



## Catalogue

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# Standard Range of Ball Valves





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## Ball Valves

### Catalogue

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## Ball Valves

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# Airline Ball Valves & Butterfly Valves

## Design Options

### Function

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

### Design Options

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

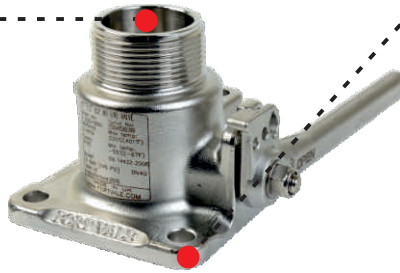
#### Nominal Bore

40mm (1½"): Ball valves

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

#### Special service conditions:

Reduced bore e.g. 25mm (1")



#### Tank Connection

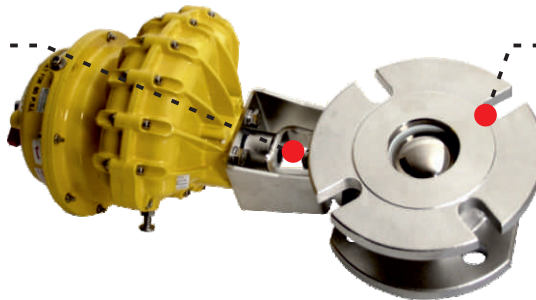
Flanged: 4 holes

Different drilling patterns

#### Operation

Manually operated: A range of handles is available

Pneumatically actuated



#### Outlet / Process Connection

Threaded: 1½" BSP, 2" BSP

Dual threaded: 1½" BSP/1½" NPT

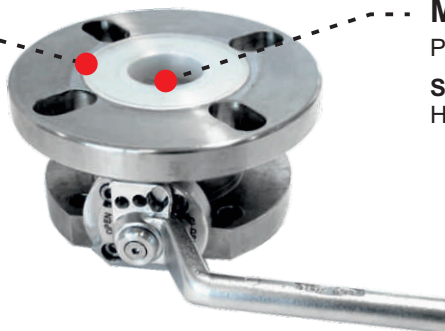
Flanged: Closed or open slots

#### Valve Materials

316 stainless steel

#### Special service conditions:

Lined wetted parts, e.g. PFA



#### Main Seal

PTFE

#### Special service conditions:

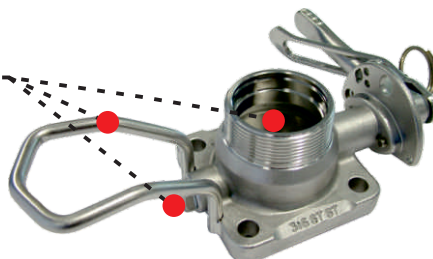
High-temperature compatible seals

#### Accessories

Gauge guard

Gauze or sintered filter

TIR to gauge inlet plug





## Airline Ball Valves & Butterfly Valves

### Design Options

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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.



# 1½” BSP Blacko Airline Ball Valve

Part No: 530/0000



## Specification

### Nominal size

32mm

### Tank connection

Flanged: 4 x 10.8mm holes on a 103.5mm PCD

### Outlet/Process connection

Threaded: 1½” BSP male

### Properties

¼” BSP gauge connection, handle with TIR

### Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to the Design Options page

## Design Conditions

Weight:	2.9 Kg
Design Pressure (MAWP):	10 Bar
Test Pressure:	21.4 Bar
Design Temperature Min:	-55°C
Design Temperature Max:	205°C

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

### Design Code

BS EN14432

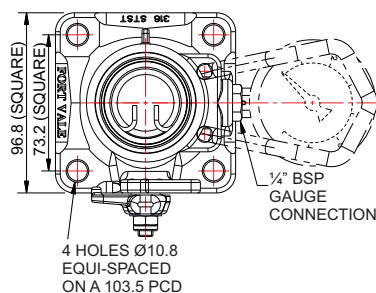
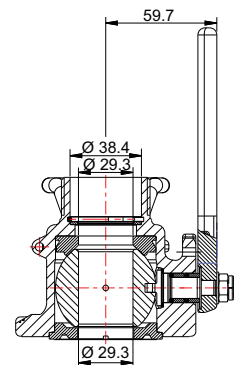
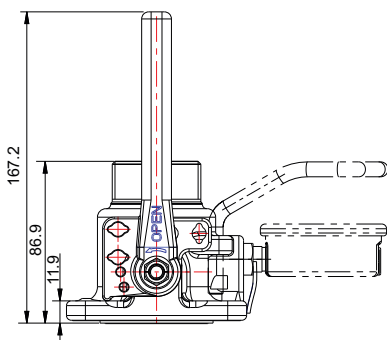
## Range

Description	Part No.
Standard specification	530/0000
With gauze	530/0000F
With gauge guard	530/0000G
With gauze and gauge guard	530/0000FG
With TIR wire to ¼” BSP plug	530/0000W

## Related Parts

Description	Part No.
Pressure gauge	920/07BBSP
Gauge adaptor	352/4004
1½” BSP dust cap	10300PS
Stud kit	350/1300
Tank weld-in flange	350/0025

## Section View

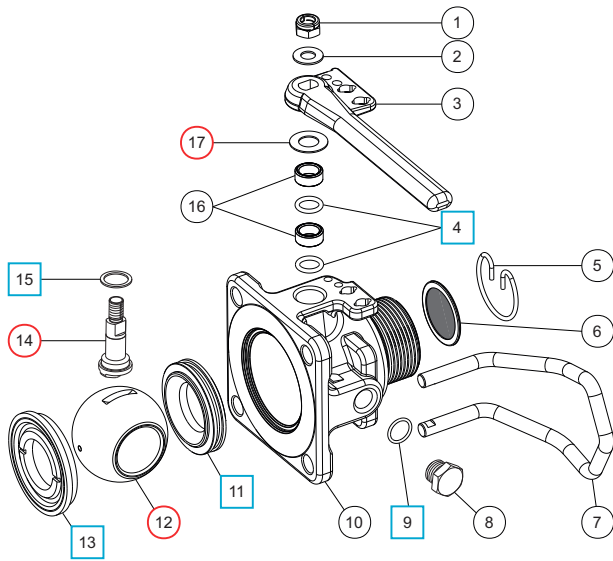




# 1½” BSP Blacko Airline Ball Valve

Part No: 530/0000

## Parts Drawing



## Parts List

Item	Description	Part No.
1	Self-locking nut	5112-031
2	M8 washer	5113-005
3	Handle	531/0025
4	PTFE O ring (2)	5005-008 <input type="checkbox"/> <input type="radio"/>
5	Snap ring *Note 1	5120-017
6	Gauze filter *Note 1	353/0010
7	Gauge guard *Note 2	530/0040
8	¼” BSP plug	5128-005
9	PTFE O ring	5005-048 <input type="checkbox"/> <input type="radio"/>
10	Body	530/0100
11	Front ball seal	5005-006 <input type="checkbox"/> <input type="radio"/>
12	Ball	350/0002 <input type="radio"/>
13	Rear ball seal	5005-007 <input type="checkbox"/> <input type="radio"/>
14	Spindle	530/0001 <input type="radio"/>
15	PTFE washer	5003-002 <input type="checkbox"/> <input type="radio"/>
16	Stuffing boss (2)	530/0003
17	Disc spring	5113-036 <input type="radio"/>

**NOTE 1:** Optional part, see Range 530/0000F

**NOTE 2:** Optional part, see Range 530/0000G

## Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	530/00SK

## Repair Kit

Description	Part No.
All parts marked <input type="radio"/> in the Parts List	530/00RK





# 1½” Dual Connection Blacko Airline Ball Valve

Part No: 530/0300



## Specification

### Nominal size

32mm

### Tank connection

Flanged: 4 x 10.7mm holes on a 103.5mm PCD

### Outlet/process connection

Dual threaded: 1½” BSP male & 1½” NPT male

### Properties

¼” BSP gauge connection, handle with TIR

### Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to the Design Options page

## Design Conditions

Weight:	3.1 Kg
Design Pressure (MAWP):	10 Bar
Test Pressure:	21.4 Bar
Design Temperature Min:	-55°C
Design Temperature Max:	205°C

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

### Design Code

BS EN14432

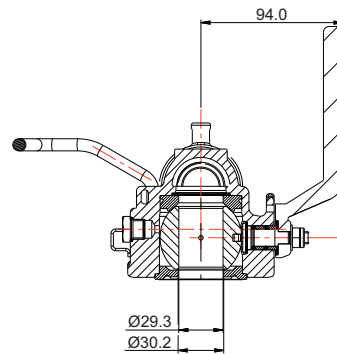
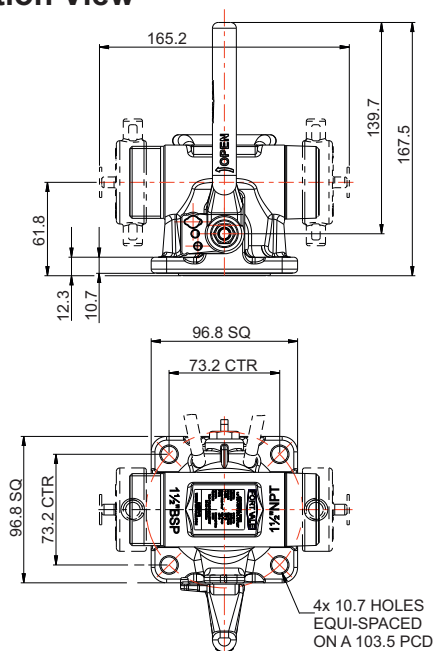
## Range

Description	Part No.
Standard specification	530/0300
With gauze	530/0300F
With gauge guard	530/0300G
With gauge and gauge guard	530/0300FG

## Related Parts

Description	Part No.
Pressure gauge	920/07BBSP
Gauge adaptor	352/4004
1½” BSP dust cap	10300PS
1½” NPT dust cap	10300PNT
Stud kit	350/1300
Tank weld-in flange	350/0025

## Section View

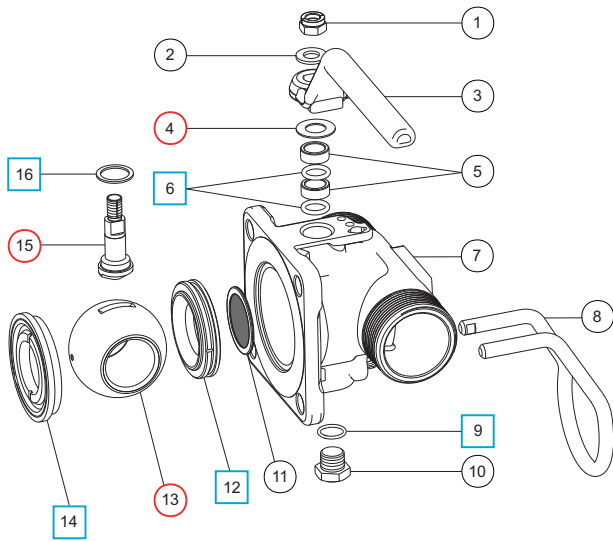




# 1½” Dual Connection Blacko Airline Ball Valve

Part No: 530/0300

## Parts Drawing



## Parts List

Item	Description	Part No.	
1	M8 self lock nut	5112-031	
2	M8 plain washer	5113-005	
3	Handle	530/0020	
4	8mm Belleville washer	5113-036	○
5	Stuffing collar (2)	530/0003	
6	PTFE O ring (2)	5005-008	□ ○
7	Body	530/0301	
8	Gauge guard <b>*Note 2</b>	530/0040	
9	PTFE O ring	5005-048	□ ○
10	¼” BSP plug	5128-005	
11	Filter <b>*Note 1</b>	353/0010	
12	PTFE front seal	5005-006	□ ○
13	Ball	350/0002	○
14	PTFE rear seal	5005-007	□ ○
15	Spindle	530/0001	○
16	PTFE thrust seal	5003-002	□ ○

**NOTE 1:** Optional part, see Range 530/0300F

**NOTE 2:** Optional part, see Range 530/0300G

## Seal Kit

Description	Part No.
All parts marked □ in the Parts List	530/00SK

## Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	530/00RK



# 1½” Flanged Blacko Airline Ball Valve

Part No: 530/1000



## Specification

### Nominal size

32mm

### Tank connection

Flanged: 4 x 10.8mm holes on a 103.5mm PCD

### Outlet/Process connection

Flanged: 4 x Ø18mm open slots on a 98.4 min. I/D

### Properties

¼” BSP gauge connection, handle with TIR

### Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to the Design Options page

## Design Conditions

Weight:	4.4 Kg
Design Pressure (MAWP):	7 Bar
Test Pressure:	15 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 Code**  
BS EN14432

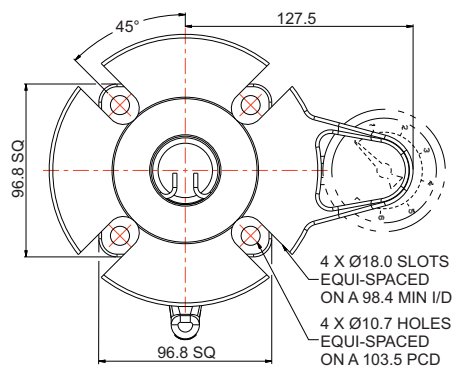
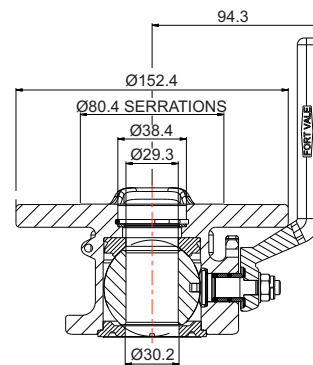
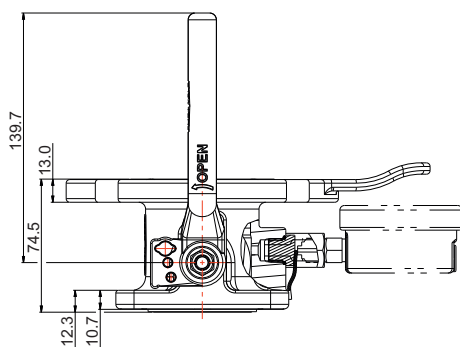
## Range

Description	Part No.
Standard specification	530/1000
With gauze	530/1000F

## Related Parts

Description	Part No.
Pressure gauge	920/07BBSP
Gauge adaptor	352/4004
Blind flange	530/8053CM
Bolting kit	311/3500
Solid PTFE gasket	5005-348
Stud kit	350/1300
Tank weld-in flange	350/0025

## Section View

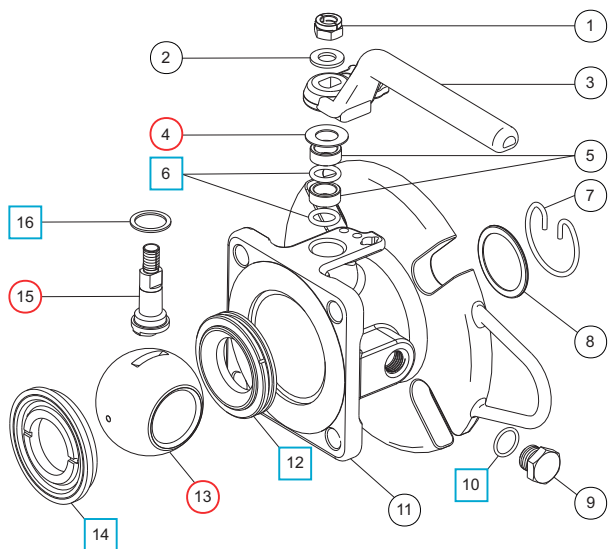




# 1½” Flanged Blacko Airline Ball Valve

Part No: 530/1000

## Parts Drawing



## Parts List

Item	Description	Part No.
1	Self-locking nut	5112-031
2	M8 washer	5113-005
3	Handle	530/0020
4	8mm Belleville washer	5113-036
5	Stuffing collar (2)	530/0003
6	PTFE O ring (2)	5005-008
7	Snap ring *Note	5120-017
8	Gauze filter *Note	353/0010
9	¼” BSP plug	5128-005
10	PTFE O ring	5005-048
11	Body	530/1100
12	PTFE front seal	5005-006
13	Ball	350/0002
14	PTFE rear seal	5005-007
15	Spindle	530/0001
16	PTFE thrust seal	5003-002

**NOTE:** Optional part, see Range 530/1000F

## Seal Kit

Description	Part No.
All parts marked <span style="color: blue;">■</span> in the Parts List	530/00SK

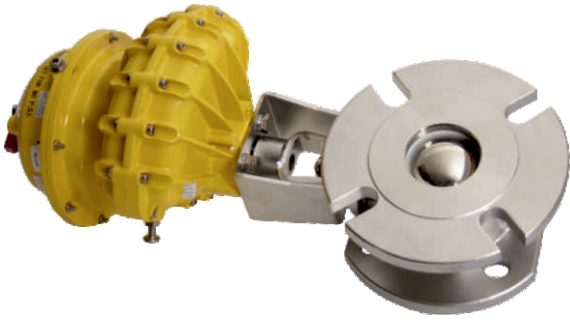
## Repair Kit

Description	Part No.
All parts marked <span style="color: red;">○</span> in the Parts List	530/00RK



# 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 1/4" 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

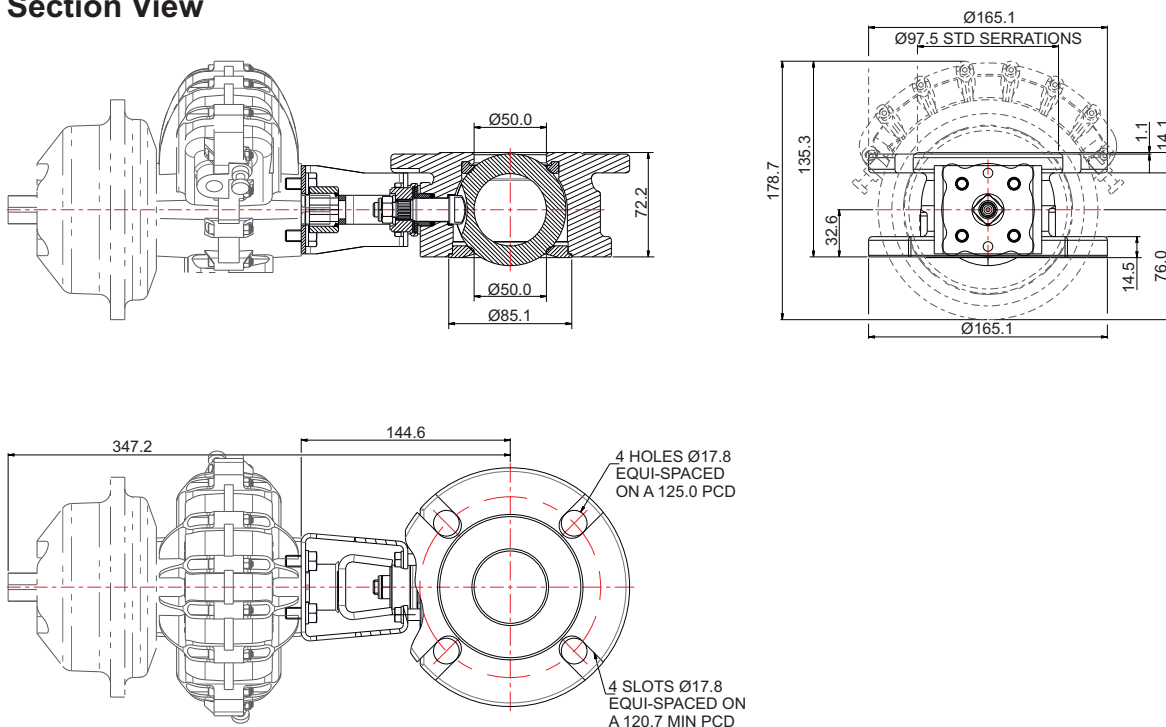
## Range

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
Tank weld-in flange	355/3100
Stud kit	311/3700
Outlet gasket	5005-361
Blind flange	370/4239CM
Bolting kit	311/3000

## Section View

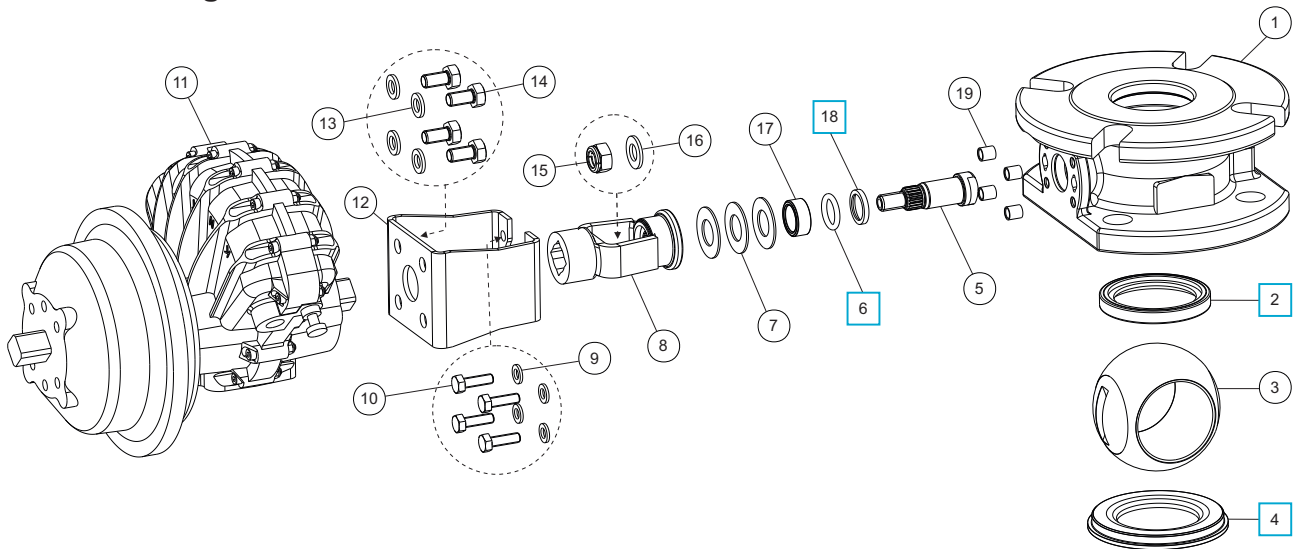




## 2" Flanged Blacko Ball Valve - Pneumatically Actuated

Part No: 370/0100PN/1

### Parts Drawing



### Parts List

Item	Description	Part No.
1	Body	370/0110
2	PTFE front seal	370/0102 <input type="checkbox"/>
3	Ø50mm ball	370/3301
4	PTFE rear seal	370/0105 <input type="checkbox"/>
5	Spindle	370/0120
6	PTFE O ring	5005-688 <input type="checkbox"/>
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 <input type="checkbox"/>
19	Spacer boss (4)	370/0163

### Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	370/01SK



## 1½” Airline Ball Valve Adaptor Kit

### Accessories & Spare Parts



### Specification

The 1½” airline ball valve adaptor kit lets you change an airline ball valve with a 1½” BSP outlet/process connection to a DIN40 or DIN50 flanged outlet/process connection.

The kit includes these parts:

- BSP to DIN adaptor flange
- blind flange
- bent handle
- envelope gasket
- bolting kit

**NOTE:** The ball valve is not included in the kit.

You can buy only the adaptor flange if you do not need the complete kit.

### Range

Description	Part No.
1½” BSP to DIN40 adaptor kit	530/ADAP40KIT
1½” BSP to DIN40 adaptor flange only	530/ADAP40
1½” BSP to DIN50 adaptor kit	530/ADAP50KIT
1½” BSP to DIN50 adaptor flange only	530/ADAP50



## Pressure Gauges Accessories & Spare Parts

### 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 1/4" BSP bottom connection and are glycerine filled.

#### Pressure range options

0-6 Bar, 0-10 Bar, 0-16 Bar

#### Material options - internal parts

Brass, stainless steel

### Standard Pressure Gauge

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

### Tell-Tale Pressure Gauge

Pressure Range Bar	Pressure Range 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





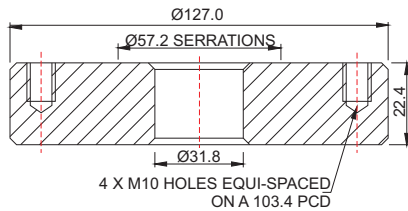
## Weld-In Flanges for Airline Valves

### Accessories & Spare Parts

**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

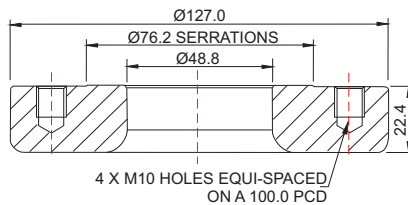
#### Related Parts

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

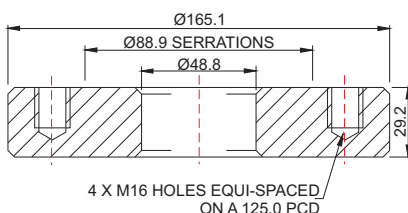
#### Related Parts

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

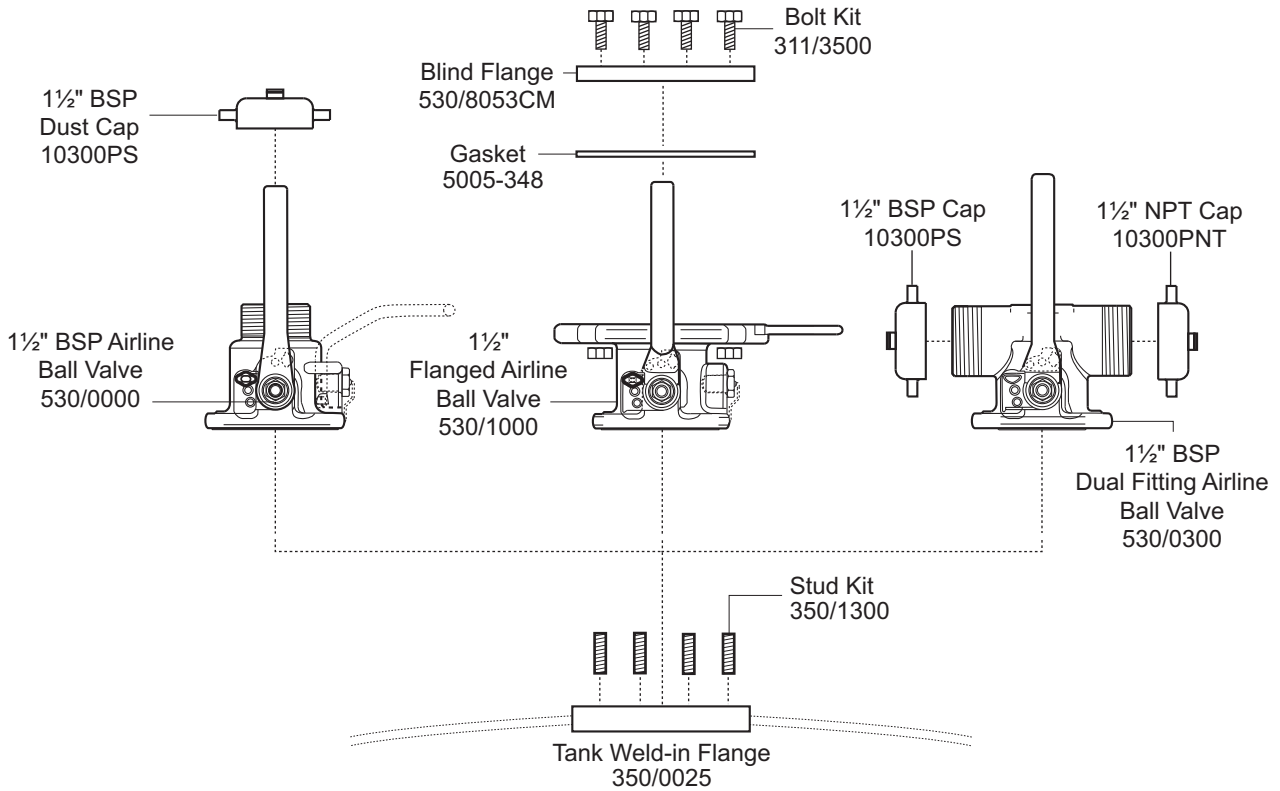
Description	Part No.
Stud kit	311/3700



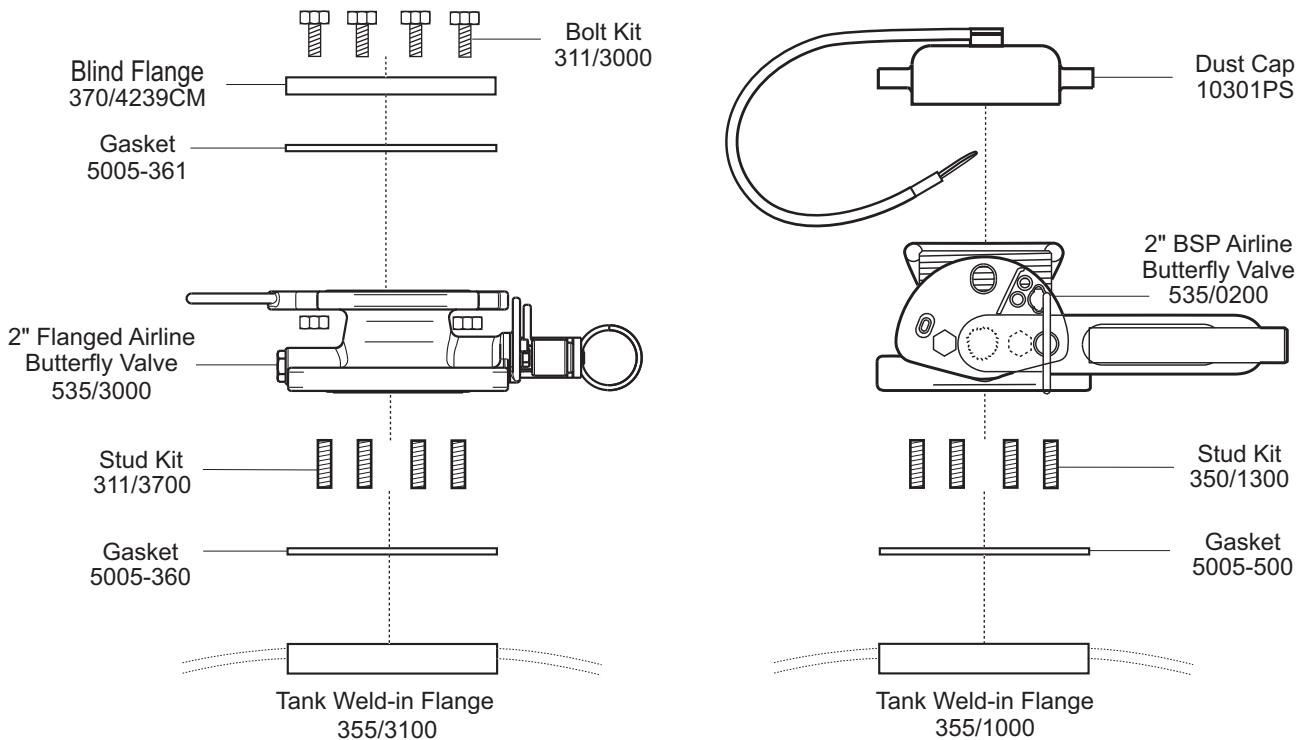
# Airline Ball Valves & Airline Butterfly Valves

## Installation Options

### 1½" Airline Ball Valves



### 2" Airline Butterfly Valves





# Discharge Ball Valves

## Design Options

### Function

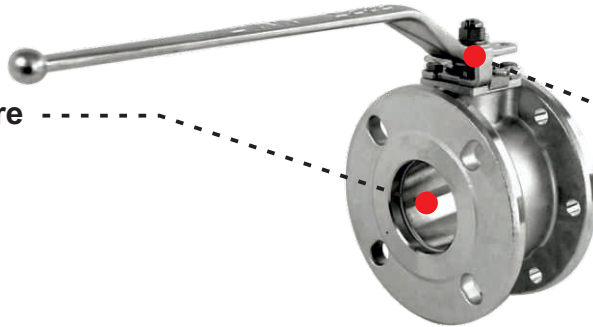
A discharge ball valve is used to load and discharge cargo. It is usually a secondary closure valve that is installed onto a footvalve (primary closure valve) at the drain point of a tank. A ball valve can also be used as a primary closure valve on the top of a tank.

### 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

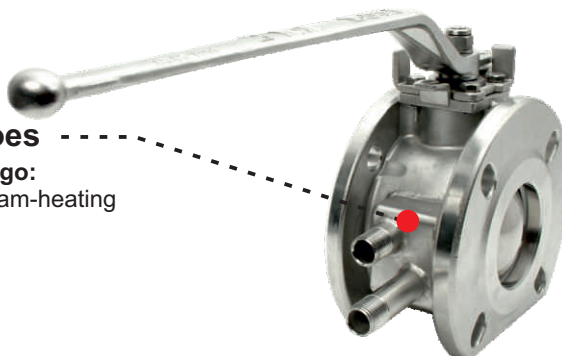


#### Main Seal

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

#### Special Cargoes

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





## Discharge Ball Valves

### Design Options

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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.



# DN40 Ball Valve with Inlet Seal Clamp

Part No: 370/2160X/XX



## Specification

### Nominal size

DN40

### 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:	4.75 Kg
Design Pressure (MAWP):	11 Bar
Test Pressure:	20.2 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

BS EN 14432

## Range

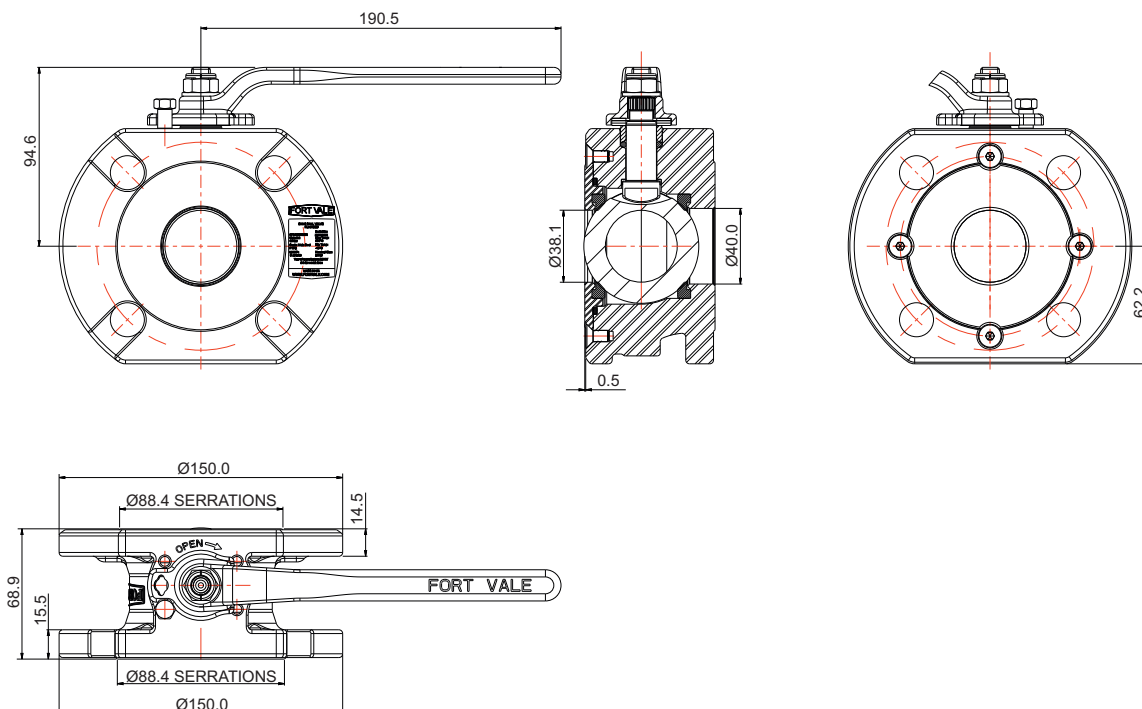
Description	Part No.
Left hand operated *Note	370/2160L/XX
Right hand operated *Note	370/2160R/XX

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

## Related Parts

Please refer to Fort Vale for Related Parts.

## Section View





# DN40 Ball Valve with Inlet Seal Clamp

Part No: 370/2160X/XX

## Part Number Code: 370/2160X / 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	370/2160L/XX
Right hand operated	370/2160R/XX

**Table 2: Inlet Flange Drilling**

Inlet Holes	Hole Ø (mm)	Hole PCD (mm)	Code
4 holes	18	110.0	A
4 slots	18 wide	110.0 to 125.0	B
4 holes	18	110.0	C

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

**Table 3: Outlet Flange Drilling**

Outlet Holes	Hole Ø (mm)	Hole PCD (mm)	Code
4 open slots	18 wide	110.0 to O/D	A
4 holes	M16	110.0	B
4 slots	18 wide	98.5 to 125.0	C
4 holes	M16	110.0	D
4 slots	18 wide	110.0 to 125.0	E
4 holes	18	110.0	F
4 slots	17 wide	98.5 to 110.0	G
4 holes and 4 slots	M16 18 wide	110.0 98.5 to 125.0	H

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

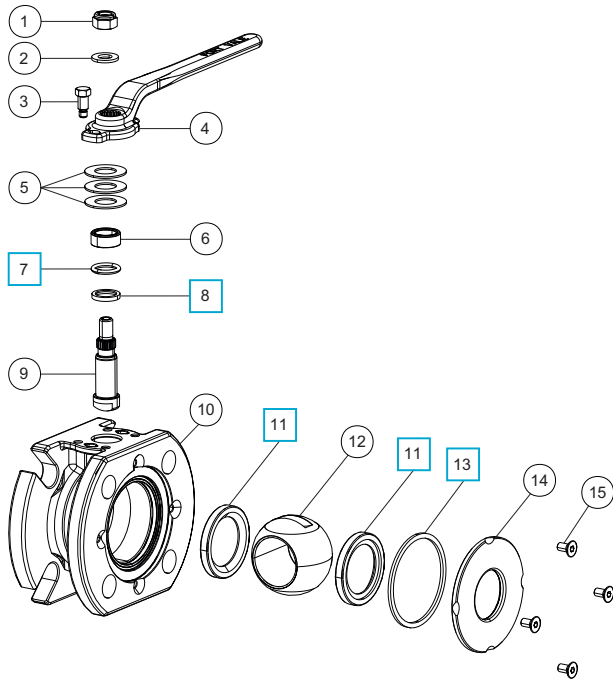




# DN40 Ball Valve with Inlet Seal Clamp

Part No: 370/2160X/XX

## Parts Drawing



## Parts List

Item	Description	Part No.
1	M10 self-lock nut	5112-008
2	M10 washer	5113-009
3	Stop pin	370/0107
4	Handle	370/0125
5	Belleville washer (3)	5113-038
6	Stuffing collar	370/0103
7	PTFE O ring	5005-688 <input type="checkbox"/>
8	Bottom bearing	370/0104 <input type="checkbox"/>
9	Spindle	370/2112
10	Body *Note	370/2101XX
11	PTFE main seal (2)	370/2102 <input type="checkbox"/>
12	Ball	370/2104
13	Body seal	370/2109 <input type="checkbox"/>
14	Seal carrier clamp	370/2161
15	6mm countersunk bolt (4)	5111-018

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

## Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	370/21SK





# DN50 Ball Valve with Inlet Seal Clamp

Part No: 370/0760X/XX



## Specification

### Nominal size

DN50

### 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:	5.74 Kg
Design Pressure (MAWP):	11 Bar
Test Pressure:	20.2 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

BS EN 14432

## Range

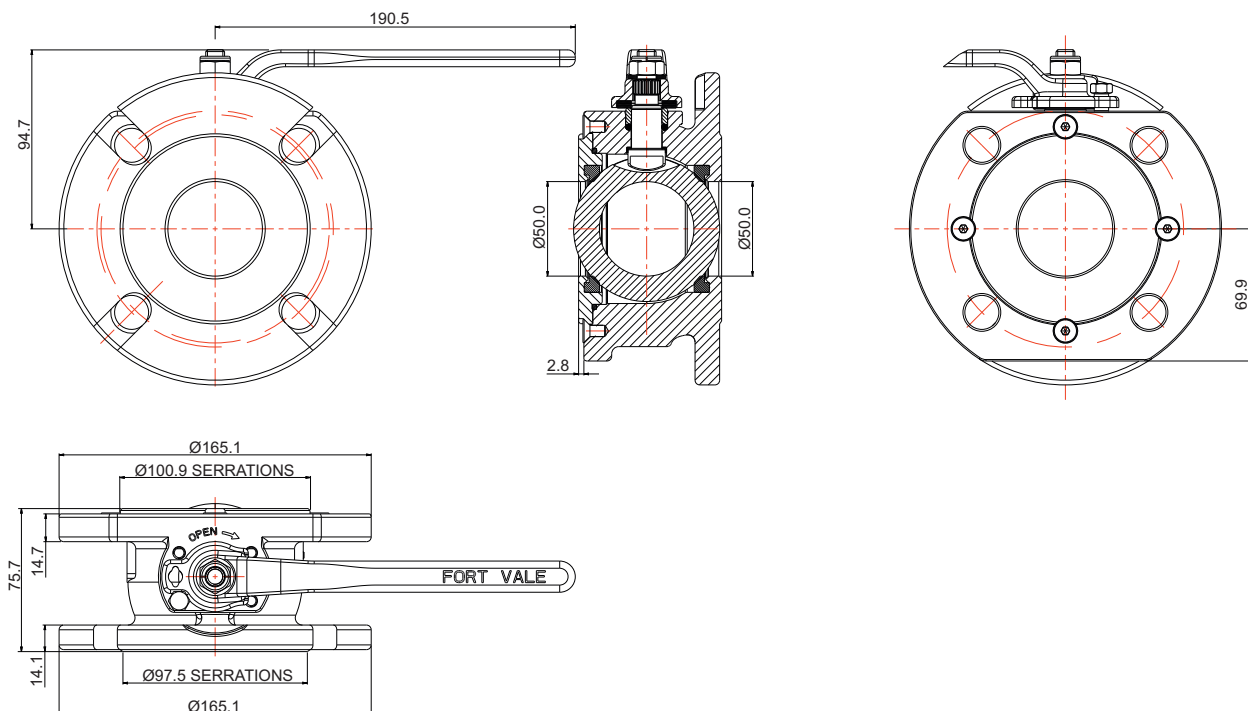
Description	Part No.
Left hand operated	370/0760L/XX
Right hand operated	370/0760R/XX

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

## Related Parts

Please refer to Fort Vale for Related Parts.

## Section View





# DN50 Ball Valve with Inlet Seal Clamp

Part No: 370/0760X/XX

## Part Number Code: 370/0760X / 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	370/0760L/XX
Right hand operated	370/0760R/XX

**Table 2: Inlet Flange Drilling**

Inlet Holes	Hole Ø (mm)	Hole PCD (mm)	Code
4 holes	18	125.0	A
4 slots	17.8 wide	120.7 to 125.0	B

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

**Table 3: Outlet Flange Drilling**

Outlet Holes	Hole Ø (mm)	Hole PCD (mm)	Code
4 open slots	17.8 wide	120.7 to O/D	A
4 open slots	17.8 wide	114.3 to O/D	B
4 holes	18	125.0	C
4 holes	M16	125.0	D
4 holes	M16	120.7	E
4 holes	M16	120.7	F
4 holes	M16	120.7	G
4 holes and 4 slots	M16	125.0	H
4 slots	17.5 wide	120.4 to 125.0	
4 slots	17.5 wide	120.4 to 125.0	I

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

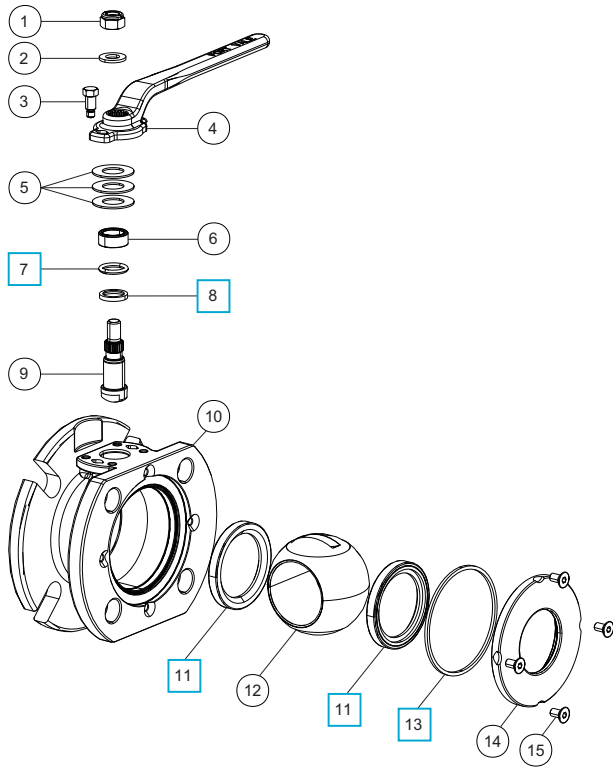




# DN50 Ball Valve with Inlet Seal Clamp

Part No: 370/0760X/XX

## Parts Drawing



## Parts List

Item	Description	Part No.
1	M10 self-lock nut	5112-008
2	M10 washer	5113-009
3	Stop pin	370/0107
4	Handle	370/0125
5	Belleville washer (3)	5113-038
6	Stuffing collar	370/0103
7	PTFE O ring	5005-688 <input type="checkbox"/>
8	Bottom bearing	370/0104 <input type="checkbox"/>
9	Spindle	370/0120
10	Body *Note	370/N761XX
11	PTFE main seal (2)	370/0102 <input type="checkbox"/>
12	Ball	370/3301
13	Body seal	370/0106 <input type="checkbox"/>
14	Seal carrier clamp	370/0762
15	6mm countersunk bolt (4)	5111-018

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

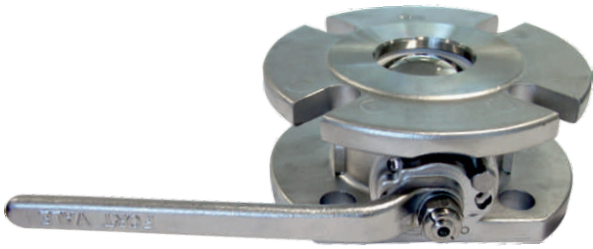
## Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	370/015SK



# 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

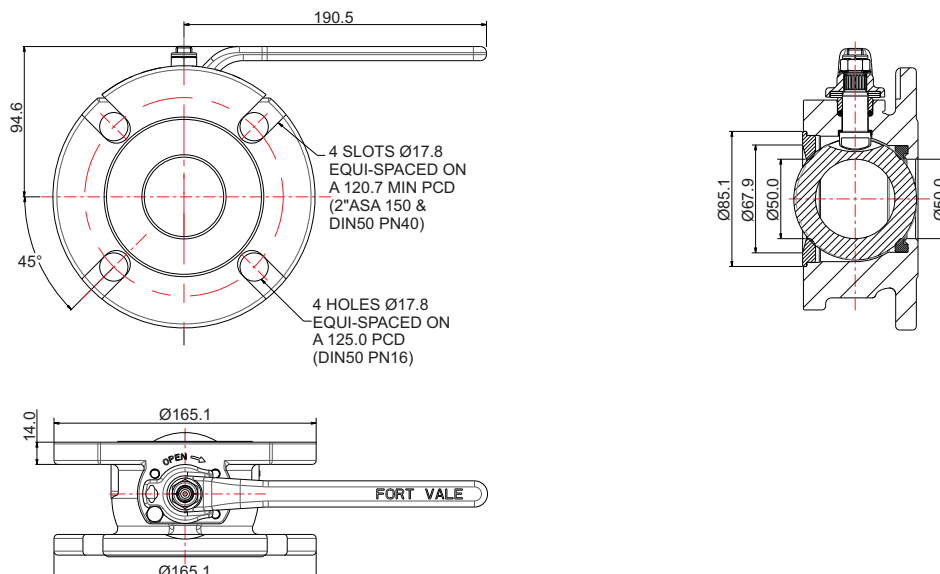
## Range

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.
Tank weld-in flange	355/3100
Stud kit	311/3700
PTFE outlet gasket	5005-361
Blind flange	370/4239CM
Bolting kit	311/3500

## Section View

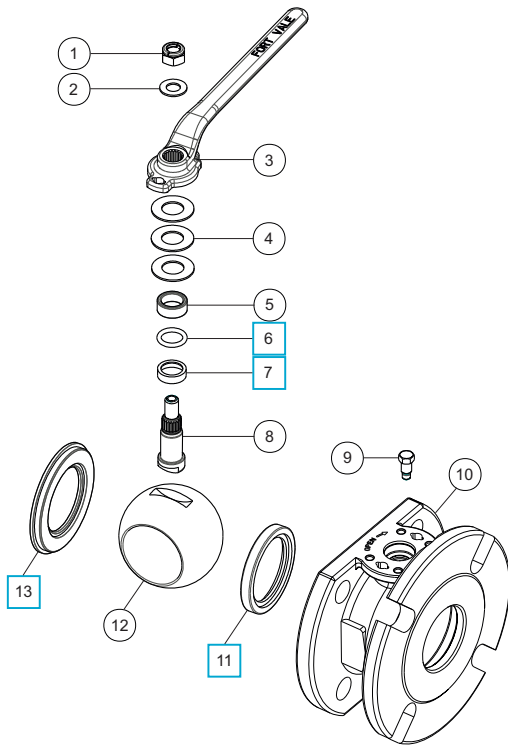




# 2" Flanged Blacko Ball Valve

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 <input type="checkbox"/>
7	Bottom bearing	370/0104 <input type="checkbox"/>
8	Spindle	370/0120
9	Stop bolt	370/0107
10	Body	370/0110
11	PTFE rear seal	370/0102 <input type="checkbox"/>
12	50mm ball	370/3301
13	PTFE front seal	370/0105 <input type="checkbox"/>

## Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	370/01SK



# DN80 Ball Valve with Inlet Seal Clamp

Part No: 360/6100X/XX



## 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

Part No. 360/6100X/BB shown

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

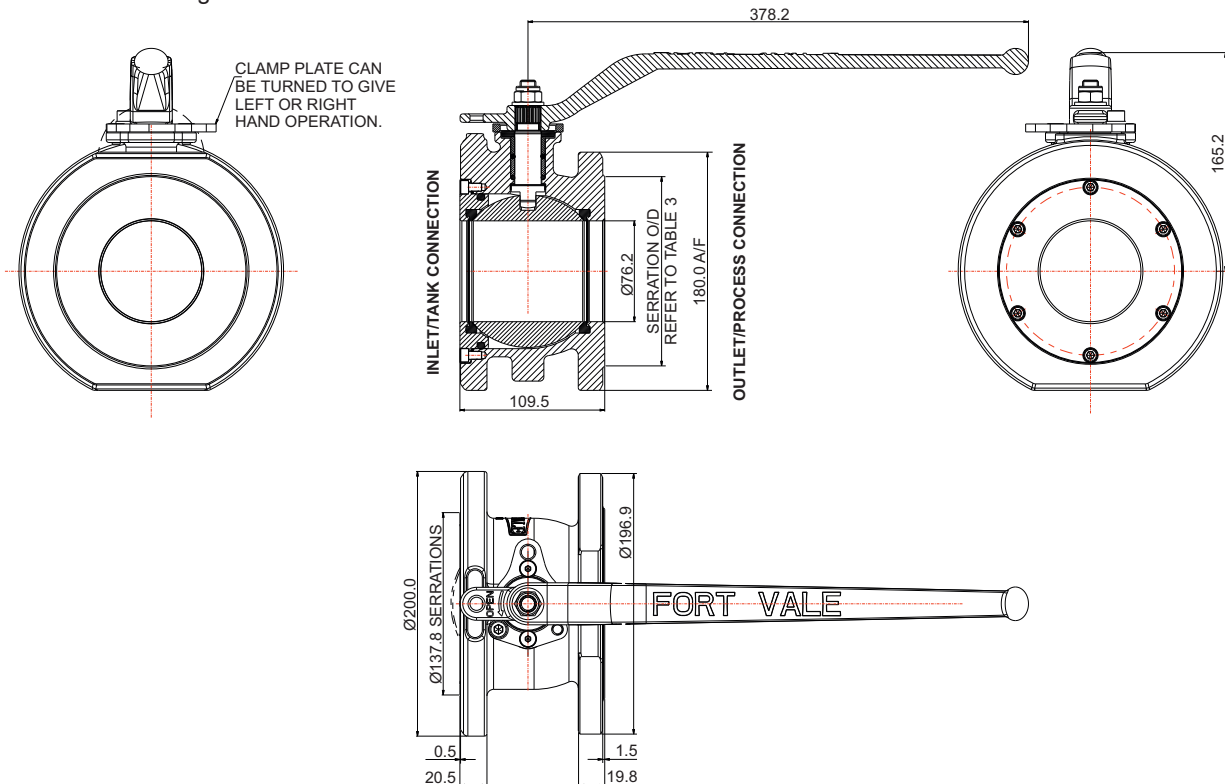
**NOTE:** The specification changes the Part No. Refer to the next page

## Related Parts

Please refer to Fort Vale for Related Parts.

## Section View

Shown with no drilling





# DN80 Ball Valve with Inlet Seal Clamp

Part No: 360/6100X/XX

## Part Number Code: 360/6100X / X X

### Valve Operation

Refer to Table 1

### Inlet Flange Drilling

Refer to Table 2

### Outlet Flange Drilling

Refer to Table 3

**Table 1: Valve Operation**

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

**Table 2: Inlet Flange Drilling**

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

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

**Table 3: Outlet Flange Drilling**

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

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



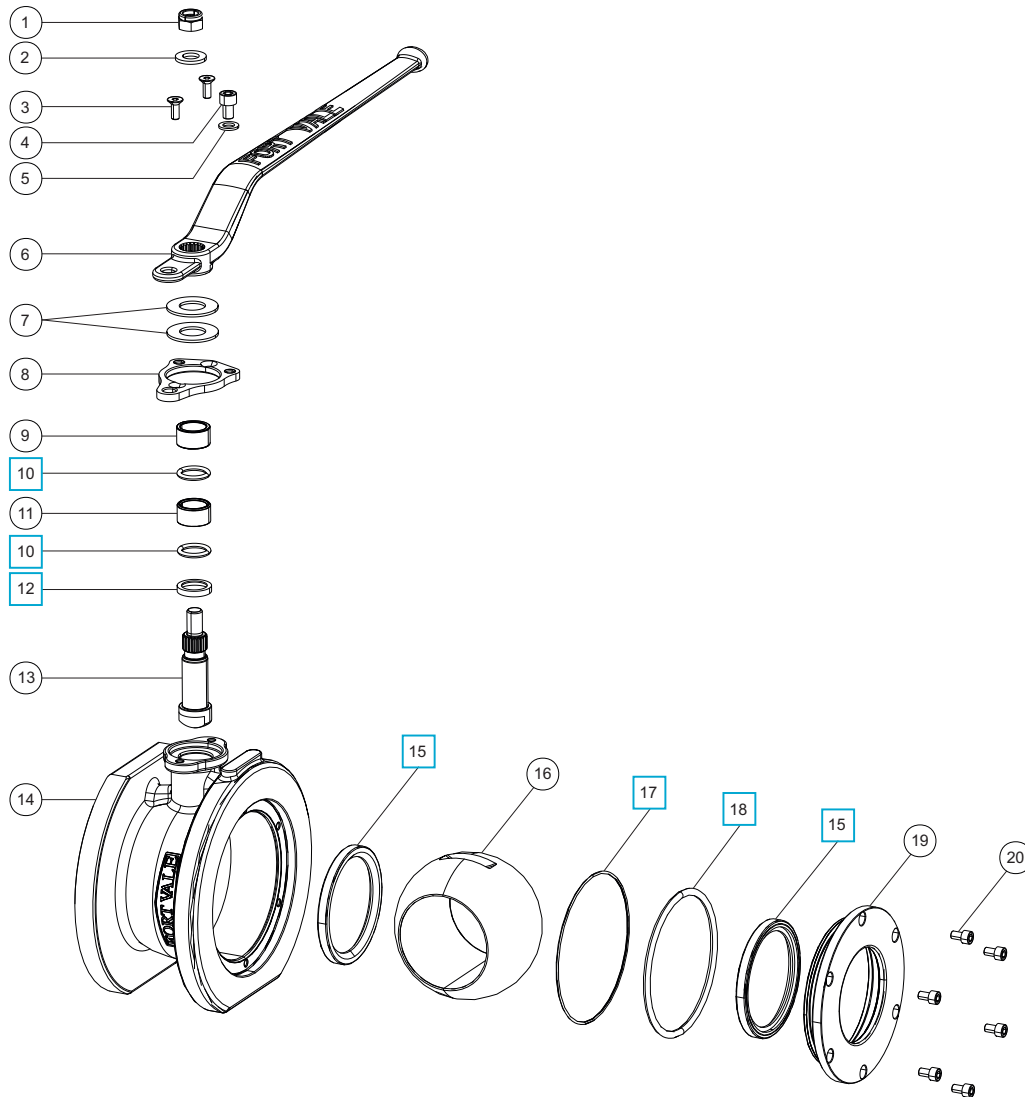




# DN80 Ball Valve with Inlet Seal Clamp

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 <input type="checkbox"/>
11	Bottom stuffing collar	360/3413
12	Bottom bearing	360/3421 <input type="checkbox"/>
13	Spindle	360/3422
14	Body * <b>Note</b>	360/6110/XX
15	PTFE main seal (2)	360/3402 <input type="checkbox"/>
16	Ball	360/3401

### Parts List

Item	Description	Part No.
17	PTFE O ring	ORB544P0 <input type="checkbox"/>
18	Fortyt O ring	ORB347F0 <input type="checkbox"/>
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 <input type="checkbox"/> in the Parts List	360/61SK



# 3" Blacko Ball Valve - 3" BSP Outlet

Part No: 360/5000L



## Specification

### Nominal size

80mm

### Tank connection

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

### Outlet/Process connection

3" BSP

### Properties

Left hand operated, handle with TIR

### Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to the Design Options page

## Design Conditions

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

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

### Design Code

BS EN 4432

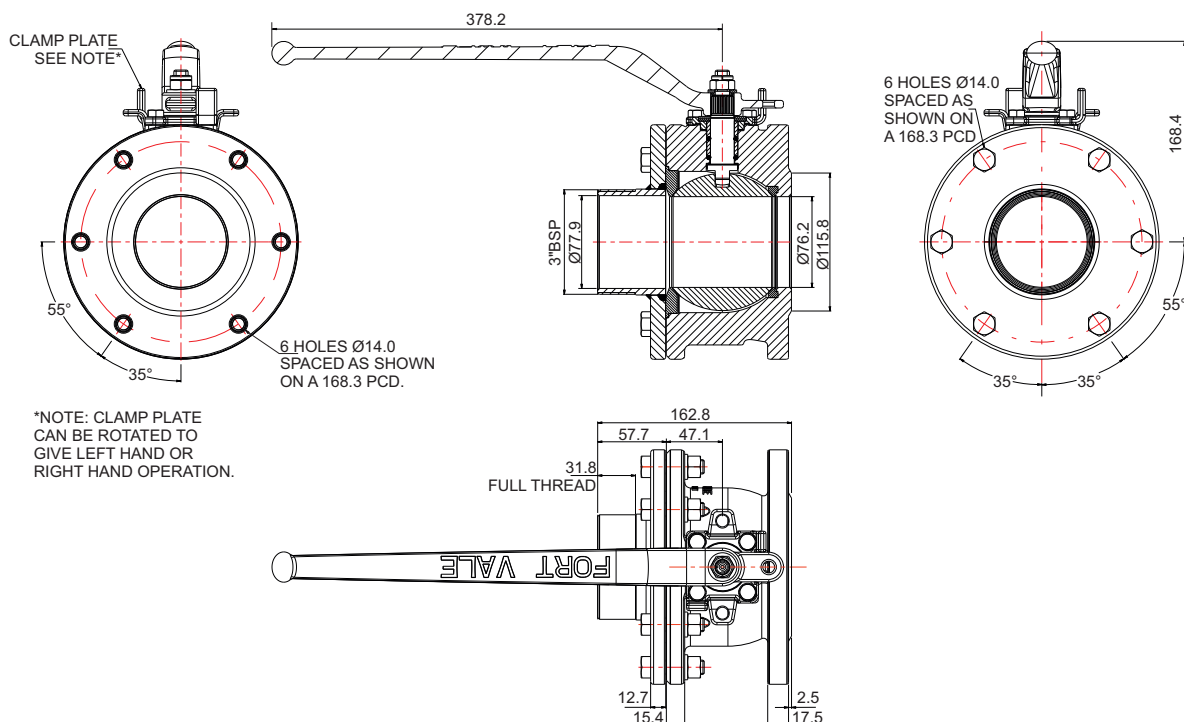
## Range

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

## Related Parts

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

## Section View

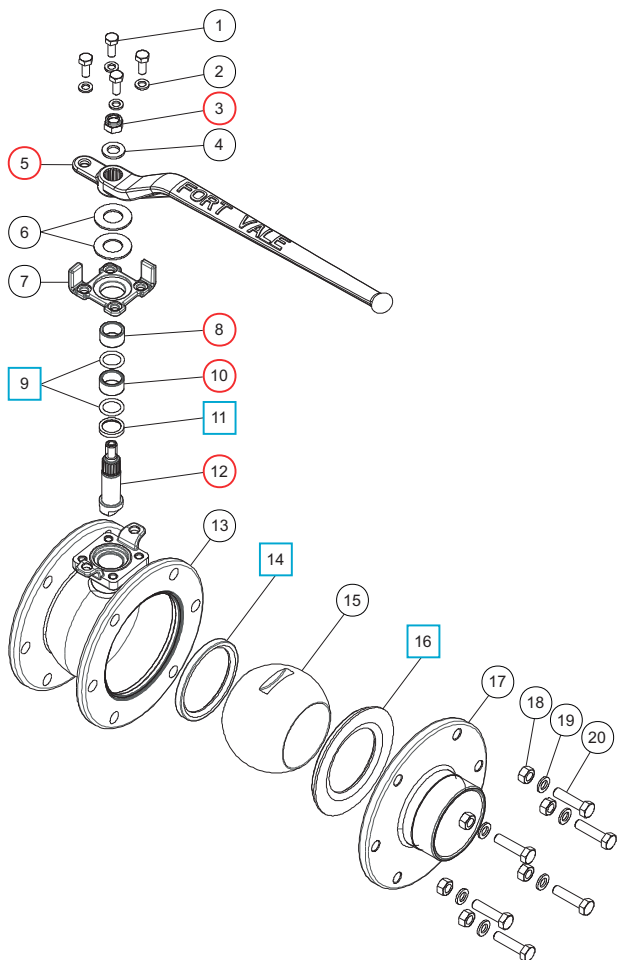




# 3" Blacko Ball Valve - 3" BSP Outlet

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 <span style="border: 1px solid blue; padding: 0 2px;"> </span> in the Parts List	360/50SK

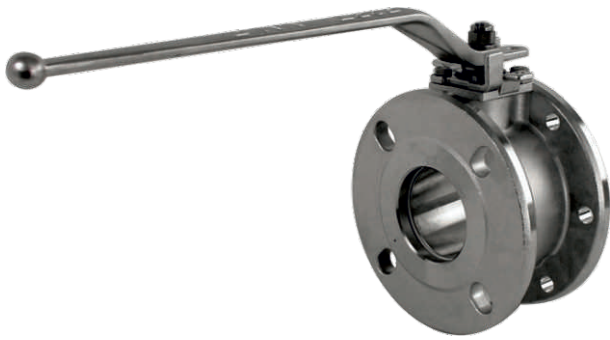
## Repair Kit

Description	Part No.
All parts marked <span style="border: 1px solid red; border-radius: 50%; padding: 0 2px;"> </span> in the Parts List	360/50RK



# 3" Blacko Ball Valve - Slotted 4 Hole Outlet

Part No: 360/5050L



## Specification

### Nominal size

80mm

### Tank connection

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

### Outlet/Process connection

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

### Properties

Left hand operated, handle with TIR

### Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to the Design Options page

## Design Conditions

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

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

### Design Code

BS EN 14432

## Range

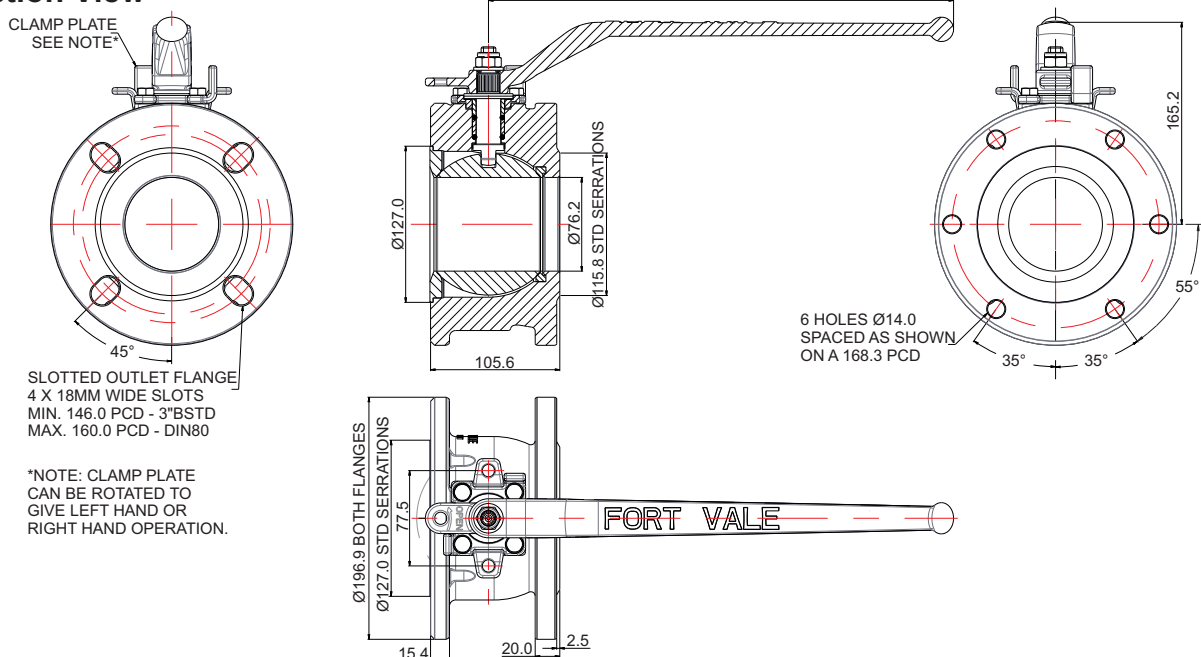
Description	Part No.
6 hole inlet, 4 hole outlet	360/5050X *
6 hole inlet, 4 hole outlet, steam heated	360/5050XSH *
4 hole inlet, 4 hole outlet	360/5030X *
4 holt inlet, 4 hole outlet, steam heated	360/5030XSH *

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

## Related Parts

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

## Section View

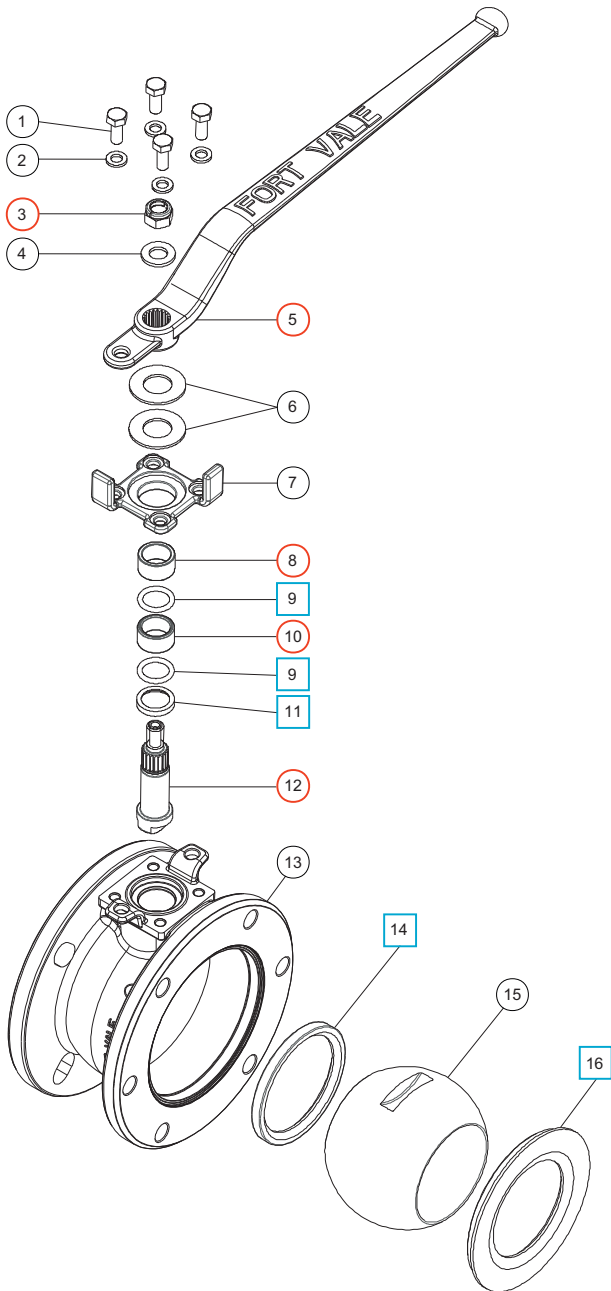




# 3" Blacko Ball Valve - Slotted 4 Hole Outlet

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 <input type="checkbox"/> in the Parts List	360/50SK

## Repair Kit

Description	Part No.
All parts marked <input type="radio"/> in the Parts List	360/50RK



# DN100 Ball Valve with Inlet Seal Clamp

Part No: 460/E000X



## Specification

### Nominal size

DN100

### Tank connection

Flanged: 8 x M16 holes on a 180mm PCD

### Outlet/process connection

Flanged: 8 x M16 holes on a 180mm PCD

### Options

Left or right hand operation

### Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to the Design Options page

## Design Conditions

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

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

### Design Codes

BS EN 14432

## Range

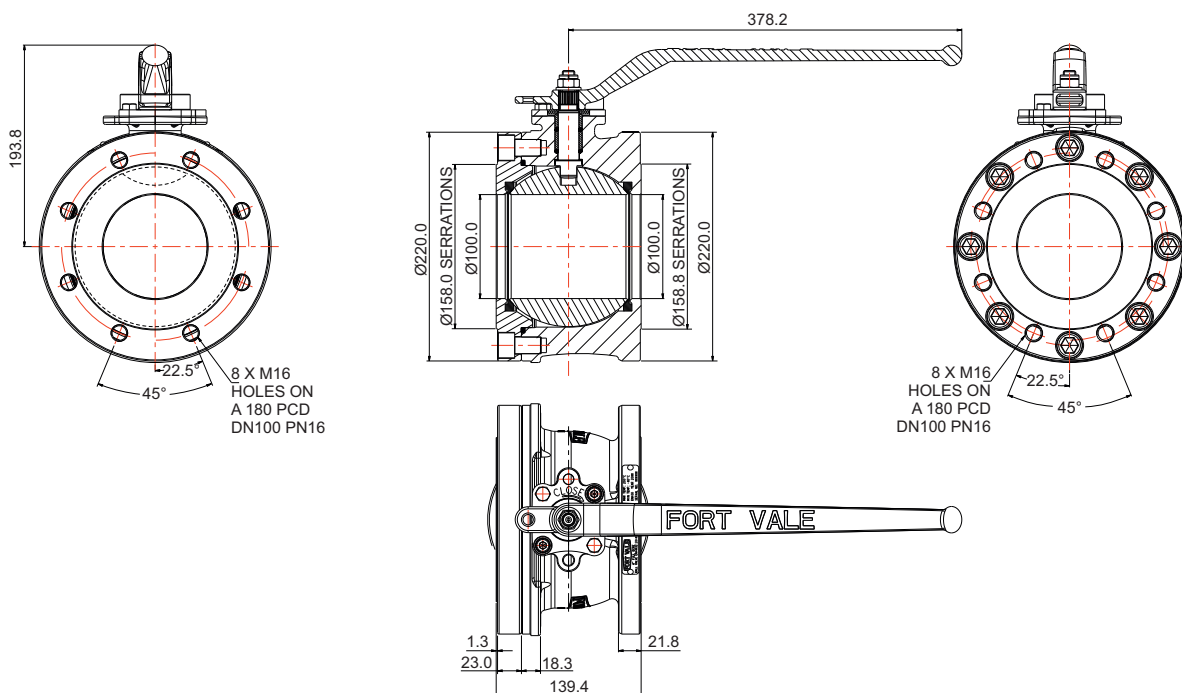
Description	Part No.
Manually operated *Note	460/E000X
Pneumatically actuated	460/E000PN
Carbon steel body *Note	460/E000XM

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

## Related Parts

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

## Section View

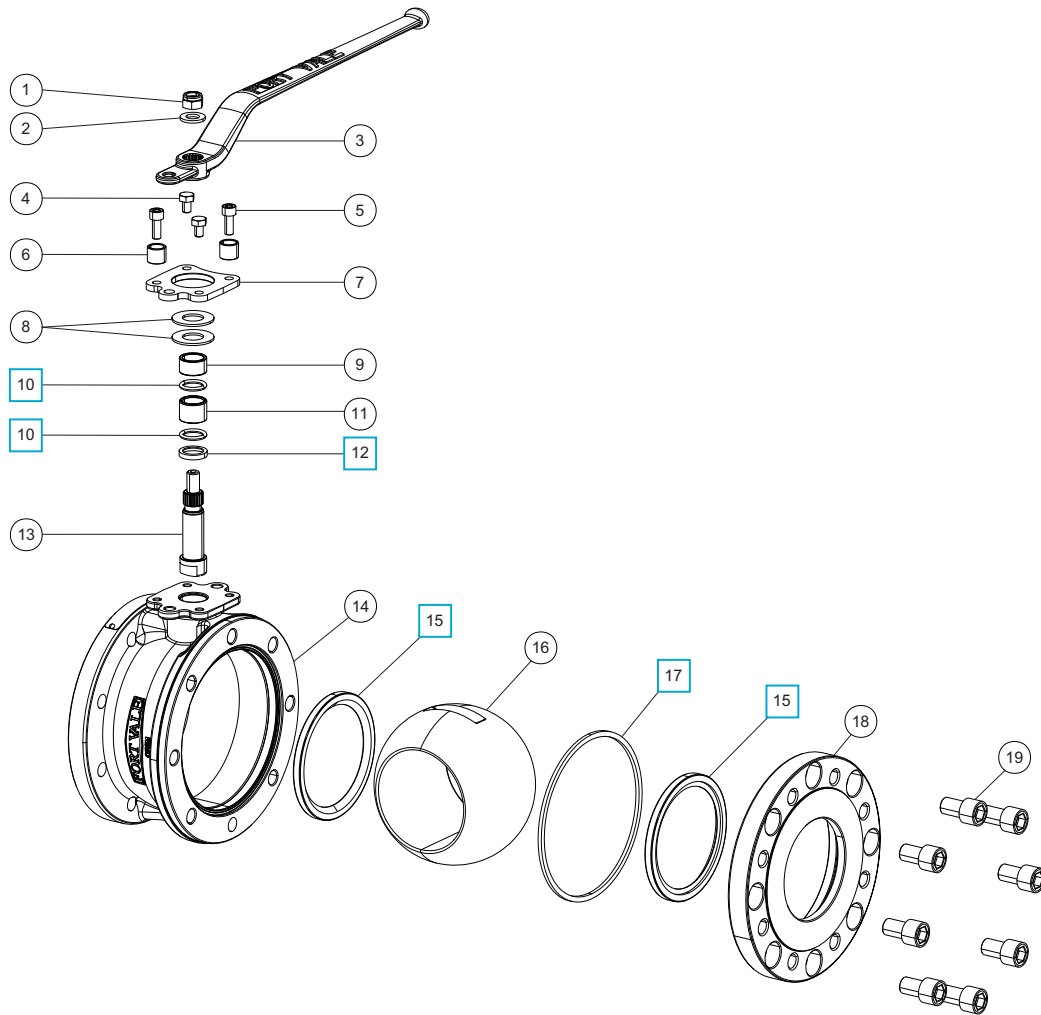




# DN100 Ball Valve with Inlet Seal Clamp

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 <input type="checkbox"/>
11	Bottom stuffing collar	460/A0010
12	Bottom bearing	360/3421 <input type="checkbox"/>
13	Spindle	460/A0009
14	Body	460/A0008
15	PTFE main seal (2)	5005-0010 <input type="checkbox"/>
16	4" Ball	460/5051S1
17	PTFE body seal	5005-0011 <input type="checkbox"/>
18	Inlet flange	460/A0002
19	M16 cap screw (8)	5111-079

### Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	460/E0SK





# 4" Full Bore Ball Valve

Part No: 460/5050X



## Specification

### Nominal size

100mm

### Tank connection

Flanged: 8 x 14mm holes on a 197mm PCD

### Outlet/process connection

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

### Options

Left hand operated, right hand operated

### Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to the Design Options page

## Design Conditions

Weight:	21.8 Kg
Design Pressure (MAWP):	7.5 Bar
Test Pressure:	13.7 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 EN 14432

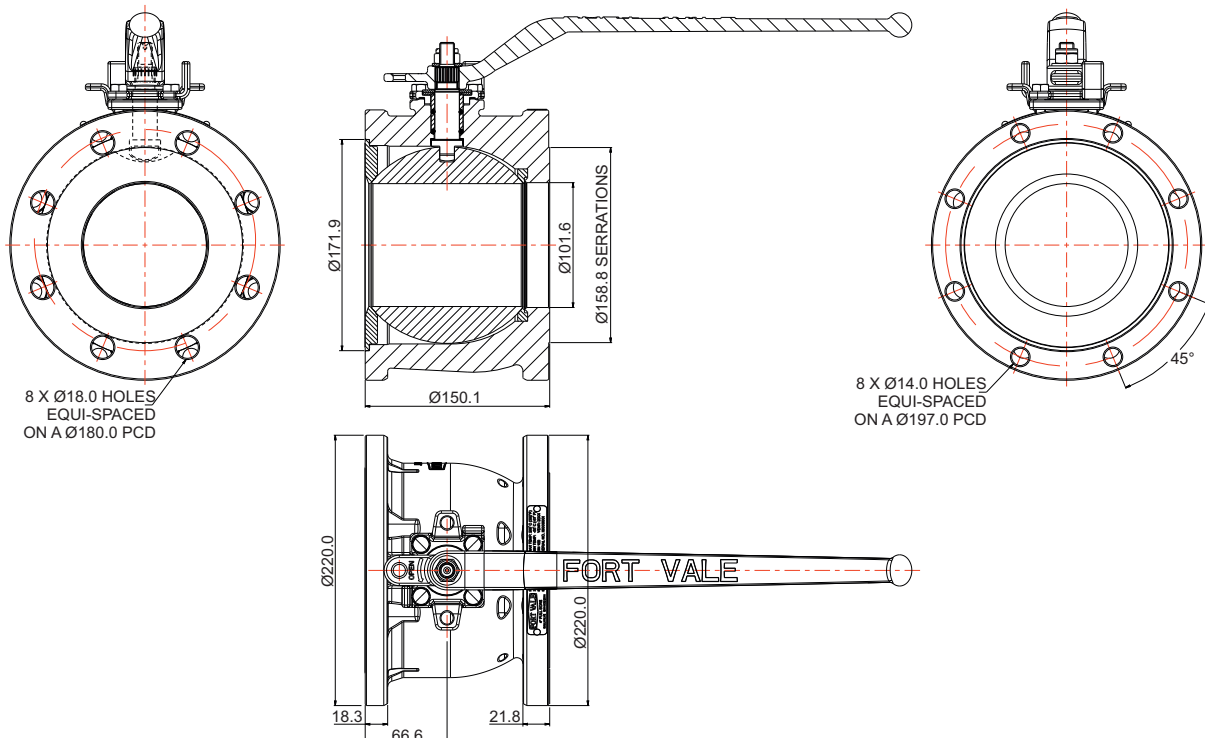
## Range

Description	Part No.
Left hand operated	460/5050L
Right hand operated	460/5050R

## 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

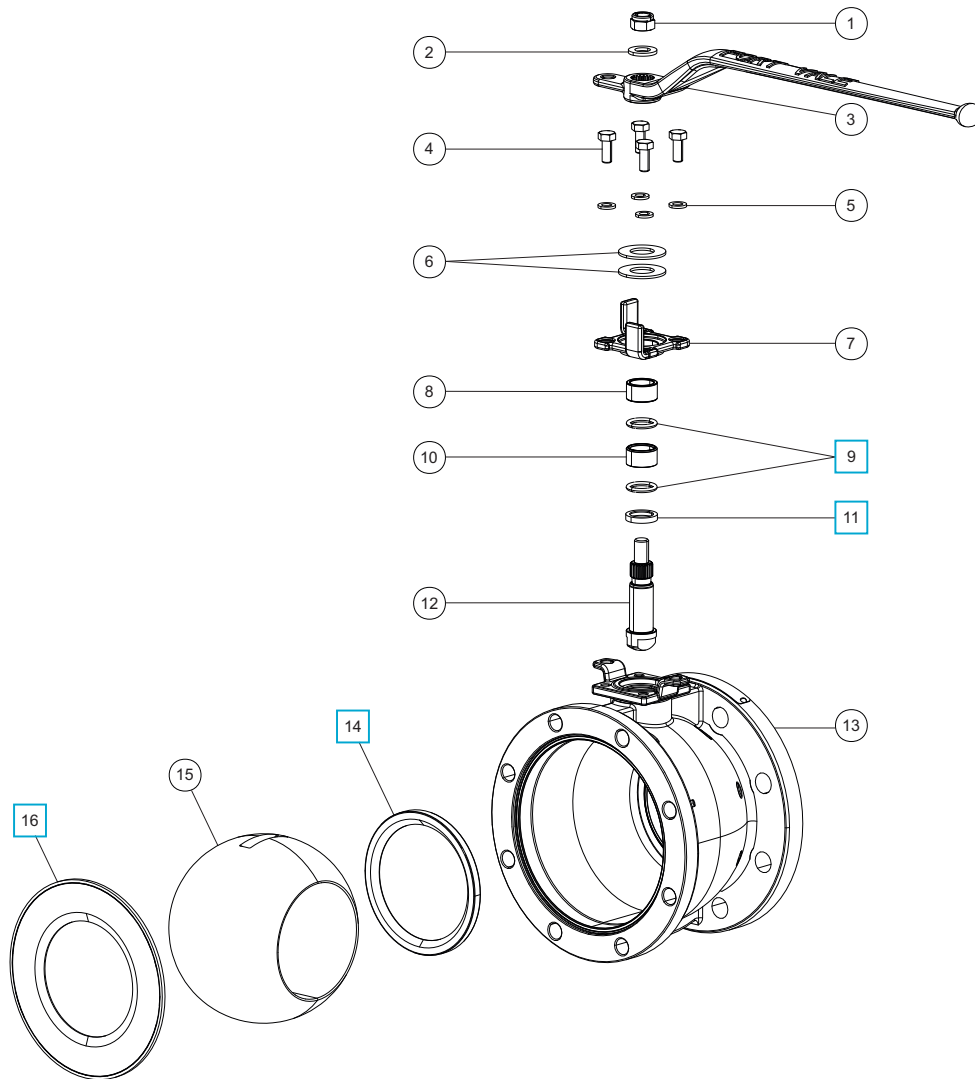




# 4" Full Bore Ball Valve

Part No: 460/5050X

## 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 (4)	5111-046
5	M8 spring washer (4)	5113-003
6	Belleville washer (2)	5113-041
7	Clamp plate	360/5005
8	Top stuffing collar	360/3412
9	PTFE O ring (2)	5005-113 <input type="checkbox"/>
10	Bottom stuffing collar	360/3413
11	PTFE bottom bearing	360/3421 <input type="checkbox"/>
12	Spindle	360/3422
13	Body	460/5020
14	PTFE rear seal	460/5056 <input type="checkbox"/>
15	Ball	460/5057
16	PTFE front seal	460/5055 <input type="checkbox"/>

### Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	460/50SK



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

#### Bolt Torque Procedure

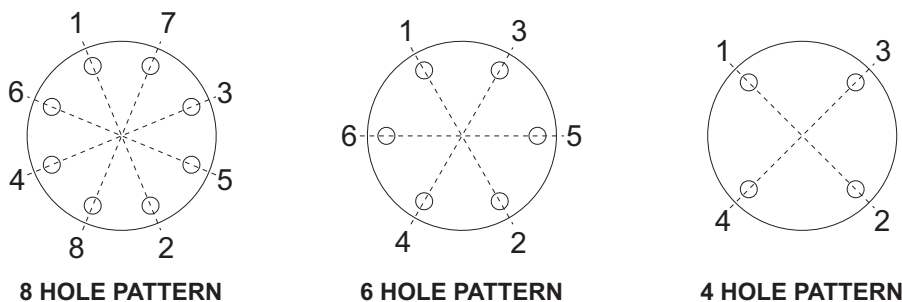
To install flanged parts correctly:

- 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**





# 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

An accessory component must cause no interference with the valve function. It must be made from compatible materials that will not cause 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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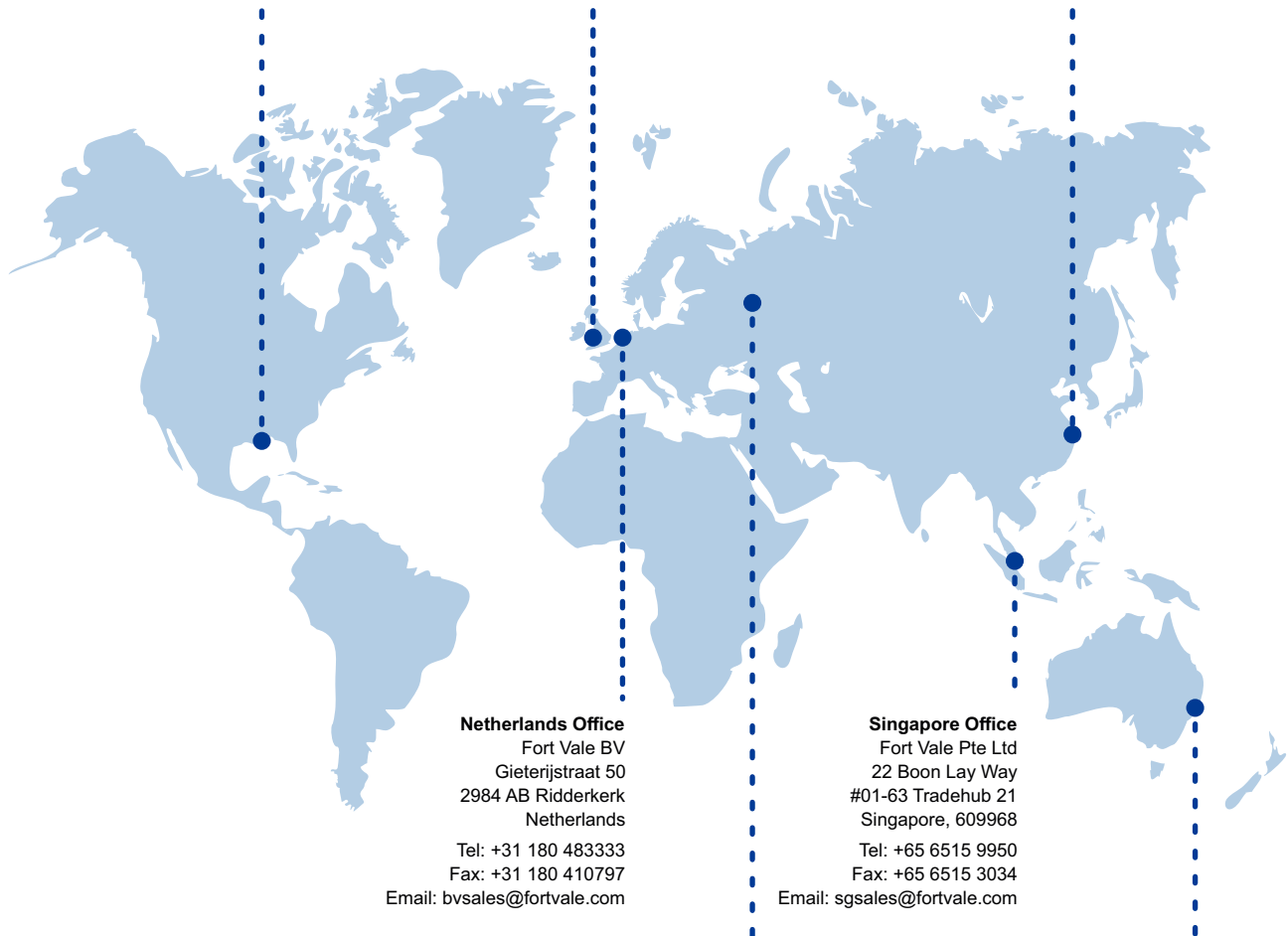
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