Base Load Power Hub (BLPH)

ULTRASONIC FLOWMETER

GENERAL ARRANGEMENT DRAWINGS

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Rev.	Date	Description	Prepared	Reviewed	Approved

Baker Hughes

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		00	01	02					
1	Cover	X	X	X					
2	Table of Contents	X	X	X					
3	Revision / Change Log / Hold List	X	X	X					
4	GENERAL ARRANGEMENT DRAWINGS - ULTRASONIC FLOWMETER	X	X	X					

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Revision / Change Log

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

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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1. FLOWMETER (QTY: 1)

TYPE:	XGF868I
ENCLOSURE:	316SS
VOLTAGE:	12 - 28 VDC
POWER USAGE:	20W
IP RATING:	IP66
HAZ AREA:	EX dIIC T6 Gb
CERT NUMBER:	SIRA 17ATEX1304X
WEIGHT:	11 kg [24 lb] B

FINISH : AS PER MANUFACTURER STANDARD

2. FLOWMETER CABLE (QTY: 1 PAIR)

TYPE:	FLAME RETARDENT RG-62
ARMOUR:	SWA
LENGTH:	10 M
CONNECTION (METER):	3/4" NPT
CONNECTION (XDUCER):	3/4" NPT
GLAND MAT'L:	316SS
HAZ AREA :	Ex nR IIC Gc
CERT. NUMBER :	CML-19ATEX4109X
WEIGHT:	0.28 kg/m B

FINISH : N/A

3. PRE-AMPLIFIER (QTY: 2)

TYPE :	XAMP
ENCLOSURE :	316SS
IP RATING :	IP65/66
HAZ. AREA :	Ex d IIC T6 Gb
CERT NUMBER :	SIRA 20ATEX1001X
WEIGHT :	2 kg [4.4 lb] EA B

FINISH : AS PER MANUFACTURER STANDARD

4. TRANSDUCER (QTY: 2)

TYPE :	T5
MATERIAL :	TITANIUM
TEMP RANGE :	-55 to 150°C (-67 to 302°F) (NT)
HAZ. AREA :	Ex d IIC T6 Gb
CERT NUMBER :	SIRA 20ATEX1001X
MAT'L CERTS :	EN10204 3.1 & NACE MR-01-75
JUNCTION BOX:	316SS
IP RATING :	IP66
WEIGHT :	2 kg [4.4 lb] EA B

FINISH : AS PER MANUFACTURER STANDARD

5. INSERTION MECHANISM (QTY: 2)

TYPE:	IMA72
SIZE:	2" x 2"
RATING:	150#
MATERIAL	
PACKING GLAND :	316SS
BARREL HOLDER:	316 / 316L SS
HYDROTEST:	PER ASME B31.3
MAT'L CERTS:	EN10204 3.1 & NACE MR-01-75
WEIGHT:	12.7 kg [28 lb] EA B

FINISH : PAINTED PER SPEC: NORSOK M-501 SYSTEM 6A

6. ISOLATION VALVE (QTY: 2)

TYPE :	GATE VALVE
SIZE :	2", 150# RF
F/F LENGTH:	177.8MM (7")
MATERIAL	
BODY:	A351 CF8M
TRIM:	316SS
MAT'L CERTS:	EN10204 3.1 & NACE MR-01-75
WEIGHT:	18 kg [39.7 lb] EA B

FINISH : PAINTED PER SPEC: NORSOK M-501 SYSTEM 6A

7. FLOWCELL (QTY : 1)

FOR DETAILS OF THE FLOWCELL, PLEASE REFER TO THE FLOWCELL FABRICATION DRAWING, REF: 182M4103
WEIGHT : 98 kg [216 lb] B

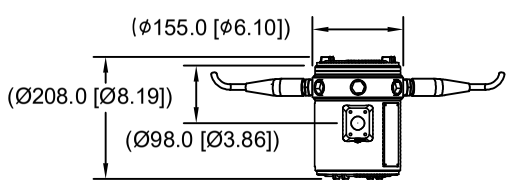
FINISH : PAINTED PER SPEC: NORSOK M-501 SYSTEM 6A

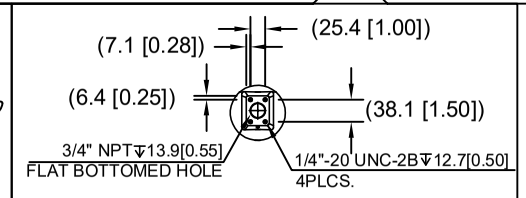
8. 2" PIPE MOUNTING BRACKET (QTY: 1)

MATERIAL : 316SS

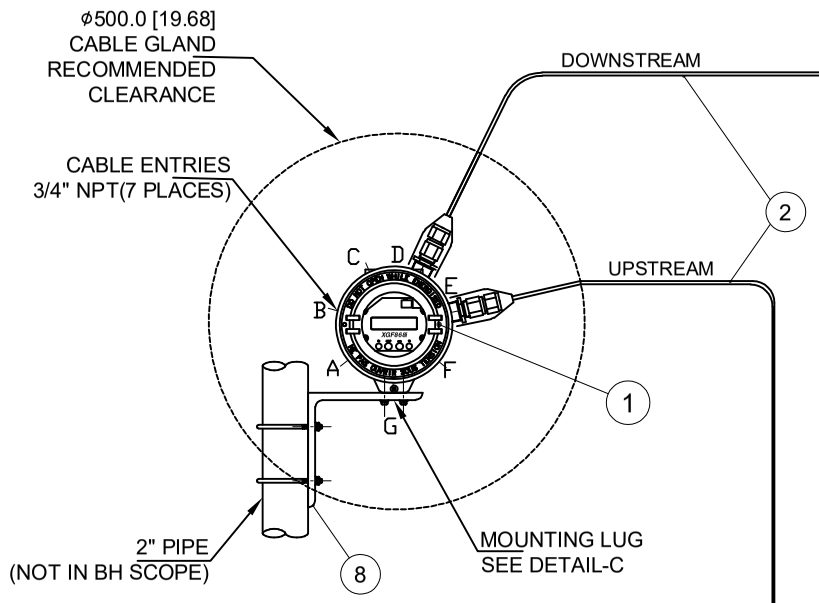
WEIGHT : 5 kg B

MISC ITEMS (NOT SHOWN)
-1x NAMEPLATE
-5x 3/4" x M20 ADAPTORS SS

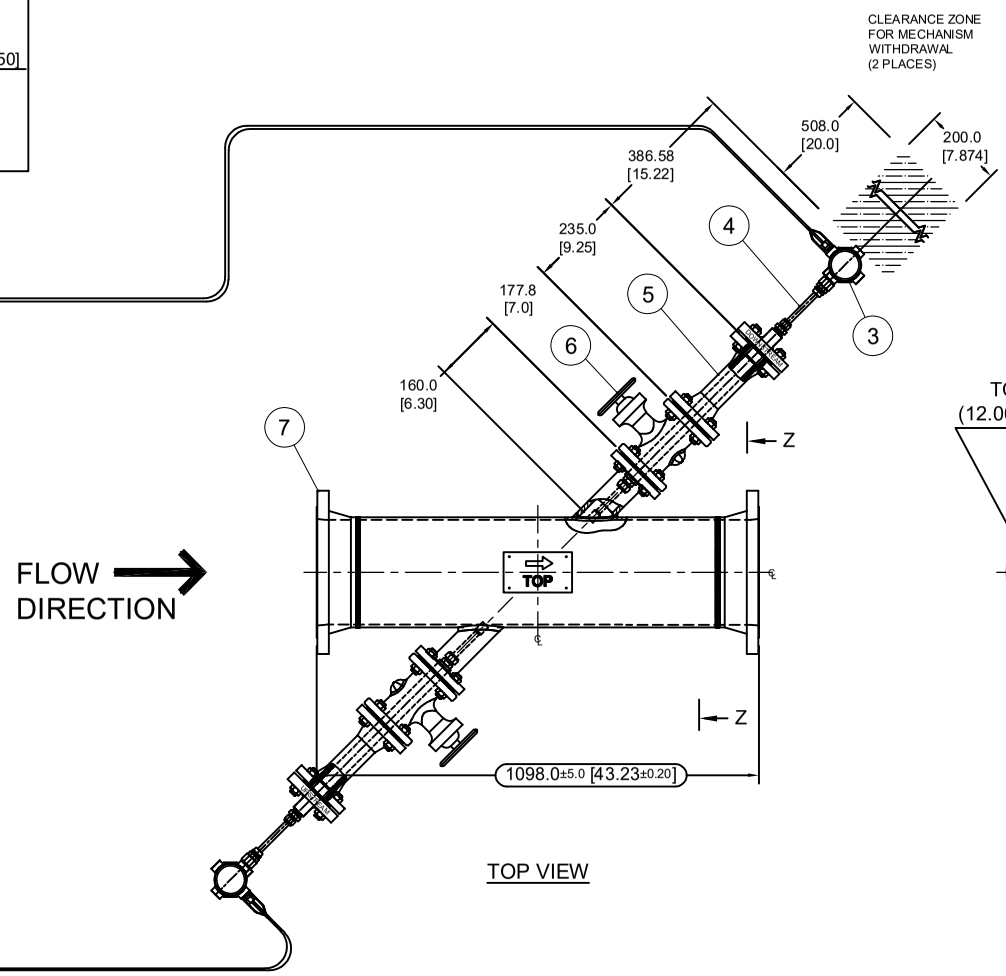




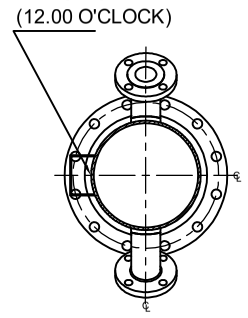
DETAIL-C
(FOR 2" PIPE MOUNTING)



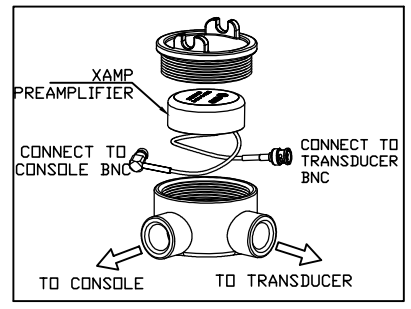
FRONT VIEW OF METER



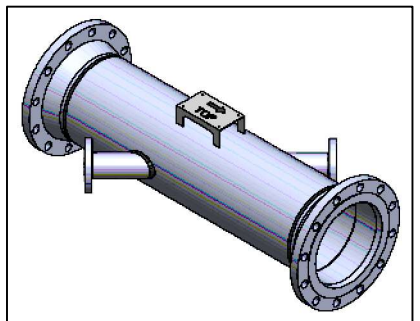
TOP VIEW



SECTION Z-Z



XAMP DETAIL

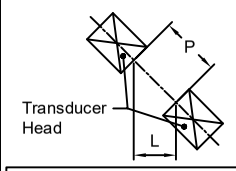


ISOMETRIC VIEW

NOTES:

1. EACH PAIR OF CABLES MUST BE CONTINUOUS IN LENGTH (NO JOINTS) AND EACH CABLE (WITHIN THE PAIR) MUST BE EQUAL IN LENGTH TO WITHIN 2.0 INCHS (50mm) OF EACH OTHER.
2. WHEN USING ARMOURED CABLE, ENSURE THAT THE ARMOURING OF THE COAXIAL CABLE AT THE INSTRUMENT ENCLOSURE END IS CONNECTED TO THE INSTRUMENT SUPPLY EARTH LINE.
3. USE ONLY Ex d CERTIFIED CABLE GLANDS / ADAPTORS PROVIDED.

WARNING
DO NOT REMOVE / REINSTALL TRANSDUCERS IF LINE PRESSURE EXCEEDS 5.5 BARG.



Path Length, P = 368.20mm[14.496"]
Axial Length, L = 260.32mm[10.248"]

Final P & L Values will be provided on Flowcell Nameplate

TAG NUMBER : 43-FT-001
PIPE SIZE : 10", 150#, SCH 20, RF
XDCR CONFIG : TILTED DIA, 1P/1T

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN "MM[INCHES]".

FLOWCELL INSTALLATION RECOMMENDATION

INSTALL FLOWCELL ON PIPELINE TO ENSURE A FULLY DEVELOPED FLOW PROFILE IS PRESENTED TO THE FLOWMETER. BAKER HUGHES RECOMMENDS A MINIMUM OF 20 DIAMETERS OF UNOBSTRUCTED STRAIGHT RUN OF PIPELINE EXIST UPSTREAM OF THE FLOWCELL LOCATION AND 10 DIAMETERS OF SAME DOWNSTREAM.

UP STREAM → FLOW → DOWN STREAM

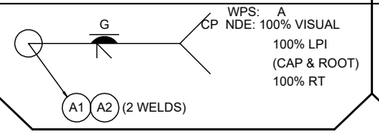
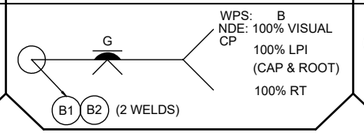
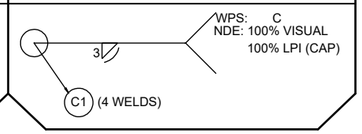
Rev	Description of Changes	Drawn	Checked	Date
B	Issued for Approval	TG	TG	14/10/24
A	Issued for Approval	TG	TG	19/09/24
-	Issued for Approval	SG	TG	12/07/24

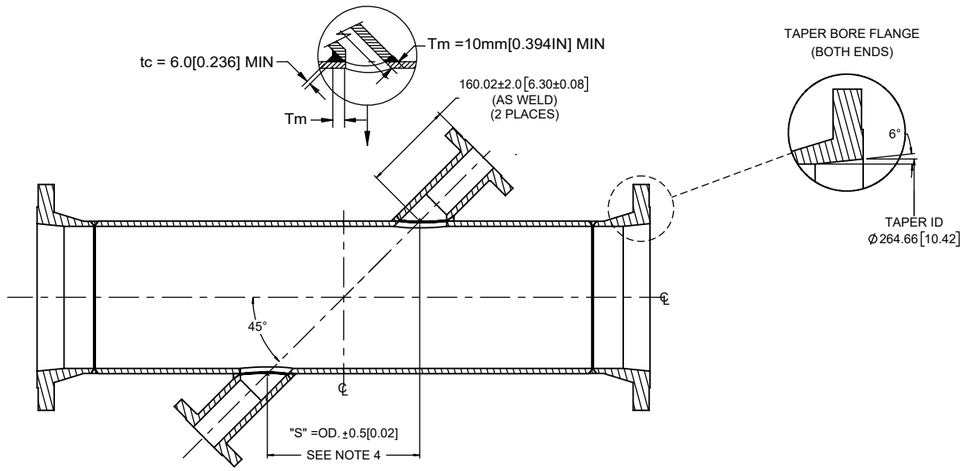
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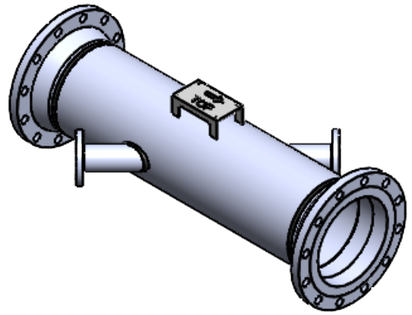
TITLE: GENERAL ARRANGEMENT FOR XGF868i FLOWMETER C/W T5 TRANSDUCERS

SCALE NTS	DO NOT SCALE DRAWING	SHEET 1	OF 1
SIZE A3	DRAWING NUMBER SK18028 / 1706864	REV B	

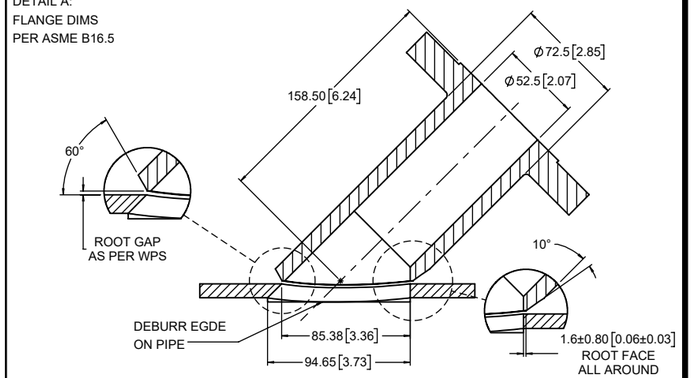
PIPE (PER ASME B36.19) :	FLOW METER NOZZLE (FORGED MATERIAL) :	PROCESS FLANGE (PER ASME B16.5) :	TAG PLATE BRACKET :
SIZE:10 IN, SCH40S, (SEAMLESS) MATERIAL: A312 Gr. TP316/316L	SIZE: 2 IN,150#, RF MATERIAL: A182 Gr. F316/316L REF DETAIL: A QTY: 2	SIZE: 10 IN, 150#, WN, RF, TAPER BORE TO MATCH PIPE SCH 10S MATERIAL: A182 Gr. F316/316L REF DETAIL: B QTY: 2	SIZE: DIMENSION AS PER "DETAIL C" MATERIAL: ASTM A240 316/316L REF DETAIL: C QTY: 1
			

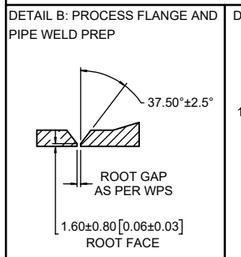


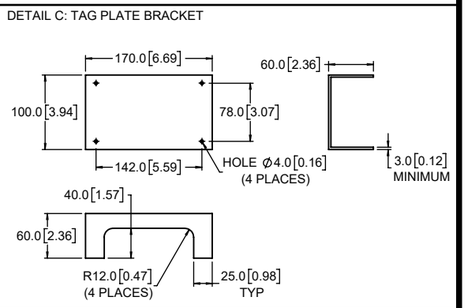
SECTION B-B

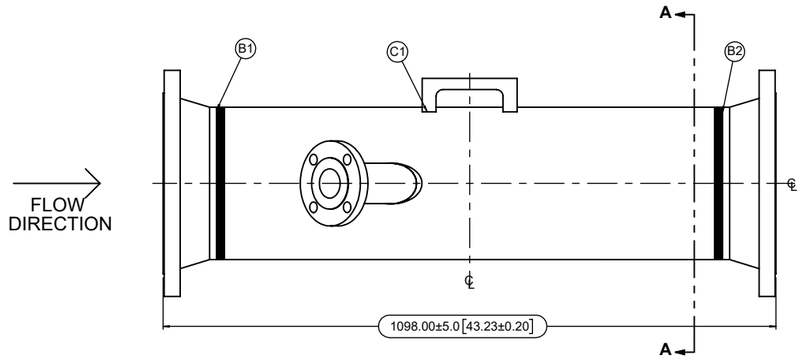


ISOMETRIC VIEW

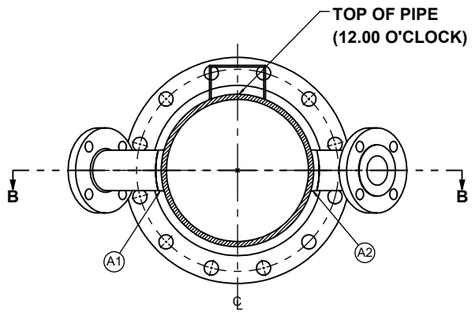








FRONT VIEW



SECTION A-A

NOTES:

1. DESIGN, FABRICATION AND WELDING TO BE IN ACCORDANCE WITH: ASME B31.12, HYDROGEN SERVICE AND ASME IX (LATEST EDITIONS).
   FLOWCELL TO BE COMPLIANT WITH PED 2014/68/EU: CATEGORY III
   EQUIPMENT TYPE - PIPING. FLUID STATE : GAS. FLUID GROUP : 1
   FLOWCELL TO COMPLY WITH THE FOLLOWING SPECIFICATIONS:
   1) 123A90-DDL-PP-SP-70000 (PIPING CLASSES).
   2) 123A90-DDL-MAT-SP-60006 (PAINT SPEC).
   3) PMI SPECIFICATION DOCUMENT NUMBER 183M5247
2. ALL WETTED PARTS TO COMPLY WITH THE MATERIAL TRACEABILITY AND CERTIFICATION REQUIREMENTS OF EN10204 3.1 AND NACE MR-01-75/ISO 15156 (LATEST EDITION). MATERIAL TEST REPORTS (MTR) ARE REQUIRED FOR ALL MATERIAL INCLUDING WELD CONSUMABLE MATERIAL & NON-WETTED ATTACHMENT MATERIALS (SUCH AS TAG BRACKET AND OTHER SUCH COMPONENTS).
3. DEFECTIVE PIPE MATERIAL WITH SURFACE IMPERFECTIONS ON THE OUTSIDE AND/OR INSIDE DIAMETER THAT PENETRATE MORE THAN 12.5% OF THE NOMINAL WALL THICKNESS OR ENCROACH ON THE MINIMUM WALL THICKNESS IS NOT ACCEPTABLE.
4. MEASURE THE PIPE O.D. AT FOUR CIRCUMFERENTIAL LOCATIONS APPROXIMATELY 45° APART, BETWEEN UPSTREAM AND DOWNSTREAM NOZZLES, AND TAKE THE AVERAGE O.D. RECORD THIS AVERAGE O.D. IN THE DATABOOK AS A PRE-FABRICATION DIMENSION.
   TOLERANCE ON NOZZLE POSITIONING : +/-0.5mm FOR MARKOUT AND +/-6.4mm AFTER WELDING.
5. STAMPINGS/MARKINGS ON FLOWCELL FLANGE/PIPE MUST MEET DOCUMENT 552-001 REQUIREMENTS.
6. ALL FLANGES/NOZZLES TO BE MOUNTED WITH BOLT HOLES STRADDLING THE CENTER LINES.
7. THE RAISED FACE OF EACH PROCESS FLANGE AT EITHER END OF THE FLOWCELL MUST BE ALIGNED TO THE DESIGN PLANE WITHIN 1MM/200MM (AS PER TEMA 9TH. EDITION), MEASURED ACROSS ANY OF THE RAISED FACE OUTSIDE DIAMETERS. THE DESIGN PLANE IS DEFINED AS A PLANE WHICH IS PERPENDICULAR TO THE LINE PASSING THROUGH THE PROCESS FLANGE CENTRES AT THE RF ENDS (REF DOC 552-009).
8. DE-BURR ALL SHARP EDGES.
9. GRIND ALL WELD ROOTS FLUSH WITH PIPE/FITTING I.D. GRINDING APPARATUS/PROCESS SHOULD NOT CONTAMINATE BASE METAL.
   NDE TO BE CARRIED OUT AFTER GRINDING ACTIVITIES AS PER COMPONENT INFORMATION PANELS ABOVE.
10. PICKLING AND PASSIVATING FLOWCELL AFTER COMPLETION OF FABRICATION.
11. HYDROSTATIC PRESSURE TEST TO BE PERFORMED AS PER PROCEDURE 552-010, FOR AT LEAST 10 MINUTES. REFER TO TABLE FOR HYDRO TEST PRESSURE.
12. EXTERIOR COATING SYSTEM: OUTSIDE SURFACES OF FLOWCELL SHALL BE PAINTED PER SPEC:
    PAINT SYSTEM: COATING AS PER NORSOK M 501 COATING SYSTEM 6A (PRIMER - PENGUARD, MID COAT - PENGUARD UNIVERSAL, TOP COAT - HARDTOP OPTIMA FROM JOTUN)
    TOP COAT COLOUR : DARK GREY
13. INTERIOR COATING SYSTEM: NONE.
14. FLOW ARROW AND "TOP OF PIPE" TO BE ON 316SS NAMEPLATE, FIXED TO TAG PLATE BRACKET USING 316SS RIVETS.
15. FIT FLANGE PROTECTORS PRIOR TO SHIPPING WHICH SHALL BE EASILY REMOVABLE. ALL FLANGE PROTECTORS TO HAVE A LABEL WITH WORDING "DO NOT CUT FLANGE PROTECTOR WITH A SHARP OBJECT DURING ITS REMOVAL".
16. PROVIDE DIMENSIONAL INSPECTION OF CTO's REPORT AS PER REF. DOC. 552-105.
17. FLOWCELL FINAL DOCUMENTATION TO BE PROVIDED TO BH SENSING AS PER DOCUMENT 552-003.
18. ALL MATERIALS TO BE ROHS COMPLIANT.
19. FULL COMPLIANCE TO ASME B31.12

NOZZLE ALIGNMENT OPTIONS

"NOZZLES TO BE ALIGNED AT 45° +/- 1° TO THE PIPE AXIS."

ANY EXTERNAL FORCES AND MOMENTS AT ALL CONNECTIONS ARE CONSIDERED AS ZERO.

TAG NUMBER	43-FT-001
DESIGN PRESSURE @ HT	0.35 MPa (G) A
DESIGN PRESSURE @ LT	0.35 MPa (G) A
DESIGN TEMPERATURE	0°C TO 80°C
CORROSION ALLOWANCE	0.00
HYDRO-TEST PRESSURE	0.53 MPa(G) +0.1 MPa(G) -0.0 MPa(G) A
PIPING CLASS	01HSS
WEIGHT (APPROX.)	98 kg A
CPO (PARENT / CHILD)	2721420/600
S.O. NUMBER	1706864
COUNTRY OF INSTALLATION	HOLLAND

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN mm[INCHES].
TOLERANCES ARE:

METRIC (mm)	US CUSTOMARY (INCHES)	TOLERANCE (mm/INCHES)
.XX	.XXX	0.13/0.005
.X	.XX	0.3/0.01

ANGLES ± 1°
FRACTIONS ± 0.8 [1/32"]
SURFACE FINISH : 3.2 [125]

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REV	DESCRIPTIONS	DWN	CKD	APVD
B	ISSUED FOR APPROVAL	TG 15/10/24	TG 15/10/24	TG 15/10/24
A	ISSUED FOR APPROVAL	TG 19/09/24	TG 19/09/24	TG 19/09/24
-	ISSUED FOR APPROVAL	SG 17/07/24	TG 12/07/24	TG 12/07/24

REVISIONS

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TITLE
FABRICATION FLOWCELL 10 IN, SCH40S, 150#, SS TILTED DIA, 1P, 1T

ECM	UPDATED
500000541127	15/10/2024

SIZE	DRAWING NUMBER	REV	VERSION
B	182M4103	B	02

GENERATED USING SOLIDWORKS	DRAWING NOT TO SCALE	SHEET 1 OF 1

SWD/182M4103/000/02