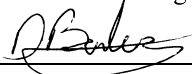


**AAR Manual of Standards and Recommended Practices
Specifications for Tank Cars**

**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
 9. Description of device: 1 1/2" FLANGED VACUUM RELIEF VALVE 10. Device ID No. 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:


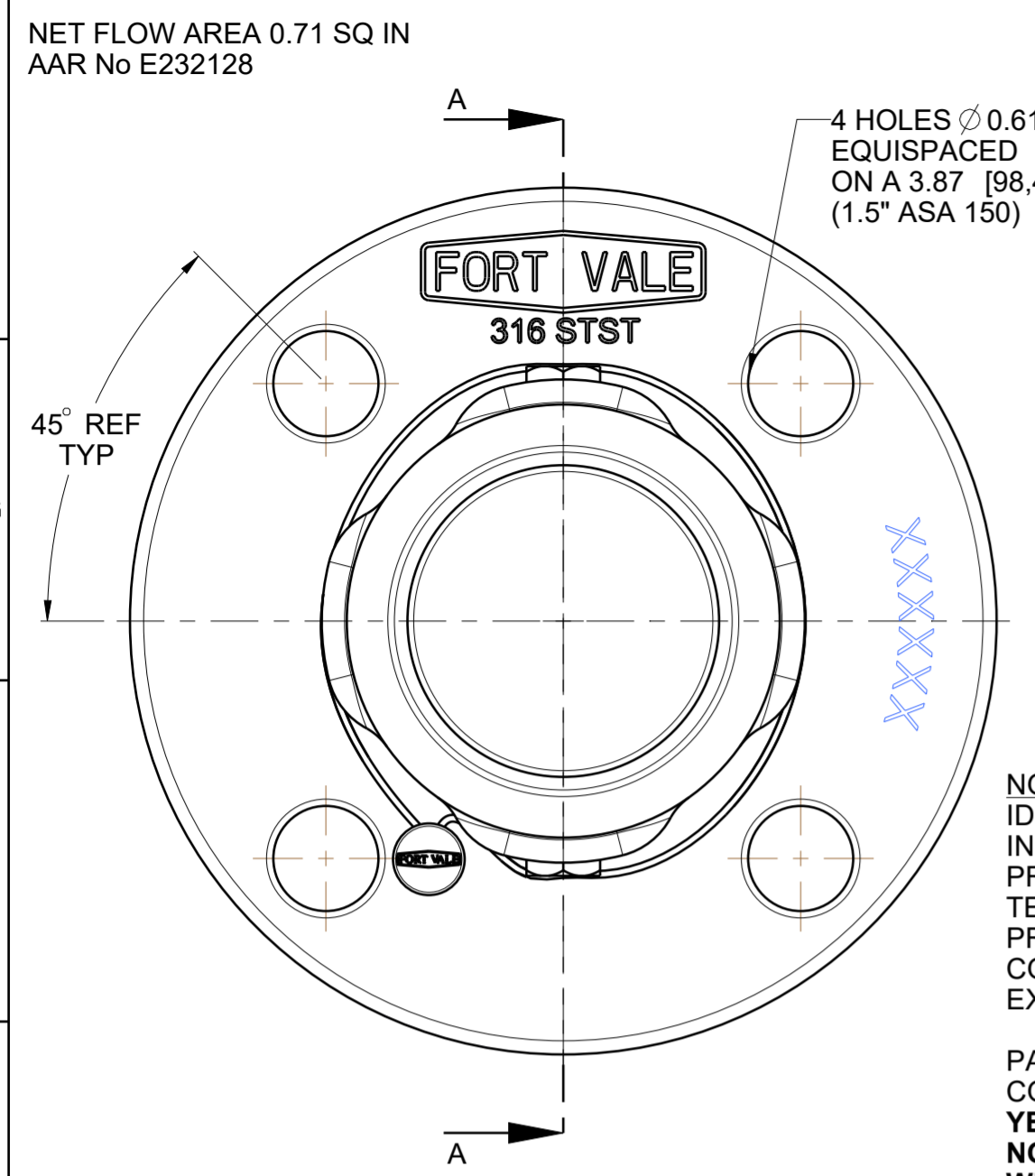
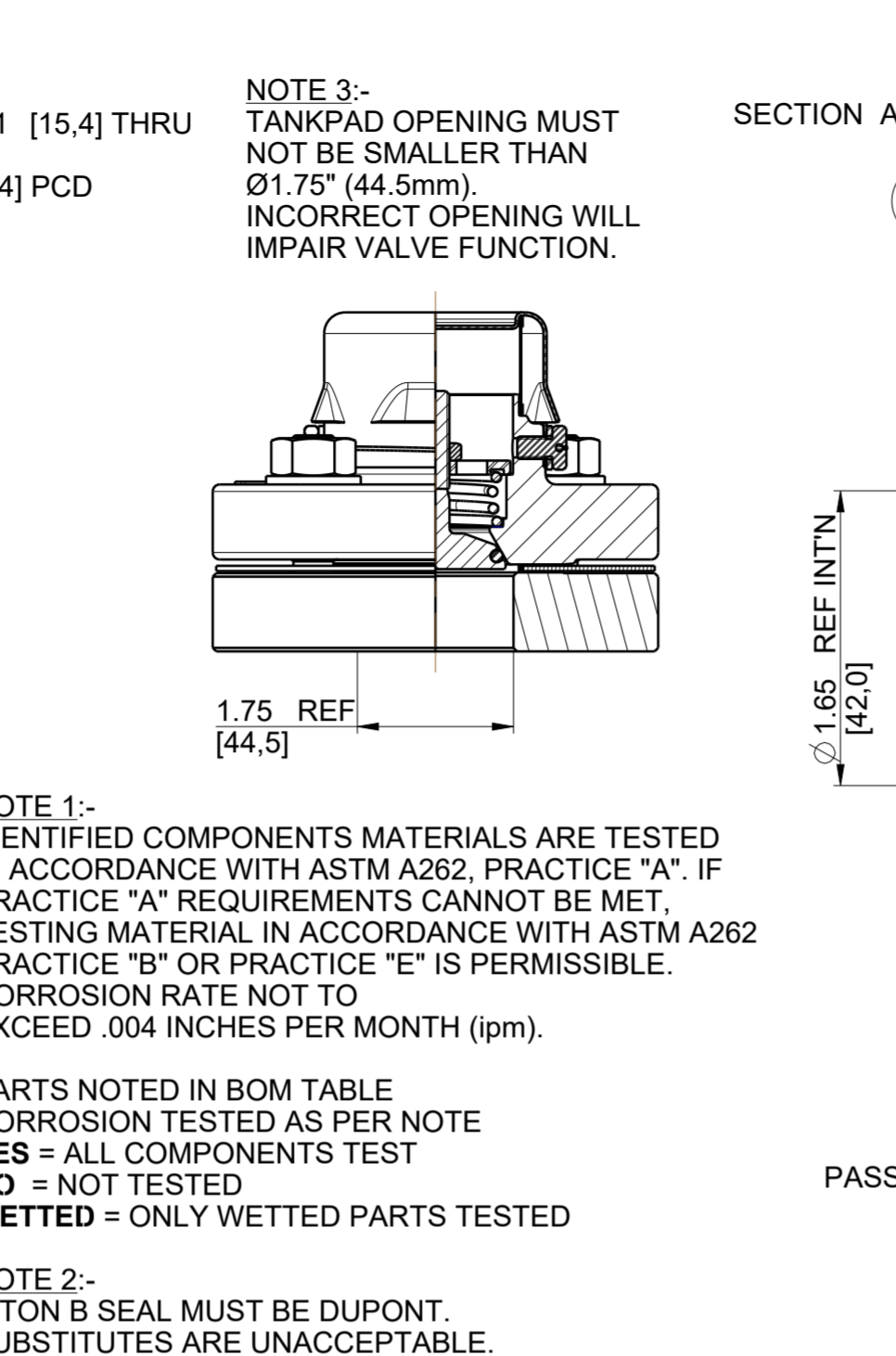
Date Approved: 12/8/2023 
 (Signature) on behalf of Committee

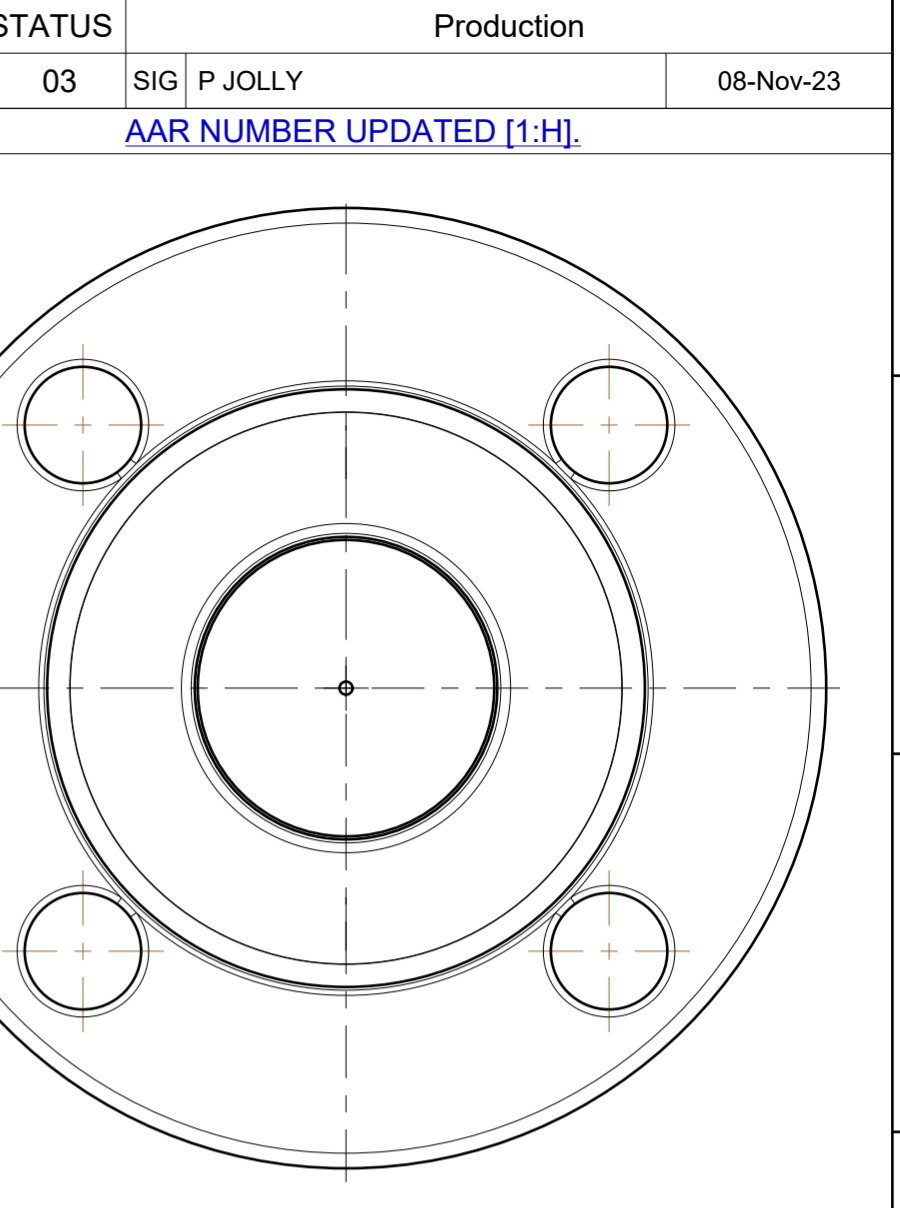
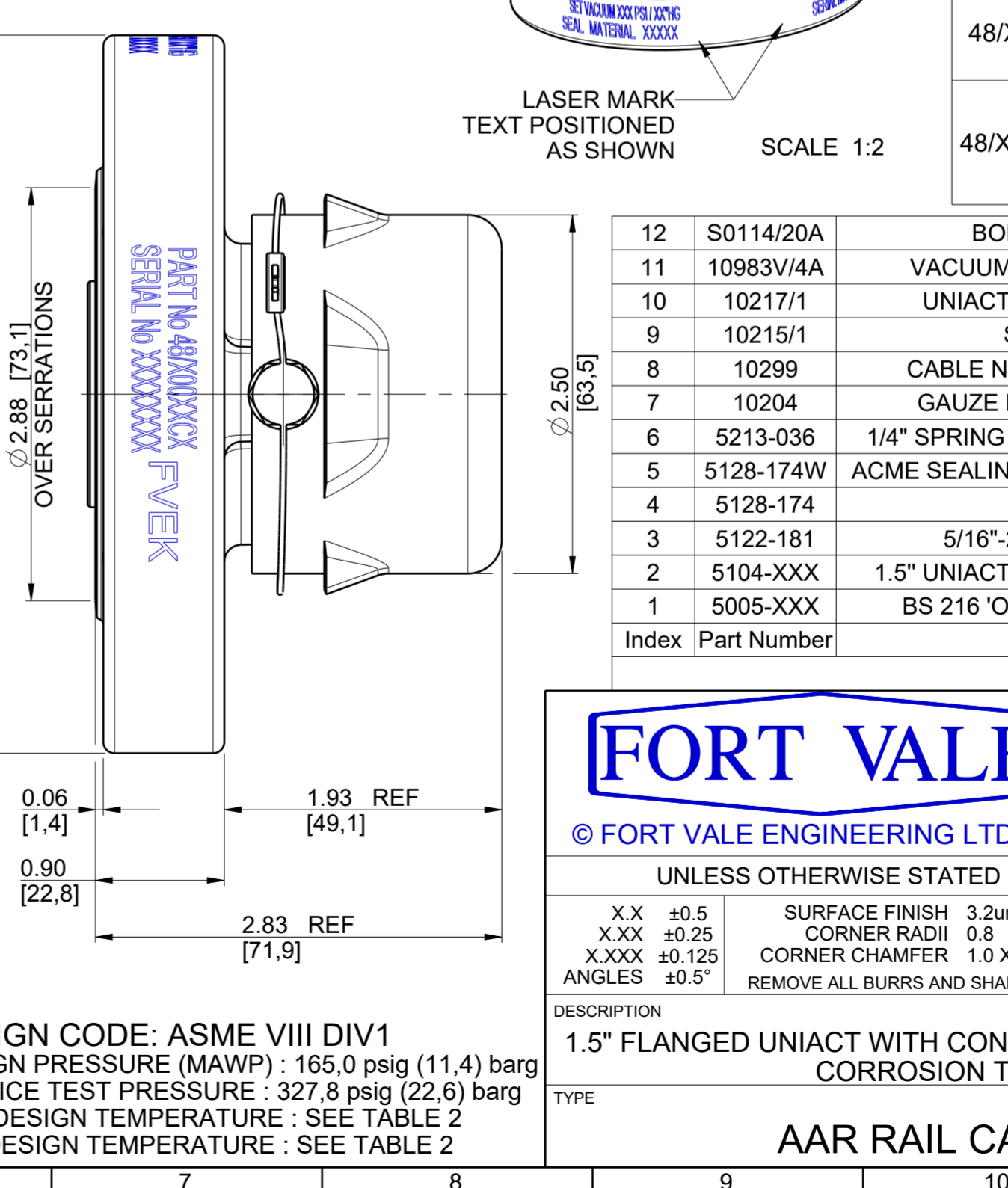
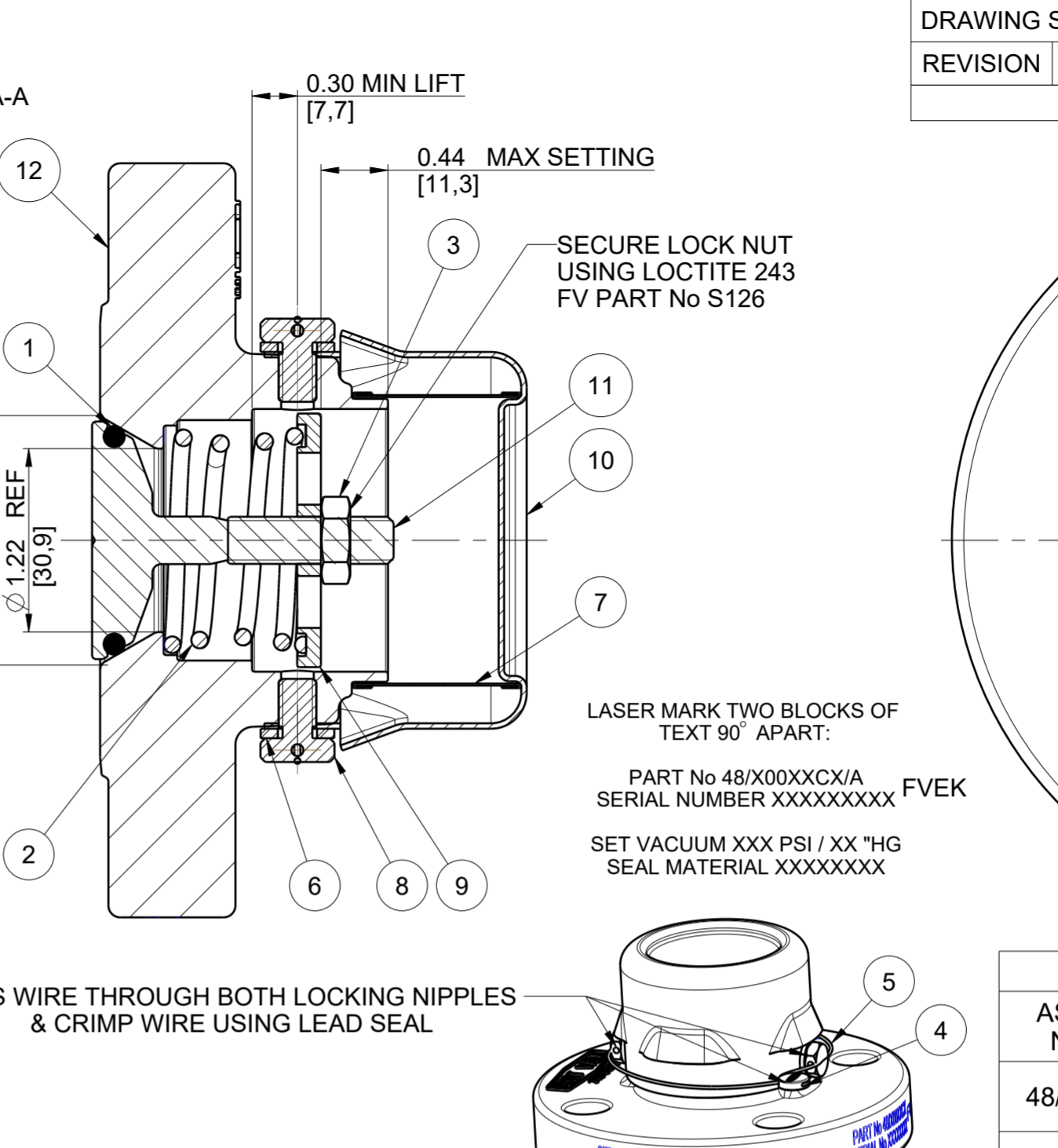
Fig. 1.5 Form AAR 4-7 Application for Renewal of Approval for Pressure Relief Devices, Valves, Closures, and Fittings



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



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)



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

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

FORT VALE 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

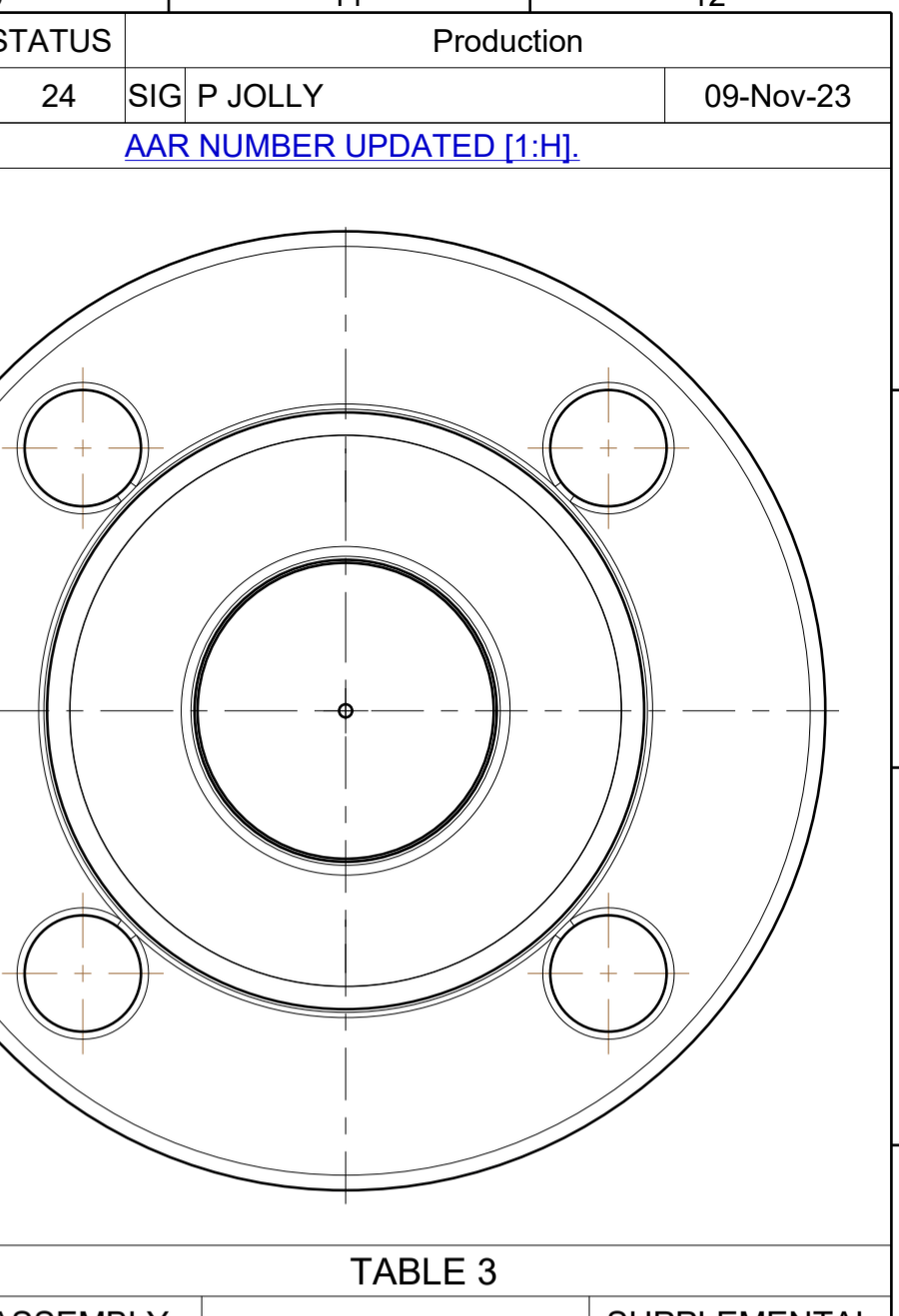
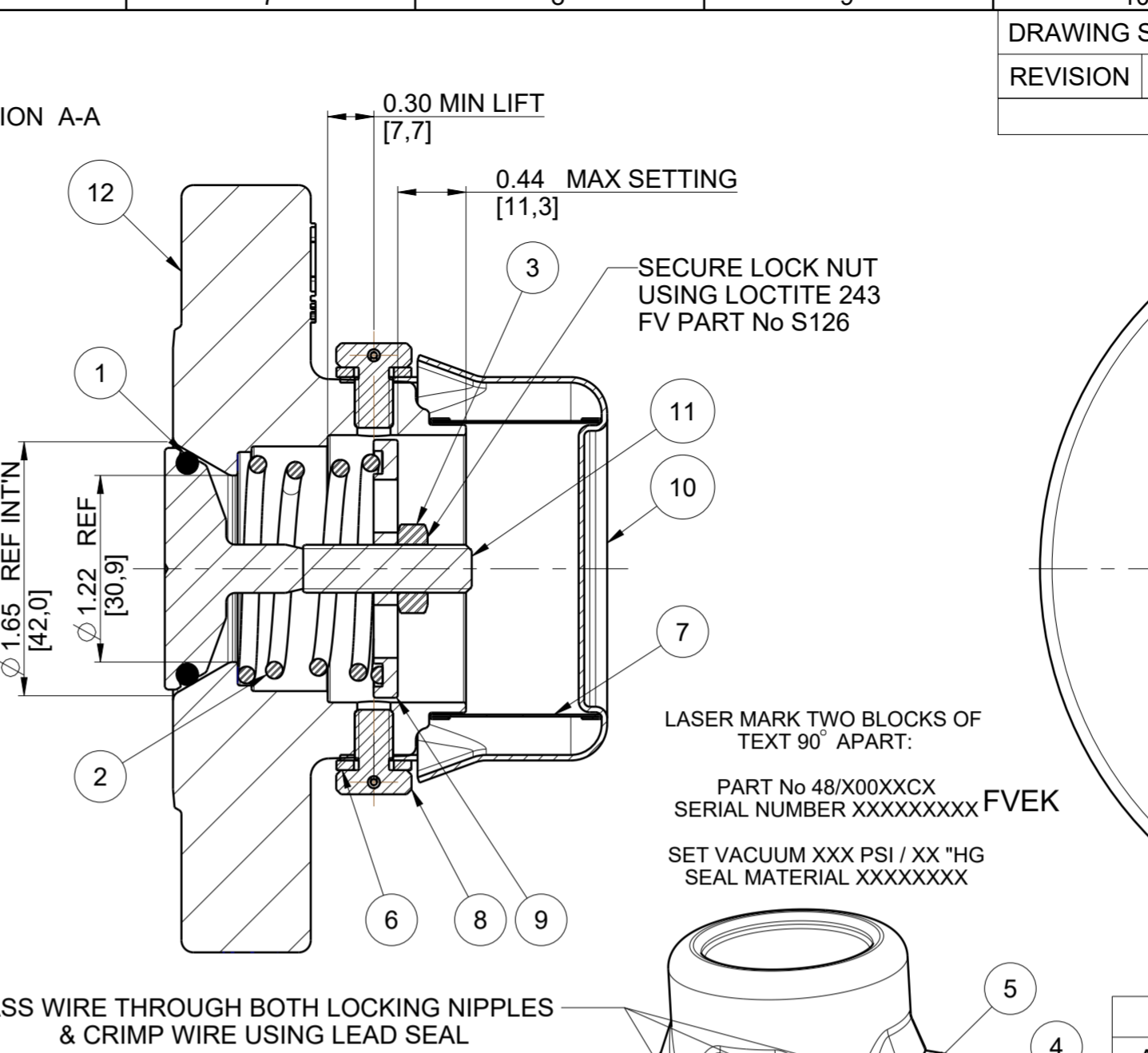
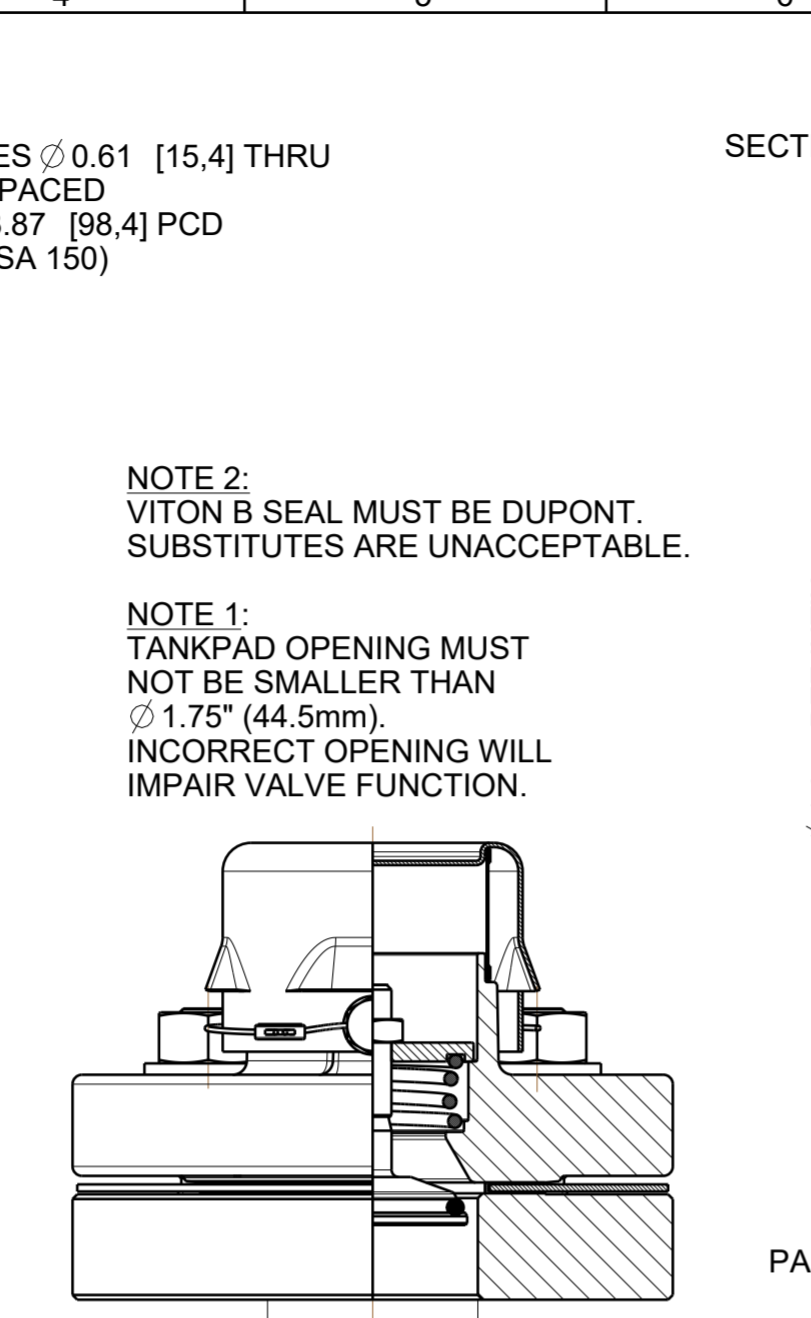
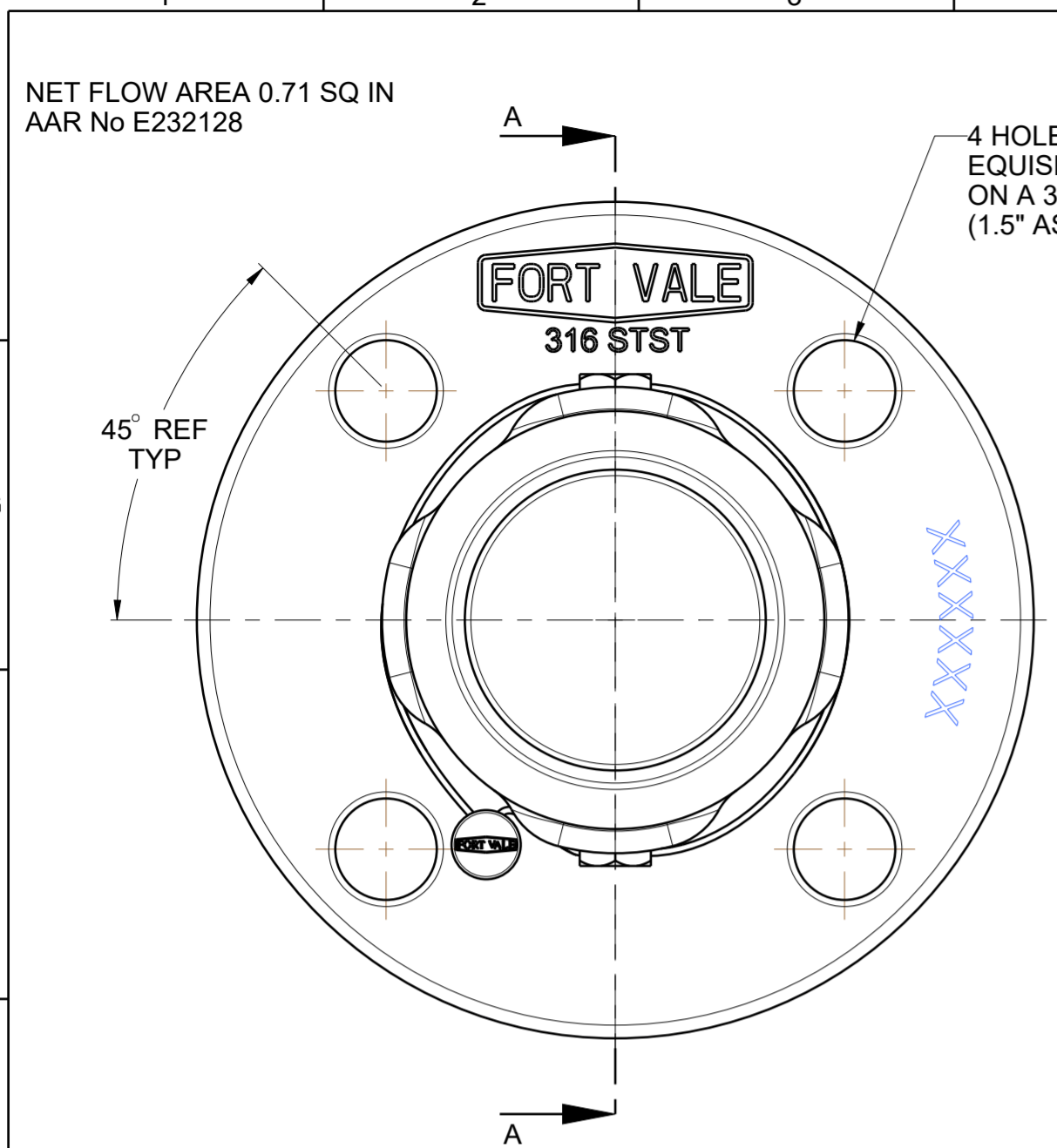
SHEET 1 OF 1

DRAWN BY: J THOMAS DATE: 15-Jul-21

TYPE: AAR RAIL CARTS

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]

TABLE 3

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

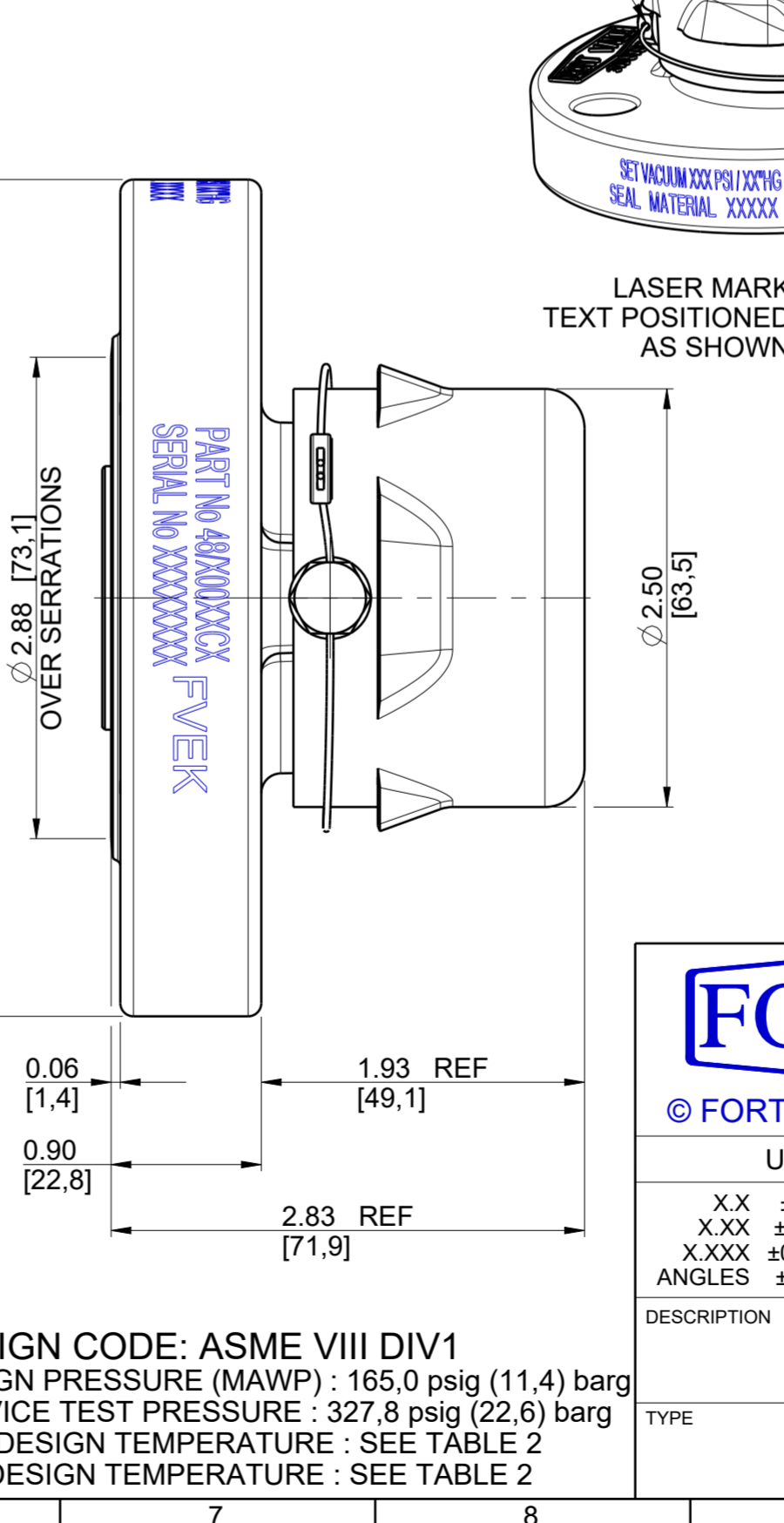
PSI UNITS ROUNDED TO NEAREST 0.25 PSI

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

TABLE 1

TABLE 2

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)



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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

TYPE: AAR RAIL CARTS

SHEET 1 OF 1
DRAWN BY: P BOULT DATE: 21-Mar-13
DRG.NO. 48/X00XXCX

INDEX

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

Assembly BOM