto: 534560

ACEROS INOXIDABLES OLARRA S.A.
Larrabarn. Elotxelerri, 1
...80 Loiu. Bizkaia
...spana
...www.olarra.com

Management Systems Certified by LRQA
ISO 9001 / SGI 6000360
ISO 14001 / SGI 1870678

ACEROS INOXIDABLES
OLARRA

CUNEO INOX, S.R.L.
VIA MOROZZO 8
12040 CASTELLETTO STURA (CN) - ITALIA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador

Works Inspector Stamp - Werkssachverständiger
Sello del Inspector 3

Certificate type - APZ Nach / Certificado tipo	EN 10204/3.1	Certificate n° - Prüf-Nr / Certificado n°	485628	Date-Datum-Fecha	07 - 03 - 2022
Our order N° / Werks - Nr / N°de Referencia	757774	Heat / Schmelze / Colada	534560	Your order N° / Bestell - Nr / Pedido N°	2663/21
Steel Grade / Werkstoff / Calidad	X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX	According to / Entsprechend / Corresponde	EN 10272-2016.		
Shape and Size - Gegenstad / Perfil y dimensión	ROUND 100 mm	Tolerance - Toleranz / Tolerancia	k 13 /ISO 286-1 /EN 10060	Bundles / Bunde / Bultos	3
Bars / Stäbe / Barras		Weight / Gewitcht / Peso	2288 Kg		

Requirements - Anforderungen - Exigencias

EN 10088-3 2014.
ASTM A 479 / A 479M-21.
ASTM A 276/A 276M-17.
NACE MR-0175/ISO 15156-3 2015.
AD-2000-W2/W10.
ASME SA 479 / SA 479M-21.
Type 316-Type 316L-UNS.S.31603.
Conformity letter/Zustimmungsschreiben TUV BADEN 28.01.1969
Waiving of Countersign/Gegenzeichnungsverzicht:01.03.1977
PED 2014/68/EU, Annex I, Parag.4.3/DGR 2014/68/EU

Anhang I Absatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

Melting process / Erschmelzungsart / Proceso de Fusión	Heat treatment / Wärmebehandlung / Tratamiento térmico
E.A.F. / A.O.D.	1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Turned/Drehen/Torneado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Reference standard / Bezugsnorm / Norma de referencia			Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kerbschlagzaehigkeit / Resiliencia ISO V Jules
ISO6892,ASTMA370	Min.		200	235	500	40				100
	Max.				700				215	
Temperature °C 20	Spec. N°.	1	249	275	564	54	57	74	149	245/241/244
	Probe Nr. / Pro N°	2	251	277	566	53	56	73	149	243/239/242

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co	
Min.						16,50	2,00	10,00			
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000		
	0,027	0,31	1,53	0,039	0,030	16,51	2,03	10,03	0,0340	0,17	

Visual and dimensional inspection / Besichtigung und Ausmessung / Control visual y dimensional	Radioactivity inspection / Radioaktivitätskontrolle / Control de Radioactividad	Antimixing test / Spektrosk Verwechslungspr / Antimezcla	Grain Size / Korngrösse / Tamaño de grano
O.K.	O.K.	O.K.	

Remarks - Bemerkungen - Observaciones

IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK

EDV / EDP
Acc. EN 10204
Marian Tejedo
Quality Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica

TERRANOVA
CIPRIANO Valcom MEC-RELA

We hereby certify that material described herein complies with the requirements agreed on the order.

Firmado digitalmente por / Signed digitally by:
ACEROS INOXIDABLES OLARRA SA - CIF A48663546
Fecha / Date:07-03-2022 08:52

CONTARDI

50 100 3910

CONTARDI. s.r.l. unipersonale
Via Milano, 19 23886 Colle Brianza (LC)
Tel 039 / 92 76 089 – Fax 039 / 92 60 329
CCIAA 03489730139
Codice Fiscale e Partita IVA 03489730139
Capitale Sociale int. vers. €. 100.000,00
Sito web: www.contardi.it
e-mail: info@contardi.it - pec: contardi@legalmail.it

ATTESTATO DI CONTROLLO

TEST REPORT
RELEVÉ DE CONTRÔLE
WERKSZEUGNIS

TERRANOVA

2.2 - UNI EN 10204

cliente customer	SPRIANO TECHNOLOGIES SRL
ordine n° purchase order n°	2605/OF DEL 26.01.2015
conferma d'ordine n° copy order n°	183 DEL 26.01.2015

posizione position	quantità quantity	descrizione description
01	405	Dischi diametro mm. 69 spessore mm. 10

Si attesta che i materiali sopra indicati :presentano le seguenti caratteristiche tecniche (1)
We certify that all above indicated products meet the following technical specifications (1)

materiale material	vetro calciosodico temprato sodalime tempered glass
sforzo di compressione indotto (σ_{BG}-σ_{BU}) induced compressive stress	≥ 100 Nmm^{-2}
temperatura normale di esercizio allowable continuous working temperature	≤ 150°C (423.15 K) (fino a 100° C se in contatto con fluidi alcalini)
temperatura massima di esercizio max. allowable working temperature	≤ 150°C (423.15 K) (fino a 100° C se in contatto con fluidi alcalini)
resistenza a shock termico (ISO 718) thermal shock resistance (ISO 718)	≥ 120 °C
resistenza idrolitica (ISO 719) hydrolytic resistance (ISO 719)	class HGB 4
resistenza agli acidi (ISO 1776) acid resistance (ISO 1776)	≤ 100 µg Na_2O per 100 cm^2
resistenza agli alcali (ISO 695) alkaline resistance (ISO 695)	class A1
coefficiente di dilatazione termica lineare linear thermal expansion coefficient	$\alpha = 9.5 \pm 0.1 \cdot 10^{-6}$ K^{-1} (20 ÷ 300 °C -- 293.15 ÷ 573.15 K)

(1) valutate in controlli non specifici / evaluated during non-specific tests

Contardi S.r.l.
Responsabile area tecnica,
Engineering activities Manager

Franco Contardi

ROLDAN, S.A. - Acciai Inossidabili

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FAX: +34 913 98 51 93
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CERTIFICATO D'ISPEZIONE EN 10204 3.1

MADE IN SPAIN - EUROPEAN UNION

Sistema de Gestión ISO 9001:2015
TÜVRheinland CERTIFICADO
www.tuv.com ID 0091003143

CE
0432
11
0432-CPR-00190-01

CERTIFICATO N° 2022/012274	DATA 28/11/2022	FOGLIO 1	N° DOCUMENTO DI TRASPOSTO 2022/003838
MATERIALE ROLDAMAX-339	EN10088:3 (1.4404.)		
CLIENTE ELVINOX SRL			
DIMENSIONI 50,00 mm.	Surface finish according EN10088-3 Table 7:2B		
LUNGHEZZA 3.100 mm.	TOLLERANZA ISO h9		
PRODOTTO [233] Barra pelata, rettificata, pulita, bisellata 45°			
SPECIFICHE EN10088:3	ORDINE DEL CLIENTE 4544		
PROVE DI TRAZIONE EN ISO 6892-1			
CORRISPONDENTE EN 10272	EDIZIONE AD2000 W0, W2 & W10		
CORROSIONE INTERGRANULARE EN ISO 3651-2 method A: SATISFACTORY	WITHOUT OBJETIONS		
CONTROLLO DIMENSIONALE E VISIVO WITHOUT OBJECTIONS	Spektrometrical Identity Test: O.K.		
PROVA DI RESILIENZA EN ISO 148-1	MATERIAL FREE FROM RADIOACTIVITY		EN 10.088:5

PROCESSO DI FABBRICAZIONE	MARCHIO DEL FORNITORE	MARCHIO	TIMBRO DI RICEZIONE	ISPETTORE DI QUALITA
EAF + AOD +CC	RDN	HEAT NUMBER GRADE (ACX-339)	R3	JUAN JOSE ALVAREZ RODRIGUEZ QUALITY CONTROL REPRESENTATIVE

CARATTERISTICHE MECCANICHE

COLATA	CAMPIONE	DIMENSIONI DEL CAMPIONE mm.	Osserv. T°.	Rm MPa	Rp 0,2% MPa	Rp 1% MPa	Z %	A % L=5d	A % L=4d	Agt %	RESILIENZA ISO-V (J) 20°C	RESILIENZA ISO-V (J) -196°C		DUREZZA HB	PROVA DI FATICA	PROVA DI TORSIONE	AREA DELLA SEZIONE mm²	Kg / m
2JCZ	2JCZ	30,00	20°C	577	250	274	69	52	54					159				
REQUISITI DELLA NORMA		EN ISO 377		500 700	200	235		40			100			215				

COMPOSIZIONE CHIMICA %

COLATA	C	P	S	Si	Mn	Cr	Ni	Mo	Ti	N	Cu	Co			
2JCZ	0,0240	0,0300	0,0250	0,2430	1,4440	16,8550	10,4700	2,0820	0,0040	0,0430	0,4040	0,1840			
REQUISITI DELLA NORMA	0,0300	0,0450	0,0300	1,0000	2,0000	16,5000 18,5000	10,0000 13,0000	2,0000 2,5000		0,1000					

TERRANOVA

OSSERVAZIONI	ASTM A-182. ASTM A-193 Class 1 Grade B8M. ASTM A-276 Condition A. ASTM A-320 Class 1 Grade B8M. ASTM A-479 Condition A. ASME SA-182. ASME SA-193 Class 1 Grade B8M. ASME SA-320 Class 1 Grade B8M. ASME SA-479 Condition A. AMS 5648. AMS 5653. AMS QQ-S-763. AISI 316/316L. UNS S31600/S31603. NACE MR0175 & MR0103. MADE IN SPAIN.

ALTRE PROVE	REQUISITI DELLA NORMA AD2000 W0, W2 & W10, 2014/68/EU (PED)
TRATTAMENTO TERMICO 1.050 °C AND WATERCOOLED	Crack tested acc. to EN10277 table 3 class 3

ROLDAN, S.A. - Acciai Inossidabili

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CERTIFICATO D'ISPEZIONE EN 10204 3.1

MADE IN SPAIN - EUROPEAN UNION

Sistema de Gestión ISO 9001:2015
TÜVRheinland CERTIFICADO
www.tuv.com ID 0091003143

CE
0432
11
0432-CPR-00190-01

EN 10.088:5

CERTIFICATO N° 2022/012274	DATA 28/11/2022	FOGLIO 1	N° DOCUMENTO DI TRASPOSTO 2022/003638

MATERIALE ROLDAMAX-339 EN10088:3 (1.4404.)

CLIENTE ELVINOX SRL

DIMENSIONI 50,00 mm. | Surface finish according EN10088-3 Table 7:2B

LUNGHEZZA 3.100 mm. TOLLERANZA ISO h9

PRODOTTO [233] Barra pelata, rettificata, pulita, bisellata 45°

SPECIFICHE EN10088:3 ORDINE DEL CLIENTE 4544

PROVE DI TRAZIONE EN ISO 6892-1

CORRISPONDENTE EN 10272 EDIZIONE AD2000 W0, W2 & W10

CORROSIONE INTERGRANULARE EN ISO 3651-2 method A: SATISFACTORY WITHOUT OBJETIONS

CONTROLLO DIMENSIONALE E VISIVO WITHOUT OBJECTIONS Spektrometrical Identity Test: O.K.

PROVA DI RESILIENZA EN ISO 148-1 MATERIAL FREE FROM RADIOACTIVITY

PROCESSO DI FABBRICAZIONE	MARCHIO DEL FORNITORE	MARCHIO	TIMBRO DI RICEZIONE	ISPETTORE DI QUALITA
EAF + AOD +CC	RDN	HEAT NUMBER GRADE (ACX-339)	R3	JUAN JOSE ALVAREZ RODRIGUEZ QUALITY CONTROL REPRESENTATIVE

N° ORDINE	LAVORO N°	CASSA / BULTO	NUMERO COLATA	CAMPIONE	PESO
SE22004599 3		99024 / RK23651-	2JCZ		335

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MATERIAL 3.1 & HYDROTEST CERTIFICATES for SST72 TEMPERATURE TRANSMITTERS

G. Luca Vergazzoli
W K
Inspector 0 B O
05/08/24 R14C

X CROSSWIND
05/08/24 R

TERRANOVA

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SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1"1/2 ANSI 150 RF		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 40 (1" 1/2)	40	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 20 bar	20	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
50-TT-001
SERIAL NUMBER
SE240658

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	28,60	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-03 PRESSURE GAUGE RANGE 0/60bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	FLANGE	Ø 165,1 mm	800078	2018070153	SUPERDUPLEX F55
B	STEM	Ø 40 mm	376908	2023050847	SUPERDUPLEX F55
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	-

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
Positive Material Identification Test (PMI)	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	YES	Terranova Dye Penetrant T.P.	437.24
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
30/07/2024

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	1"1/2 ANSI 150 RF		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 40 (1" 1/2)	40	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 20 bar	20	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
50-TT-002
SERIAL NUMBER
SE240659

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	28,60	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-03 PRESSURE GAUGE RANGE 0/60bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*					
POS	**DESCRIPTION**	**DIMENSIONS**	**HEAT**	**CERTIFICATE**	**MATERIAL**
A	FLANGE	Ø 130 mm	476203	2024011101	AISI 316/316L
B	STEM	Ø 30 mm	438044	MEST065292/2024	AISI 316/316L
C	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
D	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
E	GLASS	Ø 69 Thk.10 mm	-	183	-

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G. Luca Vergazzoli

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
Positive Material Identification Test (PMI)	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	YES	Terranova Dye Penetrant T.P.	438.24
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*		
NR	**TIPO DI CONTROLLO / *TYPE OF CONTROL***	**ESITO / *RESULT***
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
30/07/2024

COGNE ACCIAI SPECIALI S.p.a.
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TEL. +39.0165.3021 - FAX +39.0165.302296 certified according to ISO 9001, IATF
CAP. SOC. 115.000.000 EUR INT. VERS. 16949, EN 9100 and ISO 14001.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2018070153

MANUFACTURER'S WORKS:	AOSTA, VIA PARAVERA 16 - ITALY		
PRODUCER OF THE DOC:	QUALITY DEPARTMENT		
MANUFACTURER'S WORKS ORDER NO: 1108594 /40	MARK OF THE MANUFACTURER: COGNE		
DISPATCH NOTE:	81253686 /20 WEIGHT: 1000 KG		
THE CERTIFIED PRODUCTS ARE COMPLYING TO THE PURCHASE ORDER	NORSOKREV5	TECHNICAL RULE:	
INTERNAL SPEC:	38673 SPE ROUGHPEELED	ROUND BARS TOLERANCE:	+ 1,500 - 0,0000
PRODUCT:	1X Hot Finished		
SURFACE FINISH:	RS SOLUTION ANNEALED		
PRODUCT DELIVERY CONDITION:	165,100	LENGTH (mm)	04000 /06000
PRODUCT DIMENSIONS (mm):	F55 UNSS32760 1.4501	INTERNAL GRADE:	329S
GRADE:	800078	IDENTIFICATION LOT NO:	333560
IDENTIFICATION HEAT NO:	W.1.4501	TEST PIECE N:	356
MARKING OF THE PRODUCT:			

REFERENCE NORMS:EN 10088-3, EN 10272, ASTM A276/ASME SA276, ASTM A479/ASME SA479, ISO15156-3/NACE MR0175, NACE MR0103, API 6A-PSL3, NORSOK M-650 REV.4/M-630 MDS D57 REV.5 QTR04 (up to 101.6mm), QTR05 (101.61-250mm). REFERENCE NORMS ONLY FOR CHEMICAL COMPOSITION: EN 10222-5, ASTM A182/ASME SA182, ASTM A484
HEAT TREATMENT: SOLUBILIZATION 1100 ° C 1.5 min / mm COOLING WATER TEMPERATURE BELOW 260 °C (FURNACE THERMOCOUPLES)
ASTM G48 A/ASTM A923 C TESTING CONDITIONS: Sample surface 120 GRIT, Solution 100g FeCl3.6H2O+900ml H20, T 50°C, 24h, no pitting at 20X.
MELTING PROCESS UHP + AOD + INGOT CASTING
STEELMAKING EAF + AOD
HOT FORGED
REDUCTION RATIO 19,8

CHEM. COMP. (%W/W) - LADLE ANALYSIS ACCORDING TO ASTME1019-A751-E1086-E415-A580
Control lot No. - Weight :020000723615 - 84.662 KG

ELEMENTS	C	Si	Mn	P	S	N	Cr	Mo	Ni	Cu
OBTAINED	0,017	0,34	0,59	0,022	0,0006	0,24	24,92	3,73	6,93	0,52

ELEMENTS	W	CV_F8
OBTAINED	0,59	41

CV_F8 = CR+(3.3*MO)+(16*N2)

HARDNESS TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ENISO6506 HARDNESS TEST HB TESTING METHOD: 10/3000
OBTAINED 222

IMPACT TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION EN ISO 148-1-KV2 DIRECTION OF THE TEST PIECE: T

TYPE OF TEST PIECE	KV		
TEST TEMPERATURE °C		20	
MEASUREMENT UNIT	J		
OBTAINED	298	297	297

G. Luisa Vergazzoli
W R
Inspector

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SPRIANO Valcom MEC-RELA

1724000979-QC-DB-00006_03

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Company with Management Systems certified according to ISO 9001, IATF 16949, EN 9100 and ISO 14001.

TENSILE TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTMA370-E8-0.5"SPEC DIRECTION OF THE TEST PIECE: L

	Rm	Rp02%	Z	Al2
MEASUREMENT UNIT	MPA	MPA	%	% 4,0 D
OBTAINED	765	559	73,6	45,0

CORROSION
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTM G48 A
OBTAINED 0,6985

FERRITE %
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTME562 --
OBTAINED 41,77

MICROSTRUCTURE
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION -- --
OBTAINED SATISFACTORY

LATERAL EXPANSION
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTMA370 --
OBTAINED 1,5 1,3 1,0

SHEAR %
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTMA370 --
OBTAINED 65 60 50

HARDNESS TEST
Control lot No. - Weight :020000768077 - 6.090 KG
SPECIFICATION ASTMA370-E18 HARDNESS TEST HRC TESTING METHOD:
OBTAINED 21

G. Luca Bergazzoli
Inspector

TERRANOVA
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Company with Management Systems certified according to ISO 9001, IATF 16949, EN 9100 and ISO 14001.

INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2018070153

IMPACT TEST
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTM A370-E23 TYPE A DIRECTION OF THE TEST PIECE: L
TYPE OF TEST PIECE KV
TEST TEMPERATURE °C 50-
MEASUREMENT UNIT J
OBTAINED 252 175 251

IMPACT TEST
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTM A370-E23 TYPE A DIRECTION OF THE TEST PIECE: T
TYPE OF TEST PIECE KV
TEST TEMPERATURE °C 50-
MEASUREMENT UNIT J
OBTAINED 164 138 116

TENSILE TEST
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION ASTMA370-E8-0.5"SPEC DIRECTION OF THE TEST PIECE: T

	TS	YS02	EL	RA	Al2 B
MEASUREMENT UNIT	KSI	KSI	%	%	%
			5.0 D		4,0 D
OBTAINED	113	80	33,4	72,3	38,2

TENSILE TEST
Control lot No. - Weight :020000724099 - 6.090 KG
SPECIFICATION EN-ISO6892-1 DIRECTION OF THE TEST PIECE: T

	Rm C	Rp02 C	A	Z C
MEASUREMENT UNIT	MPA	MPA	%	%
			5.0 D	
OBTAINED	766	557	43,0	76,4

TERRANOVA
GIUSEPPRIANO MICHELA

VISUAL INSPECTION OF SURFACE AND DIMENSIONAL CONTROL ACCORDING TO EN 10221 CLASS C AND EN 10060: SATISFACTORY.
METALLOGRAPHIC INSPECTION ACCORDING TO ASTM A923 METHOD A: SATISFACTORY.
IMPACT TEST VALUES AT -46°C ARE NOT LESS THAN THOSE AT -50°C HERE STATED.
QTC ON PROLONGATION OF BARS TESTS AT MID RADIUS (CENTER POS. FOR SIZES <2 INCHES).
ASTM A484 DOES NOT APPLY FOR SIZE AND LENGTH TOLERANCES.
MARKING: PRODUCER LOGO, MATERIAL NO, HEAT NO, LOT NR.
ALL THE NORMS MENTIONED ARE INTENDED IN THEIR LAST REVISION AT THE DATE OF ISSUE OF THIS DOCUMENT.
COUNTRY OF ORIGIN: ITALY, THE MATERIAL COMPLIES WITH FAR DFARS
252.225-7009 ALT 1.
THE PRODUCT SATISFIES CE DIRECTIVES: 2011/65 (ROHS2) - 2000/53 - 2002/95(RoHS) - 2003/11 - 2005/618 AND PED 2014/68/EU.
THE MATERIAL IS FREE OF ANY MERCURY, MERCURY COMPOUNDS AND OR RADIUM CONTAMINATION AT TIME OF SHIPMENT AND WAS PRODUCED WITHOUT USING OZONE DEPLETING SUBSTANCES OF CLASS I AND II.
ULTRASONIC TEST ACCORDING TO EN 10308 CLASS 3, EQUIVALENT TO ASTM A388 FBH 5 : SATISFACTORY
CORROSION TEST ACCORDING TO ASTM A262 Method E EN ISO 3651-2: SATISFACTORY. NO CRACKS AT 20X MAGNIFICATION

Luca Vergazzoli
Inspector

COGNE ACCIAI SPECIALI S.p.a.

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Company with Management Systems certified according to ISO 9001, IATF 16949, EN 9100 and ISO 14001.

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DATE 28.12.2018

BARBARA VIETTI MV(QUALITY CERTIFICATOR) - ELECTRONICALLY GENERATED CERTIFICATE -Cogne

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Aziende con Sistemi di Gestione certificati secondo ISO 9001, IATF 16949, EN 9100, ISO 14001 e ISO 45001

CERTIFICATO DI COLLAUDO 3.1 (EN 10204:2004)

NUMERO DEL DOCUMENTO 2024011101

STABILIMENTO PRODUTTORE:	AOSTA, VIA PARAVERA 16 - ITALIA		
REDATTORE DEL DOCUMENTO:	SERVIZIO QUALITA'		
CONFERMA D'ORDINE DEL PRODUTTORE:	0001140336 / 000020		
SIGLA STABILIMENTO PRODUTTORE:	**COGNE**		
AVVISO DI SPEDIZIONE:	0081603737 / 000020 PESO: 579 KG / 1276 LB		
SPECIFICA INTERNA:	STOCKBARREW2	REGOLA TECNICA:	AD2000
PRODOTTO:	SPE Sgrossati di pelatura	TONDI TOLLERANZA:	+ 1,500 - 0,0000 (+ 0,0591 - 0 in)
FINITURA SUPERFICIALE:	1X		
STATO DI FORNITURA:	RS Ricotto Solubilizzato		
DIMENSIONI DEL PRODOTTO (MM):	130,000 (5,118 in)	LUNGH. (MM):	04000 06000 (00157 00236 in)
QUALITA' ACCIAIO:	316L-S31600/31603-1.4404/4401	MARCA INTERNA:	F316L IMCO
IDENTIFICAZIONE N. DI COLATA:	476203	IDENTIFICAZIONE N. DI SCHEDA:	556420
MARCATURA DEL PRODOTTO:	1.4404	MARCATURA PROVINI:	642

FABBRICAZIONE AL FORNO ELETTRICO + AOD + COLATA CONTINUA
AISI 316/316L - UNS S31600/S31603 - 1.4404/1.4401
ASTM A484 NON SI APPLICA PER TOLLERANZE SUL DIAMETRO E LUNGHEZZA.
NORME DI RIFERIMENTO: EN 10088-3 (14), EN 10272 (16), ASTM A276-r17/ASME SA276-21, ASTM A479/A479M-r21, ASTM A193-23 B8MCLASSE 1D, ASME SA276/SA276M-21,ASME SA479/SA479M-21, AMS 5653J, AMS 5648N, ISO15156-3/NACE MR0175 (15), NACE MR0103/ISO 17945 (15), NORSOK M630 MDSS01 REV5.
NORME DI RIFERIMENTO PER ANALISI CHIMICA E PROPRIETA'MECCANICHE: ASTM A182-23/ ASME SA182-21.
NORME DI RIFERIMENTO SOLO PER ANALISI CHIMICA: EN 10222-5 (17),ASTM A403-22b, ASTM A484-22, ASTM A314-23, AMS-QQ-S-763D.
ASME SECT.II PART A EDITION 2015-2017-2019-2021.
RIFERIMENTO PER GLI STANDARD ASME APPLICABILI : SEZIONE II PARTE A ED 2015-2017-2019-2021
LAMINATO A CALDO
RAPPORTO DI RIDUZIONE 6,4

ANALISI CHIMICA DI COLATA SECONDO ASTM A751 - EN ISO 14284
Lotto controllo - Peso:020000994977 - 84.492 KG - 186.270 LB

ELEMENTI	C	Si	Mn	P	S	N	Cr	Mo	Ni	Cu
UNITA' DI MISURA	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w
OTTENUTO	0,017	0,36	1,74	0,028	0,027	0,075	16,78	2,09	10,18	0,43

ELEMENTI	Co
UNITA' DI MISURA	% w/w
OTTENUTO	0,20

PROVA DI DUREZZA ALLO STATO DI FORNITURA
Lotto controllo - Peso:020000995994 - 7.698 KG - 16.971 LB

NORMA			
	ENISO6506	PROVA DI DUREZZA	HB
OTTENUTO	153		

G. Luca Borgazzoli
Inspector

TERRANOVA
SPRIANO Valcom MEC-RELA

DATA 08.03.2024

BARBARA VIETTI MV(ESPERTO DI STABILIMENTO) - CERTIFICATO GENERATO ELETTRONICAMENTE -Cogne

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Azienda con Sistemi di Gestione certificati secondo ISO 9001, IATF 16949, EN 9100, ISO 14001 e ISO 45001

CERTIFICATO DI COLLAUDO 3.1 (EN 10204:2004)
NUMERO DEL DOCUMENTO 2024011101

PROVA DI RESILIENZA ALLO STATO DI FORNITURA
Lotto controllo - Peso:020000995994 - 7.698 KG - 16.971 LB
NORMA EN ISO 148-1-KV2
TIPO DI PROVETTA KV
TEMPERATURA DI PROVA °C 20
UNITA' DI MISURA J
ORIENTAMENTO DELLE PROVETTE: L

OTTENUTO										
	426	440	442	432	426	437	443	443	431	439
	432	441								

PROVA DI TRAZIONE ALLO STATO DI FORNITURA
Lotto controllo - Peso:020000995994 - 7.698 KG - 16.971 LB
NORMA EN-ISO6892-1
ORIENTAMENTO DELLE PROVETTE: L

UNITA' DI MISURA	RM MPA	RP02 MPA	A5 %	Z %	RP1 MPA
OTTENUTO			5.0 D		
	556	258	61,0	77,2	295
	554	249	59,5	79,5	295
	559	248	59,7	81,1	297
	563	255	60,1	81,0	297

DIMENSIONE GRANO
--
Lotto controllo - Peso:020000995994 - 7.698 KG - 16.971 LB
NORMA ASTME112 --
OTTENUTO 5

PROVA DI RESILIENZA
Lotto controllo - Peso:020000995994 - 7.698 KG - 16.971 LB
NORMA EN ISO 148-1
TIPO DI PROVETTA KV
TEMPERATURA DI PROVA °C 196-
UNITA' DI MISURA J
ORIENTAMENTO DELLE PROVETTE: L

OTTENUTO										
	196	203	218	211	197	209	208	217	194	214
	196	203								

PROVA DI TRAZIONE
Lotto controllo - Peso:020000995994 - 7.698 KG - 16.971 LB
NORMA ASTMA370-E8-0.5"SPEC
ORIENTAMENTO DELLE PROVETTE: L

UNITA' DI MISURA	TS KSI	YS KSI	RA %	EL %
OTTENUTO				4,0 D
	82	36	81,4	56,9
	81	37	77,6	66,5
	80	38	80,4	63,8
	81	38	80,0	63,0

G. Luca Vergazzoli
W... Director

TERRANOVA
SPRIANO Valcom MEC-RELA

DATA 08.03.2024

BARBARA VIETTI MV(ESPERTO DI STABILIMENTO) - CERTIFICATO GENERATO ELETTRONICAMENTE -Cogne

1724000979-QC-DB-00006_03

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C.F. 02167360967
VAT: IT00571320078 - R.E.A. n. AO-50474

Azienda con Sistemi di Gestione certificati secondo ISO 9001, IATF 16949, EN 9100, ISO 14001 e ISO 45001

Paese di origine: Italia, il materiale è conforme alle normative FAR DFARS 252.225-7009 ALT 1.
DOCUMENTO EMESSO IN ACCORDO CON TUEV BAYERN (11.1972) NON SOGGETTO A CONTROFIRMA (VEDI LETTERA TUEV BAYERN 17.01.80).
MARCATURA: MARCHIO PRODUTTORE, N. WERKSTOFF, N. COLATA, N. PROVA/LOTTO PUNZONE DELL'ESPERTO
PROVA di CORROSIONE SECONDO ASTM A262/02A PRATICA E EN ISO 3651/2 A: CONFORME.
ISPEZIONE VISIVA E COLLAUDO DIMENSIONALE IN ACCORDO A EN 10221 CLASSE C E EN 10060: CONFORME.
PROVA ULTRASUONI SECONDO EN10308 Classe 3, equivalente a ASTM A388 FBH 5(diam. 100-250) e FBH 8 (diam. 250-400) oppure SECONDO EN10228-4 Classe 3: CONFORME.
CONTROLLO ANTIMISCUGLIO SUL PRODOTTO CON SPETTROMETRO PORTATILE:
CONFORME.
NON E' STATA ESEGUITA ALCUNA RIPARAZIONE DEL MATERIALE MEDIANTE
SALDATURA.
ESENTE DA CONTAMINAZIONE DA RADIOATTIVITA'.
PROVA ULTRASUONI SECONDO EN 10308 Class.3, EN 10228 Class.3, ASTM A388 FBH 5 (diam. 102-250), FBH 8 (diam. 250,01-400).
MATERIALE CONFORME ALLA NORMA NORSOK M-630 MDS S01
CONTROLLO DI RADIOATTIVITA' ESEGUITO CON UNO SPETTROMETRO GAMMA: ASTM E181.
ATTIVITA' GAMMA SUI PRODOTTI AL DI SOTTO DI 0.1 BQ/G IN ACCORDO ALLA RISOLUZIONE UE 2013/59/EURATOM, IAEA RS-G-1.7 E IAEA SSG-17.
MATERIALE PRODOTTO IN UN SISTEMA DI GESTIONE QUALITA' IN ACCORDO ALLE NORME UNI EN ISO 9001:2015 E IATF 16949:2016 (QUEST'ULTIMA SOLO PER VERGELLA E FILO, BARRE LAMINATE-PELATE-RETTIFICATE IN ACCIAIO) CERTIFICATO DA KIWA CERMET.
PRODOTTO CONFORME AL CONTRATTO IN ACCORDO CON LA REGOLA AD2000-MERKBLATT W0/W2.
PUNZONE DELL'ESPERTO LF
IL MATERIALE È CONFORME ALLE DIRETTIVE: 2015/863/EU (RoHS3) - 2011/65/EU(RoHS2) - 2000/53/EU - 2002/95/EU (RoHS) - 2003/11/EU - 2005/618/EU - PED 2014/68/EU e PE(S)R 2016/1105.
IL MATERIALE E' PRIVO DI MERCURIO E SUOI COMPOSTI ED ESENTE DA CONTAMINAZIONE DA SOSTANZE RADIOATTIVE AL MOMENTO DELLA SPEDIZIONE ED E' STATO PRODOTTO SENZA L'UTILIZZO DI SOSTANZE LESIVE DELL'OZONO DI CLASSE I E II.
NORME DI RIFERIMENTO: EN 10088-3 (14), EN 10272 (16), ASTM A276-r17/ASME SA276-21, ASTM A479/A479M-r21, ASTM A193-23 B8MCLASSE 1D, ASME SA276/SA276M-21,ASME SA479/SA479M-21, AMS 5653J, AMS 5648N, ISO15156-3/NACE MR0175 (15), NACE MR0103/ISO 17945 (15), NORSOK M630 MDSS01 REV5.
NORME DI RIFERIMENTO PER ANALISI CHIMICA E PROPRIETA'MECCANICHE: ASTM A182-23/ ASME SA182-21.
NORME DI RIFERIMENTO SOLO PER ANALISI CHIMICA: EN 10222-5 (17),ASTM A403-22b, ASTM A484-22, ASTM A314-23, AMS-QQ-S-763D.
ASME SECT.II PART A EDITION 2015-2017-2019-2021.
DOVE NON SPECIFICATO TUTTE LE NORME CITATE SI INTENDONO NELLA LORO ULTIMA REVISIONE IN VIGORE.
ASTM A484 NON SI APPLICA PER TOLLERANZE SUL DIAMETRO E LUNGHEZZA.

TERRANOVA SPRIANO Tubacom MEC-RELA

DATA 08.03.2024

BARBARA VIETTI MV(ESPERTO DI STABILIMENTO) - CERTIFICATO GENERATO ELETTRONICAMENTE -**Cogne**

Page 403 of 602

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C.F. 02187360067
VAT: IT00571320076 - R.E.A. n. AO-50474

Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.

INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2023050847

MANUFACTURER'S WORKS:	AOSTA, VIA PARAVERA 16 - ITALY		
PRODUCER OF THE DOC:	OUALITY DEPARTMENT		
MANUFACTURER'S WORKS ORDER NO:	0001137655 / 000010		
MARK OF THE MANUFACTURER:	**COGNE**		
DISPATCH NOTE:	0081578791 / 000010 WEIGHT: 60 KG / 132 LB		
INTERNAL SPEC:	NORSOKREV5		
PRODUCT:	PEL PEELED ROUND BARS TOLERANCE: ISOK11		
SURFACE FINISH:	2B Cold Finished		
PRODUCT DELIVERY CONDITION:	RS SOLUTION ANNEALED		
PRODUCT DIMENSIONS (mm):	40,000 (1,575 in)	LENGTH (mm)	04000 06200 (00157 00244 in)
GRADE:	F55 UNSS32760 1.4501	INTERNAL GRADE:	329S
IDENTIFICATION HEAT NO:	376908	IDENTIFICATION LOT NO:	358450
MARKING OF THE PRODUCT:	1.4501	TEST PIECE N:	845

STEELMAKING EAF + AOD + CONTINUOUS CASTING
HEAT TREATMENT: SOLUBILIZATION 1100 ° C 1.5 min / mm COOLING WATER TEMPERATURE BELOW 260 °C (FURNACE THERMOCOUPLES)
ASTM G48 A/ASTM A923 C TESTING CONDITIONS: Sample surface 120 GRIT, Solution 100g FeCl3.6H2O+900ml H20, T 50°C, 24h, no pitting at 20X. UNIT OF MEASURE: G/M2
HOT ROLLED
REDUCTION RATIO 39,1

CHEMICAL LADLE ANALYSIS ACCORDING TO ASTM A751 - EN ISO 14284
Control lot No. - Weight :020000968715 - 86.025 KG - 189.649 LB

ELEMENTS	C	Si	Mn	P	S	N	Cr	Mo	Ni	Cu
MEASUREMENT UNIT	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w	% w/w
OBTAINED	0,015	0,32	0,62	0,020	0,0008	0,25	25,01	3,67	6,96	0,58

ELEMENTS	W	CV_F8
MEASUREMENT UNIT	% w/w	% w/w
OBTAINED	0,56	41

CV_F8 = CR+(3.3*MO)+(16*N2)

HARDNESS TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ENISO6506 HARDNESS TEST HB TESTING METHOD: 10/3000
OBTAINED 234

IMPACT TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION EN ISO 148-1-KV2 DIRECTION OF THE TEST PIECE: L

TYPE OF TEST PIECE	KV		
TEST TEMPERATURE °C	20		
MEASUREMENT UNIT	J		
OBTAINED	429	417	437

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DATE 09.11.2023

BARBARA VIETTI MV(QUALITY CERTIFICATOR) - ELECTRONICALLY GENERATED CERTIFICATE -Cogne

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INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2023050847

TENSILE TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ASTMA370-E8 DIRECTION OF THE TEST PIECE: L

MEASUREMENT UNIT	Rm MPA	Rp02% MPA	Z %	A12 %
OBTAINED	800	556	78,8	4,0 D 43,9

CORROSION
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ASTM G48 A
OBTAINED 0,4123

FERRITE %
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ASTME562 --
OBTAINED 48,55

MICROSTRUCTURE
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION -- --
OBTAINED SATISFACTORY

LATERAL EXPANSION
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ASTMA370 --
OBTAINED 2,3 2,6 2,5

SHEAR %
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ASTMA370 --
OBTAINED 100 100 100

FERRITE CONTENT DETERMINED ACCORDING TO ASTM E 562 WITH 16 POINTS PER FIELD AND MINIMUM 30 FIELDS
REFERENCE NORMS:EN 10088-3, EN 10272, ASTM A276/ASME SA276, ASTM A479/ASME SA479, ISO 15156-3/NACE MR0175, ISO 17945/NACE MR0103, NORSOK M-650 REV.4/M-630, MDS D57 REV.5.
REFERENCE NORMS FOR CHEMICAL ANALYSIS, MECHANICAL PROPERTIES, HEAT TREATMENT: ASTM A182/ASME SA182, API 6A-PSL3
REFERENCE NORMS ONLY FOR CHEMICAL COMPOSITION: EN 10222-5, ASTM A484
HARDNESS TEST
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ASTMA370-E18 HARDNESS TEST HRC TESTING METHOD:
OBTAINED 21

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DATE 09.11.2023

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INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2023050847

IMPACT TEST
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION ASTM A370-E23 TYPE A DIRECTION OF THE TEST PIECE: L

TYPE OF TEST PIECE	KV		
TEST TEMPERATURE °C		50-	
MEASUREMENT UNIT	J		
OBTAINED	359	382	400

TENSILE TEST
Control lot No. - Weight :020000971201 - 960 KG - 2.116 LB
SPECIFICATION EN-ISO6892-1 DIRECTION OF THE TEST PIECE: L

	Rm_C	Rp02_C	A	Z_C
MEASUREMENT UNIT	MPA	MPA	%	%
OBTAINED	799	552	5.0 D 40,1	80,0

STEELMAKING EAF + AOD + CONTINUOUS CASTING
HOT ROLLED
METALLOGRAPHIC INSPECTION ACCORDING TO ASTM A923 METHOD A: SATISFACTORY.
IMPACT TEST VALUES AT -46°C ARE NOT LESS THAN THOSE AT -50°C HERE STATED.
QTC ON PROLONGATION OF BARS TESTS AT MID RADIUS (CENTER POS. FOR SIZES <2 INCHES).
ASTM A484 DOES NOT APPLY FOR SIZE AND LENGTH TOLERANCES.
MARKING: PRODUCER LOGO, MATERIAL NO, HEAT NO, LOT NR.
WHERE NOT SPECIFIED ALL THE NORMS MENTIONED ARE INTENDED IN THEIR LAST REVISION AT THE DATE OF ISSUE OF THIS DOCUMENT.
COUNTRY OF MELTING AND ORIGIN: ITALY, THE MATERIAL COMPLIES WITH FAR DFARS
252.225-7009 ALT 1.
THE PRODUCT SATISFIES THE DIRECTIVES: 2015/863/EU (ROHS3) - 2011/65/EU (ROHS2) - 2000/53/EU - 2002/95/EU(RoHS) - 2003/11/EU-
2005/618/EU AND PED 2014/68/EU.
THE MATERIAL IS FREE OF ANY MERCURY, MERCURY COMPOUNDS AND OR RADIUM CONTAMINATION AT TIME OF SHIPMENT AND WAS PRODUCED WITHOUT
USING OZONE DEPLETING SUBSTANCES OF CLASS I AND II.
VISUAL SURFACE INSPECTION AND EDDY CURRENT WITH ROTATING HEAD ACCORDING TO EN 10277 Class 4 : SATISFACTORY . DIMENSIONAL TEST
ACCORDING TO EN 10278 : SATISFACTORY . ULTRASONIC TEST IN ACCORDING TO EN 10308 , Class 3 : SATISFACTORY . ANTIMIX SPECTROMETER
CONTROL WITH PORTABLE PRODUCT : SATISFACTORY . NOT BEEN MADE BY ANY REPAIR MATERIAL WELDING
CORROSION TEST ACCORDING TO ASTM A262 Method E EN ISO 3651-2 A: SATISFACTORY. NO CRACKS AT 20X MAGNIFICATION

TERRANOVA® SPRIANO Falcam MEC-RELA

DATE 09.11.2023

BARBARA VIETTI MV(QUALITY CERTIFICATOR) - ELECTRONICALLY GENERATED CERTIFICATE -Cogne

COGNE ACCIAI SPECIALI S.P.A.

CERTIFICATO DI COLLAUDO ULTRASUONI
CERTIFICAT DE CONTROLE PAR ULTRASONS
ULTRASCHALL PRUEFZEUGNIS
REPORT OF ULTRASONIC INSPECTION
ОТЧЕТ ОБ УЛЬТРАЗВУКОВОМ КОНТРОЛЕ

N. US. 2049/23

CLIENTE / *CLIENTSGG* / *BESTELLER* / *CUSTOMER* / ЗАКАЗЧИК	*CONFERMA* / *CONFIRMATION* / *AUFTRAGSBESTRAKTIGUNG* / *CONFIRMATION* / ПОДТВЕРЖД. ЗАКАЗА
MARCA / *NUANCES* / *WERKESTOFF* / *GRADE* / МАРКА: 329S W.No 1.4501	*ORDINE* / *COMMANDE* / *AUFTRAG* / *ORDER* / ЗАКАЗ
SPECIFICA / *SPECIFICATION* / *PRUKEVORSCHRIFT* / *SPECIFICATION* / ТЕХ. ТРЕБОВАНИЯ: EN10308 prospetto3 cl3	*COLATA* / *COULEE* / *SCHMELZE* / *HEAT* / ПЛАВКА: 376908 — *SCHEDA* / *LOT* / *LAUFKARTE* / *LOT* / ПАРТИЯ: 358450
PRODOTTO / *PRODUIT* / *ERZEUGNISFORM* / *PRODUCT* / ИЗДЕЛИЕ: ROUND BARS 40 mm	*STATO DI LAVORAZIONE* / *STADE DU PRODUIT* / *LIEFERZUSTAND* / *WORKING STEP* / ОБРАБОТКА: PEELED
TIPO DI APPARECCHIO / *TIPE D'APPAREILPARUS* / *PRUEFGERAT TYP* / *INSTRUMENT TYPE* / ТИП АППАРАТА: MAC2 UT-100mm	*COSTRUTTORE* / *CONSTRUCTEUR* / *BAUART* / *MAKE* / ИЗГОТОВИТЕЛЬ: MAC
TIPO DI SONDA / *TIPE DE PALPEUR* / *PRUFKOPT* / *PROBETYPE* / ТИП ЗОНДА: U115BL, U11391, U11HFB	*FREQUENZA* / *FREQUENCE* / *FREQUENZ* / *FREQUENCY* / ЧАСТОТА: 5 MHz S/N XDCR210N; 5 MHz S/N XDCR210N; 5 MHz S/N XDCR225N

DIREZIONE D'ESAME / *DIRECTION D'EXAMEN* / *PRUEFRICHTUNG* / *SCANNING DIRECTION* / НАПРАВЛЕНИЕ ПРИ

- [X] *RADIALE - RADIAL*
- [ ] *ASSIALE - AXIAL*
- [ ] *SONDE ANGOLATE - ANGLE BEAMS*

- [X] *MATRICOLA BLOCCO CAMPIONE* / *DENTIFICATION BLOC DE REFERENCE MUSTER BLOCK* / *MUSTER BLOCK* / *TEST BLOCK NR* / № ОБРАЗЦА ДЛЯ ИСПЫТАНИЯ: 64

TERRANOVA — CIPRIANO Valcom MECRELA

AVG SCALE / *ECRANS ABAQUES AVG* / *AVG SKALEN* / *AVG SCALE* / ШКАЛА *AVG*

- [ ] *AVG DIAGRAMMI* / *DIAGRAMMES AVG* / *AVG DIAGRAMM* / *AVG DIAGRAM* / ДИАГРАММЫ *AVG*
- [ ] V1
- [ ] V2

RISULTATODELL'ESAME / RESULTAT DE L' ESSAI / PRUEFERGERBNISSE / RESULT OF THE TEST / РЕЗУЛЬТАТ ИСПЫТАНИЯ

EXAM DATA : 23/10/2023
INSPECTED N. BARS 5

THE MATERIAL IS IN ACCORDANCE TO THE FOLLOWING SPECIFICATIONS:

EN10308 prospetto3 cl3

G. Luca Vergazzoli

L'ISPETTORE CND ZUSTANDER CND / L'INSPECTEUR CND CND INSPECTOR / ИНСПЕКТОР НРК NADALIN SIMONE Liv.II - ISO 9712 N° Cert.32040/PND/C	**III LIV.CND** / III УРОВЕНЬ НРК BAISOTTI MARCO Liv.III - ISO 9712 N° Cert.34194/PND/C		**DATA DATUM** / DATE DATE / ДАТА 26/10/2023

(Mod. Certus Rev. 6)

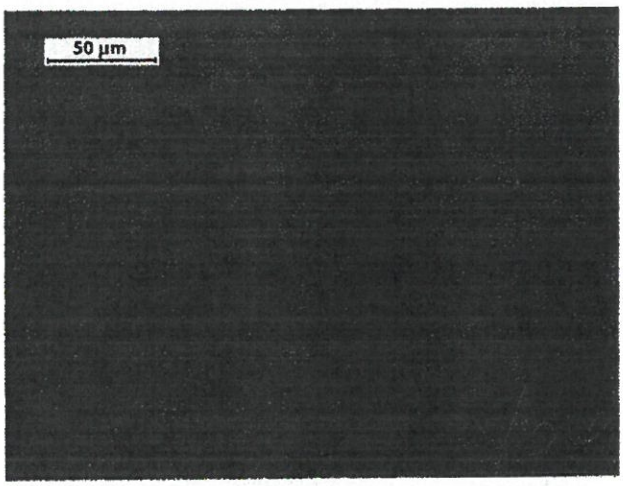
COGNE ACCIAI SPECIALI S.p.a.
Via Paravera, 16
I-11100 AOSTA

MICROPHOTO
МИКРОСЪЁМКА

All.N 1

MARCA *NUANCES* *WERKESTOFF* *GRADE* *МАРКА*	329S	*LOTTO DI CONTROLLO* *LOT DE CONTRÔLE* *LAUFKARTE* *CONTROL LOT* *ПАРТИЯ КОНТРОЛЯ*	020000971201
COLATA *COULEE* *SCHMELZE* *HEAT* *ПЛАВКА*	376908	*REAGENTE* *RÉACTIF* *REAGENS* *ETCHANT* *РЕАГЕНТ*	20 % NaOH electrolyte
TIPO DI APPARECCHIO *TIPE D'APPAREIL* *PRUEFGERAT TYP* *INSTRUMENT TYPE* *ТИП АППАРАТА*	Microscopio:	**LEICA DM2700M sn 430371**	
INGRANDIMENTO *AGRANDISSEMENT* *VERGRÖSSERUNG* *ENLARGEMENT* *УВЕЛИЧЕНИЕ*		**400 X**	
DIREZIONE D'ESAME *DIRECTION D'EXAMEN* *PRUEFRICHTUNG* SCANNING DIRECTION НАПРАВЛЕНИЕ ПРИ ИССЛЕДОВАНИИ	☐ **LONGITUDINALE - LONGITUDINAL - ПРОДОЛЬНОЕ** ☒ **TRASVERSALE – TRANSVERSAL – KREUZEND-ПОПЕРЕЧНОЕ**		

PHOTO (ELECTRONIC IMAGE) – ФОТОСНИМКИ (ЭЛЕКТРОННОЕ ИЗОБРАЖЕНИЕ)



NOTE: ПРИМЕЧАНИЯ:	FIRMA UNTERSCHRIFT SIGNATURE SIGNATURE ПОДПИСЬ	DATA DATUM DATE DATE ДАТА
"Free from Intermetallic Phases"	De Marco	27/06/23

Mod.Micro Rev.4

TERRANOVA
SPRIANO MEC-RELA

COGNE

COGNE ACCIAI SPECIALI S.p.a.
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I-11100 AOSTA

MICROPHOTO
МИКРОСЪЁМКА

All.N 2

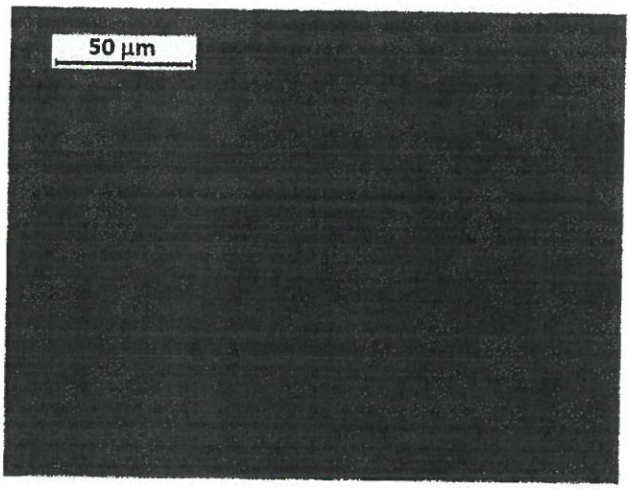
MARCA *NUANCES* *WERKESTOFF* *GRADE* *МАРКА*	329S	*LOTTO DI CONTROLLO* *LOT DE CONTRÔLE* *LAUFKARTE* *CONTROL LOT* *ПАРТИЯ КОНТРОЛЯ*	020000971201
COLATA *COULEE* *SCHMELZE* *HEAT* *ПЛАВКА*	376908	*REAGENTE* *RÉACTIF* *REAGENS* *ETCHANT* *РЕАГЕНТ*	20 % NaOH electrolyte
TIPO DI APPARECCHIO *TIPE D'APPAREIL* *PRUEFGERAT TYP* *INSTRUMENT TYPE* *ТИП АППАРАТА*	Microscopio:	**LEICA DM2700M sn 430371**	
INGRANDIMENTO *AGRANDISSEMENT* *VERGRÖSSERUNG* *ENLARGEMENT* *УВЕЛИЧЕНИЕ*		**500 X**	

DIREZIONE D'ESAME
DIRECTION D'EXAMEN
PRUEFRICHTUNG
SCANNING DIRECTION
НАПРАВЛЕНИЕ
ПРИ ИССЛЕДОВАНИИ

☐ **LONGITUDINALE - LONGITUDINAL - ПРОДОЛЬНОЕ**

☒ **TRASVERSALE – TRANSVERSAL – KREUZEND-ПОПЕРЕЧНОЕ**

PHOTO (ELECTRONIC IMAGE) – ФОТОСНИМКИ (ЭЛЕКТРОННОЕ ИЗОБРАЖЕНИЕ)



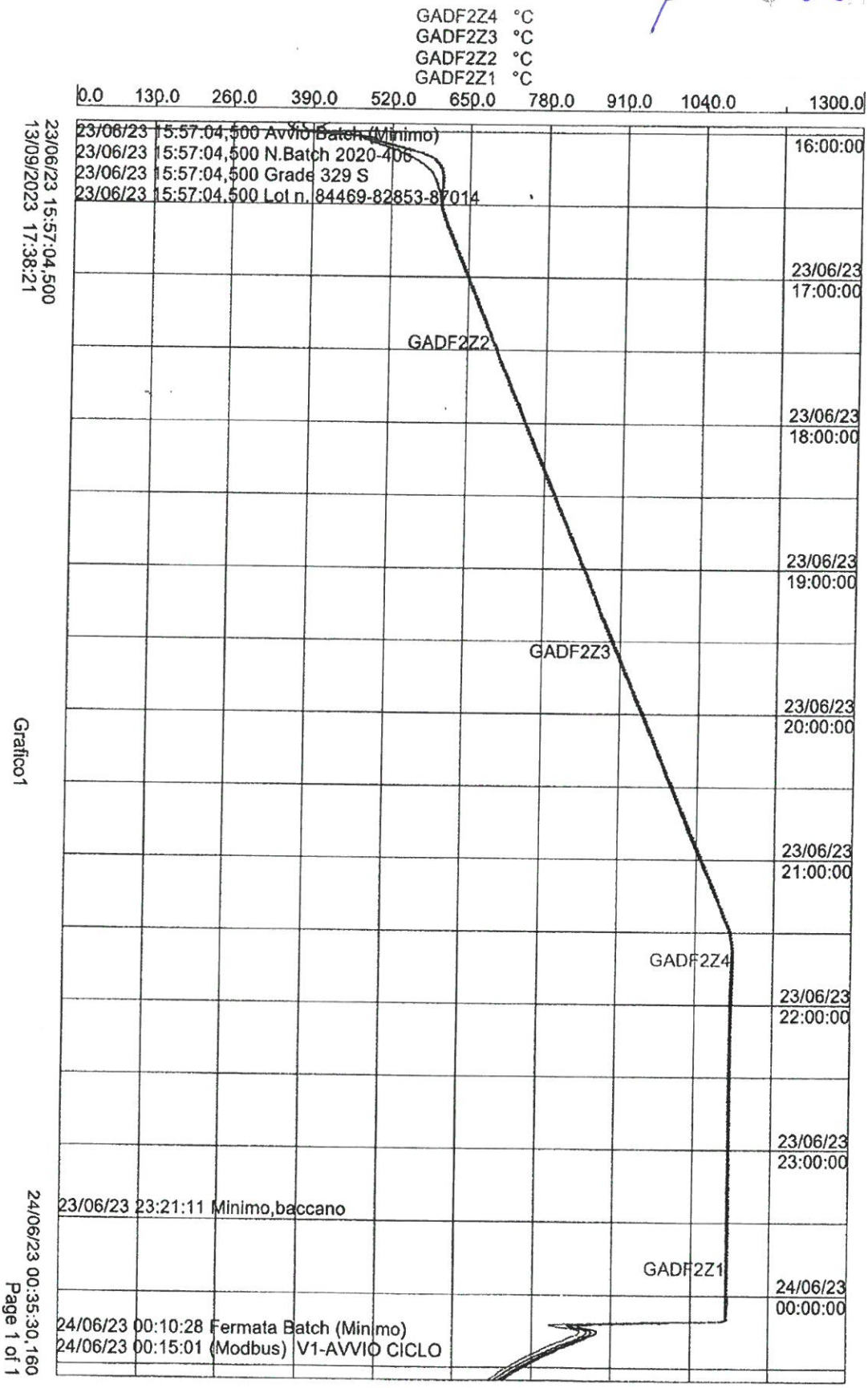
NOTE:
ПРИМЕЧАНИЯ:
"Free from Intermetallic Phases"

FIRMA / UNTERSCHRIFT / SIGNATURE / ПОДПИСЬ	DATA / DATUM / DATE / ДАТА
De Marco	27/06/23

Mod.Micro Rev.4

TERRANOVA

G. Luca Vergazzoli


GADF2Z4 °C
GADF2Z3 °C
GADF2Z2 °C
GADF2Z1 °C
0.0 130.0 260.0 390.0 520.0 650.0 780.0 910.0 1040.0 1300.0
23/06/23 15:57:04,500 Avvio Batch (Minimo)
23/06/23 15:57:04,500 N.Batch 2020-406
23/06/23 15:57:04,500 Grade 329 S
23/06/23 15:57:04,500 Lot n. 84469-82853-87014
16:00:00
23/06/23
17:00:00
GADF2Z2
23/06/23
18:00:00
23/06/23
19:00:00
GADF2Z3
23/06/23
20:00:00
23/06/23
21:00:00
GADF2Z4
23/06/23
22:00:00
23/06/23
23:00:00
23/06/23 23:21:11 Minimo,baccano
GADF2Z1
24/06/23
00:00:00
24/06/23 00:10:28 Fermata Batch (Minimo)
24/06/23 00:15:01 (Modbus) V1-AVVIO CICLO
23/06/23 15:57:04,500
13/09/2023 17:38:21
Grafico1
24/06/23 00:35:30,160
Page 1 of 1

Acciaierie Valbruna S.p.A.

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Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4/37
Telefono 0471.924111 - Fax 0471.924497

CERTIFICATO DI COLLAUDO - ABNAHMEPRUEFZEUGNIS - INSPECTION CERTIFICATE - CERTIFICAT DE RECEPTION

In conformità a / Nach/According to/Selon: EN 10204 (2004) , 3.1 / ISO 10474 (2013) , 3.1

Certificato nr. / Prüfung/Test/Essai: MEST065292 / 2024 /

Stato di fornitura / Lieferzustand / Delivery state / Etat de livraison:	Laminato Solubilizzato - FINITO A FREDDO	Produttore / Hersteller/Item/Usine productrice:	ACCIAIERIE VALBRUNA S.P.A.
Tipo di Elaborazione / Erschmelzungsart / Melting process / Mode d'elaboration:	E+AOD	Marchi di Fabbrica / Zeichen des Lieferwerkes / Trade marks / Sigles de l'usine productrice:	AV
Qualità / Werkstoff/Grade/Nuance:	1.4401/1.4404/316/316L	Punzone del Collaudatore / Stempel des Werkssachverständigen / Inspector's stamp/Poinçon de l'assayeur:	MR
Marca / Markenbezeichnung / Brand / Nuance:	MVAPML (MAXIVAL)	Punzonatura / Kennzeichnung / Marking / Marquage:	1.4401/1.4404

SPECIFICHE : / Anforderungen / Requirements / Exigences	Note: / Aufzeichnungen / Notes / Notes
VAL STOCK W2 A/1 1.4404/316L A,CF	
AD 2000-M. W 2 2022 1.4401 A,CF (0)	(0)AD 2000-MERKBLATT W 2 edition 03.2022 AD 2000-MERKBLATT W 10 edition 06.2022
AD 2000-M. W 2 2022 1.4404 A,CF (1)	(1)AD 2000-MERKBLATT W 2 edition 03.2022 AD 2000-MERKBLATT W 10 edition 06.2022
AISI . 316/316L	
AMS-QQ-S-763 D 316/316L A,CF	
ASME SA182 2023 S31600/03 A (2)	(2)Section II Part A 2023 EDITION For products machined directly from bar refer to ASME SA479.
ASME SA276 2023 S31600/03 A,CF (3)	(3)Section II Part A 2023 EDITION
ASME SA479 2023 S31600/03 A (4)	(4)Section II Part A 2023 EDITION
ASTM A182 2024 S31600/03 A (5)	(5)For products machined directly from bar refer also to ASTM A479.
ASTM A262 PR. E 2015 316/316L (6)	(6)Reapproved 2021
ASTM A276 2024A S31600/03 A,CF	
ASTM A370 2022 .	
ASTM A479 2023A S31600/03 A	
ASTM E10 2023 .	
ASTM E8 2024 .	
EN 10088 PART 3 2014 1.4401 A,CF	
EN 10088 PART 3 2014 1.4404 A,CF	
EN 10272 2016. 1.4401 A,CF	
EN 10272 2016. 1.4404 A,CF	
ISO 148-1 2016 .	
ISO 3651-2 98 METHOD A T1	
ISO 6506-1 2014 .	
ISO 6892-1 2019 .	
NACE MR0103 2015 S31600/03 A (7)	(7)ANSI/NACE MR0103/ISO 17945 November 23, 2015
NACE MR0175 4 S31600/03 A (8)	(8)ANSI/NACE MR0175/ISO 15156-3:2020 Fourth edition, approved 21 Sep 2022.
QQ-S-763 F 316/316L A,CF	
ACH CO . .	
KV L -196C . ISO 148-1	

TERRANOVA MEC-RELA

		Tolleranza: k12 / Toleranz/Allowance/Tolerance					
Pos. nr. / Pos. nr. / Item nr. / Nr. de poste	Oggetto / Gegenstand / Product description / Descrip. du produit	Dimensioni - mm / Abmessungen / Dimension / Dimension	Lunghezza - mm / Länge / Length / Longueur	Colata / Schmelze / Heat / Coulée	Pezzi / Stückzahl / Pieces / Pieces	Peso - KG / Gewicht / Weight / Poids	Lotto nr. / Loos nr. / Lot nr. / Lot nr.
0020	Tondo	30,000	6000/ 6060	438044		1270,0	406507920

G. Luca Vergazzoli

QUALITY MANAGEMENT SYSTEM CERTIFIED BY LLOYD'S REGISTER ACCORDING TO ISO 9001 : 2015, IATF 16949 : 2016, AS 9100D

Vicenza, 14/05/2024 VCQ052 - MEST065292	Direzione Qualità / Qualitätsmanagement/Quality Management/Gestion Qualité R.BERTELLI	Direzione Prodotto / Produktmanagement/Product Management/Direction Produit P.MESSORI	Pagina 1 di 4

Acciaierie Valbruna S.p.A.

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Telefono 0471.924111 - Fax 0471.924497

CERTIFICATO DI COLLAUDO - ABNAHMEPRUEFZEUGNIS - INSPECTION CERTIFICATE - CERTIFICAT DE RECEPTION

In conformità a : EN 10204 (2004) , 3.1 / ISO 10474 (2013) , 3.1
Nach/According to/Selon

Certificato nr. MEST065292 / 2024 /
Prüfung/Test/Essai

Stato di fornitura : Laminato Solubilizzato - FINITO A FREDDO
Lieferzustand / Delivery state / Etat de livraison

Produttore :
Hersteller/Item/Usine productrice

ACCIAIERIE VALBRUNA S.P.A.

Tipo di Elaborazione: E+AOD
Erschmelzungsart / Melting process / Mode d'elaboration

Marchi di Fabbrica: AV
Zeichen des Lieferwerkes / Trade marks / Sigles de l'usine productrice

Qualità: 1.4401/1.4404/316/316L
Werkstoff/Grade/Nuance

Punzone del Collaudatore: MR
Stempel des Werkssachverständigen / Inspector's stamp/Poinçon de l'assayeur

Marca: MVAPML (MAXIVAL)
Markenbezeichnung / Brand / Nuance

Punzonatura: 1.4401/1.4404
Kennzeichnung / Marking / Marquage

TEST ALLO STATO DI FORNITURA

Test on delivery condition Prüefung auf lieferbereitem produkt test a l'etat de fourniture Prueba sobre el material así come entregado

1) L=longitudinale/längs, T=trasversale/quer, Q=Tangenziale/tangential

TEST	Provetta/ Probestab Specimen/Eprouvette Larg.diam Spess. Breite Diam. Dicke Width Diam. Thickness Larg. diam. epais. mm	°C	Posiz. Saggio Probenlage Location Emplacement 1)	Snervamento Streckgrenze Yield Stress Limite elastique Rp 0,2% N/mm2	Snervamento Streckgrenze Yield Stress Limite elastique Rp 1% N/mm2	Resistenza Zugfestigkeit Tensile strength Resistance à traction Rm N/mm2	Allungamento Bruchdehnung Elongation Allongement A5 %		Strizione Einschnürung Reduction of area Striction Z %		Resilienza Kerbschlagarbeit Impact Value Resilience			Durezza Haerte Hardness Durete HB		
Valori richiesti Anforderungen/Required values Valeurs demandées		min max		200	235	500 900	20	-	-	-	-			-		315
A	10	20	L	460	538	669	45		67					221		
G	10	20	L	466	539	673	44		65					223		

TEST ALLO STATO DI FORNITURA

Test on delivery condition / Prüefung auf lieferbereitem produkt / Test a l'etat de fourniture / Prueba sobre el material así come entregado

TEST		min	max	
A	Dimensioni grano x ASTM E112			5

Charpy per ISO 148-1

1) L=longitudinale/längs, T=trasversale/quer, Q=Tangenziale/tangential

TEST	Provetta/ Probestab Specimen/Eprouvette Larg.diam Spess. Breite Diam. Dicke Width Diam. Thickness Larg. diam. epais. mm	°C	Posiz. Saggio Probenlage Location Emplacement 1)	Resilienza Kerbschlagarbeit Impact Value Resilience KV2 J			Espansione laterale Lateral Expansion Lateral ex mm			Shear Shear % Shear %		
Valori richiesti Anforderungen/Required values Valeurs demandées		min max		-	-	-	-	-	-	-	-	-
B	10X10	-196	L	148	148	157	1,385	1,410	1,480	55	58	52

Test allo stato di fornitura per ASTM A370

1) L=longitudinale/längs, T=trasversale/quer, Q=Tangenziale/tangential

TEST	Provetta/ Probestab Specimen/Eprouvette Larg.diam Spess. Breite Diam. Dicke Width Diam. Thickness Larg. diam. epais. mm	°C	Posiz. Saggio Probenlage Location Emplacement 1)	Snervamento Streckgrenze Yield Stress Limite elastique Rp 0,2% N/mm2	Snervamento Streckgrenze Yield Stress Limite elastique	Resistenza Zugfestigkeit Tensile strength Resistance à traction Rm N/mm2	Allungamento Bruchdehnung Elongation Allongement E 4d %		Strizione Einschnürung Reduction of area Striction RA %		Resilienza Kerbschlagarbeit Impact Value Resilience			Durezza Haerte Hardness Durete HB		
Valori richiesti Anforderungen/Required values Valeurs demandées		min max		210	-	517	-	30	-	50	-			-		235
C	12,5	20	L	459		660		48		69				220		

TERRANOVA SPRIANO MEC-RELA

G. Luca Vergazzoli

QUALITY MANAGEMENT SYSTEM CERTIFIED BY LLOYD'S REGISTER ACCORDING TO ISO 9001 : 2015, IATF 16949 : 2016, AS 9100D

Vicenza, 14/05/2024 VCQ052 - MEST065292	**Direzione Qualità** Qualitätsmanagement/Quality Management/Gestion Qualité **R.BERTELLI**	**Direzione Prodotto** Produktmanagement/Product Management/Direction Produit **P.MESSORI**	Pagina 2 di 4

Acciaierie Valbruna S.p.A.

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CERTIFICATO DI COLLAUDO - ABNAHMEPRUEFZEUGNIS - INSPECTION CERTIFICATE - CERTIFICAT DE RECEPTION

In conformità a / Nach/According to/Selon: EN 10204 (2004) , 3.1 / ISO 10474 (2013) , 3.1

Certificato nr. / Prüfung/Test/Essai: MEST065292 / 2024 /

Stato di fornitura / Lieferzustand / Delivery state / Etat de livraison: Laminato Solubilizzato - FINITO A FREDDO

Produttore / Hersteller/Item/Usine productrice: **ACCIAIERIE VALBRUNA S.P.A.**

Tipo di Elaborazione / Erschmelzungsart / Melting process / Mode d'elaboration: E+AOD

Marchi di Fabbrica / Zeichen des Liefernwerkes / Trade marks / Sigles de l'usine productrice: AV

Qualità / Werkstoff/Grade/Nuance: 1.4401/1.4404/316/316L

Punzone del Collaudatore / Stempel des Werkssachverständigen / Inspector's stamp/Poinçon de l'assayeur: MR

Marca / Markenbezeichnung / Brand / Nuance: MVAPML (MAXIVAL)

Punzonatura / Kennzeichnung / Marking / Marquage: 1.4401/1.4404

Charpy per ISO 148-1

1) L=longitudinale/längs, T=trasversale/quer, O=Tangenziale/tangential

TEST	Provetta/ Prebestab Specimen/Eprouvette Larg.diam. Spess. Breite Diam. Dicke Width Diam. Thickness Larg. diam. epais mm	°C	Posiz. Saggio Prelievo Lesion Emplacement	Resilienza Kerbschlagarbeit Impact Value Resilience KV2 J			Espansione laterale Lateral Expansion			Shear Shear		
Valori richiesti / Anforderungen/Required values / Valeurs demandées		min / max		100	100	100	-	-	-	-	-	-
F	10X10	20	L	199	209	202						
H	10X10	20	L	190	201	198						

Tensile testing according to ISO 6892-1
Impact testing according to ISO 148-1
Mechanical properties according to ASTM A370.
Brinnell hardness according to ASTM E10
Tensile testing according to ASTM E8
Brinnell hardness according to ISO 6506-1

TERRANOVA SPRIANO MEC-RELA

Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse chimique

Colata /Heat / Schmelze/Coulée																
	min	23,0	-	-	-	16,50	2,00	-	10,00	-	-	-	-	-	-	-
	max	28,0	0,030	1,00	2,00	18,00	2,50	1,00	13,00	-	0,045	0,030	0,100	-	-	-
	PRE		C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	Co %	P %	S %	N %			
438044	24,9		0,018	0,71	1,65	16,89	2,08	0,53	12,33	0,085	0,028	0,026	0,071			

Corrosion test in 16% sulfuric acid and copper sulfate solutions

Test standard: UNI EN ISO 3651-2 Method A

Test	Heat treatment before test	Length of Period (h)	Test temp (°C)	Bend Angle (°)	Ø spindle (mm)	Result of visual inspection at 20 x magnification after bend test	Result
Intergranular corrosion	Sensitized T1	20	boil	90	5	Absence of cracks	**SATISFACTORY**

Corrosion test in 16% sulfuric acid and copper sulfate solutions

Test standard: ASTM A262-Practice E

Test	Heat treatment before test	Length of Period (h)	Test temp (°C)	Bend Angle (°)	Ø spindle (mm)	Result of visual inspection at 20 x magnification after bend test	Result
Intergranular corrosion	Sensitization	15	boil	180	5	Absence of cracks	**SATISFACTORY**

QUALITY MANAGEMENT SYSTEM CERTIFIED BY LLOYD'S REGISTER ACCORDING TO ISO 9001 : 2015, IATF 16949 : 2016, AS 9100D

Vicenza, 14/05/2024	Direzione Qualità / Qualitätsmanagement/Quality Management/Gestion Qualité	Direzione Prodotto / Produktmanagement/Product Management/Direction Produit	Pagina
VCQ052 - MEST065292	R.BERTELLI	P.MESSORI	3 di 4

Acciaierie Valbruna S.p.A.

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CERTIFICATO DI COLLAUDO - ABNAHMEPRUEFZEUGNIS - INSPECTION CERTIFICATE - CERTIFICAT DE RECEPTION

In conformità a / Nach/According to/Selon: EN 10204 (2004) , 3.1 / ISO 10474 (2013) , 3.1

Certificato nr. / Prüfung/Test/Essai: MEST065292 / 2024 /

Stato di fornitura: Lieferzustand / Delivery state / Etat de livraison	Laminato Solubilizzato - FINITO A FREDDO
Produttore: Hersteller/Item/Usine productrice	ACCIAIERIE VALBRUNA S.P.A.
Tipo di Elaborazione: Erschmelzungsart / Melting process / Mode d'elaboration	E+AOD
Marchi di Fabbrica: Zeichen des Lieferwerkes / Trade marks / Sigles de l'usine productrice	AV
Qualità: Werkstoff/Grade/Nuance	1.4401/1.4404/316/316L
Punzone del Collaudatore: Stempel des Werkssachverständigen / Inspector's stamp/Poinçon de l'essayeur	MR
Marca: Markenbezeichnung / Brand / Nuance	MVAPML (MAXIVAL)
Punzonatura: 1.4401/1.4404 Kennzeichnung / Marking / Marquage	

Reduction ratio = 42,5 : 1
Solution annealed 1040°C for 160'(total time)/water cooled.
SURFACE QUALITY COMPLIANT TO EN 10088-3 TAB.1 COND. 2H equivalent to EN 10277-1 Cl.3
"Issued in agreement with TÜV SÜD Industrie Service GMBH
(07/1972)"
"Qs approved according to PED, Annex I, Para. 4.3 by
Notified Body 0036"
"(Certification no. DGR-0036-QS-W 23/2002/MUC)"

Sono state soddisfatte tutte le condizioni richieste Die gestellten Anforderungen sind it. Anlage erfüllt The material has been furnished in accordance with the requirements Le materiel à été trouvé conforme aux exigences	Controllo antimescolanza con tecnica XRF/OES portatile : OK Verwechslungprüfung: durch XRF/QES Gerät geführt : OK Antimixing testing performed with XRF/OES portable : OK Contrôle antimélange svt technique XRF/OES portable : OK	Controllo visivo e dimensionale: soddisfa le esigenze Besichtigung und Ausmessung, ohne Beanstandung Visual inspection and dimensional checks:satisfactory Contrôle visuel et dimensions: satisfaisant

Melted, poured and manufactured in Italy No welding or weld repair Material free from Mercury contamination

We declare that the finished product is checked for radioactive contamination by the portal system when it leaves the production plant.

The Quality Management System is also Certified according to Pressure Equipment Directive 2014/68/EU Annex 1,chapt.4.3 by TÜV and LLOYD`S
The Quality Management System is also Certified according to PER 2016/1105, Schedule 2, Part 4, Para 31 (8) by Competent Body TÜV SUD BABT Unlimited.
Any act of tampering, modification, alteration, counterfeiting and/or falsification and/or any other action which modifies the contents of this test certificate shall constitute a violation of applicable civil and criminal laws. Acciaierie Valbruna shall protect its rights and interests before any competent court, authority and jurisdiction.
Maxival and/or Valplus grades/products are manufactured with ladle techniques to control composition, distribution, size and shape of non-metallic inclusions for improved machinability.
The supplied product conforms to requirements expressly requested by the purchaser and conforms to requirements specified by certified norms and standards. Should the product be used for more severe, critical and/ or in any case different applications than those the material is generally intended for, any different and/or supplementary requirements shall be specifically demanded, at least, upon order of the Product by the Purchaser. Acciaierie Valbruna SpA shall not be responsible for any improper use of the Products.

Luca Vergazzoli

TERRANOVA

QUALITY MANAGEMENT SYSTEM CERTIFIED BY LLOYD'S REGISTER ACCORDING TO ISO 9001 : 2015, IATF 16949 : 2016, AS 9100D

Vicenza, 14/05/2024 VCQ052 - MEST065292	Direzione Qualità Qualitätsmanagement/Quality Management/Gestion Qualité R.BERTELLI	Direzione Prodotto Produktmanagement/Product Management/Direction Produit P.MESSORI	Pagina 4 di 4

CUNEO INOX SRL - Responsabile Qualità Sylvie Serale - Tel. 0171/346165 - Email certificati@cuneoinox.com

Certificato EN 10204 3.1 valido in riferimento al ns. DDT nr. 16993/2 del 11-11-2022
Per l'acquisto di KG 949,000
TONDO LAMINATO AISI 316L DIAM. 100
Vostro riferimento ordine nr. MAIL del 09-11-2022

Colata\Lotto: 534560

ACEROS INOXIDABLES OLARRA S.A
Cm. Larrabarri, Elotxelerri, 1
48180 Loiu, Bizkaia
España
www.olarra.com

Management Systems Certified by LRQA
ISO 9001 / SGI 6000360
ISO 14001 / SGI 1870678

ACEROS INOXIDABLES
OLARRA

CUNEO INOX, S.R.L.
VIA MOROZZO 8
12040 CASTELLETTO STURA (CN) - ITALIA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador

Works Inspector Stamp - Werkssachverständiger
Sello del Inspector 3

Certificate type - APZ Nach Certificado tipo	Certificate nº - Prüf-Nr Certificado nº	Date-Datum-Fecha
EN 10204/3.1	485628	07 - 03 - 2022

Our order Nº Werks - Nr Nºde Referencia	Heat Schmelze Colada	Your order Nº Bestell - Nr Pedido Nº
757774	534560	2663/21

Steel Grade Werkstoff Calidad	According to Entsprechend Corresponde
X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX	EN 10272-2016.

Shape and Size - Gegenstad Perfil y dimensión	Tolerance - Toleranz Tolerancia	Bundles Bunde Bultos	Bars Stäbe Barras	Weight Gewicht Peso
ROUND 100 mm	k 13 /ISO 286-1 /EN 10060	3		2288 Kg

Requirements - Anforderungen - Exigencias

EN 10088-3 2014.
ASTM A 479 / A 479M-21.
ASTM A 276/A 276M-17.
NACE MR-0175/ISO 15156-3 2015.
AD-2000-W2/W10.
ASME SA 479 / SA 479M-21.
Type 316-Type 316L-UNS.S.31603.
Conformity letter/Zustimmungsschreiben TUV BADEN 28.01.1969
Waiving of Countersign/Gegenzeichnungsverzicht:01.03.1977
PED 2014/68/EU, Annex I, Parag.4.3/DGR 2014/68/EU

Anhang I Absatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

TERRANOVA SPRIANO Valcom BECHELA

Melting process / Erschmelzungsart / Proceso de Fusión	Heat treatment / Wärmebehandlung / Tratamiento térmico
E.A.F. / A.O.D.	1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Turned/Drehen/Torneado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Reference standard Bezugsnorm Norma de referencia		Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kerbschlagzaehigkeit / Resiliencia ISO V Jules
ISO6892,ASTMA370	Min.	200	235	500	40				100
	Max.			700				215	
Temperature ºC 20	Spec. Nº. 1	249	275	564	54	57	74	149	245/241/244
	Probe Nr. Pro Nº. 2	251	277	566	53	56	73	149	243/239/242

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co	
Min.						16,50	2,00	10,00			
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000		
	0,027	0,31	1,53	0,039	0,030	16,51	2,03	10,03	0,0340	0,17	

Visual and dimensional inspection Besichtingung und Ausmessung Control visual y dimensional	Radioactivity inspection Radioaktivitätskontrolle Control de Radioactividad	Antimixing test Spektrosk Verwechslungspr Antimezcla	Grain Size Korngrösse Tamaño de grano
O.K.	O.K.	O.K.	

Remarks - Bemerkungen - Observaciones

IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK

G. Luca Vergazzoli

EDV / EDP
Acc. EN 10204
Marian Tejedo
Quality Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica

We hereby certify that material described herein complies with the requirements agreed on the order.

Firmado digitalmente por / Signed digitally by:
ACEROS INOXIDABLES OLARRA SA - CIF A48663546
Fecha / Date:07-03-2022 08:52

External Provider's Declaration of Conformity for Ex-d Mode of Protection as per ATEX Directive & IECEx Scheme.

1) **Issuer**
TIEMMETI di TUROTTI STEFANO

2) **Object of the declaration**
CODICE DEL PEZZO: 12-19/39/X
12-19/42/X
17/94/X
17/93/X
DESCRIZIONE DEL PEZZO: CUSTODIA PER TRASMET.ELETTR. SERIE SMART
SS AISI316 ENCLOSURE
COPERCHIO CIECO X SST7X INOX REV.0
COPERCHIO ANTERIORE X SST7X INOX REV.0
QUANTITÀ PRODOTTA: 52-20-72-72
CERTIFICATO 3.1 N. 485628
NUMERO DI COLATA del 3.1: 534560

3) **TERRANOVA purchase order**
ORDINE N. 8627 rev. 1 DEL 03/11/2022

4) **Declaration**

We *TIEMMETI di TUROTTI STEFANO* herewith declare that the information provided in this "External Provider's Declaration of Conformity" is accurate and confirm that the products supplied are in conformity to the requirements stated in above Points (2) and (3).
We confirm also that no part of the production of the object described in Points (2) above has been subcontracted to third parties without the written consent of TERRANOVA Srl.

5) **Signature of Issuer (Name & Function)**

TUROTTI STEFANO, TITOLARE
TIEMMETI di TUROTTI STEFANO

Date: *01/03/2023*
Place: VIA M. PAGANO, 23
20090 TREZZANO S/N (MI)

TERRANOVA®
SPRIANO Vakcom MEC-RELA

G. Luca Vergazzoli
Inspector

CUNEO INOX SRL - Responsabile Qualità Sylvie Serale - Tel. 0171/346165 - Email certificati@cuneoinox.com

Certificato EN 10204 3.1 valido in riferimento al ns. DDT nr. 16993/2 del 11-11-2022
Per l'acquisto di KG 949,000
TONDO LAMINATO AISI 316L DIAM. 100
Vostro riferimento ordine nr. MAIL del 09-11-2022

Colata\Lotto: 534560

ACEROS INOXIDABLES OLARRA S.A.
c/ Larrabarri, Elotxelerri, 1
48510 Loiu. Bizkaia
España
www.olarra.com

Management Systems Certified by LRQA
ISO 9001 / SGI 0000360
ISO 14001 / SGI 1870678

ACEROS INOXIDABLES
OLARRA

CUNEO INOX, S.R.L.
VIA MOROZZO 8
12040 CASTELLETTO STURA (CN) - ITALIA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador

Works Inspector Stamp - Werkssachverständiger
Sello del Inspector 3

Certificate type - APZ Nach / Certificado tipo		Certificate nº - Prüf-Nr / Certificado nº		Date-Datum-Fecha
EN 10204/3.1		485628		07 - 03 - 2022

Our order Nº / Werks - Nr / Nº de Referencia		Heat / Schmelze / Colada		Your order Nº / Bestell - Nr / Pedido Nº	
	757774		534560		2663/21

Steel Grade / Werkstoff / Calidad		According to / Entsprechend / Corresponde	
	X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX		EN 10272-2016.

Shape and Size - Gegenstad / Perfil y dimensión	Tolerance - Toleranz / Tolerancia	Bundles / Bunde / Bultos	Bars / Stäbe / Barras	Weight / Gewicht / Peso
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ASME SA 479 / SA 479M-21.
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Anhang I Absatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

TERRANOVA
SERIANO Varicom MECRELA

Melting process / Erschmelzungsart / Proceso de Fusión	Heat treatment / Wärmebehandlung / Tratamiento térmico
E.A.F. / A.O.D.	1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Turned/Drehen/Torneado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Reference standard / Bezugsnorm / Norma de referencia			Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kerbschlagzaehigkeit / Resiliencia ISO V Jules
ISO6892,ASTMA370		Min.	200	235	500	40				100
		Max.			700				215	
Temperature ºC	Spec. Nº.	1	249	275	564	54	57	74	149	245/241/244
20	Probe Nr. / Pro Nº.	2	251	277	566	53	56	73	149	243/239/242

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co	
Min.						16,50	2,00	10,00			
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000		
	0,027	0,31	1,53	0,039	0,030	16,51	2,03	10,03	0,0340	0,17	

Visual and dimensional inspection / Besichtigung und Ausmessung / Control visual y dimensional	Radioactivity inspection / Radioaktivitätskontrolle / Control de Radioactividad	Antimixing test / Spektrosk Verwechslungspr / Antimezcla	Grain Size / Korngrösse / Tamaño de grano
O.K.	O.K.	O.K.	

Remarks - Bemerkungen - Observaciones

IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK

G. Luca Vergazzoli
Works Inspector

EDV / EDP
Acc. EN 10204
Marian Tejedo
Quality Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica

We hereby certify that material described herein complies with the requirements agreed on the order.

Firmado digitalmente por / Signed digitaly by:
ACEROS INOXIDABLES OLARRA SA - CIF A48663546
Fecha / Date:07-03-2022 08:52

CONTARDI

50 100 3910

CONTARDI. s.r.l. unipersonale
Via Milano, 19 23886 Colle Brianza (LC)
Tel 039 / 92 76 089 – Fax 039 / 92 60 329
CCIAA 03489730139
Codice Fiscale e Partita IVA 03489730139
Capitale Sociale int. vers. €. 100.000,00
Sito web: www.contardi.it
e-mail: info@contardi.it - pec: contardi@legalmail.it

ATTESTATO DI CONTROLLO

TEST REPORT
RELEVÉ DE CONTRÔLE
WERKSZEUGNIS

2.2 - UNI EN 10204

cliente customer	SPRIANO TECHNOLOGIES SRL
ordine n° purchase order n°	2605/OF DEL 26.01.2015
conferma d'ordine n° copy order n°	183 DEL 26.01.2015

posizione position	quantità quantity	descrizione description
01	405	Dischi diametro mm. 69 spessore mm. 10

Si attesta che i materiali sopra indicati :presentano le seguenti caratteristiche tecniche (1)
We certify that all above indicated products meet the following technical specifications (1)

materiale material	vetro calciosodico temprato sodalime tempered glass
sforzo di compressione indotto (σ_{BG}-σ_{BU}) induced compressive stress	≥ *100* Nmm^{-2}
temperatura normale di esercizio allowable continuous working temperature	≤ *150*°C (*423.15* K) (fino a 100° C se in contatto con fluidi alcalini)
temperatura massima di esercizio max. allowable working temperature	≤ *150*°C (*423.15* K) (fino a 100° C se in contatto con fluidi alcalini)
resistenza a shock termico (ISO 718) thermal shock resistance (ISO 718)	≥ *120* °C
resistenza idrolitica (ISO 719) hydrolytic resistance (ISO 719)	class HGB 4
resistenza agli acidi (ISO 1776) acid resistance (ISO 1776)	≤ *100* µg Na_2O per *100* cm^2
resistenza agli alcali (ISO 695) alkaline resistance (ISO 695)	class A1
coefficiente di dilatazione termica lineare linear thermal expansion coefficient	$\alpha = 9.5 \pm 0.1 \cdot 10^{-6}$ K^{-1} (*20 ÷ 300* °C -- *293.15 ÷ 573.15* K)

(1) valutate in controlli non specifici / evaluated during non-specific tests

Contardi S.r.l.
Responsabile area tecnica,
Engineering activities Manager

Franco Contardi

MATERIAL 3.1 & HYDROTEST CERTIFICATES for SST76 PRESSURE TRANSMITTERS

PROCESS CONNECTION: FLANGED 2" ANSI 150 RF

PROCESS CONNECTION: 1/2" NPT-M

TERRANOVA® Srl - www.terranova-instruments.com
Factory & Sales: Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
Head Office: Via Rosso Medardo 16 – 20159 Milano – Italy
Phone: +39 0377 919119 – Fax: +39 0377 855720 - VAT IT07848810151

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	2" ANSI 150 RF		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 50 (2")	50	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 20 bar	20	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
50-PT-001
SERIAL NUMBER
SE240660

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	28,60	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,075 mm	118843	1020300-01	MONEL 400
B	FLANGE	Ø 150	901679	2235680	AISI 316/316L
C	SEAL	Ø 50	Z2ZA	2020/016120	AISI 316/316L
D	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
E	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
F	GLASS	Ø 69 Thk.10 mm	-	183	-

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

SPRIANO® TECHNOLOGIES
a TERRANOVA® Srl brand
Via Gramsci 1, 26827, Terranova Passerini (LO), ITALY
Tel & Fax +39 0377 919119
www.spriano.it
spriano@terranova-instruments.com

OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

Ing. Luca Vergazzoli
Inspector

SPRIANO TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT	SST76 SERIES		
TIPO DI ATTACCO/PROCESS CONNECTION	2" ANSI 150 RF		
DIMENSIONALE NOMINALE/NOMINAL SIZE	DN ≤ 50 (2")	50	
PRESSIONE DI LAVORO/WORKING PRESSURE	PS ≤ 20 bar	20	bar
ESTENSIONE ALETTATA/FINNED EXTENSION	No (-40÷+85°C)		
TEST IDROSTATICO/ HYDRO TEST PROCEDURE	IOP_SST_HYDRO_001_REV00		
NOTE/NOTES	-		

TAG
50-PT-002
SERIAL NUMBER
SE240661

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:	YES	28,60	10	SATISFACTORY
CALIBRATION INSTRUMENT	MAN-05 PRESSURE GAUGE RANGE 0/160bar			

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL
A	DIAPHRAGM	Thk. 0,075 mm	118843	1020300-01	MONEL 400
B	FLANGE	Ø 150	901679	2235680	AISI 316/316L
C	SEAL	Ø 50	Z2ZA	2020/016120	AISI 316/316L
D	HOUSING	Ø 100 mm	534560	485628	AISI 316/316L
E	COVER SIDE	Ø 100 mm	534560	485628	AISI 316/316L
F	GLASS	Ø 69 Thk.10 mm	-	183	-

TERRANOVA SPRIANO MEC-RELA

G. Luca Vergazzoli
W
Inspector

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance	-	-	-
NACE TM0284/2011 (H.I.C.) Compilance	-	-	-
Post Weld Heat Treatment (PWHT)	-	-	-
Penetrant Testing On Body Welds	-	-	-
Alloy Internal Coating	-	-	-
Painting Procedure Body	-	-	-
Painting Procedure Finned Extension	-	-	-

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	SATISFACTORY
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	SATISFACTORY
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	SATISFACTORY

FINAL TEST 100%
OK

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www.spriano.it
spriano@terranova-instruments.com

OPERATO DA *OPERATED BY*	OP8
CONTROLLATO DA CHECKED BY	RPR

DATA / DATE
25/07/2024

LAMINERIES MATTHEY
NOTZ group advanced metal solutions

Lamineries MATTHEY,
branch of Notz Metall AG
Montagu 38
CH-2520 La Neuveville

Tél. +41 32 752 32 32
www.matthey.ch

Métaux laminés à froid
Kaltgewalzte Metalle
Cold rolled metals

Cuivre au béryllium
Berylliumkupfer
Beryllium Copper

Inspection Certificate according to EN 10204-3.1

Batch No. : 1020300-01 **Certificate No. : 1**

La Neuveville, 25.03.2022

Customer :	**010833**	
Y/Order :	**7432/OF**	
O/Confirmation :	**CC-24519**	dated 28.01.2022
O/Delivery Note :	**BL-25688**	dated 25.03.2022
Delivered Qty :	**12 kg**	

Ship-to
TERRANOVA SRL
Via Gramsci, 1
IT - 26827 Terranova dei Passerini (LO)

O/Part No. : **B560A080.0X0.075AA** **NiCu30Fe - (Monel) Alloy 400 / 2.4360 / N04400**

Y/Part No. : CME04690

Heat No. : 118843	**Chemical composition**							
Element	Ni (incl. Co)	C	Si	Mn	S	Cu	Fe	Ti
Unit	%	%	%	%	%	%	%	%
Limit	>= 63	<= 0.15	<= 0.5	<= 2	<= 0.02	28 - 34	1 - 2.5	<= 0.3
Value	= 63.47	= 0.114	= 0.14	= 1.09	<= 0.002	= 32.78	= 2.21	= 0.04
Element	Al							
Unit	%							
Limit	<= 0.5							
Value	= 0.07							

Dimensional attributes	Unit	Result	Min.	Max.
Thickness	mm	**0.0771**	0.0690	0.0810
Width	mm	**80.02**	80.00	80.20

Mechanical properties	Unit	Result	Min.	Max.
Hardness	HV	**306**	230	310
Tensile Strength, Rm	N/mm2	**963**	770	970
Yield Stress, Rp0.2%	N/mm2	**897**	680	900
Elongation A50mm	%	**2.1**	2.0	

We hereby confirm that the shipment corresponds to the stipulations of the order acknowledgment.

Lamineries MATTHEY
branch of Notz Metall AG
Salvatore Mazzola
Inspector / Expert

TERRANOVA

sidenor

MILL TEST CERTIFICATE

ISO 9001; IATF 16949; ISO 14001; ISO 45001; ISO 50001; ISO 27001 X

AENOR AENOR

SIDENOR ACEROS ESPECIALES S.L.U.
Paseo Alejandro Calonje,1 39200 Reinosa (Cantabria)
TLF. 942775074 FAX 942775293
www.sidenor.com

Product Made in Spain

CUSTOMER:TAD LONG PRODUCTS S.P.A.	WORKS REFERENCE:2235680
REFERENCE:213867 SALES ORDER:349186-24	HEAT NUMBER:901679
PRODUCT NR: MASTER REFERENCE:289643	ROLLED:02.06.2022

REQUIRED PRODUCT

AISI316/316L ROUND BARS TURNED SOLUTION ANNEALED 150+0/+0,63mm ISO k13 5.300/6.300mm NORMAL

EXPEDITION | DELIVERY:0080767720 WEIGHT (KG):7.924 BUNDLES:3 UNITS:9

MADE ACCORDING TO

AD 2000-MERKBLATT W10 - MAYO 2016; AD 2000-MERKBLATT W2 - SEPT. 2016; AISI STAINLESS STEELS - 01.03.1999
ANSI/NACE MR0103/ISO 17945:2015 - 23.11.2015; ANSI/NACE MR0175/ISO 15156-1 3ª EDICION 23.11.2015
ANSI/NACE MR0175/ISO 15156-3 3ª EDICION 23.11.2015; ASME SA182-SA182M SECTION II, PART A - 2021
ASME SA193-SA193M SECTION II, PART A - 2021; ASME SA320-SA320M SECTION II, PART A - 2021
ASME SA479-SA479M SECTION II, PART A - 2021; ASTM A182-A182M -20 01.03.2020
ASTM A276-A276M 17 15.03.2017; ASTM A479-A479M -20 01.07.2020; EN 10088-3 - 01.10.2014
EN 10204 - OCT. 2004 3.1; EN 10272 - 2016; EN DIRECTIVA 2014/68/UE - 15.05.2014
SAE AMS 5648 M . .09.2016; SAE AMS 5653 J 01.2019; SAE AMS-QQ-S-763 D 03.2015
TRADE & LONG PROD. SPA FICHA TECNICA ED1 1 21.07.2017

CHEMICAL ANALYSIS OF HEAT U:% HEAT NUMBER:901679

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	N
Min.		1,250			0,015	16,500	10,000	2,000		
Max.	0,030	2,000	0,750	0,040	0,030	18,000	13,000	2,500	1,000	0,1000
Cer.	0,016	1,380	0,560	0,030	0,023	16,590	10,010	2,040	0,479	0,0750

MECHANICAL PROPERTIES AS SUPPLIED (CONDITIONS)

Heat treatment:Solution Annealing
Temperature of:(1):Solution annealing 1.050°C

TD100324289
Azienda:TLP Pozzo d'Adda
Tipo:Certificati di origine

MECHANICAL PROPERTIES AS SUPPLIED (TEST)

Specimen Test location:At 12,5 mm from the surface
Tensile std.(EN ISO 6892-1-DIC. 2019); Tensile dir.:Longitudinal
Ts(500/700MPA):579MPa; Ys(1)(Rp(0,2%) >=200MPA):Rp(0,2%) 277MPa; Ys(2)(1% >=235MPA):1% 286MPa
El.(5d >=40%):5d 48,4%
Standard(EN ISO 148-1 - NOV. 2016)
Notch Impact dir.:Longitudinal; N. Impact sample type(KV2):KV2; Notch Impact Temp.(20°C):20°C
K(1)(>=100J):271J; K(2):274J; K(3):272J; Hardness(<= 215HB):176HB

Specimen Test location:At 1/4 of the diameter; Tensile dir.:Longitudinal
Ts(>=515MPA):572MPa; Ys(Rp(0,2%) >=205MPA):Rp(0,2%) 267MPa; El.(4d >=40%):4d 48,8%; Z(>=50%):64,4%

ADDITIONAL TESTS (SUPPLY CONDITIONS)

Grain size std.(ASTM E112 2013 01.10.2013); Grain size:Austenitic 5; Corrosion std.(1)(ISO 3651-2 - 1998.)
Type/Method(1)(Practice A):Practice A; Corrosion std.(2)(ASTM A262-15(R2021)01.09.2021)
Type/Method(2)(Practice E):Practice E; Intercrystalline Corrosion:OK

NON DESTRUCTIVE TESTS

U.T. standard(EN 10308 - 2001); U.T. type/method(quality class 3); ULTRASONIC CONTROL 100%: OK.

ADDITIONAL INFORMATION

SOLUTION ANNEALED,(Hiperquenching) at 1050°C-IN AIR

Material manufactured through the Electric Arc Furnace (EAF) and AOD.
Steel not exposed to Mercury, or to any other metal alloy that is liquid, at ambient temperatures during processing or while in Sidenor's possession.
Material dimensionally controlled, visually inspected, and free radioactivity (<0,1Bq/g concerning a Co-60).
Steel products were not repaired by welding.

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER'S SPECIFICATION

APPROVED BY:GUILLERMO GUTIERREZ GOMEZ SIGN:
DATE:07.07.2022
REF.:6002625250000

sidenor REINOSA
Analyst of Quality certificates

Servizio controllo qualità Quality control department Service contrôle qualité
Stabil. di SONCINO (CR)

Off.Mecc.FERRARI Cav. UMBERTO & C. S.n.c.
26029 SONCINO (CR) ITALY
Spett.le TERRANOVA SRL
26827 TERRANOVA DEI PASSERINI (LO)
MATERIALE Vs. Ord. N. 9200 del 17-04-2023
N. 20 Cod. MB86P122A1 Flange 2" ASME B16,5 150 RF Nocciolo DN50 AISI 316L CME10000108

Barra Inox Tonda Caldo pelato/a ricotto/a A 316L 150,00 Client Order: TEL. SIG. GIULIANO Your Code: Your Item: Your Jo
HEAT 901679 **OUR ORDER:** 2022 SC 63656/ 200 **QTY:** NR 1,00 **MT** **KG** 443,00

Sidenor

MILL TEST CERTIFICATE

AENOR QUALITY MANAGEMENT AENOR QUALITY ASSURANCE SYSTEM

ISO 9001, IATF 16949, ISO 14001, ISO 45001, ISO 50001, ISO 27001 Y

SIDENOR ACEROS ESPECIALES S.L.U.
Paseo Alejandro Calonje,1 39200 Reinosa (Cantabria)
TLF. 942775076 FAX 942775283
www.sidenor.com

Product Made in Spain

CUSTOMER: TAD LONG PRODUCTS S.P.A.	WORKS REFERENCE: 2235680
REFERENCE: 213867 SALES ORDER: 349186-24	HEAT NUMBER: 901679
PRODUCT NR: MASTER REFERENCE: 289643	ROLLED: 02.06.2022

100% anti mix test performed.

TERRANOVA SPRIANO MECRELA

G. Luca Vergazzoli
Inspector

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER'S SPECIFICATION

APPROVED BY: GUILLERMO GUTIERREZ GOMEZ

DATE: 07.07.2022

REF.: 6002625250000

SIGN:

sidenor REINOSA

Analyst of quality certificates

Barra Inox Tonda Caldo pelato/a ricotto/a A 316L 150,00 Client Order: TEL. SIG. GIULIANO Your Code: Your Item: Your Job:
HEAT 901679 OUR ORDER: 2022 SC 63656/ 200 QTY: NR 1,00 MT KG 443,00

ROLDAN, S.A. - Stainless Steels

FACTORY

Santo Tomás de las Ollas, S/N
Apdo. de Correos 11
PONFERRADA (LEÓN)
TEL.: +34 987 44 61 00
FAX: +34 987 44 61 01
E-MAIL: rdn_fabricaAcerinox.com

HEAD OFFICE

Santiago de Compostela, 100-3º
28035 MADRID (ESPAÑA)
TEL.: +34 913 98 52 37
FAX: +34 913 98 51 93
E-MAIL: roldan@acerinox.com

INSPECTION CERTIFICATE EN 10204 3.1

MADE IN SPAIN - EUROPEAN UNION

Sistema de Gestión ISO 9001:2015

0432
11
0432-CPR-00190-01

EN 10.088:3

CERTIFICATE Nº 2020/016120	DATE 17/06/2020	SHEET 1	DELIVERY NOTE Nº 2020/002618
GRADE ROLDAMAX-339	EN10088:3 (1.4401/1.4404.)		
CUSTOMER T.L.P. SPA			
DIMENSIONS 50,00 mm.	Surface finish according EN10088-3 Table 7:1X		
LENGTH 6.100 mm.	TOLERANCE ISO k12		
PRODUCT [30] Round bar, annealed, smooth turned			
REQUIREMENTS EN10088:3	CUSTOMER ORDER 46102/20-210827		
TENSILE TEST EN ISO 6892-1			
ACCORDING TO EN 10272	EDITION AD-2000 W2 AD-2000 W10		
INTERGRANULAR CORROSION EN ISO 3651-2 method A: SATISFACTORY	WITHOUT OBJETIONS		
SURFACE AND DIMENSIONS CONTROL WITHOUT OBJECTIONS	Spektrometrical Identity Test: O.K.		
IMPACT TEST, SAMPLE DIMENSIONS EN ISO 148-1	MATERIAL FREE FROM RADIOACTIVITY		

ORDER Nº	WORKS Nº	MARKS / BOX	HEAT NUMBER	SAMPLE	WEIGHT
DW09574 21	M302005 12 15	74063 / RJ32496	Z22A	Z22A	477
	M302005 12 15	74064 / RJ32497	Z22A		477

TD100207989

Azienda:TLP Pozzo d'Adda

Tipo:Certificati di origine

PRODUCTION PROCESS
EAF + AOD +CC

TRADE MARK
RDN

MARKING
HEAT NUMBER
GRADE (ACX-339)

INSPECTOR STAMP
R3

QUALITY INSPECTOR
JUAN JOSE ALVAREZ RODRIGUEZ

QUALITY CONTROL REPRESENTATIVE

MECHANICAL PROPERTIES

CAST	SAMPLE	SAMPLE DIMENSIONS	Observ. T°.	Rm MPa	Rp 0,2% MPa	Rp 1% MPa	Z %	A % 1=50	A % 1=40	Agt %	IMPACT STRENGHT ISO-V (J) 20°C	IMPACT STRENGHT ISO-V (J) -196°C	IMPACT STRENGHT ISO-V (J)	HARDNESS HB	FATIGUE TEST	BEND TEST	CROSS SECTIONAL AREA ep.²	Rp / F
Z22A	Z22A	30,00	20°C	593	252	288	71	53	55					156				
REQUIREMENTS		EN ISO 377		500 700	200	235		40			100			215				

CHEMICAL COMPOSITION %

CAST	C	P	S	Si	Mn	Cr	Ni	Mo	Ti	N	Cu	Co
Z22A	0,0190	0,0270	0,0300	0,3840	1,5220	16,6200	10,3650	2,0180	0,0050	0,0450	0,4030	0,2490
REQUIREMENTS	0,0300	0,0450	0,0300	1,0000	2,0000	16,5000 18,5000	10,0000 13,0000	2,0000 2,5000		0,1000		

OBSERVATIONS

AISI 316/316L. UNS S31600/S31603. ASTM/ASME A/SA-182 grade F316/F316L, A/SA-193 class 1 grade B8N, A/SA-276 condition A, A/SA-320 class 1 grade B8M, A/SA-479 condition A. AMS 5648. AMS 5653. AMS QQ-S-763 condition A. NACE MR0175 & MR0103. ASME BVPC section II partA. ASTM A-262 practice E: OK.

Si dichiara che tutta la materia prima utilizzata per la ns produzione di acciaio inox é esente da contaminazione radioattiva grazie alle nostre procedure di controllo interne. NACE MR0175 & MR0103.

OTHER TEST RESULTS	REQUIREMENTS TRD100 TRB100,AD-2000-W2-W10,2014/68/EU (PED)
HEAT TREATMENT 1.050 °C AND WATERCOOLED	Crack tested acc. to EN10277 table 3 class 2

CER_INS

Enrica Vergazzoli
Inspector

TERRANOVA
SPRIANO MSC RELA

CUNEO INOX SRL - Responsabile Qualità Sylvie Serale - Tel. 0171/346165 - Email certificati@cuneoinox.com

Certificato EN 10204 3.1 valido in riferimento al ns. DDT nr. 16993/2 del 11-11-2022
Per l'acquisto di KG 949,000
TONDO LAMINATO AISI 316L DIAM. 100
Vostro riferimento ordine nr. MAIL del 09-11-2022

Colata\Lotto: 534560

ACEROS INOXIDABLES OLARRA S.A.
Cm. Larrabarri, Elotxelerri, 1
48180 Loiu, Bizkaia
España
www.olarra.com

Management Systems Certified by LRQA
ISO 9001 / SGI 6000360
ISO 14001 / SGI 1870678

ACEROS INOXIDABLES OLARRA

CUNEO INOX, S.R.L.
VIA MOROZZO 8
12040 CASTELLETTO STURA (CN) - ITALIA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador

Works Inspector Stamp - Werkssachverständiger
Sello del Inspector 3

Certificate type - APZ Nach / Certificado tipo	Certificate nº - Prüf-Nr / Certificado nº	Date-Datum-Fecha
EN 10204/3.1	485628	07 - 03 - 2022

Our order Nº / Werks - Nr / Nº de Referencia	Heat / Schmelze / Colada	Your order Nº / Bestell - Nr / Pedido Nº
757774	534560	2663/21

Steel Grade / Werkstoff / Calidad	According to / Entsprechend / Corresponde
X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX	EN 10272-2016.

Shape and Size - Gegenstad / Perfil y dimensión	Tolerance - Toleranz / Tolerancia	Bundles / Bunde / Bultos	Bars / Stäbe / Barras	Weight / Gewitcht / Peso
ROUND 100 mm	k 13 /ISO 286-1 /EN 10060	3		2288 Kg

Requirements - Anforderungen - Exigencias

EN 10088-3 2014.
ASTM A 479 / A 479M-21.
ASTM A 276/A 276M-17.
NACE MR-0175/ISO 15156-3 2015.
AD-2000-W2/W10.
ASME SA 479 / SA 479M-21.
Type 316-Type 316L-UNS.S.31603.
Conformity letter/Zustimmungsschreiben TUV BADEN 28.01.1969
Waiving of Countersign/Gegenzeichnungsverzicht:01.03.1977
PED 2014/68/EU, Annex I, Parag.4.3/DGR 2014/68/EU

Anhang I Absatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

TERRANOVA

Melting process / Erschmelzungsart / Proceso de Fusión	Heat treatment / Wärmebehandlung / Tratamiento térmico
E.A.F. / A.O.D.	1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Turned/Drehen/Torneado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Reference standard / Bezugsnorm / Norma de referencia		Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kerbschlagzaehigkeit / Resiliencia ISO V Jules
ISO6892,ASTMA370	Min.	200	235	500	40				100
	Max.			700				215	
Temperature °C 20	Spec. Nº. / Probe Nr. / Pro Nº. 1	249	275	564	54	57	74	149	245/241/244
	2	251	277	566	53	56	73	149	243/239/242

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co	
Min.						16,50	2,00	10,00			
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000		
	0,027	0,31	1,53	0,039	0,030	16,51	2,03	10,03	0,0340	0,17	

Visual and dimensional inspection / Besichtigung und Ausmessung / Control visual y dimensional	Radioactivity inspection / Radioaktivitätskontrolle / Control de Radioactividad	Antimixing test / Spektrosk Verwechslungspr / Antimezcla	Grain Size / Korngrösse / Tamaño de grano
O.K.	O.K.	O.K.	

Remarks - Bemerkungen - Observaciones

IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK

EDV / EDP
Acc. EN 10204
Marian Tejedo
Quality Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica

We hereby certify that material described herein complies with the requirements agreed on the order.

Firmado digitalmente por / Signed digitally by:
ACEROS INOXIDABLES OLARRA SA - CIF A48663546
Fecha / Date:07-03-2022 08:52

External Provider's Declaration of Conformity for Ex-d Mode of Protection as per ATEX Directive & IECEx Scheme.

1) **Issuer**
TIEMMETI di TUROTTI STEFANO

2) **Object of the declaration**
CODICE DEL PEZZO: 12-19/39/X
12-19/42/X
17/94/X
17/93/X
DESCRIZIONE DEL PEZZO: CUSTODIA PER TRASMET.ELETTR. SERIE SMART
SS AISI316 ENCLOSURE
COPERCHIO CIECO X SST7X INOX REV.0
COPERCHIO ANTERIORE X SST7X INOX REV.0
QUANTITÀ PRODOTTA: 52-20-72-72
CERTIFICATO 3.1 N. 485628
NUMERO DI COLATA del 3.1: 534560

3) **TERRANOVA purchase order**
ORDINE N. 8627 rev. 1 DEL 03/11/2022

4) **Declaration**

We *TIEMMETI di TUROTTI STEFANO* herewith declare that the information provided in this "External Provider's Declaration of Conformity" is accurate and confirm that the products supplied are in conformity to the requirements stated in above Points (2) and (3).
We confirm also that no part of the production of the object described in Points (2) above has been subcontracted to third parties without the written consent of TERRANOVA Srl.

5) **Signature of Issuer (Name & Function)**

TUROTTI STEFANO, TITOLARE
TIEMMETI
di TUROTTI STEFANO

Date: *01/03/2023*
Place: VIA M. PAGANO, 23
20090 TREZZANO S/N (MI)

CUNEO INOX SRL - Responsabile Qualità Sylvie Serale - Tel. 0171/346165 - Email certificati@cuneoinox.com

Certificato EN 10204 3.1 valido in riferimento al ns. DDT nr. 16993/2 del 11-11-2022
Per l'acquisto di KG 949,000
TONDO LAMINATO AISI 316L DIAM. 100
Vostro riferimento ordine nr. MAIL del 09-11-2022

Colata\Lotto: 534560

ACEROS INOXIDABLES OLARRA S.A.
Larrabarri, Elotxelerri, 1
48180 Loiu. Bizkaia
España
www.olarra.com

Management Systems Certified by LRQA
ISO 9001 / SGI 6000360
ISO 14001 / SGI 1870678

ACEROS INOXIDABLES
OLARRA

CUNEO INOX, S.R.L.
VIA MOROZZO 8
12040 CASTELLETTO STURA (CN) - ITALIA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador

Works Inspector Stamp - Werkssachverständiger
Sello del Inspector 3

Certificate type - APZ Nach / Certificado tipo	Certificate nº - Prüf-Nr / Certificado nº	Date-Datum-Fecha
EN 10204/3.1	485628	07 - 03 - 2022

Our order Nº / Werks - Nr / Nº de Referencia	Heat / Schmelze / Colada	Your order Nº / Bestell - Nr / Pedido Nº
757774	534560	2663/21

Steel Grade / Werkstoff / Calidad	According to / Entsprechend / Corresponde
X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX	EN 10272-2016.

Shape and Size - Gegenstad / Perfil y dimensión	Tolerance - Toleranz / Tolerancia	Bundles / Bunde / Bultos	Bars / Stäbe / Barras	Weight / Gewicht / Peso
ROUND 100 mm	k 13 /ISO 286-1 /EN 10060	3		2288 Kg

Requirements - Anforderungen - Exigencias

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ASTM A 479 / A 479M-21.
ASTM A 276/A 276M-17.
NACE MR-0175/ISO 15156-3 2015.
AD-2000-W2/W10.
ASME SA 479 / SA 479M-21.
Type 316-Type 316L-UNS.S.31603.
Conformity letter/Zustimmungsschreiben TUV BADEN 28.01.1969
Waiving of Countersign/Gegenzeichnungsverzicht:01.03.1977
PED 2014/68/EU, Annex I, Parag.4.3/DGR 2014/68/EU

Anhang I Absatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

TERRANOVA SPRIANO MEC-RELA

Melting process / Erschmelzungsart / Proceso de Fusión	Heat treatment / Wärmebehandlung / Tratamiento térmico
E.A.F. / A.O.D.	1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Turned/Drehen/Torneado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Reference standard / Bezugsnorm / Norma de referencia		Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kerbschlagzaehigkeit / Resiliencia ISO V Jules
ISO6892,ASTMA370	Min.	200	235	500	40				100
	Max.			700				215	
Temperature ºC 20	Spec. Nº. 1	249	275	564	54	57	74	149	245/241/244
	Probe Nr. Pro Nº. 2	251	277	566	53	56	73	149	243/239/242

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co	
Min.						16,50	2,00	10,00			
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000		
	0,027	0,31	1,53	0,039	0,030	16,51	2,03	10,03	0,0340	0,17	-

Visual and dimensional inspection / Besichtigung und Ausmessung / Control visual y dimensional	Radioactivity inspection / Radioaktivitätskontrolle / Control de Radioactividad	Antimixing test / Spektrosk Verwechslungspr / Antimezcla	Grain Size / Korngrösse / Tamaño de grano
O.K.	O.K.	O.K.	

Remarks - Bemerkungen - Observaciones

IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK

C. Luca Vergazzoli
Works Inspector

EDV / EDP
Acc. EN 10204
Marian Tejedo
Quality Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica

We hereby certify that material described herein complies with the requirements agreed on the order.

Firmado digitalmente por / Signed digitally by:
ACEROS INOXIDABLES OLARRA SA - CIF A48663546
Fecha / Date:07-03-2022 08:52

CONTARDI

50 100 3910

CONTARDI. s.r.l. unipersonale
Via Milano, 19 23886 Colle Brianza (LC)
Tel 039 / 92 76 089 – Fax 039 / 92 60 329
CCIAA 03489730139
Codice Fiscale e Partita IVA 03489730139
Capitale Sociale int. vers. €. 100.000,00
Sito web: www.contardi.it
e-mail: info@contardi.it - pec: contardi@legalmail.it

ATTESTATO DI CONTROLLO

TEST REPORT
RELEVÉ DE CONTRÔLE
WERKSZEUGNIS

2.2 - UNI EN 10204

cliente customer	SPRIANO TECHNOLOGIES SRL
ordine n° purchase order n°	2605/OF DEL 26.01.2015
conferma d'ordine n° copy order n°	183 DEL 26.01.2015

posizione position	quantità quantity	descrizione description
01	405	Dischi diametro mm. 69 spessore mm. 10

Si attesta che i materiali sopra indicati :presentano le seguenti caratteristiche tecniche (1)
We certify that all above indicated products meet the following technical specifications (1)

materiale material	vetro calciosodico temprato sodalime tempered glass
sforzo di compressione indotto (σ_{BG}-σ_{BU}) induced compressive stress	≥ 100 Nmm^{-2}
temperatura normale di esercizio allowable continuous working temperature	≤ 150°C (423.15 K) (fino a 100° C se in contatto con fluidi alcalini)
temperatura massima di esercizio max. allowable working temperature	≤ 150°C (423.15 K) (fino a 100° C se in contatto con fluidi alcalini)
resistenza a shock termico (ISO 718) thermal shock resistance (ISO 718)	≥ 120 °C
resistenza idrolitica (ISO 719) hydrolytic resistance (ISO 719)	class HGB 4
resistenza agli acidi (ISO 1776) acid resistance (ISO 1776)	≤ 100 µg Na_2O per 100 cm^2
resistenza agli alcali (ISO 695) alkaline resistance (ISO 695)	class A1
coefficiente di dilatazione termica lineare linear thermal expansion coefficient	$\alpha = 9.5 \pm 0.1 \cdot 10^{-6}$ K^{-1} (20 ÷ 300 °C -- 293.15 ÷ 573.15 K)

(1) valutate in controlli non specifici / evaluated during non-specific tests

Contardi S.r.l.
Responsabile area tecnica,
Engineering activities Manager

Franco Contardi

MATERIAL 3.1 CERTIFICATE for KRG RADAR LEVEL TRANSMITTER

TERRANOVA® Srl - www.terranova-instruments.com
Factory & Sales: Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
Head Office: Via Rosso Medardo 16 – 20159 Milano – Italy
Phone: +39 0377 919119 – Fax: +39 0377 855720 - VAT IT07848810151

SANDVIK

CERTIFICATE

A03/Z02
No. M/20-014158 **Rev** 00
Date 2020-07-21 **Page** 1/4

A02/Z03
INSPECTION CERTIFICATE acc to
EN 10204 3.1

A06
FERRARI CAV.UMBERTO & C.SNC
VIA DELL'ARTIGIANATO 12
26029 SONCINO CR

INSPECTION STAMP
SVQ

Customer References A07
ORD.MAIL 20/7

FERRARIUMB

Sandvik References A08

Dispatch note
023911

Suppl. No	C.Code
322671	87

Material description B01/B04
HOT WORKED STAINLESS BAR STEEL
FORGED
ANNEALED & STRAIGHTENED
PEEL TURNED AND POLISHED

Metallurgical process	Origin	C70
E+AOD+LRF	Sweden	

Steel/material Designations B02
Sandvik
SANMAC 316/SANMAC 316L

AISI	UNS
316/316L	S31600/S31603
W.nr	**EN no**
1.4401/1.4404	1.4401/1.4404

FERRARI Cav. UMBERTO & C. S.p.A.
Servizio controllo qualità
Quality control department
Service contrôle qualité
Stabil. di SONCINO (CR)

Technical requirements
EN 10088-3:-2014, EN10272:-2016*, EN10060:2003, EN 10221:1996
EN10222-5:-2017*, PED 2014/68/EU, QQ-S-763 F,
NACE MR0175/ISO 15156-3:-2015, NACE MR0103/ISO 17945-1:-2015,
ASTM A-276-17, ASME SA-276-ED-19 SECT II PART A,
ASTM A-479-19, ASME SA-479-ED-19 SECT II PART A,
ASTM A-484-18A, ASTM A-182-19A*, ASTM A-965-14*, ASTM A-314-19*,
NORSOK M-630 ED-6, NORSOK MDS S01 REV. 5,
*For detailed information, please see the appendix

EXTENT OF DELIVERY B07-B13

It	Product designation	Heat	Lot	Kg
01	MBR-SANMAC316L-190	559352	61492	1070.0
			Total	1070.0

Recycled material

Heat	%
559352	93.6

Off.Mecc.FERRARI Cav.UMBERTO & C snc
26029 SONCINO (CR) ITALY
Spett.le TERRANOVA SRL TERRANOVA DEI PASSERINI (LO)
MATERIALE per Vs.Ord.N.6549/OF del 29/03/21
N.10 MB86P052A1 Flange DN 3" ANSI 150 RF non Rot AISI316

TEST RESULTS
Reduction ratio (times)

Lot	
61492	3.1

Chemical composition (weight%) acc. to ASTM A-751

Heat	C	Si	Mn	P	S	Cr	Ni	Mo
559352	0.014	0.34	1.79	0.035	0.024	16.82	10.09	2.03

Heat	N
559352	0.036

Quality assurance - Erik Jansson/QA-manager Primary Products A05/Z02
MTC Service / Certificates

A01 AB SANDVIK MATERIALS TECHNOLOGY Reg No. 556234-6832 VAT No. SE556234683201
SE-81181 SANDVIKEN SWEDEN www.materials.sandvik mtc_service.smt@sandvik.com

Luca Vergazzoli

TERRANOVA S.r.l. MEC-RELA

FERRARI Cav. UMBERTO & C. S.p.C. Servizio controllo qualità Quality control department Service contrôle qualité Stabil. di SONCINO (CR)

Tensile test at room temperature acc. to ASTM A370/ISO 6892-1
Longitudinal
Location half radius

	Yield strength		Tensile strength	Elongation	
	Mpa	MPa	Mpa	%	%
Lot	Rp0.2	Rp1.0	Rm	A	2"
61492	265	301	538	60	60

Red.of Area
%
Z
78

Transversal, 90° from each other.
Location half radius

	Yield strength		Tensile strength	Elongation	
	MPa	MPa	MPa	%	%
Lot	Rp0.2	Rp1.0	Rm	A	2"
61492	237	276	532	56	56
	230	270	535	56	56

Red.of Area
%
Z
62
59

Hardness test acc.to ASTM A-370/ISO 6506-1
Location half radius

	Min	Max
Lot	HB	HB
61492	135	137
	Min	Max
Lot	HRB	HRB
61492	74	75

Grain size acc to ASTM E-112.
Location half radius

Lot		
61492	5.0	5.0

Impact test, J, 20°C, Transversal acc. to ISO 148-1

	Single values			Avg.
Lot	Joule	Joule	Joule	Joule
61492	141	136	138	138
	141	150	129	140

Following controls/tests have been satisfactorily performed:
- Intergranular corrosion test acc to ASTM A-262 PR.E and EN ISO 3651-2A
- Material Identification.
- Ultrasonic test acc to EN 10228-4 Scan coverage 1, Quality Class 3 Tab 4, AD 2000 - A4-2003 6.3.1 F., ASTM A-388 API 6A PSL3/3G
- Visual inspection and dimensional control.

Off.Mecc.FERRARI Cav.UMBERTO & C snc
26029 SONCINO (CR) ITALY
Spett.le TERRANOVA SRL TERRANOVA DEI PASSERINI (LO)
MATERIALE per Vs.Ord.N.6549/OF del 29/03/21
N.10 MB86P052A1 Flange DN 3" ANSI 150 RF non Rot AISI316

TERRANOVA SPRIANO Valcom MEC-RELA

HEAT TREATMENT:
20-30mm: Material soaking 1050°C, min. 20 minutes. Quenched in water. Water temp pre-quench max 40°C, after quench max 50°C.

35-150mm: In process annealed according to ASTM A484 above the minimum hot rolling temperature of 1010°C and rapidly cooled.

155-350mm: Material soaking 1065°C, min. 30 minutes. Quenched in water. Water temp pre-quench max 40°C, after quench max 50°C.

355-370mm: Material soaking 1050°C, min. 60 minutes. Quenched in water. Water temp pre-quench max 40°C, after quench max 50°C.

375-450mm: Material soaking 1050°C, min. 120 minutes. Quenched in water. Water temp pre-quench max 40°C, after quench max 50°C.

The raw material is free from radioactive contamination.

Material free from mercury contamination.

No welding or weld repair.

This is to certify that the contents of this certified material test report are correct and accurate and that all test results and operations are in compliance with the material specification.

Approved acc. AD 2000-Merkblatt W0 and certified acc. to Pressure Equipment Directive (2014/68/EU) (PMA 1326W113330-1) by TUEV NORD GmbH; notified body, reg.no. 0045.

The delivered products comply with the specifications and requirements of the order.

The material is manufactured according to a Quality system, approved and registered to ISO 9001:2015.

No unauthorized alterations. The contents of this Inspection Certificate may not be modified or revised in any way without the prior written approval of AB Sandvik Materials Technology. Unauthorized alterations to the Inspection Certificate, including introduction of false, fictitious or fraudulent statements or entries, may be punishable by fines, imprisonment, or both. This Inspection Certificate may be copied only in the manner and for the purposes specified in Section 6 of EN 10204:2004. Contravention of this notice will be prosecuted to the fullest extent of applicable law.

The certificate is produced with EDP and valid without signature.

FERRARI Cav. UMBERTO & C. S.p.C. Servizio controllo qualità Quality control department Service contrôle qualité Stabil. di SONCINO (CR)

Off.Mecc.FERRARI Cav.UMBERTO & C snc
26029 SONCINO (CR) ITALY
Spett.le TERRANOVA SRL TERRANOVA DEI PASSERINI (LO)
MATERIALE per Vs.Ord.N.6549/OF del 29/03/21
N.10 MB86P052A1 Flange DN 3" ANSI 150 RF non Rot AISI316

TERRANOVA SPRIANO MEC-RELA

APPENDIX

Lab accreditation
Our lab is accredited under SWEDAC Accreditation number 1636 for testing as per ISO/IEC 17025

Applicable only to specific dimensions
20mm - 250mm: EN 10088-5 EN (Only valid for CE marked products together with Sandvik Declaration of Performance certificate).
20mm - 400mm: PED 2014/68/EU *EN 10272 (Stainless steel bars for pressure purposes)
20mm - 375mm: *AD-2000-W2/W10
20mm - 450mm: NORSOK M-630 Ed. 6 - NORSOK MDS S01 Rev. 5
180mm- 450mm: PED 2014/68/EU *EN 10222-5
70mm - 450mm: AMS 5648 Rev. L, AMS 5653 Rev. H
Suitable for manufacturing of components in acc. with *ASTM A-182, ASTM A-965, ASTM A-314.

Test location
Mechanical, ferrite, corrosion testing:
Bar dim <=50mm - Longitudinal test pieces in center of the bar.

Bar dim > 50mm - 160 mm - Longitudinal test pieces, 1/4 T and minimum 100 mm from any second surface.
Bar dim > 160mm- 450 mm - Transversal test pieces, 1/4 T and minimum 100 mm from any second surface.

One set of test samples per heat treatment lot.
Maximum lot size 15 ton.

Furnace calibration every third month according to API 6A
Thermocouples of S-type (+/- 5°C tolerance) are used to monitor the furnace temperature.

FERRARI Cav. UMBERTO & C. S.n.c. Servizio controllo qualità Quality control department Service controlle qualité Stabil. di SONCINO (CR)

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TERRANOVA SPESSANO Silicom MEC RELA

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

CALIBRATION CERTIFICATES

Document Number: -

Document Class: 3

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CALIBRATION CERTIFICATES for SST77B DIFFERENTIAL PRESSURE TRANSMITTERS

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SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST77B SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,100 %FS

SIGLA / TAG.
43-LT-001
NUM SERIE / SERIAL NUM
SE240632

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA04 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

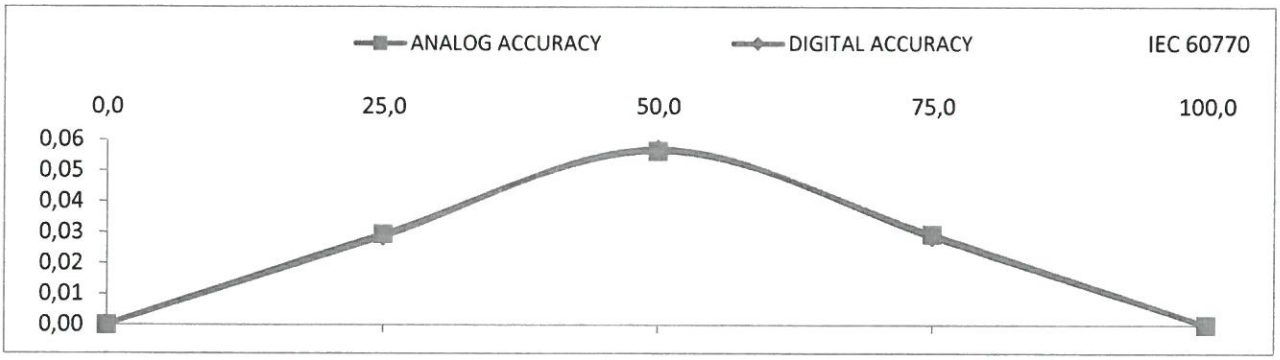
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	350	mbar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	560	mm H2O
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47 MEMBRANE DORATE

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	mbar	mbar	mbar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,000	4,00	4,000	0,000	0,000
25,0	87,500	87,500	87,600	8,00	8,005	0,029	0,029
50,0	175,000	175,000	175,200	12,00	12,009	0,057	0,056
75,0	262,500	262,500	262,600	16,00	16,005	0,029	0,029
100,0	350,000	350,000	350,000	20,00	20,000	0,000	0,000

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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WE HEREBY DECLARE THIS PRODUCT IS ACCORDING TO ORDER SPECIFICATIONS AND THAT TESTS WERE CARRIED OUT WITH POSITIVE RESULTS. THIS PRODUCT HAS BEEN MANUFACTURED ACCORDING TO QUALITY SYSTEM EN ISO 9001

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spriano@terranova-instruments.com

OPERATO DA *OPERATED BY*	OPS	DATA / *DATE*
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TERRANOVA®
SPRIANO MECRELA

Inspector OBO RHC 05/08/2024

05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST77B SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,100 %FS

SIGLA / TAG.
43-LT-003
NUM SERIE / SERIAL NUM
SE240633

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA04 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

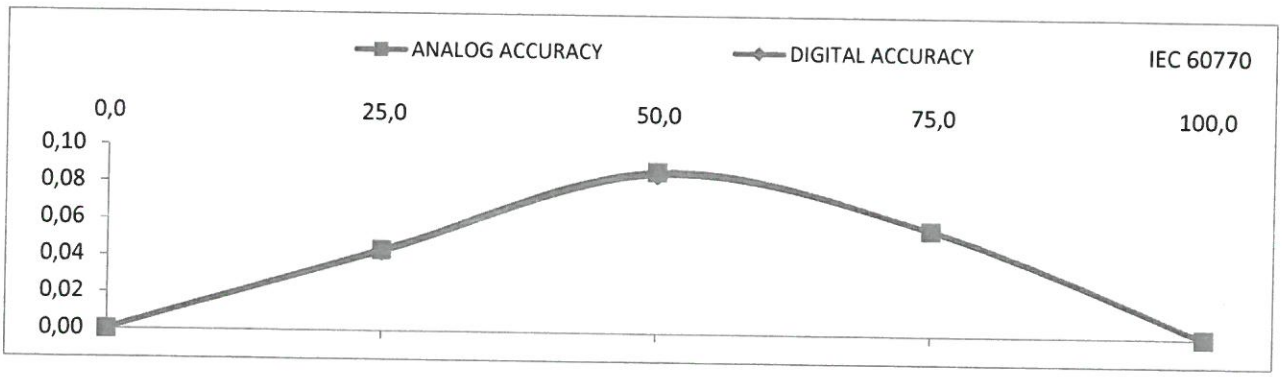
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	350	mbar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	1000	mm H2O
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47 MEMBRANE DORATE

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	mbar	mbar	mbar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,000	4,00	4,000	0,000	0,000
25,0	87,500	87,500	87,650	8,00	8,007	0,043	0,044
50,0	175,000	175,000	175,300	12,00	12,014	0,086	0,087
75,0	262,500	262,500	262,700	16,00	16,009	0,057	0,057
100,0	350,000	350,000	350,000	20,00	20,000	0,000	0,000

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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TERRANOVA® SPRIANO Yokogawa MEC-RELA

Inspector GBO 05/08/24 RMC

05/08/24

CALIBRATION CERTIFICATES for SST76 PRESSURE TRANSMITTERS

TERRANOVA® Srl - www.terranova-instruments.com
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SPRIANO® TECHNOLOGIES

RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*

MOD RCS
REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
50-PT-014
NUM SERIE / SERIAL NUM
SE240651

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
GPA03 - AUTOMATIC PRESSURE GENERATOR
PAN22 - CURRENT & VOLTAGE INDICATOR
-
-
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-

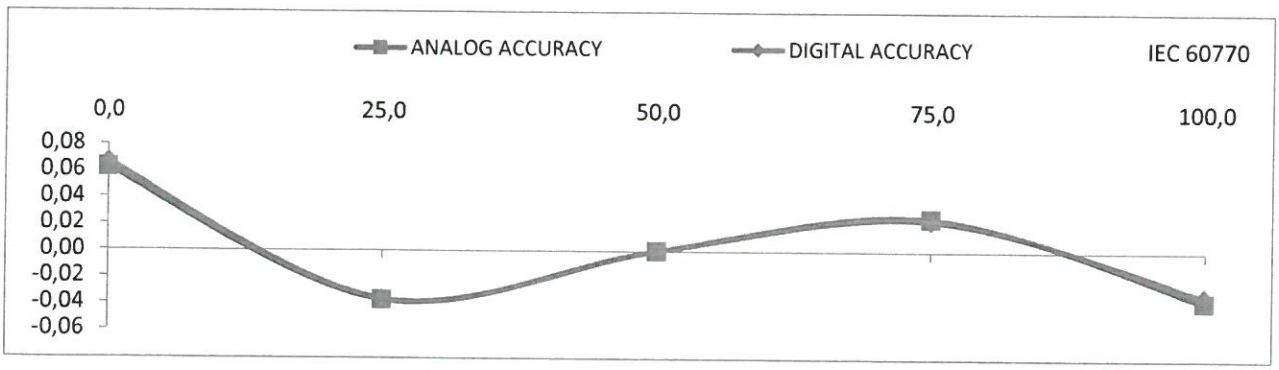
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	18	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	0,020	4,00	4,010	0,067	0,062
25,0	7,500	7,500	7,489	8,00	7,994	-0,037	-0,038
50,0	15,000	15,000	15,000	12,00	12,000	0,000	0,000
75,0	22,500	22,500	22,507	16,00	16,004	0,023	0,025
100,0	30,000	30,000	29,990	20,00	19,994	-0,033	-0,038

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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SPRIANO® TECHNOLOGIES

RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*

MOD RCS
REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
63-PT-003
NUM SERIE / SERIAL NUM
SE240652

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
GPA03 - AUTOMATIC PRESSURE GENERATOR
PAN22 - CURRENT & VOLTAGE INDICATOR
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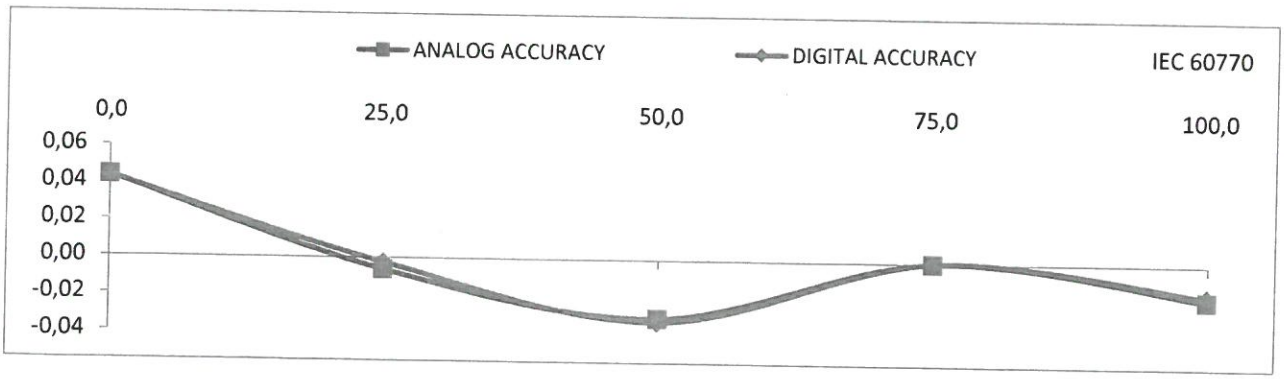
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	11	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	0,013	4,00	4,007	0,043	0,044
25,0	7,500	7,500	7,499	8,00	7,999	-0,002	-0,006
50,0	15,000	15,000	14,990	12,00	11,995	-0,033	-0,031
75,0	22,500	22,500	22,500	16,00	16,000	0,000	0,000
100,0	30,000	30,000	29,995	20,00	19,997	-0,017	-0,019

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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Inspector R OBA RNC 05/08/24

Robbix CROSSWIND 05/08/24 W

SPRIANO TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
63-PT-004
NUM SERIE / SERIAL NUM
SE240653

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	
	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
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	-
	-
	-

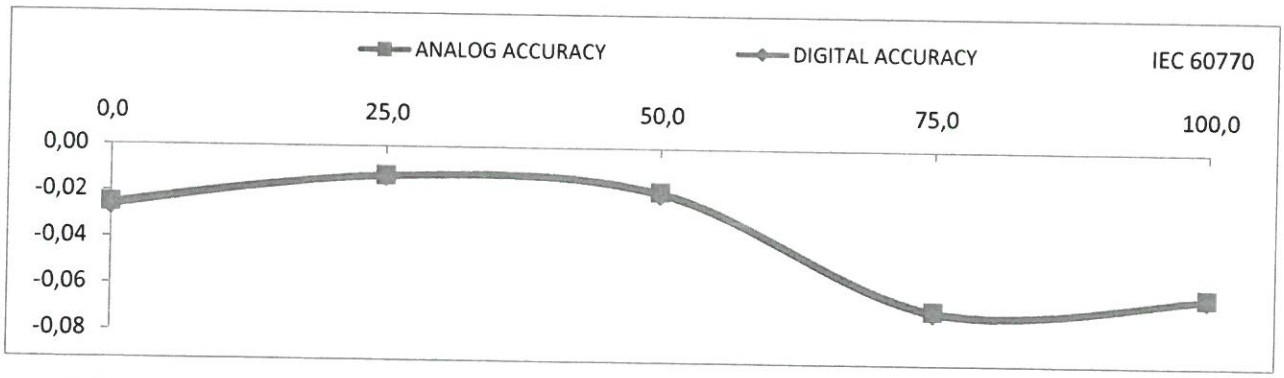
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C			
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar			
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%			
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar	
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	11	bar	
USCITA / *OUTPUT*	4	-	20	mA	

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,008	4,00	3,996	-0,027	-0,025
25,0	7,500	7,500	7,496	8,00	7,998	-0,013	-0,012
50,0	15,000	15,000	14,994	12,00	11,997	-0,020	-0,019
75,0	22,500	22,500	22,479	16,00	15,989	-0,070	-0,069
100,0	30,000	30,000	29,981	20,00	19,990	-0,063	-0,063

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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DATA / *DATE*
10/07/2024

TERRANOVA
SPRIANO Tricom MEC-RELA

G. Luca Vingazzoli
05/08/24

CROSSWINDS
05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
64-PT-031A
NUM SERIE / SERIAL NUM
SE240654

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
GPA03 - AUTOMATIC PRESSURE GENERATOR
PAN22 - CURRENT & VOLTAGE INDICATOR
-
-
-
-

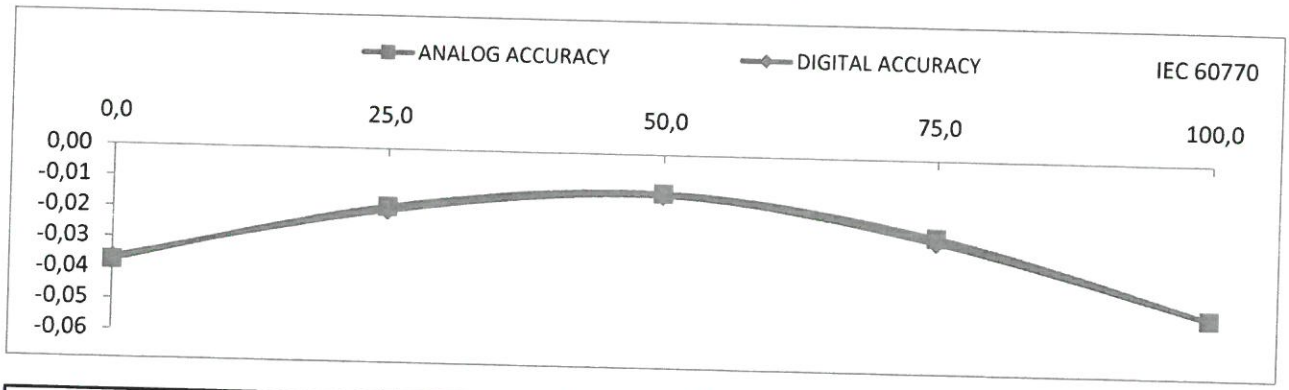
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C			
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar			
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%			
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar	
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar	
USCITA / *OUTPUT*	4	-	20	mA	

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,011	4,00	3,994	-0,037	-0,037
25,0	7,500	7,500	7,494	8,00	7,997	-0,020	-0,019
50,0	15,000	15,000	14,996	12,00	11,998	-0,013	-0,013
75,0	22,500	22,500	22,492	16,00	15,996	-0,027	-0,025
100,0	30,000	30,000	29,985	20,00	19,992	-0,050	-0,050

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



SI DICHIARA CHE QUESTO PRODOTTO E' CONFORME ALLE SPECIFICHE D'ORDINE E CHE IL COLLAUDO HA DATO ESITO POSITIVO. IL PRODOTTO E' STATO COSTRUITO IN ACCORDO AL SISTEMA DI QUALITA' EN ISO 9001

WE HEREBY DECLARE THIS PRODUCT IS ACCORDING TO ORDER SPECIFICATIONS AND THAT TESTS WERE CARRIED OUT WITH POSITIVE RESULTS. THIS PRODUCT HAS BEEN MANUFACTURED ACCORDING TO QUALITY SYSTEM EN ISO 9001

SPRIANO® TECHNOLOGIES
a TERRANOVA® Srl brand
Via Gramsci 1, 26827, Terranova Passerini (LO), ITALY
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DATA / *DATE*
10/07/2024

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Inspector OBO RMC 05/08/24

CROSSWIND 05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
64-PT-031B
NUM SERIE / SERIAL NUM
SE240655

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

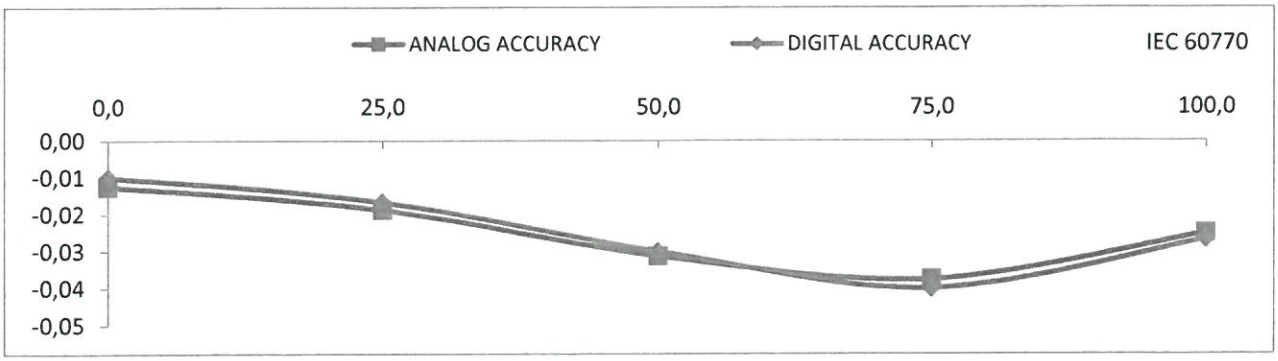
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,003	4,00	3,998	-0,010	-0,012
25,0	7,500	7,500	7,495	8,00	7,997	-0,017	-0,019
50,0	15,000	15,000	14,991	12,00	11,995	-0,030	-0,031
75,0	22,500	22,500	22,488	16,00	15,994	-0,040	-0,038
100,0	30,000	30,000	29,992	20,00	19,996	-0,027	-0,025

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



SI DICHIARA CHE QUESTO PRODOTTO E' CONFORME ALLE SPECIFICHE D'ORDINE E CHE IL COLLAUDO HA DATO ESITO POSITIVO. IL PRODOTTO E' STATO COSTRUITO IN ACCORDO AL SISTEMA DI QUALITA' EN ISO 9001

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Inspector ODO 05/09/24 RHC

x CROSSWIND 05/09/24 W

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
64-PT-002
NUM SERIE / SERIAL NUM
SE240656

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

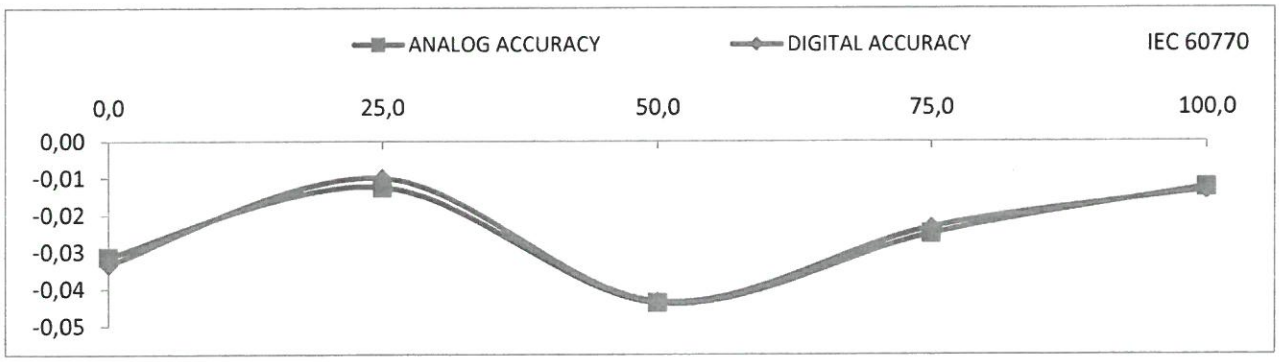
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,010	4,00	3,995	-0,033	-0,031
25,0	7,500	7,500	7,497	8,00	7,998	-0,010	-0,012
50,0	15,000	15,000	14,987	12,00	11,993	-0,043	-0,044
75,0	22,500	22,500	22,493	16,00	15,996	-0,023	-0,025
100,0	30,000	30,000	29,996	20,00	19,998	-0,013	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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Luca Vergazzoli R
Inspector OBO RMC
05/08/24

Crosswind
05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
80-PT-002
NUM SERIE / SERIAL NUM
SE240657

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

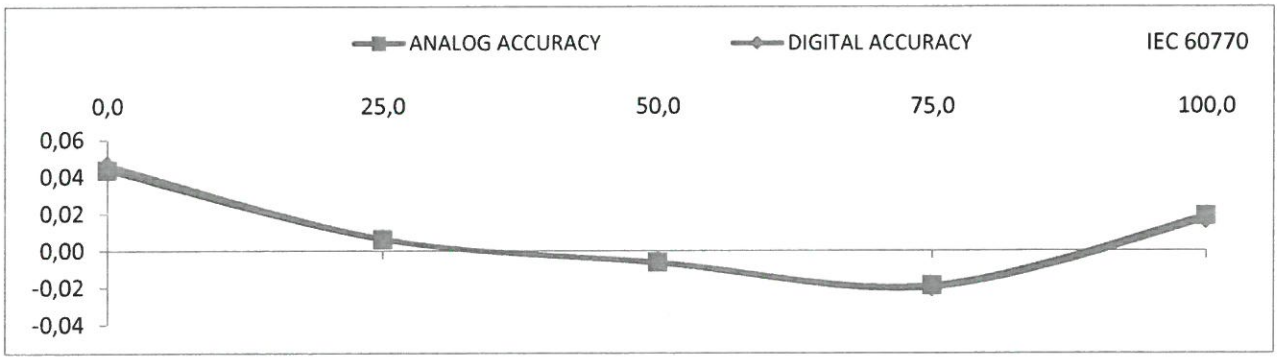
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,014	4,00	4,007	0,047	0,044
25,0	7,500	7,500	7,502	8,00	8,001	0,007	0,006
50,0	15,000	15,000	14,998	12,00	11,999	-0,007	-0,006
75,0	22,500	22,500	22,494	16,00	15,997	-0,020	-0,019
100,0	30,000	30,000	30,005	20,00	20,003	0,017	0,019

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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SPRIANO TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES	
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001	
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-	
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075	%FS

SIGLA / TAG.
25-PT-001
NUM SERIE / SERIAL NUM
SE240634

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

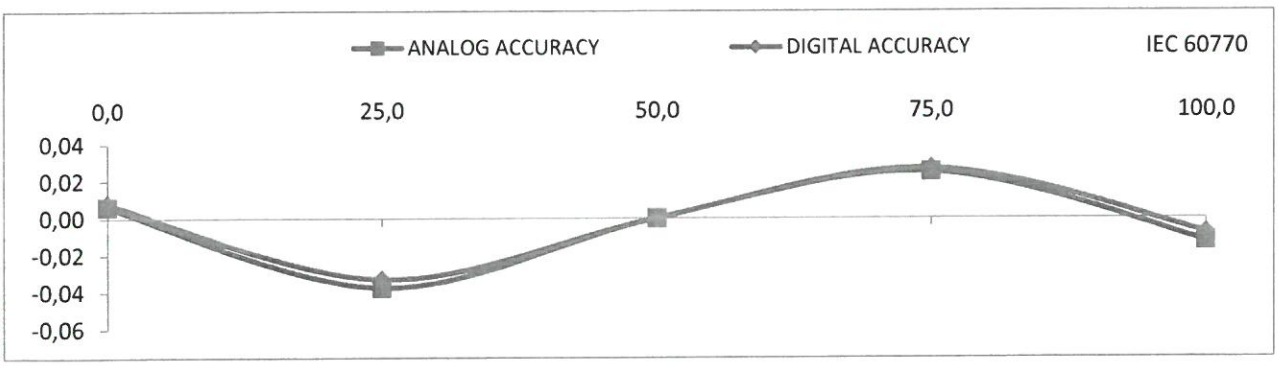
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,008	4,00	4,001	0,008	0,006
25,0	25,000	25,000	24,967	8,00	7,994	-0,033	-0,038
50,0	50,000	50,000	50,000	12,00	12,000	0,000	0,000
75,0	75,000	75,000	75,027	16,00	16,004	0,027	0,025
100,0	100,000	100,000	99,992	20,00	19,998	-0,008	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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05/08/24

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SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-002
NUM SERIE / SERIAL NUM
SE240635

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
GPA03 - AUTOMATIC PRESSURE GENERATOR
PAN22 - CURRENT & VOLTAGE INDICATOR
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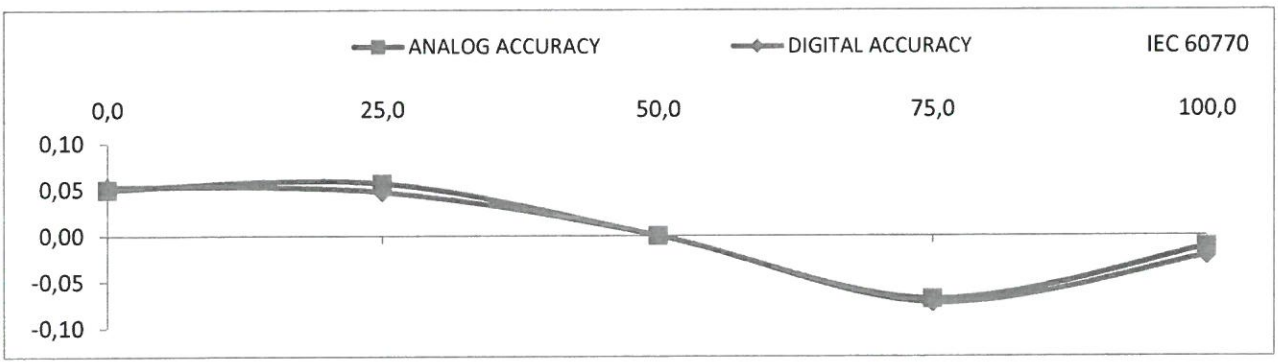
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,053	4,00	4,008	0,053	0,050
25,0	25,000	25,000	25,047	8,00	8,009	0,047	0,056
50,0	50,000	50,000	50,000	12,00	12,000	0,000	0,000
75,0	75,000	75,000	74,927	16,00	15,989	-0,073	-0,069
100,0	100,000	100,000	99,978	20,00	19,998	-0,022	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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TERRANOVA® SPRIANO Valcom MECHELA

G. Luca Verzazzoli OBD RMC 05/08/24

Dott + CROSSWIND 05/08/24

SPRIANO TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-004
NUM SERIE / SERIAL NUM
SE240636

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
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	-
	-

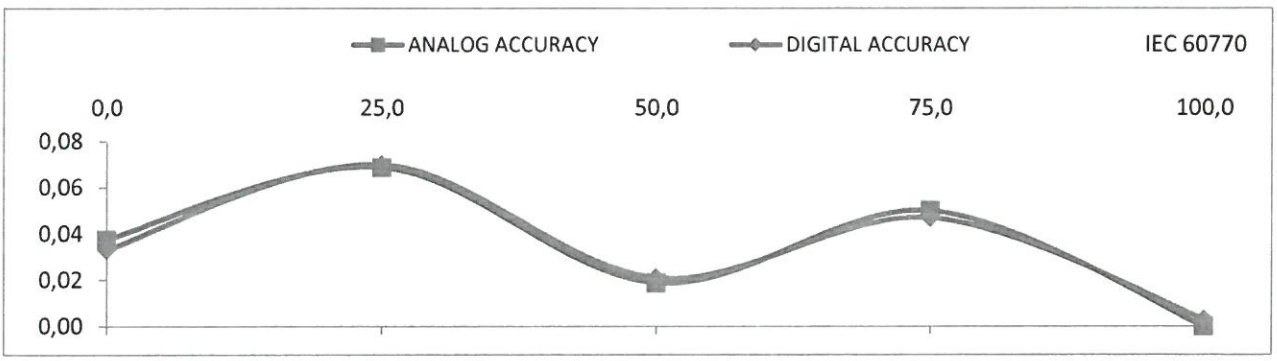
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TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,033	4,00	4,006	0,033	0,038
25,0	25,000	25,000	25,070	8,00	8,011	0,070	0,069
50,0	50,000	50,000	50,021	12,00	12,003	0,021	0,019
75,0	75,000	75,000	75,047	16,00	16,008	0,047	0,050
100,0	100,000	100,000	100,003	20,00	20,000	0,003	0,000

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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Luca Mazzoli R 05/08/24

Fabbri x CROSSWIND 05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES	
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001	
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-	
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075	%FS

SIGLA / TAG.
25-PT-035
NUM SERIE / SERIAL NUM
SE240637

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
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	-
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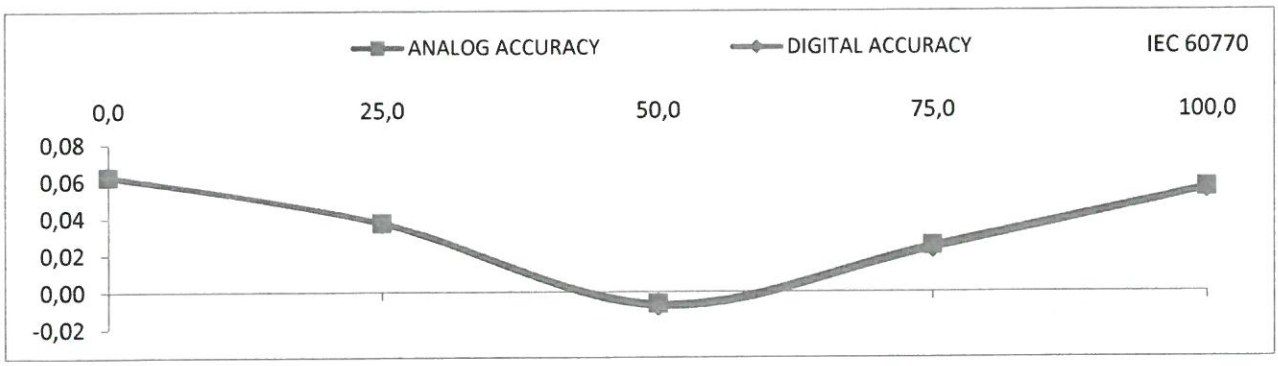
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,063	4,00	4,010	0,063	0,062
25,0	25,000	25,000	25,037	8,00	8,006	0,037	0,038
50,0	50,000	50,000	49,992	12,00	11,999	-0,008	-0,006
75,0	75,000	75,000	75,023	16,00	16,004	0,023	0,025
100,0	100,000	100,000	100,055	20,00	20,009	0,055	0,056

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



SI DICHIARA CHE QUESTO PRODOTTO E' CONFORME ALLE SPECIFICHE D'ORDINE E CHE IL COLLAUDO HA DATO ESITO POSITIVO. IL PRODOTTO E' STATO COSTRUITO IN ACCORDO AL SISTEMA DI QUALITA' EN ISO 9001

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SPRIANO® TECHNOLOGIES
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spriano@terranova-instruments.com

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22/07/2024

TERRANOVA® SPRIANO VULCANIC MECRELA

G. Luca Bergazzoli R
Inspector OBO
05/07/2024 RMC

Robbi x CROSS WIND
05/08/24 W

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES	
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001	
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-	
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075	%FS

SIGLA / TAG.
25-PT-006
NUM SERIE / SERIAL NUM
SE240638

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

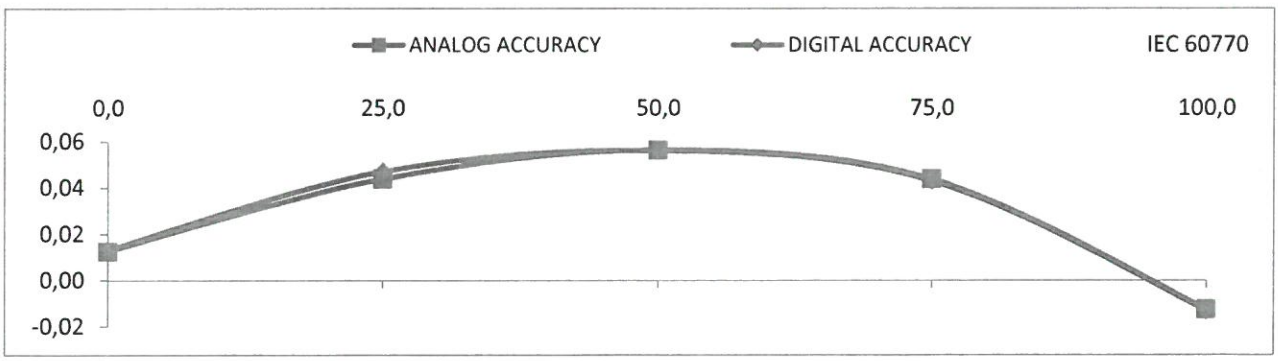
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,013	4,00	4,002	0,013	0,012
25,0	25,000	25,000	25,047	8,00	8,007	0,047	0,044
50,0	50,000	50,000	50,056	12,00	12,009	0,056	0,056
75,0	75,000	75,000	75,043	16,00	16,007	0,043	0,044
100,0	100,000	100,000	99,987	20,00	19,998	-0,013	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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TERRANOVA® SPRIANO Valcom MEC-RELA

G. Luca Vergazzoli 05/08/24

Fabbri & CROSSWIND 05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-040
NUM SERIE / SERIAL NUM
SE240641

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

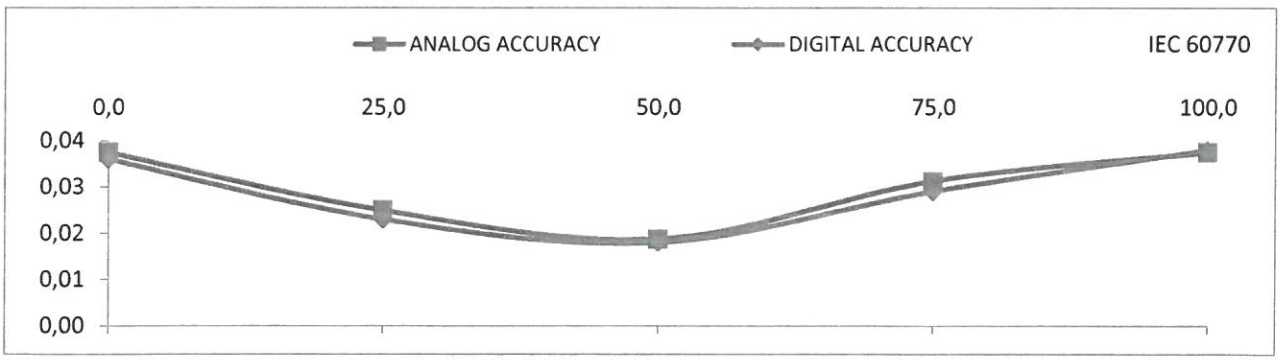
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,036	4,00	4,006	0,036	0,038
25,0	25,000	25,000	25,023	8,00	8,004	0,023	0,025
50,0	50,000	50,000	50,018	12,00	12,003	0,018	0,019
75,0	75,000	75,000	75,029	16,00	16,005	0,029	0,031
100,0	100,000	100,000	100,038	20,00	20,006	0,038	0,038

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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SPRIANO TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES	SIGLA / TAG.
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001	**25-PT-009**
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-	NUM SERIE / SERIAL NUM
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS	SE240642

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

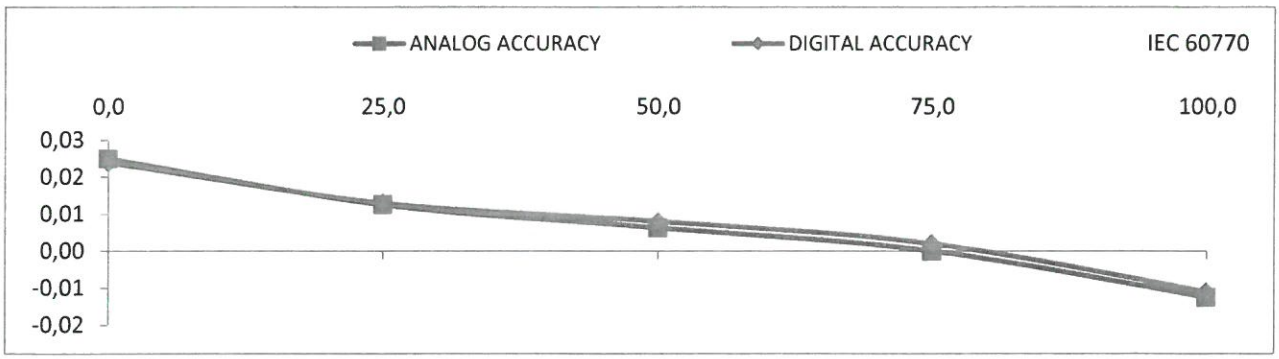
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,024	4,00	4,004	0,024	0,025
25,0	25,000	25,000	25,013	8,00	8,002	0,013	0,013
50,0	50,000	50,000	50,008	12,00	12,001	0,008	0,006
75,0	75,000	75,000	75,002	16,00	16,000	0,002	0,000
100,0	100,000	100,000	99,989	20,00	19,998	-0,011	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-043
NUM SERIE / SERIAL NUM
SE240643

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

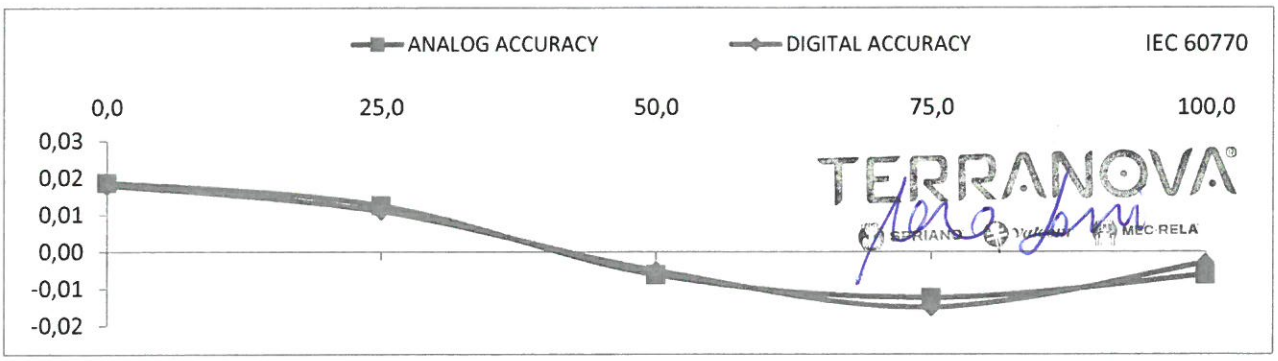
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	0,018	4,00	4,003	0,018	0,019
25,0	25,000	25,000	25,011	8,00	8,002	0,011	0,013
50,0	50,000	50,000	49,995	12,00	11,999	-0,005	-0,006
75,0	75,000	75,000	74,985	16,00	15,998	-0,015	-0,013
100,0	100,000	100,000	99,997	20,00	19,999	-0,003	-0,006

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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05/04/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-011
NUM SERIE / SERIAL NUM
SE240644

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
GPA03 - AUTOMATIC PRESSURE GENERATOR
PAN22 - CURRENT & VOLTAGE INDICATOR
-
-
-
-

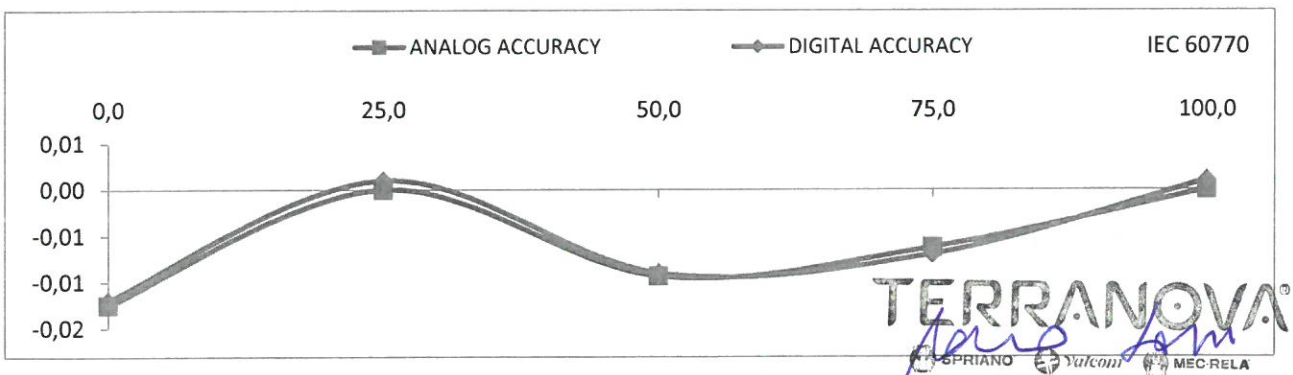
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,012	4,00	3,998	-0,012	-0,012
25,0	25,000	25,000	25,001	8,00	8,000	0,001	0,000
50,0	50,000	50,000	49,991	12,00	11,999	-0,009	-0,009
75,0	75,000	75,000	74,993	16,00	15,999	-0,007	-0,006
100,0	100,000	100,000	100,001	20,00	20,000	0,001	0,000

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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G. Luca Verrazzoli
05/08/2024

Foldr x Cross Wind
05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-037
NUM SERIE / SERIAL NUM
SE240639

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

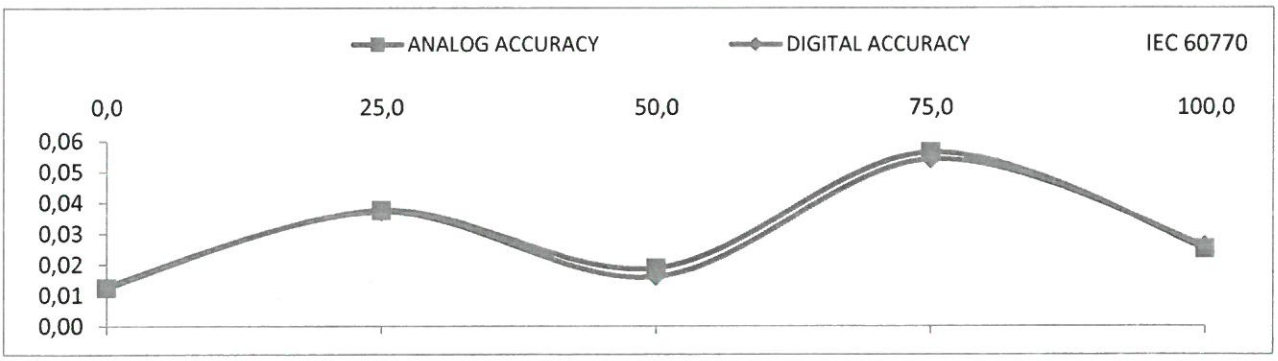
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	0,013	4,00	4,002	0,013	0,012
25,0	25,000	25,000	25,037	8,00	8,006	0,037	0,038
50,0	50,000	50,000	50,016	12,00	12,003	0,016	0,019
75,0	75,000	75,000	75,054	16,00	16,009	0,054	0,056
100,0	100,000	100,000	100,026	20,00	20,004	0,026	0,025

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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SPRIANO TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-008
NUM SERIE / SERIAL NUM
SE240640

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
GPA03 - AUTOMATIC PRESSURE GENERATOR
PAN22 - CURRENT & VOLTAGE INDICATOR
-
-
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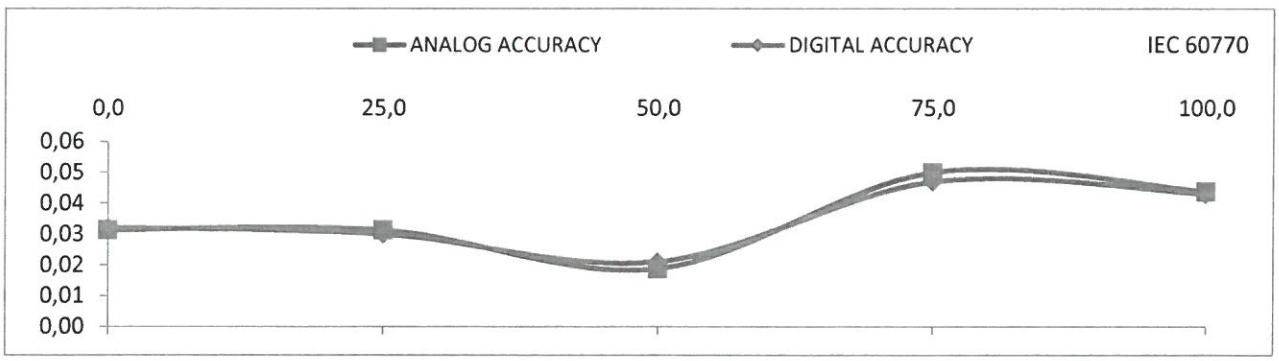
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	0,032	4,00	4,005	0,032	0,031
25,0	25,000	25,000	25,030	8,00	8,005	0,030	0,031
50,0	50,000	50,000	50,021	12,00	12,003	0,021	0,019
75,0	75,000	75,000	75,047	16,00	16,008	0,047	0,050
100,0	100,000	100,000	100,043	20,00	20,007	0,043	0,044

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



SI DICHIARA CHE QUESTO PRODOTTO E' CONFORME ALLE SPECIFICHE D'ORDINE E CHE IL COLLAUDO HA DATO ESITO POSITIVO. IL PRODOTTO E' STATO COSTRUITO IN ACCORDO AL SISTEMA DI QUALITA' EN ISO 9001

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spriano@terranova-instruments.com

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DATA / *DATE*
22/07/2024

TERRANOVA® SPRIANO Valcon MEC RELA

05/07/24

05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-046
NUM SERIE / SERIAL NUM
SE240645

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

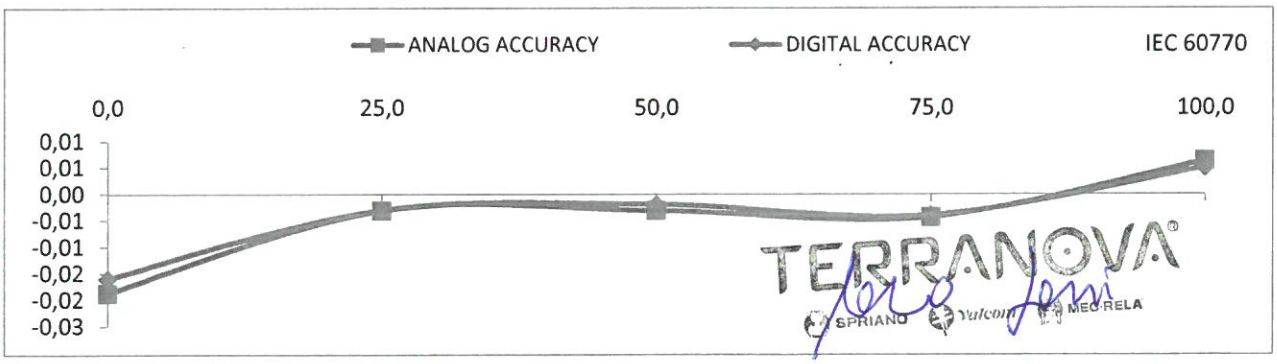
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	bar	bar	bar	mA	mA	% FS	% FS
0,0	0,000	0,000	-0,016	4,00	3,997	-0,016	-0,019
25,0	25,000	25,000	24,997	8,00	8,000	-0,003	-0,003
50,0	50,000	50,000	49,998	12,00	12,000	-0,002	-0,003
75,0	75,000	75,000	74,996	16,00	15,999	-0,004	-0,004
100,0	100,000	100,000	100,005	20,00	20,001	0,005	0,006

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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05/08/2024

05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-012
NUM SERIE / SERIAL NUM
SE240646

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

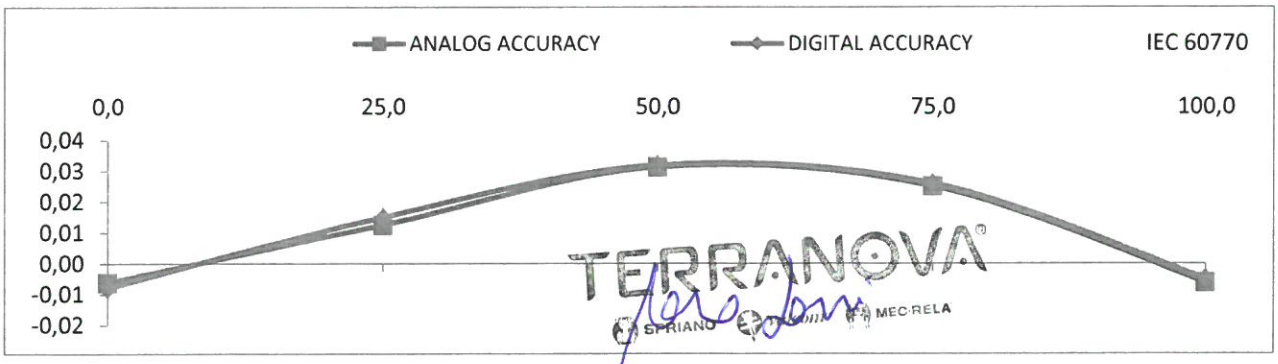
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,008	4,00	3,999	-0,008	-0,006
25,0	25,000	25,000	25,015	8,00	8,002	0,015	0,013
50,0	50,000	50,000	50,032	12,00	12,005	0,032	0,031
75,0	75,000	75,000	75,026	16,00	16,004	0,026	0,025
100,0	100,000	100,000	99,995	20,00	19,999	-0,005	-0,006

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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05/08/2024 EMC

05/08/24 W

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-049
NUM SERIE / SERIAL NUM
SE240647

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

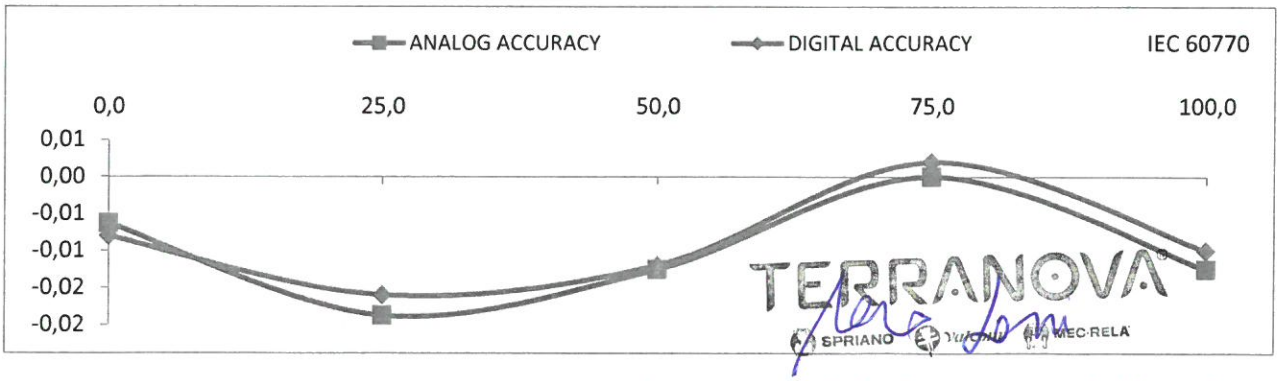
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	100	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	40	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,008	4,00	3,999	-0,008	-0,006
25,0	25,000	25,000	24,984	8,00	7,997	-0,016	-0,019
50,0	50,000	50,000	49,988	12,00	11,998	-0,012	-0,013
75,0	75,000	75,000	75,002	16,00	16,000	0,002	0,000
100,0	100,000	100,000	99,990	20,00	19,998	-0,010	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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22/07/2024

G. Luca Vergazzoli 05/07/2024 RMC

05/07/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-055A
NUM SERIE / SERIAL NUM
SE240648

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	
	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

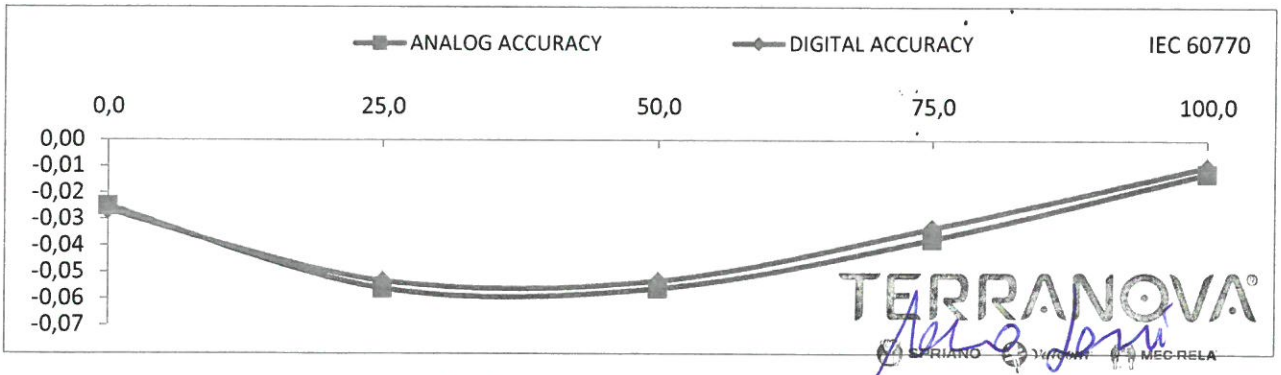
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,008	4,00	3,996	-0,027	-0,025
25,0	7,500	7,500	7,484	8,00	7,991	-0,053	-0,056
50,0	15,000	15,000	14,984	12,00	11,991	-0,053	-0,056
75,0	22,500	22,500	22,490	16,00	15,994	-0,033	-0,038
100,0	30,000	30,000	29,997	20,00	19,998	-0,010	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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22/07/2024

G. Luca Vendazzoli
05/08/24

Robbi x CROSSWIND
05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
25-PT-055B
NUM SERIE / SERIAL NUM
SE240649

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

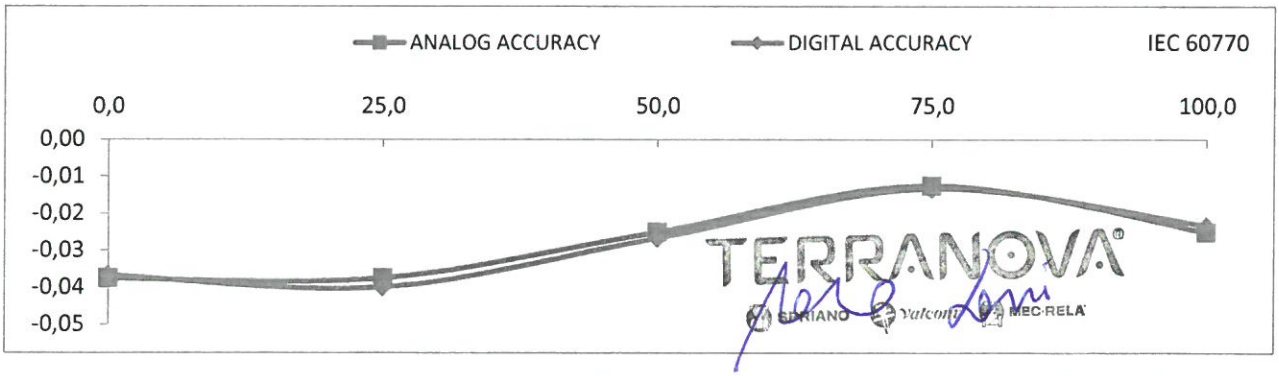
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,011	4,00	3,994	-0,037	-0,037
25,0	7,500	7,500	7,488	8,00	7,994	-0,040	-0,038
50,0	15,000	15,000	14,992	12,00	11,996	-0,027	-0,025
75,0	22,500	22,500	22,496	16,00	15,998	-0,013	-0,013
100,0	30,000	30,000	29,993	20,00	19,996	-0,023	-0,025

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
43-PT-001
NUM SERIE / SERIAL NUM
SE240650

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

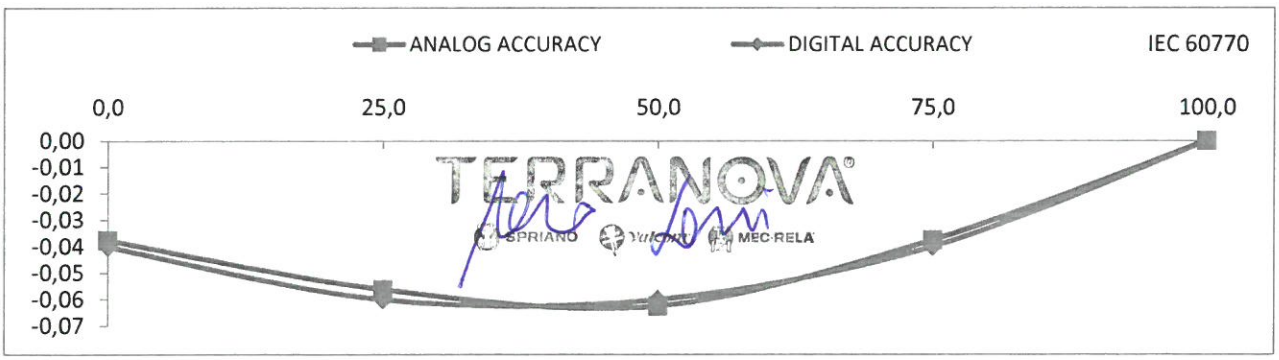
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TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	5	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	3,5	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,002	4,00	3,994	-0,040	-0,037
25,0	1,250	1,250	1,247	8,00	7,991	-0,060	-0,056
50,0	2,500	2,500	2,497	12,00	11,990	-0,060	-0,062
75,0	3,750	3,750	3,748	16,00	15,994	-0,040	-0,038
100,0	5,000	5,000	5,000	20,00	20,000	0,000	0,000

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



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G. Luca Vergazzoli 05/08/24 RMC

05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
50-PT-001
NUM SERIE / SERIAL NUM
SE240660

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

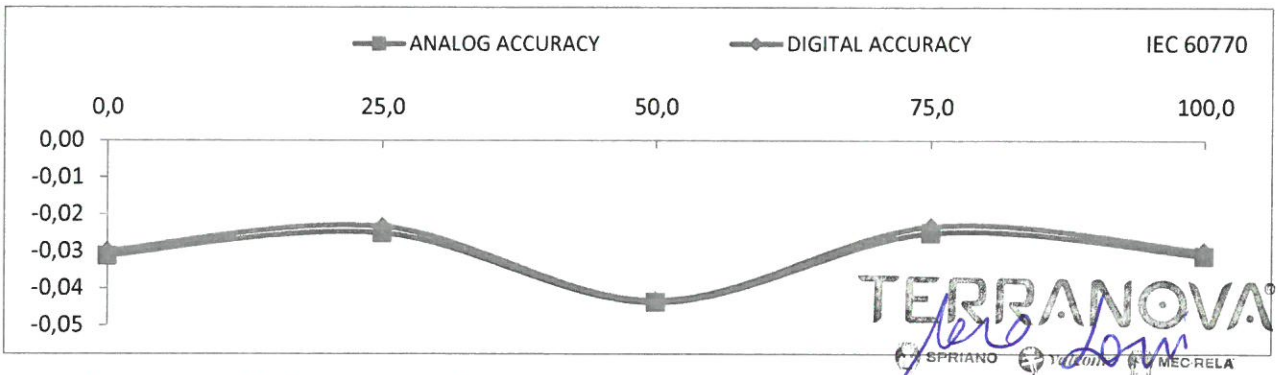
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TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,009	4,00	3,995	-0,030	-0,031
25,0	7,500	7,500	7,493	8,00	7,996	-0,023	-0,025
50,0	15,000	15,000	14,987	12,00	11,993	-0,043	-0,044
75,0	22,500	22,500	22,493	16,00	15,996	-0,023	-0,025
100,0	30,000	30,000	29,991	20,00	19,995	-0,030	-0,031

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



SI DICHIARA CHE QUESTO PRODOTTO E' CONFORME ALLE SPECIFICHE D'ORDINE E CHE IL COLLAUDO HA DATO ESITO POSITIVO. IL PRODOTTO E' STATO COSTRUITO IN ACCORDO AL SISTEMA DI QUALITA' EN ISO 9001
WE HEREBY DECLARE THIS PRODUCT IS ACCORDING TO ORDER SPECIFICATIONS AND THAT TESTS WERE CARRIED OUT WITH POSITIVE RESULTS. THIS PRODUCT HAS BEEN MANUFACTURED ACCORDING TO QUALITY SYSTEM EN ISO 9001

SPRIANO® TECHNOLOGIES
a TERRANOVA® Srl brand
Via Gramsci 1, 26827, Terranova Passerini (LO), ITALY
Tel +39 0377 919119 Fax +39 0377 855720
www.spriano.it
spriano@terranova-instruments.com

OPERATO DA *OPERATED BY*	OP7
CONTROLLATO DA CHECKED BY	RPR

DATA / *DATE*
22/07/2024

05/08/24

05/08/24

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST76 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,075 %FS

SIGLA / TAG.
50-PT-002
NUM SERIE / SERIAL NUM
SE240661

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	GPA03 - AUTOMATIC PRESSURE GENERATOR
	PAN22 - CURRENT & VOLTAGE INDICATOR
	-
	-
	-
	-

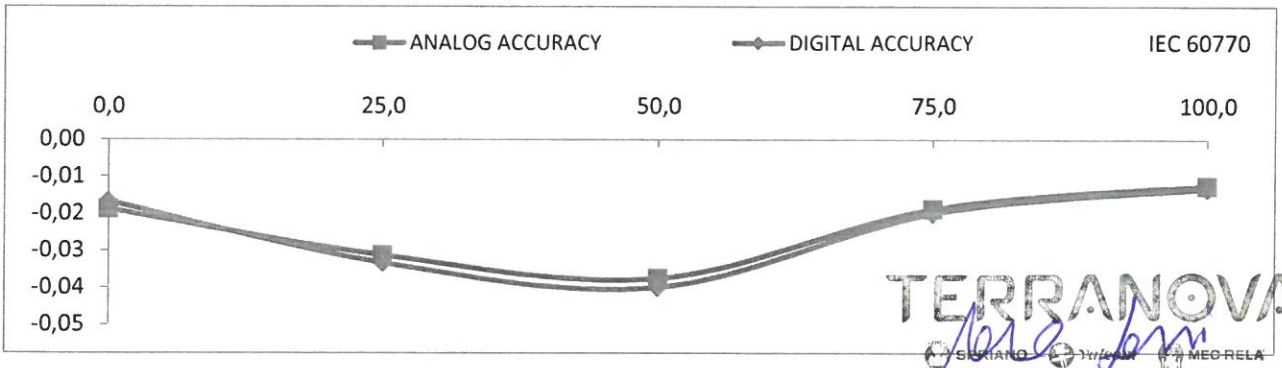
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	0	-	30	bar
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	10	bar
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW Rev. 47

STEP [%]	NOMINAL VALUE bar	GENERATED VALUE bar	MEASURED VALUE bar	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	-0,005	4,00	3,997	-0,017	-0,019
25,0	7,500	7,500	7,490	8,00	7,995	-0,033	-0,031
50,0	15,000	15,000	14,988	12,00	11,994	-0,040	-0,038
75,0	22,500	22,500	22,494	16,00	15,997	-0,020	-0,019
100,0	30,000	30,000	29,996	20,00	19,998	-0,013	-0,012

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



TERRANOVA

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OPERATO DA *OPERATED BY*	OP7
CONTROLLATO DA CHECKED BY	RPR

DATA / *DATE*
22/07/2024

G. Luca Verbazzoli R
Inspector OBO QMC
05/08/24

Robbin + Cross Wind
05/08/24 W

CALIBRATION CERTIFICATES for SST72 TEMPERATURE TRANSMITTERS

TERRANOVA® Srl - www.terranova-instruments.com
Factory & Sales: Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
Head Office: Via Rosso Medardo 16 – 20159 Milano – Italy
Phone: +39 0377 919119 – Fax: +39 0377 855720 - VAT IT07848810151

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS** REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST72 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,100 %FS

SIGLA / TAG.
50-TT-001
NUM SERIE / SERIAL NUM
SE240658

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
CAM09 - CLIMATIC CHAMBER
CAM04 - CLIMATIC CHAMBER
TER01 - DIGITAL THERMOMETER
PAN22 - CURRENT & VOLTAGE INDICATOR
-
-

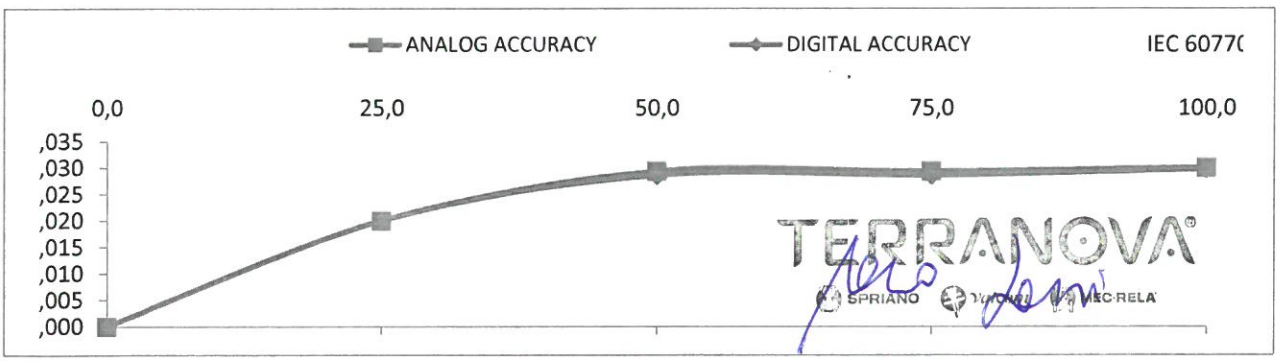
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	-100	-	350	°C
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	50	°C
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW:REV.12

STEP [%]	NOMINAL VALUE °C	GENERATED VALUE °C	MEASURED VALUE °C	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	0,000	4,00	4,000	0,000	0,000
25,0	12,500	12,500	12,570	8,00	8,003	0,020	0,020
50,0	25,000	25,000	25,100	12,00	12,005	0,029	0,029
75,0	37,500	37,500	37,600	16,00	16,005	0,029	0,029
100,0	50,000	50,000	50,104	20,00	20,005	0,030	0,030

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
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OPERATO DA *OPERATED BY*	OP9
CONTROLLATO DA CHECKED BY	RPR

DATA / *DATE*
22/07/2024

G. Luca Vindazzoli
Inspector ODO
05/08/24 EMC

Robbo x CROSSWIND
05/08/24 W

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	SST72 SERIES
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	IOP_SS7_TAR_001
FOGLIO DI CALCOLO / *CALCULATION SHEET*	-
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	± 0,100 %FS

SIGLA / TAG.
50-TT-002
NUM SERIE / SERIAL NUM
SE240659

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*
CAM09 - CLIMATIC CHAMBER
CAM04 - CLIMATIC CHAMBER
TER01 - DIGITAL THERMOMETER
PAN22 - CURRENT & VOLTAGE INDICATOR
-
-

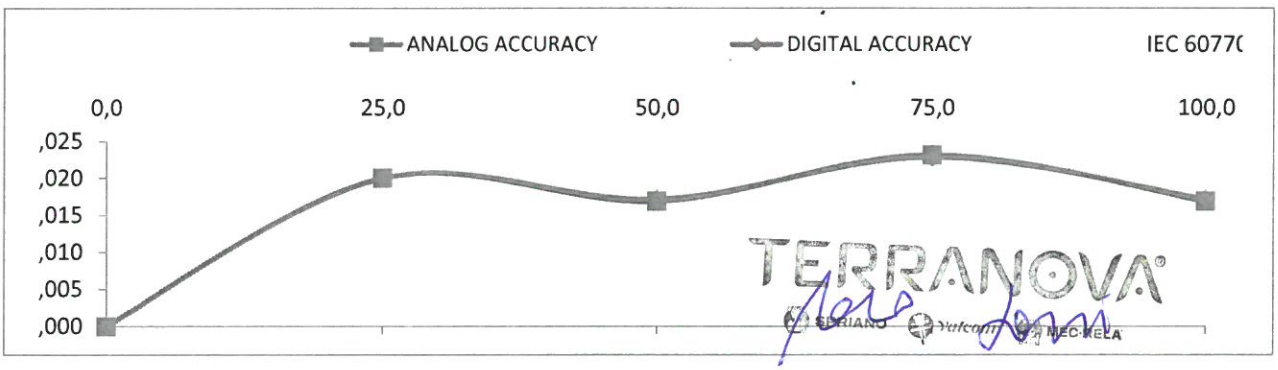
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TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*	-100	-	350	°C
CAMPO TARATURA / *CALIBRATION RANGE*	0	-	80	°C
USCITA / *OUTPUT*	4	-	20	mA

NOTE SPECIALI / *FURTHER NOTES*
SW:REV.12

STEP [%]	NOMINAL VALUE °C	GENERATED VALUE °C	MEASURED VALUE °C	NOMINAL OUTPUT mA	MEASURED OUTPUT mA	DIGITAL* ACCURACY % FS	ANALOG** ACCURACY % FS
0,0	0,000	0,000	0,000	4,00	4,000	0,000	0,000
25,0	20,000	20,000	20,070	8,00	8,003	0,020	0,020
50,0	40,000	40,000	40,060	12,00	12,003	0,017	0,017
75,0	60,000	60,000	60,080	16,00	16,004	0,023	0,023
100,0	80,000	80,000	80,060	20,00	20,003	0,017	0,017

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
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OPERATO DA *OPERATED BY*	OP9
CONTROLLATO DA CHECKED BY	RPR

DATA / *DATE*
22/07/2024

05/09/24

05/08/24

CALIBRATION CERTIFICATE for KRG RADAR LEVEL TRANSMITTER

TERRANOVA® SPRIANO Yatcom MEC-RELA

05/08/24

05/08/24

TERRANOVA® Srl - www.terranova-instruments.com
Factory & Sales: Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
Head Office: Via Rosso Medardo 16 – 20159 Milano – Italy
Phone: +39 0377 919119 – Fax: +39 0377 855720 - VAT IT07848810151

TOKYO KEIKI

CALIBRATION REPORT No. 715-2024

Factory Number:	451-4317
Customer:	TERRANOVA S.r.l.
Purchaser P.O.:	10489/OF
Date of execution:	05/07/2024

GENERAL DATA:

TAG No.	55-LIT-001
S/N	105429
Purchaser S/N	VE241368
Model	KRG-10-AD03PV-AA
Type	3" PTFE sealing antenna
Measuring Range [m]	0 ÷ 5,00
Calibration Range [m]	0 ÷ 4,66
Accuracy [%]	0,25 (of Measuring Range)
Output	4 ÷ 20 mA + HART®

CALIBRATION DATA:

Ambient Conditions:

Temperature	26 °C
Humidity	53%
Pressure	971,7 hPa

Detected Data:

Percent [%]	Distance [m]	Measured Distance [m]	Nominal Output [mA]	Measured Output [mA]	Distance Accuracy [mA]	Output Current Accuracy [mA]	Result
20% M.R.	1,000	1,001	7,200	7,203	0,020	0,019	☑ SATISFACTORY
50% M.R.	2,500	2,502	12,000	12,006	0,040	0,038	☑ SATISFACTORY
80% M.R.	4,000	4,002	16,800	12,006	0,040	0,038	☑ SATISFACTORY

WE HEREBY DECLARE THIS PRODUCT IS ACCORDING TO ORDER SPECIFICATIONS, AND THAT TESTS WERE CARRIED OUT WITH POSITIVE RESULTS.

TERRANOVA

G. Luca Verbizzoli
05/08/24

Robb x CROSSWIND
05/08/24

TOKYO KEIKI INC.

2-16-46, Minami-Kamata, Ohta-ku, Tokyo 144-8551, Japan
Tel: +81-3-3737-8664 Fax: +81-3-3737-8665

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

INSPECTION AND TEST PLAN

Document Number: 1724000979-QC-ITP-00002

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
ROSETTI MARINO SpA	06/08/2024

Document Class: 2

02	11/07/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	13/06/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	27/05/2024	Issue for Review (IFR)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

TERRANOVA
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SPRIANO Valcom MEC-RELA

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)
02	Accepted for Construction (AFC)

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No.	Description
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2	
3	
4	

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INDEX:

Page No.	Description
4	Scope of supply, list of items
5	Definition of purchaser and company involvement of supply
6 / 7	Inspection activities table

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SCOPE OF SUPPLY

This Inspection and Test Plan covers all activities that will be carried out in design and fabrication of SST77B Differential Pressure Transmitters, SST76 Pressure Transmitters, SST72 Temperature Transmitters and KRG Radar Level Transmitter

The inspection and test will be carried in accordance with Project Documents.

All inspection and witness test will be performed according priory to Project and TERRANOVA internal quality procedures, codes and standards criteria. TERRANOVA will furnish the whole documentation concerning verifications, checks and tests above mentioned and others if needed in various sets, in the numbers and in the language required as per Purchase Order.

LIST of ITEMS:

SST77B DIFFERENTIAL PRESSURE TRANSMITTERS:

43-LT-001
43-LT-003

SST76 PRESSURE TRANSMITTERS – process connection THREADED:

25-PT-001	25-PT-006	25-PT-009	25-PT-012	43-PT-001	64-PT-031A
25-PT-002	25-PT-037	25-PT-043	25-PT-049	50-PT-014	64-PT-031B
25-PT-004	25-PT-008	25-PT-011	25-PT-055A	63-PT-003	64-PT-002
25-PT-035	25-PT-040	25-PT-046	25-PT-055B	63-PT-004	80-PT-002

SST72 TEMPERATURE TRANSMITTERS with THERMOWELL:

50-TT-001 / 50-TE-001 / 50-TW-001
50-TT-002 / 50-TE-002 / 50-TW-002

SST76 PRESSURE TRANSMITTERS – process connection FLANGED:

50-PT-001
50-PT-002

KRG RADAR LEVEL TRANSMITTER

55-LIT-001

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DEFINITION OF PURCHASER AND COMPANY INVOLVEMENT OF SUPPLY

The nature of PURCHASER and company involvement is indicated against each activity of fabrication and testing by means of the letters H, W, SW, R and A with the following definitions:

H: HOLD POINT

The VENDOR cannot carry out the specified controls and tests without PURCHASER/COMPANY attendance and witnessing. The VENDOR must notify PURCHASER via inspection notification (as per inspection Notification template which will be submitted afterwards) of the dedicated inspection activity at least 14 Calendar days in advance. The VENDOR cannot deviate from this rule unless written approval has been by PURCHASER.

W: WITNESS

The VENDOR must notify PURCHASER of the dedicated inspection activity at least 14 days in advance but PURCHASER/COMPANY witnessing is not mandatory. If PURCHASER does not elect to be present, the VENDOR may proceed with his own inspection provided controls and test records are made available to PURCHASER for review.

SW: SPOT WITNESS

Spot Witness denotes to random attendance of inspector without any invitation of the VENDOR and without advance notification by the PURCHASER to the VENDOR.

R: REVIEW – Review of Documents

The VENDOR has either to submit to PURCHASER for review and comments the documents required prior to the performance of the dedicated activity or to transmit or make available for the review of PURCHASER the result of the controls and tests conducted, as the case may be.

LEGEND:

- VENDOR: Terranova®
- CONTRACTOR: Rosetti Marino
- COMPANY: Crosswind

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No.	Description of Inspection/Test	Applicable Specification or Procedure	Verifying Format	Participation by		
				VENDOR (TERRANOVA)	CONTRACTOR (ROSETTI MARINO)	COMPANY (CROSSWIND)
1	Material Certificates Check	EN 10204 standard, 3.1 type	Material 3.1 Certificates	H 05/08/24	R 05/08/2024	R 05/08/24
2	Calibration Check	IEC 60770 standard	Calibration Certificates	H 05/08/24	R 05/08/2024	R 05/08/24
3	Visual Inspection	1724000979-IN-DA-00003	1724000979-IN-DA-00003	H 05/08/24	W 05/08/2024	W 05/08/24
4	Visual check of TAG plate	1724000979-IN-DA-00003	1724000979-IN-DA-00003	H 05/08/24	W 05/08/2024	W 05/08/24
5	Check of quantities	1724000979-IN-DA-00003	1724000979-IN-DA-00003	H 05/08/24	W 05/08/2024	W 05/08/24
6	Dimensional Check	RSM-SPR-4718-DWG-001	RSM-SPR-4718-DWG-001	H 05/08/24	SW (*) 05/08/2024	SW (*) 05/08/24
7	Functional and calibration test	1724000979-QC-PRO-00005	Calibration Certificates	H 05/08/24	W 05/08/2024	W 05/08/24
8	Insulation Test	1724000979-QC-PRO-00005	Test Report	H 05/08/24	SW (*) 05/08/2024	SW (*) 05/08/24
9	Welding Book Review	WPS & PQR (for thermowells)	WPS & PQR (for thermowells)	H 05/08/24	R 05/08/2024	R 05/08/24

TERRANOVA
SPRIANO Vulcami MEC-RELA

G. Luca Tergazzoli
W R
Inspector

CROSSWIND
W/R

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File: 1724000979-QC-ITP-00002_02.pdf

No.	Description of Inspection/Test	Applicable Specification or Procedure	Verifying Format	Participation by		
				VENDOR (TERRANOVA)	CONTRACTOR (ROSETTI MARINO)	COMPANY (CROSSWIND)
10	Visual Check of Spare Parts	-	Unpriced P.O.	H 05/08/24	W 05/08/2024	W 05/08/24
11	ATEX Certificate Review	Directive 2014/34/EU	ATEX Certificate	H 05/08/24	R 05/08/2024	R 05/08/24
12	IP66 Grade	EN 60529	IP66 Grade	H 05/08/24	R 05/08/2024	R 05/08/24
13	Dye Penetrants Test Certificate	IPP-LIQ-001	Dye Penetrants Test Certificate	H 05/08/24	R 05/08/2024	R 05/08/24
14	Packing and Shipping	Packing List	Packing List	H 05/08/24	R 05/08/2024	R 05/08/24
15	IRN	-	-	R	H	R
16	Final documentation	1724000979-MD-LIS-00001	Certificates	H 05/08/24	R 05/08/24	R 05/08/24

(*): step 6 (dimensional check) and 8 (insulation test) will be executed on one item for instrument type.

W Inspector R G. Luca Meggiolaro

TERRANOVA SPRIANO Yalcom MEC-RELA

x CROSSWIND W/R

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File: 1724000979-QC-ITP-00002_02.pdf

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

FACTORY ACCEPTANCE TEST PROCEDURE

Document Number: 1724000979-QC-PRO-00005

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

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Sign	Date
V. Barratta	13-12-2024

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
04	05/12/2024	Accepted for Construction (AFC)	MZ	GA	GO
03	24/09/2024	Accepted for Construction (AFC)	MZ	GA	GO
02	29/07/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	11/07/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	07/06/2024	Issue for Review (IFR)	MZ	GA	GO

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2	
3	
4	

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4	Section 1 - Calibration Procedure for SST76 and SST77B
8	Section 2 – Calibration Procedure for SST72
10	Section 3 – Hydrotest Procedure for SST76 and SST77B
13	Section 4 – Hydrotest Procedure for TWE
15	Section 5 – Electrical Insulation Test Procedure
17	Section 6 - Functional Test Procedure for KRG Radar Level Transmitter
21	Attachment #1 – Sample of Calibration Certificate (RCS Model)
23	Attachment #2 – Sample of Material 3.1 & Hydrotest Certificate (MAT Model)

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CALIBRATION PROCEDURE for SST76 and SST77B

IOP-SXX-TAR-002

SCOPE:	Present procedure defines all the tests that have to be carried out on following electronic instruments: SST76 – Pressure transmitters SST77B – Differential pressure transmitters
OPERETING MODES:	**PURPOSE** This procedure has to be applied on all instruments in the final phase of the production (testing) **TEST EQUIPMENT** • Pressure generator • Regulated power supply with current indicator • Multi-meter All test equipment must have a Nominal Range at least 20% upper than the instrument **OPERATION SEQUENCE for SST76** • Select the direct (4÷20 mA) or reverse (20÷4 mA) current mode. • Connect the instrument to the pressure inlet on the test bench. • Execute the measurements starting from the lower value indicated on the instrument TAG plate in order to test the 0%, 25%, 50%, 75% and 100% of the nominal range both in the ascending and descending way. • Verify on the multi-meter that the current values are within the tolerances indicated on the production sheet. • Verify on the display that the percentage values are within the tolerances indicated on the production sheet. • Set the desired display calibration (internal to Nominal Range). **Transmitters final display calibration** • Select the desired display measuring unit. **Switches final display calibration** • Select the desired set point by increasing or decreasing the default value. **OPERATION SEQUENCE for SST77B** **Check the effect of the unilateral pressure** • Connect the instrument pressure inlets (**+** and **-**) to the supply inlets of the test bench. • Set on the bench the unilateral pressure value to apply on the instrument.

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This value depends by the instrument calibration range:

Up to 50 mbar → 50 bar
Over 50 mbar → 100 bar (On request 200 bar)

- Open the instrument interception valve on the **+** side.
- Close the instrument interception valve on the **+** side and open the vent valve on the same side.
- Open the instrument interception valve on the **-** side.
- Close the instrument interception valve (**-** side) and open the vent valve on the same side.
- Bring back to zero the pressure and verify the correct working of the instrument by setting a pressure value on the test instrument and verifying the correspondence between the set one and the read one. In these conditions no progressive variations are admitted on the instrument.

Test Of The Static Pressure Influence

- Connect the instrument pressure inlets (**+** and **-**) to the supply inlets of the test bench.
- Increase the pressure in both sides (**+** and **-**) with interception valves opened and vent valves closed until the following values are reached:

  Up to 50 mbar → 50 bar
  Over 50 mbar → 100 bar
- Bring back to zero the pressure and verify the correct working of the instrument by setting a pressure value on the test instrument and verifying the correspondence between the set one and the read one. In these conditions no progressive variations are admitted on the instrument.

Instrument calibration check

- Select the direct (4÷20 mA) or reverse (20÷4 mA) current mode.
- Connect the transmitter + side to the pressure inlet on the test bench and let the – side to be at ATM pressure.
- Execute the measurements starting from the lower value indicated on the instrument TAG plate in order to test the 0%, 25%, 50%, 75% and 100% of the nominal range.
- Verify on the Multi-meter that the current values are within the tolerances indicated on the production sheet.
- Verify on the Display that the percentage values are within the tolerances indicated on the production sheet.
- Set the desired display calibration (internal to Nominal Range).

  Transmitters final display calibration
  - Select the desired display measuring unit.

  Switches final display calibration
  - Select the desired set point by increasing or decreasing the default value.

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	Zero stability check for low range instruments • Electronic differential pressure transmitters have to maintain zero stability when unilateral or static pressure is applied. • Stability directly depends by the oil quantity introduced in the instrument. • Following checks have to be performed once the zero and span calibration has been done and before the thermal calibration. • Please note that: **Low range instruments → Accuracy <** ±0.5% **Medium range instruments → Accuracy <** ±0.2% • Instrument must be in standard conditions. • Apply a 10 bar pressure on the **+** side for 30 seconds then release it. • Wait 60 seconds then verify that the zero accuracy. • Apply a 10 bar pressure on the **-** side for 30 seconds then release it. • Wait 60 seconds then verify that the zero accuracy. • Apply a 10 bar pressure on both sides then release it. • Verify that the zero accuracy is within the related values. • If the zero error is >±0.5% / ±0.2% then the instrument must be rejected. • On rejected instruments must be operated a diaphragm control in order to exclude defects or damages and a new oil charge must be executed. **ACCEPTANCE CRITERIA** • The test result is POSITIVE if, for all the five ascending and descending tested points, the accuracy is within the value indicated on the working sheet. The test result is NEGATIVE if, at least one accuracy doesn't comply with the required one.
REFERENCES:	This instruction has been drawn up in accordance with the ISO 9001 quality system.
FORMS:	-

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CALIBRATION PROCEDURE for SST72

IOP-SX2-TAR-002

SCOPE:	Present procedure defines all the tests that have to be carried out on following temperature gauges: SST72 – Smart Temperature Transmitter Exd
OPERATING MODES:	**1 PURPOSE** This procedure has to be applied on all transmitters in the final phase of the production (testing) **2 TEST EQUIPMENT** • Reference Class A temperature transmitter • Temperature generator (Bath or Climatic chamber) **3 OPERATIONS SEQUENCE** • Prepare the temperature generator at a required temperature value, and let it stabilize. • Put the gauge and the Class A instrument into the temperature generator for at least 5 minutes to achieve the required temperature and execute the measurements starting from the lower value indicated on the instrument TAG plate in order to test the 0%, 25%, 50%, 75% and 100% of the nominal range both in ascending and descending way. • Remove the instrument from the bath and wait for at least 5 minutes to achieve room temperature. • Instruments over going the required specification limits of accuracy, shall be send back to production facility for re-check and re-calibration. • Instrument showing results within the required specification limits of accuracy shall be cleaned and send to final inspection and packing. **4 ACCEPTATION CRITERIA** • The test result is POSITIVE if, for all the five ascending and descending tested points, the accuracy is within the gauge class. • The test result is NEGATIVE if, at least one accuracy doesn't comply with the required one.
REFERENCES:	This instruction has been drawn up in accordance with the ISO 9001 quality system.
FORMS:	-

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23-04	03/04/23	SUBMISSION	RPR	DIR

HYDROTEST PROCEDURE for SST76 and SST77B

IOP-SSX-PRE-002

SCOPE:	Present procedure defines the Hydrotest method that have to be carried out on following electronic instruments: SST76 – Pressure transmitters SST77B – Differential pressure transmitters
OPERATING MODES:	**PURPOSE** This procedure has to be applied on all instruments in the final phase of the production phase only if it is required by customer. **TEST EQUIPMENT** • Pressure generator • Regulated power supply with current indicator • Multi-meter All test equipment must have a Nominal Range at least 20% upper than the instrument **OPERATION SEQUENCE for SST76** • Select the direct (4÷20 mA) or reverse (20÷4 mA) current mode. • Connect the instrument to the pressure inlet on the test bench. • Apply a test pressure equal to Pt=1.43*Ps where Ps is the Maximum Working Pressure. Please note that Ps is the minimum value of maximum working pressure choosing between the sensor and the process connection rating. • Maintain the applied pressure for 10 s. • Verify there is not any leakage. • Verify that the current output is forced to 3.85 or 20.8 mA and the display shows the ALARM mode. • Bring back to zero the pressure and verify the correct working of the instrument by setting a pressure value on the test instrument and verifying the correspondence between the set one and the read one. In these conditions no progressive variations are admitted on the instrument. **OPERATION SEQUENCE for SS77B** o **Check the effect of the unilateral pressure** • Connect the instrument pressure inlets (**+** and **-**) to the supply inlets of the test bench. • Set on the bench the unilateral pressure value to apply on the instrument. This value depends by the instrument calibration range: **Up to 50 mbar → 50 bar** **Over 50 mbar → 100 bar (On request 200 bar)** • Open the instrument interception valve on the **+** side. • Close the instrument interception valve on the **+** side and open the vent valve on the same side. • Open the instrument interception valve on the **-** side. • Close the instrument interception valve (**-** side) and open the vent valve on the same side. • Bring back to zero the pressure and verify the correct working of the instrument by setting a pressure value on the test instrument and verifying the correspondence between the set one and the read one. In these conditions no progressive variations are admitted on the instrument.

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	o **Test Of The Static Pressure Influence** • Connect the instrument pressure inlets (**+** and **-**) to the supply inlets of the test bench. • Increase the pressure in both sides (**+** and **-**) with interception valves opened and vent valves closed until the following values are reached: **Up to 50 mbar → 50 bar** **Over 50 mbar → 100 bar** • Bring back to zero the pressure and verify the correct working of the instrument by setting a pressure value on the test instrument and verifying the correspondence between the set one and the read one. In these conditions no progressive variations are admitted on the instrument. **ACCEPTANCE CRITERIA** • The test result is POSITIVE if there is correspondence between the generated pressure value and the read one. • The test result is NEGATIVE if there is leakage from the process connection or if there is not correspondence between the generated pressure value and the read one.
REFERENCES:	This instruction has been drawn up in accordance with the ISO 9001 quality system.
FORMS:	-

TAG REFERENCE TABLE:

#	MODEL	TAG	Test Pressure	Test Time	Test Temperature	Acceptance Criteria
1	SST77B	43-LT-001	143 bar	10 s	Ambient (25 °C)	No leakage
2	SST77B	43-LT-003	143 bar	10 s	Ambient (25 °C)	No leakage
3	SST76 (threaded)	25-PT-001	143 bar	10 s	Ambient (25 °C)	No leakage
4	SST76 (threaded)	25-PT-002	143 bar	10 s	Ambient (25 °C)	No leakage
5	SST76 (threaded)	25-PT-004	143 bar	10 s	Ambient (25 °C)	No leakage
6	SST76 (threaded)	25-PT-035	143 bar	10 s	Ambient (25 °C)	No leakage
7	SST76 (threaded)	25-PT-006	143 bar	10 s	Ambient (25 °C)	No leakage
8	SST76 (threaded)	25-PT-037	143 bar	10 s	Ambient (25 °C)	No leakage
9	SST76 (threaded)	25-PT-008	143 bar	10 s	Ambient (25 °C)	No leakage
10	SST76 (threaded)	25-PT-040	143 bar	10 s	Ambient (25 °C)	No leakage
11	SST76 (threaded)	25-PT-009	143 bar	10 s	Ambient (25 °C)	No leakage
12	SST76 (threaded)	25-PT-043	143 bar	10 s	Ambient (25 °C)	No leakage
13	SST76 (threaded)	25-PT-011	143 bar	10 s	Ambient (25 °C)	No leakage
14	SST76 (threaded)	25-PT-046	143 bar	10 s	Ambient (25 °C)	No leakage
15	SST76 (threaded)	25-PT-012	143 bar	10 s	Ambient (25 °C)	No leakage
16	SST76 (threaded)	25-PT-049	143 bar	10 s	Ambient (25 °C)	No leakage
17	SST76 (threaded)	25-PT-055A	42,9 bar	10 s	Ambient (25 °C)	No leakage
18	SST76 (threaded)	25-PT-055B	42,9 bar	10 s	Ambient (25 °C)	No leakage
19	SST76 (threaded)	43-PT-001	7,15 bar	10 s	Ambient (25 °C)	No leakage
20	SST76 (threaded)	50-PT-014	42,9 bar	10 s	Ambient (25 °C)	No leakage
21	SST76 (threaded)	63-PT-003	42,9 bar	10 s	Ambient (25 °C)	No leakage
22	SST76 (threaded)	63-PT-004	42,9 bar	10 s	Ambient (25 °C)	No leakage
23	SST76 (threaded)	64-PT-031A	42,9 bar	10 s	Ambient (25 °C)	No leakage
24	SST76 (threaded)	64-PT-031B	42,9 bar	10 s	Ambient (25 °C)	No leakage
25	SST76 (threaded)	64-PT-002	42,9 bar	10 s	Ambient (25 °C)	No leakage
26	SST76 (threaded)	80-PT-002	42,9 bar	10 s	Ambient (25 °C)	No leakage
27	SST76 (flanged)	50-PT-001	28,6 bar	10 s	Ambient (25 °C)	No leakage
28	SST76 (flanged)	50-PT-002	28,6 bar	10 s	Ambient (25 °C)	No leakage

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HYDROTEST PROCEDURE for TWE

IOP-TWE-PRE-001

SCOPE:	Present procedure defines the Hydrotest method that have to be carried out on following accessories: **TWE** – Flanged Thermowells
OPERATING MODES:	**PURPOSE** This procedure has to be applied on all flanged thermowells in the final phase of the production phase. **TEST EQUIPMENT** • Pressure generator • Reference gauge All test equipment must have a Nominal Range at least 20% upper than the instrument **TEST CONDITIONS (FOLLOWING ASME B16.5)** • Hydrotesting must be done at ambient temperature. • The test fluid must be demineralized water or water containing a corrosion inhibitor. • Other suitable test fluids may be used provided their viscosity is no greater than that of water. • The test fluid temperature shall not exceed 50°C. • The test duration shall be as follows: o ND≤2" → Duration must not exceed 60 s o 2.5"≤ND≤8" → Duration must not exceed 120 s o ND≥10 → Duration must not exceed 180 s **OPERATION SEQUENCE for FLANGED THERMOWELLS** • Hydrotesting of TWE will be executed following **ASME B16.5**. • Connect the thermowell to the flange on the test bench. • Apply a test pressure equal to Pt=1.5*Ps where Ps is the Maximum Working Pressure. Please note that Ps is the flange rating. • Verify the applied pressure on the test gauge. • Maintain the applied pressure for 60, 120 or 180 s depending by the flange Nominal Diameter. • Verify there is not any leakage during the test. • Bring back to zero the pressure and disconnect the thermowell from the test bench. • Bring back to zero the pressure and disconnect the thermowell from the test bench. **ACCEPTANCE CRITERIA** • The test result is POSITIVE if there is not any leakage from the thermowell walls. • The test result is NEGATIVE if there is leakage from the thermowell walls.
REFERENCES:	This OI has been written following **ISO 9001:2015** and **ASME B16.5**

TAG REFERENCE TABLE:

#	MODEL	TAG	Test Pressure	Test Time	Test Temperature	Acceptance Criteria
1	SST72 with TWE	50-TT-001	28,6 bar	10 s	Ambient (25 °C)	No leakage
2	SST72 with TWE	50-TT-002	28,6 bar	10 s	Ambient (25 °C)	No leakage

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ELECTRICAL INSULATION TEST PROCEDURE for TRANSMITTERS

TERRANOVA® Srl - www.terranova-instruments.com
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IPP-ISO-002

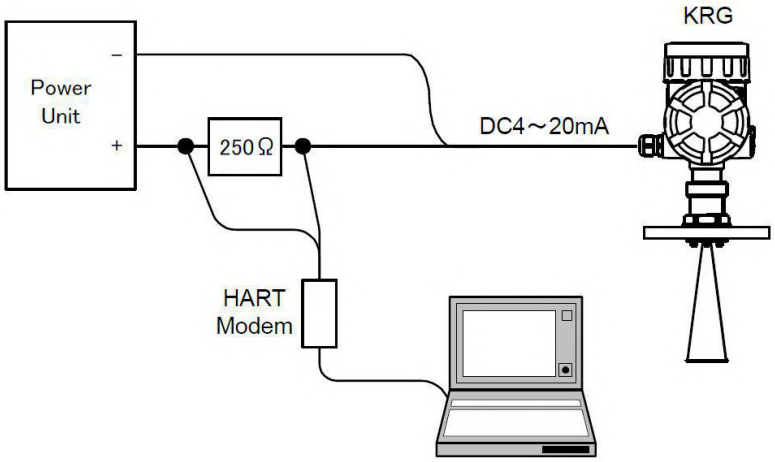
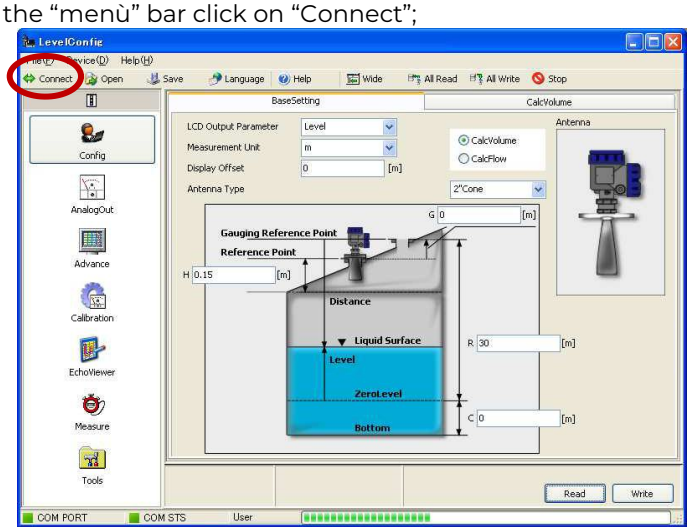
SCOPE:	ELECTRICAL INSULATION TEST
OPERATING MODE:	1. Insulation test must be done between power supply and signal wires, and the instrument ground. Electrical conductors can be tested at the same time, if the result is successful then the insulation is guaranteed, if the result is unsuccessful conductors must be tested separately in order to find the one with low insulation and evaluate a solution to the problem found. 2. With positive result we mean an insulation greater than **20 Mohm** between the positive and the negative. If the insulation is lower, then the test result is negative. 3. The voltage test value is **500 Vdc**. All the instruments must resist at that voltage. Always verify further information regarding the insulation measurement (especially control plans for ATEX instruments). 4. Insulation test must be done according to production sheet operations, typically in the first step of assembly (ISOL1) and in the last step before the shipping (ISOL2). NB. FOR INSULATION-METER **MEGGER MIT310** THE FIRST ELECTRICAL SHOCK MUST BE DONE IN AIR SINCE THE TRANSITORY VOLTAGE IS NOT COMPLIANT DUE TO WRONG VOLTAGE VALUE EQUAL TO 250% OF THE SETTED ONE. THE CORRECT VOLTAGE VALUE IS ACHIEVED AFTER 250 MS.
REFERENCES:	This instruction has been prepared following ISO 9001 quality system.
DOCUMENTS:	-

REV	DATE	DESCRIPTION	WRI	APP
17-01	31/01/17	SUBMISSION	RPR	DIR

FUNCTIONAL TEST PROCEDURE for KRG RADAR LEVEL TRANSMITTER

TERRANOVA® Srl - www.terranova-instruments.com
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IOP-KRG-FUN-001

SCOPE:	FUNCTIONAL TEST for KRG SERIES
OPERATING MODE:	CONNECTION to PC and VERIFICATION OF PARAMETERS 1) Connect the KRG to the PC by the HART® protocol, following the below connection diagram:  2) Open the “LevelConfig” software; 3) On the “menù” bar click on “Connect”;  4) Select the protocol “HART”, the port, the device number and the preamble, so click on “Connect”:

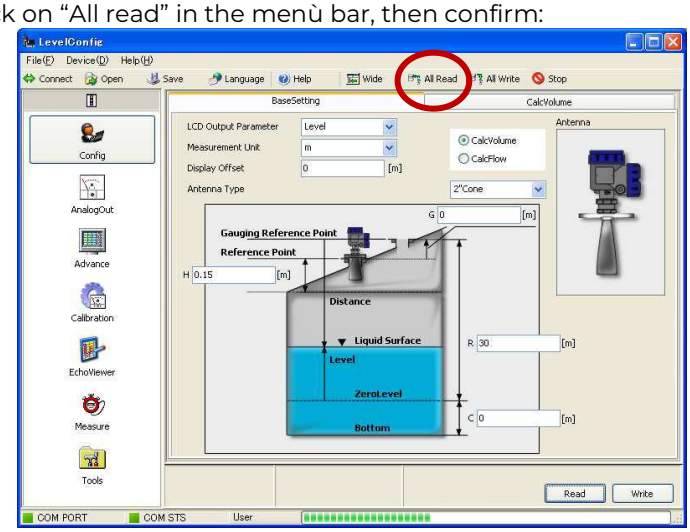
REV	DATE	DESCRIPTION	WRI	APP
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5) If the connection succeeded, the following message will appear:



6) In order to read and verify all the parameters saved in the instrument, click on “All read” in the menù bar, then confirm:

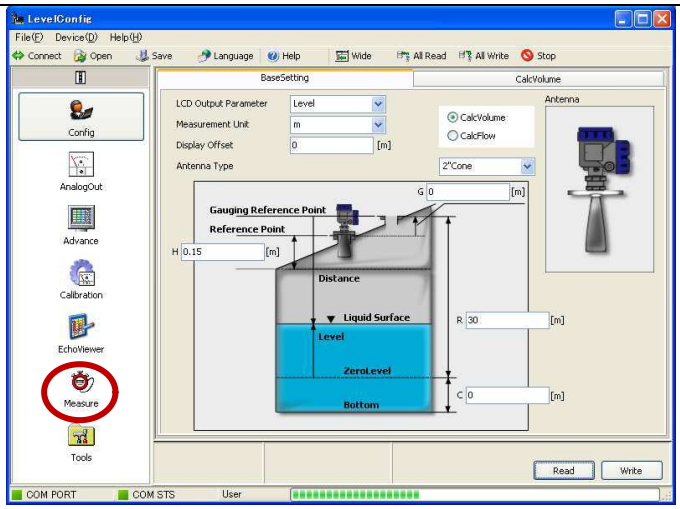


7) Verify the inserted parameters and that the calibration range is equal to what requested.

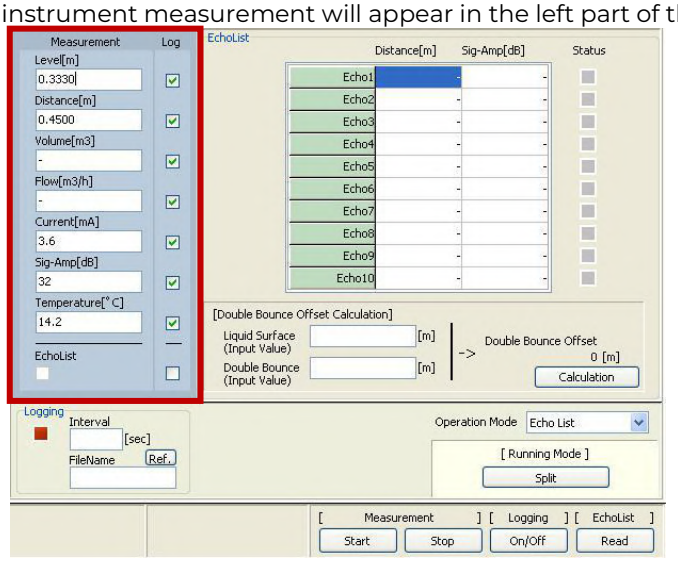
EXECUTION of FUNCTIONAL TEST and VERIFICATION OF ACCURACY:

1) Put an obstacle (ex. table, sheet) at a note distance from the KRG sensor inside the instrument range;
2) Compare the KRG reading with the obstacle distance and verify that the measurement is inside the accuracy;
3) Distance measurement can also be checked and recorded on the software in the “Measurement” menù:

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The instrument measurement will appear in the left part of the screen:



By clicking “Start”, the measurement will start to be recorded. The desired units to be recorded can be selected by flagging the buttons in “Log” column. To end the measurement, click on “Stop”. To export the data in a file, refer to the operating manual.

4) If the measurement is within the accuracy, disconnect the instrument and the check can be considered finished.
If the measurement is outside the accuracy, check the correctness of inserted parameters in “Config” menù (refer to the KRG Operating Manual), then do the test another time.

REFERENCES:	This instruction has been written according the ISO 9001 quality system.
DOCUMENTS:	-

TAG REFERENCE TABLE:

#	MODEL	TAG	Test Pressure	Test Time	Test Temperature	Acceptance Criteria
1	KRG	55-LIT-001	28,6 bar	10 s	Ambient (25 °C)	No leakage

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SAMPLE OF CALIBRATION CERTIFICATE (RCS MODEL)

SPRIANO® TECHNOLOGIES	RAPPORTO DI CALIBRAZIONE / *CALIBRATION REPORT*	**MOD RCS**
		REV 17:11

TIPO STRUMENTO / *TYPE OF INSTRUMENT*	
PROCEDURA DI CALIBRAZIONE / *CALIBRATING PROCEDURE*	
FOGLIO DI CALCOLO / *CALCULATION SHEET*	
ACCURATEZZA TOTALE / *TOTAL ACCURACY*	

SIGLA / TAG.
NUM SERIE / SERIAL NUM

STRUMENTI DI CALIBRAZIONE / *INSTRUMENTS FOR CALIBRATION*	-
	-
	-
	-
	-
	-

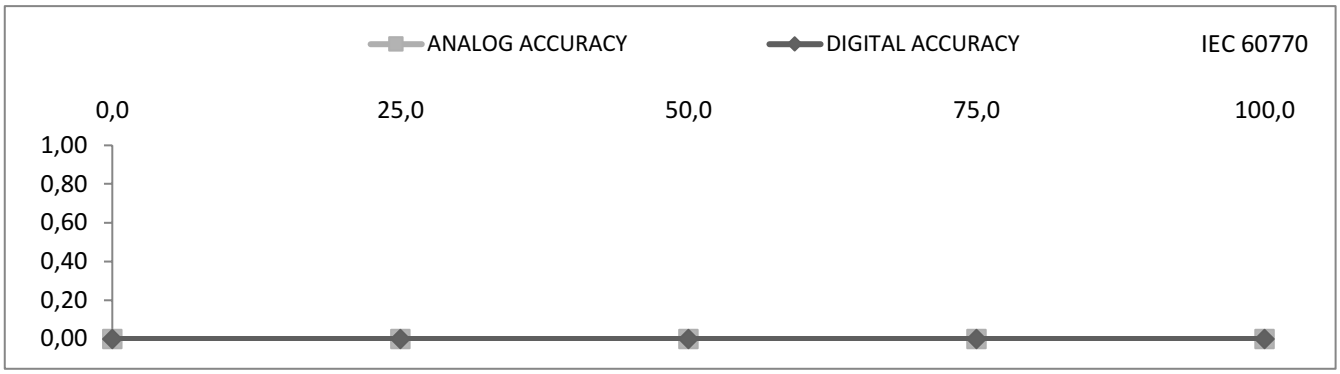
CE

TEMPERATURA / *AMBIENT TEMPERATURE*	15 - 25	°C		
PRESSIONE / *BAROMETRIC PRESSURE*	860 - 1060	mbar		
UMIDITA' RELATIVA / *RELATIVE HUMIDITY*	45 - 75	%		
CAMPO MASSIMO / *MAXIMUM RANGE*		-		°C
CAMPO TARATURA / *CALIBRATION RANGE*		-		°C
USCITA / *OUTPUT*		-		mA

NOTE SPECIALI / *FURTHER NOTES*
-

STEP	NOMINAL VALUE	GENERATED VALUE	MEASURED VALUE	NOMINAL OUTPUT	MEASURED OUTPUT	DIGITAL* ACCURACY	ANALOG** ACCURACY
[%]	°C	°C	°C	mA	mA	% FS	% FS
0,0	0,000			0,00		0,000	ND
25,0	0,000			0,00		ND	ND
50,0	0,000			0,00		ND	ND
75,0	0,000			0,00		ND	ND
100,0	0,000			0,00		ND	ND

DIGITAL ACCURACY = 100(MEASURED VALUE - GENERATED VALUE) / MAXIMUM RANGE
**ANALOG ACCURACY = 100*(MEASURED OUTPUT - NOMINAL OUTPUT) / ANALOG FULL SCALE



SI DICHIARA CHE QUESTO PRODOTTO E' CONFORME ALLE SPECIFICHE D'ORDINE E CHE IL COLLAUDO HA DATO ESITO POSITIVO. IL PRODOTTO E' STATO COSTRUITO IN ACCORDO AL SISTEMA DI QUALITA' EN ISO 9001
WE HEREBY DECLARE THIS PRODUCT IS ACCORDING TO ORDER SPECIFICATIONS AND THAT TESTS WERE CARRIED OUT WITH POSITIVE RESULTS. THIS PRODUCT HAS BEEN MANUFACTURED ACCORDING TO QUALITY SYSTEM EN ISO 9001

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spriano@terranova-instruments.com

OPERATO DA *OPERATED BY*	
CONTROLLATO DA CHECKED BY	

DATA / *DATE*

SAMPLE OF MATERIAL 3.1 & HYDROTEST CERTIFICATE (MAT MODEL)

SPRIANO® TECHNOLOGIES	RAPPORTO DI COLLAUDO E MATERIALI / *TEST AND MATERIAL REPORT*	**MOD MAT** REV 18:03

TIPO STRUMENTO/TYPE OF INSTRUMENT			
TIPO DI ATTACCO/PROCESS CONNECTION			
DIMENSIONALE NOMINALE/NOMINAL SIZE			mm
PRESSIONE DI LAVORO/WORKING PRESSURE			bar
ESTENSIONE ALETTATA/FINNED EXTENSION			
TEST IDROSTATICO/ HYDRO TEST PROCEDURE			
NOTE/NOTES			

TAG
SERIAL NUMBER

	APP	*PRESSURE [bar]*	*PERIOD [sec]*	*RESULT*
HYDROSTATIC FLUID PRESSURE TEST 1:				
CALIBRATION INSTRUMENT				

CERTIFICATI DEI MATERIALI / *MATERIAL CERTIFICATES*

POS	DESCRIPTION	DIMENSIONS	HEAT	CERTIFICATE	MATERIAL

DESCRIZIONE	APP	PROCEDURE	CERTIFICATE
NACE MR0175/01 Compilance			
NACE TM0284/2011 (H.I.C.) Compilance			
Post Weld Heat Treatment (PWHT)			
Penetrant Testing On TWE Welds			
Alloy Internal Coating			
Painting Procedure Body			
Painting Procedure Finned Extension			

CONTROLLO ISPETTIVO / *QUALITY INSPECTION*

NR	TIPO DI CONTROLLO / *TYPE OF CONTROL*	ESITO / *RESULT*
1	CONTROLLO VISIVO / *VISUAL INSPECTION*	
2	CONTROLLO DIMENSIONALE / *DIMENSIONAL INSPECTION*	
3	CONTROLLO FUNZIONALE / *FUNCTIONAL INSPECTION*	

FINAL TEST 100%
NO

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OPERATO DA *OPERATED BY*	
CONTROLLATO DA CHECKED BY	

DATA / DATE

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

DYE PENETRANTS CERTIFICATES

Document Number: -

Document Class: 3

TERRANOVA
SPRIANO Valcom MEC-RELA

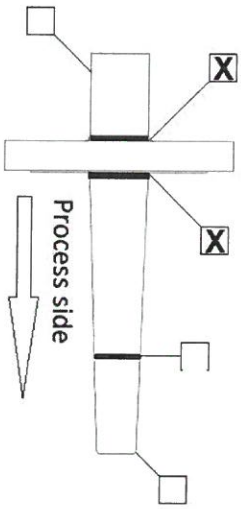
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SPRIANO Valcom MEC-RELA

DYE PENETRANT TEST REPORT
RAPPORTO DI ESAME CON LIQUIDI PENETRANTI

Customer Cliente	**ROSETTI MARINO S.p.A.**	**No.** N.	**437.24**
Order Ordine	**4718_OS**		
Date Data	**01.07.2024**	**Date** Data	**16.07.2024**
Job Commessa		**Plant** Impianto	
Item Oggetto	**Pozzetto da barra flangiato con saldatura a piena penetrazione**		
Description Descrizione	Pozzetto termometrico ricavato da barra in ASTM A182 F53/F55 esecuzione conica 28/18 mm lunghezza 220 mm sotto flangia saldata Full Penetration da 1-1/2"ANSI 150RF in ASTM A182 F53/F55, lagging Extension pozzetto 70 mm	**TAG** Tag	**50-TW-001**
		Q.ty Q.tà	**01**
Standards Specifiche		**Material** Materiale	**ASTM A182 F53/F55**

Test Products Prodotti	
Cleaner Pulitore	**SGRASSATORE BLU R2.60**
Penetrant Penetrante	**PENETRANTE ROSSO R2.71**
Solvent Solvente	**ACQUA**
Developer Rilevatore	**RILEVATORE BIANCO R2.82**
Temperature di prova Test temperature	**AMBIENTE**
Tempo di penetrazione Dwell time	**15 MIN.**
Tempo di rilevazione Survey time	**15÷20 MIN.**



DYE PENETARNT TEST RESULT Esito Esame Con Liquidi Penetranti	**SATISFACTORY**

PROCEDURA OPERATIVA	**OPERATORE**
Pulitura preliminare	Madurini Claudio
Pulitura con apposito solvente	Liv. 2 - UNI EN ISO 9712
Applicazione penetrante	Cert. No. DTC-CND-A00485-20
Attesa tempo di penetrazione	
Rimozione penetrante	
Applicazione rilevante	
Attesa tempo minimo di sviluppo	
Prima valutazione visiva	
Identificazione/valutazione eventuali difetti	

G. Luca Vergazzoli
W R
Inspector OBO RHC
05/08/24

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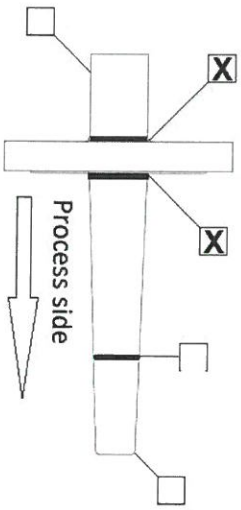
TERRANOVA®
SPRIANO Valcom MEC-RELA

DYE PENETRANT TEST REPORT

RAPPORTO DI ESAME CON LIQUIDI PENETRANTI

Customer Cliente	**ROSETTI MARINO S.p.A.**	**No.** N.	**438.24**
Order Ordine	**4718_OS**		
Date Data	**01.07.2024**	**Date** Data	**16.07.2024**
Job Commessa		**Plant** Impianto	
Item Oggetto	**Pozzetto da barra flangiato con saldatura a piena penetrazione**		
Description Descrizione	Pozzetto termometrico ricavato da barra in AISI 316 esecuzione conica 28/18 mm lunghezza 220 mm sotto flangia saldata Full Penetration da 1-1/2"ANSI 150RF in AISI 316, lagging Extension pozzetto 70 mm	**TAG** Tag	**50-TW-002** **Q.ty** Q.tà **01**
Standards Specifiche		**Material** Materiale	**AISI 316**

Test Products Prodotti	
Cleaner Pulitore	**SGRASSATORE BLU R2.60**
Penetrant Penetrante	**PENETRANTE ROSSO R2.71**
Solvent Solvente	**ACQUA**
Developer Rilevatore	**RILEVATORE BIANCO R2.82**
Temperature di prova Test temperature	**AMBIENTE**
Tempo di penetrazione Dwell time	**15 MIN.**
Tempo di rilevazione Survey time	**15÷20 MIN.**



DYE PENETARNT TEST RESULT Esito Esame Con Liquidi Penetranti	**SATISFACTORY**

PROCEDURA OPERATIVA	**OPERATORE**
Pulitura preliminare	Madurini Claudio
Pulitura con apposito solvente	Liv. 2 - UNI EN ISO 9712
Applicazione penetrante	Cert. No. DTC-CND-A00485-20
Attesa tempo di penetrazione	
Rimozione penetrante	
Applicazione rilevante	
Attesa tempo minimo di sviluppo	
Prima valutazione visiva	
Identificazione/valutazione eventuali difetti	

G. Luca Vergazzoli
W R
Inspector
05/08/24

CROSSWIND
05/08/24 R

CERTIFICATO DI LIVELLO 2
LEVEL 2 CERTIFICATE

n° DTC-CND-A00485-20

Si certifica la qualificazione per esami di Ricertificazione in Prove Non Distruttive al Livello 2

This is to certify qualification by examination for Recertification in Non Destructive Testing Level 2

di / *of*

TERRANOVA SPRIANO MEC-RELA

Claudio Madurini

Nato a / *born in: Cremona (CR)*

Il / *on: 27 Luglio 1964*

Per i seguenti metodi / *for the following methods:*

PT

(Liquidi Penetranti – Penetrant Testing)

Per i settori industriali / for the industrial sectors:

MM

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE

This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU

Antonio Fimiani
Consigliere Delegato

Data di rilascio/*issue date* : 13/10/2020 RC
Data di validità/validity from : 12/10/2020 RC
Data di scadenza/*expiry date* : 11/10/2025 RC

Certificato conforme al Regolamenti DEKRA Testing and Certification /*In compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
Regolamento per la certificazione del personale addetto PND / *Regulations for the qualification of NTD personnel*
Regolamento Generale per la Direttiva 2014/68/UE e D.Lgs n° 26 del 15/02/2016 / General Rules for DIR 2014/68 EU and LD n°26 del 15/02/2016

DEKRA Testing and Certification S.r.l.
Via Fratelli Gracchi 27 – 20092 Cinisello Balsamo (MI) – ITALY
Phone : +39 02 899.29090 / Fax +39 02 899.29200
info@dekra-certification.it *www.dekra.it*

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

PRS091C PRD198B
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

G. Luca Vergazzoli
W R
Inspector
05/08/24

x CROSSWIND
05/08/24 R

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

ATEX CERTIFICATE

Document Number: -

Document Class: 3

TERRANOVA

SPRIANO Vatcom MEC-RELA

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

ATEX CERTIFICATE for SST77B, SST76 and SST72

Technická inšpekcia, a.s.

Trnavská cesta 56, 821 01 Bratislava
Slovenská republika

[1] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System Intended for use in potentially explosive atmospheres
Directive 2014/34/EU

[3] Supplementary EU-Type Examination Certificate Number:

TI17ATEX 304 X / 1

[4] Product:

SPRIANO® Electronic transmitter series SST7X
Type: SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B and SST70-REM (Indicator)

[5] Manufacturer: **TERRANOVA S.r.l.**

[6] Address: **Via Gramsci, 1, 26827 – Terranova dei Passerini (LO), Italy**

[7] This supplementary certificate extends EU – Type Examination Certificate No. TI17ATEX 304 X to apply to products designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

[8] Technická inšpekcia, a.s., Notified Body Number 1354 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that the product, as modified by this supplementary certificate, has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

Bratislava, March 08th, 2021

Ing. Dušan Perniš
General Director

Technická inšpekcia, a.s.
Trnavská cesta 56
821 01 Bratislava, Slovakia
e-mail: tisr@tisr.sk
web: www.tisr.sk
Tel.: +421 2 49208 100

This certificate may only be reproduced in its entirety and change, schedule included.

NB 1354

[13] **Schedule**

[14] **Supplementary EU-Type Examination Certificate Number: TI17ATEX 304 X / 1**

[15] Description of the variation to the product:

The subject of this supplementary certificate is extension of product SPRIANO® Electronic transmitter series SST7X, Type: SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B and SST70-REM (Indicator), which has protection mode "Ex-db" certified by certificate TI17ATEX304X, to the protection mode "Ex-ia" certified by certificate TI17ATEX305X.
Electronic inside the Series SST7X has been used the same as the SST5X described into TI17ATEX305X certificate.
Housing materials to be used Anticorodal Aluminum or Stainless Steel according previous certificates.
New Variation to the product are:

		With Aluminum housing	
		Without safety barrier	
Ex	II 1/2 G	Ex db IIC T6 Ga/Gb	-40°C<Tamb<+60°C
		Ex db IIB T5 Ga/Gb	-40°C<Tamb<+80°C
		or	
		With safety barrier	
Ex	II 1/2 G	Ex ia IIC T6, T5, T4 Ga	-40°C<Tamb<+40°C / +55°C / +80°C
		With SS AISI 316 housing	
		Without safety barrier	
Ex	II 1/2 G	Ex db IIC T6 Ga/Gb	-40°C<Tamb<+60°C
		Ex db IIB T5 Ga/Gb	-40°C<Tamb<+80°C
		or	
		With safety barrier	
Ex	II 1 G	Ex ia IIC T6, T5, T4 Ga	-40°C<Tamb<+40°C / +55°C / +80°C

Basic description of product:

The Transmitters series electronic SST7X measure pressure, level or temperature of liquids, gases and vapors and transmit a current signal 4-20mA + HART®.
According to the process connection, the series SST7X is constituted by the following models, they can be identified by the code following the series name:

SST70	Displacer level transmitter
SST71	Float level transmitter
SST72	Temperature transmitter
SST75	Relative or absolute pressure transmitter with incorporate separating diaphragm (ceramic)
SST76	Relative or absolute pressure transmitter with incorporate separating diaphragm (piezo)
SST77B	Differential pressure transmitter
SST77BL	Pressure transmitter for level measure
SST79B	Submersible level transmitter
SST70-REM	Field digital indicator

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Model SST70: The transmitter is isolated from the process via a mechanical system to the torsion tube and also the measuring cell presents a separation membrane filled with inert fluid.
Model SST71: The transmitter is isolated from the process via a tube containing reed switches.
Model SST72: The transmitter is isolated from the process via a tube containing sensors PT100.
Models SST75, SST76, SST77B and SST77BL: The transmitter is isolated from the process by membrane separation metal filled with inert fluid.
Model SST79 (version with remote sensor): The remote transmitter is isolated from the process by separation membranes metal filled with inert fluid. It is connected to the housing means shielded cable with 5 wires soldered.
Model SST70-REM (Loop powered field digital indicator): The indicator has no element part but only it is connected via current loop for displaying the desired variable.

Product with variation of Exdb protection:

The instruments are suitable for gas group IIC or IIB depending by the Ambient Temperature and they have the type of protection "Ex db".
Temperature: -40 ° C ≤Tamb≤ + 60 ° C (or -40 ° C ≤Tamb≤ + 80 ° C)
In the case where the process temperatures are higher than the maximum ambient temperature (or below the minimum ambient temperature), the instrument is installed with a suitable finned arm that can dissipate the temperature in excess and ensure the installation inside the ambient temperature range specified by the manufacturer.
The instruments are composed of two parts:
• The housing, the same for all models, which contains the electronic board and the electrical connections.
• The sensing element contained in a body of stainless steel that allows the process connection.
The housing is constituted by the body and by two closing covers (one of which is equipped with transparent windows). The metal parts can be made in Anticorodal Aluminum or Stainless Steel AISI 304 / 316 (Thickness of coating <0.15mm) while the door is tempered-glass glued to the lid with a silicone seal.

Electrical characteristics:

Supply voltage	≤ 30 VDC
Output signal	4 ÷ 20 mA + HART®
Maximum power transferred	0,75 W
ATEX category	II 1/2 G
Protection mode	Ex db IIC T6 Ga/Gb with Tamb [- 40°C, +60°C] Ex db IIB T5 Ga/Gb with Tamb [- 40°C, +80°C]
IP Code	IP 66
The power cables must be at least 22 AWG (0.34mm2 section section - 0.64mm2), suitable for an operating temperature ≥ 90 ° C for Tamb ≥ 70 ° C.	

The marking of the product shall include the following:

⟨Ex⟩ II 1/2 G Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C

Product with variation of Exia protection:

The instruments are suitable for gas group IIC and have the type of protection "Ex i".
The instruments are composed of two parts:
• The housing, the same for all models, which contains the electronic board and the electrical connections.
• The sensing element contained in a body of stainless steel that allows the process connection.
The housing is constituted by the body and by two closing covers (one of which is equipped with transparent windows). The metal parts can be made of stainless steel or aluminum having a content Mg of less than 6% (coating thickness <0.15mm) while the door can be static plastic, 5 mm thick (glue Araldite 2021) or sodalime tempered glass, 5 mm thick (glue Araldite 2011).

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Electrical characteristics:

Parameter	Tamb<60°C	Tamb<80°C
Maximum voltage input **Ui**	30 V	25.2 V
Maximum current input **Ii**	100 mA	100 mA
Power maximum input **Pi**	0.75 W	0.62 W
Maximum capacity Internal	10 nF	10 nF
Maximum Internal Inductance	0.2 mH	0.2 mH
Output signal	4 ÷ 20 mA + HART®	
Degree of protection	IP 66 for Aluminum housing IP67 for SS AISI 316 housing	

The marking of the product shall include the following:

II 1/2G Ex ia IIC T6, T5, T4 Ga/Gb **-40°C ≤ Tamb ≤ 40°C (T6)** **-40°C ≤ Tamb ≤ 55°C (T5)** **-40°C ≤ Tamb ≤ 80°C (T4)** **For Aluminum housing**	**1G Ex ia IIC T6, T5, T4 Ga** **-40°C ≤ Tamb ≤ 40°C (T6)** **-40°C ≤ Tamb ≤ 55°C (T5)** **-40°C ≤ Tamb ≤ 80°C (T4)** **For SS AISI 316 housing**

[16] Report Number:
Inspection report No: 54/5/2021
Final Test Report No: 54/5/2021

[17] Specific Conditions of Use:

Product with variation of Exdb protection:

Ambient temperature:
Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C
In the case where the process temperatures are higher than the maximum ambient temperature (or lower than the minimum ambient temperature), the equipment is installed with a suitable spacer (example: finned arm, syphon, capillary, remote head, etc.) capable of dissipating the excess temperature and ensure the installation inside the temperature range specified by the manufacturer.

Entries for flameproof enclosure:
The accessories used for cable entry into the housing (which must be treated ½ "NPT or M20x1.5) must comply with the standards EN 60079-0 and EN 60079-1.
The entrance hole leads not used should be closed with the cap conforms to EN 60079-1.

Warning marking:
- "WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT"

Informative marking:
- "SEE INSTALLATION INSTRUCTION DOCUMENT".

Product with variation of Exia protection:

Ambient temperature:

-40°C ÷ +40°C	For Class T6
-40°C ÷ +55°C	For Class T5
-40°C ÷ +80°C	For Class T4

In the case where the process temperatures are higher than the maximum ambient temperature (or lower than the minimum ambient temperature), the equipment is installed with a suitable

spacer (example: finned arm, syphon, capillary, remote head, etc.) capable of dissipating the excess temperature and ensure the installation inside the temperature range specified by the manufacturer.

[18] Essential Health and Safety Requirements:
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.
Additional information: None.

[19] Drawings and Documents:

Number	Sheet	Issue	Date	Description
DTP-SST7X	4pgs	REV No.21.02	12/02/2021	List of drawings and Documents SPRIANO ® Electronic Switches SST7X By TERRANOVA ®
TI17ATEX305X	3 pgs	-	13/03/2017	EU –Type Examination Certificate (Exia)

Technická inšpekcia, a.s.
Trnavskácesta 56
821 01 Bratislava, Slovakia
e-mail: tisr@tisr.sk
web: www.tisr.sk
Tel.: +421 2 49208 100

TECHNICKÁ INŠPEKCIA • TI NB 1354 - 5 - • SLOVENSKÁ REPUBLIKA

Bratislava, March 08th, 2021

Ing. Dušan Perniš
General Director

TERRANOVA® SPRIANO Vulcain MEC-RELA

TECHNICKÁ INŠPEKCIA, a.s.

SLOVENSKÁ REPUBLIKA

CEOC INTERNATIONAL

[1] EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System Intended for use in potentially explosive atmospheres
Directive 2014/34/EU

[3] EU-Type Examination Certificate Number:

TI17ATEX 304 X

[4] Product:

SPRIANO® Electronic transmitter series SST7X
Type: SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B and SST70-REM (Indicator)

[5] Manufacturer: **TERRANOVA S.r.l.**

[6] Address: **Via Gramsci, 1, 26827 – Terranova dei Passerini (LO), Italy**

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] Technická inšpekcia, a.s., Notified Body Number 1354 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of product intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in confidential report No. 304/5/2017.

[9] Compliance with the Essential Health and safety Requirements has been assured by compliance with: **EN 60079-0:2012+A11:2013, EN 60079-1:2014**
except in respect of those requirements listed at item 18 of the Schedule.

[10] If the sign "X" is placed after the certificate number, it indicate that the product is subject to the Specific conditions of Use specified in the schedule to this certificate.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of this Directive apply to the manufacturing process and supply of this product.

[12] The marking of the product shall include the following:

Ex II 1/2 G Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C

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Trnavská cesta 56
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TECHNICKÁ INŠPEKCIA • TI • NB 1354 - 5 - • SLOVENSKÁ REPUBLIKA

Bratislava, March 13th, 2017

Ing. Dušan Perniš
General Director

333123

CSTA3-128

NB 1354

[13] Schedule

[14] EU-Type Examination Certificate Number: TI17ATEX 304 X

[15] Description of product:

The Transmitters series electronic SST7X measure pressure, level or temperature of liquids, gases and vapors and transmit a current signal 4-20mA.
The instruments are suitable for gas group IIC and have the type of protection "Ex db".
Temperature: -40 ° C ≤Tambs≤ + 60 ° C (or -40 ° C ≤Tambs≤ + 80 ° C)
In the case where the process temperatures are higher than the maximum ambient temperature (or below the minimum ambient temperature), the appliance is installed with a suitable spacer can dissipate the temperature in excess and ensure the installation inside the ambient temperature range specified by the manufacturer.
The instruments are composed of two parts:
• The housing, the same for all models, which contains the electronic board and the electrical connections.
• The sensing element contained in a bodice of stainless steel that allows the process connection.
The housing is constituted by the body and by two closing covers (one of which is equipped with transparent windows). The metal parts can be made in anticorodal aluminum or stainless steel AISI 304 (Thickness of coating <0.15mm) while the door is tempered-glass glued to the lid with a silicone seal.

According to the process connection, the series SST7 is formed by the following models, they can be identified by the code following the series name:

SST70	Displacer level transmitter
SST71	Float level transmitter
SST72	Temperature transmitter
SST75	Relative or absolute pressure transmitter with incorporate separating diaphragm (ceramic)
SST76	Relative or absolute pressure transmitter with incorporate separating diaphragm (piezo)
SST77B	Differential pressure transmitter
SST77BL	Pressure transmitter for level measure
SST79B	Submersible level transmitter
SST70-REM	Field digital indicator

Model SST70: The transmitter is isolated from the process via a mechanical system to the torsion tube and also the measuring cell presents a separation membrane filled with inert fluid.

Model SST71: The transmitter is isolated from the process via a tube containing reed switches.

Model SST72: The transmitter is isolated from the process via a tube containing sensors PT100.

Models SST75, SST76, SST77B and SST77BL: The transmitter is isolated from the process by membrane separation metal filled with inert fluid.

Model SST79 (version with remote sensor): The remote transmitter is isolated from the process by separation membranes metal filled with inert fluid. It is connected to the housing means shielded cable with 5 wires soldered.

Model SST70-REM (Loop powered field digital indicator): The indicator has no element part but only it is connected via current loop for displaying the desired variable.

This certificate may only be reproducedin its entirety and change, schedule included.

Electrical characteristics:

Supply voltage	≤ 30 VDC
Output signal	4 ÷ 20 mA
Maximum power transferred	0,75 W
ATEX category	1/2 G
Protection mode	Ex db IIC T6 Ga/Gb with Tamb [- 40°C, +60°C] Ex db IIB T5 Ga/Gb with Tamb [- 40°C, +80°C]
IP Code	IP 66
The power cables must be at least 22 AWG (0.34mm2 section section - 0.64mm2), suitable for an operating temperature ≥ 90 ° C for Tamb ≥ 70 ° C.	

[16] Report Number:
Inspection report No: 304/5/2017
Final Test Report No: 304/5/2017

[17] Specific Conditions of Use:

Ambient temperature:
Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C

In the case where the process temperatures are higher than the maximum ambient temperature (or lower than the minimum ambient temperature), the equipment is installed with a suitable spacer (example: finned arm, syphon, capillary, remote head, etc.) capable of dissipating the excess temperature and ensure the installation inside the temperature range specified by the manufacturer.

Entries for flameproof enclosure:
The accessories used for cable entry into the housing (which must be treated ½ "NPT) must comply with the standards EN 60079-0 and EN 60079-1.
The entrance hole leads not used should be closed with the cap conforms to EN 60079-1.

Warning marking:
- "WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT"

Informative marking:
- "SEE INSTALLATION INSTRUCTION DOCUMENT".

[18] Essential Health and Safety Requirements:
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.
Additional information: None.

[19] Drawings and Documents:

Number	Sheet	Issue	Date	Description
DTP-SST7X	3pgs	REV No.17.01	31/01/2017	List of drawings and Documents SPRIANO® Electronic Switches SST7X

Technická inšpekcia, a.s.
Trnavskácesta 56
821 01 Bratislava, Slovakia
e-mail: tisr@tisr.sk
web: www.tisr.sk
Tel.: +421 2 49208 100

TECHNICKÁ INŠPEKCIA · SLOVENSKÁ REPUBLIKA · TI NB 1354 - 5 -

Bratislava, March 13th, 2017

Ing. Dušan Perniš
General Director

ATEX CERTIFICATE for KRG

TERRANOVA® Srl - www.terranova-instruments.com
Factory & Sales: Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
Head Office: Via Rosso Medardo 16 – 20159 Milano – Italy
Phone: +39 0377 919119 – Fax: +39 0377 855720 - VAT IT07848810151

1 EU-TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU**

3 **EU-Type Examination Certificate No:** **FM13ATEX0069X**

4 **Equipment or protective system: (Type Reference and Name)** **KRG-10 Microwave Level Gauge**

5 **Name of Applicant:** **Tokyo Keiki Inc.**

6 **Address of Applicant:** **2-16-46 Minami-Kamata Ohta-ku Tokyo-To 144-8551 Japan**

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3049358 dated 20th January 2015

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015 and EN 60529:1991+A1:2000+A2:2013

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:

II 1 G Ex ia IIC T4 Ga
II 1 D Ex ia IIIC T135°C Da
II 1/2 G Ex ia/db IIC T4 Ga/Gb
Ta = -40°C to +60°C

Martin Crowe
Certification Manager, FM Approvals Europe Ltd.

Issue date: 30th March 2023

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals Europe Limited, One Georges Quay Plaza, Dublin. Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

SCHEDULE

to EU-Type Examination Certificate No. FM13ATEX0069X

13 **Description of Equipment or Protective System:**

The KRG-10 Microwave Level Gauge is designed for level measurements using microwave technology. The KRG-10 Type A is an Intrinsically Safe protection scheme with or without an LCD display installed. The Type B version also comes with an optional LCD display but is flameproof protected as well as intrinsically safe. The Type B version contains a IS barrier circuit allowing 250V to power the unit. The KRG-10 utilizes 6 different antennas which contain both metal and plastic. There are 3 different O-ring options depending on the antenna installed. All signal outputs are available in 4 to 20 mA and HART communications. The KRG-10 electronic enclosure is made of die cast aluminum with the LCD version having a polycarbonate window and silicone rubber LCD cover cap.

The equipment is rated for Degree of Protection IP66 in accordance with EN 60529.

Operation Temperature Ranges:
The ambient operating temperature range of the KRG-10 Microwave Level Gauge is -40°C to 60°C. Process temperature range is -40°C to 200°C for flameproof applications. Depending on the antenna used and the o-ring, the process temperature range varies within the range of -40°C to +200°C The process pressure range is -0.1 to +1.5 MPa.

Electrical data:

In type of protection intrinsic safety, the following energy limitation parameters apply (Type A only): U_i = 30Vdc; I_i = 93mA; P_i = 0.7W; C_i = 0nF; L_i = 0mH

All other protection techniques, the electronic connection has the following values (Type B only): Um= 250VAC

KRG-10a0bc-dA Microwave Level Gauge
Type A
II 1 G Ex ia IIC T4 Ga Ta = -40°C to +60°C; IP66
II 1 D Ex ia IIIC T135°C Da Ta = -40°C to +60°C; IP66
Ui = 30Vdc, Ii = 93mA, Pi = 0.7W, Li = 0mH, Ci = 0nF

Type B
II 1/2 G Ex ia/db IIC T4 Ga/Gb Ta = -40°C to +60°C; IP66

a = EX Approval; AI, or AD
b = Antenna Type; 2H, 4H, 2P, 3P, 4P, or 1R
c = Material of Seal; V, S, or K
d = Display; N or A

14 **Specific Conditions of Use:**

1. *The KRG-10 enclosure contains aluminium and is considered to present a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.*
2. *The KRG-10 enclosure contains exposed non-metallic surfaces considered to constitute an electrostatic discharge hazard. Clean only with a damp cloth.*
3. *The painted surface of the KRG-10 may store electrostatic charge and become a source of ignition in applications with a low relative humidity <30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in PD CLC/TR 60079-32-1 and IEC TS 60079-32. Cleaning of the painted surface should only be done with a damp cloth.*

4 .*For the Ex ia/db rated Microwave Level Gauge, this equipment can be installed in the boundary wall*

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SCHEDULE

to EU-Type Examination Certificate No. FM13ATEX0069X

between an area of EPL Ga (Category 1) and the less hazardous area, EPL Gb (Category 2). In this configuration, the antenna process connection portion may be installed in EPL Ga (Category 1), while the electronics housing is installed in EPL Gb (Category 2).

5. *For the Ex ia/db rated Microwave Level Gauge, consult the manufacturer for dimensional information on the flameproof joints for repair.*
6. *The device contains a nonmetallic wall constructed of PTFE, PFA, Glass parts and Epoxy resin that acts as a partition wall between the process and the device. Installation, Maintenance and use shall take into account the environmental conditions to which the partition wall will be subjected. The manufacturer's instruction for maintenance shall be followed in detail to assure safety during its expected lifetime.*

15 **Essential Health and Safety Requirements:**

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

16 **Test and Assessment Procedure and Conditions:**

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

17 **Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
20th January 2015	Original Issue.
12th January 2017	Supplement 1: Report Reference: - 3056241 Dated 11th January 2017. Description of the Change: Redesign of inter-compartmental feed through. Increase process temperature for flameproof applications. Correction of drawing errors. Change of Type B product ratings. Removal of Cone Antenna rating. Correction of Specific Condition 6. Updated to EU format.

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FM Approvals Europe Limited, One Georges Quay Plaza, Dublin. Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

SCHEDULE

to EU-Type Examination Certificate No. FM13ATEX0069X

Date	Description
04th June 2019	Supplement 2: Report Reference: - RR218082 Dated 31st May 2019. Description of the Change: Revised Certificate Specific Conditions of Use: Item 3 - replaced EN TR50404 with PD CLC/TR 60079-32-1. Updates made to Product Label Marking and Notified Body Number. Updated Installation Manual label. Certificate transferred from FM Approvals Ltd., notified body no. 1725, to FM Approvals Europe Ltd., notified body no. 2809.
29th May 2020	Supplement 3: Report Reference: - RR222698 Dated 28th May 2020. Description of the Change: i) Minor documentation update (no physical changes; only editorial changes). ii) Updated description correctly in the certificate from "for flameproof applications. Process temperature range is -40°C to 180°C for all other applications." and ".1 to 1.5 MPa" to "[d]epending on the antenna used and the o-ring, the process temperature range varies within the range of -40°C to +200°C" and "-.1 to 1.5 MPa", respectively.
28th October 2020	Supplement 4: Report Reference: - PR457466 Dated 26th October 2020. Description of the Change: Evaluation conducted to qualify updates to enclosure and probe construction, minor drawing revisions, moved IP66 ratings from Section 12 to Section 13 as is appropriate, removed Material of Seal option V that had previously been added in error.
25th February 2021	Supplement 5: Report Reference: - RR226323 Dated 23rd February 2021. Description of the Change: Add a new antenna (3" PTFE Sealing Antenna option 3P). Update of safety instructions, model code and manual.
30th July 2021	Supplement 6: Report Reference: - RR228480 Dated 29th July 2021. Description of the Change: Change description in ATEX Cert to match IECEx cert IECEx FMG13.0039X. Um=250VAC was previously 120/240VAC 50/60Hz.
30th March 2023	Supplement 7: Report Reference: - RR236287 Dated 28th March 2023. Description of the Change: Minor technical and documentation changes.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals Europe Limited, One Georges Quay Plaza, Dublin. Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

Blueprint Report

Tokyo Keiki Inc (144654)

Class No 3610

Original Project I.D. ***3049358***

Certificate I.D. ***FM13ATEX0069X***

Drawing No.	Revision Level	Drawing Title	Last Report
51986690	06	External Dim DWG	PR457466
51986691	**05**	**Internal Structure DWG Type A**	**RR236287**
51986692	**07**	**Internal Structure DWG Type B**	**RR236287**
51986693	05	Internal Structure Detail DWG	PR457466
51986694	05	Assembly Dimension DWG 1	PR457466
51986695	06	Assembly Dimension DWG 2	RR226323
51986696	05	Assembly Dimension DWG 3	PR457466
51986697	10	Labels DWG	RR228480
51986714	00	KAR-20 PCB diagram 1-2	3049358
51986715	00	KMB-10 PCB diagram	3049358
51986716	00	KRF-10 PCB diagram	3049358
51986717	00	KIB-10 PCB diagram	3049358
51986718	01	KTR-20 PCB diagram 1-2	3049358
51986719	02	KPB-20 PCB diagram 1-4	3049358
51986720	01	KPB-20 Parts list 1-6	3049358
51986721	00	KAR-20 Parts list	3049358
51986722	00	KTR-20 Parts list 1-2	3049358
51986723	00	ARM-10 parts list	3049358
51986724	01	BRM-10 parts list 1-3	3049358
51986725	00	KRF-10 Parts list 1-5	3049358
51986726	00	KMB-10 Parts list 1-9	3049358
51986727	00	KIB-10 Parts list	3049358
51986729	01	Blind Plug	3056241
51986962	03	O-Ring Detail DWG	RR226323
51987060	01	Installation DWG Type A	3049358
51987061	04	Installation DWG Type B	RR218082
51987062	01	Intrinsic Safety Concept Type A	3049358
51987063	04	Intrinsic Safety Concept Type B	RR218082
51987064	00	KAR-20 Circuit Diagram	3049358
51987065	00	KTR-20 Circuit Diagram	3049358
51987066	00	ARM-10 Circuit Diagram	3049358
51987067	00	BRM-10 Circuit Diagram	3049358
51987068	00	KPB-20 Circuit Diagram 1-2	3049358
51987069	00	KMB-10 Circuit Diagram 1-4	3049358
51987070	00	KRF-10 Circuit Diagram 1-2	3049358
51987071	00	KIB-10 Circuit Diagram	3049358
51987072	00	BRM-10 PCB Diagram 1-2	3049358
51987073	01	ARM-10 PCB Diagram 1-2	3049358
51987188	01	Line bushing	3056241
KF13-001	**R**	**KRG-10 Manual**	**RR236287**
KF13-003	H	KRG-10 Safety Instructions	RR228480

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

IP GRADE CERTIFICATE

Document Number: -

Document Class: 3

TERRANOVA

SPRIANO Vatcom MEC-RELA

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

ENV - TEST REPORT

Type / Model	:	**SST7X**
Equipment	:	Enclosure for electronic transmitter
Applicant	:	**SPRIANO Technologies Srl**
Address	:	Via Gramsci 1, 26827 Terranova dei Passerini (LO), Italy
Manufacturer	:	**SPRIANO Technologies Srl**
Address	:	Via Gramsci 1, 26827 Terranova dei Passerini (LO), Italy
Date of receipt of test sample	:	2014-10-21
Testing commenced on	:	2014-10-28
Testing concluded on	:	2014-10-30

Test Result (according to the standards on page 4)	**PASS**

G. Luca Verdizzotti
W
Inspector
05/08/2024

RMC

Robin's CROSSWIND
05/08/24 R

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SPRIANO Valkyon MEC-RELA

G. Luca Vergazzoli
W R
Inspector

1 TESTS PERFORMED

The IP6X test was performed.

2 TEST STANDARDS AND PROCEDURES

The following specification(s) are not covered by ACCREDIA accreditation:

Nemko WML0177:
General routines for using instruments at Nemko.

Nemko WML1002:
Measurement Uncertainty - Policy and Statement.

The following specification(s) are covered by ACCREDIA accreditation:

EN 60529:1991+A1:2000
Degrees of protection provided by enclosures (IP code)

3 SUMMARY

3.1 General remarks:

The IP6X test was performed in accordance with clauses 12.2, 13.4 and 13.6.1 of EN 60529. Acceptance criteria were as required on clause 12.3.1, 13.6.2 of EN 60529. Enclosure has been considered category 1.

This report 272101-4TRFENV has been issued to replace the 272101-2TRFENVFAIL report, issued on 2014/10/30, in order to update the trademark logo and specify that the EuT pass the dust IP test.

3.2 Definitions of symbols used in this Test Report

■ - The black square indicates that the listed condition, standard or equipment is applicable.
o - The empty circle indicates that the listed condition, standard or equipment is **not** applicable.

3.3 Final assessment:

The protection requirements pertaining to the technical standards and tested operation modes are

■ - **fulfilled.**
o - Not fulfilled.

The equipment under test

■ - **fulfils** the protection requirements cited in 1.
o - does not fulfil the protection requirements cited in 1.

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SPRIANO Vulcom MEC RELA

G. Luca Vergazzoli
W R
Inspector

4 EQUIPMENT UNDER TEST

4.1 Power supply system used

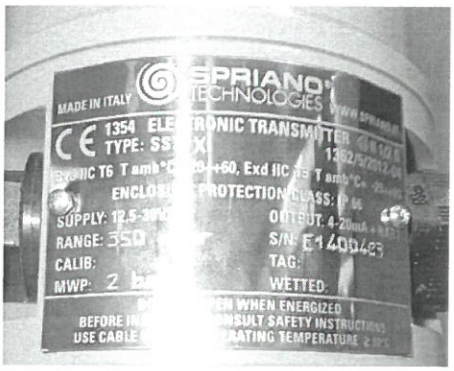
Power supply voltage : o 230V/50 Hz / 1ϕ o 115V/60Hz / 1ϕ
o 400V/50 Hz 3PE o 400V/50 Hz 3NPE
o 12 V DC o 24 V DC
■ Equipment not supplied during the tests.

4.2 Short description of the Equipment under Test (EuT)

Enclosure for electronic transmitter

Number of tested samples: 1
Serial number: E1400483

Marking plate:



4.3 EuT operation mode

For the IP6X test E.u.T. was mounted as in normal use.

TERRANOVA SPRIANO Vulcam MEC-RELA

4.4 EuT configuration:

For the IP test the EuT was not supplied.

4.5 Performance level

The test results shall be classified in terms of loss of protection or degradation of protection of the EuT, referred to a performance level defined by the standard and the relevant degree of protection.

Required performance level:

■ based on EN 60529
o based on the declaration of the manufacturer, requestor or purchaser

G. Luca Terrazzoli W R Inspector

The EUT shall comply with the following requirements:

§ 12.3.1 The access probe shall not touch hazardous live parts;

§ 13.6.2 The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.

5 TEST ENVIRONMENT

5.1 Environmental conditions

Unless different values are declared in the test case, following ambient conditions apply for the tests:

Temperature:	18-33 °C
Humidity:	30-70 %
Atmospheric pressure:	980-1020 hPa

5.2 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to Nemko SpA Technical Procedure VML1002 and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Hereafter the best measurement capability of Nemko Spa laboratory for the tests performed is reported:

Test	Range	Measurement Uncertainty	Notes
IP protection	Water flow	2 %	(1)
	Probe dimensions	± 0.05 mm	(1)
Construction verifications	AC/DC Voltage 10 mV ÷ 1000 V up to 5kHz.	1.5 %	(1)
	AC/DC Voltage 10 mV ÷ 1000 V 5-100kHz	2.5 %	(1)
	AC/DC Voltage 1 kV ÷ 5 kV up to 1kHz	2.5 %	(1)
	AC/DC Current 0.1 mA ÷ 5 A up to 1kHz	1.5 %	(1)
	AC/DC Current 5 A ÷ 400 A up to 1kHz	2.5 %	(1)
	Resistance 200 mΩ ÷ 40 kΩ	2.0 %	(1)
	Active Power 200 mW ÷ 1 W	20mW	(1)
	Active Power 1 W ÷ 6 kW	3.0 %	(1)
	Power factor	± 0.05	(1)
	Dimensions 1-150mm	± 0.05 mm	(1)
	Dimensions 150-1000mm	0.3%	(1)
	Force 0.2-2500N	3%	(1)
	Torque 0.2-200Nm	5%	(1)
	Weight 1mg-30kg	2.5%	(1)
Protection against access to live parts	Dimensions 1-1000mm Force 0.2-1000N	± 0.05 mm or 0.3% 3%	

TERRANOVA® SPRIANO Valcim MECRELA

G. Luca Bergazzoli

6 TEST CONDITIONS AND RESULTS

6.1 IP 6X

Test probe diameter.....: 1 mm
Enclosure category.....: 1
Depression.....: 2 kPa
Test Duration .....: 8 h
Talcum powder .....: 2 kg/m^3

6.1.2 Description of the test location

Test location: Nemko S.p.a. laboratory

6.1.3 Photo documentation of the test set-up

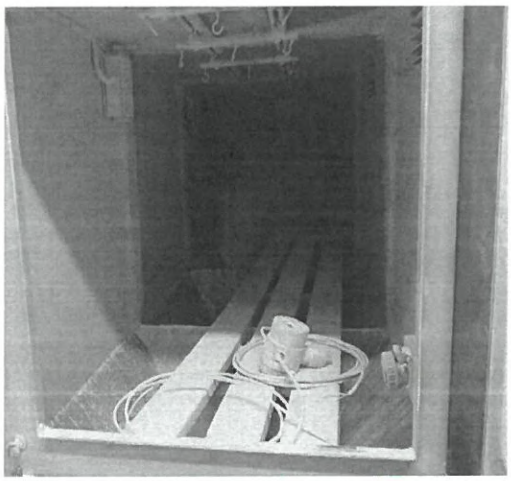


Figure 1: The EuT inside the dust chamber

6.1.4 Test result

The requirements are: **Fulfilled**

Test probe is not penetrated inside the enclosure.
At the end of test no presence of dust has been found inside the enclosure, nor on live parts.

TERRANOVA
BRIANO MEDREL A

G. Luca Vergazzoli
W
R
Inspector

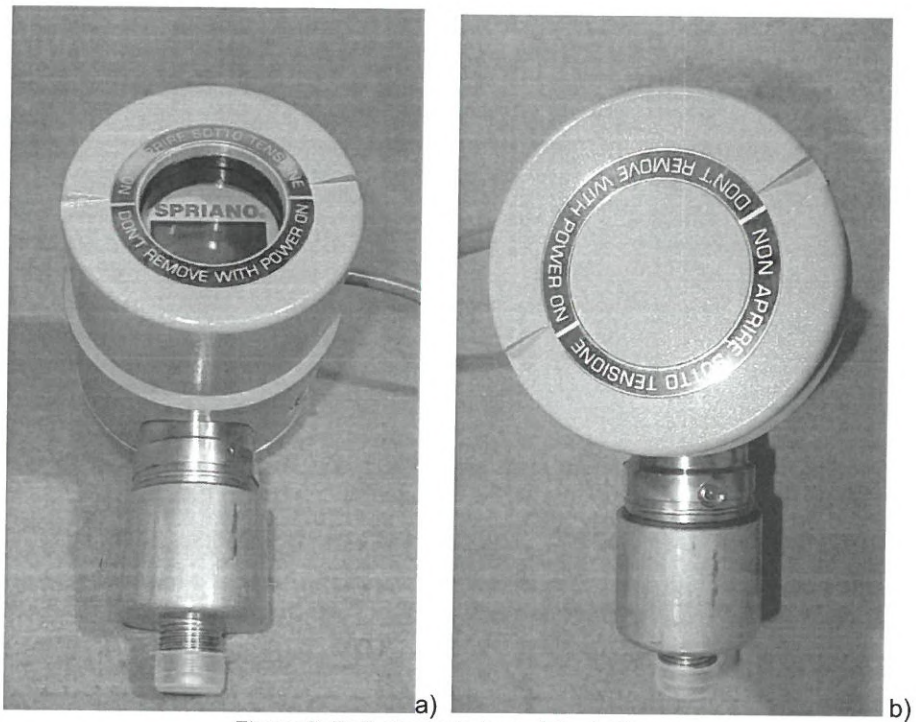
7 USED TEST EQUIPMENT

Equipment	Manufacturer and model	Serial N°	Calibration due date
Thermohygrometer data loggers	Testo 175-H2	20012380/305	08/2015
Digital barometer	Haenni ZED 150/111.121	900301402/0013	07/2015
Dust chamber	Attrezzature tecniche speciali 3.03	00/567-96	NST
1 mm test pin	Attrezzature tecniche speciali mod. D=1.0mm – 1N+/-10%	00944	09/2016

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G. Luca Vergazzoli
W
K
...ector

8 PHOTOS



a) b)

Figure 3: EuT, general view: a) front, b) rear

- End of test report -

TERRANOVA

SPRIANO VECCHIA SEC-RELA

G. Luca Verrazzali

LAB N° 1244

TEST REPORT

EN 60529:1991+A1:2000

Degrees of protection provided by enclosures (IP Code)

Report Reference No. ..... :	273486-4TRFENV: This test report replaces 273486-2 issued on 2014/11/17
Tested by (name, function + signature) ..... :	Manuela Grassi (project handler) Manuela Grassi
Approved by (name, function + signature) ..... :	Giulio Tassinari (verifier) Giulio Tassinari
Date of issue ..... :	2014-11-20
Testing Laboratory ..... :	**Nemko Spa**
Address ..... :	Via del Carroccio, 4 20853 BIASSONO (MB) - Italy
Testing location/ procedure ..... :	Full application of Harmonised standards ☒ Partial application of Harmonised standards ☐ Other standard testing methods ☐ Non-standard testing methods ☐
Testing location/ address ..... :	Nemko Spa – Via del Carroccio, 4 20853 BIASSONO (MB) - Italy
Applicant's name ..... :	**Spriano Technologies Srl**
Address ..... :	via Gramsci 1, 26827 Terranova dei Passerini (LO), Italy
Test specification	
Standard ..... :	EN 60529:1991+A1:2000
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	TRF EN60529
TRF Originator ..... :	Nemko Spa
Master TRF ..... :	2009-06

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Test item description ..... :	Enclosure for electronic transmitter
Trade Mark ..... :	SPRIANO® TECHNOLOGIES
Manufacturer ..... :	SPRIANO Technologies Srl
Model/Type reference ..... :	SST7X
Ratings ..... :	12,5 - 30 Vdc 4÷20mA

This test report may not be partially reproduced, except with the prior written permission of Nemko Spa
The test report merely corresponds to the test sample.
The phase of sampling / collection of equipment under test is carried out by the customer

This Test Report, when bearing the Nemko name and logo is only valid when issued by a Nemko laboratory, or by a laboratory having special agreement with Nemko.

ENV - TEST REPORT

Type / Model	:	**SST7X**
Equipment	:	Enclosure for electronic transmitter
Applicant	:	**SPRIANO Technologies Srl**
Address	:	Via Gramsci 1, 26827 Terranova dei Passerini (LO), Italy
Manufacturer	:	**SPRIANO Technologies Srl**
Address	:	Via Gramsci 1, 26827 Terranova dei Passerini (LO), Italy
Date of receipt of test sample	:	**2014-11-07**
Testing commenced on	:	**2014-11-14**
Testing concluded on	:	**2014-11-14**

Test Result (according to the standards on page 4)	**PASS**

TERRANOVA® SPRIANO MEC-RELA

05/00/14 QAC QMC

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TERRANOVA®
SPRIANO MEC-RELA

G. Luca Vergazzoli
W K
Director

1 TESTS PERFORMED

The IPX6 test was performed.

2 TEST STANDARDS AND PROCEDURES

The following specification(s) are not covered by ACCREDIA accreditation:

Nemko WML0177:
General routines for using instruments at Nemko.

Nemko WML1002:
Measurement Uncertainty - Policy and Statement.

The following specification(s) are covered by ACCREDIA accreditation:

EN 60529:1991+A1:2000
Degrees of protection provided by enclosures (IP code)

3 SUMMARY

3.1 General remarks:

The IPX6 test was performed in accordance with clauses 6 and clauses 14.2.6 of EN 60529. Acceptance criteria were as required on clause 14.3 of EN 60529.

This report 273486-4TRFENV has been issued to replace the 273486-2TRFENV report, issued on 2014/11/17, in order to update the trademark logo.

3.2 Definitions of symbols used in this Test Report

■ - The black square indicates that the listed condition, standard or equipment is applicable.
o - The empty circle indicates that the listed condition, standard or equipment is **not** applicable.

3.3 Final assessment:

The protection requirements pertaining to the technical standards and tested operation modes are

■ - **fulfilled.**
o - Not fulfilled.

The equipment under test

■ - **fulfils** the protection requirements cited in 1.
o - does not fulfil the protection requirements cited in 1.

4 EQUIPMENT UNDER TEST

4.1 Power supply system used

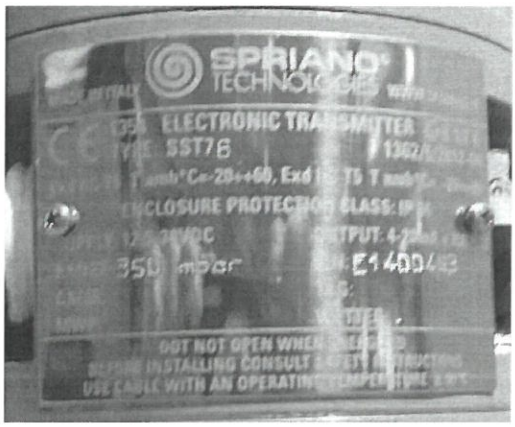
Power supply voltage : o 230V/50 Hz / 1ϕ o 115V/60Hz / 1ϕ
o 400V/50 Hz 3PE o 400V/50 Hz 3NPE
o 12 V DC o 24 V DC
■ Equipment not supplied during the tests.

4.2 Short description of the Equipment under Test (EuT)

Enclosure for electronic transmitter

Number of tested samples: 1
Serial number: E1400483

Marking plate:



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SPRIANO Falcon MEC-RELA

4.3 EuT operation mode

For the IPX6 test E.u.T. was mounted as in normal use.

G. Lucchergazzoli
W R
Inspector

4.4 EuT configuration:

For the IP test the EuT was not supplied.

4.5 Performance level

The test results shall be classified in terms of loss of protection or degradation of protection of the EuT, referred to a performance level defined by the standard and the relevant degree of protection.

Required performance level:

■ based on EN 60529
o based on the declaration of the manufacturer, requestor or purchaser

The EUT shall comply with the following requirements:.

§ 14.3 No deposit of water inside the enclosure at the end of the test or if the any water has entered, it shall not:

- Be sufficient to interfere with the correct operation of the equipment or impair safety;
- Deposit on insulation parts where it could lead to tracking along the creepage distances;
- Reach live parts or windings not designed to operate when wet;
- Accumulate near the cable end or enter the cable if any.

5 TEST ENVIRONMENT

5.1 Environmental conditions

Unless different values are declared in the test case, following ambient conditions apply for the tests:

Temperature:	18-33 °C
Humidity:	30-70 %
Atmospheric pressure:	980-1020 hPa

5.2 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to Nemko SpA Technical Procedure VML1002 and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Hereafter the best measurement capability of Nemko Spa laboratory for the tests performed is reported:

Test	Range	Measurement Uncertainty	Notes
IP protection	Water flow	2 %	(1)
	Probe dimensions	± 0.05 mm	(1)
Construction verifications	AC/DC Voltage 10 mV ÷ 1000 V up to 5kHz	1.5·%	(1)
	AC/DC Voltage 10 mV ÷ 1000 V 5-100kHz	2.5·%	(1)
	AC/DC Voltage 1 kV ÷ 5 kV up to 1kHz	2.5·%	(1)
	AC/DC Current 0.1 mA ÷ 5 A up to 1kHz	1.5·%	(1)
	AC/DC Current 5 A ÷ 400 A up to 1kHz	2.5·%	(1)
	Resistance 200 mΩ ÷ 40 kΩ	2.0·%	(1)
	Active Power 200 mW ÷ 1 W	20mW	(1)
	Active Power 1 W ÷ 6 kW	3.0 %	(1)
	Power factor	± 0.05	(1)
	Dimensions 1-150mm	± 0.05 mm	(1)
	Dimensions 150-1000mm	0.3%	(1)
	Force 0.2-2500N	3%	(1)
	Torque 0.2-200Nm	5%	(1)
	Weight 1mg-30kg	2.5%	(1)
Protection against access to live parts	Dimensions 1-1000mm Force 0.2-1000N	± 0.05 mm or 0.3% 3%	

6 TEST CONDITIONS AND RESULTS

6.1 IP X6

Diameter of the nozzle .....: 12,5 mm
Delivery rate .....: 100 l/min
Test duration .....: 3 min
Distance .....: 3 m

6.2.1 Photo documentation of the test set-up.

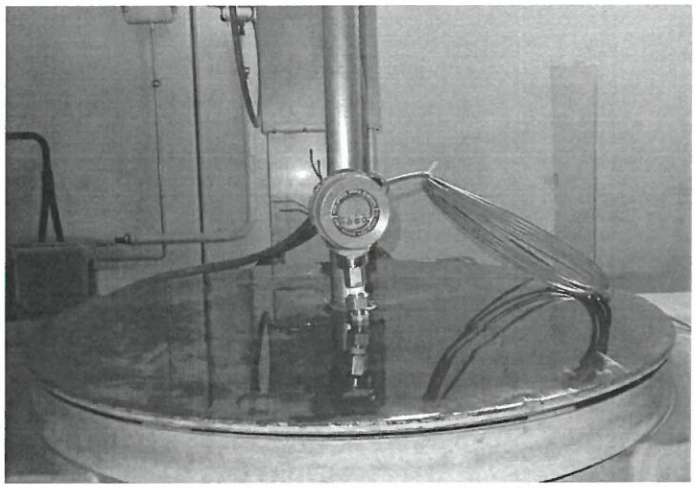


Figure 2: The EuT mounted on the rotating table

6.2.2 Test result

The requirements are: **Fulfilled**

At the end of test no presence of water has been found inside the enclosure, nor on live parts.

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7 USED TEST EQUIPMENT

Equipment	Manufacturer and model	Serial N°	Calibration due date
Thermohygrometer data loggers	Testo 175-H2	20012380/305	08/2015
Digital barometer	Haenni ZED 150/111.121	900301402/0013	07/2015
Tape measure	Stanley 8 m	30-457	08/2015
Spray nozzle IPX6	ATS IPX6	496/927	NST
Fluxmeter	Cryotec D7 (20-130) l/min	050441240	07/2016

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8 PHOTOS

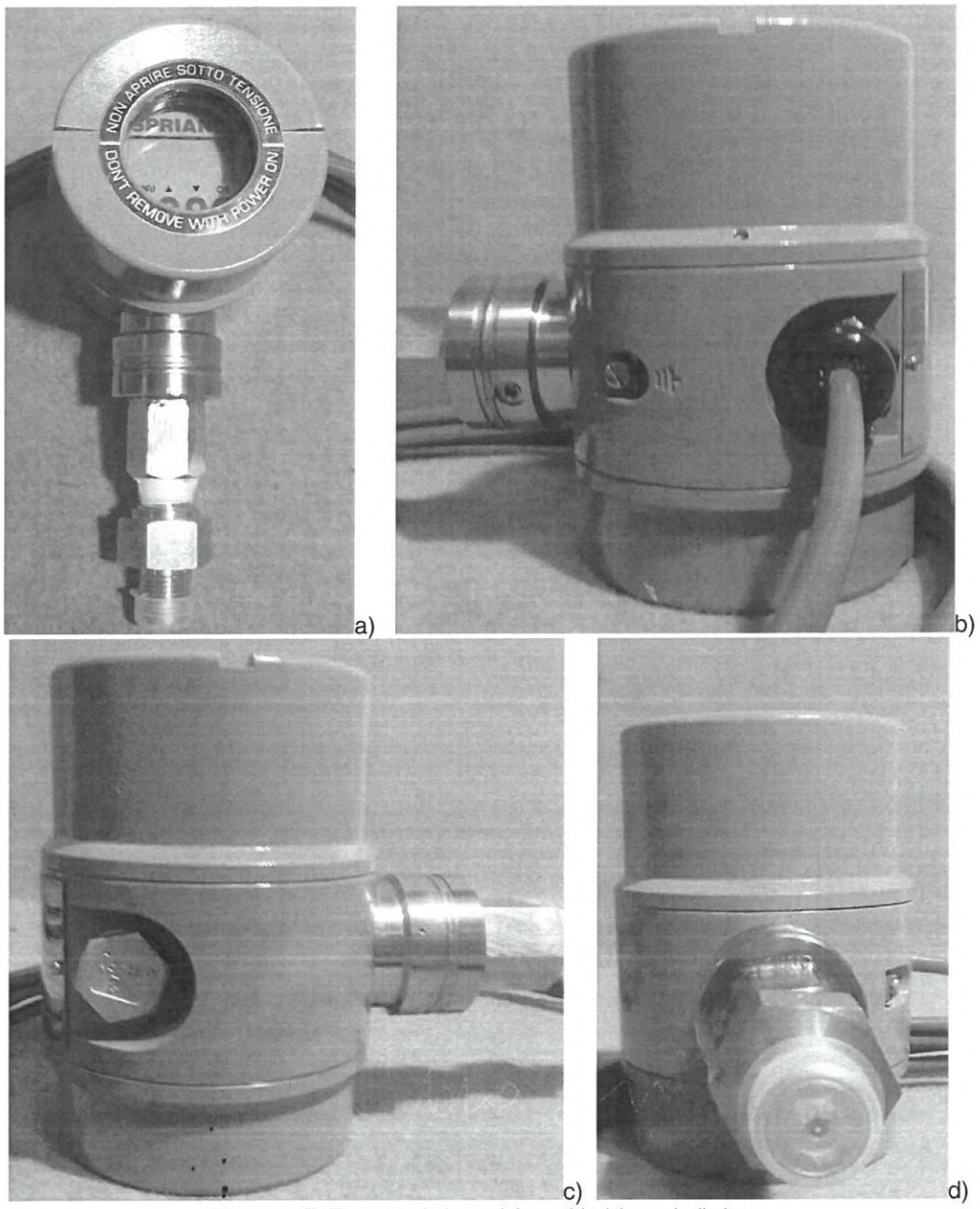


Figure 3: EuT, general view: a) front, b) c) lateral, d) down

LAB N° 1244

TEST REPORT

EN 60529:1991+A1:2000

Degrees of protection provided by enclosures (IP Code)

Report Reference No. ..... :	272101-4TRFENV: This test report replaces 272101-2TRFENVFAIL issued on 2014/10/30
Tested by (name, function + signature)..... :	Manuela Grassi (project handler) Manuela Grassi
Approved by (name, function + signature)..... :	Giulio Tassinari (verifier) Giulio Tassinari
Date of issue..... :	2014-11-19
Testing Laboratory ..... :	**Nemko Spa**
Address..... :	Via del Carroccio, 4 20853 BIASSONO (MB) - Italy
Testing location/ procedure ..... :	Full application of Harmonised standards ☒ Partial application of Harmonised standards ☐ Other standard testing methods ☐ Non-standard testing methods ☐
Testing location/ address..... :	Nemko Spa – Via del Carroccio, 4 20853 BIASSONO (MB) - Italy
Applicant's name ..... :	**Spriano Technologies Srl**
Address..... :	via Gramsci 1, 26827 Terranova dei Passerini (LO), Italy
Test specification	
Standard ..... :	EN 60529:1991+A1:2000
Non-standard test method..... :	N/A
Test Report Form No. ..... :	TRF EN60529
TRF Originator..... :	Nemko Spa
Master TRF..... :	2009-06

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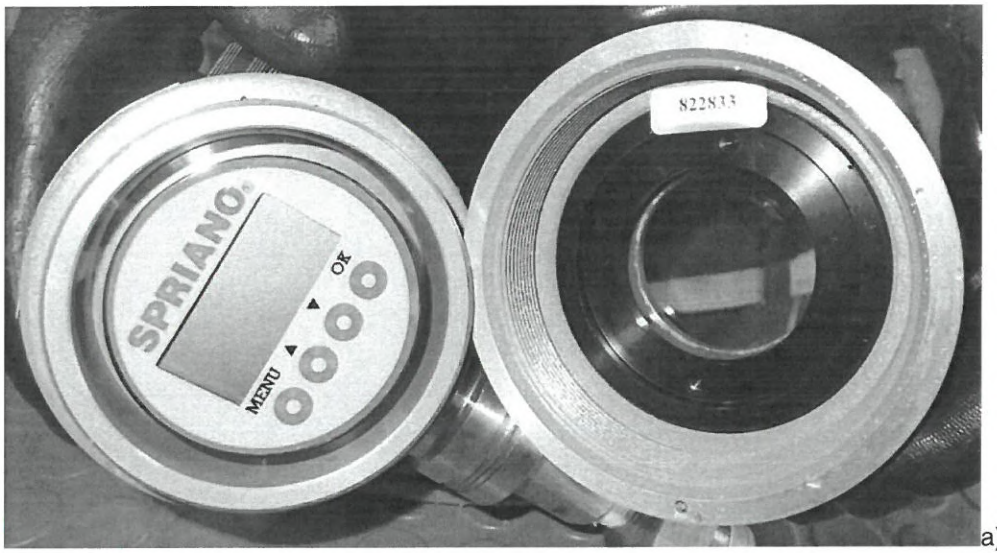
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Test item description ..... :	Enclosure for electronic transmitter
Trade Mark ..... :	SPRIANO® TECHNOLOGIES
Manufacturer..... :	SPRIANO Technologies Srl
Model/Type reference..... :	SST7X
Ratings..... :	12,5 - 30 Vdc 4÷20mA

G. Luca Vergazzoli

This test report may not be partially reproduced, except with the prior written permission of Nemko Spa
The test report merely corresponds to the test sample.
The phase of sampling / collection of equipment under test is carried out by the customer

This Test Report, when bearing the Nemko name and logo is only valid when issued by a Nemko laboratory, or by a laboratory having special agreement with Nemko.



a)


b)

Figure 4: a) and b) particular of the EuT after IP test

- End of test report -

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SPRIANO
MSC RELA

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

WPS & PQR

Document Number: -

Document Class: 3

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WPS, PQR and WPQ for TWE in SS AISI 316/316L

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SPRIANO MEC-RELA

G. Luca Perfazzoli
W K
OBO
05/04/24 RHC

CROSSWIND
05/04/24 R

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TERRANOVA

QW-482 WPS
WELDING PROCEDURE SPECIFICATION
According to SECTION IX OF ASME CODE
Ed. 2017
Foglio 1 di 2 / sheet 1 of 2

SPECIFICA DI SALDATURA N° *Welding Procedure Specification N°.:*	06/18	QUALIFICA DI SUPPORTO *Supporting PQR No(s).:*	02/18
REVISIONE *Revision:* 0	DATA *Date:* 23/10/18	CLIENTE *Customer:*	N.A
TIPO Type:	MANUAL	COMMESSA *Job Nr.:*	N.A
PROCEDIMENTO DI SALDATURA *Welding Process:*	GTAW	DISEGNO N° *Drawing N°.:*	N.A

GIUNTO / Joints (QW-402)

SUPPORTO / Backing: YES	DISTANZA/Root spacing 1 mm
MATERIALE SUPPORTO / Backing Material (type): Yes	
Base Metal — No fusible metal — Weld metal	
FERMI / Retainers: NO	

DISEGNO DEL GIUNTO / *Joint Design:*



METALLO BASE / *BASE MATERIALS* (QW-403):

P.No: 8	GRUPPO No *Group No:* 1	To P.No: 8	CON GRUPPO No *With group No:* 1
O SPECIFICA TIPO E GRADO *Or Specification Type and Grade:*	ASTM A 240 Typ 316L	CON SPECIFICA TIPO E GRADO *To Specification Type and Grade:*	ASTM A 240 Typ 316L
O ANALISI CHIMICA E PROP. MECC. *Or Chem.Analysis and Mecch.Prop.:*	S31600	CON ANALISI CHIMICA E PROP. MECC. *To Chem.Analysis and Mecch.Prop.:*	S31600
GAMMA SPESSORI *Thickness range:*			
METALLO BASE *Base Metalerial*	SMUSSO (mm) *Groove (mm):* 5 to 40	ANGOLO *Fillet:*	All weld sizes and parent metal thickness
GAMMA DIAMETRI TUBI *Pipe Dia. Range*	SMUSSO *Groove:* ≥ 25	ANGOLO *Fillet::*	All weld sizes and parent metal thickness
T Limits (S.Circ. Arc.)	N.A.	T Limits for impact test : NA	
t Pass > ½ in. (13 mm)	NO PASS ≥ 13 mm	ALTRO *Other:*	NO

METALLO D'APPORTO / *FILLER METALS* (QW-404):

PROCEDIMENTO *Process:*	GTAW		
Speci.No. (SFA): *Specification (SFA):*	A5.9		
AWS No:(Class): *AWS No:(Class):*	ER 316 L 1G		
F-NO No.: *F-NO No.:*	6		
A-NO No.: *A-NO No.:*	8		
DIAM. METALLO D'APPORTO *Diameter of filler metals::*	Ø 1.6 - 2.4 mm		
TIPO DEL METALLO D'APPORTO *Filler Metal Product Form::*	Solid Wire		
GAMMA SPESSORI *Maximum deposited weld metal*	40 mm max		
SMUSSO *Groove:*	40 mm max		
ANGOLO *Fillet::*	All		
FILO-NOME COMMERCIALE *Electrode – Brand Name*	316L 1G		
COSTRUTTORE *Manufacturer:*	Bohler		
t LIMITE (S.Circ. Arc.) t Limits (S.Circ. Arc.)	N.A		
CAMBIO DI CLASSIFICAZIONE *Ch'ange of classification:*	N.A		
METALLO APPORTO SUPPLEM. *Supplemental filler metal*	N.A		
ELEMENTI LEGA *Alloy elements*	–		

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QW-482 WPS
WELDING PROCEDURE SPECIFICATION
According to SECTION IX OF ASME CODE
Ed. 2017

Foglio 2 di 2 / *sheet 2 of 2*

POSIZIONE / *POSITION* (QW-405)	
POSIZIONE SMUSSO *Position(s) Groove*:	1G
PROGRESSIONE SALDATURA *Welding progression (up/down)*:	N.A.
POSIZIONE SALD. ANGOLO *Position(s) of Fillet*:	N.A

PRERISCALDO / *Preheat* (QW-406)	
TEMP. PRERISCALDO MIN. *Preheat Temp. Min.*:	>= 20°C
TEMP. DI INTERPASS MAX. Interpass Temp. Max:	Max 150°C
MANTENIMENTO PRERISC. Preheat Maintenance:	NO

TRATTAMENTO TERMICO DOPO SALDATURA *POSTWELD HEAT TREATMENT* (QW-407)	
GAMMA DI TEMPERATURA *Temperat. Range*:	NONE
TEMPO DI MANTENIMENTO *Time Range*:	NONE

GAS (QW-408)	Gas(es)	% COMPOSIZIONE MISCELA *Percent composit. mixture*	PORTATA *Flow rate* l/min
PROTEZIONE *Shielding*:	Argon	99,99%	6-8
AGGIUNTO *Trailing*:	NO	//	//
ROVESCIO *Backing*:	Argon	99,99%	7

CARATTERISTICHE ELETTRICHE / *ELECTRICAL CHARACTERISTICS* (QW-409)			
CORRENTE *Current A.C.or D.C.*:	SEE TABLE	POLARITA' *Polarity*:	SEE TABLE
CAMPO AMPERAGGIO *Amps (Range)*:	SEE TABLE	CAMPO VOLTS *Volts (Range)*:	SEE TABLE
HEAT INPUT *Heat Input*:	MAX 2.0 Kj/mm		
CARATTERISTICHE DELL'ARCO PER GMAW *Mode of Metal Transfer for GMAW*:	N.A		
GAMMA DI VELOCITA' ALIMENTAZIONE FILO *Electrodes Wire Feed Speed Range*:	N.A		
DIMENSIONI/TIPO ELETTRODO di TUNGSTENO *Tungsten Electrode size/type*	3.0 mm 5.12 EWTh-2%		

TECNICA / *TECHNIQUE* (QW-410)	
PASSATA STRETTA O LARGA *String or Weave Bead*:	STRING
DIMENSIONE UGELLO *Orifice or Gas Cup Size*:	12 mm
PULIZIA INIZIALE E TRA LE PASSATE (spazzolatura, molatura,etc.) *Initial and Interpass Cleaning (Brushing, Grinding, etc.)*:	BRUSHING
METODO DI RIPRESA AL ROVESCIO *Method of Back Gouging*:	GRINDING
OSCILLAZIONE *Oscillation*:	NO
DISTANZA UGELLO DI CONTATTO/PEZZO *Contact Tube to Work Distance*:	N.A
PASSATA SINGOLA O MULTIPLA (per lato) *Single or Multiple Pass (For Side)*:	MULTIPLE
ELETTRODO MULTIPLO O SINGOLO *Multiple or Single Electrodes*:	SINGLE
PROCESSI TERMICI *Thermal process*:	NO
MARTELLATURA *Peening*:	NO
SPAZIATURA ELETTRODI *Electrode spacing*:	N.A

STRATI DI SALDATURA *Weld* Layer(s)	PROCED. DI SALDATURA *Welding* Process	METALLO D'APPORTO *Filler metal* Classif.	METALLO D'APPORTO *Filler metal* Dia.(mm)	CORRENTE *Current* POLARITA' *Polarity*	CORRENTE *Current* CAMPO AMPERE *Amp.Range*	CAMPO VOLTS *Voltage Range*	GAMMA VELOCITA' DI LAVORO *Travel speed Range* (cm/1')	APPORTO TERMICO *Heat Input* (Kj/cm)
1-2/1R-2R	GTAW	ER 316 L 1G	1.6	D.C. – E.N	154 ÷ 155	11,1 ÷ 11,3	1,1 – 1,15	8,9 – 9,7
3 / 3R	GTAW	ER 316 L 1G	2.4	D.C. – E.N	164 ÷ 165	11,1 ÷ 11,6	1,1 – 1,15	9,8 – 10,4
N / NR	GTAW	ER 316 L 1G	2.4	D.C. – E.N	185 ÷ 190	13,1 ÷ 13,2	1,2 – 1,25	12,2 – 13,7

Redatto/*prepared by*:	Controllato/*checked by*:	Data/*date*:
Ing. G. Ghirardelli	Ing. G. Ghirardelli IWE 120235A	23/10/2018

G. Luca Vergazzoli

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PROCEDURE QUALIFICATION RECORD
Sect.IX of the ASME Code. 2017 Ed.
QW-483 (PQR)
Sheet 1 of 2 PQR Nr.**02/18**

Procedure Qualification Record PQR n° **02/18** Date **12/09/2018**

WPS N° **02/18 Rev.01**

Welding Process(es) **GTAW** Types **MANUAL**

Joint scketch (QW-402)



BASE METAL (QW-403)			
Material Spec. **ASTM**			
Type and Grade **A 182 Typ. 316L**			
P.N°8 Group N° 1 to **P.N° 8 Group N° 1**			
Thickness **20 (5 to 40)**	T Limit Impact: **NA**		
Diameter **NA**	T Limit (S.Circ.Arc): **NA**		
Other **No Pass ≥ 13mm**			
FILLER METALS (QW-404) **GTAW**			
SFA Specification **A5.9**			
AWS Classification **ER 316LSi**			
Filler Metal F. N° **6**			
Weld Metal Analysis A. N° **8**			
Size of Electrodes **Ø 1,6-2,4 mm**			
Deposited Weld Metal t **5,0 mm to 40 mm**			
t Limit (S.Circ.Arc) **NA**			
Filler Metal Product Form **Solid Wire**			
± Ø Supplemental Filler metal **Not Used**			
Ø Alloy elements **Not Used**			
Brand name **316LSi**			
Manufacturer **Bohler**			
POSITION (QW-405)			
Position of Groove **1G**			
Weld Progression (Uph. Or Dow.) **NA**			
PREHEAT (QW-406)			
Preheat Temperature **20 °C**			
Interpass Temperature **≤ 150 °C**			
Preheat maintenance **NO**			
Other **NO**			

POSTWELD HEAT TREATMENT (QW-407)			
Temperature **NA**			
Time **NA**			
T Limits **NA**			
GAS (QW-408)	% composition		
	Gas(es)	(Mixture)	Flow Rate
Shielding	**Argon**	**99,99%**	**8 ÷ 12**
Shielding	//	//	//
Backing	**Argon**	**99,99%**	**8**
ELECTRICAL CHARACTERISTICS (QW-409)			
Current **D.C.**			
Polarity **GTAW: DC- GMAW: DC+**			
Amperes **: 150 ÷ 195** V **13 ÷ 14**			
Transfer mode **N.A.**			
Heat Input (KJ / mm) **≤ 2,0 KJ / mm**			
Heat Input 409.1 **NA**			
Heat Input 409.2 **NA**			
Travel Speed(mm/min) **200-250 mm/1'**			
TECHNIQUE (QW-410)			
Peening **Not Used**			
String or Weawe Bead. **STRING**			
Oscillation **NO**			
Multipass or Single Pass (for Side) **MULTIPLE**			
Single or Multiple Electrodes **SINGLE**			
Use of thermal process **NO**			
Closed to out Chamber **NO**			

IIW
Dott. Ing. C. Ghirardelli
W.E. /120235A

G. Luca Mangazzo
W
Inspector

TERRANOVA

PROCEDURE QUALIFICATION RECORD
Sect.IX of the ASME Code. 2017 Ed.
QW-483 (PQR)
Sheet 2 of 2 PQR Nr.**02/18**

Tensile Test (QW - 150)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ult.Total Load (KN)	Ult.Unit Stress (N/mm^2) ≥ 515	Charact.of Fail & Location
BW	**19,12**	**19,98**	**382,0**	**------**	**551**	**Ductile out weld**
BW	**19,19**	**19,95**	**382,8**	**------**	**552**	**Ductile out weld**

Guided Bend Test (QW - 160)

Type and Figure No.462.3 (a)	Result
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**

Toughness Test (QW - 170)

Specimen No.	Notch Location	Notch Type	Test Temp. °C	Impact Value	Lateral Expansion		Drop Weight	
					% Shear	Mils	Break	No Break
BW	**W.Z**	**KV**	**-196**	**67-75-68**	**0.50-0.65-0.50**			
	H.A.Z	**KV**	**-196**	**98-97-99**	**1.20-1.18-1.23**			

Fillet Weld Test (QW - 180)

Result-Satisfactory (yes/no) NO	Penetr.into Parent Meatal (yes/no) : //
Macro - Result: // NO	

Other Test

Type of Test			
VT Examination:	**Acceptable: carried out on 27/07/2018 By G. Ghirardelli**		
PT Examination:	**Result: NA**		
RT Examination	**Result: Satisfactory. See Omeco Report SND/1081/18 dated: 12/09/2018**		
Hardness Test	**Result: Satisfactory. See Omeco Report SAM/0511/18 dated: 12/09/2018**		
Macro Examination	**Result: satisfactory. See Omeco Report SAM/0511/18 dated: 12/09/2018**		
Welders Name **Tura Alessandro**		Clock No. //	Stamp No. **TA**
Test Conducted by	**Omeco S.r.l**	Laboratory Test No. **Omeco S.r.l SAM/0511/18**	

We certify that the statement in the record are correct and that the test welds were prepared,welded and tested in accordance with the requirements of Sect.IX of the ASME Code. 2015 Ed.

Examiner or Examinig Body
Ing.G. Ghirardelli IWE/IT 120235 A

IIW Dott. Ing G. Ghirardelli IWE /120235A

Date **12/09/18**

By G. Luca Negazzoli

TERRANOVA

MANUFACTURER'S RECORD OF WELDER PERFORMANCE QUALIFICATION TEST (WPQ)

QW-301, Section IX, ASME Boiler and Pressure Vessel Code

QUALIFICATION TEST No. WPQ 01-18

Welder's name	CASCATO MARCO	Clock No. -		Stamp No.	CM
Welding process(es) used	GTAW	Type	Manual		
Identification of WPS followed by welder during welding of test coupon	06/18	Rev.	00	Date	23/10/2018
Base material(s) welded	ASME SA240 Type 316L	Thickness mm:	16,00 mm	**Diameter:**	n/a Plate
Filler metal specification (SFA) Class (QW-404)	SFA 5.9				

MANUAL OR SEMIAUTOMATIC FOR EACH PROCESS (QW-350 and QW-380)

	Actual Values	Range Qualified
Backing (metal,weld metal,welded from both sides,flux etc.) (QW-402)	with	**with**
Material : ASME P.No. to P.No. (QW-403)	P8 G1 to P8 G 1	**1 to 15F , 34 , 41 to 49**
(x) Plate () Pipe - thk.: 16,00 m - Dia.: ------ mm	Plate	**Plate & pipe Pipe Dia. ≥ 73 mm**
Filler metal specification (F.No) 6 (QW-404)	6	**6**
Consumable insert for GTAW or PAW	None	**None**
Filler metal variety	Solid	**Solid & Metalcored**
Weld deposit thickness for each welding process	16,00 mm (3 layers minimun)	**Max. to be welded**
Welding position (QW-405)	1G	**F (Flat)**
Progression (uphill/downhill)	Not Applicable	------
Backing gas for GTAW,PAW or GMAW; fuel gas for OFW (QW-408)	without	**with or without**
GMAW transfer mode (QW-409)	Not Applicable	------
GTAW welding current type/polarity (QW-409)	Straight (SP)	**Straight (SP)**
GTAW with or without filler metal (QW-404.14)	With	**With**

MACHINE WELDING VARIABLES FOR THE PROCESS USED (QW-360 and QW-380)

	Actual Values	Range Qualified
Direct/remote visual control	-	-
Automatic voltage control (GTAW)	-	-
Automatic joint tracking	-	-
Welding position	-	-
Consumable insert	-	-
Single or multiple passes for side/ Backing	-	-

GUIDED BEND TEST RESULT

Guide Bend Test Type	(X)QW-462.2 (Side) Result	( )QW-462.3(a)(Trans.R&F)Type	( )QW-462.3(b)(Long.R&F)Result
-	Satisfactory	-	-

Visual examination result (QW-302.4) Omeco Test certificate n° SPT/1741/18

Radiographic test result (QW-304 and QW-305 -

(For alternative qualification of groove welds by radiography)

Fillet weld-Fracture test - Lenght and percent of defects - mm

Macro test fusion - fillet leg test - mm. X - mm. Concavity/convexity - mm.

Welding test conducted by Omeco

Mechanical tests conducted by Omeco Laboratory test No. SPT/1741/18

We certify that statements in this record are correct and that the test coupons were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code:

Test supervised by Ing. G. Ghirardelli

Dott. Ing. G.Ghirardelli I.W.E. /12[illegible]35A

Organization

Date 10/11/2018 By

G. Luca Verfazzoli

OMECO SRL
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Research Centre - Material Testing - Calibration

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ACCREDIA
LAB N° 0009L

TEST REPORT

Number: SPT/1741/18 **date:** 06/11/2018
OMECO Ref.: 3247/18 Page 1 of 1
CUSTOMER Ref.: Quot. 2906/18

TERRANOVA SPRIANO MEC-RELA

Sample: N. 1 WELDED TEST COUPON (BUTT JOINT) PLATE Thk 16.0 mm DECLARED AS ASTM A240 Tp 316L FOR WELDING PERFORMANCE QUALIFICATION (ASME IX : 2017)

Identification:	WPS N.	Welder's name	Stamp	Process	Position
A	06/18	CASCATO MARCO	CM	GTAW	1G

Date of receipt: 25/10/2018

Test standards: ASME IX : 2017

Equipments: Universal machines identified SPT-0007

Test results:

	BEND TEST (QW 160)					
Identif. N.	Specimen dimensions (mm)	Ø Former (mm)	Distance between rollers (mm)	Curvature (α°)	Bend Test	Test Results
A	10 x Thk	40	62	180	SIDE	SATISFACTORY
	10 x Thk	40	62	180	SIDE	SATISFACTORY
	10 x Thk	40	62	180	SIDE	SATISFACTORY
	10 x Thk	40	62	180	SIDE	SATISFACTORY

This document concerns only the sample submitted to the test. If not otherwise indicated, the sampling operation were performed by the Customer.

Date/s of execution: 06/11/2018 **At:** OMECO Lab. – Monza

The samples have to be kept (after the test execution): 30 days (in case of Law 1086 and supervised tests) and 6 months (in case of other tests).
Technical recordings are kept : 10 years

Operator/s		Technical Manager	
ING. N. INCAMPO		ING. M. CASARIL	

IIW Dott. Ing. G.Ghirardelli W.E. /120215A

Document end

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PGO-014/2 Rev.1

WPS, PQR and WPQ for TWE in ASTM A182 F53/F55

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TERRANOVA S.r.l. — SAN PRIANO — MECCANICA

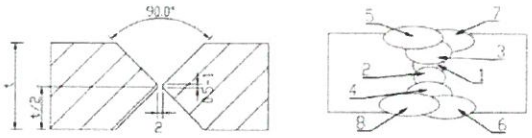
QW-482 WPS
WELDING PROCEDURE SPECIFICATION
According to SECTION IX OF ASME CODE
Ed. 2019
Foglio 1 di 2 / sheet 1 of 2

SOCIETA' *Company Name:*			
SPECIFICA DI SALDATURA N° *Welding Procedure Specification N°.:*	02/21	QUALIFICA DI SUPPORTO *Supporting PQR No(s).:*	18/09
REVISIONE *Revision:* 0 — DATA *Date:* 30/04/21		CLIENTE *Customer:*	N.A
TIPO *Type:*	MANUAL	COMMESSA *Job Nr.:*	N.A
PROCEDIMENTO DI SALDATURA *Welding Process:*	GTAW	DISEGNO N° *Drawing N°.:*	N.A

GIUNTO / Joints (QW-402)

SUPPORTO / Backing: YES	DISTANZA/Root spacing 1 mm
MATERIALE SUPPORTO / Backing Material (type): Yes	
No fusible metal	Weld metal
FERMI / Retainers: Yes NO	

DISEGNO DEL GIUNTO / *Joint Design:*



S= 25 mm

METALLO BASE / *BASE MATERIALS* (QW-403):

P.No: 10H	GRUPPO No *Group No:* 1	To P.No: 10H	CON GRUPPO No *With group No:* 1
O SPECIFICA TIPO E GRADO *Or Specification Type and Grade:*	ASTM SA 182 F51	CON SPECIFICA TIPO E GRADO *To Specification Type and Grade:*	ASTM SA 182 F51
O ANALISI CHIMICA E PROP. MECC. *Or Chem.Analysis and Mecch.Prop.:*		CON ANALISI CHIMICA E PROP. MECC. *To Chem.Analysis and Mecch.Prop.:*	
GAMMA SPESSORI *Thickness range:*			

METALLO BASE *Base Metalerial*	SMUSSO (mm) *Groove (mm):* 5 to 50	ANGOLO *Fillet:*	All weld sizes and parent metal thickness
GAMMA DIAMETRI TUBI *Pipe Dia. Range*	SMUSSO *Groove:* ≥ 73	ANGOLO *Fillet::*	All weld sizes and parent metal thickness

T Limits (S.Circ. Arc.) N.A.	T Limits for impact test : NA
t Pass > ½ in. (13 mm) NO PASS ≥ 13 mm	ALTRO *Other:* NO

METALLO D'APPORTO / *FILLER METALS* (QW-404):

PROCEDIMENTO *Process:*	GTAW		
Speci.No. (SFA): *Specification (SFA):*	A5.9		
AWS No:(Class): *AWS No:(Class):*	ER 2209		
F-NO No.: *F-NO No.:*	6		
A-NO No.: *A-NO No.:*	8		
DIAM. METALLO D'APPORTO *Diameter of filler metals::*	Ø 1.6 - 2.4 mm		
TIPO DEL METALLO D'APPORTO *Filler Metal Product Form::*	Solid Wire		
GAMMA SPESSORI *Thickness Range:*			
SMUSSO Groove:	5 mm to 50 mm		
ANGOLO *Fillet::*	All		
FILO-NOME COMMERCIALE *Electrode – Brand Name*	SIDER 2209		
COSTRUTTORE *Manufacturer:*	Soges		
t LIMITE (S.Circ. Arc.) t Limits (S.Circ. Arc.)	N.A		
CAMBIO DI CLASSIFICAZIONE *Ch'ange of classification:*	N.A		
METALLO APPORTO SUPPLEM. *Supplemental filler metal*	N.A		
ELEMENTI LEGA *Alloy elements*	--		

TERRANOVA S.r.l. — Loc. Le Lame — 61122 PESARO (PU) — MECCANICA

QW-482 WPS
WELDING PROCEDURE SPECIFICATION
According to SECTION IX OF ASME CODE
Ed. 2019

Foglio 2 di 2 / *sheet 2 of 2*

POSIZIONE / *POSITION* (QW-405)	
POSIZIONE SMUSSO *Position(s) Groove*:	1G
PROGRESSIONE SALDATURA *Welding progression (up/down)*:	N.A.
POSIZIONE SALD. ANGOLO *Position(s) of Fillet*:	N.A

PRERISCALDO / *Preheat* (QW-406)	
TEMP. PRERISCALDO MIN. *Preheat Temp. Min.*:	>= 20°C
TEMP. DI INTERPASS MAX. Interpass Temp. Max:	Max 90°C
MANTENIMENTO PRERISC. Preheat Maintenance:	NO

TRATTAMENTO TERMICO DOPO SALDATURA *POSTWELD HEAT TREATMENT* (QW-407)	
GAMMA DI TEMPERATURA *Temperat. Range*:	NONE
TEMPO DI MANTENIMENTO *Time Range*:	NONE

GAS (QW-408)	Gas(es)	% COMPOSIZIONE MISCELA *Percent composit. mixture*	PORTATA *Flow rate* l/min
PROTEZIONE *Shielding*:	Argon	99,99%	15
AGGIUNTO *Trailing*:	NO	//	//
ROVESCIO *Backing*:	Argon	99,99%	15

CARATTERISTICHE ELETTRICHE / *ELECTRICAL CHARACTERISTICS* (QW-409)			
CORRENTE *Current A.C.or D.C.*:	SEE TABLE	POLARITA' *Polarity*:	SEE TABLE
CAMPO AMPERAGGIO *Amps (Range)*:	SEE TABLE	CAMPO VOLTS *Volts (Range)*:	SEE TABLE
HEAT INPUT *Heat Input*:	MAX 1.70 Kj/mm		
CARATTERISTICHE DELL'ARCO PER GMAW *Mode of Metal Transfer for GMAW*:	N.A		
GAMMA DI VELOCITA' ALIMENTAZIONE FILO *Electrodes Wire Feed Speed Range*:	N.A		

TECNICA / *TECHNIQUE* (QW-410)	
PASSATA STRETTA O LARGA *String or Weave Bead*:	STRING
DIMENSIONE UGELLO *Orifice or Gas Cup Size*:	12 mm
PULIZIA INIZIALE E TRA LE PASSATE (spazzolatura, molatura,etc.) *Initial and Interpass Cleaning (Brushing, Grinding, etc.)*:	BRUSHING
METODO DI RIPRESA AL ROVESCIO *Method of Back Gouging*:	GRINDING
OSCILLAZIONE *Oscillation*:	NO
DISTANZA UGELLO DI CONTATTO/PEZZO *Contact Tube to Work Distance*:	N.A
PASSATA SINGOLA O MULTIPLA (per lato) *Single or Multiple Pass (For Side)*:	MULTIPLE
ELETTRODO MULTIPLO O SINGOLO *Multiple or Single Electrodes*:	SINGLE
PROCESSI TERMICI *Thermal process*:	NO
MARTELLATURA *Peening*:	NO
SPAZIATURA ELETTRODI *Electrode spacing*:	N.A

STRATI DI SALDATURA *Weld* Layer(s)	PROCED. DI SALDATURA *Welding* Process	METALLO D'APPORTO *Filler metal* Classif.	Dia.(mm)	CORRENTE *Current* POLARITA' *Polarity*	CAMPO AMPERE *Amp.Range*	CAMPO VOLTS *Voltage Range*	GAMMA VELOCITA' DI LAVORO *Travel speed Range* (mm/1')	ALTRO *Other*
1-2 1R-2R	GTAW	ER 2209	1.6	D.C. – E.N	155	16,5	12,5	no
3-4-5 3R-4R-5R	GTAW	ER 2209	2.4	D.C. – E.N	190	16,7	115	no
6-7 6R-7R	GTAW	ER 2209	2.4	D.C. – E.N	195	16,7	115	no
8 to 11 8R-11R	GTAW	ER 2209	2.4	D.C. – E.N	190	16,7	115	no

Redatto/*prepared by*:	Controllato/*checked by*:	Data/*date*:
Ing. G. Ghirardelli	G. Ghirardelli	30/04/21

Dott. Ing. G. Ghirardelli I.W.E. n. 120235A INTERNATIONAL WELDING ENGINEER

p.I. G. Ghirardelli IIW IT/I.W.T. 19034/A INTERNATIONAL WELDING TECHNOLOGIST

G. Luca Vergazzoli

TERRANOVA
SPRIANO Welcom MEC-RELA

PROCEDURE QUALIFICATION RECORD
Sect.IX of the ASME Code. 2017 Ed.
QW-483 (PQR)
Sheet 1 of 2 PQR Nr.**02/18**

Company Name:

Procedure Qualification Record PQR n° **02/18** Date **12/09/2018**

WPS N° **02/18 Rev.01**

Welding Process(es) **GTAW** Types **MANUAL**

Joint sketch (QW-402)



BASE METAL (QW-403)

Material Spec. **ASTM**

Type and Grade **A 182 Typ. 316L**

P.N°8 Group N° 1 to **P.N° 8 Group N° 1**

Thickness **20 (5 to 40)** T Limit Impact: **NA**

Diameter **NA** T Limit (S.Circ.Arc): **NA**

Other **No Pass ≥ 13mm**

FILLER METALS (QW-404) **GTAW**

SFA Specification **A5.9**

AWS Classification **ER 316LSi**

Filler Metal F. N° **6**

Weld Metal Analysis A. N° **8**

Size of Electrodes **Ø 1,6-2,4 mm**

Deposited Weld Metal t **5,0 mm to 40 mm**

t Limit (S.Circ.Arc) **NA**

Filler Metal Product Form **Solid Wire**

± Ø Supplemental Filler metal **Not Used**

Ø Alloy elements **Not Used**

Brand name **316LSi**

Manufacturer **Bohler**

POSITION (QW-405)

Position of Groove **1G**

Weld Progression (Uph. Or Dow.) **NA**

PREHEAT (QW-406)

Preheat Temperature **20** **°C**

Interpass Temperature **≤ 150 °C**

Preheat maintenance **NO**

Other **NO**

POSTWELD HEAT TREATMENT (QW-407)

Temperature **NA**

Time **NA**

T Limits **NA**

GAS (QW-408) % composition

	Gas(es)	(Mixture)	Flow Rate
Shielding	**Argon**	**99,99%**	**8 ÷ 12**
Shielding	//	//	//
Backing	**Argon**	**99,99%**	**8**

ELECTRICAL CHARACTERISTICS (QW-409)

Current **D.C.**

Polarity **GTAW: DC- GMAW: DC+**

Amperes **: 150 ÷ 195** V **13 ÷ 14**

Transfer mode **N.A.**

Heat Input (KJ / mm) **≤ 2,0 KJ / mm**

Heat Input 409.1 **NA**

Heat Input 409.2 **NA**

Travel Speed(mm/min) **200-250 mm/1'**

TECHNIQUE (QW-410)

Peening **Not Used**

String or Weawe Bead. **STRING**

Oscillation **NO**

Multipass or Single Pass (for Side) **MULTIPLE**

Single or Multiple Electrodes **SINGLE**

Use of thermal process **NO**

Closed to out Chamber **NO**

IIW
Dott. Ing. G. Ghirardelli
I.W.E. /120235A

TERRANOVA

PROCEDURE QUALIFICATION RECORD
Sect.IX of the ASME Code. 2017 Ed.
QW-483 (PQR)
Sheet 2 of 2 PQR Nr.**02/18**

Tensile Test (QW - 150)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ult.Total Load (KN)	Ult.Unit Stress (N/mm^2) ≥ 515	Charact.of Fail & Location
BW	**19,12**	**19,98**	**382,0**	**-----**	**551**	**Ductile out weld**
BW	**19,19**	**19,95**	**382,8**	**-----**	**552**	**Ductile out weld**

Guided Bend Test (QW - 160)

Type and Figure No.462.3 (a)	Result
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**
BW 10 X Thk - PLUNGER Ø 40 - ANGLE 180°	**Side / SATISFACTORY**

Toughness Test (QW - 170)

Specimen No.	Notch Location	Notch Type	Test Temp. °C	Impact Value	Lateral Expansion		Drop Weight	
					% Shear	Mils	Break	No Break
BW	**W.Z**	**KV**	**-196**	**67-75-68**	**0.50-0.65-0.50**			
	H.A.Z	**KV**	**-196**	**98-97-99**	**1.20-1.18-1.23**			

Fillet Weld Test (QW - 180)

Result-Satisfactory (yes/no) NO	Penetr.into Parent Meatal (yes/no) : //
Macro - Result: // NO	

Other Test

Type of Test			
VT Examination:	**Acceptable: carried out on 27/07/2018 By G. Ghirardelli**		
PT Examination:	**Result: NA**		
RT Examination	**Result: Satisfactory. See Omeco Report SND/1081/18 dated: 12/09/2018**		
Hardness Test	**Result: Satisfactory. See Omeco Report SAM/0511/18 dated: 12/09/2018**		
Macro Examination	**Result: satisfactory. See Omeco Report SAM/0511/18 dated: 12/09/2018**		
8Welders Name	**Tura Alessandro**	Clock No. //	Stamp No. **TA**
Test Conducted by	**Omeco S.r.l**	Laboratory Test No.	**Omeco S.r.l SAM/0511/18**
We certify that the statement in the record are correct and that the test welds were prepared,welded and tested in accordance with the requirements of Sect.IX of the ASME Code. 2015 Ed.			

Examiner or Examining Body
Ing.G. Ghirardelli IWE/IT 120235 A

IIW Dott. Ing G. Ghirardelli IWE /120235A INTERNATIONAL WELDING ENGINEER

Date **12/09/18**

Manufacturer:

By

TERRANOVA SPRING MEC-RELA

MANUFACTURER'S RECORD OF WELDER WELDING OPERATOR QUALIFICATION TEST (WPQ)

QW-301, Section IX, ASME Boiler and Pressure Vessel Code

QUALIFICATION TEST No. 02-21-CM

Welder's name	CASCATO MARCO	Clock No. -		Stamp No.	CM
Welding process(es) used	GTAW	Type	Manual		
Identification of WPS followed by welder during welding of test coupon	02/21	Rev.	00	Date	20/05/2021
Base material(s) welded	ASTM SA 182 Type F51	Thickness mm:	25,00 mm	**Diameter:**	n/a Plate
Filler metal specification (SFA) Class (QW-404)	SFA 5.9				

MANUAL OR SEMIAUTOMATIC FOR EACH PROCESS (QW-350 and QW-380)

	Actual Values	Range Qualified
Backing (metal,weld metal,welded from both sides,flux etc.) (QW-402)	with	**with**
Material : ASME P.No. to P.No. (QW-403)	10H	**1 to 15F , 34 , 41 to 49**
(x) Plate () Pipe - thk.: 25,00 mm - Dia.: ------ mm	Plate	**Plate & pipe Pipe Dia. ≥ 73 mm**
Filler metal specification (F.No) 6 (QW-404)	6	**6**
Consumable insert for GTAW or PAW	None	**None**
Filler metal variety	Solid	**Solid & Metalcored**
Weld deposit thickness for each welding process	25,00 mm (3 layers minimum)	**Max. to be welded**
Welding position (QW-405)	1G	**F (Flat)**
Progression (uphill/downhill)	Not Applicable	------
Backing gas for GTAW,PAW or GMAW; fuel gas for OFW (QW-408)	without	**with or without**
GMAW transfer mode (QW-409)	Not Applicable	------
GTAW welding current type/polarity (QW-409)	Straight (SP)	**Straight (SP)**
GTAW with or without filler metal (QW-404.14)	With	**With**

MACHINE WELDING VARIABLES FOR THE PROCESS USED (QW-360 and QW-380)

	Actual Values	Range Qualified
Direct/remote visual control	-	-
Automatic voltage control (GTAW)	-	-
Automatic joint tracking	-	-
Welding position	-	-
Consumable insert	-	-
Single or multiple passes for side/ Backing	-	-

GUIDED BEND TEST RESULT

Guide Bend Test Type	(X)QW-462.2 (Side) Result	( )QW-462.3(a)(Trans.R&F)Type	( )QW-462.3(b)(Long.R&F)Result
-	Satisfactory	-	-

Visual examination result (QW-302.4)

Radiographic test result (QW-304 and QW-305 Omeco Test certificate n° SPT/0263/21

(For alternative qualification of groove welds by radiography)

Fillet weld-Fracture test - Lenght and percent of defects - mm

Macro test fusion - fillet leg test - mm. X - mm. Concavity/convexity - mm.

Welding test conducted by Omeco

Mechanical tests conducted by Omeco Laboratory test No. SPT/0705/21

We certify that statements in this record are correct and that the test coupons were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code:

Test supervised by Ing. G. Ghirardelli

Dott. Ing. G. Ghirardelli IWE 120235A

Organization

Date 20 / 05 /2021

By

Welding Procedure Qualification Record (PQR) - ***Modulo di Verbale di qualificazione di procedura di saldatura (PQR)***
Welding procedure approval - Test certificate - ***Qualificazione della procedura di saldatura - Certificato di prova***

Manufacturer's Welding Procedure Ref. No. ***N°. di riferimento della procedura del costruttore***	**PQR 01/14 Ref. WPS n° 01/14**
Costruttore	
Examiner or test body - Ref. No. ***No. di identificazione dell'esaminatore o dell'ente di prova***	**Dott. Ing Giuseppe Ghirardelli IWE 120235/A**
Address ***Indirizzo***	**25048 Sonico (BS)**
Code / Testing Standard ***Codice / Norma di prova***	**ASME CODE SECT. IX 2013 Ed.**
Date of welding ***Data di esecuzione della saldatura***	**07/03/14**

Extent of approval
Campo della qualificazione

Welding process ***Procedimento di saldatura***	**GTAW**
Technique: ***tecnica di saldatura***	**String Beads** **Multipass**
Joint Type ***Tipo di giunto***	**All Joint Types Approved**
Parent metal ***Metallo(i) base***	**All P-No 10H G. No 1 to All P-No 10H G. No 1**
Metal Thickness (mm) ***Spessore del metallo base (mm)***	**5 to 40**
Outside diameter (mm) ***Diametro esterno (mm)***	**All diameters and product forms approved Ref QW211**
Filler Metal Type ***Tipo di metallo d'apporto***	**AWS SFA A5.9 ER 2209**
Shielding Gas / Flux ***Gas di protezione / Flusso***	**Ar 99,99%**
Tipo di corrente di saldatura	**DC-EN**
Welding position ***Posizioni di saldatura***	**All welding positions Except Vertical Up Approved**
Preheat ***Preriscaldo***	**20°C min**
Interpas ***Interpass***	**Max. 150 °C**
Post Weld Heat Treatment and / or ageing ***Trattamento termico e/o invecchiamento dopo saldatura***	**NO**
Other information ***Altre informazioni***	**NO**

We Certified that test welds prepared, welded and tested satisfactorily in accordance with the requirements of the code/testing standard indicated above.

Si certifica che i saggi di prova sono stati preparati, saldati e controllati con esito soddisfacente in conformità ai requisiti del codice / norma di prova sopra indicato

Location ***Luogo***	Date of issue ***Data di emissione***	Examiner or test body ***Esaminatore o Ente di prova*** Name/date/signature ***Nome/Data/firma***
Sonico (BS) ITALY	17 Marzo 2014	G Ghirardelli 17/03/2014

Detail of weld test - *Dettagli della prova di saldatura*

Location
Luogo 25048 Sonico (BS)

Examiner or test body
Esaminatore o Ente di prova Dott. Ing Ghirardelli IWE 120235/A

Manufacturer's Welding Procedure Ref / WPAR No.
N°. di riferimento della procedura del costruttore / No. WPAR
PQR 01/14 Ref. WPS n° 01/14

Method of preparation and Cleaning
Metodo di preparazione e pulitura
MACHINING & GRINDING

Manufacturer
Costruttore

Parent Material Specification
Specifica del materiale base ASTM SA 182 - F51

Welders name
Nome del saldatore Alessandro Tura

Welding process
Procedimento di saldatura GTAW

Material Thickness (mm)
Spessore del materiale (mm) 20 + 20

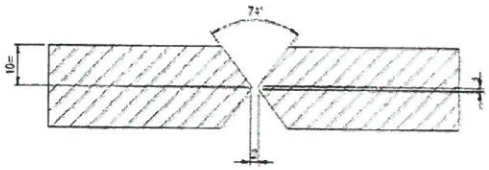
Joint Type
Tipo di giunto DOUBLE "V" BUTT WELD

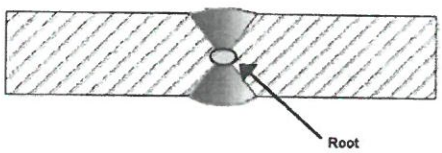
Outside diameter (mm)
Diametro esterno (mm) NA

Weld Preparation Detail (Sketch)
Dettagli della preparazione del giunto (schizzo)

Welding position
Posizioni di saldatura 1G

Joint





Welding Details / ***Parametri di saldatura***

Run *Passata No.*	Process *Procedimento*	Size of filler Metal *Dimensioni del metallo d'apporto*	Current *Corrente* *(A)*	Voltage *Tensione* *(V)*	Type of current *Tipo di corrente* Polarity *Polarità*	Wire Feed Speed *Velocità del filo* *(cm/min)*	Travel speed * *Velocità di saldatura* *(mm/min)*	Heat input * *Apporto termico* *(KJoules/mm)*
1-3	GTAW	Ø 2.4mm	135	15	DC-EN		130	0,9
R	GTAW	Ø 2.4mm	145	16	DC-EN		130	1,1
To Fill	GTAW	Ø 2.4mm	160	16	DC-EN		130	1,2

Filler Metal Classification and trade name
Classificazione del metallo d'apporto e denominaz. commerciale AWS SFA A5.9 ER 2209 Daiko Nicros (Solid Wire)

Any Special Baking or Drying
Eventuale ricottura o essicazione NO

Details of Back Gouging/Backing
Dettagli di solcatura/sostegno al rovescio YES - GRINDING

Gas / Flux - Shielding
Gas / Flusso - Protezione Ar 99,99%

Gas Flow Rate - Shielding
Portata gas protezione (l/min) 6÷8

Backing / ***Sostegno*** NO

Backing / ***Sostegno (l/min)*** NO

Tungsten Electrode type/Size
Elettrodo di tungsteno: Tipo/Diam. NO

Transfer mode
Modalità di trasferimento NA

Preheat Temperature
Temperatura di preriscaldo 20°C min

Interpass temperature
Temperatura tra le passate ≤ 150°C

Post-Weld Heat Treatment and/or Ageing
Trattamento termico e/o invecchiamento dopo saldatura: tempo, temperatura, metodo
NO

Pulsed arc
Arco pulsato NO

Location
Luogo Sonico (BS) ITALY

Date of issue
Data di emissione 17 Marzo 2014

Examiner or test body
Esaminatore o Ente di prova
Name/date/signature
Nome/Data/firma
G. Ghirardelli
17/03/2014

* If required / ***Se richiesto***

G. Luca Vergazzoli

Test results - *Risultati di prova*

Manufacturer's Welding Procedure Ref/WPAR No.
N°. di riferimento della procedura di saldatura del costruttore **PQR 01/14 Ref. WPS n° 01/14**

1.NDE TESTS / *Controlli non distruttivi*

Non destructive test *Controlli non distruttivi*	Performed by *Eseguito da*	Certificate Nr. and date *Certificato No. e data*
Visual / ***Visivo***	Satisfactory / Soddisfacente	Carried out on 07/03/2014
Magnetic Testing/ ***Magnetico***	Not performed	
Radiografy / ***Radiografico***	Satisfactory / Soddisfacente	See Report SBG/0307/14
Ultrasonic Exam. / ***Ultrasuoni***	Not performed	

2.TENSILE TESTS / *Prove meccaniche:*

Performed by / ***Eseguito da*** OMECO S.r.L ALBANO S.A (BG) Date / ***Date*** 17/03/14

Test No. *No di test*	Section *Sezione del provino* (mm)	All/part of thk *Tutto so. o parte sp.*	Rm *Resistenza rottura* (N/mm^2) ≥ 620	Re *Resistenza snervamento* (N/mm^2)	Elongation A *Allungamento* %	Reduction of area Z *Strizione* %	Fracture Location & type *Rottura* (mb/saldatura)	Remarks *Note*
01/14	ϕ 12,70	All	725	--	--	broken in the base-metal		
01/14	ϕ 12,65	All	729	--	--	broken in the base-metal		

3.BEND TESTS / *Prove di piega:*

Performed by / ***Eseguito da*** OMECO S.r.L ALBANO S.A (BG) Date / ***Date*** 17/03/14

No. of test *No. di test*	Specimen type (trans. or long.) *Provino trasv. o longitudinale*	Ø Former (mm) *Ø del mandrino*	Face bend test *Piega al diritto*	Side bend test *Piega laterale*	Angle *Angolo di piega*	Remarks *Note*
01/14	SIDE	40		x	180°	SATISFACTORY
01/14	SIDE	40		x	180°	SATISFACTORY
01/14	SIDE	40		x	180°	SATISFACTORY
01/14	SIDE	40		x	180°	SATISFACTORY

4.IMPACT TESTS / *Resilienze:*

Performed by / ***Eseguito da*** Date / ***Date***

Test No. *No di test*	Temp. °C *Temp. °C*	Specimen location *Zona di prelievo*	Weld metal *Centro saldatura* Individual *Singolo*	Weld metal *Centro saldatura* Average *Media*	HAZ *ZTA* Individual *Singolo*	HAZ *ZTA* Average *Media*	BM *BM* Individual *Singolo*	BM *BM* Average *Media*	Remarks *Note*



Test results - ***Risultati di prova***

Manufacturer's Welding Procedure Ref/WPAR No.
N°. di riferimento della procedura di saldatura del costruttore **PQR 01/14 Ref. WPS n° 01/14**

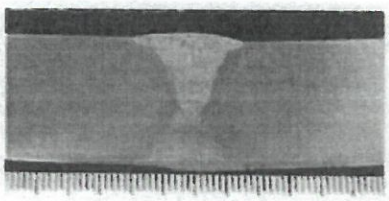
5.HARDNESS TESTS / ***Controllo durezza***

Performed by / ***Eseguito da*** OMECO S.r.L ALBANO S.A (BG)
Date / ***Data*** 17/03/14

POS	B.M.	H.A.Z.	W.M.	H.A.Z.	B.M.
LINE 1	238-238-238	238-254-254	237-237-237	243-247-247	243-242-242
LINE 2	243-242-242	297-297-297	297-285-285	285-281-272	251-251-251
LINE 3	238-238-238	247-251-253	237-237-268	268-268-258	249-242-242

6.MACROGRAPHIC EXAMINATION / ***Controllo macrografico: Satisfactory / Soddisfacente***
MICROGRAPHIC EXAMINATION / ***Controllo micrografico:***

Performed by / ***Eseguito da*** OMECO S.r.L ALBANO S.A (BG)
Date / ***Data*** 17/03/14



7.OTHER EXAMINATION OR TESTS / ***Altri controlli:*** NO

Tests carried out in accordance with the requirements of:
Prove eseguite in accordo con i requisiti della norma: ASME CODE SECT. IX 2013 Ed.

Test result were acceptable
I risultati risultano accettabili

We cerify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of a section IX of the ASME code 2013 Ed.

Annexed Documents Identification *Elenco documenti allegati*	Examiner or test body *Esaminatore o Ente di prova*	Name/date/signature *Nome/Data/Firma*
WPS 01/14 Rev. 0		
Test Report SBG/0307/14		
Test Report SBG/0308/14		
Test Report SBG/0309/14		

CERTIFICATO DI CONFORMITA
NO 80944870000010
(EN 10204 3.1)

UGITECH
Providing special steel solutions

Ugitech Tréfi. Bourg en Bresse
3 à 7 chemin de Majornas
01000 Bourg en Bresse

CLIENTE	NICROS SRL
VOSTRO ORDINE	556
NORMA	AWS ER2209 ;
NOSTRO ORDINE	0000427726 / 000290
PRODOTTI	800817 * FILO PER SALTADURA TIG UGI ARC45N STANDARD BACCHETTA * 1,600MM 0,020-/0,000MM LUNG. 1000,000 MM 5,000-/5,000MM *
DIAMETRO	1,600 mm
NO LOTTO DEL CLIENTE	COLATA CLIENTE
CLIENTE ARTICOLO	TIG 4462G BAG 1,600 1000 S QUALITA TIG ER 2209

ANALISI CHIMICA COLATA QL092 No LOTTO 10121029

% C	% Si	% Mn	% Ni	% Cr	% Mo	% Cu	% S	% P	% N
0,0110	0,3380	1,6800	8,6900	22,7100	3,1600	0,0530	0,0010	0,0170	0,1560

PROVA MECCANICA

	Dimensione 1 (mm)
0001	1,595

Peso consegnato 210,000 KG		CONTROLLATO E VALIDATO PER IL SERVIZIO QUALITA DI BOURG

Soges
Via alla stazione di S. QUIRICO, 7
16163 GENOVA / ITALY
TEL. 010/7401941 - FAX 010-7413591
www.soges-spa.it - e-mail: soges@soges-spa.it

Soges SpA
Via alla Stazione di San Quirico 7
16163 GENOVA BOLZANETO / IT
TEL. - FAX
E-mail: - web:
Partita IVA IT 00849330105

CERTIFICATO DI CONFORMITA' / CERTIFICATE OF CONFORMANCE

CERTIFICATO N° / CERTIFICATE N°	DATA / DATE	DIAMETRI / DIAMETERS
DQ-190483	13/06/2019	2,4

DESCRIZIONE / DESCRIPTION

SIDER 2209 DUPLEX

PRODOTTO / ITEM	BATCH N° / COLATA N°
BAC. SIDER 2209 D. 2.4X1000	182002

Analisi chimica / Chemical analysis (%) - EN 10204 - 3.1

Elemento Element	Valori di riferimento Reference Values	AWS A5.9 ER2209		EN 14343-A 22 9 3 N L		Valore / Value
C	Minore	0,0000	0,0300	0,0000	0,0300	0,013
CR	Compreso	21,5000	23,5000	21,0000	24,0000	22,73
CU	Minore	0,0000	0,7500	0,0000	0,3000	0,047
MN	Compreso	0,5000	2,0000	0,0000	2,5000	1,54
MO	Compreso	2,5000	3,5000	2,5000	4,0000	3,08
N	Compreso	0,0800	0,2000	0,1000	0,2000	0,158
NI	Compreso	7,5000	9,5000	7,0000	10,0000	8,56
P	Minore	0,0000	0,0300	0,0000	0,0300	0,019
S	Minore	0,0000	0,0300	0,0000	0,0200	0,001
SI	Minore	0,0000	0,9000	0,0000	1,0000	0,531

Caratteristiche meccaniche / Mechanical properties - EN 10204 - 2.2	
Resistenza alla trazione Tensile Strenght Rm	690,0000
Limite di snervamento Yield Strenght	520,0000
Allungamento Elongation A	20,0000

	Ferrite
FN(DeLong)	0,00
WRC(1992)	0,00
FN(Schaeff.)	0,00

I dati riportati sono ricavati dai documenti del fornitore in nostro possesso

The data are obtained from the manufacturer's documents in out possession

Certificato generato da un sistema informatico, valido senza firma

The ceritficate was generated by a customer system, and is valid without signature

Articolo commercializzato

Soges SpA

voestalpine Böhler Welding Italia S.r.l.

Via Palizzi, 90
I – 20157 MILANO MI
Tel. +39 02 39017.1
Fax +39 02 39017244

www.voestalpine.com/welding

Certificato 2.2
Test Report 2.2

secondo / as per : EN 10204
No. : No. : 2018-2014520918-40-103395-003
Rev. 0 Page / Page : 1 / 1

MARCELLO NEGRETTI

VIA LEONARDO DA VINCI 10/G
25043 BRENO
Italia

Ordine N°	PO no.	N.36	del / of	17.04.2018
Ordine N°	Order no.	1014210396		
Bolla di consegna/Pos./Splitt.	Delivery note/pos./splitt	2014520918/000000/000040	del / of	18.04.2018

Oggetto test	Product	bacchetta/filo GTAW / GTAW rod/wire
Denominazione commerciale	Trade name	**BÖHLER AWS ER316LSi**
Classificazione norma	Standard designation	EN ISO 14343-A: W 19 12 3 L Si
		AWS A5.9: ER316LSi

259260
31112
1SB8A00W
0140

Dimensione	Dimension	1,6 x 1000 mm
Colata - Lotto	Heat no.	103395
Quantità fornita	Quantity	10,0 KG

Composizione chimica in % del prodotto **Chemical composition in % of the product**

C	Si	Mn	P	S	Cr	Mo	Ni	Cu						
< 0,01	0,82	1,5	0,022	0,011	18,1	2,5	12,1	0,1						

proprietà meccaniche **Mechanical properties**

Prova di trazione Tensile test

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 5d) %	Z %	WBH PWHT	Note Remarks
20°C	≥ 380	≥ 420	≥ 560	≥ 35			

Prova di resilienza Impact test

T	Energia di impatto Impact energy KV / J	Medio Average KV / J	Espansione lat. Lateral expansion mm	Frattura cristalliina Shear fracture %	WBH PWHT	Note Remarks
20°C	≥ 70					

Questo certificate è stato emesso con sistema automatizzato e non richiede firma
This certificate was issued by DP-equipment and does not require signature.

Centro / Town Milano

Data / Date 18.04.2018

Q.A. representative / Authorized representative
Zuin

voestalpine

voestalpine Böhler Welding Italia S.r.l.

Via Palizzi, 90
I – 20157 MILANO MI
Tel. +39 02 39017.1
Fax +39 02 39017244

www.voestalpine.com/welding

Certificato 2.2
Test Report 2.2

secondo / as per : EN 10204
No. : No. : 2018-2014522874-10-103774-003
Rev. 0 Page / Page : 1 / 1

MARCELLO NEGRETTI

VIA LEONARDO DA VINCI 10/G
25043 BRENO
Italia

Ordine N°	PO no.	n.56	del / of	30.05.2018
Ordine N°	Order no.	1014211815		
Bolla di consegna/Pos./Splitt.	Delivery note/pos./splitt	2014522874/000000/000010	del / of	01.06.2018

Oggetto test	Product	bacchetta/filo GTAW / GTAW rod/wire	
Denominazione commerciale	Trade name	**BÖHLER AWS ER316LSi**	259260
lassificazione norma	Standard designation	EN ISO 14343-A: W 19 12 3 L Si	31196
		AWS A5.9: ER316LSi	1SB8A00W 0140

Dimensione	Dimension	2,4 x 1000 mm
Colata - Lotto	Heat no.	103774
Quantità fornita	Quantity	20,0 KG

Composizione chimica in % del prodotto **Chemical composition in % of the product**

C	Si	Mn	P	S	Cr	Mo	Ni	Cu						
0,01	0,89	1,6	0,022	0,010	18,2	2,6	12,0	0,1						

proprietà meccaniche **Mechanical properties**

Prova di trazione Tensile test

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 5d) %	Z %	WBH PWHT	Note Remarks
20°C	≥ 380	≥ 420	≥ 560	≥ 35			

Prova di resilienza Impact test

T	Energia di impatto Impact energy KV / J	Medio Average KV / J	Espansione lat. Lateral expansion mm	Frattura cristalliina Shear fracture %	WBH PWHT	Note Remarks
20°C	≥ 70					

Questo certificate è stato emesso con sistema automatizzato e non richiede firma
This certificate was issued by DP-equipment and does not require signature.

tro / Town Data / Date Q.A. representative / Authorized representative
no 01.06.2018 Zuin

voestalpine

Base Load Power Hub (BLPH)

PT, PDT, TT, LT RADAR

FAT REPORT

Document Number: -

Document Class: 3

TERRANOVA
SPRIANO Vatcom MEC-RELA

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

WITNESS TEST REPORT

- SPRIANO® JOB: 4718_OS
- Contract No. CW-I-WP4-2023-05
- Project: HOLLANDSE KUST NOORD WIND PARK Project
- Equipment: Pressure Transmitters, Differential Pressure Transmitters, Temperature Transmitters, Radar Level Transmitter
- Total Number of items: 31

TAG LIST:

SST77B DIFFERENTIAL PRESSURE TRANSMITTERS:

43-LT-001
43-LT-003

SST76 PRESSURE TRANSMITTERS – process connection THREADED:

25-PT-001	25-PT-006	25-PT-009	25-PT-012	43-PT-001	64-PT-031A
25-PT-002	25-PT-037	25-PT-043	25-PT-049	50-PT-014	64-PT-031B
25-PT-004	25-PT-008	25-PT-011	25-PT-055A	63-PT-003	64-PT-002
25-PT-035	25-PT-040	25-PT-046	25-PT-055B	63-PT-004	80-PT-002

SST72 TEMPERATURE TRANSMITTERS with THERMOWELL:

50-TT-001 / 50-TE-001 / 50-TW-001
50-TT-002 / 50-TE-002 / 50-TW-002

SST76 PRESSURE TRANSMITTERS – process connection FLANGED:

50-PT-001
50-PT-002

KRG RADAR LEVEL TRANSMITTER

55-LIT-001

APPLICABLE DOCUMENTS:

- ITP doc. number ITP 1724000979-QC-ITP-00002 rev. 02;
- Dimensional drawings doc. number 1724000979-IN-DA-00003 rev. 03;
- List of Spare Parts doc. number 1724000979-COM-LIS-00011 rev. 01.

Today 05/08/2024, in presence of the inspectors mr. Gobbi and mr. Vergazzoli, following activities has been performed:

- Point 3 – Visual Inspection (W);
- Point 4 – Visual Check of Tag Plate (W);
- Point 5 – Check of Quantities (W);
- Point 6 – Dimensional Check (SW – one item for each instrument type);
- Point 7 – Functional and Calibration Test (W);
- Point 8 – Insulation Check (SW – one item for each instrument type);
- Point 10 – Visual Check of Spare Parts (W).

OVERALL RESULT: SATISFACTORY

TERRANOVA® SPRIANO Valcom MEC-RELA

Terranova dei Passerini, 05/08/2024

G. Luca Vergazzoli
R
Inspector
05/08/24

TERRANOVA® THE PROCESS INSTRUMENTATION GROUP	SCHEDA STRUMENTAZIONE	MOD SCS	
		REV	0

NOME:	CAL 10	**CLASSE:**	B	**MATRICOLA:**	C090610	VECCHIO CODICE:	-
COSTRUTTORE:	JUWEL PLUS			MODELLO:	JUWEL PLUS	RIVENDITORE:	-
DESCRIZIONE:	CALIBRO DIGITALE						
FUNZIONE:	EFFETTUARE MISURE DI PEZZI MECCANICI						
CAMPO DELLO STRUMENTO:	0-200mm						
PRECISIONE:	0.05%FS						
FREQUENZA VERIFICA:	1 ANNO		ISTRUZIONE:	ICS_CAL_001		UBICAZIONE:	RIC

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
19/05/2023	OP02		Inserito nella strumentazione CL.B	OP2	mag-24
28/05/2024	OP02			OP2	mag-25

REVISIONE	DATA	DESCRIZIONE MODIFICA	FUNZIONE E FIRMA
0	10/10/2017	EMISSIONE	RPR

TERRANOVA® SPRIANO Yalcom MEC RELA

G. Luca Vergazzoli W R Inspector 030 QHC 05/08/24

Robbi x CROSSWIND 05/08/24

TERRANOVA® THE PROCESS INSTRUMENTATION GROUP	SCHEDA STRUMENTAZIONE	MOD SCS
		REV 0

NOME:	GPA 03	**CLASSE:**	B	**MATRICOLA:**	611221	VECCHIO CODICE:	GENP12
COSTRUTTORE:	MENSOR			MODELLO:	CPC 6000	RIVENDITORE:	SCANDURA
DESCRIZIONE:	GENERATORE DI PRESSIONE AUTOMATICO						
FUNZIONE:	GENERARE PRESSIONE PER TARATURA E CONTROLLO						
CAMPO DELLO STRUMENTO:	0-103 barA 0-4,8 barA						
PRECISIONE:	0,01% FS						
FREQUENZA VERIFICA:	1 ANNO			ISTRUZIONE:	ICS_GPA_001	UBICAZIONE:	TAR

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
04/12/2012			Inserito nella strumentazione CL.B		feb-13
28/02/2013	OP01	OK		CA	feb-14
05/03/2014	OPD	OK		VM	mar-15
20/03/2015	OPD	OK		VM	mar-16
19/03/2016	OPD	OK		VM	mar-17
30/03/2017	OPD	OK		VM	mar-18
29/03/2018	OPD	OK		VM	mar-19
27/03/2019	OPD	OK		VM	mar-20
31/03/2020	OPD	OK		VM	mar-21
23/03/2021	OPD	OK		VM	mar-22
29/03/2022	OPD	OK		VM	mar-23
12/06/2023	OPD	OK		MV	mar-24
28/03/2024	OPD	OK		MV	mar-25

REVISIONE	DATA	DESCRIZIONE MODIFICA	FUNZIONE E FIRMA
0	04/12/2012	EMISSIONE	RPR

TERRANOVA® SPRIANO Valcom MEC-RELA

G. Luca Mraggiolli W Inspector 030 05/08/24 QIC

CROSSWIND 05/08/24

TERRANOVA® THE PROCESS INSTRUMENTATION GROUP	SCHEDA STRUMENTAZIONE	MOD SCS
		REV 0

NOME:	MEG 05	**CLASSE:**	B	**MATRICOLA:**	061006/1073	VECCHIO CODICE:	MEG05
COSTRUTTORE:	MEGGER			MODELLO:	MIT310IT	RIVENDITORE:	ELDES
DESCRIZIONE:	MISURATORE DI ISOLAMENTO						
FUNZIONE:	VERIFICARE L'ISOLAMENTO TRA 2 PUNTI						
CAMPO DELLO STRUMENTO:	0-1Gohm						
PRECISIONE:	3% FS						
FREQUENZA VERIFICA:	1 ANNO			ISTRUZIONE:	ICS_MEG_001	UBICAZIONE:	TAR

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
04/12/2012			Inserito nella strumentazione CL.B		ott-13
30/10/2013	OP04	OK		ZR	ott-14
31/10/2014	OP04	OK		ZR	ott-15
23/10/2015	OP04	OK		ZR	ott-16
27/10/2016	OP04	OK		ZR	ott-17
24/11/2017	OP04	OK		ZR	ott-18
27/11/2018	OP04	OK	Tasto di blocco non funzionante	ZR	ott-19
16/10/2019	OP10	OK	Tasto di blocco non funzionante	FD	ott-20
15/10/2020	OP03	OK	Tasto di blocco non funzionante	RD	ott-21
18/10/2021	OP03	OK	Tasto di blocco non funzionante	RD	ott-22
17/11/2022	OP03	OK	Tasto di blocco non funzionante	RD	ott-23
09/11/2023	OP03	OK	Tasto di blocco non funzionante	RD	ott-24

REVISIONE	DATA	DESCRIZIONE MODIFICA	FUNZIONE E FIRMA
0	04/12/2012	EMISSIONE	RPR

TERRANOVA® SPRIANO Valcon MEC-RELA

G. Luca Pergazzoli W R Inspector 030 05/09/24 2nd

CAOSSWIND 05/09/24

TERRANOVA® THE PROCESS INSTRUMENTATION GROUP	SCHEDA STRUMENTAZIONE	MOD SCS
		REV 0

NOME:	MET 04	**CLASSE:**	B	**MATRICOLA:**	/	VECCHIO CODICE:	
COSTRUTTORE:	METRICA			MODELLO:	REF 08365	RIVENDITORE:	
DESCRIZIONE:	METRO						
FUNZIONE:	CONTROLLO LUNGHEZZA						
CAMPO DELLO STRUMENTO:	0-5 mt						
PRECISIONE:							
FREQUENZA VERIFICA:	1 ANNO			ISTRUZIONE:	ICS_MET_001	UBICAZIONE:	AEM

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
23/07/2014	-	-	Inserito nella strumentazione CL.B		mag-15
29/05/2015	OP02			NF	mag-16
25/05/2016	OP02			NF	mag-17
04/05/2017	OP02	OK		NF	mag-18
23/05/2018	OP02	OK		NF	mag-19
23/05/2019	OP02	OK		NF	mag-20
30/05/2020	OP07	OK		BL	mag-21
30/05/2021	OP07	OK		FA	mag-22
20/05/2022	OP09	OK		RS	mag-23
15/05/2023	OP09	OK		RS	mag-24
09/05/2024	OP09	OK		RS	mag-25

REVISIONE	DATA	DESCRIZIONE MODIFICA	FUNZIONE E FIRMA
0	23/07/2014	EMISSION	RPR

TERRANOVA® SPRIANO MEC-RELA

G. Luca Bergazzoli W B Inspector e30 05/08/24 RHC

CROSSWIND 07/08/24

TERRANOVA® THE PROCESS INSTRUMENTATION GROUP	SCHEDA STRUMENTAZIONE	MOD SCS
		REV 0

NOME:	PAN 17	**CLASSE:**	B	**MATRICOLA:**	-	VECCHIO CODICE:	-
COSTRUTTORE:	VALCOM SOLUTIONS			MODELLO:	-	RIVENDITORE:	-
DESCRIZIONE:	PANNELLO GENERATORE E MISURATORE A 3 DISPLAY						
FUNZIONE:	GENERAZIONE E MISURA DI TENSIONE E CORRENTE						
CAMPO DELLO STRUMENTO:	0-20mA						
PRECISIONE:	0.01%FS						
FREQUENZA VERIFICA:	1 ANNO			ISTRUZIONE:	ICS_PAN_001	UBICAZIONE:	TAR

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
-	-	-			ott-11
14/11/2011	OP03	OK		AC	nov-12
14/11/2012	OP03	OK	RICALIBRATI I DISPLAY	AC	nov-13
29/11/2013	OP03	OK	RICALIBRATI I DISPLAY	AC	nov-14
28/11/2014	OP03	OK	RICALIBRATI I DISPLAY 2,3	AC	nov-15
03/11/2015	OP03	OK	RICALIBRATI DISPLAY 1,2,3	AC	nov-16
28/11/2016	OP03	OK	RICALIBRATI DISPLAY 1,2,3	AC	apr-17
26/04/2017	OP07	OK	RICALIBRATI DISPLAY 1,2,3	DZ	apr-18
23/04/2018	OP03	OK	RICALIBRATO DISPLAY 2	AC	apr-19
03/04/2019	OP03	OK	RICALIBRATI DISPLAY 1,2,3	AC	apr-20
06/03/2020	OP04	OK		AC	mar-21
18/03/2021	OP04	OK	RICALIBRATO DISPLAY 2	AC	mar-22
28/03/2022	OP04	OK	RICALIBRATI DISPLAY 1,2,3	AC	mar-23
23/03/2023	OP04	OK	RICALIBRATI DISPLAY 1,2,3	AC	mar-24
27/03/2024	OP04	OK	RICALIBRATO DISPLAY 3	AC	mar-25

REVISIONE	DATA	DESCRIZIONE MODIFICA	FUNZIONE E FIRMA
0	27/03/2008	EMISSIONE	RPR

TERRANOVA

G. Luca Vergazzoli W R Inspector 080 05/08/24 ERC

Lotta x Cross Wind 05/08/24

TERRANOVA

INSTRUMENTATION SHEET

MOD SCS

REV 0

NAME	TAM 07	CLASS	A	S/N	69736/17	OLD CODE	CMECLA07
MANUFACTURER	OFFICINA			MODEL		SUB SUPPLIER	-
DESCRIPTION	Anello filettato conico 1/2- 14 NPT						
FUNCTION	Componente meccanico di riferimento per verifica conformita materiale in ingresso						
INSTRUMENT RANGE	-						
ACCURACY	VEDI CERTIFICATO						
FREQUENCY CHECKS	2 ANNI		INSTRUCTION	ESTERNA		LOCATION	RIC

CHECK DATE	CHECKED BY	RESULT	NOTES	SIGNATURE	NEXT CHECK
21/05/2014	ENTE EST	OK	Rapp. n:2014/10976-LATn.CT-TF-0010	-	mag-19
03/05/2019	ENTE EST	OK	Rapp. Di prova N°: 2019/ 13592	-	mag-24
07/04/2021	ENTE EST	OK	Rapp. Di prova N°: 2021/ 10712	RGQ	apr-23
25/05/2023	ENTE EST	OK	Rapp. Di prova N°: 2023/ 18127	RGQ	MAY-25

REVISION	DATE	DESCRIPTION	SIGNATURE
08/06/2023	25/05/2023	UPDATED SHEET	RGQ
2	22/06/2017	UPDATED SHEET	RGQ

TERRANOVA SPRIANO MEC-RELA

G. Luca Vergazzoli
W R
Inspector OBO
05/08/24 RMC

CROSS WIND
05/08/24

COSTRUZIONE UTENSILI E CALIBRI FILETTATI
TAMBURINI s.r.l - 25080 MAZZANO (BRESCIA) ITALY - VIA G. PASTORE, 6
TEL. +39 030.2791033 - FAX +39 030.2594494
E-mail: info@tamburinigroup.it - www.tamburinigroup.it

LABORATORIO METROLOGICO TEMPERATURA 20°C

RAPPORTO DI TARATURA N°: 2023/18127

Spett/le:
TERRANOVA S.R.L. (003648V)
/
/ / (/)

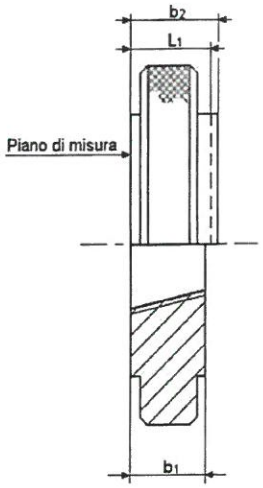
Data: 25/05/2023
Denominazione: **Anello filettato conico 1/2 - 14 NPT**

MATRICOLA: 69736/17

TERRANOVA
SPRIANO MEC-RELA

Codice Cliente : TAM07
Riferimento Norma : ANSI/ASME B1.20.1:1983
Istruzione Controllo : LM-105-01
Campione riferimento : Risc. fil. con. 1/2 NPT, cod. 0020, Cert. LAT n° CT-TF-0665
Campione in corso di validità al momento della taratura
Strumento utilizzato : Riscontri conici
Ordine Cliente : 52/F del 15/05/2023

	QUOTE (mm)		
	Teoriche	**Toll.**	**Rilevate**
Ø Esterno	21,230	MIN.	Scaricato
Ø Medio(1)	19,772	±0,008	19,773
Ø Nocciolo (2)	18,564	0/0,025	18,570
Passo	1,814	±0,008	1,814
Semiangolo L.M.	30°	±15'	29°49'
Semiangolo L.O.	30°	±15'	30°07'
Lunghezza di base L1	8,128	0/0,025	8,147
Lunghezza b2	9,942	0/0,025	9,955
Lunghezza b1	6,314	0/0,025	6,330
Conicità su L1	0,508	-0,023/0	0,514



L.M. = Lato Marcatura
L.O. = Lato Opposto

(1) Riscontro cod. 0020
(2) Riscontro cod. 6017/B

OSSERVAZIONI:
Le quote si intendono rilevate sul "Piano di Misura", coincidente con il piano della faccia d'imbocco dell'anello.
Controllo eseguito su calibro usato di Vostra proprietà.
L'incertezza di misura sul Ømedio è U95= 4,1 µm.

CROSSWIND
05/05/23

G. Luca Vergazzoli
W R
Inspector

IL RESPONSABILE LM
Sandrini Ing. Fabio

* Questo rapporto di Taratura non può essere riprodotto, anche in forma parziale, senza l'autorizzazione della società Tamburini.
* Il presente rapporto riguarda esclusivamente il campione esaminato.
* Tale rapporto non è emesso sotto accreditamento e non è coperto dagli accordi EA-MLA.

TERRANOVA® THE PROCESS INSTRUMENTATION GROUP	SCHEDA STRUMENTAZIONE	MOD SCS	
		REV	0

NOME:	TER 01	**CLASSE:**	A	**MATRICOLA:**	134903 / S24382	VECCHIO CODICE:	-
COSTRUTTORE:	EUTECH ltd			MODELLO:	Temp 6	RIVENDITORE:	OPTO-LAB srl
DESCRIZIONE:	Catena termometrica, indicatore con sonda a PT100						
FUNZIONE:	Tarare termometri classe B						
CAMPO DELLO STRUMENTO:	-50÷200°C						
PRECISIONE:	±0.3°C						
FREQUENZA VERIFICA:	5 ANNI			ISTRUZIONE:	ESTERNA	UBICAZIONE:	RGQ

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
16/06/2003	ENTE EST	OK	-		lug-08
14/10/2008	ENTE EST	OK	Portata scadenza da 5 a 10 anni		ott-13
13/07/2009	ENTE EST	RIPARARE	Sonda distrutta e sostituita		
29/07/2009	ENTE EST	OK	-		lug-14
24/06/2014	ENTE EST	OK	-		giu-19
20/06/2019	ENTE EST	OK	-		giu-24
10/06/2024	ENTE EST	OK			giu-29

REVISIONE	DATA	DESCRIZIONE MODIFICA	FUNZIONE E FIRMA
1	05/12/2012	AGGIORNATA SCHEDA	RGQ
2	22/06/2017	AGGIORNATA SCHEDA	RGQ

TERRANOVA® SPRIANO Yalcom MEC RELA

x CROSS WINDS 05/07/24

G. Luca Vergazzoli W R Inspector 030 EMC 05/07/24

CAMAR Elettronica s.r.l.
Via Mulini Esterna, 18
41012 Carpi (MO)
Tel 059 663006 Fax 059 663128
Web: www.camarelettronica.it

Centro di Taratura LAT 123
Calibration Centre
Laboratorio Accreditato di Taratura
Accredited Calibration Laboratory

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

LAT 123

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

Signatory of EA, IAF and ILAC Mutual Recognition Agreements

CERTIFICATO DI TARATURA LAT 123 24-ST-1956
Certificate of Calibration

- data di emissione / *date of issue*: 2024-06-10
- cliente / *customer*: TERRANOVA S.r.l. Via Rosso Medardo, 16 - 20159 Milano (MI)
- destinatario / *receiver*: TERRANOVA S.r.l. Via A.Gramsci, 1 - 26827 Terranova dei Passerini (LO)

Il presente certificato di taratura è emesso in base all'accreditamento LAT 123 rilasciato in accordo ai decreti attuativi della legge n. 273/1991 che ha istituito il Sistema Nazionale di Taratura (SNT).
ACCREDIA attesta le capacità di misura e di taratura, le competenze metrologiche del Centro e la riferibilità delle tarature eseguite ai campioni nazionali e internazionali delle unità di misura del Sistema Internazionale delle Unità (SI).
Questo certificato non può essere riprodotto in modo parziale, salvo espressa autorizzazione scritta da parte del Centro.

This certificate of calibration is issued in compliance with the accreditation LAT 123 granted according to decrees connected with Italian law No. 273/1991 which has established the National Calibration System. ACCREDIA attests the calibration and measurement capability, the metrological competence of the Centre and the traceability of calibration results to the national and international standards of the International System of Units (SI).
This certificate may not be partially reproduced, except with the prior written permission of the issuing Centre.

Si riferisce a / *Referring to*

- oggetto / *item*: Catena Termometrica con sonda a termoresistenza Pt100
- costruttore / *manufacturer*: indic.: EUTECH Instruments Ltd. sonda: N.n.
- modello / *model*: indic.: Temp 6 sonda: PT56L 1/5 DIN (PT100)
- matricola / *serial number*: indic.: 134903 sonda: 24382
- data di ricevimento oggetto / *date of receipt of item*: –
- data delle misure / *date of measurements*: 2024-06-06 - 2024-06-07
- registro di laboratorio / *laboratory reference*: BCSGL/91199

I risultati di misura riportati nel presente Certificato sono stati ottenuti applicando le procedure di taratura citate alla pagina seguente, dove sono specificati anche i campioni o gli strumenti che garantiscono la catena di riferibilità del Centro e i rispettivi certificati di taratura in corso di validità. Essi si riferiscono esclusivamente all'oggetto in taratura e sono validi nel momento e nelle condizioni di taratura, salvo diversamente specificato.
The measurement results reported in this Certificate were obtained following the calibration procedures given in the following page, where the reference standards or instruments are indicated which guarantee the traceability chain of the laboratory, and the related calibration certificates in the course of validity are indicated as well. They relate only to the calibrated item and they are valid for the time and conditions of calibration, unless otherwise specified.

Le incertezze di misura dichiarate in questo documento sono state determinate conformemente alla Guida ISO/IEC 98 e al documento EA-4/02. Solitamente sono espresse come incertezza estesa ottenuta moltiplicando l'incertezza tipo per il fattore di copertura *k* corrispondente ad un livello di fiducia di circa il 95 %. Normalmente tale fattore *k* vale 2.
The measurement uncertainties stated in this document have been determined according to the ISO/IEC Guide 98 and to EA-4/02. Usually, they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor k corresponding to a confidence level of about 95%. Normally, this factor k is 2.

Direzione tecnica
(Approving Officer)
p. i. Cristian Pratissoli

TERRANOVA® SPRIANO MEC-RELA

G. Luca Vergazzoli
Inspector

CamScanner

CAMAR Elettronica s.r.l.
Via Mulini Esterna, 18
41012 Carpi (MO)
Tel 059 663006 Fax 059 663128
Web: www.camarelettronica.it

Centro di Taratura LAT 123
Calibration Centre
Laboratorio Accreditato di Taratura
Accredited Calibration Laboratory

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

LAT 123

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

Signatory of EA, IAF and ILAC Mutual Recognition Agreements

CERTIFICATO DI TARATURA LAT 123 24-ST-1956
Certificate of Calibration

Di seguito vengono riportate le seguenti informazioni:
In the following, information is reported about:

- la descrizione dell'oggetto in taratura (se necessaria);
  description of the item to be calibrated (if necessary)
  --
- l'identificazione delle procedure in base alle quali sono state eseguite le tarature:
  technical procedures used for calibration performed
  PT01 rev.08, PT05 rev.06, PT15 rev.06
- gli strumenti/campioni che garantiscono la catena della riferibilità del Centro:
  instruments or measurement standards which guarantee the traceability chain of the Centre
  TRI4665
- gli estremi dei certificati di taratura di tali campioni:
  relevant calibration certificates of those standards
  23-0578-01
- l'Ente che li ha emessi:
  the issuing Body
  I.N.Ri.M. (Italy)
- il luogo di taratura (se effettuata fuori dal Laboratorio);
  site of calibration (if different from the Laboratory)
  --
- le condizioni ambientali:
  calibration and environmental conditions
  Temperatura: 23 °C ± 1 °C
  Umidita' relativa: 50 % UR ± 10 %UR

- le condizioni di taratura dello strumento:

da -90 °C a 20 °C	In termostato ad alcool per confronto con termometro campione a resistenza di platino, immersione di 200 mm circa.
0 °C	In dewar con una miscela di ghiaccio fondente ed acqua deionizzata satura d'aria, immersione di 200 mm circa.
da 20 °C a 85 °C	In termostato ad acqua per confronto con termometro campione a resistenza di platino, immersione di 200 mm circa.
da 85 °C a 250 °C	In termostato ad olio siliconico per confronto con termometro a resistenza di platino, immersione di 200 mm circa.

TERRANOVA
SPRIANO MEC-RELA

- richiesta *application* 10485/OF - in data *date* 2024-05-28

G. Luca Verzazzoli
W
Inspector

CertCAT_v3.12.1.xls

Path x Crosswind
05/04/24

CamScanner

RISULTATI DELLA TARATURA

Catena Termometrica con sonda a termoresistenza Pt100

Costruttore : EUTECH Instruments Ltd.
Modello : Temp 6
Matricola : 134903
Risoluzione: 0,1 °C da -99,9 a 199,9 °C
1 °C da 200 a 850 °C
Alimentazione: batterie interne

Dati relativi alla sonda:
Costruttore: N.n.
Modello: PT56L 1/5 DIN (PT100)
Matricola : 24382

Numero punti	Temperatura di riferimento t_{rif} / °C	Temperatura indicata t_{mis} / °C	Errore $t_{mis} - t_{rif}$ / °C	Incertezza di misura U / °C
1	-50,06	-50,5	-0,44	0,07
2	0,00	-0,3	-0,30	0,08
3	49,97	49,8	-0,17	0,08
4	100,00	99,8	-0,20	0,08
5	150,01	149,9	-0,11	0,08
6	199,98	199,7	-0,28	0,08
7				
8				
9				
10				
11				
12				
13				
14				
15				

TERRANOVA
SRRIANO MBC-RELA

Lo strumento indicatore in oggetto è stato configurato secondo la calibrazione standard impostata dal costruttore (tasto CAL, poi tasto ENTER).

Non è stata eseguita nessuna messa in punto sullo strumento in taratura.
La taratura è stata fatta per espressa richiesta del Cliente, con un numero di punti inferiore a quello minimo stabilito.
I punti di taratura sono stati indicati dal committente.

G. Luca Bergazzoli
Inspector

05/08/14

CamScanner

Base Load Power Hub (BLPH)

ATEX REGISTER

PT, PDT, TT, LT RADAR

Document Number: 1724000979-IN-LIS-00009

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
V. Barratta	03-02-2025

Rev.	Date	Description	Prepared	Reviewed	Approved
02	03/02/2025	Accepted for Construction (AFC)	MZ	GA	GO
01	30/08/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	06/08/2024	Issue for Review (IFR)	MZ	GA	GO

TERRANOVA

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		00	01	02					
1	Cover	X	X	X					
2	Table of Contents	X	X	X					
3	Revision / Change Log	X	X	X					
4	Table	X	X	X					

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Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ACCEPTED FOR CONSTRUCTION (AFC)
02	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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No.	Revision	Tag Number	Description	Location	Manufacturer	Model Type Catalogue Number	Serial Number	ATEX Certification Marking	Reference Document	ATEX Certificate Number	Installation Zone	Notes / Comments	P.O.	Vendor	Skid / Package	Barrier Calculation Ref.	Non-Electrical Equipment	Special Conditions of safe use Applicable
1	00	43-LT-001	Differential Pressure Transmitter	Upper Deck	Terranova Srl	SST77B-H-9-D-2-3-0-0-4 + MAN5-D1	SE240632	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
2	00	43-LT-003	Differential Pressure Transmitter	Upper Deck	Terranova Srl	SST77B-H-9-D-2-3-0-0-4 + MAN5-D1	SE240633	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
3	00	25-PT-001	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240634	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
4	00	25-PT-002	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240635	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
5	00	25-PT-004	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240636	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
6	00	25-PT-035	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240637	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
7	00	25-PT-006	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240638	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
8	00	25-PT-037	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240639	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
9	00	25-PT-008	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240640	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
10	00	25-PT-040	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240641	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
11	00	25-PT-009	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240642	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
12	00	25-PT-043	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240643	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
13	00	25-PT-011	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240644	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
14	00	25-PT-046	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240645	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
15	00	25-PT-012	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240646	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
16	00	25-PT-049	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-L-2-9-2-1-4 + MAN2-R6	SE240647	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
17	00	25-PT-055A	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-K-2-9-2-1-4 + MAN2-R6	SE240648	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
18	00	25-PT-055B	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-K-2-9-2-1-4 + MAN2-R6	SE240649	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
19	00	43-PT-001	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-G-2-9-2-1-4 + MAN2-R6	SE240650	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
20	00	50-PT-014	Pressure Transmitter	Lower Deck	Terranova Srl	SST76-H-7-K-2-0-2-1-4 + MAN2-R6	SE240651	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
21	00	63-PT-003	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-K-2-0-2-1-4 + MAN2-R6	SE240652	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
22	00	63-PT-004	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-K-2-0-2-1-4 + MAN2-R6	SE240653	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
23	00	64-PT-031A	Pressure Transmitter	Lower Deck	Terranova Srl	SST76-H-7-K-2-0-2-1-4 + MAN2-R6	SE240654	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
24	00	64-PT-031B	Pressure Transmitter	Lower Deck	Terranova Srl	SST76-H-7-K-2-0-2-1-4 + MAN2-R6	SE240655	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
25	00	64-PT-002	Pressure Transmitter	Lower Deck	Terranova Srl	SST76-H-7-K-2-0-2-1-4 + MAN2-R6	SE240656	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
26	00	80-PT-002	Pressure Transmitter	Upper Deck	Terranova Srl	SST76-H-7-K-2-0-2-1-4 + MAN2-R6	SE240657	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
27	00	50-TT-001 / 50-TE-001 / 50-TW-001	Temperature Transmitter	Lower Deck	Terranova Srl	SST72-TH-1-C-9-1-B-4-3 + TWE	SE240658	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
28	00	50-TT-002 / 50-TE-002 / 50-TW-002	Temperature Transmitter	Lower Deck	Terranova Srl	SST72-TH-1-C-9-1-B-4-3 + TWE	SE240659	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
29	00	50-PT-001	Pressure Transmitter	Lower Deck	Terranova Srl	SST76-H-7-K-2-9-2-1-4 + SEA03 + CAP-2-03	SE240660	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
30	00	50-PT-002	Pressure Transmitter	Lower Deck	Terranova Srl	SST76-H-7-K-2-9-2-1-4 + SEA03 + CAP-2-03	SE240661	ATEX Ex II 1/2G Ex db IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	TI17ATEX304X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes
31	00	55-LIT-001	Radar Level Transmitter	Lower Deck	Tokio Heiki Inc.	KRG-10-AD03PV-AA (KRG-E-P3-R01-N-L-D08-F79-N00-N-D-V-81-A-R2-Z6)	105429 (VE241368)	ATEX Ex II 1/2 G Ex ia/db IIC T4 Ga/Gb	1724000979-IN-DA-00003 Rev. 03	FM13ATEX0069X	Zone 2	N/A	4718_OS	Terranova Srl	N/A	N/A	No	Yes

ATEX CERTIFICATE for SST77B, SST76 and SST72

Technická inšpekcia, a.s.

Trnavská cesta 56, 821 01 Bratislava
Slovenská republika

[1] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System Intended for use in potentially explosive atmospheres
Directive 2014/34/EU

[3] Supplementary EU-Type Examination Certificate Number:

TI17ATEX 304 X / 1

[4] Product:

SPRIANO® Electronic transmitter series SST7X
Type: SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B and SST70-REM (Indicator)

[5] Manufacturer: **TERRANOVA S.r.l.**

[6] Address: **Via Gramsci, 1, 26827 – Terranova dei Passerini (LO), Italy**

[7] This supplementary certificate extends EU – Type Examination Certificate No. TI17ATEX 304 X to apply to products designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

[8] Technická inšpekcia, a.s., Notified Body Number 1354 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that the product, as modified by this supplementary certificate, has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

Bratislava, March 08th, 2021

Ing. Dušan Perniš
General Director

Technická inšpekcia, a.s.
Trnavská cesta 56
821 01 Bratislava, Slovakia
e-mail: tisr@tisr.sk
web: www.tisr.sk
Tel.: +421 2 49208 100

This certificate may only be reproduced in its entirety and change, schedule included.

NB 1354

[13] **Schedule**

[14] **Supplementary EU-Type Examination Certificate Number: TI17ATEX 304 X / 1**

[15] Description of the variation to the product:

The subject of this supplementary certificate is extension of product SPRIANO® Electronic transmitter series SST7X, Type: SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B and SST70-REM (Indicator), which has protection mode "Ex-db" certified by certificate TI17ATEX304X, to the protection mode "Ex-ia" certified by certificate TI17ATEX305X.
Electronic inside the Series SST7X has been used the same as the SST5X described into TI17ATEX305X certificate.
Housing materials to be used Anticorodal Aluminum or Stainless Steel according previous certificates.
New Variation to the product are:

		With Aluminum housing	
		Without safety barrier	
Ex	II 1/2 G	Ex db IIC T6 Ga/Gb	-40°C<Tamb<+60°C
		Ex db IIB T5 Ga/Gb	-40°C<Tamb<+80°C
		or	
		With safety barrier	
Ex	II 1/2 G	Ex ia IIC T6, T5, T4 Ga	-40°C<Tamb<+40°C / +55°C / +80°C
		With SS AISI 316 housing	
		Without safety barrier	
Ex	II 1/2 G	Ex db IIC T6 Ga/Gb	-40°C<Tamb<+60°C
		Ex db IIB T5 Ga/Gb	-40°C<Tamb<+80°C
		or	
		With safety barrier	
Ex	II 1 G	Ex ia IIC T6, T5, T4 Ga	-40°C<Tamb<+40°C / +55°C / +80°C

Basic description of product:

The Transmitters series electronic SST7X measure pressure, level or temperature of liquids, gases and vapors and transmit a current signal 4-20mA + HART®.
According to the process connection, the series SST7X is constituted by the following models, they can be identified by the code following the series name:

SST70	Displacer level transmitter
SST71	Float level transmitter
SST72	Temperature transmitter
SST75	Relative or absolute pressure transmitter with incorporate separating diaphragm (ceramic)
SST76	Relative or absolute pressure transmitter with incorporate separating diaphragm (piezo)
SST77B	Differential pressure transmitter
SST77BL	Pressure transmitter for level measure
SST79B	Submersible level transmitter
SST70-REM	Field digital indicator

TECHNICKÁ INŠPEKCIA TI NB 1354 - 5 - SLOVENSKÁ REPUBLIKA

TERRANOVA SPRIANO MEC-RELA

G. Luca Mirgazzoli
Director

Model SST70: The transmitter is isolated from the process via a mechanical system to the torsion tube and also the measuring cell presents a separation membrane filled with inert fluid.
Model SST71: The transmitter is isolated from the process via a tube containing reed switches.
Model SST72: The transmitter is isolated from the process via a tube containing sensors PT100.
Models SST75, SST76, SST77B and SST77BL: The transmitter is isolated from the process by membrane separation metal filled with inert fluid.
Model SST79 (version with remote sensor): The remote transmitter is isolated from the process by separation membranes metal filled with inert fluid. It is connected to the housing means shielded cable with 5 wires soldered.
Model SST70-REM (Loop powered field digital indicator): The indicator has no element part but only it is connected via current loop for displaying the desired variable.

Product with variation of Exdb protection:

The instruments are suitable for gas group IIC or IIB depending by the Ambient Temperature and they have the type of protection "Ex db".
Temperature: -40 ° C ≤Tamb≤ + 60 ° C (or -40 ° C ≤Tamb≤ + 80 ° C)
In the case where the process temperatures are higher than the maximum ambient temperature (or below the minimum ambient temperature), the instrument is installed with a suitable finned arm that can dissipate the temperature in excess and ensure the installation inside the ambient temperature range specified by the manufacturer.
The instruments are composed of two parts:
• The housing, the same for all models, which contains the electronic board and the electrical connections.
• The sensing element contained in a body of stainless steel that allows the process connection.
The housing is constituted by the body and by two closing covers (one of which is equipped with transparent windows). The metal parts can be made in Anticorodal Aluminum or Stainless Steel AISI 304 / 316 (Thickness of coating <0.15mm) while the door is tempered-glass glued to the lid with a silicone seal.

Electrical characteristics:

Supply voltage	≤ 30 VDC
Output signal	4 ÷ 20 mA + HART®
Maximum power transferred	0,75 W
ATEX category	II 1/2 G
Protection mode	Ex db IIC T6 Ga/Gb with Tamb [- 40°C, +60°C] Ex db IIB T5 Ga/Gb with Tamb [- 40°C, +80°C]
IP Code	IP 66
The power cables must be at least 22 AWG (0.34mm2 section section - 0.64mm2), suitable for an operating temperature ≥ 90 ° C for Tamb ≥ 70 ° C.	

The marking of the product shall include the following:

⟨Ex⟩ II 1/2 G Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C

Product with variation of Exia protection:

The instruments are suitable for gas group IIC and have the type of protection "Ex i".
The instruments are composed of two parts:
• The housing, the same for all models, which contains the electronic board and the electrical connections.
• The sensing element contained in a body of stainless steel that allows the process connection.
The housing is constituted by the body and by two closing covers (one of which is equipped with transparent windows). The metal parts can be made of stainless steel or aluminum having a content Mg of less than 6% (coating thickness <0.15mm) while the door can be static plastic, 5 mm thick (glue Araldite 2021) or sodalime tempered glass, 5 mm thick (glue Araldite 2011).

TERRANOVA
TEKNOINSPEKCIA SLOVENSKÁ REPUBLIKA NB 1354 -5-

Electrical characteristics:

Parameter	Tamb<60°C	Tamb<80°C
Maximum voltage input **Ui**	30 V	25.2 V
Maximum current input **Ii**	100 mA	100 mA
Power maximum input **Pi**	0.75 W	0.62 W
Maximum capacity Internal	10 nF	10 nF
Maximum Internal Inductance	0.2 mH	0.2 mH
Output signal	4 ÷ 20 mA + HART®	
Degree of protection	IP 66 for Aluminum housing IP67 for SS AISI 316 housing	

The marking of the product shall include the following:

II 1/2G Ex ia IIC T6, T5, T4 Ga/Gb **-40°C ≤ Tamb ≤ 40°C (T6)** **-40°C ≤ Tamb ≤ 55°C (T5)** **-40°C ≤ Tamb ≤ 80°C (T4)** **For Aluminum housing**	**1G Ex ia IIC T6, T5, T4 Ga** **-40°C ≤ Tamb ≤ 40°C (T6)** **-40°C ≤ Tamb ≤ 55°C (T5)** **-40°C ≤ Tamb ≤ 80°C (T4)** **For SS AISI 316 housing**

[16] Report Number:
Inspection report No: 54/5/2021
Final Test Report No: 54/5/2021

[17] Specific Conditions of Use:

Product with variation of Exdb protection:

Ambient temperature:
Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C
In the case where the process temperatures are higher than the maximum ambient temperature (or lower than the minimum ambient temperature), the equipment is installed with a suitable spacer (example: finned arm, syphon, capillary, remote head, etc.) capable of dissipating the excess temperature and ensure the installation inside the temperature range specified by the manufacturer.

Entries for flameproof enclosure:
The accessories used for cable entry into the housing (which must be treated ½ "NPT or M20x1.5) must comply with the standards EN 60079-0 and EN 60079-1.
The entrance hole leads not used should be closed with the cap conforms to EN 60079-1.

Warning marking:
- "WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT"

Informative marking:
- "SEE INSTALLATION INSTRUCTION DOCUMENT".

Product with variation of Exia protection:

Ambient temperature:

-40°C ÷ +40°C	For Class T6
-40°C ÷ +55°C	For Class T5
-40°C ÷ +80°C	For Class T4

In the case where the process temperatures are higher than the maximum ambient temperature (or lower than the minimum ambient temperature), the equipment is installed with a suitable

spacer (example: finned arm, syphon, capillary, remote head, etc.) capable of dissipating the excess temperature and ensure the installation inside the temperature range specified by the manufacturer.

[18] Essential Health and Safety Requirements:
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.
Additional information: None.

[19] Drawings and Documents:

Number	Sheet	Issue	Date	Description
DTP-SST7X	4pgs	REV No.21.02	12/02/2021	List of drawings and Documents SPRIANO ® Electronic Switches SST7X By TERRANOVA ®
TI17ATEX305X	3 pgs	-	13/03/2017	EU –Type Examination Certificate (Exia)

Technická inšpekcia, a.s.
Trnavskácesta 56
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Tel.: +421 2 49208 100

TECHNICKÁ INŠPEKCIA • TI NB 1354 -5- • SLOVENSKÁ REPUBLIKA

Bratislava, March 08th, 2021

Ing. Dušan Perniš
General Director

TERRANOVA® SPRIANO Valcom MEC-RELA

TECHNICKÁ INŠPEKCIA, a.s.

SLOVENSKÁ REPUBLIKA

CEOC INTERNATIONAL

[1] EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System Intended for use in potentially explosive atmospheres
Directive 2014/34/EU

[3] EU-Type Examination Certificate Number:

TI17ATEX 304 X

[4] Product:

SPRIANO® Electronic transmitter series SST7X
Type: SST70, SST71, SST72, SST75, SST76, SST77B, SST77BL, SST79B and SST70-REM (Indicator)

[5] Manufacturer: **TERRANOVA S.r.l.**

[6] Address: **Via Gramsci, 1, 26827 – Terranova dei Passerini (LO), Italy**

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] Technická inšpekcia, a.s., Notified Body Number 1354 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of product intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in confidential report No. 304/5/2017.

[9] Compliance with the Essential Health and safety Requirements has been assured by compliance with: **EN 60079-0:2012+A11:2013, EN 60079-1:2014**
except in respect of those requirements listed at item 18 of the Schedule.

[10] If the sign "X" is placed after the certificate number, it indicate that the product is subject to the Specific conditions of Use specified in the schedule to this certificate.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of this Directive apply to the manufacturing process and supply of this product.

[12] The marking of the product shall include the following:

Ex II 1/2 G Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C

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Bratislava, March 13th, 2017

Ing. Dušan Perniš
General Director

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CSTA3-128

NB 1354

[13] **Schedule**

[14] **EU-Type Examination Certificate Number: TI17ATEX 304 X**

[15] Description of product:
The Transmitters series electronic SST7X measure pressure, level or temperature of liquids, gases and vapors and transmit a current signal 4-20mA.
The instruments are suitable for gas group IIC and have the type of protection "Ex db".
Temperature: -40 ° C ≤Tambs≤ + 60 ° C (or -40 ° C ≤Tambs≤ + 80 ° C)
In the case where the process temperatures are higher than the maximum ambient temperature (or below the minimum ambient temperature), the appliance is installed with a suitable spacer can dissipate the temperature in excess and ensure the installation inside the ambient temperature range specified by the manufacturer.
The instruments are composed of two parts:
• The housing, the same for all models, which contains the electronic board and the electrical connections.
• The sensing element contained in a bodice of stainless steel that allows the process connection.
The housing is constituted by the body and by two closing covers (one of which is equipped with transparent windows). The metal parts can be made in anticorodal aluminum or stainless steel AISI 304 (Thickness of coating <0.15mm) while the door is tempered-glass glued to the lid with a silicone seal.

According to the process connection, the series SST7 is formed by the following models, they can be identified by the code following the series name:

SST70	Displacer level transmitter
SST71	Float level transmitter
SST72	Temperature transmitter
SST75	Relative or absolute pressure transmitter with incorporate separating diaphragm (ceramic)
SST76	Relative or absolute pressure transmitter with incorporate separating diaphragm (piezo)
SST77B	Differential pressure transmitter
SST77BL	Pressure transmitter for level measure
SST79B	Submersible level transmitter
SST70-REM	Field digital indicator

Model SST70: The transmitter is isolated from the process via a mechanical system to the torsion tube and also the measuring cell presents a separation membrane filled with inert fluid.

Model SST71: The transmitter is isolated from the process via a tube containing reed switches.

Model SST72: The transmitter is isolated from the process via a tube containing sensors PT100.

Models SST75, SST76, SST77B and SST77BL: The transmitter is isolated from the process by membrane separation metal filled with inert fluid.

Model SST79 (version with remote sensor): The remote transmitter is isolated from the process by separation membranes metal filled with inert fluid. It is connected to the housing means shielded cable with 5 wires soldered.

Model SST70-REM (Loop powered field digital indicator): The indicator has no element part but only it is connected via current loop for displaying the desired variable.

This certificate may only be reproducedin its entirety and change, schedule included.

Electrical characteristics:

Supply voltage	≤ 30 VDC
Output signal	4 ÷ 20 mA
Maximum power transferred	0,75 W
ATEX category	1/2 G
Protection mode	Ex db IIC T6 Ga/Gb with Tamb [- 40°C, +60°C] Ex db IIB T5 Ga/Gb with Tamb [- 40°C, +80°C]
IP Code	IP 66
The power cables must be at least 22 AWG (0.34mm2 section section - 0.64mm2), suitable for an operating temperature ≥ 90 ° C for Tamb ≥ 70 ° C.	

[16] Report Number:
Inspection report No: 304/5/2017
Final Test Report No: 304/5/2017

[17] Specific Conditions of Use:

Ambient temperature:
Ex db IIC T6 Ga/Gb -40°C ≤ Tamb ≤ 60°C
Ex db IIB T5 Ga/Gb -40°C ≤ Tamb ≤ 80°C

In the case where the process temperatures are higher than the maximum ambient temperature (or lower than the minimum ambient temperature), the equipment is installed with a suitable spacer (example: finned arm, syphon, capillary, remote head, etc.) capable of dissipating the excess temperature and ensure the installation inside the temperature range specified by the manufacturer.

Entries for flameproof enclosure:
The accessories used for cable entry into the housing (which must be treated ½ "NPT) must comply with the standards EN 60079-0 and EN 60079-1.
The entrance hole leads not used should be closed with the cap conforms to EN 60079-1.

Warning marking:
- "WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT"

Informative marking:
- "SEE INSTALLATION INSTRUCTION DOCUMENT".

[18] Essential Health and Safety Requirements:
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.
Additional information: None.

[19] Drawings and Documents:

Number	Sheet	Issue	Date	Description
DTP-SST7X	3pgs	REV No.17.01	31/01/2017	List of drawings and Documents SPRIANO® Electronic Switches SST7X

Technická inšpekcia, a.s.
Trnavskácesta 56
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TECHNICKÁ INŠPEKCIA · TI · NB 1354 - 5 - · SLOVENSKÁ REPUBLIKA ·

Bratislava, March 13th, 2017

Ing. Dušan Perniš
General Director

DECLARATION of CONFORMITY for SST77B, SST76 and SST72

CE 1354

EU Declaration of Conformity

TERRANOVA® Srl

Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
declares on his sole responsibility that the product:

SPRIANO® Electronic Transmitter series **SST7x**

(device controlling or regulating the limits of an industrial process, like pressure, level and temperature)
satisfies the essential requirements and conformity assessment procedures of the following legislation:

Directive 2014/34/EU (ATEX)

EU TYPE CERTIFICATE: TI 17 ATEX 304 X / 1

Equipment for use in potentially explosive atmospheres, suitable for Zones 0, 1, 2 (process side and external side)

With Aluminum housing

Without safety barrier

Ex	II 1/2 G	Ex db IIC T6 Ga/Gb	-40°C<Tamb<+60°C
		Ex db IIB T5 Ga/Gb	-40°C<Tamb<+80°C

or

With safety barrier

Ex	II 1/2 G	Ex ia IIC T6, T5, T4 Ga	-40°C<Tamb<+40°C / +55°C / +80°C

With SS AISI 316 housing

Without safety barrier

Ex	II 1/2 G	Ex db IIC T6 Ga/Gb	-40°C<Tamb<+60°C
		Ex db IIB T5 Ga/Gb	-40°C<Tamb<+80°C

or

With safety barrier

Ex	II 1 G	Ex ia IIC T6, T5, T4 Ga	-40°C<Tamb<+40°C / +55°C / +80°C

Presumption of conformity provided by the application of the harmonised standards:
EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2007
The Notified Body NB 1354 Technicka inspekcia a.s. performed Module D, Annex IV, Directive 2014/34/EU and issued the Production Quality Assurance Notification. Periodical Surveillance is provided according to Annex IV, Point 4, Directive 2014/34/EU by the same Notified Body.

Continues in next page.

CE 1354

EU Declaration of Conformity

TERRANOVA® Srl

Via Gramsci 1 – 26827 Terranova dei Passerini (LO) – Italy
declares on his sole responsibility that the product:

SPRIANO® Electronic Transmitter series **SST7x**

(device controlling or regulating the limits of an industrial process, like pressure, level and temperature)
satisfies the essential requirements and conformity assessment procedures of the following legislation:

Directive 2014/68/EU (PED)

EU DESIGN EXAMINATION CERTIFICATE:
1292/1/2017-2 - Carbon steel torque tube level transmitters / switches
1292/1/2017-3 - Stainless steel torque tube level transmitters / switches

1292/1/2017-4 – Carbon steel transmitters / switches
1292/1/2017-5 – Stainless steel transmitters / switches
1292/1/2017-6 – Titanium transmitters / switches
1292/1/2017-7 – Hastelloy alloy transmitters / switches
1292/1/2017-8 – Inconel alloy transmitters / switches

Pressure equipment, up to Category III, for fluids (gases, liquids and vapours) in Group 1.

Presumption of conformity provided by the application of the harmonised standard:
EN 13445-2:2009/A2:2012

The Notified Body NB 1354 Technicka inspekcia a.s. performed Module H1, Directive 2014/68/EU and issued the Production Examination Certificate N.° 1860/1/2020. Periodical Surveillance is provided according to Directive 2014/68/EU by the same Notified Body.

Directive 2014/30/EU (EMC)

Equipment with an adequate level of electromagnetic compatibility.

Presumption of conformity provided by the application of the harmonised standard:
EN 61326-1:2006

Terranova dei Passerini, 08/03/2021

Mr Sergio Valletti,
General Manager



ATEX CERTIFICATE for KRG

1 EU-TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU**

3 **EU-Type Examination Certificate No:** **FM13ATEX0069X**

4 **Equipment or protective system: (Type Reference and Name)** **KRG-10 Microwave Level Gauge**

5 **Name of Applicant:** **Tokyo Keiki Inc.**

6 **Address of Applicant:** **2-16-46 Minami-Kamata Ohta-ku Tokyo-To 144-8551 Japan**

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3049358 dated 20th January 2015

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015 and EN 60529:1991+A1:2000+A2:2013

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:

II 1 G Ex ia IIC T4 Ga
II 1 D Ex ia IIIC T135°C Da
II 1/2 G Ex ia/db IIC T4 Ga/Gb
Ta = -40°C to +60°C

Martin Crowe
Certification Manager, FM Approvals Europe Ltd.

Issue date: 30th March 2023

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals Europe Limited, One Georges Quay Plaza, Dublin. Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

SCHEDULE

to EU-Type Examination Certificate No. FM13ATEX0069X

13 **Description of Equipment or Protective System:**

The KRG-10 Microwave Level Gauge is designed for level measurements using microwave technology. The KRG-10 Type A is an Intrinsically Safe protection scheme with or without an LCD display installed. The Type B version also comes with an optional LCD display but is flameproof protected as well as intrinsically safe. The Type B version contains a IS barrier circuit allowing 250V to power the unit. The KRG-10 utilizes 6 different antennas which contain both metal and plastic. There are 3 different O-ring options depending on the antenna installed. All signal outputs are available in 4 to 20 mA and HART communications. The KRG-10 electronic enclosure is made of die cast aluminum with the LCD version having a polycarbonate window and silicone rubber LCD cover cap.

The equipment is rated for Degree of Protection IP66 in accordance with EN 60529.

Operation Temperature Ranges:
The ambient operating temperature range of the KRG-10 Microwave Level Gauge is -40°C to 60°C. Process temperature range is -40°C to 200°C for flameproof applications. Depending on the antenna used and the o-ring, the process temperature range varies within the range of -40°C to +200°C The process pressure range is -0.1 to +1.5 MPa.

Electrical data:

In type of protection intrinsic safety, the following energy limitation parameters apply (Type A only): U_i = 30Vdc; I_i = 93mA; P_i = 0.7W; C_i = 0nF; L_i = 0mH

All other protection techniques, the electronic connection has the following values (Type B only): Um= 250VAC

KRG-10a0bc-dA Microwave Level Gauge
Type A
II 1 G Ex ia IIC T4 Ga Ta = -40°C to +60°C; IP66
II 1 D Ex ia IIIC T135°C Da Ta = -40°C to +60°C; IP66
Ui = 30Vdc, Ii = 93mA, Pi = 0.7W, Li = 0mH, Ci = 0nF

Type B
II 1/2 G Ex ia/db IIC T4 Ga/Gb Ta = -40°C to +60°C; IP66

a = EX Approval; AI, or AD
b = Antenna Type; 2H, 4H, 2P, 3P, 4P, or 1R
c = Material of Seal; V, S, or K
d = Display; N or A

14 **Specific Conditions of Use:**

1. *The KRG-10 enclosure contains aluminium and is considered to present a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.*
2. *The KRG-10 enclosure contains exposed non-metallic surfaces considered to constitute an electrostatic discharge hazard. Clean only with a damp cloth.*
3. *The painted surface of the KRG-10 may store electrostatic charge and become a source of ignition in applications with a low relative humidity <30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in PD CLC/TR 60079-32-1 and IEC TS 60079-32. Cleaning of the painted surface should only be done with a damp cloth.*

4 .For the Ex ia/db rated Microwave Level Gauge, this equipment can be installed in the boundary wall

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between an area of EPL Ga (Category 1) and the less hazardous area, EPL Gb (Category 2). In this configuration, the antenna process connection portion may be installed in EPL Ga (Category 1), while the electronics housing is installed in EPL Gb (Category 2).

5. *For the Ex ia/db rated Microwave Level Gauge, consult the manufacturer for dimensional information on the flameproof joints for repair.*
6. *The device contains a nonmetallic wall constructed of PTFE, PFA, Glass parts and Epoxy resin that acts as a partition wall between the process and the device. Installation, Maintenance and use shall take into account the environmental conditions to which the partition wall will be subjected. The manufacturer's instruction for maintenance shall be followed in detail to assure safety during its expected lifetime.*

15 **Essential Health and Safety Requirements:**

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

16 **Test and Assessment Procedure and Conditions:**

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

17 **Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
20th January 2015	Original Issue.
12th January 2017	Supplement 1: Report Reference: - 3056241 Dated 11th January 2017. Description of the Change: Redesign of inter-compartmental feed through. Increase process temperature for flameproof applications. Correction of drawing errors. Change of Type B product ratings. Removal of Cone Antenna rating. Correction of Specific Condition 6. Updated to EU format.

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SCHEDULE

to EU-Type Examination Certificate No. FM13ATEX0069X

Date	Description
04th June 2019	Supplement 2: Report Reference: - RR218082 Dated 31st May 2019. Description of the Change: Revised Certificate Specific Conditions of Use: Item 3 - replaced EN TR50404 with PD CLC/TR 60079-32-1. Updates made to Product Label Marking and Notified Body Number. Updated Installation Manual label. Certificate transferred from FM Approvals Ltd., notified body no. 1725, to FM Approvals Europe Ltd., notified body no. 2809.
29th May 2020	Supplement 3: Report Reference: - RR222698 Dated 28th May 2020. Description of the Change: i) Minor documentation update (no physical changes; only editorial changes). ii) Updated description correctly in the certificate from "for flameproof applications. Process temperature range is -40°C to 180°C for all other applications." and ".1 to 1.5 MPa" to "[d]epending on the antenna used and the o-ring, the process temperature range varies within the range of -40°C to +200°C" and "-.1 to 1.5 MPa", respectively.
28th October 2020	Supplement 4: Report Reference: - PR457466 Dated 26th October 2020. Description of the Change: Evaluation conducted to qualify updates to enclosure and probe construction, minor drawing revisions, moved IP66 ratings from Section 12 to Section 13 as is appropriate, removed Material of Seal option V that had previously been added in error.
25th February 2021	Supplement 5: Report Reference: - RR226323 Dated 23rd February 2021. Description of the Change: Add a new antenna (3" PTFE Sealing Antenna option 3P). Update of safety instructions, model code and manual.
30th July 2021	Supplement 6: Report Reference: - RR228480 Dated 29th July 2021. Description of the Change: Change description in ATEX Cert to match IECEx cert IECEx FMG13.0039X. Um=250VAC was previously 120/240VAC 50/60Hz.
30th March 2023	Supplement 7: Report Reference: - RR236287 Dated 28th March 2023. Description of the Change: Minor technical and documentation changes.

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Blueprint Report

Tokyo Keiki Inc (144654)

Class No 3610

Original Project I.D. ***3049358***

Certificate I.D. ***FM13ATEX0069X***

Drawing No.	Revision Level	Drawing Title	Last Report
51986690	06	External Dim DWG	PR457466
51986691	**05**	**Internal Structure DWG Type A**	**RR236287**
51986692	**07**	**Internal Structure DWG Type B**	**RR236287**
51986693	05	Internal Structure Detail DWG	PR457466
51986694	05	Assembly Dimension DWG 1	PR457466
51986695	06	Assembly Dimension DWG 2	RR226323
51986696	05	Assembly Dimension DWG 3	PR457466
51986697	10	Labels DWG	RR228480
51986714	00	KAR-20 PCB diagram 1-2	3049358
51986715	00	KMB-10 PCB diagram	3049358
51986716	00	KRF-10 PCB diagram	3049358
51986717	00	KIB-10 PCB diagram	3049358
51986718	01	KTR-20 PCB diagram 1-2	3049358
51986719	02	KPB-20 PCB diagram 1-4	3049358
51986720	01	KPB-20 Parts list 1-6	3049358
51986721	00	KAR-20 Parts list	3049358
51986722	00	KTR-20 Parts list 1-2	3049358
51986723	00	ARM-10 parts list	3049358
51986724	01	BRM-10 parts list 1-3	3049358
51986725	00	KRF-10 Parts list 1-5	3049358
51986726	00	KMB-10 Parts list 1-9	3049358
51986727	00	KIB-10 Parts list	3049358
51986729	01	Blind Plug	3056241
51986962	03	O-Ring Detail DWG	RR226323
51987060	01	Installation DWG Type A	3049358
51987061	04	Installation DWG Type B	RR218082
51987062	01	Intrinsic Safety Concept Type A	3049358
51987063	04	Intrinsic Safety Concept Type B	RR218082
51987064	00	KAR-20 Circuit Diagram	3049358
51987065	00	KTR-20 Circuit Diagram	3049358
51987066	00	ARM-10 Circuit Diagram	3049358
51987067	00	BRM-10 Circuit Diagram	3049358
51987068	00	KPB-20 Circuit Diagram 1-2	3049358
51987069	00	KMB-10 Circuit Diagram 1-4	3049358
51987070	00	KRF-10 Circuit Diagram 1-2	3049358
51987071	00	KIB-10 Circuit Diagram	3049358
51987072	00	BRM-10 PCB Diagram 1-2	3049358
51987073	01	ARM-10 PCB Diagram 1-2	3049358
51987188	01	Line bushing	3056241
KF13-001	**R**	**KRG-10 Manual**	**RR236287**
KF13-003	H	KRG-10 Safety Instructions	RR228480

Base Load Power Hub (BLPH)

VENDOR ASSET REGISTER

PT, PDT, TT, LT RADAR

Document Number: 1724000979-IN-LIS-00010

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
V. Barratta	01-10-2024

Rev.	Date	Description	Prepared	Reviewed	Approved
01	12/09/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	30/08/2024	Issue for Review (IFR)	MZ	GA	GO

TERRANOVA

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4	Asset Register	X	X						

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Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
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Tag Number	Tag Description	Physical Class Name	Location	System/SubSystem Code	Purchase Order Number	Vendor Company Name	Manufacturer Company Name	Model Number	Equipment Manufacturer- Serial Number	Model Part No	Hazardous Area Equip Relevant	Hazardous Area Certificate Standard	Hazardous Area Certifying Authority	Hazardous Area Certificate Number	Atex Classification	Explosion Protection Examination Certificate Document Number	Layout Drawing	Datasheet	Assembly/Connection/Drawing	General Arrangement	Operating & Maintenance Manual	Wiring Diagram	Spare Parts List	Lockout/Document Reference	Weight	Remarks
43-LT-001	Differential Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377TR-H-B-D-2-0-0-0-4 + MANI01	332409032	3377TR4D4B2D004 + MANI01	ATEX Ex II 1/2G Ex ab IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
43-LT-003	Differential Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377TR-H-B-D-2-0-0-0-4 + MANI01-D1	332409033	3377TR4D4B2D004 + MANI01	ATEX Ex II 1/2G Ex ab IIC / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-031	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409034	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-032	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409035	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-034	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409036	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-035	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409037	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-036	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409038	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-037	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409039	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-038	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409040	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-040	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409041	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-069	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409042	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-043	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409043	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-071	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409044	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-072	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409045	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-030	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-N-H-7-L-2-9-2-0-4 + MAN2-R6	332409047	3377-N-H-7-L-2-9-2-0-4 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-030A	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-9-2-0-4 + MAN2-R6	332409048	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
29-PT-030B	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-9-2-0-4 + MAN2-R6	332409049	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
43-PT-001	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-D-2-9-2-0-4 + MAN2-R6	332409050	3377R4H7D2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
50-PT-014	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-0-2-0-4 + MAN2-R6	332409051	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
63-PT-003	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-0-2-0-4 + MAN2-R6	332409052	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
63-PT-004	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-0-2-0-4 + MAN2-R6	332409053	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
64-PT-031A	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-0-2-0-4 + MAN2-R6	332409054	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
64-PT-031B	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-0-2-0-4 + MAN2-R6	332409055	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
64-PT-032	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-0-2-0-4 + MAN2-R6	332409056	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
80-PT-002	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-0-2-0-4 + MAN2-R6	332409057	3377R4H7K2E04 + MAN2R6	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
50-TT-001 / 50-TE-001 / 50-TW-001	Temperature Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-T-TH-1-C-S-1-B-4-3 + TW8	332409058	3377-T-TH-1-C-S-1-B-4-3 + TW8	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
50-TT-002 / 50-TE-002 / 50-TW-002	Temperature Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377-T-TH-1-C-S-1-B-4-3 + TW8	332409059	3377-T-TH-1-C-S-1-B-4-3 + TW8	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
50-PT-001	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-9-2-0-4 + SB-AD3 + CAP-2 + R3	332409060	3377R4H7K2E04 + SB-AD3 + CAP2R3	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
50-PT-002	Pressure Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Teranova Srl	3377R-H-7-K-2-9-2-0-4 + SB-AD3 + CAP-2 + R3	332409061	3377R4H7K2E04 + SB-AD3 + CAP2R3	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	ATEX 2014/34/EU	Technische inligtasiu, a.s.	TIT-TATK/3OX/EX	ATEX Ex II 1/2G Ex db / IIB, T6/T5, Ga/Gb or ATEX Ex II 1/2G Ex ia IIC T6/T5/T4 Ga/Gb	TIT-TATK/3OX/EX	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-
59-LIT-001	Radar Level Transmitter	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724000979	Teranova Srl	Tokia Heiki Inc.	KRG-S-P-R01-N-L-020F-TR-N00-N-D-V-01-A-W-2B	105429 (VN241399)	KRG8PSR01NL020FTRN00ND1V1A02	ATEX Ex II 1/2 G Ex ia/db IIC T6 Ga/Gb	ATEX 2014/34/EU	FM Approvals Europe Limited	FM15ATEX00006X	ATEX Ex II 1/2 G Ex ia/db IIC T6 Ga/Gb	FM15ATEX00006X	1724000979-IN-DA-00003	1724000979-IN-DS-00004	1724000979-IN-DA-00003	1724000979-IN-DA-00003	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-IN-MAN-00008	1724000979-CDM-LIS-00011	N/A	N/A	-