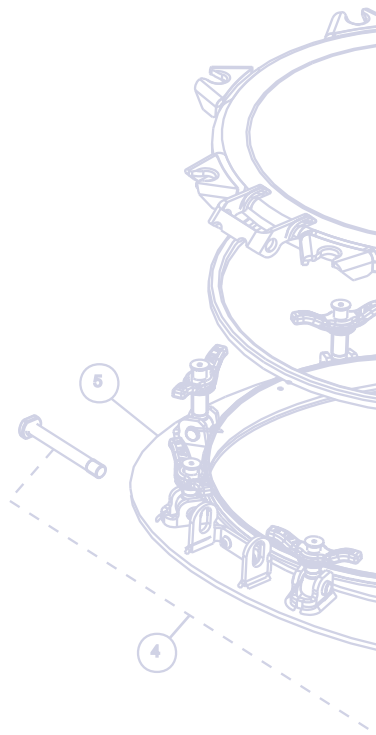




MANLID
CATALOGUE

//



The Fort Vale
Range of Manlid
Equipment

INSPECTION HATCH ASSEMBLIES

- » 170MM INSPECTION HATCH
- » 300MM PENDLE INSPECTION HATCH
- » 300MM ULTRA LOW PROFILE INSPECTION HATCH

460MM MANLID ASSEMBLIES

- » 460MM PENDLE MANLID ASSEMBLY
- » 460MM PENNINE MANLID ASSEMBLY

500MM MANLID ASSEMBLIES

- » 500MM PENDLE MANLID ASSEMBLY
- » 500MM ULTRA LOW PROFILE PENDLE MANLID ASSEMBLY
- » 500MM MANLID ASSEMBLY - OFFSHORE SPECIFICATION
- » 500MM QUICK RELEASE LATCH MANLID ASSEMBLY

600MM MANLID ASSEMBLY

OVAL MANLIDS & SPECIALS

- » 500MM SIDE ENTRY MANLID ASSEMBLY
- » IN-OUT OVAL MANLID ASSEMBLY
- » SPECIAL MANLIDS

SWINGBOLTS & SAFEBOLTS

- » SWINGBOLT ASSEMBLIES
- » SWINGBOLT ASSEMBLY COMPONENTS
- » SAFEBOLT ASSEMBLIES

SEALS & ANCILLARIES

- » MANLID SEALS
- » RUBBER MANLID SEAL FITTING INSTRUCTIONS
- » BRAIDED MANLID SEAL FITTING INSTRUCTIONS
- » MANLID ANCILLARIES

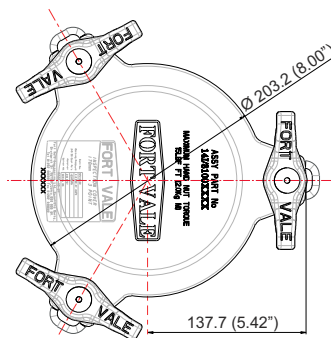
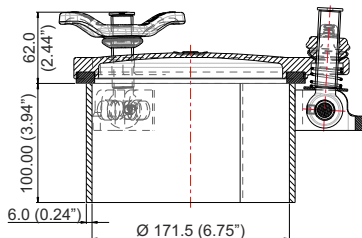


170mm Inspection Hatch - 3 point fastening. 6mm thick x 100mm deep neckring. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with stainless steel handnuts, 1-off spring-loaded to allow the cover to rotate clear of the neckring when in the open position. Seal supplied separately.

Options - alternative neckring depths and swingbolt combinations available.

Fitting Details

Example shown : 14I/3100100A



Specification

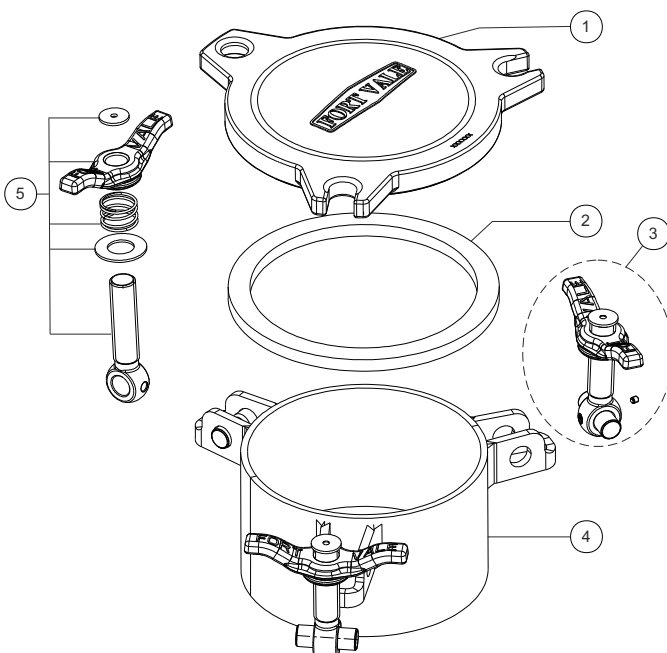
Weight	8.9 Kgs *See note
Design Pressure (MAWP)	4 Bar (58 PSI)
Test Pressure	6 Bar (87 PSI)
Design Temperature	-20°C to +150°C (-4°F to +302°F)

NB Weight will vary according to specification

Range

Part No	Neckring Height
14I/3100075X	75mm (2.95")
14I/3100100X	100mm (3.94")
14I/3100125X	125mm (4.92")
14I/3100150X	150mm (5.91")
14I/3100200X	200mm (7.87")
14I/3100305X	305mm (12.00")

Parts drawing



Item	Description	Part No.
1	Cover	672/0120
2	Seal (sold separately)	See separate sheet
3	Swingbolt assembly (2)	496/X342
4	Neckring *See note	661/36100
5	Spring loaded swingbolt, comprising	
	Top washer	5113-080
	Swingbolt	540/0342
	Spring	5104-506
	Washer	5123-005
	Swingbolt pin	10913SS
	Handnut **See note	490/XXXX

***NB:** part number may vary according to specification

****Note**

X in swingbolt part number denotes handnut material
5 = stainless steel
1 = naval brass
E = low profile stainless steel/brass composite

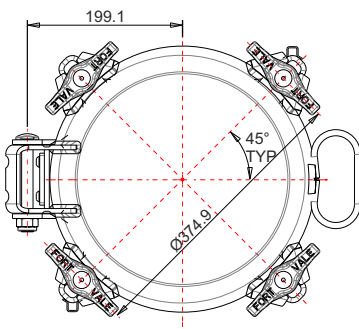
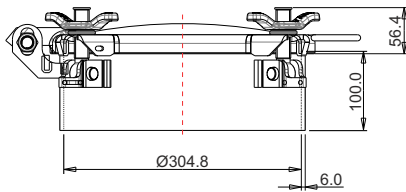


300mm Inspection Hatch - 4 point fastening. Double skin cover. 6mm thick x 100mm deep neckring. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with naval brass handnuts. Seal supplied separately.

Options - 100mm, 150mm and 200mm deep neckrings. Stainless steel swingbolts with stainless steel handnuts. Profiled and compensated versions available.

Fitting Details

Example shown : 34C/4100100B



Specification

Weight	16 Kg	*See note
Design Pressure (MAWP)	4 Bar (58 PSI)	
Test Pressure	6 Bar (87 PSI)	
Design Temperature Range	-40°C to 200°C	(-40°F to 392°F)

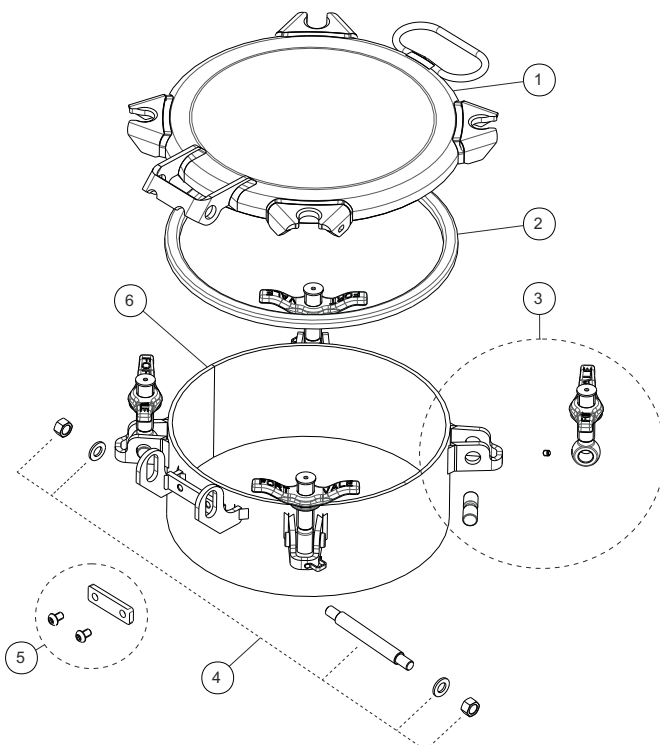
***NB** Above data will vary according to specification

Manlid cover 703/0600P approved to BS EN14025

Range

Part No.	Neckring description
34C/4100100B	6mm thick x 100mm deep
34C/4100150B	6mm thick x 150mm deep
34C/4100200B	6mm thick x 200mm deep

Parts drawing



Item	Description	Part No.
1	Cover *See note	703/0600P
2	Seal	See DS/MAN028
3	Swingbolt assembly (4)	496/X342
4	Hinge pin assembly	600/1060
5	Hinge kit *See note	135B
6	Neckring *See note	663/46XXX

***NB** Part numbers will vary according to specification

X in swingbolt assembly part number denotes handnut material:

1 = naval brass

5 = stainless steel

E = low profile stainless steel/brass composite

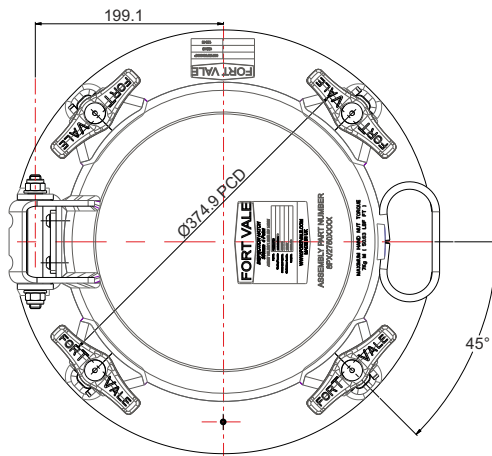
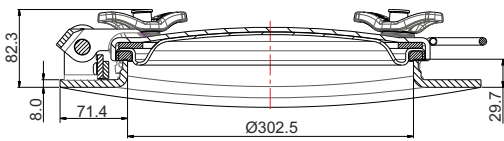


300mm Ultra Low Profile Inspection Hatch Assembly - 4 point fastening double skin cover. 8mm thick pressed neck/compensating ring profiled to suit tank radius range from 850 to 1220mm. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with naval brass handnuts. Seal supplied separately.

Options - Stainless steel swingbolts with either stainless steel handnuts or low profile stainless steel/brass composite handnuts.

Fitting Details

Example shown : 8PB/2750XXXP



Specification

Weight	19.8 Kg *See Note
Design Pressure (MAWP)	4 Bar (58 PSI)
Test Pressure	6 Bar (87 PSI)
Design Temperature	-40°C to 200°C (-40°F to 392°F)

*NB Above data varies according to specification

Manlid cover 703/0600P approved to BS EN14025

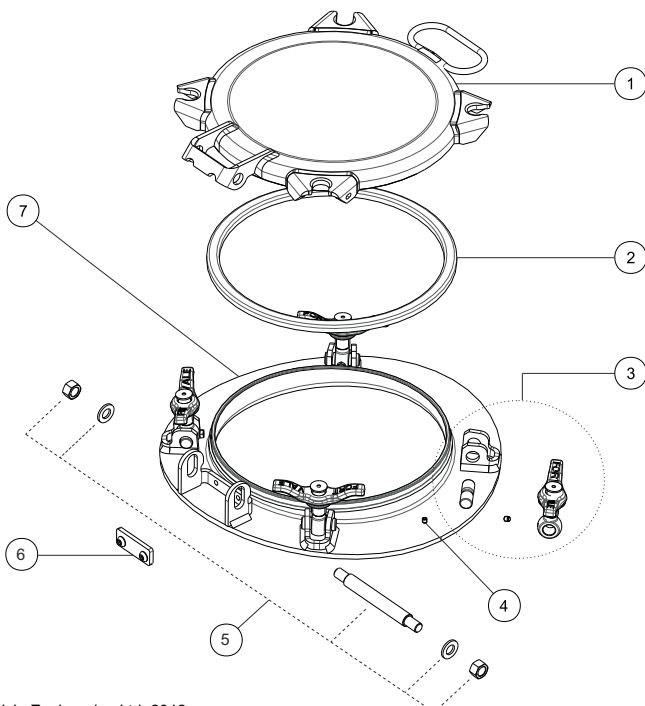
Range

Part No.	Description
8PB/2750XXXP	Fitted with naval brass handnuts
8PB/2750XXXS	Fitted with stainless steel handnuts

XXX in part number above denotes the radius range:-

- 087 = 850 mm to 900 mm
- 092 = 900 mm to 950 mm
- 097 = 950 mm to 1005 mm
- 104 = 1005 mm to 1075 mm
- 111 = 1075 mm to 1145 mm
- 118 = 1145 mm to 1220 mm

Parts drawing



Item	Description	Part No.
1	Cover	703/0600P
2	Seal	See DS/MAN028
3	Swingbolt assembly (4)	496/X260
4	Grubscrew	5111-009
5	Hinge pin assembly	600/1060
6	Hinge kit – 135° fixed	135B
7	Neck/compensating ring *See note	63P/2750XXXP

*NB Part number varies according to specification

X in swingbolt part number denotes handnut material :
1 = naval brass
5 = stainless steel
E = low profile stainless steel/brass composite

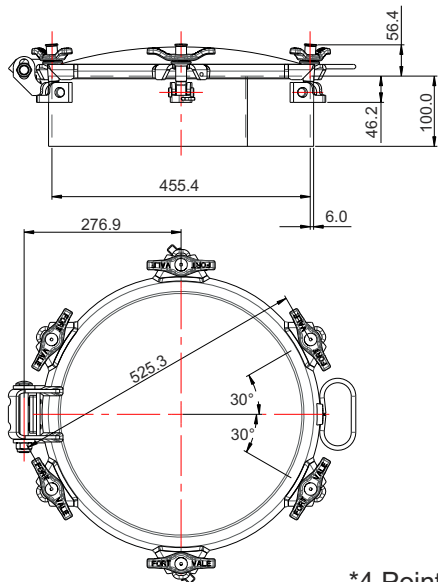


460mm Manlid Assembly - 6 point fastening. 6mm thick x 100mm deep neckring. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with naval brass handnuts. Seal supplied separately.

Options - 0.7 Bar, 2 Bar, 3 Bar and 4 Bar version. 4 point, 6 point and 8 point assemblies. 100mm, 150mm and 200mm deep neckrings. Stainless steel swingbolts with stainless steel handnuts. Profiled and compensated versions. 304 Stainless steel and Carbon steel (SA516 G60) neckrings available.

Fitting Details **Specification**

Example shown : 43C/6100100B



*4 Point = 45°

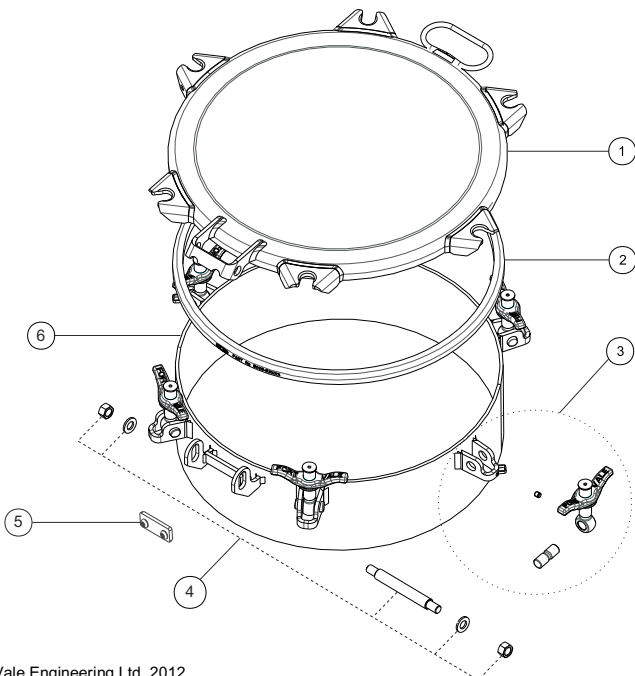
Weight	30 Kg *NB
Design Pressure (MAWP)	3 Bar (43.5 PSI)
Test Pressure	4.5 Bar (65.2 PSI)
Design Temperature Range	-20°C to 100°C (-4°F to 212°F)

* NB Weight will vary according to specification

Range

Part No.	Points	MAWP	Neckring	Material
4AC/4100100B	4	0.7 Bar	6mm x 100mm	St Steel
4AC/4100100BM	4	0.7 Bar	6mm x 100mm	Carbon Steel
4BC/4100100B	4	2 Bar	6mm x 100mm	St Steel
4BC/4100100BM	4	2 Bar	6mm x 100mm	Carbon Steel
43C/6100100B	6	3 Bar	6mm x 100mm	St Steel
43C/6100100BM	6	3 Bar	6mm x 100mm	Carbon Steel
44C/6100100B	6	4 Bar	6mm x 100mm	St Steel
44C/8100100B	8	4 Bar	6mm x 100mm	St Steel

Parts drawing



Item	Description	Part No.
1	Cover *See note	710/0000P
2	Seal	See separate sheet
3	Swingbolt assembly (6)	496/X342 **See note
4	Hinge pin assembly	600/1060
5	Hinge kit * See note	135B
6	Neckring	664/66100A

*Note : Part numbers will vary according to specification

**Note :
X in swingbolt assembly part number denotes handnut material:
1 = naval brass
5 = stainless steel
E = low profile stainless steel/brass



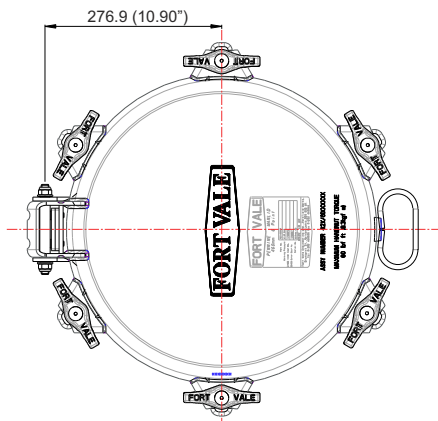
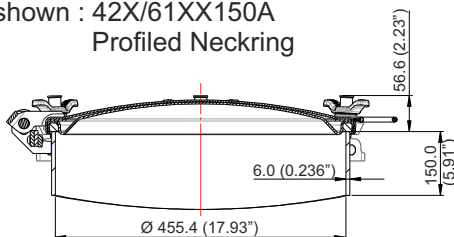
42C/6100150A illustrated

460mm Pennine Manlid Assembly - 6 point double skin cover, designed to open to 135°. 6mm thick x 150mm deep neck profiled to suit tank radius. Contact parts manufactured in 316 stainless steel with stainless steel swingbolts and handnuts. Seal supplied separately.

Options - 100mm, 150mm, 200mm & 250mm deep neckrings. Neckring profiling to suit a tank radius range from 850mm to 1220mm. Straight necks available. 120° opening. May be supplied fitted with a safebolt. Alternative handnut and hinge kit options available.

Fitting Details

Example shown : 42X/61XX150A
Profiled Neckring



Specification

Weight	24 Kg *See note
Design Pressure (MAWP)	2.67 Bar (38.7 PSI)
Service Test Pressure	6 Bar (58 PSI)
Design Temperature Range	-20°C to 200°C (-4°F to 392°F)
Maximum handnut torque	60 LBF FT

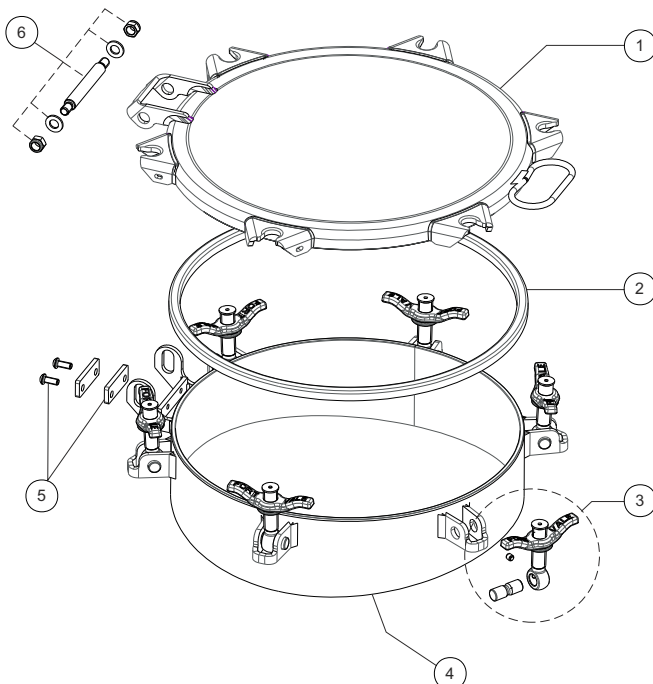
*NB Weight varies according to specification

Range

Part No.	Description
42X/6100XXXX	Assembly with straight neckring
42X/61XXXXXX	Assembly with profiled neckring

Part No.	Tank Radius Range
42X/6X87XXXXA	850 to 900mm
42X/6X92XXXXA	900 to 950mm
42X/6X97XXXXA	950 to 1005mm
42X/6X04XXXXA	1005 to 1075mm
42X/6X11XXXXA	1075 to 1145mm
42X/6X18XXXXA	1145 to 1220mm

Parts drawing



Item	Description	Part No.
1	Manlid	722/0000P
2	Manlid seal (sold separately)	11536XXX
3	Swingbolt assembly (6) *see Note A	496/X342
4	Neckring *see Note B	664/6XXXAXXX
5	Hinge kit *see Note B	135B
6	Hinge pin assembly	600/1060

Note A

X in swingbolt assembly part number denotes handnut material:

1 = naval brass

5 = stainless steel

E = low profile stainless steel/brass composite

Note B

Part number varies according to specification.

Please refer to **Manlid Part Number Breakdown** datasheet (reference **MAN020**) for full details.

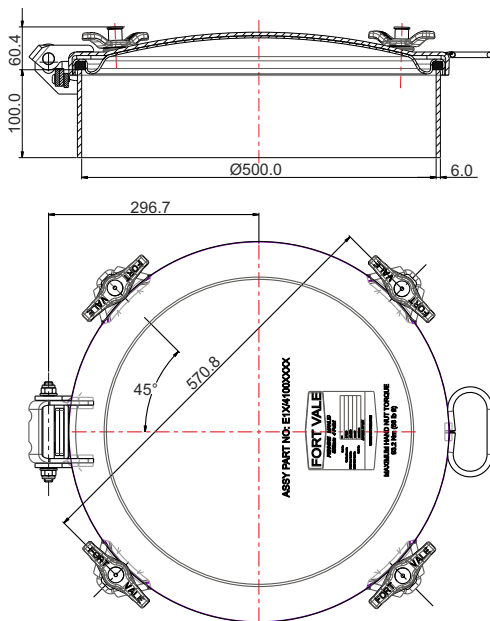


500mm Low Pressure Pendle Manlid Assembly - 4 point fastening cover. 6mm x 100mm straight neckring. Contact parts manufactured in 316 stainless steel with stainless steel swingbolts and handnuts. Seal supplied separately.

Options - 100mm, 150mm, 200mm & 250mm deep neckrings. Neckring profiling to suit a tank radius from 850mm to 1220mm. 135° and 120° opening. Stainless steel swingbolt with naval brass handnut available.

Fitting Details

Example shown : E1X/4100XXXX



Specification

Weight	15.3 Kg *See note
Design Pressure (MAWP)	1 Bar (14.5 PSI)
Test Pressure	1.5 Bar (21.8 PSI)
Design Temperature Range	-40°C to 200°C (-40°F to 392°F)

*NB Weight varies according to specification.

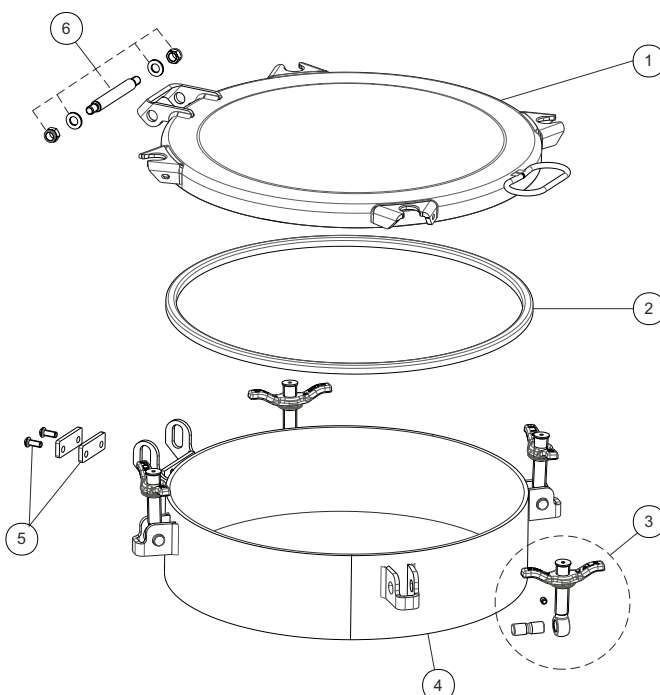
Approved to BS EN14025

Recommended handnut torque : 68Nm (50 Lb/ft)

Range

Part No.	Description
E1X/4100XXXX	316 st.st. with straight neckring
E1X/41XXXXXX	316 st.st. with profiled neckring
E1X/4100XXXXA	Assy with 304 st.st. straight neck
E1X/4100XXXXM	Assy with mild steel straight neck

Parts drawing



Item	Description	Part No.
1	Manlid cover	71E/0500
2	Manlid seal (sold separately)	5005-50XXX
3	Swingbolt assembly (4) *see Note A	496/X379
4	Neckring *see Note B	66E/46XXXXA
5	Hinge kit *see Note B	135B
6	Hinge pin assembly	600/1060

Note A

X in swingbolt assembly part number denotes handnut material :

1 = naval brass

5 = stainless steel

E = low profile stainless steel/brass composite

Note B

Part number varies according to specification.

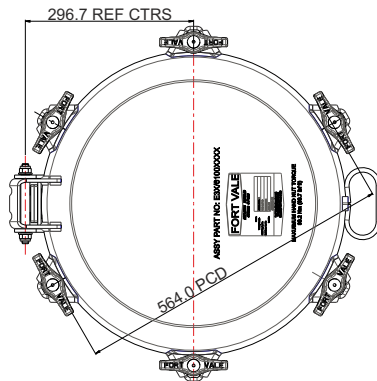
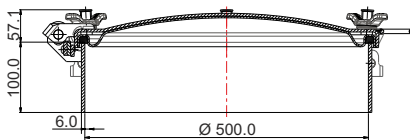


500mm Pendle Manlid Assembly - 6 point fastening. 6mm thick x 100mm deep neckring. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with naval brass handnuts. Seal supplied separately.

Options - 3 Bar, 6 point fastening and 4 Bar, 8 point fastening assemblies. 60mm, 100mm, 150mm, 200mm, 250mm and 350mm deep neckrings. Profiled and compensated versions. 304 Stainless steel and Carbon steel (SA516 G60) neckrings available. Stainless steel swingbolts with stainless steel handnuts.

Fitting Details

Example shown : E3C/6100100B



Specification

Weight	30.4 Kg *NB
Design Pressure (MAWP)	3 Bar (43.5 PSI) *NB
Test Pressure	4.5 Bar (65.3 PSI) *NB
Design Temperature Range	-40°C to 200°C (-40°F to 392°F)

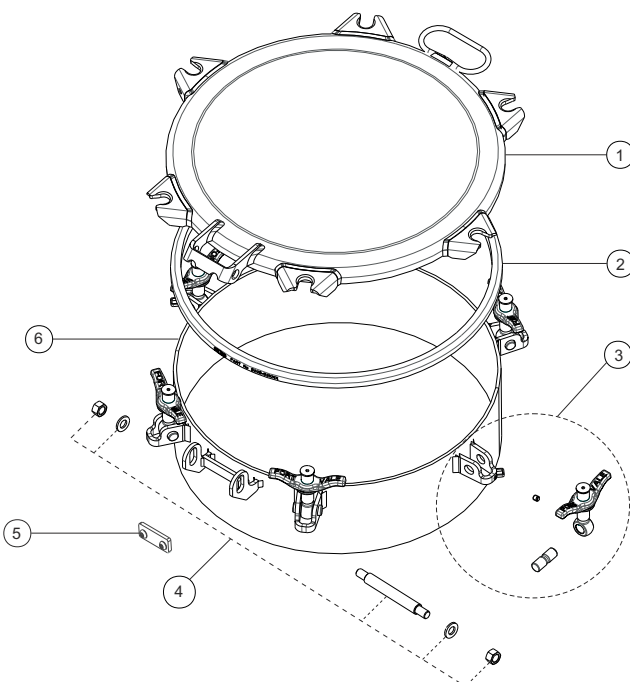
* NB Data will vary according to specification

Approved to BS EN14025

Range

Part No.	Points	MAWP	Neckring	Material
E3C/6100100B	6	3 Bar	6 x 100 mm	St Steel
E4C/8100100B	8	4 Bar	8 x 100 mm	St Steel

Parts drawing



Item	Description	Part No.
1	Manlid cover	73E/0500
2	16 x 10mm seal	See separate sheet
3	Swingbolt assembly (6)	496/X379 **See note
4	Hinge pin assembly	600/1060
5	Hinge kit *See note	135B
6	Neckring *See note	66E/66100A

*Note Part numbers will vary according to specification

****Note**

X in swingbolt part number denotes handnut material
 5 = stainless steel
 1 = naval brass
 E = low profile stainless steel/brass composite
 0 = stainless steel hex nut

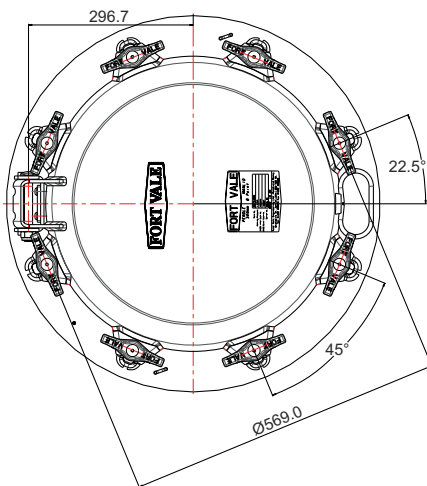
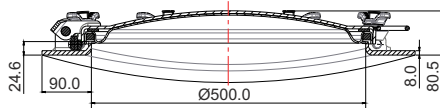


500mm Ultra Low Profile Manlid Assembly - 8 point fastening. 8mm thick pressed neck/compensating ring profiled to suit tank radius. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with naval brass handnuts. Seal supplied separately.

Options - 3 Bar 6 point version and 4 Bar 8 point version. Tank radius range from 850mm to 1300mm. Stainless steel swingbolts with either stainless steel handnuts or low profile stainless steel/brass composite handnuts. Cover hinge stop plate may be fitted to adjust opening angle.

Fitting Details

Example shown : E4C/85XX025B



Specification

Weight	40 Kg
Design Pressure (MAWP)	4 Bar (58 PSI)
Test Pressure	6 Bar (87 PSI)
Design Temperature	-40°C to 200°C -40°F to 392°F

NB Above data varies according to specification

Manlid covers 74E/0500 (4 Bar) & 73E/0500 (3 Bar) are approved to BS EN14025.

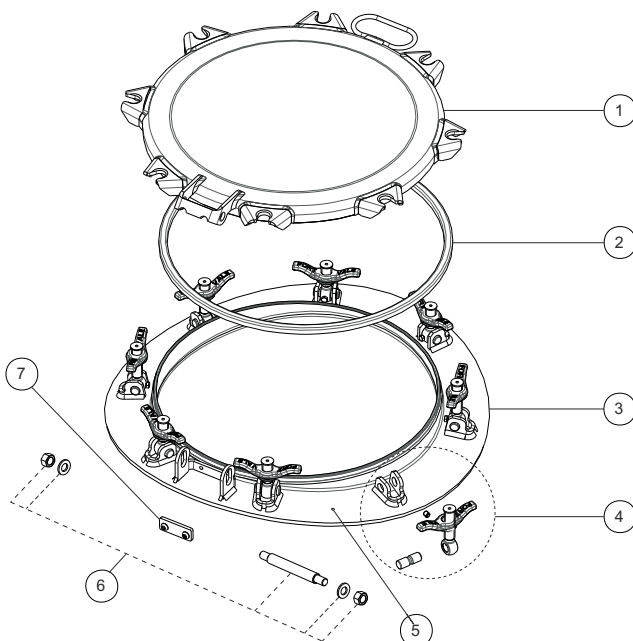
Range

Part Number	Points	MAWP
E4C/85XX025B	8	4 Bar
E3C/65XX025B	6	3 Bar

XX in part number above denotes the radius range:-

- 87 = 850 mm to 900 mm
- 92 = 900 mm to 950 mm
- 97 = 950 mm to 1005 mm
- 04 = 1005 mm to 1075 mm
- 11 = 1075 mm to 1145 mm
- 18 = 1145 mm to 1220 mm
- 20 = 1220 mm to 1300 mm

Parts drawing



Item	Description	Part No.
1	Cover	74E/0500
2	Seal (sold separately)	See DS/MAN028
3	Neck/compensating ring	6EP/7403XXXXP
4	Long swingbolt assembly (4)	496/XXXX see Note
	Short swingbolt assembly (4)	496/X240 see Note
5	Grubscrew	5111-009
6	Hinge pin assembly	600/1060
7	Hinge kit – 135° fixed	135B

Note
496/X in swingbolt part number denotes handnut material

- 1 = naval brass
- 5 = stainless steel
- E = low profile stainless steel/brass composite

496/XXXX - long swingbolt length depends upon tank radius.

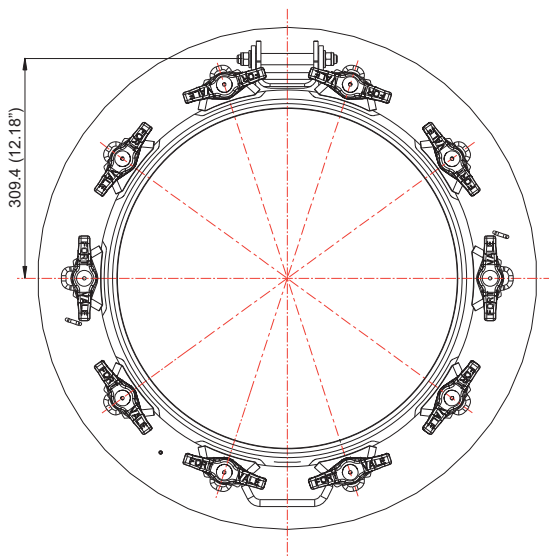
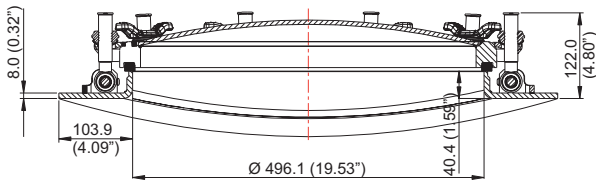


500mm Offshore Manlid Assembly - 10 point fastening. 8mm thick x 90mm deep transverse opening compensating ring. Profiled to suit tank radius range of 1145 to 1220mm. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with naval brass handnuts. Seal supplied separately.

Options - tank radius range from 850mm to 1220mm. Stainless steel swingbolts with stainless steel handnuts. 6 Bar and 7.7 Bar design pressures optional.

Fitting Details

Example shown: 86A/9446118P



Specification

Weight	48 Kg *see note
Design Pressure (MAWP)	6.9 Bar (100 PSI)
Test Pressure	8.97 Bar (130 PSI)
Design Temperature	130°C (266°F)

*NB above data varies according to specification.

Range

Part No.	Neckring	Swingbolts
86A/9446XXXXP	8mm x 90mm	St. Steel swingbolts / naval brass handnuts
86A/9446XXXS	8mm x 90mm	St. Steel swingbolts / St. Steel handnuts

The last letter indicates **handnut material**
P = naval brass **S** = stainless steel

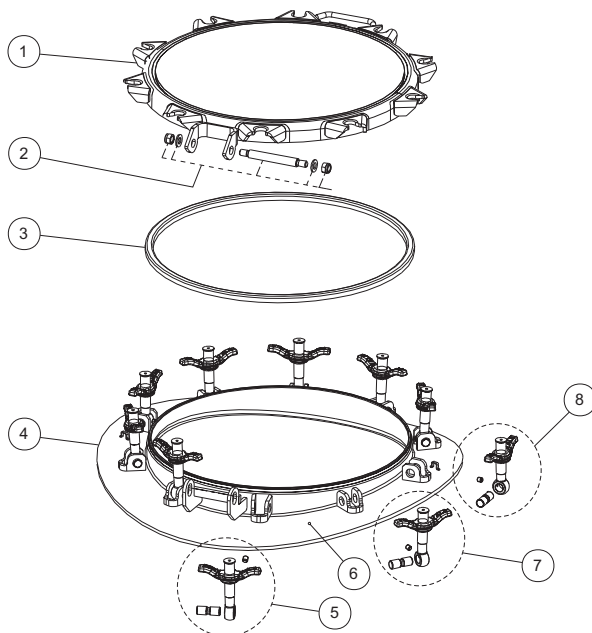
XXX in part number above denotes the radius range:-

097 = 950mm - 1005mm	111 = 1075mm - 1145mm
104 = 1005mm - 1075mm	118 = 1145mm - 1220mm

Associated Parts

Part No.	Associated Parts
5005-50XXX	16mm x 10mm manlid seal

Parts drawing



Item	Description	Part No.
1	Manlid cover	605/4000
2	Hinge pin assembly	600/1060
3	Seal – sold separately	5005-50XXX
4	500mm transverse neckring	679/9445XXXXP
5	Swingbolt assy - 4.25" long (4)	496/X425 *NB
6	Grubscrew	5111-009
7	Swingbolt assy – 4.0" long (4)	496/X400 *NB
8	Swingbolt assy – 3.75" long (2)	496/X375 *NB

*NB : **X** in swingbolt assembly denotes handnut material

- 1** = naval brass
- 5** = stainless steel
- E** = low profile stainless steel/brass composite



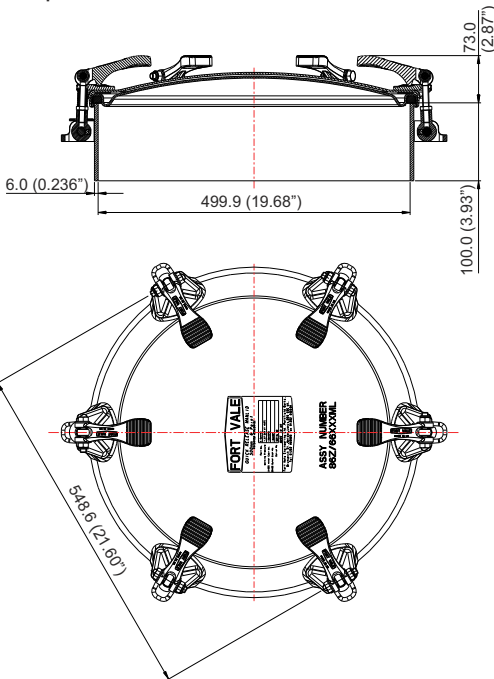
500mm Quick Release Latch Manlid Assembly - pressed 6 point fastening cover. 6mm thick x 100mm deep neckring manufactured in SA516 G60 Carbon Steel. Manlid contact parts manufactured in 316L stainless steel. Quick release swingbolts manufactured in 304L stainless steel. Seal supplied separately.

Note : Manlid swivels about the axis of one bolt. No hinge.

Options - 100mm, 125mm and 150mm neckrings. Stainless Steel neckrings available. Version with conventional hinge and handle. Available etched with customer logo upon request.

Fitting Details

Example shown : 86Z/66100ML



Specification

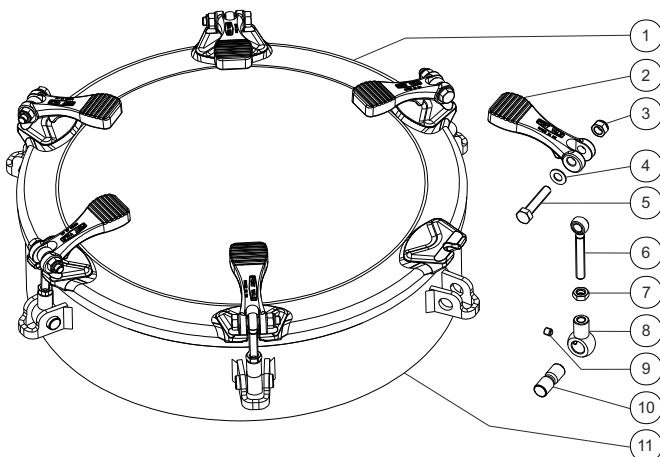
Weight	31.3 Kg *See note
Design Pressure (MAWP)	36.3 PSI (2.50 Bar)
Test Pressure	47.1 PSI (3.25 Bar)
Design Temperature	-20°C to 150°C (-4°F to 302°F)

*NB : varies according to specification.

Range

Part No.	Neckring
86Z/66100ML	100mm deep x 6mm thick. No hinge.
86Z/66100MH	100mm deep x 6mm thick. Hinged.
86Z/66125ML	125mm deep x 6mm thick. No hinge.
86Z/66125MH	125mm deep x 6mm thick. Hinged.
86Z/66150ML	150mm deep x 6mm thick. No hinge.
86Z/66150MH	150mm deep x 6mm thick. Hinged.

Parts drawing



Item	Description	Part No.
1	Hinge-less Manlid *See note	721/7200NH
2	Quick release handle (6)	490/4000
3	M10 self locking nut (6)	5112-008
4	M10 washer (12)	5113-009
5	M10 hex head bolt (6)	5111-110
6	M12 swingbolt (6)	86Z/0003
7	M12 half nut (6)	5112-017
8	16mm eye female swingbolt (6)	86Z/0002
19	M8 socket grubscrew (6)	5111-002
10	16mm swingbolt pin (6)	10913SS
11	Neckring *See note	665/66XXXML

*NB Part number varies according to specification.

Quick release swingbolt assembly part number **86Z/0001** includes items 2-10.

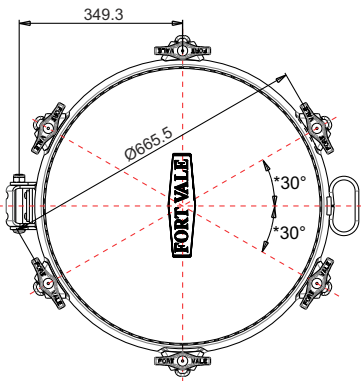
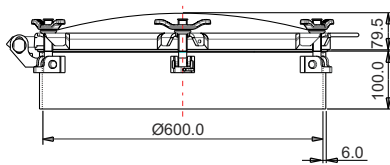


600mm Manlid Assembly - 6 point fastening fabricated cover. 6mm thick x 100mm deep neckring. Contact parts manufactured in 316 stainless steel. Stainless steel swingbolts with naval brass handnuts. Seal supplied separately.

Options - 3 Bar 6 point version and 4 Bar 8 point version. 100mm to 400mm deep neckrings. Stainless steel swingbolts with stainless steel handnuts. Profiled and compensated version. Carbon steel (SA516 G60) neckring available.

Fitting Details

Example shown : 63X/6100100B



* 8 point = 22½°

Specification

Weight	37.8 Kg *See note
Design Pressure (MAWP)	3 Bar (43.5 PSI)
Test Pressure	4.5 Bar (65.25 PSI)
Design Temperature Range	-29°C to 200°C (-20.2°F to 392°F)

* NB Weight will vary according to specification

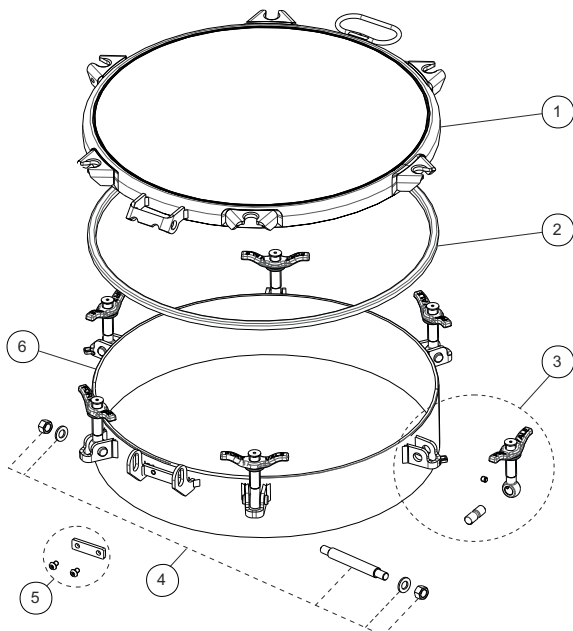
Range

Part No.	Points	MAWP	Neckring	Material
63X/6100100B	6	3 Bar	6 x 100mm	St Steel
63X/6100100BM	6	3 Bar	6 x 100mm	Carbon Steel neck
64X/8100100B	8	4 Bar	6 x 100mm	St Steel

00 in part number above denotes straight neckring.

X in part number above denotes the hinge kit.

Parts drawing



Item	Description	Part No.
1	Cover *See NB	606/2500P
2	Seal	See separate sheet
3	Swingbolt assembly (6)	496/X400 *See Note
4	Hinge pin assembly	600/1060
5	Hinge kit *See NB	135A
6	Neckring *See NB	666/66XXXA

* NB Part numbers will vary according to specification

Note

X in swingbolt part number denotes handnut material

1 = naval brass

5 = stainless steel

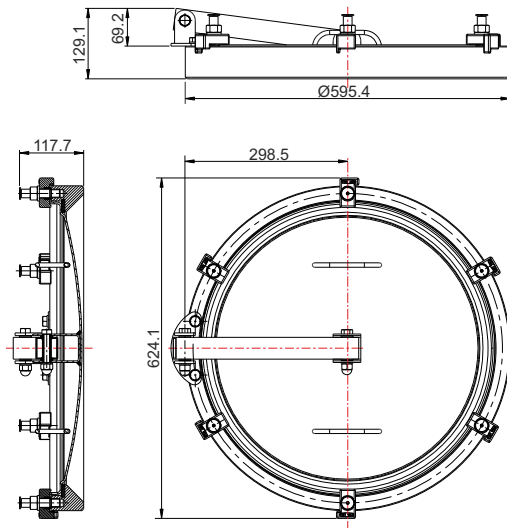
E = low profile stainless steel/brass composite



500mm Side Entry Manlid Assembly - suitable for Milk Tankers. Cover with cross arm and 6 point fastening with clamp system. 60mm deep neckring. Contact parts manufactured in 304 stainless steel. Fitted with a sweet white rubber seal. (FDA compliant)

Fitting Details

Part Number : 850/3500

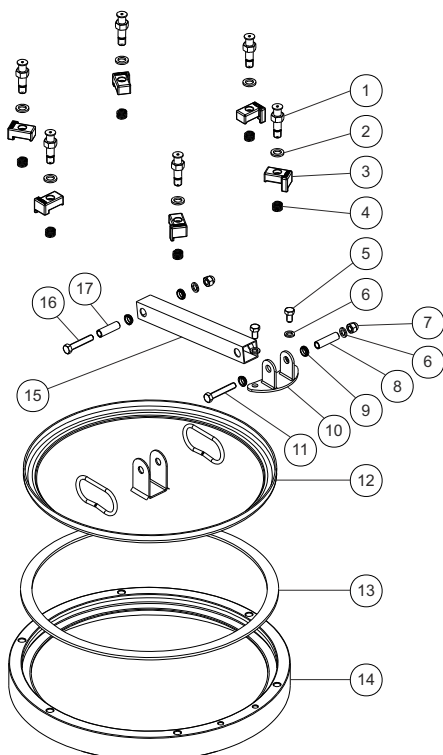


Specification

Weight	36.8 Kg
Design Pressure (MAWP)	0.5 Bar (7.25 PSI)
Test Pressure	0.75 Bar (10.9 PSI)
Design Vacuum	-0.62 Bar (460mmHg)
Test Vacuum	-0.68 Bar (510mmHg)
Design Temperature	-20°C to +85°C (-4°F to +185°F)

Bolt torque 20 Nm

Parts drawing



Item	Description	Part No.
1	Stud assembly (6)	850/3501
2	Spring washer (6)	5113-012
3	Clamp bracket (6)	760/0033
4	Lug spring (6)	5104-785
5	Hex bolt (2)	5111-021
6	Spring washer (4)	5113-010
7	Dome nut (2)	5112-050
8	Spacer tube	677/0034/1
9	Brass bush (4)	677/0035
10	Hinge assembly	677/0039
11	Hex bolt	5111-164
12	Manlid weld assembly	760/0030
13	Sweet white rubber seal	760/0031
14	Neckring	677/0045
15	Hinge arm	760/0032
16	Hex bolt	5111-098
17	Spacer tube	677/0034

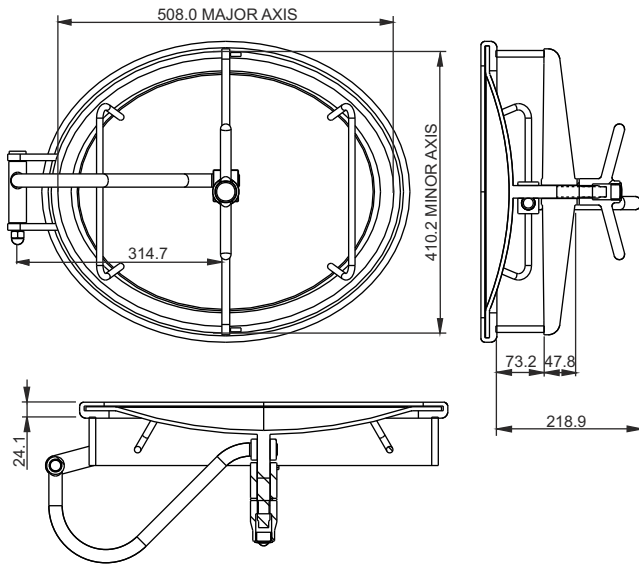


In-Out Oval Manlid Assembly - opens into the tank vessel, the cover may then be rotated to swing out through the manway. The manlid is operated using a double arm handnut and incorporates a cross arm to clamp and seal the cover on closure. Internal tank pressure enhances sealing performance. Contact parts manufactured in 316 stainless steel polished to 180 grit. Fitted with sweet white rubber seal as standard. Left hand operation.

Options - hand polishing and other seal materials available on request. Sampling point may be incorporated. Range of neckring depths possible from 73mm-200mm. Right hand operation. Low profile oval manlid range.

Fitting Details

Example shown : 850/6000XXX



Specification

Weight	25.5 Kg *See note
Design Pressure (MAWP)	3 Bar (43.5 PSI)
Test Pressure	4.5 Bar (65.25 PSI)
Vacuum Conditions	Suitable for 0.21mbar (6"Hg)
Design Temperature	-20°C to 70°C -4°F to 158°F

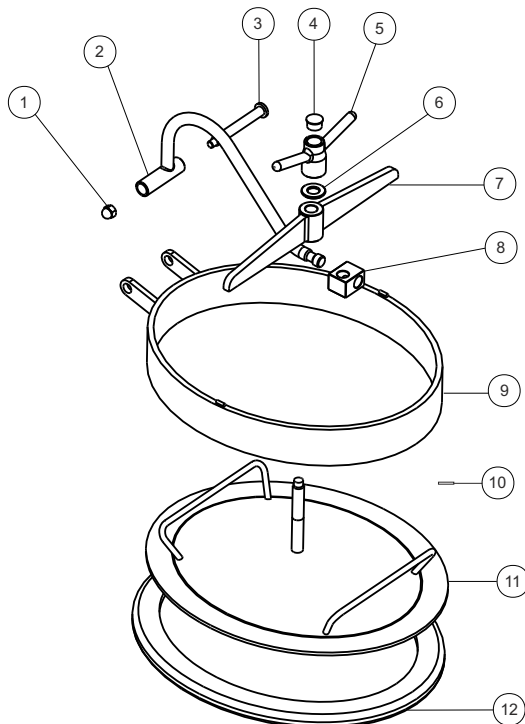
N.B. Weight will vary according to neckring depth.

Range

Part No.	Variations	Neckring Depth
850/6000XXX	Left hand swing	73.2mm (2.88")
850/6000304XXX	304 stainless steel	73.2mm (2.88")
850/6200XXX	Left hand swing	200mm (7.87")
850/6200304XXX	304 stainless steel	200mm (7.87")
850/6530XXX	High vacuum	200mm (7.87")
850/6530304XXX	304 stainless steel	200mm (7.87")

"XXX" indicates variable seal material. Contact parts manufactured in 316 stainless steel unless otherwise stated.

Parts Drawing



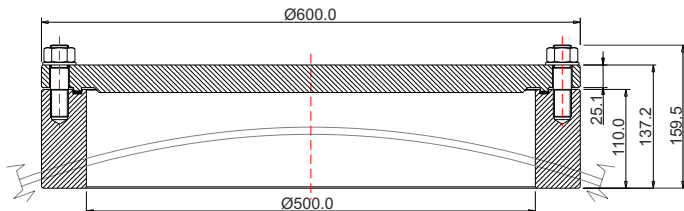
Item	Description	Part No.
1	M12 dome nut	5112-050
2	Pivot beam assembly	650/6020
3	Hinge pin	650/6002
4	Cap	750/6015
5	Handnut	750/6030
6	Thrust bearing	750/6003
7	Cross arm	750/6020
8	Pivot block	750/6001
9	Neckring	650/6010
10	Retaining pin	750/6035
11	Lid assembly	750/6010
12	Sweet white rubber seal	750/60XXX

Below are some typical examples of fabricated manlid assemblies developed for specific vessel or product requirements. Our state-of-the-art manufacturing capabilities teamed with our in-house design expertise allows for great flexibility. Please contact our Sales team to discuss your special requirements more fully.

Parts drawing



US DOT51 500MM FLAT BOLTED MANLID PART NO : S0859/3



20 point fastening cover - \varnothing 22mm equi-spaced on a 560mm PCD. 50mm wide solid neckring flange. Tongue and groove sealing system. Contact parts manufactured in 316 stainless steel. Supplied with all studs, nuts and washers and with PTFE seal.

Designed to ASME VIII Div 1

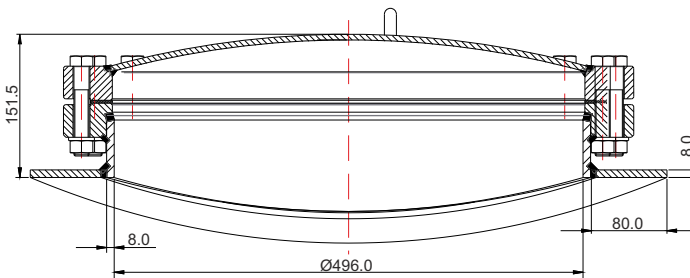
Maximum Working Pressure	6.9 Bar (100 PSI)
Test Pressure	10.5 Bar (152.3 PSI)
Design Temperature	121°C (250°F)

Available with ASME certified materials.

Parts drawing



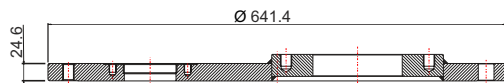
500MM FLAT BOLTED DOMED MANLID ASSEMBLY PART NO : 959/6403CXXXX



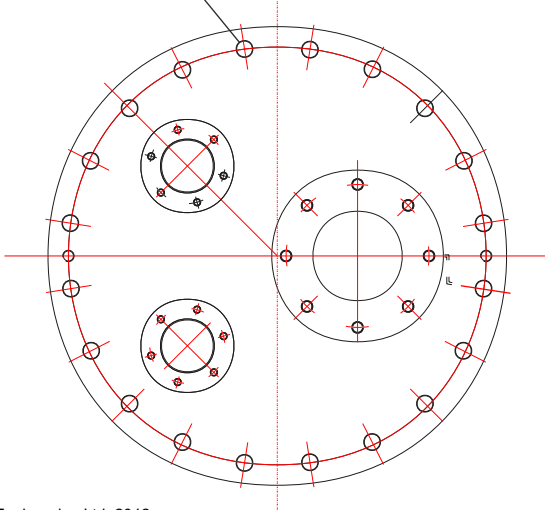
20 point fastening cover - \varnothing 18mm equi-spaced on a 565.0mm PCD. 8mm thick neckring with 8mm x 80mm compensating ring profiled to suit customer tank radius. Contact parts manufactured in 316 stainless steel. Supplied with all M16 bolts, nuts and washers. PTFE seal supplied separately.

Maximum Working Pressure	7 Bar (102 PSI)
Test Pressure	10 Bar (145 PSI)
Design Temperature	-40°C to 150°C (-40°F to 302°F)

Parts drawing



20 HOLES \varnothing 22MM EQUI-SPACED
ON A 584.2MM PCD

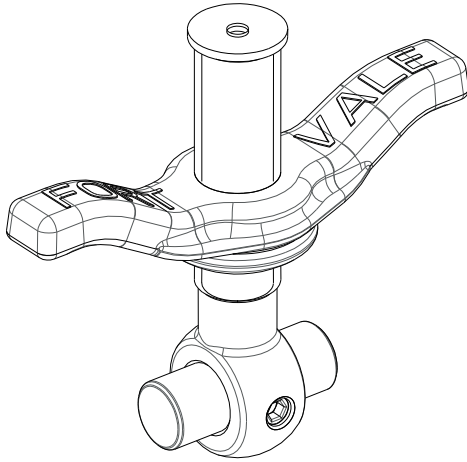


Flat bolted manlid covers may be machined to your requirements to accept the tank service equipment (i.e. relief valves, airline valves and discharge valves) which alleviates the need to fit separate weld-in flanges to the tank shell.

Please discuss your individual requirements with our Sales team.

Standard Swingbolt Assembly Part Number Breakdown

Example : **4 9 6 / XXXX**



Specification

$\frac{3}{4}$ " BSW stainless steel bolt with 16mm diameter eye, swingbolt hinge pin and captivated handnut.

Handnut Type

- 0 = $\frac{3}{4}$ " BSW stainless steel hexagonal nut.
- 1 = $\frac{3}{4}$ " BSW low profile naval brass with stainless steel thrust washer.
- 2 = $\frac{3}{4}$ " BSW naval brass with TIR holes.
- 4 = $\frac{3}{4}$ " BSW naval brass safebolt assembly.
- 5 = $\frac{3}{4}$ " BSW low profile stainless steel.
- 6 = $\frac{3}{4}$ " BSW stainless steel single arm, long handle.
- 7 = $\frac{3}{4}$ " BSW stainless steel single arm, short handle.
- C = $\frac{3}{4}$ " BSW stainless steel extended double arm with brass insert to prevent galling.
- E = low profile stainless steel with brass insert to prevent galling.

Eyebolt Length

Equivalent to working length of bolt, calculated from centre of eye to end of bolt and expressed in inches. See Swingbolt Assembly Components Data sheet (MAN018) for full range of eyebolt lengths. Please refer to Sales department for assembly numbers.

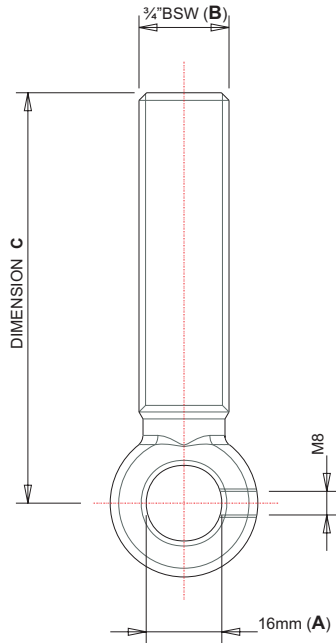
Options

Components may be purchased separately - see Swingbolt Assembly Components Data sheet

Swingbolt assemblies with $\frac{3}{4}$ " eye and $\frac{3}{4}$ " pivot pin may be supplied as a spare part

Other thread sizes available on request

Eyebolt **Specification**



3/4" BSW Eyebolt

16mm eye (dimension **A**) x 3/4" BSW (dimension **B**) x length from centre of eye to end of bolt (dimension **C**). With M8 grubscrew. Manufactured in stainless steel.

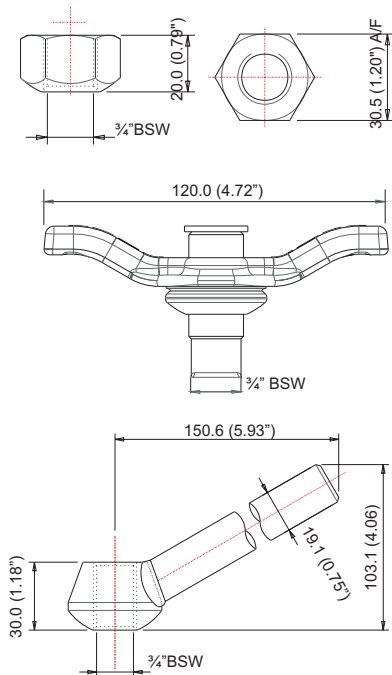
Options - other eye/thread sizes available on request.

N.B. 3/4" eye x 3/4" BSW available as spares

Range

Part No.	Length (mm/")
540/0210	53mm (2.10")
540/0240	61mm (2.40")
540/0250	64mm (2.50")
540/0260	66mm (2.60")
540/0275	70mm (2.75")
540/0290	74mm (2.90")
540/0315	80mm (3.15")
540/0342	87mm (3.42")
540/0375	95mm (3.75")
540/0400	102mm (4.00")
540/0475	121mm (4.75")
540/0690	175mm (6.90")

Handnut **Specification**



3/4" BSW Handnut

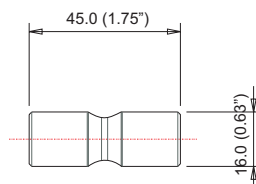
Standard range includes naval brass and stainless steel low profile handnut, stainless steel hexagonal handnut and stainless steel single arm handnut.

Options - safebolt handnuts available - please see separate sheet. Other sizes and materials available on request.

Range

Part No.	Handnut Description	Assy.Code
490/1190	3/4" stainless steel hex nut	0
490/1060	3/4" naval brass low profile	1
490/0310	3/4" stainless steel low profile	5
490/0610	3/4" stainless steel single arm	6
490/0380	Low profile stainless steel/brass composite	E

Hinge Pin **Specification**



16mm diameter x 45mm Hinge Pin - part no. 10913SS
Manufactured in stainless steel.

N.B. 3/4" x 1.75" and 2.00" stainless steel hinge pins available as spares.

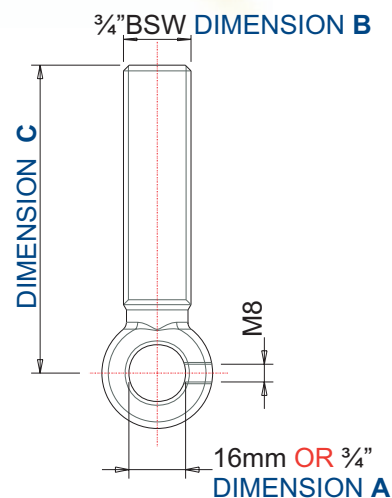
Swingbolt Assemblies



Eyebolt with 16mm or 3/4" eye (Dimension A) x 3/4" BSW (Dimension B) x length from centre of eye to end of bolt (Dimension C). Manufactured in Stainless Steel. Fitted with M8 grubscrew. Supplied with swingbolt hinge pin and captivated handnut (see below for options)

Standard handnuts :

- low profile stainless steel
- low profile naval brass with stainless steel thrust washer
- stainless steel "Anti-Galling" handnut (brass thread)



16mm eye Swingbolt Assemblies

Part Number : 496/XXXX

Eyebolt Length (mm/") Dimension "C"	Swingbolt Assy. St.St. handnut	Swingbolt Assy. N. Brass handnut	Swingbolt Assy. Anti-Galling handnut
66mm (2.60")	496/5260	496/1260	496/C260
87mm (3.42")	496/5342	496/1342	496/C342
95mm (3.75")	496/5375	496/1375	496/C375

3/4" eye Swingbolt Assemblies

Part Number : 495/XXXX

Eyebolt Length (mm/") Dimension "C"	Swingbolt Assy St. St. handnut	Swingbolt Assy N. Brass handnut
66mm (2.60")	495/1005	495/1081
87mm (3.42")	495/1015	495/1060
95mm (3.75")	495/1059	495/1055

Hinge Pins

Description	Part Number
16mm Ø eyebolt pivot pin	10913SS
3/4" Ø eyebolt pivot pin	10911SS
Manlid/neck hinge pin assembly	600/1060
16mm Ø locking manway hinge pin	600/1060/3





3/4" BSW Safebolt Assembly - an important safety feature suitable for use on all standard manlid assemblies.

Use of a safebolt assembly enables the controlled release of any residual tank pressure by breaking the seal between the lid and neck whilst retaining the manlid cover, thus eliminating any possibility of operator injury.

Simple to operate and may easily be retro-fit.

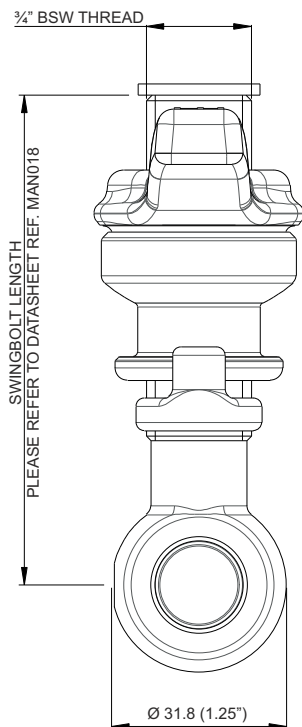
Fitting Details

SAFEBOLT WITH RETAINING COLLAR

PART NO : 496/XXXXXX

(Part number dependant upon eyebolt length & handnut material)

Part number 496/4XXX illustrated below



IMPORTANT NOTE

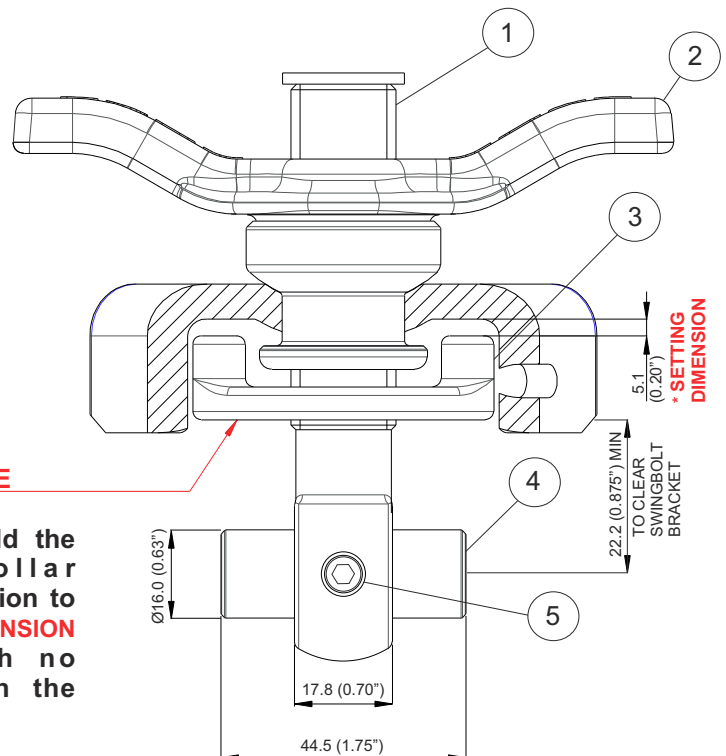
Customer to weld the retaining collar 701/0050 in position to the ***SETTING DIMENSION** indicated with no compression on the manlid seal.

Specification

3/4" BSW eyebolt with 16mm eye, pivot pin, retaining collar and captivated safety handnut. Manufactured in stainless steel. (Fits to existing bracketry)

For full range of swingbolt lengths, please refer to Swingbolt Assembly Components data sheet.

Options - stainless steel low profile handnut (pictured), stainless steel low profile handnut with brass thread insert, extended stainless steel handnut with brass thread insert.



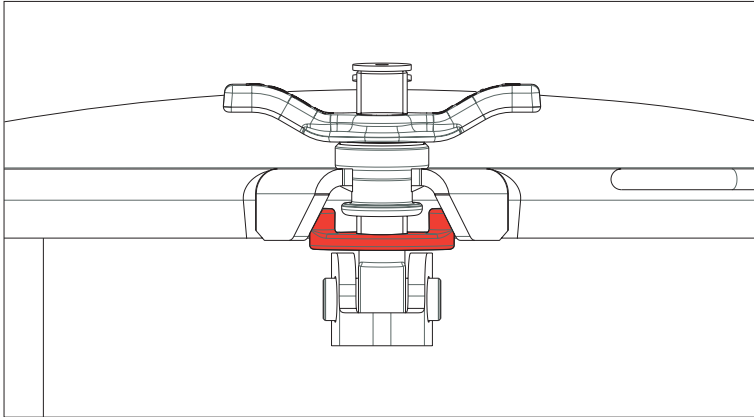
Item	Description	Part No
1	3/4" eyebolt with 16mm eye *See Note	540/0XXX
2	Safebolt handnut *See Note	490/0XXX
3	Retaining collar	701/0050
4	Pivot pin	10913SS
5	M8 grubscrew	5111-002

Note : Part number varies according to specification.

Operating Details

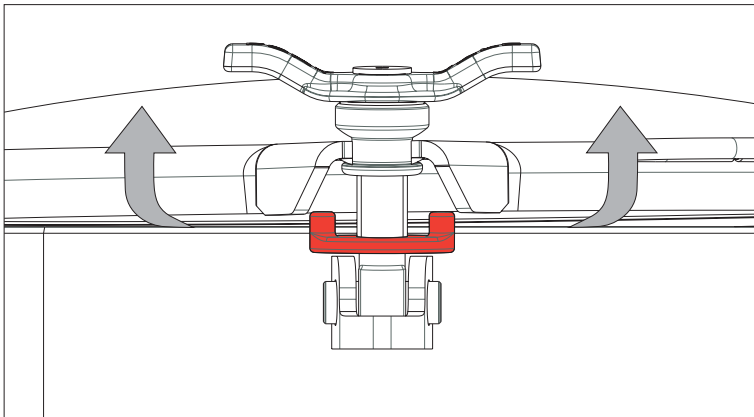
SAFEbolt WITH RETAINING COLLAR

CLOSED POSITION



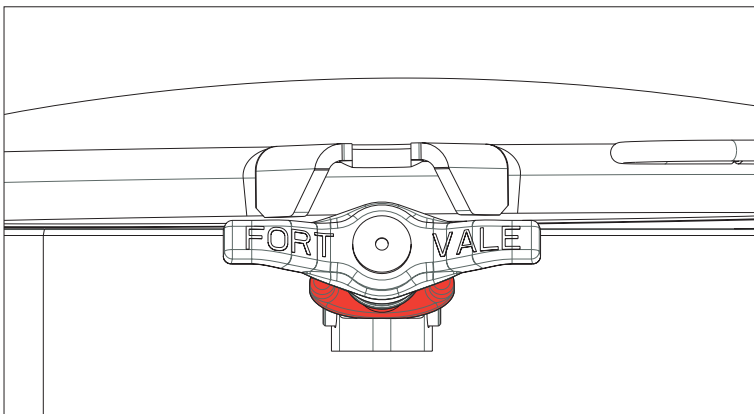
In this position, the safebolt retains the manlid closed, as does a standard swingbolt. In the event of the handnut coming loose, the retaining collar (shown in red) will prevent the swingbolt from tilting, thus keeping the lid loosely in position.

RETAINED POSITION

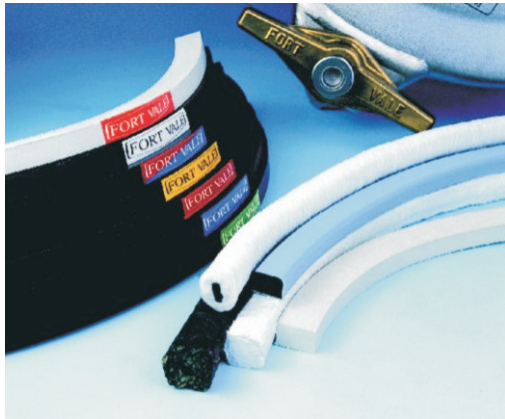


When intentionally unscrewed, the bottom collar on the handnut forces the lid to open, even if the gasket is sticking to the neckring, thus venting the tank automatically and making it safe for the operative to open the lid.

OPEN POSITION



Only when the safebolt has been fully unscrewed will the retaining collar be clear of the manlid lug bracket, allowing the bolt to tilt and the manlid to open fully.



Fort Vale offer an extensive selection of manlid seals to suit all applications and a range of temperatures.

Standard seal section dimensions are approximately 16mm x 10mm. Alternative dimensions are available as well as special seals to suit specific manways.

Seals may be fitted into the manlid cover if requested at the time of order.

A comprehensive range of genuine Fort Vale spare seals is available from all Fort Vale group companies as well as from our worldwide network of authorised distributors and service centres.

Rubber Compounds

Seals moulded from rubber compounds are suitable for many duties. Advantages include :

- Easily cleaned
- Good resilience qualities
- Excellent sealing capabilities
- Economical to replace regularly

Please be aware that many of these compounds are suitable only for specific types of cargo. The temperature range of each type of rubber must be observed. Please refer to the table overleaf for a general guide to product suitability. For more specific advice, please contact our Sales team.

Composite Seals

Composite seals have been developed for general purpose tanks where the products carried can vary and therefore, where a multi-purpose seal is required.

Braided - (NON-GAS TIGHT) PTFE impregnated fibre tightly braided around a silicone core and jointed into a solid ring. Caution should be taken when fitting rigid seals. Fitting this seal is at the discretion of the tank builder. See note on reverse for duty.

*** NB (see over)** *This material is lubricant free but does contain a small percentage of residual wetting agents essential to the PTFE dispersion with which this packing is impregnated. It should be noted that small amounts of these wetting agents may leach during application.*

Super Tanktyt - a virgin PTFE sheath bonded to three sides of a nitrile rubber core offering excellent sealing capabilities and cleanliness together with suitability for a wide variety of cargoes. It remains gas tight at 6 Bar.

Advantages include:

- Easily cleaned
- Excellent resilience qualities
- Excellent sealing capabilities
- Does not become porous
- Suitable for a wide variety of cargoes and a broad temperature range

Overall, the "Super Tanktyt" is the ideal sealing solution for the chemical industry. Its rubber core gives flexibility to ensure a gastight seal and its PTFE envelope gives optimum protection in hazardous cargo applications.

The table below is a guide to the standard range of Fort Vale manlid seals. We also offer a wide variety of different sizes and materials - please contact our sales department if the seal you require is not listed below.

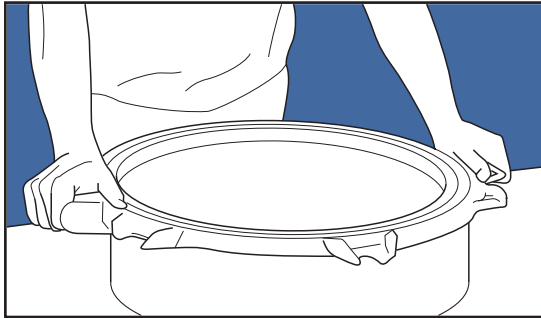
Fort Vale rubber manlid seals have a unique colour-coding system to identify the seal material. The appropriate colour is marked on the outer edge of the seal as indicated in the table below.

	Duty (example only)	Pendle Manlid Seals					Euro-Lid Seals			Colour Code
		170mm (7")	300mm (12")	460mm (18")	500mm (20")	600mm (24")	300mm (12")	460mm (18")	500mm (20")	
Butyl	Non-corrosive cargo -40°C to 120°C (-40°F to -248°F)	5005-17B	5005-30B	11536B	5005-50B	5005-60B	5005-33B	5005-47B	5005-53B	Blue
EPDM	Some corrosive cargoes. Not suitable for petroleum based liquids. -50°C to 150°C (-58°F to 302°F)	5005-17EPD	5005-30EPD	11536EPD	5005-50EPD	5005-60EPD	5005-33EPD	5005-47EPD	5005-53EPD	Red/Blue
Graphite Impregnated Fibre (non-asbestos)	Non-corrosive high temperature products e.g. tar, bitumen etc. -50°C to 250°C (-58°F to 482°F)	5005-17GA	5005-30GA	11536GA	5005-50GA	5005-60GA	5005-33GA	5005-47GA	5005-53GA	
CSM	Moderately corrosive cargoes. -40°C to 85°C (-40°F to 185°F). Not suitable for petroleum based liquids	5005-17CSM	5005-30CSM	11536CSM	5005-50CSM	5005-60CSM	5005-33CSM	5005-47CSM	5005-53CSM	White
Natural White Rubber	Food products -50°C to 80°C (-58°F to 176°F)	5005-17SWR	5005-30SWR	11536SWR	5005-50SWR	5005-60SWR	5005-33SWR	5005-47SWR	5005-53SWR	
Neoprene	Non-corrosive cargo -30°C to 100°C (-22°F to 212°F)	5005-17NR	5005-30NR	11536NR	5005-50NR	5005-60NR	5005-33NR	5005-47NR	5005-53NR	Green
Nitrile	Aliphatic hydrocarbons -25°C to 100°C (-13°F to 212°F)	5005-17N	5005-30N	11536N	5005-50N	5005-60N	5005-33N	5005-47N	5005-53N	Red
PTFE Impregnated Braided Fibre (silicone core)	Most corrosive cargoes – commonly used on general purpose tanks. -30°C to 120°C (-22°F to 248°F) See note on reverse	5005-17P/A	5005-30P/A	11536P/A	5005-50P/A		5005-33P/A	5005-47P/A	5005-53P/A	
Orange silicone	High temperature non-corrosive cargoes -50°C to 200°C (-58°F to 392°F)	5005-17S	5005-30S	11536S	5005-50S	5005-60S	5005-33S	5005-47S	5005-53S	
White silicone	Food products. FDA approved -50°C to 200°C (-58°F to 392°F)	5005-17WS	5005-30WS	11536WS	5005-50WS	5005-60WS	5005-33WS	5005-47WS	5005-53WS	Orange
Super Tanktyt Nitrile Core	Corrosive cargoes – resistance similar to that of PTFE -25°C to 140°C (-13°F to 284°F)		5005-890	5005-870	5005-860	5005-850			5005-871	
Super Tanktyt EPDM Core	Corrosive cargoes – resistance similar to that of PTFE -50°C to 150°C (-58°F to 302°F)	5005-830EP	5005-890EP	5005-870EP	5005-860EP	5005-850EP				
Viton A	Non-corrosive cargo -15°C to 200°C (5°F to 392°F)	5005-17VR	5005-30VR	11536VR	5005-50VR	5005-60VR	5005-33VR	5005-47VR	5005-53VR	Yellow

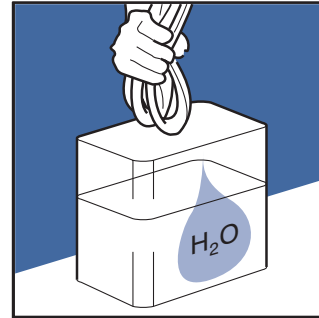
Super Tanktyt is a Fort Vale trade name.

Viton is a trademark of DuPont Dow Elastomers L.L.C.

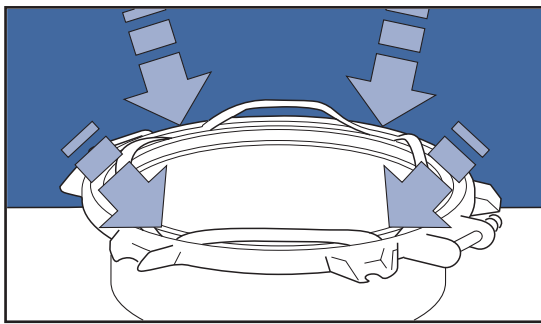
Fitting a Rubber Seal



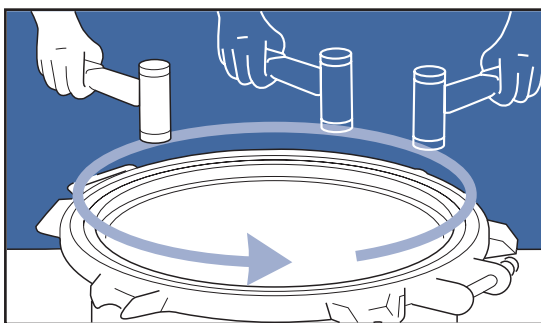
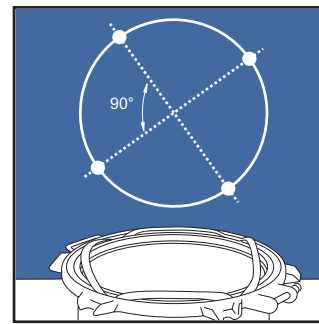
Turn the manlid upside down on its neckring



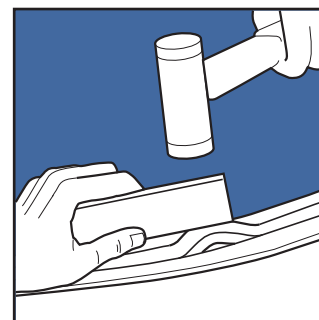
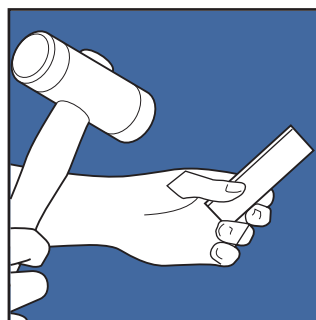
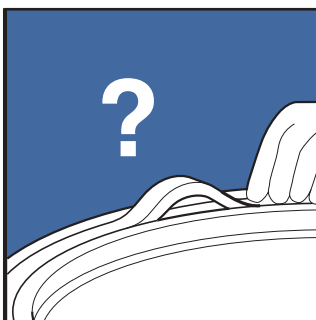
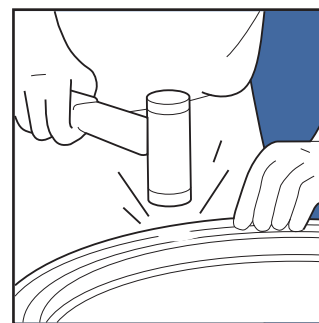
Take the rubber seal and immerse it in cold water



Push the seal into the manlid groove at four points, 90° to each other

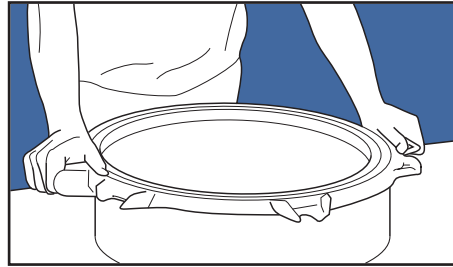


Knock the seal firmly into place with a plastic or wooden mallet, all round the manlid

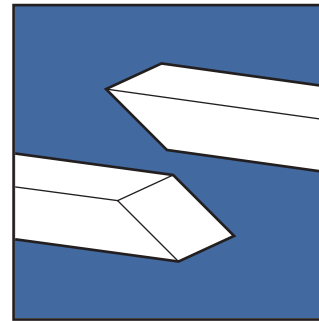
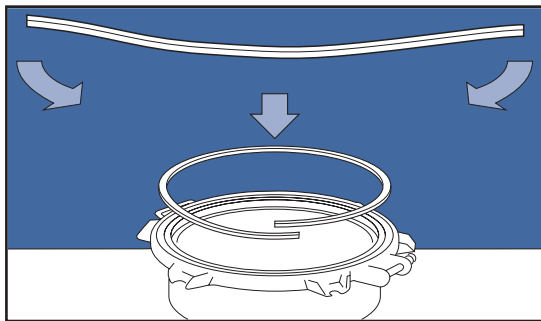


If a kink occurs, use a small piece of clean plastic or spare rubber seal material and the mallet to work the seal back into the groove.

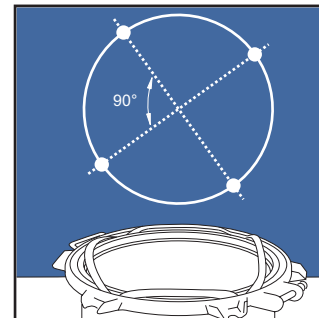
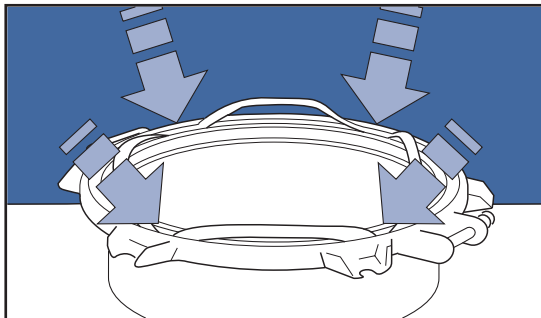
Fitting a Braided Seal



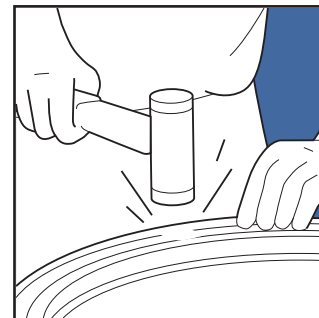
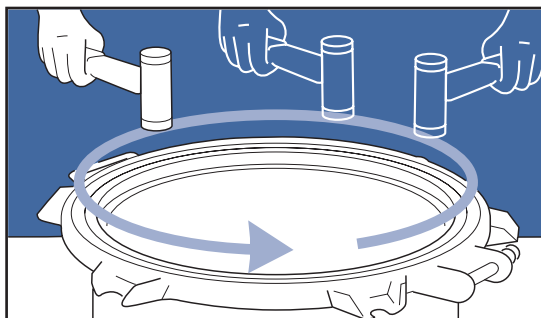
Turn the manlid upside down on its neckring



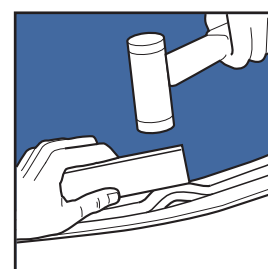
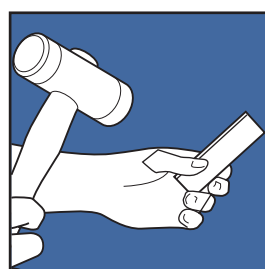
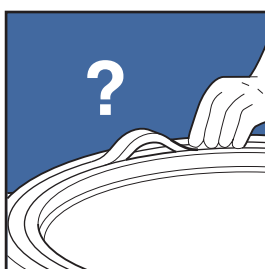
Take the braided seal and place it over the manlid groove to measure the length required.
Cut the seal with a mitre joint.



Push the seal into the manlid groove at four points, 90° to each other



Knock the seal firmly into place with a plastic or wooden mallet, all around the manlid



If a kink occurs, use a small piece of clean plastic or spare seal material and the mallet to work the seal back into the groove

We are able to respond to a variety of specialized demands from all market sectors and the following is a sample of ancillary products which may be incorporated into the Fort Vale manlid range. Please enquire with our Sales department if your specific requirement is not detailed below.

Weld-in Adaptors

A wide range of adaptors may be welded into the cover to accommodate additional fittings, such as a relief valve, sampling valve, fill aperture etc. Fittings available include BSP, NPT, RJT, SMS, DIN 11851 and flanges. Please discuss your individual needs with our Sales team.

Insulation

For the transportation and storage of heated products, insulation may be incorporated into the manlid cover, giving improved heat-retaining properties and increasing the tank's overall efficiency.

Breather Assembly

A stainless steel sintered disc holder with venting cap can be fitted for the purpose of filtering air entering the tank and preventing internal pressure build-up. This is especially suited to the handling of hydrogen peroxide.

Vacuum Vent

A vacuum vent valve is available as a catastrophic vacuum relief provision for road tankers. The valve is especially suited to hygienic situations. Various vacuum settings are available and an optional gauzed cowl may be supplied.

Safety Grille

A range of designs is available depending upon the level of protection required - from preventing debris entering the tank to guarding against operator injury from tank internal mechanisms. Please discuss your individual requirements with our Sales team.

Sight Glass

A customer-supplied sight glass may be expertly welded into the manlid dome for a nominal fee.

Dipstick Holder

Bracketry may be fitted to the neckring at the time of manufacture if specified at the time of order.

Customer Logo

A facsimile of your logo may be included in the lid marking for a nominal charge.

Polishing

Clean, weld-free lines to underside of cover with a high grade electro polish giving a standard surface finish of 10-30 microns Rtm. Hand polished finish to ultra high grade specification available on request.



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