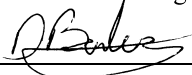


AAR Manual of Standards and Recommended Practices
Specifications for Tank Cars

**APPLICATION FOR RENEWAL OF APPROVAL FOR PRESSURE RELIEF
DEVICES, VALVES, CLOSURES, AND FITTINGS**

1. AAR APPROVAL No. E232128
2. Date of Application SEPT-28-2023
3. Previous AAR Approval E139513
4. Applicant: Fort Vale Engineering Ltd
5. Address: Calder Vale Business Park, Simonstone Lane Simonstone Lanashire UK BB12 7ND
6. Drawing No. 48/X00XXCX 7. Latest rev. 24 8. Date of latest rev. NOV-24-2021
48/X00XXCX/A 03
9. Description of device: 1 1/2" FLANGED VACUUM RELIEF VALVE 10. Device ID No. 48/X00XXCX
48/X00XXCX/A

CERTIFICATION: The subject device is **unchanged** from the previous approval, and conforms with the latest revision of AAR Specifications for Tank Cars, Appendix A. The device conforms with drawing listed above.

11. By:  Title: Design and Development Director

If device is **changed** since latest approval, fill in the following blanks

12. Reference Previous Drawing	New Drawing	If on Service Trial
No. _____ Rev. ____ Date _____	No. _____ Rev. ____ Date _____	S.T. No. _____
No. _____ Rev. ____ Date _____	No. _____ Rev. ____ Date _____	S.T. No. _____
No. _____ Rev. ____ Date _____	No. _____ Rev. ____ Date _____	S.T. No. _____

13. New drawing supersedes previous one or does not obsolete it

CHANGES

REASONS FOR CHANGES

14. a. <u>48/X00XXCX issue 13 to 24</u>	a. <u>Various updates that do not change design fit-form-function</u>
b. <u>48/X00XXCX issue 0 to 3</u>	b. <u>Various updates that do not change design fit-form-function</u>
c. _____	c. <u>See supplemental sheet "Reasons for change"</u>
d. _____	d. _____

(if needed use supplemental sheet)

15. Normal operational effect of changes of device: None

16. Drawing submitted with this application: 48/X00XXCX, 48/X00XXCX/A

CERTIFICATION: The above data is correct and conforms with AAR Specifications for Tank Cars, Appendix A. The device conforms with drawing listed above.

17. By:  Title: Design and Development Director

APPROVAL AAR Tank Car Committee:


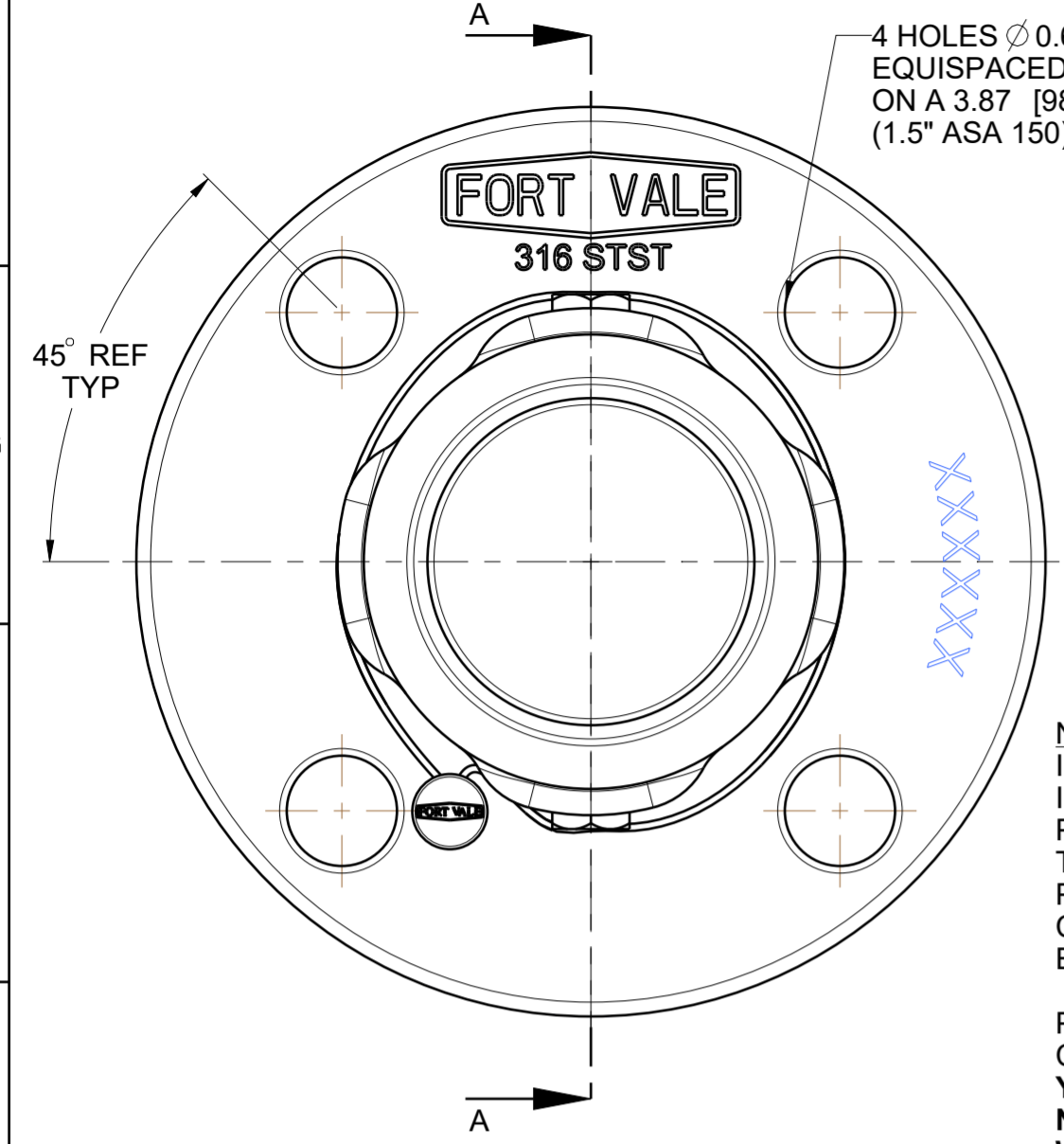
Date Approved: 12/8/2023 
(Signature) on behalf of Committee

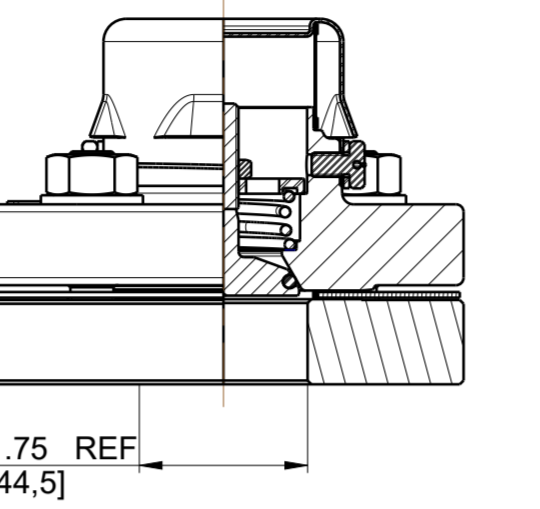
Fig. 1.5 Form AAR 4-7 Application for Renewal of Approval for Pressure Relief Devices, Valves, Closures, and Fittings

NET FLOW AREA 0.71 SQ IN
AAR No E232128



4 HOLES \varnothing 0.61 [15,4] THRU
EQUISPACED
ON A 3.87 [98,4] PCD
(1.5" ASA 150)

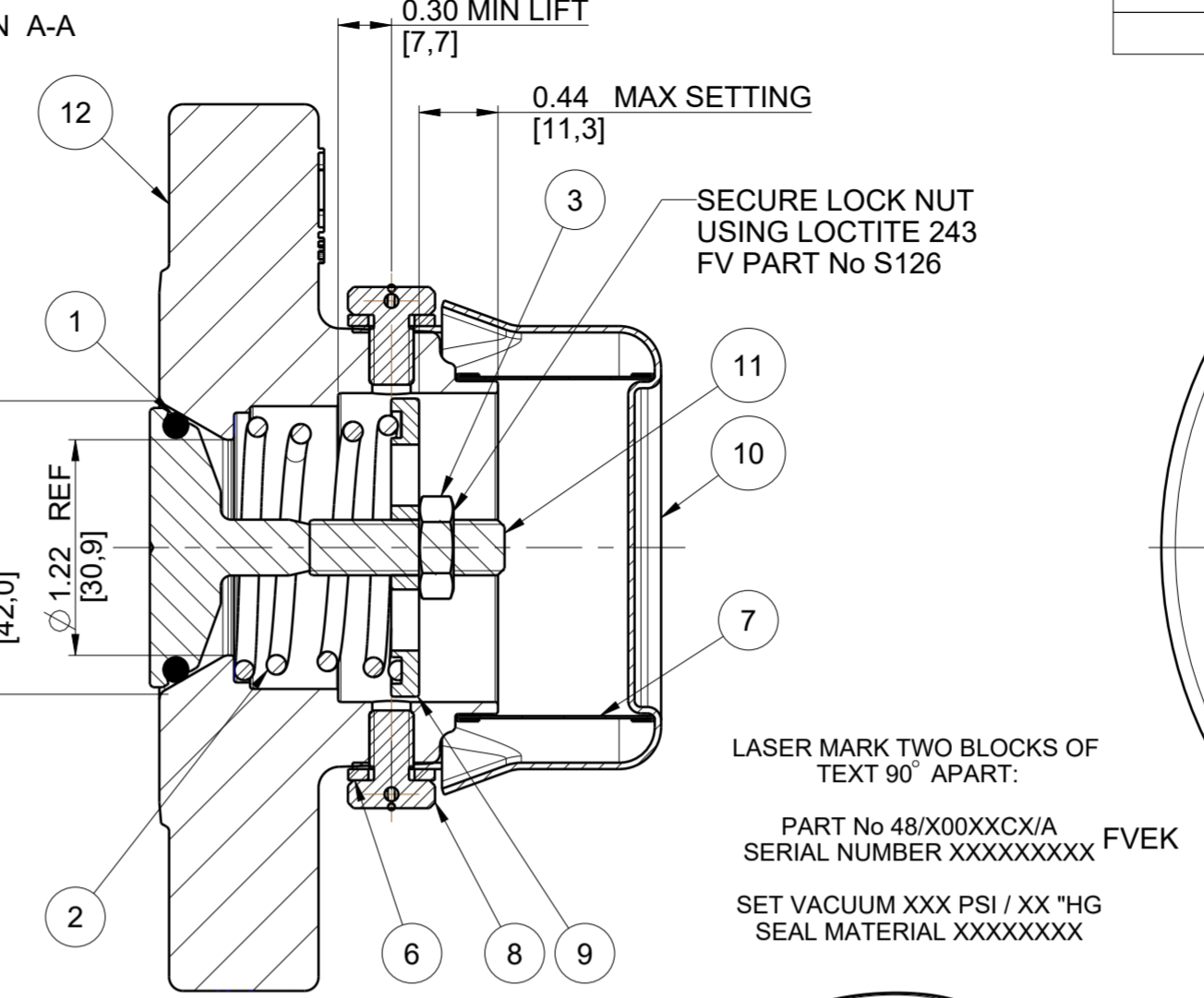
NOTE 3:-
TANKPAD OPENING MUST
NOT BE SMALLER THAN
 \varnothing 1.75" (44.5mm).
INCORRECT OPENING WILL
IMPAIR VALVE FUNCTION.



NOTE 1:-
IDENTIFIED COMPONENTS MATERIALS ARE TESTED
IN ACCORDANCE WITH ASTM A262, PRACTICE "A". IF
PRACTICE "A" REQUIREMENTS CANNOT BE MET,
TESTING MATERIAL IN ACCORDANCE WITH ASTM A262
PRACTICE "B" OR PRACTICE "E" IS PERMISSIBLE.
CORROSION RATE NOT TO
EXCEED .004 INCHES PER MONTH (ipm).

PARTS NOTED IN BOM TABLE
CORROSION TESTED AS PER NOTE
YES = ALL COMPONENTS TEST
NO = NOT TESTED
WETTED = ONLY WETTED PARTS TESTED

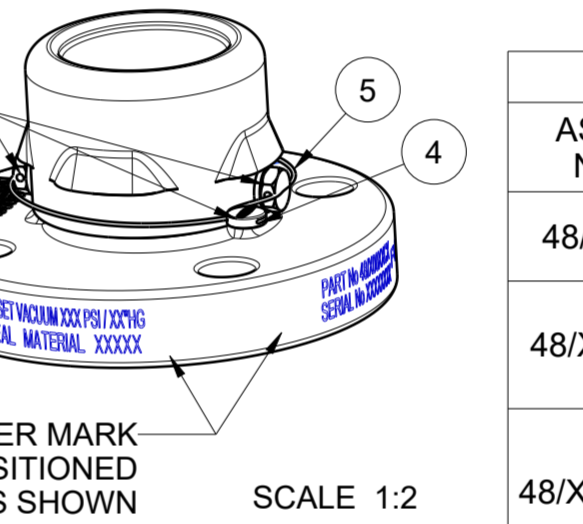
NOTE 2:-
VITON B SEAL MUST BE DUPONT.
SUBSTITUTES ARE UNACCEPTABLE.



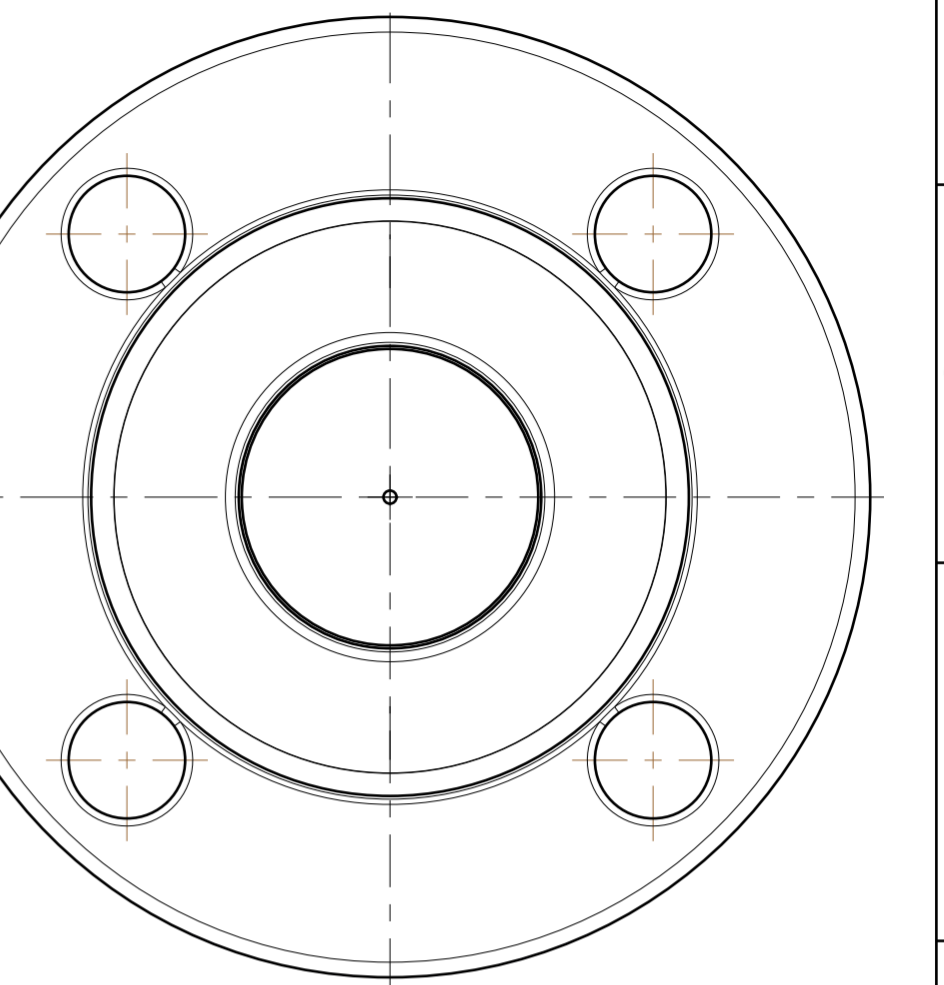
SECURE LOCK NUT
USING LOCTITE 243
FV PART No S126

LASER MARK TWO BLOCKS OF
TEXT 90° APART:
PART No 48/X00XXCX/A
SERIAL NUMBER XXXXXXXXX FVEK
SET VACUUM XXX PSI / XX "HG
SEAL MATERIAL XXXXXXXX

PASS WIRE THROUGH BOTH LOCKING NIPPLES
& CRIMP WIRE USING LEAD SEAL



DRAWING STATUS		Production	
REVISION	03	SIG P JOLLY	08-Nov-23
AAR NUMBER UPDATED [1:H].			

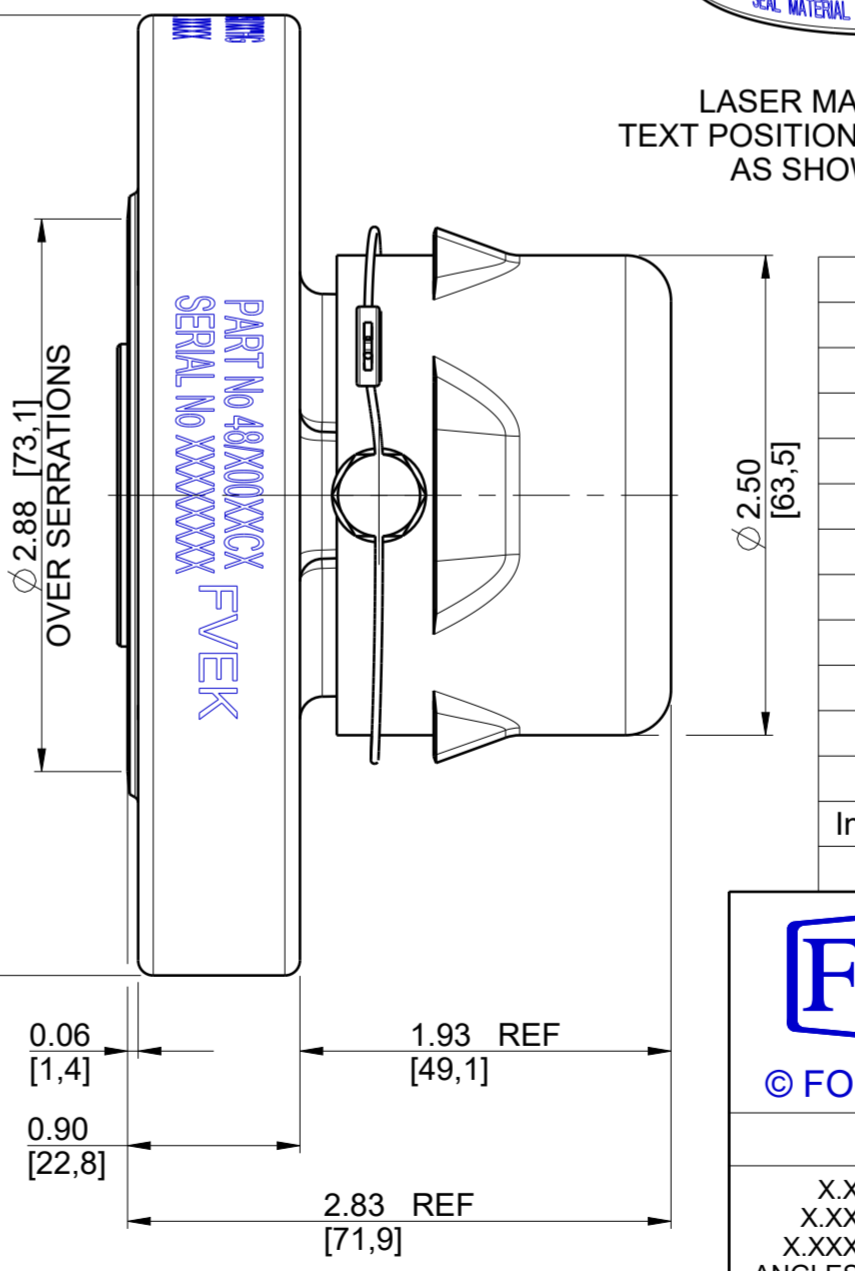


48/X00--CX/A
DENOTES VACUUM
SETTING (x2 "Hg)

PSI UNITS ROUNDED
TO NEAREST 0.25 PSI

ASSEMBLY NUMBER	SPRING	psi	"Hg	psi	"Hg	psi	"Hg
		NOMINAL	LOWER LIMIT	UPPER LIMIT	VACUUM SETTINGS		
48/X0050CX/A	5104-778	12,50	25,0	11,50	23,0	13,5	27,0
48/X0048CX/A	5104-778	12,00	24,0	11,00	22,0	13,0	26,0
48/X0044CX/A	5104-778	11,00	22,0	10,00	20,0	12,0	24,0
48/X0040CX/A	5104-612	10,00	20,0	9,00	18,0	11,0	22,0
48/X0036CX/A	5104-610	9,00	18,0	8,00	16,0	10,0	20,0
48/X0030CX/A	5104-610	7,50	15,0	6,50	13,0	8,5	17,0
48/X0028CX/A	5104-610	7,00	14,0	6,00	12,0	8,0	16,0
48/X0027CX/A	5104-606	6,75	13,5	5,75	11,5	7,8	15,5
48/X0024CX/A	5104-606	6,00	12,0	5,00	10,0	7,0	14,0
48/X0020CX/A	5104-777	5,00	10,0	4,50	9,0	5,5	11,0
48/X0018CX/A	5104-777	4,50	9,0	4,00	8,0	5,0	10,0
48/X0016CX/A	5104-777	4,00	8,0	3,50	7,0	4,5	9,0
48/X0014CX/A	5104-605	3,50	7,0	3,00	6,0	4,0	8,0
48/X0013CX/A	5104-605	3,25	6,5	2,75	5,5	3,8	7,5
48/X0012CX/A	5104-605	3,00	6,0	2,50	5,0	3,5	7,0
48/X0011CX/A	5104-605	2,75	5,5	2,25	4,5	3,3	6,5
48/X0010CX/A	5104-776	2,50	5,0	2,00	4,0	3,0	6,0
48/X0008CX/A	5104-603	2,00	4,0	1,50	3,0	2,5	5,0
48/X0006CX/A	5104-775	1,50	3,0	1,00	2,0	2,0	4,0
48/X0005CX/A	5104-602/1	1,25	2,5	1,25	1,5	1,8	3,5
48/X0004CX/A	5104-602/1	1,00	2,0	1,00	2,0	1,8	4,0
48/X0003CX/A	5104-602/1	0,75	1,5	0,75	1,5	1,5	3,0
48/X0002CX/A	5104-601/1	0,50	1,0	0,50	1,0	1,0	2,0
48/X0001CX/A	5104-600/1	0,25	0,5	0,25	0,5	0,5	1,0

TABLE 2				
ASSEMBLY NUMBER	SEAL CODE	PRESSURE SEAL	MIN TEMP	MAX TEMP
48/000XXCX/A (VITON A)	0	5005-107AD	-4°F (-20°C)	399°F (204°C)
48/100XXCX/A (FORTYT FEP OUTER / SILICON CORE)	1	5005-108HL	-67°F (-55°C)	392°F (200°C)
48/300XXCX/A (KALREZ 6375)	3	5005-107K	5°F (-15°C)	527°F (275°C)
48/400XXCX/A (HNBR)	4	5005-984	-22°F (-30°C)	302°F (150°C)
48/700XXCX/A (PERFLUOROELASTOMER)	7	5005-764	5°F (-15°C)	500°F (260°C)
48/900XXCX/A (EPDM)	9	5005-255	-58°F (-50°C)	302°F (150°C)
48/B00XXCX/A (VITON B DUPONT) (SEE NOTE 2)	B	5005-107BD	5°F (-15°C)	392°F (200°C)
48/C00XXCX/A (CHEMRAZ 505)	C	5005-107K9	-22°F (-30°C)	446°F (230°C)
48/D00XXCX/A (WHITE EPDM)	D	ORB216WEF	-58°F (-50°C)	302°F (150°C)
48/E00XXCX/A (VITON GF-S, TRELLEBORG COMPOUND - CS5350)	E	ORB216GFS	-4°F (-20°C)	392°F (200°C)
48/F00XXCX/A (BLACK NEOPRENE)	F	ORB216NEO	-49°F (-45°C)	212°F (100°C)
48/G00XXCX/A (VITON GFLT)	G	5005-107GD	-13°F (-25°C)	392°F (200°C)
48/H00XXCX/A (BLACK EPDM TRELLEBORG EP787)	H	ORB216EPP	-51°F (-46°C)	250°F (121°C)
48/I00XXCX/A (VITON GFS COMPOUND VSP-E22)	I	ORB216E22	-4°F (-20°C)	392°F (200°C)
48/J00XXCX/A (FORTYT FEP OUTER / VITON CORE)	J	ORB216F2	-40°F (-40°C)	392°F (200°C)
48/N00XXCX/A (WHITE NEOPRENE FOOD GRADE)	N	5005-107C	-22°F (-30°C)	212°F (100°C)
48/S00XXCX/A (VITON GF-S PEROXIDE CURED)	S	5005-107SD	-4°F (-20°C)	392°F (200°C)
48/T00XXCX/A (HIGH TEMP FORTYT)	T	5005-108HPFAL	-67°F (-55°C)	500°F (260°C)
48/W00XXCX (WHITE BUNA N FOOD GRADE)	W	5005-107W	-22°F (-30°C)	212°F (100°C)



Index	Part Number	Description	Material	Qty	TEST NOTE
12	S0114/20A	BODY MACHINING	316 STST	1	YES
11	10983V/4A	VACUUM POPPET UNF STEM	316 STST	1	YES
10	10217/1	UNIACT CAP(SEE TABLE 3)	304 STST	1	NO
9	10215/1	SPRING PAD	304 STST	1	NO
8	10299	CABLE NIPPLE (SEE TABLE 3)	316 STST	2	NO
7	10204	GAUZE RING (SEE TABLE 3)	316 STST	1	NO
6	5213-036	1/4" SPRING WASHER (SEE TABLE 3)	304 STST	2	NO
5	5128-174W	ACME SEALING WIRE (250mm LENGTH)	316 STST	1	NO
4	5128-174	WIRE SEAL	LEAD	1	NO
3	5122-181	5/16"-24 UNF HALF NUT	316 STST	1	NO
2	5104-XXX	1.5" UNIACT SPRING (SEE TABLE 1)	STST	1	NO
1	5005-XXX	BS 216 "O" RING (SEE TABLE 2)	SEE TABLE 2	1	NO

SALES@FORTVALE.COM WWW.FORTVALE.COM

ENGLAND, USA, CHINA
NETHERLANDS, SINGAPORE

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DO NOT SCALE - IF IN DOUBT ASK

UNLESS OTHERWISE STATED

FIRST ANGLE PROJECTION

MATERIAL: 316 STST

SCALE: NTS MASS: 5,00 lb (2,27 kg)

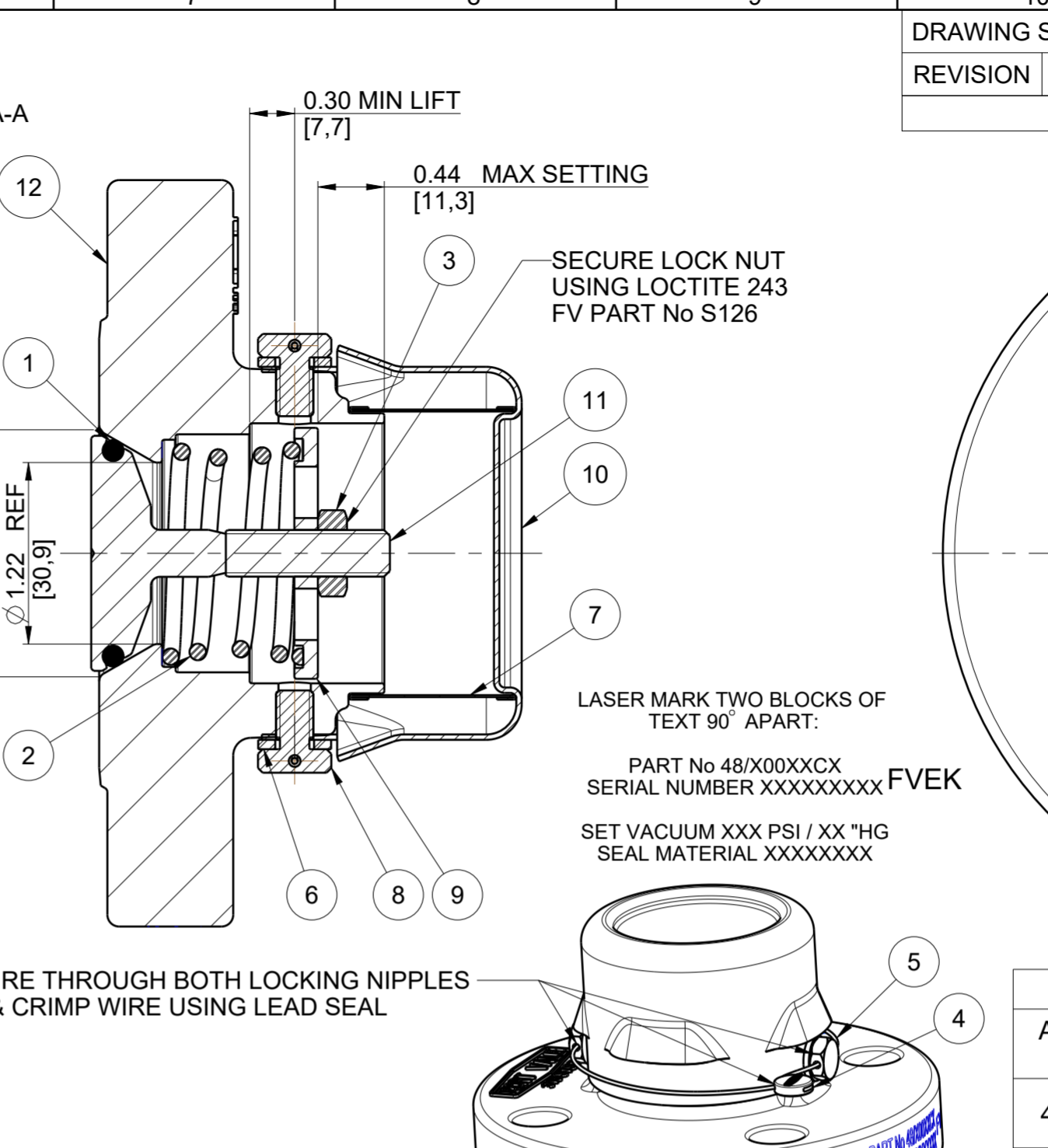
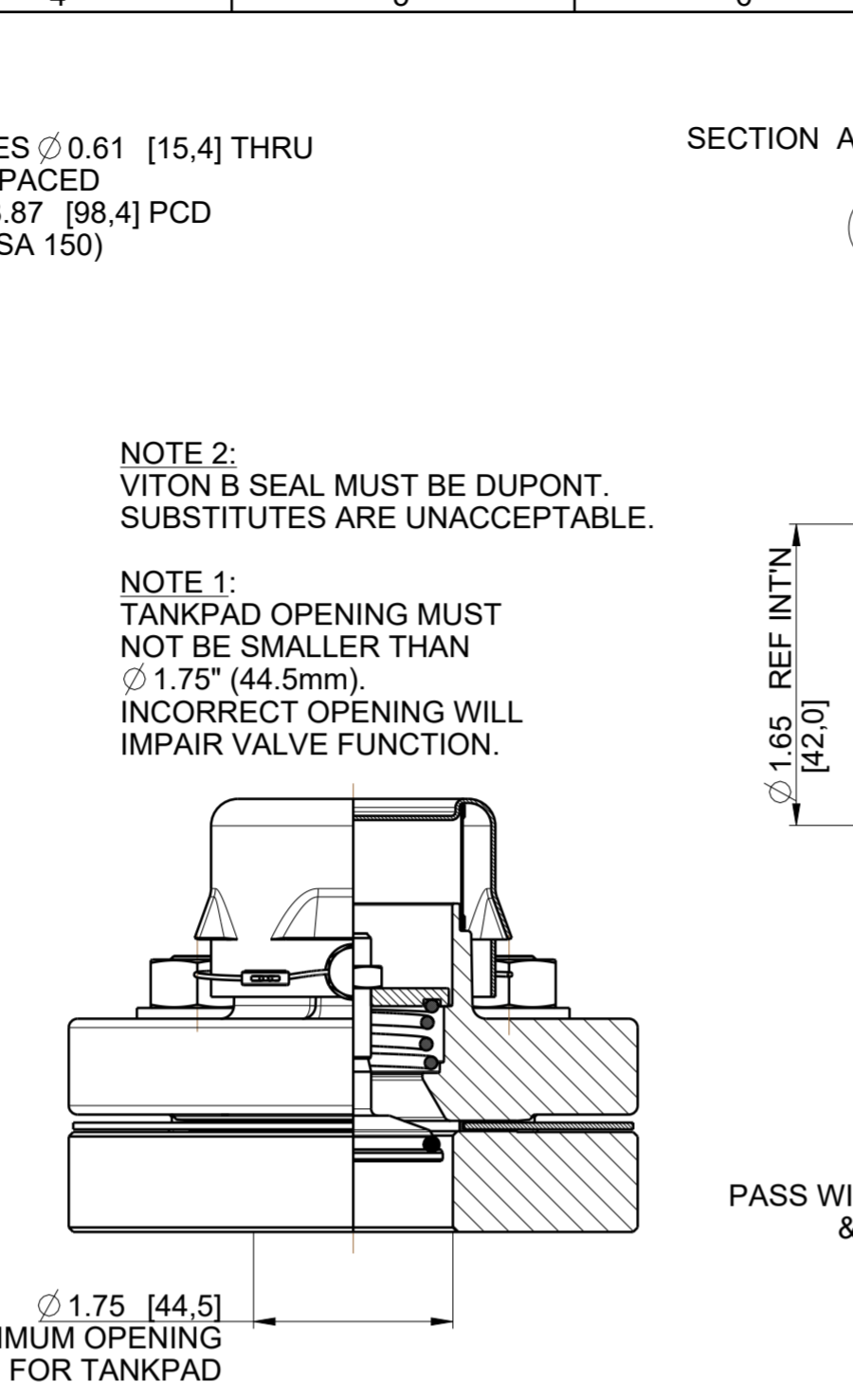
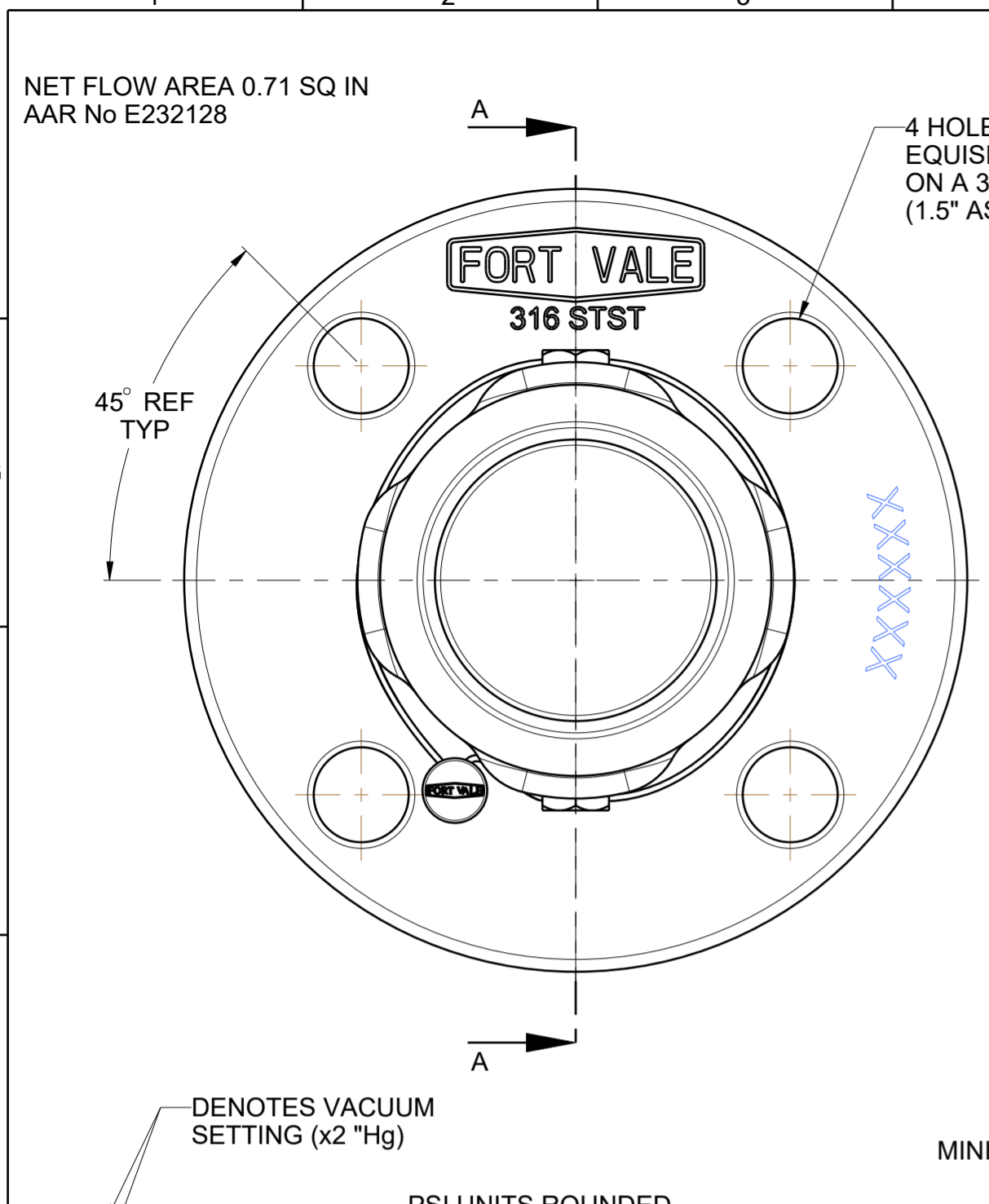
CHECKED: DVN: 38713

DESCRIPTION: 1.5" FLANGED UNIACT WITH CONTACT PART MATERIAL CORROSION TEST

TYPE: AAR RAIL CARTS

SHEET 1 OF 1
DRAWN BY: J THOMAS DATE: 15-Jul-21
DRG.NO. 48/X00XXCX/A

DESIGN CODE: ASME VIII DIV1
DESIGN PRESSURE (MAWP) : 165,0 psig (11,4) barg
SERVICE TEST PRESSURE : 327,8 psig (22,6) barg
MAX DESIGN TEMPERATURE : SEE TABLE 2
MIN DESIGN TEMPERATURE : SEE TABLE 2



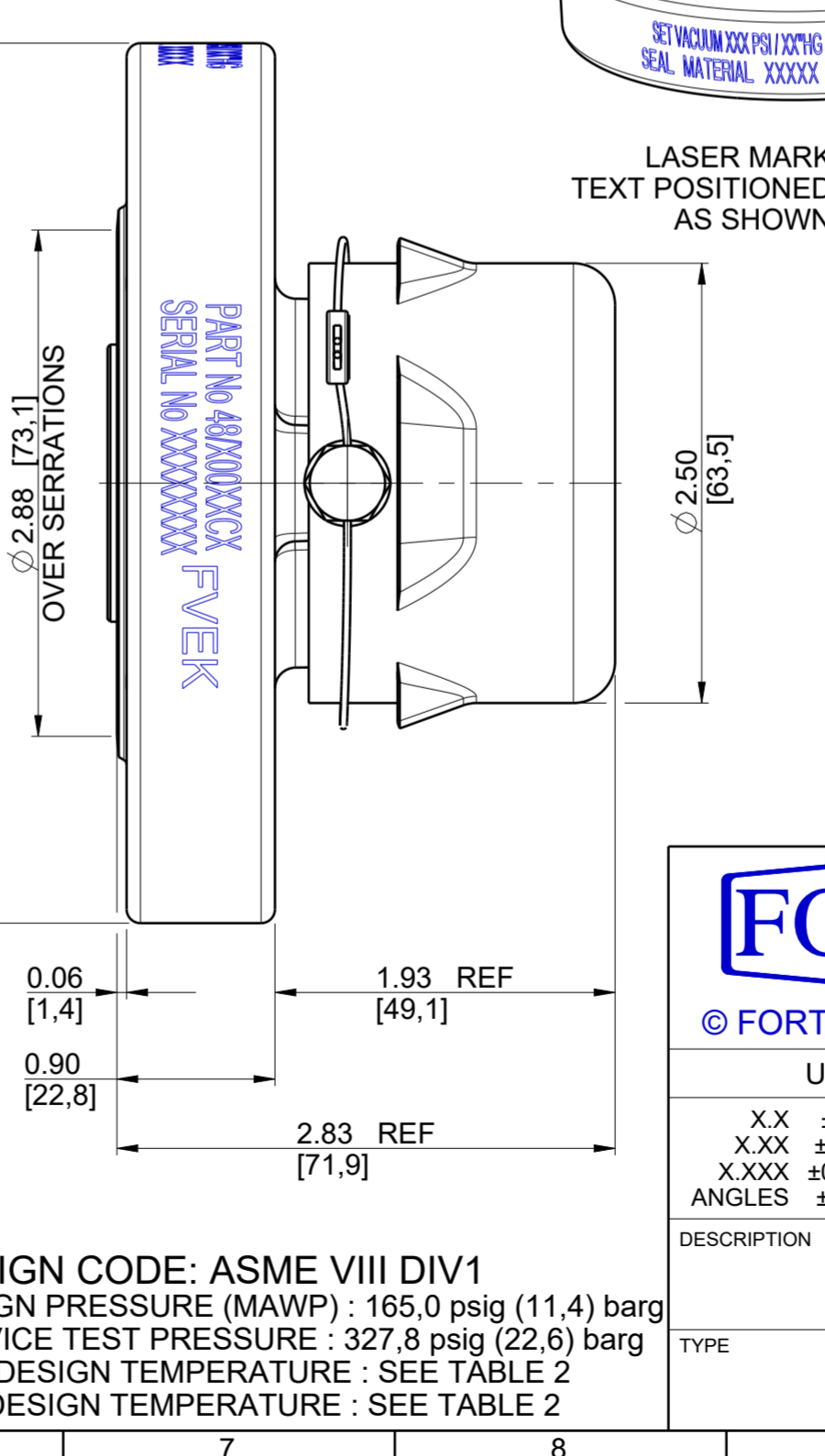
DRAWING STATUS		Production	
REVISION	24	SIG P JOLLY	09-Nov-23
AAR NUMBER UPDATED [1:H].			

ASSEMBLY NUMBER	DESCRIPTION	SUPPLEMENTAL COMPONENTS
48/X00XXC	STANDARD VALVE	NONE
48/X00XXCC	STANDARD VALVE WITH COWL	10217/1 10299 5213-036
48/X00XXCGZ	STANDARD VALVE WITH COWL & GAUZE	10217/1 10299 5213-036 10204

48/X00XXCX	PSI UNITS ROUNDED TO NEAREST 0.25 PSI						
	psi	"Hg	psi	"Hg	psi	"Hg	
48/X0050CX	5104-778	12,50	25,0	11,50	23,0	13,5	27,0
48/X0048CX	5104-778	12,00	24,0	11,00	22,0	13,0	26,0
48/X0044CX	5104-778	11,00	22,0	10,00	20,0	12,0	24,0
48/X0040CX	5104-612	10,00	20,0	9,00	18,0	11,0	22,0
48/X0036CX	5104-610	9,00	18,0	8,00	16,0	10,0	20,0
48/X0030CX	5104-610	7,50	15,0	6,50	13,0	8,5	17,0
48/X0028CX	5104-610	7,00	14,0	6,00	12,0	8,0	16,0
48/X0027CX	5104-606	6,75	13,5	5,75	11,5	7,8	15,5
48/X0024CX	5104-606	6,00	12,0	5,00	10,0	7,0	14,0
48/X0020CX	5104-777	5,00	10,0	4,50	9,0	5,5	11,0
48/X0018CX	5104-777	4,50	9,0	4,00	8,0	5,0	10,0
48/X0016CX	5104-777	4,00	8,0	3,50	7,0	4,5	9,0
48/X0014CX	5104-605	3,50	7,0	3,00	6,0	4,0	8,0
48/X0013CX	5104-605	3,25	6,5	2,75	5,5	3,8	7,5
48/X0012CX	5104-605	3,00	6,0	2,50	5,0	3,5	7,0
48/X0011CX	5104-605	2,75	5,5	2,25	4,5	3,3	6,5
48/X0010CX	5104-776	2,50	5,0	2,00	4,0	3,0	6,0
48/X0008CX	5104-603	2,00	4,0	1,50	3,0	2,5	5,0
48/X0006CX	5104-775	1,50	3,0	1,00	2,0	2,0	4,0
48/X0005CX	5104-602/1	1,25	2,5	1,25	1,5	1,8	3,5
48/X0004CX	5104-602/1	1,00	2,0	1,00	2,0	1,8	4,0
48/X0003CX	5104-602/1	0,75	1,5	0,75	1,5	1,5	3,0
48/X0002CX	5104-601/1	0,50	1,0	0,50	1,0	1,0	2,0
48/X0001CX	5104-600/1	0,25	0,5	0,25	0,5	0,5	1,0

ASSEMBLY NUMBER	SPRING	VACUUM SETTINGS					
		psi	"Hg	psi	"Hg	psi	"Hg
		NOMINAL	LOWER LIMIT	UPPER LIMIT			

ASSEMBLY NUMBER	SEAL CODE	PRESSURE SEAL	MIN TEMP	MAX TEMP
48/000XXCX (VITON A)	0	5005-107AD	-4°F (-20°C)	399°F (204°C)
48/100XXCX (FORTYT FEP OUTER / SILICON CORE)	1	5005-108HL	-67°F (-55°C)	392°F (200°C)
48/300XXCX (KALREZ 6375)	3	5005-107K	5°F (-15°C)	527°F (275°C)
48/400XXCX (HNBR)	4	5005-984	-22°F (-30°C)	302°F (150°C)
48/700XXCX (PERFLUOROELASTOMER)	7	5005-764	5°F (-15°C)	500°F (260°C)
48/900XXCX (EPDM)	9	5005-255	-58°F (-50°C)	302°F (150°C)
48/B00XXCX (VITON B DUPONT) (SEE NOTE 2)	B	5005-107BD	5°F (-15°C)	392°F (200°C)
48/C00XXCX (CHEMRAZ 505)	C	5005-107K9	-22°F (-30°C)	446°F (230°C)
48/D00XXCX (WHITE EPDM)	D	ORB216WEF	-58°F (-50°C)	302°F (150°C)
48/E00XXCX (VITON GF-S, TRELLEBORG COMPOUND - CS5350)	E	ORB216GFS	-4°F (-20°C)	392°F (200°C)
48/F00XXCX (BLACK NEOPRENE)	F	ORB216NEO	-49°F (-45°C)	212°F (100°C)
48/G00XXCX (VITON GFLT)	G	5005-107GD	-13°F (-25°C)	392°F (200°C)
48/H00XXCX (BLACK EPDM TRELLEBORG EP787)	H	ORB216EPP	-51°F (-46°C)	250°F (121°C)
48/I00XXCX (VITON GFS COMPOUND VSP-E22)	I	ORB216E22	-4°F (-20°C)	392°F (200°C)
48/J00XXCX (FORTYT FEP OUTER / VITON CORE)	J	ORB216F2	-40°F (-40°C)	392°F (200°C)
48/N00XXCX (WHITE NEOPRENE FOOD GRADE)	N	5005-107C	-22°F (-30°C)	212°F (100°C)
48/S00XXCX (VITON GF-S PEROXIDE CURED)	S	5005-107SD	-4°F (-20°C)	392°F (200°C)
48/T00XXCX (HIGH TEMP FORTYT)	T	5005-108HPFAL	-67°F (-55°C)	500°F (260°C)
48/W00XXCX (WHITE BUNA N FOOD GRADE)	W	5005-107W	-22°F (-30°C)	212°F (100°C)



Index	Part Number	Description	Material	Qty
12	S0114/20	BODY MACHINING	316 STST	1
11	10983V/4	VACUUM POPPET UNF STEM	316 STST	1
10	10217/1	UNIACT CAP(SEE TABLE 3)	304 STST	1
9	10215/1	SPRING PAD	304 STST	1
8	10299	CABLE NIPPLE (SEE TABLE 3)	316 STST	2
7	10204	GAUZE RING (SEE TABLE 3)	316 STST	1
6	5213-036	1/4" SPRING WASHER (SEE TABLE 3)	304 STST	2
5	5128-174W	ACME SEALING WIRE (250mm LENGTH)	316 STST	1
4	5128-174	WIRE SEAL	LEAD	1
3	5122-181	5/16"-24 UNF HALF NUT	316 STST	1
2	5104-XXX	1.5" UNIACT SPRING (SEE TABLE 1)	STST	1
1	5005-XXX	BS 216 'O' RING (SEE TABLE 2)	SEE TABLE 2	1

DESCRIPTION		MATERIAL:	
UNLESS OTHERWISE STATED		316 STST	
X.X ±0.5	SURFACE FINISH 3.2um MAX	SCALE: NTS	
X.XX ±0.25	CORNER RADI 0.8	MASS: 5,00 lb (2,27 kg)	
X.XXX ±0.125	CORNER CHAMFER 1.0 X 45°	CHECKED DVN: 38713	
ANGLES ±0.5°	REMOVE ALL BURRS AND SHARP EDGES	SHEET 1 OF 1	

DESIGN CODE: ASME VIII DIV1		DATE: 21-Mar-13	
DESIGN PRESSURE (MAWP) : 165,0 psig (11,4) barg		DRAWN BY: P BOULT	
SERVICE TEST PRESSURE : 327,8 psig (22,6) barg		DATE: 21-Mar-13	
MAX DESIGN TEMPERATURE : SEE TABLE 2		DRG.NO.	
MIN DESIGN TEMPERATURE : SEE TABLE 2		48/X00XXCX	

FORT VALE		ENGLAND, USA, CHINA NETHERLANDS, SINGAPORE	
© FORT VALE ENGINEERING LTD 2023.		DO NOT SCALE - IF IN DOUBT ASK	
FIRST ANGLE PROJECTION		REGISTERED FIRM: LREQ4007111	
TYPE		AAR RAIL CARTS	