



## Catalogue

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# **Standard Range of Fire Safe & Lethal Service Ball Valves**





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## Fire Safe & Lethal Service Ball Valves

### Catalogue

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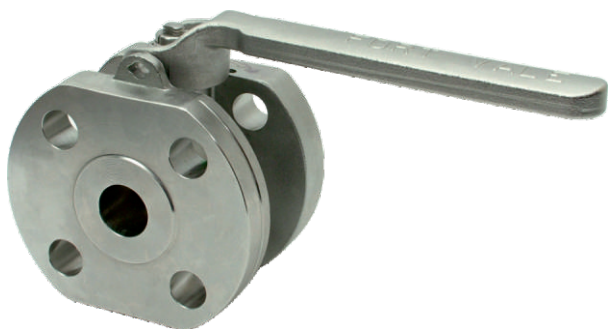
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# 1" Fire Safe / Lethal Service Ball Valve

Part No: 310/5000XXX



## Specification

### Nominal size

DN25

### Tank connection

Flanged: 4 x 18mm holes on a 89mm PCD

### Outlet/Process connection

Flanged: 4 x 18mm holes on a 89mm PCD

### Options

Fire safe specification or lethal service specification - refer to Design Conditions: NOTE

Left or right hand operation

### Materials

Contact parts: 316 stainless steel

Main seal: TFM PTFE

## Design Conditions

Weight:	4.77 Kg
Design Pressure (MAWP):	16 Bar
Test Pressure:	24 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	205°C

**NOTE:** The fire safe specification ball valve is not compatible with lethal service conditions. The lethal service specification ball valve is compatible with fire safe and lethal service conditions

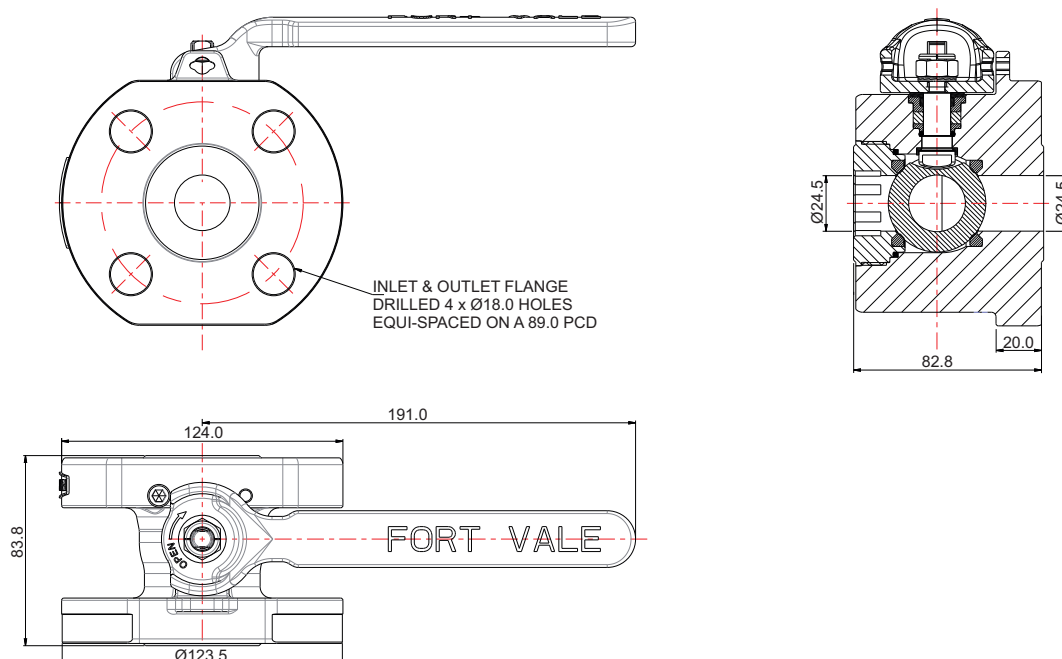
### Design Codes

BS EN14432, EN12516-2, EN10497  
API 607

## Range

Description	Part No.
1" fire safe valve, left hand	310/5000FSL
1" fire safe valve, right hand	310/5000FSR
1" fire safe/lethal service valve, left hand	310/5000LSL
1" fire safe/lethal service valve, right hand	310/5000LSR

## Section View

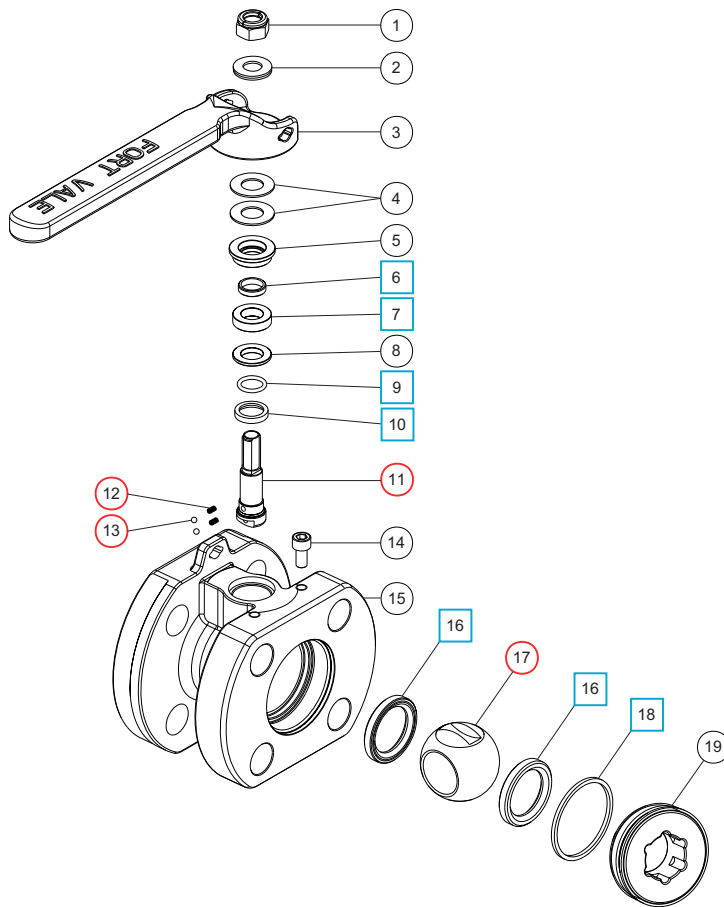




# 1" Fire Safe / Lethal Service Ball Valve

Part No: 310/5000XXX

## Parts Drawing



## Parts List

Item	Description	Part No.
1	M10 locking nut *Note	5112-008-XX
2	M10 locking washer (pair)	5113-191
3	Handle *Note	310/0125XX
4	12mm Belleville washer (2)	5113-045
5	Stuffing gland	310/3458
6	Bearing bush	310/3443 <span style="color: blue;">□</span> <span style="color: red;">○</span>
7	Gland seal	310/0133 <span style="color: blue;">□</span> <span style="color: red;">○</span>
8	Stuffing gland	310/0130
9	Perfluoroelastomer O ring	5005-212PER <span style="color: blue;">□</span> <span style="color: red;">○</span>
10	Bottom bearing	310/0104FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
11	Spindle	310/0120FS <span style="color: red;">○</span>
12	Plunger spring (2)	370-3469 <span style="color: red;">○</span>
13	3mm ball (2)	10154SS <span style="color: red;">○</span>
14	M6 cap screw	5111-034
15	1" ball valve body *Note	310/5010XX
16	TFM PTFE ball seat (2)	310/0102FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
17	Ball *Note	370/1002XX <span style="color: red;">○</span>
18	Body seal	310/0106GR <span style="color: blue;">□</span> <span style="color: red;">○</span>
19	Seal retainer	310/0176/2

NOTE: The valve specification changes the part number

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

Description	Part No.
For fire safe & lethal service valves	310/50LSK

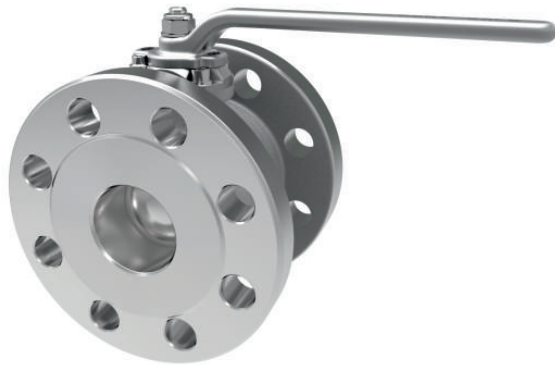
## Repair Kit - All parts marked ○ in the Parts List

Description	Part No.
For fire safe valves only	310/50FRK
For lethal service valves only	310/50LRK



## 2" Fire Safe / Lethal Service Ball Valve

Part No: 370/5000LSX



### Specification

#### Nominal size

DN50

#### Tank connection

Flanged: 8 x 19mm holes on a 127mm PCD

#### Outlet/Process connection

Flanged: 8 x 19mm holes on a 127mm PCD

#### Properties

Refer to Design Conditions: NOTE

#### Options

Left or right hand operation

#### Materials

Contact parts: 316 stainless steel

Main seal: TFM PTFE

### Design Conditions

Weight:	10.3 Kg
Design Pressure (MAWP):	16 Bar
Test Pressure:	29.2 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	205°C

**NOTE:** This lethal service specification ball valve is compatible with fire safe and lethal service conditions.

#### Design Codes

BS EN14432, EN12516-2, EN10497  
API 607

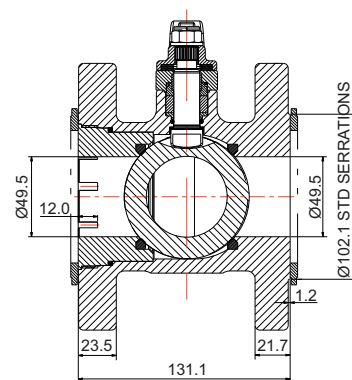
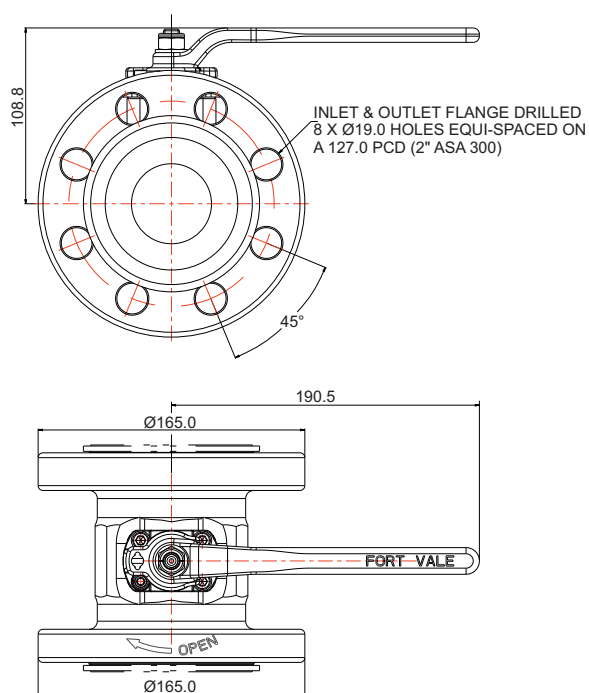
### Range

Description	Part No.
2" fire safe/lethal service valve, left hand	370/5000LSL
2" fire safe/lethal service valve, right hand	370/5000LSR

### Related Parts

Description	Part No.
Stainless steel/graphite spiral wound gasket: 2" ball valve inlet and outlet	5005-724SP

### Section View

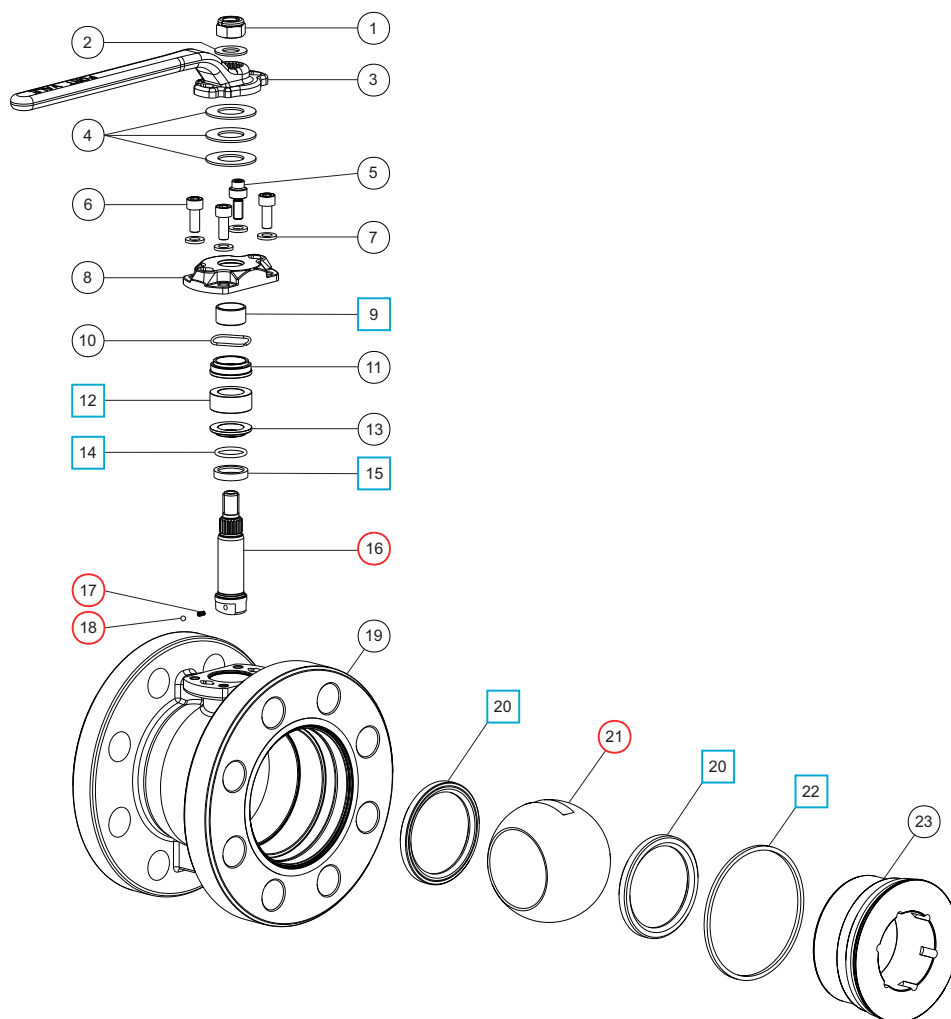




## 2" Fire Safe / Lethal Service Ball Valve

Part No: 370/5000LSX

### Parts Drawing



### Parts List

Item	Description	Part No.
1	M10 locking nut <b>*Note</b>	5112-008-XX
2	M10 washer	5113-009
3	Handle	370/0125
4	16mm Belleville washer (3)	5113-038
5	Stop pin <b>*Note</b>	370/3442-XX
6	M6 cap screw (3) <b>*Note</b>	5111-108-XX
7	M6 spring washer (4)	5113-008
8	Retaining gland <b>*Note</b>	370/3449XX
9	Bearing bush	370/3443 <span style="color: blue;">□</span> <span style="color: red;">○</span>
10	Wave spring	370/3457
11	Stuffing gland	370/3458
12	Gland seal	370/3353 <span style="color: blue;">□</span> <span style="color: red;">○</span>
13	Stuffing gland	370/3459
14	Perfluoroelastomer O ring	5005-216PER <span style="color: blue;">□</span> <span style="color: red;">○</span>
15	Bottom bearing	370/0104FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
16	Spindle	370/0120FS <span style="color: red;">○</span>
17	Plunger spring	370-3469 <span style="color: red;">○</span>

### Parts List

Item	Description	Part No.
18	3mm ball	10154SS <span style="color: red;">○</span>
19	2" ball valve body <b>*Note</b>	370/5001XXX
20	TFM PTFE ball seal (2)	370/0102FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
21	Ball <b>*Note</b>	370/3301XX <span style="color: red;">○</span>
22	Body seal	370/0106GR <span style="color: blue;">□</span> <span style="color: red;">○</span>
23	Seal retainer	370/5103

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

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

Description	Part No.
For fire safe & lethal service valves	370/50LSK

### Repair Kit - All parts marked ○ in the Parts List

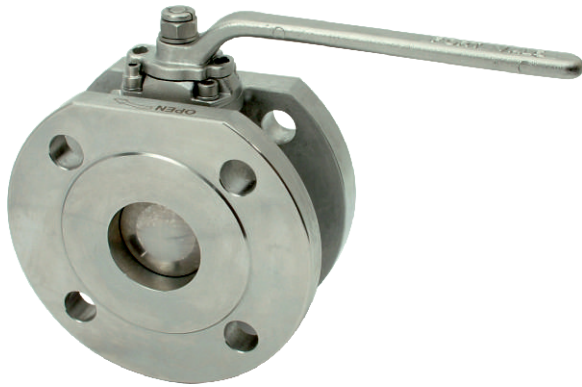
Description	Part No.
For fire safe valves only	370/50FRK
For lethal service valves only	370/50LRK





## 2" Fire Safe Ball Valve

Part No: 370/0100FSX



### Specification

#### Nominal size

DN50

#### Tank connection

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

#### Outlet/Process connection

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

#### Properties

Refer to Design Conditions: NOTE

#### Options

Left or right hand operation

#### Materials

Contact parts: 316 stainless steel

Main seal: TFM PTFE

### Design Conditions

Weight:	7.64 Kg
Design Pressure (MAWP):	16 Bar
Test Pressure:	29.4 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	205°C

**NOTE:** This fire safe specification ball valve is not compatible with lethal service conditions.

#### Design Codes

BS EN14432, EN12516-2, EN10497  
API 607

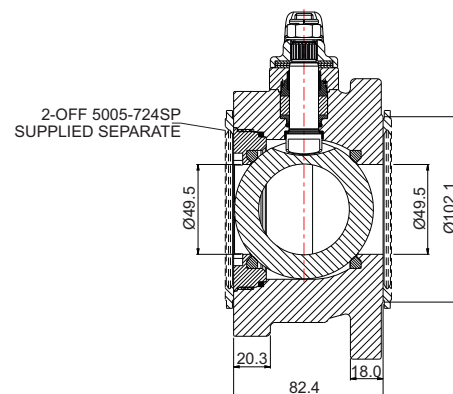
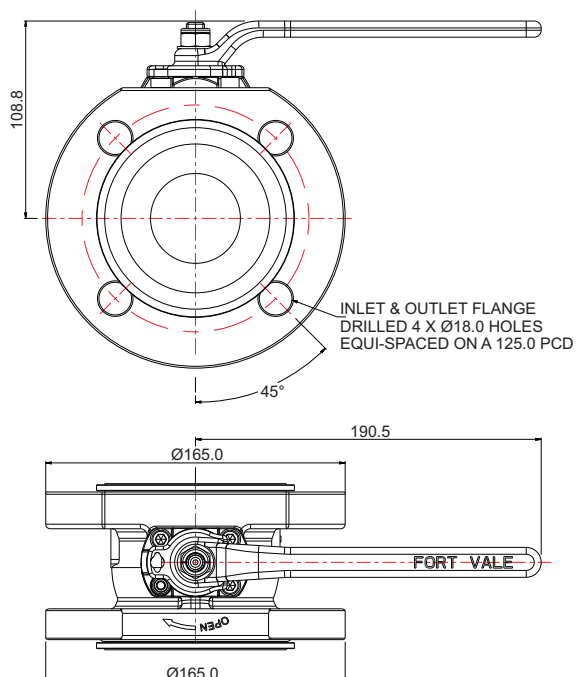
### Range

Description	Part No.
2" fire safe valve, left hand	370/0100FSL
2" fire safe valve, right hand	370/0100FSR

### Related Parts

Description	Part No.
Stainless steel/graphite spiral wound gasket: 2" ball valve inlet and outlet	5005-724SP

### Section View

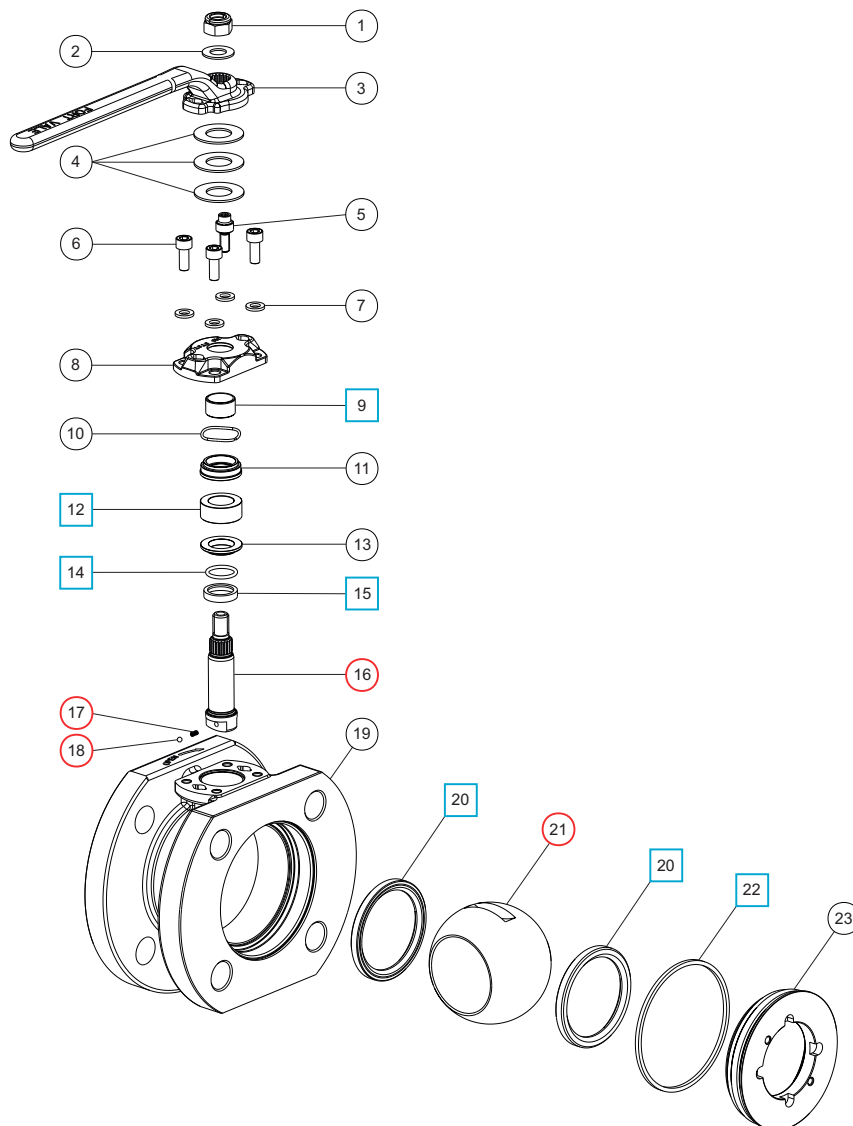




## 2" Fire Safe Ball Valve

Part No: 370/0100FSX

### Parts Drawing



### Parts List

Item	Description	Part No.
1	M10 locking nut	5112-008
2	M10 washer	5113-009
3	Handle	370/0125
4	16mm Belleville washer (3)	5113-038
5	Stop pin	370/3442
6	M6 cap screw (3)	5111-108
7	M6 spring washer (4)	5113-008
8	Retaining gland	370/3449
9	Bearing bush	370/3443 <span style="color: blue;">□</span> <span style="color: red;">○</span>
10	Wave spring	370/3457
11	Stuffing gland	370/3458
12	Gland seal	370/3353 <span style="color: blue;">□</span> <span style="color: red;">○</span>
13	Stuffing gland	370/3459
14	Perfluoroelastomer O ring	5005-216PER <span style="color: blue;">□</span> <span style="color: red;">○</span>
15	Bottom bearing	370/0104FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
16	Spindle	370/0120FS <span style="color: red;">○</span>

### Parts List

Item	Description	Part No.
17	Plunger spring	370-3469 <span style="color: red;">○</span>
18	3mm ball	10154SS <span style="color: red;">○</span>
19	2" ball valve body	370/0110FS
20	TFM PTFE ball seal (2)	370/0102FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
21	Ball	370/3301 <span style="color: red;">○</span>
22	Body seal	370/0106GR <span style="color: blue;">□</span> <span style="color: red;">○</span>
23	Seal retainer	370/0176/2

**Seal Kit** - All parts marked □ in the Parts List

Description	Part No.
For fire safe & lethal service valves	370/50LSK

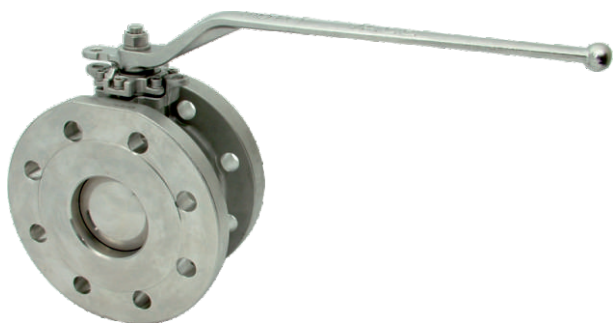
**Repair Kit** - All parts marked ○ in the Parts List

Description	Part No.
For fire safe valves only	370/50FRK



## 3" Fire Safe / Lethal Service Ball Valve

Part No: 360/5000XXX



### Specification

#### Nominal size

DN80

#### Tank connection

Flanged: 8 x 18mm holes on a 160mm PCD

#### Outlet/Process connection

Flanged: 8 x 18mm holes on a 160mm PCD

#### Options

Fire safe specification or lethal service specification - refer to Design Conditions: NOTE

Left or right hand operation

#### Materials

Contact parts: 316 stainless steel

Main seal: TFM PTFE

### Design Conditions

Weight:	17.0 Kg
Design Pressure (MAWP):	16 Bar
Test Pressure:	29.4 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	205°C

**NOTE:** The fire safe specification ball valve is not compatible with lethal service conditions. The lethal service specification ball valve is compatible with fire safe and lethal service conditions.

#### Design Codes

BS EN14432, EN12516-2, EN10497  
API 607

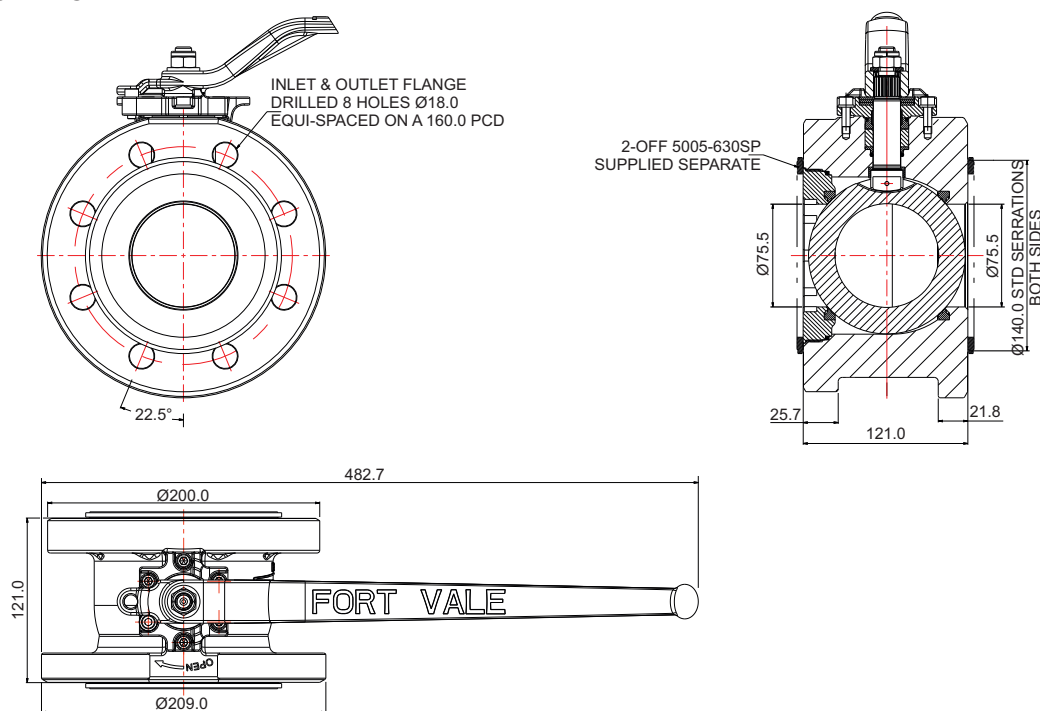
### Range

Description	Part No.
3" fire safe valve, left hand	360/5000FSL
3" fire safe valve, right hand	360/5000FSR
3" fire safe/lethal service valve, left hand	360/5000LSL
3" fire safe/lethal service valve, right hand	360/5000LSR

### Related Parts

Description	Part No.
Stainless steel/graphite spiral wound gasket: 3" ball valve inlet and outlet	5005-630SP

### Section View

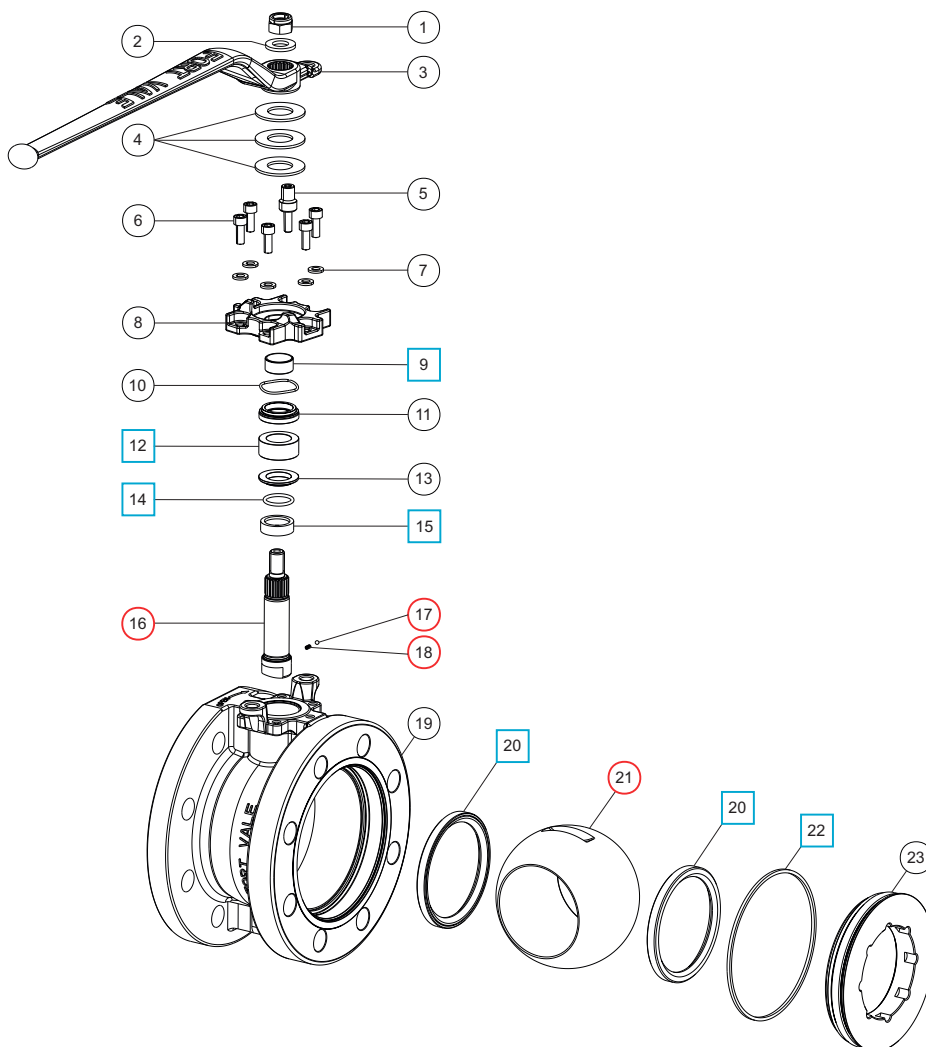




## 3" Fire Safe / Lethal Service Ball Valve

Part No: 360/5000XXX

### Parts Drawing



### Parts List

Item	Description	Part No.
1	M12 locking nut <b>*Note</b>	5112-007-XX
2	M12 washer	5123-003
3	Handle	360/3416FS
4	20mm Belleville washer (3)	5113-041
5	Stop bolt	360/5007
6	M6 cap screw (5) <b>*Note</b>	5111-015-XX
7	M6 spring washer (5)	5113-008
8	Retaining gland <b>*Note</b>	360/5005XX
9	Bearing bush	360/0182 <span style="color: blue;">□</span> <span style="color: red;">○</span>
10	Wave spring	360/3351
11	Stuffing gland	360/0180
12	Gland seal	360/3353 <span style="color: blue;">□</span> <span style="color: red;">○</span>
13	Stuffing gland	360/0181
14	Perfluoroelastomer O ring	5005-928HT <span style="color: blue;">□</span> <span style="color: red;">○</span>
15	Bearing bush	360/3421FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
16	Spindle	360/3422FS <span style="color: red;">○</span>
17	3mm ball	10154SS <span style="color: red;">○</span>

### Parts List

Item	Description	Part No.
18	Plunger spring	370-3469 <span style="color: red;">○</span>
19	3" ball valve body <b>*Note</b>	360/5014XX
20	TFM PTFE ball seal (2)	360/3402FS <span style="color: blue;">□</span> <span style="color: red;">○</span>
21	Ball <b>*Note</b>	360/3401XX <span style="color: red;">○</span>
22	Body seal	360/0106GR <span style="color: blue;">□</span> <span style="color: red;">○</span>
23	Seal retainer	360/0176/2

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

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

Description	Part No.
For fire safe & lethal service valves	360/50LSK

### Repair Kit - All parts marked ○ in the Parts List

Description	Part No.
For fire safe valves only	360/50FRK
For lethal service valves only	360/50LRK



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# APPENDIX

## Catalogue

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





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

#### Bolt Torque Procedure

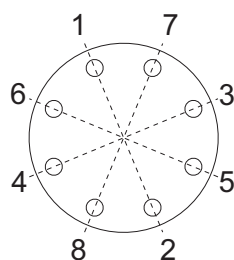
To install flanged parts correctly:

- 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.

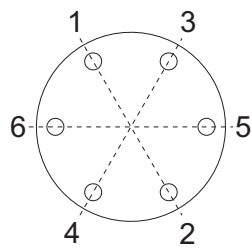
Table BT1

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

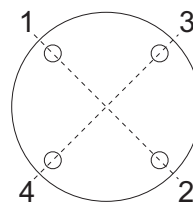
Figure BT1



8 HOLE PATTERN



6 HOLE PATTERN



4 HOLE PATTERN



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

### **Installation & Operating Instructions**

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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.





## 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/gas/liquid flow capacity
- maximum allowable working pressure
- test pressure
- minimum/maximum design temperatures
- materials of construction.

## Maintenance

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

### Visual checks at regular intervals:

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

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

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

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

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

### After 5 years of service, do the checks that follow:

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

## Replacement Parts

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

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

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

## External Fire

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

## Compatibility of Accessories

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

## Mis-use

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





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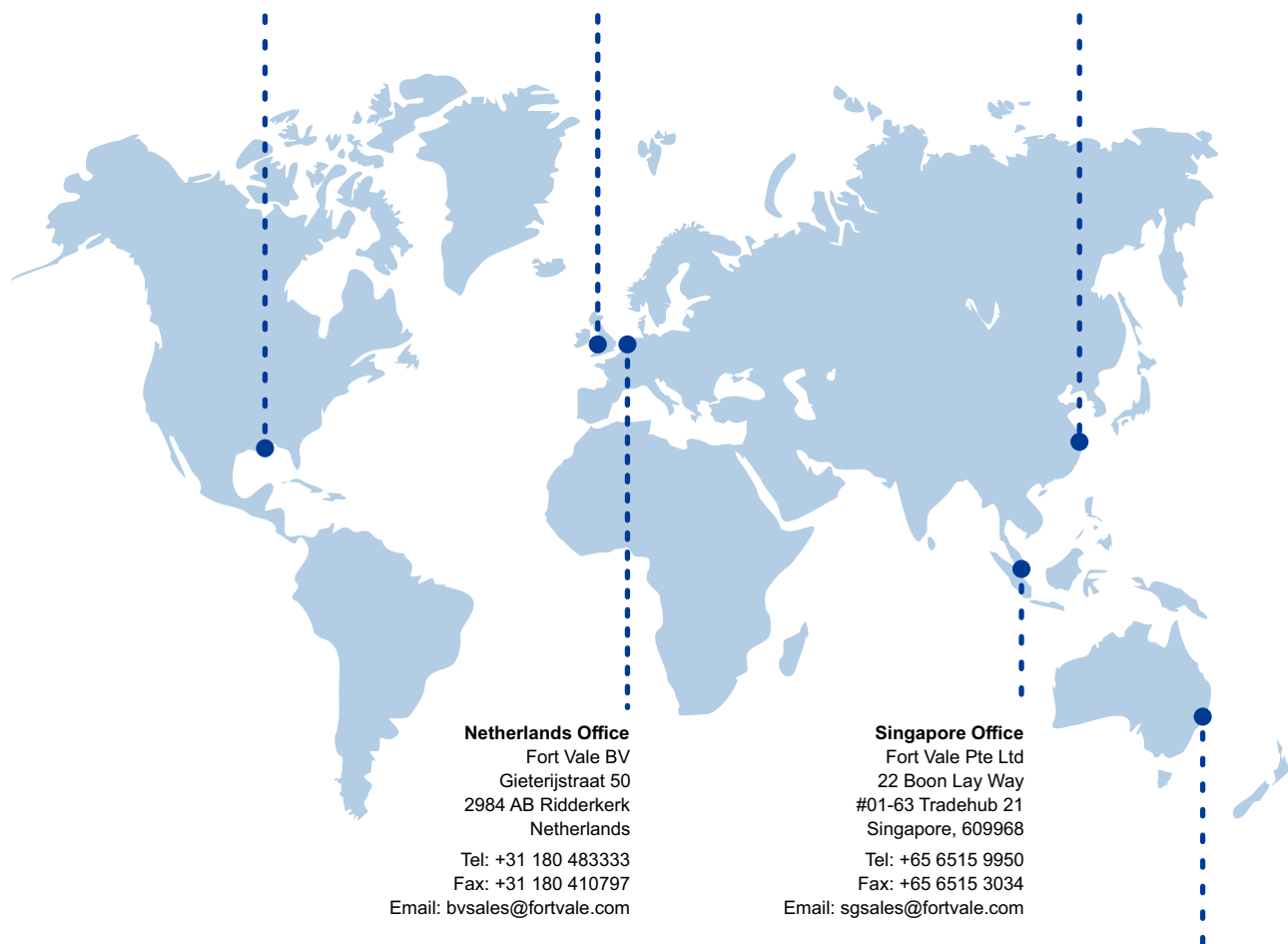
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