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FORT VALE®



Catalogue

Standard Equipment for Road Tankers



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Manlid & Inspection Hatch Assemblies

Road Tanker Catalogue





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Function

A manlid assembly or inspection hatch assembly is usually installed on the top of the tank. A manlid assembly is used to give access to personnel to let them examine, repair or clean the inside of the tank. An inspection hatch is used for access to take a sample of cargo and can also be used as access for cleaning equipment.

Design Options

The design options below are available on our standard range of hinged circular manlid and inspection hatch assemblies. We can deliver manlids and inspection hatches assembled or disassembled.

Nominal Diameter

Inspection Hatch:
170mm, 300mm

Manlid:
460mm, 500mm, 600mm



Design Pressure: MAWP

From 0 Bar to 4 Bar

Special service conditions:
> 4 Bar

Opening Angle

120°: Fixed or liftover

135°: Fixed or liftover



Fixing Points

3, 4, 6, 8 points

Special service conditions:
Single point, 10 points

Neckring / Compensating Ring

Height: From ultra-low to extended

Profile: Straight (no profile) or profiled compatible with the tank radius

Compensation: With or without compensating ring

Material thickness: 6mm, 8mm or compatible with the MAWP and the tank shell thickness



Swingbolt Assemblies

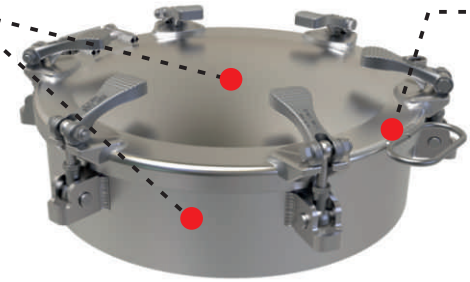
Eyebolt: stainless steel
Handnut: naval brass - low profile; stainless steel - low profile or extended, with/without brass insert

Special service conditions:
Safebolt assembly (at one point)
Hexagonal nuts
Bow nuts
Single arm handnuts
Quick release latches
With locknuts

Material

Contact parts: 316 stainless steel

Special service conditions:
304 stainless steel
High nickel alloys
Carbon steel: Neckring only



Seal

A large range of seal materials is available

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Design Options - continued

Special Options

Where compatible, we can also offer:

Weld-in fittings: E.g. sockets, flanges, breathers, vents, sight glass

Customer logo: Laser etched on cover

Hand polishing: To ultra-high grade

Lining: For corrosive cargo



Related Parts

We recommend our range of compatible accessories:

- Manlid cover seals
- Safebolts
- Fasteners

We have a large range of accessories, please contact us for more information about these parts.

Manlid Assemblies for Dedicated Service

We offer a range of manlid assemblies for these service conditions and special cargoes:

- Elliptical manlid assemblies for brewery & hygienic service
- Flat bolted assemblies for high pressure/dangerous cargo
- U.S. tank trucks
- Rail tank cars
- Hydrogen peroxide service
- Side-entry manlid assemblies for hygienic service

Please contact us for more information about these special assemblies.

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300mm Inspection Hatch Assembly

Part No: 34C/43XX051E



Specification

Nominal size
DN300

Cover
4 point

Neckring/compensating ring
Thickness: 8mm
Height: 51mm from TDC
Tank radius profile range: 850mm to 1220mm

Materials
Contact parts: 316 stainless steel
Fasteners: stainless steel swingbolts with stainless steel handnuts
Seal: supplied separately

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	22.2 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

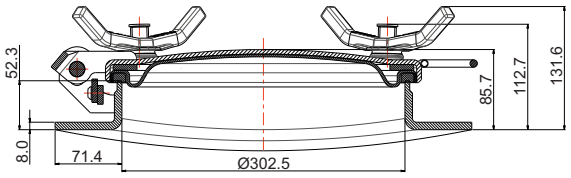
NOTE: The Design Temperature limits refer to metal parts only. The Design Conditions and Section View dimensions are for the specified part number only.

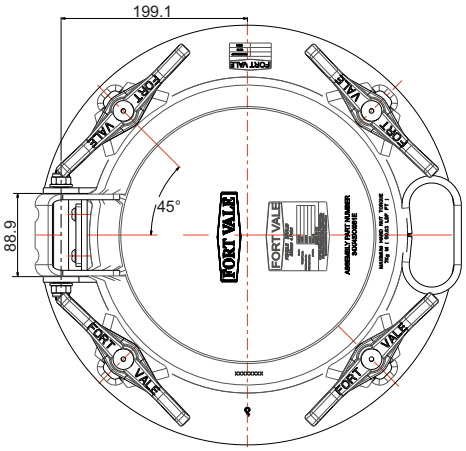
Design Code
BS EN 14025: 730/0600P cover only

Range

Standard Radii	Part No.
1040mm	34C/4304051E

Section View





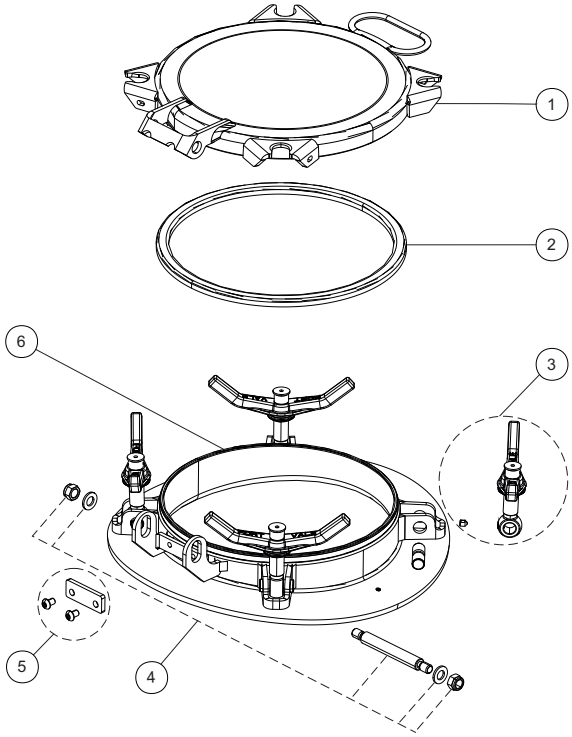
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300mm Inspection Hatch Assembly

Part No: 34C/43XX051E

Parts Drawing



Parts List

Item	Description	Part No.
1	Cover	703/0600P
2	Seal (not included) ***Note**	5005-XXXX
3	Swingbolt assembly (4)	496/8342
4	Hinge pin assembly	600/1060
5	Hinge kit	135B
6	Neck/compensating ring ***Note**	673/2852XXXP

NOTE: The specification changes the Part No.

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500mm Pendle Manlid Assembly - Extended Neck

Part No: E3C/64XXXXXC



Specification

Nominal size
DN500

Cover
6 point

Neckring/compensating ring
Thickness: 8mm/6mm
Height range: 110mm to 200mm high
Tank radius profiling range: 850mm to 1220mm

Materials
Contact parts: 316 stainless steel
Fasteners: stainless steel swingbolts and low profile handnuts and 1x stainless steel safebolt assembly
Seal: supplied separately

Refer to Range for other neckring height options
Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	52.8 Kg ***Note**
Design Pressure (MAWP):	3 Bar
Test Pressure:	4.5 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The assembly specification changes the weight. The Design Temperature limits refer to metal parts only. The Design Conditions and Section View dimensions are for the specified part number only.

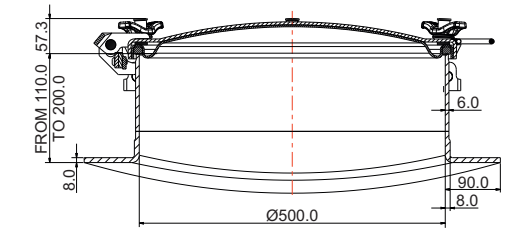
Design Code
BS EN14025

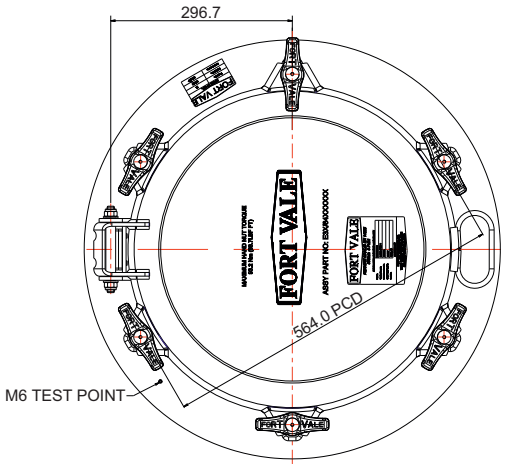
Range

Neckring Height Options	Part No.
Extended: 110mm to 200mm ***Note**	E3C/64XXXXXE
25mm ultra low profile	E3C/65XX025E
51mm standard	E3C/63XX051E

NOTE: The neckring height & radius changes the Part No.

Section View





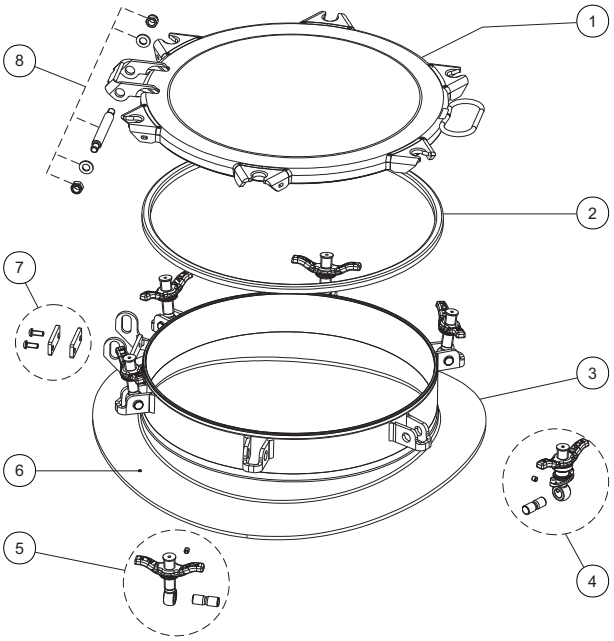
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500mm Pendle Manlid Assembly - Extended Neck

Part No: E3C/64XXXXXC

Parts Drawing



Parts List

Item	Description	Part No.
1	Cover	73E/0500
2	Seal (not included) ***Note**	5005-50XXX
3	Neck/compensating ring ***Note**	68E/SXXXXXXP
4	Safebolt assembly	496/4400
5	Swingbolt assembly (5)	496/5379
6	M6 grub screw	5111-009
7	Hinge kit: 135° fixed	135B
8	Hinge pin assembly	600/1060

NOTE: The specification changes the Part No.

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500mm Manlid Assembly with Flash Vacuum Vent

Part No: E1X/4100001AA



Specification

Nominal size
DN500

Cover
4 point with a flash vacuum vent set at 1"Hg (0.03 Bar)

Neckring
Thickness: 6mm
Height: 150mm

Materials
Manlid cover: 316 stainless steel
Neckring: 304 stainless steel
Fasteners: stainless steel
Seal: supplied separately

Alternatives are available, refer to the Design Options page

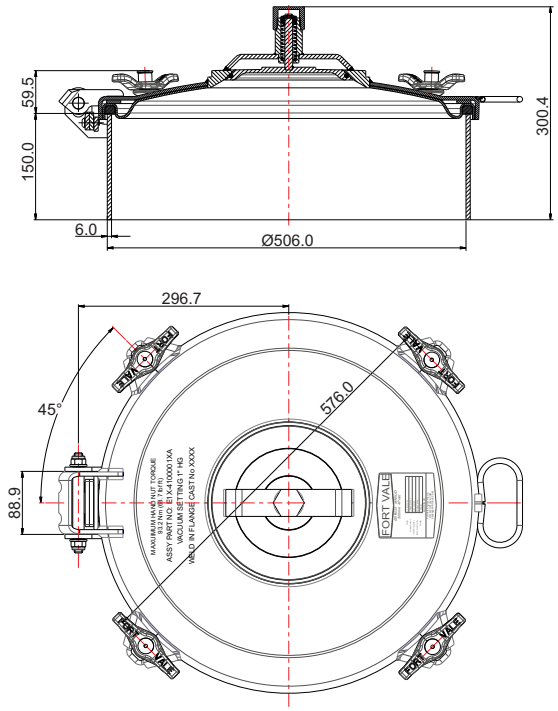
Design Conditions

Weight:	36.0 Kg
Design Pressure (MAWP):	1 Bar
Test Pressure:	1.5 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	200°C

NOTE: The Design Temperature limits refer to metal parts only. The Design Conditions and Section View dimensions are for the specified part number only.

Design Codes
BS EN 14025

Section View



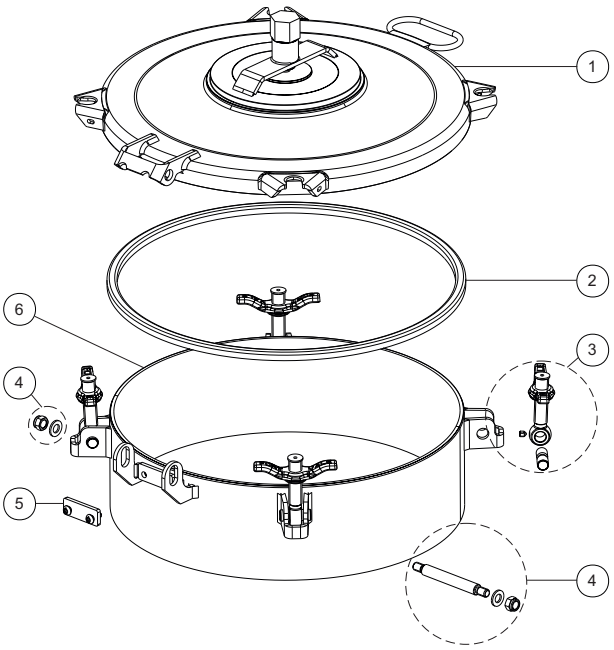
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500mm Manlid Assembly with Flash Vacuum Vent

Part No: E1X/4100001AA

Parts Drawing



Parts List

Item	Description	Part No.
1	Cover with 1"Hg vac vent	71E/0520PV02
2	Seal (not included) ***Note**	5005-50XXX
3	Swingbolt assembly (4)	496/5379
4	Hinge pin assembly	600/1060
5	Hinge kit	135A
6	Neckring	66E/46150A304

NOTE: The specification changes the Part No.

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Elliptical Manlid Assembly - Low Profile Neckring

Part No: 850/7500VXX



Specification

Nominal size
508mm x 406mm

Neckring
Thickness: 10mm
Height: 73.2mm

Properties
Cross-arm with handnut to clamp and seal the assembly; 2x handles to move the cover to the open/closed position

Operation
The cover opens into the vessel and turns to move out of the neckring, clear of the vessel

Materials
Contact parts: 316 stainless steel, cover surface finish 0.8um - 0.5um
Seal: vulcanised - refer to Range

Design Conditions

Weight:	25.3 Kg
Design Pressure (MAWP):	3 Bar
Design Vacuum:	-0.20 Bar ***Conditions**
Design Temperature Min:	-20°C
Design Temperature Max:	70°C

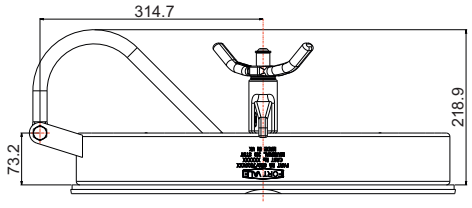
Vacuum Conditions: The assembly is compatible with -0.20 Bar vacuum only if neckring distortion caused by welding is kept to a minimum.

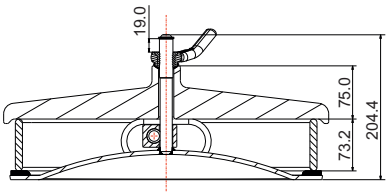
NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

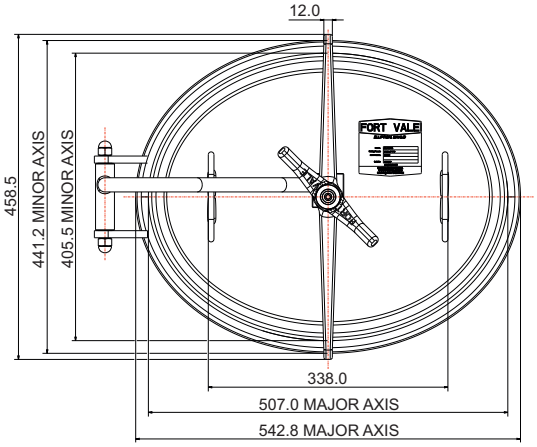
Range

Description	Part No.
With vulcanised black EPDM seal	850/7500VEP
With vulcanised blue nitrile seal	850/7500VBN
With vulcanised sweet white rubber seal	850/7500VSW

Section View







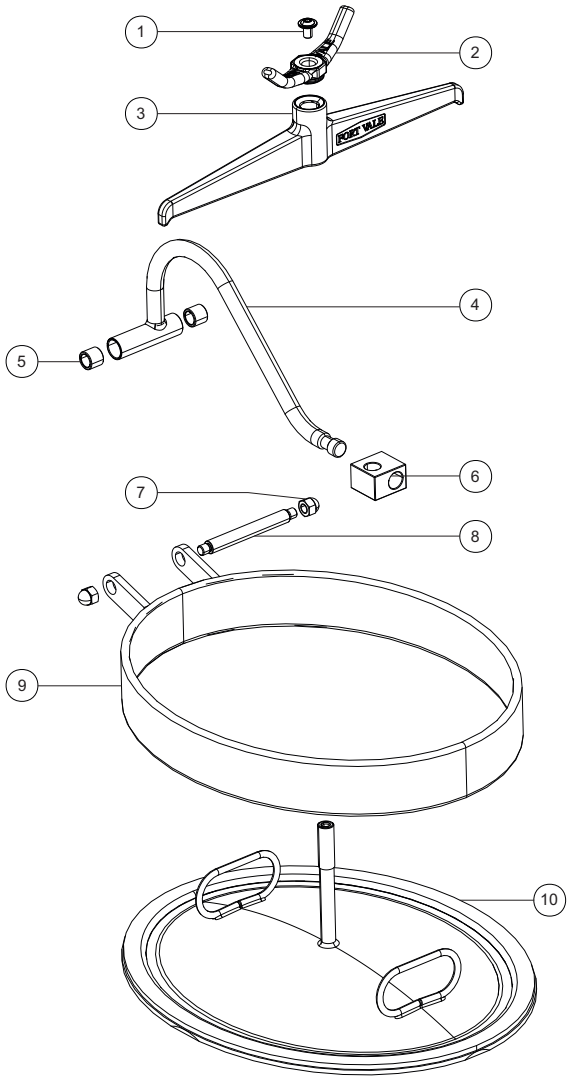
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Elliptical Manlid Assembly - Low Profile Neckring

Part No: 850/7500VXX

Parts Drawing



Parts List

Item	Description	Part No.
1	M10 flanged button screw	5111-600
2	¾" star lock handnut	490/0410
3	Cross arm	750/6020DC
4	Pivot beam assembly	650/6020
5	Gunmetal bush (2)	650/6001
6	Pivot block	750/6001
7	M12 dome nut (2)	5112-050
8	Hinge pin	650/6008
9	Neckring	650/6010
10	Cover with vulcanised seal ***Note**	750/6070VSXX

NOTE: The specification changes the Part No.

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Elliptical Manlid Assembly - Deep Neckring

Part No: 850/7600VXX



Specification

Nominal size
508mm x 406mm

Neckring
Thickness: 10mm
Height: 200.7mm

Properties
Cross-arm with handnut to clamp and seal the assembly; 2x handles to move the cover to the open/closed position

Operation
The cover opens into the vessel and turns to move out of the neckring, clear of the vessel

Materials
Contact parts: 316 stainless steel, cover surface finish 0.8um - 0.5um
Seal: vulcanised - refer to Range

Design Conditions

Weight:	41.3 Kg
Design Pressure (MAWP):	3 Bar
Design Vacuum:	-0.20 Bar ***Conditions**
Design Temperature Min:	-20°C
Design Temperature Max:	70°C

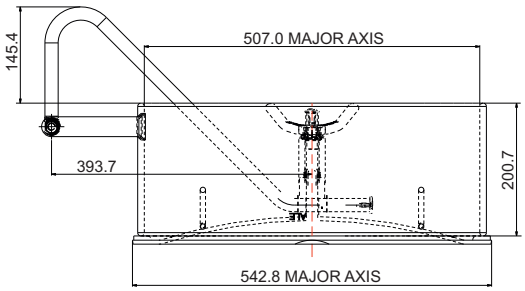
Vacuum Conditions: The assembly is compatible with -0.20 Bar vacuum only if neckring distortion caused by welding is kept to a minimum.

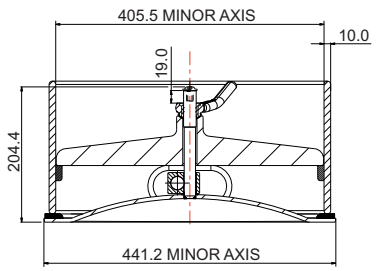
NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

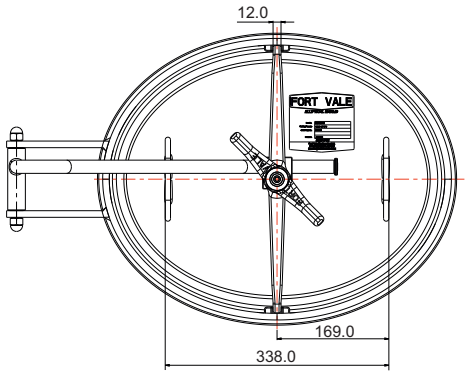
Range

Description	Part No.
With vulcanised black EPDM seal	850/7600VEP
With vulcanised blue nitrile seal	850/7600VBN

Section View







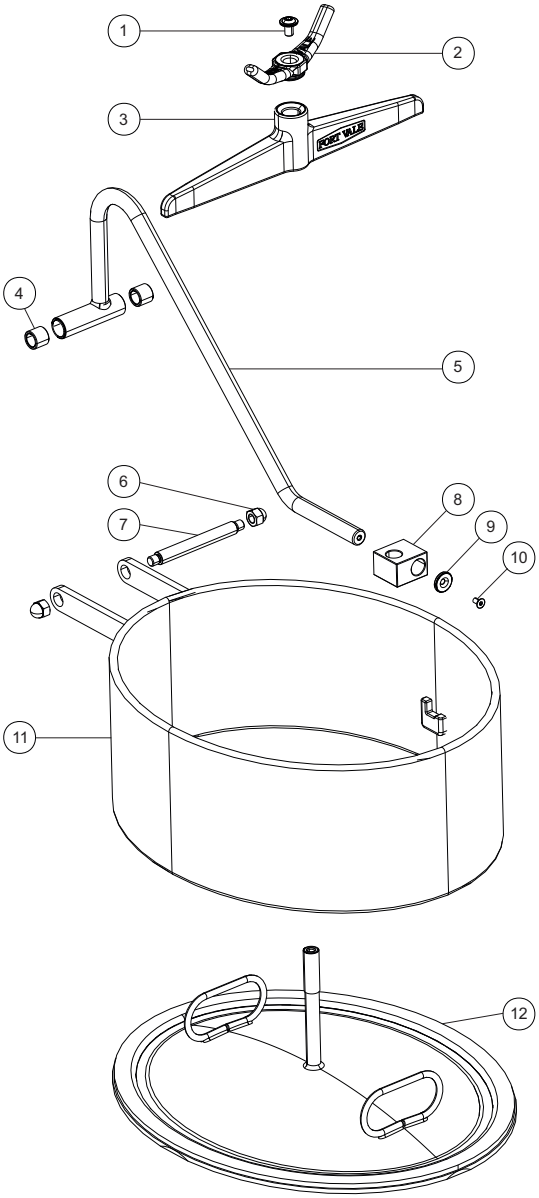
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Elliptical Manlid Assembly - Deep Neckring

Part No: 850/7600VXX

Parts Drawing



Parts List

Item	Description	Part No.
1	M10 flanged button screw	5111-600
2	¾" star lock handnut	490/0410
3	Cross arm	750/6535DC
4	Gunmetal bush (2)	650/6001
5	Pivot beam assembly	650/6535
6	M12 dome nut (2)	5112-050
7	Hinge pin	650/6008
8	Long pivot block	750/2501
9	Retaining washer	20370/2
10	6mm countersunk bolt	5111-018
11	Neckring	650/6530
12	Cover with vulcanised seal ***Note**	750/6070VSXX

NOTE: The specification changes the Part No.

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Manlid & Inspection Hatch Seals - Introduction

Accessories & Spare Parts



Specification

We supply a large range of seals in a selection of sizes and materials for compatibility with many different types of cargo and service conditions. Please contact us if the material you want is not on our data sheet.

If you are ordering a manlid or inspection hatch assembly, we can install the seal if you request this at the time of your order.

We supply three seal types:

- Elastomer Seals
- Composite Seals
- Braided Packing (Non Gas-Tight)

Elastomer Seals

Seals moulded from rubber compounds are suitable for many types of cargo and service conditions. Some advantages of elastomer seals include:

- easy to clean
- good resilience qualities
- excellent sealing performance
- economical to replace regularly

Please refer to data sheet SPA062 for our standard range of elastomer seals.

Composite Seals

Composite seals have been developed for general purpose tanks where the cargo can vary, therefore a multi-purpose seal is useful. Advantages of composite seals include:

- easy to clean
- good resilience qualities
- excellent sealing performance
- do not become porous
- suitable for a range of cargoes and temperatures

Please refer to data sheet SPA063 for our standard range of composite seals.

Composite Seal Types:

Super Tanktyt

The Super Tanktyt seal has a rubber core with a PTFE envelope bonded to three sides. There are two types:

- high temperature Nitrile core/PTFE envelope
- EPDM core/PTFE envelope

The Super Tanktyt seal is the ideal choice for the chemical industry. The seal's rubber core gives it the resilience to be gas-tight up to 4 Bar, and the PTFE envelope gives it excellent resistance to hazardous cargoes.

Please refer to data sheet SPA074 for more information about Super Tanktyt manlid seals.

Fortyt

The Fortyt seal has a silicone rubber core fully encapsulated with a FEP envelope. There are two types:

- round section
- square section

Please refer to data sheet SPA074 for more information about Fortyt manlid seals.

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Tuffort

The Tuffort seal has a silicone rubber core fully encapsulated with an advanced fluoroplastic envelope which gives the seal increased resilience. There are two types:

- round section
- square section

Please refer to data sheet SPA074 for more information about Tuffort manlid seals.

Braided Packing (Non Gas-Tight)

Braided packing is made from PTFE impregnated fibre that is tightly braided. There are two types:

- PTFE braided fibre with silicone core
- PTFE braided fibre (no core)

We supply PTFE braided fibre packing either as a cut length or in a roll for you to cut to the necessary size.

CAUTION: Braided packing is a rigid material that will not give a gas-tight seal. The material is lubricant-free but it does contain a small percentage of the wetting agents used during its manufacturing process. Note that small amounts of these wetting agents can leach during use.

For high temperature service conditions, we also supply a Graphite impregnated fibre seal.

Please refer to data sheet SPA064 for our standard range of braided seals.

Precautions

Seal Gas-Tightness

The seal material, the number of manlid bolt fasteners and neckring distortion can affect seal gas-tightness.

For more information, please refer to the linked document below, or contact us.

View Handnut Torque Guide - Hinged Manlid Assemblies

CAUTION: When the neckring has been welded into the vessel, the neckring must be flat to a maximum tolerance of 2mm and round to a maximum tolerance of 4mm. If the neckring is distorted during welding, the manlid assembly will not seal correctly and it can malfunction during operation. Fort Vale accepts no responsibility for distortion caused by welding.

Compatibility

CAUTION: Make sure that the seal material is compatible with the cargo and the service conditions. This includes, but is not limited to:

- dimensions
- maximum allowable working pressure
- test pressure
- vacuum conditions
- minimum/maximum design temperatures
- materials of construction.

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PTFE Impregnated Braided Fibre

PTFE braided packing is available as a cut length or as a roll of material for you to cut to the necessary size. There are two types:

- PTFE braided fibre with silicone core - see Table 1
- PTFE braided fibre (no core) - see Table 2

CAUTION: Braided packing is a rigid material that will not give a gas-tight seal. The material is lubricant-free but it does contain a small percentage of the wetting agents used during its manufacturing process. Note that small amounts of these wetting agents can leach during use.

Table 1 - With Silicone Core

Section (mm)	Length (m)	Part No.
14 x 10	1.65	5005-1410S165
15 x 10	1.65	5005-1510S165
14 x 14	1.65	5005-1414S165
14 x 14	50	5005-1414SR50
15 x 15	1.65	5005-1515S165
16 x 16	1.75	5005-1616S175
16 x 16	30	5005-1616SR30

Table 2 - No Silicone Core

Section (mm)	Length (m)	Part No.
14 x 10	1.65	5005-1410D165
15 x 10	1.65	5005-1510D165
14 x 14	1.65	5005-1414D165
14 x 14	50	5005-1414DR50
15 x 15	1.65	5005-1515D165
16 x 16	1.75	5005-1616D175
16 x 16	30	5005-1616DR30



Related Parts

Description	Part No.
Mitre seal cutter - for use with braided packing	400/3100

Graphite Impregnated Braided Fibre

CAUTION: Braided packing is a rigid material that will not give a gas-tight seal.

Material	Compatibility (Example Only) & Minimum/Maximum Temperature	Pendle Manlid Seal Part Number & Section Dimension (mm)			Euro Lid Seal
		300mm (12")	500mm (20")	600mm (24")	500mm (20")
Graphite Impregnated Fibre (Non-asbestos)	Non-corrosive high temperature cargo e.g. tar, bitumen -50°C to 250°C (-58°F to 482°F)	5005-30GA 14.2 x 14.2	5005-50GA 14.2 x 14.2	5005-60GA 14.2 x 14.2	5005-53GA 16 x 16

Compatibility

CAUTION: The compatibility information in the table is for general guidance only. Make sure that the seal material is compatible with the cargo and the service conditions. This includes, but is not limited to:

- dimensions
- maximum allowable working pressure
- test pressure
- vacuum conditions
- minimum/maximum design temperatures
- materials of construction.

For our standard range of elastomer seals and composite seals, please refer to data sheet SPA062 and SPA063.

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Composite Seals

The table shows our standard range. For more information about composite seals, please refer to data sheet SPA074.

If the material you need is not shown, please contact Fort Vale. For our standard range of elastomer seals and braided packing, please refer to data sheet SPA062 and SPA064.

Material	Compatibility (Example Only) & Minimum/Maximum Temperature	Pendle Manlid Seal Part Number & Section Dimension (mm)					Euro Lid Seal
		170mm (7")	300mm (12")	460mm (18")	500mm (20")	600mm (24")	500mm (20")
Fortyt Round section Silicone/FEP	Corrosive cargo - resistance similar to PTFE -60°C to 205°C (-76°F to 401°F)		5005-30FT Ø15		5005-50FT Ø15		
Fortyt Square section Silicone/FEP	Corrosive cargo - resistance similar to PTFE -60°C to 205°C (-76°F to 401°F)		5005-30FTSQ 14 x 12		5005-50FTSQ 14 x 12		
Fortyt Square section White silicone/FEP	Corrosive cargo - resistance similar to PTFE -40°C to 205°C (-40°F to 401°F)				5005-50FTSQWS 14 x 12		
Super Tanktyt Nitrile core	Corrosive cargo - resistance similar to PTFE -25°C to 140°C (-13°F to 284°F)		5005-890 15 x 10	5005-870 14.5 x 10	5005-860 14.5 x 12	5005-850 16 x 10	5005-871 16 x 16
Super Tanktyt EPDM core	Corrosive cargo - resistance similar to PTFE -50°C to 150°C (-58°F to 302°F)	5005-830EP 15.5 x 10	5005-890EP 15 x 10	5005-870EP 14.5 x 10	5005-860EP 14.5 x 12	5005-850EP 15 x 10	
Tuffort D Section Silicone/FEP	Corrosive cargo - resistance similar to PTFE -60°C to 160°C (-76°F to 320°F)		5005-30TUF 15.1 x 12.5		5005-50TUF 15.1 x 12.5		
PFA White silicone/ PFA	Corrosive cargo - resistance similar to PTFE -40°C to 260°C (-40°F to 500°F)		5005-30PFA Ø15		5005-50PFA Ø15		

Compatibility

CAUTION: The compatibility information in the table is for general guidance only. Make sure that the seal material is compatible with the cargo and the service conditions. This includes, but is not limited to:

- dimensions
- maximum allowable working pressure
- test pressure
- vacuum conditions
- minimum/maximum design temperatures
- materials of construction.

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Elastomer Seals

The table shows our standard range. Our elastomer seals are colour-coded to identify the material. The applicable colour is marked on the outer edge of the seal.

If the material you need is not shown, please contact Fort Vale. For our standard range of composite seals and braided packing, please refer to data sheet SPA063 and SPA064.

Material	Compatibility (Example Only) & Minimum/Maximum Temperature	Pendle Manlid Seal Part Number & Section Dimension (mm)					Euro Lid Seal Part Number & Section Dimension (mm)			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 16 x 10	5005-30B 16 x 10	11536B 14.5 x 11.8	5005-50B 15.24 x 11.8	5005-60B 16 x 10	5005-33B 16 x 16	5005-47B 16 x 16	5005-53B 16 x 16	Blue
EPDM	Some corrosive cargoes. Do not use with petroleum-cased cargo -50°C to 150°C (-58°F to 302°F)	5005-17EPD 16 x 10	5005-30EPD 16 x 10	11536EPD 14.5 x 11.8	5005-50EPD 15.24 x 11.8	5005-60EPD 16 x 10	5005-33EPD 16 x 16	5005-47EPD 16 x 16	5005-53EPD 16 x 16	Red/Blue
CSM	Moderately corrosive cargo. Do not use with petroleum-cased cargo -40°C to 85°C (-40°F to 185°F)	5005-17CSM 16 x 10	5005-30CSM 16 x 10	11536CSM 14.5 x 11.8	5005-50CSM 15.24 x 11.8	5005-60CSM 16 x 10	5005-33CSM 16 x 16	5005-47CSM 16 x 16	5005-53CSM 16 X 16	White
Natural White Rubber	Food products -50°C to 80°C (-58°F to 176°F)	5005-17SWR 16 x 10	5005-30SWR 16 x 10	11536SWR 14.5 x 11.8	5005-50SWR 15.24 x 11.8	5005-60SWR 16 x 10	5005-33SWR 16 x 16	5005-47SWR 16 x 16	5005-53SWR 16 x 16	
Neoprene	Non-corrosive cargo -30°C to 100°C (-22°F to 212°F)	5005-17NR 16 x 10	5005-30NR 16 x 10	11536NR 14.5 x 11.8	5005-50NR 15.24 x 11.8	5005-60NR 16 x 10	5005-33NR 16 x 16	5005-47NR 16 x 16	5005-53NR 16 x 16	Green
Nitrile (Black)	Aliphatic hydrocarbons -25°C to 100°C (-13°F to 212°F)	5005-17N 16 x 10	5005-30N 16 x 10	11536N 14.5 x 11.8	5005-50N 15.24 x 11.8	5005-60N 16 x 10	5005-33N 16 x 16	5005-47N 16 x 16	5005-53N 16 x 16	Red
Orange Silicone	High temperature non-corrosive cargo -50°C to 200°C (-58°F to 392°F)	5005-17S 16 x 10	5005-30S 16 x 10	11536S 14.5 x 11.8	5005-50S 15.24 x 11.8	5005-60S 16 x 10	5005-33S 16 x 16	5005-47S 16 x 16	5005-53S 16 x 16	
White Silicone	Food products. FDA approved -50°C to 200°C (-58°F to 392°F)	5005-17WS 16 x 10	5005-30WS 16 x 10	11536WS 14.5 x 11.8	5005-50WS 15.24 x 11.8	5005-60WS 16 x 10	5005-33WS 16 x 16	5005-47WS 16 x 16	5005-53WS 16 x 16	Red
Viton A	Moderately corrosive cargo -15°C to 200°C (5°F to 392°F)	5005-17VR 16 x 10	5005-30VR 16 x 10	11536VR 14.5 x 11.8	5005-50VR 15.24 x 11.8	5005-60VR 16 x 10	5005-33VR 16 x 16	5005-47VR 16 x 16	5005-53VR 16 x 16	Yellow

Compatibility

CAUTION: The compatibility information in the table is for general guidance only. Make sure that the seal material is compatible with the cargo and the service conditions. This includes, but is not limited to:

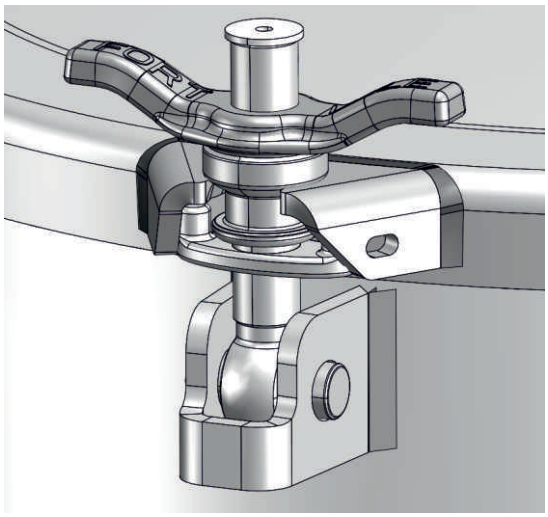
- dimensions
- maximum allowable working pressure
- test pressure
- vacuum conditions
- minimum/maximum design temperatures
- materials of construction.

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Safebolt Assembly

Part No: 496/4XXX



Specification

Description
Safebolt assembly including eyebolt with pivot pin, retaining collar and captivated low profile safebolt handnut

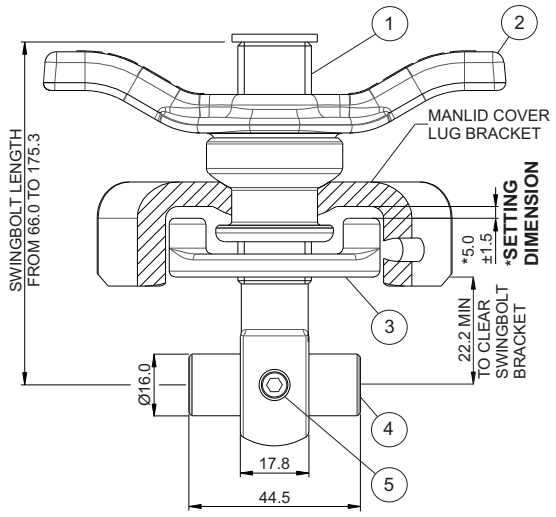
Size
Eyebolt: ¾" BSW eyebolt with Ø 16mm eye, available length from 66mm to 175.3mm (Dimension C)
Safebolt handnut & retaining collar: ¾" BSW
Pivot pin: Ø 16mm

Materials
304 stainless steel

Options
Eyebolt: ¾" eye - refer to Fort Vale
Handnut: refer to the Range table

Special instructions
The customer must set the retaining collar and weld it in the correct position. Refer to the procedure below.

Section View: 496/4XXX



Range: Standard Safebolt Assemblies

Handnut Description	Part No.
Low profile stainless steel ***Note**	496/4XXX
Low profile anti-galling - stainless steel with brass thread insert ***Note**	496/EXXXSB
Extended anti-galling - stainless steel with brass thread insert ***Note**	496/CXXXSB

Parts List: 496/4XXX

Item	Description	Part No.
1	¾" BSW eyebolt, 16mm eye ***Note**	540/0XXX
2	Low profile st.st. safebolt handnut	490/0305
3	Retaining collar	701/0050
4	Ø 16mm pivot pin	10913SS
5	M8 grubscrew	5111-002

NOTE: The eyebolt length changes the Part No.

IMPORTANT PRECAUTIONS

A safebolt must be installed opposite the manlid hinge. The safebolt retaining collar must be set by the customer. This includes a safebolt that is supplied as part of a manlid assembly and a safebolt supplied as a spare part.

How to set the safebolt retaining collar:

- With the safebolt assembly installed in the neckring lug bracket, start with the retaining collar at the bottom of the swingbolt thread. Engage the safebolt assembly with the manlid cover lug bracket.
- Do not tighten the handnut, there must be no compression on the seal.
- Measure the SETTING DIMENSION (Refer to the Section View).
- Disengage the safebolt assembly from the cover lug and move the retaining collar up to the correct position.
- Engage the safebolt assembly with the cover lug bracket again. Check that the SETTING DIMENSION is satisfactory. Adjust the position of the retaining collar if necessary.
- When the SETTING DIMENSION is satisfactory, tack weld the retaining collar to the eyebolt.
- The safebolt retaining collar is now set.

CAUTION: If you change the seal material type in your manlid cover, you must check the setting dimension again. It is possible that you must change the position of the retaining collar to be compatible with the new seal.

Please read the User Manual on page 2.

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Overview

A safebolt is a special fastener that can be used on all standard manlid assemblies. It is a safety device that permits the controlled release of residual tank pressure before the manlid is opened.

If there is residual tank pressure, the manlid cover can open suddenly with force which can cause serious injury to the operator. A safebolt lets the operator break the seal between the manlid cover and the neckring while it holds the manlid cover in a retained position, thus preventing the risk of injury.

Precautions

Install the safebolt next to the manlid cover handle, opposite the hinge. Obey the SETTING DIMENSION - refer to the Section View on page 1.

When you operate a manlid assembly installed with a safebolt you must:

- release the safebolt last when you open the manlid.
- fasten the safebolt first when you close the manlid.

WARNING: Before you try to open the manlid, make sure that the vessel/system pressure is at zero. When all the vessel/system pressure is released, use an approved method to release all residual pressure before you loosen any fasteners. If you do not release all pressure, the manlid cover can open suddenly with force which can cause serious injury or death. Open the fasteners gradually in a diametrically opposite sequence.

Operation

This information is for general guidance only. For more information, please refer to our Installation & Operating Instructions - Hinged Manlid Assemblies.

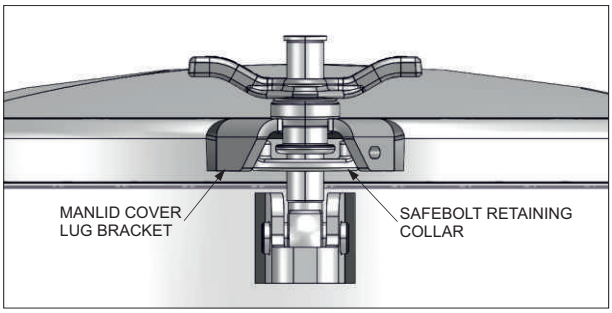


Figure 1 - Closed Position

Closed Position

When the safebolt is in the closed position, the safebolt keeps the manlid cover closed. Refer to Figure 1.

If the handnut becomes loose accidentally, the safebolt retaining collar keeps the eyebolt in the vertical position. This prevents the manlid cover from opening suddenly if there was an increase of pressure in the vessel.

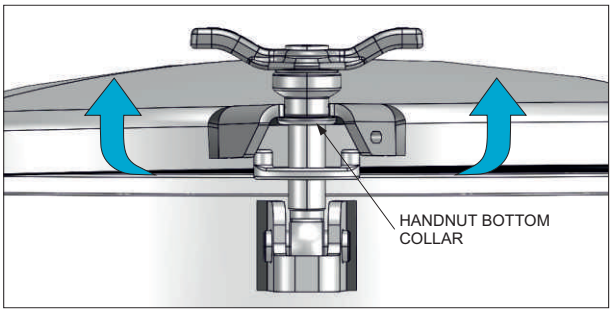


Figure 2 - Retained Position

Retained Position

To operate the safebolt, loosen the handnut and keep the safebolt in the vertical position. When the handnut is loosened, the handnut bottom collar lifts the manlid cover up. This breaks the seal between the manlid seal and the neckring but keeps the manlid cover in a safe “retained position” to prevent it from opening suddenly. Refer to Figure 2.

Make sure that all residual pressure is released before you move the safebolt to the open position.

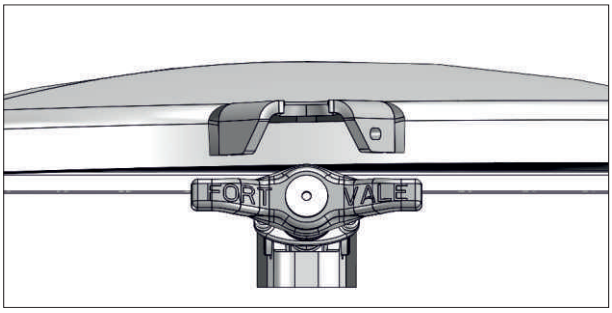


Figure 3 - Open Position

Open Position

To put the safebolt in the open position, turn the handnut until it touches the top retaining washer on the eyebolt. This gives clearance between the safebolt retaining collar and the manlid cover lug bracket. You can then rotate the safebolt assembly away from the manlid cover. Refer to Figure 3.

If the safebolt is difficult to rotate away, use the manlid cover handle to lift the manlid cover by a small amount.

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Swingbolt Assemblies

Accessories & Spare Parts



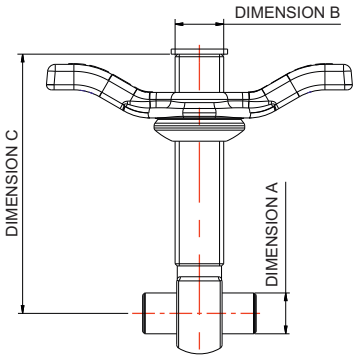
We supply a range of swingbolt assemblies with different eyebolt lengths and handnut types.

The standard sizes shown are the most frequently used. If the size you want is not shown, please contact us.

A complete swingbolt assembly includes the eyebolt, the pivot pin (attached with a grubscrew) and the handnut with captivating washer. You can also buy all these components separately.

For Safebolt assemblies, please refer to data sheet SPA065 or contact us for more information.

Standard Swingbolt Assemblies



Specification

Eyebolt options

Ø eye: Dimension A - 16mm or ¾”
Thread: Dimension B - ¾” BSW
Length: Dimension C - from 49.3mm to 175.3mm
NOTE: Length is measured from the centre of the eye to the end of the bolt
Material: stainless steel

Standard handnut options

Low profile stainless steel
Low profile naval brass with stainless steel thrust washer
Extended stainless steel with anti-galling brass thread

Special handnut options

Extended stainless steel
Low profile stainless steel with anti-galling brass thread
Hexagonal stainless steel nut

Range: Standard Swingbolt Assemblies

The sizes shown are the most frequently used. If the size you want is not shown, please contact us.

16mm Eye Swingbolt Assemblies

Eyebolt Length (Dimension C)		Stainless Steel Handnut	Naval Brass Handnut	Anti-galling Extended Handnut
mm	inches			
62	2.44	496/5260	496/1260	-
66	2.60	496/5275	496/1275	496/C260
70	2.75	496/5290	496/1290	496/C275
83	3.26	496/5342	496/1342	-
87	3.42	496/5358	496/1358	496/C342
92	3.63	496/5379	496/1379	496/C379
95	3.75	496/5375	496/1375	496/C375
108	4.25	496/5425	496/1425	496/C425
133.4	5.25	496/5525	496/1525	496/C525

¾” Eye Swingbolt Assemblies

Eyebolt Length (Dimension C)		Stainless Steel Handnut	Naval Brass Handnut
mm	inches		
66	2.60	495/1005	495/1081
87	3.42	495/1015	495/1060
95	3.75	495/1059	495/1055
120.7	4.75	495/0210	-

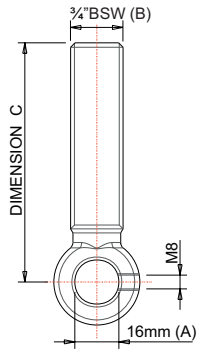
Related Parts

Description	Part No.
Handnut torque increase tool, compatible with low profile handnuts	495/10T0

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16mm Eye (A) x ¾” BSW Eyebolt (B)



Specification

Supplied as standard with an M8 grub screw

Length options (C): from 49.3mm to 175.3mm

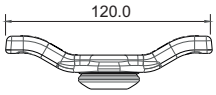
Material: stainless steel

Other eye sizes and thread types are available, please contact us.

Eyebolt Length (Dimension C)		Part No.
mm	inches	
69.85	2.75	540/0275
75.95	2.99	540/0299
80.01	3.15	540/0315
95.25	3.75	540/0375

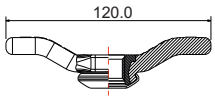
¾” BSW Handnut

Standard low profile handnut

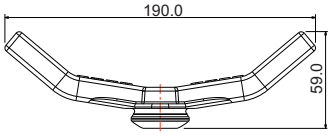


Anti-galling handnut

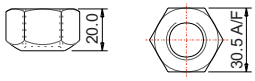
Low profile



Extended



Hexagonal nut



Specification

Standard handnuts are low profile in stainless steel or naval brass.

Special handnuts include extended stainless steel and anti-galling in stainless steel with a brass thread insert. These are available low profile or extended.

For our flat bolted manlids, we also supply stainless steel hexagonal nuts.

Description	Material	Part No.
Low profile	Stainless steel	490/0310
Low profile	Naval brass with stainless steel thrust washer	490/1060
Extended	Stainless steel	490/0313
Anti-galling low profile	Stainless steel with brass thread insert	490/0380
Anti-galling extended	Stainless steel with brass thread insert	490/0410
Hexagonal nut	Stainless steel	490/1190

Eyebolt Pivot Pin



Specification

Standard Ø: 16mm or ¾”

Material: stainless steel

Description	Part No.
Ø 16mm x 44.5mm long	10913SS
Ø ¾” x 1.82" long	10911SS

Related Parts

Manlid/Neckring Hinge Pin Assembly



Specification

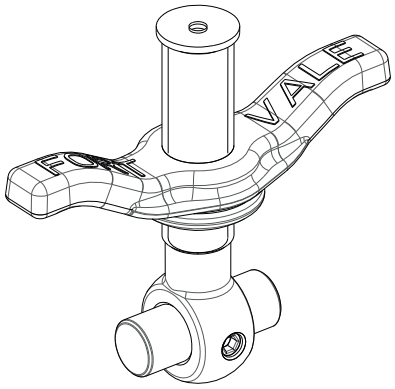
Includes the pin, washers and nyloc nuts

Material: stainless steel

Description	Part No.
Manlid/neckring hinge pin assembly	600/1060

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Example: 4 9 6 / X X X X

496/ Specification

16mm eye x ¾"BSW swingbolt assembly, including eyebolt, hinge pin and captivated handnut.

¾" BSW Handnut Type

Code	Description	Material
0	Hexagonal nut	Stainless steel
1	Low profile	Naval brass with stainless steel thrust washer
4	Safebolt	Stainless steel
5	Low profile	Stainless steel
8	Extended	Stainless steel
C	Extended anti-galling	Stainless steel with brass thread insert
E	Low profile anti-galling	Stainless steel with brass thread insert

Eyebolt Length

The code is equivalent to the working length of the bolt. This is calculated from the centre of the eye to the end of the bolt, given in inches.

e.g. **375** = 3.75" (95.25mm)

Eyebolts are available from 49.3mm (2.10") long to 175.3mm (6.90") long.
Refer to the Range tables on page 1 for standard sizes.

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300mm Flash Vacuum Vent Assembly

Part No: 618/6102XXX304



Specification

Nominal size
DN300

Neckring/flange assembly
Neckring thickness: 6mm
Tank radius profiling range: 850mm to 1005mm

Vacuum setting
1" Hg (0.03 Bar)

Materials
Neckring/flange: 304 stainless steel
Vacuum vent: 304/316 stainless steel
Vacuum vent seal: EPDM
Gasket: sweet white rubber

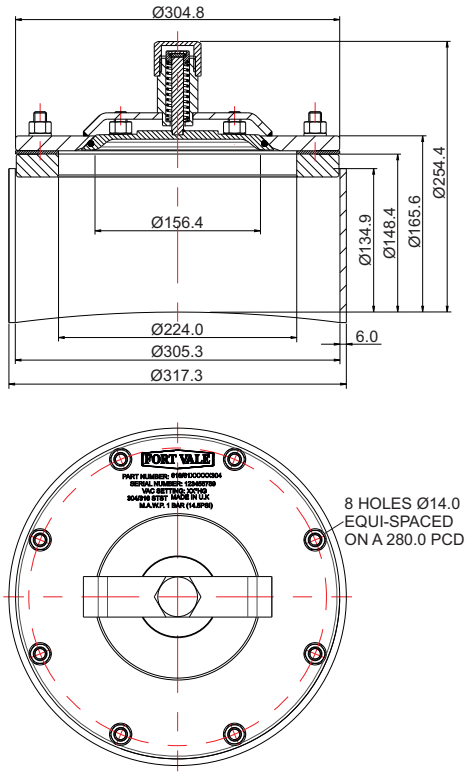
Alternatives are available, please contact Fort Vale

Design Conditions

Weight:	20.4 Kg
Design Pressure (MAWP):	1 Bar
Test Pressure:	1.5 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	150°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Section View



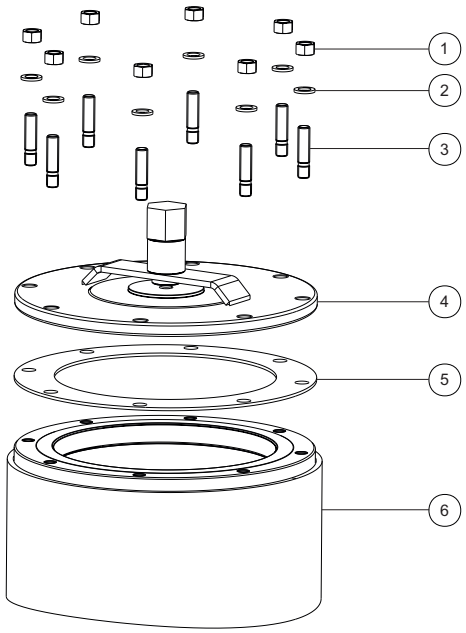
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300mm Flash Vacuum Vent Assembly

Part No: 618/6102XXX304

Parts Drawing



Parts List

Item	Description	Part No.
1	M12 full nut (8)	5112-006
2	M12 spring washer (8)	5113-010
3	M12 stud (8)	312/1001
4	1" Hg flash vacuum vent ***Note**	618/620002XXX
5	Sweet white rubber gasket	5005-988
6	Neckring/flange assembly ***Note**	618/614XXX304

NOTE: The specification changes the Part No.

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FORT VALE

Relief Valves

Road Tanker Catalogue







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2" to 2½" 90° Angled Blower Relief Valve

Part No: 2B/XXXX00



Specification

Nominal size
DN50

Inlet connection
2" BSPM

Outlet connection
2½" BSPF

Set pressure
From 0.5 Bar to 1.5 Bar

Properties
90° body with cam lever to lift/lock the pressure plate for cleaning or maintenance

Materials
Contact parts: 304/316 stainless steel
Pressure O ring: Viton or EPDM

Design Conditions

Weight:	4.02 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar

Seal Design Temperature Range:

Material	Min.Temp.°C	Max.Temp.°C
Viton	-20	200
EPDM	-50	150

Range

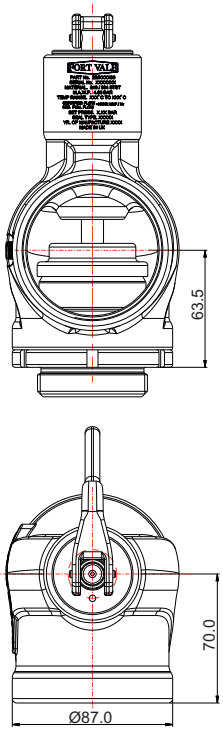
Description	Part No.
With Viton pressure O ring	2B/0XXX00
With EPDM pressure O ring	2B/1XXX00

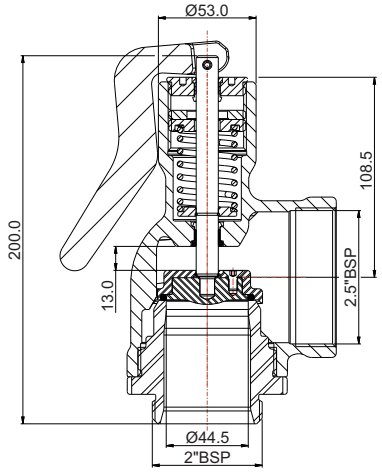
NOTE: The pressure setting changes the part number

Flow Rate

Set Pressure Bar	90% Volumetric Flow: Nm^3/hr	Over Pressure Bar
0.5	726	0.55
0.8	908	0.88
1.0	1015	1.10
1.5	1408	1.65

Section View





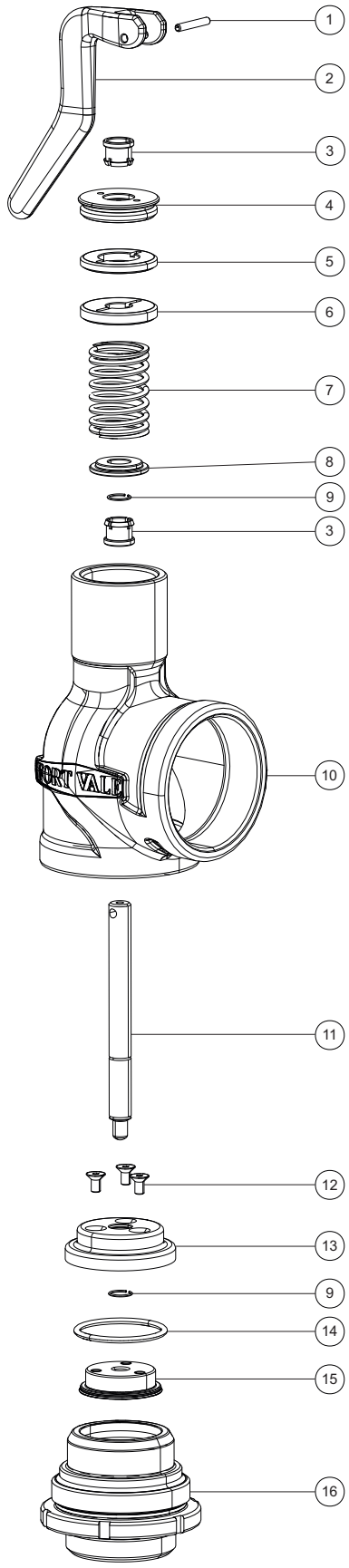
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2" to 2½" 90° Angled Blower Relief Valve

Part No: 2B/XXXX00

Parts Drawing



Parts List

Item	Description	Part No.
1	Selok pin	5128-020
2	Lifting handle	175/0053
3	Guide bush (2)	175/0039
4	Top cap	175/0049
5	Stuffing nut	175/0047
6	Top spring pad	175/0048
7	Spring *Note	5104-XXX
8	Bottom spring pad	175/0029
9	Retaining ring clip (2)	5120-086
10	2½" BSP 90° angled body	175/0052
11	Guide stem	175/0028
12	M5 countersunk screw (3)	5111-499
13	Outer blowdown plate	175/0027
14	Pressure plate O ring *Note	XXXXX
15	Inner pressure plate	175/0026
16	2" BSP inlet fitting	175/0024

NOTE: The valve specification changes the Part No.

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Function

A relief valve is installed in the vapour space of a tank. It vents to protect the tank from accidental over-pressure or unwanted vacuum conditions. Minnow relief valves are pre-set to give protection against pressure only or against pressure and vacuum.

We offer a range of relief valves for different service conditions and flow requirements. Contact us for more information.

Design Options

The design options below are available on our standard range of Minnow relief valves.

Tank Connection

Threaded: 1” BSP male,
1" BSP female, 1" NPT male



Tank Seal

PTFE

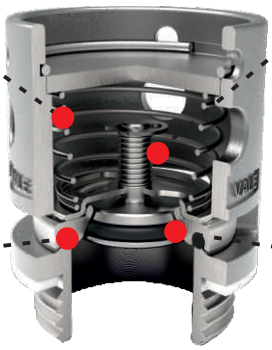
Nominal Bore

25mm (1”)

Pressure Setting

Standard valve:
From 1 PSIG to 45 PSIG
(0.07 Bar to 3.10 Bar)

Ventlock valve:
From 1 PSIG to 9 PSIG only
(0.07 Bar to 0.62 Bar only)



Vacuum Setting

From 0.5"Hg to 7"Hg
(0.02 Bar to 0.24 Bar)

Pressure Seal

Viton

Special service conditions:
A range of elastomer seals is available

Vacuum Seal

Viton

Special service conditions:
A range of elastomer seals is available

Special Options

Manual vacuum vent button

Ventlock bracket

Body with TIR bracket



Valve Materials

316 stainless steel

Special service conditions:
Wetted parts in high nickel alloys

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Related Parts

We recommend our range of compatible accessories:

- Flame arrester
- Weld-in sockets and nipples

Please contact us for more information about these parts.

Relief Valves for Dedicated Service

We offer a range of relief valves for these service conditions and special cargoes:

- T50 tank containers for liquefied gas
- Rail tank wagons
- U.S. tank trucks
- IBCs and small capacity tanks
- Steam-heating systems for tanks
- Hygienic service
- Food grade for liquid flow

Please contact us for more information about these valves.

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1" BSP Minnow Relief Valve - Pressure Only

Part No: 65/0XX00



Specification

Nominal size
DN25

Tank connection
1" BSPM

Set pressure
From 1 PSI to 45 PSI (0.07 Bar to 3.10 Bar)

Materials
Contact parts: 316 stainless steel
Pressure O ring: Viton
Tank seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 0.18 Kg

Seal Temperature Range:

Material	Min.Temp.°C	Max.Temp.°C
EPDM	-50	150
Perfluoroelastomer	-15	240
Viton	-20	200

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Range

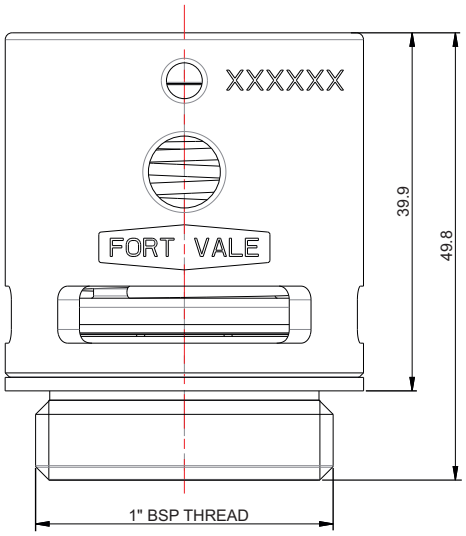
Description	Part No.
1" BSPM standard valve	65/XXXXX
1" BSPM with vent button	65B/XXXXX
1" BSPM with vent button & TIR	65BT/XXXXX
1" BSPM with vent button & ventlock	68/XXXXX
1" BSPF standard valve	66/XXXXX
1" BSPF with vent button & ventlock	69/XXXXX
1" NPT standard valve	65/XXXXXNPT

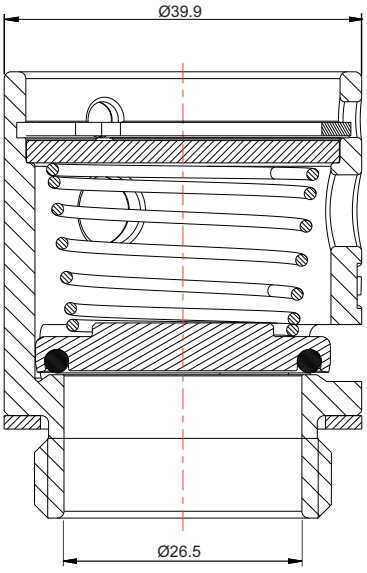
NOTE: The valve specification changes the part number

Related Parts

Description	Part No.
1" BSP weld-in socket	600/1025
1" BSP weld-in nipple	600/1026
1" flame arrester	179/0300

Section View





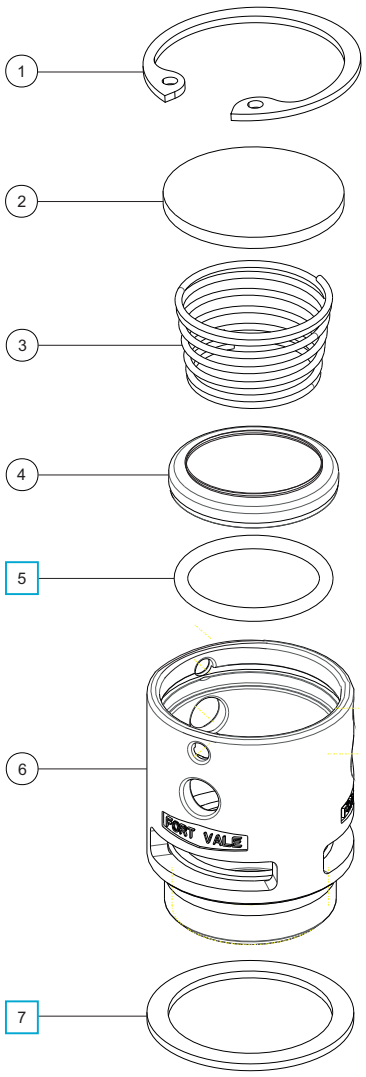
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1" BSP Minnow Relief Valve - Pressure Only

Part No: 65/0XX00

Parts Drawing



Parts List

Item	Description	Part No.
1	Retaining clip	5120-021
2	Top cap	179/0010
3	Pressure spring	Refer to Table 1
4	Pressure plate ***Note**	Refer to Table 2
5	Pressure O ring ***Note**	Refer to Table 2 ☐
6	Body	179/0100
7	PTFE gasket	5005-553 ☐

NOTE: You will need special tools to install an O ring into a pressure plate. We recommend that you order a pressure plate/O ring assembly. Refer to Table 2.

Table 1

Std. Pressure Settings	Pressure Spring Part No.
3 PSI (0.21 Bar)	5104-653
6 PSI (0.41 Bar)	5104-656
9 PSI (0.62 Bar)	5104-659
30 PSI (2.07 Bar)	5104-695

Available settings: 1 PSI (0.07 Bar) to 45 PSI (3.10 Bar)

Table 2 - Refer to Note

Seal Material	Pressure O Ring	Pressure Plate/ O Ring Assembly
EPDM	5005-651	179/0050ES
Perfluoroelastomer	5005-585	179/0050PERS
Viton	5005-552	179/0050VS

Seal Kit - All parts marked ☐ in the Parts List

Seal Material	Part No.
EPDM	65/9PSK
Perfluoroelastomer	65/7PSK
Viton	65/0PSK

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Function

A relief valve is installed in the vapour space of a tank. It vents to protect the tank from accidental over-pressure or unwanted vacuum conditions. A Uniact relief valve is a single-acting valve. It is pre-set to give protection against pressure only or against vacuum only conditions.

We offer a range of relief valves for different service conditions and flow requirements. Contact us for more information.

Design Options

The design options below are available on our standard range of Uniact relief valves.

Tank Connection

Threaded: , 1½” BSP, 2" BSP

Flanged: 1½” ASA 150

Special service conditions:
Threaded: 1¼" BSP
DIN11851: 50mm, 65mm



Tank Seal

CNAF

Special service conditions:
PTFE

Nominal Bore

40mm (1½”)

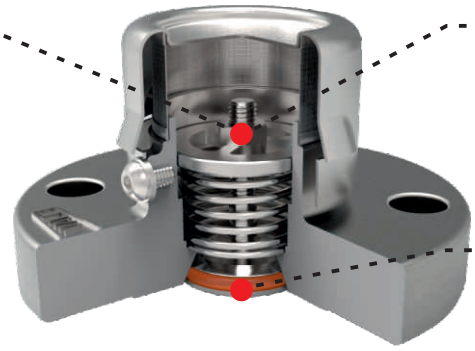
50mm (2”)

Special service conditions:
32mm (1¼”)

Pressure Setting

1½”: From 0.05 Bar to 4.5 Bar

2”: From 0.02 Bar to 4.15 Bar



Vacuum Setting

1½”: From 2 kPa to 88 kPa

2": From 2 kPa to 95 kPa

Pressure or Vacuum Seal

Fortyt

Special service conditions:
A range of elastomer seals is available

Valve Materials

316 stainless steel

Special service conditions:
Wetted parts in high nickel alloys



Ancillaries

Cowl

Gauze

Cap

Manual vent button (vacuum valve only)

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Related Parts

We recommend our range of compatible accessories:

- Cowl or cap - with or without gauze
- Weld-in sockets
- Weld-in flanges
- Gaskets
- Fasteners

Please contact us for more information about these parts.

Relief Valves for Dedicated Service

We offer a range of relief valves for these service conditions and special cargoes:

- T50 tank containers for liquefied gas
- Rail tank wagons
- U.S. tank trucks
- IBCs and small capacity tanks
- Steam-heating systems for tanks
- Hygienic service
- Food grade for liquid flow

Please contact us for more information about these valves.

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1½” BSP Uniact Relief Valve - Pressure Only

Part No: 47/1XXX00AGZ - Metric Setting



Specification

Nominal size
DN40

Tank connection
1½” BSP

Set pressure
From 0.05 Bar to 4.50 Bar

Properties
With cowl and gauze

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt
Tank seal: CNAF

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	0.8 Kg
Design Pressure (MAWP):	4.5 Bar
Test Pressure:	7 Bar

For more Design Conditions, please contact Fort Vale and refer to the parts drawing.

Range

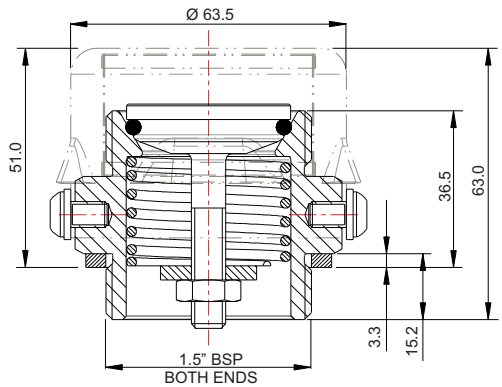
Description	Part No.
1½" BSP standard valve	47/XXXX00A
1½” BSP with cowl	47/XXXX00AC
1½” BSP with cowl and gauze	47/XXXX00AGZ
1½” BSP, alloy C276 contact parts	47H/XXXX00AX
1½” BSP with PTFE tank seal	47V/XXXX00AX
50mm DIN11851 connection	47M/XXXX00AX

NOTE: The valve specification changes the part no.

Related Parts

Description	Part No.
1½” weld-in socket	600/1010
50mm DIN11851 weld-in socket	176/2660
50mm DIN11851 fitting nut	176/2670
Installation C spanner	400/3000

Section View



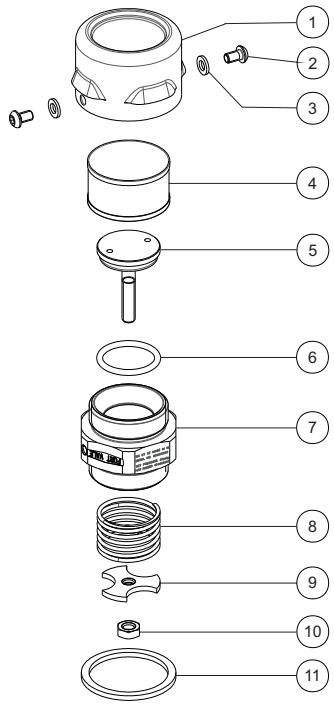
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1½” BSP Uniact Relief Valve - Pressure Only

Part No: 47/1XXX00AGZ - Metric Setting

Parts Drawing



Parts List

Item	Description	Part No.
1	Cap	10217/1
2	M6 button screw (2)	5111-611
3	M6 spring washer (2)	5113-008
4	Gauze ring	10204
5	Poppet	10983V
6	Pressure O ring	Refer to Table 1
7	Body	10213
8	Spring	Refer to Table 2
9	Spring pad	10215
10	M8 half nut	5112-004
11	CNAF tank seal	5005-011

Table 1

O Ring Material	Part No.
Fortyt	5005-108H
High-temp. Fortyt	5005-108HPFA

Table 2

Std. Pressure Setting	Pressure Spring Part No.
2.05 Bar	5104-630

Available settings: 0.05 Bar to 4.50 Bar

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1½” BSP Uniact Relief Valve - Vacuum Only

Part No: 47/1000XXAGZ - Metric Setting



Specification

Nominal size
DN40

Tank connection
1½” BSP

Set vacuum
From 2 kPa to 88 kPa

Properties
With cowl and gauze

Materials
Contact parts: 316 stainless steel
Vacuum O ring: Fortyt
Tank seal: CNAF

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	0.8 Kg
Design Pressure (MAWP):	4.5 Bar
Test Pressure:	7 Bar

For more Design Conditions, please contact Fort Vale and refer to the parts drawing.

Range

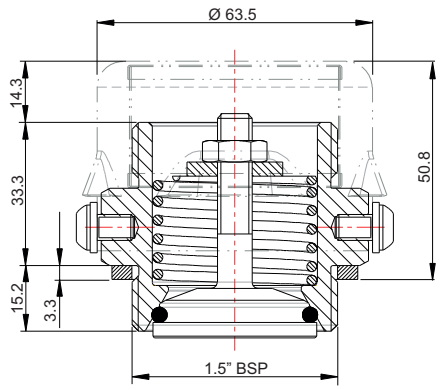
Description	Part No.
1½" BSP standard valve	47/X000XXA
1½” BSP with cowl	47/X000XXAC
1½” BSP with cowl and gauze	47/X000XXAGZ
1½” BSP with vent button	47/X000XXVBA
1½” BSP, alloy C276 contact parts	47H/X000XXAX
1½” BSP with PTFE tank seal	47V/X000XXAX
50mm DIN11851 connection	47M/X000XXAX

NOTE: The valve specification changes the part no.

Related Parts

Description	Part No.
1½” weld-in socket	600/1010
50mm DIN11851 weld-in socket	176/2660
50mm DIN11851 fitting nut	176/2670
Installation C spanner	400/3000

Section View



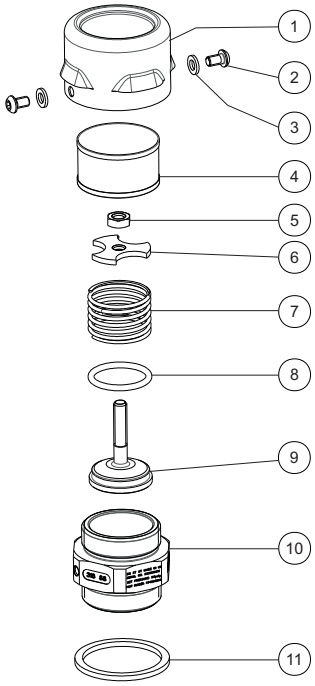
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1½” BSP Uniact Relief Valve - Vacuum Only

Part No: 47/1000XXAGZ - Metric Setting

Parts Drawing



Parts List

Item	Description	Part No.
1	Cap	10217/1
2	M6 button screw (2)	5111-611
3	M6 spring washer (2)	5113-008
4	Gauze ring	10204
5	M8 half nut	5112-004
6	Spring pad	10215
7	Spring	Refer to Table 1
8	Vacuum O ring	Refer to Table 2
9	Poppet	10983V
10	Body	10213VO
11	CNAF gasket	5005-011

Table 1

Std. Vacuum Settings	Vacuum Spring Part No.
3 kPa	5104-601
20 kPa	5104-605

Available settings: 2 kPa to 88 kPa

Table 2

O Ring Material	Part No.
Fortyt	5005-108H
High-temp. Fortyt	5005-108HPFA

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Function

A relief valve is installed in the vapour space of a tank. It vents to protect the tank from accidental over-pressure or unwanted vacuum conditions. Twinact relief valves are pre-set to give protection against pressure only or against pressure and vacuum.

We offer a range of relief valves for different service conditions and flow requirements. Contact us for more information.

Design Options

The design options below are available on our standard range of Twinact relief valves.

Tank Connection

Threaded: 1½" BSP, 2½" BSP

Special service conditions:
Threaded: 1¼" BSP
DIN11851: 50mm, 80mm



Tank Seal

1½": CNAF

2½": Rubber/PTFE

Special service conditions:
Other materials are available

Nominal Bore

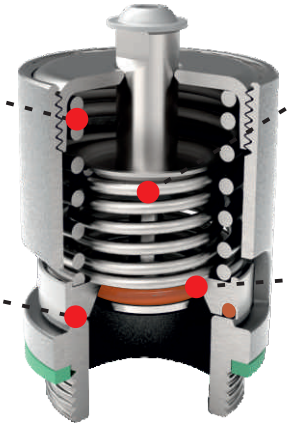
40mm (1½")

65mm (2½")

Special service conditions:
32mm (1¼")

Pressure Setting

From 0.05 Bar to 4.5 Bar



Vacuum Setting

From 1 kPa to 98 kPa

Pressure Seal

Fortyt

Special service conditions:
A range of seal materials is available

Vacuum Seal

Fortyt

Special service conditions:
A range of seal materials is available

Valve Materials

316 stainless steel

Special service conditions:
Wetted parts in high-nickel alloys



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Related Parts

We recommend our range of compatible accessories:

- Flame arrester
- Weld-in sockets
- Flanges - weld-in and adaptor
- Gaskets

Please contact us for more information about these parts.

Relief Valves for Dedicated Service

We offer a range of relief valves for these service conditions and special cargoes:

- T50 tank containers for liquefied gas
- Rail tank wagons
- U.S. tank trucks
- IBCs and small capacity tanks
- Steam-heating systems for tanks
- Hygienic service
- Food grade for liquid flow

Please contact us for more information about these valves.

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1½” BSP MK2 Twinact Relief Valve - Pressure Only

Part No: 3A/XXXX00 - Metric Setting



Specification

Nominal size
DN40

Tank connection
1½” BSP

Set pressure
From 0.05 Bar to 4.5 Bar

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt (Fig.1) or Viton (Fig.2)
Vacuum O ring: Fortyt (Fig.1) or Viton (Fig.2)
Tank seal: Rubber/PTFE envelope

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 0.84 Kg

For more Design Conditions, please contact Fort Vale and refer to the parts drawing.

WARNING: If you install an approved relief valve accessory item, e.g. a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity will give sufficient protection to your vessel/system. Please refer to Fort Vale for more information.

Range

Description	Part No.
Standard valve - pressure/vacuum	3A/XXXXXX
Standard valve - pressure only	3A/XXXX00

NOTE: The valve specification changes the Part No.

Related Parts

Description	Part No.
1½” BSP weld-in socket	600/1010
1½” flame arrester ***Warning**	200/5000
PTFE tank seal	5005-012
Installation C spanner	400/3000

Section View

NOTE: The pressure plate is different for a Fortyt pressure O ring (Figure 1) and a Viton pressure O ring (Figure 2)

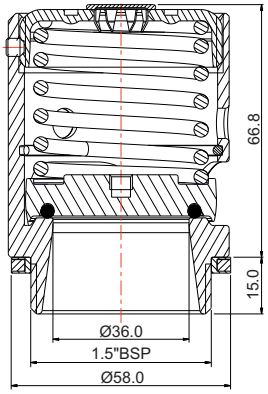


Figure 1. Valve with a Fortyt pressure O ring

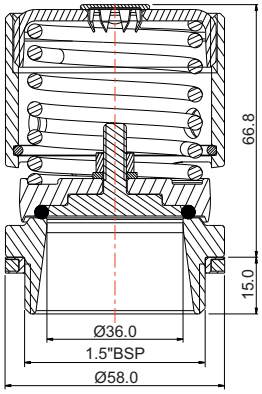


Figure 2. Valve with a Viton pressure O ring

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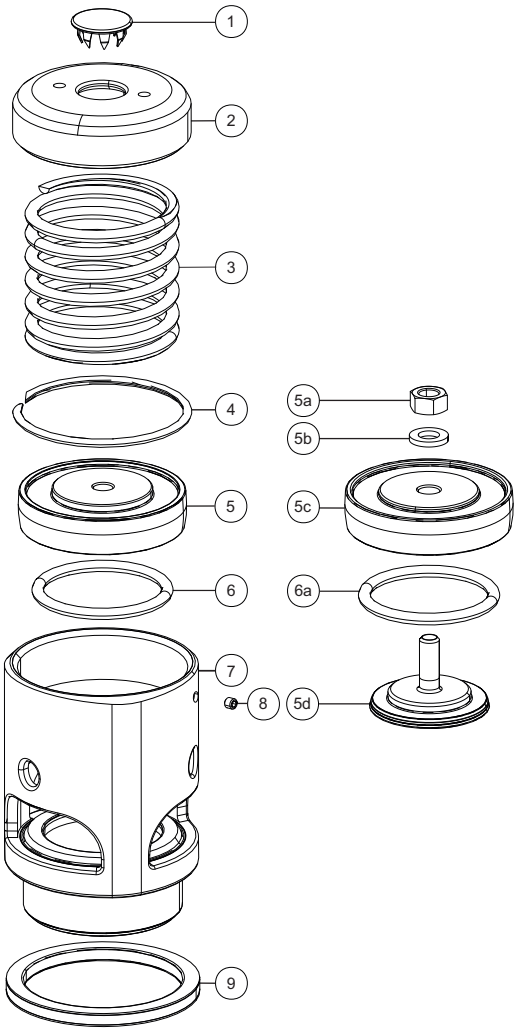
1½” BSP MK2 Twinact Relief Valve - Pressure Only

Part No: 3A/XXXX00 - Metric Setting

Parts Drawing

Figure 1: Fortyt pressure plate/O ring

Figure 2: Viton pressure plate/O ring



Parts List

Item	Description	Part No.
1	Stainless steel plug	10978
2	Top cap	11004
3	Pressure spring	Refer to Table 1
4	Retaining ring clip	5120-070
5	Pressure plate for a Fortyt O ring *Note	175/X124 Refer to Table 2
5a-d	Composite pressure plate for a Viton O ring	110/0100X Refer to Table 3
6/6a	Pressure O ring *Note	Refer to Table 4
7	Body	11300
8	Anti-tamper screw	5121-001
9	Rubber/PTFE gasket	5005-006

NOTE: You will need special tools to install a Fortyt O ring into a pressure plate. We recommend that you order a pressure plate/O ring assembly. Refer to Table 2.

Table 1

Std. Pressure Setting	Pressure Spring Part No.
0.2 Bar	5104-0026
2 Bar	5104-0041

Available settings: 0.05 to 4.5 Bar

Table 2 - Refer to Note

O Ring Material	Pressure Plate Part No.	Pressure Plate/O Ring Assembly Part No.
Fortyt	175/0124	175/F124

Table 3

Item	Description	Part No.
5a	M6 full nut	5112-012
5b	M6 spring washer	5113-008
5c	Outer pressure plate	110/0100/1
5d	Inner pressure plate	110/0100/2

Table 4 - Refer to Note

Item	O Ring Material	Part No.
6	Fortyt	ORM0340400F0
6a	Viton	ORB220VR

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1½” BSP MK2 Twinact Relief Valve - Pressure/Vacuum

Part No: 3A/XXXXXX - Metric Settings



Specification

Nominal size
DN40

Tank connection
1½” BSP

Set pressure
From 0.05 Bar to 4.5 Bar

Set vacuum
From 1 kPa to 98 kPa

Properties
With manual vent button

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt (Fig.1) or Viton (Fig.2)
Vacuum O ring: Fortyt (Fig.1) or Viton (Fig.2)
Tank seal: Rubber/PTFE envelope

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 0.78 Kg

For more Design Conditions, please contact Fort Vale and refer to the parts drawing.

WARNING: If you install an approved relief valve accessory item, e.g. a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity will give sufficient protection to your vessel/system. Please refer to Fort Vale for more information.

Range

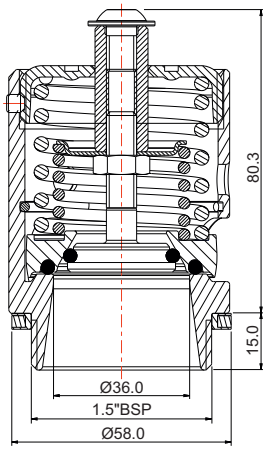
Description	Part No.
Standard valve - pressure/vacuum	3A/XXXXXX
Standard valve - pressure only	3A/XXXX00

NOTE: The valve specification changes the Part No.

Related Parts

Description	Part No.
1½” BSP weld-in socket	600/1010
1½” flame arrester ***Warning**	200/5000
PTFE tank seal	5005-012
Installation C spanner	400/3000

Section View



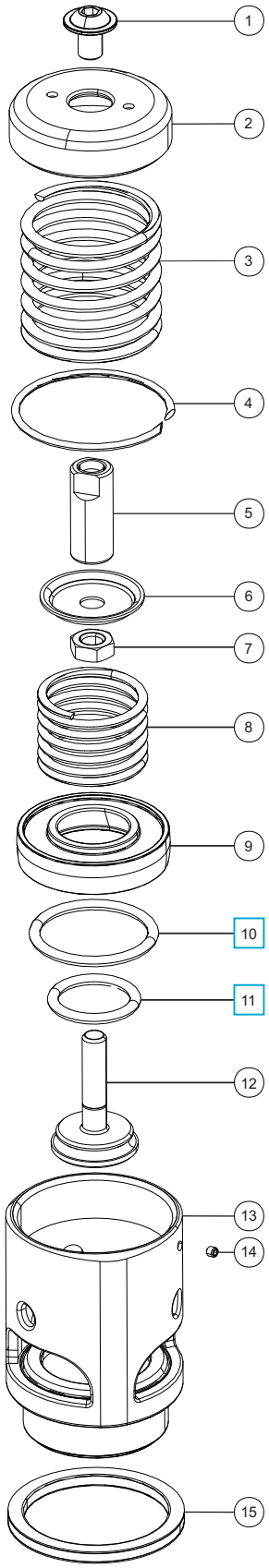
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1½” BSP MK2 Twinact Relief Valve - Pressure/Vacuum

Part No: 3A/XXXXXX - Metric Settings

Parts Drawing



Parts List

Item	Description	Part No.
1	Flanged button screw	5111-9812
2	Top cap	11004
3	Pressure spring	Refer to Table 1
4	Retaining ring clip	5120-070
5	Spring stem	10984
6	Spring pad	11006
7	M8 half nut	5112-004
8	Vacuum spring	Refer to Table 2
9	Pressure plate *Note	Refer to Table 3
10	Pressure O ring *Note	Refer to Table 4 ☐
11	Vacuum O ring	Refer to Table 4 ☐
12	Vacuum poppet	11003
13	Body	11300
14	Anti-tamper screw	5121-001
15	Rubber/PTFE gasket	5005-006

NOTE: You will need special tools to install an O ring into a pressure plate. We recommend that you order a pressure plate/O ring assembly. Refer to Table 3.

Table 1

Std. Pressure Setting	Pressure Spring Part No.
0.2 Bar	5104-0026
2 Bar	5104-0041

Available settings: 0.05 to 4.5 Bar

Table 2

Std. Vacuum Setting	Vacuum Spring Part No.
2 kPa	5104-760
3 kPa	5104-761
10 kPa	5104-765

Available settings: 1 to 99 kPa

Table 3 - Refer to Note

O Ring Material	Pressure Plate Part No.	Pressure Plate/O Ring Assembly Part No.
Fortyt	175/0125	175/F125
Viton	175/0125	175/V125

Table 4 - Refer to Note

O Ring Material	Pressure O Ring Part No.	Vacuum O Ring Part No.
Fortyt	ORM0340400F0	5005-114
Viton	ORM0340400VR	5005-112

Seal Kit - All parts marked ☐ in the Parts List

Seal Material	Part No.
Fortyt	3A/1PVSK
Viton	3A/0PVSK

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1½” Twinact Relief Valve 50mm DIN11851 - Pressure/Vacuum

Part No: 3M/1XXXX



Specification

Nominal size
DN40

Tank connection
50mm DIN11851

Set pressure
From 1 PSI to 64 PSI (0.07 Bar to 4.41 Bar)

Set vacuum
From 0.5"Hg to 28"Hg (0.02 Bar to 0.94 Bar)

Properties
With manual vent button

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt
Vacuum O ring: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 0.94 Kg

Seal Temperature Range:

Material	Min.Temp.°C	Max.Temp.°C
Fortyt	-55	200
Viton	-20	200

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

WARNING: If you install an approved relief valve ancillary item, such as a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity of the relief valve and ancillary item will give sufficient protection to your vessel/system. Refer to Fort Vale for more information.

Range

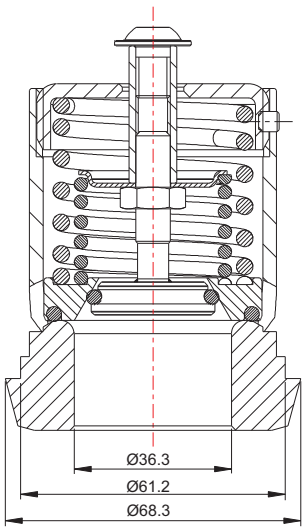
Description	Part No.
Standard valve - pressure/vacuum	3M/1XXXX
Standard valve - pressure only	3M/1XX00

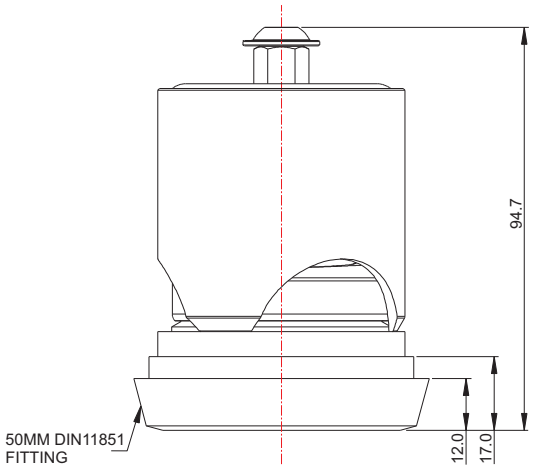
NOTE: The valve specification changes the Part No.

Related Parts

Description	Part No.
50mm DIN11851 weld-in socket	176/2660
50mm DIN11851 slotted nut	176/2670
50mm DIN11851 silicone seal	176/2675S
1½” clamped flame arrester ***Warning**	200/5000
Installation C spanner	400/3000

Section View





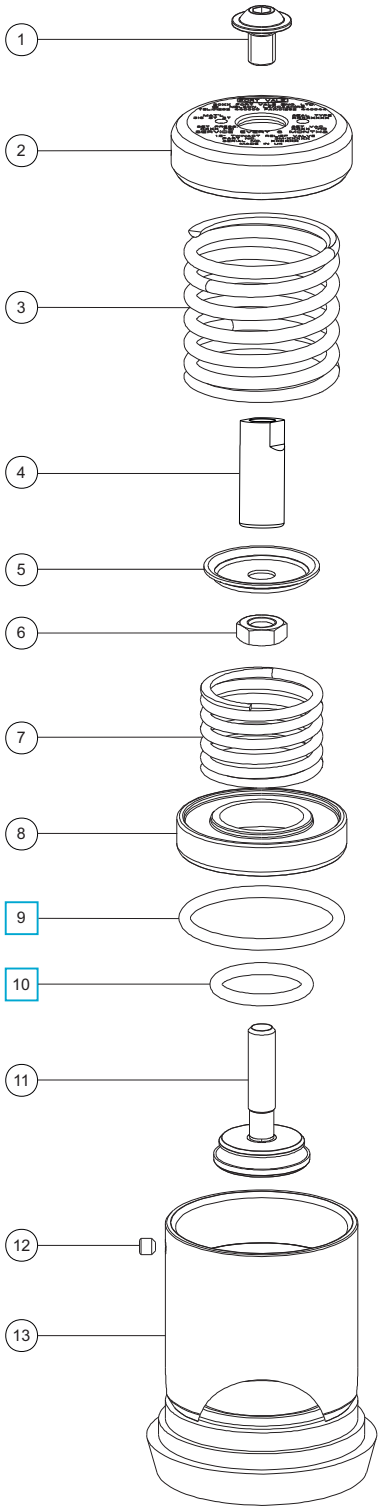
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1½” Twinact Relief Valve 50mm DIN11851 - Pressure/Vacuum

Part No: 3M/1XXXX

Parts Drawing



Parts List

Item	Description	Part No.
1	Flanged button screw	5111-9812
2	Top cap	11004
3	Pressure spring	Refer to Table1
4	Spring stem	10984
5	Spring pad	11006XX
6	M8 half nut	5112-004
7	Vacuum spring	Refer to Table 2
8	Pressure plate *Note	Refer to Table 3
9	Pressure O ring *Note	Refer to Table 3 ☐
10	Vacuum O ring	Refer to Table 4 ☐
11	Vacuum poppet	11003
12	Anti-tamper screw	5121-001
13	Body	10990

NOTE: You will need special tools to install a pressure O ring into a pressure plate. We recommend that you order a pressure plate/O ring assembly. Refer to Table 3.

Table 1

Std. Pressure Settings	Pressure Spring Part No.
3 PSI (0.21 Bar)	5104-703
29 to 32 PSI (2.0 to 2.21 Bar)	5104-730

Pressure springs are available from 1 PSI (0.07 Bar) to 64 PSI (4.41 Bar)

Table 2

Std. Vacuum Setting	Vacuum Spring Part No.
0.5"Hg (0.02 Bar)	5104-760
1"Hg (0.03 Bar)	5104-761
3"Hg (0.10 Bar)	5104-765

Vacuum springs are available from 0.5"Hg (0.02 Bar) to 28"Hg (0.94 Bar)

Table 3

Seal Material	Pressure O Ring	Pressure Plate	Pressure Plate/ O Ring Assembly
Fortyt	5005-118	11002XX	11002F
Viton	5005-110	11002XX	11002V

Table 4

Seal Material	Vacuum O Ring
Fortyt	5005-114
Viton	5005-112

Seal Kit

All parts marked ☐ in the Parts List

Seal Material	Part No.
Fortyt	30/1PVSK
Viton	30/0PVSK

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2½” BSP MK2 Twinact Relief Valve - Pressure Only

Part No: 2A/XXXX00 - Metric Setting



Specification

Nominal size
DN65

Tank connection
2½” BSP

Set pressure
From 0.05 Bar to 4.5 Bar

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt (Fig.1) or Viton (Fig.2)
Vacuum O ring: Fortyt (Fig.1) or Viton (Fig.2)
Tank seal: Rubber/PTFE envelope

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 1.54 Kg

For more Design Conditions, please contact Fort Vale and refer to the parts drawing.

WARNING: If you install an approved relief valve accessory item, e.g. a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity will give sufficient protection to your vessel/system. Please refer to Fort Vale for more information.

Range

Description	Part No.
Standard valve - pressure/vacuum	2A/XXXXXX
Standard valve - pressure only	2A/XXXX00

NOTE: The valve specification changes the Part No.

Related Parts

Description	Part No.
2½” BSP weld-in socket	600/1000
Tank weld-in flange	176/3150
2½” flame arrester ***Warning**	130/5000
CNAF tank seal	5005-026
Installation C spanner	400/3000

Section View

NOTE: The pressure plate is different for a Fortyt pressure O ring (Figure 1) and a Viton pressure O ring (Figure 2)

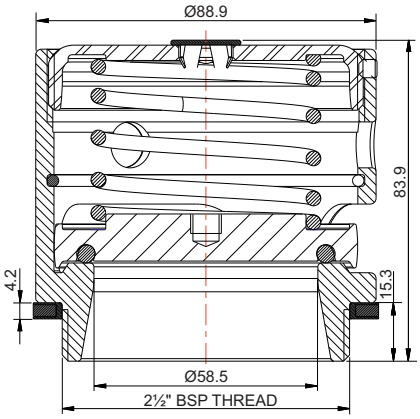


Figure 1. Valve with a Fortyt pressure O ring

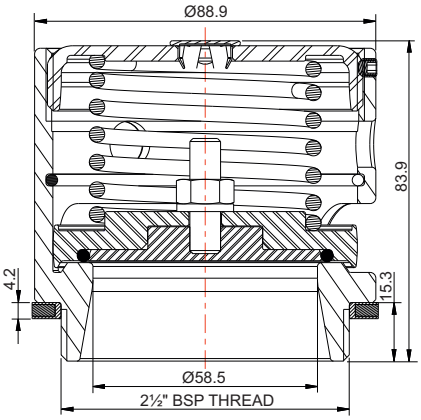


Figure 2. Valve with a Viton pressure O ring

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2½” BSP MK2 Twinact Relief Valve - Pressure Only

Part No: 2A/XXXX00 - Metric Setting

Parts Drawing

Figure 1: Fortyt pressure plate/O ring

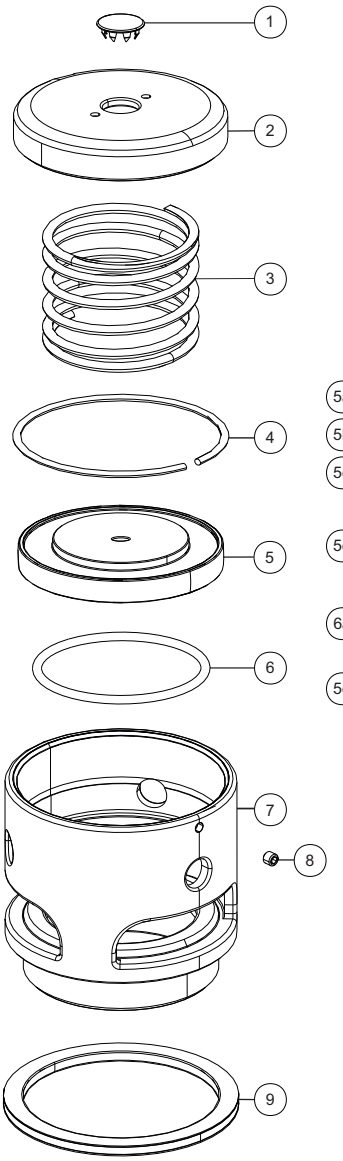
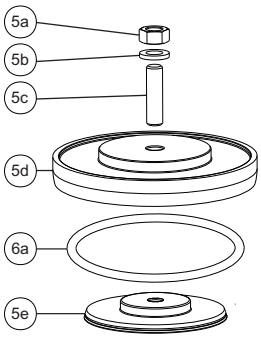


Figure 2: Viton pressure plate/O ring



Parts List

Item	Description	Part No.
1	Stainless steel plug	10978
2	Top cap	10967/1
3	Pressure spring	Refer to Table 1
4	Retaining ring clip	5120-071
5	Pressure plate for a Fortyt O ring *Note	175/X116 Refer to Table 2
5a-e	Composite pressure plate for a Viton O ring	175/X114 Refer to Table 3
6/6a	Pressure O ring *Note	Refer to Table 4
7	Body	10951/1
8	Anti-tamper screw	5121-001
9	Rubber/PTFE gasket	5005-046

NOTE: You will need special tools to install a Fortyt O ring into a pressure plate. We recommend that you order a pressure plate/O ring assembly. Refer to Table 2.

Table 1

Std. Pressure Setting	Pressure Spring Part No.
2 Bar	5104-0020

Available settings: 0.05 to 4.5 Bar

Table 2 - Refer to Note

O Ring Material	Pressure Plate Part No.	Pressure Plate/O Ring Assembly Part No.
Fortyt	175/0116	175/F116

Table 3

Item	Description	Part No.
5a	M8 full nut	5112-001
5b	M8 spring washer	5113-003
5c	M8 stud	11426
5d	Outer pressure plate	175/0114/1
5e	Inner pressure plate	175/0114/2

Table 4 - Refer to Note

Item	O Ring Material	Part No.
6	Fortyt	ORB330F0
6a	Viton	5005-313

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2½” BSP MK2 Twinact Relief Valve - Pressure/Vacuum

Part No: 2A/XXXXXX - Metric Settings



Specification

Nominal size
DN65

Tank connection
2½” BSP

Set pressure
From 0.05 Bar to 4.5 Bar

Set vacuum
From 1 kPa to 98 kPa

Properties
With manual vent button

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt (Fig.1) or Viton (Fig.2)
Vacuum O ring: Fortyt (Fig.1) or Viton (Fig.2)
Tank seal: Rubber/PTFE envelope

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 1.59 Kg

For more Design Conditions, please contact Fort Vale and refer to the parts drawing.

WARNING: If you install an approved relief valve accessory item, e.g. a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity will give sufficient protection to your vessel/system. Please refer to Fort Vale for more information.

Range

Description	Part No.
Standard valve - pressure/vacuum	2A/XXXXXX
Standard valve - pressure only	2A/XXXX00

NOTE: The valve specification changes the Part No.

Related Parts

Description	Part No.
2½” BSP weld-in socket	600/1000
Tank weld-in flange	176/3150
2½” flame arrester ***Warning**	130/5000
CNAF tank seal	5005-026
Installation C spanner	400/3000

Section View

NOTE: The pressure plate is different for a Fortyt pressure O ring (Figure 1) and a Viton pressure O ring (Figure 2)

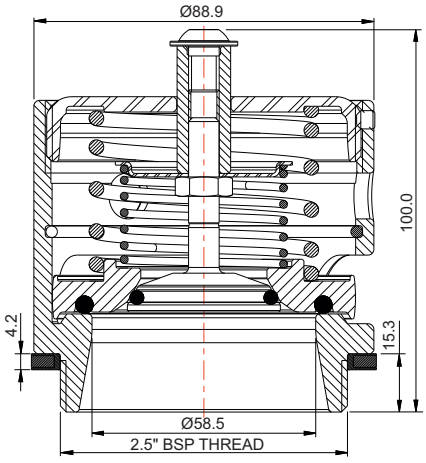


Figure 1. Valve with a Fortyt pressure O ring

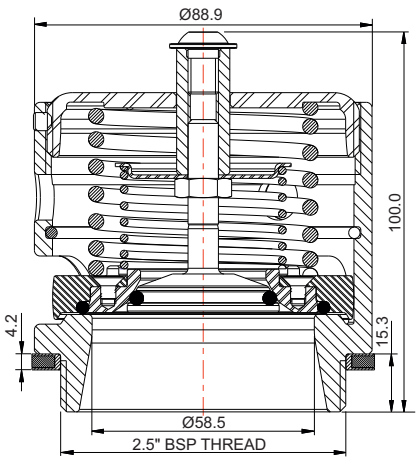


Figure 2. Valve with a Viton pressure O ring

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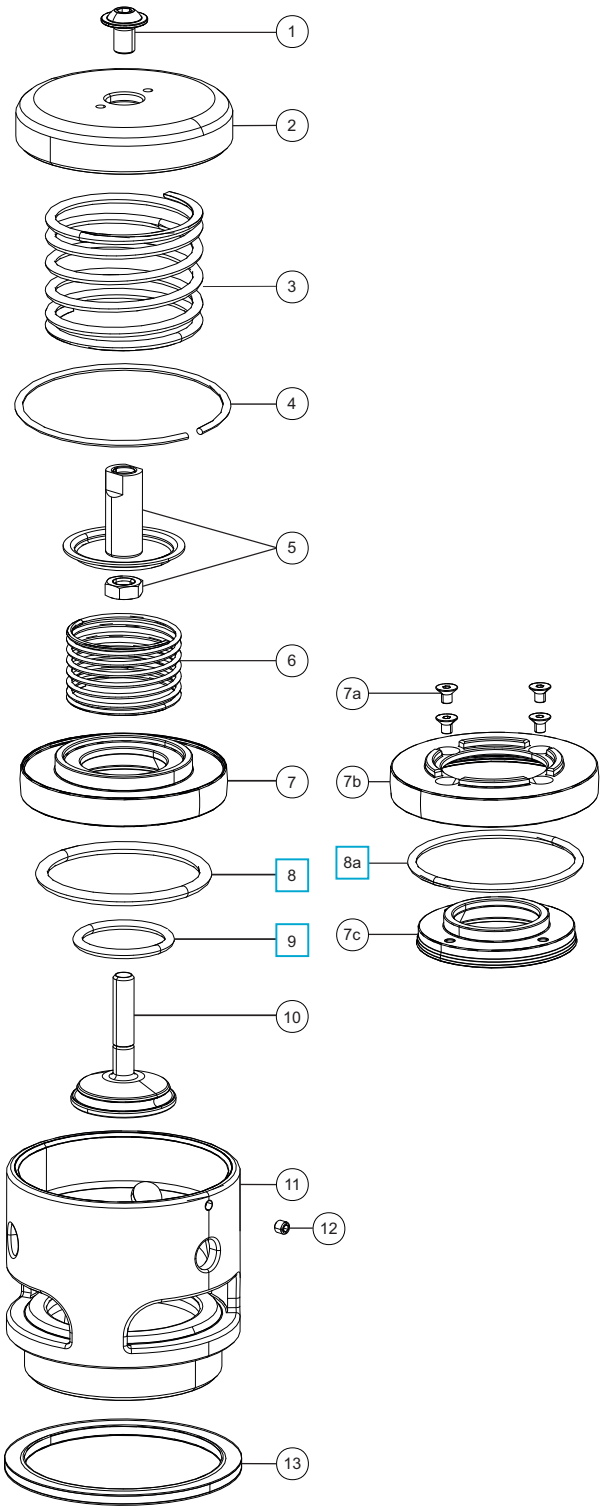
2½" BSP MK2 Twinact Relief Valve - Pressure/Vacuum

Part No: 2A/XXXXXX - Metric Settings

Parts Drawing

Figure 1: Fortyt pressure plate/O ring

Figure 2: Viton pressure plate/O ring



Parts List

Item	Description	Part No.
1	Flanged button screw	5111-9812
2	Top cap	10967/1
3	Pressure spring	Refer to Table 1
4	Retaining ring clip	5120-071
5	Spring pad assembly	130/0010
6	Vacuum spring	Refer to Table 2
7	Pressure plate for a Fortyt O ring *Note	Refer to Table 3
7a-c	Pressure plate for a Viton O ring	175/X260 Refer to Table 4
8/8a	Pressure O ring *Note	Refer to Table 5 □
9	Vacuum O ring	Refer to Table 5 □
10	Vacuum poppet	10983V
11	Body	10951/1
12	Anti-tamper screw	5121-001
13	Rubber/PTFE gasket	5005-046

NOTE: You will need special tools to install a Fortyt O ring into a pressure plate. We recommend that you order a pressure plate/O ring assembly. Refer to Table 3.

Table 1

Std. Pressure Setting	Pressure Spring Part No.
2 Bar	5104-0020

Available settings: 0.05 to 4.5 Bar

Table 2

Std. Vacuum Setting	Vacuum Spring Part No.
2 kPa	5104-560
3 kPa	5104-561
10 kPa	5104-563

Available settings: 1 to 99 kPa

Table 3 - Refer to Note

O Ring Material	Pressure Plate Part No.	Pressure Plate/O Ring Assembly Part No.
Fortyt	175/0117	175/F117

Table 4

Item	Description	Part No.
7a	M4 countersunk screw (4)	5111-310
7b	Outer pressure plate	175/0260/1
7c	Inner pressure plate	175/0260/2

Seal Kit - All parts marked □ in the Parts List

Seal Material	Part No.
Fortyt	2A/1PVSK
Viton	2A/0PVSK

Table 5 - Refer to Note

Item	O Ring Material	Pressure O Ring Part No.	Vacuum O Ring Part No.
8	Fortyt *Note	ORB330F0	5005-108H
8a	Viton	5005-313	5005-107

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2½” Twinact Relief Valve - 80mm DIN11851, Pressure/Vacuum

Part No: 2M/1XXXX



Specification

Nominal size
DN65

Tank connection
80mm DIN11851

Set pressure
From 1 PSI to 63 PSI (0.07 Bar to 4.34 Bar)

Set vacuum
From 0.5"Hg to 28"Hg (0.02 Bar to 0.94 Bar)

Properties
With manual vent button

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt
Vacuum O ring: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 1.84 Kg

Seal Temperature Range

Material	Min.Temp.°C	Max.Temp.°C
Fortyt	-55	200
Viton	-20	200

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

WARNING: If you install an approved relief valve ancillary item, such as a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity of the relief valve and ancillary item will give sufficient protection to your vessel/system. Refer to Fort Vale for more information.

Range

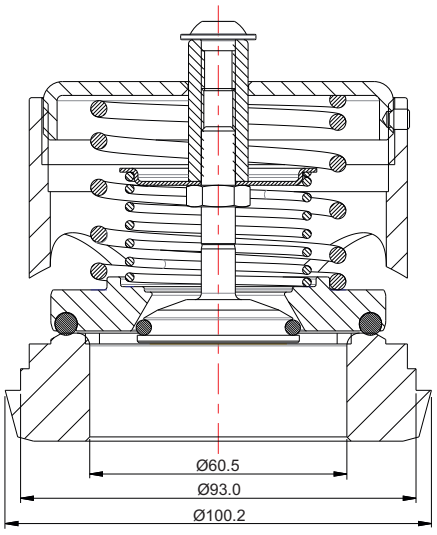
Description	Part No.
Standard valve - pressure/vacuum	2M/1XXXX
Standard valve - pressure only	2M/1XX00

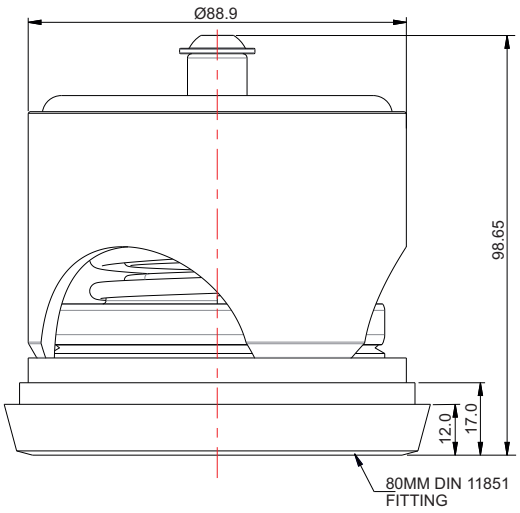
NOTE: The valve specification changes the Part No.

Related Parts

Description	Part No.
80mm DIN11851 weld-in socket	176/2550
80mm DIN11851 fitting nut	176/2650
Silicone seal for DIN11851 socket	176/2685S
2½” flame arrester ***Warning**	130/5000
Installation C spanner	400/3000

Section View





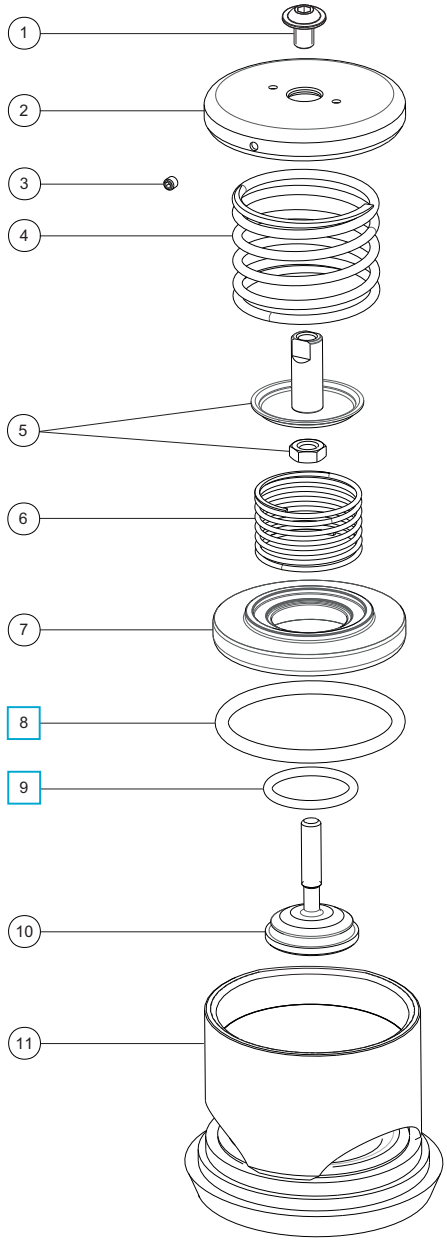
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2½” Twinact Relief Valve - 80mm DIN11851, Pressure/Vacuum

Part No: 2M/1XXXX

Parts Drawing



Parts List

Item	Description	Part No.
1	Flanged button screw	5111-9812
2	Top cap	10967/1
3	Anti-tamper screw	5121-001
4	Pressure spring	Refer to Table 1
5	Spring pad assembly	130/0010
6	Vacuum spring	Refer to Table 2
7	Pressure plate *Note	Refer to Table 3
8	Pressure O ring *Note	Refer to Table 3 ☐
9	Vacuum O ring	Refer to Table 4 ☐
10	Vacuum poppet	10983V
11	Body	11021

NOTE: You will need special tools to install a pressure O ring into a pressure plate. We recommend that you order a pressure plate/O ring assembly. Refer to Table 3.

Table 1

Std. Pressure Setting	Pressure Spring Part No.
28 to 30 PSI (1.93 to 2.07 Bar)	5104-529

Pressure springs are available from 1 PSI (0.07 Bar) to 63 PSI (4.34 Bar)

Table 2

Std. Vacuum Setting	Vacuum Spring Part No.
0.5"Hg (0.02 Bar)	5104-560
1"Hg (0.03 Bar)	5104-561
3"Hg (0.10 Bar)	5104-563

Vacuum springs are available from 0.5"Hg (0.02 Bar) to 28"Hg (0.94 Bar)

Table 3

Material	Pressure O Ring	Pressure Plate	Pressure Plate/ O Ring Assembly
Fortyt	5005-101	175/0061	175/0061F
Viton	5005-102	175/0031	175/0031V

Table 4

Material	Vacuum O Ring
Fortyt	5005-108H
Viton	5005-107

Seal Kit

All parts marked ☐ in the Parts List

Seal Material	Part No.
Fortyt	20/1PVSK
Viton	20/0PVSK

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Function

A Super Maxi or Hyper Maxi is a spring-loaded relief valve which is installed in the vapour space of a tank. It is pre-set to be compatible with the service conditions and it vents to protect the tank from accidental over-pressure or unwanted vacuum conditions.

Super Maxi & Hyper Maxi relief valves have a high flow performance to prevent the catastrophic failure of a tank. This type of valve is often used on tanks carrying hazardous cargo.

We offer a range of relief valves for different service conditions and flow requirements. Contact us for more information.

Design Options

The design options below are available on our standard range of Super Maxi & Hyper Maxi relief valves.

Tank Connection

2½" BSP

Flanged with holes or slots: a selection of drilling patterns is available

Special service conditions:
DIN11851: 80mm



Special Options

Manual vacuum vent button

Tank Seal

Rubber/PTFE - 2½" BSP only

Other materials are available

Nominal Bore

65mm: Super Maxi

82.5mm: Hyper Maxi

Special service conditions:
Tapered bore: 65mm to 80mm



Body

Standard body:
Super Maxi: ≤ 4.8 Bar
Hyper Maxi: ≤ 5.15 Bar

Extended body:
Super Maxi: ≥ 4.55 Bar
Hyper Maxi: ≥ 5.15 Bar

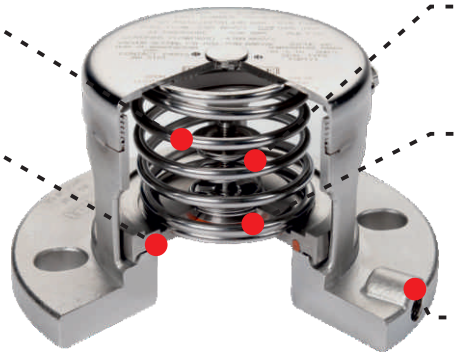
Pressure Setting

Super Maxi: 0.15 Bar to 16 Bar
Hyper Maxi: 0.15 Bar to 14.3 Bar

Pressure Seal

Fortyt

Special service conditions:
A range of seal materials is available



Vacuum Setting

From 2 kPa to 88 kPa

Vacuum Seal

Fortyt

Special service conditions:
A range of seal materials is available

Gauge Connection

Flanged valves only:
¼" BSP (standard)
¼" NPT (special)

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Design Options - continued

Valve Materials

316 stainless steel

Special service conditions:
Lined/coated wetted parts e.g. PFA

High nickel alloys



Related Parts

We recommend our range of compatible accessories:

- Flame arrester or gauzed cowl ***Note**
- Burst discs ***Note**
- Pressure gauges
- Flanges - weld-in and adaptor
- Weld-in sockets
- Gaskets
- Fasteners

NOTE: If you install an accessory item, e.g. a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased flow capacity will give sufficient protection to your vessel/system.

Please contact us for more information about these parts.

Relief Valves for Dedicated Service

We offer a range of relief valves for these service conditions and special cargoes:

- T50 tank containers for liquefied gas
- Rail tank wagons
- U.S. tank trucks
- IBCs and small capacity tanks
- Steam-heating systems for tanks
- Hygienic service
- Food grade for liquid flow

Please contact us for more information about these valves.

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2½” BSP Super Maxi Relief Valve - Pressure Only

Part No: 010/1XXX00 - Metric Setting



Specification

Nominal size
DN65

Tank connection
2½” BSP

Set pressure
From 0.15 Bar to 5.15 Bar

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt
Tank seal: Rubber/PTFE envelope

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	2.9 Kg
Design Pressure (MAWP):	5.2 Bar
Test Pressure:	10.1 Bar
Design Temperature Min:	-55°C
Design Temperature Max:	200°C

NOTE: The working temperature of the pressure O ring can change the design temperature limits. The Design Conditions and Section View dimensions are for the specified part number only.

Approval
Design Approval by Lloyds Register of Shipping

WARNING: If you install an approved relief valve accessory item, e.g. a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity will give sufficient protection to your vessel/system. Refer to Fort Vale for more information.

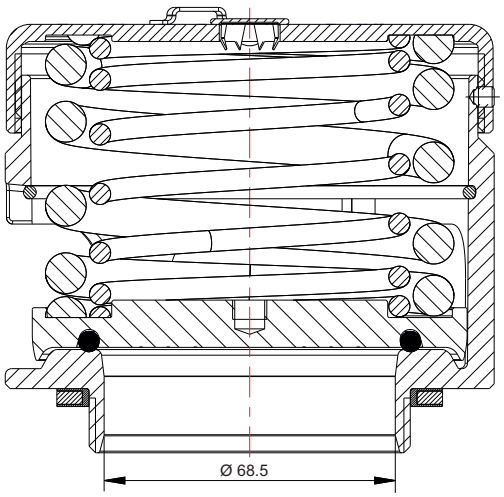
Range

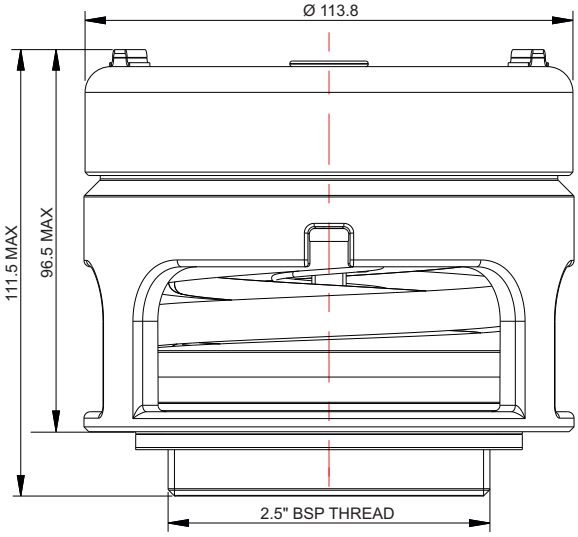
Standard Settings	Part No.
2.19 Bar	010/121900
3.31 Bar	010/133100
3.71 Bar	010/137100
4.40 Bar	010/144000

Related Parts

Description	Part No.
2½” BSP weld-in socket	600/1000
2½” BSP burst disc adaptor assembly	176/7020
Tank weld-in flange	176/3150
Burst disc adaptor flange	176/7001
65mm burst disc - refer to Fort Vale	862/XXXX
CNAF/PTFE gasket (adaptor flange)	5005-398
0-7 Bar pressure gauge, brass internal parts	921/07BBSP
0-7 Bar pressure gauge, stainless steel internal parts	920/07BBSP
Flame arrester ***Warning**	176/2900
Gauzed cowl ***Warning**	176/6000

Section View





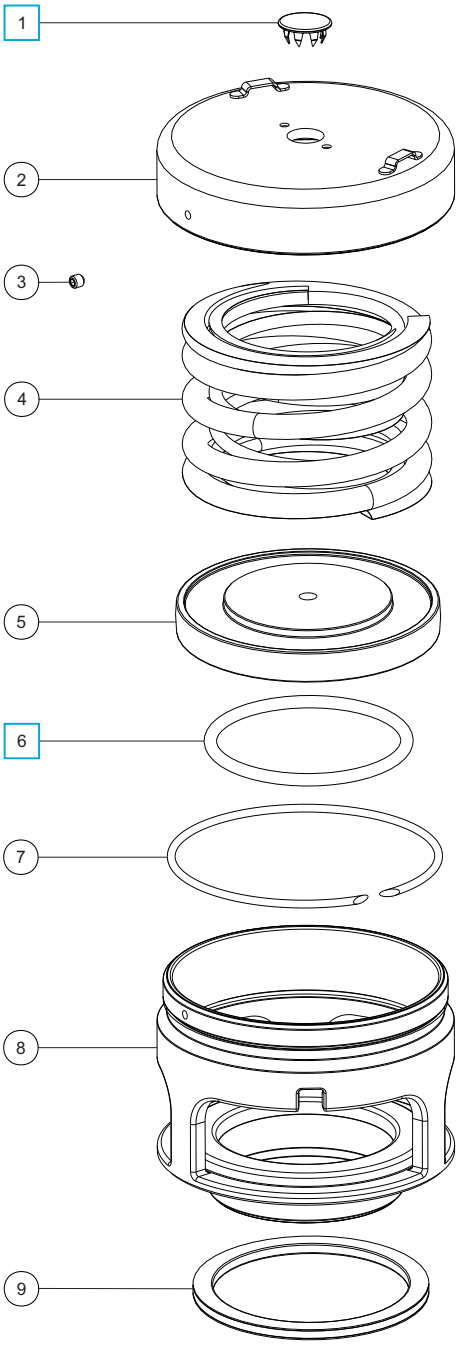
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2½” BSP Super Maxi Relief Valve - Pressure Only

Part No: 010/1XXX00 - Metric Setting

Parts Drawing



Parts List

Item	Description	Part No.	
1	Stainless steel plug	10978	☐
2	Cap ***Note**	1760/0005XX	
3	Anti-tamper screw	5121-001	
4	Pressure springs	Refer to Table 1	
5	Pressure plate ***Note**	1860/005XXX	
6	Fortyt pressure O ring	5005-101	☐
7	Retaining ring clip	5120-067	
8	Body	1860/0100	
9	Rubber/PTFE envelope seal	5005-046	

NOTE: The valve specification changes the Part No.

Table 1

Std. Pressure Settings	Pressure Spring Part No.
2.19 Bar	6104-0252
3.31 Bar	6104-0112 & 6104-0252
3.71 Bar	6104-0422 (Pair)
4.40 Bar	6104-0485 (Pair)

Pressure springs are available from 0.15 Bar to 5.15 Bar

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	000/1PSK

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2½” BSP Super Maxi Relief Valve - Pressure/Vacuum

Part No: 010/1XXXXX - Metric Setting



Specification

Nominal size
DN65

Tank connection
2½” BSP

Set pressure
From 0.15 Bar to 5.15 Bar

Set vacuum
From 1 kPa to 88 kPa

Materials
Contact parts: 316 stainless steel
Pressure O ring: Fortyt
Vacuum O ring: Fortyt
Tank seal: Rubber/PTFE envelope

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	2.9 Kg
Design Pressure (MAWP):	5.2 Bar
Test Pressure:	10.1 Bar
Design Temperature Min:	-55°C
Design Temperature Max:	200°C

NOTE: The working temperature of the pressure and vacuum O rings can change the design temperature limits. The Design Conditions and Section View dimensions are for the specified part number only.

Approval
Design Approval by Lloyds Register of Shipping

WARNING: If you install an approved relief valve accessory item, e.g. a flame arrester, cowl, burst disc or baffle, it will decrease the air flow capacity of the relief valve. Thus, you must calculate again to make sure that the decreased air flow capacity will give sufficient protection to your vessel/system. Refer to Fort Vale for more information.

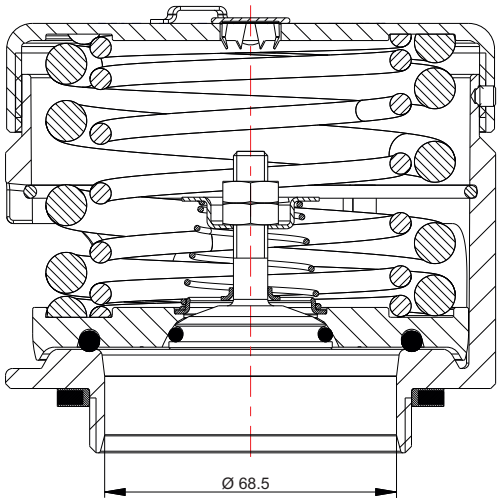
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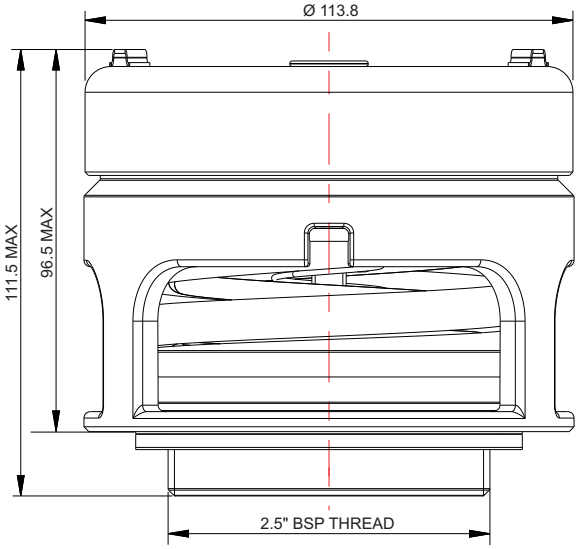
Standard Settings	Part No.
2.19 Bar & 21 kPa	010/121921
3.31 Bar & 21 kPa	010/133121
3.71 Bar & 21 kPa	010/137121
4.40 Bar & 21 kPa	010/144021

Related Parts

Description	Part No.
2½” BSP weld-in socket	600/1000
Tank weld-in flange	176/3150
CNAF/PTFE gasket (adaptor flange)	5005-398
0-7 Bar pressure gauge, brass internal parts	921/07BBSP
0-7 Bar pressure gauge, stainless steel internal parts	920/07BBSP
Flame arrester ***Warning**	176/2900
Gauzed cowl ***Warning**	176/6000

Section View





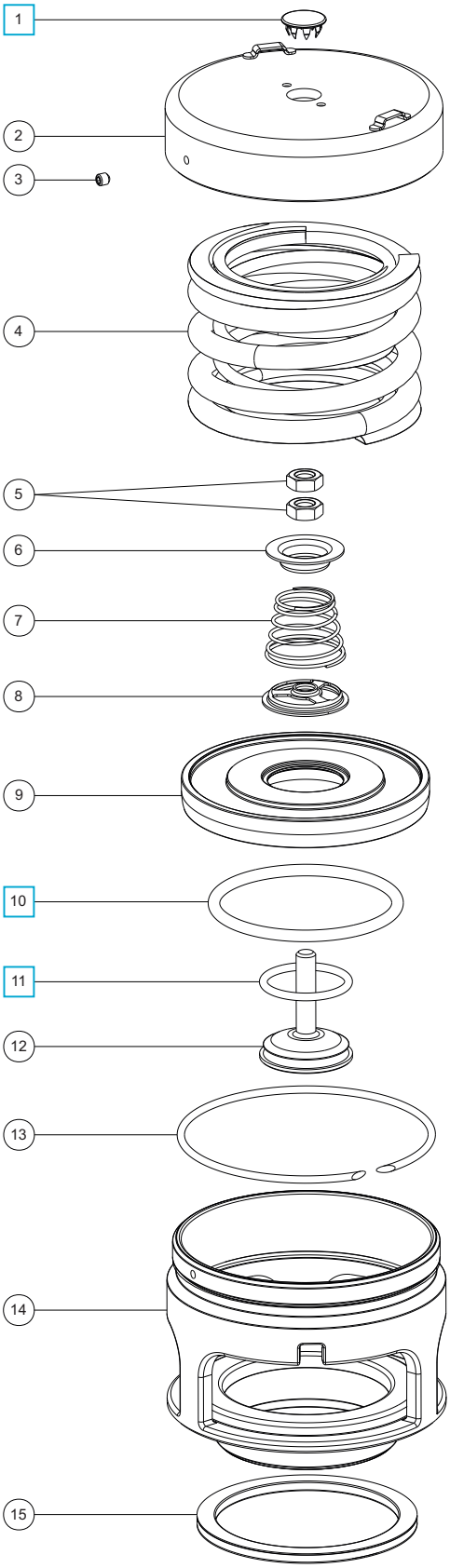
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2½” BSP Super Maxi Relief Valve - Pressure/Vacuum

Part No: 010/1XXXXX - Metric Setting

Parts Drawing



Parts List

Item	Description	Part No.	
1	Stainless steel plug	10978	☐
2	Cap ***Note**	1760/0005XX	
3	Anti-tamper screw	5121-001	
4	Pressure springs	Refer to Table 1	
5	M8 half nut (2)	5112-004	
6	Vacuum spring pad	1860/0005	
7	Vacuum spring	Refer to Table 2	
8	Spring pad	10986/3	
9	Pressure plate ***Note**	1860/005XXX	
10	Fortyt pressure O ring	5005-101	☐
11	Fortyt vacuum O ring	5005-108H	☐
12	Vacuum poppet	10983V/3	
13	Retaining ring clip	5120-067	
14	Body	1860/0100	
15	Rubber/PTFE envelope seal	5005-046	

NOTE: The valve specification changes the Part No.

Table 1

Std. Pressure Settings	Pressure Spring Part No.
2.19 Bar	6104-0252
3.31 Bar	6104-0112 & 6104-0252
3.71 Bar	6104-0422 (Pair)
4.40 Bar	6104-0485 (Pair)

Pressure springs are available from 0.15 Bar to 5.15 Bar

Table 2

Std. Vacuum Setting	Vacuum Spring Part No.
21 kPa	7104-012

Vacuum springs are available from 1 kPa to 88 kPa

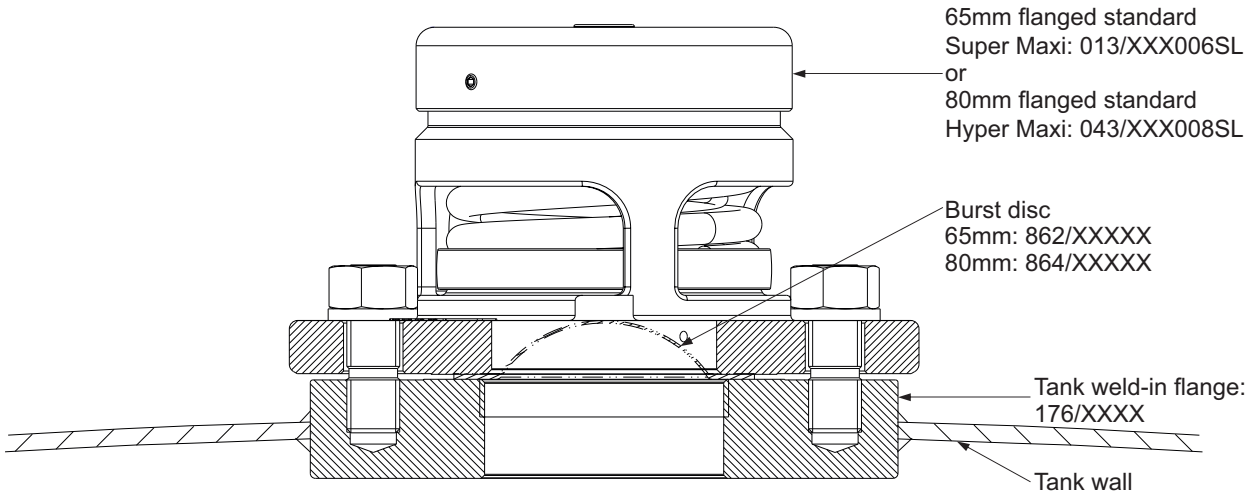
Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	000/1PVSK

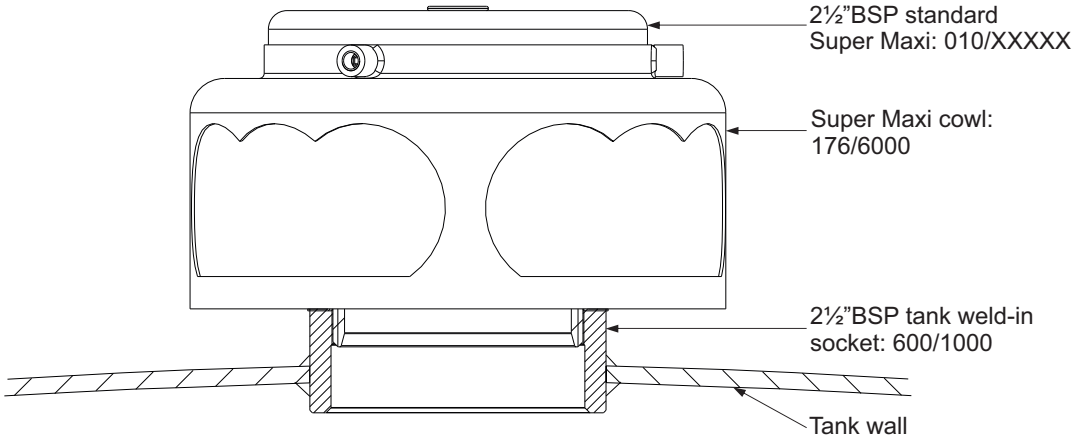
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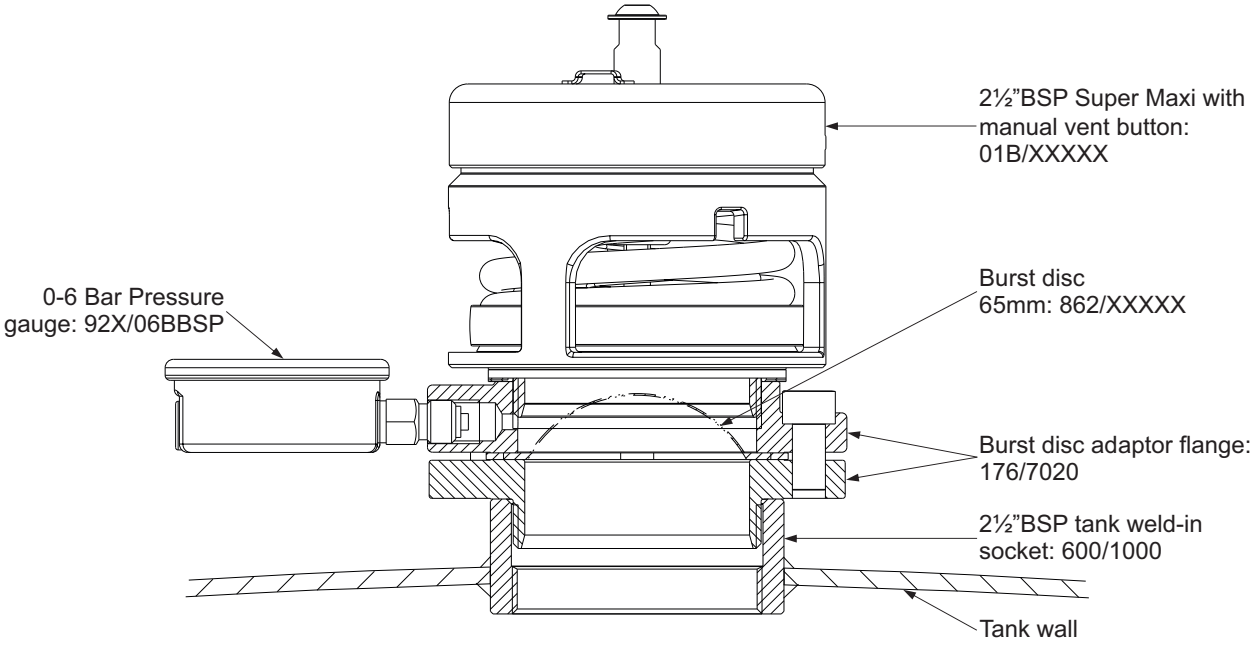
Flanged Super Maxi/Hyper Maxi relief valve with burst disc and tank weld-in flange



2½”BSP Super Maxi with weatherproof cowl and tank weld-in socket



2½”BSP Super Maxi with burst disc, pressure gauge, adaptor flange & weld-in socket



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Specification

Nominal sizes
65mm, 65mm XL, 80mm, 80mm XL, 89mm, 250mm

Disc options
Forward Acting: a cross-scored solid metal disc

Forward Composite: a multi-layered disc for burst settings of less than 3.67 Bar

Reverse Acting: compatible with gas service

WARNING: If you install a burst disc, it will decrease the air flow capacity of the relief valve. Thus, you must calculate to make sure that the decreased air flow capacity of the relief valve and burst disc will give sufficient protection to your vessel/system. Refer to Fort Vale for more information.

NOTE: The disc specification changes the Part No.

65mm XL Burst Discs

Compatible with general purpose tank containers and road tankers.

Burst Pressure Bar	Burst Temperature °C	Part No.
2.28	20	862/X0228
2.41	20	862/X0241
2.69	20	862/X0269
3.10	20	862/X0310
3.67	20	862/X0367
4.10	20	862/X0410
4.40	20	862/X0440
4.84	20	862/X0484

80mm XL Burst Discs

Compatible with general purpose tank containers and road tankers.

Burst Pressure Bar	Burst Temperature °C	Part No.
3.67	20	864/X0367
4.10	20	864/X0410
4.84	20	864/X0484

89mm Reverse Acting Burst Discs

Compatible with compressed liquefied gas tank containers.

Burst Pressure Bar	Burst Temperature °C	Part No.
12.10	55	864/X1210
15.00	55	864/X1500
22.00	55	864/X2200
27.50	55	864/X2750
34.50	55	864/X3450

250mm Standard Burst Discs

Compatible with hydrogen peroxide service.

Burst Pressure Bar	Burst Temperature °C	Part No.
4.50	20	865/1200
4.50	60	865/1250
6.00	20	865/1400

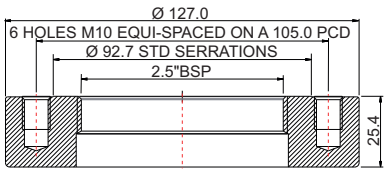
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Part No: 176/3150



Section View



Specification

Flange type
Weld-in flange

Nominal size
DN65 with 2½" BSP thread

Flange drilling
6 x M10 holes equi-spaced on a 104.9mm PCD

Material
316L stainless steel

Compatible valve/part
2½" BSP Super Maxi relief valve
176/7001 adaptor flange with 65mm XL burst disc

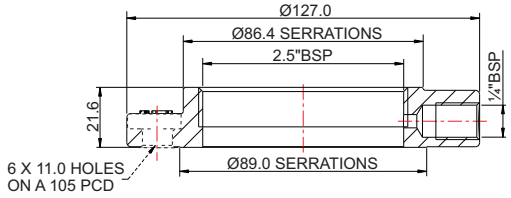
Related Parts

Description	Part No.
CNAF/PTFE gasket	5005-398
Bolting kit	176/7021
Adaptor flange	176/7001

Part No: 176/7001



Section View



Specification

Flange type
Burst disc adaptor flange

Nominal size
DN65 with 2½" BSP thread

Flange drilling
6 x 11mm holes equi-spaced on a 105mm PCD

Properties
¼" BSP gauge connection

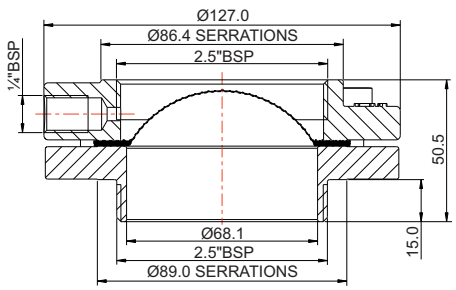
Material
316 stainless steel

Compatible valve/part
2½" BSP Super Maxi relief valve
65mm XL burst disc

Part No: 176/7020



Section View



Specification

Flange type
Burst disc adaptor flange assembly

Nominal size
DN65 with 2½" BSP thread

Inlet connection
2½" BSP

Properties
¼" BSP gauge connection, includes M10 washers & bolts
Burst disc not included

Material
316 stainless steel

Compatible valve/part
2½" BSP Super Maxi relief valve
65mm XL burst disc

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Flame Arresters



Specification

A relief valve flame arrester attaches around the ports of the relief valve body. It prevents an external flame from being transmitted into the tank on relief valves with a vacuum setting of ≤ 0.21 Bar (6"Hg).

For relief valves with a vacuum setting of > 0.21 Bar (6"Hg), a flame arrester is frequently used to prevent debris from going into the tank through the relief valve.

Nominal sizes
Compatible with 1", 1½" 2½", 65mm and 80mm relief valves

Material
Stainless steel

WARNING: If you install a flame arrester, it will decrease the air flow capacity of the relief valve. Thus, you must calculate to make sure that the decreased air flow capacity of the relief valve and flame arrester will give sufficient protection to your vessel/system. Refer to Fort Vale for more information.

Flame Arresters

Each flame arrester is compatible for the specified relief valve type only. Flame arresters are not interchangeable between relief valve types.

IMPORTANT: Refer to the air flow decrease data for your valve type. (See **WARNING**)

Compatible Relief Valve	Air Flow Decrease	Part No.
1" Minnow	17% to 20%	179/0300
1½" Twinact	See Note	200/5000
2½" Twinact	See Note	130/5000
2½" & 65mm Super Maxi	1%	176/2900
80mm Hyper Maxi	5.4%	176/2920

NOTE: For the air flow decrease data for Twinact relief valves, please contact Fort Vale.

Debris Protection - Gauzed Cowl

Part No: 176/6000



Specification

A gauzed cowl attaches to the 65mm Super Maxi relief valve cap. It is used to prevent debris from going into the tank through the relief valve.

Nominal sizes
Compatible with a 65mm/2½" Super Maxi relief valve only

Material
Stainless steel

CAUTION: If you install a gauzed cowl onto a Super Maxi relief valve, it can decrease the relief valve air flow capacity. Refer to Fort Vale for more information.

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Standard Pressure Gauge



Tell-Tale Pressure Gauge



Specification

We supply standard pressure gauges and tell-tale pressure gauges. Tell-tale pressure gauges have a secondary pointer to indicate if there has been an increase in pressure, even if the pressure subsequently decreases.

All pressure gauges have a ¼" BSP bottom connection and are glycerine filled.

Pressure range options
0-6 Bar, 0-10 Bar, 0-16 Bar

Material options - internal parts
Brass, stainless steel

Standard Pressure Gauge

Pressure Range Bar	PSI	Internal Parts	Part No.
0-6	0-90	Brass	921/06BBSP
0-6	0-90	St/steel	920/06BBSP
0-10	0-150	Brass	921/10BBSP
0-10	0-150	St/steel	920/10BBSP

Tell-Tale Pressure Gauge

Pressure Range Bar	PSI	Internal Parts	Part No.
0-6	0-90	Brass	921/06TTBBSP
0-6	0-90	St/steel	920/06TTBBSP
0-10	0-150	Brass	921/10TTBBSP
0-10	0-150	St/steel	920/10TTBBSP
0-16	0-230	St/steel	920/16TTBBSP

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Threaded Weld-In Sockets



Specification

Weld-in sockets are heavy-duty and have an oversized thread so that re-tapping after welding is not necessary

Nominal sizes
From DN15 to DN65

Thread sizes
From ½" BSP to 2½"BSP

Material
316 stainless steel

If the type you need is not shown, please contact us

Weld-In Sockets

Nominal Size	Thread	Part No.
DN15	½" BSP	600/1030
DN20	¾" BSP	653/1000
DN25	1" BSP	600/1025
DN40	1½" BSP	600/1010
DN50	2" BSP	600/1017
DN65	2½" BSP	600/1000

DIN11851 Weld-In Sockets



Specification

DIN11851 fittings are compatible with hygienic service conditions. A complete assembly includes a weld-in socket, a slotted nut and a silicone seal

Nominal sizes
DN50, DN65, DN80

Compatible parts
1½", 2" and 2½" relief valves

Material
Socket & nut: 316 stainless steel
Seal: Silicone

If the type you need is not shown, please contact us

DIN11851 Hygienic Fittings

Size	Weld Socket Part No.	Slotted Nut Part No.	Silicone Seal Part No.
DN50	176/2660	176/2670	176/2675S
DN65	176/2645	176/2630	176/2653S
DN80	176/2550	176/2650	176/2685S

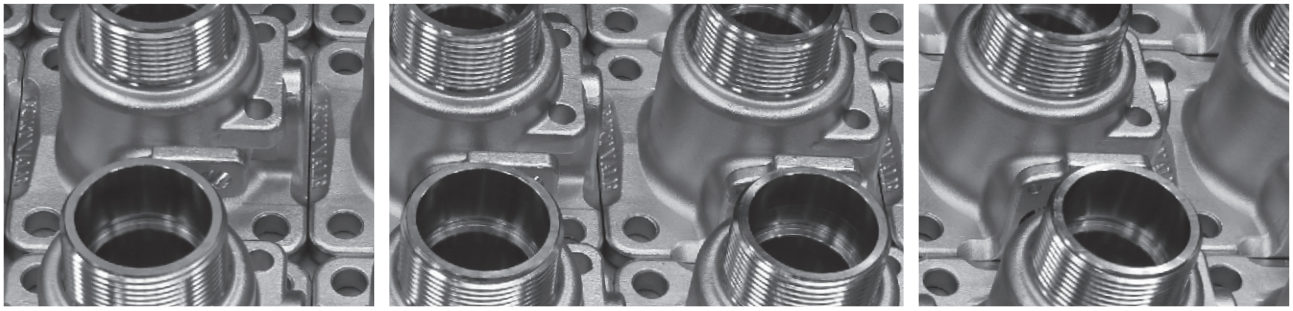
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FORT VALE

Airline Valves

Road Tanker Catalogue



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Function

An airline valve is used when the tank is pressurised during testing or discharge and can be used for inert gas blanketing or vapour recovery. We offer ball valves and butterfly valves for airline connections.

Design Options

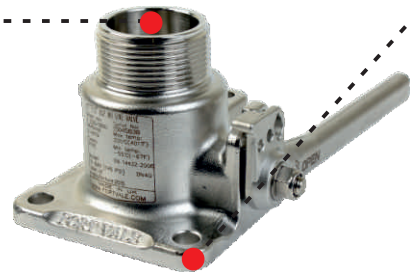
The design options below are available on our standard range of airline valves.

Nominal Bore

40mm (1½"): Ball valves

50mm (2"): Ball valves & butterfly valves

Special service conditions:
Reduced bore e.g. 25mm (1")



Tank Connection

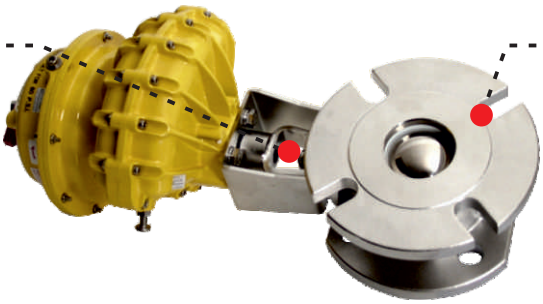
Flanged: 4 holes

Different drilling patterns

Operation

Manually operated: A range of handles is available

Pneumatically actuated



Outlet / Process Connection

Threaded: 1½" BSP, 2" BSP

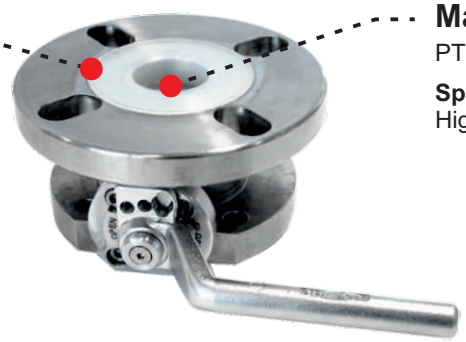
Dual threaded: 1½" BSP/1½" NPT

Flanged: Closed or open slots

Valve Materials

316 stainless steel

Special service conditions:
Lined wetted parts, e.g. PFA



Main Seal

PTFE

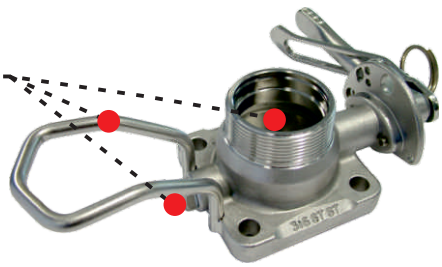
Special service conditions:
High-temperature compatible seals

Accessories

Gauge guard

Gauze or sintered filter

TIR to gauge inlet plug



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Related Parts

We recommend our range of compatible accessories:

- Pressure gauges
- Filters: gauzed or sintered
- Blank caps
- Flanges - weld-in and adaptor
- Fasteners
- Gaskets

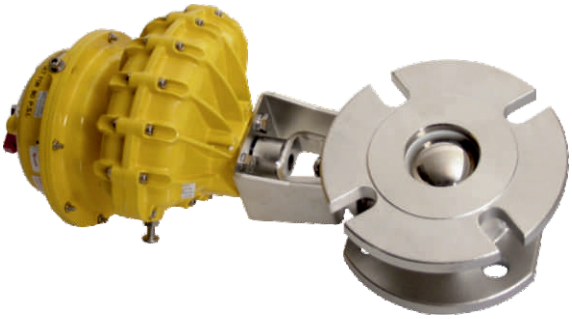
Please contact us for more information about these parts.

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2" Flanged Blacko Ball Valve - Pneumatically Actuated

Part No: 370/0100PN/1



Specification

Nominal size
50mm

Tank connection
Flanged: 4 x 18mm holes on a 125mm PCD

Outlet/Process connection
Flanged: 4 x 18mm open slots on a 120.7mm min. PCD compatible with 2" ASA150/DIN50 PN40

Properties
Kinetrol pneumatic actuator with spring return and ¼" BSP air inlet

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	5.81 Kg
Design Pressure (MAWP):	7.5 Bar
Test Pressure:	13.8 Bar
Design Temperature Min.	Valve: -40°C
Design Temperature Min.	Actuator: -20°C
Design Temperature Max:	Valve: 205°C
Design Temperature Max:	Actuator: 80°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

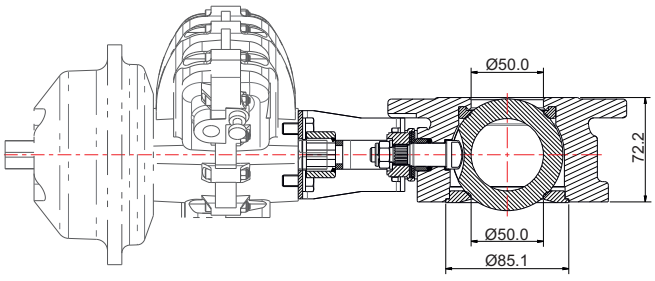
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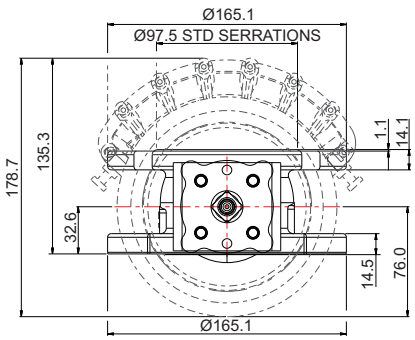
Description	Part No.
2" ball valve pneumatically actuated	370/0100PN/1
2" ball valve manually operated	370/0100

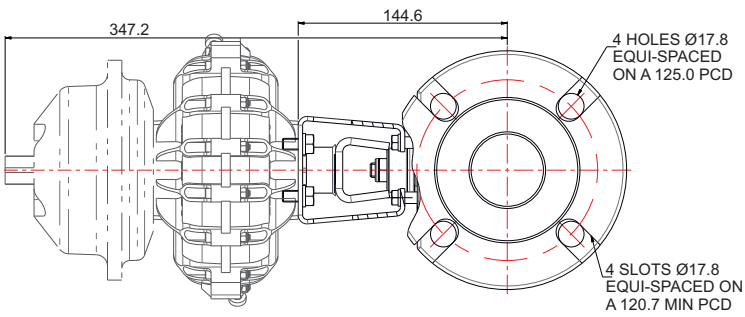
Related Parts

Description	Part No.
Mating flange	294/0082
Weld-in flange	355/3100
Stud kit	311/3700
Outlet gasket	5005-361
Blind flange	370/4239CM
Bolting kit	311/3000

Section View







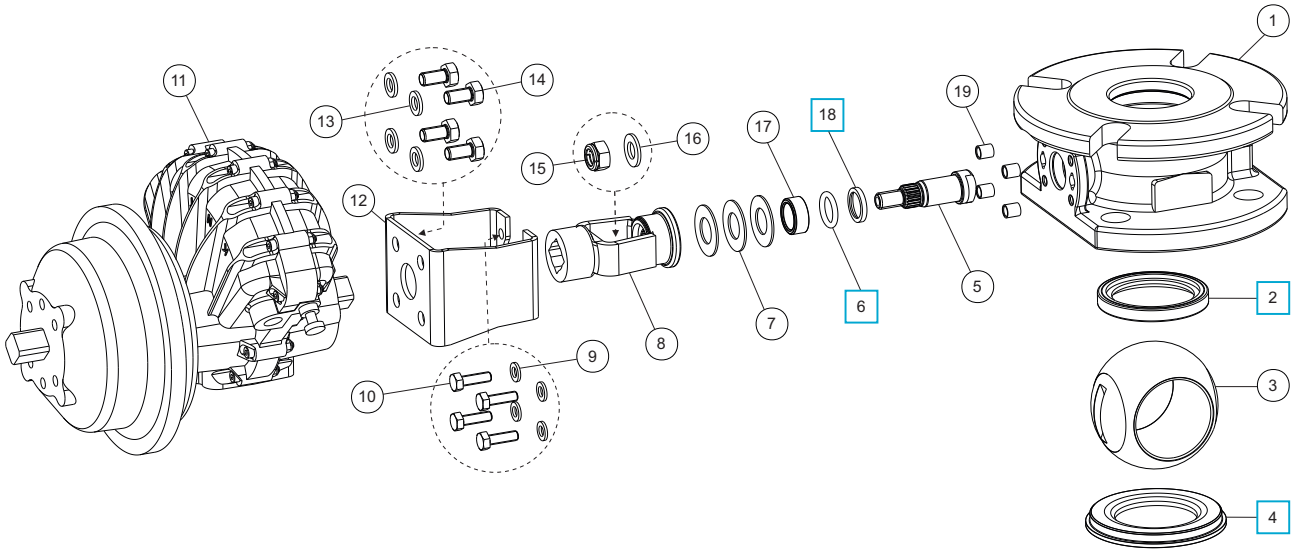
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2" Flanged Blacko Ball Valve - Pneumatically Actuated

Part No: 370/0100PN/1

Parts Drawing



Parts List

Item	Description	Part No.	
1	Body	370/0110	
2	PTFE front seal	370/0102	☐
3	Ø50mm ball	370/3301	
4	PTFE rear seal	370/0105	☐
5	Spindle	370/0120	
6	PTFE O ring	5005-688	☐
7	Belleville washer (3)	5113-038	
8	Spline adaptor assembly	370/0209	
9	M6 spring washer (4)	5113-008	
10	M6 hex bolt (4)	5111-076	
11	Kinetrol pneumatic actuator	5127-078	
12	Mounting bracket	370/0208	
13	M8 spring washer (4)	5113-003	
14	M8 hex bolt (4)	5111-822	
15	M10 self lock nut	5112-008	
16	M10 plain washer	5113-009	
17	Stuffing collar	370/0103	
18	Bottom bearing bush	370/0104	☐
19	Spacer boss (4)	370/0163	

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	370/01SK

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Specification

Nominal sizes
From 6mm to 100mm

Body type options
One piece
Two piece
Three piece

Inlet/outlet connection options
BSP female both ends - all types
Weld prepared both ends - 3 piece valve only

Properties
Lockable handle

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Part Numbers

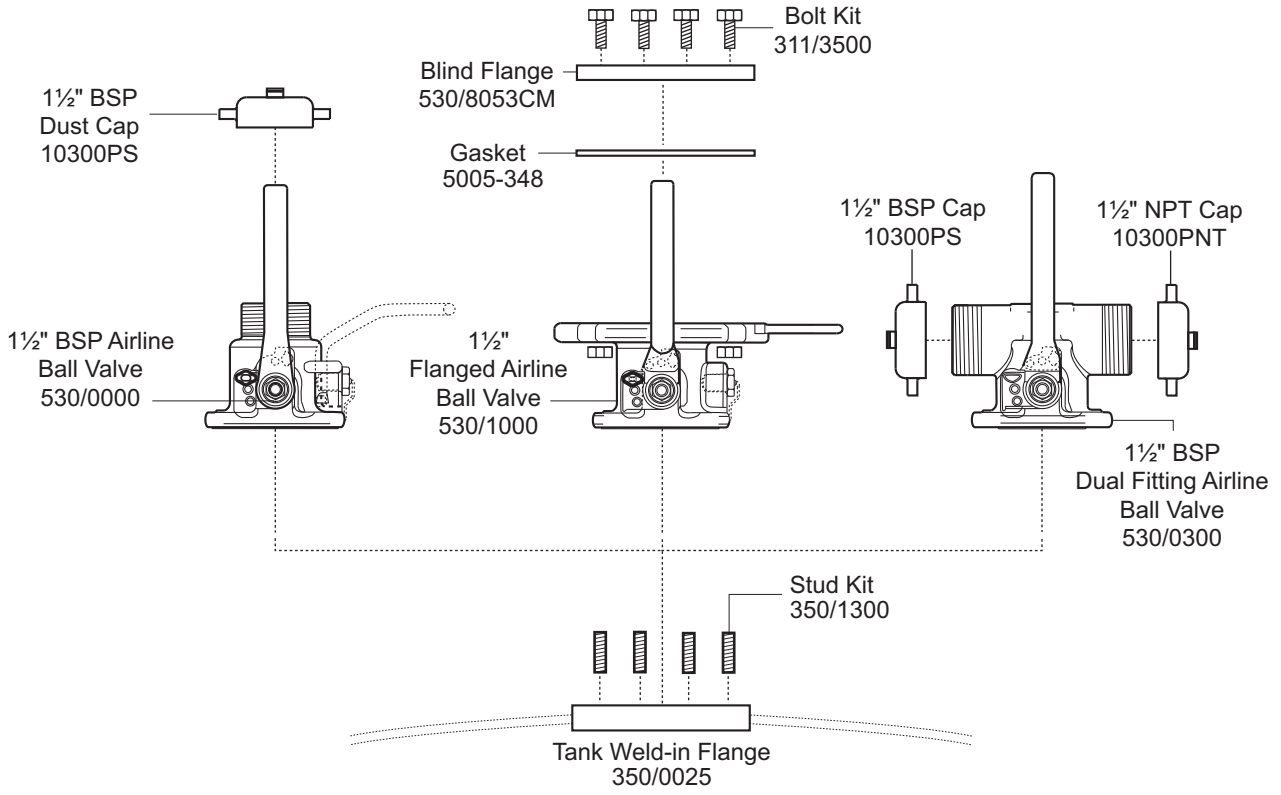
Size mm	Size inch	One Piece BSP	Two Piece BSP	Three Piece BSP	Three Piece Weld Prepared
6	¼	410/104025	410/204025	410/304025B	410/304025W
10	⅜	410/104037	410/204037	410/304037B	410/304037W
15	½	410/104050	410/204050	410/304050B	410/304050W
20	¾	410/104075	410/204075	410/304075B	410/304075W
25	1	410/104100	410/204100	410/304100B	410/304100W
32	1¼	410/104125	410/204125	410/304125B	410/304125W
40	1½	410/104150	410/204150	410/304150B	410/304150W
50	2	410/104200	410/204200	410/304200B	410/304200W
65	2½	-	410/204250	410/304250B	410/304250W
80	3	-	410/204300	410/304300B	410/304300W
100	4	-	-	410/304400B	410/304400W

CAUTION: During installation, do not tighten the ball valve too much or it will cause the valve to malfunction.

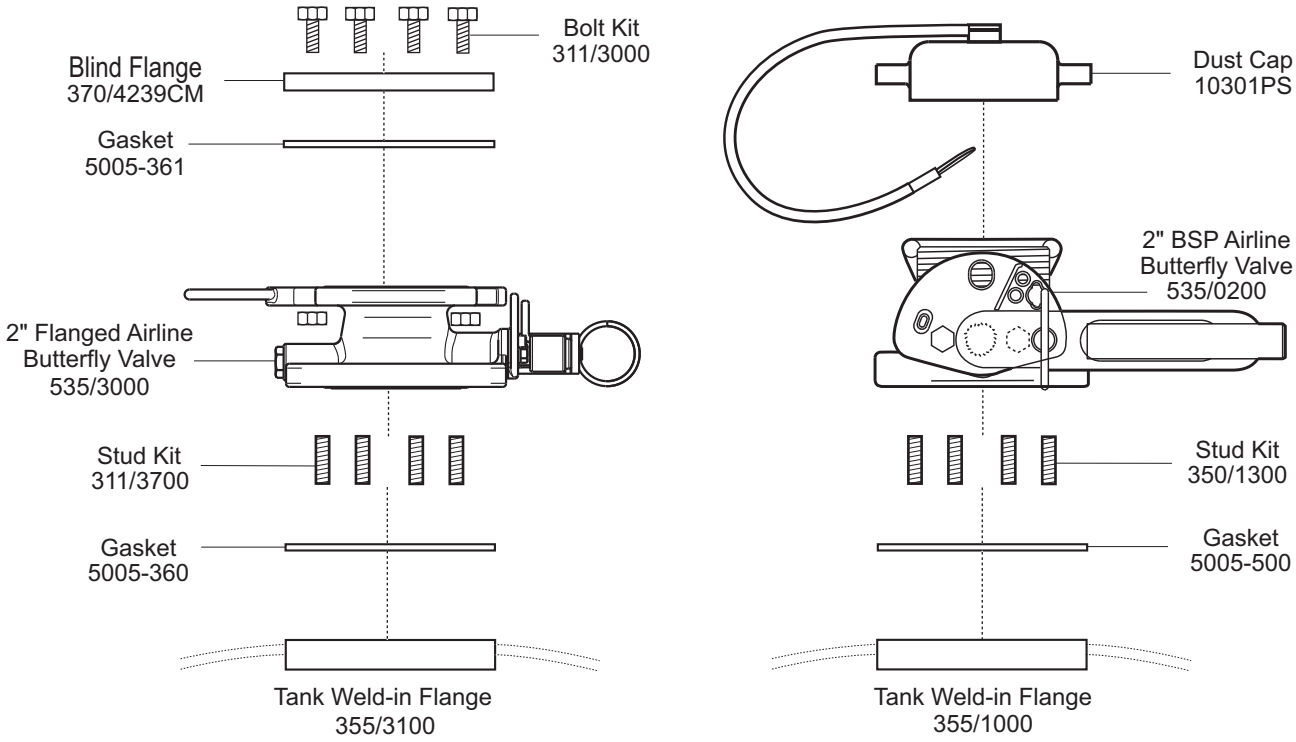
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1½” Airline Ball Valves



2” Airline Butterfly Valves



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Threaded Blank Caps

Accessories & Spare Parts



Specification

Caps are supplied with a washer and a security wire or heavy duty chain as standard.

Nominal sizes
From ½" to 4"

Thread options
BSP, NPT, NPSL

Material options
Cap: stainless steel, aluminium
Washer: PTFE, leather

If the type you need is not shown, please contact us.

Stainless Steel Caps - BSP Thread

Supplied as standard with a PTFE washer and a stainless steel chain or wire to prevent loss/theft.

Size	Wire or Chain	Part No.
½" BSP	Wire	10316PS
¾" BSP	Chain	10306PS
1" BSP	Chain	10305PS
1½" BSP	Chain	10300PS
2" BSP	Chain	10301PS
2½" BSP	Wire	10302PS
3" BSP	Chain	10303PS
4" BSP	Wire	10304PSC

Spare Parts - Washers

Description	Part No. Leather	Part No. PTFE
½" washer	-	10335P
¾" washer	10331L	10331P
1" washer	10319L	10319P
1½" washer	10326L	10326P
2" washer	10327L	10327P
2½" washer	10328L	10328P
3" washer	10329L	10329P

NPT & NPSL Caps

Supplied as standard with a washer and a chain to prevent loss/theft.

Size	Cap	Washer	Chain	Part No.
1½" NPT	st/st	PTFE	st/st	10300NPTP
2" NPT	st/st	PTFE	st/st	10301NPTP
3" NPSL	st/st	PTFE	st/st	425/3240
3" NPT	aluminium	leather	brass	10711NPT

Aluminium Caps - BSP Thread

Supplied as standard with a leather washer and a brass chain to prevent loss/theft.

Size	Part No.
¾" BSP	10706AL
1" BSP	10707AL
1½" BSP	10708AL
2" BSP	10709AL
2½" BSP	10710AL
3" BSP	10711AL

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Standard Pressure Gauge



Tell-Tale Pressure Gauge



Specification

We supply standard pressure gauges and tell-tale pressure gauges. Tell-tale pressure gauges have a secondary pointer to indicate if there has been an increase in pressure, even if the pressure subsequently decreases.

All pressure gauges have a ¼" BSP bottom connection and are glycerine filled.

Pressure range options
0-6 Bar, 0-10 Bar, 0-16 Bar

Material options - internal parts
Brass, stainless steel

Standard Pressure Gauge

Pressure Range Bar	PSI	Internal Parts	Part No.
0-6	0-90	Brass	921/06BBSP
0-6	0-90	St/steel	920/06BBSP
0-10	0-150	Brass	921/10BBSP
0-10	0-150	St/steel	920/10BBSP

Tell-Tale Pressure Gauge

Pressure Range Bar	PSI	Internal Parts	Part No.
0-6	0-90	Brass	921/06TTBBSP
0-6	0-90	St/steel	920/06TTBBSP
0-10	0-150	Brass	921/10TTBBSP
0-10	0-150	St/steel	920/10TTBBSP
0-16	0-230	St/steel	920/16TTBBSP

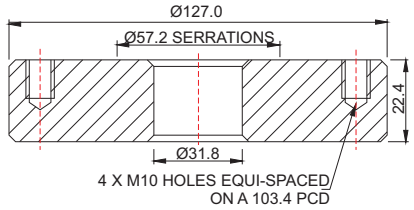
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Part No: 350/0025



Section View



Specification

Flange type
Weld-in flange

Nominal size
32mm

Flange drilling
4 x M10 holes equi-spaced on a 103.4mm PCD

Material
316L stainless steel

Compatible valve
1½" airline ball valve

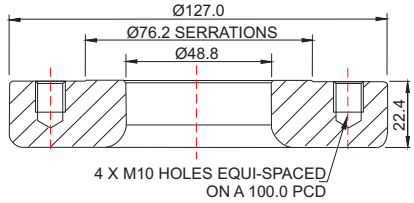
Related Parts

Description	Part No.
Stud kit	350/1300

Part No: 355/1000



Section View



Specification

Flange type
Weld-in flange

Nominal size
50mm

Flange drilling
4 x M10 holes equi-spaced on a 100.0mm PCD

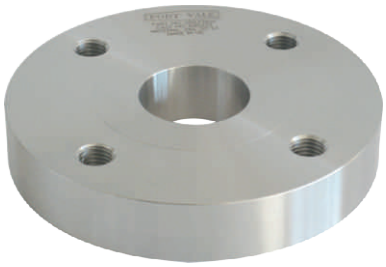
Material
316L stainless steel

Compatible valve
2" BSP airline butterfly valve

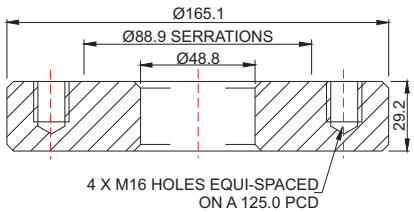
Related Parts

Description	Part No.
Stud kit	350/1300

Part No: 355/3100



Section View



Specification

Flange type
Weld-in flange

Nominal size
50mm

Flange drilling
4 x M16 holes equi-spaced on a 125.0mm PCD

Material
316L stainless steel

Compatible valve
2" flanged butterfly valve
2" flanged ball valve

Related Parts

Description	Part No.
Stud kit	311/3700

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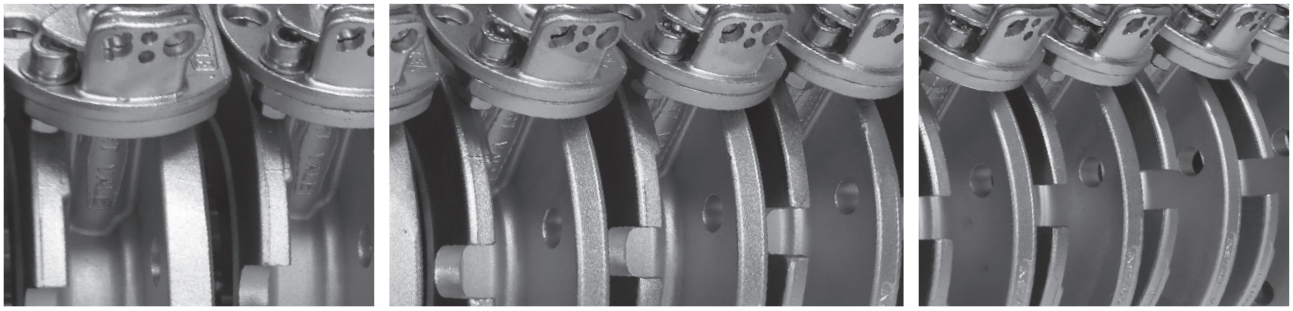
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Top Discharge Provision

Road Tanker Catalogue



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Function

A discharge butterfly valve is used to load and discharge cargo. It is usually a secondary closure valve that is installed onto a footvalve (primary closure valve) at the drain point of a tank. A butterfly valve can also be used as a primary closure valve on the top of a tank.

NOTE: Refer to a separate page for discharge butterfly valves dedicated to Road Tankers.

Design Options

The design options below are available on our standard range of discharge butterfly valves.

Clamped Body

Scrolled face, installed between two flanges



Flanged Body

4 or 6 hole drilling patterns

Dual-drilled hole patterns

Open slots



TW Drilled Body

Compatible with Tankwagen drilling pattern

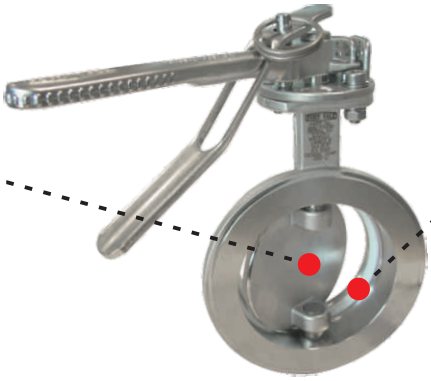


Nominal Bore

50mm (2")

80mm (3")

100mm (4")



Main Seal

PTFE

Special service conditions:
High-temperature compatible seals

Operation

Manually operated

Lockable handle

Left hand or right hand operation

Pneumatically actuated



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Design Options - continued

Valve Materials

316 stainless steel

Special service applications:
Lined wetted parts, e.g. PFA

Wetted parts in high nickel alloys, e.g. 904L stainless steel, Alloy C276



Special Cargoes

Solidifying cargo:
Body with steam-heating connections

Hemispherical closure plate



Related Parts

We recommend our range of compatible accessories:

- Flanges - inlet, adapter, outlet, blind
- Tertiary closures
- Fasteners
- Gaskets

Please contact us for more information about these parts.

Discharge Butterfly Valves for Dedicated Service

We offer a range of discharge butterfly valves suitable for these service conditions and special cargoes:

- Road Tankers
- Hygienic service

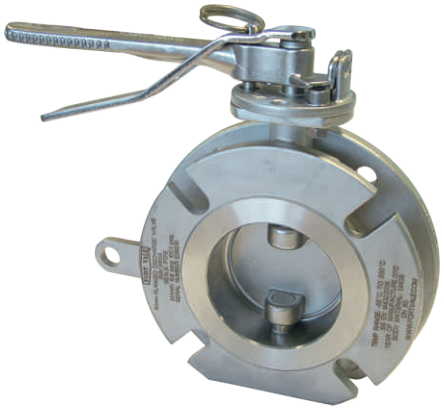
Please contact us for more information about these valves.

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3" Flanged Widdop Butterfly Valve

Part No: 368/3160A



Specification

Nominal size
80mm

Tank connection
Flanged: 6 x 14mm holes on a 168mm PCD

Outlet/Process connection
Flanged: 4 x open slots on a 146mm minimum PCD

Properties
Left hand operated, handle with TIR and padlock slots

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	7.0 Kg
Design Pressure (MAWP):	6.9 Bar
Test Pressure:	12.6 Bar
Design Temperature Min:	-55°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

Design Approvals
Lloyds Register of Shipping
Rijksdienst
SNCF
RMRS

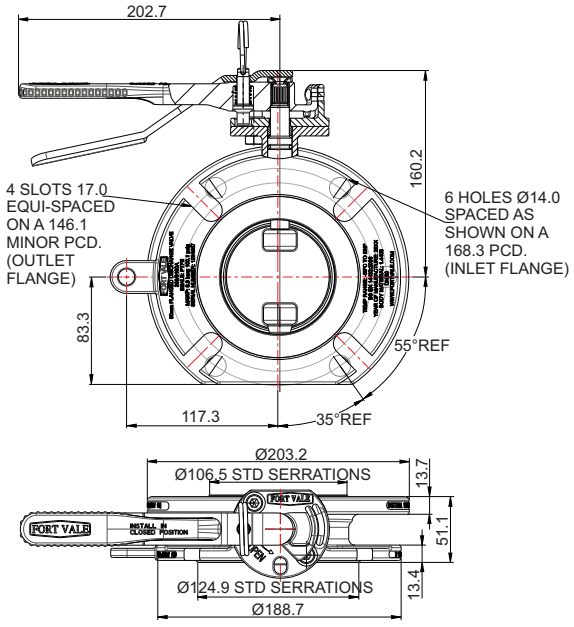
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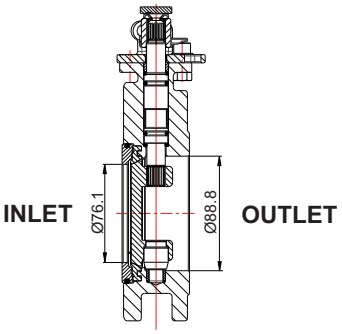
Description	Part No.
Standard specification	368/3160A
Inlet flange dual drilled: 4 hole/4 hole	368/3180A
Inlet flange dual drilled: 6 hole/4 hole	368/3280A

Related Parts

Description	Part No.
Tank weld-in flange	368/0800
CNAF/PTFE syphon tube inlet gasket	5005-222
Syphon tube	368/0810
Stud kit	312/1000
CNAF/PTFE inlet gasket	5005-169
Solid PTFE outlet gasket	5005-417
Dished blind flange	312/0022CM
Outlet bolting kit	311/3500
Pivot pin for blind flange	368/7506

Section View





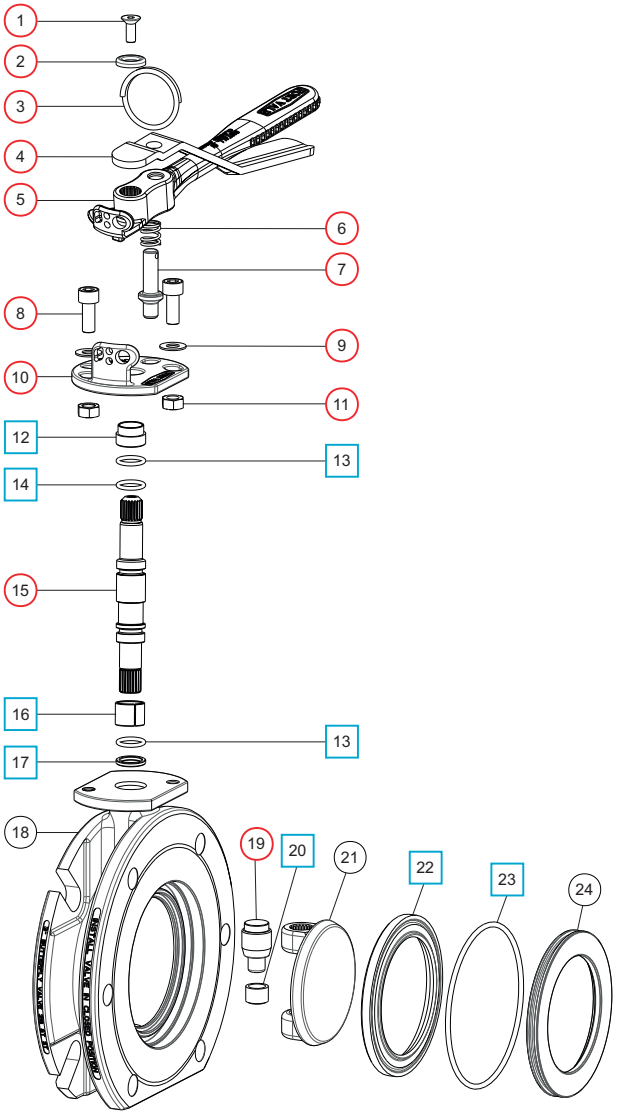
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3" Flanged Widdop Butterfly Valve

Part No: 368/3160A

Parts Drawing



Parts List

Item	Description	Part No.	
1	M6 set screw	5111-030	○
2	Washer	20370	○
3	Split ring	368/0011	○
4	Operating lever	368/9837	○
5	Handle	368/0050	○
6	Handle location spring	368/0012	○
7	Handle location pin	368/0010	○
8	M8 cap screw (2)	5111-255	○
9	M8 plain washer (2)	5113-005	○
10	Stuffing clamp	368/0040	○
11	M8 full nut (2)	5112-001	○
12	PTFE stuffing clamp bush	368/0301	□ ○
13	PTFE O ring (2)	20363	□ ○
14	Viton O ring	20361	□ ○
15	Spindle	368/0200	○
16	Split bearing	252/0517	□ ○
17	PTFE spindle seat	368/0009	□ ○
18	Body	368/9141	
19	Bottom spindle	368/0036	○
20	PTFE bottom bush	368/0035	□ ○
21	Closure plate	368/0400	
22	PTFE main seal	368/0002	□ ○
23	Nitrile O ring	5005-342	□ ○
24	Seal clamp plate	368/9148	

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	368/00SK

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	368/316RKA

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3" Flanged Widdop Butterfly Valve - Dual Drilled Inlet

Part No: 368/3280A



Specification

Nominal size
80mm

Tank connection
Dual-drilled flange: 6 x 14mm holes on a 168.3mm PCD & 4 x 18mm holes on a 160mm PCD

Outlet/Process connection
Flanged: 4 x open slots on a 146mm minimum PCD

Properties
Left hand operated, handle with TIR and padlock slots

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	6.9 Kg
Design Pressure (MAWP):	6.9 Bar
Test Pressure:	10.35 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

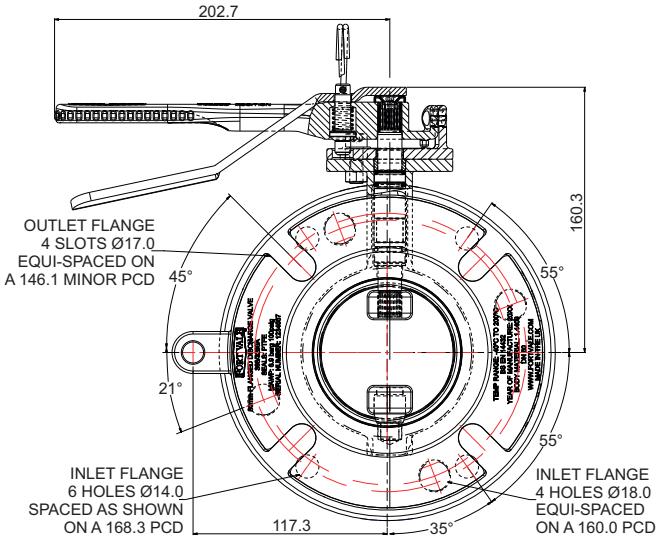
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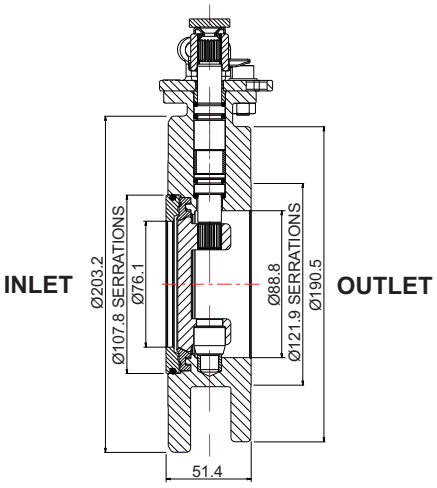
Description	Part No.
Inlet flange dual drilled: 6 hole/4 hole	368/3280A
Inlet flange dual drilled: 4 hole/4 hole	368/3180A
Inlet flange with flat, drilled 6 holes	368/3160A

Related Parts

Description	Part No.
CNAF/PTFE dual drilled inlet gasket	5005-770
CNAF/PTFE 6 hole inlet gasket	5005-222
CNAF/PTFE 4 hole inlet gasket	5005-034
Solid PTFE outlet gasket	5005-417
Dished blind flange	312/0022CM
Outlet bolting kit	311/3500
Pivot pin for blind flange	368/7506

Section View





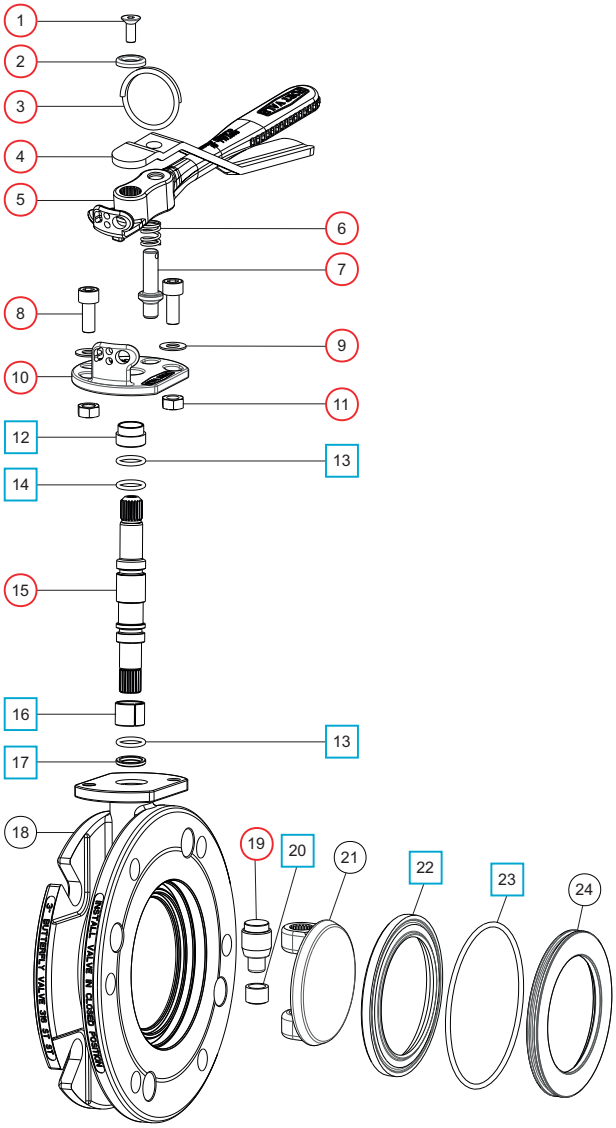
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3" Flanged Widdop Butterfly Valve - Dual Drilled Inlet

Part No: 368/3280A

Parts Drawing



Parts List

Item	Description	Part No.	
1	M6 set screw	5111-030	○
2	Washer	20370	○
3	Split ring	368/0011	○
4	Operating lever	368/9837	○
5	Handle	368/0050	○
6	Handle location spring	368/0012	○
7	Handle location pin	368/0010	○
8	M8 cap screw (2)	5111-255	○
9	M8 plain washer (2)	5113-005	○
10	Stuffing clamp	368/0040	○
11	M8 full nut (2)	5112-001	○
12	PTFE stuffing clamp bush	368/0301	□ ○
13	PTFE O ring (2)	20363	□ ○
14	Viton O ring	20361	□ ○
15	Spindle	368/0200	○
16	Split bearing	252/0517	□ ○
17	PTFE spindle seat	368/0009	□ ○
18	Body	368/9192	
19	Bottom spindle	368/0036	○
20	PTFE bottom bush	368/0035	□ ○
21	Closure plate	368/0400	
22	PTFE main seal	368/0002	□ ○
23	Nitrile O ring	5005-342	□ ○
24	Seal clamp plate	368/9148	

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	368/00SK

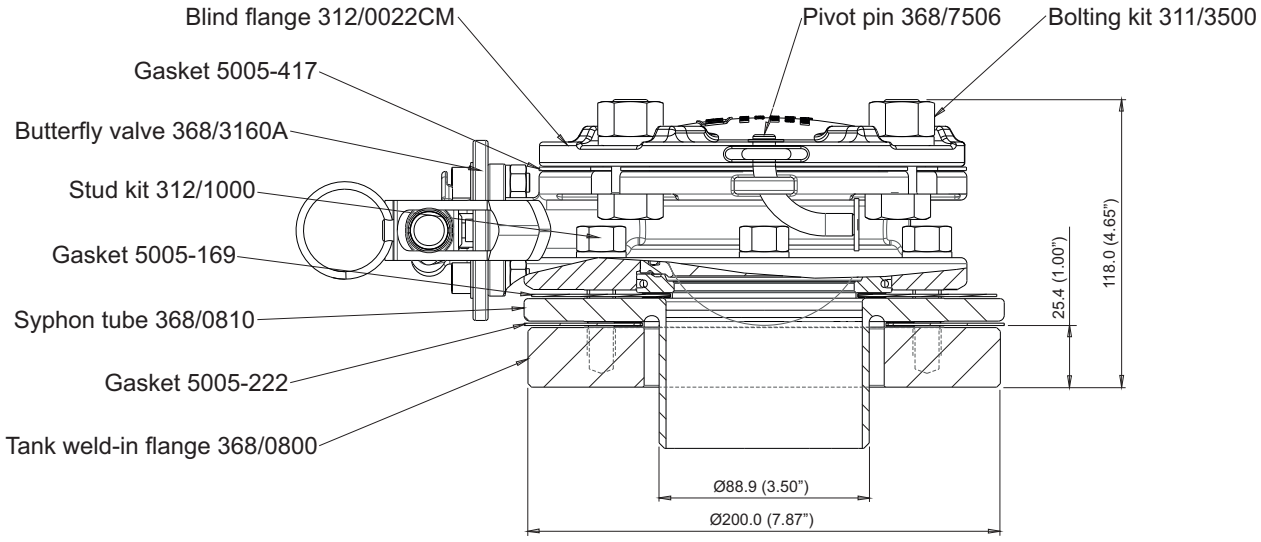
Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	368/316RKA

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Example: 3" Flanged Butterfly Valve Top Discharge Assembly



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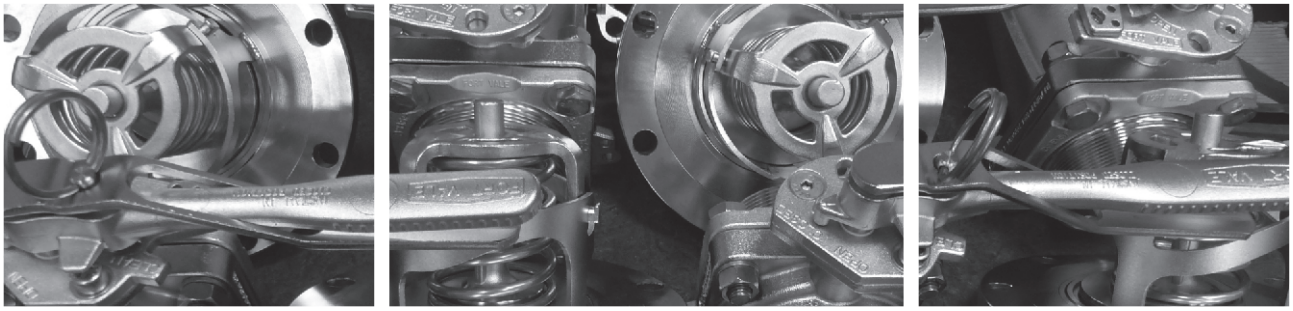
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FORT VALE

Bottom Discharge - Primary Closure Valves

Road Tanker Catalogue



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Function

A footvalve is a primary closure valve that is installed at the drain point of a tank. It is used to load and discharge cargo in combination with a secondary closure valve. The footvalve body has a shear groove. To prevent leakage if there was an accident, the groove will break and keep the internal part of the valve closed and attached to the tank.

In our standard range, we offer two main types of footvalve; Cleanflow and Highlift.



Cleanflow

The Cleanflow footvalve does not protrude into the tank. When the valve is open, the poppet does not obstruct the discharge orifice, so the cargo discharges faster.



Highlift

The Highlift footvalve has a traditional internal cage and a spring-loaded poppet with a lifting finger.

Design Options

The design options below are available on our standard range of Cleanflow and Highlift footvalves.

Nominal Bore

80mm (3")

100mm (4")

Special service conditions:
125mm (5")

150mm (6")

Reduced bore: 80mm to 50mm (3" to 2")



Body Style

Angle between the inlet & outlet flange

30°

45°

90°

180°

Special service conditions:
105° - Cleanflow only

Outlet Flange

Round and square flanges

4, 6 and 8 hole drilling patterns

Flats milled top and bottom



Operation

Manually operated: A range of handles is available

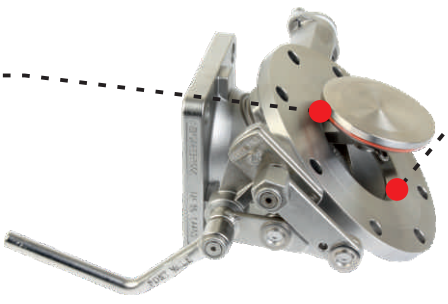
Pneumatically actuated

Hydraulically actuated

Main Seal

Fortyt

Special service conditions:
A range of seal materials is available



Inlet/Seat Area

Superseat: Alloy 625 integral seat

Special service conditions:
Replaceable seat:
High nickel alloy, e.g. Alloy C276, 904L stainless steel or special metals, e.g. Titanium GR2

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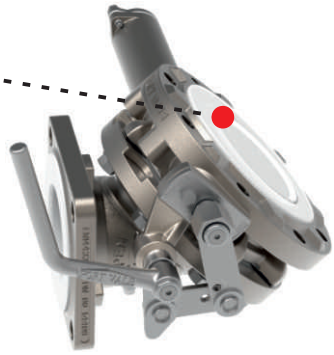
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Design Options - continued

Valve Materials

316 stainless steel

Special service conditions:
Lined wetted parts, e.g. PFA, Halar ®

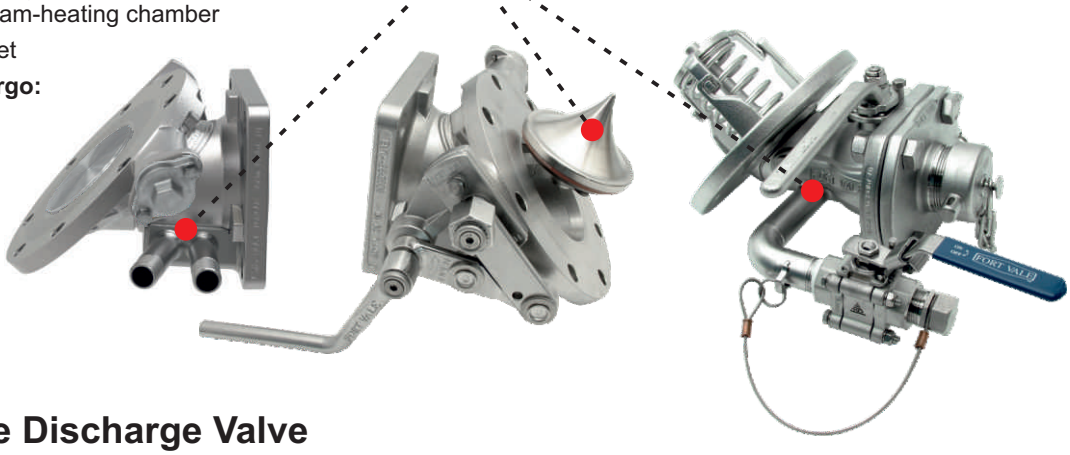


Special Cargoes

Solidifying cargo:
Body with steam-heating chamber

Conical poppet

Sensitive cargo:
Sample point



Composite Discharge Valve

A composite discharge valve is a combined primary and secondary closure valve. It saves space and reduces the number of joints between valves. Many of our design options are available on composite valves.

Please contact us for more information.

Related Parts

We recommend our range of compatible accessories:

- Remote closure systems and fusible elements
- Flanges - weld-in and adaptor
- Fasteners
- Gaskets

Please contact us for more information about these parts.

Footvalves for Dedicated Service

We offer a range of footvalves and discharge systems suitable for these service conditions and special cargoes:

- Offshore fuel and chemical tanks
- T50 tank containers for liquefied gas
- Rail tank wagons
- Road tankers carrying hot product (bitumen)
- Road tankers: top operated screwdown valve

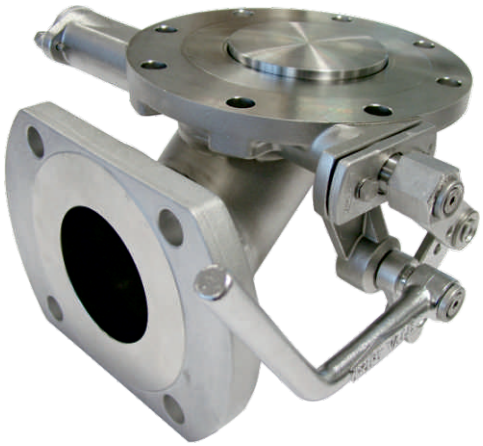
Please contact us for more information about these valves.

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3" 90° Cleanflow Footvalve

Part No: 844/3000A



Specification

Nominal size/body angle
3" / 90°

Inlet connection
Flanged: 8 x 14mm holes on a 178mm PCD

Outlet connection
Flanged: 4 x 17mm holes on a 160mm PCD

Materials
Seating area: Superseat (alloy 625)
Contact parts: 316 stainless steel
Main seal: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	15.0 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	7.3 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Codes
BS EN14433
Design Approval by Lloyds Register of Shipping

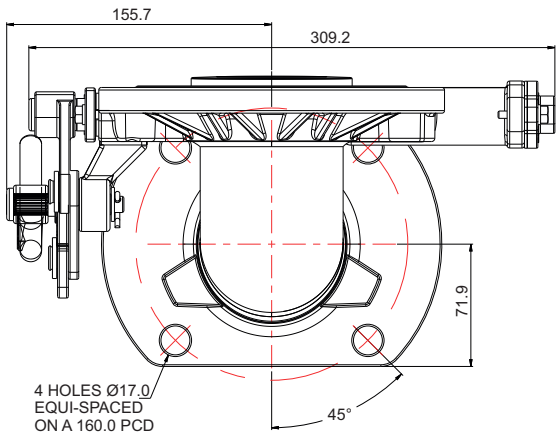
Range

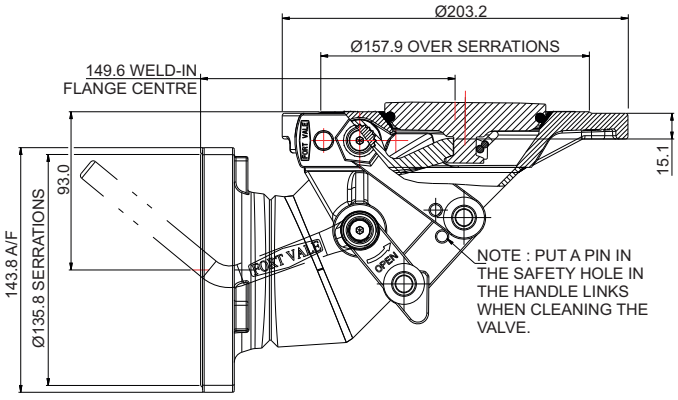
Description	Part No.
Standard body, manually operated	844/3000A
Extended body, manually operated	844/7400A
Standard body, pneumatically actuated	844/3080ASS
Extended body, pneumatically actuated, slotted outlet	844/7700ASS

Related Parts

Description	Part No.
Weld-in flange	324/9000
Stud kit	Refer to drawing
CNAF/PTFE inlet gasket	5005-015
CNAF/PTFE ring gasket	5005-049
CNAF/PTFE 4 hole gasket with flats	5005-034
Mating flange	294/0081

Section View





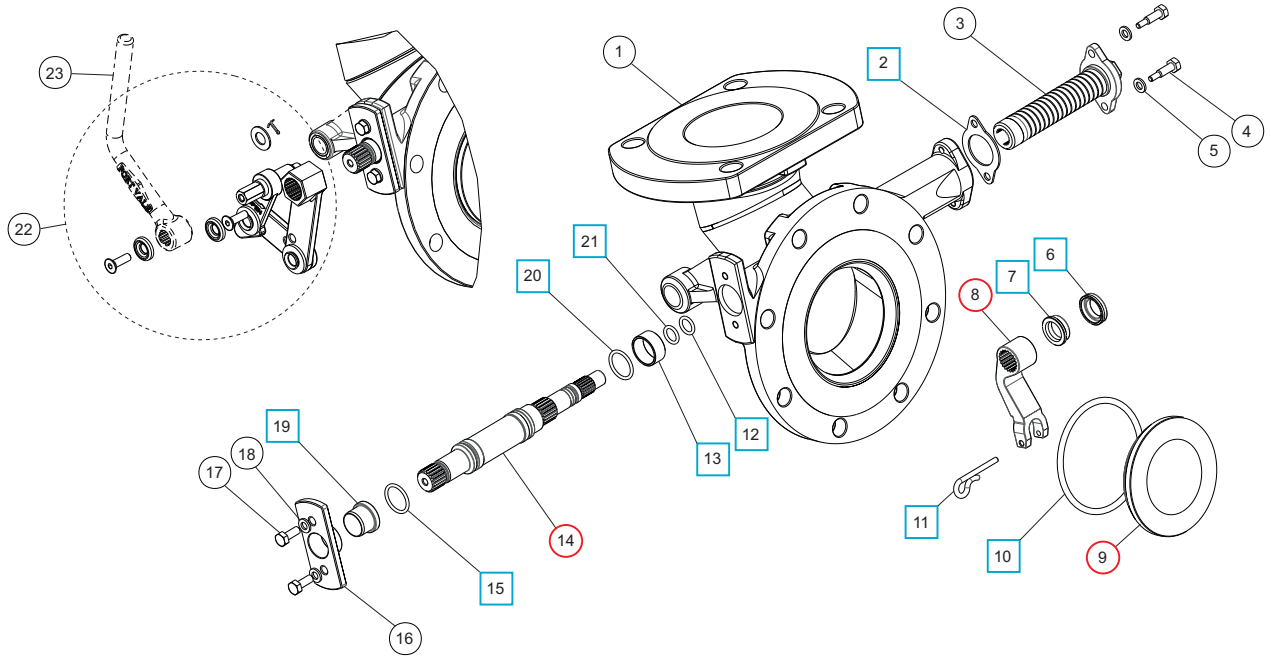
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3" 90° Cleanflow Footvalve

Part No: 844/3000A

Parts Drawing



Parts List

Item	Description	Part No.	
1	Body	844/2075B	
2	Spring boss gasket	5005-845	□ ○
3	Spring assembly	845/0050	
4	Clamp screw (2)	845/0017	
5	Spring washer (2)	5113-008	
6	Bush seal	845/0064	□ ○
7	Seal energizer	845/0063	□ ○
8	Lifting fork	845/0010	○
9	Poppet	845/0040	○
10	Fortyt O ring	5005-104	□ ○
11	Retaining pin	845/0015	□ ○
12	Perfluoroelastomer O ring	10133PHT	□ ○
13	Spindle bearing	845/0062	□ ○
14	Spindle	845/0200	○
15	Viton O ring	5005-336	□ ○
16	Stuffing clamp	845/0016	
17	Clamp bolt (2)	5111-022	
18	Spring washer (2)	5113-008	
19	Stuffing seal	845/0061	□ ○
20	Perlast O ring	5005-384	□ ○
21	PTFE O ring	5005-008	□ ○
22	Handle linkage assembly	324/8910	
23	Handle ***Refer to the Handle Options Table**		

Footvalve Handle Options

Specification	Type	Part No.
Std. Cleanflow handle		324/8670
Std. Highlift handle		330/5010

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	845/00SK

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	845/00RK

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4" 90° Cleanflow Footvalve - Pneumatically Actuated

Part No: 875/4800SS



Specification

Nominal size/body angle
4" / 90°

Inlet connection
Flanged: 8 x 18mm holes on a 210mm PCD

Outlet connection
Flanged: 8 x 18mm holes on a 180mm PCD

Properties
With pneumatic actuator

Materials
Seating area: Superseat (alloy 625)
Contact parts: 316 stainless steel
Main seal: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	32.1 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature min:	-40°C
Design Temperature max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Approvals
BS EN14433

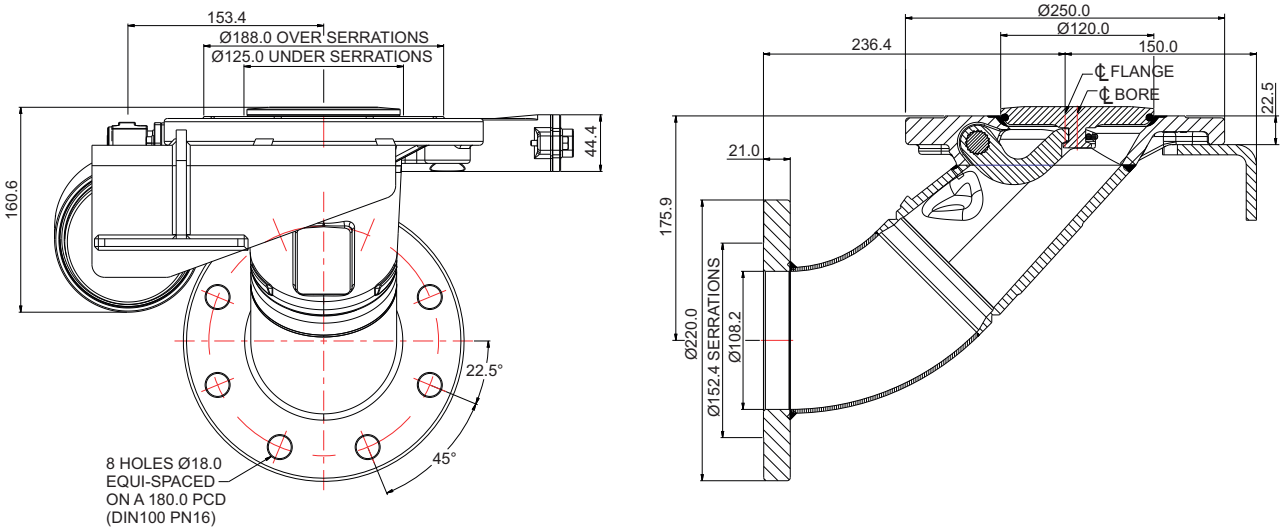
Range

Description	Part No.
Standard valve	875/4800SS
With replaceable seat inlet	875/4800SSRX
With replaceable seat inlet, conical poppet, steam chamber	875/4800SSHRX

Related Parts

Description	Part No.
Weld-in flange	854/9000
Stud kit (875/4800SS only)	875/2044
CNAF/PTFE inlet gasket	5005-467
CNAF/PTFE outlet gasket	5005-468
Mating flange - DIN100 PN16	875/4150
Bolting kit for mating flange 875/4150	875/4160
Valve operation decal	845/0320

Section View



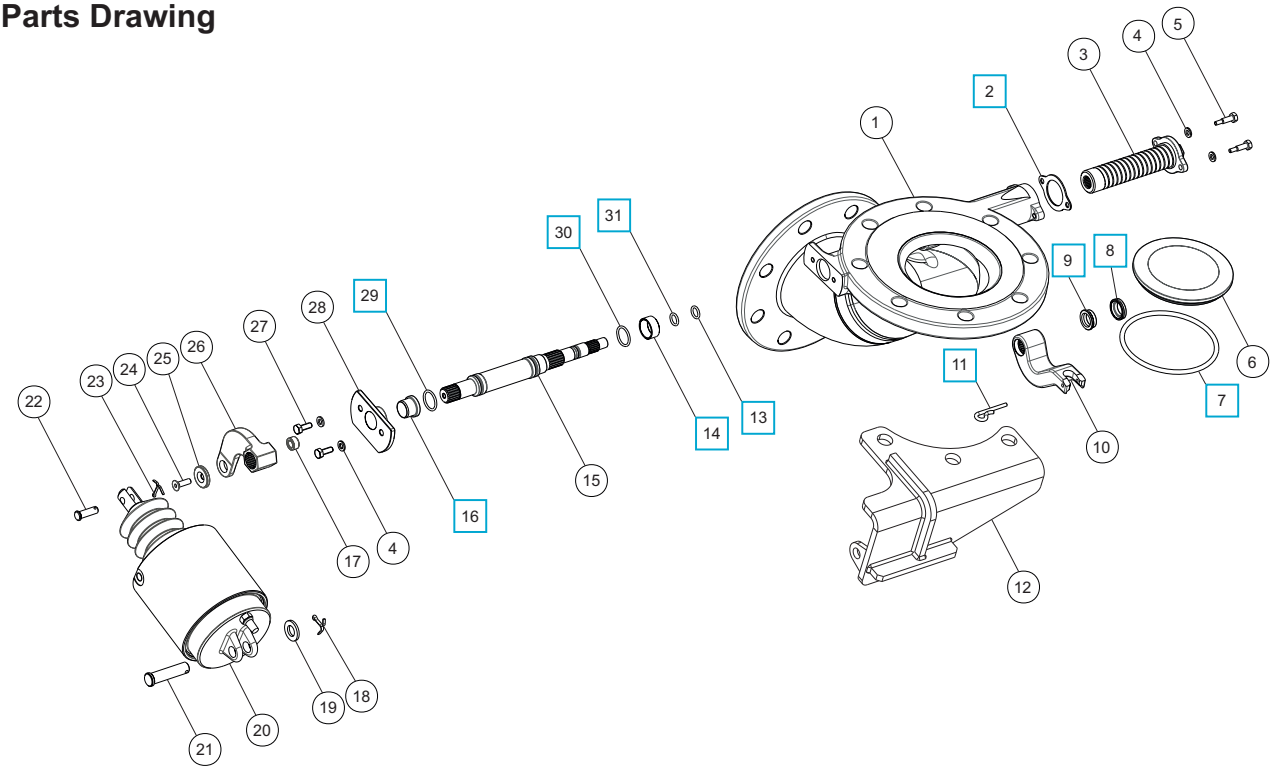
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4" 90° Cleanflow Footvalve - Pneumatically Actuated

Part No: 875/4800SS

Parts Drawing



Parts List

Item	Description	Part No.	
1	Body	875/4110B	
2	Spring boss gasket	5005-846	☐
3	Spring assembly	875/0050	
4	Spring washer (4)	5113-008	
5	Clamp screw (2)	845/0017	
6	Poppet	875/0040	
7	Fortyt O ring	5005-349	☐
8	PTFE bottom bush seal	845/0064	☐
9	Bottom seal energizer	845/0063	☐
10	Lifting fork	875/0010	
11	Retaining pin	845/0015	☐
12	Pneumatic cylinder bracket	845/8064	
13	Perfluoroelastomer O ring	10133PHT	☐
14	PTFE spindle bearing	845/0062	☐
15	Main spindle	875/0200	
16	PTFE spindle stuffing seal	845/0061	☐
17	Bronze bush	844/2011	
18	Split pin	5220-008	
19	Plain washer	5113-006	
20	Pneumatic cylinder	875/2125	
21	Clevis pin	875/2122	
22	Clevis pin	875/2121	
23	Split pin	5118-016	
24	Countersunk bolt	5111-019	

Parts List

Item	Description	Part No.	
25	Retaining washer	20370/2	
26	Crank arm	844/2049	
27	Hex bolt (2)	5111-022	
28	Stuffing clamp flange	845/0066	
29	Viton O ring	5005-336	☐
30	Perfluoroelastomer O ring	5005-384	☐
31	PTFE O ring	5005-008	☐

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	875/00SK

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3" 90° Tankstream Footvalve

Part No: 28F/0000F



Specification

Nominal size/body angle
3" / 90°

Inlet connection
Flanged: 12 x 14mm holes on a 158.8mm PCD (6 inlet holes are plugged with a plastic plug)

Outlet connection
Flanged: 8 x 10.5mm holes on a 124mm PCD

Materials
Contact parts: 316 stainless steel
Main seal: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	7.5 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature min:	-20°C
Design Temperature max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

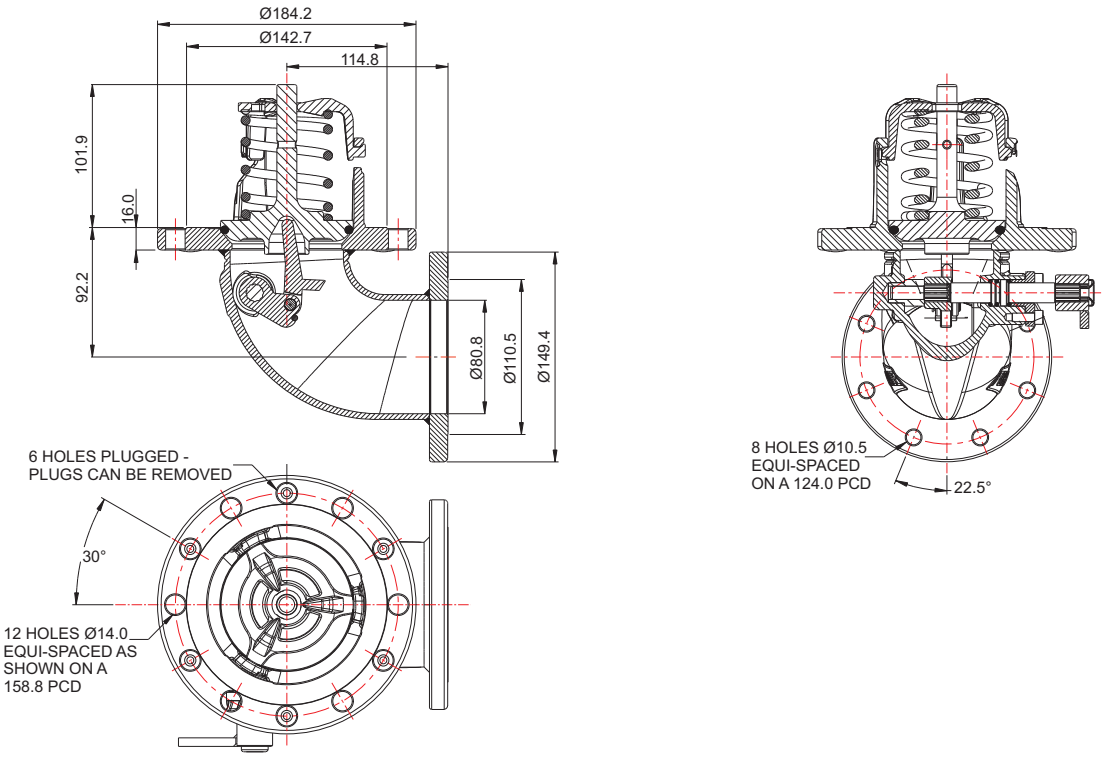
Range

Description	Part No.
Standard valve, Fortyt seal	28F/0000F
Standard valve, Viton seal	28F/0000V

Related Parts

Description	Part No.
Weld-in flange	11954/S
Stud kit	290/1300
CNAF/PTFE inlet gasket	5005-016
CNAF/PTFE outlet gasket	5005-445
3" TTMA mating flange	299/7116

Section View



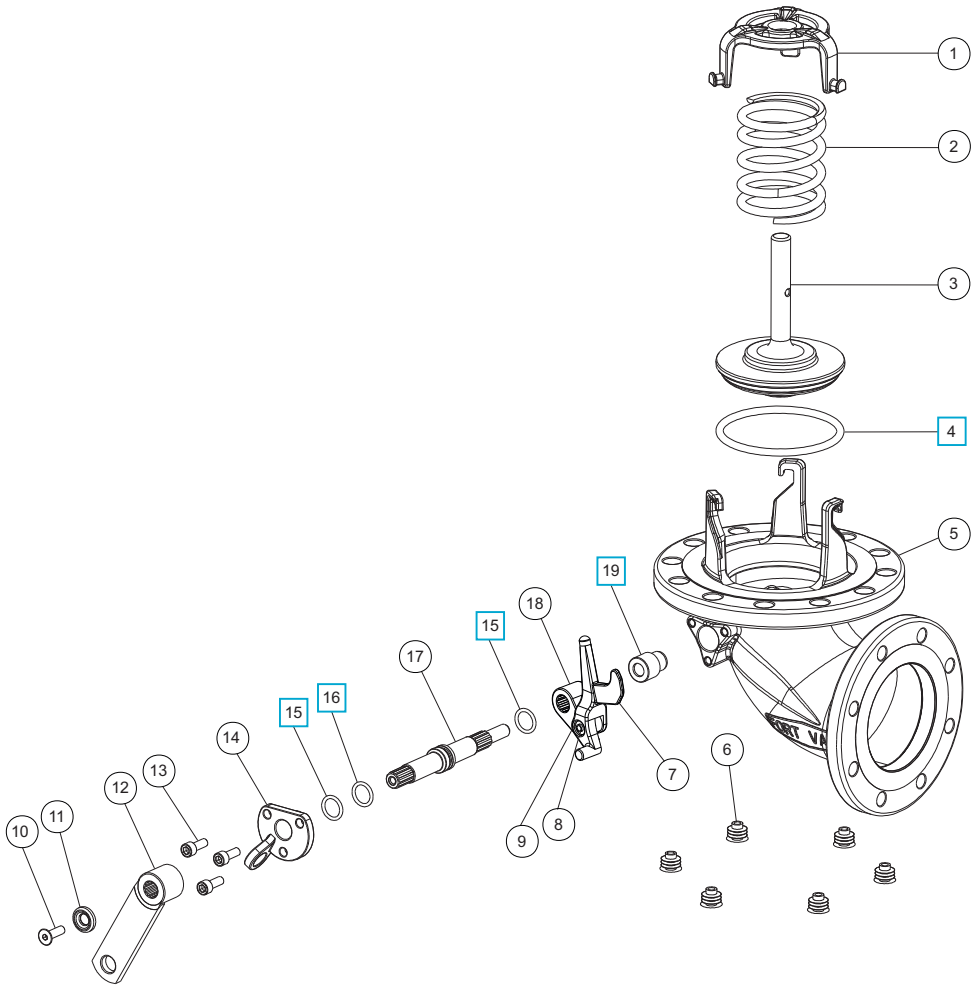
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3" 90° Tankstream Footvalve

Part No: 28F/0000F

Parts Drawing



Parts List

Item	Description	Part No.	
1	Spring top plate	290/6104	
2	Closure spring	5104-971	
3	Solid poppet	324/2020	
4	Fortyt O ring	5005-104	☐
5	Body assembly	28F/0003	
6	Plastic plug (6)	5028-227	
7	Lifting finger	821/0056	
8	Pivot pin	821/0034	
9	Plain washer	5113-015	
10	Countersunk bolt	5111-019	
11	Retaining washer	20370	
12	Crank arm	20607	
13	Cap screw (3)	5111-017	
14	Stuffing clamp	324/1001	
15	PTFE O ring (2)	20363	☐
16	Viton O ring	20361	☐
17	Spindle	821/0010	
18	Crank block	821/0025	
19	Crankshaft end bush	20362	☐

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	826/00SK

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4" 90° Sealtyt Extended Footvalve - Pneumatically Actuated

Part No: 299/7000PN



Specification

Nominal size/body angle
4" / 90°

Inlet connection
Flanged: 8 x 14mm holes on a 190mm PCD

Outlet connection
Flanged: 8 x 14mm holes on a 150.1mm PCD

Properties
With pneumatic actuator

Materials
Contact parts: 316 stainless steel
Main seal: PTFE/elastomer

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	22 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	200°C

Pneumatic Cylinder
Maximum Operating Pressure: 7 Bar

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Approvals
BS EN14433

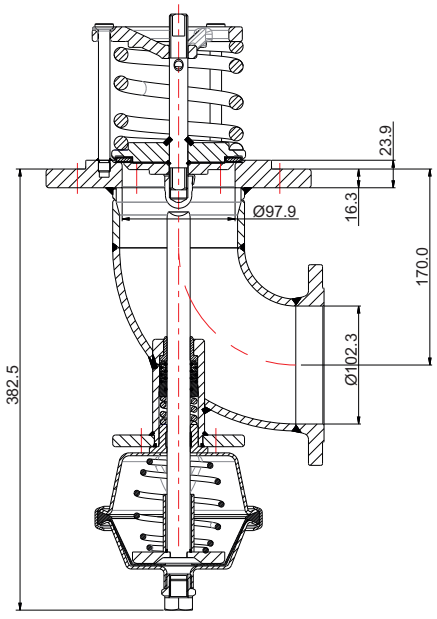
Range

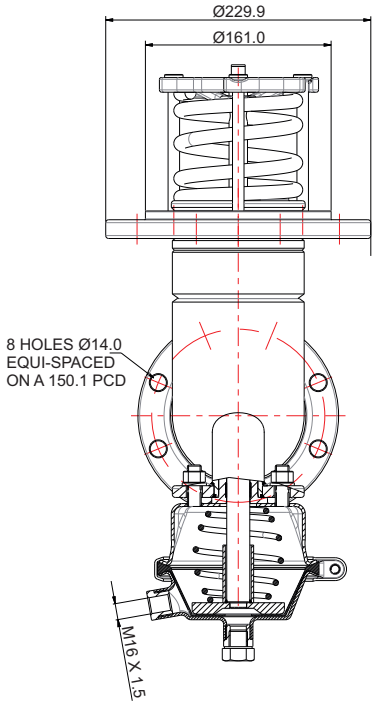
Description	Part No.
Standard valve	299/7000PN
4" 105° with pneumatic actuator	299/7200PN

Related Parts

Description	Part No.
Weld-in flange	299/7001
Stud kit	299/7060
CNAF/PTFE inlet gasket	5005-945
CNAF/PTFE outlet gasket	5005-835

Section View





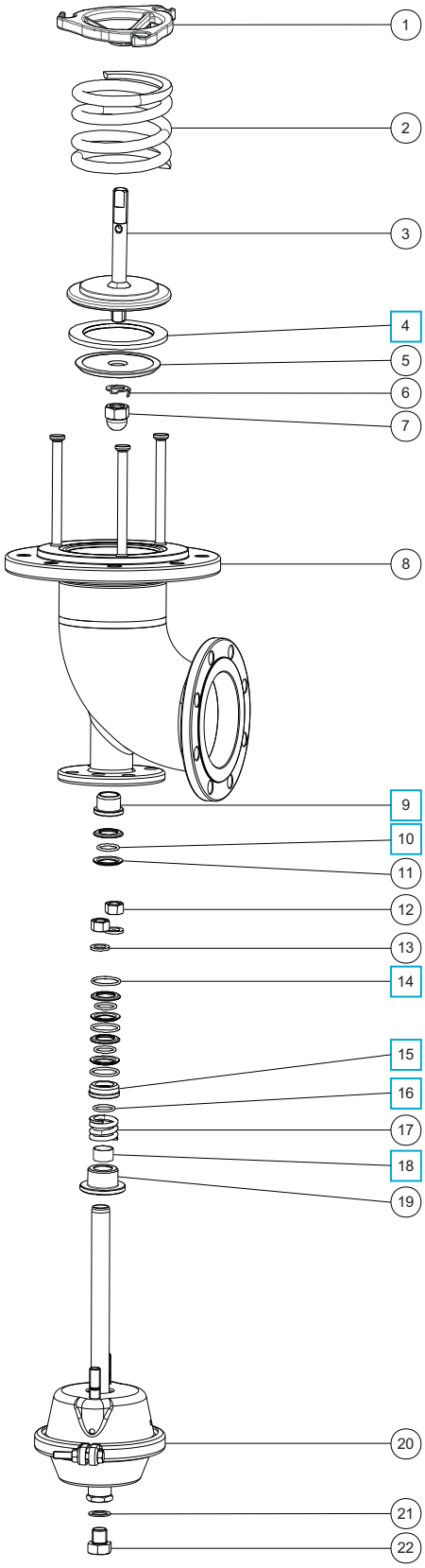
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4" 90° Sealtyt Extended Footvalve - Pneumatically Actuated

Part No: 299/7000PN

Parts Drawing



Parts List

Item	Description	Part No.	
1	Spring top plate	299/7017	
2	Closure spring	5104-981	
3	Poppet seal housing	299/7034	
4	Poppet composite seal	299/7035	☐
5	Poppet seal clamp plate	299/7036	
6	Locking tab washer	299/7031	
7	M12 dome nut	5112-052	
8	Body	299/7010	
9	Top bearing	299/7011	☐
10	PTFE bearing (3)	5005-926	☐
11	Stuffing bush (6)	299/7013	
12	M12 full nut (2)	5112-006	
13	M12 spring washer (2)	5113-010	
14	PTFE O ring (3)	5005-927	☐
15	Bottom bearing bush	299/7015	☐
16	Viton O ring	5005-928	☐
17	Seal housing spring	5104-982	
18	Scarf bearing	299/7032	☐
19	Stuffing bush	299/7016	
20	Pneumatic cylinder	299/7020	
21	M16 Dowty washer	5005-696	
22	M16 bolt	5111-138	

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	299/70SK

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4" Screwdown Valve Assembly

Part No: 270/0000RX





Specification

Nominal size
100mm

Top operator connection
Flanged: 4 x 11mm holes on a 133.4mm PCD

Bottom outlet connection
Flanged: 8 x M12 holes on a 177.8mm PCD

Parts included
Top weld-in flange, stud kit, PTFE inlet gasket, spring-loaded top operator, 4" poppet assembly, 4" NB bottom weld-in flange with replaceable seat area
NOTE: 1" Sched.10 tube is not included

Materials
Seating area: 316 stainless steel
Contact parts: 316 stainless steel
Main seal: PTFE

Design Conditions

Weight:	16.2 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	250°C
Pre-load	4479N @ 5.25mm
Max. solid washers	10.5mm
Stroke	50mm

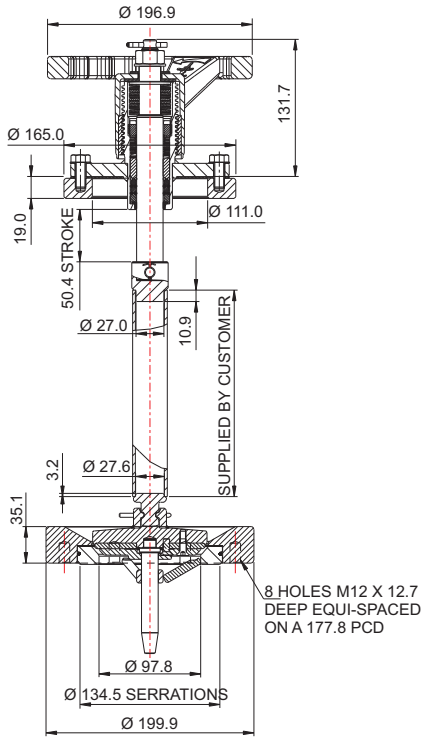
NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Approvals
BS EN14433

Related Parts

Description	Part No.
Top PTFE gasket	5005-985
High nickel alloy replaceable seat	267/3715H
Outlet mating flange	294/0087
Outlet stud kit	324/2050
CNAF/PTFE outlet gasket	5005-015

Section View



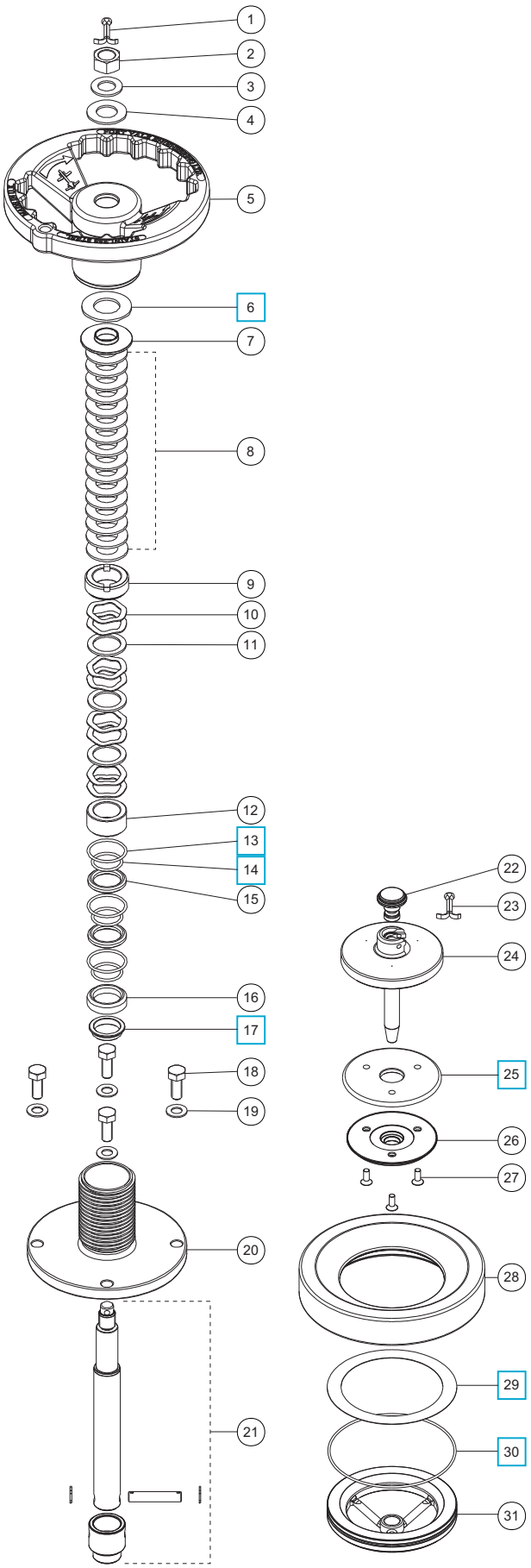
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4" Screwdown Valve Assembly

Part No: 270/0000RX

Parts Drawing



Parts List

Item	Description	Part No.	
1	Split pin	5118-043	
2	M16 castle nut	5112-026	
3	M16 plain washer	5113-057	
4	Handwheel bearing pad	270/0019	
5	Handwheel assembly	270/0020	
6	PTFE thrust washer	270/0026	☐
7	Handwheel bearing pad	270/0018	
8	Belleville washer (16)	5113-048	
9	Stuffing bush	270/0016	
10	5 wave spring (8)	5104-212	
11	Spacing washer (3)	270/0014	
12	Top bearing bush	270/0015	
13	PTFE O ring (3)	5005-560	☐
14	PTFE O ring (3)	5005-558	☐
15	Stuffing bush (2)	270/0013	
16	Bearing backing ring	270/0012	
17	Bottom bearing	270/0011	☐
18	M10 hex bolt (4)	5111-042	
19	M41 plain washer (4)	5113-009	
20	Body assembly	270/0025	
21	Spindle sub-assemly	270/0032	
22	Bottom stem end	266/1015	
23	Split pin	5118-019	
24	4" poppet weld assembly	269/7019	
25	4" PTFE poppet seal disc	269/7023A	☐
26	4" poppet seal clamp plate	269/7028A	
27	Countersunk set screw (3)	5111-030	
28	4" bottom tank weld-in flange	267/3741	
29	Wafer gasket	267/3719G	☐
30	Silicone O ring	5005-788HT	☐
31	4" replaceable seat	267/3715	

Seal Kit

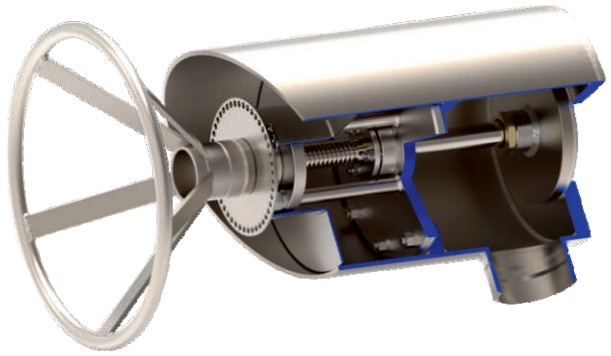
Description	Part No.
All parts marked ☐ in the Parts List	270/00SK

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150mm Reedley Horizontal Hot Product Valve

Part No: 262/2000



Specification

Inlet nominal size
150mm

Outlet connection
100mm NB weld prepared, machined with a shear groove

Operation
Manually operated by a handwheel. The handwheel assembly has a fixed splash-guard, a padlock security system and a machined shear groove

Materials
Contact parts: 304/316 stainless steel
Spindle: 1.4462 duplex steel
Main seal: RTFE

Design Conditions

Weight:	65 Kg
Design Pressure (MAWP):	3.5 Bar
Test Pressure:	5.25 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	250°C

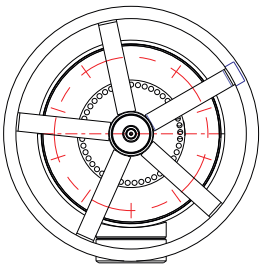
NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Approvals
BS EN14433

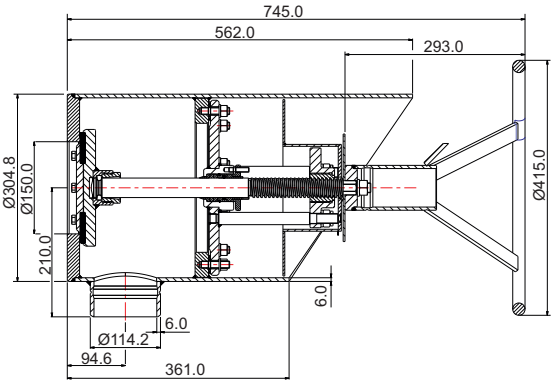
Related Parts

Description	Part No.
100mm butterfly valve with hemi-spherical closure plate - manually operated	468/75HTB
100mm butterfly valve with hemi-spherical closure plate - pneumatically actuated	468/75HTBPN

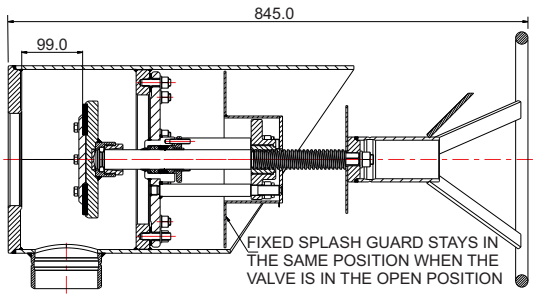
Section View



Valve shown in the CLOSED position



Valve shown in the OPEN position



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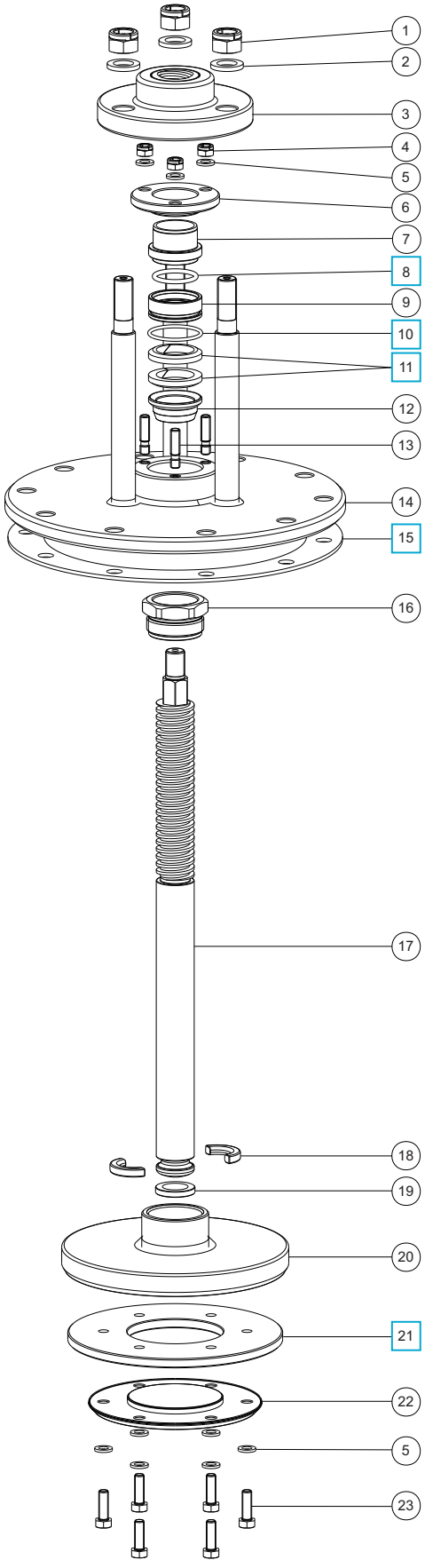
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150mm Reedley Horizontal Hot Product Valve

Part No: 262/2000

Parts Drawing: Internal Sub-Assembly

Part No: 262/2150



Parts List

Item	Description	Part No.
1	M16 self-locking nut (3)	5112-053
2	M16 spring washer (3)	5113-012
3	Threaded flange assembly	262/1037
4	M8 self-locking nut (3)	5112-031
5	M8 spring washer (9)	5113-003
6	Stuffing clamp	262/1035
7	Packing clamp bush	262/1051
8	Viton O ring	ORB218VR ☐
9	Wiper bearing	262/1052
10	Viton O ring	ORB129VR ☐
11	Gland packing (2)	262/1024 ☐
12	Wiper bearing	262/1049
13	M8 x 33mm stud	S0396/10
14	Tie bar weld assembly	262/1059
15	Sigma gasket *Note	262/1007 ☐
16	Stuffing nut	262/1033
17	Spindle	262/2003
18	Thrust bearing pair	262/1028
19	Thrust bearing	262/1027
20	Poppet	262/1013
21	Poppet seal disc	262/1026 ☐
22	Seal clamp plate	262/1025
23	M8 x 25mm hex bolt (6)	5111-048

NOTE: Item 15 Sigma gasket 262/1007 is not included in the internal sub-assembly 262/2150. Please order it separately.

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	262/20SK

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6" 180° Cleanflow Footvalve - Hydraulically Actuated

Part No: 874/0000



Specification

Nominal size/body angle
6" / 150mm / 180°

Inlet connection
Flanged: 12 x 0.6" (14.0) holes equi-spaced on a 9.3" (234.95) PCD - 6" TTMA sump specification

Outlet connection
Flanged: 12 x 0.44" (11.1) holes equi-spaced on a 8.13" (206.4) PCD - 6" TTMA flange specification

Properties
Hydraulically actuated with ⅛" NPT connection

Materials
Contact parts: 316 stainless steel
Main seal: Fortyt

Design Conditions

Weight:	68.7 Lb (31.2 Kg)
Design Pressure (MAWP):	58 PSI (4 Bar)
Test Pressure:	100.1 PSI (6.9 Bar)
Design Temperature Min:	-4°F (-20°C)
Design Temperature Max:	302°F (150°C)
Hydraulic Actuator MAWP:	1305.3 PSI (90 Bar)

Max.Internal Pressure on Opening: 20 PSI (1.38 B) Ambient
Max.Internal Pressure on Opening: 15 PSI (1.03 B) At Temp.

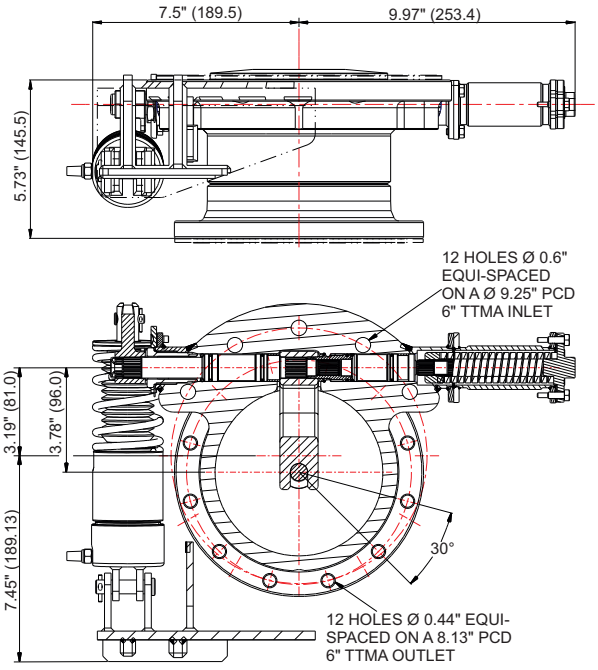
NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

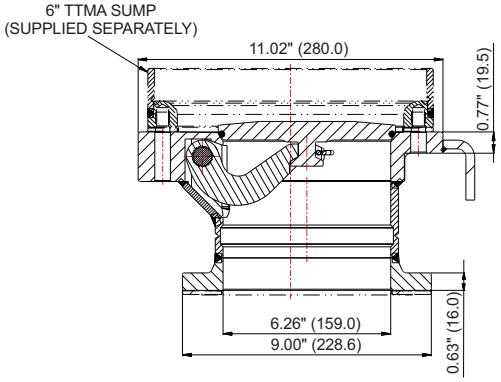
Design Code
BS EN 14433

Related Parts

Description	Part No.
Sump weld-in flange - ½" UNC holes	874/0040
Sump weld in flange - M12 holes	874/0055
Stud kit - ½" UNC	874/00SK
Stud kit - M12	874/00MSK
CNAF/PTFE inlet gasket	874/0041
CNAF/PTFE outlet gasket	874/0042

Section View





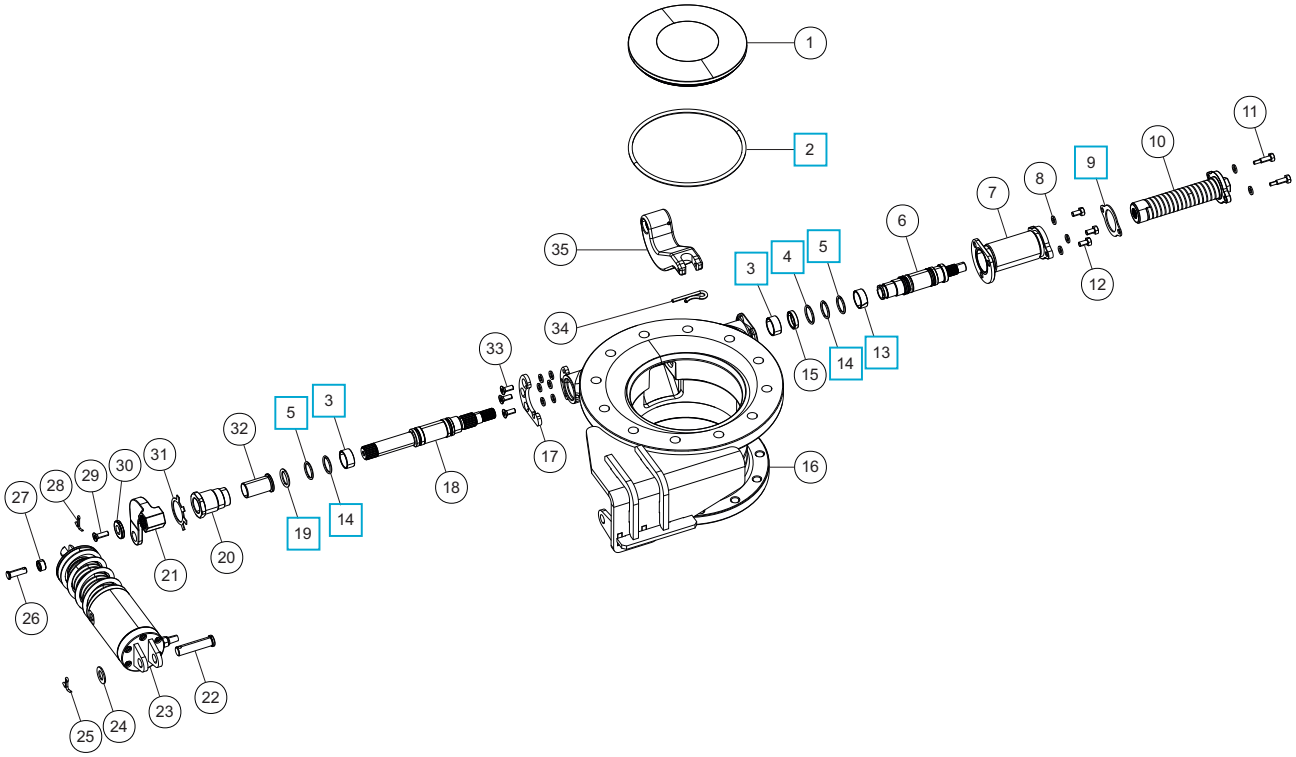
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6" 180° Cleanflow Footvalve - Hydraulically Actuated

Part No: 874/0000

Parts Drawing



Parts List

Item	Description	Part No.	
1	Poppet	874/0015	
2	Fortyt O ring	ORB360FO	□
3	Spindle bearing (2)	845/0062	□
4	PTFE O ring	5005-319	□
5	Viton O ring (2)	5005-336MF	□
6	Bottom extension spindle	874/0025	
7	Spring extension housing	874/0014	
8	M6 spring washer (11)	5113-008	
9	Spring housing gasket	5005-846	□
10	Torsion spring	875/0050	
11	M6 hex screw (2)	845/0017	
12	M6 hex bolt (3)	5111-050	
13	Split bearing	874/0023	□
14	Perfluroelastomer O ring (2)	5005-384	□
15	Bottom seal energizer	874/0027	
16	Body	874/0100	
17	Indicator plate	874/0019	
18	Main spindle	874/0020	
19	PTFE O ring	5005-113	□
20	Stuffing gland nut	874/0016	
21	Extended crank arm	844/2067	
22	Clevis pin	875/2122	
23	Hydraulic cylinder ***Note**	875/2160N	△
24	M12 plain washer	5113-006	
25	⅛" split pin	5220-008	

Parts List

Item	Description	Part No.
26	Clevis pin	844/2121
27	Bronze bush	844/2011
28	3/32" split pin	5118-016
29	6mm countersunk bolt	5111-019
30	Retaining washer	20370/2
31	Locking washer	853/7029
32	Spindle guide bush	874/0024
33	M6 countersunk bolt (3)	5111-030
34	Retaining pin	845/0015
35	Lifting fork	874/0018

Seal Kits

Description	Part No.
Seal kit for footvalve 874/0000: contains all parts marked □ in the Parts List	874/0000SK
△ Seal kit for hydraulic cylinder 875/2160N, includes silencer	875/2160NSK

NOTE: A hydraulic cylinder with BSP connections and a compatible seal kit is available. Please contact Fort Vale.

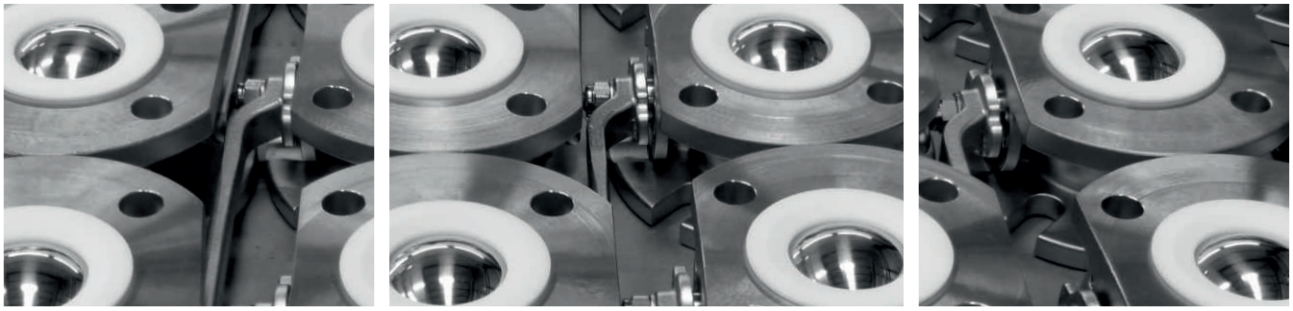
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FORT VALE

Bottom Discharge - Secondary Closure Valves

Road Tanker Catalogue



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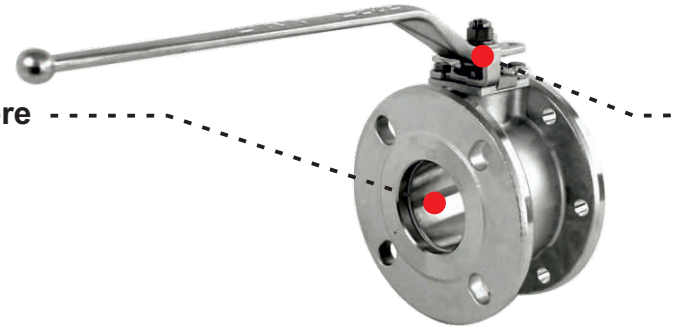
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Function

A discharge ball valve is used to load and discharge cargo. It is usually a secondary closure valve that is installed onto a footvalve (primary closure valve) at the drain point of a tank. A ball valve can also be used as a primary closure valve on the top of a tank.

Design Options

The design options below are available on our standard range of discharge ball valves.



Nominal Bore

50mm (2")

80mm (3")

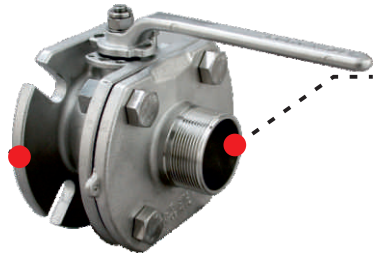
100mm (4")

Operation

Manually operated: A range of handles is available

Left hand, right hand, ambidextrous

Pneumatically actuated



Inlet Flange

4, 6 and 8 holes/slots drilling patterns

Flats milled top and bottom

Outlet

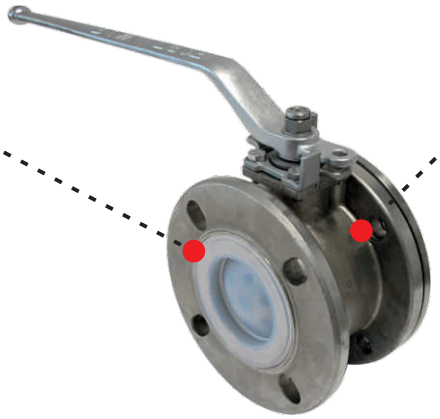
Threaded spigot flange

Flush fit

Bobbin flange with a range of drilling patterns

Flats milled top and bottom

Camlock



Valve Materials

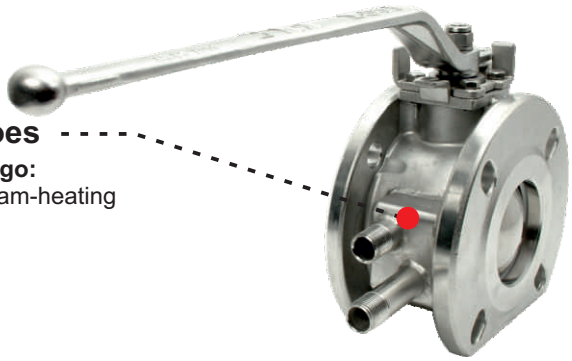
316 stainless steel

Special service conditions:
High nickel alloys
Lined wetted parts, e.g. PFA

Main Seal

PTFE

Special service conditions:
High-temperature compatible seals



Special Cargoes

For solidifying cargo:
Valve body with steam-heating chamber

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Related Parts

We recommend our range of compatible accessories:

- Flanges - mating, adapter, blind, weld-in, syphon
- Tertiary closures
- Fasteners
- Gaskets

Please contact us for more information about these parts.

Discharge Ball Valves for Dedicated Service

We offer a range of discharge ball valves suitable for these service conditions and special cargoes:

- T50 tank containers for liquefied gas
- Rail wagons
- Hydrogen peroxide
- Firesafe/lethal service

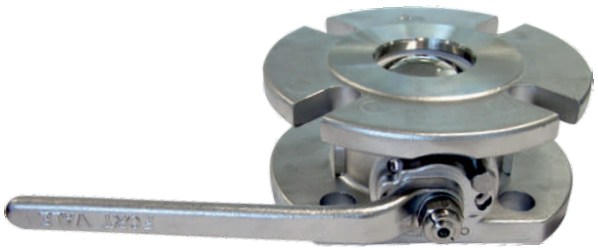
Please contact us for more information about these valves.

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2" Flanged Blacko Ball Valve

Part No: 370/0100



Specification

Nominal size
50mm

Tank connection
Flanged: 4 x 18mm holes on a 125mm PCD

Outlet/Process connection
Flanged: 4 x open slots on a 120.7mm minimum PCD

Properties
Left hand operated, handle with TIR

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	5.5 Kg
Design Pressure (MAWP):	7.5 Bar
Test Pressure:	13.8 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	205°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Codes
Design Approval by Lloyds Register of Shipping
BS EN14432

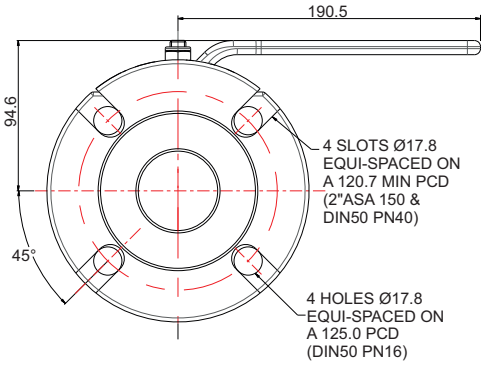
Range

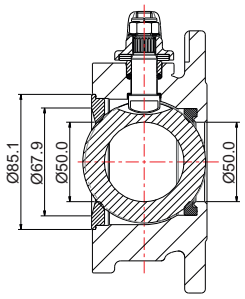
Description	Part No.
Standard specification	370/0100
With steam heating chamber	370/0100SH
DIN80 inlet adaptor & outlet blind flange	370/0140
With 2" BSP outlet spigot flange	370/0150
With outlet blind flange	370/0180

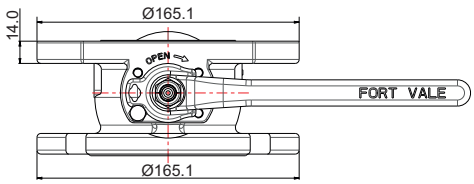
Related Parts

Description	Part No.
Weld-in flange	355/3100
Stud kit	311/3700
PTFE outlet gasket	5005-361
Blind flange	370/4239CM
Bolting kit	311/3500

Section View







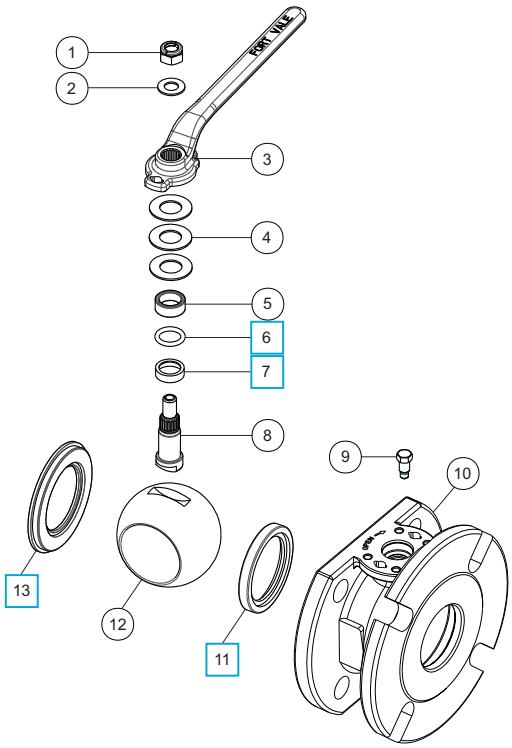
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2" Flanged Blacko Ball Valve

Part No: 370/0100

Parts Drawing



Parts List

Item	Description	Part No.	
1	M10 self locking nut	5112-008	
2	M10 plain washer	5113-009	
3	Handle	370/0125	
4	16mm Belleville washer (3)	5113-038	
5	Stuffing collar	370/0103	
6	PTFE O ring	5005-688	☐
7	Bottom bearing	370/0104	☐
8	Spindle	370/0120	
9	Stop bolt	370/0107	
10	Body	370/0110	
11	PTFE rear seal	370/0102	☐
12	50mm ball	370/3301	
13	PTFE front seal	370/0105	☐

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	370/01SK

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3" Blacko Ball Valve - 3" BSP Outlet

Part No: 360/5000L



Specification

Nominal size
80mm

Tank connection
Flanged: 6 x 14mm holes on a 168.3mm PCD

Outlet/Process connection
3" BSP

Properties
Left hand operated, handle with TIR

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	16 Kg
Design Pressure (MAWP):	7 Bar
Test Pressure:	12.8 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN 4432

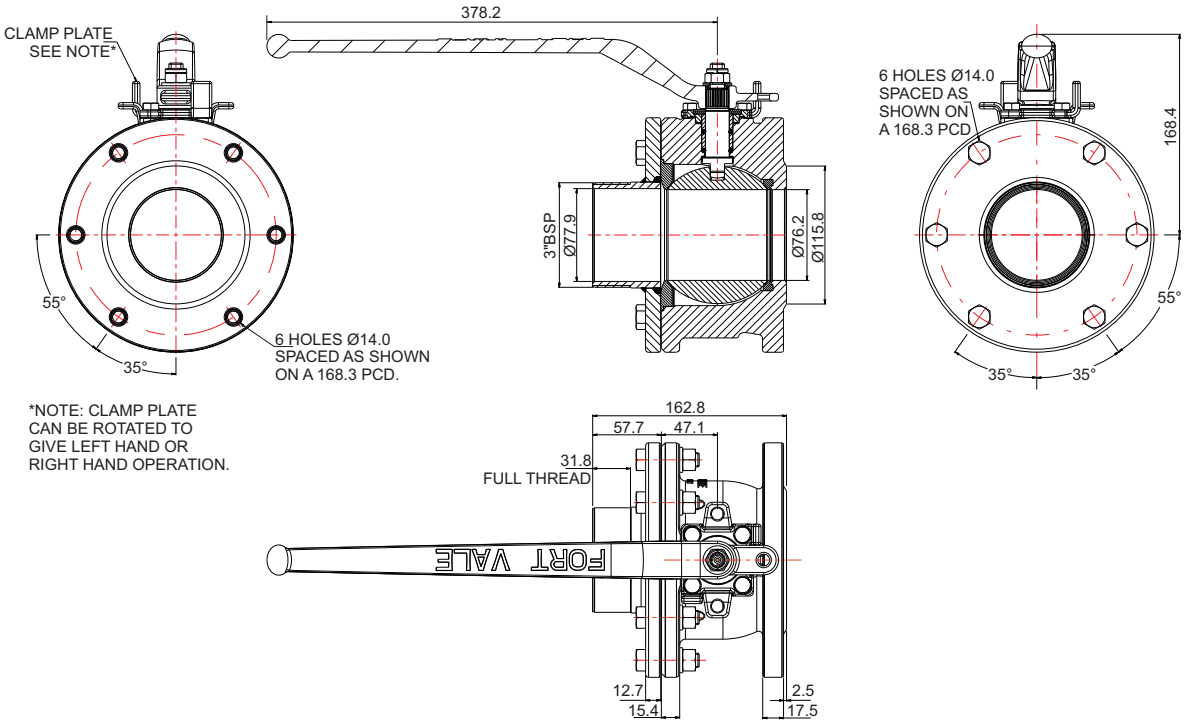
Range

Description	Part No.
Left hand operated	360/5000L
Right hand operated	360/5000R

Related Parts

Description	Part No.
Mating flange	20378
Inlet bolting kit	360/0300
3" BSP cap with PTFE washer	10303PS

Section View



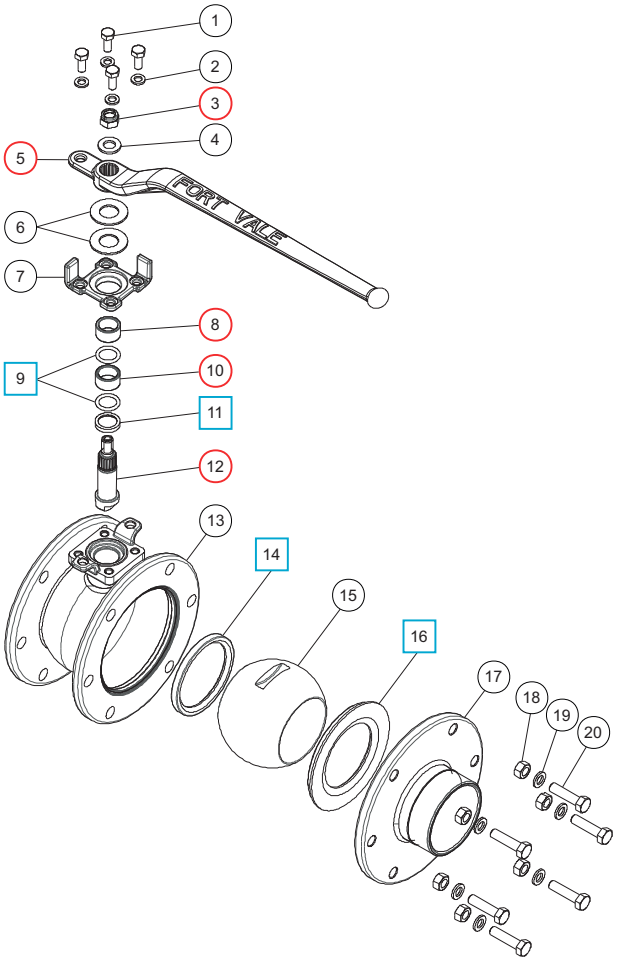
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3" Blacko Ball Valve - 3" BSP Outlet

Part No: 360/5000L

Parts Drawing



Parts List

Item	Description	Part No.	
1	M8 hex head bolt (4)	5111-822	
2	M8 flat spring washer (4)	5113-003	
3	M12 self-locking nut	5112-007	○
4	M12 washer	5123-003	
5	Handle	360/3416	○
6	20mm Belleville washer (2)	5113-041	
7	Clamp plate	360/5005	
8	Top stuffing collar	360/3412	○
9	PTFE O ring (2)	5005-113	□ ○
10	Bottom stuffing collar	360/3413	○
11	Bottom bearing	360/3421	□ ○
12	Spindle	360/3422	○
13	Body	360/5014	
14	PTFE rear seal	360/3402	□ ○
15	Solid ball	360/3401	
16	PTFE front seal	360/3405	□ ○
17	3" BSP male outlet flange	20409/14	
18	M12 full nut (6)	5112-006	
19	M12 flat spring washer (6)	5113-010	
20	M12 hex bolt (6)	5111-023	

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	360/50SK

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	360/50RK

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3" Blacko Ball Valve - Slotted 4 Hole Outlet

Part No: 360/5050L



Specification

Nominal size
80mm

Tank connection
Flanged: 6 x 14mm holes on a 168.3mm PCD

Outlet/Process connection
Flanged: 4 x 18mm slots on a 146-160mm PCD

Properties
Left hand operated, handle with TIR

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	12.5 Kg
Design Pressure (MAWP):	7.5 Bar
Test Pressure:	13.7 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN 14432

Range

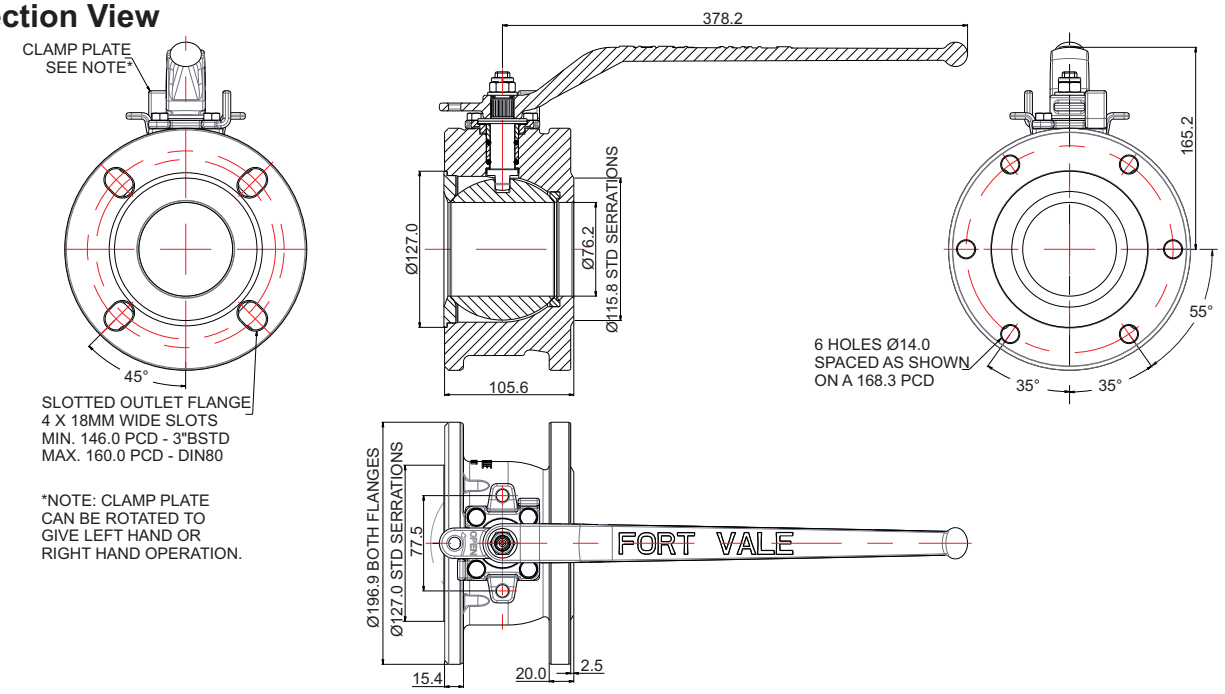
Description	Part No.
6 hole inlet, 4 hole outlet	360/5050X *
6 hole inlet, 4 hole outlet, steam heated	360/5050XSH *
4 hole inlet, 4 hole outlet	360/5030X *
4 holt inlet, 4 hole outlet, steam heated	360/5030XSH *

*The part number changes for left or right hand operated

Related Parts

Description	Part No.
3" BSP outlet flange	368/0500
PTFE outlet gasket	5005-417
Blind flange	360/8095
Outlet bolting kit	311/3500
Inlet mating flange	20378
CNAF/PTFE gasket for mating flange	5005-169
Inlet bolting kit	360/0300

Section View



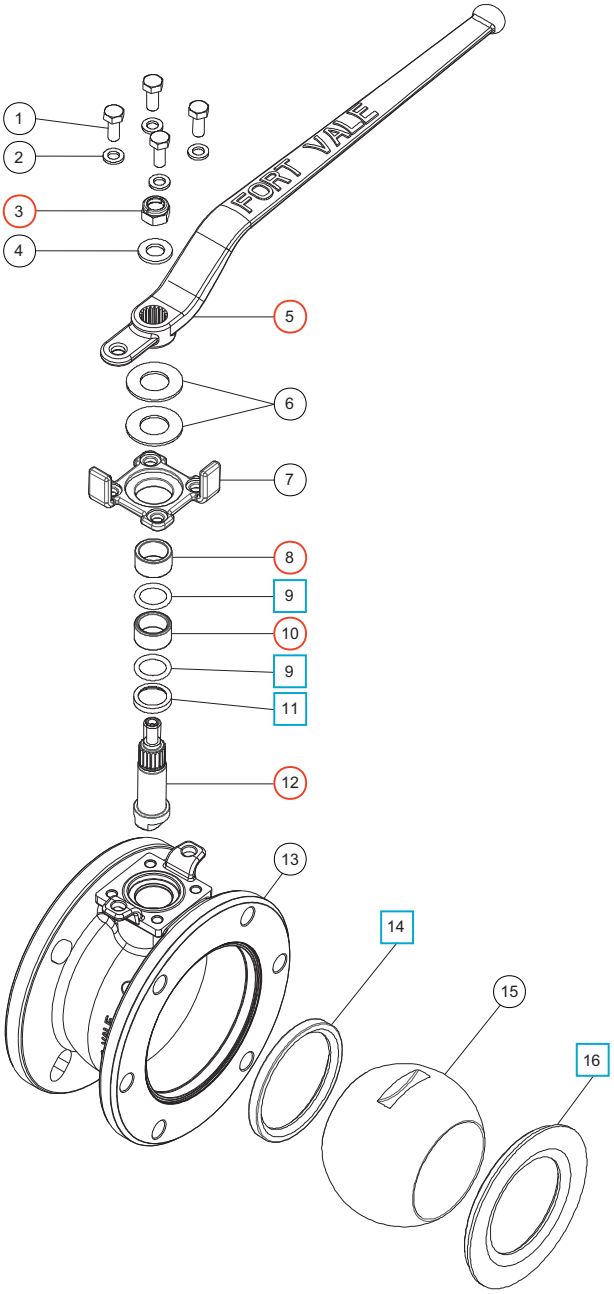
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3" Blacko Ball Valve - Slotted 4 Hole Outlet

Part No: 360/5050L

Parts Drawing



Parts List

Item	Description	Part No.	
1	M8 hex head bolt (4)	5111-822	
2	M8 flat spring washer (4)	5113-003	
3	M12 self-locking nut	5112-007	○
4	M12 washer	5123-003	
5	Handle	360/3416	○
6	20mm Belleville washer (2)	5113-041	
7	Clamp plate	360/5005	
8	Top stuffing collar	360/3412	○
9	PTFE O ring (2)	5005-113	□ ○
10	Bottom stuffing collar	360/3413	○
11	Bottom bearing	360/3421	□ ○
12	Spindle	360/3422	○
13	Body	360/5015	
14	PTFE rear seal	360/3402	□ ○
15	Solid ball	360/3401	
16	PTFE front seal	360/3405	□ ○

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	360/50SK

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	360/50RK

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DN80 Ball Valve with Inlet Seal Clamp

Part No: 360/6100X/XX



Part No. 360/6100X/BB shown

Specification

Nominal size
DN80

Tank connection
Flanged: a selection is available - Refer to Table 2 on the next page

Outlet/process connection
Flanged: a selection is available - Refer to Table 3 on the next page

Options
Left or right hand operation

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	13.6 Kg
Design Pressure (MAWP):	7 Bar
Test Pressure:	12.9 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN 14432

Range

Description	Part No.
Left hand operated ***Note**	360/6100L/XX
Right hand operated ***Note**	360/6100R/XX

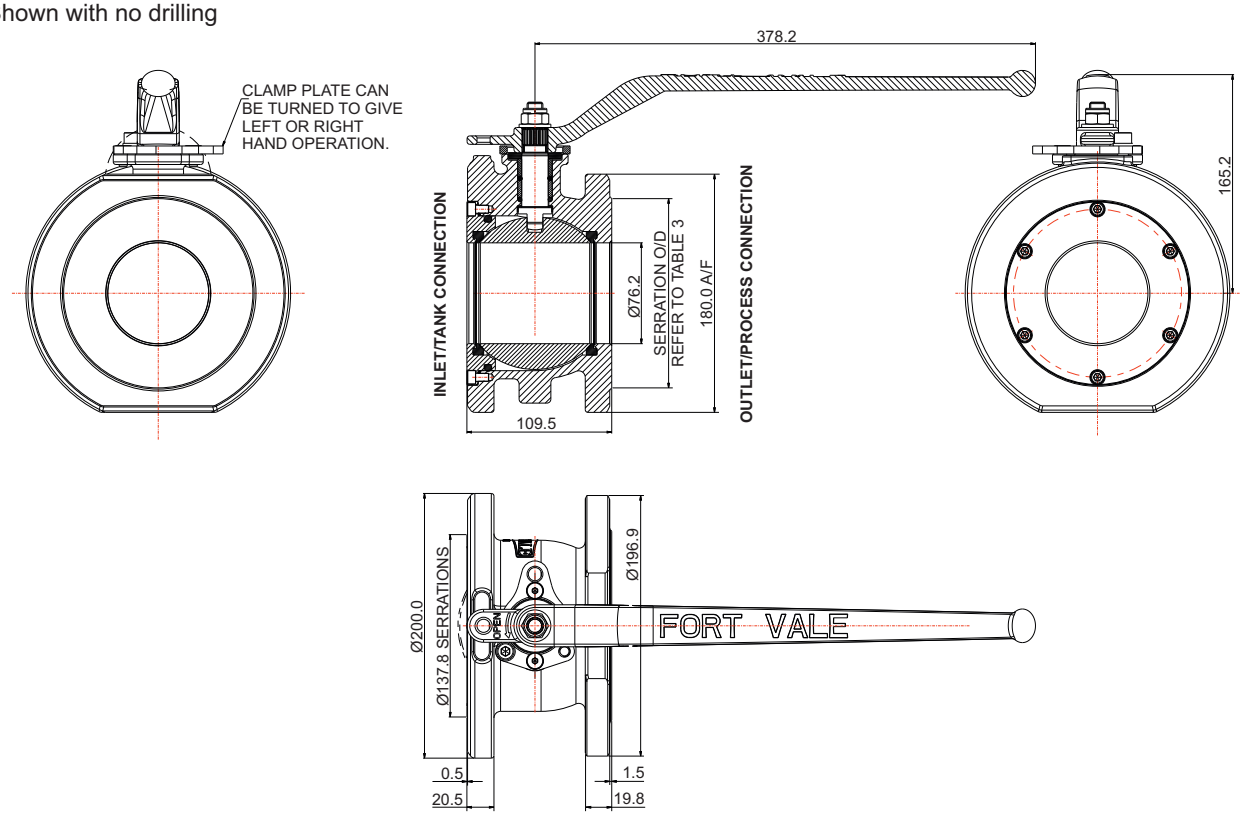
NOTE: The specification changes the Part No. Refer to the next page

Related Parts

Please refer to Fort Vale for Related Parts.

Section View

Shown with no drilling



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Part Number Code: 360/6100X / X X

Valve Operation
Refer to Table 1

Inlet Flange Drilling
Refer to Table 2

Outlet Flange Drilling
Refer to Table 3

Table 1: Valve Operation

Description	Part No.
Left hand operated	360/6100L/XX
Right hand operated	360/6100R/XX

Table 2: Inlet Flange Drilling

Inlet Holes	Hole Ø (mm)	Hole PCD (mm)	Code
0 holes	N/A	N/A	0
6 holes	14	168.3	A
8 holes	18	160.0	B
4 holes	17	160.0	C
8 slots	18 wide	159.0 to 168.0	D
4 holes and 6 holes	18 14	160.0 168.3	E

Refer to Figure 1 on the next page for more information.

Table 3: Outlet Flange Drilling

Outlet Holes	Hole Ø (mm)	Hole PCD (mm)	Serrations O/D (mm)	Code
0 holes	N/A	N/A	143.0	0
4 open slots	18 wide	160.0 to O/D	138.0	A
8 holes	18	160.0	138.0	B
8 slots	18 wide	152.4 to 160.0	130.0	C
4 holes and 4 holes	18 M16	160.0 160.0	143.0	D
4 slots	18 wide	146.0 to 160.0	127.0	E
4 holes and 4 holes	18 M16	160.0 160.0	143.0	F
8 holes and 4 holes	18 18	160.0 152.4	130.0	G
8 holes	M16	160.0	143.0	H
4 holes and 4 holes	18 18	160 152.4	127.0	I
4 slots and 4 holes	18 wide M16	146.0 to 160.0 160.0	127.0	J

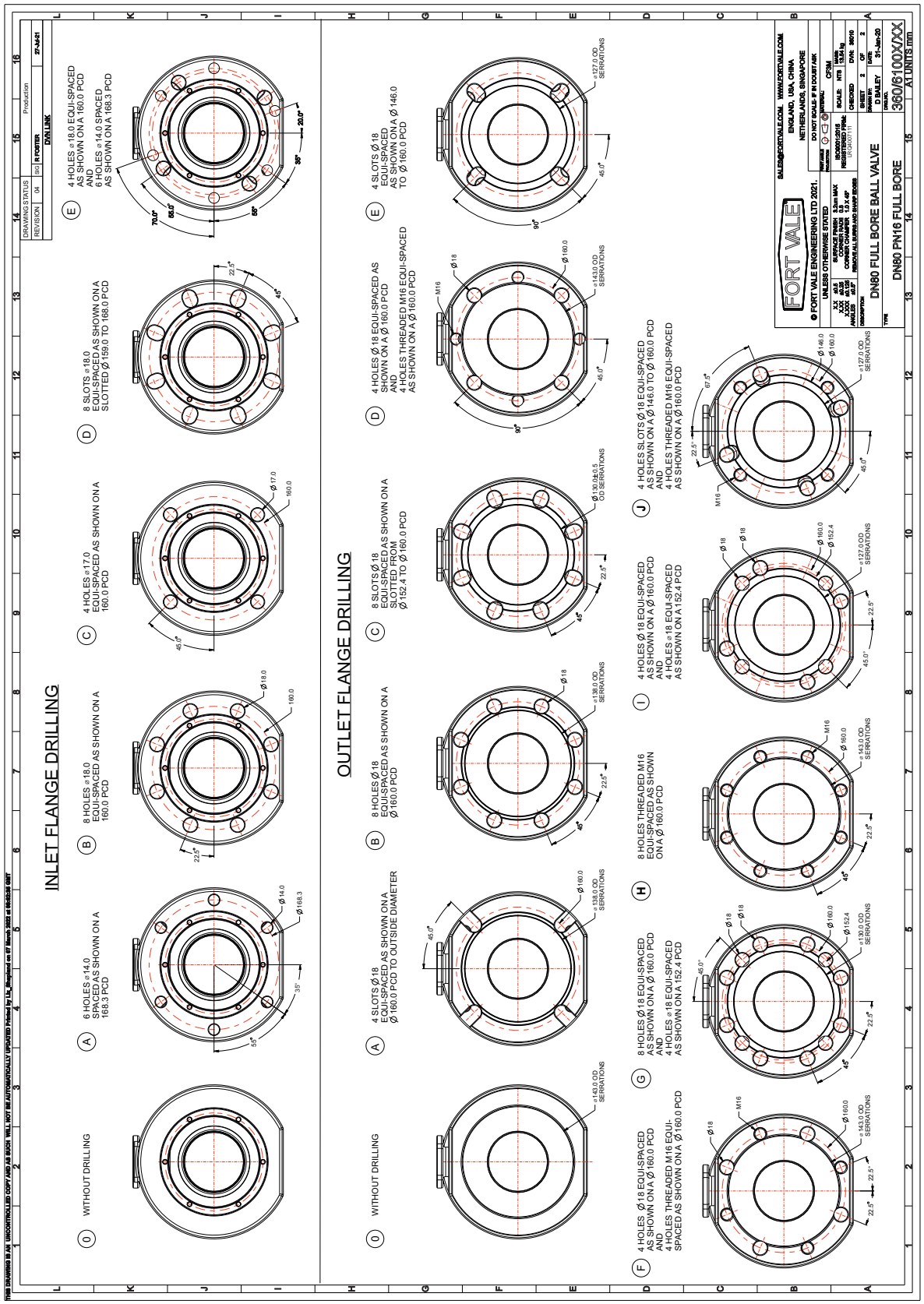
Refer to Figure 1 on the next page for more information.

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Figure 1

Uncontrolled Copy of Drawing 360/6100X/XX - Inlet/Outlet Flange Information



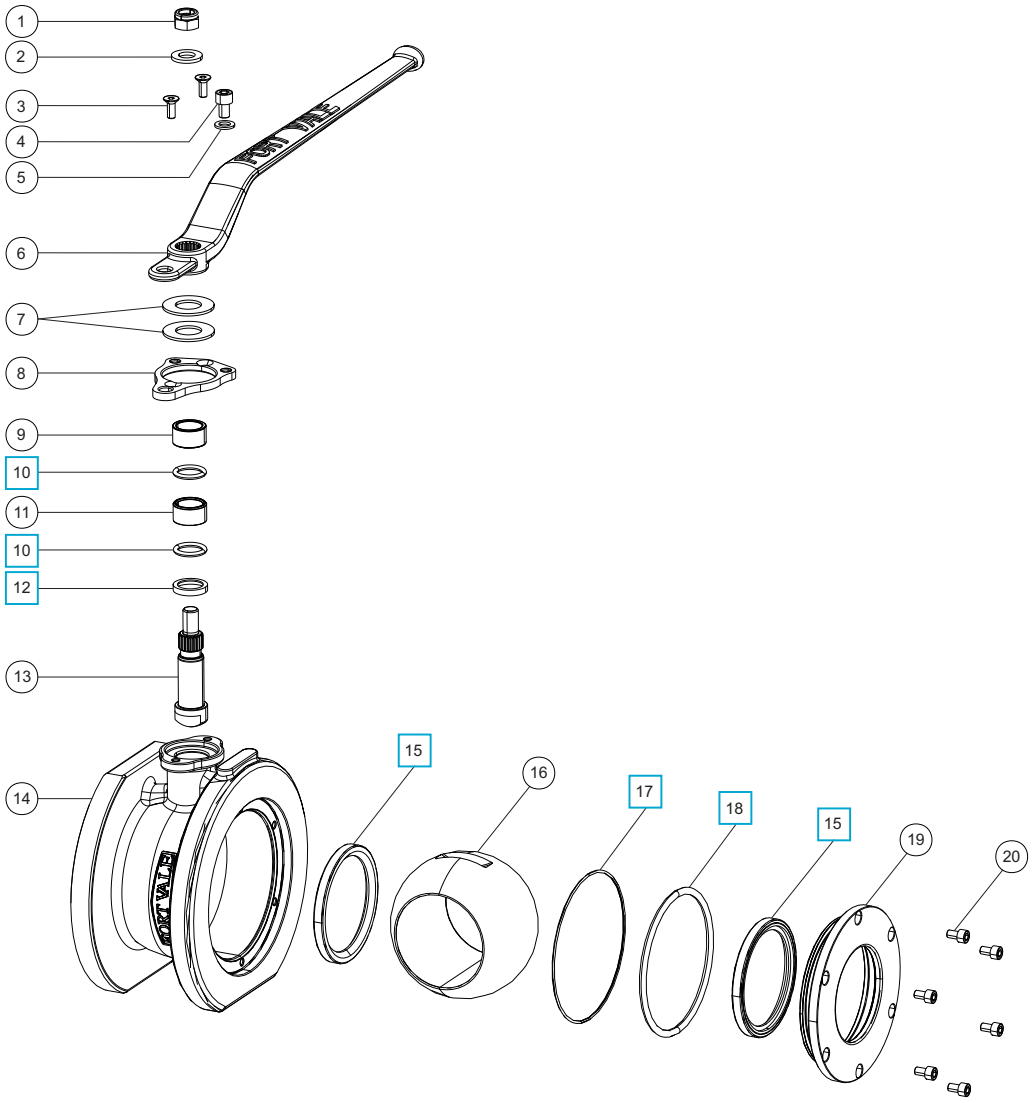
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DN80 Ball Valve with Inlet Seal Clamp

Part No: 360/6100X/XX

Parts Drawing



Parts List

Item	Description	Part No.	
1	M12 self-lock nut	5112-007	
2	M12 washer	5123-003	
3	M6 countersunk bolt (2)	5111-030	
4	M8 cap screw	5111-215	
5	M8 spring washer	5113-003	
6	Handle	360/3416	
7	Belleville washer (2)	5113-041	
8	Stop plate	360/6111	
9	Top stuffing collar	360/3412	
10	PTFE O ring (2)	5005-113	☐
11	Bottom stuffing collar	360/3413	
12	Bottom bearing	360/3421	☐
13	Spindle	360/3422	
14	Body ***Note**	360/6110/XX	
15	PTFE main seal (2)	360/3402	☐
16	Ball	360/3401	

Parts List

Item	Description	Part No.	
17	PTFE O ring	ORB544P0	☐
18	Fortyt O ring	ORB347F0	☐
19	Seal carrier clamp	360/6105	
20	M6 cap screw (6)	5111-061	

NOTE: The specification changes the Part No.

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	360/61SK

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DN100 Ball Valve with Inlet Seal Clamp

Part No: 460/E000X



Specification

Nominal size
DN100

Tank connection
Flanged: 8 x M16 holes on a 180mm PCD

Outlet/process connection
Flanged: 8 x M16 holes on a 180mm PCD

Options
Left or right hand operation

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	25.4 Kg
Design Pressure (MAWP):	16 Bar
Test Pressure:	29.2 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Codes
BS EN 14432

Range

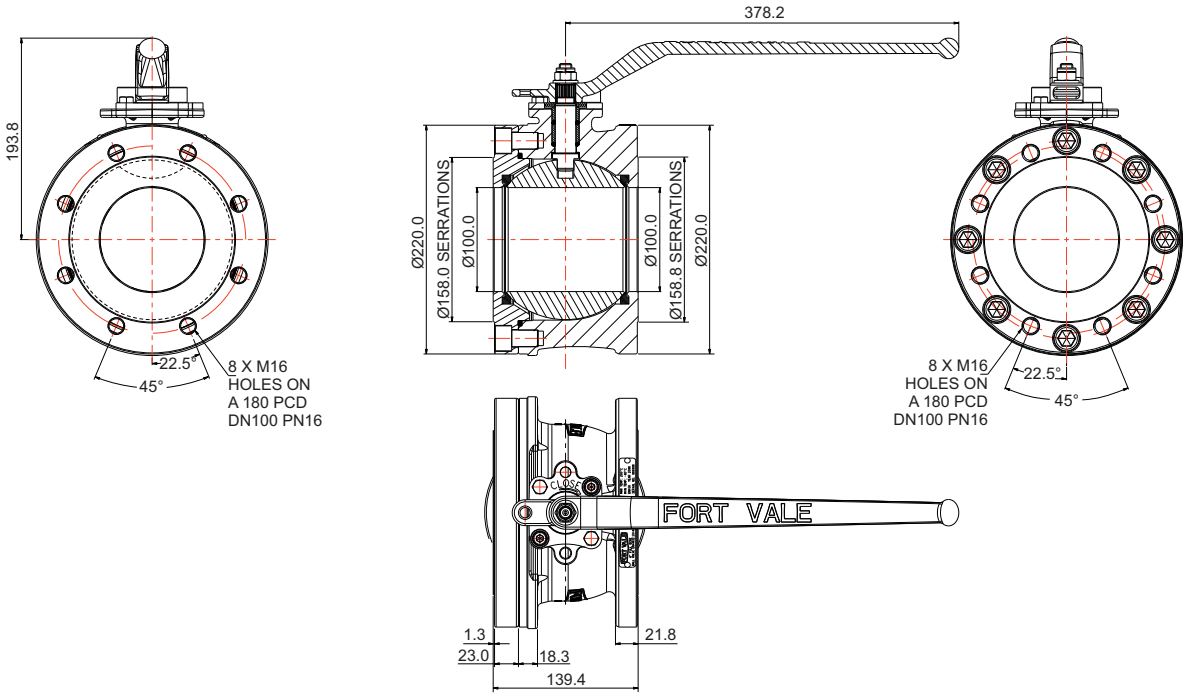
Description	Part No.
Manually operated ***Note**	460/E000X
Pneumatically actuated	460/E000PN
Carbon steel body ***Note**	460/E000XM

NOTE: The valve specification changes the part number

Related Parts

Description	Part No.
4" BSP eccentric outlet flange	SP468/8047
4" BSP blank cap	10304PSC
Blind flange	360/8108
CNAF/PTFE gasket	5005-468
Solid PTFE gasket	5005-468P

Section View



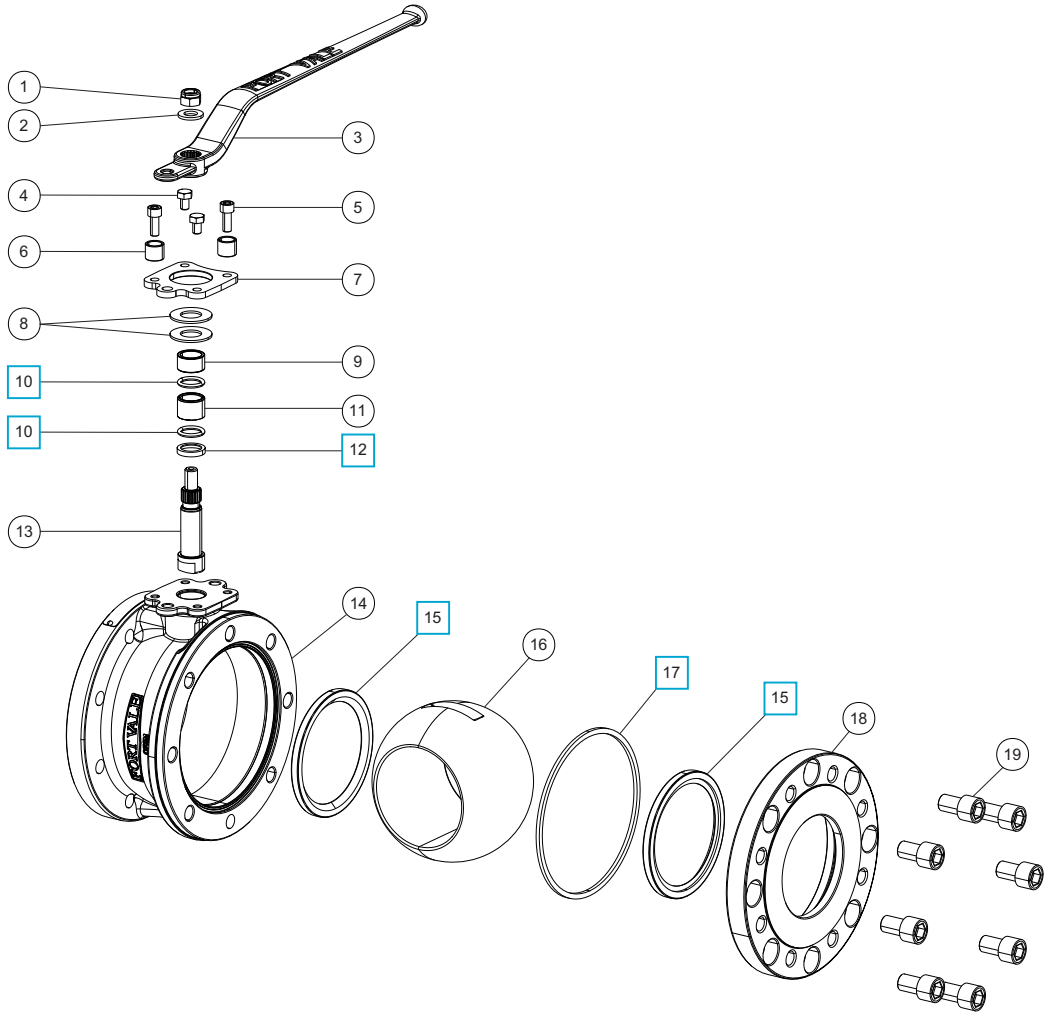
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DN100 Ball Valve with Inlet Seal Clamp

Part No: 460/E000X

Parts Drawing



Parts List

Item	Description	Part No.
1	M12 self-lock nut	5112-007
2	M12 washer	5123-003
3	Handle	360/3416
4	M8 hex bolt (2)	5111-037
5	M8 cap screw (2)	5111-010
6	Handle stop bush (2)	460/A0012
7	Stop plate	460/A0011
8	20mm Belleville washer (2)	5113-041
9	Top stuffing collar	360/3412
10	PTFE O ring (2)	5005-113 ☐
11	Bottom stuffing collar	460/A0010
12	Bottom bearing	360/3421 ☐
13	Spindle	460/A0009
14	Body	460/A0008
15	PTFE main seal (2)	5005-0010 ☐
16	4" Ball	460/5051S1
17	PTFE body seal	5005-0011 ☐
18	Inlet flange	460/A0002
19	M16 cap screw (8)	5111-079

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	460/E0SK

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Function

A discharge butterfly valve is used to load and discharge cargo. It is usually a secondary closure valve that is installed after a footvalve (primary closure valve) at the drain point of a tank. Our road tanker discharge butterfly valves are designed to weld to the discharge pipework so that there is no need to centralise the valve.

We offer two types of road tanker discharge butterfly valves:

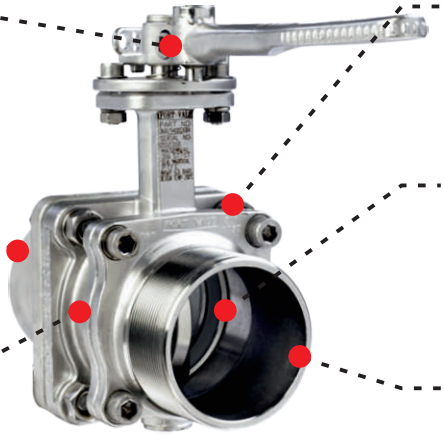
- DN80 (3") Tankpro - 3 piece valve
- DN80 (3") Unifly - 2 piece valve

NOTE: Refer to a separate page for discharge butterfly valves dedicated to tank containers and transportable tanks.

Design Options

The design options below are available on our standard range of Tankpro and Unifly discharge butterfly valves.

DN80 (3") Tankpro



Operation
Manually operated
Pneumatically actuated

Inlet
None
Straight
Angled

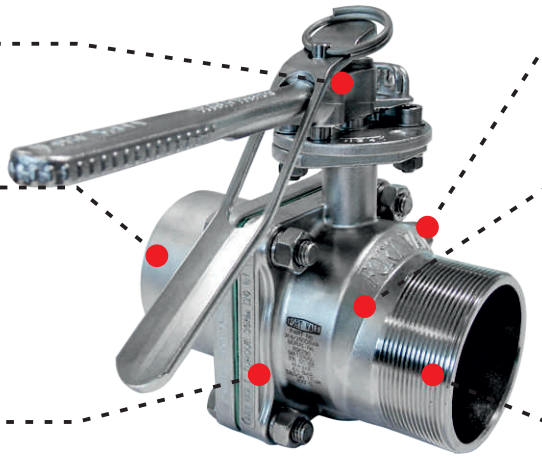
Valve Materials
316 stainless steel
Special service conditions:
High nickel alloys

Body
Non-vented
Vented: ⅜" BSP
Vented: ⅜" NPT

Main Seal
PTFE
Special service conditions:
High-temperature compatible seals

Outlet
3" BSP
3" BSP extended
3" NPT
Weld prepared

DN80 (3") Unifly



Operation
Manually operated
Pneumatically actuated

Inlet
None
Straight
Angled
85mm I/D

Valve Materials
316 stainless steel
Special service conditions:
High nickel alloys

Body
Non-vented
Vented: ⅜" BSP

Main Seal
PTFE
Special service conditions:
High-temperature compatible seals

Outlet
3" BSP
3" BSP extended

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Related Parts

We recommend our range of compatible accessories:

- Flanges - inlet, adapter, outlet
- Tertiary closures
- Fasteners

Please contact us for more information about these parts.

Discharge Butterfly Valves for Dedicated Service

We offer a range of discharge butterfly valves suitable for these service conditions and special cargoes:

- Tank containers & transportable tanks
- Hygienic service

Please contact us for more information about these valves.

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3" Tankpro Road Tanker Butterfly Valve

Part No: 368/9400SXBA



Specification

Nominal size
80mm

Body type
Weld-prepared inlet, 3" BSP threaded outlet

Properties
Left hand operated, lockable handle with TIR

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	6.15 Kg
Design Pressure (MAWP):	6 Bar
Test Pressure:	11 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Approvals
BS EN14432
Lloyds Register of Shipping Design Appraisal: DCF9376/1
Rijksdienst voor het Wegverkeer Approval: VLG S-9301

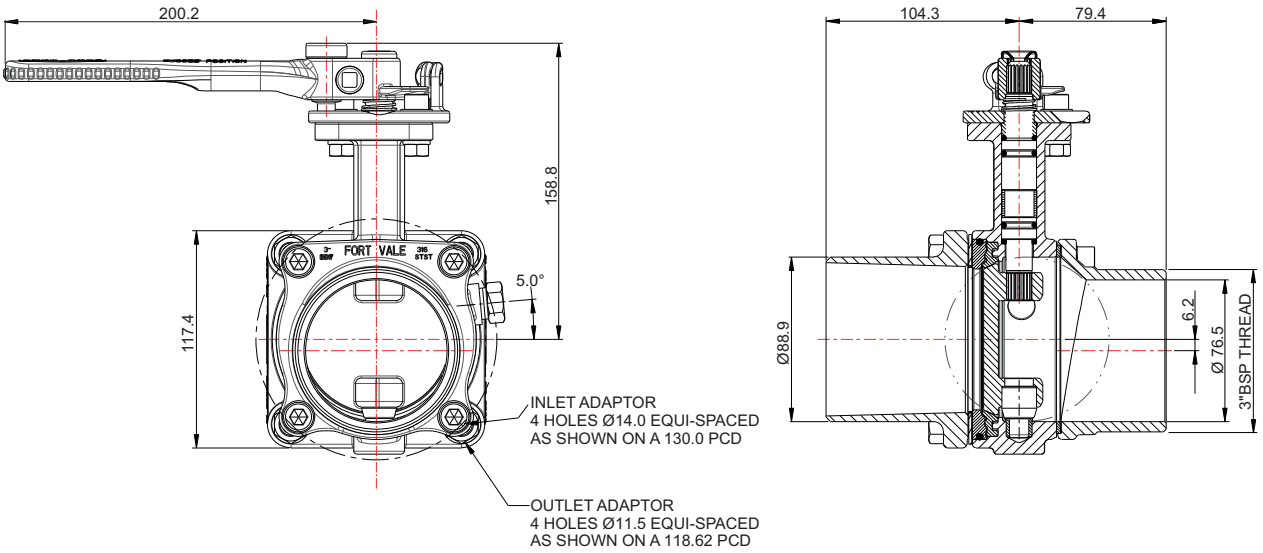
Range

Body	Outlet	Part No.
Non-vented	3" BSP standard	368/9400SXBA
Vented ⅜" BSP	3" BSP standard	368/9400SVBA
Non-vented	3" BSP extended	368/9400SXEA
Vented ⅜" BSP	3" BSP extended	368/9400SVEA

Related Parts

Description	Part No.
3" BSP blank cap with PTFE seal	10303PS
Conversion mounting kit	368/9401KIT

Section View



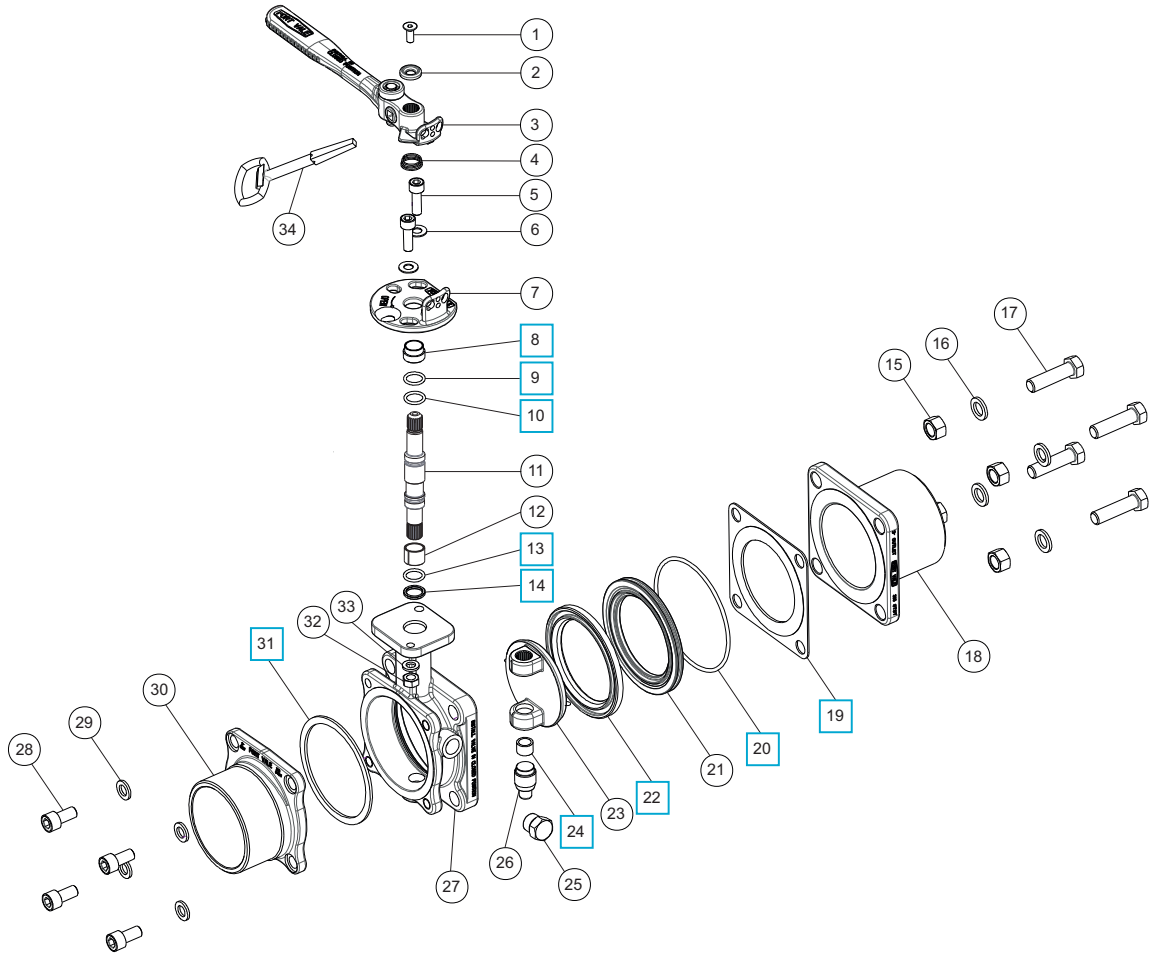
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3" Tankpro Road Tanker Butterfly Valve

Part No: 368/9400SXBA

Parts Drawing



Parts List

Item	Description	Part No.	
1	M6 socket head set screw	5111-030	
2	Washer	20370	
3	Handle	368/0075	
4	Electrical continuity spring	368/0014	
5	M8 socket head cap screw (2)	5111-148	
6	M8 plain washer (2)	5113-005	
7	Stuffing plate	368/0041	
8	Stuffing clamp bush	368/0301	☐
9	PTFE O ring	20363	☐
10	Viton O ring	20361	☐
11	Spindle	368/0200	
12	Split bearing	252/0517	
13	Perfluoroelastomer O ring	5005-586	☐
14	PTFE spindle seat	368/0009	☐
15	M12 full nut (4)	5112-006	
16	M12 spring washer (4)	5113-010	
17	M12 hex head set screw (4)	5111-023	
18	Inlet adaptor *Note	368/9410	
19	CNAF/PTFE inlet gasket	5005-707	☐
20	Nitrile O ring	5005-342	☐

Parts List

Item	Description	Part No.	
21	Seal clamp	368/9148	
22	PTFE main seal	368/0002	☐
23	Closure plate	368/0400	
24	Bottom spindle bush	368/0035	☐
25	⅜" taper plug *Note	5128-0XX	
26	Bottom spindle	368/0036	
27	Body (non-vented) *Note	368/9420A	
28	M10 socket head cap screw (4)	5111-053	
29	M10 spring washer (4)	5113-002	
30	3" BSP outlet *Note	368/9430	
31	PTFE outlet seal	5005-706	☐
32	M8 full nut (2)	5112-001	
33	M8 spring washer (2)	5113-003	
34	Key	368/4625	

NOTE: The valve specification changes the part number

Seal Kit

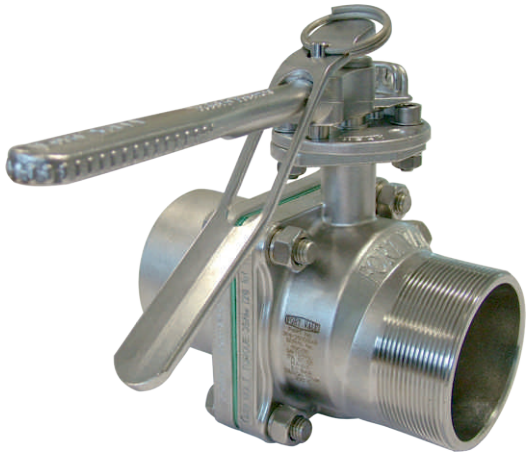
Description	Part No.
All parts marked ☐ in the Parts List	368/94SK

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3" Unifly Road Tanker Butterfly Valve

Part No: 368/2500SVA



Specification

Nominal size
80mm

Body type
Weld-prepared inlet, 3" BSP threaded outlet

Properties
Left hand operated, handle with TIR

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	5.76 Kg
Design Pressure (MAWP):	6 Bar
Test Pressure:	10 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

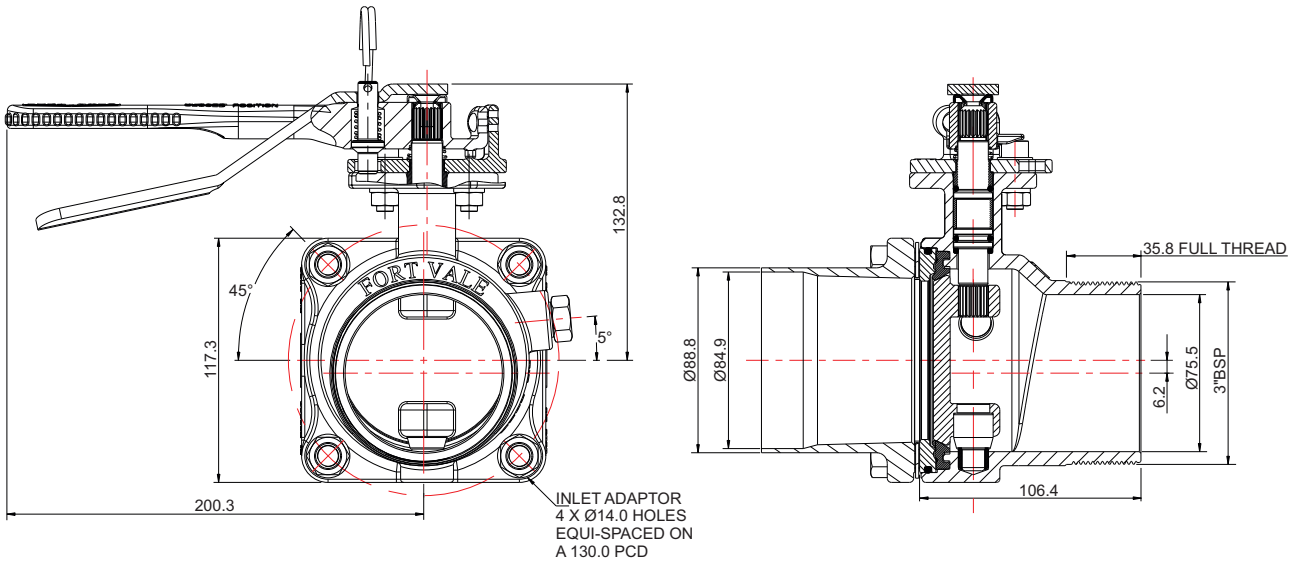
Range

Body	Inlet Adaptor	Part No.
Vented ⅜" BSP	Straight	368/2500SVA
Non-vented	Straight	368/2500SNA
Vented ⅜" BSP	None	368/2500NVA
Non-vented	None	368/2500NNA
Vented ⅜" BSP	Angled	368/2500AVA
Non-vented	Angled	368/2500ANA
Vented ⅜" BSP	85mm I/D	368/2500BVA
Non-vented	85mm I/D	368/2500BNA

Related Parts

Description	Part No.
3" BSP blank cap with PTFE seal	10303PS

Section View



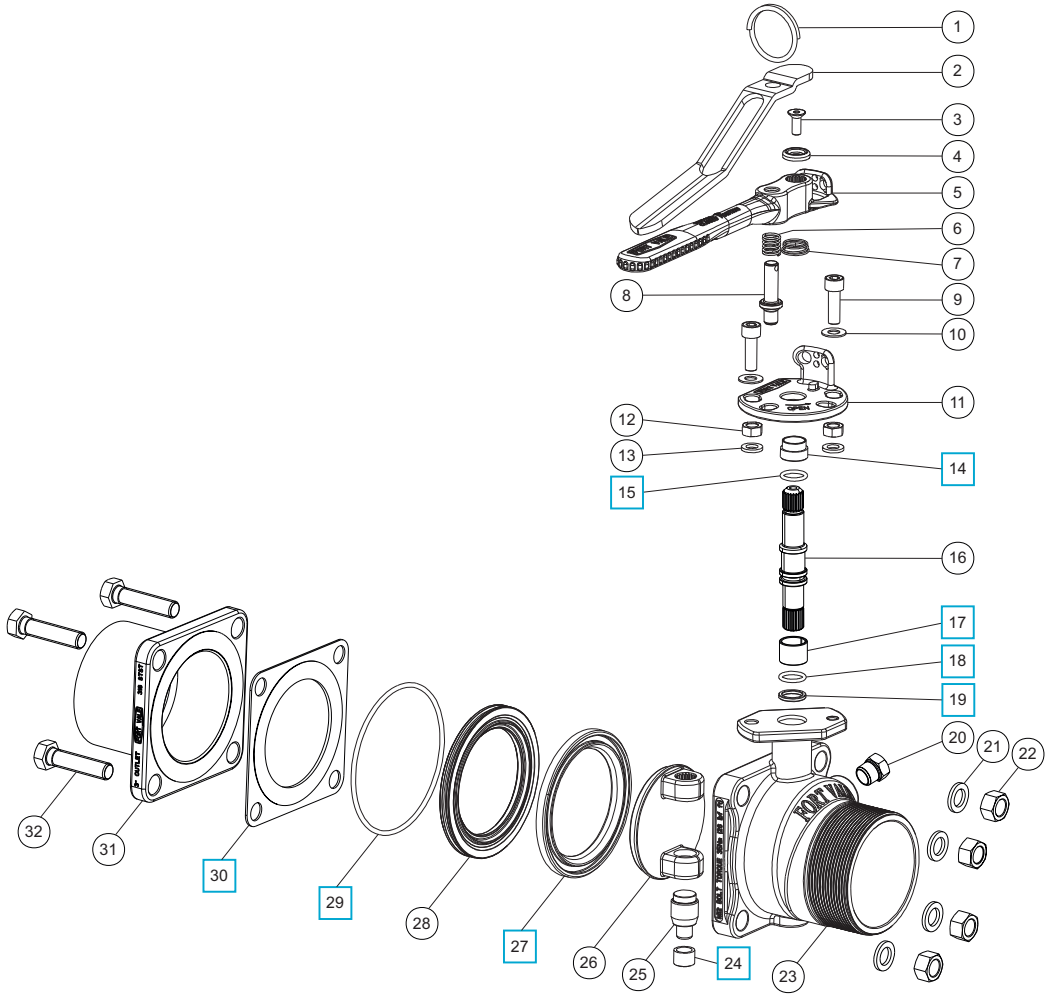
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3" Unifly Road Tanker Butterfly Valve

Part No: 368/2500SVA

Parts Drawing



Parts List

Item	Description	Part No.	
1	Split ring	368/0011	
2	Handle lever	368/9837	
3	Countersunk bolt	5111-030	
4	Retaining washer	20370	
5	Handle	368/0050	
6	Handle spring	368/0012	
7	Electrical continuity spring	368/0014	
8	Handle location pin	368/0010	
9	M8 cap screw (2)	5111-148	
10	M8 plain washer (2)	5113-005	
11	Stuffing clamp	368/0040	
12	M8 full nut (2)	5112-001	
13	M8 spring washer (2)	5113-003	
14	Stuffing clamp bush	368/0301	☐
15	PTFE O ring	20363	☐
16	Spindle	368/0201	
17	Split bearing	252/0517	☐
18	Viton O ring	20361	☐
19	PTFE spindle seat	368/0009	☐

Parts List

Item	Description	Part No.	
20	⅜" taper plug	5128-011	
21	M12 spring washer (4)	5113-010	
22	M12 full nut (4)	5112-006	
23	Vented body *Note	368/2520	
24	Bottom bush	368/0035	☐
25	Bottom spindle	368/0036	
26	Closure plate	368/0400	
27	PTFE main seal	368/0002	☐
28	Seal clamp	368/9148	
29	Nitrile O ring	5005-342	☐
30	CNAF/PTFE gasket	5005-707	☐
31	Inlet flange *Note	368/9410	
32	M12 hex bolt (4)	5111-032	

NOTE: The valve specification changes the part number

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	368/25SK

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3" Clamped Widdop Butterfly Valve

Part No: 368/7000B



Specification

Nominal size
80mm

Body type
Clamped

Properties
Left hand operated, handle with TIR and padlock slots

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	3.5 Kg
Design Pressure (MAWP):	6 Bar
Test Pressure:	10 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

Design Approvals
Lloyds Register of Shipping
Rijksdienst
SNCF
RMRS

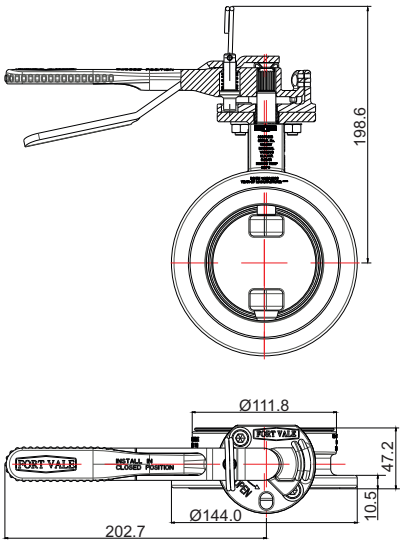
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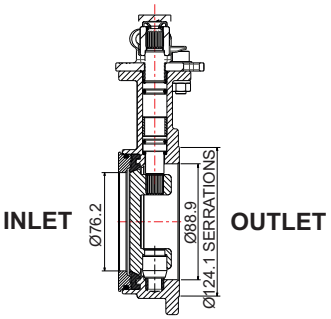
Description	Part No.
Standard specification	368/7000B
With hemi-spherical closure plate	368/9110B
Std. specification, right hand operated	368/4000A

Related Parts

Description	Part No.
CNAF/PTFE inlet gasket	5005-049
CNAF/PTFE outlet gasket	5005-490
CNAF/PTFE 4 hole square inlet gasket	5005-198
CNAF/PTFE 4 hole square outlet gasket	5005-195
Bolting kit	368/1100
3" BSP outlet flange	368/8047
3" BSP blank cap with PTFE seal	10303PS
3" camlock outlet flange	368/8058
3" camlock blank cap	90/DC300
3" NPT outlet flange	368/8049
3" NPT blank cap with PTFE washer	425/3250

Section View





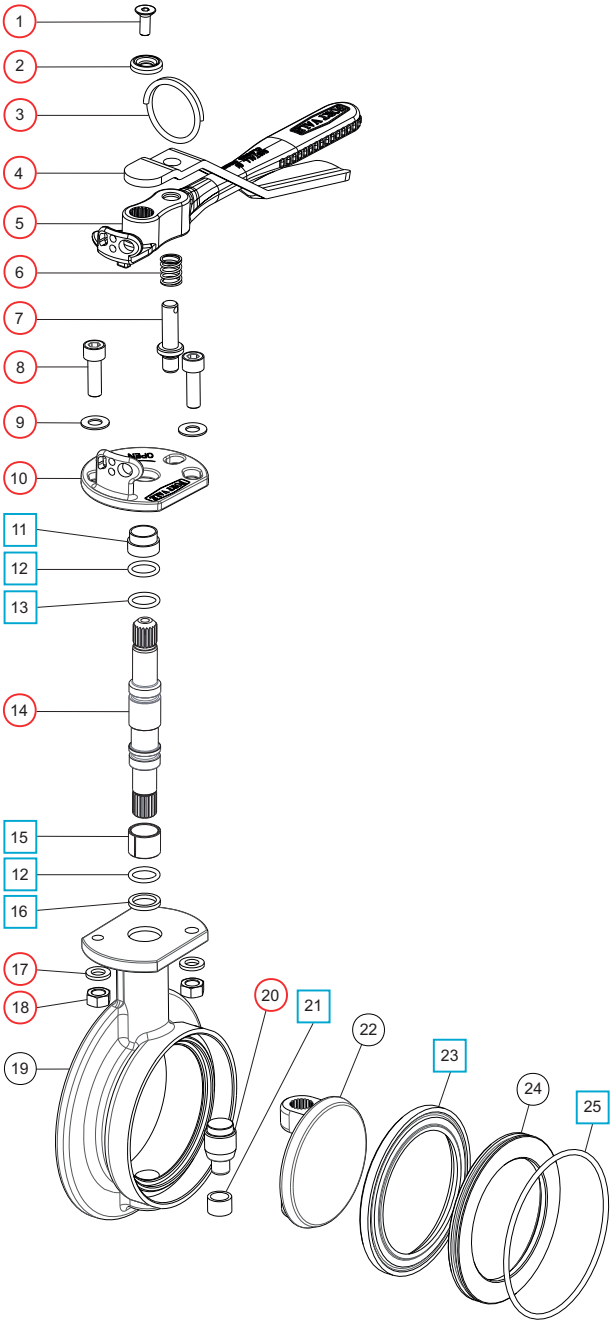
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3" Clamped Widdop Butterfly Valve

Part No: 368/7000B

Parts Drawing



Parts List

Item	Description	Part No.	
1	M6 set screw	5111-030	○
2	Washer	20370	○
3	Split ring	368/0011	○
4	Operating lever	368/9837	○
5	Handle	368/0050	○
6	Handle location spring	368/0012	○
7	Handle location pin	368/0010	○
8	M8 cap screw (2)	5111-148	○
9	M8 plain washer (2)	5113-005	○
10	Stuffing clamp	368/0040	○
11	PTFE stuffing clamp bush	368/0301	□ ○
12	PTFE O ring (2)	20363	□ ○
13	Viton O ring	20361	□ ○
14	Spindle	368/0200	○
15	Split bearing	252/0517	□ ○
16	PTFE spindle seat	368/0009	□ ○
17	M8 spring washer (2)	5113-003	○
18	M8 full nut (2)	5112-001	○
19	Body	368/0150	
20	Bottom spindle	368/0036	○
21	PTFE bottom bush	368/0035	□ ○
22	Closure plate	368/0400	
23	PTFE main seal	368/0002	□ ○
24	Seal clamp plate	368/0045	
25	Nitrile O ring	5005-342	□ ○

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	368/00SK

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	368/00RKA

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3" Clamped Widdop Butterfly Valve - Pneumatically Actuated

Part No: 368/7000BPN



Specification

Nominal size
80mm

Body type
Clamped

Properties
With spring-return pneumatic actuator and anti-clockwise opening

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Valve Assembly Weight:	14 Kg

Butterfly Valve

Design Pressure (MAWP):	6 Bar
Test Pressure:	10 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

Actuator

Actuator Maximum Pressure:	8 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	80°C

Actuator Operating Conditions

Start to open	3.1 Bar
Fully open	3.8 Bar

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

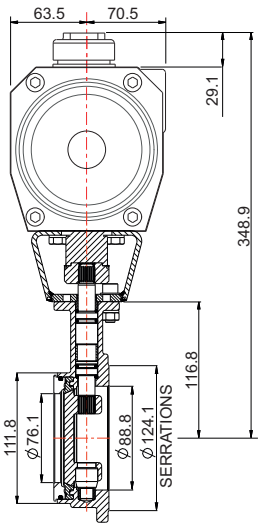
Range

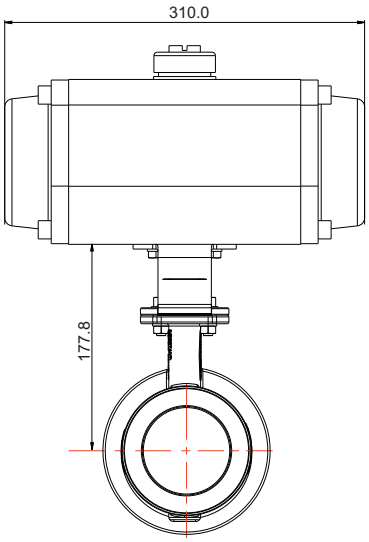
Description	Part No.
Std. specification - pneumatic actuator	368/7000BPN
Std. specification - manually operated	368/7000B

Related Parts

Description	Part No.
CNAF/PTFE inlet gasket	5005-049
CNAF/PTFE outlet gasket	5005-490
Bolting kit	368/1100
3" BSP outlet flange	368/8047
3" BSP blank cap with PTFE seal	10303PS

Section View





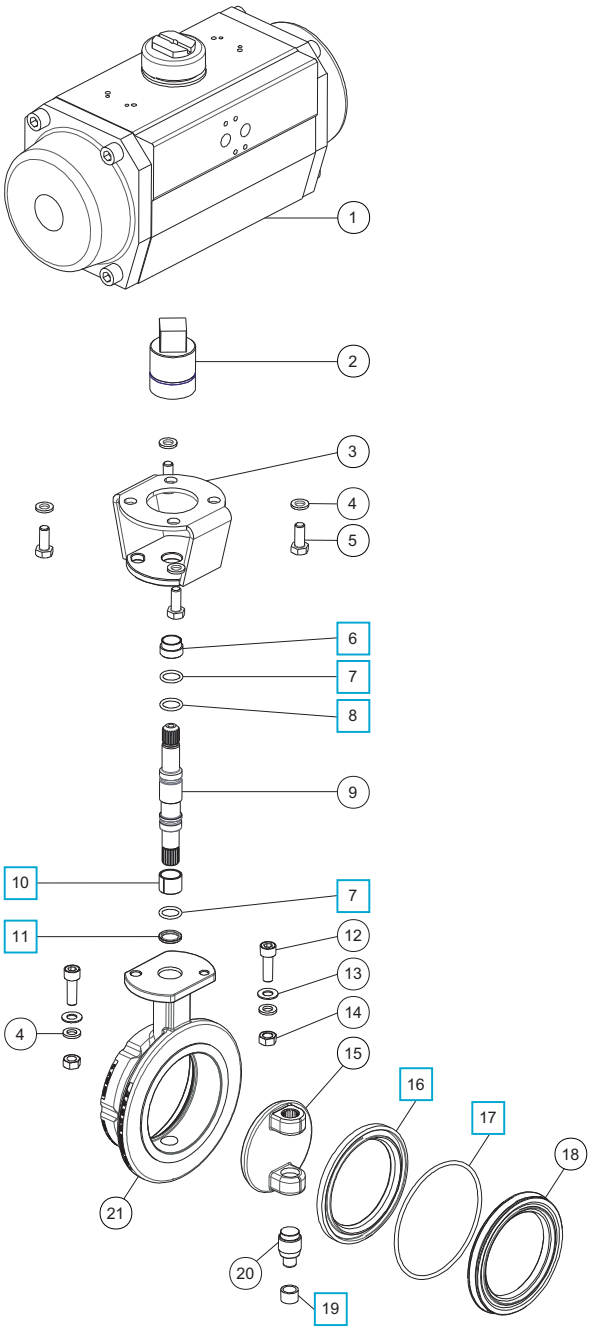
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3" Clamped Widdop Butterfly Valve - Pneumatically Actuated

Part No: 368/7000BPN

Parts Drawing



Parts List

Item	Description	Part No.	
1	Pneumatic actuator	5127-115	
2	Drive adaptor assembly	368/2824	
3	Bridge assembly	368/2820	
4	M8 flat spring washer (6)	5113-003	
5	M8 x 20mm bolt (4)	5111-822	
6	Stuffing clamp bush	368/0301	☐
7	PTFE O ring (2)	20363	☐
8	Viton O ring	20361	☐
9	Spindle	368/0200	
10	Split bearing	252/0517	☐
11	PTFE spindle seat	368/0009	☐
12	M8 x 25mm cap screw (2)	5111-148	
13	M8 plain washer (2)	5113-005	
14	M8 full nut (2)	5112-001	
15	Closure plate	368/0400	
16	Main seal	368/0002	☐
17	Nitrile O ring	5005-342	☐
18	Seal clamp plate	368/0045	
19	Bottom bush	368/0035	☐
20	Bottom spindle	368/0036	
21	Body	368/0150	

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	368/00SK

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TW80 Clamped Butterfly Valve

Part No: 368/5500B



Specification

Nominal size
80mm

Body type
Drilled 8 x 12mm holes on a 130mm PCD (TW80)

Properties
Left hand operated, lockable handle with TIR

Materials
Contact parts: 316 stainless steel
Main seal: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	5.4 Kg
Design Pressure (MAWP):	6 Bar
Test Pressure:	10 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

Design Approval
AIB Vincotte

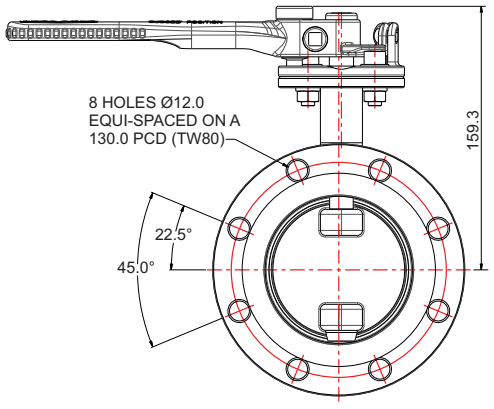
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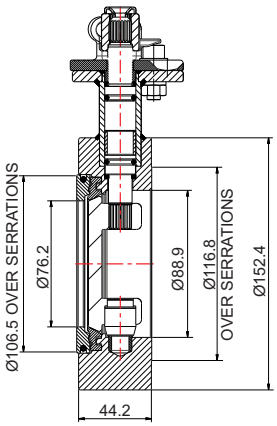
Description	Part No.
TW80 clamped valve	368/5500B
TW100 clamped valve	468/5600B

Related Parts

Description	Part No.
CNAF/PTFE TW80 gasket	5005-715
TW80 mating flange	845/8001
3" BSP eccentric TW80 outlet flange	368/5513

Section View





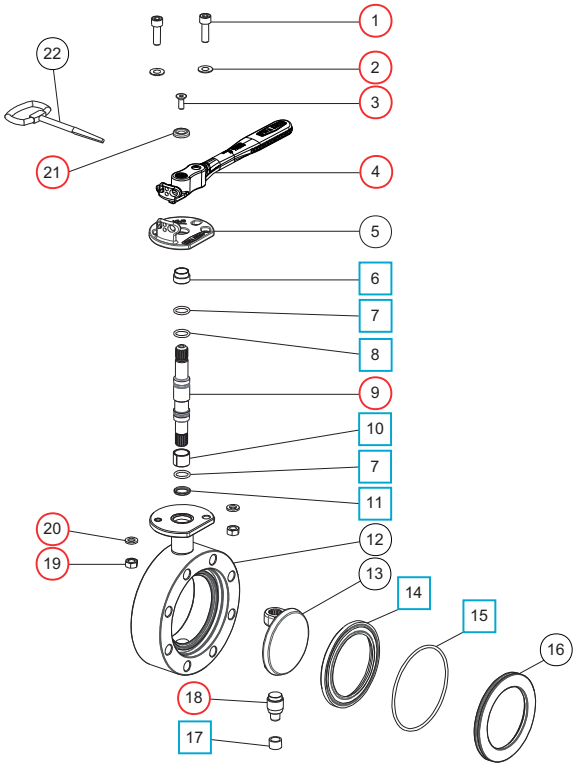
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TW80 Clamped Butterfly Valve

Part No: 368/5500B

Parts Drawing



Parts List

Item	Description	Part No.	
1	M8 cap screw (2)	5111-148	○
2	M8 plain washer (2)	5113-005	○
3	M6 countersunk set screw	5111-030	○
4	Barrel lock handle	368/0075	○
5	Stuffing clamp	368/0041	
6	PTFE stuffing clamp bush	368/0301	□ ○
7	PTFE O ring (2)	20363	□ ○
8	Viton O ring	20361	□ ○
9	Spindle	368/0200	○
10	Split bearing	252/0517	□ ○
11	PTFE bearing	368/0009	□ ○
12	Body	368/5510	
13	Closure plate	368/0400	
14	Main seal	368/0002	□ ○
15	Nitrile O ring	5005-342	□ ○
16	Seal clamp	368/9148	
17	PTFE bottom bush	368/0035	□ ○
18	Bottom spindle	368/0036	○
19	M8 full nut (2)	5112-001	○
20	M8 spring washer (2)	5113-003	○
21	Retaining washer	20370	○
22	Key	368/4625	

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	368/00SK

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	368/50RKB

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4" Clamped Butterfly Valve

Part No: 468/7250B



Specification

Nominal size
100mm

Body type
Clamped

Properties
Left hand operated, handle with TIR and padlock slots

Materials
Contact parts: 316 stainless steel
Main seal: Flextyt

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	4 Kg
Design Pressure (MAWP):	6 Bar
Test Pressure:	9 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

Design Approvals
Lloyds Register of Shipping

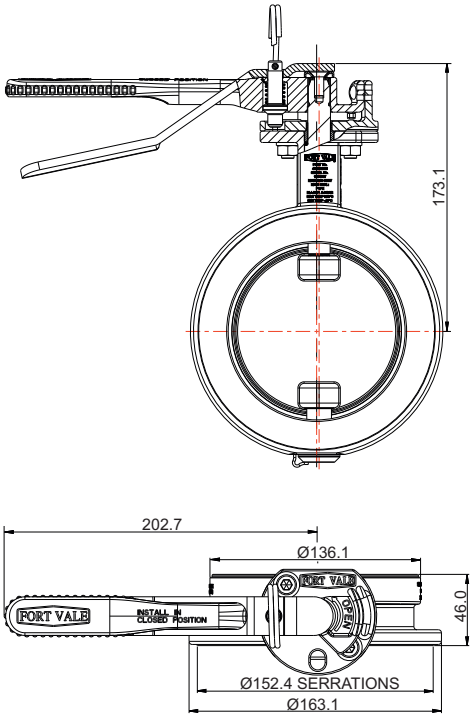
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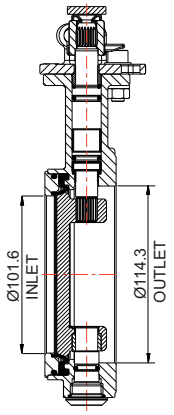
Description	Part No.
Standard specification	468/7250B
Pneumatically actuated	468/7200BPN
With high-temperature seals	468/725HTB

Related Parts

Description	Part No.
CNAF/PTFE inlet gasket	5005-468
CNAF/PTFE outlet gasket	5005-469
Bolting kit (8x bolts, nuts, washers)	468/1100
4" BSP outlet flange	468/8047
4" BSP blank cap with PTFE seal	10304PSC

Section View





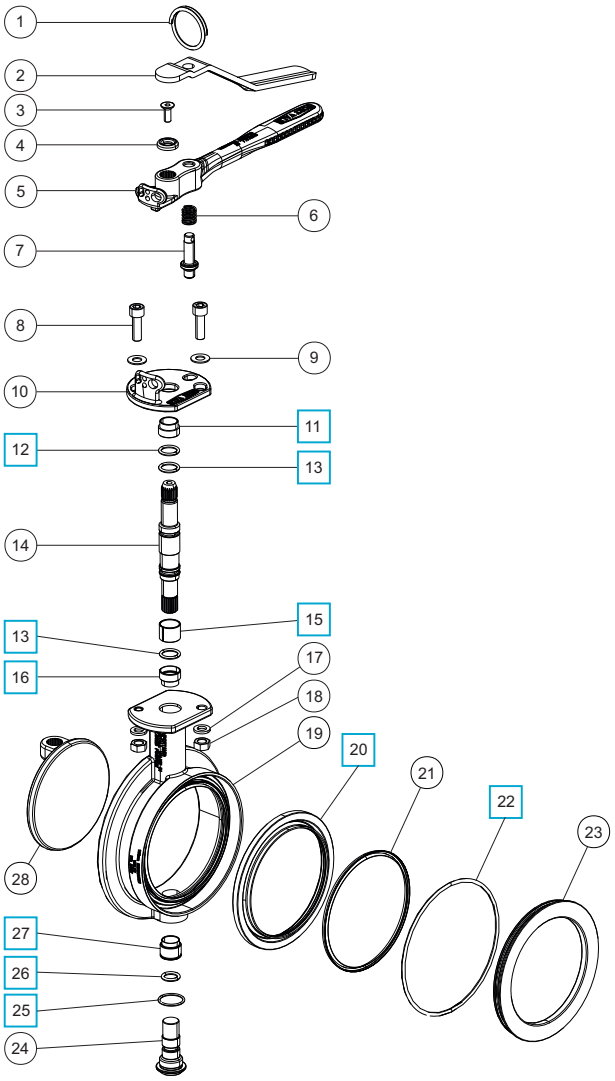
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4" Clamped Butterfly Valve

Part No: 468/7250B

Parts Drawing



Parts List

Item	Description	Part No.	
1	Split ring	368/0011	
2	Operating lever	368/9837	
3	Countersunk set screw	5111-030	
4	Washer	20370	
5	Handle	368/0050	
6	Handle spring	368/0012	
7	Handle location pin	368/0010	
8	M8 cap screw (2)	5111-148	
9	M8 plain washer (2)	5113-005	
10	Stuffing clamp	368/0040	
11	PTFE stuffing clamp bush	368/0301	☐
12	PTFE O ring	20363	☐
13	Viton O ring (2)	20361	☐
14	Spindle	368/0205	
15	Split bearing	368/0039	☐
16	PTFE bearing	368/0009HT/1	☐
17	M8 spring washer (2)	5113-003	
18	M8 full nut (2)	5112-001	
19	Body	468/0200	
20	Flextyt PTFE main seal	468/0030	☐
21	Flextyt seal spring	468/0031	
22	Nitrile O ring	5005-357	☐
23	Seal clamp plate	468/0033	
24	Bottom spindle	468/0005	
25	PTFE O ring	5005-160	☐
26	High temperature seal	ORB614K1	☐
27	PTFE bottom bush	468/0035	☐
28	Closure plate	468/0400	

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	468/725SKB

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TW100 Clamped Butterfly Valve

Part No: 468/5600B



Specification

Nominal size
100mm

Body type
Drilled 8 x 14mm holes on a 150mm PCD (TW100)

Properties
Left hand operated, lockable handle with TIR

Materials
Contact parts: 316 stainless steel
Main seal: Flextyt

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	3.85 Kg
Design Pressure (MAWP):	6 Bar
Test Pressure:	9 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

NOTE: The Design Conditions and Section View dimensions are for the specified part number only.

Design Code
BS EN14432

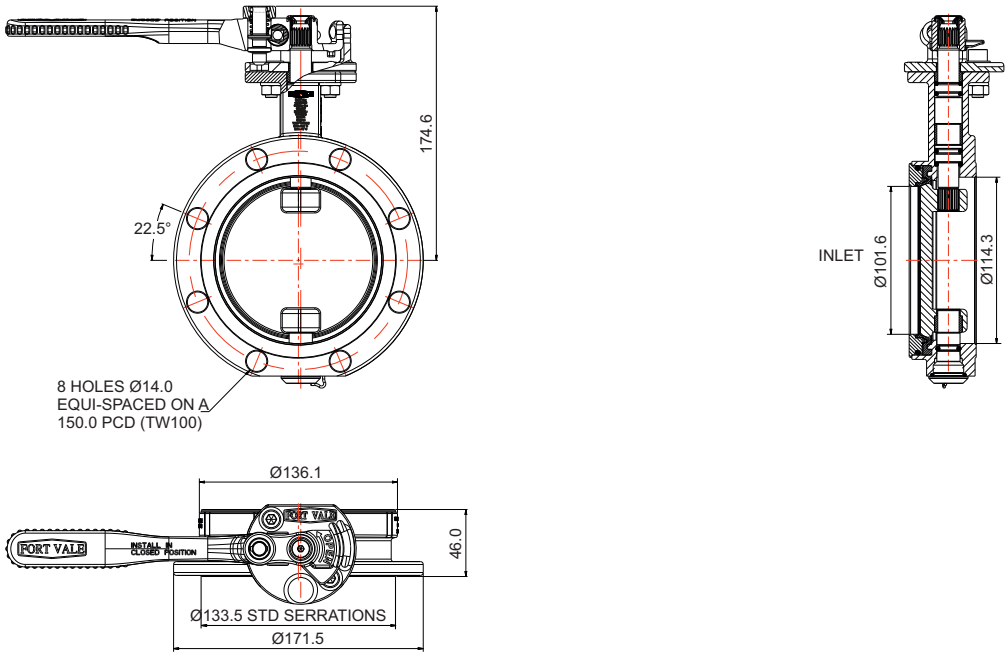
Range

Description	Part No.
TW100 clamped valve	468/5600B
TW80 clamped valve	368/5500B

Related Parts

Description	Part No.
CNAF/PTFE TW100 inlet gasket	5005-832
CNAF/PTFE TW100 outlet gasket	5005-832/1
TW100 mating flange	875/8001
4" BSP eccentric TW100 outlet flange	468/5175

Section View



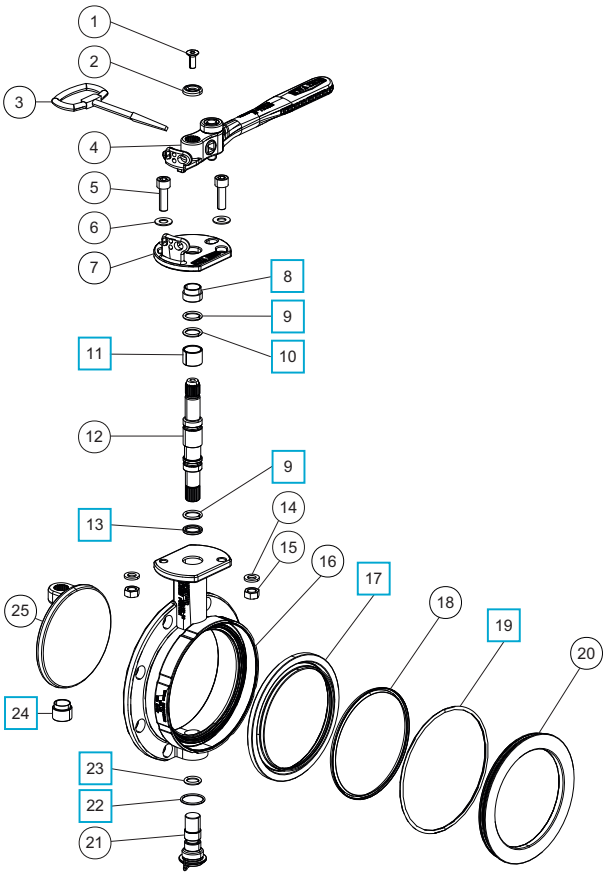
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TW100 Clamped Butterfly Valve

Part No: 468/5600B

Parts Drawing



Parts List

Item	Description	Part No.	
1	Countersunk set screw	5111-030	
2	Retaining washer	20370	
3	Key	368/4625	
4	Barrel lock handle	368/0075	
5	M8 cap screw (2)	5111-148	
6	M8 plain washer (2)	5113-005	
7	Stuffing clamp	368/0041	
8	PTFE stuffing clamp bush	368/0301	☐
9	PTFE O ring (2)	20363	☐
10	Viton O ring	20361	☐
11	Split bearing	252/0517	☐
12	Spindle	368/0200	
13	PTFE bearing	368/0009	☐
14	M8 flat spring washer (2)	5113-003	
15	M8 full nut (2)	5112-001	
16	TW100 body	468/0170	
17	Flextyt PTFE main seal	468/0030	☐
18	Flextyt seal spring	468/0031	
19	Nitrile O ring	5005-357	☐
20	Seal clamp plate	468/0033	
21	Bottom spindle	468/0005	
22	PTFE O ring	5005-160	☐
23	Perfluoroelastomer O ring	ORB614K1	☐
24	Bottom bush	468/0035	☐
25	Closure plate	468/0400	

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	468/56SKB

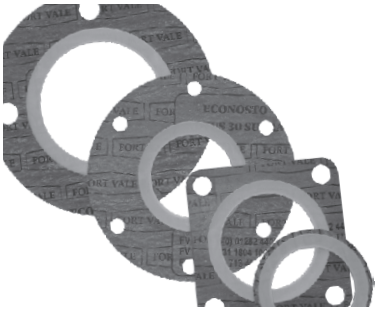
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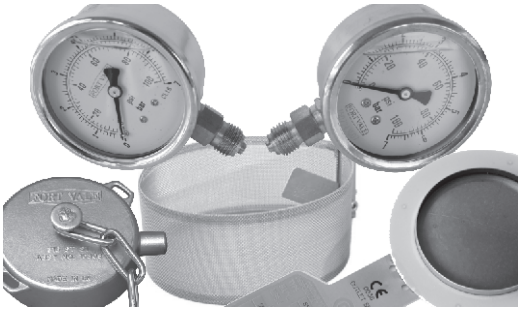
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FORT VALE

Ancillaries

Road Tanker Catalogue







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Document Holders

Accessories & Spare Parts



Specification

Nominal sizes
75mm and 110mm

Body material options
Opaque plastic
Transparent plastic

Fixing bracket options
Plastic
Stainless steel

Cap
All document holders are supplied with a plastic cap as standard which is attached by a stainless steel wire to prevent loss/theft.

Document Holders

Size	Body	Brackets	Part No.
75mm	Opaque	Plastic	360/1101
75mm	Transparent	Plastic	360/1101T
75mm	Opaque	St/steel	360/1101ABSS
75mm	Transparent	St/steel	360/1101TBSS
110mm	Transparent	Plastic	460/1101T
110mm	Transparent	St/steel	460/1101TBSS

Spare Parts - Plastic Caps

All caps are supplied with a stainless steel cable.

Size	Part No.
75mm	360/1010
110mm	460/1010

Spare Parts - Fixing Brackets

Size	Material	Part No.
75mm	Plastic	360/1007
75mm	Stainless steel	360/1007SS
110mm	Plastic	460/1007
110mm	Stainless steel	460/1007SS

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Analogue Temperature Gauge - Capillary



Analogue Temperature Gauge - Probe



Digital Temperature Gauge - Capillary



Specification

Temperature range options
-20°C to 160°C
-20°C to 200°C
-50°C to 200°C - digital only
NOTE: The temperature range refers to the capillary or probe only

Gauge display options
Analogue
Digital

Temperature monitoring options
2500mm capillary
250mm stainless steel tube with brass thermowell probe

Gauge fill options
Silicone oil filled
Not filled

Analogue Temperature Gauges

Temperature Range °C	Temperature Range °F	Capillary or Probe	Oil Filled	Part No.
-20 to 200	-4 to 392	Capillary	Yes	922/TEMP200
-20 to 160	-4 to 320	Capillary	Yes	922/TEMP160
-20 to 200	-4 to 392	Probe	No	922/TEMPT200
-20 to 160	-4 to 320	Probe	No	922/TEMPT160

NOTE: The temperature range refers to the capillary/probe only.

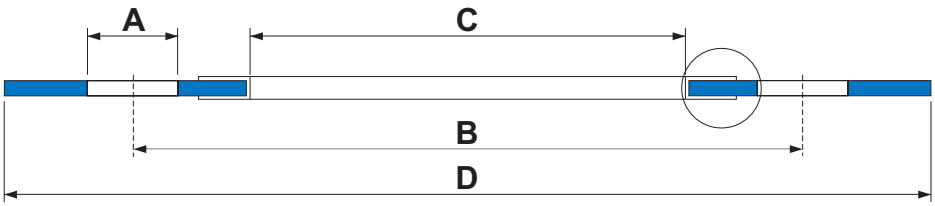
Digital Temperature Gauge

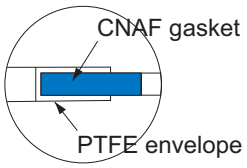
Temperature Range °C	Temperature Range °F	Capillary or Probe	Part No.
-50 to 200	-58 to 392	Capillary	944/TEMPDIGI

NOTE: The temperature range refers to the capillary/probe only.

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Part No	No. of holes	A Hole Ø mm	B PCD mm	C Internal Ø mm	D External Ø mm	Material	Compatible with
5005-046	-	-	-	75	90	Black rubber/PTFE	2½" BSP relief valve tank seal
5005-191	-	-	-	75	90	CNAF/PTFE	2½" BSP relief valve tank seal
5005-049	-	-	-	78	112	CNAF/PTFE	3" clamped butterfly valve inlet
5005-052	-	-	-	78	142	CNAF/PTFE	3" clamped butterfly valve inlet
5005-490	-	-	-	89	142	CNAF/PTFE	3" clamped butterfly valve outlet
5005-193	4	14	98	50	127	Solid PTFE	1½" ASA150 & 1½" BSTD
5005-500	4	11	100	50	95 SQUARE	Solid PTFE	2" BSP butterfly valve inlet
5005-348	4	18	110	37	152	Solid PTFE	1½" flanged ball valve outlet
5005-361	4	18 open slot	114 minimum	50	165	Solid PTFE	2" flanged butterfly valve outlet
5005-055	4	17	114	55	152	CNAF/PTFE	2" BSTE
5005-360	4	18	125	49	165	Solid PTFE	2" flanged butterfly valve inlet
5005-036	4	18	146	80	184	Solid PTFE	3" BSTD
5005-427	4	18 open slot	146 minimum	83	190	CNAF/PTFE	3" ASA/BSTD/DIN80 3" ball/butterfly valve outlet
5005-417	4	18 open slot	146 minimum	83	190	Solid PTFE	3" ASA/BSTD/DIN80 3" ball/butterfly valve outlet
5005-875	4	18	146	89	184	CNAF/PTFE	3" clamped butterfly valve outlet 3" BSTD
5005-288	4	18	152	78	184	Solid PTFE	3" ASA150
5005-195	4	18	160	89	144 SQUARE	CNAF/PTFE	3" clamped butterfly valve outlet
5005-023	4	18	172	127	203	CNAF/PTFE	3" top discharge valve & 30° footvalve inlet
5005-177	4	18	172	136	203	CNAF/PTFE	3" top discharge ball valve inlet
5005-032	4	19	178	114	216	CNAF/PTFE	30° footvalve inlet
5005-398	6	11	105	75	127	CNAF/PTFE	2½" flanged relief valve weld-in flange
5005-345	6	11	119	89	140	Solid PTFE	3" composite butterfly valve outlet
5005-016	6	14	159	127	184	CNAF/PTFE	Parkfield footvalve inlet
5005-169	6 not equi-spaced	13	168	78	197	CNAF/PTFE	3" flanged butterfly & 3" ball valve inlet
5005-222	6 not equi-spaced	14	168	102	203	CNAF/PTFE	3" top discharge butterfly valve inlet
5005-015	8	14	178	114	203	CNAF/PTFE	45° & 90° Cleanflow/Highlift footvalve inlet

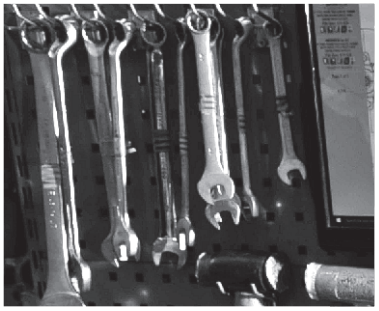
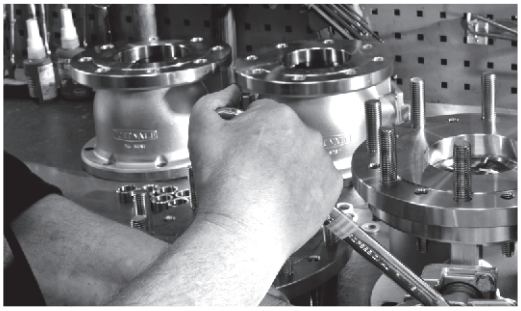
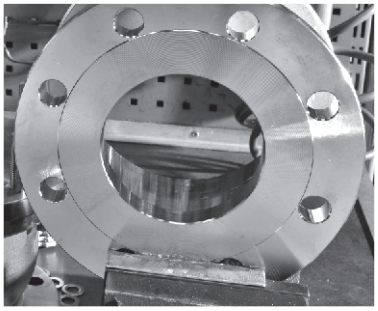
NOTE: All diameters are nominal

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After Sales Service

Road Tanker Catalogue

We offer a refurbishment and repair services for all our valves. We can also provide you with technical support if you want to do your own maintenance. Please contact us for more information about maintenance instruction manuals and special tools and equipment.

We keep a wide range of spare parts and ancillary items in stock at our Fort Vale worldwide locations. We also have authorised distributors around the world who can supply you with replacement and consumable parts, and help you with after sales service.

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Footvalve Replaceable Seat Kit - Cleanflow Footvalve

Accessories & Spare Parts



Specification

The Cleanflow footvalve replaceable seat kit lets you replace the footvalve seating area if there is damage or corrosion. This saves time and avoids the cost of replacing a complete valve.

We also supply a complete 3" 45° Cleanflow footvalve assembly with replaceable seat, please refer to Range.

Compatibility
3"/80mm Cleanflow footvalve: 30°, 45°, 90°, 180°
4"/100mm Cleanflow footvalve: 30°, 45°, 90°, 180°

Seating flange materials
316 stainless steel
904L stainless steel
High nickel alloy
Titanium

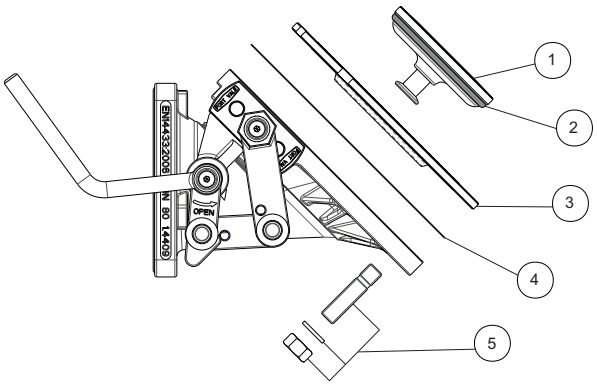
IMPORTANT: A Cleanflow footvalve with a replaceable seat protrudes more from the tank and the outlet centre line is lower than that of a standard valve. Please contact us for dimensions and more information.

Range

Description	Part No.
3" Cleanflow replaceable seat kit	845/16CKX *
4" Cleanflow replaceable seat kit	875/16CKX *
3" 45° Cleanflow with replaceable seat	845/16RXX *

* The seating flange material changes the Part No.

Kit Parts Drawing



Kit Parts List

Item	Description	3" Kit Part No.	4" Kit Part No.
1	Extended poppet	845/0042	875/0042
2	Fortyt O ring	5005-104	5005-349
3	Seating flange *Note	845/0090X	875/0090S
4	PTFE gasket	5005-829	5005-855
5	Stud kit	845/2055	875/2055

NOTE: The seating flange material changes the Part No.

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Footvalve Replaceable Seat Kit - Highlift Footvalve

Accessories & Spare Parts



Specification

The 3" 45° Highlift footvalve assembly with replaceable seat lets you replace the footvalve seating flange assembly if there is damage or corrosion. This saves time and avoids the cost of replacing a complete valve.

Please refer to the Spare Parts Drawing and List.

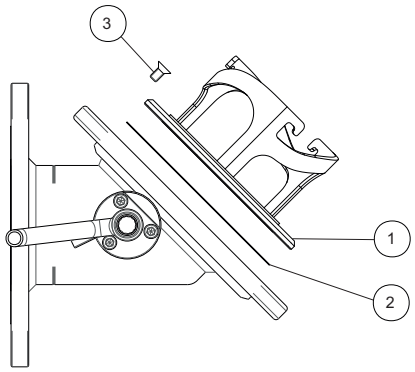
Seating flange materials
316 stainless steel
High nickel alloy
Titanium

Range

Description	Part No.
3" 45° Highlift with replaceable seat	826/0800XA *

* The seating flange material changes the Part No.

Spare Parts Drawing



Spare Parts List

Item	Description	Part No.
1	Seating flange *Note	826/0817X
2	PTFE gasket	5005-828
3	Retaining screw (3)	5111-018

NOTE: The seating flange material changes the Part No.

IMPORTANT: Some of the spare parts for a replaceable seat Highlift footvalve are different from a standard Highlift footvalve. Please contact Fort Vale for footvalve spare parts.

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We supply a range of special tools and repair kits to do scheduled maintenance and repair procedures to our valves.

We recommend that you use the correct special tools to help you do maintenance and repairs quickly and easily without causing damage to the valve or the new spare parts.

A selection of step-by-step maintenance instruction manuals is also available, please contact us.

CAUTION: Valve maintenance and repair can be dangerous. To do maintenance, you must have experience and qualifications related to valve installation on pressure vessels and systems.

Relief Valve Pressure/Vacuum Test Rig

Part No: 400/8000



Specification

You can use the relief valve test rig to test the pressure and vacuum setting of Hyper Maxi, Super Maxi, Twinact, Uniact, Minnow and Steam relief valves.

Valve connection
2½" BSP.
We supply adaptors to change to other BSP and flanged connections.

Test rig supply connection
¼" BSP female socket

Test range
From -0.7 Bar to 6.9 Bar (-10 PSI to 100 PSI)

Related documents
Operating Instructions: OPIN26. Please contact us.

Footvalve & Relief Valve Seat Repair Kit

Part No: 400/2600



Specification

You can use the seat repair kit to re-surface the seating face of a 2½" BSP Super Maxi relief valve and the 3" Cleanflow and Highlift footvalves if there is damage caused by corrosion.

Connection
Compatible with power tools with a ½" chuck

Kit contents
Selection of grinding and polishing discs
Selection of face-forming tools
Instruction manual

Related documents
Operating Instructions: OPIN70. Please contact us.

Spare Parts

Description	Part No.
Box of 100 x 60 grit grinding discs	400/2610
Box of 100 x 80 grit grinding discs	400/2620
Box of 100 x 180 grit polishing discs	400/2630
Box of 100 x 500 grit polishing discs	400/2640

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Relief Valve Tool Kits

Description	Part No.
Test rig adaptor flange - adapts 2½"BSP to 3"ASA150, DIN65 PN10 & DIN80 PN6	425/1000
C spanner - to install/remove Twinact relief valves	400/3000
C spanner - to install/remove Super Maxi relief valves	400/3001
Tightening tool for MKIII Super Maxi relief valves	400/8380
Tool kit - 1½" & 2½" Twinact valves	400/2000
Tool kit - 2½" Maxi & Highflow valves	400/8100
Tool kit - 65mm & 80mm Super Maxi	400/8300



Footvalve Tool Kits

Description	Part No.
3" Cleanflow footvalve tool kit	400/2150
3" Highlift footvalve tool kit	400/2450



Ball Valve Tool Kits

Description	Part No.
1½" ball valve tool kit	400/2500
3" ball valve tool kit	400/2200

Butterfly Valve Tool Kits

Description	Part No.
2" butterfly valve tool kit	400/2300
3" butterfly valve tool kit	400/2700

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Flange Bolting

CAUTION: Weld-distortion and too much tightening force will cause damage to a flange.

It is important not to cause damage to weld-in flanges and mating flanges. If a flange is damaged it will not give a satisfactory seal when a gasket and secondary mating flange is installed.

Bolt-stress can decrease after initial tightening. The cause can be deformation of the gasket material, particularly with soft materials such as a CNAF/PTFE envelope gasket.

Best procedure recommends that, after initial bolting, the flange joint is tightened again after a period of time. Most gasket manufacturers advise a period of 24 hours. ASME PCC-1-2000 GUIDELINES FOR PRESSURE BOUNDARY BOLTED FLANGE JOINT ASSEMBLY advises a minimum period of 4 hours.

Bolt torque calculations are based on a flat flange to within 0.15mm.

Recommended bolt torque values will be reduced if a lubrication is used.

Bolt Torque

Bolt Torque Values

Fort Vale bolt torque values are given as a reference guide only and are based on:

- The use of a CNAF/PTFE gasket.
- Unlubricated fasteners.
- A flange flat to within 0.15mm.

CAUTION: If you use a different gasket material, a lubricant, a flange with distortion, you must re-calculate the torque value.

Bolt Torque Procedure

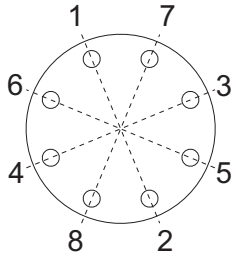
To install flanged parts correctly:

- Examine the mating flange of the part.
- If the flange is marked with a torque value, obey that torque value.
- If there is no torque value marked on the mating flange, obey the bolt torque values given in Table BT1.
- Tighten the bolts evenly in sequence. See Figure BT1.
- Obey the Step Loading Procedure (ASME PCC-1-2000). See next page.

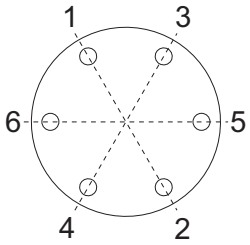
Table BT1

Thread	Torque Value
M10	30 Nm (22 lbf.ft)
M12	65 Nm (48 lbf.ft)
M16	81 Nm (60 lbf.ft)

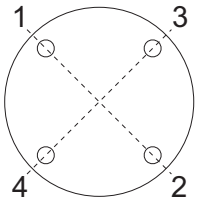
Figure BT1



8 HOLE PATTERN



6 HOLE PATTERN



4 HOLE PATTERN

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Step Loading Procedure

To install flanged parts correctly, obey the Step Loading Procedure extract from ASME PCC-1-2000:

Install

Hand tighten, then “snug up” to 15 Nm (10 lbf.ft) to 30 Nm (20 lbf.ft) (not to exceed 20% of Target Torque).
Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 1

Tighten to 20% to 30% of Target Torque. Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 2

Tighten to 50% to 70% of Target Torque. Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 3

Tighten to 100% of Target Torque. Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 4

Continue tightening the bolts, but on a rotational clockwise pattern until no further nut rotation occurs at the Round 3 Target Torque value. For indicator bolting, tighten bolts until the indicator rod retraction readings for all bolts are within the specified range.

Round 5

Time permitting, wait a minimum of 4 hr and repeat Round 4; this will restore the short-term creep relaxation/embedment losses. If the flange is subjected to a subsequent test pressure higher than its rating, it may be desirable to repeat this round after the test is completed.

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Compatibility

Make sure that the function and technical specification of the valve/accessory is compatible with the vessel service conditions and the cargo. This includes, but is not limited to:

- dimensions
- pressure/vacuum setting
- air/gas/liquid flow capacity
- maximum allowable working pressure
- test pressure
- minimum/maximum design temperatures
- materials of construction.

Maintenance

Fort Vale valves and accessories have a long life if you use them correctly in compatible service conditions. It is not necessary to lubricate the parts, but we recommend that you obey the precautions that follow:

Visual checks at regular intervals:

1. Examine the valve to make sure there is no damage, wear or corrosion.
2. Examine the valve and adjacent area to make sure there is no leakage of cargo.
3. Examine the fasteners to make sure they are not loose.
4. Make sure the valve operates correctly.

CAUTION: If you operate the valve with very corrosive cargo, or near its temperature and/or pressure limit (very high or very low temperature and/or pressure), do the visual checks more frequently.

As well as the visual checks, schedule suitable maintenance intervals for the valve based on how frequently the valve is used, the type of cargo and the service conditions.

After 2½ years of service, do the checks that follow:

1. Examine the valve to make sure there is no damage, wear or corrosion.
2. Make sure the valve operates correctly.
3. Do a pressure test on the valve.

After 5 years of service do the checks that follow:

1. Disassemble and clean the valve.
2. Replace all the valve seals.

Replacement Parts

Do not adapt or change the valve. If you install a replacement part, it must be a genuine Fort Vale part.

WARNING: If you install a part that is not a genuine Fort Vale part, there is a risk of:

- injury to personnel
- permanent damage to the valve
- permanent damage to the vessel
- valve malfunction.

External Fire

If the valve is installed in an area where there is a risk of external fire, you must install compatible accessories to prevent damage to the valve.

Compatibility of Accessories

Accessory components must cause no interference with the valve function. Accessories must be made from compatible materials that will cause no damage to the valve materials. Do not install an accessory that will cause an increased load on the valve, i.e. mechanical, static, dynamic, thermal.

Mis-use

Obey the instructions and recommended procedures in the installation and operating instructions. Obey the pressure and temperature markings on the valve and on the drawing. Use the valve/accessory for its correct function only. Fort Vale accept no liability or responsibility for incorrect use of the valve/accessory.

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