Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

MANUFACTURERS RECORD BOOK (FINAL DOSSIER)

Document Number: 1724001690-QC-DB-00007

Document Class: 2

01	10/04/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	18/02/2025	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	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

MANUFACTURERS RECORD BOOK (FINAL DOSSIER) INDEX

Document Number: 1724001690-QC-LIS-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
ROSETTI MARINO SpA Statutory Lloyd Quality Control Dept.	20/12/2024

Document Class: 2

02	06/12/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	24/10/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	04/10/2024	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	Accepted for Construction (AFC)
02	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	Doc. Client Revision
2	Doc. Supplier Revision
3	
4	

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GENERAL:

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
0	1724001690-QC-LIS-00008	02	RSM-SPR-4791-MBI-001	02	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX - RESTRICTION ORIFICE
0.1	-	-	-	-	INSPECTION RELEASE NOTE

PART 1 - DESIGN DOSSIER:

LIST:

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
1.1	1724001690-MD-LIS-00001	01	RSM-SPR-4791-VDL-001	01	SUPPLIER MASTER INDEX REGISTER (SMIR) - RESTRICTION ORIFICE

DIAGRAMS (N/A)

DRAWINGS:

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
1.2	1724001690-IN-DA-00003	02	RSM-SPR-4791-DWG-001	02	GENERAL ARRANGEMENT DRAWINGS - RESTRICTION ORIFICE

PROJECT PROCEDURES AND SPECIFICATION:

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
1.3	1724001690-QC-PRO-000011	00	RSM-SPR-4791-PRC-002	00	PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES - RESTRICTION ORIFICE

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PIPING CLASSES (N/A)

CALCULATION NOTES:

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
1.4	1724001690-IN-CA-00005	02	RSM-SPR-4791-CAL-001	02	CALCULATION SHEETS - RESTRICTION ORIFICE

EQUIPMENT REQUISITIONS (N/A)

DATASHEETS:

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
1.5	1724001690-IN-DS-00004	03	RSM-SPR-4791-DSH-001	03	INSTRUMENT DATA SHEETS - RESTRICTION ORIFICE

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-4791-CER-001	-	MATERIAL 3.1 CERTIFICATES

MANUFACTURING RECORD AND PROCEDURES:

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
2.2	1724001690-QC-ITP-00002	01	RSM-SPR-4791-ITP-001	01	INSPECTION AND TEST PLAN - RESTRICTION ORIFICE
2.3	1724001690-QC-PRO-00006	02	RSM-SPR-4791-PRC-001	02	FACTORY ACCEPTANCE TEST PROCEDURE - RESTRICTION ORIFICE

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TEST RECORD

Pos.	Document nr. Client	Doc. Client Rev.	Document nr. Supplier	Doc. Supplier Rev.	Document Title
2.4	-	-	RSM-SPR-4791-CER-002	-	PMI REPORT
2.5	-	-	RSM-SPR-4791-CER-003	-	FAT REPORT (including dimensional, tag and marking check)
2.6	1724001690-IN-LIS-000010	01	RSM-SPR-4791-VAR-001	01	VENDOR ASSET REGISTER - RESTRICTION ORIFICE

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ROSETTI MARINO	RELEASE NOTE	Nr. RN-1690-TER-01	Sheet 1 of 2
		DATA *Date* 05/12/2024	Rev. 00

PROGETTO *Project*	CLIENTE *Client*	COMMESSA *Job*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	*123A90*

FORNITORE *Vendor*	NUMERO D' ORDINE *Purchase Order No.*
Terranova Instruments	1724001690

Release Note	☐ FOR PAYMENT	☒ FOR SHIPMENT

RELEASE NOTE FOR PAYMENT

PO Art.	

RELEASE NOTE FOR SHIPMENT

POS. *Item*	QTÀ *Quantity*	DESCRIZIONE *Description*	Nr. TAG *TAG No.*	TIPO DI ISPEZIONE *Kind of Inspection*	ESITO *Result*
10	1	Calibrate Orifice	25-RO-005	N/A	N/A
20	1	Calibrate Orifice	25-RO-007	N/A	N/A
30	1	Calibrate Orifice	25-RO-010	N/A	N/A
40	1	Calibrate Orifice	25-RO-013	N/A	N/A
50	1	Calibrate Orifice	25-RO-016	N/A	N/A
60	1	Calibrate Orifice	25-RO-019	N/A	N/A
70	1	Calibrate Orifice	25-RO-022	N/A	N/A
80	1	Calibrate Orifice	25-RO-024	N/A	N/A
90	1	Calibrate Orifice	80-RO-001	N/A	N/A

Warehouse open Monday to Friday from 08.00 to12.00 and from 13.00 to 17.00.
Contact Mr Rota +39 3451608099

DOCUMENTI APPLICABILI / *APPLICABLE DOCUMENTS*

POSIZIONE *Items*	TIPO DI DOCUMENTO *Type of Document*	NUMERO DI DOCUMENTO *Document Number*	Rev.	COD. DI APPROV. *Approval Code*
N/A	PO	1724001690	00	N/A
N/A	Packing List	Packing_List_Scanned	N/A	N/A

PUNCH LIST:
☐ **SI** / *YES* **VEDI PUNCH LIST ALLEGATA N°** / *REFER TO ATTACHED PUNCH LIST N°*
☒ **NO**/ *NO*

CONTROLLO VALIDITA' FIDEJUSSIONE / *PERFORMANCE or WARRANTY BOND expiration date check*
Estensione Fidejussione Richiesta / *Performance or Warranty Bond Extension of Validity required*
☐ **SI** / *YES*
☒ **NO**/ *NO*
***Acceptance Method**: Performance or Warranty Bond valid if the actual delivery date isn't greater than two weeks from contractual delivery date.*

INCARICATO *Person in charge* ROSETTI MARINO *Supply Management dept.*		RAPPR. DEL CLIENTE *Client Representative*	FORNITORE *Vendor*	CONSTRUCTION MANAGER *Only requested for Punch List to be closed at Yard*
Nome Cognome *Name Surname*	**Firma** *Signature*			
Leonardo PASQUALI	Leonardo Pasquali 2024.12.05 15:12:42+01'00'	N/A	N/A	N/A

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO / *The present RELEASE NOTE does not relieve the Supplier of the responsibility of any possible defects and/or malfunctioning arising during the utilisation.*

ROSETTI MARINO	RELEASE NOTE	Nr. RN-1690-TER-01	Sheet 2 of 2
		DATA *Date* 05/12/2024	Rev. 00
PROGETTO *Project* **HOLLANDSE KUST NOORD WIND PARK**	**CLIENTE** *Client* CROSSWIND	**COMMESSA** *Job* ***123A90***	
FORNITORE *Vendor* Terranova Instruments	**NUMERO D' ORDINE** *Purchase Order No.* 1724001690		

RELEASE NOTE

RISULTATO *RESULT*	**FORNITURA** *SUPPLY*	**DISTRIBUZIONE A** *DISTRIBUTION TO:*	
☒POSITIVO / *POSITIVE*	☐COMPLETA / *COMPLETE*	☒Project Manager	☒Administration
☐ NEGATIVO / *NEGATIVE*	☐ PARZIALE / *PARTIAL*	☒ Project Quality Manager	☒ Project Eng-/Procurement Coord
☐PUNTI PENDENTI / *PUNCH-LIST*	☒ ULTIMA / *FINAL*	☐ Warehouse	☐ Supplier

NOTE / *NOTES*

None

INCARICATO *Person in charge* **ROSETTI MARINO** *Supply Management dept.*		**RAPPR. DEL CLIENTE** *Client Representative*	**FORNITORE** *Vendor*	**CONSTRUCTION MANAGER** *Only requested for Punch List to be closed at Yard*
Nome Cognome *Name Surname*	**Firma** *Signature*			
Leonardo PASQUALI	Leonardo Pasquali 2024.12.05 15:12:42+01'00'	N/A	N/A	N/A

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO / *The present RELEASE NOTE does not relieve the Supplier of the responsibility of any possible defects and/or malfunctioning arising during the utilisation.*

ROSETTI MARINO	RELEASE NOTE	Nr. RN-1690-TER-02	Sheet 1 of 1
		DATA *Date* 17/02/2025	Rev. 00

PROGETTO *Project*	CLIENTE *Client*	COMMESSA *Job*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	*123A90*

FORNITORE *Vendor*	NUMERO D' ORDINE *Purchase Order No.*
Terranova Instruments	1724001690

Release Note	☐ FOR PAYMENT	☒ FOR SHIPMENT

RELEASE NOTE FOR PAYMENT

PO Art.	

RELEASE NOTE FOR SHIPMENT

POS. *Item*	QTÀ *Quantity*	DESCRIZIONE *Description*	Nr. TAG *TAG No.*	TIPO DI ISPEZIONE *Kind of Inspection*	ESITO *Result*
90	1	Calibrate Orifice	50-RO-001	N/A	N/A
100	1	Calibrate Orifice	50-RO-002	N/A	N/A

Warehouse open Monday to Friday from 08.00 to12.00 and from 13.00 to 17.00.
Contact Mr Rota +39 3451608099

DOCUMENTI APPLICABILI / *APPLICABLE DOCUMENTS*

POSIZIONE *Items*	TIPO DI DOCUMENTO *Type of Document*	NUMERO DI DOCUMENTO *Document Number*	Rev.	COD. DI APPROV. *Approval Code*
N/A	PO	1724001690	00	N/A
N/A	Packing List	Packing_List	N/A	N/A

PUNCH LIST:
☐ **SI** / *YES* **VEDI PUNCH LIST ALLEGATA N°** / *REFER TO ATTACHED PUNCH LIST N°*
☒ **NO**/ *NO*

CONTROLLO VALIDITA' FIDEJUSSIONE / *PERFORMANCE or WARRANTY BOND expiration date check*
Estensione Fidejussione Richiesta / *Performance or Warranty Bond Extension of Validity required*
☐ **SI** / *YES*
☒ **NO**/ *NO*
***Acceptance Method**: Performance or Warranty Bond valid if the actual delivery date isn't greater than two weeks from contractual delivery date.*

RELEASE NOTE

RISULTATO *RESULT*	FORNITURA *SUPPLY*	DISTRIBUZIONE A *DISTRIBUTION TO:*	
☒POSITIVO / *POSITIVE*	☐COMPLETA / *COMPLETE*	☒Project Manager	☒Administration
☐ NEGATIVO / *NEGATIVE*	☐ PARZIALE / *PARTIAL*	☒ Project Quality Manager	☒ Project Eng-/Procurement Coord
☐PUNTI PENDENTI / *PUNCH-LIST*	☒ ULTIMA / *FINAL*	☐ Warehouse	☐ Supplier

NOTE / *NOTES*

None

INCARICATO *Person in charge* ROSETTI MARINO *Supply Management dept.*		RAPPR. DEL CLIENTE *Client Representative*	FORNITORE *Vendor*	CONSTRUCTION MANAGER *Only requested for Punch List to be closed at Yard*
Nome Cognome *Name Surname*	**Firma** *Signature*			
Leonardo PASQUALI	Leonardo Pasquali 2025.02.17 16:20:22+01'00'	N/A	N/A	N/A

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO / *The present RELEASE NOTE does not relieve the Supplier of the responsibility of any possible defects and/or malfunctioning arising during the utilisation.*

PART 1
DESIGN DOSSIER

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Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

SUPPLIER MASTER INFORMATION REGISTER

Document Number: 1724001690-MD-LIS-00001

Document Class: 3

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	31-10-2024

Rev.	Date	Description	Prepared	Reviewed	Approved
01	24/10/2024	Issue for Information (IFI)	MZ	GA	GO
00	03/10/2024	Issue for Information (IFI)	MZ	GA	GO

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Table of Contents

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

Revision / Change Log

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

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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

Ordine n°/*order nr.*	1724001690		Fornitore/*Supplier*:	TERRANOVA SRL	
data / *dated:*			Codice F./ *S. Code:*		
Commessa / *Job:*	123A90		Indirizzo/ *address* :	Via Antonio Gramsci, 1, 26827 Terranova dei Passerini (LO)	
Descrizione / *Description*	RESTRICTION ORIFICE		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 / *Document title* (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	1724001690-MD-LIS-00001	00	1724001690-MD-LIS-00001	00	RSM-SPR-4791-VDL-001	00	SUPPLIER MASTER INDEX REGISTER (SMIR) - RESTRICTION ORIFICE	INS		A3	03/10/2024				I
							QUALITY DOCUMENTS								
2	1724001690-QC-ITP-00002	00	1724001690-QC-ITP-00002	00	RSM-SPR-4791-ITP-001	00	INSPECTION AND TEST PLAN - RESTRICTION ORIFICE	QUA		A4	04/10/2024				A
							ENGINEERING DOCUMENTS								
3	1724001690-IN-DA-00003	00	1724001690-IN-DA-00003	00	RSM-SPR-4791-DWG-001	00	GENERAL ARRANGEMENT DRAWINGS - RESTRICTION ORIFICE	INS		A4	03/10/2024		X		A
4	1724001690-IN-DS-00004	00	1724001690-IN-DS-00004	00	RSM-SPR-4791-DSH-001	00	INSTRUMENT DATA SHEETS - RESTRICTION ORIFICE	INS		A4	04/10/2024		X		A
5	1724001690-IN-CA-00005	00	1724001690-IN-CA-00005	00	RSM-SPR-4791-CAL-001	00	CALCULATION SHEETS - RESTRICTION ORIFICE	INS		A4	03/10/2024		X		A
6	1724001690-QC-PRO-00006	00	1724001690-QC-PRO-00006	00	RSM-SPR-4791-PRC-001	00	FACTORY ACCEPTANCE TEST PROCEDURE - RESTRICTION ORIFICE	QUA		A4	04/10/2024				I
							CERTIFICATES								
7	1724001690-QC-DB-00007	00	1724001690-QC-DB-00007	00	RSM-SPR-4791-MRB-001	00	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - RESTRICTION ORIFICE	CERT		A4	20/12/2024				A
8	1724001690-QC-LIS-00008	00	1724001690-QC-LIS-00008	00	RSM-SPR-4791-MBI-001	00	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX - RESTRICTION ORIFICE	QUA		A4	04/10/2024				A
							SPARES & MAINTENANCE DATA								
9	1724001690-IN-LIS-000010	00	1724001690-IN-LIS-000010	00	RSM-SPR-4791-VAR-001	00	VENDOR ASSET REGISTER - RESTRICTION ORIFICE	DATA		A4	04/10/2024				A
10	1724001690-QC-PRO-000011	00	1724001690-QC-PRO-000011	00	RSM-SPR-4791-PRC-002	00	PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES - RESTRICTION ORIFICE	EXP		A4	04/10/2024				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)

GENERAL ARRANGEMENT DRAWINGS

RESTRICTION ORIFICE

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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Sign	Date
V. Barratta	11-03-2025

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CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	19/02/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
02	20/01/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
01	23/10/24	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
00	03/10/24	MZ	GA	GO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
GENERAL ARRANGEMENT DRAWINGS–RESTRICTION ORIFICE
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724001690–IN–DA–00003 | SHEET 001 | REV. 03

File Name : 123A90.DDL.XX.XXXXXX Rev. 00

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
03	001	FRONT PAGE	
03	002	SUMMARY and GENERAL NOTES	
03	003	GENERAL ARRANGEMENT DRAWINGS - RESTRICTION ORIFICE (SINGLE HOLE)	
03	004	GENERAL ARRANGEMENT DRAWINGS - RESTRICTION ORIFICE (MULTI HOLE)	

GENERAL NOTES

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ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	19/02/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
02	20/01/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
01	23/10/24	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
00	03/10/24	MZ	GA	GO	ISSUE FOR REVIEW (IFR)

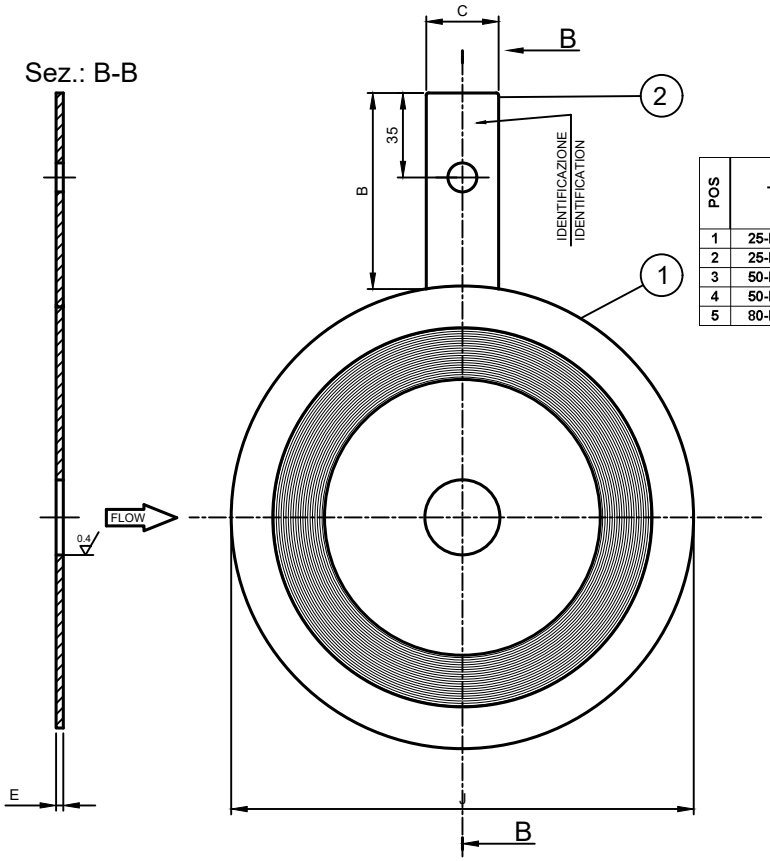
TITLE : BASE LOAD POWER HUB (BLPH)
GENERAL ARRANGEMENT DRAWINGS–RESTRICTION ORIFICE
SUMMARY and GENERAL NOTES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724001690–IN–DA–00003 | SHEET 002 | REV. 03

File Name : 123A90.DDL.XX.XXXXXX Rev. 00

ORI ORIFICE PLATES (SINGLE HOLE)



POS	TAG	ND	RATING	SCH	PIPE			RESTRICTION ORIFICE								NOISE LEVEL [Dba]	CAV. NUMBER	NOTE	
					O.D. [mm]	I.D. [mm]	THK [mm]	MTL	n°OF HOLES	d [mm]	d1 [mm]	E [mm]	J [mm]	B [mm]	C [mm]				
1	25-RO-022	1"	300	40S	33.4	26.64	3.38	SS 316/316L	1	5.19347	5.19347	6	73.0	115	30	86		CRITICAL	THICK PLATE RESTRICTION
2	25-RO-024	1"	300	40S	33.4	26.64	3.38	SS 316/316L	1	4.26650	4.26650	6	73.0	115	30	65		CRITICAL	THICK PLATE RESTRICTION
3	50-RO-001	1"	150	40S	33.4	26.64	3.38	SS 316/316L	1	0.12976	0.12976	3	67.0	110	30	65	1.22		
4	50-RO-002	1"	150	40S	33.4	26.64	3.38	SS 316/316L	1	0.12976	0.12976	3	67.0	110	30	65	1.22		
5	80-RO-001	1"	150	40S	33.4	26.64	3.38	SS 316/316L	1	4.26646	4.26646	6	67.0	110	30	65		CRITICAL	THICK PLATE RESTRICTION

NOTES:
1. FLOW METER REFERENCE CODE: ISO 5167 / MILLER ENGINEERING HANDBOOK
2. MARKING: MARKING DETAIL AS PER CUSTOMER SPECIFICATION (TAG / d / ID / SIZE / RATING / MATERIAL / REF CODE / DIRECTION OF FLOW (as minimum)
3. d, PRESSURE DROP: refer to CALCULATION SHEETS

CERTIFICATES
- Material Certificates 3.1 (EN 10204)
- PMI Test on all Plates
- Visual & Dimensional Test

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	19/02/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
02	20/01/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
01	23/10/24	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
00	03/10/24	MZ	GA	GO	ISSUE FOR REVIEW (IFR)

TERRANOVA SPRIANO Tekfem MEC-RELA

CROSSWIND

ROSETTI MARINO

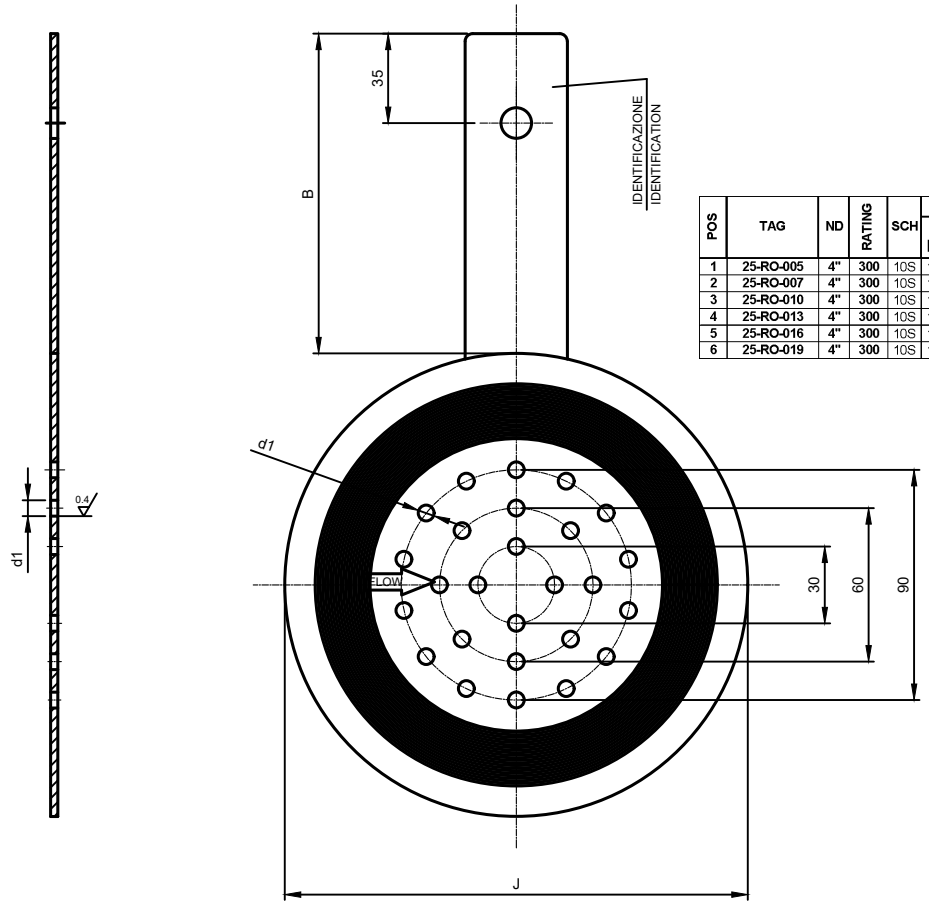
TITLE : BASE LOAD POWER HUB (BLPH)
GENERAL ARRANGEMENT DRAWINGS–RESTRICTION ORIFICE
RESTRICTION ORIFICE (SINGLE HOLE)

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:2

A3 | DRAWING NO. 1724001690–IN–DA–00003 | SHEET 003 | REV. 03

File Name : 123A90.DDL.XX.XXXXXX Rev. 00

ORI ORIFICE PLATES (MULTI HOLE)



POS	TAG	ND	RATING	SCH	PIPE			RESTRICTION ORIFICE								NOISE LEVEL [Dba]	CAV. NUMBER	NOTE	
					O.D. [mm]	I.D. [mm]	THK [mm]	MTL	n°OF HOLES	d [mm]	d1 [mm]	E [mm]	J [mm]	B [mm]	C [mm]				
1	25-RO-005	4"	300	10S	114.3	108.20	3.05	SS 316/316L	26	21.53	4.22	10	181.0	125	40	85		CRITICAL	THICK PLATE RESTRICTION
2	25-RO-007	4"	300	10S	114.3	108.20	3.05	SS 316/316L	26	21.53	4.22	10	181.0	125	40	85		CRITICAL	THICK PLATE RESTRICTION
3	25-RO-010	4"	300	10S	114.3	108.20	3.05	SS 316/316L	26	21.53	4.22	10	181.0	125	40	85		CRITICAL	THICK PLATE RESTRICTION
4	25-RO-013	4"	300	10S	114.3	108.20	3.05	SS 316/316L	26	21.53	4.22	10	181.0	125	40	85		CRITICAL	THICK PLATE RESTRICTION
5	25-RO-016	4"	300	10S	114.3	108.20	3.05	SS 316/316L	26	21.53	4.22	10	181.0	125	40	85		CRITICAL	THICK PLATE RESTRICTION
6	25-RO-019	4"	300	10S	114.3	108.20	3.05	SS 316/316L	26	21.53	4.22	10	181.0	125	40	85		CRITICAL	THICK PLATE RESTRICTION

NOTES:
1. FLOW METER REFERENCE CODE: ISO 5167 / MILLER ENGINEERING HANDBOOK
2. MARKING: MARKING DETAIL AS PER CUSTOMER SPECIFICATION (TAG / d / ID / SIZE / RATING / MATERIAL / REF CODE / DIRECTION OF FLOW (as minimum)
3. d, PRESSURE DROP: refer to CALCULATION SHEETS

CERTIFICATES
- Material Certificates 3.1 (EN 10204)
- PMI Test on all Plates
- Visual & Dimensional Test

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	19/02/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
02	20/01/25	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
01	23/10/24	MZ	GA	GO	ACCEPTED FOR CONSTRUCTION (AFC)
00	03/10/24	MZ	GA	GO	ISSUE FOR REVIEW (IFR)

TERRANOVA SPRIANO Valcum MEC-RELA
CROSSWIND
ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
GENERAL ARRANGEMENT DRAWINGS–RESTRICTION ORIFICE
RESTRICTION ORIFICE (MULTI HOLE)

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:2

A3 | DRAWING NO. 1724001690–IN–DA–00003 | SHEET 004 | REV. 03

File Name : 123A90.DDL.XX.XXXXXX Rev. 00

Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES

Document Number: 1724001690-QC-PRO-000011

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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
PASQUALI Leonardo	07/10/2024

Document Class: 3

00	04/10/2024	Issue for Information (IFI)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

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SPRIANO Yokogawa MEC-RELA

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1. CONSTRUCTION

Lumber must be new, sound and well-seasoned with a moisture content between 12 and 20%. Knots must be sound and not in excess of 1/3 of the width of the board and must not cause any nailing interference. Where possible, nails should be driven into side grain of lumber. Exterior grade plywood of equivalent strength, minimum 12 mm thickness, may also be used as sheathing.

- Lumber sizes indicated are nominal and must be considered as a minimum.
- Where a range is indicated, the lumber dimensions will depend on the weight and type of materials to be packed. Vendor is to ensure that the lumber dimensions selected are adequate for the weight and type of materials.
- Fasteners must be of adequate length and quantity and must be of the coated type; e.g., cement, resin, galvanized, or chemically etched. Staples are not permitted, except in the securing of plywood sheathing.
- Metal strapping must be unannealed steel applied with a stretching tool and secured with joints as strong as the strapping. No sharp edges are to be left exposed.
- The top of the sides of lumber boxes must be lined with waterproof paper or plastic film.

2. LAYOUT

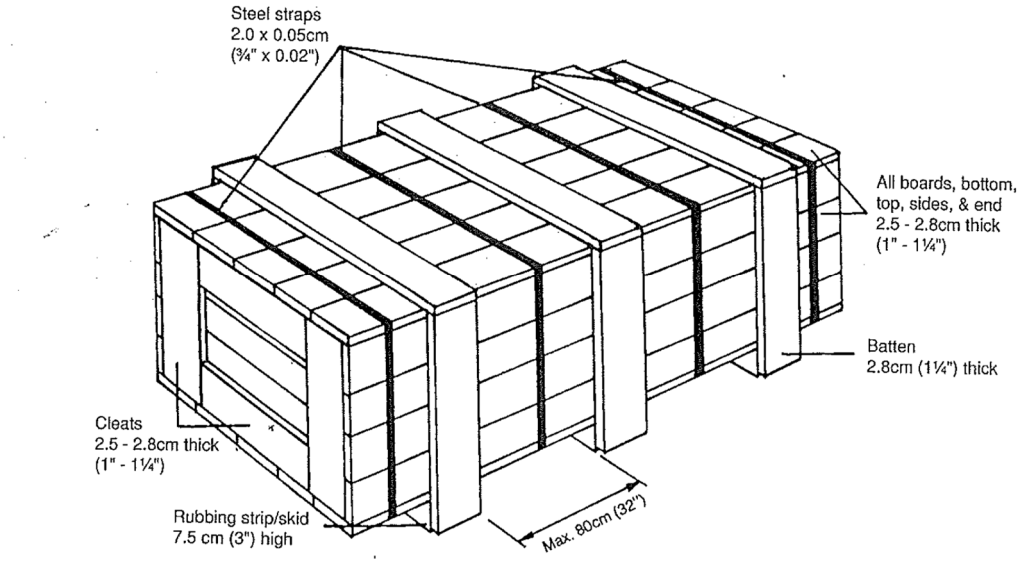
- Articles must be nested or packed firmly in minimal space. Unnecessary free space within the box must be avoided to reduce shipping costs.
- Fragile articles must be wrapped in cushioning material to provide protection and prevent movement.
- Heavy items must be secured to the base of the box and any movement prevented by means of adequate bracing, with cushioning used as needed.

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3. SAMPLE DRAWINGS

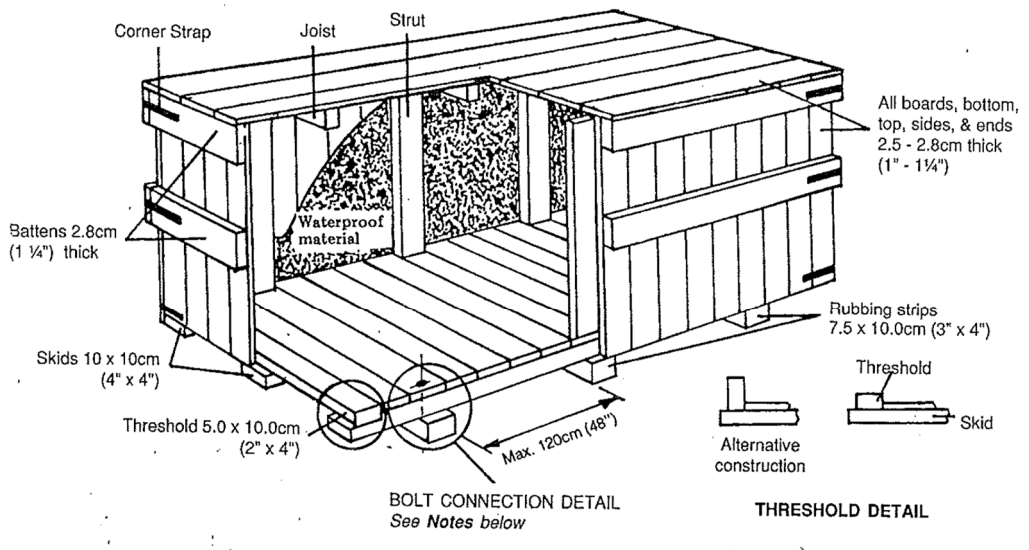
BOX TYPE 1

For net weights up to 1,000 kg (2,200 lb)



BOX TYPE 2

For net weights 1,000-5,000 kg (2,200-11,000 lb)



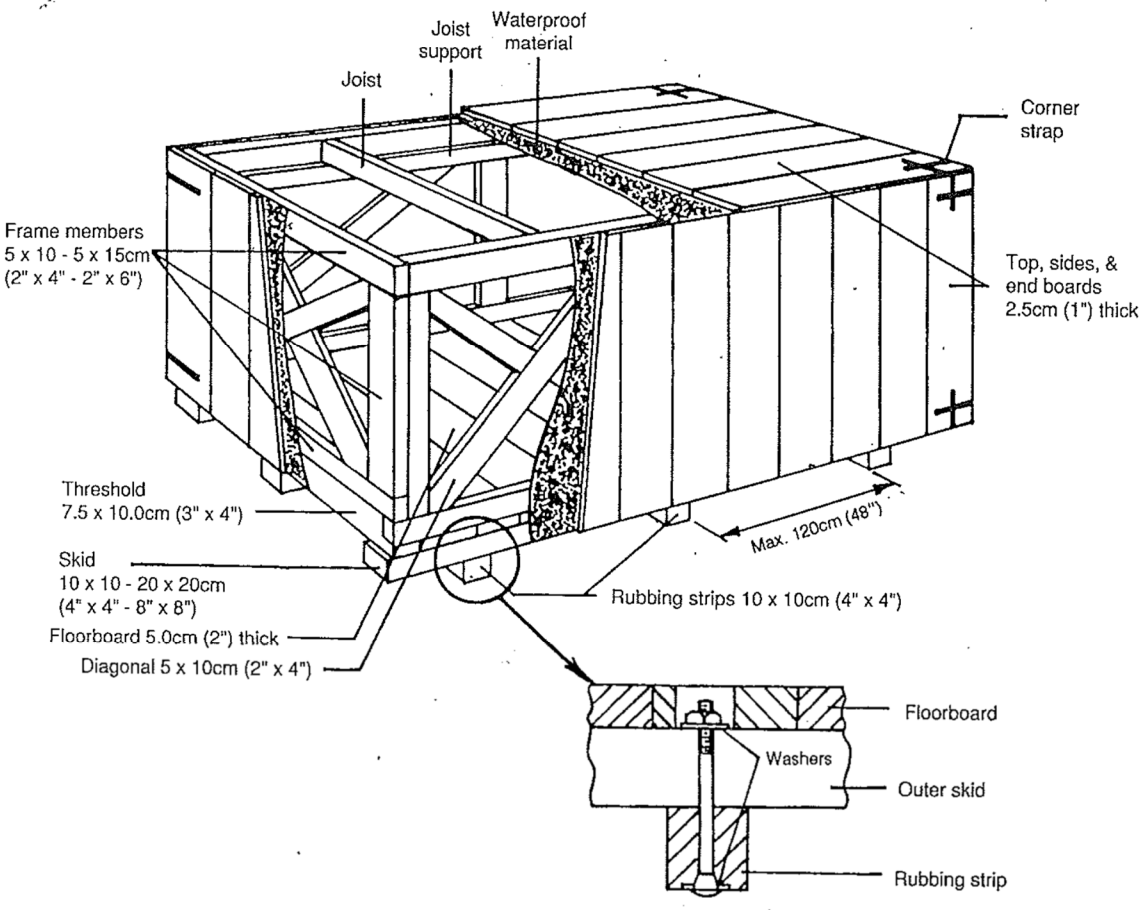
Notes: 1. Bolt connections are required when point loads will result in distortion of the base during lifting by slings. If required, adopt BOLT CONNECTION DETAIL shown in BOX TYPE 3.

2. Joists and struts may be required to provide top load support and to prevent compression by slings.

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BOX TYPE 3

For net weights 5,000-15,000 kg (11,000-33,000 lb)



BOLT CONNECTION DETAIL

Notes: 1. For net weights over 15,000 kg (33,000 lb), box design is to be approved by the Buyer.

2. Joists and struts of adequate size and quantity must be applied to provide top load support and to prevent compression by slings.

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4. GENERAL NOTES

- The equipment is protected from damage due to handling and environmental elements during shipment.
- All opening, weld-end and threaded connections shall be especially protected from damage and shall be adequately prepared as to be free of corrosion and foreign matter.
- All loose parts shall be crated or boxed for shipment and appropriately identified.
- All equipment shall be suitable to the environmental conditions.
- All boxes must identify with capital characters of height suitable to the dimensions of the same box, brought with indelible ink or with varnishes covered of rubber lacquer after their application.
- Marking will come carried out on 3 sides (2 lateral ones and the cover of the case).
- Packing list will come applied to the case by means of envelope in aluminum.

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

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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		

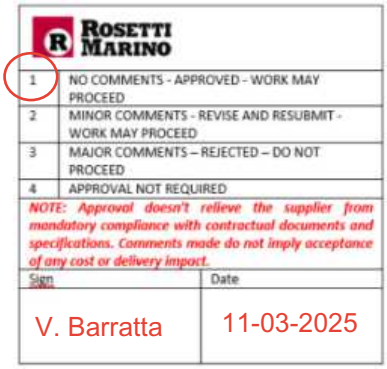
Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

CALCULATION SHEETS

Document Number: 1724001690-IN-CA-00005

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	11-03-2025

03	19/02/2025	Accepted for Construction (AFC)	MZ	GA	GO
02	20/01/2025	Accepted for Construction (AFC)	MZ	GA	GO
01	23/10/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	03/10/2024	Issue for Review (IFR)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

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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)
03	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-005	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:HYDROGEN_GAS	Sales Order:	/
Fluid Ref.	:ENTER HYDROGEN_GAS	Service	:HYDROGEN GAS
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

Flow		
Flow Rate	2047.00	kg/h
Pipe Reynolds Number	669032.	
Measurements		
Pressure (Upstream pG1)	30.0000	bar(g)
Pressure (Downstream pG2)	15.9115	bar(g)
Choking Pressure Ratio pf2/pf1	0.5457	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC
Fluid Properties @ dry conditions		
Density Flowing	2.5021	kg/m^3
Specific Gravity, G	0.0691	
Molecular Weight (Mw)	2.0000	
Compressibilty (Zf)	1.0000	
Viscosity	0.0100	cP
Isentropic Exponent(Cp/Cv)	1.3000	
Factors		
Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6673	
Design Information		
Pipe Diameter(D)	108.20400	mm@20. degC
Bore Diameter (d)	21.53988	mm@20. degC
Beta	0.19907	@20. degC
Orifice Minimum Thickness (tPE)	21.5399	mm
Pipeline Velocity V	24.71	m/s
Overall Pressure Loss	14.0885	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

R.W. Miller and Associates, Inc. The FLOW CONSULTANT TM Licensed Software C1987-2012 Version 7.1.0007

Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-007	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:HYDROGEN_GAS	Sales Order:	:/
Fluid Ref.	:ENTER HYDROGEN_GAS	Service	:HYDROGEN GAS
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

---------- Flow ----------

Flow Rate	2047.00	kg/h
Pipe Reynolds Number	669032.	

---------- Measurements ----------

Pressure (Upstream pG1)	30.0000	bar(g)
Pressure (Downstream pG2)	15.9115	bar(g)
Choking Pressure Ratio pf2/pf1	0.5457	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC

---------- Fluid Properties @ dry conditions ----------

Density Flowing	2.5021	kg/m^3
Specific Gravity, G	0.0691	
Molecular Weight (Mw)	2.0000	
Compressibilty (Zf)	1.0000	
Viscosity	0.0100	cP
Isentropic Exponent(Cp/Cv)	1.3000	

----------Factors----------

Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6673	

---------- Design Information ----------

Pipe Diameter(D)	108.20400	mm@20. degC
Bore Diameter (d)	21.53988	mm@20. degC
Beta	0.19907	@20. degC
Orifice Minimum Thickness (tPE)	21.5399	mm
Pipeline Velocity V	24.71	m/s
Overall Pressure Loss	14.0885	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

R.W. Miller and Associates, Inc. The FLOW CONSULTANT TM Licensed Software C1987-2012 Version 7.1.0007

Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-010	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:HYDROGEN_GAS	Sales Order:	:/
Fluid Ref.	:ENTER HYDROGEN_GAS	Service	:HYDROGEN GAS
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

Flow		
Flow Rate	2047.00	kg/h
Pipe Reynolds Number	669032.	
Measurements		
Pressure (Upstream pG1)	30.0000	bar(g)
Pressure (Downstream pG2)	15.9115	bar(g)
Choking Pressure Ratio pf2/pf1	0.5457	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC
Fluid Properties @ dry conditions		
Density Flowing	2.5021	kg/m^3
Specific Gravity, G	0.0691	
Molecular Weight (Mw)	2.0000	
Compressibilty (Zf)	1.0000	
Viscosity	0.0100	cP
Isentropic Exponent(Cp/Cv)	1.3000	
Factors		
Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6673	
Design Information		
Pipe Diameter(D)	108.20400	mm@20. degC
Bore Diameter (d)	21.53988	mm@20. degC
Beta	0.19907	@20. degC
Orifice Minimum Thickness (tPE)	21.5399	mm
Pipeline Velocity V	24.71	m/s
Overall Pressure Loss	14.0885	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

R.W. Miller and Associates, Inc. The FLOW CONSULTANT TM Licensed Software C1987-2012 Version 7.1.0007

Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-013	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:HYDROGEN_GAS	Sales Order:	/
Fluid Ref.	:ENTER HYDROGEN_GAS	Service	:HYDROGEN GAS
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

Flow		
Flow Rate	2047.00	kg/h
Pipe Reynolds Number	669032.	
Measurements		
Pressure (Upstream pG1)	30.0000	bar(g)
Pressure (Downstream pG2)	15.9115	bar(g)
Choking Pressure Ratio pf2/pf1	0.5457	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC
Fluid Properties @ dry conditions		
Density Flowing	2.5021	kg/m^3
Specific Gravity, G	0.0691	
Molecular Weight (Mw)	2.0000	
Compressibilty (Zf)	1.0000	
Viscosity	0.0100	cP
Isentropic Exponent(Cp/Cv)	1.3000	
Factors		
Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6673	
Design Information		
Pipe Diameter(D)	108.20400	mm@20. degC
Bore Diameter (d)	21.53988	mm@20. degC
Beta	0.19907	@20. degC
Orifice Minimum Thickness (tPE)	21.5399	mm
Pipeline Velocity V	24.71	m/s
Overall Pressure Loss	14.0885	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

R.W. Miller and Associates, Inc. The FLOW CONSULTANT TM Licensed Software C1987-2012 Version 7.1.0007

Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-016	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:HYDROGEN_GAS	Sales Order:	/
Fluid Ref.	:ENTER HYDROGEN_GAS	Service	:HYDROGEN GAS
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

---------- Flow ----------

Flow Rate	2047.00	kg/h
Pipe Reynolds Number	669032.	

---------- Measurements ----------

Pressure (Upstream pG1)	30.0000	bar(g)
Pressure (Downstream pG2)	15.9115	bar(g)
Choking Pressure Ratio pf2/pf1	0.5457	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC

---------- Fluid Properties @ dry conditions ----------

Density Flowing	2.5021	kg/m^3
Specific Gravity, G	0.0691	
Molecular Weight (Mw)	2.0000	
Compressibilty (Zf)	1.0000	
Viscosity	0.0100	cP
Isentropic Exponent(Cp/Cv)	1.3000	

----------Factors----------

Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6673	

---------- Design Information ----------

Pipe Diameter(D)	108.20400	mm@20. degC
Bore Diameter (d)	21.53988	mm@20. degC
Beta	0.19907	@20. degC
Orifice Minimum Thickness (tPE)	21.5399	mm
Pipeline Velocity V	24.71	m/s
Overall Pressure Loss	14.0885	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

R.W. Miller and Associates, Inc. The FLOW CONSULTANT TM Licensed Software C1987-2012 Version 7.1.0007

Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-019	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:HYDROGEN_GAS	Sales Order:	/
Fluid Ref.	:ENTER HYDROGEN_GAS	Service	:HYDROGEN GAS
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

---------- Flow ----------

Flow Rate	2047.00	kg/h
Pipe Reynolds Number	669032.	

---------- Measurements ----------

Pressure (Upstream pG1)	30.0000	bar(g)
Pressure (Downstream pG2)	15.9115	bar(g)
Choking Pressure Ratio pf2/pf1	0.5457	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC

---------- Fluid Properties @ dry conditions ----------

Density Flowing	2.5021	kg/m^3
Specific Gravity, G	0.0691	
Molecular Weight (Mw)	2.0000	
Compressibilty (Zf)	1.0000	
Viscosity	0.0100	cP
Isentropic Exponent(Cp/Cv)	1.3000	

----------Factors----------

Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6673	

---------- Design Information ----------

Pipe Diameter(D)	108.20400	mm@20. degC
Bore Diameter (d)	21.53988	mm@20. degC
Beta	0.19907	@20. degC
Orifice Minimum Thickness (tPE)	21.5399	mm
Pipeline Velocity V	24.71	m/s
Overall Pressure Loss	14.0885	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

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Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-022	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:HYDROGEN_GAS	Sales Order:	/
Fluid Ref.	:ENTER HYDROGEN_GAS	Service	:HYDROGEN GAS
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

---------- Flow ----------

Flow Rate	119.000	kg/h
Pipe Reynolds Number	157946.	

---------- Measurements ----------

Pressure (Upstream pG1)	30.0000	bar(g)
Pressure (Downstream pG2)	15.9115	bar(g)
Choking Pressure Ratio pf2/pf1	0.5457	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC

---------- Fluid Properties @ dry conditions ----------

Density Flowing	2.5021	kg/m^3
Specific Gravity, G	0.0691	
Molecular Weight (Mw)	2.0000	
Compressibilty (Zf)	1.0000	
Viscosity	0.0100	cP
Isentropic Exponent(Cp/Cv)	1.3000	

----------Factors----------

Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6673	

---------- Design Information ----------

Pipe Diameter(D)	26.64460	mm@20. degC
Bore Diameter (d)	5.19351	mm@20. degC
Beta	0.19492	@20. degC
Orifice Minimum Thickness (tPE)	5.1935	mm
Pipeline Velocity V	23.69	m/s
Overall Pressure Loss	14.0885	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

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Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:25-RO-024	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:Nitrogen	Sales Order:	:/
Fluid Ref.	:MBWR State Equation	Service	:NITROGEN
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

Flow		
Flow Rate	30.0000	kg/h
Pipe Reynolds Number	22145.	
Measurements		
Pressure (Upstream pG1)	2.0000	bar(g)
Pressure (Downstream pG2)	0.5770	bar(g)
Choking Pressure Ratio pf2/pf1	0.5277	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC
Fluid Properties @ dry conditions		
Density Flowing	3.4072	kg/m^3
Specific Gravity, G	0.9672	
Molecular Weight (Mw)	28.0134	
Compressibilty (Zf)	0.9994	
Viscosity	0.0180	cP
Isentropic Exponent(Cp/Cv)	1.4032	
Factors		
Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6855	
Design Information		
Pipe Diameter(D)	26.64460	mm@20. degC
Bore Diameter (d)	4.26669	mm@20. degC
Beta	0.16013	@20. degC
Orifice Minimum Thickness (tPE)	4.2667	mm
Pipeline Velocity V	4.39	m/s
Overall Pressure Loss	1.4230	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

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Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:50-RO-001	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:SEA_WATER	Sales Order:	:/
Fluid Ref.	:ENTER SEA_WATER	Service	:SEA WATER
Pipe	:316 Stainless Steel	Primary	:Super Duplex
Meter	:Pipe Taps, Restrictive Orifice	Taps	:2 1/2 & 8 D
Coeff Eq	:Stolz	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

Max/Design/Normal		
Flow Rate	0.850000	litre/h(Flow Volume)
Differential	4.6000	Bar
Pipe Reynolds Number	12.	
Measurements		
Pressure pG	5.6000	bar(g)
Barometric	1.0133	bar(a)
Temperature (Flowing)	22.0000	degC
Fluid Properties		
Density (Flowing)	1025.00000	kg/m^3
Viscosity	1.00000	cP
Factors		
Sizing Factor(SM)	0.00001	@ Normal Flow
Discharge Coefficient(C)	0.59593	@ Normal Flow
Pipe Thermal Expansion(FaD)	1.00003	
Bore Thermal Expansion(Fad)	1.00003	
Design Information		
Pipe Diameter(D)	26.64460	mm@20.degC
Bore Diameter	0.12976	mm@20. degC
Plate thickness-Flange Mounted Plate	3.1750	mm@20. degC
Beta	0.00487	@20. degC
Pipeline Velocity (Max)	0.00	m/s
Overall Pressure Loss(Max)	4.6000	bar

Meter is starting to cavitate

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Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:50-RO-002	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:SEA_WATER	Sales Order:	:/
Fluid Ref.	:ENTER SEA_WATER	Service	:SEA WATER
Pipe	:316 Stainless Steel	Primary	:Super Duplex
Meter	:Pipe Taps, Restrictive Orifice	Taps	:2 1/2 & 8 D
Coeff Eq	:Stolz	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

Max/Design/Normal		
Flow Rate	0.850000	litre/h(Flow Volume)
Differential	4.6000	Bar
Pipe Reynolds Number	12.	
Measurements		
Pressure pG	5.6000	bar(g)
Barometric	1.0133	bar(a)
Temperature (Flowing)	22.0000	degC
Fluid Properties		
Density (Flowing)	1025.00000	kg/m^3
Viscosity	1.00000	cP
Factors		
Sizing Factor(SM)	0.00001	@ Normal Flow
Discharge Coefficient(C)	0.59593	@ Normal Flow
Pipe Thermal Expansion(FaD)	1.00003	
Bore Thermal Expansion(Fad)	1.00003	
Design Information		
Pipe Diameter(D)	26.64460	mm@20.degC
Bore Diameter	0.12976	mm@20. degC
Plate thickness-Flange Mounted Plate	3.1750	mm@20. degC
Beta	0.00487	@20. degC
Pipeline Velocity (Max)	0.00	m/s
Overall Pressure Loss(Max)	4.6000	bar

Meter is starting to cavitate

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Customer:	ROSETTI MARINO	JOB	:4791_OS
TAG	:80-RO-001	Doc	:1724001690-IN-CA-00005-03
TAGFluid	:Nitrogen	Sales Order:	/
Fluid Ref.	:MBWR State Equation	Service	:NITROGEN
Pipe	:316 Stainless Steel	Primary	:316 Stainless Steel
Meter	:Orifice:Choked Flow	Taps	:Upstream
Coeff Eq	:Ward-Smith	Calculation	:SIZE
Preparer	:THORAT	Printed	:19/02/2025

Flow		
Flow Rate	30.0000	kg/h
Pipe Reynolds Number	22145.	
Measurements		
Pressure (Upstream pG1)	2.0000	bar(g)
Pressure (Downstream pG2)	0.5770	bar(g)
Choking Pressure Ratio pf2/pf1	0.5277	
Barometric	1.0133	bar(a)
Temperature Flowing	25.0000	degC
Fluid Properties @ dry conditions		
Density Flowing	3.4072	kg/m^3
Specific Gravity, G	0.9672	
Molecular Weight (Mw)	28.0134	
Compressibilty (Zf)	0.9994	
Viscosity	0.0180	cP
Isentropic Exponent(Cp/Cv)	1.4032	
Factors		
Discharge Coefficient(C)	0.8392	
Pipe Thermal Expansion (FaD)	1.0001	
Critical Flow Function (Ycr)	0.6855	
Design Information		
Pipe Diameter(D)	26.64460	mm@20. degC
Bore Diameter (d)	4.26669	mm@20. degC
Beta	0.16013	@20. degC
Orifice Minimum Thickness (tPE)	4.2667	mm
Pipeline Velocity V	4.39	m/s
Overall Pressure Loss	1.4230	bar

CHOKED/CRITICAL FLOW CONDITIONS

BORE DIAMETER AND THICKNESS AS DISPLAYED ON THE GAD TABLE

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Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

INSTRUMENT DATA SHEETS

Document Number: 1724001690-IN-DS-00004

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	24-01-2025

03	20/01/2025	Accepted for Construction (AFC)	MZ	GA	GO
02	13/11/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	24/10/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	04/10/2024	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	Accepted for Construction (AFC)
02	Accepted for Construction (AFC)
03	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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GENERAL NOTES:

1) This datasheet is to be read in conjunction with following documents:
    - Project Datasheets 123A90-DDL-IN-DS-40054;
    - General Arrangement Drawings - Restriction Orifice 1724001690-IN-DA-00003;
    - Calculation Sheets - Restriction Orifice 1724001690-IN-CA-00005.
2) Ambient Temperature Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.
3) The orifice bore sizing calculation is based on ISO 5167 and when not applicable e.g. for sonic flow R.W. Miller can be used. The sizing and thickness calculation is reviewed by Buyer. Restriction orifice plates is mounted between piping flanges. The surface finish matches the flange surface finish.
4) Restriction orifice is single stage or single stage multi-hole or multi-stage type depending upon requirement.
5) Single stage multi-hole restriction orifice is used to abate the noise generated by single stage orifice due to high velocity through restriction orifice plate, bore which offers restriction from incoming fluid.
6) All flanges in ASME B31.3 and ASME B31.12 are Raised Face type.
7) Material test certificates MTCs are provided by Manufacturer for all valves, tubing & fittings. MTCs shall include EN 10204 3.1 certification for all metallic materials.
8) Orifice plate is permanently marked with Orifice plate information with sizing details, dimensional and material details.
9) Orifice tag number, material, direction of flow, nominal diameter and bore diameter are permanently stamped on the orifice plate handle (on upstream side).
10) Vendor to ensure that the noise is within 85 dBA in orifice sizing and selection.
11) Maximum flow run case: "Emergency Fire Blowdown", as per 123A90-DDL-PR-RE-80030_01 "Relief, Vent and Blowdown Report", rev01.
12) Minimum temperature run case: "Low Temperature depressurization case", as per 123A90-DDL-PR-RE-80030_01 "Relief, Vent and Blowdown Report", rev01.

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GENERAL	1	Tag Number			25-RO-005			
	2	Service			HYDROGEN FROM STORAGE VESSEL (V-25001A) TO HYDROGEN VENT HEADER			
	3	P&ID Number			123A90-DDL-PR-PID-80015			
	4	Line Number			4"-HY-142-03HSS-N			
	5	Line Size	Line Schedule		4"		Thk (mm) = 3.05	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		HYDROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	Note 11		Note 12
	15	Flow Operating			kg/hr	2047		1300
	16	Upsteam Pressure			barg	30		28
	17	Temperature			°C	25		-8.4
	18	Density			kg/m^3	2.5		2.63
	19	Compressibility Factor			-	1		1
	20	Viscosity			cP	0.01		0.01
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.3		1.3
	23	Molecular Weight			2			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			10 mm			
	27	Bore Diameter			4.22 mm (26 holes)			
	28	Beta Ratio			0.19907			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			2047 kg/h			
	31	Differential Pressure @ Full scale			30 barg – 15.9115 barg = 14.0885 bar			
	32	Choking Pressure Ratio			0.5457			
ORIFICE FLANGES	33	Size			4" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			25-RO-007			
	2	Service			HYDROGEN FROM STORAGE VESSEL (V-25001B) TO HYDROGEN VENT HEADER			
	3	P&ID Number			123A90-DDL-PR-PID-80016			
	4	Line Number			4"-HY-167-03HSS-N			
	5	Line Size	Line Schedule		4"		Thk (mm) = 3.05	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		HYDROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	Note 11		Note 12
	15	Flow Operating			kg/hr	2047		1300
	16	Upsteam Pressure			barg	30		28
	17	Temperature			°C	25		-8.4
	18	Density			kg/m^3	2.5		2.63
	19	Compressibility Factor			-	1		1
	20	Viscosity			cP	0.01		0.01
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.3		1.3
	23	Molecular Weight			2			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			10 mm			
	27	Bore Diameter			4.22 mm (26 holes)			
	28	Beta Ratio			0.19907			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			2047 kg/h			
	31	Differential Pressure @ Full scale			30 barg - 15.9115 barg = 14.0885 bar			
	32	Choking Pressure Ratio			0.5457			
ORIFICE FLANGES	33	Size			4" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			25-RO-010			
	2	Service			HYDROGEN FROM STORAGE VESSEL (V-25001C) TO HYDROGEN VENT HEADER			
	3	P&ID Number			123A90-DDL-PR-PID-80017			
	4	Line Number			4"-HY-171-03HSS-N			
	5	Line Size	Line Schedule		4"		Thk (mm) = 3.05	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		HYDROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	Note 11		Note 12
	15	Flow Operating			kg/hr	2047		1300
	16	Upsteam Pressure			barg	30		28
	17	Temperature			°C	25		-8.4
	18	Density			kg/m^3	2.5		2.63
	19	Compressibility Factor			-	1		1
	20	Viscosity			cP	0.01		0.01
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.3		1.3
	23	Molecular Weight			2			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			10 mm			
	27	Bore Diameter			4.22 mm (26 holes)			
	28	Beta Ratio			0.19907			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			2047 kg/h			
	31	Differential Pressure @ Full scale			30 barg - 15.9115 barg = 14.0885 bar			
	32	Choking Pressure Ratio			0.5457			
ORIFICE FLANGES	33	Size			4" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			25-RO-013			
	2	Service			HYDROGEN FROM STORAGE VESSEL (V-25001D) TO HYDROGEN VENT HEADER			
	3	P&ID Number			123A90-DDL-PR-PID-80018			
	4	Line Number			4"-HY-175-03HSS-N			
	5	Line Size	Line Schedule		4"		Thk (mm) = 3.05	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		HYDROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	Note 11		Note 12
	15	Flow Operating			kg/hr	2047		1300
	16	Upsteam Pressure			barg	30		28
	17	Temperature			°C	25		-8.4
	18	Density			kg/m^3	2.5		2.63
	19	Compressibility Factor			-	1		1
	20	Viscosity			cP	0.01		0.01
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.3		1.3
	23	Molecular Weight			2			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			10 mm			
	27	Bore Diameter			4.22 mm (26 holes)			
	28	Beta Ratio			0.19907			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			2047 kg/h			
	31	Differential Pressure @ Full scale			30 barg - 15.9115 barg = 14.0885 bar			
	32	Choking Pressure Ratio			0.5457			
ORIFICE FLANGES	33	Size			4" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			25-RO-016			
	2	Service			HYDROGEN FROM STORAGE VESSEL (V-25001E) TO HYDROGEN VENT HEADER			
	3	P&ID Number			123A90-DDL-PR-PID-80019			
	4	Line Number			4"-HY-180-03HSS-N			
	5	Line Size	Line Schedule		4"		Thk (mm) = 3.05	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		HYDROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	Note 11		Note 12
	15	Flow Operating			kg/hr	2047		1300
	16	Upsteam Pressure			barg	30		28
	17	Temperature			°C	25		-8.4
	18	Density			kg/m^3	2.5		2.63
	19	Compressibility Factor			-	1		1
	20	Viscosity			cP	0.01		0.01
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.3		1.3
	23	Molecular Weight			2			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			10 mm			
	27	Bore Diameter			4.22 mm (26 holes)			
	28	Beta Ratio			0.199			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			2047 kg/h			
	31	Differential Pressure @ Full scale			30 barg - 15.9115 barg = 14.0885 bar			
	32	Choking Pressure Ratio			0.5457			
ORIFICE FLANGES	33	Size			4" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			25-RO-019			
	2	Service			HYDROGEN FROM STORAGE VESSEL (V-25001F) TO HYDROGEN VENT HEADER			
	3	P&ID Number			123A90-DDL-PR-PID-80020			
	4	Line Number			4"-HY-184-03HSS-N			
	5	Line Size	Line Schedule		4"		Thk (mm) = 3.05	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		HYDROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	Note 11		Note 12
	15	Flow Operating			kg/hr	2047		1300
	16	Upsteam Pressure			barg	30		28
	17	Temperature			°C	25		-8.4
	18	Density			kg/m^3	2.5		2.63
	19	Compressibility Factor			-	1		1
	20	Viscosity			cP	0.01		0.01
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.3		1.3
	23	Molecular Weight			2			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			10 mm			
	27	Bore Diameter			4.22 mm (26 holes)			
	28	Beta Ratio			0.199			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			2047 kg/h			
	31	Differential Pressure @ Full scale			30 barg - 15.9115 barg = 14.0885 bar			
	32	Choking Pressure Ratio			0.5457			
ORIFICE FLANGES	33	Size			4" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			25-RO-022			
	2	Service			HYDROGEN FROM H2 TANKS			
	3	P&ID Number			123A90-DDL-PR-PID-80014			
	4	Line Number			1"-HY-144-03HSS-N			
	5	Line Size	Line Schedule		1"		Thk (mm) = 3.38	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		HYDROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	Note 11		Note 12
	15	Flow Operating			kg/hr	119		90
	16	Upsteam Pressure			barg	30		28
	17	Temperature			°C	25		-8.4
	18	Density			kg/m^3	2.5		2.63
	19	Compressibility Factor			-	1		1
	20	Viscosity			cP	0.01		0.01
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.3		1.3
	23	Molecular Weight			2			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			6 mm			
	27	Bore Diameter			5.19347 (1 hole)			
	28	Beta Ratio			0.19492			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			119 kg/h			
	31	Differential Pressure @ Full scale			30 barg – 15.9115 barg = 14.0885 bar			
	32	Choking Pressure Ratio			0.5457			
ORIFICE FLANGES	33	Size			1" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			25-RO-024			
	2	Service			HYDROGEN FROM ELECTROLYZER (A-20000) TO HYDROGEN VENT HEADER			
	3	P&ID Number			123A90-DDL-PR-PID-80013			
	4	Line Number			1"-HY-143-03HSS-N			
	5	Line Size	Line Schedule		1"		Thk (mm) = 3.38	
	6	Line Material			ASTM A312 Gr.TP316/316L			
PROCESS CONDITIONS	7	Fluid	State		NITROGEN		GAS	
	8	Design Pressure	Min.	Max.			40 barg	
	9	Design Temperature	Min.	Max.			80	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units			
	15	Flow Operating			kg/hr	30 (*)	30	
	16	Upsteam Pressure			barg	2 (*)	8	
	17	Temperature			°C	25 (*)	25	
	18	Density			kg/m^3	3.4 (*)	10.2	
	19	Compressibility Factor			-	1 (*)	1	
	20	Viscosity			cP	0.018 (*)	0.018	
	21	Vapour Pressure						
	22	Specific Heat Ratio Cp/Cv			-	1.4 (*)	1.4	
	23	Molecular Weight			28			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE MULTIHOLES (Chocked Flow)			
	25	Material			AISI 316/316L			
	26	Thickness			6 mm			
	27	Bore Diameter			4.26 mm (1 hole)			
	28	Beta Ratio			0.16013			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale			30 kg/h			
	31	Differential Pressure @ Full scale			2 barg – 0.5770 barg = 1.423 bar			
	32	Choking Pressure Ratio			0.5277			
ORIFICE FLANGES	33	Size			1" (Flanges are Out of scope of Vendor's supply)			
	34	Rating			300#			
	35	Type			Flanged			
	36	Facing			RF			
	37	Flange Material			ASTM A182 Gr. F316/316L			
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	39	Taps Type	Quantity		-		-	
	40	Taps Size	Connection		-		-	
	41	Taps Orientation			-			
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl			
	43	Model			ORI			
	44	Purchase Order Number			4791_OS			

(*) = sizing case

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GENERAL	1	Tag Number			50-RO-001			
	2	Service			SEA WATER BY-PASS PUMP P-50001A			
	3	P&ID Number			123A90-DDL-PR-PID-80021			
	4	Line Number			1"-SWS-146-01SD-E			
	5	Line Size	Line Schedule		1"		Thk (mm) = 3.38	
	6	Line Material			ASTM A790 UNS S32760			
PROCESS CONDITIONS	7	Fluid	State		SEA WATER		LIQUID	
	8	Design Pressure	Min.	Max.			7.6 barg	
	9	Design Temperature	Min.	Max.			100°C	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	@ Max. Flow	@ Norm. Flow	@ Min. Flow
	15	Flow Operating			lt/hr		0.85	
	16	Upsteam Pressure			barg		5.60	
	17	Temperature			°C		22	
	18	Density			kg/m^3		1025	
	19	Compressibility Factor			-		N/A	
	20	Viscosity			cP		1	
	21	Vapour Pressure			bar		0.02	
	22	Specific Heat Ratio Cp/Cv			-		1.33	
	23	Molecular Weight			18			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE CONCENTRIC TYPE			
	25	Material			25% CR SDPLX			
	26	Thickness			3 mm			
	27	Bore Diameter			0.12976 mm (1 hole)			
	28	Beta Ratio			0.00487			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale						
	31	Differential Pressure @ Full scale						
ORIFICE FLANGES	32	Size			1" (Flanges are Out of scope of Vendor's supply)			
	33	Rating			150#			
	34	Type			Flanged			
	35	Facing			RF			
	36	Flange Material			ASTM A182 Gr. F55			
	37	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	38	Taps Type	Quantity		-		-	
	39	Taps Size	Connection		-		-	
	40	Taps Orientation			-			
PURCHASE	41	Manufacturer			Tecnomatic Flow Elements Srl			
	42	Model			ORI			
	43	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			50-RO-002			
	2	Service			SEA WATER BY-PASS PUMP P-50001B			
	3	P&ID Number			123A90-DDL-PR-PID-80021			
	4	Line Number			1"-SWS-147-01SD-E			
	5	Line Size	Line Schedule		1"		Thk (mm) = 3.38	
	6	Line Material			ASTM A790 UNS S32760			
PROCESS CONDITIONS	7	Fluid	State		SEA WATER		LIQUID	
	8	Design Pressure	Min.	Max.			7.6 barg	
	9	Design Temperature	Min.	Max.			100°C	
	10	Base Pressure	Base Temperature					
	11	Critical Pressure						
	12	Permanent Pressure Loss Across Meter						
	13	Entrained Gas / Liquid (% Mass)						
	14				Units	@ Max. Flow	@ Norm. Flow	@ Min. Flow
	15	Flow Operating			lt/hr		0.85	
	16	Upsteam Pressure			barg		5.60	
	17	Temperature			°C		22	
	18	Density			kg/m^3		1025	
	19	Compressibility Factor			-		N/A	
	20	Viscosity			cP		1	
	21	Vapour Pressure			bar		0.02	
	22	Specific Heat Ratio Cp/Cv			-		1.33	
	23	Molecular Weight			18			
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE CONCENTRIC TYPE			
	25	Material			25% CR SDPLX			
	26	Thickness			3 mm			
	27	Bore Diameter			0.12976 mm (1 hole)			
	28	Beta Ratio			0.00487			
	29	Drain or Vent Hole			N/A			
	30	Flow Full Scale						
	31	Differential Pressure @ Full scale						
ORIFICE FLANGES	32	Size			1" (Flanges are Out of scope of Vendor's supply)			
	33	Rating			150#			
	34	Type			Flanged			
	35	Facing			RF			
	36	Flange Material			ASTM A182 Gr. F55			
	37	Gasket Material			(Gaskets are Out of scope of Vendor's supply)			
	38	Taps Type	Quantity		-		-	
	39	Taps Size	Connection		-		-	
	40	Taps Orientation			-			
PURCHASE	41	Manufacturer			Tecnomatic Flow Elements Srl			
	42	Model			ORI			
	43	Purchase Order Number			4791_OS			

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GENERAL	1	Tag Number			80-RO-001				
	2	Service			HYDROGEN FROM STORAGE VESSEL TO FUEL CELL				
	3	P&ID Number			123A90-DDL-PR-PID-80012				
	4	Line Number			1"-HY-163-01HSS-N				
	5	Line Size	Line Schedule		1"		Thk (mm) = 3.38		
	6	Line Material			ASTM A312 Gr.TP316/316L				
PROCESS CONDITIONS	7	Fluid	State		NITROGEN		GAS		
	8	Design Pressure	Min.	Max.			10		
	9	Design Temperature	Min.	Max.			80		
	10	Base Pressure	Base Temperature						
	11	Critical Pressure							
	12	Permanent Pressure Loss Across Meter							
	13	Entrained Gas / Liquid (% Mass)							
	14				Units				
	15	Flow Operating			kg/hr	30			
	16	Upsteam Pressure			barg	2			
	17	Temperature			°C	25			
	18	Density			kg/m^3	3.4			
	19	Compressibility Factor			-	1			
	20	Viscosity			cP	0.018			
	21	Vapour Pressure							
	22	Specific Heat Ratio Cp/Cv			-	1.4			
	23	Molecular Weight			28				
ORIFICE PLATE	24	Type			RESTRICTION ORIFICE CONCENTRIC TYPE (Chocked Flow)				
	25	Material			AISI 316/316L				
	26	Thickness			6 mm				
	27	Bore Diameter			4.26646 mm (1 hole)				
	28	Beta Ratio			0.16012				
	29	Drain or Vent Hole			N/A				
	30	Flow Full Scale			30 kg/h				
	31	Differential Pressure @ Full scale			2 barg – 0.5770 barg = 1.423 bar				
	32	Chocked Pressure Ratio			0.5277				
ORIFICE FLANGES	33	Size			1" (Flanges are Out of scope of Vendor's supply)				
	34	Rating			150#				
	35	Type			Flanged				
	36	Facing			RF				
	37	Flange Material			ASTM A182 Gr. F316/316L				
	38	Gasket Material			(Gaskets are Out of scope of Vendor's supply)				
	39	Taps Type	Quantity		-		-		
	40	Taps Size	Connection		-		-		
	41	Taps Orientation			-				
PURCHASE	42	Manufacturer			Tecnomatic Flow Elements Srl				
	43	Model			ORI				
	44	Purchase Order Number			4791_OS				

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PART 2
CERTIFICATION DOSSIER

TERRANOVA®
WE DO PROCESS INSTRUMENTATION PRECISELY
SPRIANO Valcom MEC-RELA

Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

MATERIAL 3.1 CERTIFICATES

Document Number: -

Document Class: 3

TERRANOVA® SPRIANO Valcom MEC-RELA

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TERRANOVA
Terranova Srl
26827 Terranova dei Passerini (LO) - Via Gramsci 1 – Tel. +39 0377 911066
Email: sales@terranova-instruments.com

MATERIAL DETAIL (RIEPILOGO MATERIALI)

N. 01/4791 Page 1 of 1

Customer (Cliente)		JOB Number
ROSETTI MARINO		4791_OS
Quality Plan No. (PFC N.)	**Step (Fase)**	**Plant (Impianto)**
-	-	-

DESCRIPTION (DESCRIZIONE)

Drawing No. (Disegno N.)	Item (Pos)	Product (Prodotto)	Material (Materiale)	Heat No. (Colata N.)	Supplier (Fornitore)	Certificate (Certificato)
6 x RESTRICTION ORIFICE PLATE RF TYPE MULTIHOLE - Thk 10mm						
Tags No.						
25-RO-005, 25-RO-007, 25-RO-010, 25-RO-013, 25-RO-016, 25-RO-019						
1724001690-IN-DA-00003	1	ORIFICE PLATE THK 10mm	SS 316/316L	511125	MARCEGAGLIA	10723135876
1724001690-IN-DA-00003	2	HANDLE THK 3mm	SS 316/316L	2ZWN	ACERINOX	F0 2023 20495 10002
3 x RESTRICTION ORIFICE PLATE RF TYPE - Thk 6mm						
Tags No.						
25-RO-022, 25-RO-024, 80-RO-001						
1724001690-IN-DA-00003	1,2	ORIFICE PLATE THK 6mm	SS 316/316L	50218	OUTOKUMPU	950706/001

Terranova Inspector (Ispettore Terranova)	Purchaser's Inspector (Ispettore Cliente)	Authorized Inspector (Ispettore Ente Autorizzato)
TERRANOVA SPRIANO Vulcom MEC-RELA	x CROSSWIND R	
Date (Data) 20/11/2024	Date (Data) 5/12/24	Date (Data)

Order ref. ORDINE MAIL - Item LACBF11000155 - Quantity 713,000 Kg - NIM Acciai Vender 02023800956 - Heat 511125 - Product ID 23TV005697
Doc. A1-2023-0008432 - Order n. 0009792 - 05/04/2023

MARCEGAGLIA SPECIALTIES

Type: Inspection Certificate 3.1 AD-2000 EN10204 | Number: 10723135878 | Issued On: 24/02/2023

- QMS approved acc AD-2000 W0 with Cert 01 202 I/Q-08 5131 by TUV Rheinland (0035), cert. PED 2014/68/UE Annex I §4.3 by TUV Rheinland (0035)
- Material acc. AD2000 W2 - W10 in ref to EN10028-7
- Material conforming to NACE MR0175/MR0103 - ISO15156-1/ISO15156-3

Customer
ACCIAI VENDER SOCIETA' PER AZI
VIA NOBEL 4/A-Q.RE IND.LE S.P.
43122 PARMA IT

Consignee
ACCIAI VENDER SOCIETA' PER AZIONI
VIA NOBEL 4/A-Q.RE IND.LE S.P.
43122 PARMA IT

Delivery Nr: 8920057741
Of: 24/02/2023
Delivery note nr: 1007002253

Quality Control: Q.M.D./Q.M. A.Venturini
Plant Of Gazoldo

Pages: 1/1

Material: 51800975
Description: LXC 10,00 X 1500 X 3000 316L/4404

Norm/Grade: EN10028-7,EN10088-2,EN10088-4, ASTM A240, ASME SA240, ASTM A480, ASME SA480
Quality/Qualità: X2CrNiMo17-12-2, WNR1.4404, 316L / AISI316, X5CrNiMo17-12-2, WNR1.4401, 316

Order Nr: 1191545741/50
Client Order: 2P/0000242
Client Date: 7/10/2022

Item	Identification Nr	Heat	Quantity
1	23TV005694	511125	2138 KG
2	23TV005695	511125	2138 KG
3	23TV005697	511125	2138 KG

Dimensional tolerances/
EN9444-2

Steel Processing/
Electric arc furnace VOD/AOD, continuous casting, heat threatment /annealing at 1050°C, forced air cooling

Mark Tester/
- Organization inspection: CQ3

- ASME norms acc. Sec. II Part A Ed. 2021

Terms of Delivery/

Identification Nr	Chemical Type	Mark	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Ni (%)	Mo (%)	N (%)
23TV005694		23A9000323	.024	.569	1.362	.0193	.0124	17.066	10.557	2.083	.0557
23TV005695		23A9000323	.024	.569	1.362	.0193	.0124	17.066	10.557	2.083	.0557
23TV005697		23A9000323	.024	.569	1.362	.0193	.0124	17.066	10.557	2.083	.0557

Identification Nr	Test position	Test direction	Mark	Rm [N/mm²]	Rp 0.2 [N/mm²]	RP 1 [N/mm²]	A5D (%)	A5D (%)	HRB B	HRB T
23TV005694	B	T	23A9000323	605	325	375	49.9	53.1	88	88
23TV005695	B	T	23A9000323	605	325	375	49.9	53.1	88	88
23TV005697	B	T	23A9000323	605	325	375	49.9	53.1	88	88

Test Position/Posizione Prova
B=Coil End
C=Coil middle
T=Coil head

Test Direction/Direzione Prova
T=Transverse Direction
L=Longitudinal Direction

Remarks about tensile test:
- Confirmation of adequate degree of reliability for the uniformity over the strip length with certificate issued by TÜV Rheinland Group dt. June 19, 2019
- Tensile test according EN ISO 6892-1 B / A-SA 370

Other controls:
- Dimensions within tolerances, spectrometrical identity test OK
- Corrosion Test EN ISO3651-2 Method A and ASTM A262 pract.E OK

Remarks:
- We certify that products listed above comply with order requirements
- Document validated acc. EN10204 par. 5
- Norms are intended in the valid edition at the time of the order
- Durability: NPD
- Regulated Substances: NPD
- Intended Uses: Building Constructions or Civil Engineering .
- DoP available at http://www.marcegaglia.com/brochure/e/quality/dop.html
- surface finish 1D

1244
33
MARCEGAGLIA SPECIALTIES
EN 10088-4:2009

0474
13
MARCEGAGLIA
EN 10088-4:2009

ACCIAI VENDER SPA - CONFORM TO THE ORIGINAL

TERRANOVA
SPRIANO Telcom MEC-RELA

CROSSWIND
5/12/24

ACERINOX EUROPA
FABRICA DEL CAMPO DE GIBRALTAR
PALMONES (LOS BARRIOS)
TFNO. (34) - 956 62 33 00
FAX (34) - 956 62 31 11
P.O. BOX 83
11370 LOS BARRIOS (CADIZ)
ESPAÑA

by Accredited Body

INSPECTION CERTIFICATE
CERTIFICADO DE INSPECCION 3.1

ACCORDING TO EN 10204

CERTIFICATE Nº F0 2023 20495 10002

CUSTOMER	OUR ORDER Nº	YOUR ORDER Nº
OKI ACCIAI INOSSIDABILI S.P.A VIA PARADIGNA, 95/A 43100 PARMA ITALIA	MA 27300	BO 89

TRADE MARK	INSPECTOR'S STAMP	STEELMAKING PROCESS
	4511	A.O.D.

REQUIREMENTS	INTERGRANULAR CORROSION	GRADE		FINISH
EN 10028-7/TRD 100/AD-2000-MERKBLATT W0/W2/W10 PED2014/68/EU	EN ISO 3651-2	Acx 240	1.4404/1.4401	2B
EN 10088-2:2014	EN ISO 3651-2	Acx 240	1.4401	2B
ASTM A240Ed23/A480Ed23-ASME SecIIA SA240/SA480Ed23	ASTM-A-262 PRACTICA E	Acx 240	316	2B
EN 10088-2:2014	EN ISO 3651-2	Acx 240	1.4404	2B
ASTM A240Ed23/A480Ed23-ASME SecIIA SA240/SA480Ed23	ASTM-A-262 PRACTICA E	Acx 240	316L	2B

COIL / BOX	CONTENT	DIMENSIONS (mm) THICKNESS	WIDTH	LENGTH	MARKS	QUANTITY	TEST Nº	
052ZWN A	052ZWN A	3,000	1500,00		29	1	052ZWN	C
052ZWN B	052ZWN B	3,000	1500,00		30	1	052ZWN	C

CHEMICAL ANALYSIS / COMPOSICIÓN QUÍMICA (%)

HEAT Nº	C	CR	MN	MO	N	NI	P	S	SI
2ZWN	0,019	16,816	1,244	2,057	0,047	10,085	0,028	0,004	0,351

MECHANICAL PROPERTIES / CARACTERÍSTICAS MECÁNICAS

TEST Nº	PROBE	Rm N/mm2	Rp 0.2 N/mm2	Rp 1.0 N/mm2	A50 %	A5 %	HRB
052ZWN	C T	501,76	316,25	357,07	53,13	55,13	77,00
052ZWN	F T						78,00

REMARKS / OBSERVACIONES

Spectrochemical identity test O.K.
Heat treatment: 1050-1100ºC.
Cooling with air.
Issued in agreement with TÜV SÜD Industrie Service GmbH (02/1983).
The delivery is in accordance with the order
Temperatura de hipertemple entre 1050 y 1100 ° C.
NACE-MR0175/ISO 15156-3:2015;NACE MR0103:2012/ISO 17945:2015 (Chem & Mech only).
MATERIAL FREE OF RADIACTIVITY

SURFACE AND DIMENSIONAL CONTROL

SATISFACTORY
SATISFACTORIA

WORK INSPECTOR

pp A. Heredia

A. Heredia

Palmones, 21 Agosto 2023

F0T0009

This to declare that the material as described in here as been cut to :
COIL 316/L 1500X 3,0 2B Lenght: 3000,000
and remarked with steelgrade, heat n°, workinspector's stamp CC

TERRANOVA
SPIRIANO Yuricom MEC-RELA

CROSSWIND
5/12/24

Seriale Certificato 0000000000000564505 File R:\A0002\0000000000000564505_ART_ICOL_10NA03501000088.TIF

outokumpu

Certificate No. / Zeugnis Nr. / N° du certificat: 950706/001
Page / Seite / Page: 1(01)
Date / Datum / Date: 28.12.2022

INSPECTION CERTIFICATE 3.1
DIN EN 10204 3.1

Delivery address, Empfänger, Lieu de livraison:
OIKI ACCIAI INOSSIDABILI SPA
VIA PARADIGNA 95/A
43122 PARMA
ITALY

OIKI ACCIAI INOSSIDABILI SPA
VIA PARADIGNA 95/A
43122 PARMA
ITALY

Requirements, Anforderungen, Exigences:
EN 10088-4:2009
AD 2000 W2, W10 & EN 10028-7:2016
ASTM A240/A240M
ASME SA-240/SA-240M II A ED. 2021

Our Order No. / Unser Auftrag Nr. / Notre commande n°: 300658616
Your order, Ihre Bestellung, Votre commande: 377

Product, Erzeugnisform, Produit: COIL , STAINLESS STEEL
Mark of Manufacturer, Zeichen des Lieferwerkes, Signe de producteur: outokumpu
Process, Erschmelzungsart, Mode de fusion: AOD
Inspector's stamp, Zeichen d. Sachverst., Poinçon de l'expert:

Grade, Werkstoff, Nuance: 1.4404 1.4401 TYPE 316L
Tolerances, Toleranzen, Tolérances: EN ISO 9445-2

Marking, Kennzeichnung, Marquage: 1.4404 2B
Marks, Versandzeichen, Marques: 377

Line / Reihe / Ligne	Item / Position / Poste	Charge-test No. / Schmelze-Probe Nr. / Coulée n°	Size, Abmessungen, Dimensions	Quantity / Stückzahl / Nombre	Weight, Gewicht, Poids	Finish / Ausführung / Fini EN/ASTM
1	7	50218 1	6,0 X 1500 MM		22040 KG	2B

CE 10 0045-CPR-0567

Chemical composition, Chemische Zusammensetzung, Composition chimiques

Charge no. / Schmelze Nr. / Coulée n°	C %	Si %	Mn %	P %	S %	Cr %	Ni %	MO %	N %	CO %	CU %
50218	0,023	0,50	0,90	0,033	0,001	17,2	10,0	2,03	0,049	0,32	0,41

Mechanical properties, Mechanische Eigenschaften, Caracteristiques mecaniques

Line / Reihe / Ligne	Sample ID / Proben ID / Echantillon	Rp0.2 MPa	Rp1.0 MPa	Rm MPa	A5 %	A50 %	%	Hardness / Härte,Dureté HBW
1	01	315	347	595	57	56		178
	02	317	349	598	57	57		178

Tensile test, Zugversuch, Essai de traction: ISO 6892-1:2019 A224 SAMPLES PERPENDICULAR TO THE ROLLING DIRECTION

APPROVED ACC.TO AD2000-W0 WITH VERIFICATION OF THE UNIFORMITY OVER THE STRIP LENGTH. CERTIFIED ACC.TO PED 2014/68/EU BY TÜV NORD REG. NO. 0045. DOPS ACC. TO CPR AVAILABLE ON THE WEB PAGE BY STEEL NUMBER

Identity test, Verwechslungsprüfung, Controle d'identification: OK
Sizes, Abmessungen, Dimensions: OK
Surface, Oberfläche, Surface: OK
Test of intergran. corros, Prüfung auf Interkrist. Korros, Test de corros. Intercrist.
EN ISO 3651-2 A: OK

Avg.t CO2e/t 1.74
Model verified
Scope 1,2,3

ASTM A240/A240M
ASME SA-240/SA-240M II A ED. 2021
TYPE 316
EN 10088-2:2014/1.4404, 1.4401
NACE MR0103/ISO 17945 AND
NACE MR0175/ISO 15156-1 / NACE MR0175/ISO 15156-3
NORSOK STANDARD M-630 MDS S01 REV. 5
HEAT TREATED AND SOLUTION ANNEALED
HEAT TREATMENT 1070 C
MATERIAL IS FREE OF KNOWN MERCURY CONTAMINATION

We certify that the above mentioned products comply with the terms of the order contract.
Wir bestätigen, dass die Lieferung den Vereinbarungen der Bestellannahme entspricht.
Nous certifions que les produits énumérés ci-dessus sont conformes aux prescriptions de la commande.

This test certificate is made by controlled ADP-system and is valid without signature.
Dieses Zeugnis wurde von einem überprüften Datenverarbeitungssystem erstellt und ist ohne Unterschrift gültig.
Ce certificat a été établi par un système informatique controlé et est valide sans signature.

Outokumpu Stainless Oy

Authorized inspector / Werkssachverständiger / Inspecteur autorisé: SUSANNA SIUKONEN

FI-95490 Tornio, Finland
Tel. +358 16 4521,email certificate.tornio@outokumpu.com,
www.outokumpu.com
Domicile: Tornio, Finland. Business Identity Code 0823315-9

This to declare that the material as described in here as been cut to :
LAM.316L 3000X1500X6,0 2B Lenght: 3000,000
and remarked with steelgrade, heat n°, workinspector's stamp CC

TERRANOVA®
ACCIAIERIANO Vulcano MECRELA

CROSSWIND
5/12/24

TERRANOVA
SPRIANO Valcom MEC-RELA

Terranova Srl
26827 Terranova dei Passerini (LO) - Via Gramsci 1 – Tel. +39 0377 911066
Email: sales@terranova-instruments.com

MATERIAL DETAIL (RIEPILOGO MATERIALI)

N. **02/4791** Page 1 of 1

Customer (Cliente)		**JOB Number**
ROSETTI MARINO		4791_OS
Quality Plan No. (PFC N.)	**Step (Fase)**	**Plant (Impianto)**
-	-	-

DESCRIPTION (DESCRIZIONE)

Drawing No. (Disegno N.)	Item (Pos)	Product (Prodotto)	Material (Materiale)	Heat No. (Colata N.)	Supplier (Fornitore)	Certificate (Certificato)
2 x RESTRICTION ORIFICE PLATE RF TYPE - Thk 3mm						
Tags No.						
50-RO-001, 50-RO-002						
1724001690-IN-DA-00003	1	ORIFICE PLATE THK 3mm	SS 316/316L	E240640	MARCEGAGLIA	10724583913

Terranova Inspector (Ispettore Terranova)	Purchaser's Inspector (Ispettore Cliente)	Authorized Inspector (Ispettore Ente Autorizzato)
TERRANOVA SPRIANO Valcom MEC-RELA		x SHELL 17/02/25
Date (Data) 13/02/2025	Date (Data)	Date (Data)

Order ref. 24 - Item 1 316/316L 2B E 3X1500X3000 - Quantity 9 UM ST NIM Acciai Vender 2024220720 - Heat E240948 - Supplier Batch 24XA035665 - Product Id 20241-00193
Delivery note 0101000163 - Confirmation Order 2020001/3983 - Date 05/12/2024 00:00:00

MARCEGAGLIA SPECIALTIES

Type Inspection Certificate 3.1 AD-2000 EN10204 | Number 10724583913 | Issued On 13/09/2024

- QMS approved acc AD-2000 W0 with Cert 01 202 I/Q-08 5131 by TUV Rheinland (0035), cert. PED 2014/68/UE Annex I §4.3 by TUV Rheinland (0035)
- Material acc. AD2000 W2 - W10 in ref to EN10028-7
- Material conforming to NACE MR0175/MR0103 - ISO17945 - ISO15156-1/ISO15156-3

Customer
NS.DEP.C/O ACCIAI VENDER SPA
VIA NOBEL 4A-Q.RE IND.LE S.P.I
43100 PARMA IT

Consignee
NS.DEP.C/O ACCIAI VENDER SPA
VIA NOBEL 4A-Q.RE IND.LE S.P.I
43100 PARMA IT

Delivery Nn	8920644142	Quality Control	Pages
Of	13/09/2024	Q.M.D./Q.M. A.Venturini	6/6
Delivery note nr	2507003123	Plant Of Gazoldo	

Material
51800098
Description
LXF002 3,00 x 1500 x 3000 316L/4404

Norm/Grade
EN10028-7,EN10088-2,EN10088-4,ASTM A240/A240M, A480/A480M, ASME SA240/SA240M, SA480/SA480M
Quality/Qualità
X2CrNiMo17-12-2, WNR1.4404, 316L / AISI316, X5CrNiMo17-12-2, WNR1.4401, 316

Order Nr 1591893047/120 | Client Order 4300000074 | Client Date 10/06/2024

Item	Identification Nr	Heat	Quantity
1	24XA035653	E240640	1466 KG
2	24XA035654	E240640	1478 KG
3	24XA035664	E240948	1454 KG
4	24XA035665	E240948	1468 KG

Dimensional tolerances/
EN9445-2

Steel Processing/
Electric arc furnace VOD/AOD, continuous casting, heat threatment /annealing at 1050°C, forced air cooling

Mark Tester/
- Organization inspection: CO3

- ASME norms acc. Sec. II Part A Ed. 2023

Terms of Delivery/

Identification Nr	Chemical Type	Mark	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Ni (%)	Mo (%)	N (%)
24XA035653	Product	24YP009861	.020	.450	1.199	.0134	.0065	16.903	10.353	2.049	.0345
24XA035654	Product	24YP009861	.020	.450	1.199	.0134	.0065	16.903	10.353	2.049	.0345
24XA035664	Product	24YP009870	.019	.459	1.209	.0372	.0090	16.917	10.371	2.187	.0364
24XA035665	Product	24YP009870	.019	.459	1.209	.0372	.0090	16.917	10.371	2.187	.0364

TERRANOVA® SPRIANO Valcom MEC-RELA

Identification Nr	Test position	Test direction	Mark	Rm [N/mm²]	Rp 0.2 [N/mm²]	RP 1 [N/mm²]	A5D (%)	A50 (%)	HRB B	HRB T
24XA035653	B	T	24YP009861	615	302	342	55.0	54.3	82	82
24XA035654	B	T	24YP009861	615	302	342	55.0	54.3	82	82
24XA035664	B	T	24YP009870	582	280	324	42.2	41.6	79	79
24XA035665	B	T	24YP009870	582	280	324	42.2	41.6	79	79

× SHELL

17/02/25

Test Position/Posizione Prova
B=Coil End
C=Coil middle
T=Coil head

Test Direction/Direzione Prova
T=Transverse Direction
L=Longitudinal Direction

Remarks about tensile test:
- Confirmation of adequate degree of reliability for the uniformity over the strip length with certificate issued by TÜV Rheinland Group dt. June 19, 2019
- Tensile test according EN ISO 6892-1 B / A-SA 370

Other controls:
- Dimensions within tolerances, spectrometrical identity test OK
- Corrosion Test EN ISO3651-2 Method A and ASTM A262 pract.E OK

Remarks:
- Surface finish 2B
- We certify that products listed above comply with order requirements
- Document validated acc. EN10204 par. 5
- Norms are intended in the valid edition at the time of the order
- Durability: NPD
- Regulated Substances: NPD
- Intended Uses: Building Constructions or Civil Engineering
- DoP available at http://www.marcegaglia.com/brochure/e/quality/dop.html
-surface finish 2B

UKCA 1244 22 MARCEGAGLIA SPECIALTIES v. Bresciani, 16 46040 - Gazoldo D. I. Mantova - Italy EN 10088-4:2009

CE 0474 13 MARCEGAGLIA SPECIALTIES v. Bresciani, 16 46040 - Gazoldo D. I. Mantova - Italy EN 10088-4:2009

Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

INSPECTION AND TEST PLAN

Document Number: 1724001690-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 Shipboard Lloyd Quality Control Dept.	15/11/2024

Document Class: 2

01	24/10/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	04/10/2024	Issue for Review (IFR)	MZ	GA	GO
Rev.	Date	Description	Prepared	Reviewed	Approved

TERRANOVA
WE DO PROCESS INSTRUMENTATION PRECISELY
SPRIANO Valcom MEC-RELA

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Revision / Change Log

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

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No.	Description
1	
2	
3	
4	

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INDEX:

Page No.	Description
4	Scope of supply, list of items, definition of purchaser and company involvement of supply, legend
5	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 Restriction Orifices.

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:

25-RO-005	25-RO-007	25-RO-010	25-RO-013	25-RO-016	25-RO-019
25-RO-022	25-RO-024	50-RO-001	50-RO-002	80-RO-001	

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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INSPECTION ACTIVITIES TABLE:

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**	**R**	**R**
2	PMI Report Review	1724001690-QC-PRO-00006	PMI Report	**H**	**R**	**R**
3	Visual Inspection	1724001690-IN-DA-00003	1724001690-IN-DA-00003	**H**	**W**	**W**
4	Check of marking	1724001690-IN-DA-00003	1724001690-IN-DA-00003	**H**	**W**	**W**
5	Check of quantities	1724001690-IN-DA-00003	1724001690-IN-DA-00003	**H**	**W**	**W**
6	Dimensional Check	1724001690-IN-DA-00003	1724001690-IN-DA-00003	**H**	**SW (*)**	**SW (*)**
7	Packing and Shipping	Packing List	Packing List	**H**	**R**	**R**
8	IRN	-	-	**R**	**H**	**R**
9	Final documentation	1724000979-MD-LIS-00001	Certificates	**H**	**R**	**R**

(*): step 6 (dimensional check) will be executed on one item for each orifice size.

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INSPECTION ACTIVITIES TABLE:

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	R	R
2	PMI Report Review	1724001690-QC-PRO-00006	PMI Report	H	R	R
3	Visual Inspection	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	W	W
4	Check of marking	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	W	W
5	Check of quantities	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	W	W
6	Dimensional Check	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	SW (*)	SW (*)
7	Packing and Shipping	Packing List	Packing List	H	R	R
8	IRN	-	-	R	H	R
9	Final documentation	1724000979-MD-LIS-00001	Certificates	H	R	R

(*): step 6 (dimensional check) will be executed on one item for each orifice size.

TERRANOVA
OPRIANO MECHELA

xCROSSWIND
5/12/24 R

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File: 1724001690-QC-ITP-00002_01.pdf

INSPECTION ACTIVITIES TABLE:

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	R	R
2	PMI Report Review	1724001690-QC-PRO-00006	PMI Report	H	R	R
3	Visual Inspection	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	W	W 17/02/25
4	Check of marking	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	W	W 17/02/25
5	Check of quantities	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	W	W 17/02/25
6	Dimensional Check	1724001690-IN-DA-00003	1724001690-IN-DA-00003	H	SW (*)	SW (*) 17/02/25
7	Packing and Shipping	Packing List	Packing List	H	R	R
8	IRN	-	-	R	H	R
9	Final documentation	1724000979-MD-LIS-00001	Certificates	H	R	R

(*): step 6 (dimensional check) will be executed on one item for each orifice size.

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Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

FACTORY ACCEPTANCE TEST PROCEDURE

Document Number: 1724001690-QC-PRO-00006

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	29-11-2024

Document Class: 2

02	13/11/2024	Accepted for Construction (AFC)	MZ	GA	GO
01	24/10/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	04/10/2024	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)
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HOLDS LIST

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2	
3	
4	

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INDEX:

Page No.	Description
4	Visual / Dimensional Procedure
6	PMI Procedure

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VISUAL / DIMENSIONAL PROCEDURE:

1. SCOPE

This procedure covers the requirements which shall be used about the visual and dimensional inspection of parts and assembly of flowmeters and restriction orifices.

2. RESPONSIBILITY

The workshop Q.C. supervisor is responsible for the control of materials in accordance with this specification.

3. PROCEDURE

Visual and dimensional examinations shall be performed in accordance with the manufacturing and control plan requirements.

Controls shall be performed at least at these manufacturing steps:

- Raw material reception;
- Process machining;
- Assembly;
- Release for shipping.

4. CONTROL TOOLS for DIMENSIONAL EXAMINATION

For dimensional examinations, according to the piece dimensions and parts the following

tools shall be used:

- for lengths up to 500 mm: sliding gauge;
- for lengths over 500 mm: steel tape;
- for diameters with decimal tolerance: sliding qauge;
- for diameters with centesimal tolerance: micrometer qauqe;
- for threads: plug gauge or roller thread gauge
- for surface finish: roughness Gauge

All the instruments used for examinations shall be controlled and calibrated instruments, certified by the Q.A. manager.

For visual examinations in aid of naked eye the following tools may be used:

- Mirrors;
- Magnifying lens;
- Illuminators.

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5. PROCEDURE for VISUAL and DIMENSIONAL EXAMINATION

Dimensional examinations shall be performed on 100% of the pieces. All the dimensions shown on reference documents listed on the manufacturing and control plan (drawings, codes, contract specifications, etc...) shall be checked.

All pieces whose dimensions are outside the manufacturing tolerances, shown on the reference documents, shall be rejected and segregated from the remaining pieces, identifying them with label marked "HOLD ITEMS". In such event a non-conforming material report shall be issued by the Q.C. supervisor and promptly forwarded to Q.A. manager.

Visual examinations shall be performed on 100% of the pieces. The examination shall consist of observation of whatever portions of a component or weld. The following parts shall be checked carefully:

- External and internal surfaces;
- Bevels;
- Marking;
- Packing;
- Welds (where applicable).

All surfaces shall be clean and free of scales, rust, oil and grease. All welds, pipe and components shall be capable of complying with the requirements specified below or with the limitations on imperfections specified in the Material Specification under with the component was furnished.

The following indications are unacceptable:

- Cracks on external surface;
- Undercut on surface which is greater than 1 mm deep;
- Lack of fusion on surface;
- Weld reinforcement greater than specified in the welding specification (where applicable);
- Incomplete weld penetration (where applicable).

6. REPORT

A report shall be issued by the Q.A. department and this report shall become a part of the manufacturer's final quality control documentation to be submitted to the purchaser.

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POSITIVE MATERIAL IDENTIFICATION PROCEDURE:

1. SCOPE

This document contains all the necessary instructions to identify an alloy and to carry out its chemical composition Quantitative analysis with normal accuracy degree by using Niton Xtl 800 mod. 898 and Xtl 700 mod. 797Z.

2. REFERENCE DOCUMENTS

- Operating Manual for alloy Analyzer Niton;
- ASME BPVC IIA Latest Edition.

3. PERSONNEL TRAINING

The personnel carrying out the tests shall have an adequate knowledge of the operating instructions included in the Manual.

4. MEASUREMENT AND OPERATION PRINCIPLES

The apparatus applies the X Ray fluorescence analytic technique through energy issue from a X Ray-tube, for the followings object:

- Quality control and examination of type of alloy.
- Quantitative analysis of chemical composition.

The alloy identification is carried out through the chemical recognition of the X ray's intensity chemical combination corresponding to the Specific document composition range.

Therefore, it is necessary to ensure that the surface of the material to be analysed chemically represents the sample under examination and, when necessary, even by means of mechanical working (cleaning, polishing, grinding, etc.) in order to remove oxidations or any parts of not representative material.

5. RADIATIONS SECURITY

The operator must follow the manual instructions. The inspection performed with "Niton equipment" will not cause any environment incompatibility and will not interfere with all the operations performed near the operator.

6. CALIBRATION CHECK

Switch on the instrument and then wait for its self – checking starting with its calibration test through identification of the standard sample 1.1/4 Cr ½ Mo UNS K11572 - IARM 35 EN. In case the apparatus does not identify the standard sample, it will be necessary to proceed as described in the Manual.

7. ALLOY IDENTIFICATION

Check the surface conditions and select the appropriate operating mode. Position the instrument taking care that the window is completely covered with the material to be examined and start with the alloy identification.

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After completion of the identification procedure, the apparatus will show on the display the name and code of the alloy which has been analyzed.
The failure of an identification can be due to one of the following reasons:

- Movement of the probe during data acquisition.
- Surface coat chemical not representative.
- Dimension of part under examination lower than probe window dimension or non-contact conditions.
- Metal thickness not suitable.
- Alloy not included in the specifications which have been stored.

The percentages of the different elements are visualized on the display at the end of the alloy identification.

After PMI testing has been successfully completed, each equipment component shall be marked.

If the result is different from the expected one, repeat the identification to confirm, verify that the operating system applied is suitable to the surface conditions and in case select an operating system more adequate.

Testing of C (Carbon) will not be performed because it is not specifically required.

8. ACCEPTANCE CRITERIA

For acceptance, it must be demonstrated that materials contain the amounts of alloying elements shown in the material specification. Alloys shall be acceptable if the alloying elements are each within 10% of the specified range of values. Welds with consumables that match, or nearly match, the base metal composition shall be within ±12.5% of the ranges allowed in ASME SEC IIC for each element.

9. REJECTION PROCEDURES

If the PMI testing results fall outside the acceptable range using a method described, the Equipment Manufacturer or the Fabricator, as applicable, has the option to conduct a more accurate analysis at his own expense to determine the component acceptance such as obtaining a chemical analysis performed by an independent testing laboratory.

The alternative test method or independent laboratory must be acceptable to the Company Inspector. The results of the more accurate test method or independent chemical analysis shall govern. If any component or weld is found unacceptable, it shall be marked with an "X" and replaced. The replacement shall be alloy verified in accordance with this standard.

10. TEST REPORT

After completion of the examination the operator will record the results on the Test Report.

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APPENDIX #1:
VISUAL & DIMENSIONAL REPORT

TERRANOVA® Srl - 26827 Terranova dei Passerini (LO) - Via Gramsci 1 – Tel. +39 0377 9110636
Email: sales@terranova-instruments.com – Web: www.terranova-instruments.com

TEST CERTIFICATE (Certificato di Collaudo)

Customer (Cliente)	P.O. (Ordine)	Plant (Impianto)	Job (Commessa N.)

TEST RESULT (ESITO DEL COLLAUDO)

Date (Data)						Attachment (Allegati)	TER Inspector Ispettore TER)	Purchaser's Inspector (Ispettore Cliente)	Total Page (Tot. Pagine)
		Conforming (Conforme)	**Dimensional Check (Controllo Dimensionale)**		**Conforming (Conforme)**				
					Not Conforming (Non Conforme)				
			Marking/Tagging check (Controllo Marcature)		**Conforming (Conforme)**				
		Not Conforming (Non Conforme)			Not Conforming (Non Conforme)				Total Item (Totale Pezzi)
			Surface Finish Check (Controllo Finiture Superficiali)		**Conforming (Conforme)**				
					Not Conforming (Non Conforme)				

RESULT (RISULTATI)

N.	Quantity (Pezzi)	P.O. Item (P.O. Ref)	Product (Prodotto)	Model/Tag (Serial Number/Sigla)	COMPONENTS MATERIALS (MATERIALI DEI COMPONENTI)			
					Flange Material (Materiale Flangia)	Pipe Material (Materiale Tubo)	Plate Material (Materiale Disco)	Drawings N° (Numero Disegni)
1								
2								
...								

APPENDIX #2: PMI REPORT

TERRANOVA®
WE DO PROCESS INSTRUMENTATION PRECISELY
SPRIANO Valcom MEC-RELA

Email: sales@terranova-instruments.com – Web: www.terranova-instruments.com

POSITIVE ALLOY MATERIAL IDENTIFICATION

IDENTIFICAZIONE MATERIALI

REPORT N°.	
Date / *Data*	
Sheet / *Pagina*	OF

APPARATUS / *STRUMENTO*				**PROCEDURE** / *PROCEDURA*	
CUSTOMER / *CLIENTE*		**JOB N°.** / *N°. COMMESSA*		**PLANT** / *IMPIANTO*	
HEAT N°. / *COLATA N°.*		**P.O.** / *ORDINE CLIENTE*		**QCP** / **QUAL. PLAN No.**	
MATERIAL / *MATERIALE*		**OBJECT** / *OGGETTO*			
DRAWING / *DISEGNO*		**EXTEND OF ANALYSE** / *ESTENSIONE CONTROLLO*		**QUANTITY ANALYSIS** / *N°. ANALISI TOTALI*	

PO ITEM	**ITEM DESCRIPTION** / *DESCRIZIONE ITEM*	**ANALYSIS RESULTS** / *RISULTATI D' ANALISI*										**CONFORMING** / *CONFORME*	**HEAT** / *COLATA*
		% REQUIRED / *RICHIESTE*					**% MEASURED** / MISURATE						
		Ni	**Cr**	**Mo**			**Ni**	**Cr**	**Mo**			**YES / NO**	

Operator / *Operatore:* **Customer** / *Cliente:* **Inspector** / *Ispettore:*

Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

PMI REPORT

Document Number: -

Document Class: 3

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POSITIVE ALLOY MATERIAL IDENTIFICATION

IDENTIFICAZIONE MATERIALI

REPORT N°.	**TER-PMI-4791**
Date / *Data*	20/11/2024
Sheet / *Pagina*	1 OF 2

APPARATUS / *STRUMENTO*	**NITON XLt 898SW - S.N.17259**			**PROCEDURE** / *PROCEDURA*	1724001690-QC-PRO-00006
CUSTOMER / *CLIENTE*	ROSETTI MARINO	**JOB N°.** / *N°. COMMESSA*	4791_OS	**PLANT** / *IMPIANTO*	-
HEAT N°. / *COLATA N°.*	SEE BELOW	**P.O.** / *ORDINE CLIENTE*	1724001690	**QCP** / **QUAL. PLAN No.**	-
MATERIAL / *MATERIALE*	AISI 316/316L	**OBJECT** / *OGGETTO*	ORIFICE PLATES / RESTRICTION ORIFICES		
DRAWING / *DISEGNO*	1724001690-IN-DA-00003	**EXTEND OF ANALYSE** / *ESTENSIONE CONTROLLO*	100%	**QUANTITY ANALYSIS** / *N°. ANALISI TOTALI*	see table

PO ITEM	ITEM DESCRIPTION / *DESCRIZIONE ITEM*	ANALYSIS RESULTS / *RISULTATI D' ANALISI*										CONFORMING / *CONFORME*	HEAT / *COLATA*
		% REQUIRED / *RICHIESTE*					% MEASURED / MISURATE						
		Ni	Cr	Mo			Ni	Cr	Mo		THK	YES / NO	
10	RESTRICTION ORIFICE – TAG No. 25-RO-022	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.0	17.25	2.09		6 mm	YES	50218
20	RESTRICTION ORIFICE – TAG No. 25-RO-024	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.1	17.24	2.05		6 mm	YES	50218
30	RESTRICTION ORIFICE – TAG No. 80-RO-001	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.1	17.23	2.06		6 mm	YES	50218

Operator / *Operatore:*

Customer / *Cliente:* TERRANOVA SPRIANO Valcom MEC-RELA

Inspector / *Ispettore:* CROSSWIND 5/12/24

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SPRIANO Valcom MEC-RELA
Email: sales@terranova-instruments.com
Web: www.terranova-instruments.com

POSITIVE ALLOY MATERIAL IDENTIFICATION

IDENTIFICAZIONE MATERIALI

REPORT N°.	**TER-PMI-4791**
Date / *Data*	20/11/2024
Sheet / *Pagina*	2 OF 2

APPARATUS / *STRUMENTO*	**NITON XLt 898SW - S.N.17259**			**PROCEDURE** / *PROCEDURA*	1724001690-QC-PRO-00006
CUSTOMER / *CLIENTE*	ROSETTI MARINO	**JOB N°.** / *N°. COMMESSA*	4791_OS	**PLANT** / *IMPIANTO*	-
HEAT N°. / *COLATA N°.*	SEE BELOW	**P.O.** / *ORDINE CLIENTE*	1724001690	**QCP** / **QUAL. PLAN No.**	-
MATERIAL / *MATERIALE*	AISI 316/316L	**OBJECT** / *OGGETTO*	ORIFICE PLATES / RESTRICTION ORIFICES		
DRAWING / *DISEGNO*	1724001690-IN-DA-00003	**EXTEND OF ANALYSE** / *ESTENSIONE CONTROLLO*	100%	**QUANTITY ANALYSIS** / *N°. ANALISI TOTALI*	see table

PO ITEM	**ITEM DESCRIPTION** / *DESCRIZIONE ITEM*	**ANALYSIS RESULTS** / *RISULTATI D' ANALISI*										**CONFORMING** / *CONFORME*	**HEAT** / *COLATA*
		% REQUIRED / *RICHIESTE*					**% MEASURED** / MISURATE						
		Ni	**Cr**	**Mo**			**Ni**	**Cr**	**Mo**		**THK**	**YES / NO**	
10	RESTRICTION ORIFICE MULTIHOLE – TAG No. 25-RO-005	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.49	17.1	2.07		10 mm	YES	511125
20	RESTRICTION ORIFICE MULTIHOLE – TAG No. 25-RO-007	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.57	17.0	2.09		10 mm	YES	511125
30	RESTRICTION ORIFICE MULTIHOLE – TAG No. 25-RO-010	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.54	17.2	2.08		10 mm	YES	511125
40	RESTRICTION ORIFICE MULTIHOLE – TAG No. 25-RO-013	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.45	17.2	2.07		10 mm	YES	511125
50	RESTRICTION ORIFICE MULTIHOLE – TAG No. 25-RO-016	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.47	17.2	2.06		10 mm	YES	511125
60	RESTRICTION ORIFICE MULTIHOLE – TAG No. 25-RO-019	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.53	17.2	2.06		10 mm	YES	511125

Operator / *Operatore:*

Customer / *Cliente:* TERRANOVA® SPRIANO Valcom MEC-RELA

Inspector / *Ispettore:* CROSSWIND 5/12/24

TECNOMATIC	INSTRUMENTATION FORM	MOD SCS
		REV 0
		DATE: 10/10/21

NOME:	PMI TM01	**CLASSE:**	B	**MATRICOLA:**	17259	VECCHIO CODICE:	-
COSTRUTTORE:	NITON			MODELLO:	XLT 898	RIVENDITORE:	-
DESCRIZIONE:	SPETTROMETRO PER FLUORESCENZA PMI						
FUNZIONE:	EFFETTUARE ANALISI CHIMICA DEI MATERIALI						
CAMPO DELLO STRUMENTO:	COME DA DATASHEET						
PRECISIONE:	COME DA DATASHEET						
FREQUENZA VERIFICA:	1 ANNO		ISTRUZIONE:	ICS_PMI_001		UBICAZIONE:	MAG
FREQUENZA VERIFICA RADIOPROTEZIONE:	3 ANNI						

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
02/03/2020	OP03	OK	Inserito nella strumentazione CL.B		mar-21
05/03/2021	OP03	OK	-		mar-22
04/03/2022	OP03	OK	-		mar-23
01/03/2023	OP03	OK	-		mar-24
08/03/2023	ENTE ESTERNO	OK	U-SERIES (Massimo Esposito)		mar-26
05/03/2024	OP03	OK	-		mar-25

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5/12/24

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POSITIVE ALLOY MATERIAL IDENTIFICATION
IDENTIFICAZIONE MATERIALI

REPORT N°.	**TER-PMI-4791-02**
Date / *Data*	13/02/2025
Sheet / *Pagina*	1 OF 2

APPARATUS / *STRUMENTO*	**NITON XLt 898SW - S.N.17259**			**PROCEDURE** / *PROCEDURA*	-
CUSTOMER / *CLIENTE*	ROSETTI MARINO	**JOB N°.** / *N°. COMMESSA*	4791_OS	**PLANT** / *IMPIANTO*	-
HEAT N°. / *COLATA N°.*	SEE BELOW	**P.O.** / *ORDINE CLIENTE*	1724001690	**QCP** / **QUAL. PLAN No.**	-
MATERIAL / *MATERIALE*	AISI 316/316L	**OBJECT** / *OGGETTO*	ORIFICE PLATES / RESTRICTION ORIFICES		
DRAWING / *DISEGNO*	1724001690-IN-DA-00003	**EXTEND OF ANALYSE** / *ESTENSIONE CONTROLLO*	100%	**QUANTITY ANALYSIS** / *N°. ANALISI TOTALI*	see table

PO ITEM	ITEM DESCRIPTION / *DESCRIZIONE ITEM*	ANALYSIS RESULTS / *RISULTATI D' ANALISI*										CONFORMING / *CONFORME*	HEAT / *COLATA*
		% REQUIRED / *RICHIESTE*					% MEASURED / MISURATE						
		Ni	Cr	Mo			Ni	Cr	Mo		THK	YES / NO	
90	RESTRICTION ORIFICE – TAG No. 50-RO-001	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.33	16,92	2.09		3 mm	YES	E240640
100	RESTRICTION ORIFICE – TAG No. 50-RO-002	10.0÷14.0	16.0÷18.0	2.0÷3.0			10.36	16,88	2.05		3 mm	YES	E240640

Operator / *Operatore:* OP03 **Customer** / *Cliente:* SHELL 17/02/25 **Inspector** / *Ispettore:* TERRANOVA® SPRIANO Valcom MEC-RELA

TECNOMATIC	INSTRUMENTATION FORM	MOD SCS
		REV 0
		DATE: 10/10/21

NOME:	PMI TM01	**CLASSE:**	B	**MATRICOLA:**	17259	VECCHIO CODICE:	-
COSTRUTTORE:	NITON			MODELLO:	XLT 898	RIVENDITORE:	-
DESCRIZIONE:	SPETTROMETRO PER FLUORESCENZA PMI						
FUNZIONE:	EFFETTUARE ANALISI CHIMICA DEI MATERIALI						
CAMPO DELLO STRUMENTO:	COME DA DATASHEET						
PRECISIONE:	COME DA DATASHEET						
FREQUENZA VERIFICA:	1 ANNO			ISTRUZIONE:	ICS_PMI_001	UBICAZIONE:	MAG
FREQUENZA VERIFICA RADIOPROTEZIONE:	3 ANNI						

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
02/03/2020	OP03	OK	Inserito nella strumentazione CL.B		mar-21
05/03/2021	OP03	OK	-		mar-22
04/03/2022	OP03	OK	-		mar-23
01/03/2023	OP03	OK	-		mar-24
08/03/2023	ENTE ESTERNO	OK	U-SERIES (Massimo Esposito)		mar-26
05/03/2024	OP03	OK	-		mar-25

xSHELL
17/02/25 R

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Base Load Power Hub (BLPH)

RESTRICTION ORIFICE

FAT REPORT (including dimensional, tag and marking check)

Document Number: -

Document Class: 3

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Email: sales@terranova-instruments.com – Web: www.terranova-instruments.com

TEST CERTIFICATE (Certificato di Collaudo)

Customer (Cliente)	P.O. (Ordine)	Procedure	Job No. (Commessa N.)
ROSETTI MARINO	**1724001690**	**1724001690-QC-PRO-00006**	**4791_OS**

TEST RESULT (ESITO DEL COLLAUDO)

Date (Data)						Attachment (Allegati)	Terranova Inspector (Ispettore Terranova)	Purchaser's Inspector (Ispettore Cliente)	Total Page (Tot. Pagine)
	X	**Conforming** (Conforme)	**Dimensional Check (Controllo Dimensionale)**	X	**Conforming (Conforme)**				**12**
					Not Conforming (Non Conforme)				
			Marking/Tagging check (Controllo Marcature)	X	**Conforming (Conforme)**				
26/11/2024					Not Conforming (Non Conforme)				Total Item (Totale Pezzi)
		Not Conforming (Non Conforme)	**Surface Finish Check (Controllo Finiture Superficiali)**	X	**Conforming (Conforme)**				**9**
					Not Conforming (Non Conforme)				

RESULT (RISULTATI)

N.	Quantity (Pezzi)	P.O. Item (P.O. Ref)	Product (Prodotto)	Model/Tag (Serial Number/Sigla)	COMPONENTS MATERIALS (MATERIALI DEI COMPONENTI)		
					Flange Material (Materiale Flangia)	Plate Material (Materiale Disco)	Drawings N° (Numero Disegni)
1	1	10	RESTRICTION ORIFICE PLATE RF TYPE MULTIHOLE	25-RO-005	-	316/316L	1724001690-IN-DA-00003
2	1	20	RESTRICTION ORIFICE PLATE RF TYPE MULTIHOLE	25-RO-007	-	316/316L	1724001690-IN-DA-00003
3	1	30	RESTRICTION ORIFICE PLATE RF TYPE MULTIHOLE	25-RO-010	-	316/316L	1724001690-IN-DA-00003
4	1	40	RESTRICTION ORIFICE PLATE RF TYPE MULTIHOLE	25-RO-013	-	316/316L	1724001690-IN-DA-00003
5	1	50	RESTRICTION ORIFICE PLATE RF TYPE MULTIHOLE	25-RO-016	-	316/316L	1724001690-IN-DA-00003
6	1	60	RESTRICTION ORIFICE PLATE RF TYPE MULTIHOLE	25-RO-019	-	316/316L	1724001690-IN-DA-00003
7	1	70	RESTRICTION ORIFICE PLATE RF TYPE	25-RO-022	-	316/316L	1724001690-IN-DA-00003
8	1	80	RESTRICTION ORIFICE PLATE RF TYPE	25-RO-024	-	316/316L	1724001690-IN-DA-00003
9	1	110	RESTRICTION ORIFICE PLATE RF TYPE	80-RO-001	-	316/316L	1724001690-IN-DA-00003

CROSSWIND 5/12/24 WI R

TECNOMATIC	INSTRUMENTATION FORM	MOD SCS
		REV 0
		DATE: 10/10/21

NOME:	CAL TM02	**CLASSE:**	B	**MATRICOLA:**	8A120401	VECCHIO CODICE:	-
COSTRUTTORE:	TESA			MODELLO:	00530323	RIVENDITORE:	-
DESCRIZIONE:	CALIBRO DIGITALE						
FUNZIONE:	EFFETTUARE MISURE DI PEZZI MECCANICI						
CAMPO DELLO STRUMENTO:	0-300mm						
PRECISIONE:	0.05%FS						
FREQUENZA VERIFICA:	1 ANNO		ISTRUZIONE:	ICS_CAL_001		UBICAZIONE:	CQA

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
19/02/2022	OP03	OK	-		feb-23
08/02/2023	OP03	OK	-		feb-24
06/02/2024	OP03	OK	-		feb-25

* CROSSWIND 5/12/24

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TECNOMATIC

INSTRUMENTATION FORM

MOD SCS	
REV	0
DATE: 10/10/21	

NOME:	RUG TM01	CLASSE:	B	MATRICOLA:	TR110	VECCHIO CODICE:	-
COSTRUTTORE:	INNOVATEST TIME			MODELLO:	-	RIVENDITORE:	-
DESCRIZIONE:	RUGOSIMETRO MANUALE DIGITALE						
FUNZIONE:	EFFETTUARE MISURE DI RUGOSITA'						
CAMPO DELLO STRUMENTO:	Ra 0,05 – 10,0 µm						
PRECISIONE:	3%						
FREQUENZA VERIFICA:	2 ANNI	ISTRUZIONE:	ICS_RUG_001			UBICAZIONE:	CQA

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
19/02/2022	OP03	OK	-		feb-24
06/02/2024	OP03	OK	-		feb-26

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5/12/24 R

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Email: sales@terranova-instruments.com – Web: www.terranova-instruments.com

TEST CERTIFICATE (Certificato di Collaudo)

Customer (Cliente)	P.O. (Ordine)	Procedure	Job No. (Commessa N.)
ROSETTI MARINO	**1724001690**	**1724001690-QC-PRO-00006**	**4791_OS**

TEST RESULT (ESITO DEL COLLAUDO)

Date (Data)						Attachment (Allegati)	Terranova Inspector (Ispettore Terranova)	Purchaser's Inspector (Ispettore Cliente)	Total Page (Tot. Pagine)
13/02/2025	X	**Conforming** (Conforme)	**Dimensional Check (Controllo Dimensionale)**	X	**Conforming (Conforme)**				**5**
					Not Conforming (Non Conforme)				Total Item (Totale Pezzi)
			Marking/Tagging check (Controllo Marcature)	X	**Conforming (Conforme)**				**2**
					Not Conforming (Non Conforme)				
		Not Conforming (Non Conforme)	**Surface Finish Check (Controllo Finiture Superficiali)**	X	**Conforming (Conforme)**				
					Not Conforming (Non Conforme)				

RESULT (RISULTATI)

#	Quantity (Pezzi)	Product (Prodotto)	Model/Tag (Serial Number/Sigla)	COMPONENTS MATERIALS (MATERIALI DEI COMPONENTI)		
				Flange Material (Materiale Flangia)	Plate Material (Materiale Disco)	Drawings N° (Numero Disegni)
1	1	RESTRICTION ORIFICE PLATE RF TYPE	50-RO-001	-	316/316L	1724001690-IN-DA-00003
2	1	RESTRICTION ORIFICE PLATE RF TYPE	50-RO-002	-	316/316L	1724001690-IN-DA-00003

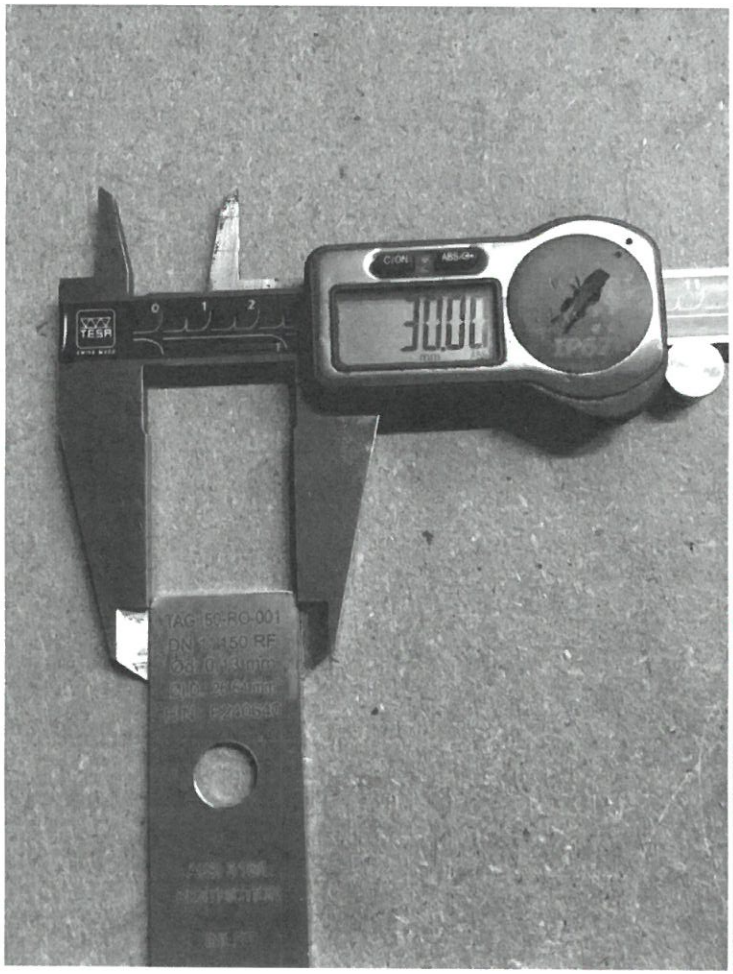
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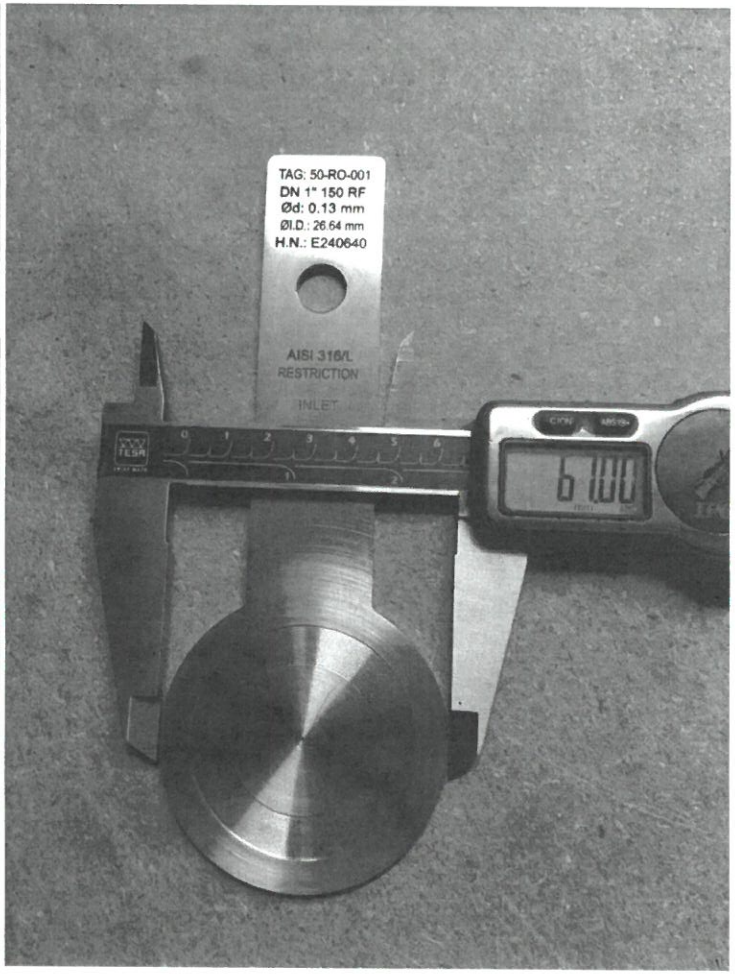
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17/02/25

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TEST CERTIFICATE (Certificato di Collaudo)

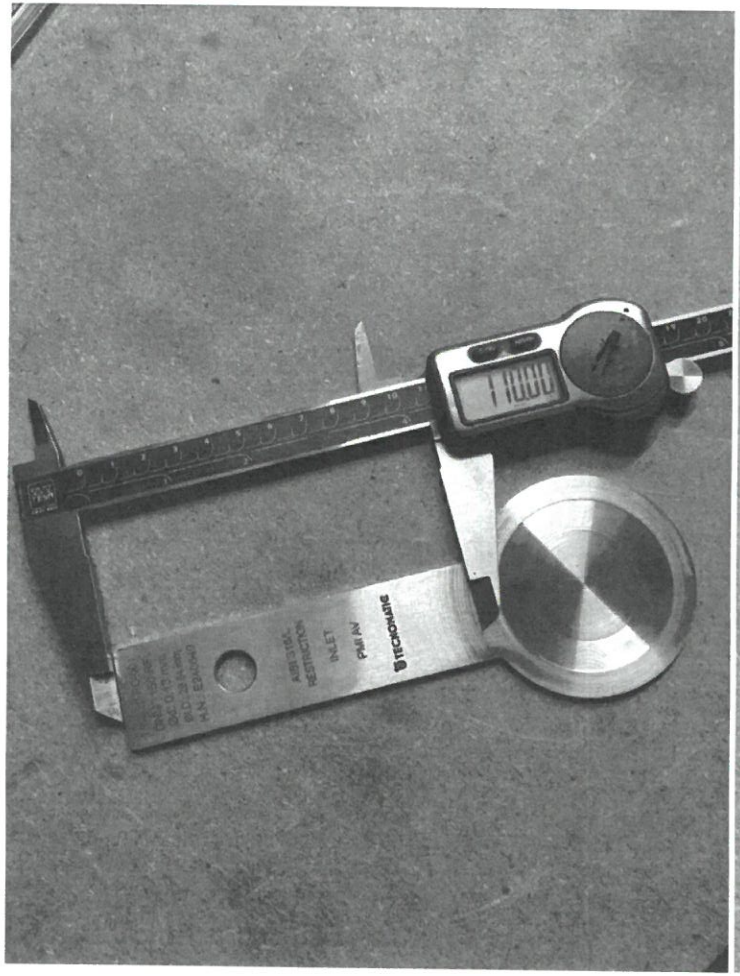


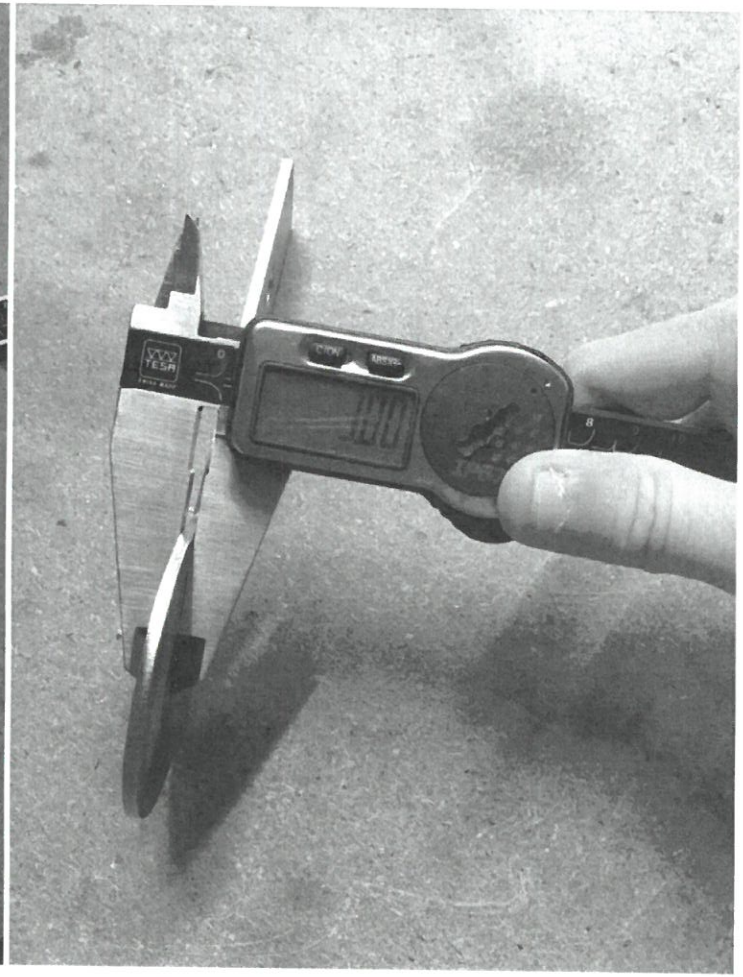


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TEST CERTIFICATE (Certificato di Collaudo)





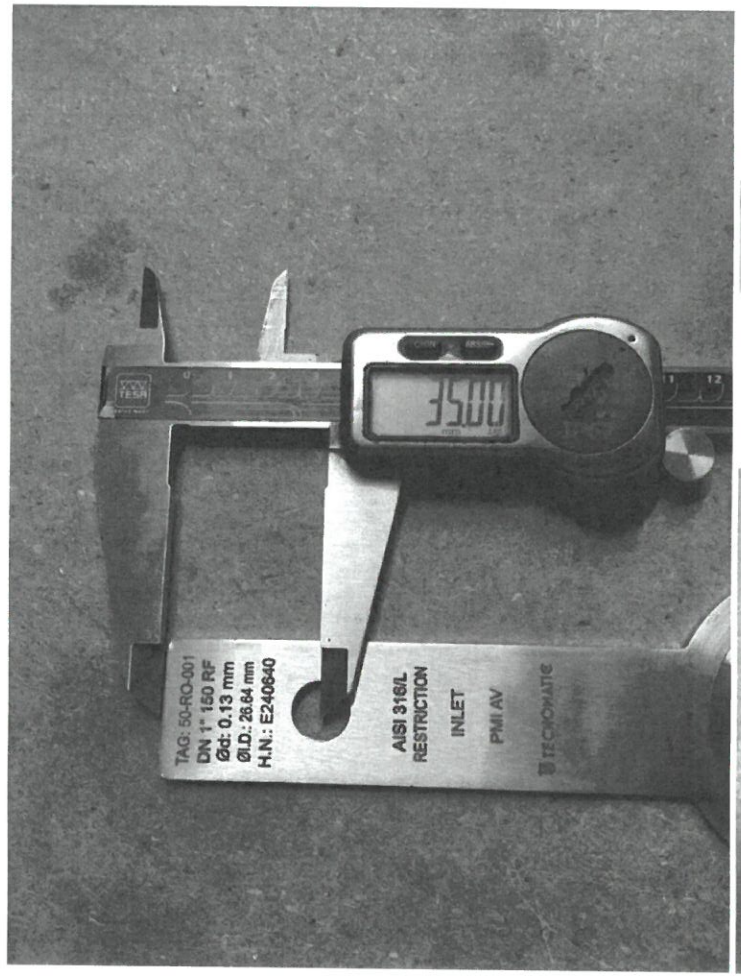
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1724001690-QC-DB-00007_01

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TEST CERTIFICATE (Certificato di Collaudo)





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TECNOMATIC	INSTRUMENTATION FORM	MOD SCS
		REV 0
		DATE: 10/10/21

NOME:	CAL TM02	**CLASSE:**	B	**MATRICOLA:**	8A120401	VECCHIO CODICE:	-
COSTRUTTORE:	TESA			MODELLO:	00530323	RIVENDITORE:	-
DESCRIZIONE:	CALIBRO DIGITALE						
FUNZIONE:	EFFETTUARE MISURE DI PEZZI MECCANICI						
CAMPO DELLO STRUMENTO:	0-300mm						
PRECISIONE:	0.05%FS						
FREQUENZA VERIFICA:	1 ANNO			ISTRUZIONE:	ICS_CAL_001	UBICAZIONE:	CQA

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
19/02/2022	OP03	OK	-		feb-23
08/02/2023	OP03	OK	-		feb-24
06/02/2024	OP03	OK	-		feb-25

TERRANOVA MEC RELA

× SHELL

17/02/25

MOD RML	RAPPORTO MISURE DI LABORATORIO / *MEASURING REPORT*				DATA
REV 0	TEMP [°C] = 16 - 28		PRES [mbar] = 980 - 1040	HUMID [%] = 40 - 70	06/02/24

STRUMENTO DA CONTROLLARE / *EQUIPMENT UNDER TEST*				
NOME	DESCRIZIONE	MODELLO	CLAS	SN
CAL-TM02	CALIBRO DIGITALE	TESA 00530323	B	8A120401

ISTRUZIONE DI RIFERIMENTO / *OPERATING INSTRUCTION*	ICS_CAL_001

STRUMENTAZIONE UTILIZZATA PER IL CONTROLLO / *INSTRUMENTS USED FOR TEST OPERATIONS*				
STRUMENTO	DESCRIZIONE	MODELLO	CLAS	SN
BLOC01	BLOCCHETTI DI RISCONTRO	UKAS	A	10021

MISURAZIONI RILEVATE / *MEASURED VALUES*

FULL SCALE [mm]
300

SPESSORI O DIAMETRI ESTERNI

	VALORE REALE	VALORE EUT 1	VALORE EUT 2	VALORE EUT 3	VALORE EUT MEDIO	ERRORE FS [%]
[mm]	10,000	10,013	10,033	10,023	10,023	0,0077
[mm]	150,000	150,023	150,033	150,013	150,023	0,0077
[mm]	300,000	299,953	299,983	300,013	299,983	-0,0057

SPESSORI O DIAMETRI INTERNI

	VALORE REALE	VALORE EUT 1	VALORE EUT 2	VALORE EUT 3	VALORE EUT MEDIO	ERRORE FS [%]
[mm]	10,000	9,963	9,983	10,023	9,990	-0,0034
[mm]	150,000	149,923	149,963	149,943	149,943	-0,0190
[mm]	300,000	299,983	299,963	300,013	299,986	-0,0046

PROFONDITA' O ALTEZZA

	VALORE REALE	VALORE EUT 1	VALORE EUT 2	VALORE EUT 3	VALORE EUT MEDIO	ERRORE FS [%]
[mm]	10,000	10,023	10,033	9,973	10,010	0,0032
[mm]	150,000	150,033	149,943	149,923	149,966	-0,0112
[mm]	300,000	300,013	299,983	299,953	299,983	-0,0057

TERRANOVA

x SHELL 17/02/25

I VALORI RILEVATI RISULTANO ESSERE ENTRO I LIMITI DI SPECIFICA DICHIARATI	SI ☑	NO ☐

Operator:	OP03	Checker:	RPR	TECNOMATIC

TECNOMATIC	INSTRUMENTATION FORM	MOD SCS
		REV 0
		DATE: 10/10/21

NOME:	RUG TM01	**CLASSE:**	B	**MATRICOLA:**	TR110	VECCHIO CODICE:	-
COSTRUTTORE:	INNOVATEST TIME			MODELLO:	-	RIVENDITORE:	-
DESCRIZIONE:	RUGOSIMETRO MANUALE DIGITALE						
FUNZIONE:	EFFETTUARE MISURE DI RUGOSITA'						
CAMPO DELLO STRUMENTO:	Ra 0,05 – 10,0 µm						
PRECISIONE:	3%						
FREQUENZA VERIFICA:	2 ANNI		ISTRUZIONE:	ICS_RUG_001		UBICAZIONE:	CQA

DATA CONTROLLO	ESEGUITO DA (FUNZIONE)	ESITO	NOTE	FIRMA	PROSSIMO CONTROLLO
19/02/2022	OP03	OK	-		feb-24
06/02/2024	OP03	OK	-		feb-26

TERRANOVA SPRIANO Falcom MEC RELA

SHELL 17/02/25 R

MOD RML		RAPPORTO MISURE DI LABORATORIO / *MEASURING REPORT*				DATA
REV	0	TEMP [°C] = 16 - 28	PRES [mbar] = 980 - 1040	HUMID [%] = 40 - 70		06/02/24

STRUMENTO DA CONTROLLARE / *EQUIPMENT UNDER TEST*				
NOME	DESCRIZIONE	MODELLO	CLAS	SN
RUG-TM01	RUGOSIMETRO MANUALE DIGITALE	-	B	TR110

ISTRUZIONE DI RIFERIMENTO / *OPERATING INSTRUCTION*	ICS_RUG_001

STRUMENTAZIONE UTILIZZATA PER IL CONTROLLO / *INSTRUMENTS USED FOR TEST OPERATIONS*				
STRUMENTO	DESCRIZIONE	MODELLO	CLAS	SN
BLOC02	BLOCCHETTO CALIBRATO	INNOVATEST TIME	A	23448

MISURAZIONI RILEVATE / *MEASURED VALUES*

POS	VALORE IMPOSTATO SET VALUE	VALORE RISCONTR. READING	SCOSTAMENTO DEVIATION
1	3,25	3,21	-1,23%
	3,25	3,31	1,85%
	3,25	3,25	0,00%
2	3,25	3,31	1,85%
	3,25	3,28	0,92%
	3,25	3,24	-0,31%
3	3,25	3,25	0,00%
	3,25	3,22	-0,92%
	3,25	3,29	1,23%

POS	VALORE IMPOSTATO SET VALUE	VALORE RISCONTR. READING	SCOSTAMENTO DEVIATION
1			
2			
3			

ACCURACY CLASS	3%

TERRANOVA
SERIANO MEC RELA

xSHELL
17/02/25

I VALORI RILEVATI RISULTANO ESSERE ENTRO I LIMITI DI SPECIFICA DICHIARATI	SI	☑	NO	☐

Operator:	OP03	Checker:	MFC	TECNOMATIC

Base Load Power Hub (BLPH)

VENDOR ASSET REGISTER

RESTRICTION ORIFICE

Document Number: 1724001690-IN-LIS-000010

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	31-10-2024

Rev.	Date	Description	Prepared	Reviewed	Approved
01	24/10/2024	Accepted for Construction (AFC)	MZ	GA	GO
00	04/10/2024	Issue for Review (IFR)	MZ	GA	GO

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Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01						
1	Cover	X	X						
2	Table of Contents	X	X						
3	Revision / Change Log	X	X						
4	Asset Register	X	X						

Revision / Change Log

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

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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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/Dimensional Drawing	General Arrangement	Operating & Maintenance Manual	Wiring Diagram	Spare Parts List	Lubricant Document Reference	Criticality	Remarks
25-RO-005	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
25-RO-007	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
25-RO-010	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
25-RO-013	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
25-RO-016	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
25-RO-019	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
25-RO-022	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
25-RO-024	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
50-RO-001	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
50-RO-002	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-
80-RO-001	Restriction Orifice	N/A	HOLLANDSE KUST NOORD WIND PARK	N/A	1724001690	Tenaneva Srl	Tecnomatic Flow Elements Srl	ORI	N/A	RO	-	-	-	-	-	-	1724001690-IN-DA-00003	1724001690-IN-DS-00004	1724001690-IN-DA-00003	1724001690-IN-DA-00003	N/A	N/A	N/A	N/A	N/A	-