

## Catalogue

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# Lined Equipment for Special Service Conditions





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## Lined Equipment for Special Service Conditions

### Catalogue

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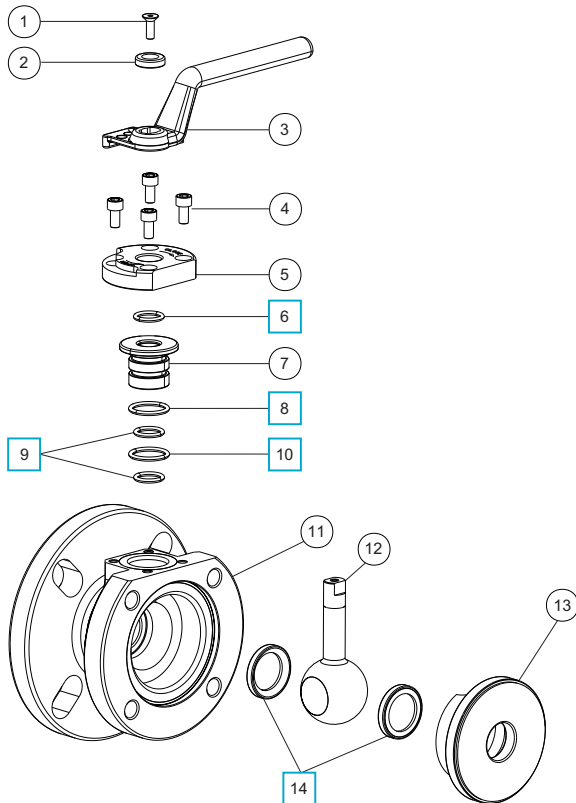




# 25mm Reduced Bore Airline Ball Valve - PFA Lined

Part No: 530/P100

## Parts Drawing



## Parts List

| Item | Description                               | Part No.                            |
|------|---|-------------------------------------|
| 1    | M5 socket screw                           | 5111-111                            |
| 2    | Retaining washer                          | 20370/5                             |
| 3    | Handle                                    | 530/0020/1                          |
| 4    | M6 button screw (4)                       | 5121-013                            |
| 5    | Stuffing clamp                            | 530/1014                            |
| 6    | Viton O ring                              | 20361 <input type="checkbox"/>      |
| 7    | Seal carrier (modified 2024)* <b>Note</b> | 530/1013                            |
| 8    | Low temp. Viton O ring                    | 5005-336MF <input type="checkbox"/> |
| 9    | Perfluoroelastomer O ring (2)             | 5005-586 <input type="checkbox"/>   |
| 10   | Perfluoroelastomer O ring                 | 5005-384 <input type="checkbox"/>   |
| 11   | PFA lined body                            | 530/P110/2                          |
| 12   | PFA lined obturator                       | 530/1010L                           |
| 13   | PFA lined clamp plate                     | 530/1011P                           |
| 14   | PTFE front/rear seal (2)                  | 530/0024 <input type="checkbox"/>   |

## Seal Kit

| Description   | Part No. |
|---|----------|
| All parts marked <input type="checkbox"/> in the Parts List | 530/P1SK |

### NOTE

From January 2024, the spindle seals and seal carrier have changed, items 6 thru 10.

If you buy a seal kit for a valve made before January 2024, you must also replace the seal carrier, item 7.



# 50mm Full Bore Ball Valve - PFA Lined

Part No: 370/P200



## Specification

### Nominal size

50mm

### Tank connection

Flanged: 4 x 18mm holes on a 126mm PCD

### Outlet/Process connection

Flanged: 4 x 18mm slots on a 120 - 127mm PCD

### Options

Finish: Corrosion-resistant paint on external surfaces to prevent damage from corrosive cargo vapour/splash

### Materials

Contact parts: PFA lined

Main seal: PTFE

Refer to Range for other PFA Lined Ball Valves

Alternatives are available, refer to the Design Options page

## Design Conditions

|                         |          |
|-------------------------|----------|
| Weight:                 | 9.76 Kg  |
| Design Pressure (MAWP): | 6.9 Bar  |
| Test Pressure:          | 12.6 Bar |
| Design Temperature Min: | -40°C    |
| Design Temperature Max: | 200°C    |

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

### Design Codes

BS EN14432  
RID

## Range

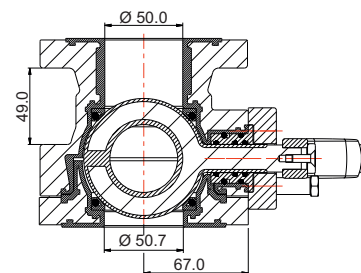
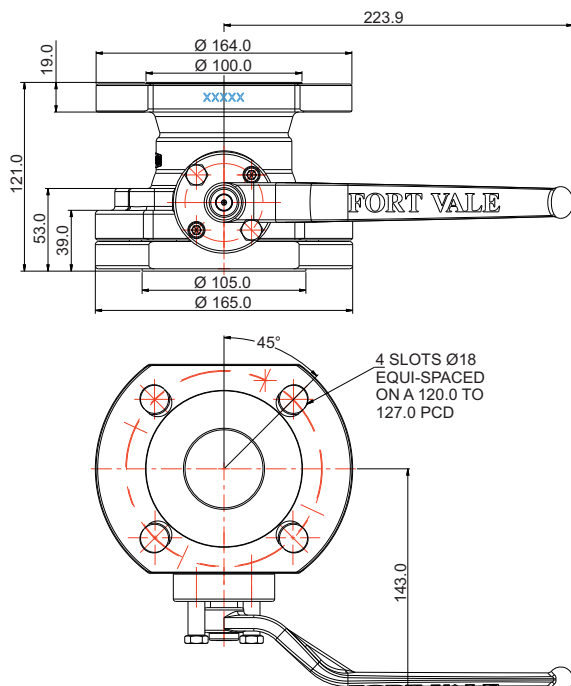
| Description                             | Part No.    |
|---|-------------|
| 25mm reduced bore ball valve PFA lined  | 530/P100    |
| 50mm full bore ball valve PFA lined     | 370/P200    |
| 50mm ball valve PFA lined, painted body | 370/P200PA  |
| 80mm full bore ball valve PFA lined     | 360/P030X * |

\*The part number changes for left or right hand operated

## Related Parts

| Description            | Part No.    |
|------------------------|-------------|
| Stud kit               | 311/3790    |
| PFA lined blind flange | 370/4239PFA |

## Section View



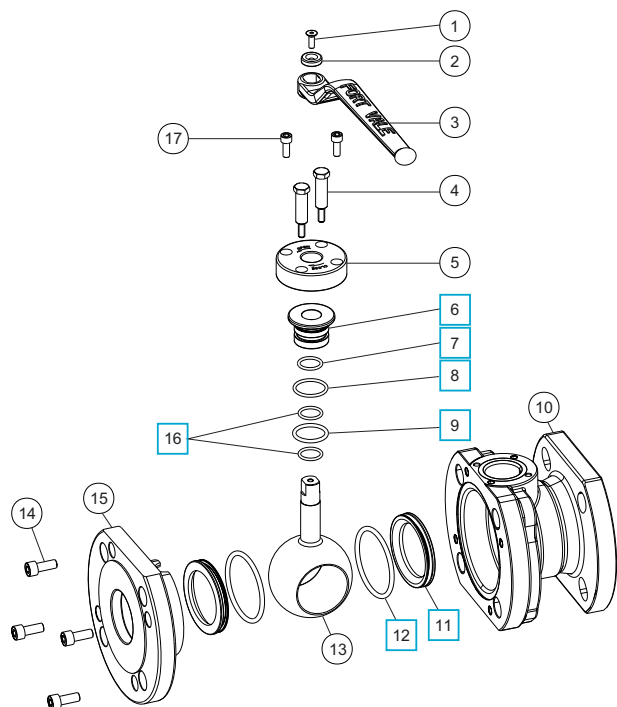
4 SLOTS Ø18  
EQUI-SPACED  
ON A 120.0 TO  
127.0 PCD



# 50mm Full Bore Ball Valve - PFA Lined

Part No: 370/P200

## Parts Drawing



## Parts List

| Item | Description                   | Part No.     |                          |
|------|-------------------------------|--------------|--------------------------|
| 1    | M5 screw                      | 5111-113     |                          |
| 2    | Retaining washer              | 20370/5      |                          |
| 3    | Handle                        | 370/3306/1   |                          |
| 4    | Stop pin (2)                  | 370/P107     |                          |
| 5    | Stuffing plate                | 370/P114     |                          |
| 6    | Seal carrier                  | 370/P113     | <input type="checkbox"/> |
| 7    | Viton O ring                  | ORB115VL     | <input type="checkbox"/> |
| 8    | Viton O ring                  | ORB121VL     | <input type="checkbox"/> |
| 9    | Perfluoroelastomer O ring     | 5005-214PER  | <input type="checkbox"/> |
| 10   | PFA lined body                | 370/P110/2   |                          |
| 11   | PTFE ball seal (2)            | 370/P115     | <input type="checkbox"/> |
| 12   | Fortyt O ring (2)             | ORM0580400F0 | <input type="checkbox"/> |
| 13   | PFA lined spindle/ball        | 370/P101     |                          |
| 14   | M8 cap screw (4)              | 5111-010     |                          |
| 15   | PFA lined clamp plate         | 370/P111     |                          |
| 16   | Perfluoroelastomer O ring (2) | 5005-370P    | <input type="checkbox"/> |
| 17   | M6 cap screw (2)              | 5111-015     |                          |

## Seal Kit

| Description   | Part No.   |
|---|------------|
| All parts marked <input type="checkbox"/> in the Parts List | 370/P100SK |





# 80mm Full Bore Ball Valve - PFA Lined

Part No: 360/P030X



## Specification

### Nominal size

80mm

### Tank connection

Flanged: 4 x 18mm holes on a 160mm PCD

### Outlet/Process connection

Flanged: 4 x 18mm slots on a 146-160mm PCD

### Options

Left hand operated, right hand operated

Finish: Corrosion-resistant paint on external surfaces to prevent damage from corrosive cargo vapour/splash

### Materials

Contact parts: PFA lined

Main seal: PTFE

Refer to Range for other PFA Lined Ball Valves

Alternatives are available, refer to the Design Options page

## Design Conditions

|                         |           |
|-------------------------|-----------|
| Weight:                 | 12.6 Kg   |
| Design Pressure (MAWP): | 6.9 Bar   |
| Test Pressure:          | 10.34 Bar |
| Design Temperature Min: | -40°C     |
| Design Temperature Max: | 130°C     |

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

### Design Codes

BS EN14432  
RID

## Range

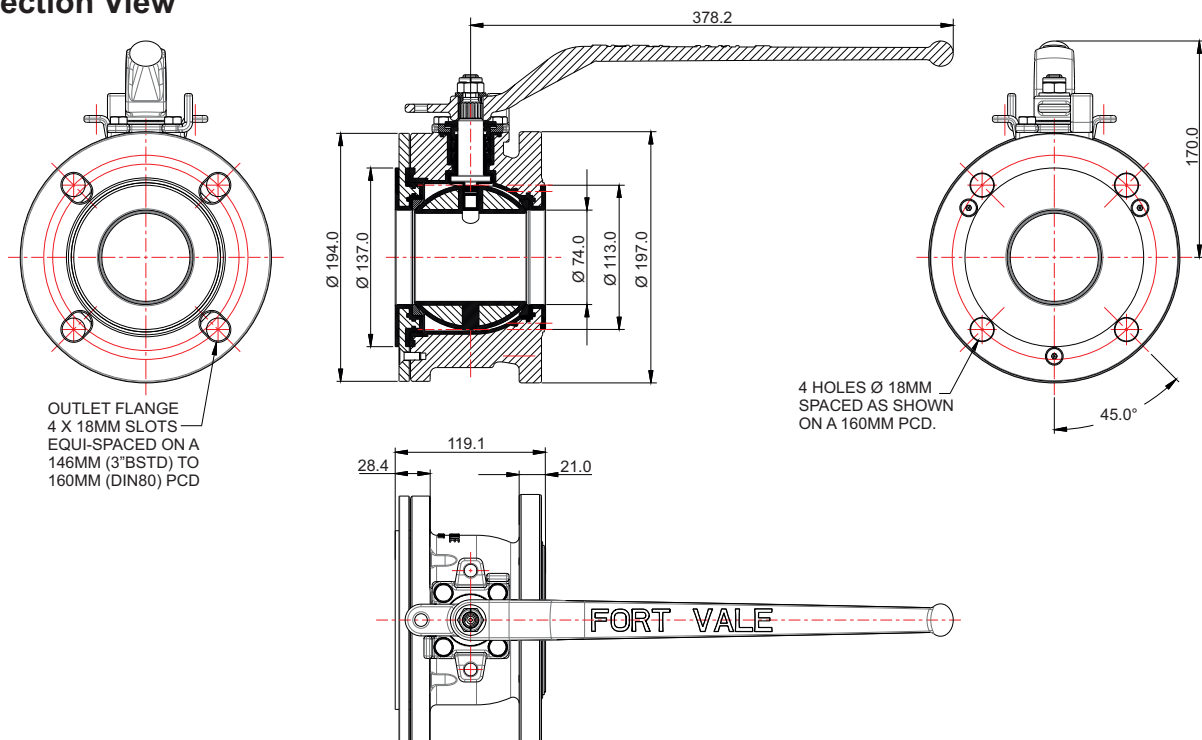
| Description                            | Part No.    |
|--|-------------|
| 25mm reduced bore ball valve PFA lined | 530/P100    |
| 50mm full bore ball valve PFA lined    | 370/P200    |
| 80mm full bore ball valve PFA lined    | 360/P030X * |

\*The part number changes for left or right hand operated

## Related Parts

| Description                    | Part No.    |
|--------------------------------|-------------|
| 3" BSP PFA lined outlet flange | SP368/8047P |
| Solid PTFE outlet gasket       | 5005-417    |

## Section View

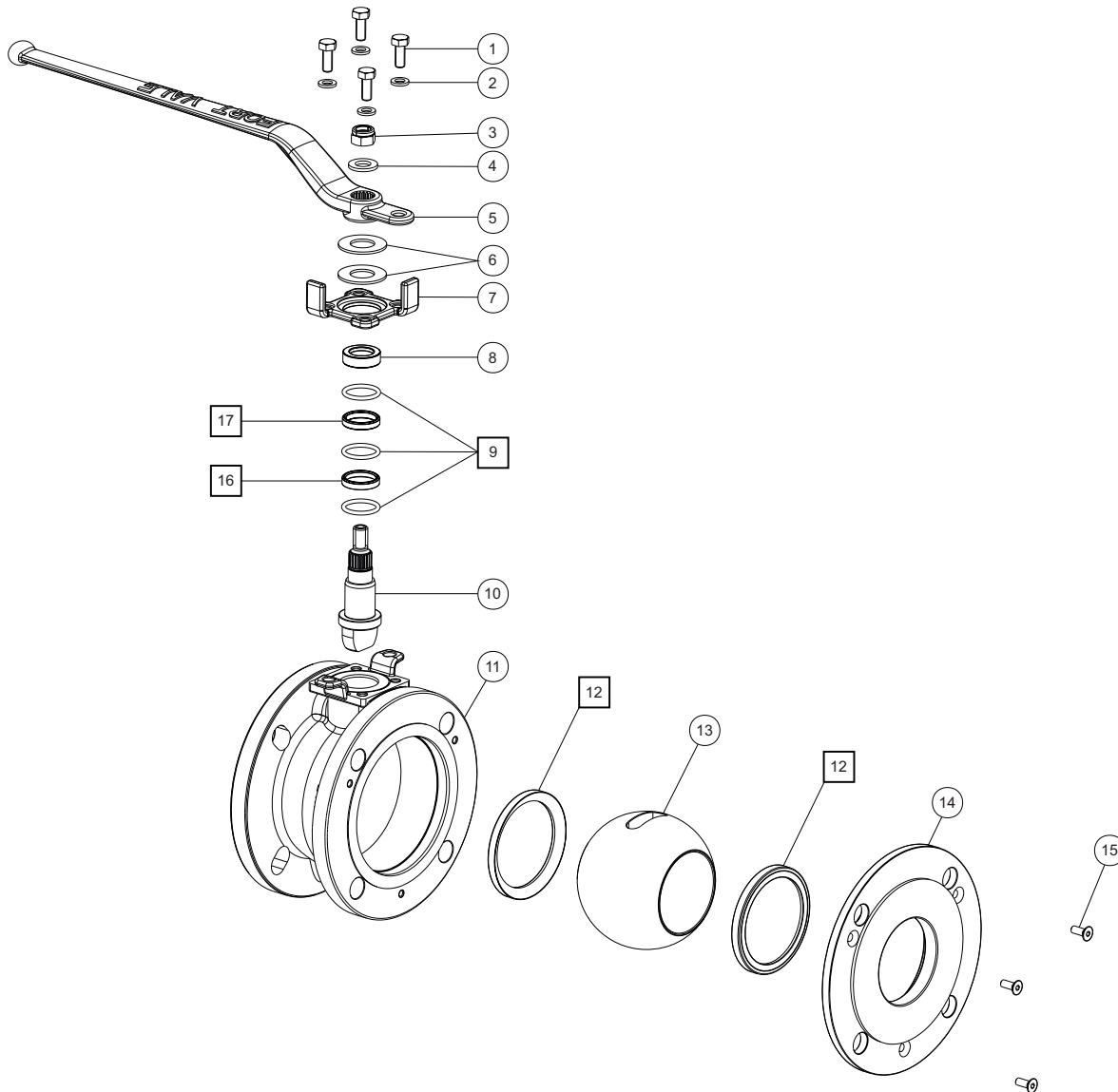




# 80mm Full Bore Ball Valve - PFA Lined

Part No: 360/P030X

## Parts Drawing



### Parts List

| Item | Description                     | Part No.                            |
|------|---------------------------------|-------------------------------------|
| 1    | M8 hex bolt (4)                 | 5111-046                            |
| 2    | M8 spring washer (4)            | 5113-003                            |
| 3    | M12 locking nut                 | 5112-007                            |
| 4    | M12 washer                      | 5123-003                            |
| 5    | Handle                          | 360/3416                            |
| 6    | 20mm washer (2)                 | 5113-041                            |
| 7    | Clamp plate                     | 360/3406/1                          |
| 8    | Stainless steel stuffing collar | 360/3464                            |
| 9    | PTFE O ring (3)                 | 5005-654 <input type="checkbox"/>   |
| 10   | PFA lined spindle               | 360/3422PL                          |
| 11   | PFA lined body                  | 360/P020                            |
| 12   | PTFE front & rear seal (2)      | 360/3402/5 <input type="checkbox"/> |
| 13   | PFA coated ball                 | 360/3401PL                          |
| 14   | PFA lined clamp plate           | 360/3462PL                          |

### Parts List

| Item | Description             | Part No.                            |
|------|-------------------------|-------------------------------------|
| 15   | M6 countersunk bolt (3) | 5111-030                            |
| 16   | Bottom stuffing collar  | 360/3413/1 <input type="checkbox"/> |
| 17   | Top stuffing collar     | 360/3412/1 <input type="checkbox"/> |

### Seal Kit

| Description   | Part No. |
|---|----------|
| All parts marked <input type="checkbox"/> in the Parts List | 360/P0SK |



## 2" Clamped Butterfly Valve - PFA Lined

Part No: 258/P700



### Specification

**Nominal size**

50mm

**Body type**

Clamped

**Properties**

In-line spindle and closure plate

Left hand operated, handle with TIR and padlock slots

**Materials**

Contact parts: PFA lined

Alternatives are available, refer to the Design Options page

### Design Conditions

|                         |         |
|-------------------------|---------|
| Weight:                 | 2.2 Kg  |
| Design Pressure (MAWP): | 4 Bar   |
| Test Pressure:          | 6.4 Bar |
| Design Temperature Min: | -40°C   |
| Design Temperature Max: | 150°C   |

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

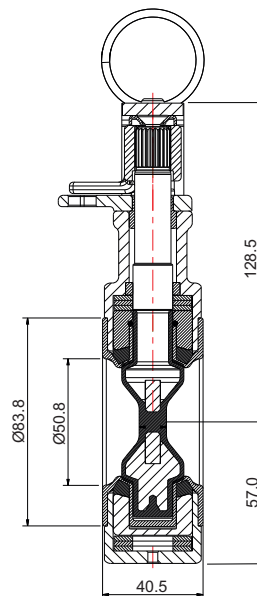
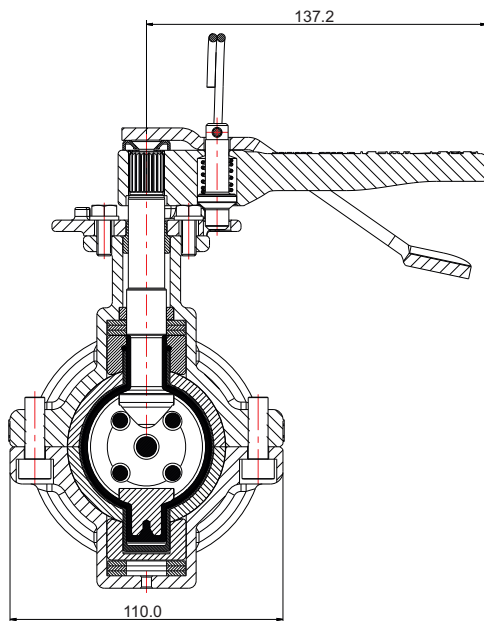
**Design Code**

BS EN 14432

### Range

| Description                          | Part No. |
|--------------------------------------|----------|
| 2" clamped PFA lined butterfly valve | 258/P700 |
| 3" clamped PFA lined butterfly valve | 358/P700 |

### Section View

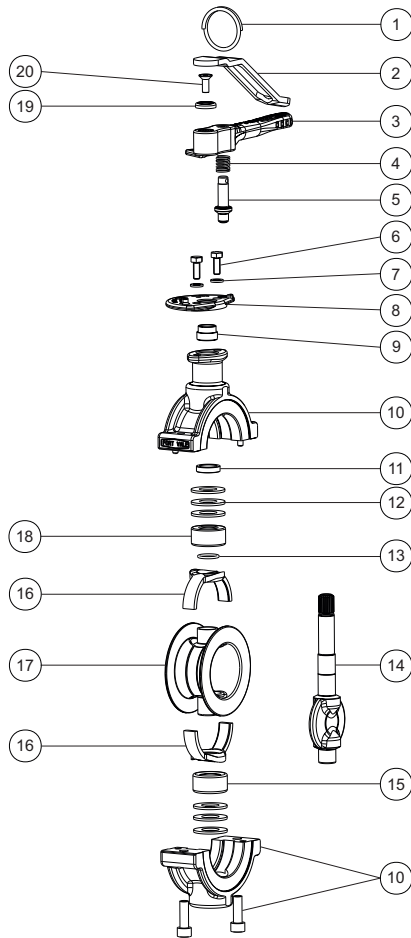




## 2" Clamped Butterfly Valve - PFA Lined

Part No: 258/P700

### Parts Drawing



### Parts List

| Item | Description                     | Part No.    |
|------|---------------------------------|-------------|
| 1    | Split ring                      | 368/0011    |
| 2    | Handle lever                    | 368/9838    |
| 3    | Handle                          | 535/0050    |
| 4    | Handle spring                   | 368/0012    |
| 5    | Handle location pin             | 368/0010    |
| 6    | M6 hex bolt (2)                 | 5111-022    |
| 7    | M6 spring washer (2)            | 5113-008    |
| 8    | Stuffing clamp                  | 535/0204    |
| 9    | Stuffing clamp bush             | 368/0301    |
| 10   | Body assembly                   | 258/P253    |
| 11   | Top guide bush                  | 358/P236    |
| 12   | Belleville washer (6)           | 5113-052    |
| 13   | Perfluoroelastomer O ring       | 5005-216PER |
| 14   | PFA lined spindle/closure plate | 258/P235    |
| 15   | Bottom thrust bearing           | 358/P233/1  |
| 16   | Backing rubber (2)              | 258/P257    |
| 17   | PFA body seal                   | 258/P250    |
| 18   | Stem seal housing               | 358/P233    |
| 19   | Retaining washer                | 20370       |
| 20   | M6 countersunk bolt             | 5111-030    |



# 3" Clamped Butterfly Valve - PFA Lined

Part No: 358/P700



## Specification

### Nominal size

80mm

### Body type

Clamped

### Properties

In-line spindle and closure plate

Left hand operated, handle with TIR and padlock slots

### Materials

Contact parts: PFA lined

Alternatives are available, refer to the Design Options page

## Design Conditions

|                         |        |
|-------------------------|--------|
| Weight:                 | 3.7 Kg |
| Design Pressure (MAWP): | 4 Bar  |
| Test Pressure:          | 6 Bar  |
| Design Temperature Min: | -40°C  |
| Design Temperature Max: | 200°C  |

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

### Design Code

BS EN 14432

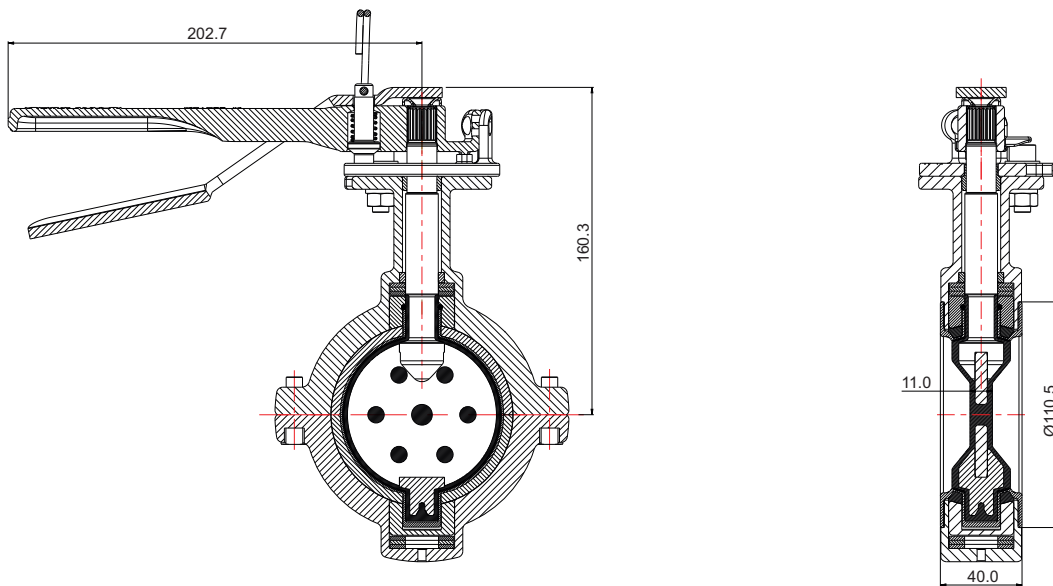
## Range

| Description                          | Part No. |
|--------------------------------------|----------|
| 2" clamped PFA lined butterfly valve | 258/P700 |
| 3" clamped PFA lined butterfly valve | 358/P700 |

## Related Parts

| Description                        | Part No.  |
|------------------------------------|-----------|
| 3" BSP outlet flange - Halar lined | 368/8047L |
| 3" BSP cap with chain              | 10303SS   |
| PTFE disc seal for 3" cap          | 10329P/1  |

## Section View

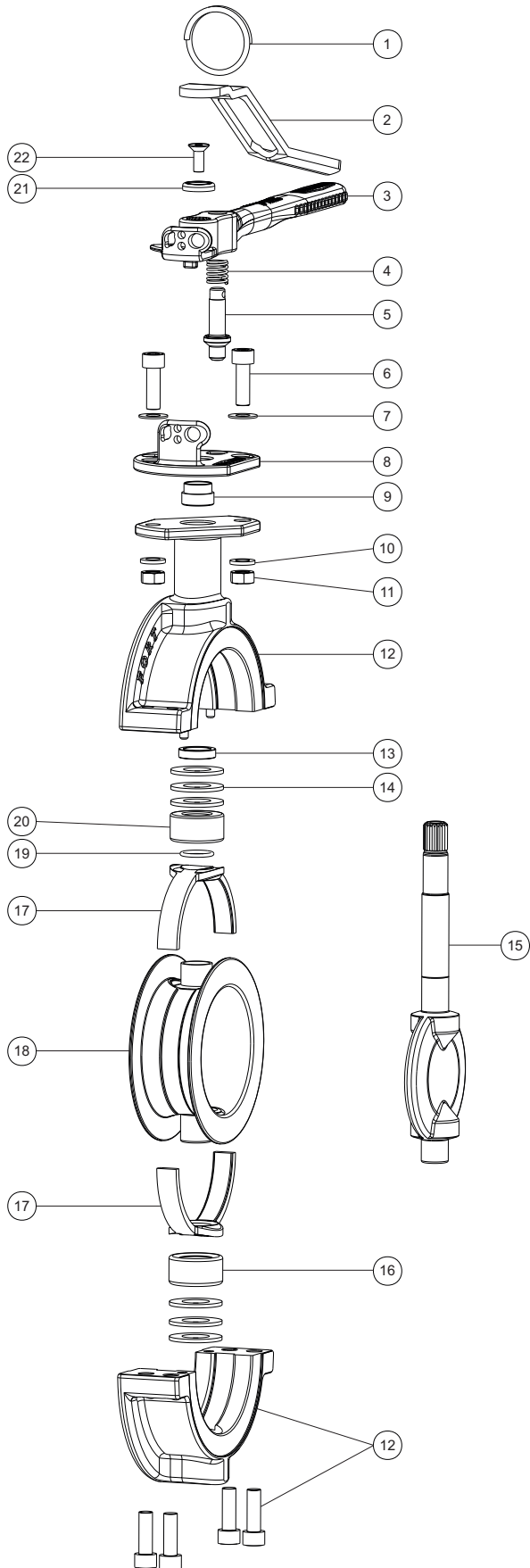




# 3" Clamped Butterfly Valve - PFA Lined

Part No: 358/P700

## Parts Drawing



## Parts List

| Item | Description                     | Part No.    |
|------|---------------------------------|-------------|
| 1    | Split ring                      | 368/0011    |
| 2    | Handle lever                    | 368/9837    |
| 3    | Handle                          | 368/0050    |
| 4    | Handle spring                   | 368/0012    |
| 5    | Handle location pin             | 368/0010    |
| 6    | M8 cap screw (2)                | 5111-148    |
| 7    | M8 plain washer (2)             | 5113-005    |
| 8    | Stuffing clamp                  | 368/0040    |
| 9    | Stuffing clamp bush             | 368/0301    |
| 10   | M8 spring washer (2)            | 5113-003    |
| 11   | M8 full nut (2)                 | 5112-001    |
| 12   | Body assembly                   | 358/P253    |
| 13   | Top guide bush                  | 358/P236    |
| 14   | Belleville washer (6)           | 5113-052    |
| 15   | PFA lined spindle/closure plate | 358/P235    |
| 16   | Bottom thrust ring              | 358/P233/1  |
| 17   | Backing rubber (2)              | 358/P257    |
| 18   | PFA body seal                   | 358/P250    |
| 19   | Perfluoroelastomer O ring       | 5005-216PER |
| 20   | Stem seal housing               | 358/P233    |
| 21   | Retaining washer                | 20370       |
| 22   | M6 countersunk bolt             | 5111-030    |



# 3" Flanged Butterfly Valve - PVDF Lined

Part No: 368/K300



## Specification

### Nominal size

80mm

### Tank connection

Flanged: 6 x 14mm holes on a 168.3mm 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: PVDF lined

Main seal: PTFE

## Design Conditions

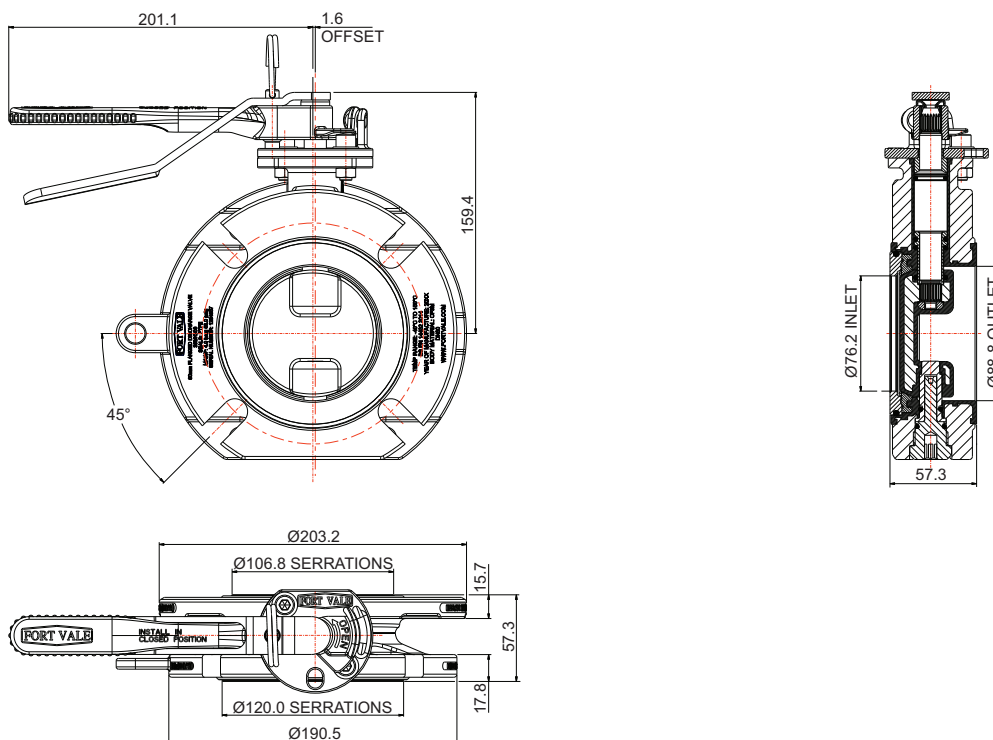
|                         |         |
|-------------------------|---------|
| Weight:                 | 7.3 Kg  |
| Design Pressure (MAWP): | 4 Bar   |
| Test Pressure:          | 6.8 Bar |
| Design Temperature Min: | -40°C   |
| Design Temperature Max: | 150°C   |

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

## Design Codes

BS EN 14432

## Section View

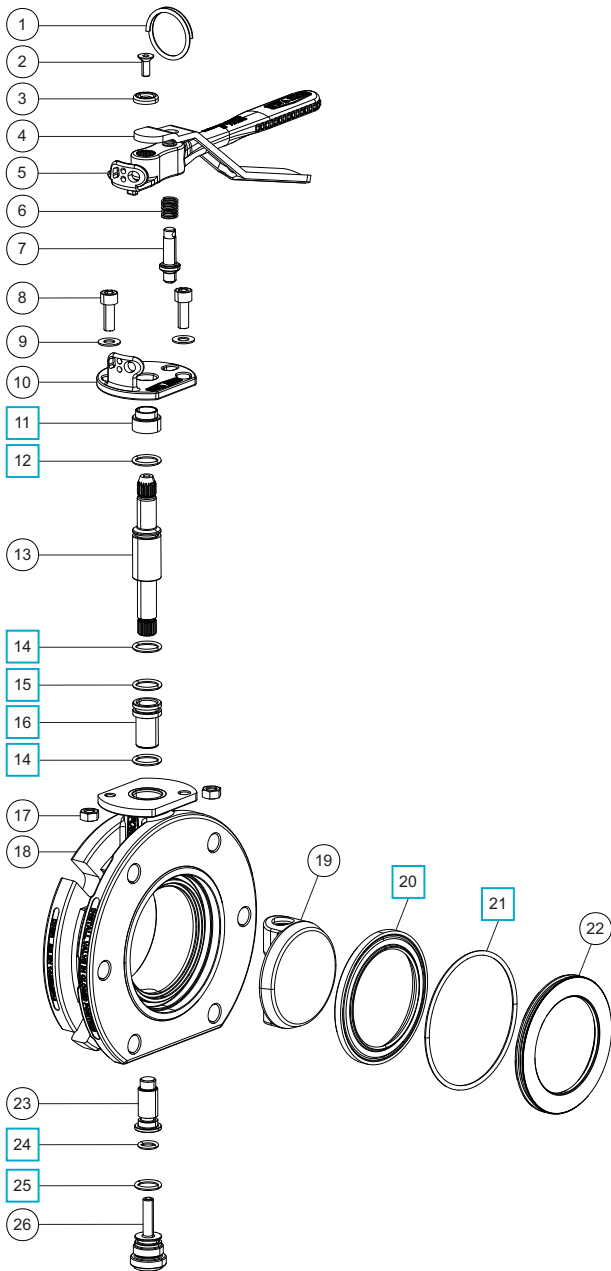




# 3" Flanged Butterfly Valve - PVDF Lined

Part No: 368/K300

## Parts Drawing



## Parts List

| Item | Description                   | Part No.    |                          |
|------|-------------------------------|-------------|--------------------------|
| 1    | Split ring                    | 368/0011    |                          |
| 2    | M6 countersunk bolt           | 5111-030    |                          |
| 3    | Retaining washer              | 20370       |                          |
| 4    | Handle lever                  | 368/9837    |                          |
| 5    | Handle                        | 368/0050    |                          |
| 6    | Handle 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   | Top bush                      | 368/K308    | <input type="checkbox"/> |
| 12   | Viton O ring                  | ORB115VL    | <input type="checkbox"/> |
| 13   | Spindle                       | 368/K310    |                          |
| 14   | Perfluoroelastomer O ring (2) | 5005-370P   | <input type="checkbox"/> |
| 15   | PTFE O ring                   | ORB115P0    | <input type="checkbox"/> |
| 16   | PVDF top spindle sleeve       | 368/K309    | <input type="checkbox"/> |
| 17   | M8 full nut                   | 5112-001    |                          |
| 18   | PVDF lined body               | 368/K301    |                          |
| 19   | PVDF lined closure plate      | 368/K306    |                          |
| 20   | PTFE main seal                | 368/0002    | <input type="checkbox"/> |
| 21   | Nitrile O ring                | 5005-342    | <input type="checkbox"/> |
| 22   | PVDF seal clamp               | 368/9148K   |                          |
| 23   | PVDF bottom spindle sleeve    | 368/K307    |                          |
| 24   | Perfluoroelastomer O ring     | 10133PHT    | <input type="checkbox"/> |
| 25   | Viton O ring                  | 5005-134VLT | <input type="checkbox"/> |
| 26   | Lower spindle                 | 368/K315    |                          |

## Seal Kit

| Description   | Part No.   |
|---|------------|
| All parts marked <input type="checkbox"/> in the Parts List | 368/K300SK |





# 3" Cleanflow Footvalve with 45° Outlet - PFA Lined

Part No: 845/P1205



## Specification

### Nominal size/body angle

80mm / 45°

### Inlet connection

Flanged: 8 x 14mm holes equi-spaced on a 178mm PCD

### Outlet connection

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

### Properties

2-part body assembly: inlet cassette with poppet and operating assembly; 45° outlet assembly

### Materials

Inlet cassette and outlet assembly contact parts: 316 stainless steel with PFA moulded lining

Main seal: Fortyt

Alternatives are available, refer to Range

## Design Conditions

|                         |         |
|-------------------------|---------|
| Weight:                 | 17.7 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 EN 14433

## Range

| Description   | Part No.  |
|---|-----------|
| 3" 45° valve, PFA lined inlet/outlet                | 845/P1205 |
| 3" 30° valve, PFA lined inlet, Halar ® lined outlet | 848/P1000 |
| 3" 90° valve, PFA lined inlet, Halar ® lined outlet | 844/P3000 |

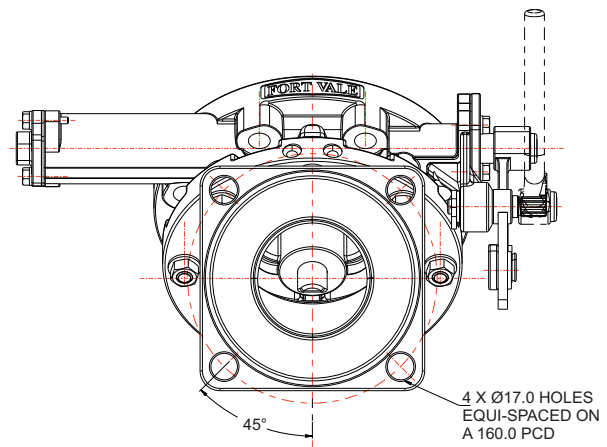
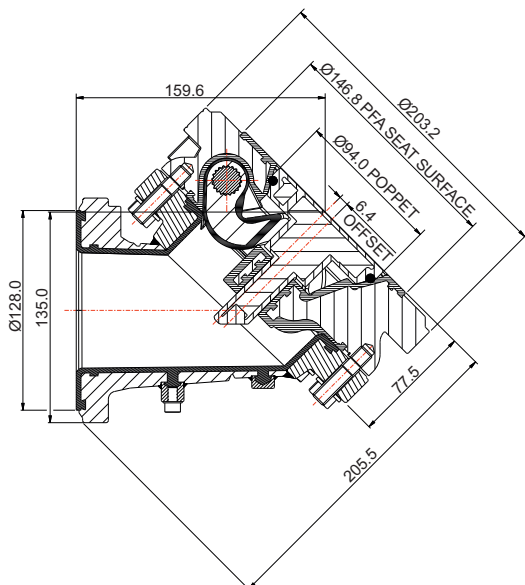
## Related Parts

| Description               | Part No.  |
|---------------------------|-----------|
| Weld-in flange for lining | 324/9000L |
| Stud kit                  | 845/P128  |

**GASKETS:** Do not install an inlet gasket. Do not install a gasket between the inlet cassette and the outlet assembly.

If a Fort Vale PFA lined ball valve or PFA lined butterfly valve is installed to the outlet assembly, do not install an intermediate gasket.

## Section View

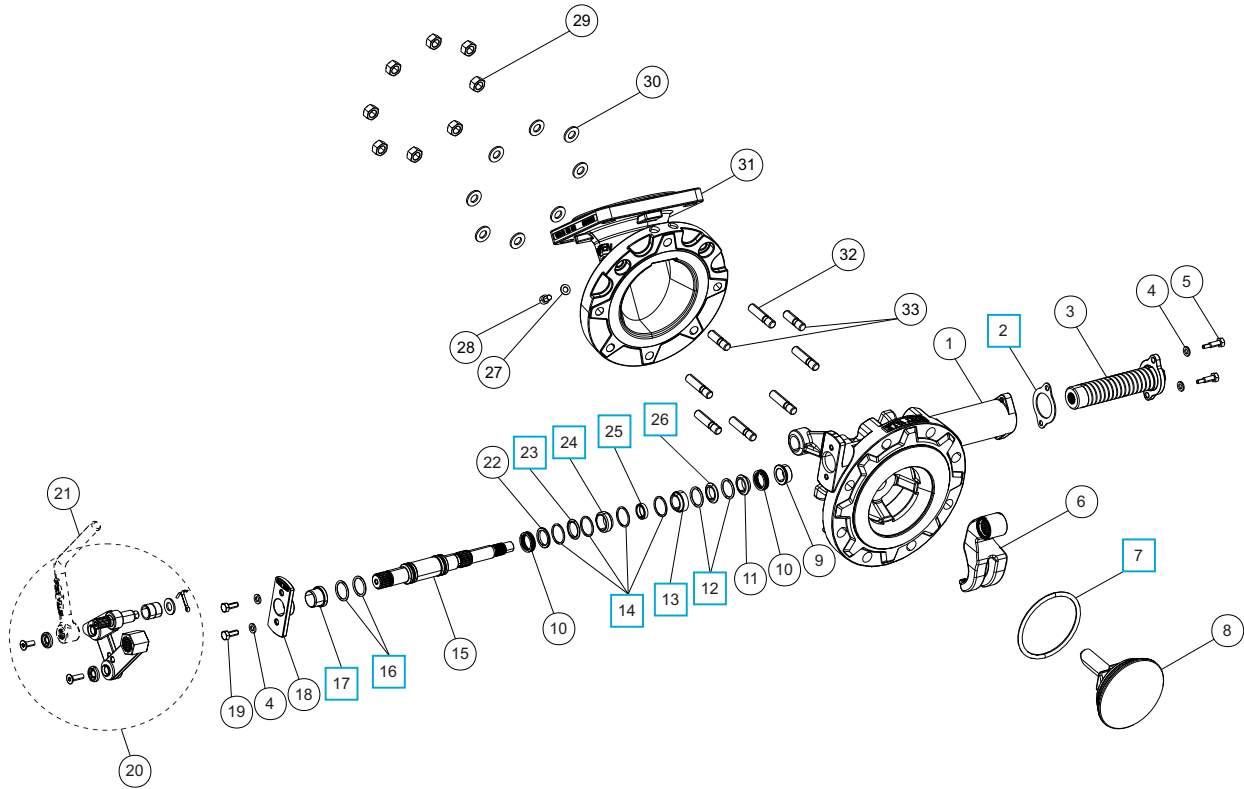




# 3" Cleanflow Footvalve with 45° Outlet - PFA Lined

Part No: 845/P1205

## Parts Drawing



### Parts List

| Item | Description                   | Part No.                            |
|------|-------------------------------|-------------------------------------|
| 1    | PFA lined body                | 845/P137LM                          |
| 2    | Spring housing gasket         | 5005-846 <input type="checkbox"/>   |
| 3    | Torsion spring assembly       | 875/0050                            |
| 4    | M6 spring washer (4)          | 5113-008                            |
| 5    | M6 special hex screw (2)      | 845/0017                            |
| 6    | PFA lined lifting fork        | 845/P124L                           |
| 7    | Fortyt O ring                 | 5005-104H <input type="checkbox"/>  |
| 8    | PFA lined poppet              | 845/P125LM                          |
| 9    | Spindle bearing               | 845/P127/3                          |
| 10   | Spirawave spring (2)          | 5104-027                            |
| 11   | Spring housing bush           | 845/P127/4                          |
| 12   | Perfluoroelastomer O ring (2) | ORB117KD <input type="checkbox"/>   |
| 13   | Spindle bush                  | 845/P127/2 <input type="checkbox"/> |
| 14   | Perfluoroelastomer O ring (4) | ORB020KD <input type="checkbox"/>   |
| 15   | Main spindle                  | 845/P126                            |
| 16   | Viton O ring (2)              | 5005-336 <input type="checkbox"/>   |
| 17   | RTFE spindle stuffing seal    | 845/0061 <input type="checkbox"/>   |
| 18   | Stuffing clamp flange         | 845/0016                            |
| 19   | M6 x 16mm hex head bolt (2)   | 5111-022                            |
| 20   | Handle linkage assembly       | 324/8910                            |
| 21   | Handle - supplied separate    | 324/8670                            |
| 22   | Wave spring seating washer    | 845/P127/5                          |
| 23   | Handle side chevron           | 845/P127/6 <input type="checkbox"/> |

### Parts List

| Item | Description                   | Part No.                            |
|------|-------------------------------|-------------------------------------|
| 24   | Spindle bush                  | 845/P127/1 <input type="checkbox"/> |
| 25   | Support ring                  | 845/P127/8 <input type="checkbox"/> |
| 26   | Spring side chevron           | 845/P127/7 <input type="checkbox"/> |
| 27   | M6 plain washer               | 5113-001                            |
| 28   | M6 cap screw                  | 5111-061                            |
| 29   | M10 full nut (8)              | 5112-002                            |
| 30   | M10 washer (8)                | 5113-025                            |
| 31   | 45° PFA lined outlet assembly | 845/P123/45P                        |
| 32   | M10 x 45mm stud (6)           | 371/0002                            |
| 33   | M10 x 35mm stud (2)           | 371/0001                            |

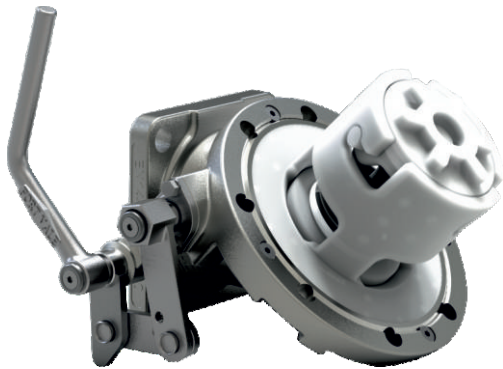
### Seal Kit

| Description   | Part No.  |
|---|-----------|
| All parts marked <input type="checkbox"/> in the Parts List | 845/P12SK |



## 3" 45° Cleanlift Footvalve - PFA Lined

Part No: 870/P1200



### Specification

#### Nominal size/body angle

80mm / 45°

#### Inlet connection

Flanged: 8 x 14mm holes equi-spaced on a 178mm PCD

#### Outlet connection

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

#### Materials

Contact parts: 316 stainless steel with PFA moulded lining

Main seal: Fortyt

### Design Conditions

|                         |         |
|-------------------------|---------|
| Weight:                 | 11.9 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 EN 14433

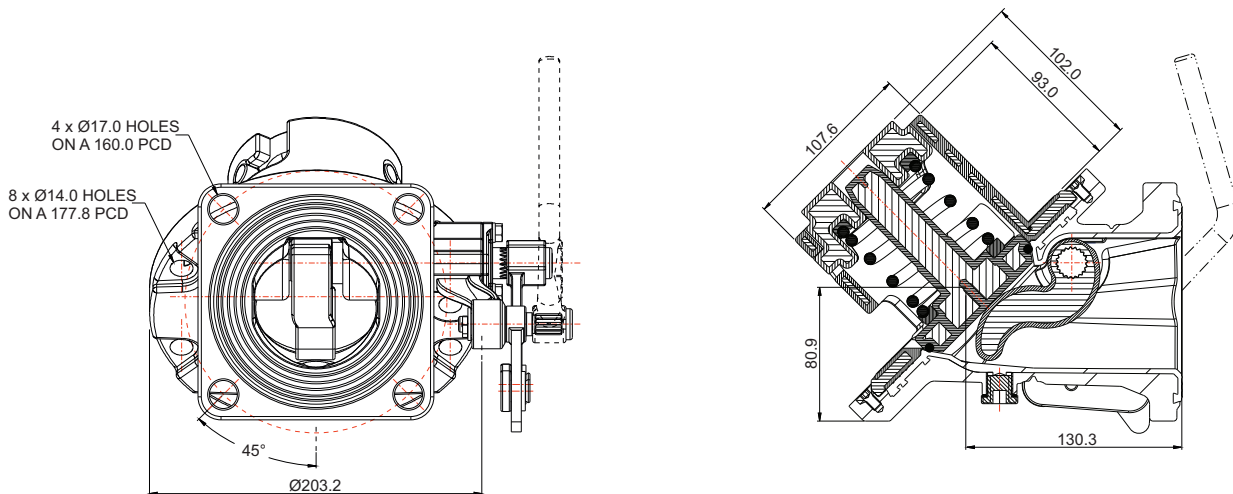
### Related Parts

| Description               | Part No.  |
|---------------------------|-----------|
| Weld-in flange for lining | 324/9000L |
| Stud kit                  | 312/1177  |

**GASKETS:** Do not install an inlet gasket.

If you install a Fort Vale PFA lined ball valve or PFA lined butterfly valve to the outlet, do not install an intermediate gasket.

### Section View

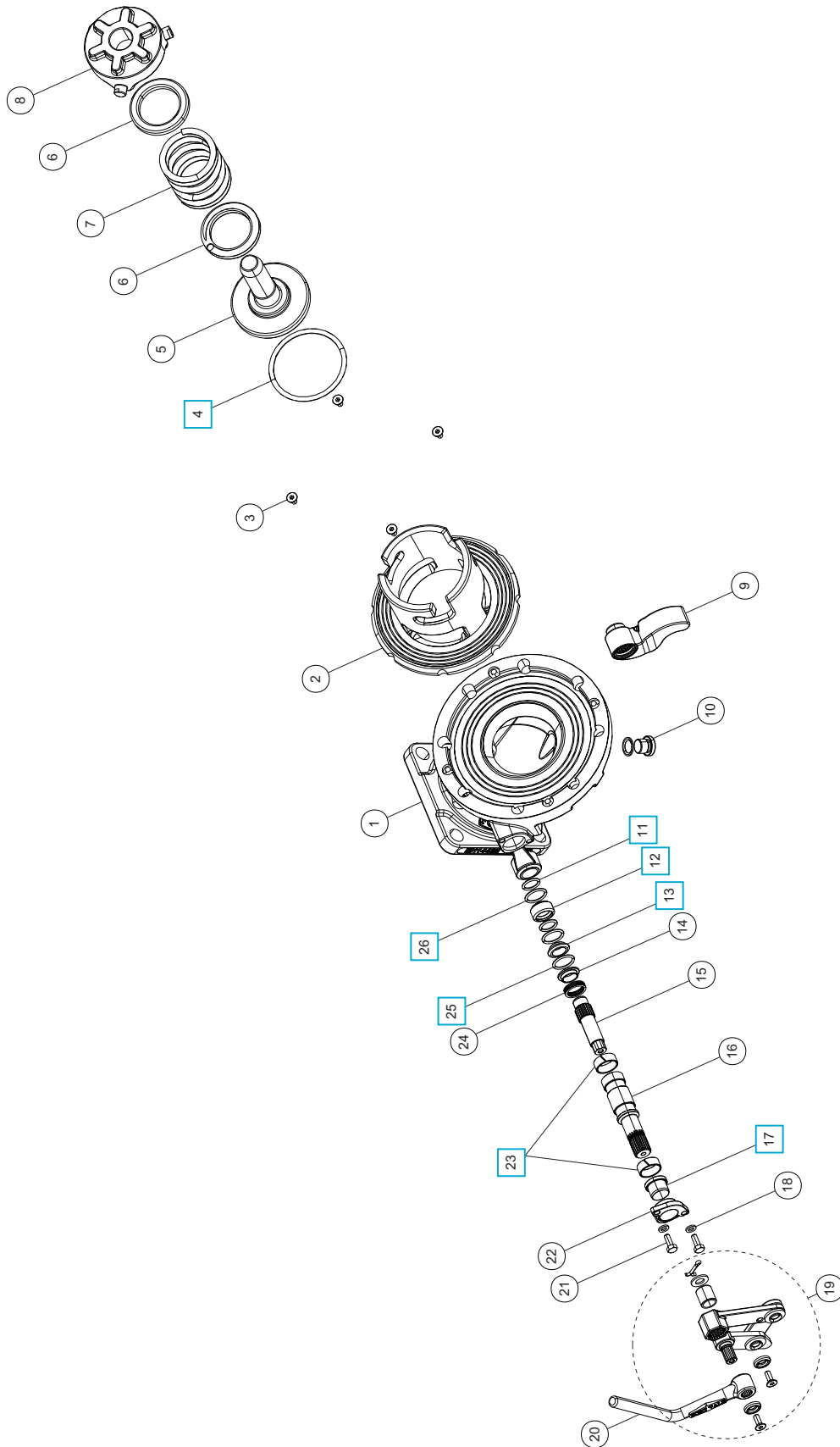




# 3" 45° Cleanlift Footvalve - PFA Lined

Part No: 870/P1200

## Parts Drawing





## 3" 45° Cleanlift Footvalve - PFA Lined

Part No: 870/P1200

### Parts List

| Item | Description                   | Part No.                            |
|------|-------------------------------|-------------------------------------|
| 1    | PFA lined body                | 870/P1370LM                         |
| 2    | PFA lined cage                | 870/P1371LM                         |
| 3    | 6mm countersunk bolt (4)      | 5111-018                            |
| 4    | Fortyt O ring                 | ORB337F1 <input type="checkbox"/>   |
| 5    | PFA lined poppet              | 870/P125LM                          |
| 6    | PTFE spring support plate (2) | 870/1146                            |
| 7    | PFA lined spring              | 5104-865P                           |
| 8    | PFA lined spring retainer cap | 870/P1374LM                         |
| 9    | PFA lined lifting fork        | 870/P124LM                          |
| 10   | M16 plug with seal            | 5128-333                            |
| 11   | Viton O ring (2)              | 5005-134V <input type="checkbox"/>  |
| 12   | RTFE spindle bush             | 870/P127/1 <input type="checkbox"/> |
| 13   | RTFE spindle bush             | 870/P127/2 <input type="checkbox"/> |
| 14   | Spring housing bush           | 845/P127/4                          |
| 15   | Spindle section 2             | 870/P128                            |
| 16   | Spindle section 1             | 870/P129                            |
| 17   | PTFE spindle stuffing seal    | 845/0061 <input type="checkbox"/>   |
| 18   | M6 spring washer (2)          | 5113-008                            |
| 19   | Handle linkage assembly       | 324/8910                            |
| 20   | Handle <b>*Note</b>           | 324/8670                            |
| 21   | M6 hex bolt (2)               | 5111-022                            |
| 22   | Stuffing clamp flange         | 870/P1376C                          |
| 23   | Split bearing (2)             | 874/0023 <input type="checkbox"/>   |
| 24   | Spirawave spring              | 5104-027                            |
| 25   | Viton O ring                  | 5005-336 <input type="checkbox"/>   |
| 26   | Perfluoroelastomer O ring (2) | ORB117KD <input type="checkbox"/>   |

**NOTE:** The handle is sold separately. We recommend the handle shown, but other types are available.

### Seal Kit

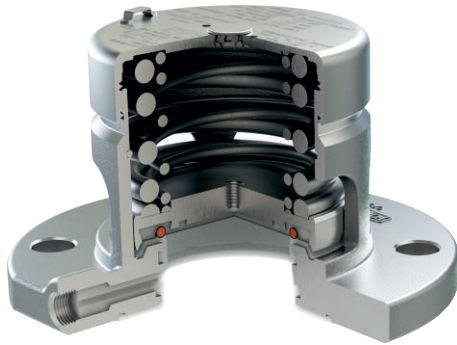
| Description   | Part No.  |
|---|-----------|
| All parts marked <input type="checkbox"/> in the Parts List | 870/P12SK |

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# 65mm Super Maxi Relief Valve - PFA Lined Pressure Only

Part No: 0U3/1XXX006SL - Metric Setting



## Specification

### Nominal size

DN65

### Tank connection

Flanged: 4 x 18mm slots on a 145.0mm/152.4mm min/max PCD. 1/4" BSP gauge connection

### Set pressure

From 0.15 Bar to 5.15 Bar

### Options

Finish: Corrosion-resistant paint on external surfaces to prevent damage from corrosive cargo vapour/splash

### Materials

Body & pressure plate: PFA lined

Springs: Halar® coated

Pressure O ring: Fortyt

Alternatives are available, refer to the Design Options page

## Design Conditions

|                         |          |
|-------------------------|----------|
| Weight:                 | 5.7 Kg   |
| Design Pressure (MAWP): | 6 Bar    |
| Test Pressure:          | 10.1 Bar |
| Design Temperature Min: | -55°C    |
| Design Temperature Max: | 150°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.

## Design Codes

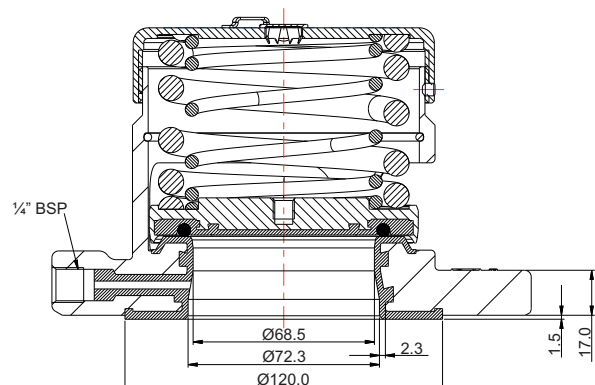
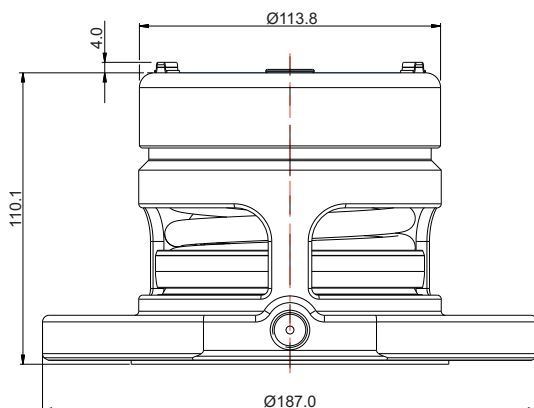
Design Approval by Lloyds Register of Shipping

**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.

## Related Parts

| Description  | Part No.   |
|--|------------|
| 0-7 Bar pressure gauge, brass internal parts           | 921/07BBSP |
| 0-7 Bar pressure gauge, stainless steel internal parts | 920/07BBSP |
| Flame arrester <b>*Warning</b>                         | 176/2900   |
| M16 stud kit: 150 & 152.4 PCD                          | 311/3700   |
| M16 cap screw bolt kit: 145 & 146 PCD                  | 311/3785   |

## Section View

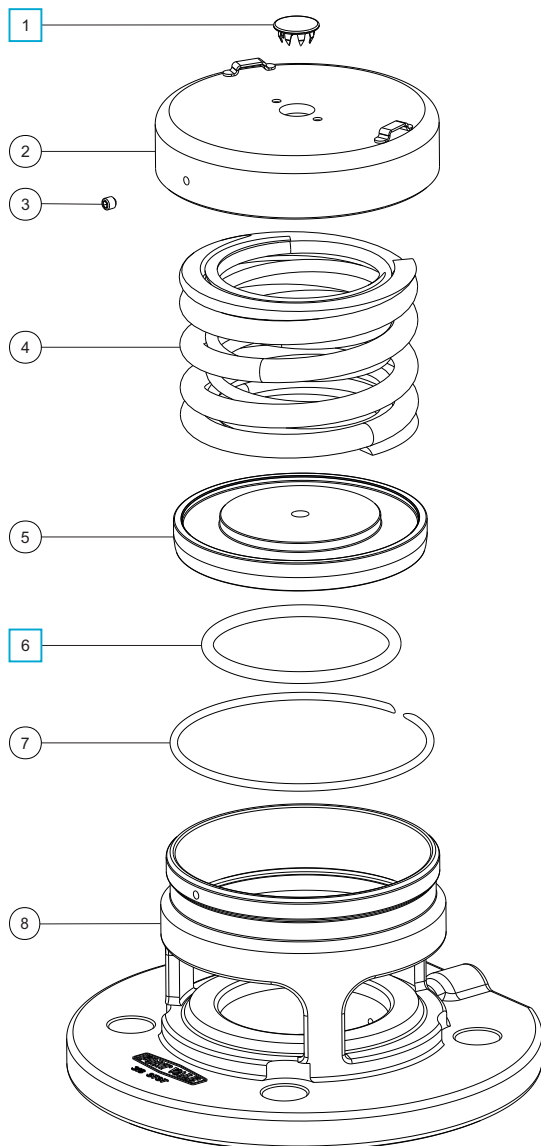




# 65mm Super Maxi Relief Valve - PFA Lined Pressure Only

Part No: 0U3/1XXX006SL - Metric Setting

## Parts Drawing



## Parts List

| Item | Description                           | Part No.                          |
|------|---------------------------------------|-----------------------------------|
| 1    | Stainless steel plug                  | 10978 <input type="checkbox"/>    |
| 2    | Cap <b>*Note</b>                      | 1860/0046XXX                      |
| 3    | Anti-tamper screw                     | 5121-001                          |
| 4    | Halar® coated springs <b>*Note</b>    | 6104-XXXXX                        |
| 5    | PFA lined pressure plate <b>*Note</b> | 1860/PX58XXX                      |
| 6    | Fortyt pressure O ring                | 5005-101 <input type="checkbox"/> |
| 7    | Retaining ring clip                   | 5120-067                          |
| 8    | PFA lined body                        | 1860/06SLU                        |

**NOTE:** The valve specification changes the Part No.

## Seal Kit

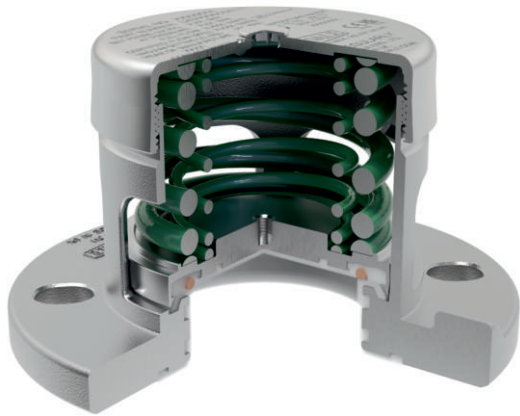
| Description   | Part No. |
|---|----------|
| All parts marked <input type="checkbox"/> in the Parts List | 000/1PSK |





# 82.5mm Hyper Maxi Relief Valve - PFA Lined Pressure Only

Part No: U43/1XXX0082S



## Specification

### Nominal size

DN80

### Tank connection

Flanged: 4 slots equi-spaced on a 145.0/152.4 min/max PCD

### Set pressure

From 0.05 Bar to 5.2 Bar

### Materials

Body & pressure plate: PFA lined

Springs: Halar® coated

Pressure O ring: Fortyt

Alternatives are available, refer to Range

## Design Conditions

|                         |         |
|-------------------------|---------|
| Weight:                 | 6.6 Kg  |
| Design Pressure (MAWP): | 5.2 Bar |
| Test Pressure:          | 10 Bar  |
| Design Temperature Min: | -55°C   |
| Design Temperature Max: | 150°C   |

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

### Approval

Design Approval by Lloyds Register of Shipping for valves with a setting of  $\geq 1.7$  Bar.

**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.

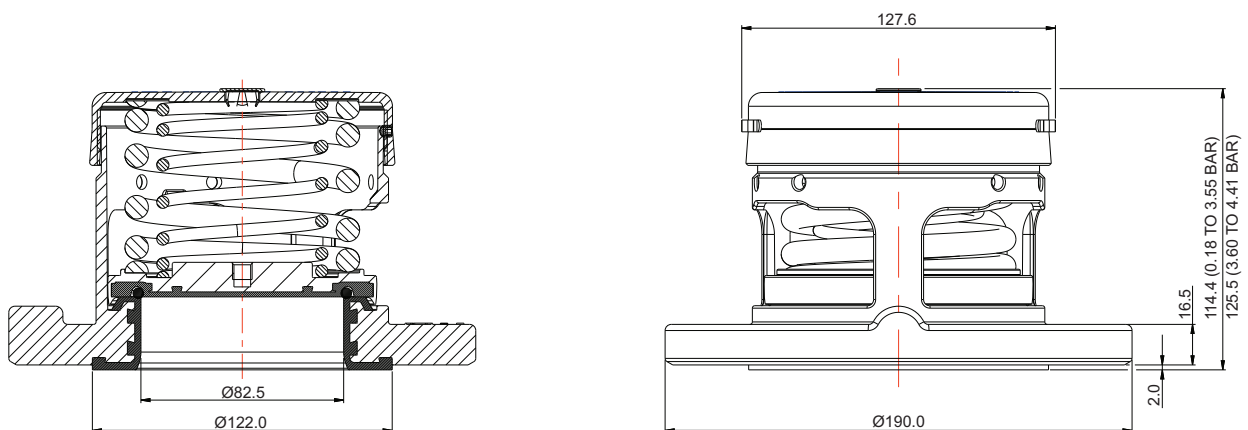
## Range

| Description                     | Part No.        |
|---------------------------------|-----------------|
| No gauge hole                   | U43/1XXX0082S   |
| With 1/4" BSP gauge hole        | U43/1XXX0082SG  |
| Alloy C276 cap and painted body | U43/1XXX0082SPA |

## Related Parts

| Description  | Part No.     |
|--|--------------|
| 0-7 Bar pressure gauge, brass internal parts           | 921/07BBSP   |
| 0-7 Bar pressure gauge, stainless steel internal parts | 920/07BBSP   |
| 1/4" BSP gauge adaptor                                 | 1860/08BSP/4 |
| M16 stud kit: 150 & 152.4 PCD                          | 311/3700     |
| M16 cap screw bolt kit: 145 & 146 PCD                  | 311/3785     |

## Section View

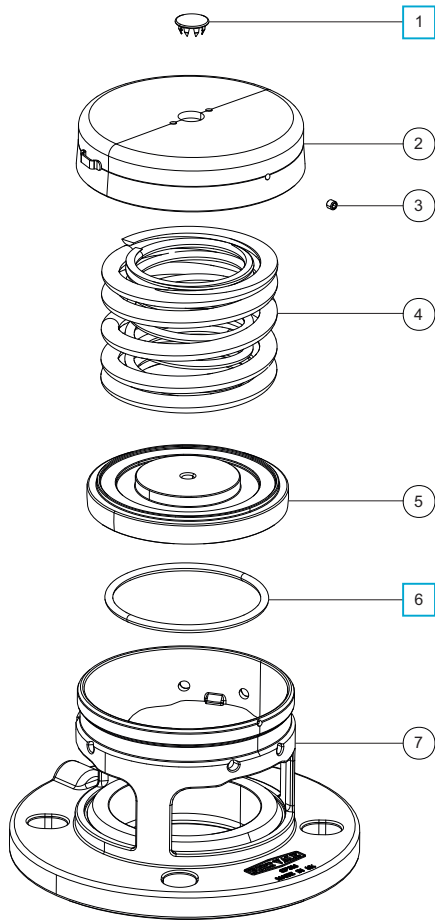




# 82.5mm Hyper Maxi Relief Valve - PFA Lined Pressure Only

Part No: U43/1XXX0082S

## Parts Drawing



## Parts List

| Item | Description                    | Part No.                          |
|------|--------------------------------|-----------------------------------|
| 1    | Stainless steel plug           | 10978 <input type="checkbox"/>    |
| 2    | Cap *Note                      | 1860/1XXXXXX                      |
| 3    | Anti-tamper screw              | 5121-001                          |
| 4    | Halar® coated springs *Note    | 6104-XXXX                         |
| 5    | PFA lined pressure plate *Note | 1860/P080XXX                      |
| 6    | Fortyt pressure O ring         | ORB337F0 <input type="checkbox"/> |
| 7    | PFA lined body                 | 1860/19SLP                        |

**NOTE:** The valve specification changes the Part No.

## Seal Kit

| Description   | Part No. |
|---|----------|
| All parts marked <input type="checkbox"/> in the Parts List | 043/1PSK |



# 82.5mm Hyper Maxi Relief Valve - PFA Lined Pressure/Vacuum

Part No: U43/1XXXXX82S



## Specification

### Nominal size

DN80

### Tank connection

Flanged: 4 slots equi-spaced on a 145.0/152.4 min/max PCD

### Set pressure

From 0.05 Bar to 5.2 Bar

### Set vacuum

From 1 kPa to 88 kPa

### Materials

Body, pressure plate, vacuum poppet: PFA lined

Pressure springs: Halar® coated

Vacuum spring: Alloy 276

Pressure/vacuum O rings: Fortyt

Alternatives are available, refer to Range

## Design Conditions

|                         |         |
|-------------------------|---------|
| Weight:                 | 6.7 Kg  |
| Design Pressure (MAWP): | 5.2 Bar |
| Test Pressure:          | 10 Bar  |
| Design Temperature Min: | -55°C   |
| Design Temperature Max: | 150°C   |

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

### Approval

Design Approval by Lloyds Register of Shipping for valves with a setting of  $\geq 1.7$  Bar.

**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

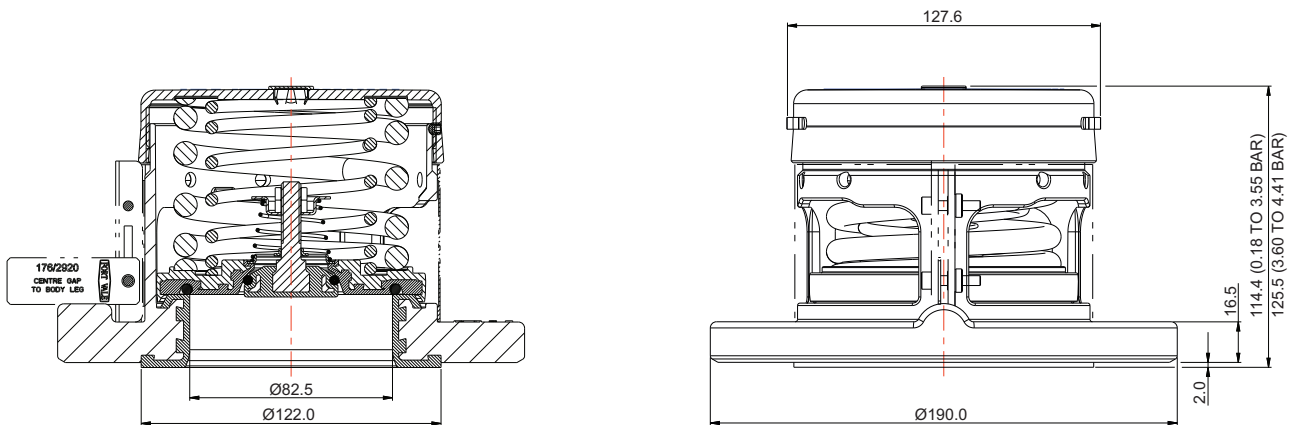
| Description                     | Part No.        |
|---------------------------------|-----------------|
| No gauge hole                   | U43/1XXXXX82S   |
| With 1/4" BSP gauge hole        | U43/1XXXXX82SG  |
| Alloy C276 cap and painted body | U43/1XXXXX82SPA |

## Related Parts

| Description  | Part No.     |
|--|--------------|
| 0-7 Bar pressure gauge, brass internal parts           | 921/07BBSP   |
| 0-7 Bar pressure gauge, stainless steel internal parts | 920/07BBSP   |
| 1/4" BSP gauge adaptor                                 | 1860/08BSP/4 |
| Flame arrester <b>*Warning</b>                         | 176/2920     |
| M16 stud kit: 150 & 152.4 PCD                          | 311/3700     |
| M16 cap screw bolt kit: 145 & 146 PCD                  | 311/3785     |

## Section View

Shown with a flame arrester installed

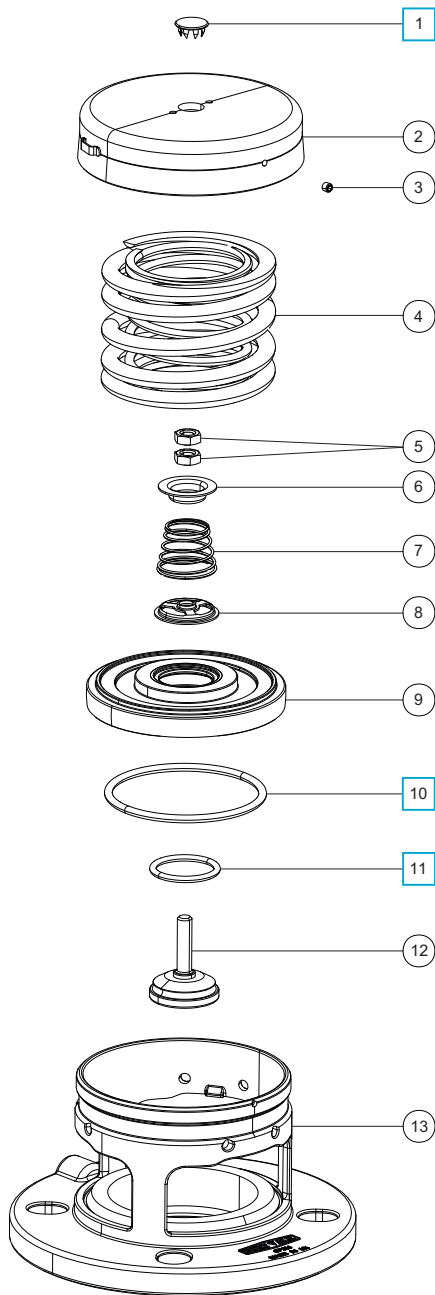




# 82.5mm Hyper Maxi Relief Valve - PFA Lined Pressure/Vacuum

Part No: U43/1XXXXX82S

## Parts Drawing



## Parts List

| Item | Description                           | Part No.                           |
|------|---------------------------------------|------------------------------------|
| 1    | Stainless steel plug                  | 10978 <input type="checkbox"/>     |
| 2    | Cap <b>*Note</b>                      | 1860/1XXXXXX                       |
| 3    | Anti-tamper screw                     | 5121-001                           |
| 4    | Halar® coated springs <b>*Note</b>    | 6104-XXXX                          |
| 5    | M8 half nut (2)                       | 5112-039H                          |
| 6    | Vacuum spring pad                     | 1860/0005H                         |
| 7    | Alloy 276 vacuum spring <b>*Note</b>  | 7104-XXXH                          |
| 8    | Spring pad                            | 10986/3H                           |
| 9    | PFA lined pressure plate <b>*Note</b> | 1860/P081XXX                       |
| 10   | Fortyt pressure O ring                | ORB337F0 <input type="checkbox"/>  |
| 11   | Fortyt vacuum O ring                  | 5005-108H <input type="checkbox"/> |
| 12   | PFA lined vacuum poppet               | 10983V/P                           |
| 13   | PFA lined body                        | 1860/19SLP                         |

**NOTE:** The valve specification changes the Part No.

## Seal Kit

| Description   | Part No.  |
|---|-----------|
| All parts marked <input type="checkbox"/> in the Parts List | 043/1PVSK |



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# APPENDIX

## Catalogue

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|   |  |
|---|--|
| A | Bolt Torque Guide & Step Loading Procedure     |
| B | Client Responsibilities - Valves & Accessories |

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# Bolt Torque Guide & Step Loading Procedure

## Installation & Operating Instructions

### 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 or a flange with distortion, you must re-calculate the torque value.

#### Bolt Torque Procedure

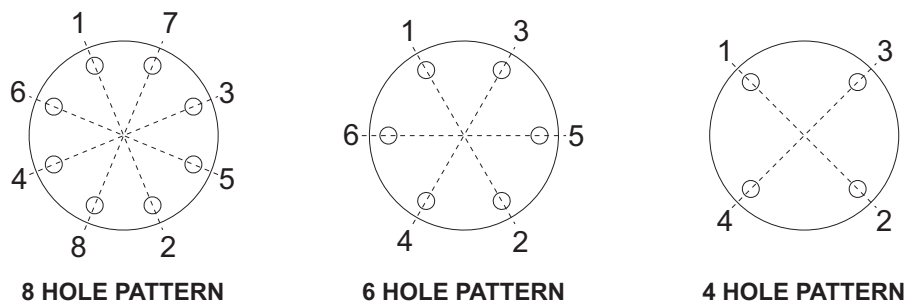
To install flanged parts correctly:

- 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. Refer to Figure BT1.
- Obey the Step Loading Procedure (ASME PCC-1-2000). Refer to the 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**





## **Bolt Torque Guide & Step Loading Procedure**

### **Installation & Operating Instructions**

---

### **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.





## Client Responsibilities - Valves & Accessories

### Installation, Operation & Maintenance Instructions

## 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 and Inspection

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 inspections that follow:

### Inspections 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 inspections more frequently.

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

### Inspections after 2½ years of service or a minor incident:

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.

### Inspections after 5 years of service or a major incident:

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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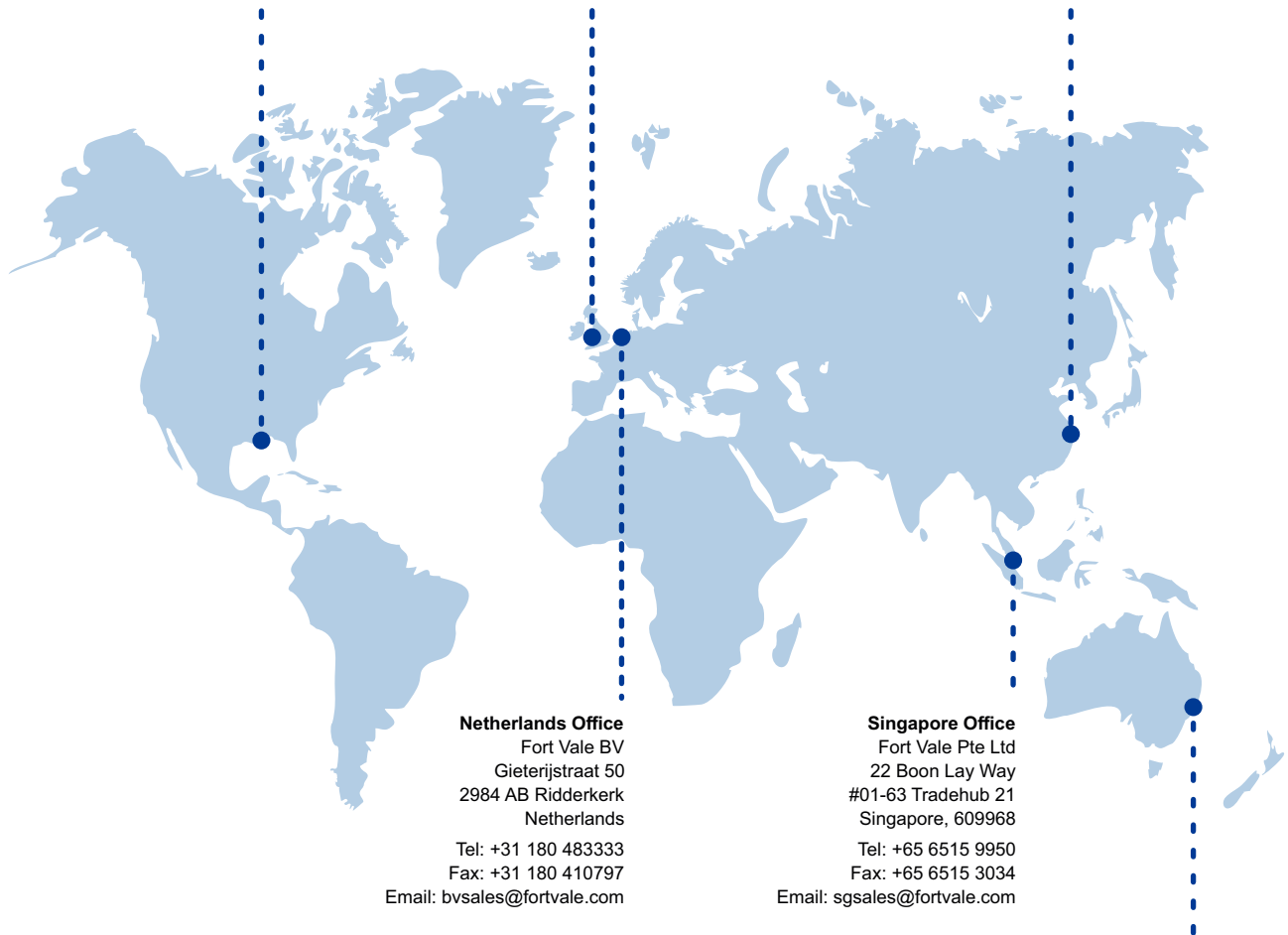
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