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FORT VALE®




## Catalogue

# Standard Equipment for Road Tankers



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# Manlid & Inspection Hatch Assemblies






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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

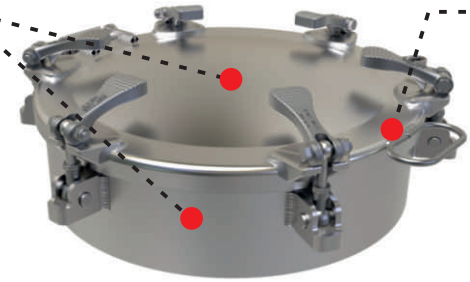
**Eyebolt**: stainless steel
**Handnut**: naval brass - low profile; stainless steel - low profile or extended, with/without brass insert

**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 |

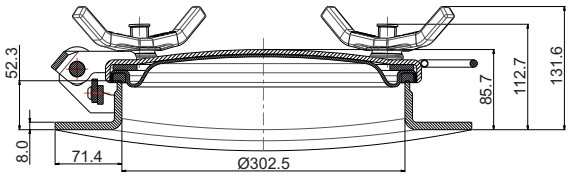
**NOTE:** The Design Temperature limits refer to metal parts only. The Design Conditions and Section View dimensions are for the specified part number only.

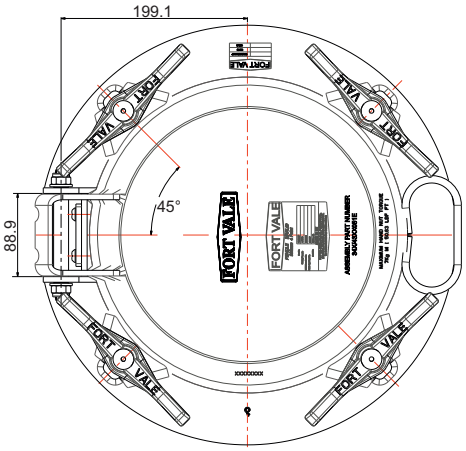
**Design Code**
BS EN 14025: 730/0600P cover only

## Range

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

## Section View





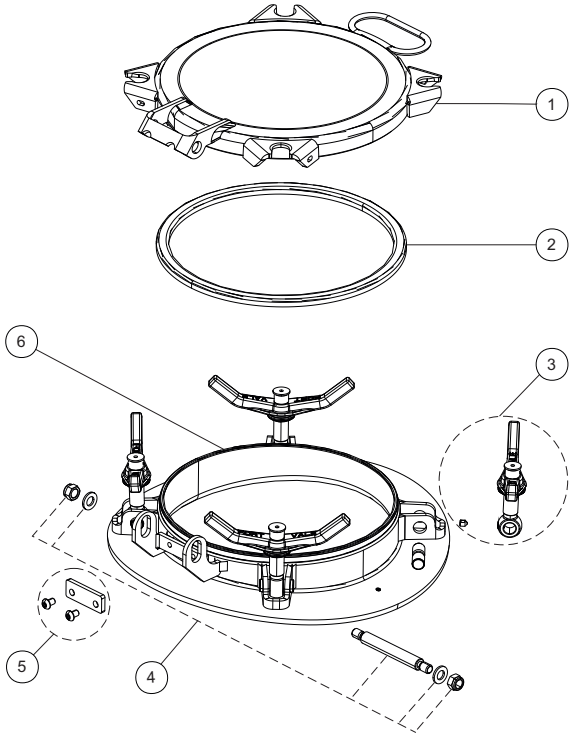
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# 300mm Inspection Hatch Assembly

**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.

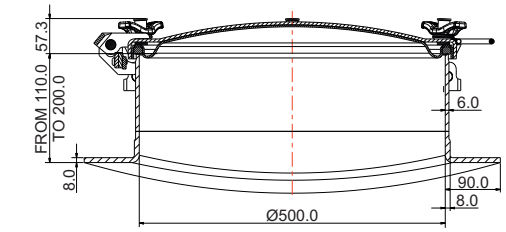
**Design Code**
BS EN14025

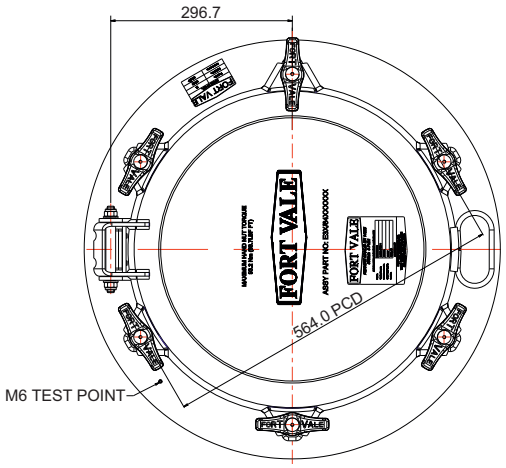
## Range

| 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





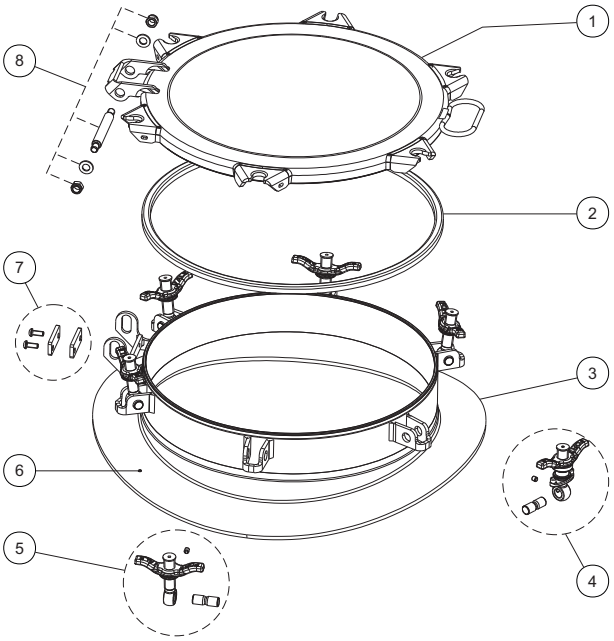
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# 500mm Pendle Manlid Assembly - Extended Neck

**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**

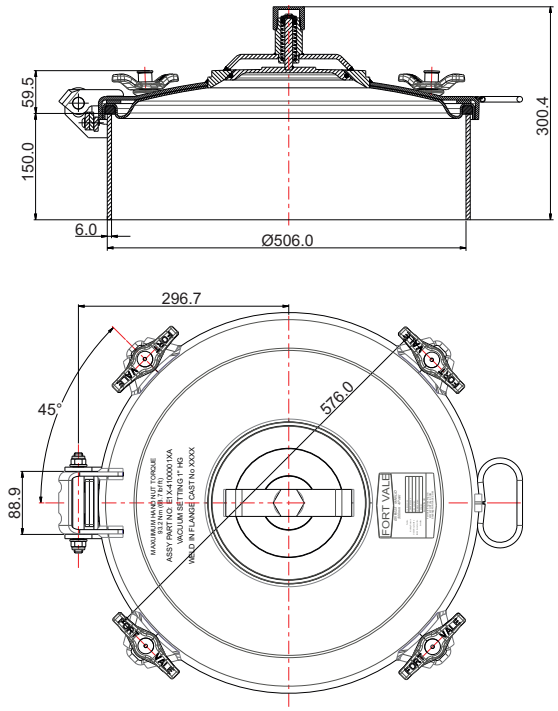
## Design Conditions

| | |
|---|---|
| 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





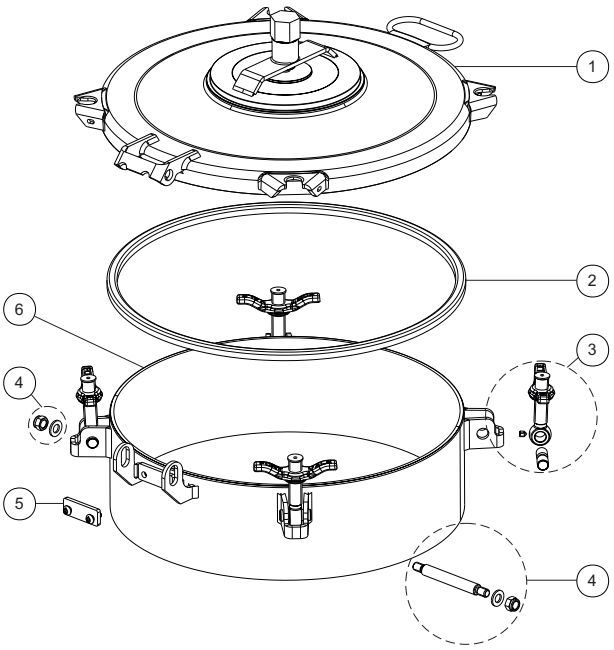
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# 500mm Manlid Assembly with Flash Vacuum Vent

## 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 |

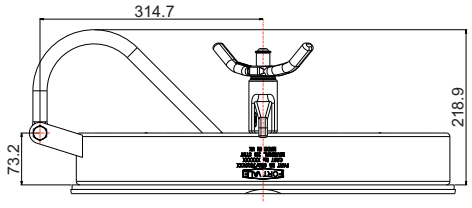
**Vacuum Conditions**: The assembly is compatible with -0.20 Bar vacuum only if neckring distortion caused by welding is kept to a minimum.

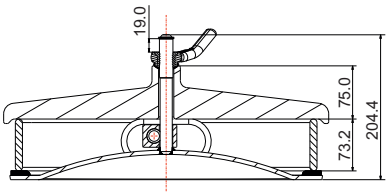
**NOTE:** The Design Conditions and Section View dimensions are for the specified part number only.

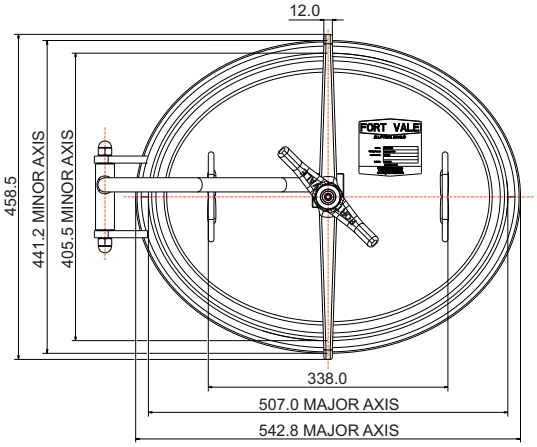
## Range

| 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





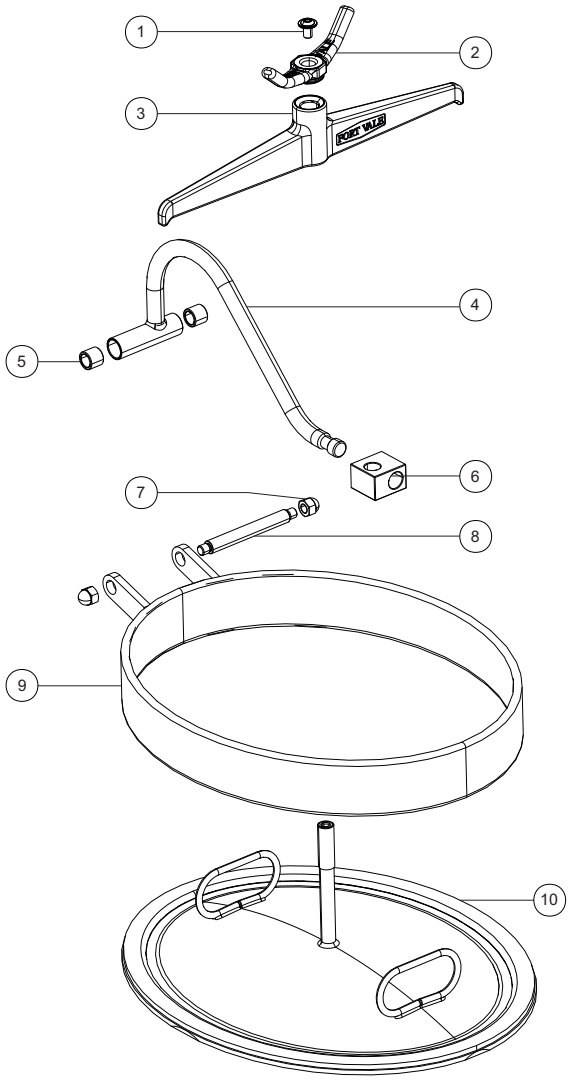
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# Elliptical Manlid Assembly - Low Profile Neckring

## 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 |

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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 |

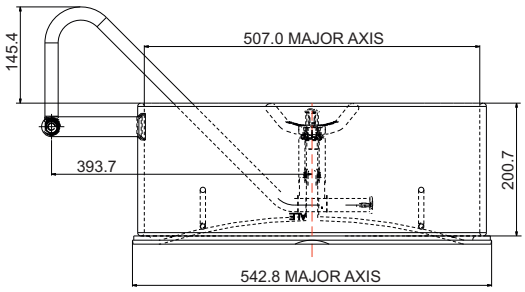
**Vacuum Conditions**: The assembly is compatible with -0.20 Bar vacuum only if neckring distortion caused by welding is kept to a minimum.

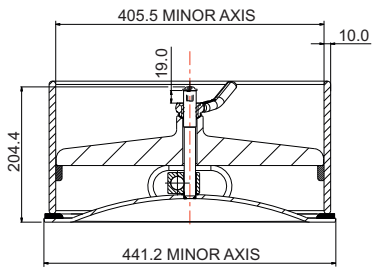
**NOTE:** The Design Conditions and Section View dimensions are for the specified part number only.

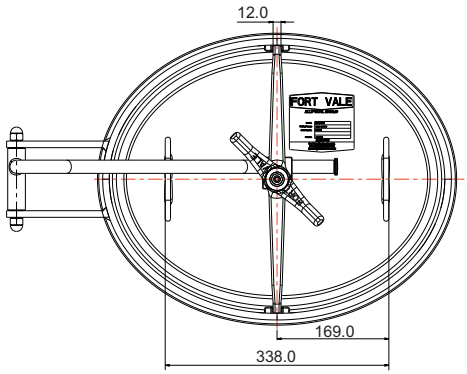
## Range

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

## Section View





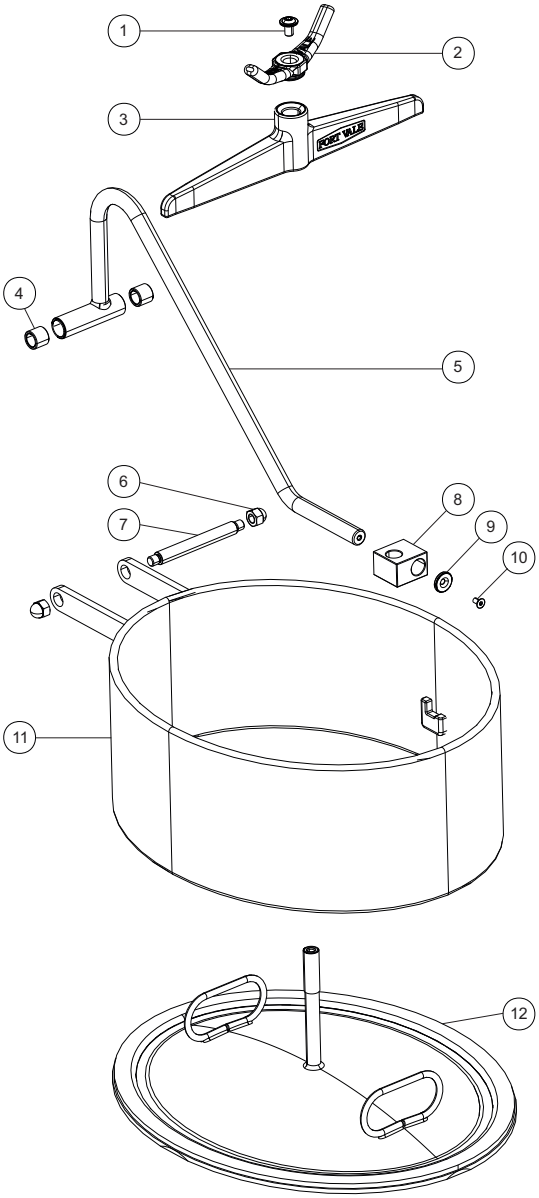
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# Elliptical Manlid Assembly - Deep Neckring

**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<br>-40°C to 120°C (-40°F to 248°F) | 5005-17B<br>16 x 10 | 5005-30B<br>16 x 10 | 11536B<br>14.5 x 11.8 | 5005-50B<br>15.24 x 11.8 | 5005-60B<br>16 x 10 | 5005-33B<br>16 x 16 | 5005-47B<br>16 x 16 | 5005-53B<br>16 x 16 | Blue |
| **EPDM** | Some corrosive cargoes. Do not use with petroleum-cased cargo<br>-50°C to 150°C (-58°F to 302°F) | 5005-17EPD<br>16 x 10 | 5005-30EPD<br>16 x 10 | 11536EPD<br>14.5 x 11.8 | 5005-50EPD<br>15.24 x 11.8 | 5005-60EPD<br>16 x 10 | 5005-33EPD<br>16 x 16 | 5005-47EPD<br>16 x 16 | 5005-53EPD<br>16 x 16 | Red/Blue |
| **CSM** | Moderately corrosive cargo. Do not use with petroleum-cased cargo<br>-40°C to 85°C (-40°F to 185°F) | 5005-17CSM<br>16 x 10 | 5005-30CSM<br>16 x 10 | 11536CSM<br>14.5 x 11.8 | 5005-50CSM<br>15.24 x 11.8 | 5005-60CSM<br>16 x 10 | 5005-33CSM<br>16 x 16 | 5005-47CSM<br>16 x 16 | 5005-53CSM<br>16 X 16 | White |
| **Natural White Rubber** | Food products<br>-50°C to 80°C (-58°F to 176°F) | 5005-17SWR<br>16 x 10 | 5005-30SWR<br>16 x 10 | 11536SWR<br>14.5 x 11.8 | 5005-50SWR<br>15.24 x 11.8 | 5005-60SWR<br>16 x 10 | 5005-33SWR<br>16 x 16 | 5005-47SWR<br>16 x 16 | 5005-53SWR<br>16 x 16 | |
| **Neoprene** | Non-corrosive cargo<br>-30°C to 100°C (-22°F to 212°F) | 5005-17NR<br>16 x 10 | 5005-30NR<br>16 x 10 | 11536NR<br>14.5 x 11.8 | 5005-50NR<br>15.24 x 11.8 | 5005-60NR<br>16 x 10 | 5005-33NR<br>16 x 16 | 5005-47NR<br>16 x 16 | 5005-53NR<br>16 x 16 | Green |
| **Nitrile (Black)** | Aliphatic hydrocarbons<br>-25°C to 100°C (-13°F to 212°F) | 5005-17N<br>16 x 10 | 5005-30N<br>16 x 10 | 11536N<br>14.5 x 11.8 | 5005-50N<br>15.24 x 11.8 | 5005-60N<br>16 x 10 | 5005-33N<br>16 x 16 | 5005-47N<br>16 x 16 | 5005-53N<br>16 x 16 | Red |
| **Orange Silicone** | High temperature non-corrosive cargo<br>-50°C to 200°C (-58°F to 392°F) | 5005-17S<br>16 x 10 | 5005-30S<br>16 x 10 | 11536S<br>14.5 x 11.8 | 5005-50S<br>15.24 x 11.8 | 5005-60S<br>16 x 10 | 5005-33S<br>16 x 16 | 5005-47S<br>16 x 16 | 5005-53S<br>16 x 16 | |
| **White Silicone** | Food products. FDA approved<br>-50°C to 200°C (-58°F to 392°F) | 5005-17WS<br>16 x 10 | 5005-30WS<br>16 x 10 | 11536WS<br>14.5 x 11.8 | 5005-50WS<br>15.24 x 11.8 | 5005-60WS<br>16 x 10 | 5005-33WS<br>16 x 16 | 5005-47WS<br>16 x 16 | 5005-53WS<br>16 x 16 | Red |
| **Viton A** | Moderately corrosive cargo<br>-15°C to 200°C (5°F to 392°F) | 5005-17VR<br>16 x 10 | 5005-30VR<br>16 x 10 | 11536VR<br>14.5 x 11.8 | 5005-50VR<br>15.24 x 11.8 | 5005-60VR<br>16 x 10 | 5005-33VR<br>16 x 16 | 5005-47VR<br>16 x 16 | 5005-53VR<br>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:

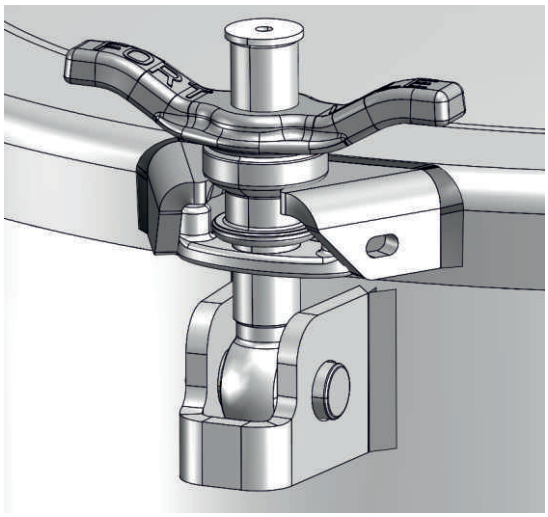
- dimensions
- maximum allowable working pressure
- test pressure
- vacuum conditions
- minimum/maximum design temperatures
- materials of construction.

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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

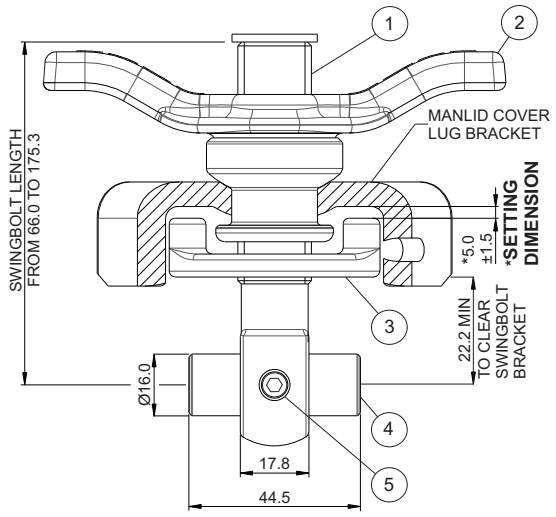
**Size**
Eyebolt: ¾" BSW eyebolt with Ø 16mm eye, available length from 66mm to 175.3mm (Dimension C)
Safebolt handnut & retaining collar: ¾" BSW
Pivot pin: Ø 16mm

**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.

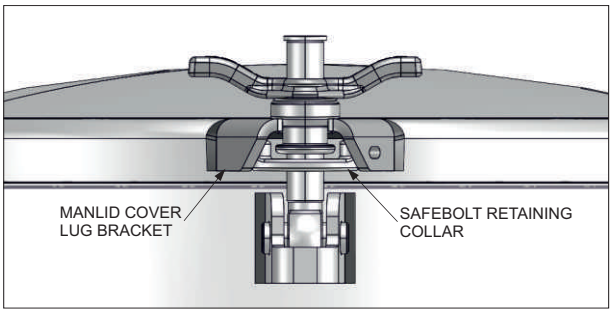



Figure 1 - Closed Position

### 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.

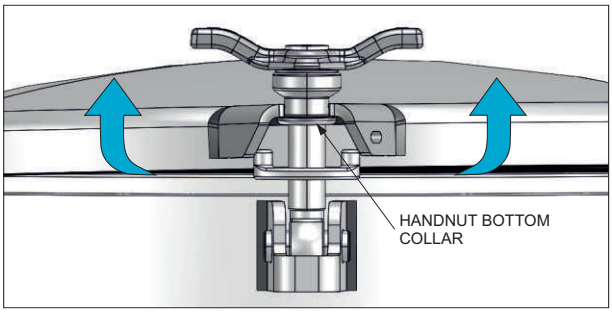



Figure 2 - Retained Position

### 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.

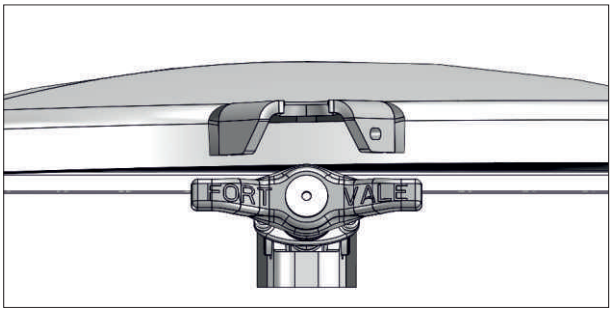



Figure 3 - Open Position

### 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



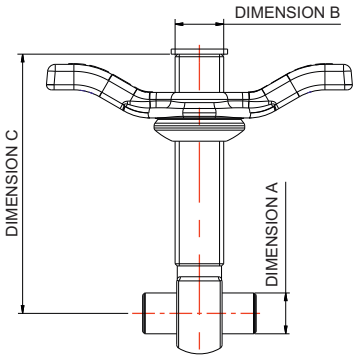
We supply a range of swingbolt assemblies with different eyebolt lengths and handnut types.

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

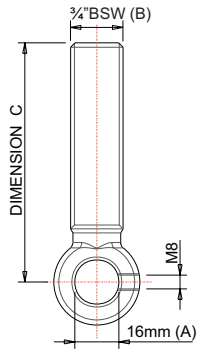
| Description | Part No. |
|---|---|
| Handnut torque increase tool, compatible with low profile handnuts | 495/10T0 |


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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

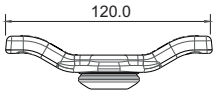
Material: stainless steel

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 |

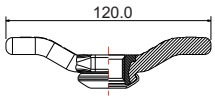
## ¾" BSW Handnut

### Standard low profile handnut

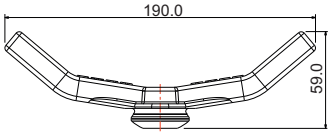



### Anti-galling handnut

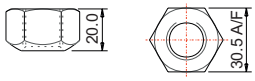
**Low profile**




**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 |

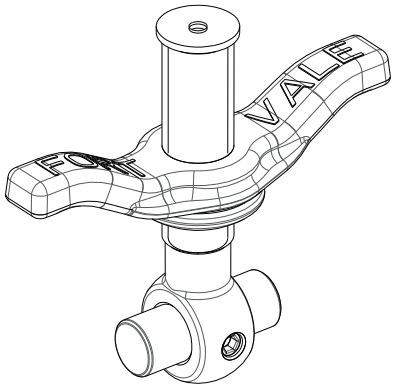


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# Swingbolt Assembly Part Number Code

## Accessories & Spare Parts




**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

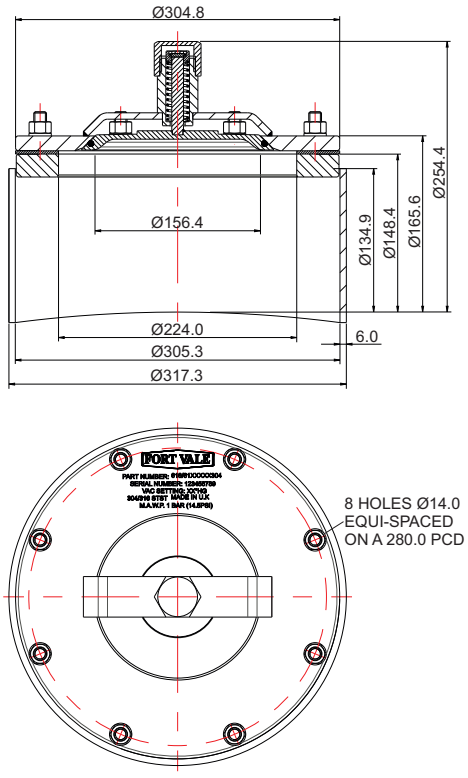
**Alternatives are available, please contact Fort Vale**

## 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





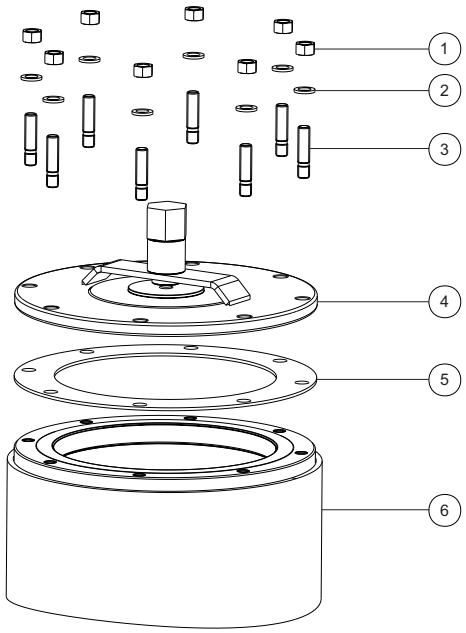
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# 300mm Flash Vacuum Vent Assembly

## 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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# Relief Valves





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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

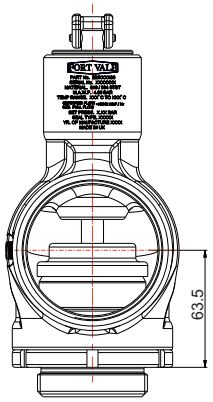
| Description | Part No. |
|---|---|
| With Viton pressure O ring | 2B/0XXX00 |
| With EPDM pressure O ring | 2B/1XXX00 |

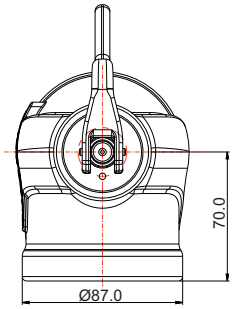
NOTE: The pressure setting changes the part number

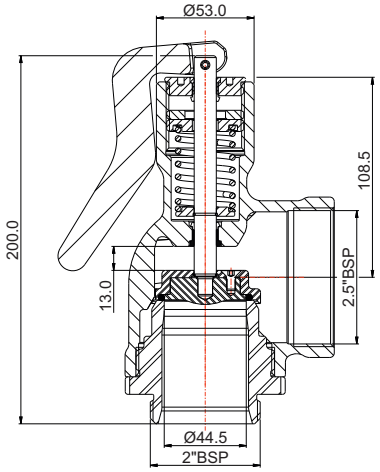
## Flow Rate

| 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





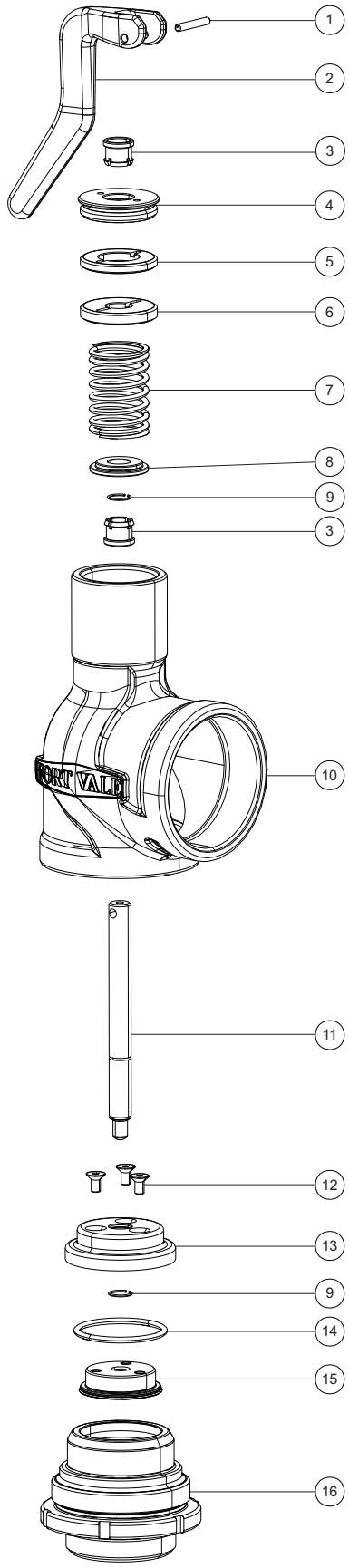
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# 2" to 2½" 90° Angled Blower Relief Valve

**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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# Minnow Relief Valves

## Design Options

## 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”)

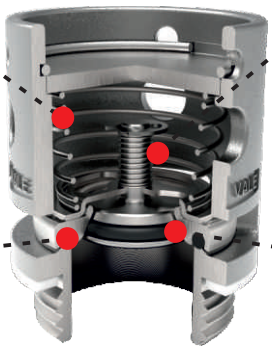
### Pressure Setting

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

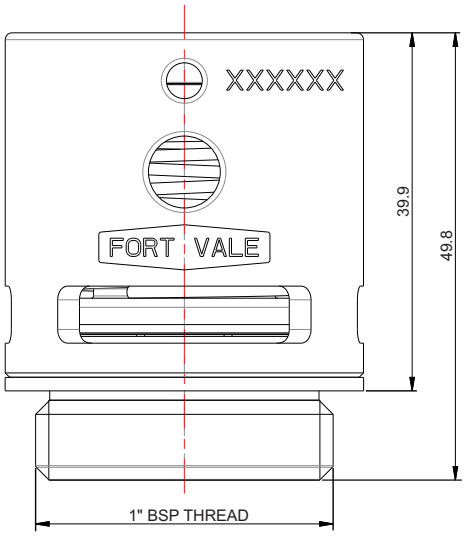
| Description | Part No. |
|---|---|
| 1" BSPM standard valve | 65/XXXXX |
| 1" BSPM with vent button | 65B/XXXXX |
| 1" BSPM with vent button & TIR | 65BT/XXXXX |
| 1" BSPM with vent button & ventlock | 68/XXXXX |
| 1" BSPF standard valve | 66/XXXXX |
| 1" BSPF with vent button & ventlock | 69/XXXXX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

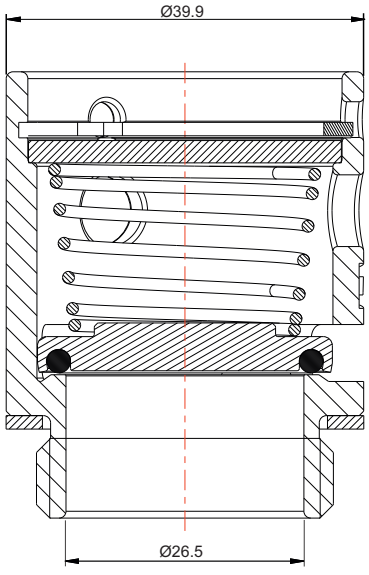
**NOTE:** The valve specification changes the part number

## 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





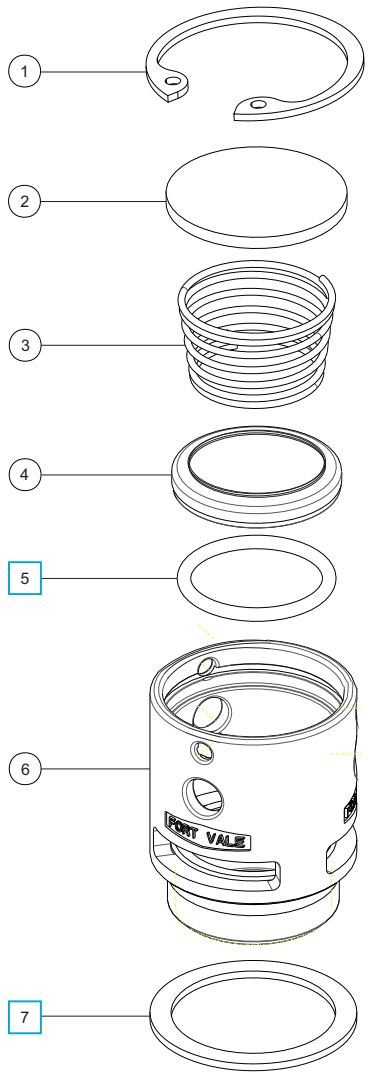
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# 1" BSP Minnow Relief Valve - Pressure Only

## 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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# Uniact Relief Valves

## Design Options

## 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”)

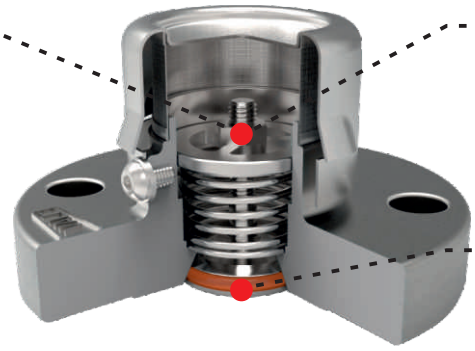
50mm (2”)

**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

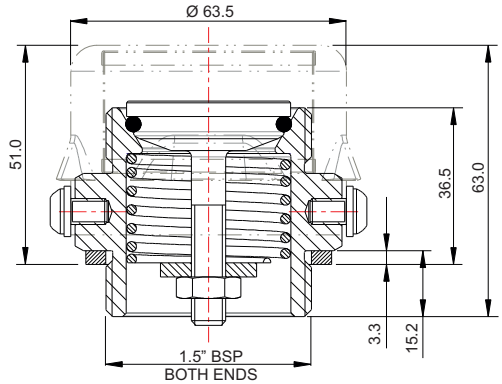
| Description | Part No. |
|---|---|
| 1½" BSP standard valve | 47/XXXX00A |
| 1½” BSP with cowl | 47/XXXX00AC |
| 1½” BSP with cowl and gauze | 47/XXXX00AGZ |
| 1½” BSP, alloy C276 contact parts | 47H/XXXX00AX |
| 1½” BSP with PTFE tank seal | 47V/XXXX00AX |
| 50mm DIN11851 connection | 47M/XXXX00AX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

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





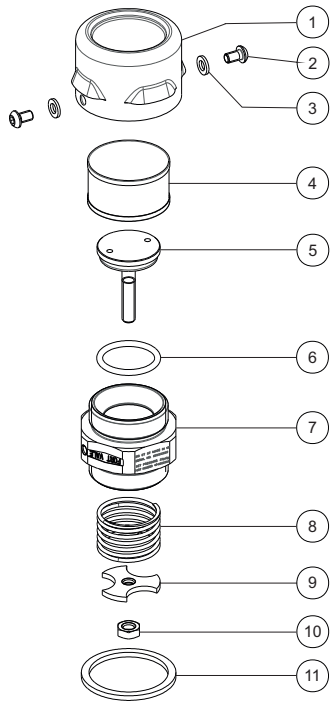
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# 1½” BSP Uniact Relief Valve - Pressure Only

## 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

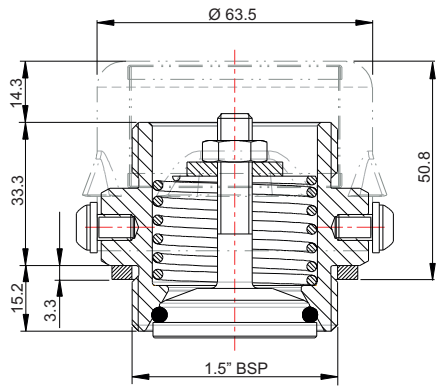
| Description | Part No. |
|---|---|
| 1½" BSP standard valve | 47/X000XXA |
| 1½” BSP with cowl | 47/X000XXAC |
| 1½” BSP with cowl and gauze | 47/X000XXAGZ |
| 1½” BSP with vent button | 47/X000XXVBA |
| 1½” BSP, alloy C276 contact parts | 47H/X000XXAX |
| 1½” BSP with PTFE tank seal | 47V/X000XXAX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





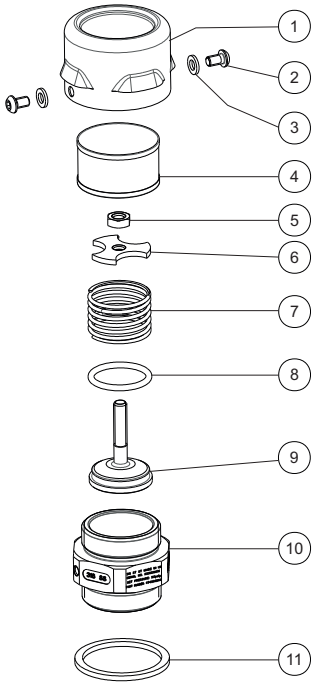
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# 1½” BSP Uniact Relief Valve - Vacuum Only

## 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

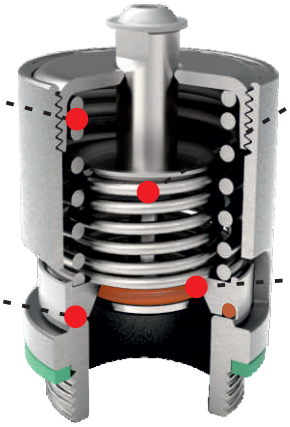
40mm (1½")

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)

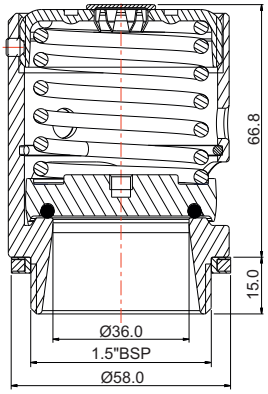



Figure 1. Valve with a Fortyt pressure O ring

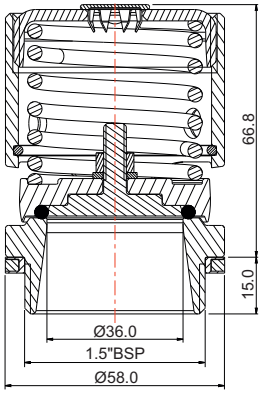



Figure 2. Valve with a Viton pressure O ring


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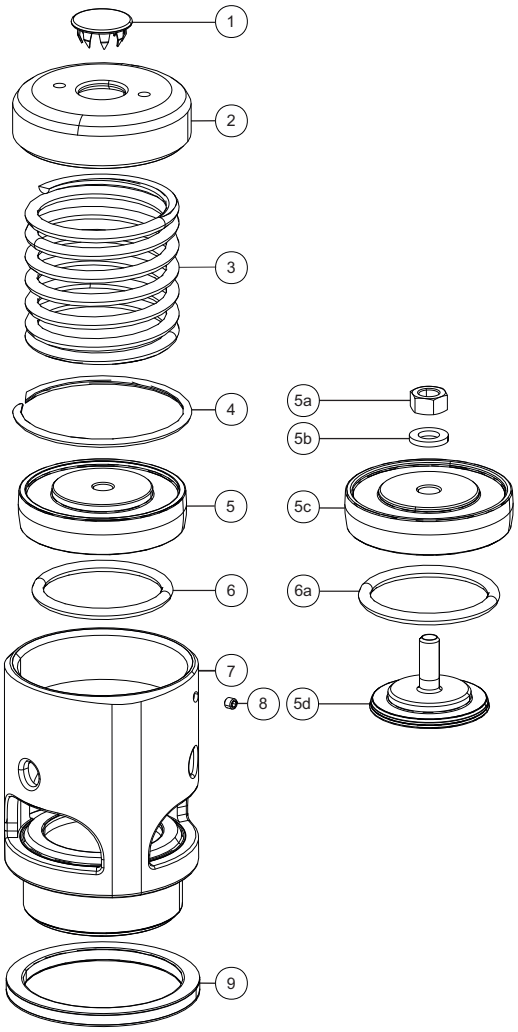
# 1½” BSP MK2 Twinact Relief Valve - Pressure Only

## 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 | 5006-006 |

**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: 0.86 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)

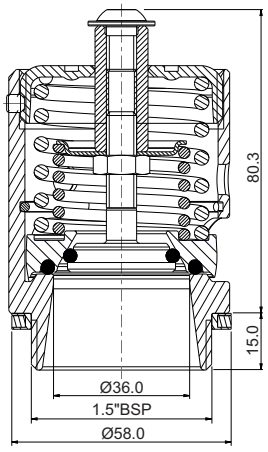



Figure 1. Valve with Fortyt pressure/vacuum O rings

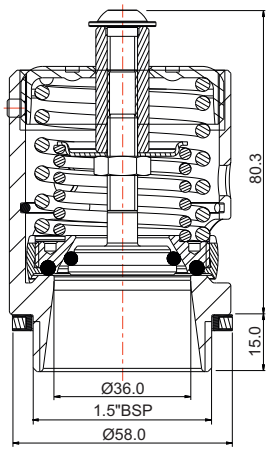



Figure 2. Valve with Viton pressure/vacuum O rings


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# 1½" BSP MK2 Twinact Relief Valve - Pressure/Vacuum

## Part No: 3A/XXXXXX - Metric Settings

## Parts Drawing

**Figure 1:** Fortyt pressure plate/O ring

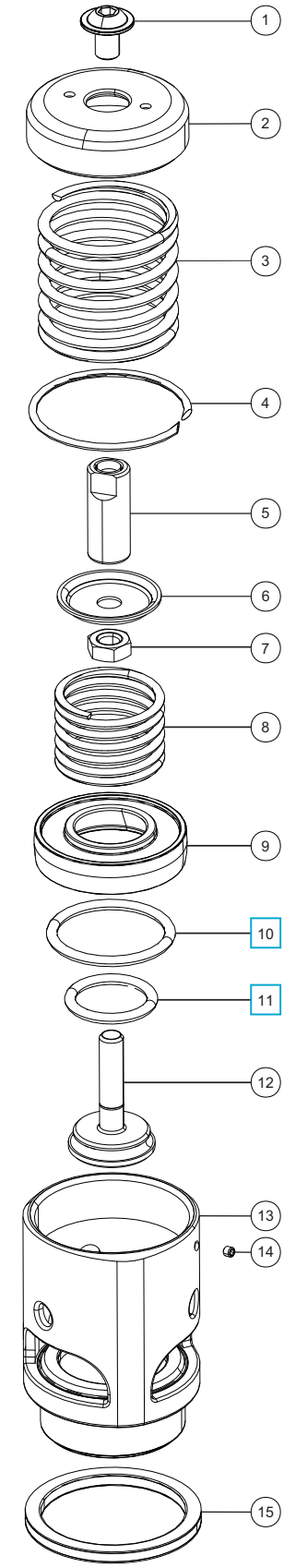
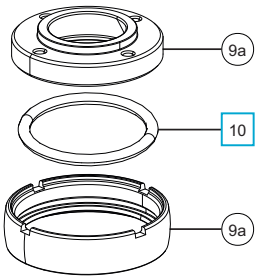



**Figure 2:** Viton pressure plate/O ring




## Parts List

| Item | Description | Part No. |
|---|---|---|
| 1 | Flanged button screw | 5111-9812 |
| 2 | Top cap | 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 |
| 9/9a | 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 | 5006-006 |

**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 98 kPa

## Table 3 - Refer to Note

| O Ring Material | Pressure Plate Part No. | Pressure Plate/O Ring Assembly Part No. |
|---|---|---|
| Fortyt | (9) 175/0125 | 175/F125 |
| Viton | (9a) 110/X150 | 110/0150 |

## 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: 3AM/XXXXXX - Metric Settings



## Specification

**Nominal size**
DN40

**Tank connection**
50mm DIN11851

**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 elastomer (Fig.2)
Vacuum O ring: Fortyt (Fig.1) or elastomer (Fig.2)

**Alternatives are available, refer to the Design Options page**

## Design Conditions

Weight: 1.0 Kg

For more Design Conditions, please contact Fort Vale and refer to the parts drawing. The Section View dimensions are for the specified part number only.

**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 | 3AM/XXXXXX |
| Standard valve - pressure only | 3AM/XXXX00 |

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 |
| Silicone seal for 50mm socket | 176/2675S |
| 1½” clamped flame arrester ***Warning** | 200/5000 |
| Installation C spanner | 400/3000 |

## Section View

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

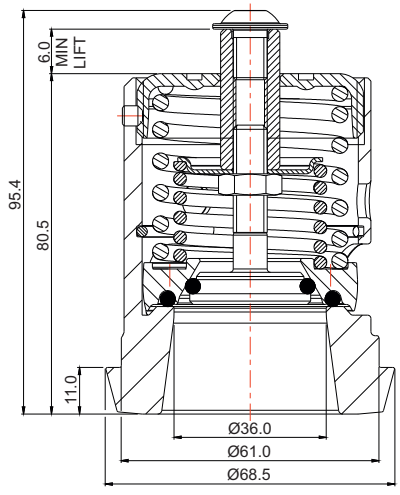



Figure 1. Valve with Fortyt pressure/vacuum O rings

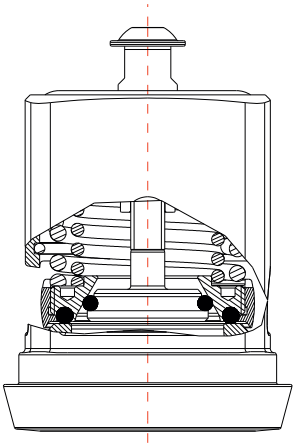


Figure 2. Valve with elastomer pressure/vacuum O rings


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# 1½" Twinact Relief Valve 50mm DIN11851 - Pressure/Vacuum

## Part No: 3AM/XXXXXX - Metric Settings

## Parts Drawing

**Figure 1:** Fortyt pressure plate/O ring

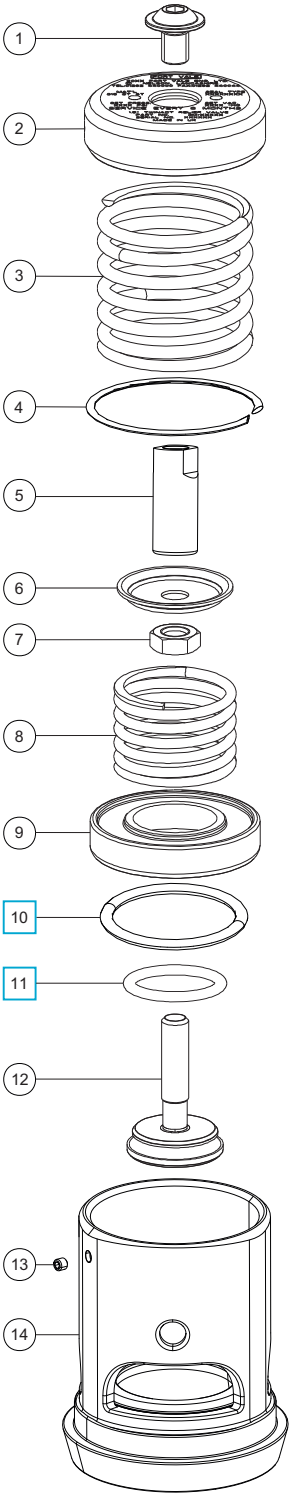
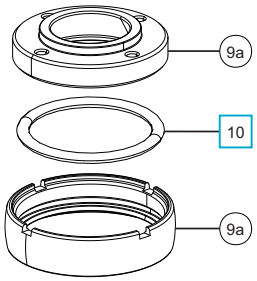



**Figure 2:** Viton pressure plate/O ring




## Parts List

| Item | Description | Part No. |
|---|---|---|
| 1 | Flanged button screw | 5111-9812 |
| 2 | Top cap | 11004 |
| 3 | Pressure spring | Refer to Table1 |
| 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 |
| 9/9a | 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 | Anti-tamper screw | 5121-001 |
| 14 | Body | 10990/1 |

**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 |
| 2.0 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 98 kPa

## Table 3 - Refer to Note

| O Ring Material | Pressure Plate Part No. | Pressure Plate/O Ring Assembly Part No. |
|---|---|---|
| Fortyt | (9) 175/0125 | 175/F125 |
| Viton | (9a) 110/X150 | 110/0150 |

## 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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# 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)

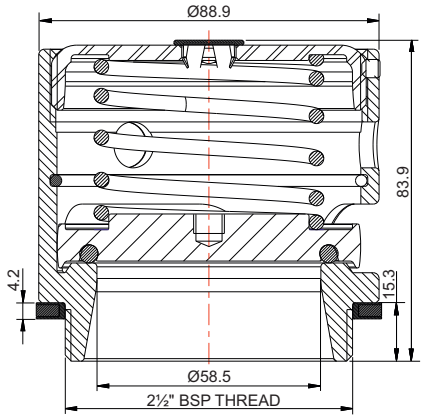



Figure 1. Valve with a Fortyt pressure O ring

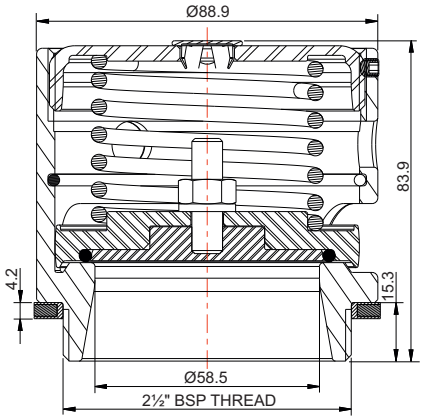



Figure 2. Valve with a Viton pressure O ring


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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

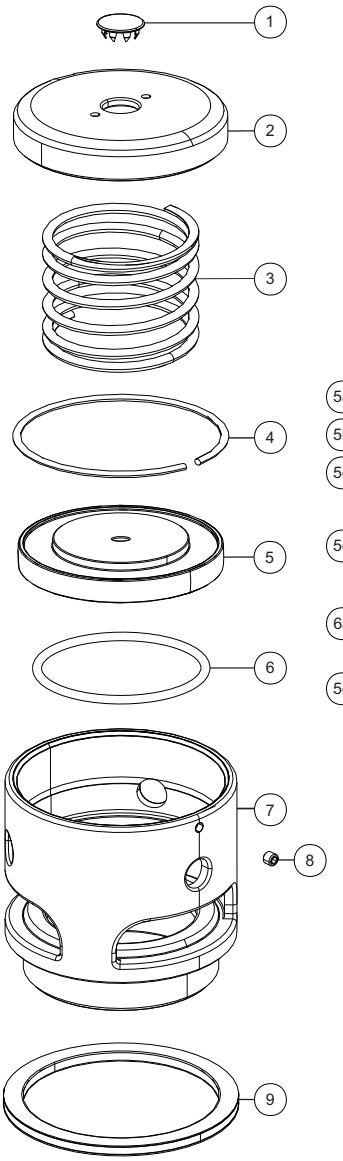
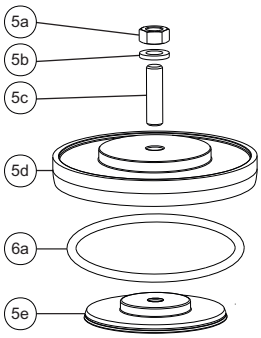



**Figure 2:** Viton pressure plate/O ring




## 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)

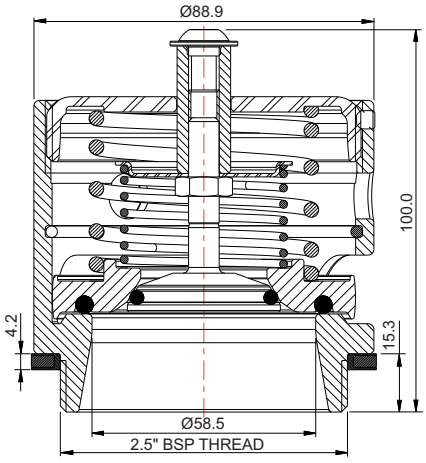



Figure 1. Valve with a Fortyt pressure O ring

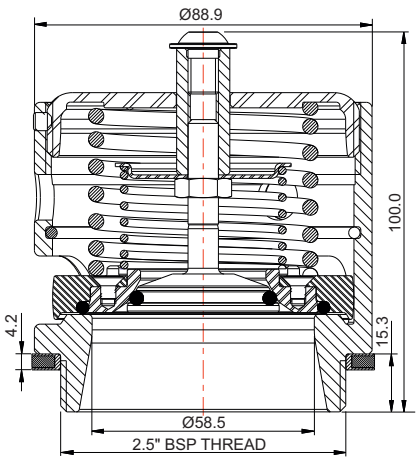



Figure 2. Valve with a Viton pressure O ring


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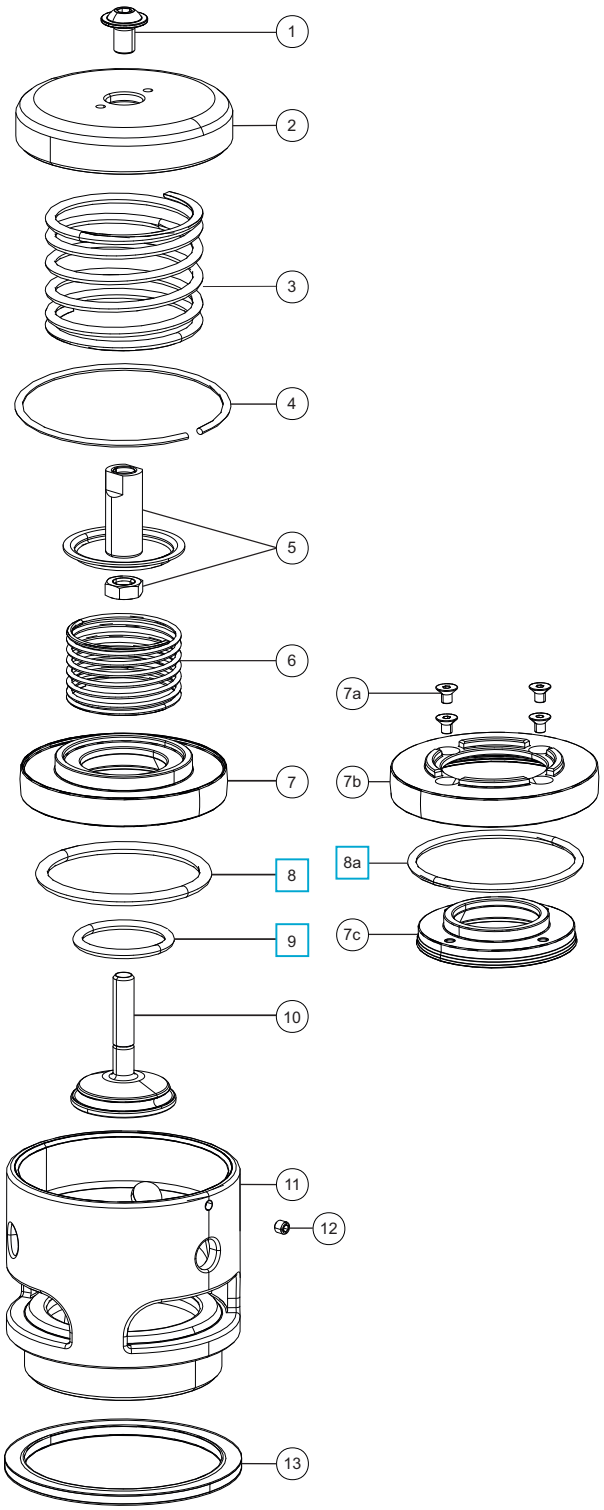
# 2½" BSP MK2 Twinact Relief Valve - Pressure/Vacuum

## 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 98 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: 2AM/XXXXXX - Metric Settings



## Specification

**Nominal size**
DN65

**Tank connection**
80mm DIN11851

**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 elastomer (Fig.2)
Vacuum O ring: Fortyt (Fig.1) or elastomer (Fig.2)

**Alternatives are available, refer to the Design Options page**

## Design Conditions

Weight: 1.94 Kg

For more Design Conditions, please contact Fort Vale and refer to the parts drawing. The Section View dimensions are for the specified part number only.

**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 | 2AM/XXXXXX |
| Standard valve - pressure only | 2AM/XXXX00 |

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 80mm socket | 176/2685S |
| 2½” flame arrester ***Warning** | 130/5000 |
| Installation C spanner | 400/3000 |

## Section View

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

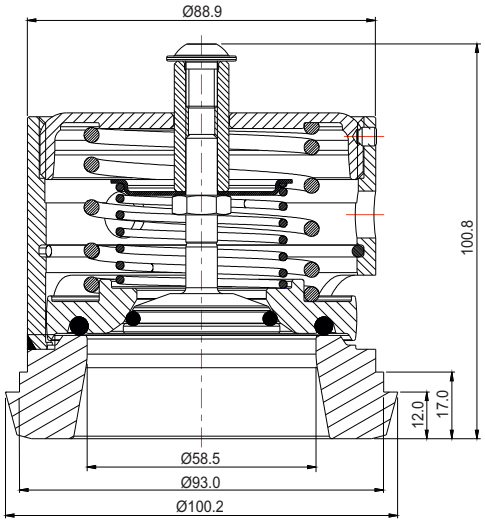



Figure 1. Valve with Fortyt pressure/vacuum O rings

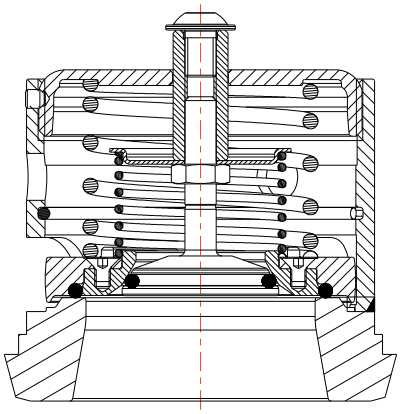


Figure 2. Valve with elastomer pressure/vacuum O rings


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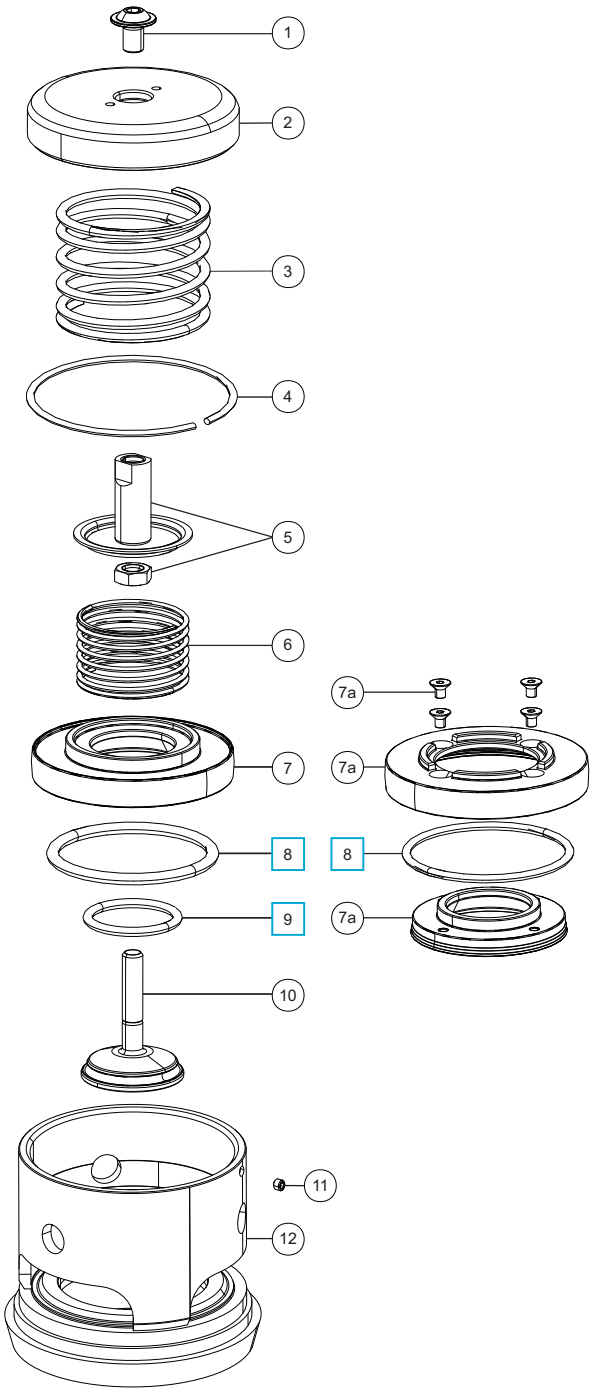
# 2½" Twinact Relief Valve - 80mm DIN11851, Pressure/Vacuum

## Part No: 2AM/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 |
| 7/7a | Pressure plate *Note | Refer to Table 3 |
| 8 | Pressure O ring *Note | Refer to Table 4 ☐ |
| 9 | Vacuum O ring | Refer to Table 4 ☐ |
| 10 | Vacuum poppet | 10983V |
| 11 | Anti-tamper screw | 5121-001 |
| 12 | Body | 175/2203 |

**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. |
|---|---|
| 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 98 kPa

## Table 3 - Refer to Note

| O Ring Material | Pressure Plate Part No. | Pressure Plate/O Ring Assembly Part No. |
|---|---|---|
| Fortyt | (7) 175/0117 | 175/F117 |
| Viton | (7a) 175/X260 | 175/0260 |

## Table 4 - Refer to Note

| O Ring Material | Pressure O Ring Part No. | Vacuum O Ring Part No. |
|---|---|---|
| Fortyt | ORB330F0 | 5005-108H |
| Viton | 5005-313 | 5005-107 |

## Seal Kit - All parts marked ☐ in the Parts List

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

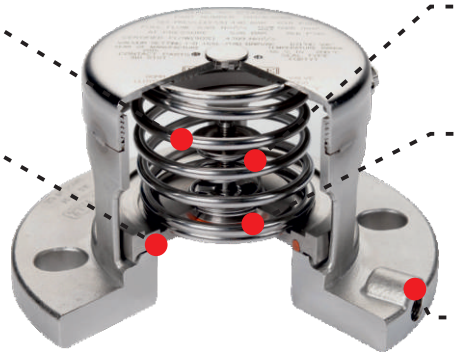
### Pressure Setting

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



**Finish**

Electropolished

**Special service conditions**:
Corrosion-resistant paint on external surfaces to prevent damage from corrosive cargo vapour/splash

## 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.

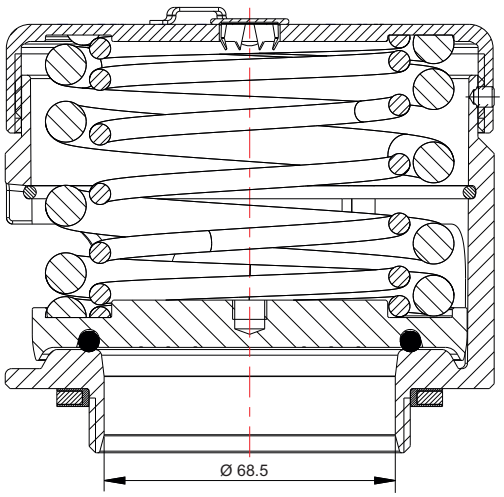
## Range

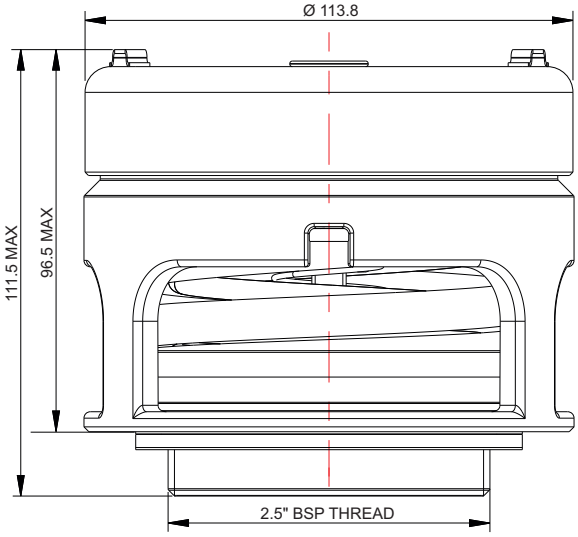
| Standard Settings | Part No. |
|---|---|
| 2.19 Bar | 010/121900 |
| 3.31 Bar | 010/133100 |
| 3.71 Bar | 010/137100 |
| 4.40 Bar | 010/144000 |

## 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





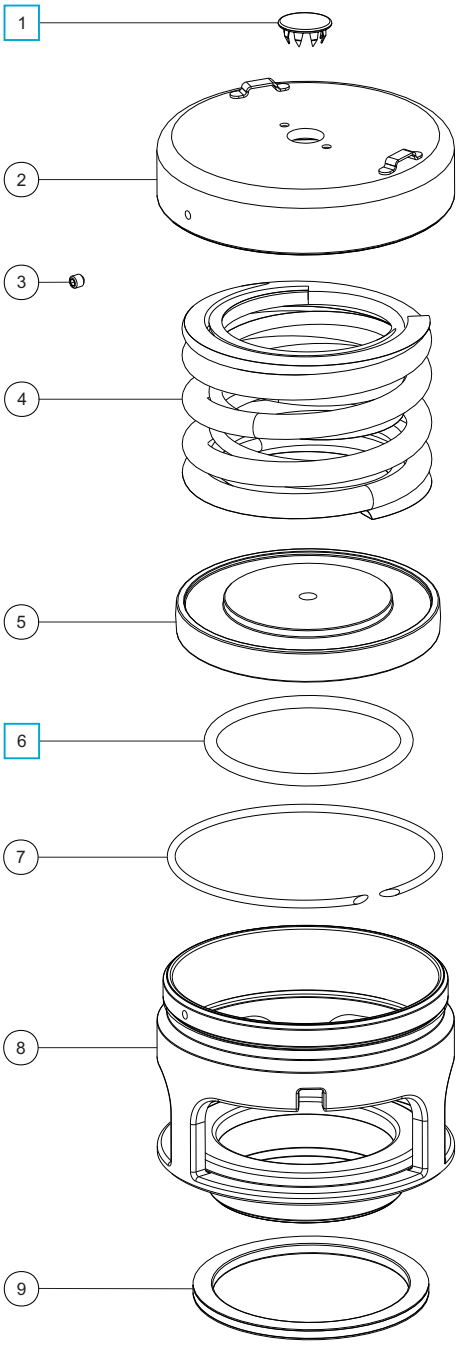
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# 2½” BSP Super Maxi Relief Valve - Pressure Only

## 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.

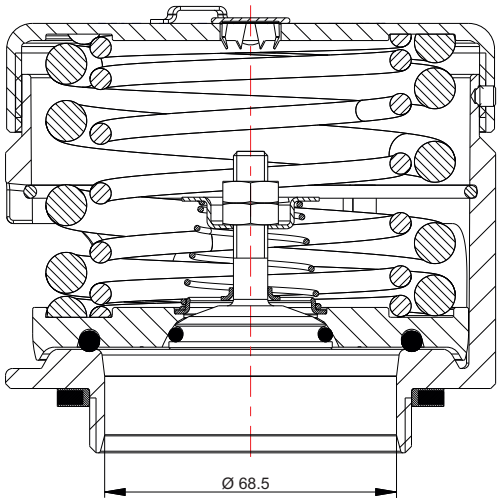
## Range

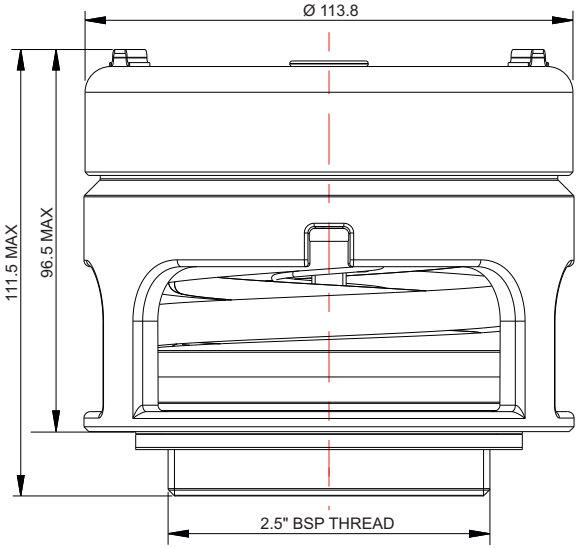
| Standard Settings | Part No. |
|---|---|
| 2.19 Bar & 21 kPa | 010/121921 |
| 3.31 Bar & 21 kPa | 010/133121 |
| 3.71 Bar & 21 kPa | 010/137121 |
| 4.40 Bar & 21 kPa | 010/144021 |

## 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





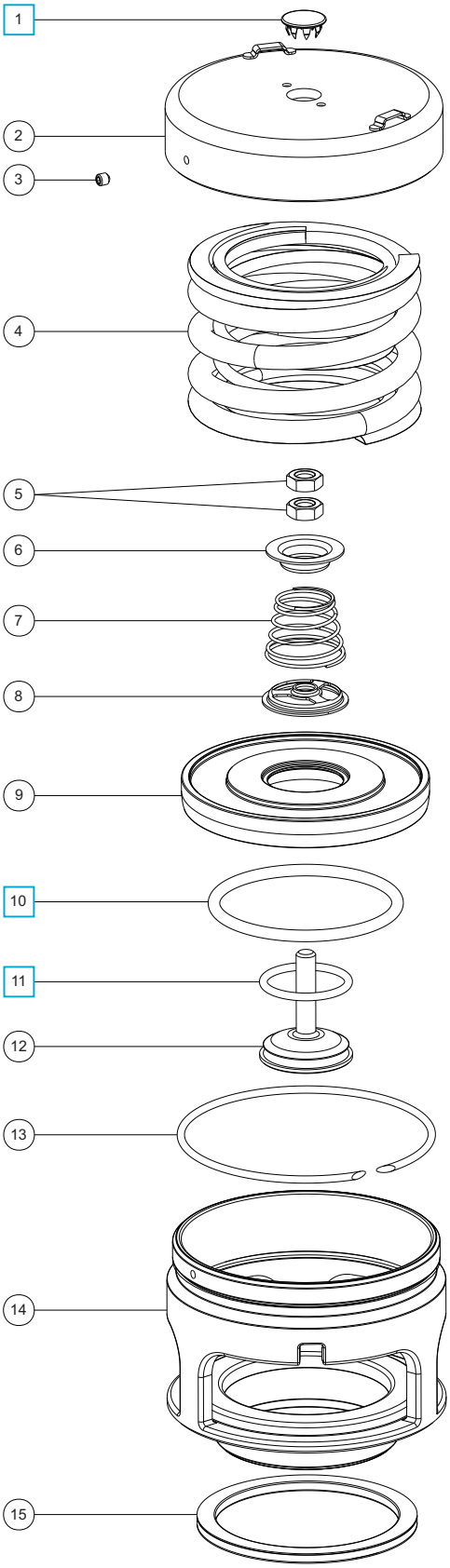
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# 2½” BSP Super Maxi Relief Valve - Pressure/Vacuum

## 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

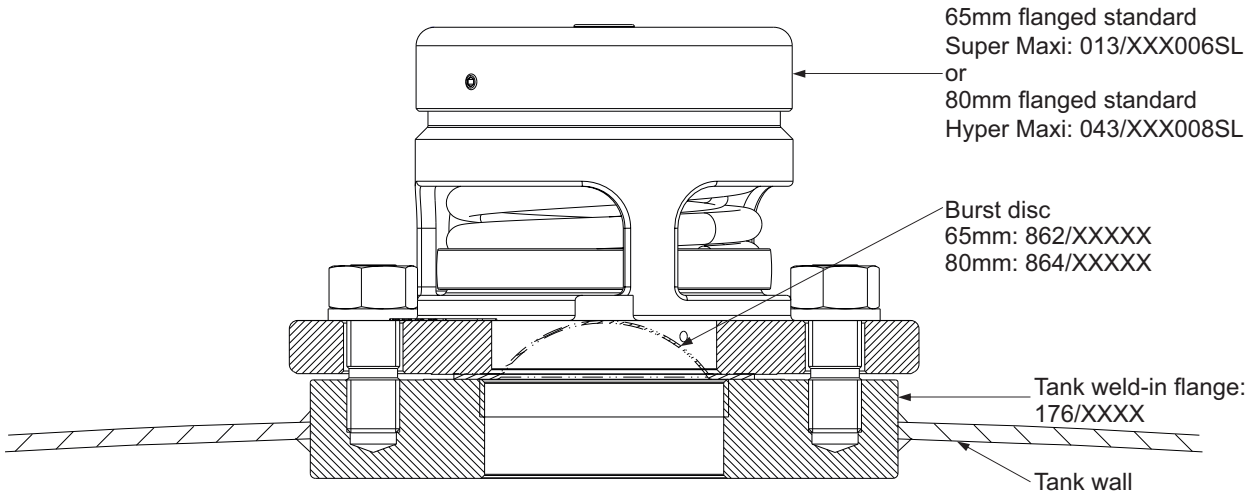
| Description | Part No. |
|---|---|
| All parts marked ☐ in the Parts List | 000/1PVSK |


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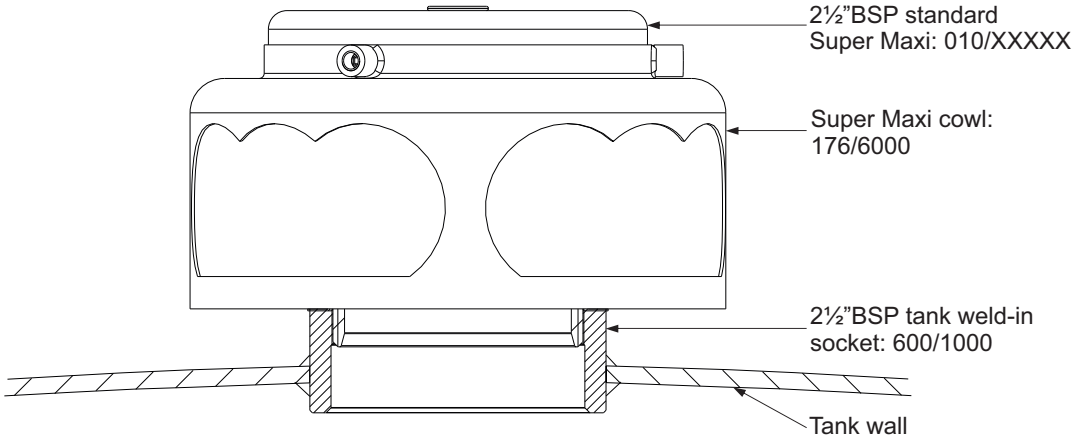
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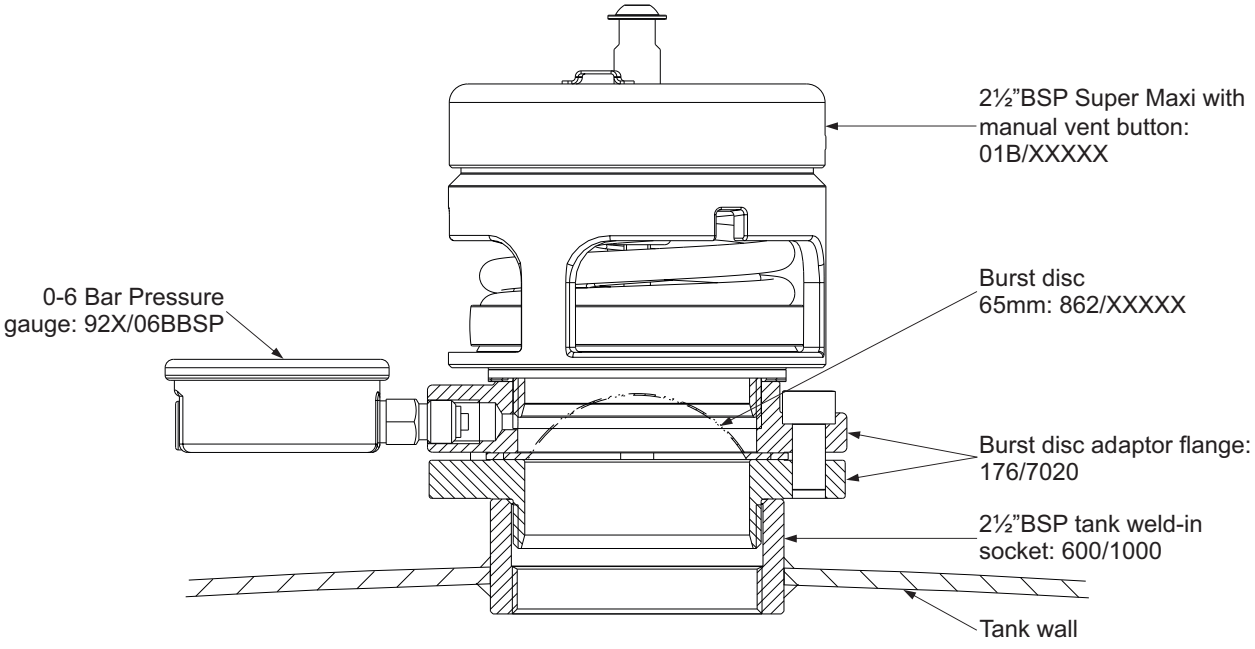
## Flanged Super Maxi/Hyper Maxi relief valve with burst disc and tank weld-in flange




## 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



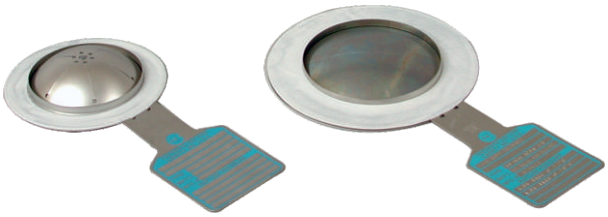



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# Burst Discs

## Accessories & Spare Parts





## Specification

Our range of non-fragmenting burst discs is compatible with Fort Vale relief valves and accessories. If you have other manufacturer's equipment, please contact us.

**WARNING**: A burst disc decreases the air flow capacity of a relief valve. Calculate to make sure that the decreased flow will give sufficient protection to your tank/system. Refer to Fort Vale for more information.

**Nominal sizes**

65mm XL, 80mm XL, 89mm, 250mm
Other sizes are available, please contact us.
**NOTE**: 65mm XL/80mm XL discs replace the original 65mm/80mm discs. We do not recommend 65mm/80mm discs with Fort Vale relief valves.

**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

**Materials**

65XL/80XL/89mm: PTFE/316 stainless steel/Nickel
250mm: PTFE/316 stainless steel
Other materials are available, refer to next page.

## 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/X0228020B |
| 2.41 | 20 | 862/X0241020B |
| 2.69 | 20 | 862/X0269020B |
| 3.10 | 20 | 862/X0310020B |
| 3.67 | 20 | 862/X0367020A |
| 4.10 | 20 | 862/X0410020A |
| 4.40 | 20 | 862/X0440020A |
| 4.84 | 20 | 862/X0484020A |

**NOTE**: The specification changes the part no.

## 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/X0367020A |
| 4.10 | 20 | 864/X0410020A |
| 4.84 | 20 | 864/X0484020A |

**NOTE**: The specification changes the part no.

## 89mm Reverse Acting Burst Discs

Compatible with compressed liquefied gas tank containers.

| Burst Pressure Bar | Burst Temperature °C | Part No. |
|---|---|---|
| 12.10 | 55 | 864/X1210055GX |
| 15.00 | 55 | 864/X1500055GX |
| 22.00 | 55 | 864/X2200055GX |
| 27.50 | 55 | 864/X2750055GX |
| 34.50 | 55 | 864/X3450055GX |

**NOTE**: The specification changes the part no.

## 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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**Example: 8 6 X / X 0484 020 X X**

## Disc Size

**862/** 65mm XL
**864/** 80mm XL or 89mm Reverse Acting

## Disc Manufacturer

**A** CDC (Continental Disc Corporation)
**B** BS&B Safety Systems
**C** Schlesinger

## Burst Pressure in kPa

**0484** 484 kPa (4.84 Bar)

## Burst Temperature in °C

**020** 20°C

## Disc Type

**A** Forward Acting (ICON)
**B** Forward Composite (PC-SERT)
**G** Reverse Acting: Gas service

## Special Material/Service: Disc Type A & B Only

**Note:** No number = Standard Material/Service
**1** PFA Lined
**2** PTFE Lined
**3** Tantalum
**4** Alloy 600
**5** Oxygen Cleaned
**6** High Temperature 250°
**7** Titanium
**8** Standard 30° Angle
**9** Monel ®

## Special Material/Service: Disc Type G Only

**Note:** No number = Standard Material/Service
**1** Hastelloy ® / PTFE
**2** Monel ®
**3** Tantalum
**4** Alloy 400


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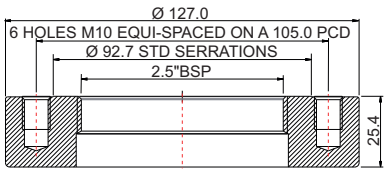
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## Part No: 176/3150



### 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

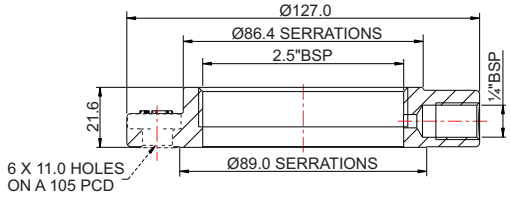
### Related Parts

| 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

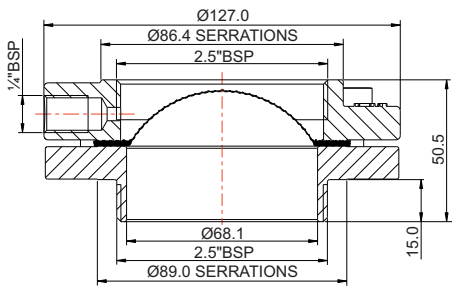
**Material**
316 stainless steel

**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, 0-40 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 |
| 0-40 | 0-580 | St/steel | 920/40BBSP |

### 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 |
| 0-40 | 0-580 | St/steel | 920/40TTBBSP |


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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 |

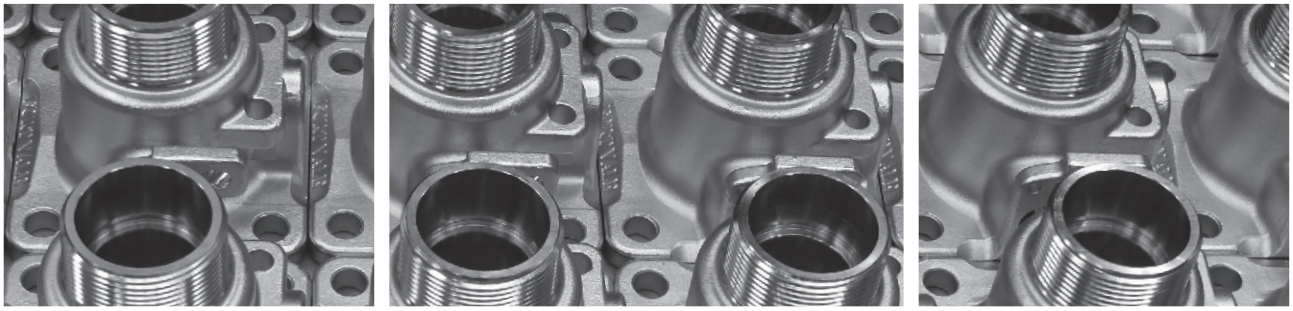

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# Airline Valves




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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

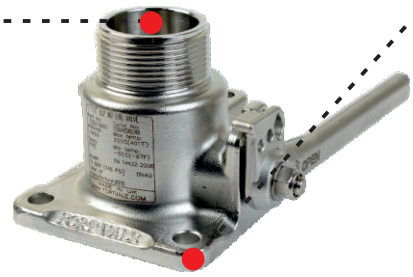
The design options below are available on our standard range of airline valves.

### Nominal Bore

40mm (1½"): Ball valves

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

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



### Tank Connection

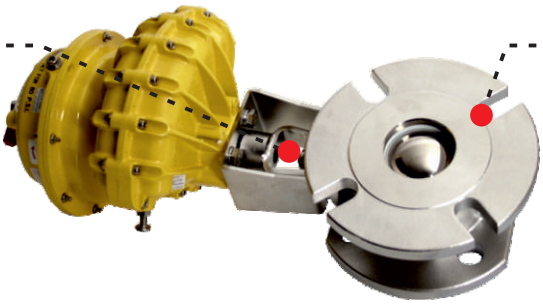
Flanged: 4 holes

Different drilling patterns

### Operation

Manually operated: A range of handles is available

Pneumatically actuated



### Outlet / Process Connection

Threaded: 1½" BSP, 2" BSP

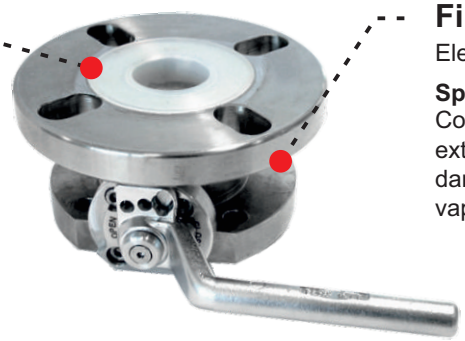
Dual threaded: 1½" BSP/1½" NPT

Flanged: Closed or open slots

### Valve Materials

316 stainless steel

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



### Finish

Electropolished

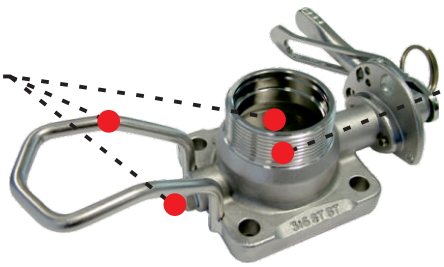
**Special service conditions**:
Corrosion-resistant paint on external surfaces to prevent damage from corrosive cargo vapour/splash

### Accessories

Gauge guard

Gauze or sintered filter

TIR to gauge inlet plug



### Main Seal

PTFE

**Special service conditions:**
High-temperature compatible seals



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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

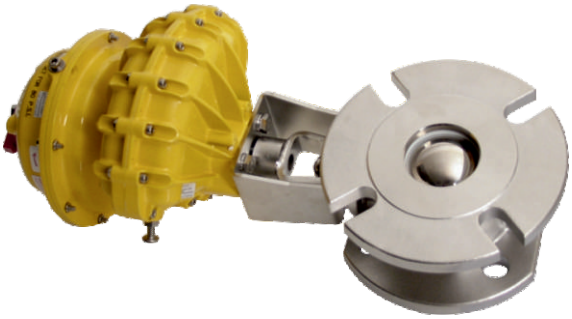
Please contact us for more information about these parts.


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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

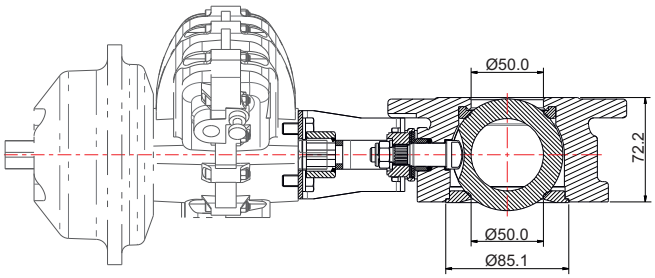
## Range

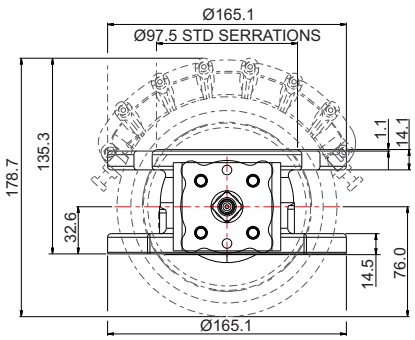
| Description | Part No. |
|---|---|
| 2" ball valve pneumatically actuated | 370/0100PN/1 |
| 2" ball valve manually operated | 370/0100 |

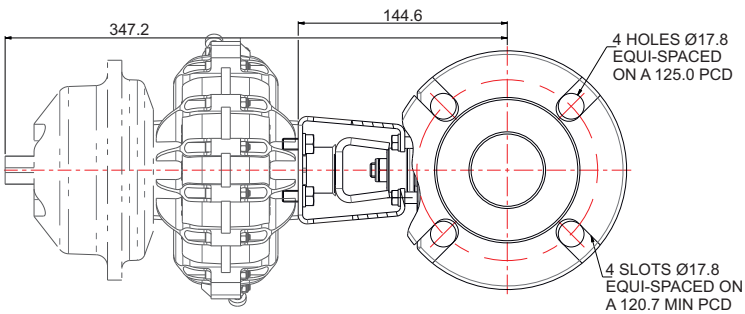
## Related Parts

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

## Section View





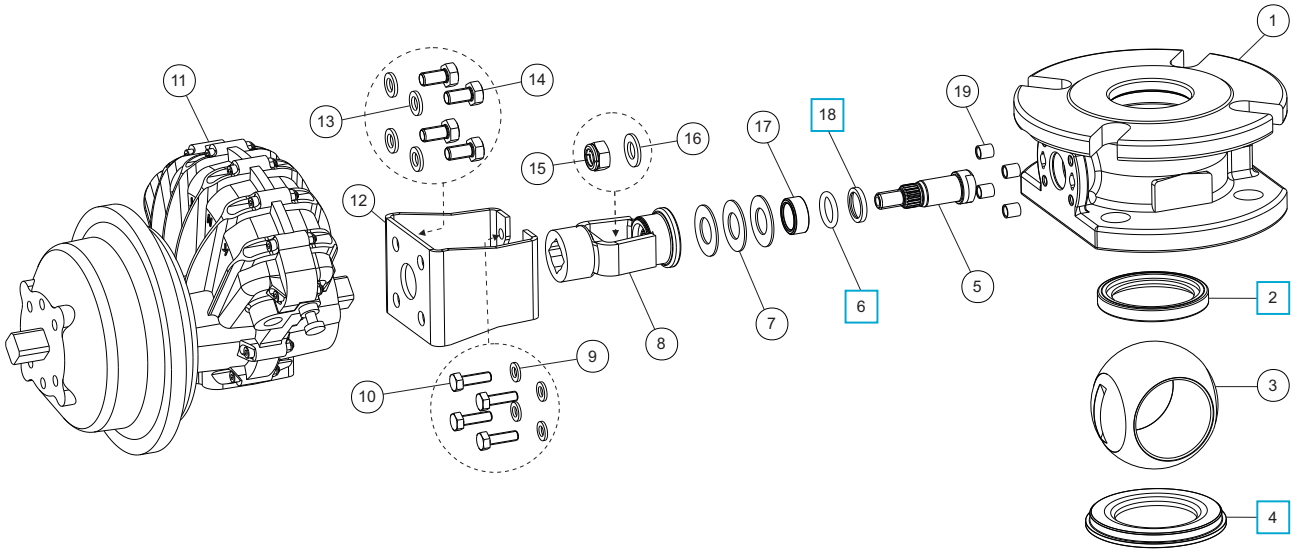
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# 2" Flanged Blacko Ball Valve - Pneumatically Actuated

**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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# Female Socket Ball Valves

## Accessories & Spare Parts



## 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 |

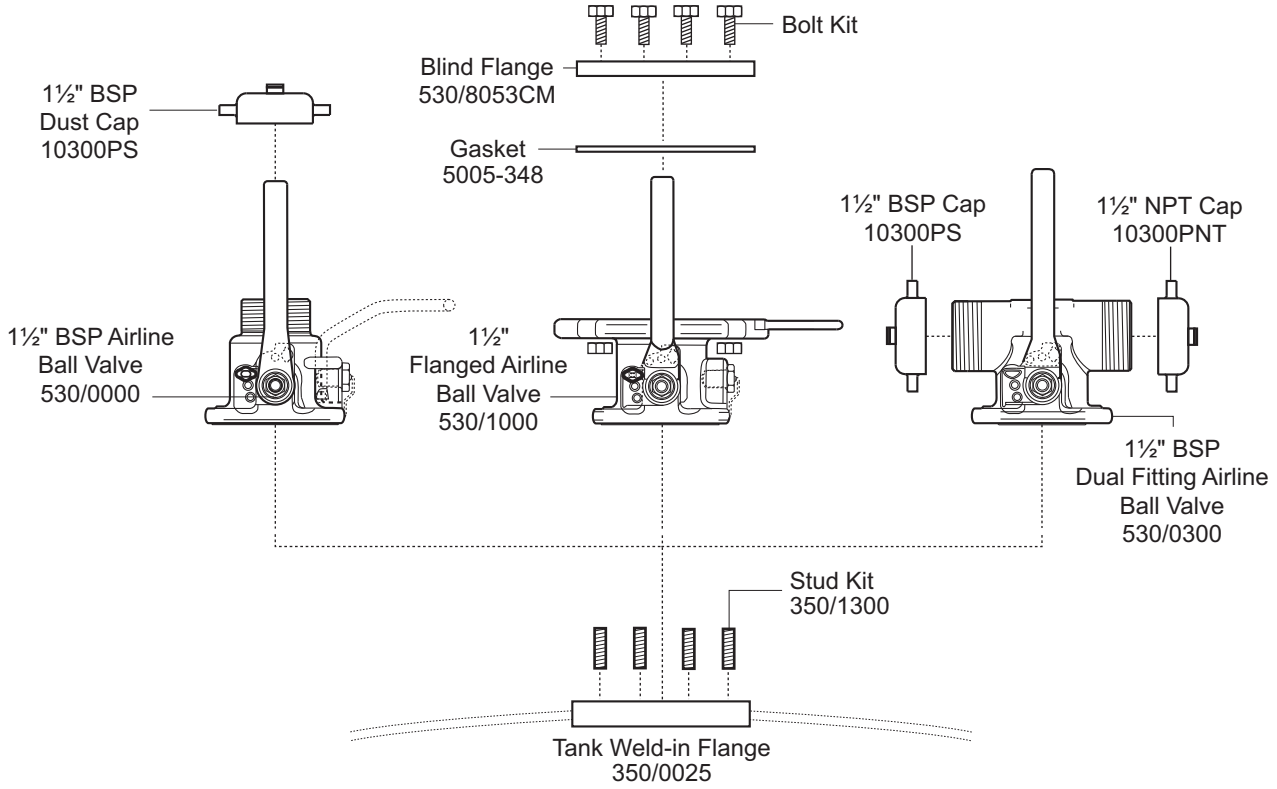
**CAUTION:** During installation, do not tighten the ball valve too much or it will cause the valve to malfunction.


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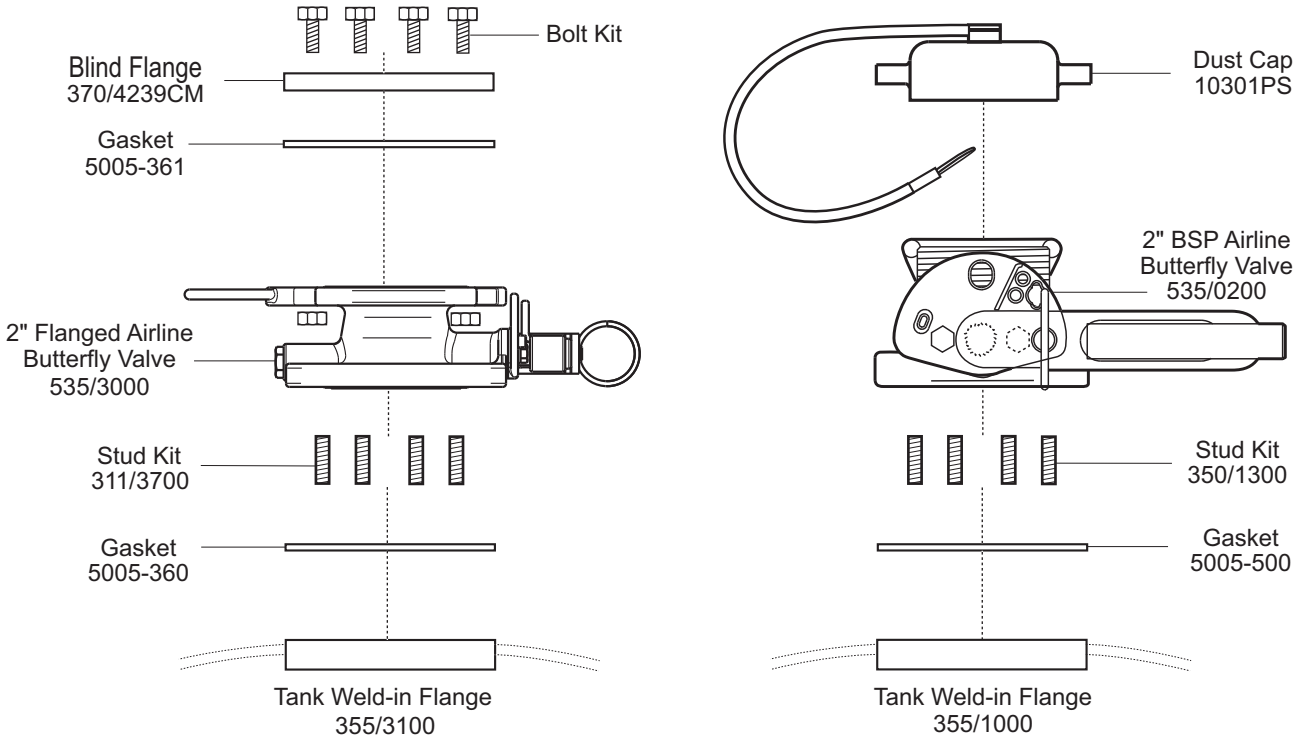
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## 1½” Airline Ball Valves




## 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, 0-40 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 |
| 0-40 | 0-580 | St/steel | 920/40BBSP |

### 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 |
| 0-40 | 0-580 | St/steel | 920/40TTBBSP |


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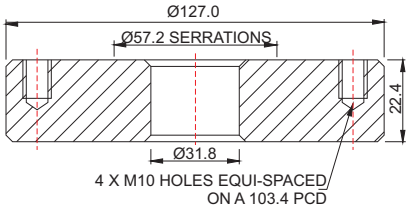
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### Part No: 350/0025



### 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

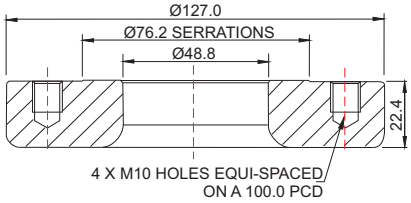
### Related Parts

| 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

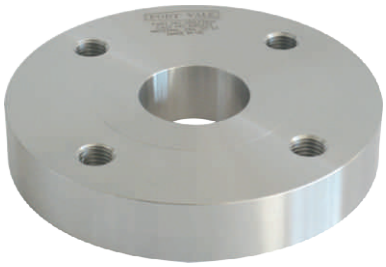
**Material**
316L stainless steel

**Compatible valve**
2" BSP airline butterfly valve

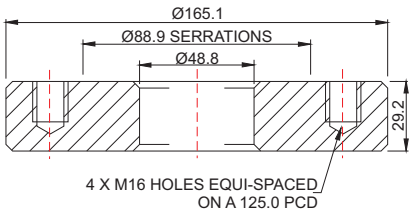
### Related Parts

| 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 |

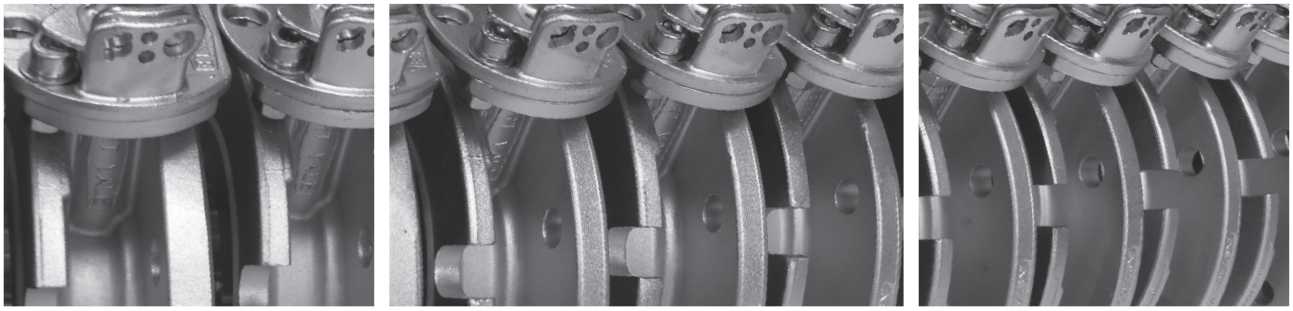

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# Top Discharge Provision




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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

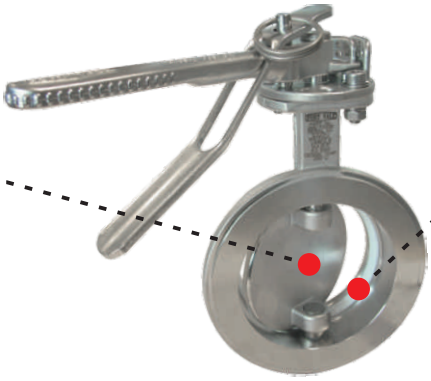


### Nominal Bore

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

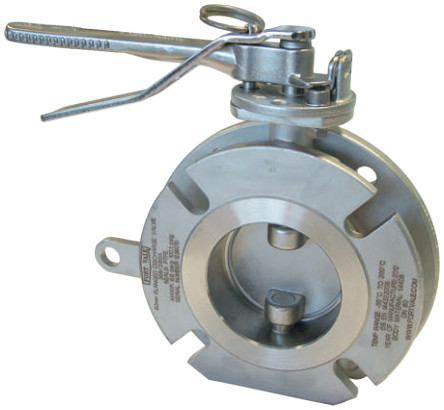
Please contact us for more information about these valves.


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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

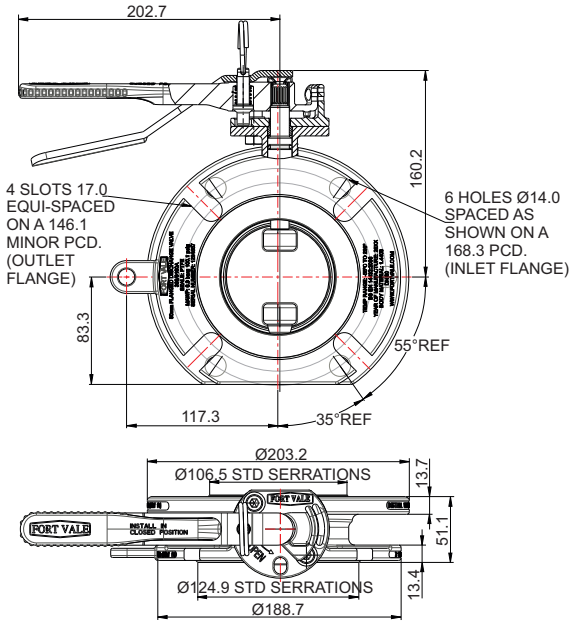
## Range

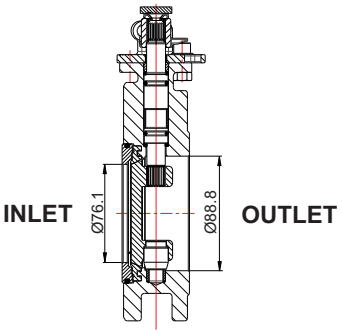
| Description | Part No. |
|---|---|
| Standard specification | 368/3160A |
| Inlet flange dual drilled: 4 hole/4 hole | 368/3180A |
| Inlet flange dual drilled: 6 hole/4 hole | 368/3280A |

## 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 |
| Pivot pin for blind flange | 368/7506 |

## Section View





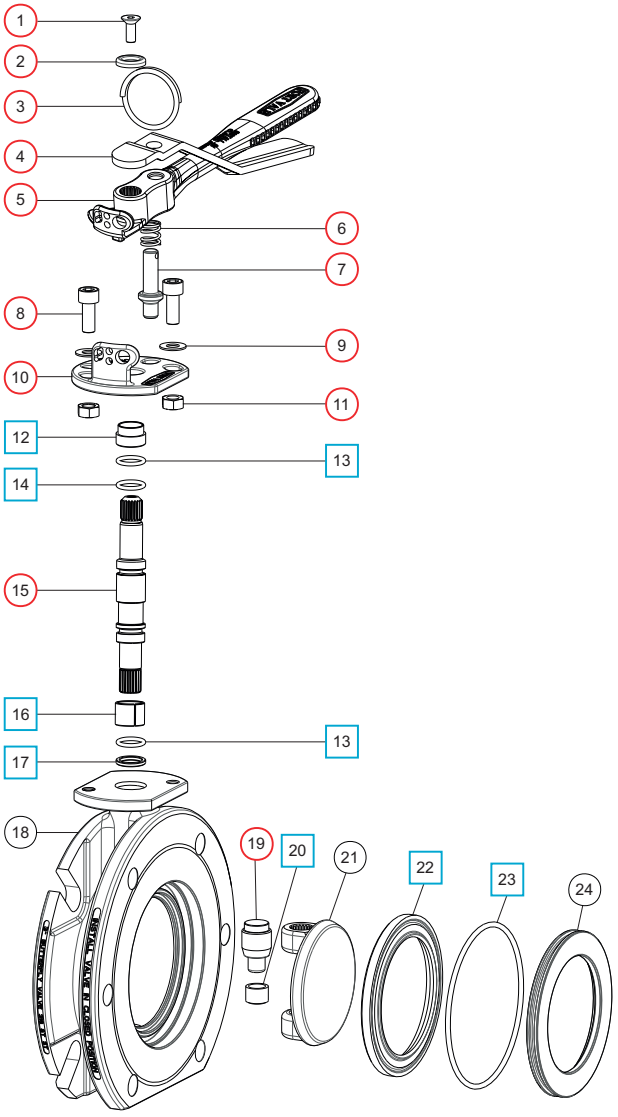
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# 3" Flanged Widdop Butterfly Valve

## 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

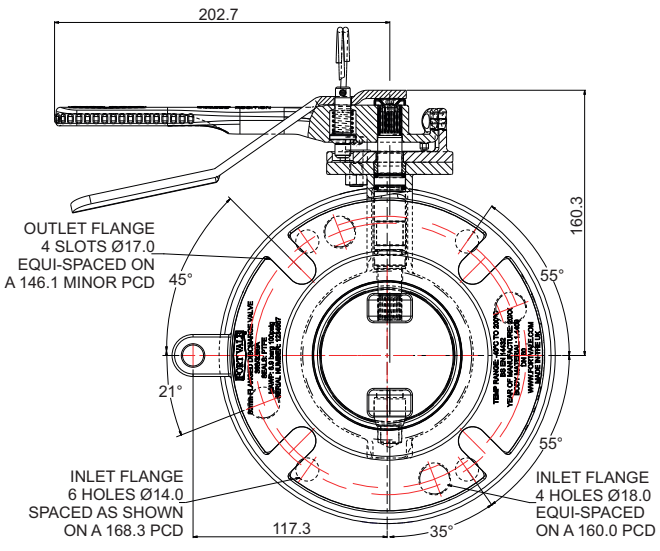
## Range

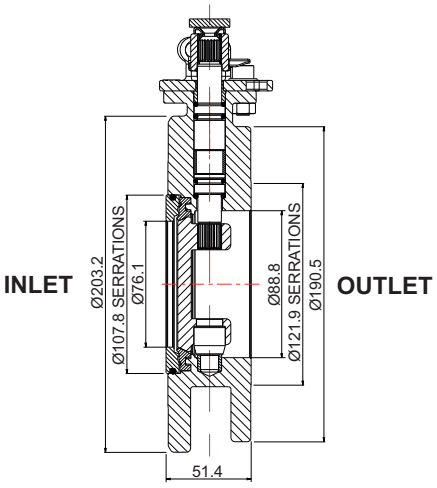
| Description | Part No. |
|---|---|
| Inlet flange dual drilled: 6 hole/4 hole | 368/3280A |
| Inlet flange dual drilled: 4 hole/4 hole | 368/3180A |
| Inlet flange with flat, drilled 6 holes | 368/3160A |

## 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 |
| Pivot pin for blind flange | 368/7506 |

## Section View





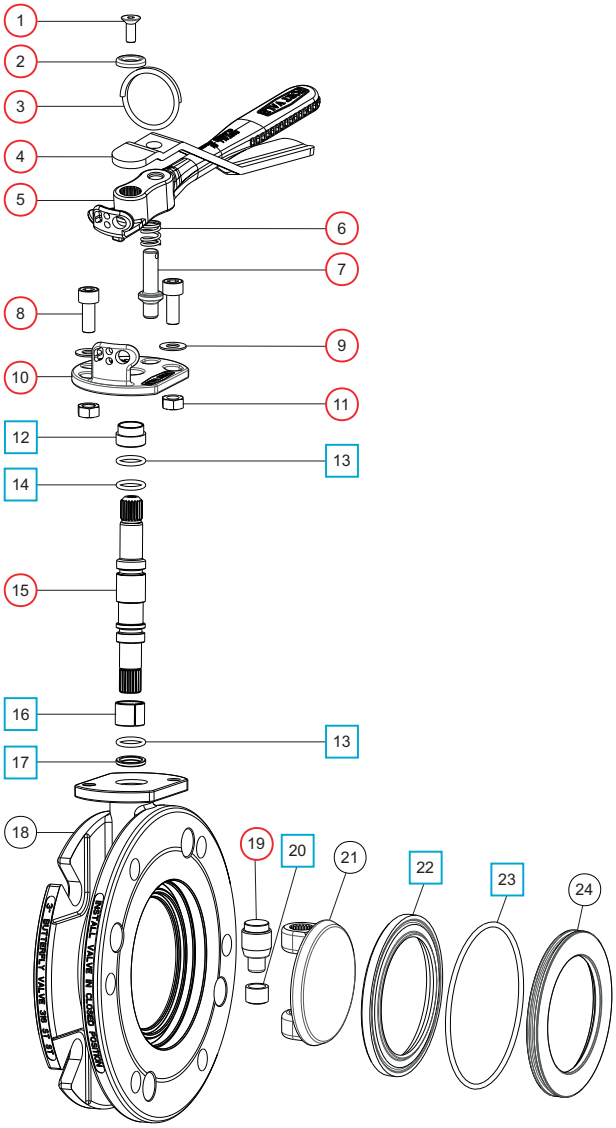
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# 3" Flanged Widdop Butterfly Valve - Dual Drilled Inlet

**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

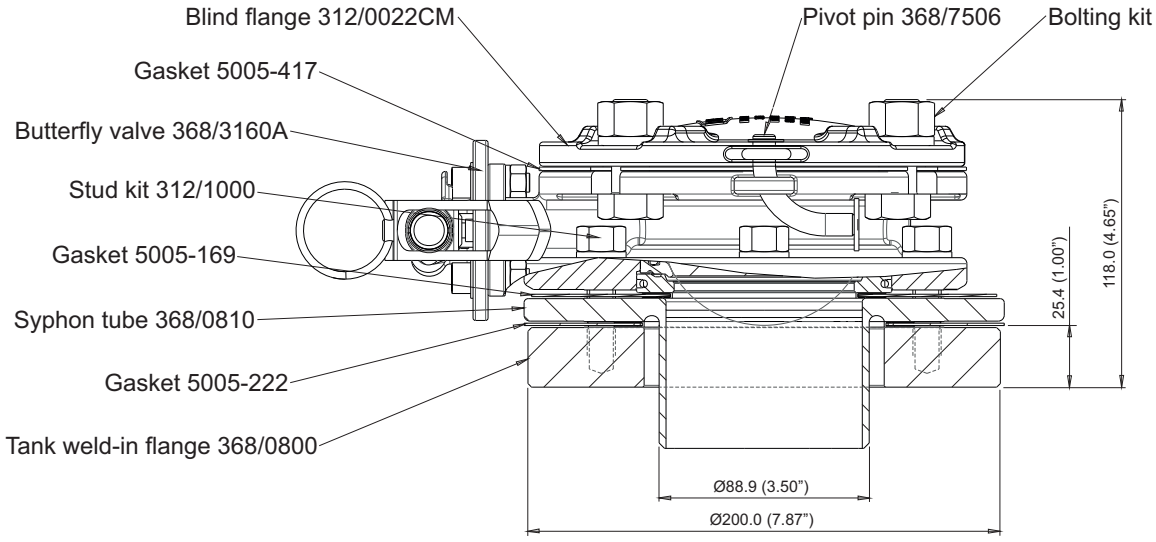
| Description | Part No. |
|---|---|
| All parts marked ○ in the Parts List | 368/316RKA |


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## Example: 3" Flanged Butterfly Valve Top Discharge Assembly





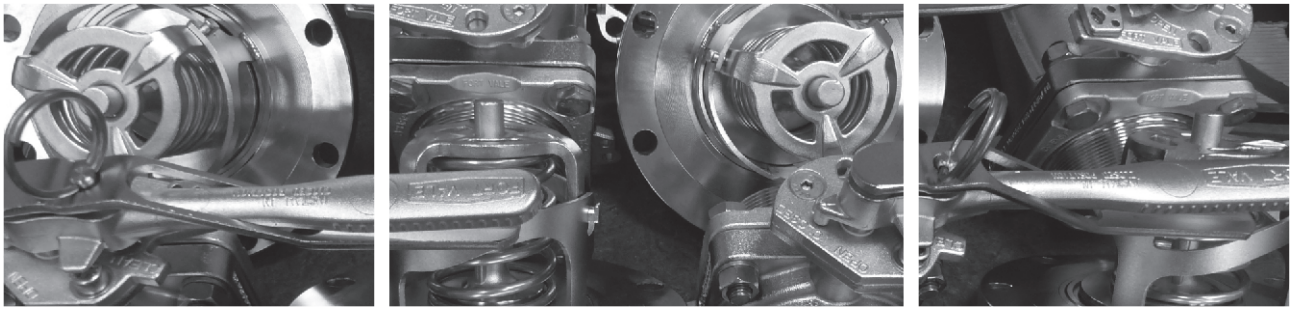
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# Bottom Discharge: Primary Valves




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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

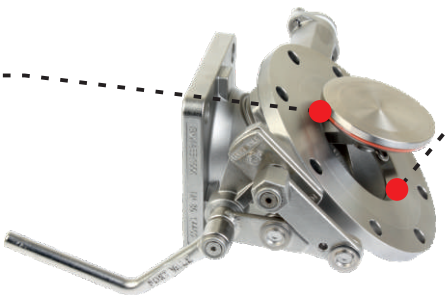
Pneumatically actuated

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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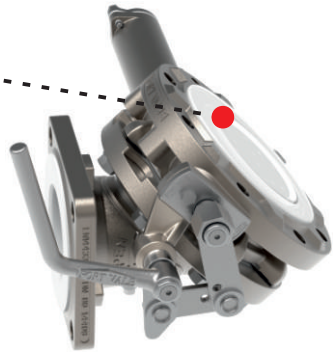


## Design Options - continued

### Valve Materials

316 stainless steel

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

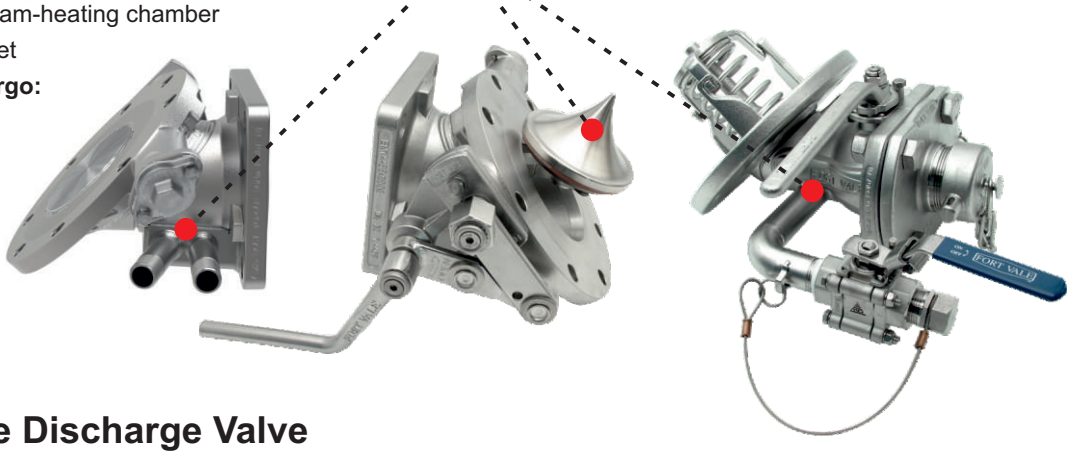


### Special Cargoes

**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 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

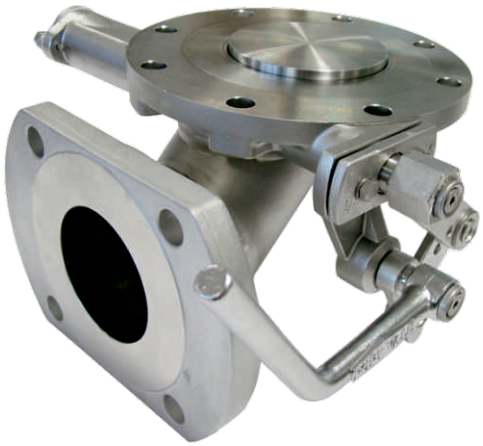
Please contact us for more information about these valves.


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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

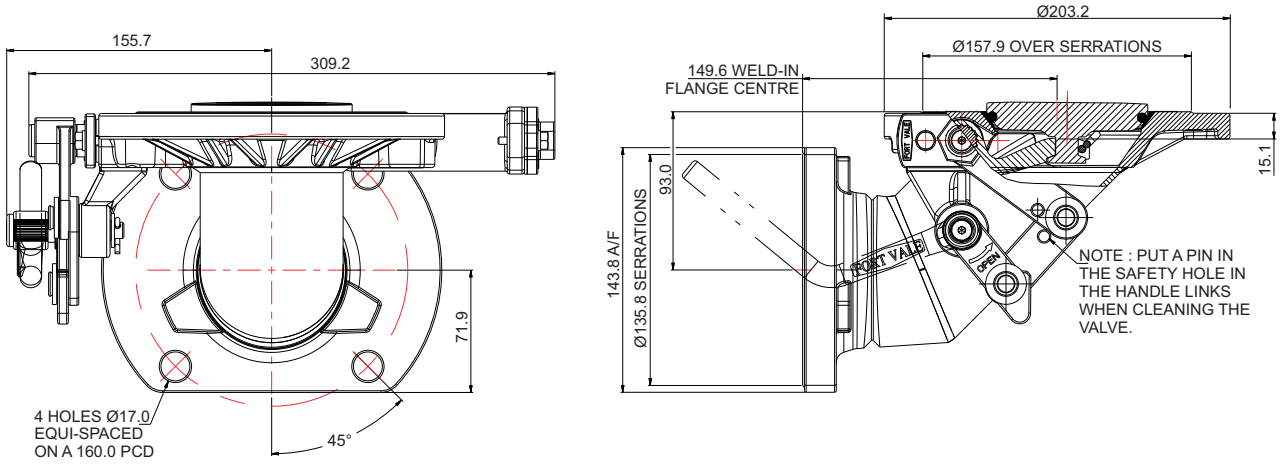
## Range

| 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





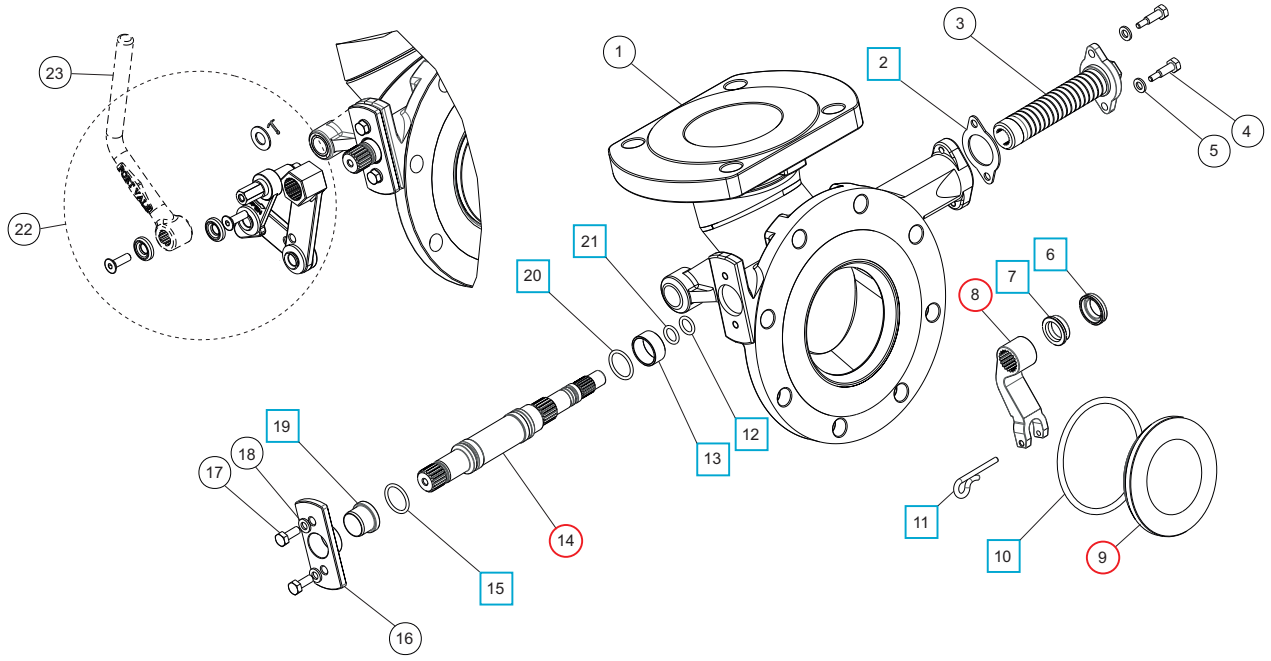
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# 3" 90° Cleanflow Footvalve

**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: | 32.0 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.

**Approvals**
BS EN14433

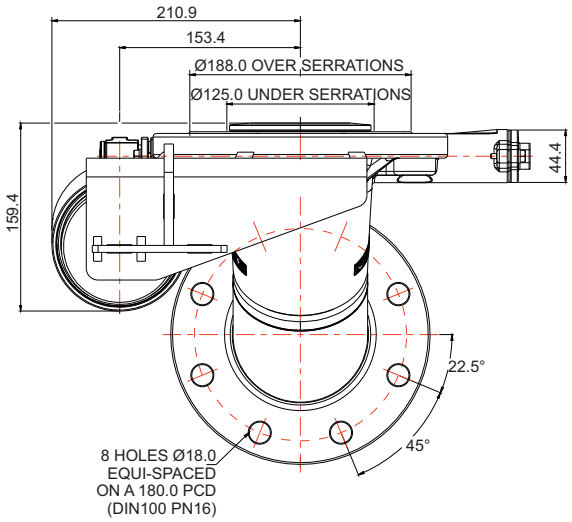
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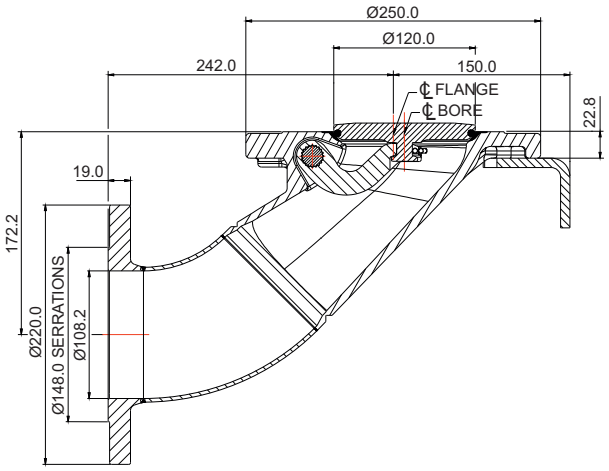
| Description | Part No. |
|---|---|
| Standard valve | 875/4800SS |
| With replaceable seat inlet | 875/4800SSRX |
| With replaceable seat inlet, conical poppet, steam chamber | 875/4800SSHRX |

## 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 |
| Valve operation decal | 845/0320 |

## Section View





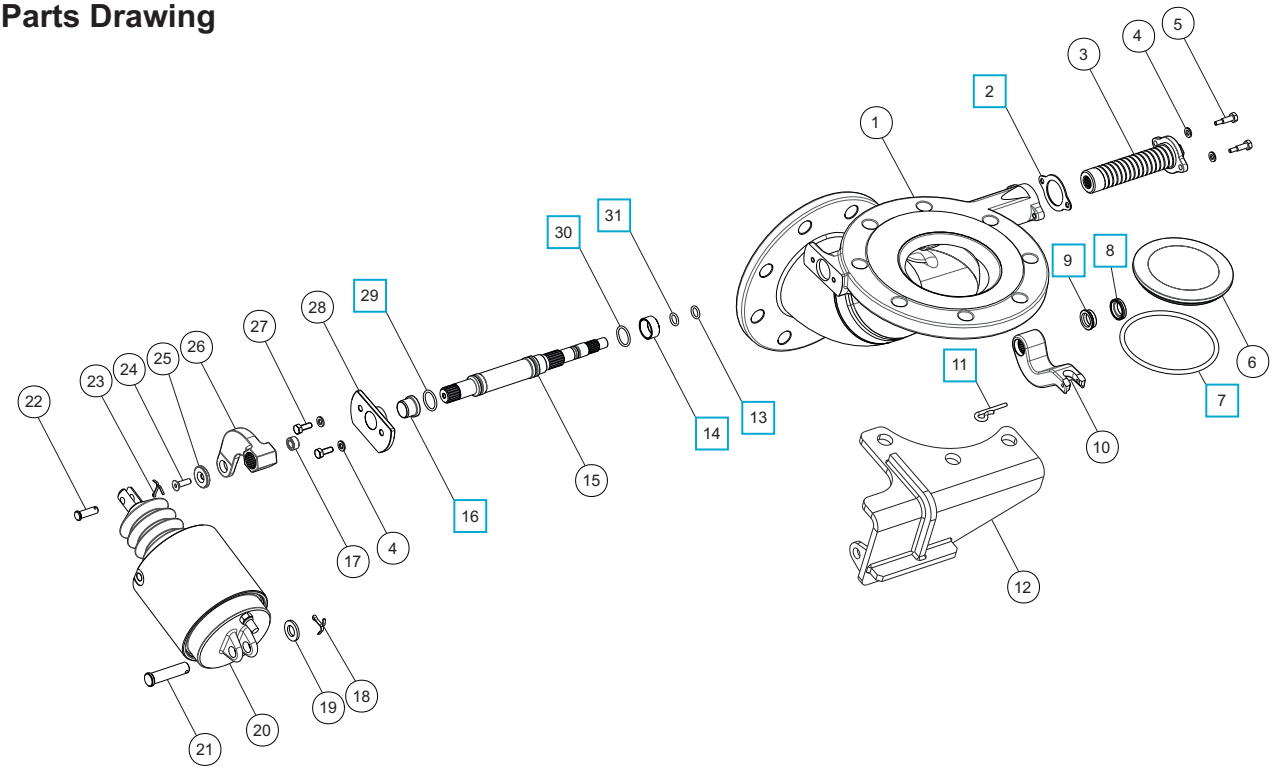
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# 4" 90° Cleanflow Footvalve - Pneumatically Actuated

**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 | 844/2121 | |
| 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.

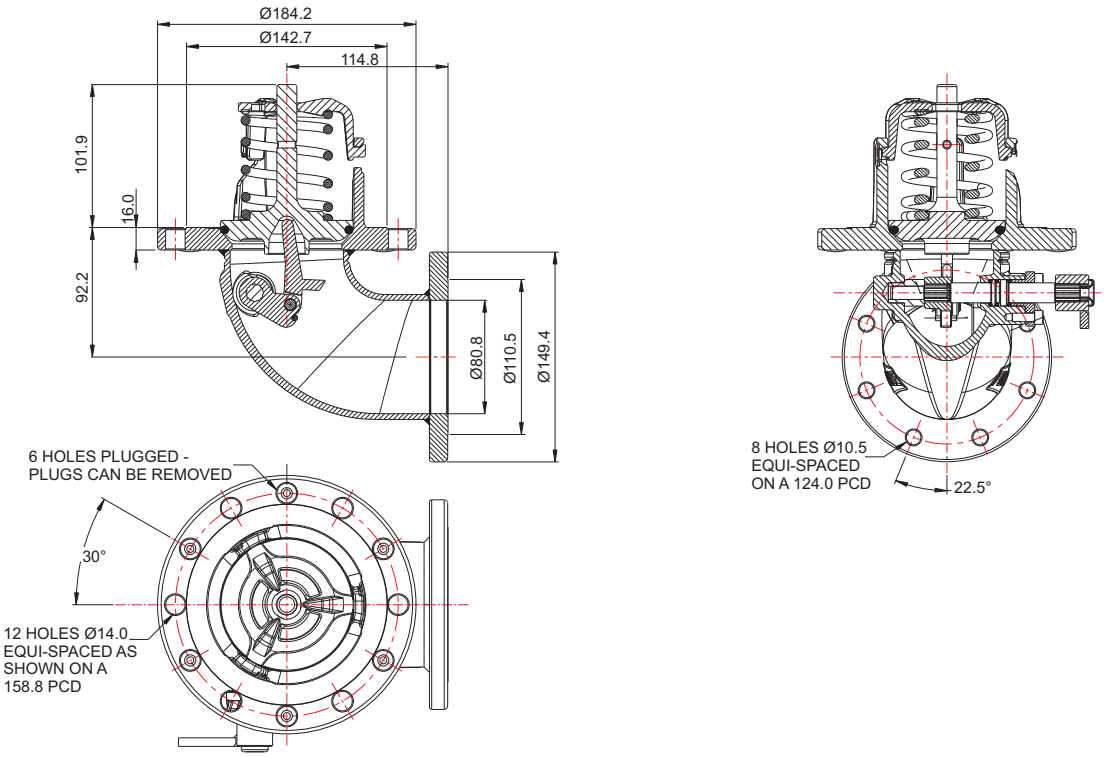
## Range

| 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





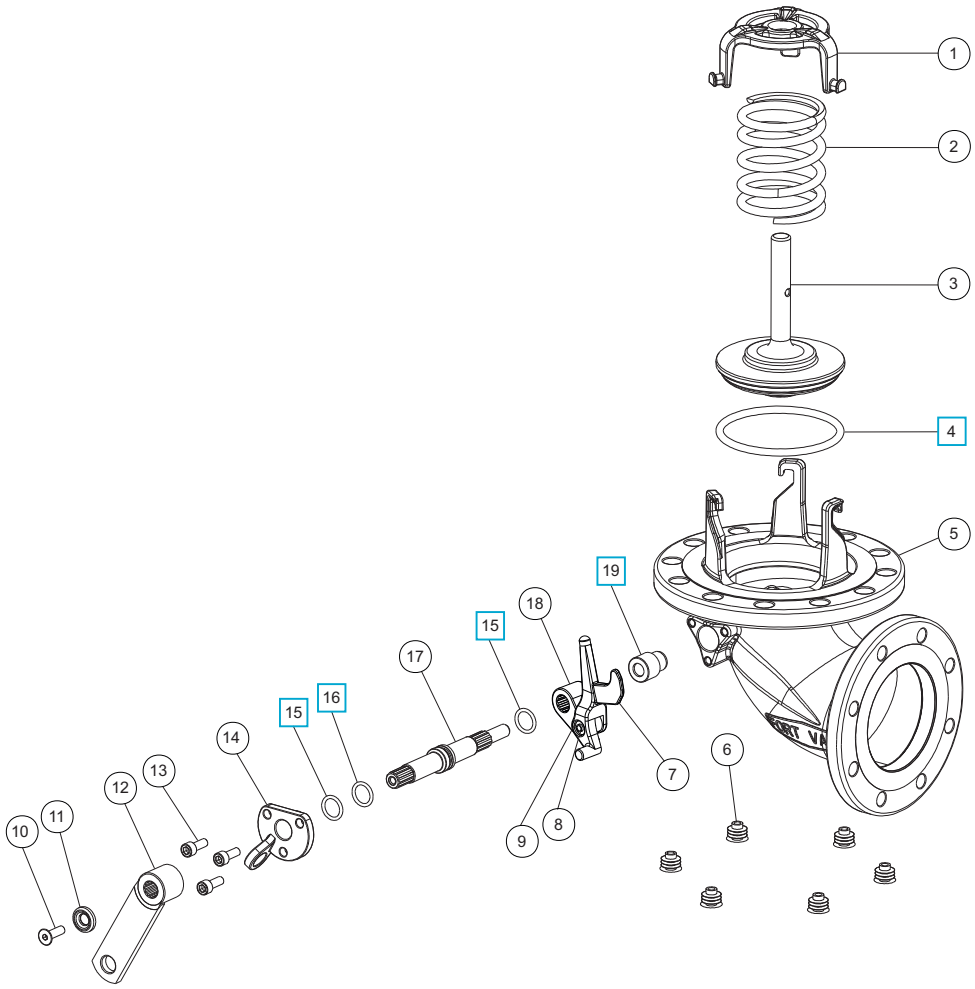
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# 3" 90° Tankstream Footvalve

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

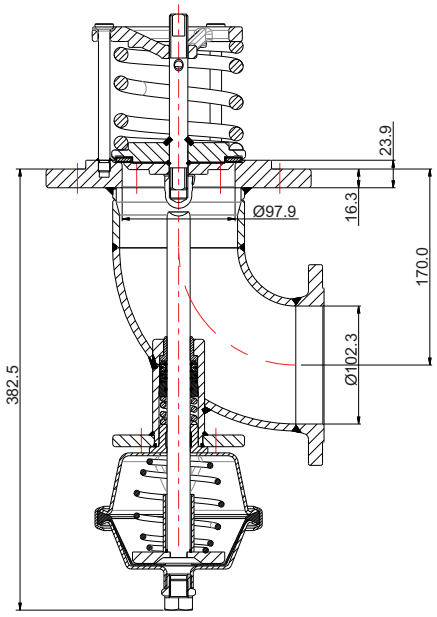
## Range

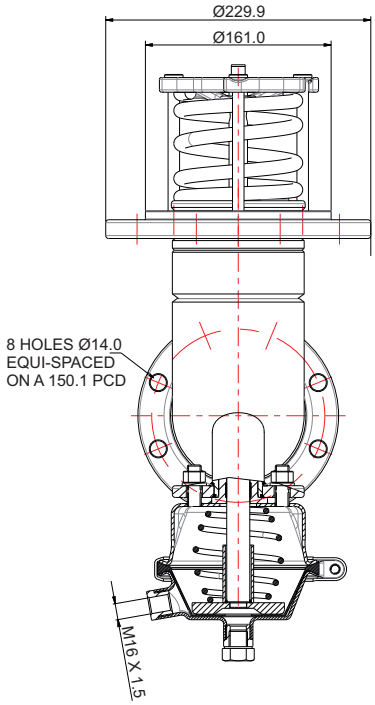
| Description | Part No. |
|---|---|
| Standard valve | 299/7000PN |
| 4" 105° with pneumatic actuator | 299/7200PN |

## 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





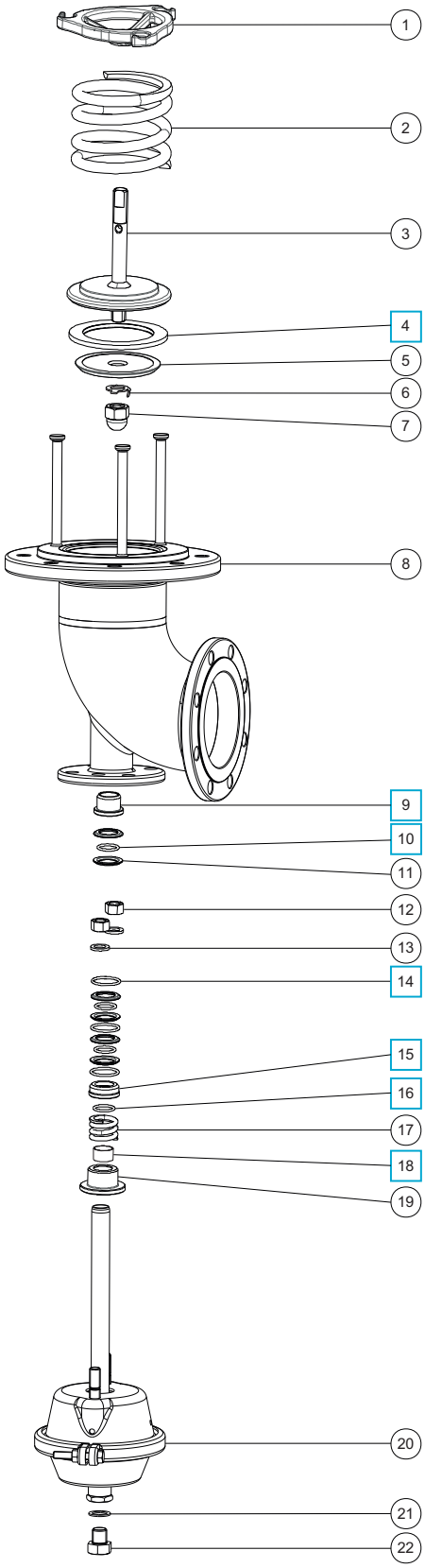
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# 4" 90° Sealtyt Extended Footvalve - Pneumatically Actuated

**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 |

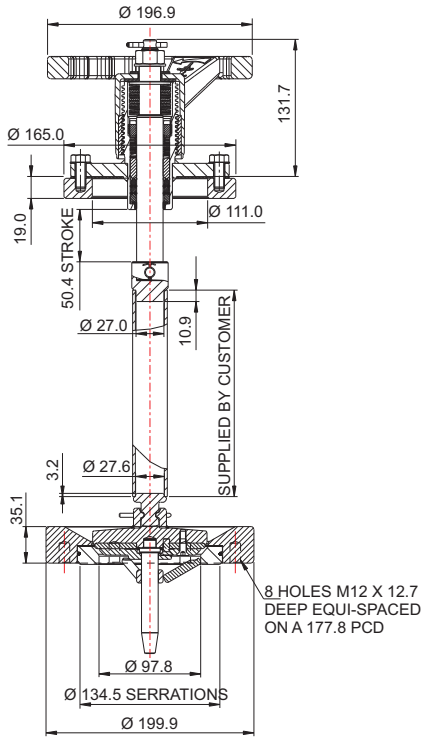
**NOTE:** The Design Conditions and Section View dimensions are for the specified part number only.

**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





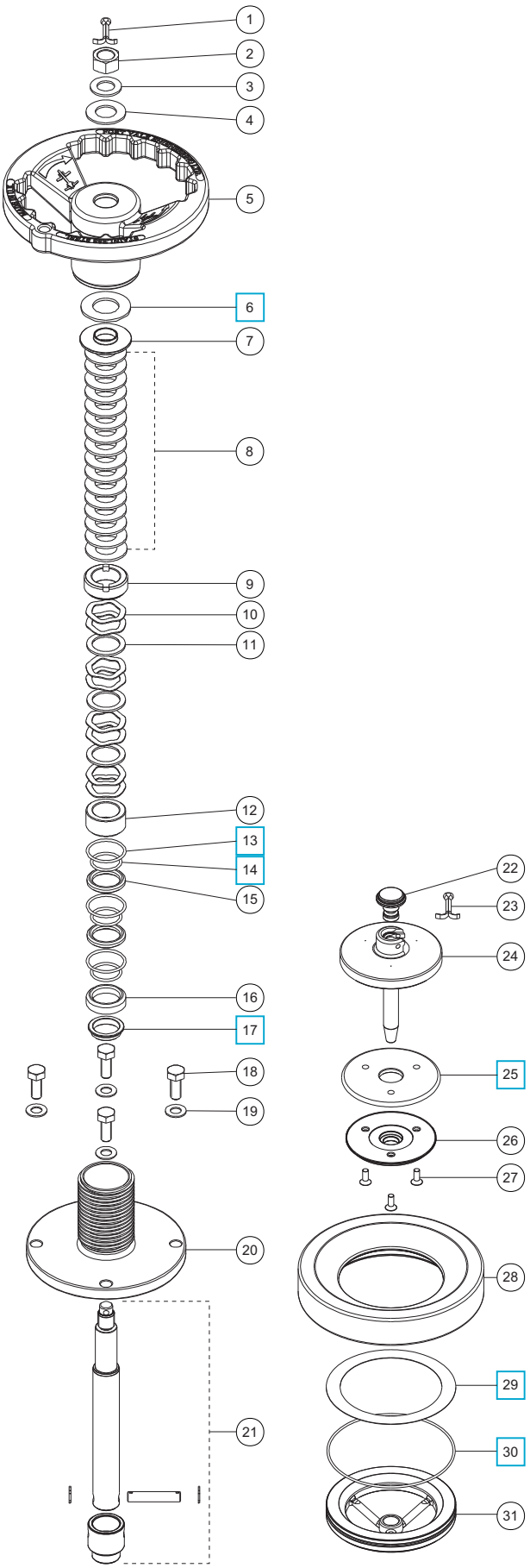
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# 4" Screwdown Valve Assembly

## 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

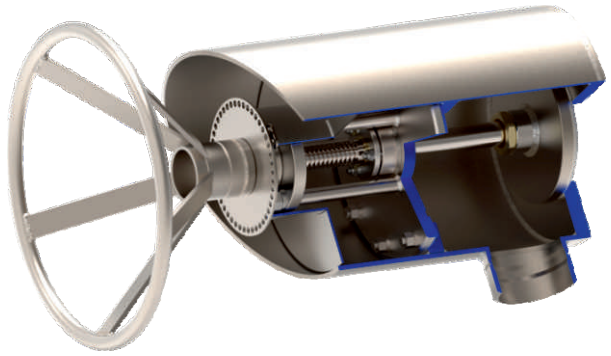
| Description | Part No. |
|---|---|
| All parts marked ☐ in the Parts List | 270/00SK |


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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 |

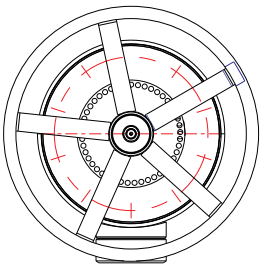
**NOTE:** The Design Conditions and Section View dimensions are for the specified part number only.

**Approvals**
BS EN14433

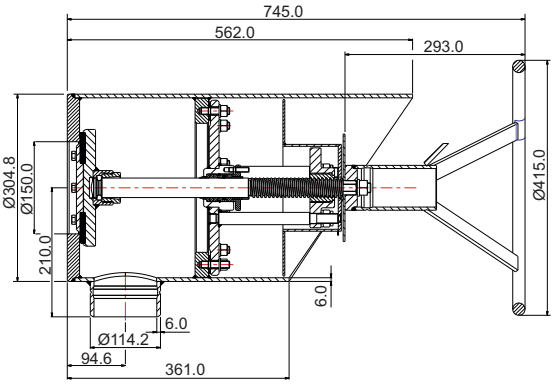
## Related Parts

| 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 |

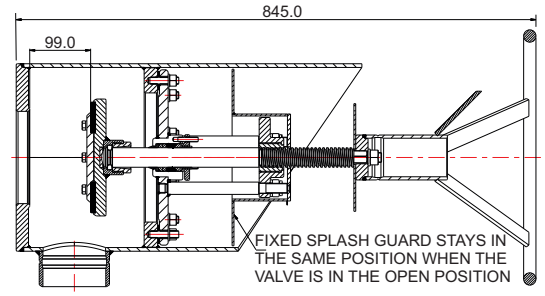
## Section View



Valve shown in the CLOSED position




Valve shown in the OPEN position





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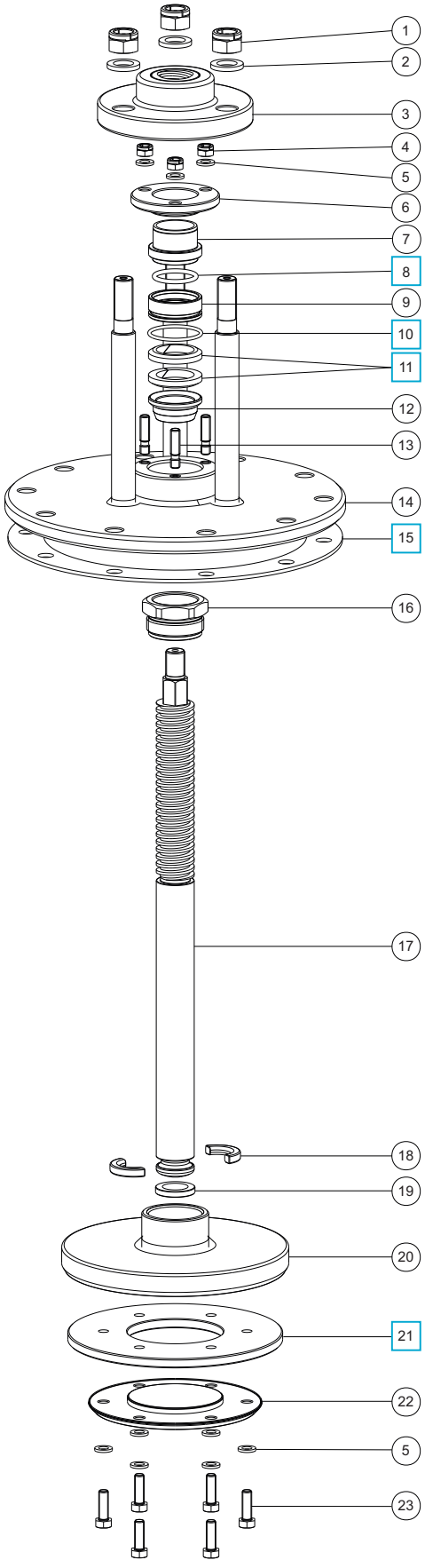
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# 150mm Reedley Horizontal Hot Product Valve

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.

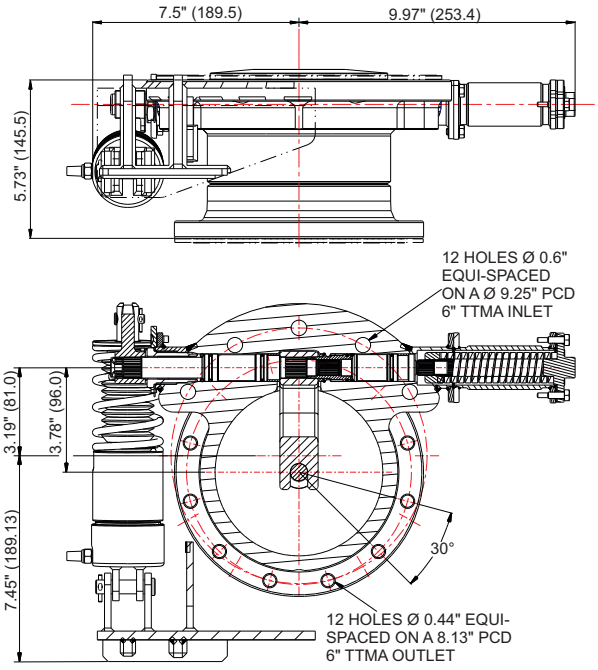
**NOTE:** The Design Conditions and Section View dimensions are for the specified part number only.

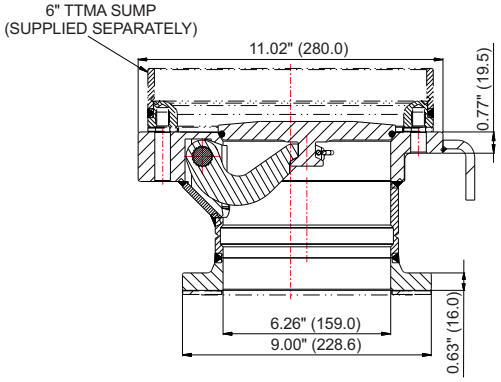
**Design Code**
BS EN 14433

## 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





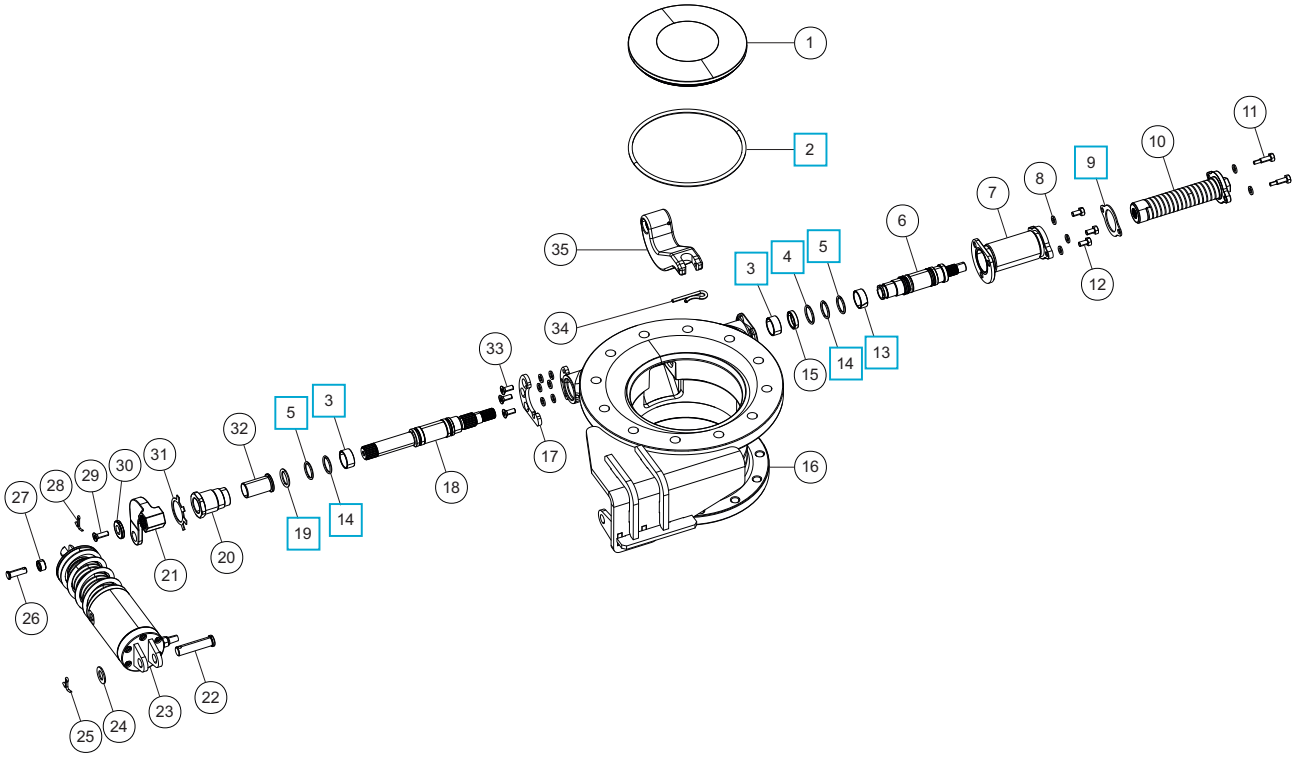
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# 6" 180° Cleanflow Footvalve - Hydraulically Actuated

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

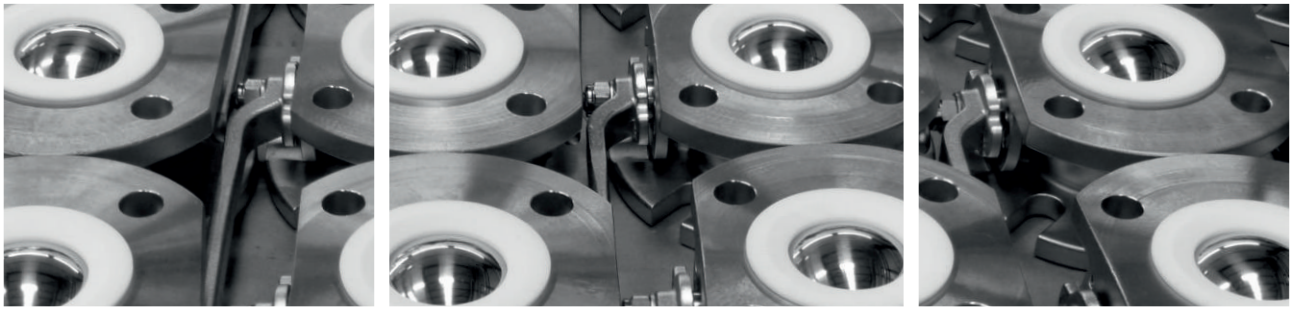
| Description | Part No. |
|---|---|
| Seal kit for footvalve 874/0000: contains all parts marked □ in the Parts List | 874/0000SK |
| △ Seal kit for hydraulic cylinder 875/2160N, includes silencer | 875/2160NSK |

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


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# Bottom Discharge: Secondary Valves




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# Discharge Ball Valves

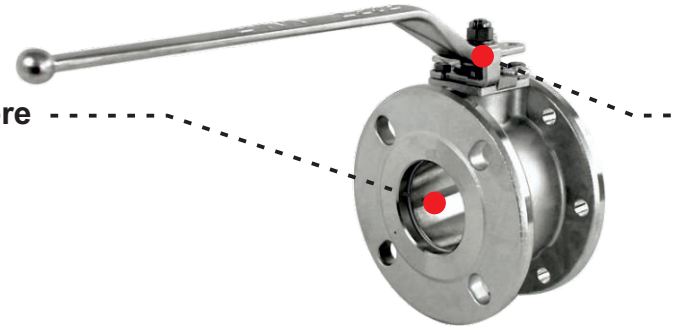
## Design Options

## 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")

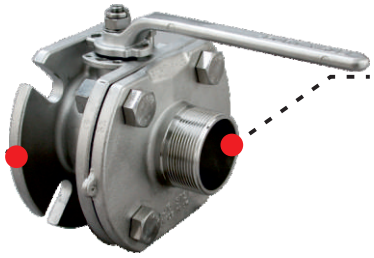
100mm (4")

### 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

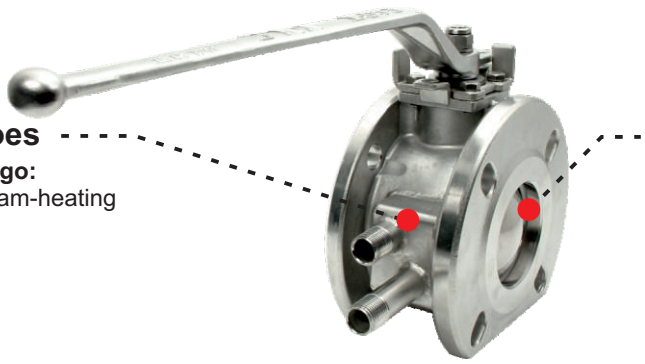
316 stainless steel

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

### Finish

Electropolished

**Special service conditions**:
Corrosion-resistant paint on external surfaces to prevent damage from corrosive cargo vapour/splash



### Special Cargoes

**For solidifying cargo:**
Valve body with steam-heating chamber

### Main Seal

PTFE

**Special service conditions:**
High-temperature compatible seals


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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

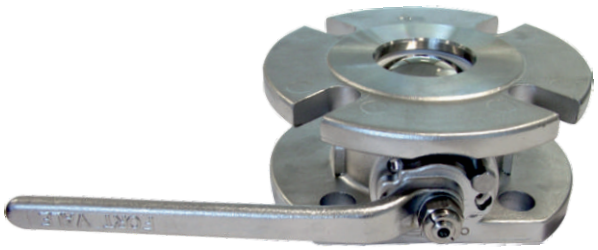
Please contact us for more information about these valves.


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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

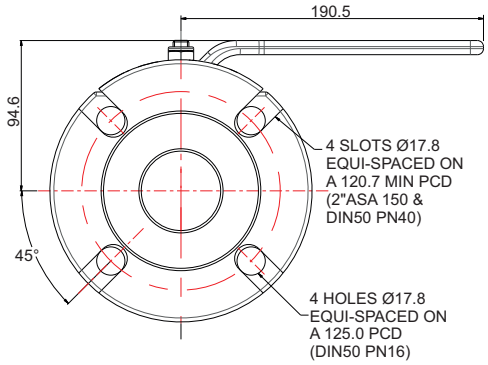
## Range

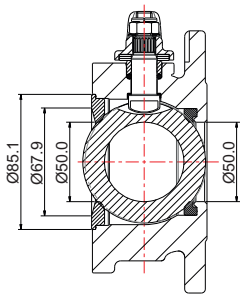
| Description | Part No. |
|---|---|
| Standard specification | 370/0100 |
| With steam heating chamber | 370/0100SH |
| DIN80 inlet adaptor & outlet blind flange | 370/0140 |
| With 2" BSP outlet spigot flange | 370/0150 |
| With outlet blind flange | 370/0180 |

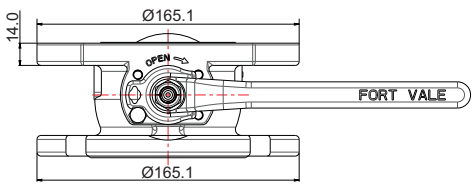
## Related Parts

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

## Section View





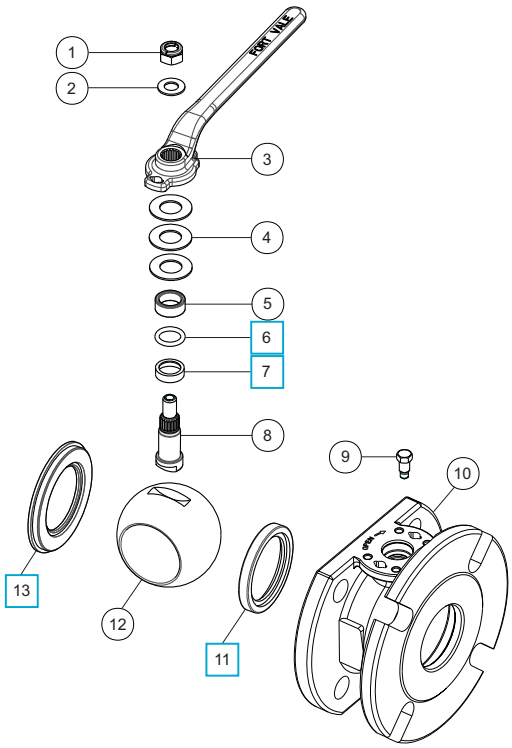
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# 2" Flanged Blacko Ball Valve

## 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 14432

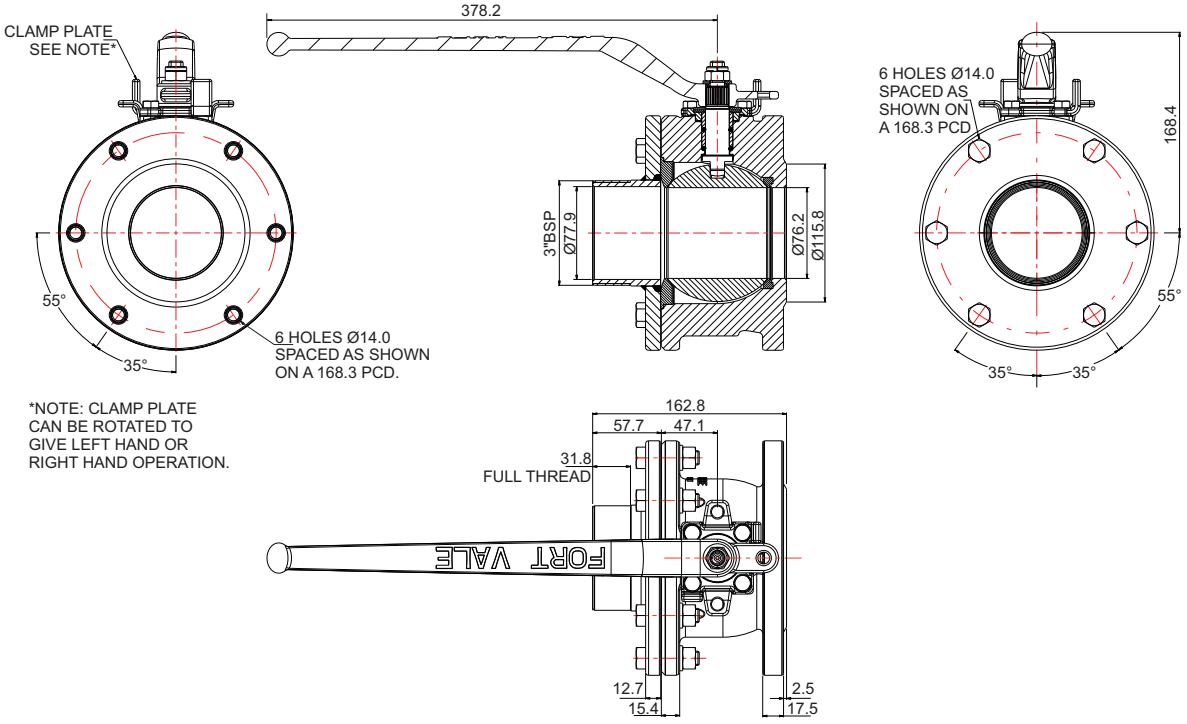
## Range

| 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





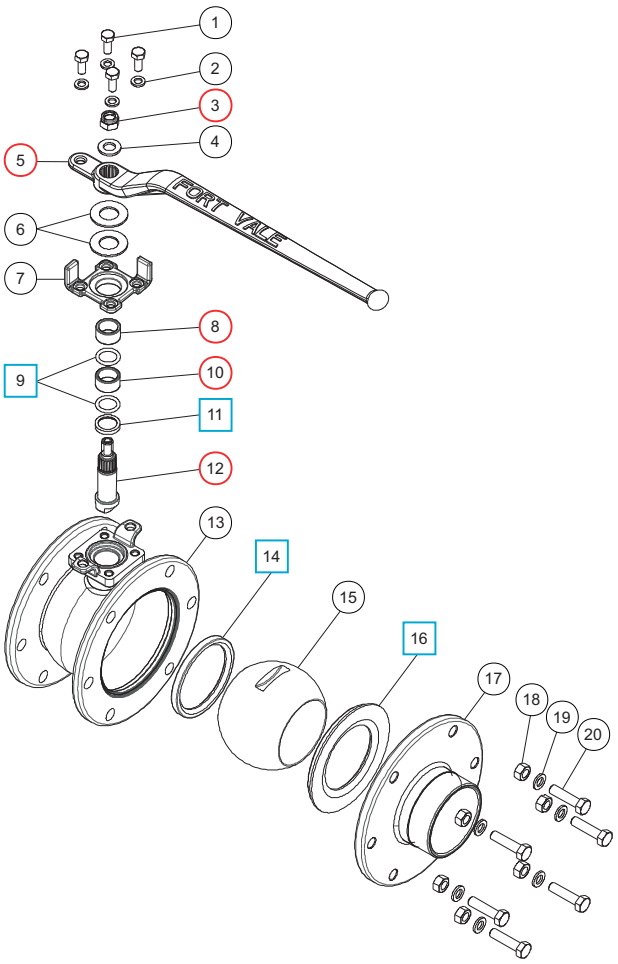
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# 3" Blacko Ball Valve - 3" BSP Outlet

## 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

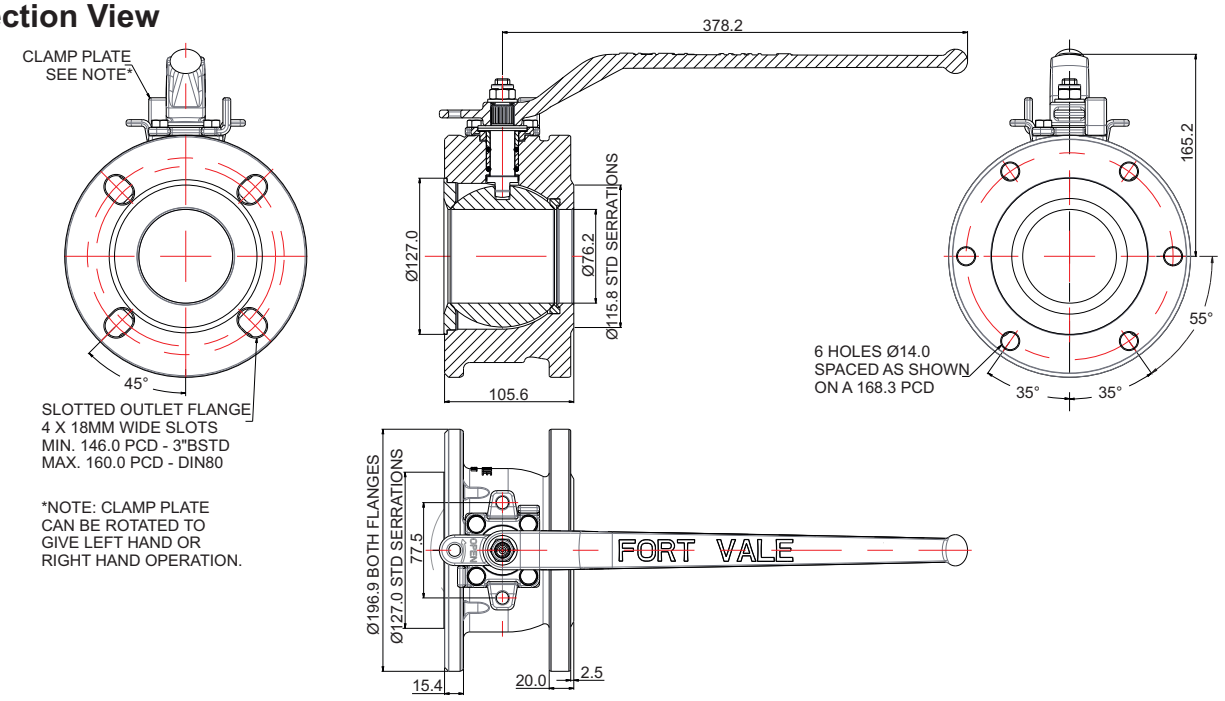
| Description | Part No. |
|---|---|
| 6 hole inlet, 4 hole outlet | 360/5050X * |
| 6 hole inlet, 4 hole outlet, steam heated | 360/5050XSH * |
| 4 hole inlet, 4 hole outlet | 360/5030X * |
| 4 holt inlet, 4 hole outlet, steam heated | 360/5030XSH * |

*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 |
| Inlet mating flange | 20378 |
| CNAF/PTFE gasket for mating flange | 5005-169 |
| Inlet bolting kit | 360/0300 |

## Section View





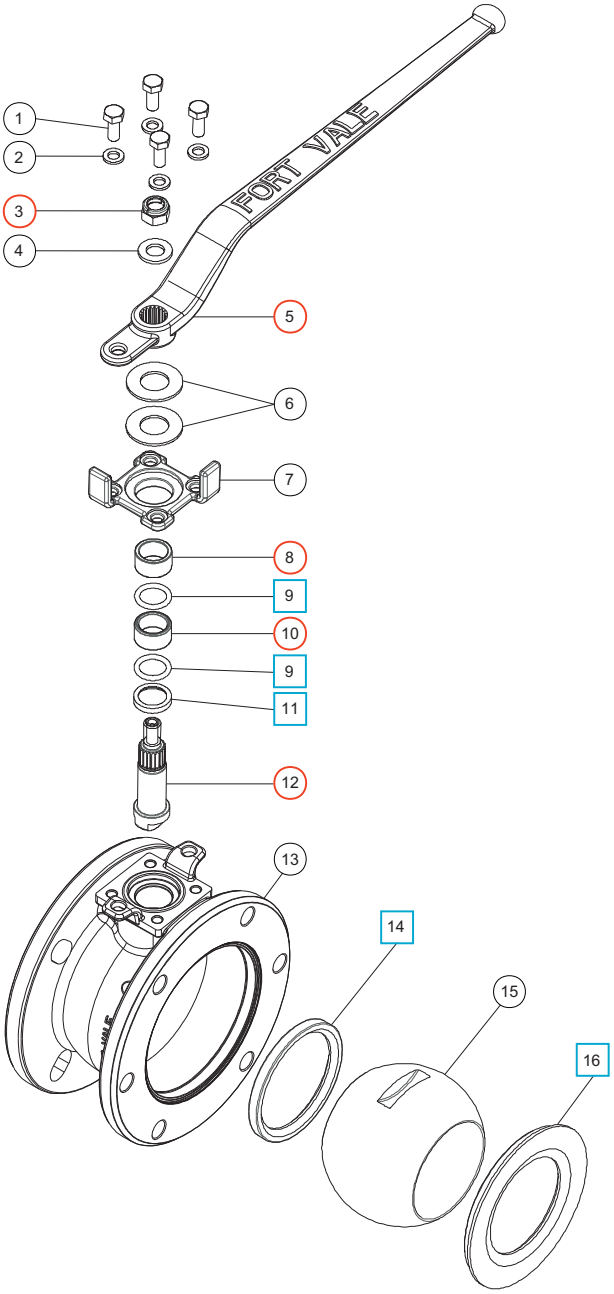
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# 3" Blacko Ball Valve - Slotted 4 Hole Outlet

**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 |

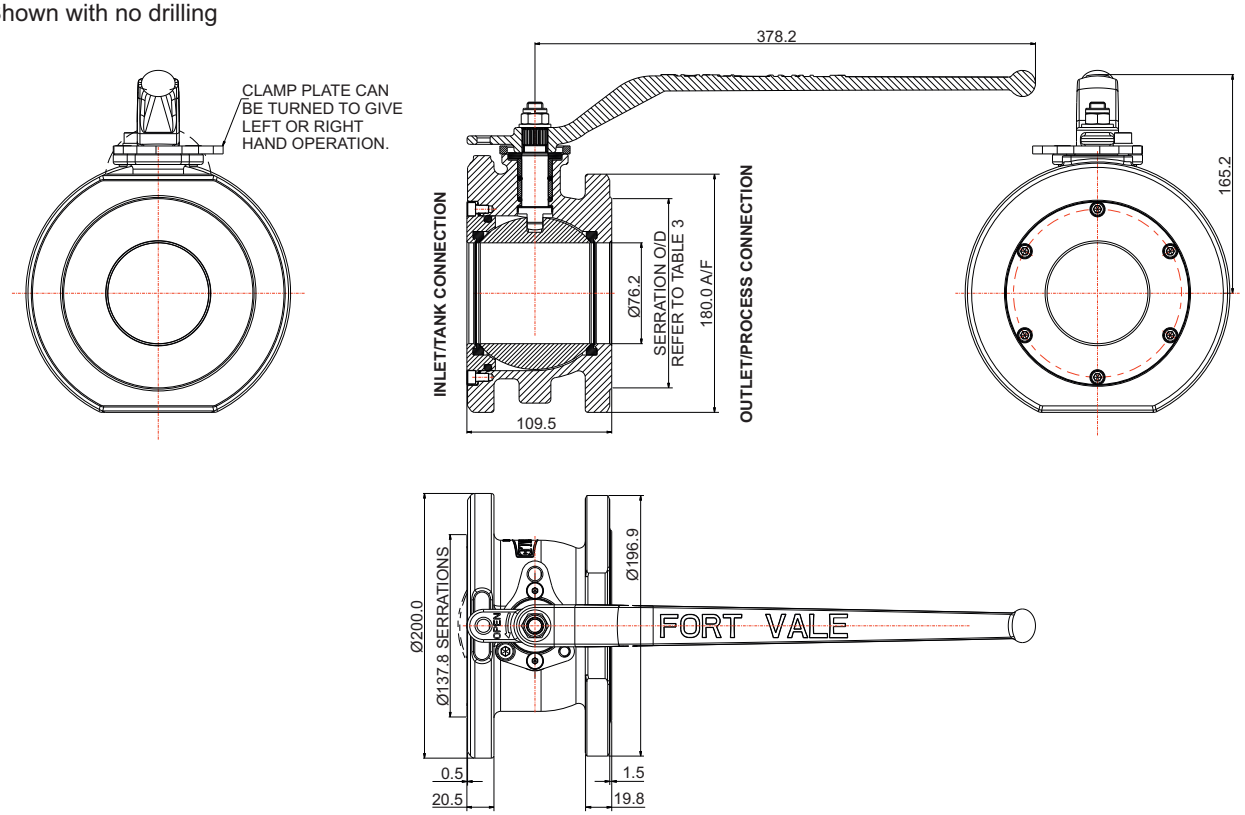
**NOTE**: The specification changes the Part No. Refer to the next page

## 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<br><br>14 | 160.0<br><br>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<br><br>M16 | 160.0<br><br>160.0 | 143.0 | D |
| 4 slots | 18 wide | 146.0 to 160.0 | 127.0 | E |
| 4 holes and 4 holes | 18<br><br>M16 | 160.0<br><br>160.0 | 143.0 | F |
| 8 holes and 4 holes | 18<br><br>18 | 160.0<br><br>152.4 | 130.0 | G |
| 8 holes | M16 | 160.0 | 143.0 | H |
| 4 holes and 4 holes | 18<br><br>18 | 160<br><br>152.4 | 127.0 | I |
| 4 slots and 4 holes | 18 wide<br><br>M16 | 146.0 to 160.0<br><br>160.0 | 127.0 | J |

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

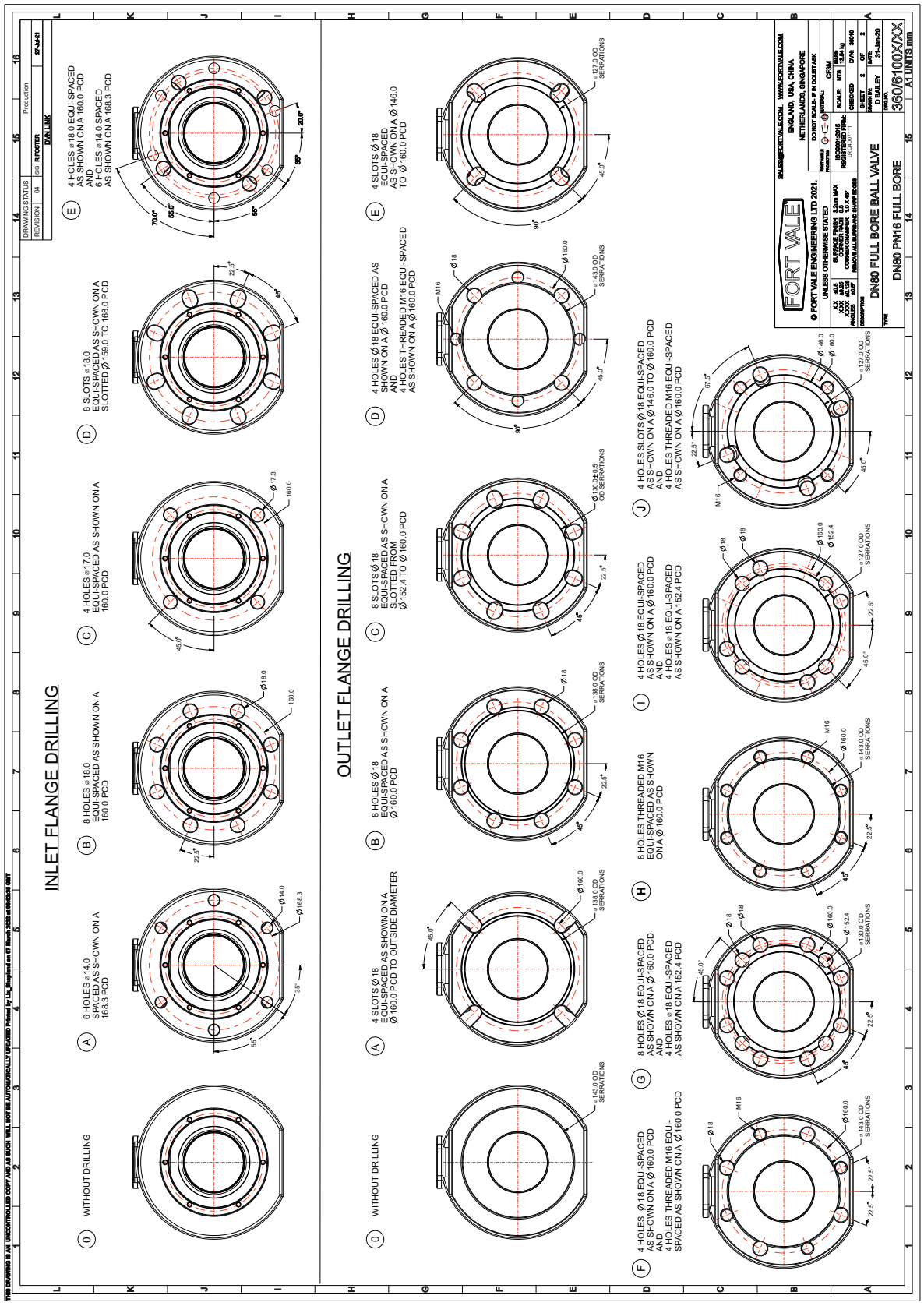

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## Figure 1

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





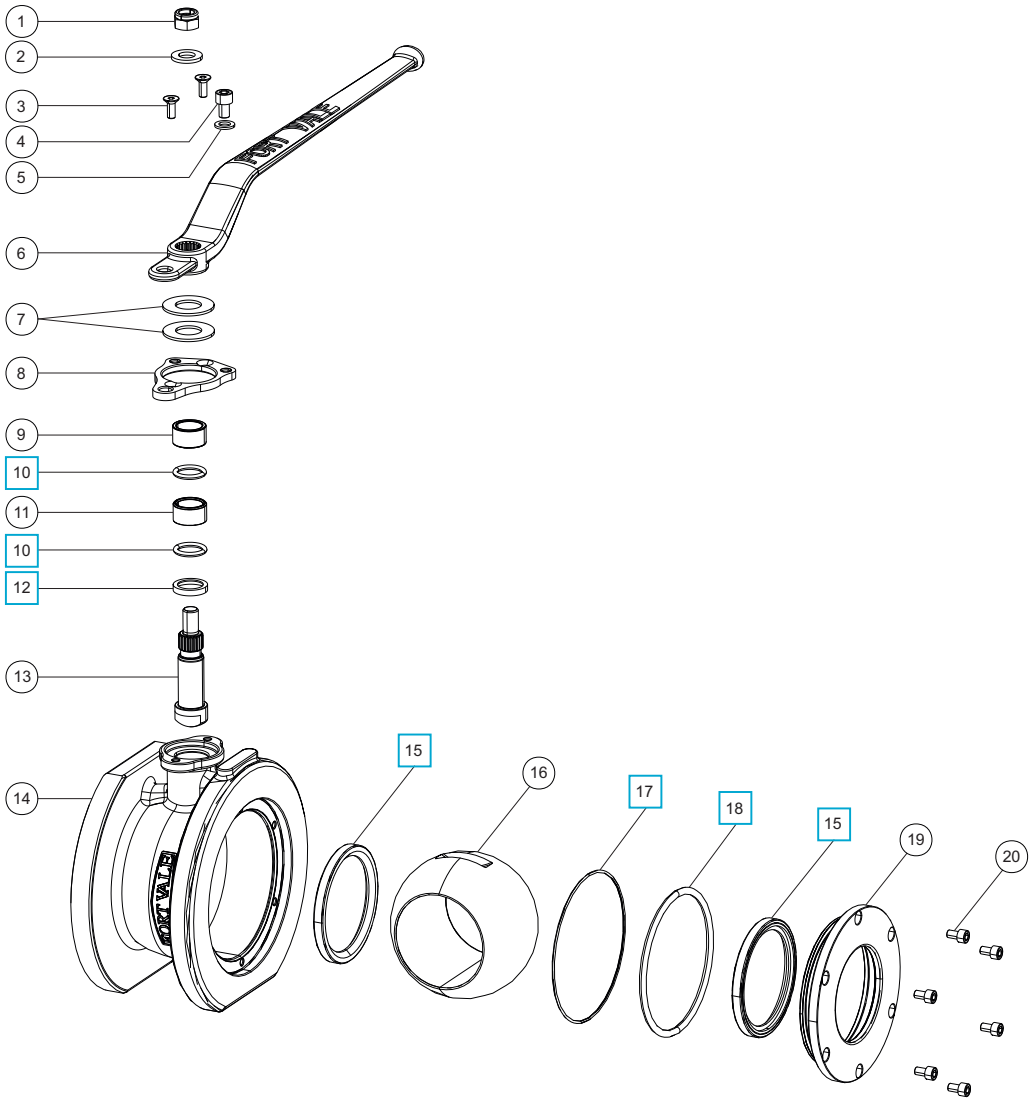

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# DN80 Ball Valve with Inlet Seal Clamp

## 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): | 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 Codes**
BS EN 14432
BS EN 12516-2

## Range

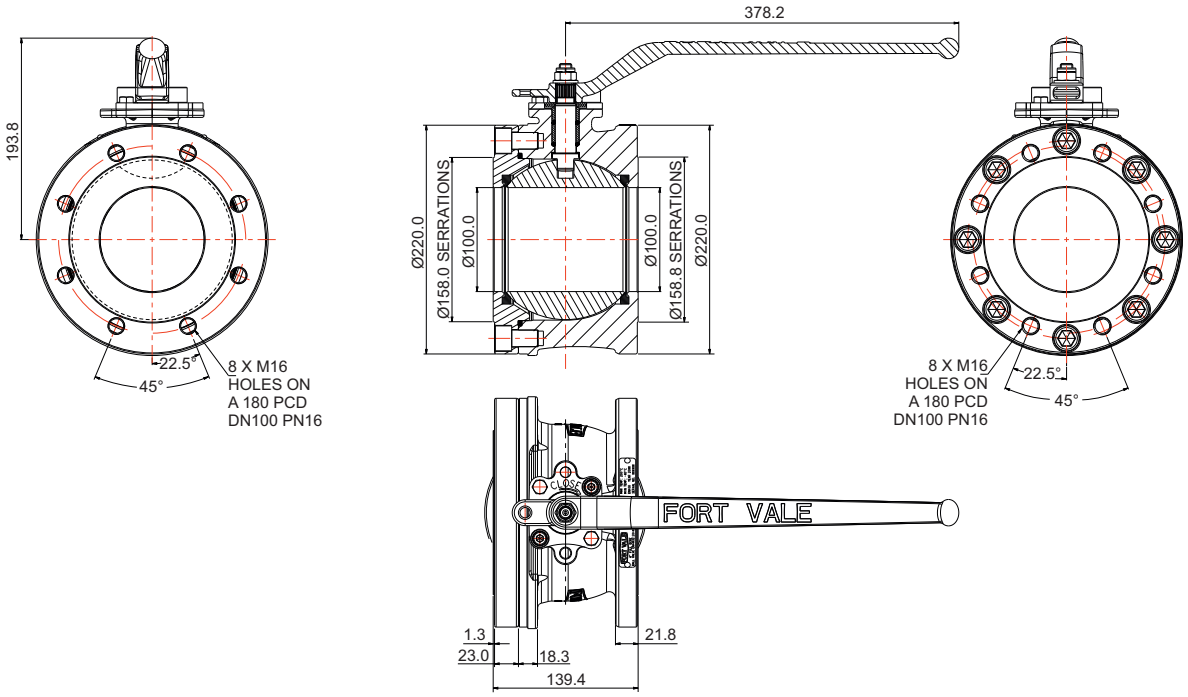
| Description | Part No. |
|---|---|
| Manually operated ***Note** | 460/E000X |
| Pneumatically actuated | 460/E000PN |
| Carbon steel body ***Note** | 460/E000XM |

**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





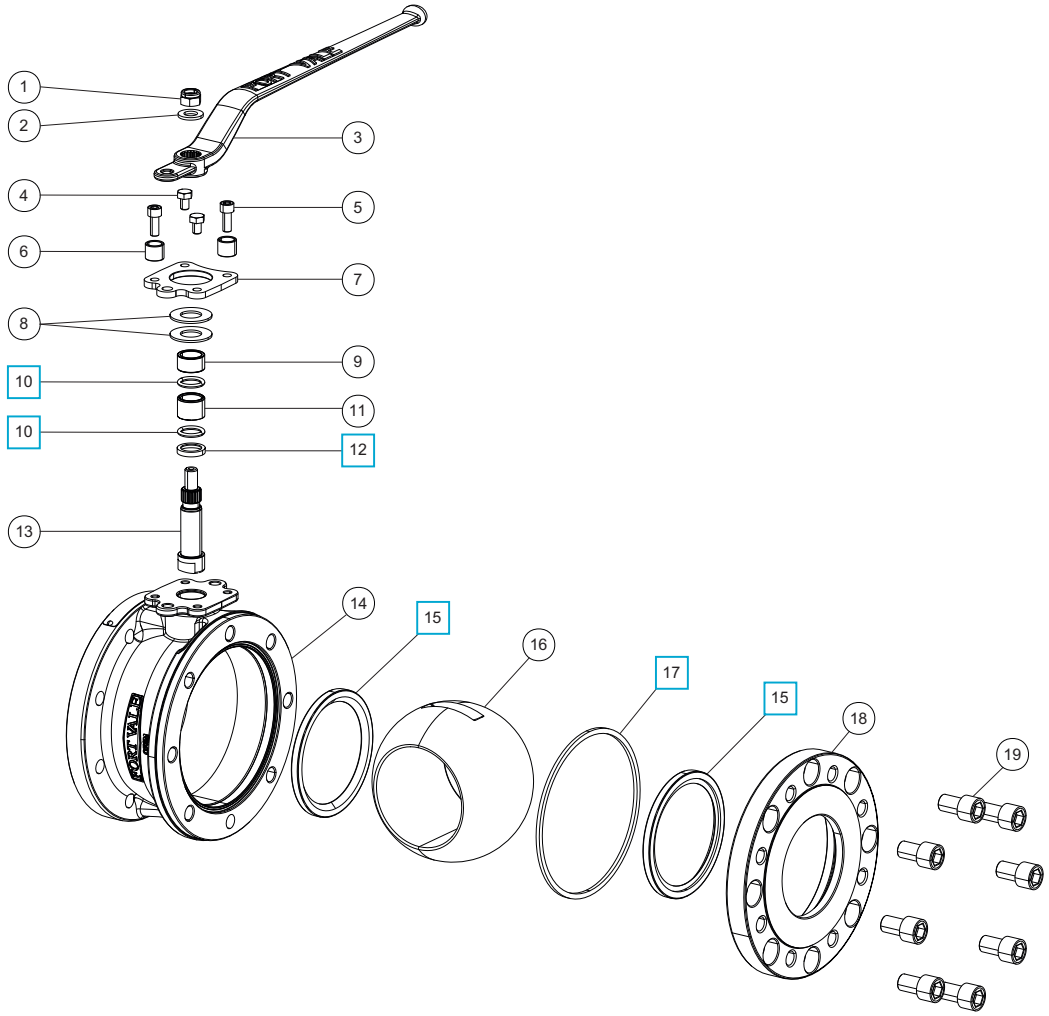
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# DN100 Ball Valve with Inlet Seal Clamp

## 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:

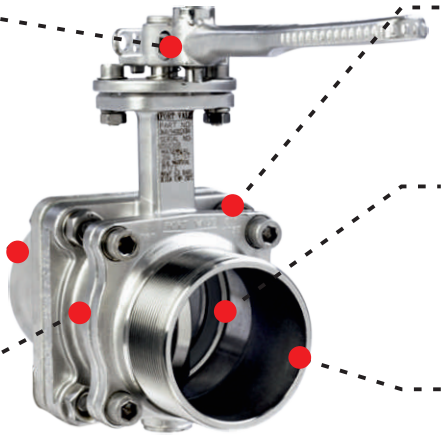
- DN80 (3") Tankpro - 3 piece valve
- DN80 (3") Unifly - 2 piece valve

**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

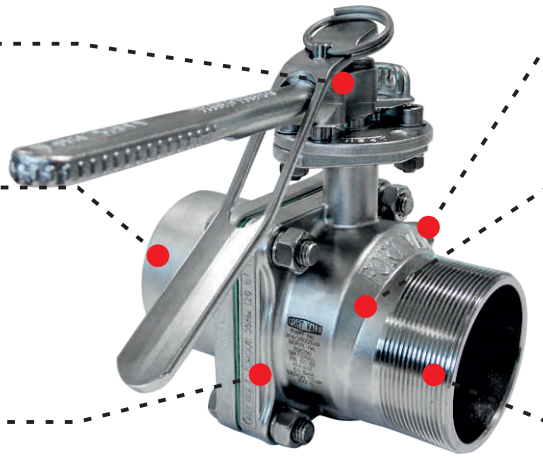
**Valve Materials**
316 stainless steel
**Special service conditions:**
High nickel alloys

**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

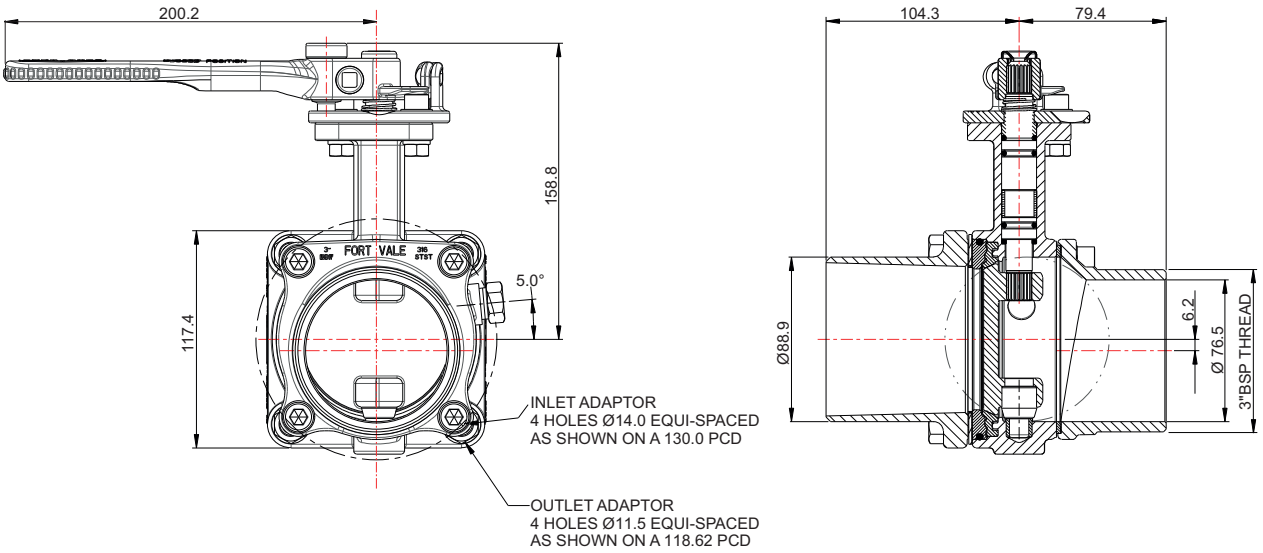
## Range

| 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





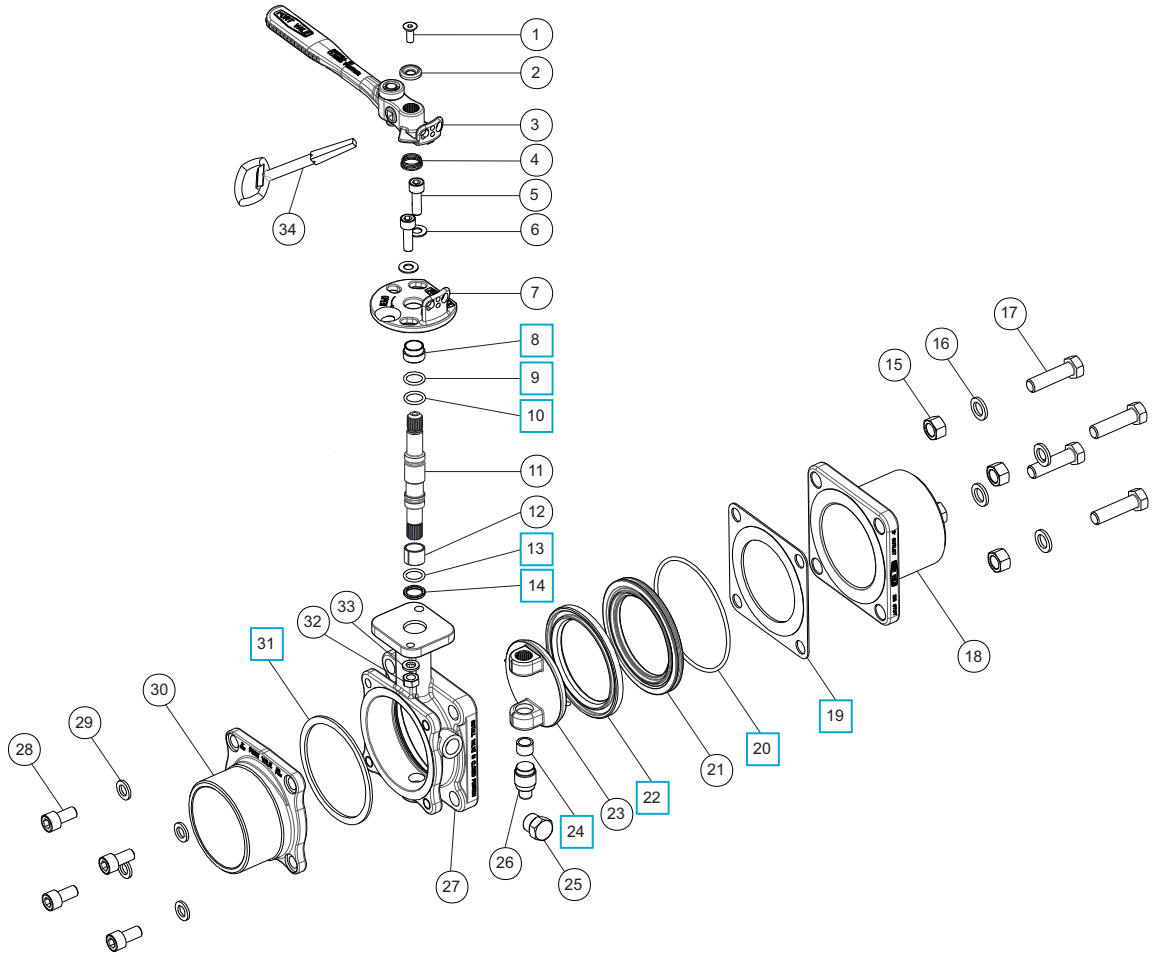
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# 3" Tankpro Road Tanker Butterfly Valve

## 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

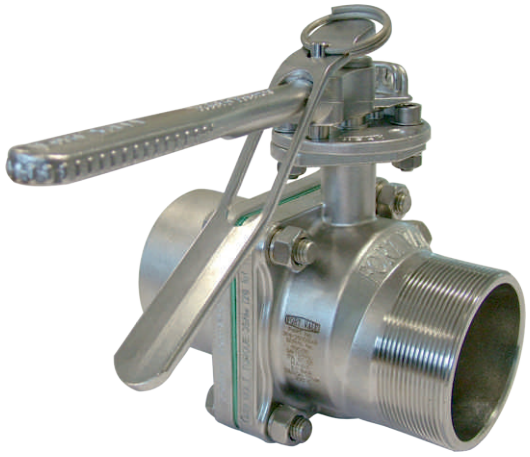
| Description | Part No. |
|---|---|
| All parts marked ☐ in the Parts List | 368/94SK |


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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

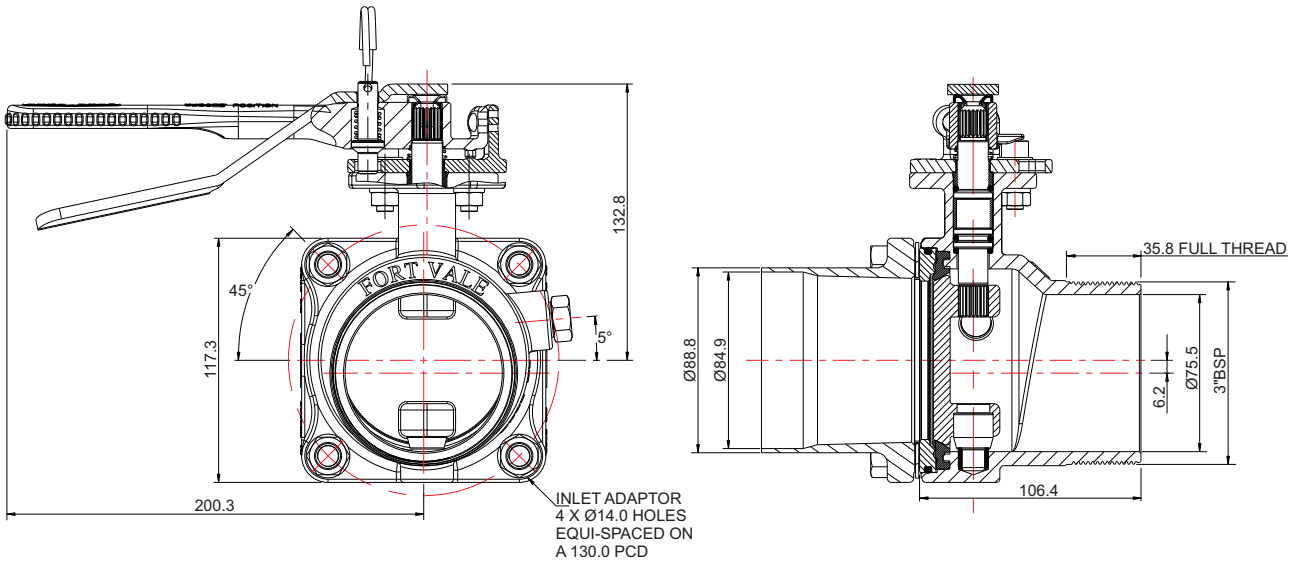
## Range

| 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





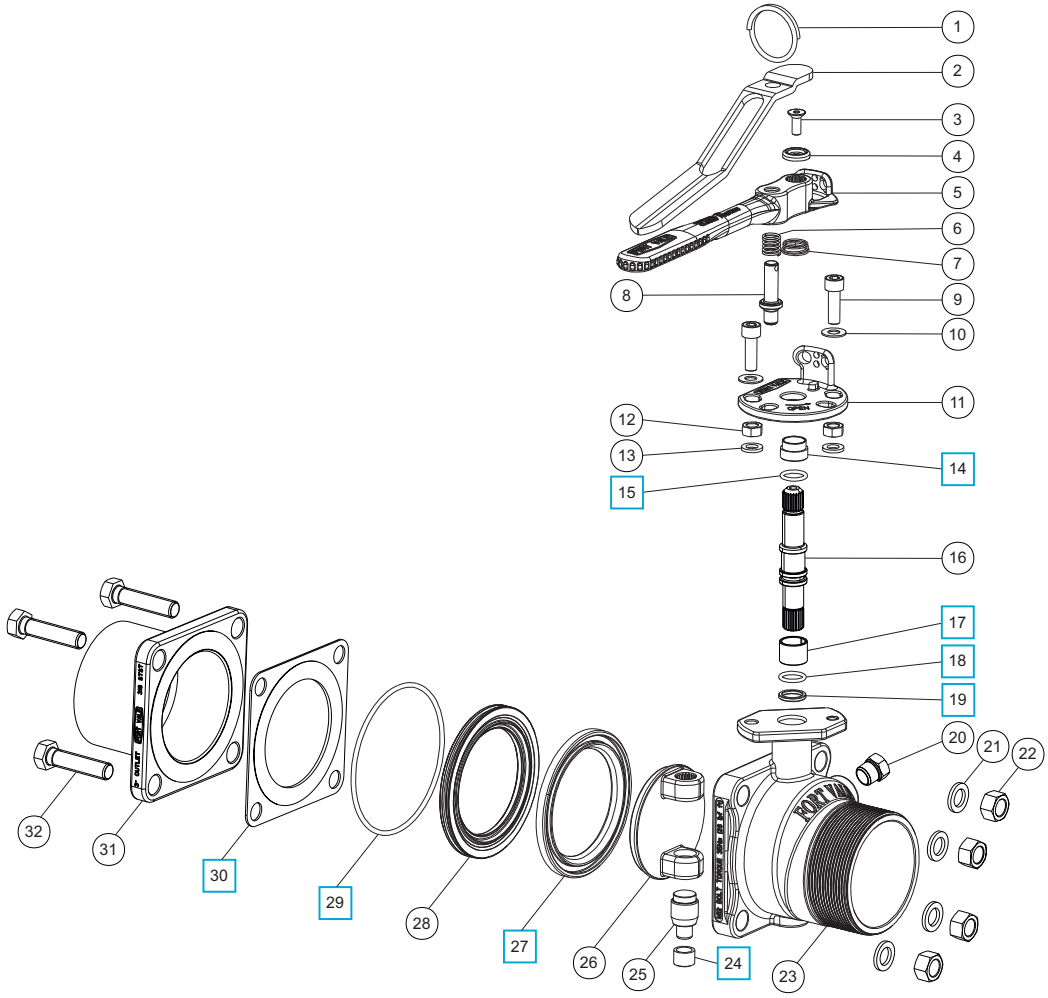
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# 3" Unifly Road Tanker Butterfly Valve

## 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

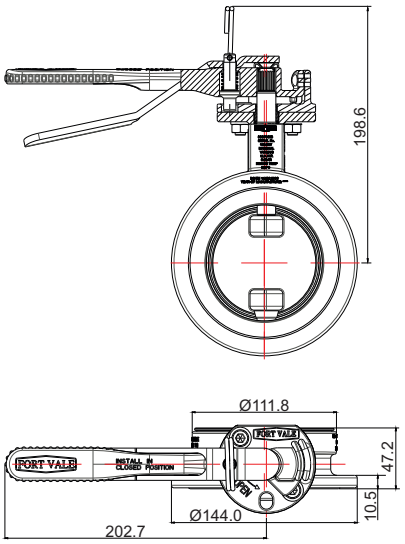
## Range

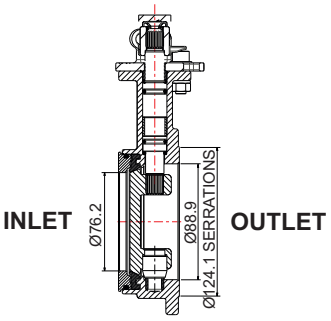
| Description | Part No. |
|---|---|
| Standard specification | 368/7000B |
| With hemi-spherical closure plate | 368/9110B |
| Std. specification, right hand operated | 368/4000A |

## 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





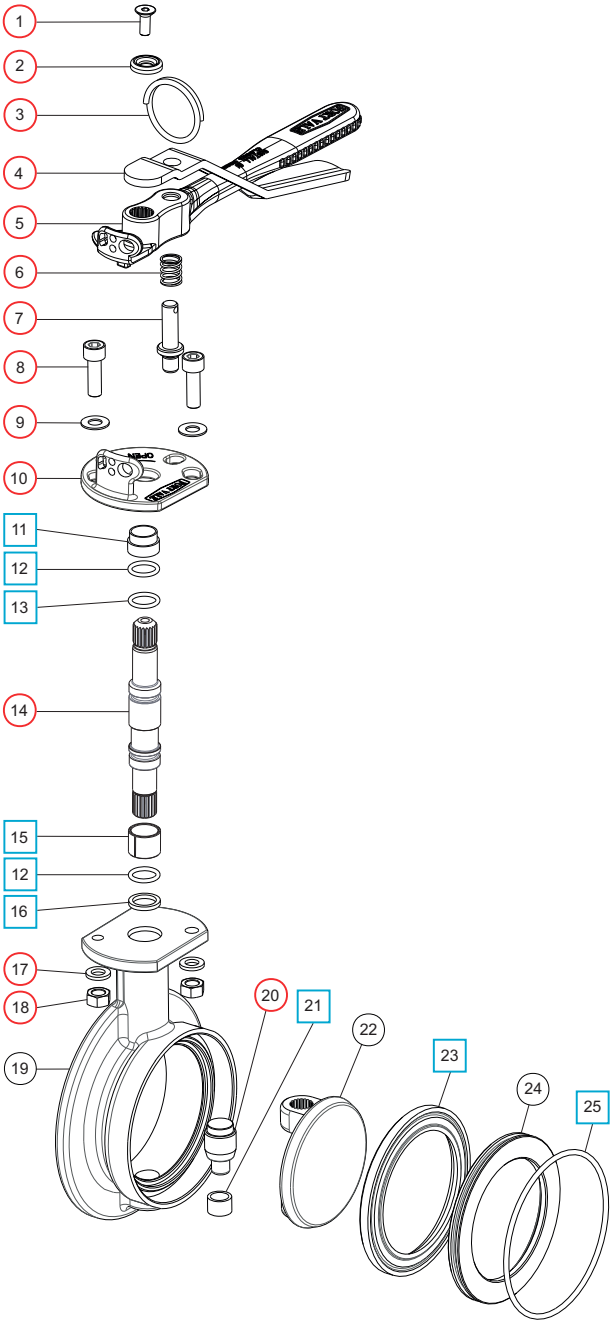
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# 3" Clamped Widdop Butterfly Valve

## 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

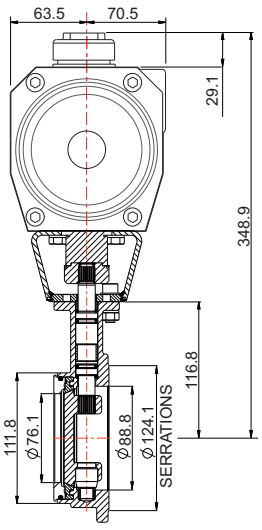
## Range

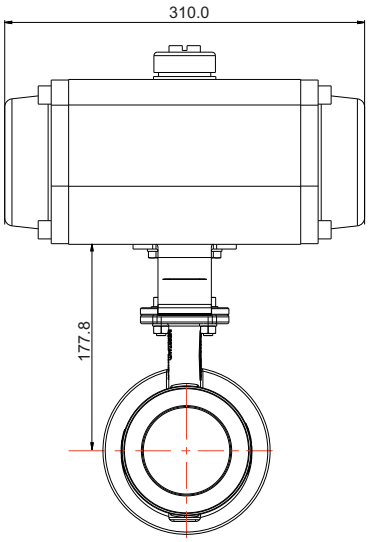
| Description | Part No. |
|---|---|
| Std. specification - pneumatic actuator | 368/7000BPN |
| Std. specification - manually operated | 368/7000B |

## 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





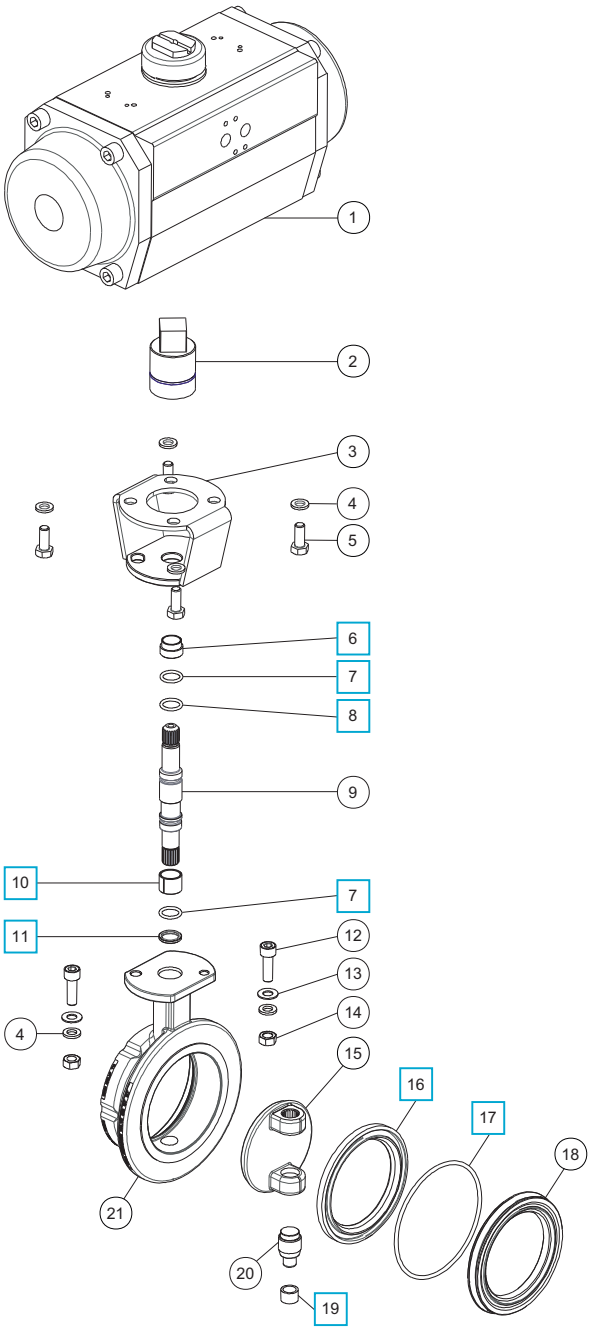
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# 3" Clamped Widdop Butterfly Valve - Pneumatically Actuated

**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

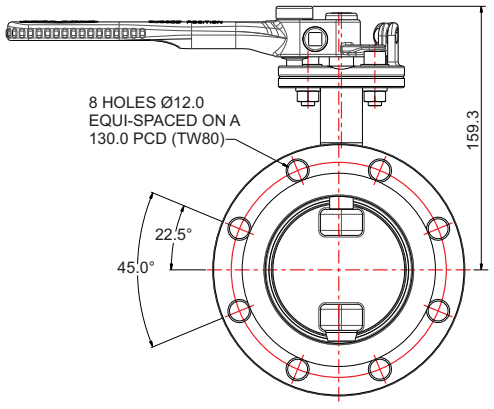
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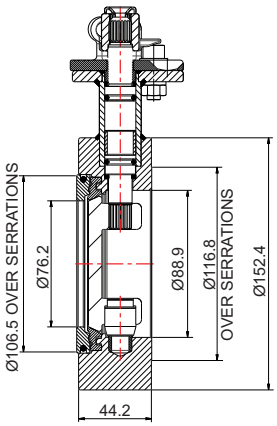
| Description | Part No. |
|---|---|
| TW80 clamped valve | 368/5500B |
| TW100 clamped valve | 468/5600B |

## 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





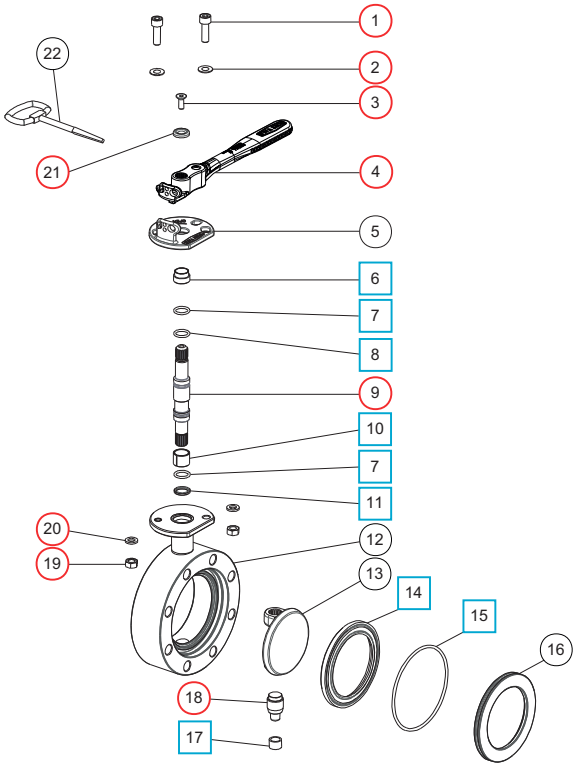
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# TW80 Clamped Butterfly Valve

## 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

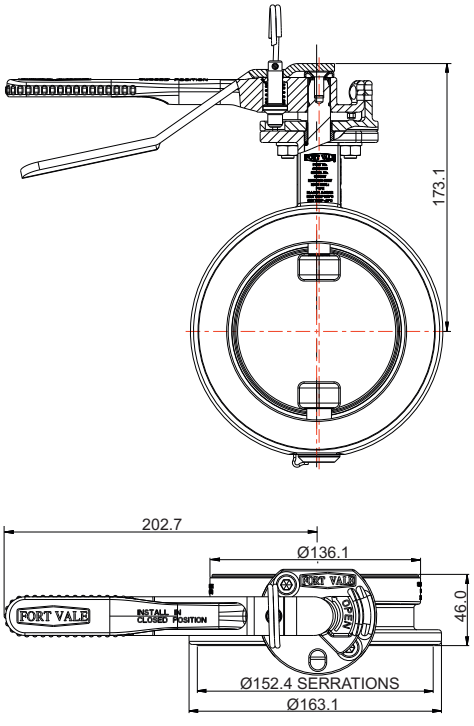
## Range

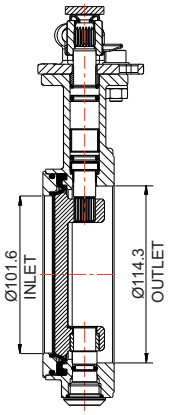
| Description | Part No. |
|---|---|
| Standard specification | 468/7250B |
| Pneumatically actuated | 468/7200BPN |
| With high-temperature seals | 468/725HTB |

## 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





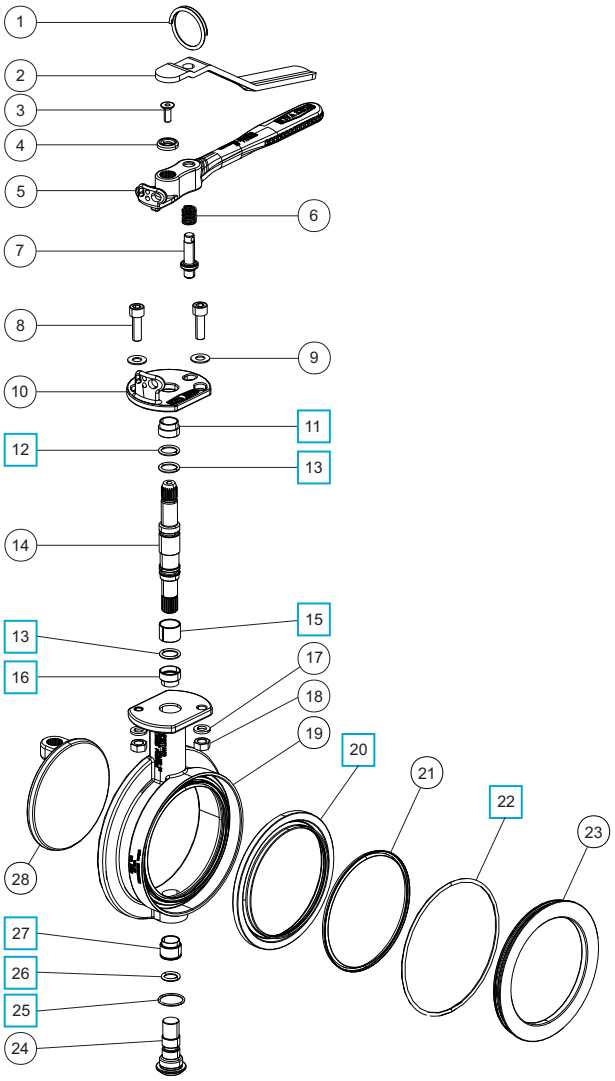
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# 4" Clamped Butterfly Valve

## 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

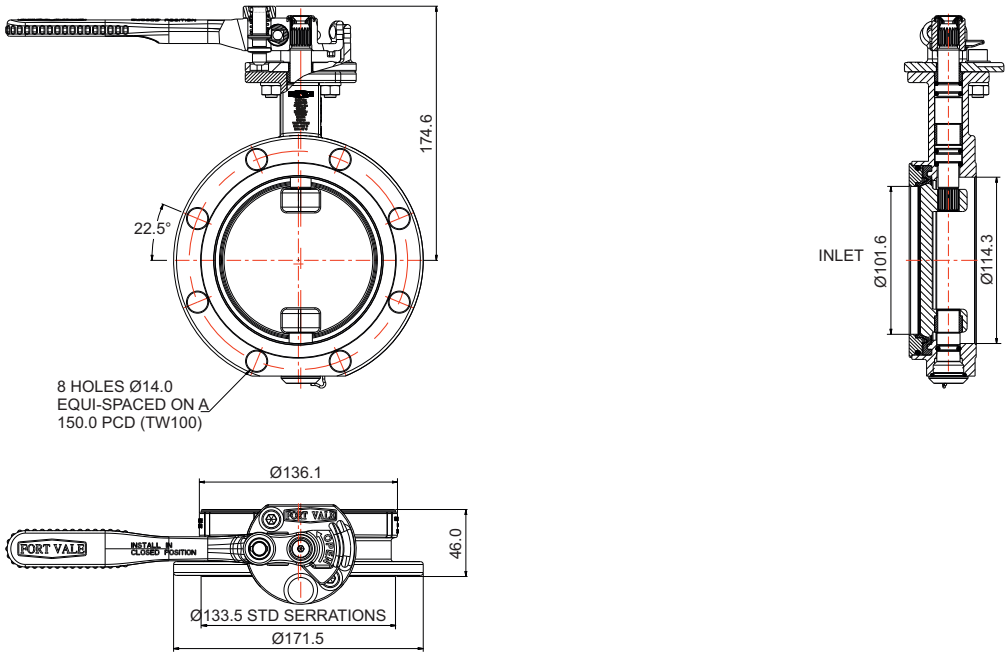
## Range

| 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





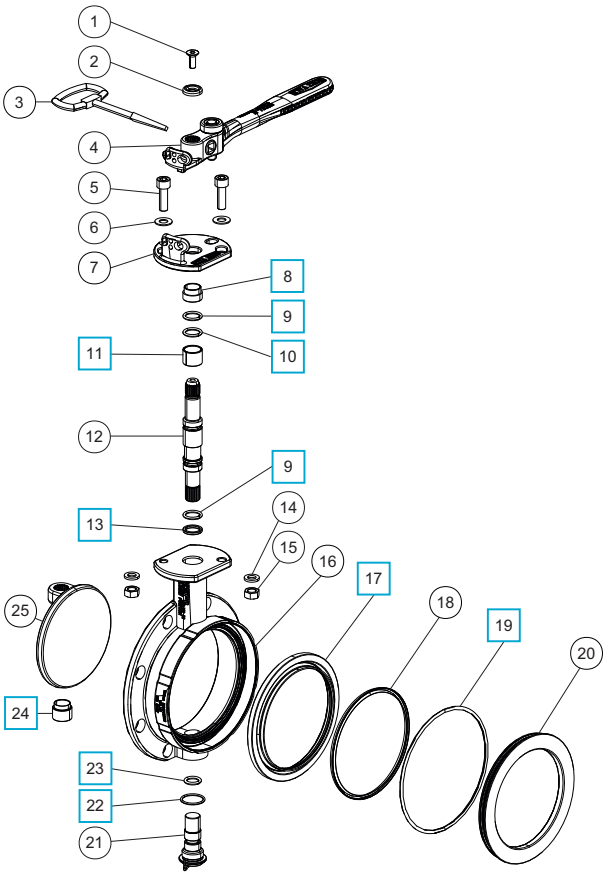
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# TW100 Clamped Butterfly Valve

## 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 | |

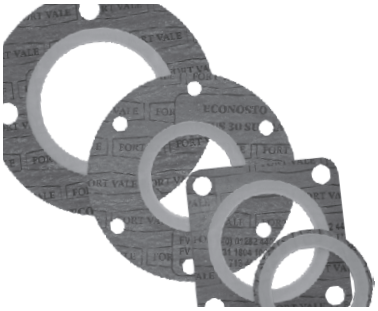
## Seal Kit

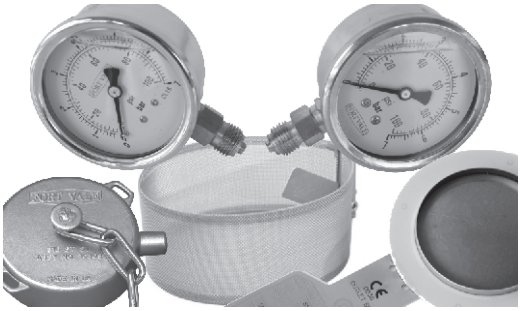
| Description | Part No. |
|---|---|
| All parts marked ☐ in the Parts List | 468/56SKB |


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# Accessories









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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



## Specification: Analogue

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

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

**Gauge fill options**
Silicone oil filled
Not filled

## Analogue Temperature Gauge - Probe

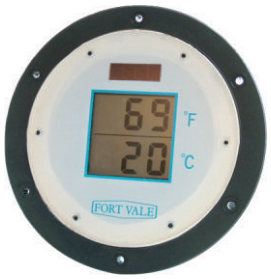


## Analogue Temperature Gauges

| 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 - Capillary




## Specification: Digital

**Temperature range options**
-200°C to 250°C
**NOTE:** The temperature range refers to the capillary or probe only

**Temperature sensor options**
1000mm capillary

## Digital Temperature Gauge

| Temperature Range °C | Temperature Range °F | Capillary or Probe | Part No. |
|---|---|---|---|
| -200 to 250 | -328 to 482 | Capillary | 922/TEMPDIGI250 |

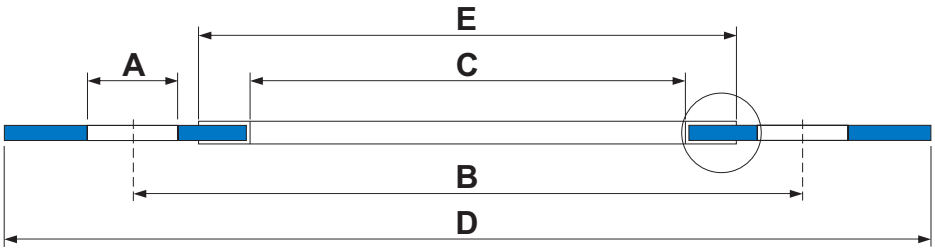
**NOTE:** The temperature range refers to the capillary/probe only.

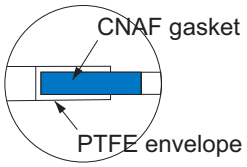


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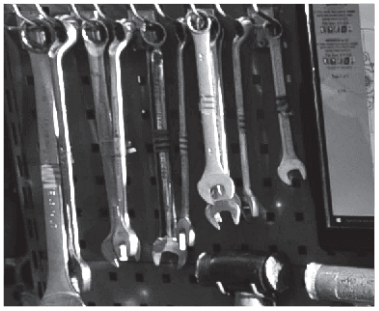
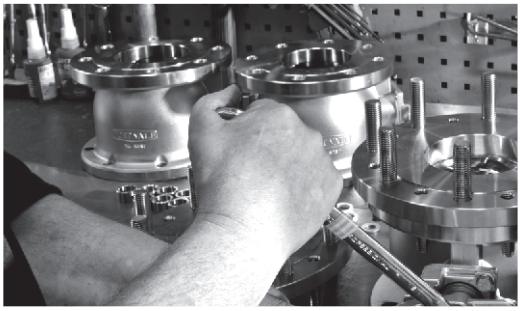
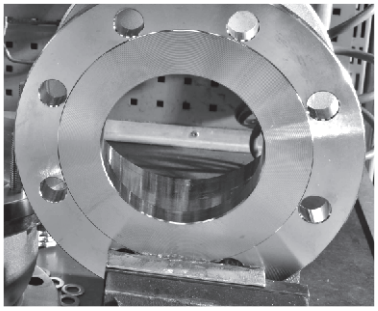

| Part No | No. of holes | Ø A Hole mm | B PCD mm | Ø C Internal mm | Ø D External mm | Ø E Envelope mm | Material | Compatible with |
|---|---|---|---|---|---|---|---|---|
| 5005-046 | - | - | - | 75 | 90 | 90 | Rubber/PTFE | 2½" BSP relief valve tank seal |
| 5005-191 | - | - | - | 75 | 90 | 90 | CNAF/PTFE | 2½" BSP relief valve tank seal |
| 5005-049 | - | - | - | 78 | 112 | 103 | CNAF/PTFE | 3" clamped butterfly valve inlet |
| 5005-052 | - | - | - | 78 | 142 | 103 | CNAF/PTFE | 3" clamped butterfly valve inlet |
| 5005-490 | - | - | - | 89 | 142 | 114 | 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 | 80 | 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 | 103 | 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 | 114 | 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 | 114 | CNAF/PTFE | 3" clamped butterfly valve outlet |
| 5005-023 | 4 | 18 | 172 | 127 | 203 | 152 | CNAF/PTFE | 3" top discharge valve & 30° footvalve inlet |
| 5005-177 | 4 | 18 | 172 | 136 | 203 | 152 | CNAF/PTFE | 3" top discharge ball valve inlet |
| 5005-032 | 4 | 19 | 178 | 114 | 216 | 141 | CNAF/PTFE | 30° footvalve inlet |
| 5005-398 | 6 | 11 | 105 | 75 | 127 | 90 | 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 | 146 | CNAF/PTFE | Parkfield footvalve inlet |
| 5005-169 | 6 not equi-spaced | 13 | 168 | 78 | 197 | 103 | CNAF/PTFE | 3" flanged butterfly & 3" ball valve inlet |
| 5005-222 | 6 not equi-spaced | 14 | 168 | 102 | 203 | 127 | CNAF/PTFE | 3" top discharge butterfly valve inlet |
| 5005-015 | 8 | 14 | 178 | 114 | 203 | 141 | CNAF/PTFE | 45° & 90° Cleanflow/Highlift footvalve inlet |

**NOTE:** All diameters are nominal


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# After Sales Service

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

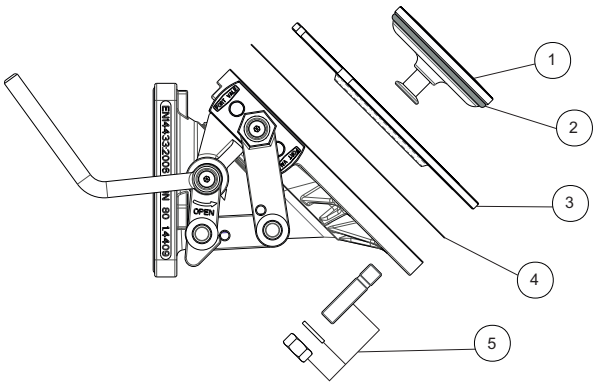
**IMPORTANT:** A Cleanflow footvalve with a replaceable seat protrudes more from the tank and the outlet centre line is lower than that of a standard valve. Please contact us for dimensions and more information.

## 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.

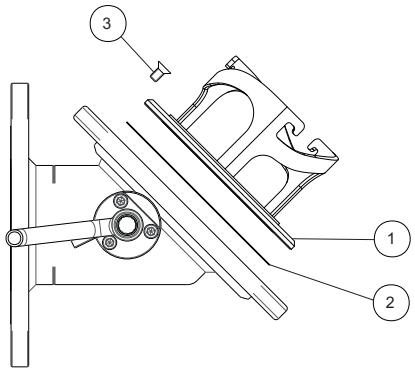
**Seating flange materials**
316 stainless steel
High nickel alloy
Titanium

## 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: 3" Kit - 400/2600**
**Part No: 4" Kit - 400/2900**



### Specification

You can use the seat repair kit to re-surface the seating face of a valve if there is damage caused by corrosion.

**Compatible**
**3" Kit:** compatible with 2½" Super Maxi relief valve and 3" Cleanflow and Highlift footvalves
**4" Kit:** compatible with 4" Cleanflow & Highlift footvalves

**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: 3" Kit OPIN70, 4" Kit OPIN77. Please contact us.

### Spare Parts: Grinding Discs

| Description | Part No. 3" | Part No. 4" |
|---|---|---|
| Box of 100 x 60 grit | 400/2610 | 400/2615 |
| Box of 100 x 80 grit | 400/2620 | 400/2625 |
| Box of 100 x 180 grit | 400/2630 | 400/2635 |
| Box of 100 x 500 grit | 400/2640 | 400/2645 |


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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 | 400/1000 |
| Tool kit - 65mm & 80mm Super Maxi & Hyper Maxi relief valves | 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

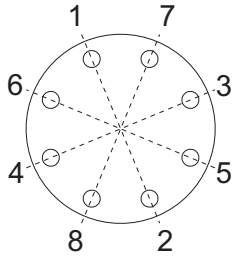
To install flanged parts correctly:

- 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.

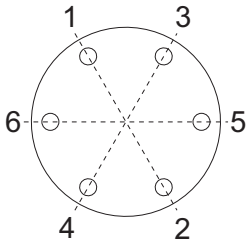
**Table BT1**

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

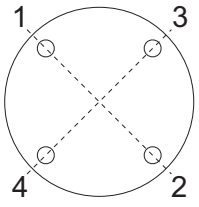
**Figure BT1**




**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/vapour/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 do the checks 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.

Also, schedule regular maintenance based on how frequently the valve is used, the type of cargo and the service conditions.

**Checks after 2½ years of service:**

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.

**Checks after 5 years of service:**

1. Disassemble and clean the valve.
2. Replace all the valve seals and do a pressure test. .

## 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 genuine, there is a risk of:

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

## External Fire

If you install the valve 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's 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, such as mechanical, static, dynamic or thermal load.

## 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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Our subsidiaries are located in:

**US Office**
126 N. Virginia
La Porte
TX 77571
USA

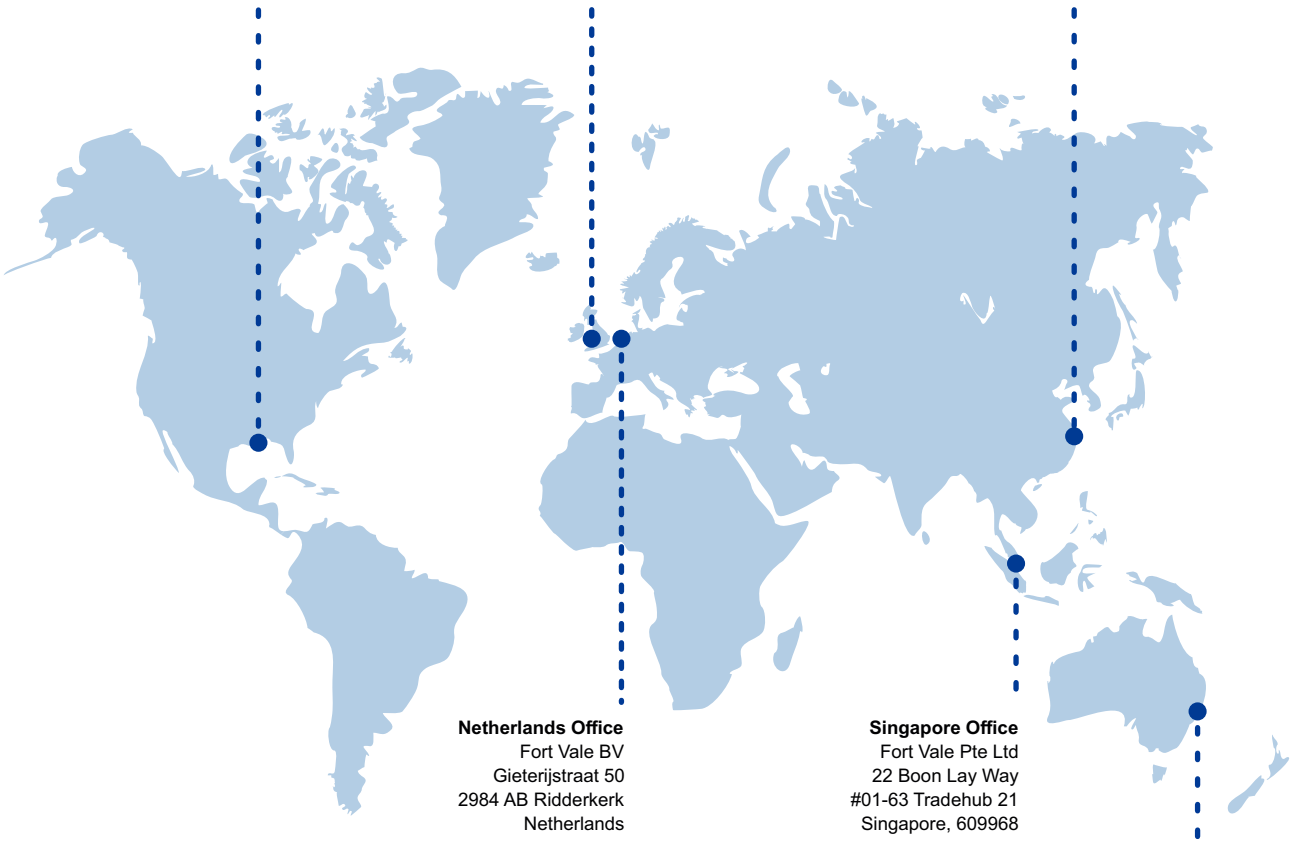
Tel: +1 281 471 8100
Fax: +1 281 471 8116
Email: ussales@fortvale.com

**Head Office**
Calder Vale Park
Simonstone Lane
Simonstone, Burnley
Lancashire, BB12 7ND, UK

Tel: +44 (0) 1282 687120
Fax: +44 (0) 1282 687110
Email: sales@fortvale.com

**China Office**
Fort Vale Engineering Shanghai Ltd
Building 11 88 Yuanshan Road
Xinzhuang Industry Park
Shanghai 201108 China

Tel: +86 21 6442 1367
Fax: +86 21 6442 1376
Email: cnsales@fortvale.com



**Netherlands Office**
Fort Vale BV
Gieterijstraat 50
2984 AB Ridderkerk
Netherlands

Tel: +31 180 483333
Fax: +31 180 410797
Email: bvsales@fortvale.com

**Singapore Office**
Fort Vale Pte Ltd
22 Boon Lay Way
#01-63 Tradehub 21
Singapore, 609968

Tel: +65 6515 9950
Fax: +65 6515 3034
Email: sgsales@fortvale.com

**Australia Office**
Fort Vale Australia Pty Ltd
Bellwood Business Park
Unit 14, 49 Bellwood Street
Darra, Queensland, 4076

Tel: +61 7 3189 5059
Email: ausales@fortvale.com

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