



Catalogue

Standard Equipment for Offshore Fuel and Chemical Tanks





CONTENTS

Equipment for Offshore Tanks

Catalogue

Manlid & Inspection Hatch Assemblies	3
170mm Inspection Hatch Assembly	5
460mm Pendle Manlid Assembly	7
500mm Pendle Manlid Assembly	9
Relief Valves	11
Design Options: Super Maxi & Hyper Maxi Relief Valves	13
2½" BSP Super Maxi Relief Valve - Pressure/Vacuum	15
Airline Valves	17
Design Options: Airline Ball Valves & Butterfly Valves	19
1½" BSP Blacko Airline Ball Valve	21
Bottom Discharge Equipment	23
Design Options: Discharge Valve Assembly	25
3" 45° Highlift/2" Ball Valve Assembly	27
3" to 2" 90° Discharge Assembly	31
3" to 2" 90° Tankstream Footvalve	35
2" Blacko Ball Valve	37
3" 90° Helifuel Discharge Assembly	39
3" 90° Tankstream Footvalve	43

Continued over



CONTENTS

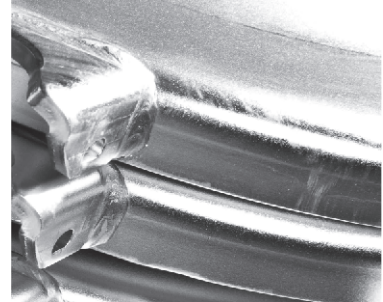
Equipment for Offshore Tanks

Catalogue

70mm Drytyt Dry Disconnect Tank Unit	45
70mm Drytyt Dry Disconnect Hose Unit	47
Dry Disconnect Coupling Selectivity: 70mm	49
105mm Drytyt Dry Disconnect Tank Unit	51
105mm Drytyt Dry Disconnect Hose Unit	53
Dry Disconnect Coupling Selectivity: 105mm	55
Pressure-Tight Caps for Drytyt Tank Units	57
Sampling Valve Assembly	
1½" to ¾" 90° Sampling Valve Assembly	59
1½" 90° Sampling Footvalve	63
Accessories	65
Socket Ball Valves	67
Document Holders	68
Pressure Gauges	69
Temperature Gauges	70
After Sales Service	71
Valve Repair & Maintenance	73
Bolt Torque Guide & Step Loading Procedure	75
Client Responsibilities	77



Manlid & Inspection Hatch Assemblies





170mm Inspection Hatch Assembly

Part No: 14I/3100XXA



Specification

Nominal size

170mm

Cover

3 point

Neckring

Thickness: 6mm

Height range: 75mm to 305mm

Properties

1x spring-loaded swingbolt assembly lets the cover turn clear of the neckring in the open position

Materials

Contact parts: 316 stainless steel

Fasteners: stainless steel swingbolts and handnuts

Seal: supplied separately

Alternatives are available, refer to the Design Options page

Design Conditions

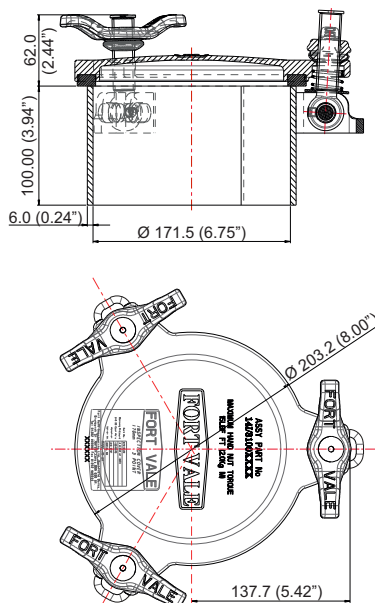
Weight:	8.9 Kg *Note
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	150°C

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

Range

Description	Part No.
With 75mm neckring	14I/3100075A
With 100mm neckring	14I/3100100A
with 200mm neckring	14I/3100200A

Section View

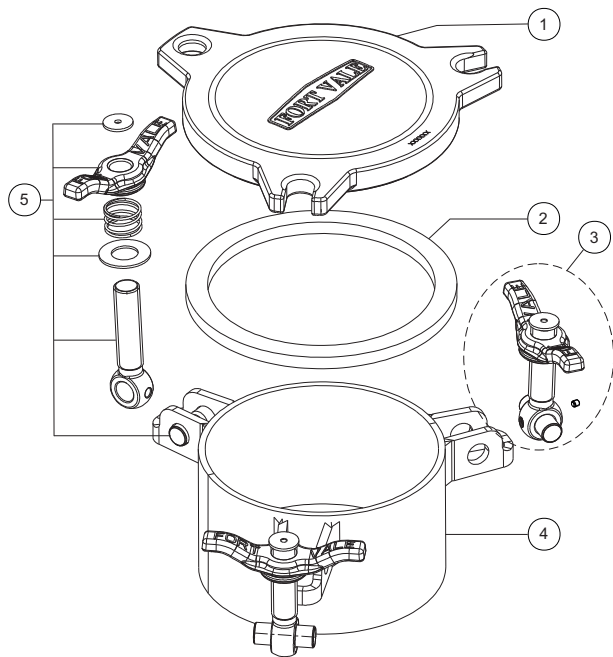




170mm Inspection Hatch Assembly

Part No: 14I/3100XXA

Parts Drawing



Parts List

Item	Description	Part No.
1	Cover	672/0120
2	Seal (not included) *Note	5005-XXXX
3	Swingbolt assembly (2)	496/5342
4	Neckring *Note	661/36XXX
5	Spring-loaded swingbolt:	
	Top washer	5113-080
	Handnut	490/0310
	Spring	5104-506
	Washer	5123-005
	Swingbolt	540/0342
	Pivot pin	10913SS

NOTE: The specification changes the Part No.



460mm Pendle Manlid Assembly

Part No: 44C/6100XXXB



Specification

Nominal size

DN450

Cover

6 point

Neckring

Thickness: 6mm

Height range: 100mm to 250mm

Materials

Contact parts: 316 stainless steel

Fasteners: stainless steel swingbolts with naval brass handnuts

Seal: supplied separately

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 30 Kg *Note

Design Pressure (MAWP): 4 Bar

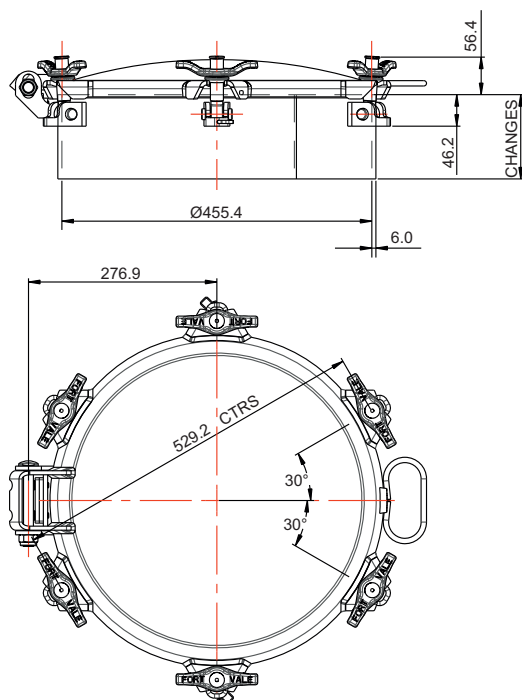
Test Pressure: 6 Bar

Design Temperature Min: -40°C

Design Temperature Max: 180°C

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

Section View

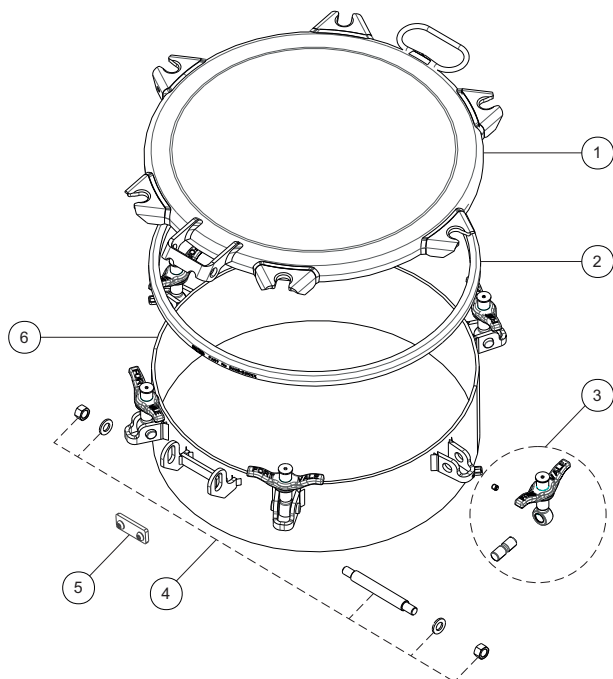




460mm Pendle Manlid Assembly

Part No: 44C/6100XXXB

Parts Drawing



Parts List

Item	Description	Part No.
1	Cover	710/1200P
2	Seal (not included) *Note	5005-XXXX
3	Swingbolt assembly (6)	496/1342
4	Hinge pin assembly	600/1060
5	Hinge kit	135B
6	Neckring *Note	664/66XXXA

NOTE: The specification changes the Part No.



500mm Pendle Manlid Assembly

Part No: E3C/6100XXXB



Specification

Nominal size

DN500

Cover

6 point

Neckring

Thickness: 6mm

Height: 60mm to 350mm

Materials

Contact parts: 316 stainless steel

Fasteners: stainless steel swingbolts with naval brass handnuts

Seal: supplied separately

Alternatives are available, refer to the Design Options page

Design Conditions

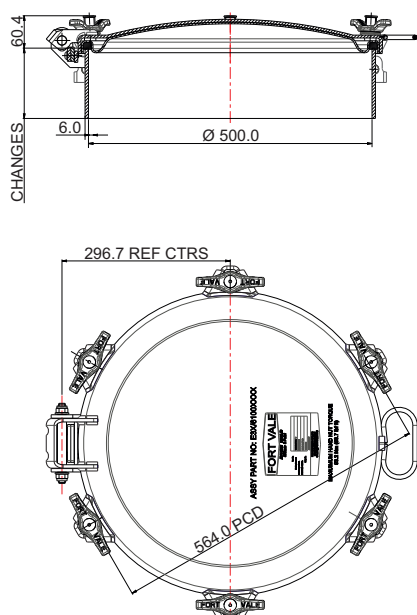
Weight:	28.6 to 50.9 Kg *Note
Design Pressure (MAWP):	3 Bar
Test Pressure:	4.5 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	250°C

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

Design Codes

BS EN 14025

Section View

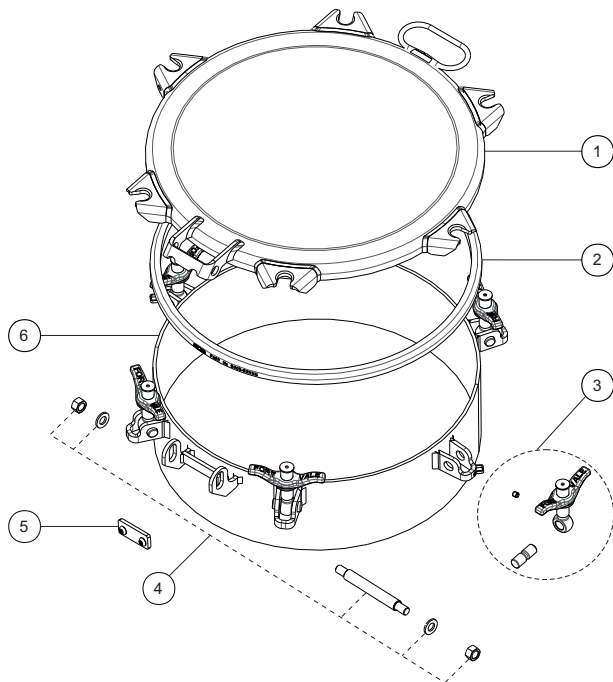




500mm Pendle Manlid Assembly

Part No: E3C/6100XXXB

Parts Drawing



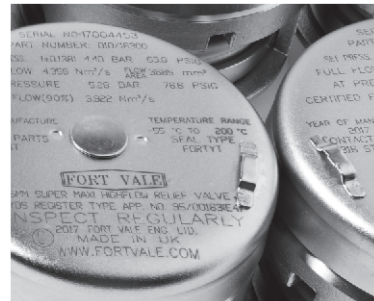
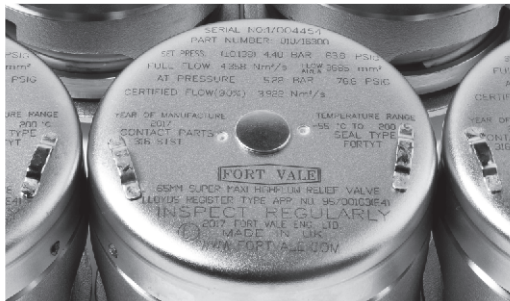
Parts List

Item	Description	Part No.
1	Manlid cover	73E/0500
2	Seal (not included) *Note	5005-50XXX
3	Swingbolt assembly (6)	496/1375
4	Hinge pin assembly	600/1060
5	Hinge kit	135B
6	Neckring *Note	66E/66XXA

NOTE: The specification changes the Part No.



Relief Valves





Super Maxi & Hyper Maxi Relief Valves

Design Options

Function

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

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

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

Design Options

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

Tank Connection

2½" BSP

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

Special service conditions:
DIN11851: 80mm

Special Options

Manual vacuum vent button

Tank Seal

Rubber/PTFE - 2½" BSP only
Other materials are available

Nominal Bore

65mm: Super Maxi

82.5mm: Hyper Maxi

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

Body

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

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

Pressure Setting

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

Vacuum Setting

From 2 kPa to 88 kPa

Pressure Seal

Fortyt

Special service conditions:
A range of seal materials is available

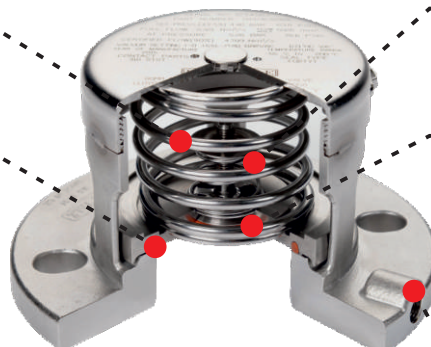
Vacuum Seal

Fortyt

Special service conditions:
A range of seal materials is available

Gauge Connection

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





Super Maxi & Hyper Maxi Relief Valves

Design Options

Design Options - continued

Valve Materials

316 stainless steel

Special service conditions:

Lined/coated wetted parts e.g. PFA

High nickel alloys



Finish

Electropolished

Special service conditions:

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

Related Parts

We recommend our range of compatible accessories:

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

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

Please contact us for more information about these parts.

Relief Valves for Dedicated Service

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

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

Please contact us for more information about these valves.



2½" BSP Super Maxi Relief Valve - Pressure/Vacuum

Part No: 010/1XXXXX - Metric Setting



Specification

Nominal size

DN65

Tank connection

2½" BSP

Set pressure

From 0.15 Bar to 5.15 Bar

Set vacuum

From 1 kPa to 88 kPa

Materials

Contact parts: 316 stainless steel

Pressure O ring: Fortyt

Vacuum O ring: Fortyt

Tank seal: Rubber/PTFE envelope

Alternatives are available, refer to the Design Options page

Design Conditions

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

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

Approval

Design Approval by Lloyds Register of Shipping

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

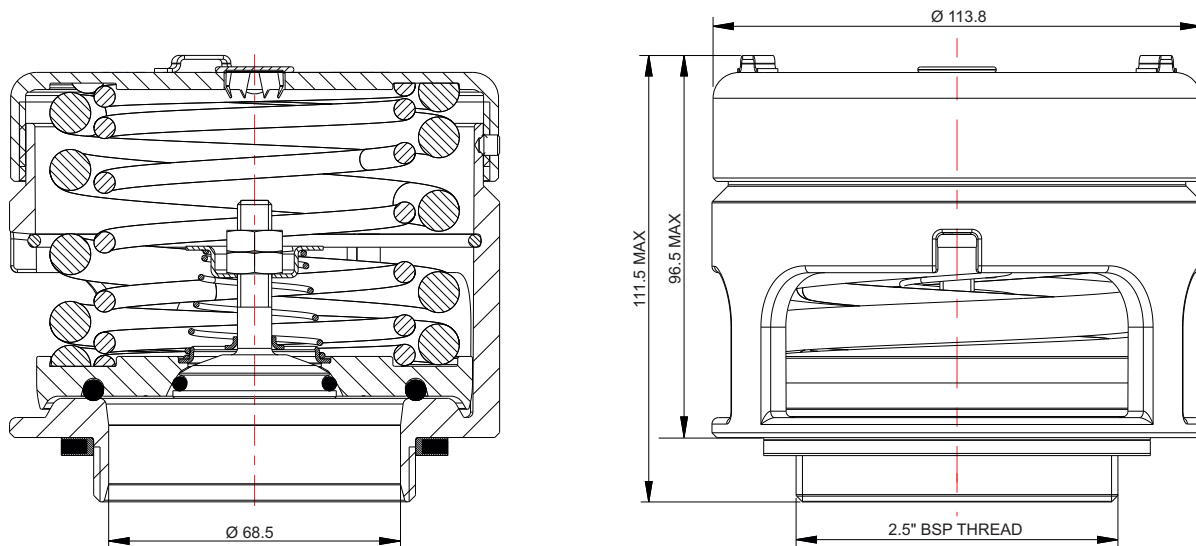
Range

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

Related Parts

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

Section View

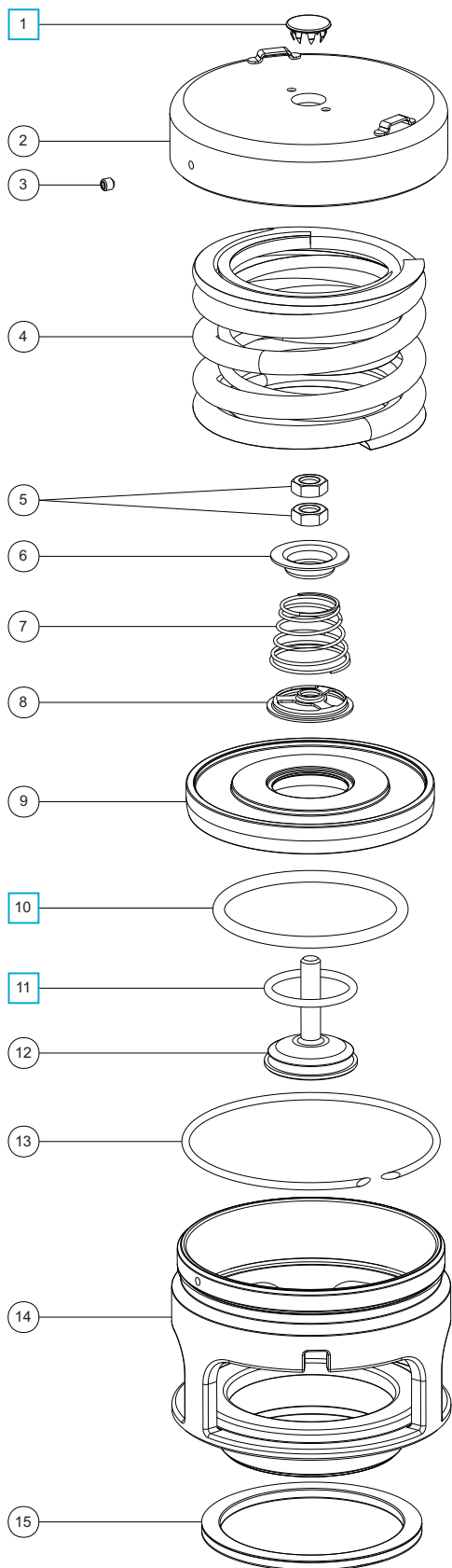




2½" BSP Super Maxi Relief Valve - Pressure/Vacuum

Part No: 010/1XXXXX - Metric Setting

Parts Drawing



Parts List

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

NOTE: The valve specification changes the Part No.

Table 1

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

Pressure springs are available from 0.15 Bar to 5.15 Bar

Table 2

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

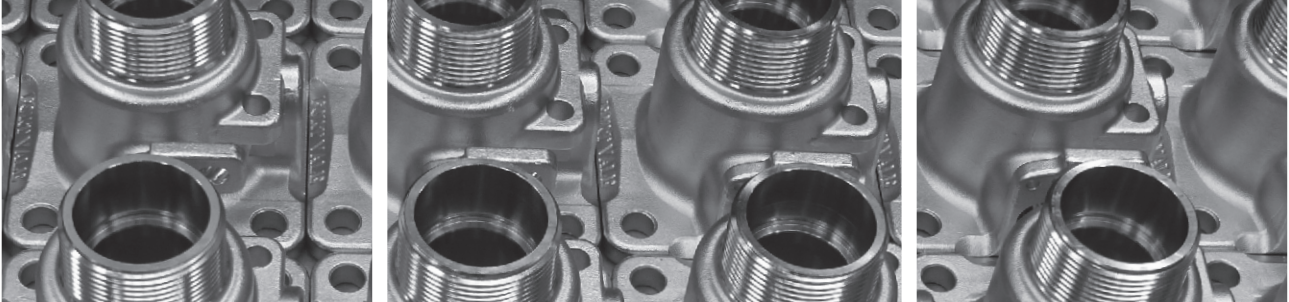
Vacuum springs are available from 1 kPa to 88 kPa

Seal Kit

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



Airline Valves





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.

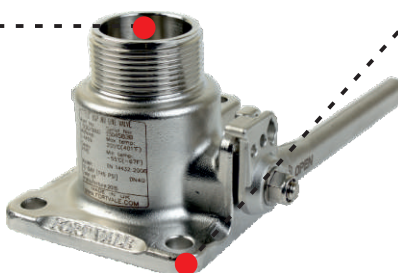
Nominal Bore

40mm (1½"): Ball valves

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

Special service conditions:

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



Tank Connection

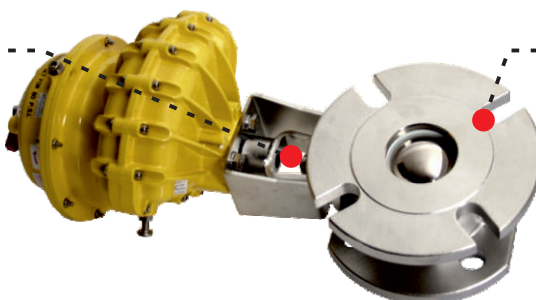
Flanged: 4 holes

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

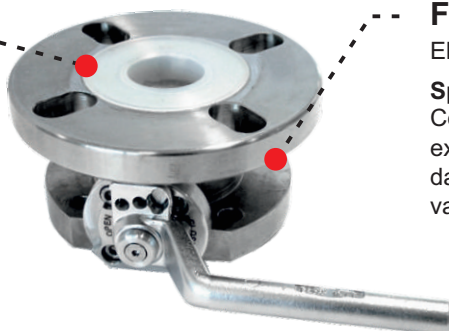
Flanged: Closed or open slots

Valve Materials

316 stainless steel

Special service conditions:

Lined wetted parts, e.g. PFA



Finish

Electropolished

Special service conditions:

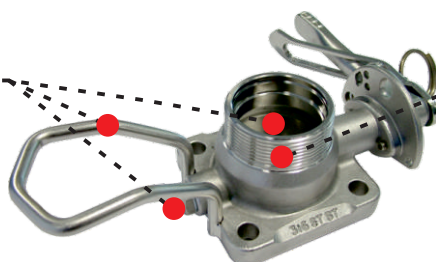
Corrosion-resistant paint on external surfaces to prevent damage from corrosive cargo vapour/splash

Accessories

Gauge guard

Gauze or sintered filter

TIR to gauge inlet plug



Main Seal

PTFE

Special service conditions:

High-temperature compatible seals



Airline Ball Valves & Butterfly Valves

Design Options

Related Parts

We recommend our range of compatible accessories:

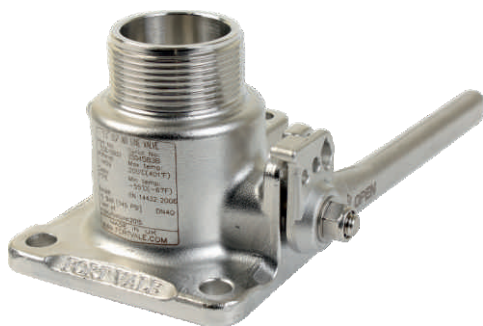
- Pressure gauges
- Filters: gauzed or sintered
- Blank caps
- Flanges - weld-in and adaptor
- Fasteners
- Gaskets

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

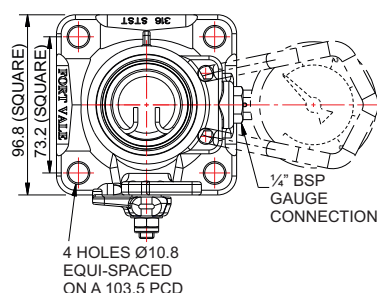
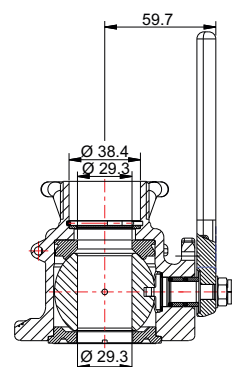
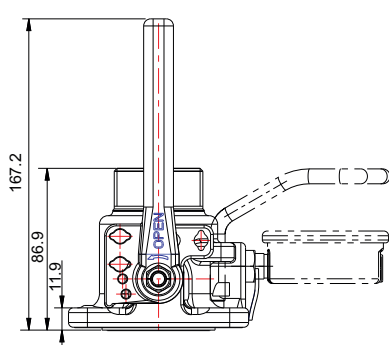
Range

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
Weld-in flange	350/0025

Section View

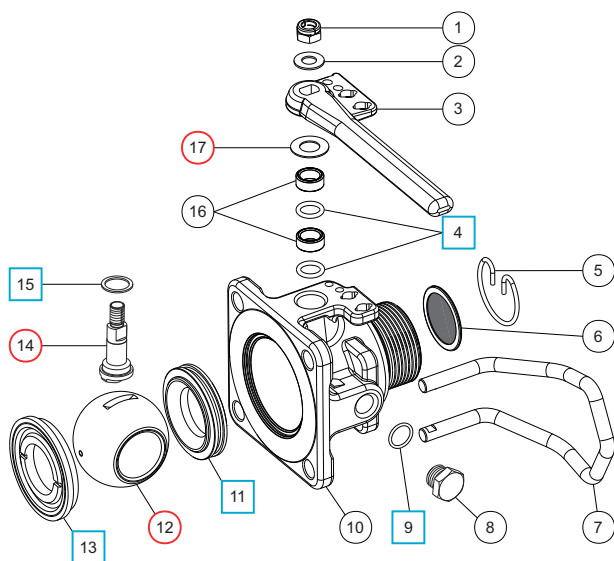




1½" BSP Blacko Airline Ball Valve

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 □ ○
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 □ ○
10	Body	530/0100
11	Front ball seal	5005-006 □ ○
12	Ball	350/0002 ○
13	Rear ball seal	5005-007 □ ○
14	Spindle	530/0001 ○
15	PTFE washer	5003-002 □ ○
16	Stuffing boss (2)	530/0003
17	Disc spring	5113-036 ○

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

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

Seal Kit

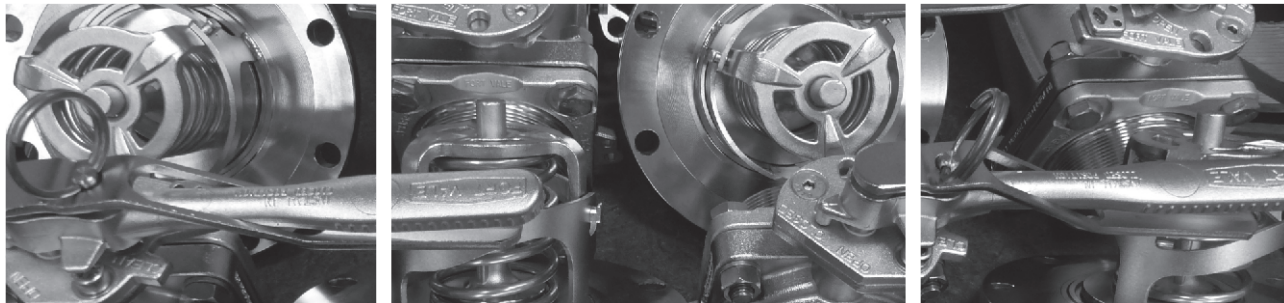
Description	Part No.
All parts marked □ in the Parts List	530/00SK

Repair Kit

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



Bottom Discharge Valves





Discharge Valve Assembly: Offshore

Design Options

Function

The discharge assembly is installed at the drain point of a tank. It is used to load, discharge and sample the cargo. We can supply a number of valve combinations, compatible with different offshore tank specifications. These include primary, secondary and tertiary closures, with and without sample points. A separate sample valve assembly is also available.

Our Highlift footvalve is the normal type of primary valve for offshore tanks, but Cleanflow footvalve assemblies are also available. All our primary valves have a shear groove. To prevent leakage if there was an accident, the groove will break and keep the internal part of the footvalve closed and attached to the tank.

Design Options

The design options below are available on our standard range of discharge assemblies for offshore tanks.

Please contact us for more information about valve options.

Discharge Assemblies

Footvalve Seat Area

Standard seat
Replaceable seat

Special service conditions:
Special alloys

Footvalve Body Angle

45° - compact valve assembly
90° - extended valve assembly

Footvalve Main Seal

Fortyt

Special service conditions:
Elastomer

Footvalve Outlet Tube

Compact:
With integral ball valve

Extended:
Different lengths are available

Footvalve Nominal Bore

80mm (3" to 3")
80mm to 50mm (3" to 2")

Footvalve Operation

Manually operated

Special service conditions:
Pneumatically actuated

Secondary Valve Operation

Left handed
Right handed

Tertiary Outlet

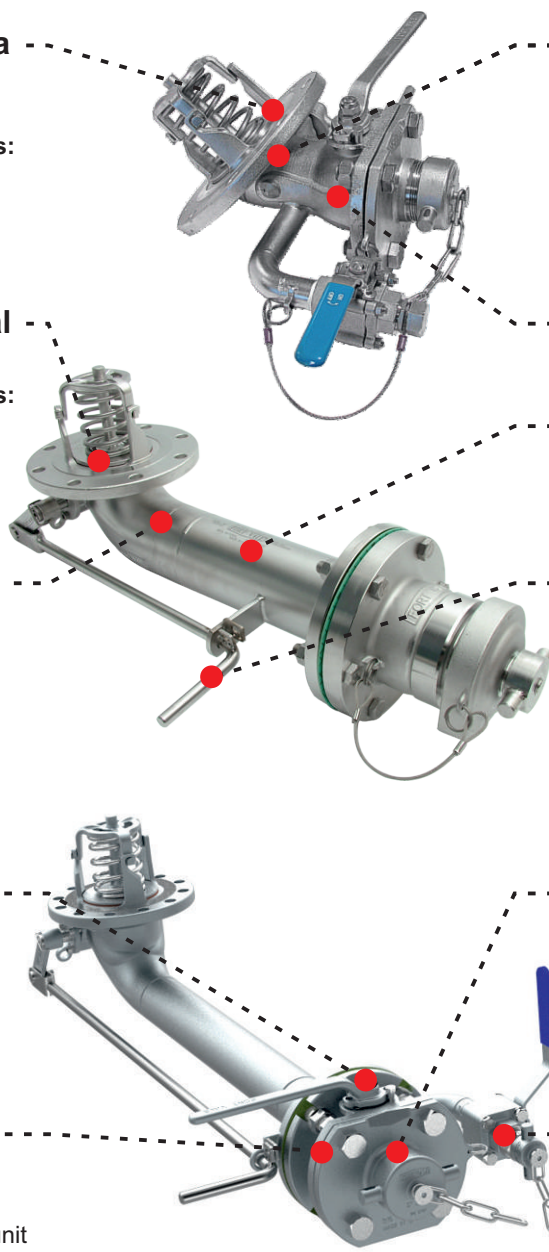
Threaded cap - BSP, NPT
Pressure-tight Drytyt cap
Camlock cap

Secondary Valve Outlet

Threaded - BSP, NPT
Drytyt dry disconnect tank unit
Camlock

Sample Point

With or without
Left or right





Discharge Valve Assembly: Offshore

Design Options

Related Parts

We recommend our range of compatible accessories:

- Flanges - weld-in and adaptor
- Couplings, caps and plugs
- Gaskets
- Fasteners

Please contact us for more information about these parts.

Footvalves for Dedicated Service

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

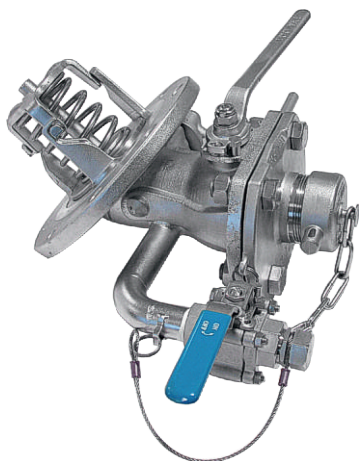
- General purpose tank containers
- T50 tank containers for liquefied gas
- Rail tank wagons
- Road tankers carrying hot product (bitumen)
- Road tankers: top operated screwdown valve

Please contact us for more information about these valves.



3" 45° Highlift/2" Ball Valve Assembly: Offshore

Part No: 804/0085XXA



Specification

Nominal size/body angle

80mm to 50mm / 45°

Inlet connection

Flanged: 8 x 14mm holes on a 177.8mm PCD

Properties

80mm footvalve with replaceable seat, 3/4" firesafe sample ball valve and cap, integral 50mm ball valve with 2"BSP outlet and cap

Options

Different seat materials are available, contact Fort Vale

Materials

Contact parts: 316 stainless steel

Main seal footvalve: Fortyt

Main seal ball valve: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	15.4 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.

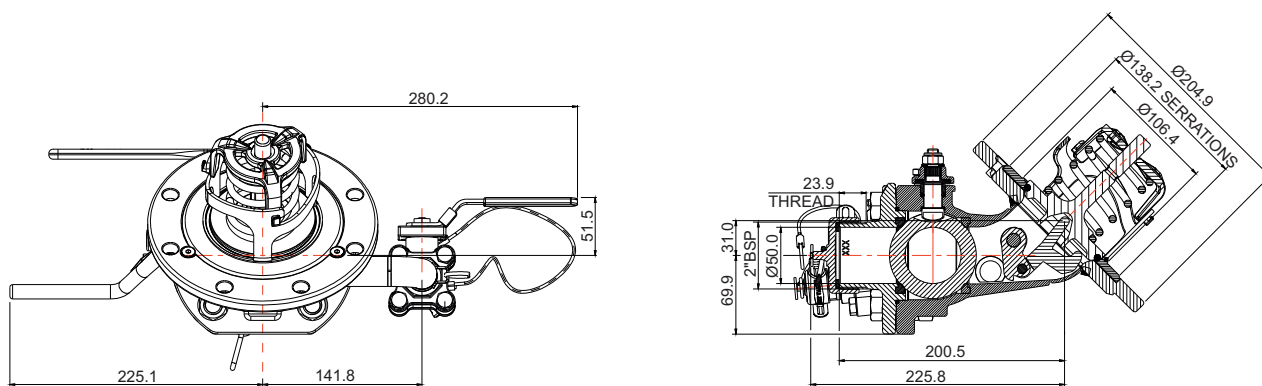
Range

Description	Part No.
St/st seat, left hand ball valve	804/0085LSA
St/st seat, right hand ball valve	804/0085RSA

Related Parts

Description	Part No.
Weld-in flange	324/9000
M12 stud kit	324/2060
CNAF/PTFE inlet gasket	5005-015

Section View

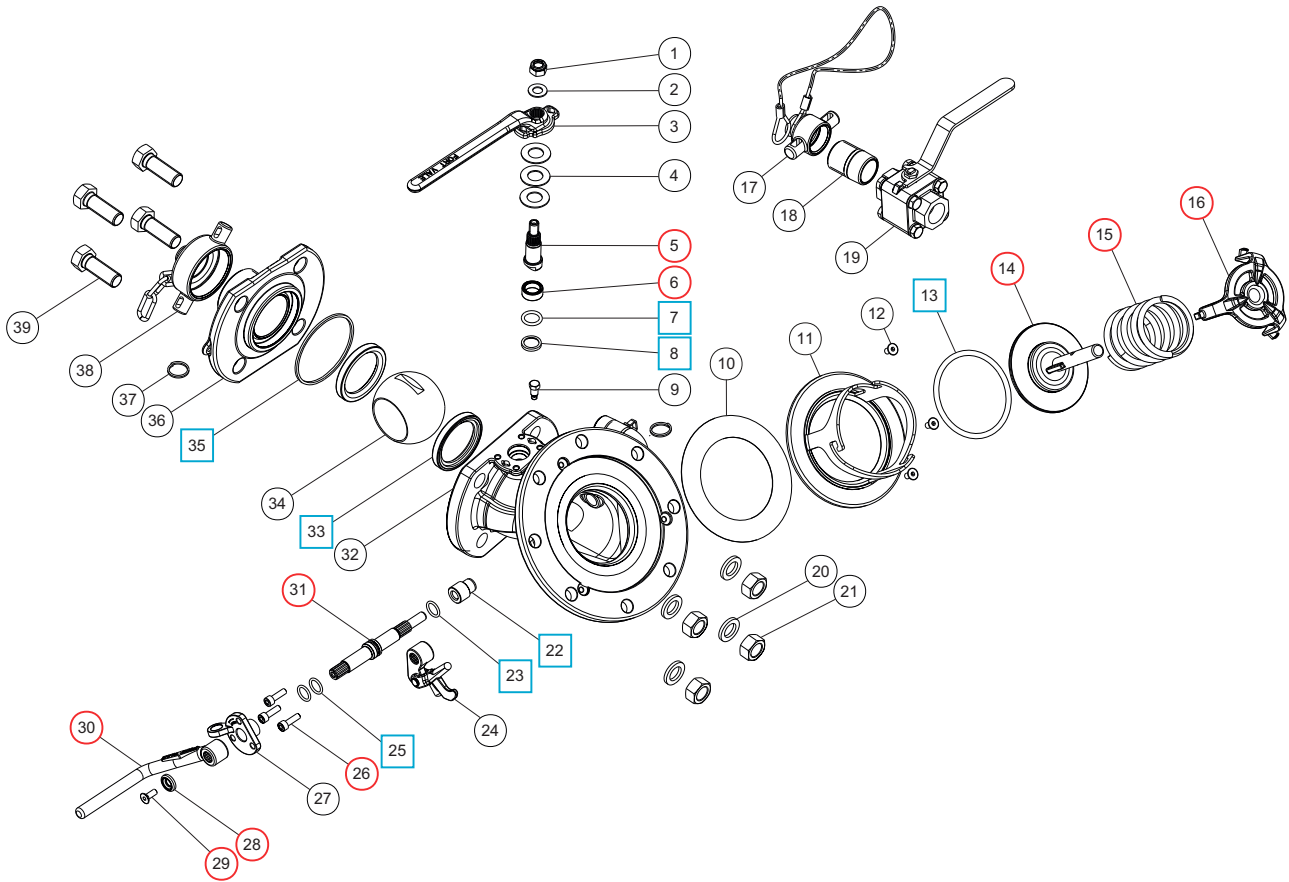




3" 45° Highlift/2" Ball Valve Assembly: Offshore

Part No: 804/0085XXA

Parts Drawing





3" 45° Highlift/2" Ball Valve Assembly: Offshore

Part No: 804/0085XXA

Parts List

Item	Description	Part No.
1	M10 self locking nut	5112-008
2	M10 washer	5113-009
3	Ball valve handle	370/0125
4	Belleville washer (3)	5113-038
5	2" ball valve spindle	370/0120
6	Stuffing collar	370/0103
7	PTFE O ring	5005-688
8	Bottom bearing	370/0104
9	Stop pin	370/0107
10	PTFE wafer gasket *Note 1	5005-828
11	Seal flange assembly *Note	826/0817X
12	6mm countersunk screw (3)	5111-018
13	Fortyt O ring	5005-104
14	Solid poppet	324/2020
15	Spring	5104-971
16	Spring top plate	290/6104
17	¾" cap with wire	10306PSW
18	¾" nipple	338/1304
19	¾" firesafe ball valve	410/500F
20	M16 spring washer (4)	5113-012
21	M16 full nut (4)	5112-003
22	Crankshaft end bush	20362
23	PTFE O ring (2)	20363
24	Crank block assembly	821/0300
25	Viton O ring	20361
26	M6 cap screw (3)	5111-017
27	Stuffing clamp	324/1001
28	Retaining washer	20370
29	M6 countersunk set screw	5111-030
30	Footvalve handle	330/5010
31	Spindle	821/0010
32	45° footvalve body	826/1176316
33	PTFE ball seal (2)	370/0102
34	50mm ball	370/3301
35	Body seal	370/0106
36	Outlet flange	370/0130
37	Split ring (2)	5128-013
38	2" BSP cap	10301PS
39	M16 hex bolt (4)	5111-031

NOTE: The valve specification changes the Part No.

NOTE 1: The PTFE wafer gasket is not included in the footvalve seal kit. We recommend that you replace the gasket during normal maintenance or if you disassemble the footvalve. Please order it separately.

Seal Kit

Description	Part No.
All parts marked  in the Parts List	826/00SK
All parts marked  in the Parts List	370/015SK

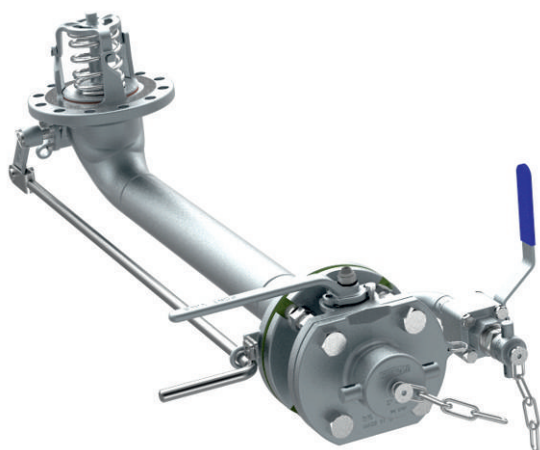
Repair Kit

Description	Part No.
All parts marked  in the Parts List	826/00RKA
All parts marked  in the Parts List	370/015RK



3" to 2" 90° Discharge Assembly: Offshore

Part No: 29F/10520834F08



Specification

Nominal size/body angle

80mm to 50mm / 90°

Inlet connection

Flanged: 12 x 14mm holes on a 158.75mm PCD

Properties

80mm footvalve with Ø50mm extended outlet tube with ¾" firesafe sample ball valve and cap, 50mm ball valve with 2" BSP outlet and cap. Assembly length: 834mm

Materials

Contact parts: 316 stainless steel

Main seal footvalve: Fortyt

Main seal ball valve: PTFE

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	23 Kg *Note
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

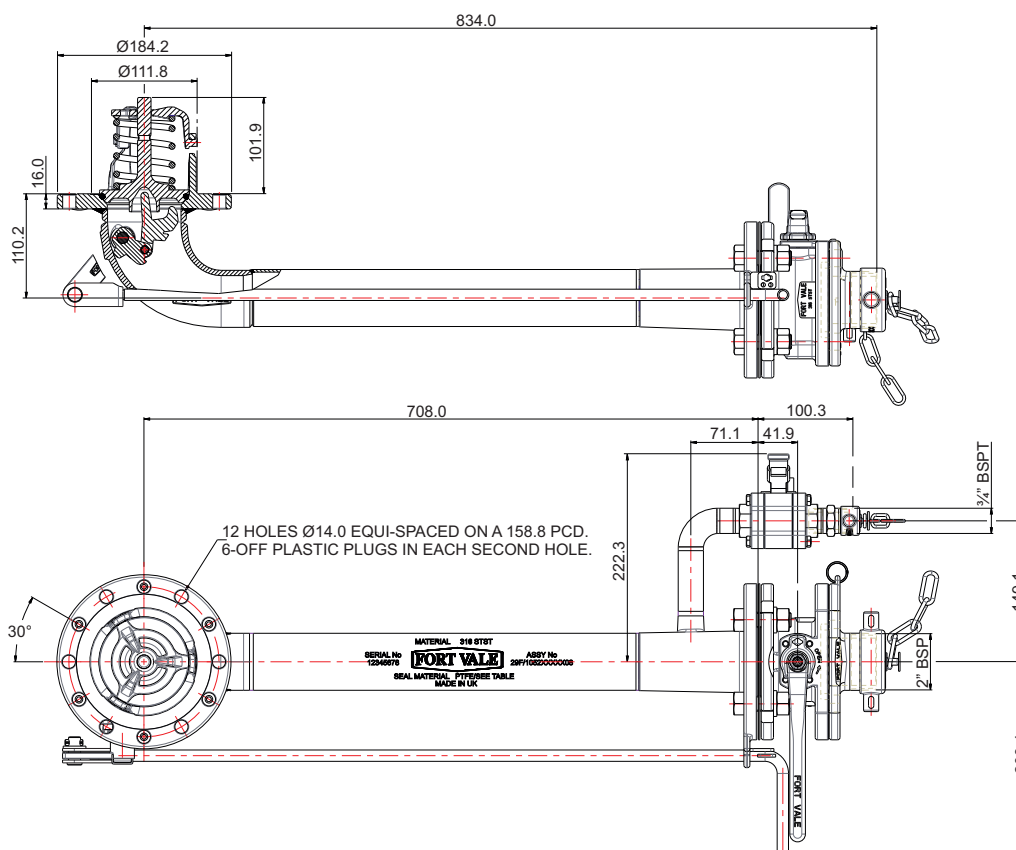
NOTE: The valve specification changes the weight. The Design Conditions and Section View dimensions are for the specified part number only.

This assembly is compatible with DNV 2.7-1 chemical offshore tanks

Related Parts

Description	Part No.
Weld-in flange	11954/S
M12 stud kit	290/1300
CNAF/PTFE inlet gasket	5005-016

Section View

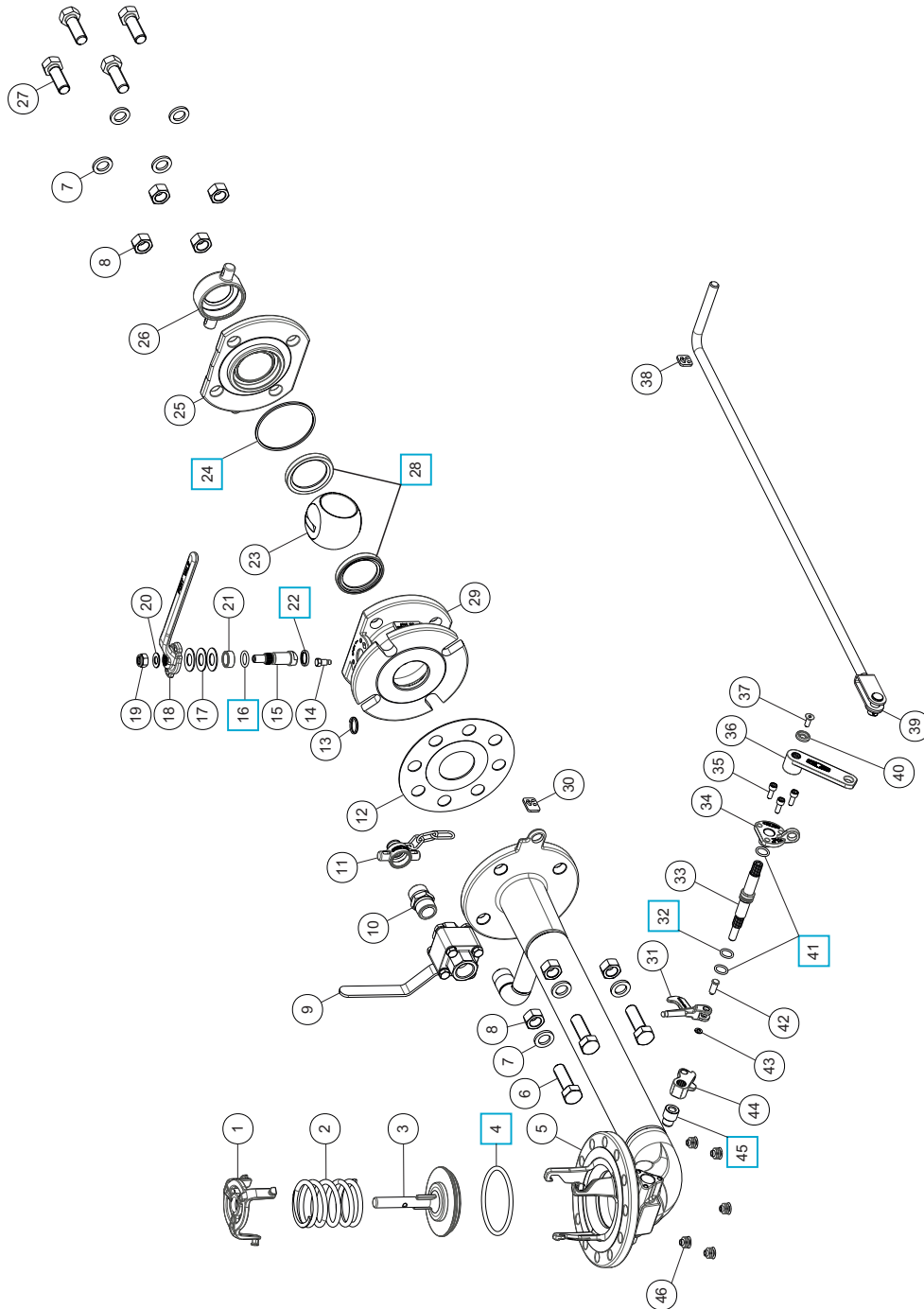




3" to 2" 90° Discharge Assembly: Offshore

Part No: 29F/10520834F08

Parts Drawing





3" to 2" 90° Discharge Assembly: Offshore

Part No: 29F/10520834F08

Parts List

Item	Description	Part No.
1	Spring top plate	290/6104
2	Spring	5104-971
3	Solid poppet	324/2020
4	Fortyt O ring	5005-104 
5	Body weld assembly *Note	29F/XXXXA08
6	M16 hex bolt (4)	5111-031
7	M16 spring washer (8)	5113-012
8	M16 full nut (8)	5112-003
9	¾" firesafe ball valve	410/5000F
10	¾" BSPTM/¾" BSPT hex nipple	5128-091
11	¾" BSP cap with washer & chain	10306PSS
12	CNAF/PTFE gasket	5005-726
13	Split ring	5128-013
14	Stop pin	370/0107
15	Spindle	370/0120
16	PTFE O ring	5005-688 
17	16mm Belleville washer (3)	5113-038
18	Ball valve handle	370/0125
19	M10 self locking nut	5112-008
20	M10 plain washer	5113-009
21	Stuffing collar	370/0103
22	Bottom bearing	370/0104 
23	50mm ball	370/3301
24	Body seal	370/0106 
25	Outlet flange	370/0130
26	2" BSP cap with seal & chain	10301PSS
27	M16 hex bolt (4)	5111-036
28	PTFE ball seal (2)	370/0102 
29	2" ball valve body	370/0110
30	Large TIR tab	20491
31	Extended lifting finger	821/0054
32	Viton O ring	20361 
33	Spindle	821/0010
34	Stuffing clamp	324/1001
35	M6 cap screw (3)	5111-017
36	Handle *Note	20607/X
37	M6 countersunk bolt	5111-030
38	Small TIR plate	20492
39	Remote handle *Note	330/5020X
40	Retaining washer	20370
41	PTFE O ring (2)	20363 
42	Pivot pin	821/0034
43	5mm plain washer	5113-015
44	Crank block	821/0025/3
45	Crankshaft end bush	20362 
46	Plastic plug (6)	5028-227

NOTE: The valve specification changes the Part No.

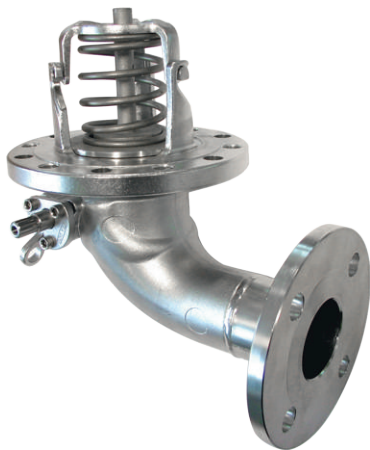
Seal Kit

Description	Part No.
Ball valve seal kit includes all parts marked  in the Parts List	370/015SK
Footvalve seal kit includes all parts marked  in the Parts List	826/00SK



3" to 2" 90° Tanksteam Footvalve: Offshore

Part No: 29F/0000XXXXX02



Specification

Nominal size/body angle

80mm to 50mm / 90°

Inlet connection

Flanged: 12 x 14mm holes on a 158.75mm PCD

Outlet connection

Flanged: 4 x 17mm holes on a 114.3mm PCD

Options

Different lengths of body outlet tube are available

Materials

Contact parts: 316 stainless steel

Main seal: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

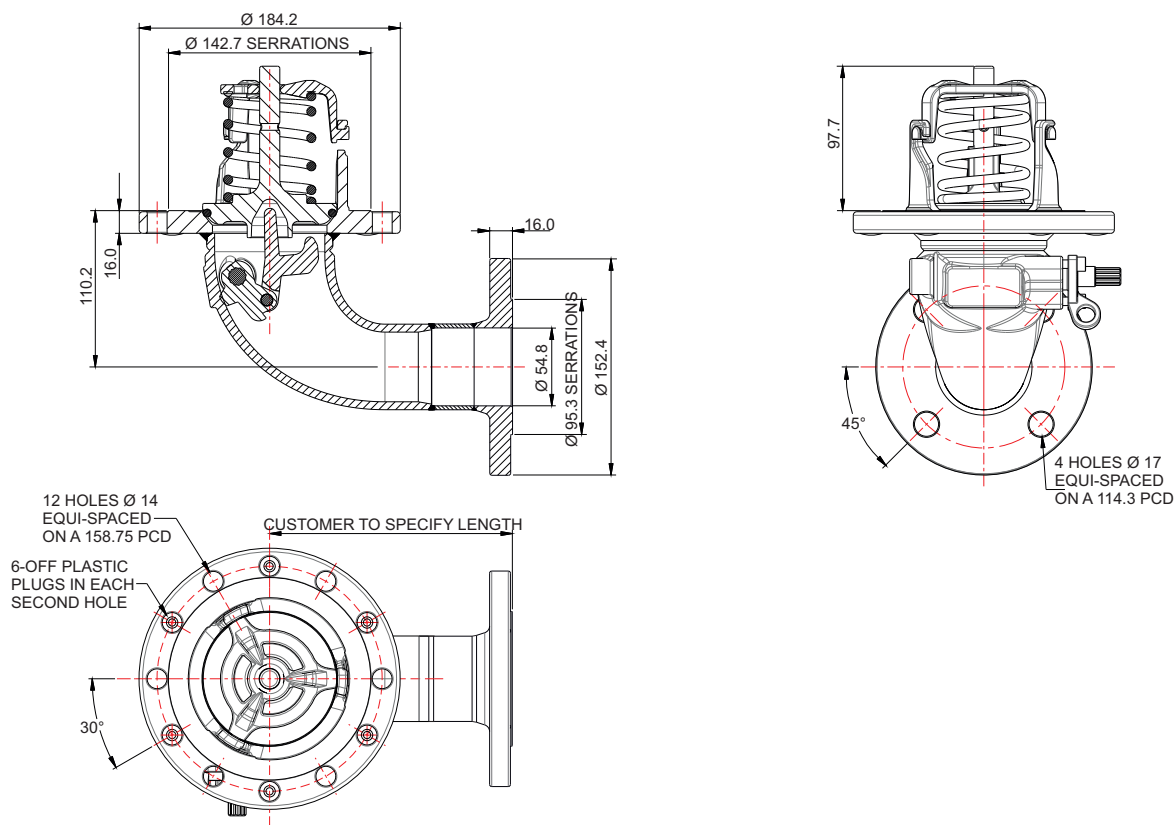
Weight:	8.3 Kg
Design Pressure (MAWP):	6.66 Bar
Test Pressure:	10 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	200°C

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

Related Parts

Description	Part No.
Weld-in flange	11954/S
M12 stud kit	290/1300
CNAF/PTFE inlet gasket	5005-016

Section View

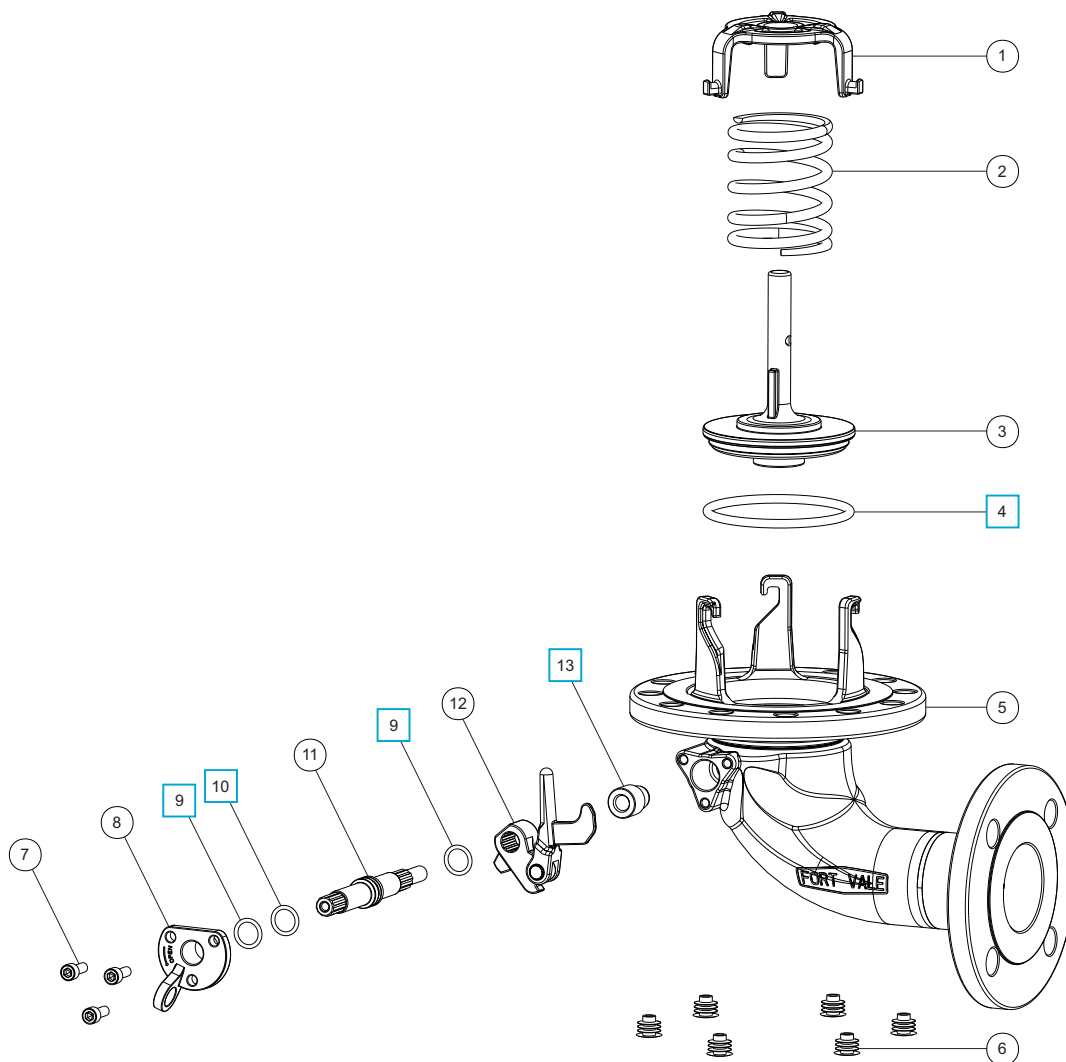




3" to 2" 90° Tanksteam Footvalve: Offshore

Part No: 29F/0000XXXXX02

Parts Drawing



Parts List

Item	Description	Part No.
1	Spring top plate	290/6104
2	Spring	5104-971
3	Solid poppet	324/2020
4	Fortyt O ring	5005-104 ☐
5	Body weld assembly *Note	29F/XXXXB
6	Plastic plug (6)	5028-227
7	M6 cap screw (3)	5111-015
8	Stuffing clamp	324/1001
9	PTFE O ring (2)	20363 ☐
10	Viton O ring	20361 ☐
11	Spindle	821/0010
12	Lifting finger assembly	821/0301
13	PTFE crankshaft end bush	20362 ☐

NOTE: The valve specification changes the Part No.

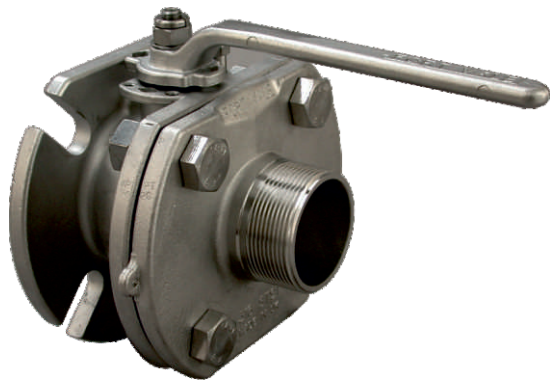
Seal Kit

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



2" Blacko Ball Valve: Offshore Specification

Part No: 370/0150



Specification

Nominal size

50mm

Tank connection

Flanged: 4 open slots - 2" BSTD / 2" ASA 150 / DIN50 PN40

Outlet/Process connection

2" BSP male

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:	7.91 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

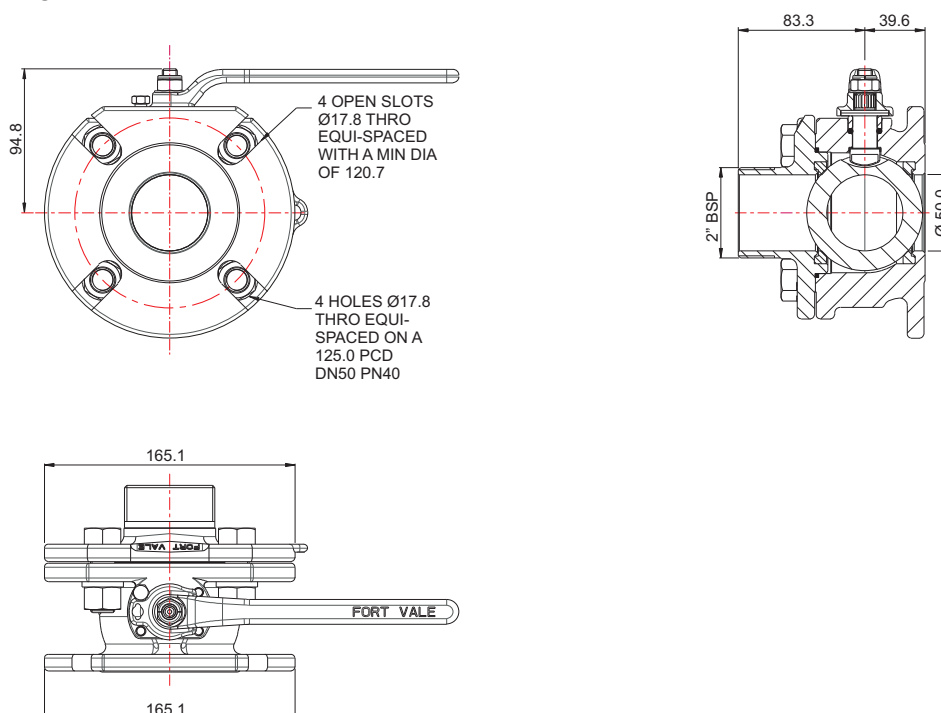
BS EN14432

Design approval by Lloyds Register of Shipping

Related Parts

Description	Part No.
Tank weld-in flange	355/3100
Stud kit	311/3700
2" BSP cap with chain & PTFE seal	10301PS

Section View

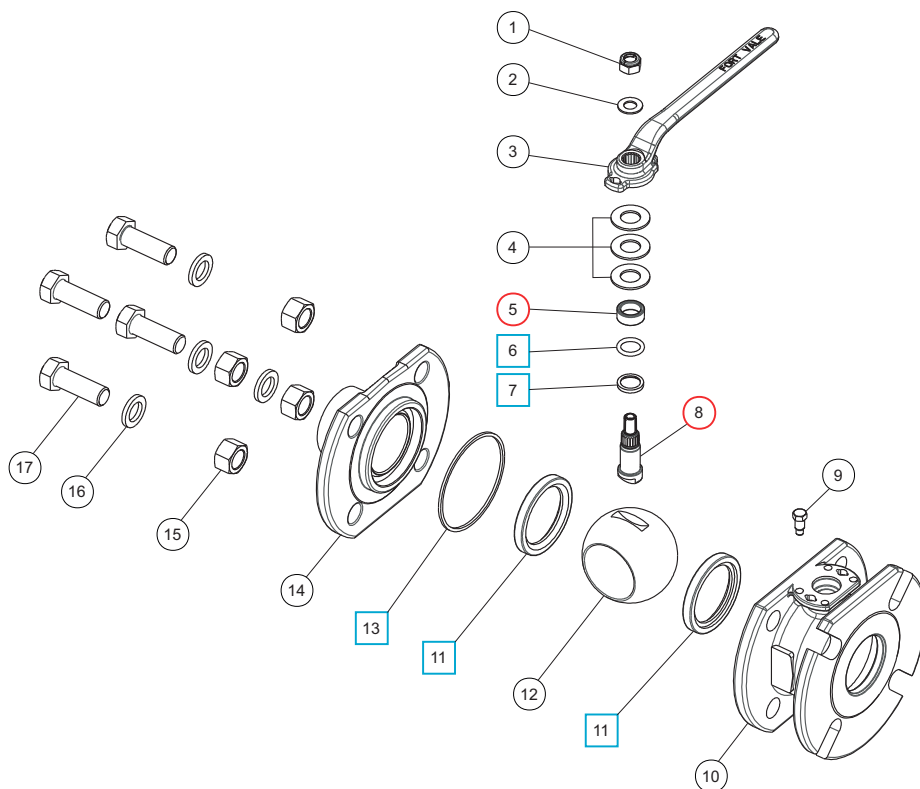




2" Blacko Ball Valve: Offshore Specification

Part No: 370/0150

Parts Drawing



Parts List

Item	Description	Part No.
1	M10 self locking nut	5112-008
2	M10 plain washer	5113-009
3	Handle	370/0125
4	16mm Belleville washer (3)	5113-038
5	Stuffing collar	370/0103
6	PTFE O ring	5005-688
7	Bottom bearing bush	370/0104
8	Spindle	370/0120
9	Stop bolt	370/0107
10	2" ball valve body	370/0110
11	PTFE ball seal (2)	370/0102
12	50mm ball	370/3301
13	Body seal	370/0106
14	Outlet flange	370/0130
15	M16 full nut (4)	5112-003
16	M16 spring washer (4)	5113-012
17	M16 hexhead setscrew (4)	5111-036

Seal Kit

Description	Part No.
All parts marked in the Parts List	370/015SK

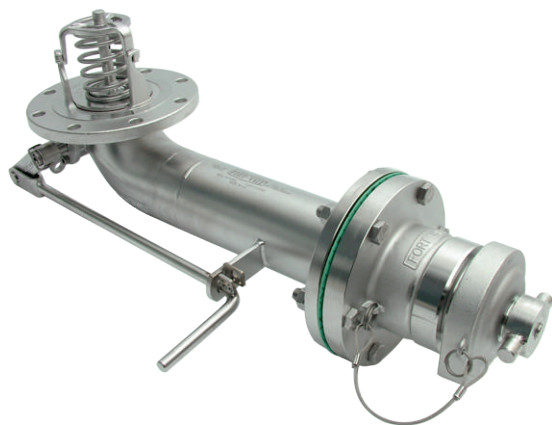
Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	370/015RK



3" 90° Helifuel Discharge Assembly: Offshore

Part No: 28F/00900490F00



Specification

Nominal size/body angle

80mm / 90°

Inlet connection

Flanged: 8 x 14mm holes on a 177.8mm PCD

Properties

80mm footvalve with extended outlet tube, flanged
105mm Drytyt dry disconnect tank unit with pressure-tight cap. Assembly length: 534mm

Materials

Contact parts: 316 stainless steel

Main seal footvalve: Fortyt

Tank unit seal: low temperature Viton

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	20 Kg *Note
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

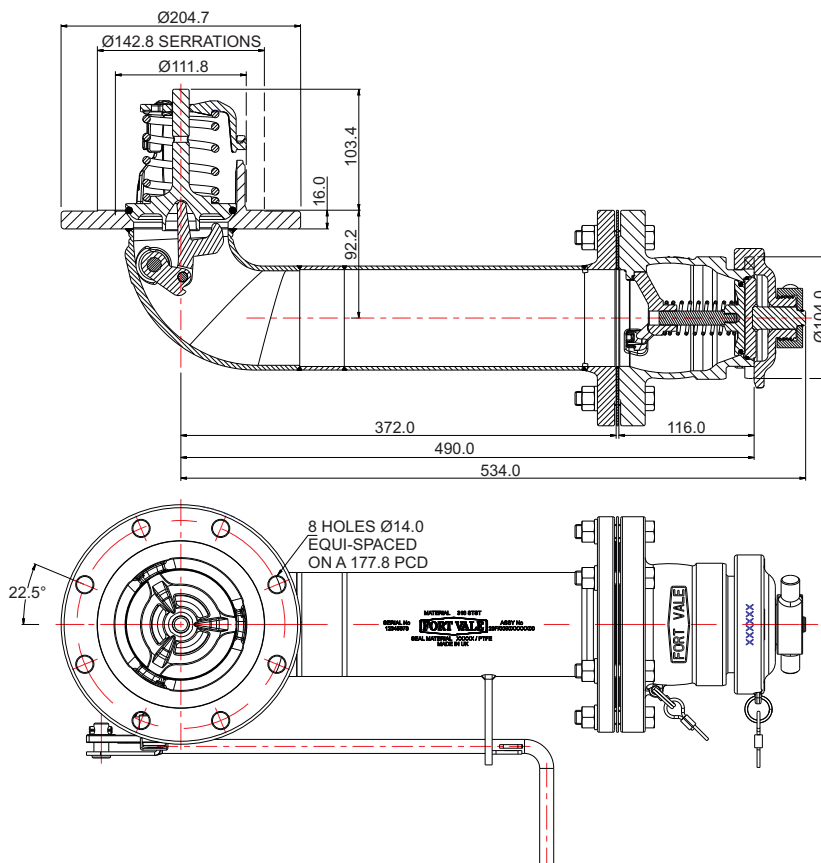
NOTE: The valve specification changes the weight. The Design Conditions and Section View dimensions are for the specified part number only.

This assembly is compatible with DNV 2.7-1 Helifuel offshore tanks

Related Parts

Description	Part No.
Weld-in flange	324/9000
M12 stud kit	324/2040
CNAF/PTFE inlet gasket	5005-015
105mm pressure-tight cap, Fortyt seal	915/5480F

Section View

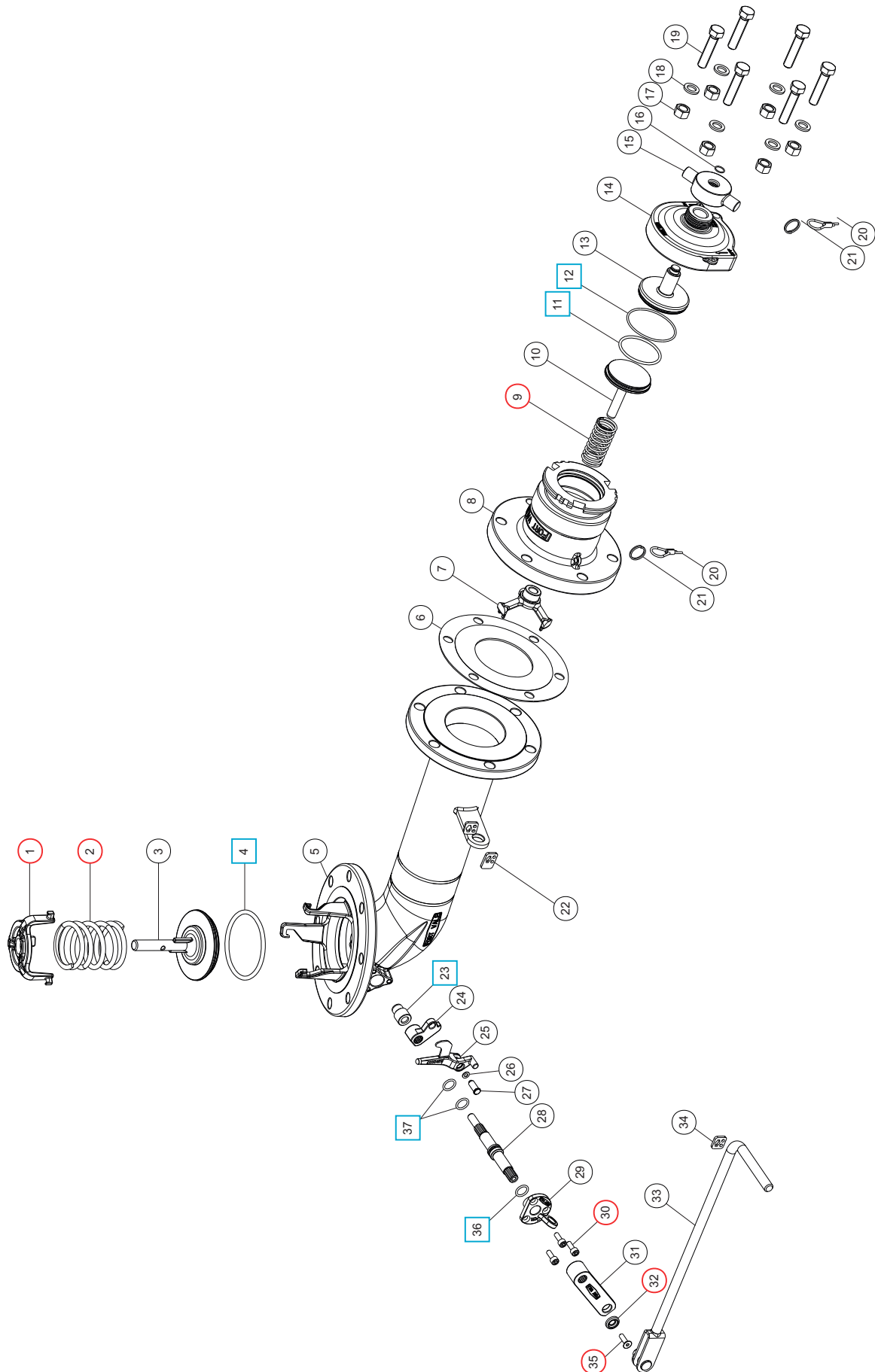




3" 90° Helifuel Discharge Assembly: Offshore

Part No: 28F/00900490F00

Parts Drawing





3" 90° Helifuel Discharge Assembly: Offshore

Part No: 28F/00900490F00

Parts List

Item	Description	Part No.	
1	Spring top plate	290/6104	○
2	Spring	5104-971	○
3	Solid poppet	324/2020	
4	Fortyt O ring	5005-104	□ ○
5	Body weld assembly *Note	28F/XXXXA	
6	CNAF/PTFE gasket	5005-159	
7	Coupling spider	376/1192	
8	105mm coupling body *Note	376/1051EXX	
9	Coupling poppet spring	5104-799	○
10	Coupling poppet *Note	376/1053	
11	Coupling Viton poppet O ring	5005-156	□ ○
12	Cap Fortyt O ring	5005-234	□ ○
13	Cap sealing plate	915/5485	
14	Cap body	915/5481	
15	Top cap	915/5474	
16	Cap circlip	5120-056	
17	M12 full nut (6)	5112-006	
18	M12 spring washer (6)	5113-010	
19	M12 hex bolt (6)	5111-100	
20	2.5mm st/st wire (2)	SF2.5 & 6110-005	
21	Split ring (2)	5128-130	
22	Large TIR plate	20491	
23	Crankshaft end bush	20362	□ ○
24	Crank block	821/0025	
25	Lifting finger assembly	821/0056	
26	5mm plain washer	5113-015	
27	Pivot pin	821/0034	
28	Spindle	821/0010	
29	Stuffing clamp	324/1001	
30	M6 cap screw (3)	5111-017	○
31	Handle (included in item 33)	20607	
32	Retaining washer	20370	○
33	Remote handle	330/5020A	
34	Small TIR plate	20492	
35	6mm countersunk bolt	5111-019	○
36	Viton O ring	20361	□ ○
37	PTFE O ring (2)	20363	□ ○

NOTE: The valve specification changes the Part No.

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	290/53SKA

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	290/53RK



3" 90° Tankstream Footvalve

Part No: 28F/0000F



Specification

Nominal size/body angle

3" / 90°

Inlet connection

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

Outlet connection

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

Materials

Contact parts: 316 stainless steel

Main seal: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

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

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

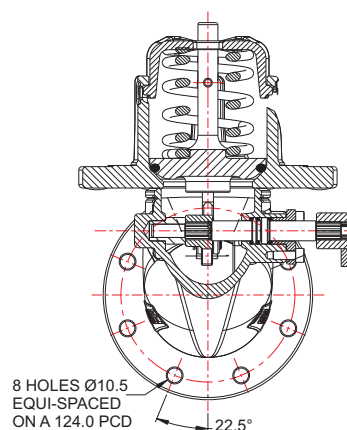
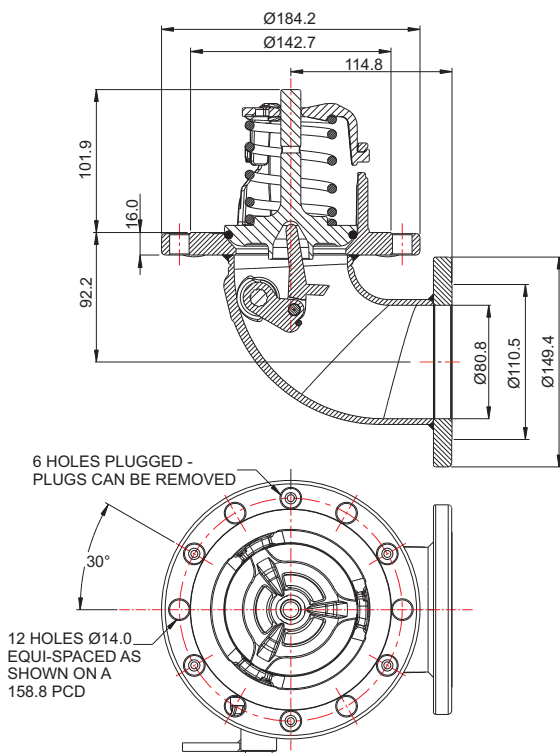
Range

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

Related Parts

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

Section View

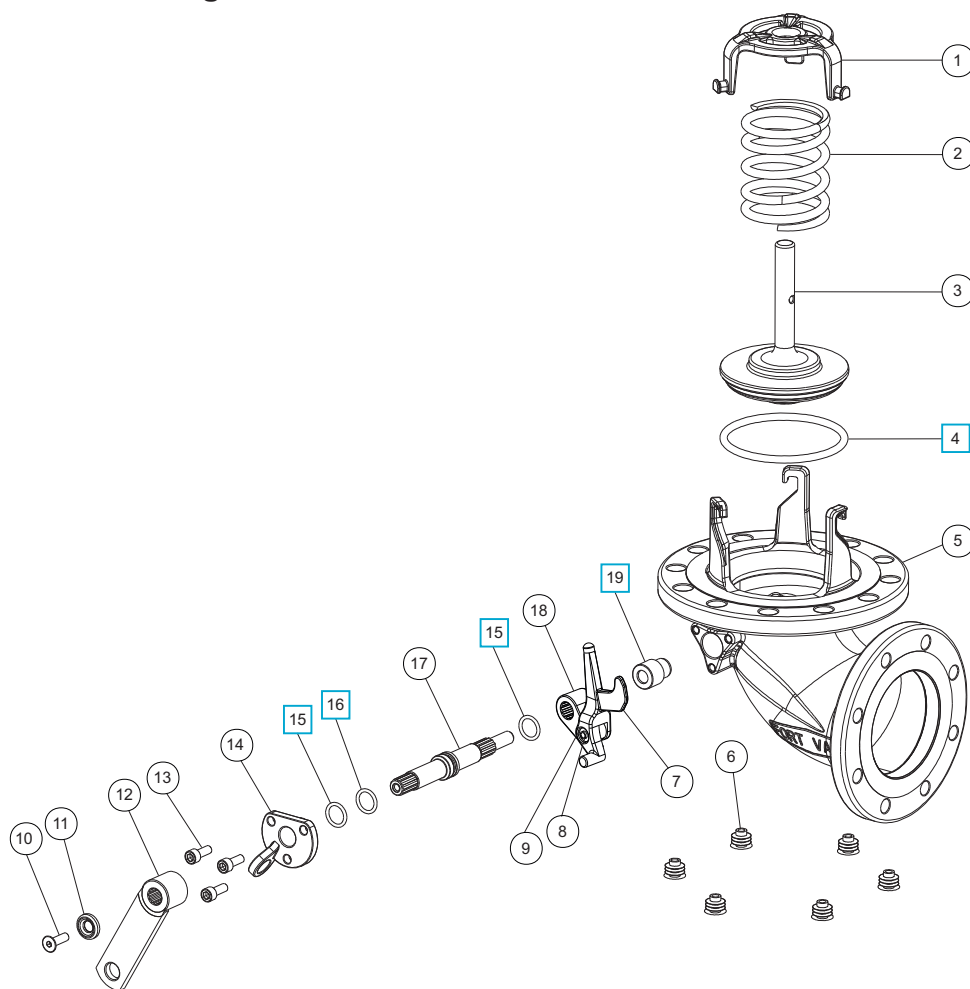




3" 90° Tankstream Footvalve

Part No: 28F/0000F

Parts Drawing



Parts List

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

Seal Kit

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



70mm Drytyt Dry Disconnect Tank Unit

Part No: 376V/B700A00



Specification

Nominal size

70mm

Inlet connection

2" BSP

Outlet/process connection

70mm

Properties

Fire-safe design. Non-protruding poppet

Selectivity

None as standard. All industry accepted selective positions are available, refer to the Selectivity data sheet

Materials

Contact parts: 316 stainless steel

Poppet O ring: Viton

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	1.2 Kg
Design Pressure (MAWP):	25 Bar
Test Pressure:	37.5 Bar
Max. Coupling Pressure:	specified by the hose unit
Design Temp. Min/Max:	-40°C / 200°C (metal parts)
Design Temp. Min/Max:	-20°C / 200°C (Viton O ring)

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

Design Code

BS EN 14432

Range

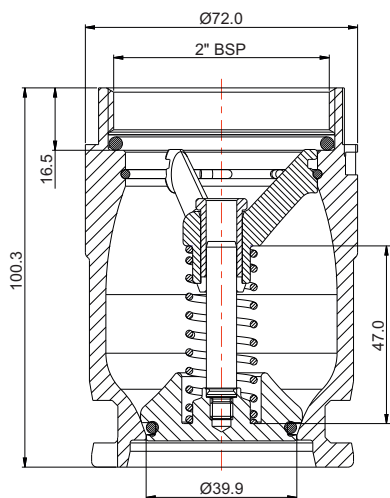
Description	Part No.
2" BSP inlet, Viton seal, no selectivity	376V/B700A00
Flanged inlet, no selectivity *Note	376V/B700X00

NOTE: Different flange specifications are available. Please contact Fort Vale.

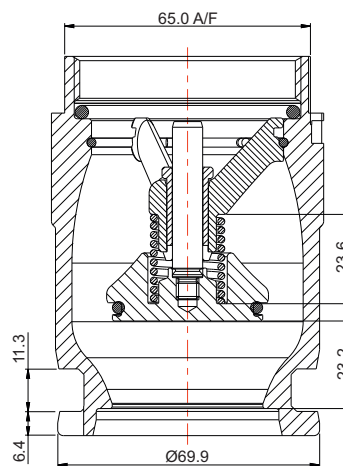
Related Parts

Description	Part No.
70mm pressure-tight cap	915/5420X
70mm/2" BSP hose unit, Viton seal	895V/B700A00
70mm rubber dust cap	915/5172

Section View



CLOSED POSITION



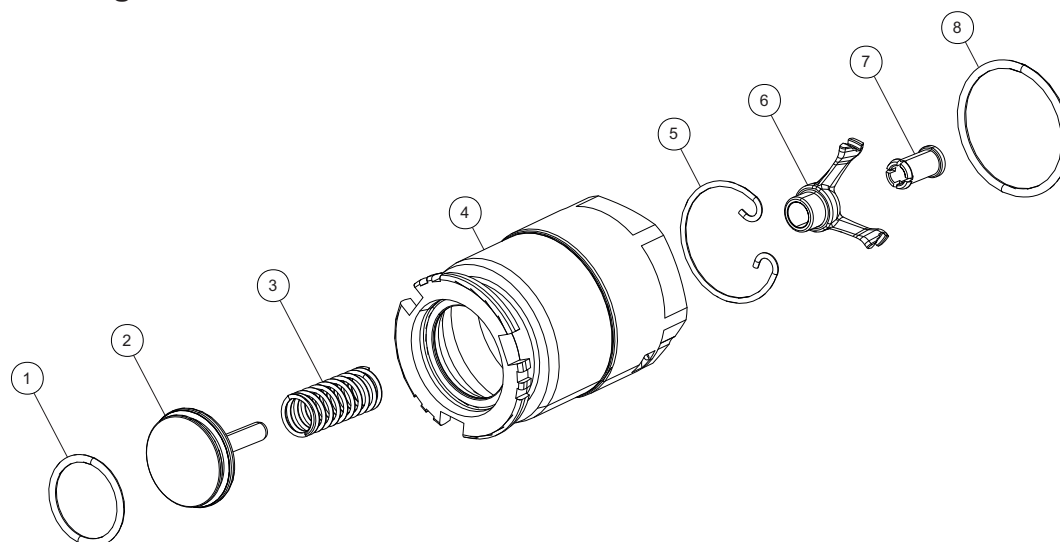
OPEN POSITION



70mm Drytyt Dry Disconnect Tank Unit

Part No: 376V/B700A00

Parts Drawing



Parts List

Item	Description	Part No.
1	Viton poppet O ring *Note	5005-171
2	Poppet assembly	376/B703
3	Poppet spring	5104-800
4	70mm body (no selectivity) *Note	376/B701A00
5	Snap ring	5120-081
6	Spider	376/B702
7	Guide bush	376/0702/2
8	PTFE O ring	ORB832P0

NOTE: The tank unit specification changes the Part No.



70mm Drytyt Dry Disconnect Hose Unit

Part No: 895V/B700A00



Specification

Nominal size

70mm

Inlet connection

2" BSP with swivel

Outlet connection

70mm

Selectivity

None as standard. All industry accepted selective positions are available, refer to the Selectivity data sheet

Materials

Contact parts: 316 stainless steel

Main seals: Viton

Alternatives are available, refer to the Design Options page

Design Conditions

Weight: 3.0 Kg
 Design Pressure (MAWP): 25 Bar
 Test Pressure: 37.5 Bar
 Max. Coupling Pressure: 2 Bar
 Design Temp. Min/Max: -40°C / 200°C (**metal parts**)
 Design Temp. Min/Max: -20°C / 200°C (**Viton seals**)

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

Design Code

BS EN 12516-2

Range

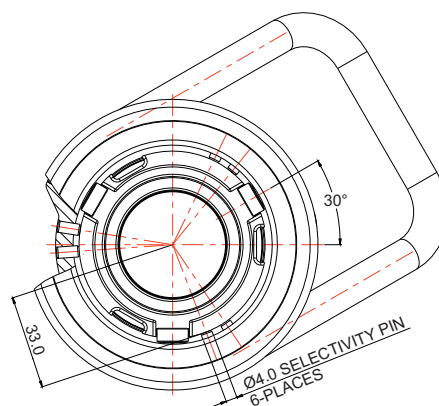
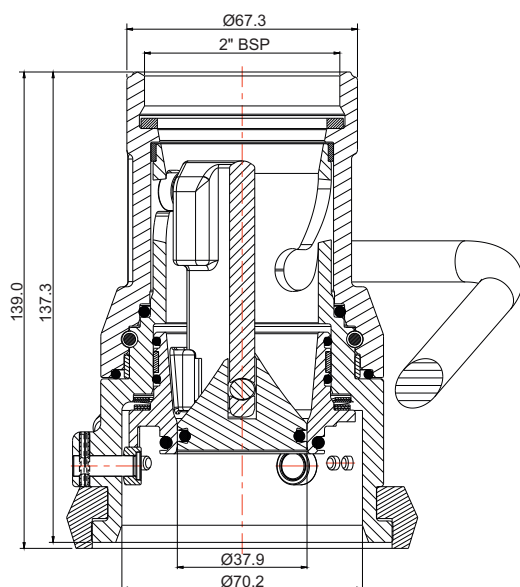
Description	Part No.
2" BSP inlet, Viton seal, no selectivity	895V/B700A00

Related Parts

Description	Part No.
70mm/2" BSP tank unit, Viton seal	376V/B700A00
Pressure-tight cap for 70mm tank unit	915/5420X
70mm rubber dust plug	915/5171

Section View

Shows the selectivity pin position

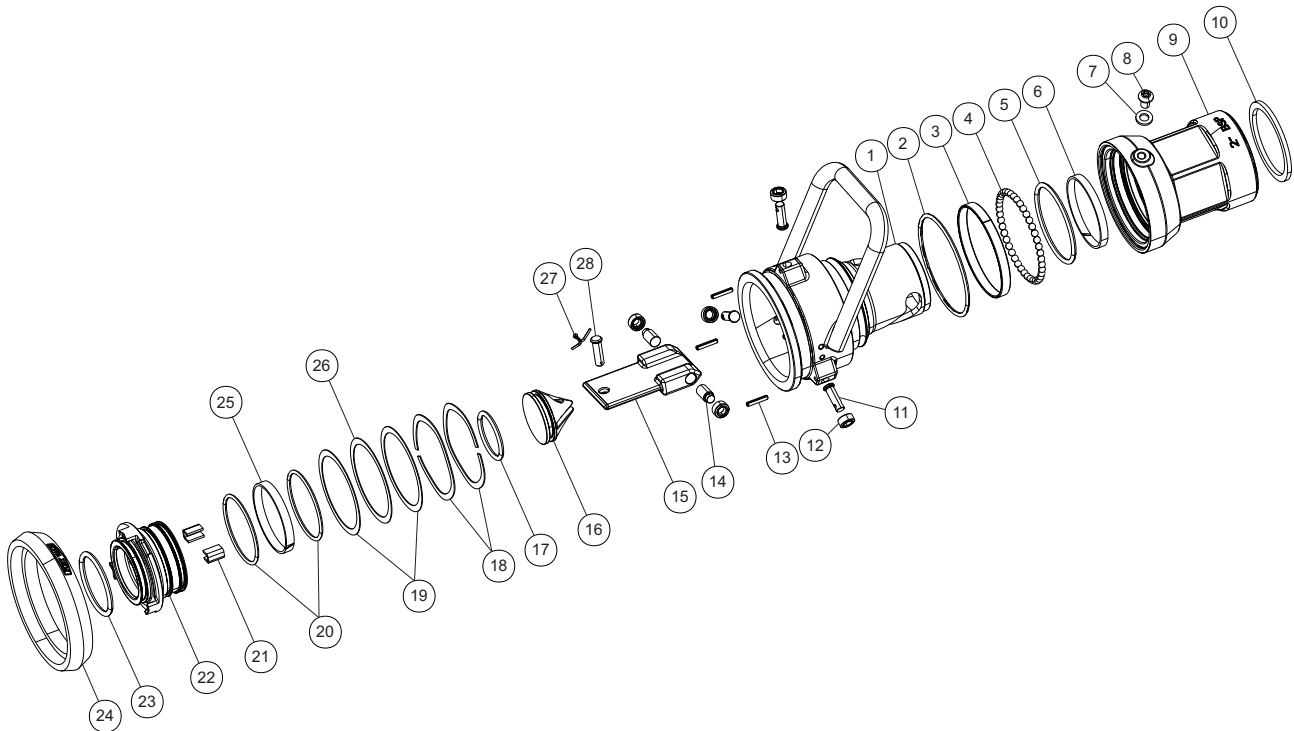




70mm Drytyt Dry Disconnect Hose Unit

Part No: 895V/B700A00

Parts Drawing



Parts List

Item	Description	Part No.
1	70mm body (no selectivity) *Note	895/B70200
2	Fortyt O ring	ORB149F1
3	RTFE plain bearing	895/0708/9
4	Ball bearing (42)	10145SS
5	Viton O ring *Note	ORB832VR
6	RTFE scarf cut bearing	895/0708/8
7	M6 spring washer	5113-008
8	M6 button screw	5111-610
9	Swivel body	895/B701
10	PTFE gasket	10450P
11	Roller spindle pin (3)	895/0707
12	Roller (5)	895/0706
13	Roll pin (3)	5128-071
14	Piston spindle (2)	895/B705/6
15	Piston plate	895/B705/5
16	Poppet head	895/B705/1
17	Viton O ring *Note	5005-173
18	Wave spring (2)	5104-1002
19	Thrust washer (2)	895/0703/6
20	Viton O ring (2) *Note	ORB134VR
21	Slide strip (2)	895/B708/4
22	Piston guide	895/B703
23	Viton O ring *Note	5005-172

Parts List

Item	Description	Part No.
24	Rubber buffer ring	895/0708/2
25	RTFE inner housing bearing	895/0708/6
26	PTFE thrust bearing	895/0708/7
27	Split pin	5118-012
28	Clevis pin	895/0705/8

NOTE: The hose unit specification changes the Part No.



Dry Disconnect Coupling Selectivity: 70mm

Selectivity Systems

Fort Vale 70mm Drytyt couplings are compatible with Todo®, Mann-Tek® and Avery Hardoll® couplings and are available with these selectivity systems to prevent accidental mixing of cargoes:

Selectivity	Compatible	Refer to
15 Position	Fort Vale®	Figure 1 and Table 1
7 Position	Todo®, Mann-Tek®, Avery Hardoll®	Figure 2 and Table 2
21 Position	Todo®, Mann-Tek®, Avery Hardoll®	Figure 2 and Table 3

Figure 1: 70mm Tank Unit and 70mm Hose Unit - 15 Position Selectivity

70mm Tank Unit with slots

70mm Hose Unit with pins

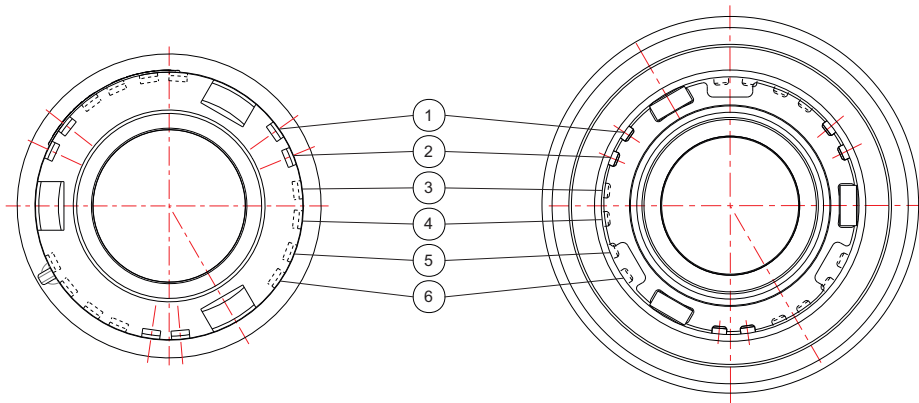


Table 1: 15 Position Selectivity

Selectivity Letter	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
Pin & Slot Position	1+2	1+3	1+4	1+5	1+6	2+3	2+4	2+5	2+6	3+4	3+5	3+6	4+5	4+6	5+6

Figure 2: 70mm Tank Unit and 70mm Hose Unit - 7 and 21 Position Selectivity

70mm Tank Unit with slots

70mm Hose Unit with pins

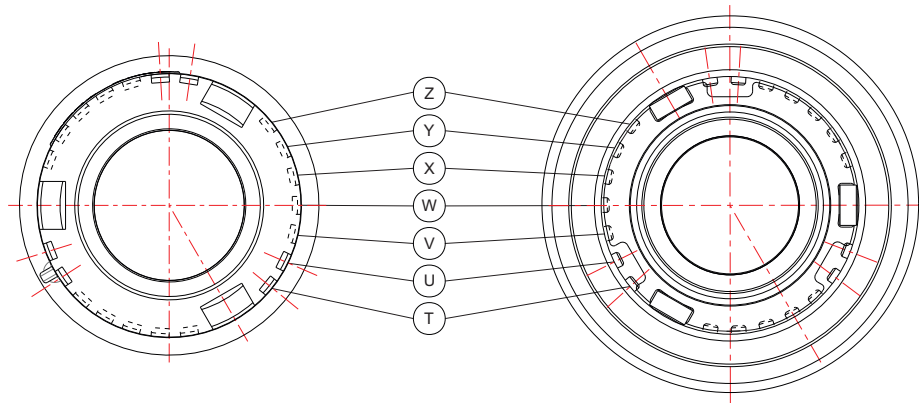


Table 2: 7 Position Selectivity

Pin/Slot Position						
T	U	V	W	X	Y	Z

Table 3: 21 Position Selectivity

Pin/Slot Position						
TU	TV	TW	TX	TY	TZ	UV
UW	UX	UY	UZ	VW	VX	VY
VZ	WX	WY	WZ	XY	XZ	YZ

CAUTION: A hose unit with one pin (from 7 position selectivity) can engage with a tank unit with two slots (from 21 position selectivity). Check the compatibility of the tank and hose units carefully before you connect them.



Dry Disconnect Coupling Selectivity: 70mm

How to Order

To order a 70mm Drytyt tank unit or hose unit with selectivity, select the slot/pin position and add the letter or number code to the end of the tank/hose unit part number. Please refer to the example below:

e.g. tank unit - 7 or 15 position selectivity: 376X/B700X**Q**

tank unit - 21 position selectivity: 376X/B700X**TU**

e.g. hose unit - 7 or 15 position selectivity: 895X/B700X**Q**

hose unit - 21 position selectivity: 895X/B700X**TU**

NOTE: The seal material and inlet connection change the "X" values in the part numbers above.



105mm Drytyt Dry Disconnect Tank Unit

Part No: 376V/B050A00



Specification

Nominal size

105mm

Inlet connection

3" BSP

Outlet/process connection

105mm

Properties

Fire-safe design. Non-protruding poppet

Selectivity

None as standard. All industry accepted selective positions are available, refer to the Selectivity data sheet

Materials

Contact parts: 316 stainless steel

Poppet O ring: Viton

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	3.3 Kg
Design Pressure (MAWP):	25 Bar
Test Pressure:	37.5 Bar
Max. Coupling Pressure:	specified by the hose unit
Design Temp. Min/Max:	-40°C / 200°C (metal parts)
Design Temp. Min/Max:	-20°C / 200°C (Viton O ring)

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

Design Code

BS EN 14432

Range

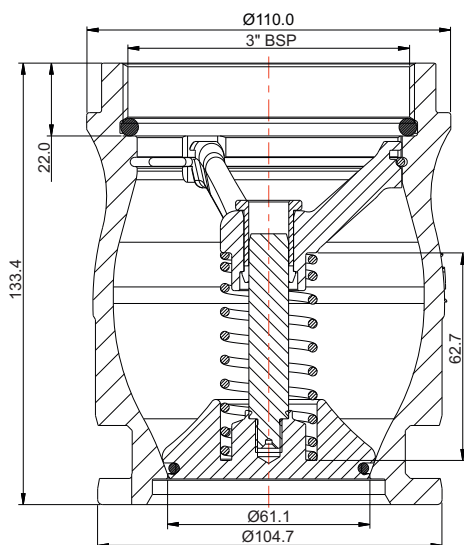
Description	Part No.
3" BSP inlet, Viton seal, no selectivity	376V/B050A00
Flanged inlet, no selectivity *Note	376V/B050X00

NOTE: Different flange specifications are available. Please contact Fort Vale.

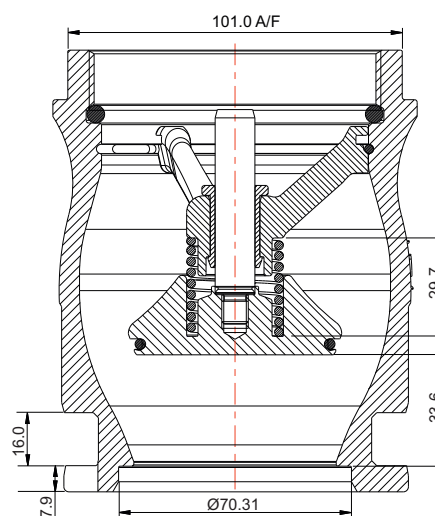
Related Parts

Description	Part No.
105mm pressure-tight cap	915/5480X
105mm/3" BSP hose unit, Viton seal	895V/B105A00

Section View



CLOSED POSITION



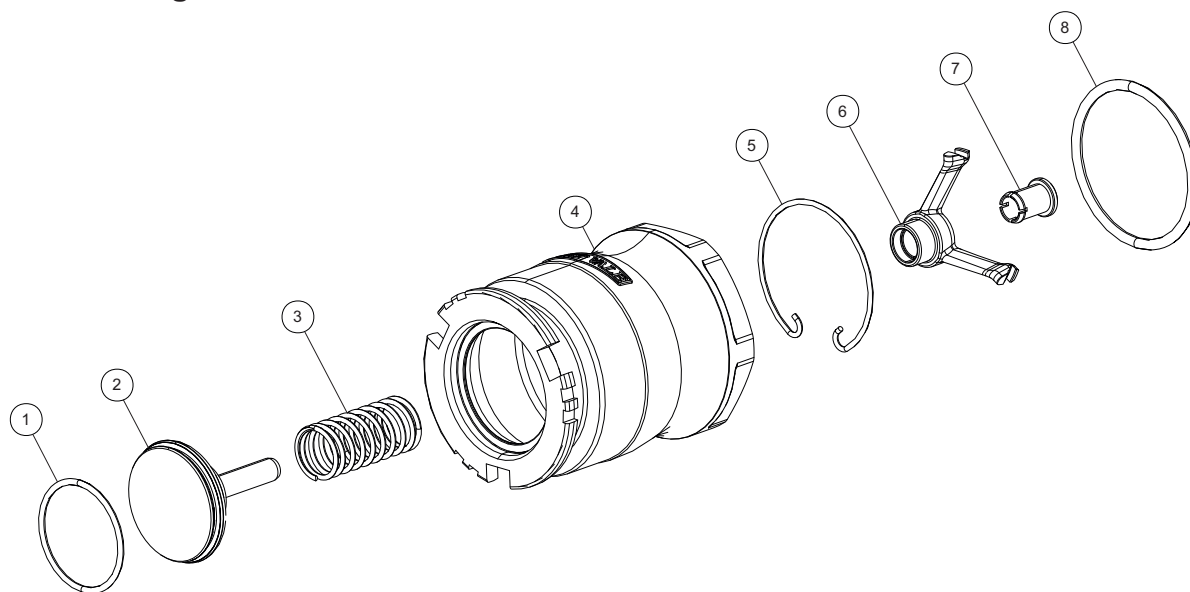
OPEN POSITION



105mm Drytyt Dry Disconnect Tank Unit

Part No: 376V/B050A00

Parts Drawing



Parts List

Item	Description	Part No.
1	Viton poppet O ring *Note	5005-156
2	Poppet assembly	376/B153
3	Poppet spring	5104-799
4	105mm body (no selectivity) *Note	376/B051A00
5	Snap ring	5120-082
6	Spider	376/B192
7	Guide bush	376/1052/2
8	PTFE O ring	5005-103

NOTE: The tank unit specification changes the Part No.



105mm Drytyt Dry Disconnect Hose Unit

Part No: 895V/B105X00



Specification

Nominal size

105mm

Inlet connection options

2½" BSP with swivel

3" BSP with swivel

Outlet connection

105mm

Selectivity

None as standard. All industry accepted selective positions are available, refer to the Selectivity data sheet

Materials

Contact parts: 316 stainless steel

Main seals: Viton

Alternatives are available, refer to the Design Options page

Design Conditions

Weight:	8.9 Kg
Design Pressure (MAWP):	25 Bar
Test Pressure:	37.5 Bar
Max. Coupling Pressure:	2 Bar
Design Temp. Min/Max:	-40°C / 200°C (metal parts)
Design Temp. Min/Max:	-20°C / 200°C (Viton seals)

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

Design Code

BS EN 12516-2

Range

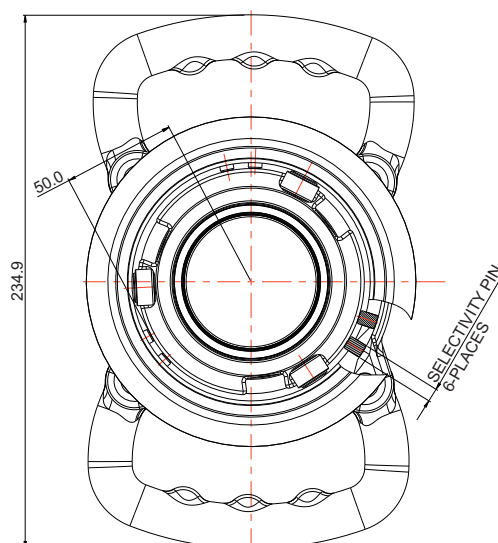
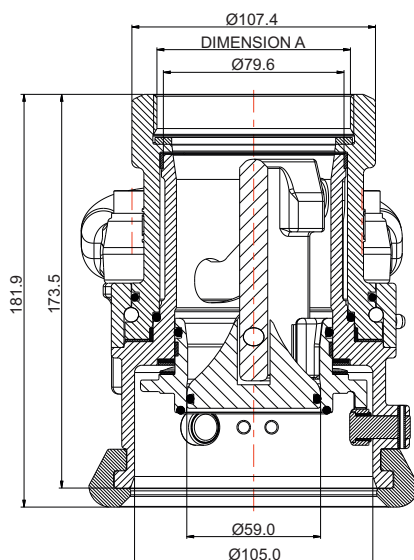
Description	Part No.
2½" BSP inlet, Viton seal, no selectivity	895V/B105B00
3" BSP inlet, Viton seal, no selectivity	895V/B105A00

Related Parts

Description	Part No.
105mm/3" BSP tank unit, Viton seal	376V/B050A00
Pressure-tight cap for 105mm tank unit	915/5480X

Section View

Shows the selectivity pin position



DIMENSION A: 2½" BSP inlet: Part No. 895X/B105BXX

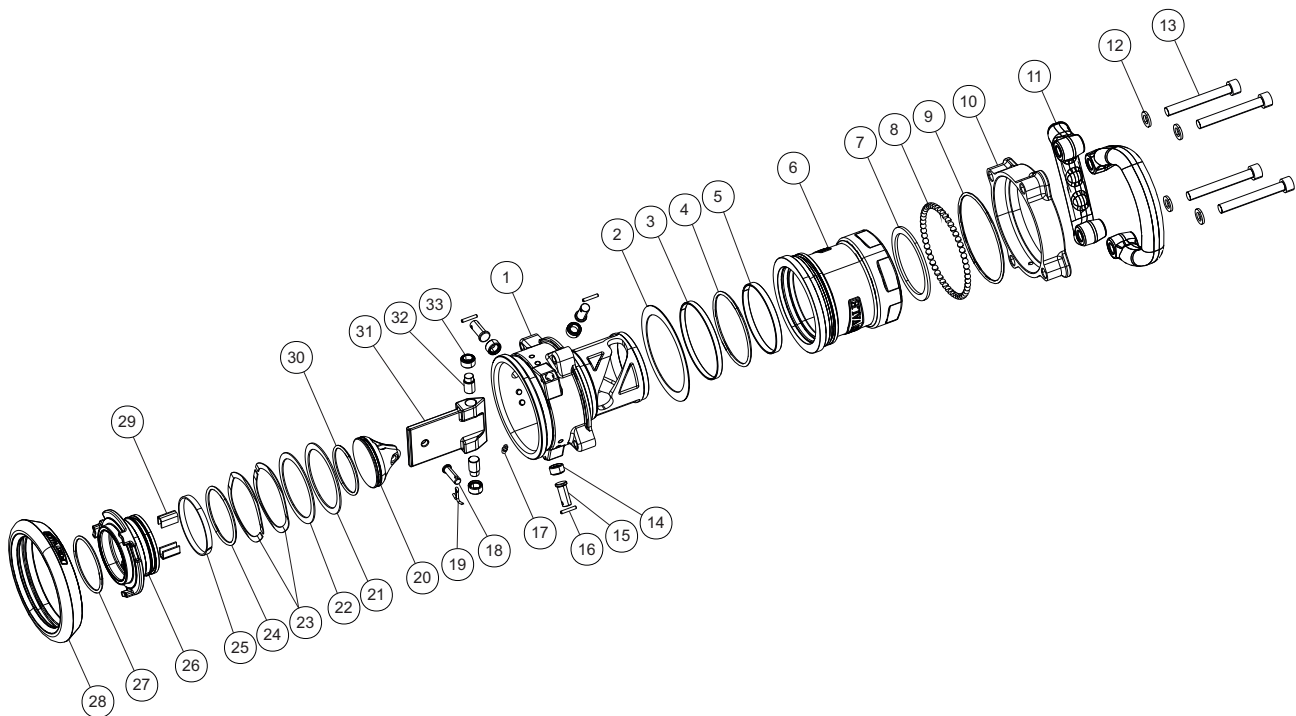
DIMENSION A: 3" BSP inlet: Part No. 895X/B105AXX



105mm Drytyt Dry Disconnect Hose Unit

Part No: 895V/B105X00

Parts Drawing



Parts List

Item	Description	Part No.
1	105mm body (no selectivity) *Note	895/B19200
2	RTFE thrust bearing	895/1058/8
3	RTFE plain bearing	895/1058/7
4	Viton O ring *Note	5005-941
5	RTFE plain bearing	895/1058/6
6	Swivel body - 3" BSP Swivel body - 2½" BSP	895/B151 895/B151B
7	PTFE gasket - 3" PTFE gasket - 2½"	10452P 10328P
8	Ball bearing (52)	10143SS
9	Viton O ring	5005-658V
10	Bearing outer body	895/1054
11	Plastic coated handle (2)	895/1199L
12	Spring washer (4)	5113-029
13	Cap head bolt (4)	5111-183
14	Roller (3)	895/1196/1
15	Roller spindle pin (3)	895/1197/2
16	Roll pin (3)	5128-002
17	Grease nipple	5128-026
18	Clevis pin	895/1195/8
19	Split pin	5118-017
20	Poppet head	895/B155/1
21	RTFE face bearing	895/B105
22	Face bearing plate	895/B105/1

Parts List

Item	Description	Part No.
23	Wavey washer (2)	5111-186
24	Viton O ring *Note	5005-996
25	Scarf cut bearing	895/1058/4
26	Piston guide	895/B153
27	Viton O ring *Note	5005-313
28	Rubber buffer ring	895/1058/2
29	Slide strip (2)	895/B158/5
30	Viton O ring *Note	ORB832VR
31	Piston plate	895/B155/4
32	Roller spindle (2)	895/B155/6
33	Piston roller (2)	895/1196

NOTE: The hose unit specification changes the Part No.



Dry Disconnect Coupling Selectivity: 105mm & 119mm

Selectivity Systems

Fort Vale 105mm and 119mm Drytyt couplings are compatible with Todo®, Mann-Tek® and Avery Hardoll® couplings and are available with these selectivity systems to prevent accidental mixing of cargoes:

Selectivity	Compatible	Refer to
15 Position	Fort Vale®	Figure 1 and Table 1
7 Position	Todo®, Mann-Tek®, Avery Hardoll®	Figure 2 and Table 2
21 Position	Todo®, Mann-Tek®, Avery Hardoll®	Figure 2 and Table 3

Figure 1: 105mm/119mm Tank Unit and 105mm/119mm Hose Unit - 15 Position Selectivity

105mm/119mm Tank Unit with slots

105mm/119mm Hose Unit with pins

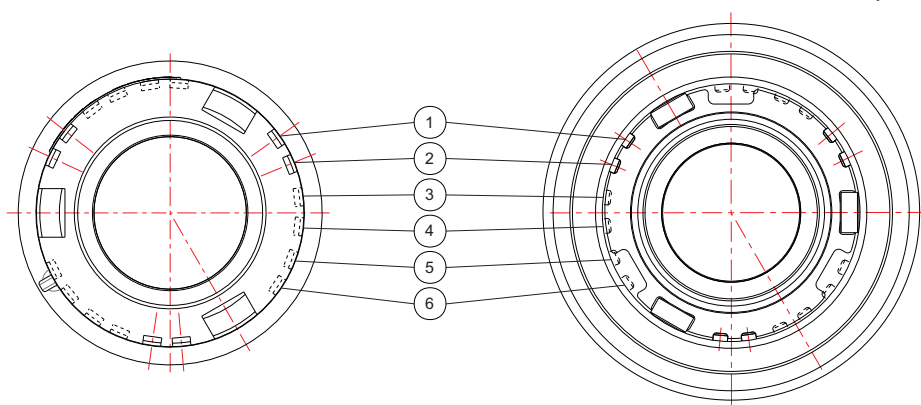


Table 1: 15 Position Selectivity

Selectivity Letter	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
Pin & Slot Position	1+2	1+3	1+4	1+5	1+6	2+3	2+4	2+5	2+6	3+4	3+5	3+6	4+5	4+6	5+6

Figure 2: 105mm/119mm Tank Unit and 105mm/119mm Hose Unit - 7 and 21 Position Selectivity

105mm/119mm Tank Unit with slots

105mm/119mm Hose Unit with pins

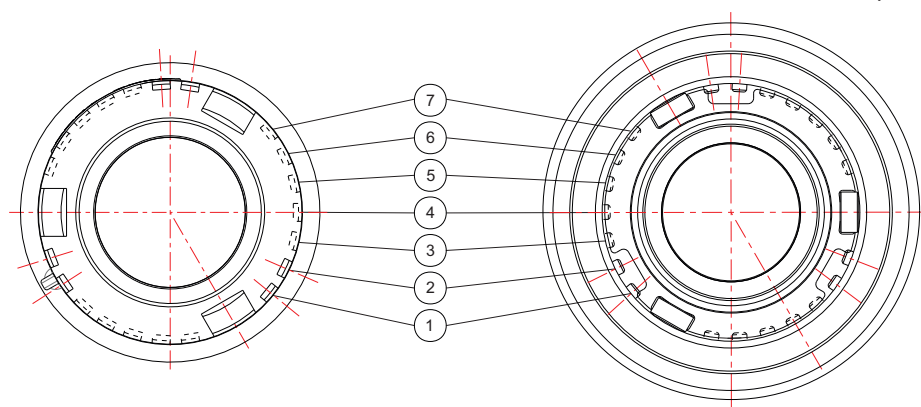


Table 2: 7 Position Selectivity

Pin/Slot Position						
1	2	3	4	5	6	7

Table 3: 21 Position Selectivity

Pin/Slot Position						
12	13	14	15	16	17	23
24	25	26	27	34	35	36
37	45	46	47	56	57	67

CAUTION: A hose unit with one pin (from 7 position selectivity) can engage with a tank unit with two slots (from 21 position selectivity). Check the compatibility of the tank and hose units carefully before you connect them.



Dry Disconnect Coupling Selectivity: 105mm & 119mm

How to Order

To order a 105mm or a 119mm Drytyt tank unit or hose unit with selectivity, select the slot/pin position and add the letter or number code to the end of the tank/hose unit part number. Please refer to the example below:

e.g. 105mm tank unit - 7 or 15 position selectivity: 376X/B050X**Q**

119mm tank unit - 21 position selectivity: 376X/B190X**TU**

e.g. 105mm hose unit - 7 or 15 position selectivity: 895X/B105X**Q**

119mm hose unit - 21 position selectivity: 895X/B190X**TU**

NOTE: The seal material and inlet connection change the "X" values in the part numbers above.



Pressure-Tight Caps for Drytyt Tank Units

Accessories & Spare Parts



Example shown: 119mm cap, Part No. 915/5470X

The pressure-tight cap protects the tank unit outlet face from damage and can be used as a secondary or a tertiary closure. The top cap/seal plate assembly lets you safely release pressure that can be inside the tank unit.

All pressure-tight caps are fire-safe designed and seal metal-to-metal when installed onto the tank unit. The seal plate O ring makes a gas-tight and liquid-tight seal. (Refer to Seal Options NOTE).

Please read the Installation Instructions on the next page.

Design Conditions

56mm, 70mm, 105mm, 119mm only

Design Pressure (MAWP): 25.0 Bar
Test Pressure: 37.5 Bar

164mm only

Design Pressure (MAWP): 10.0 Bar
Test Pressure: 16.0 Bar

Design Temp. Min/Max: -40°C / 200°C (metal parts)

NOTE: The design temperature conditions are for metal parts only. The working temperature of the seal plate O ring can change the design temperature limits. Refer to Seal Options.

Design Codes

BS EN 14432

Specification

Nominal sizes

56mm, 70mm, 105mm, 119mm, 164mm

Compatibility

Fort Vale Drytyt, Todo®, Mann-Tek®, Avery Hardoll®

Properties

Chain point and TIR/padlock hole

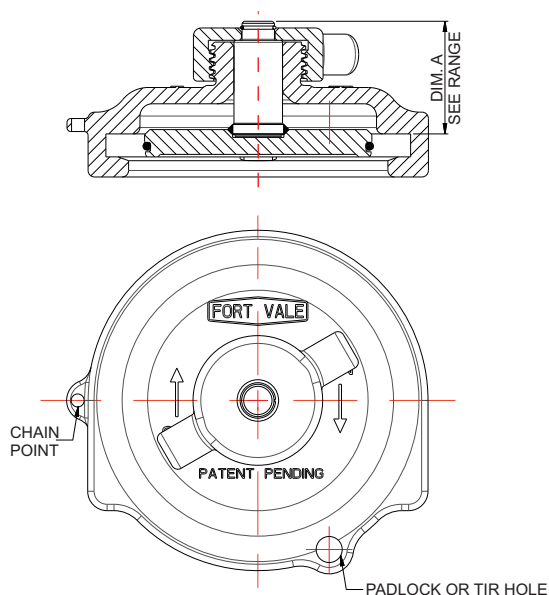
Materials

Contact parts: 316 stainless steel

Seal plate O ring: refer to Seal Options

Section View

119mm cap (915/5470X) shown in the closed position



Range

Size	Weight	Dim.A	Part No.
56mm	0.91 Kg	45.1mm	915/5410X
70mm	1.07 Kg	42.1mm	915/5420X
105mm	1.92 Kg	44.1mm	915/5480X
119mm	2.33 Kg	44.1mm	915/5470X
164mm	3.68 Kg	44.1 mm	915/5490X

The Part No. suffix X refers to the seal material code - refer to Seal Options

Seal Options

Seal Code	Seal Material	Seal Temp.Range
915/54XXB	Butyl	-30°C to +120°C
915/54XXE	EPDM	-20°C to +150°C
915/54XXF	Fortyt *Note	-55°C to +200°C
915/54XXN	Nitrile	-20°C to +100°C
915/54XXP	Perfluoroelastomer	-15°C to +200°C
915/54XXQ	Viton FDA approved	-20°C to +200°C
915/54XXV	Viton	-20°C to +200°C

NOTE: Fortyt is liquid-tight but is not bubble-tight

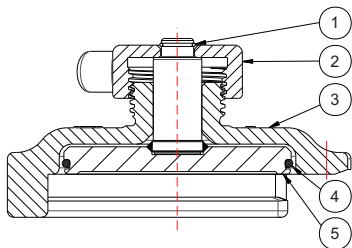


Pressure-Tight Caps for Drytyt Tank Units

Accessories & Spare Parts

Parts Drawing

119mm cap (915/5470X) shown in the open position



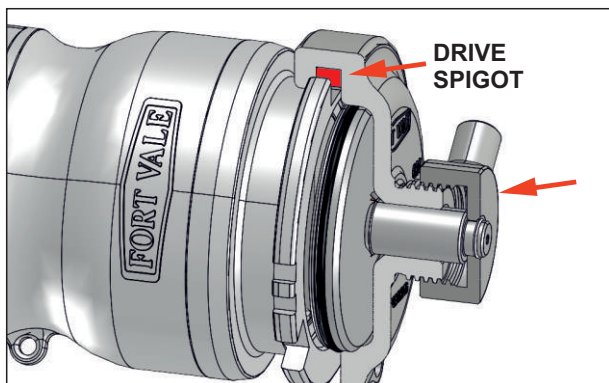
Parts List

Item	Description	Part No.
1	Retaining clip	5120-056
2	Anti-galling top cap *Note	915/54X4
3	Cap body *Note	915/54XX
4	O ring *Note	XXXXXXX
5	Seal plate *Note	915/54XX

NOTE: The cap specification changes the Part No.

Installation Instructions

Example shown: 119mm cap and tank unit



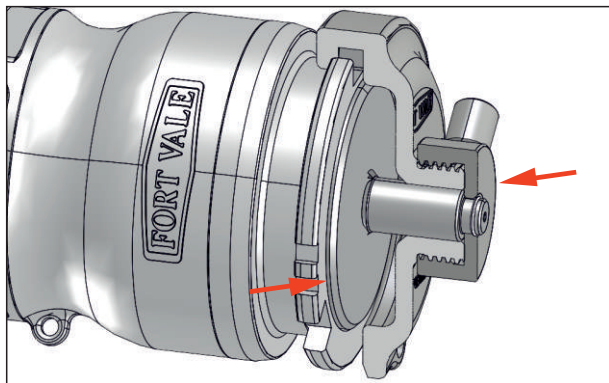
How to install the pressure-tight cap assembly

Move the top cap to the top of its thread.

Note the drive spigot position.

Align the drive spigot with a roller slot on the tank unit and move the cap assembly down to install it onto the tank unit.

Make sure the drive spigot engages with the slot.



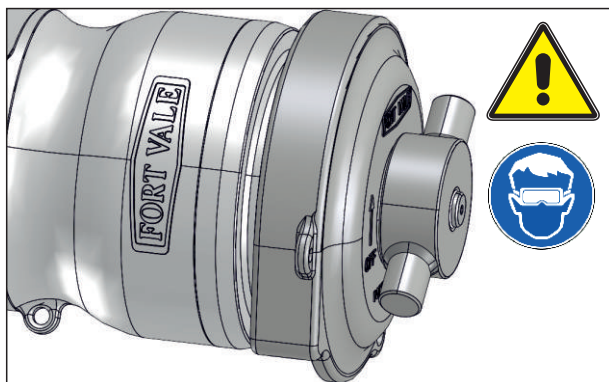
Tighten the top cap.

The seal plate will move into the recess in the tank unit.

When the top cap is fully tight, the assembly is locked and sealed.

NOTE: A Fortyt O ring will give a liquid-tight seal, but will not give a bubble-tight seal.

Attach a chain as necessary.



How to remove the pressure-tight cap assembly

CAUTION: There can be pressure inside the tank unit. Keep your face away from the cap and wear PPE.

Loosen the top cap and unscrew it until it is at the top of its thread.

The seal plate will retract into the cap body. If there is pressure inside the tank unit, it will be safely released.

When the pressure is released, move the cap assembly up to remove it from the tank unit.



1½"/¾" 90° Sampling Valve Assembly: Offshore

Part No: 338/2800



Specification

Nominal size/body angle

40mm to 20mm / 90°

Inlet connection

Flanged: 6 x 14mm holes on a 114.3mm PCD

Properties

40mm footvalve with Ø20mm extended outlet tube with ¾" firesafe sample ball valve and check cap. Assembly length: 567mm

Options

Different assembly lengths available, contact Fort Vale

Materials

Contact parts: 316 stainless steel

Main seal footvalve: Viton

Alternatives are available, please refer to Fort Vale

Design Conditions

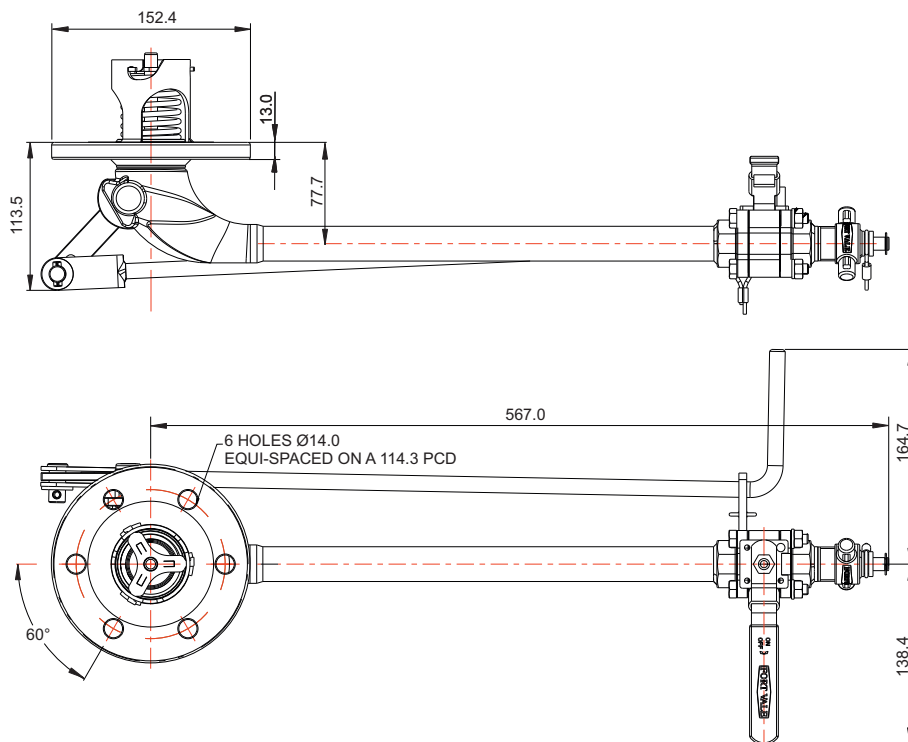
Weight:	8.2 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	125°C

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

Related Parts

Description	Part No.
Weld-in flange	20594/T
Stud kit	290/1300
CNAF/PTFE inlet gasket	5005-050

Section View

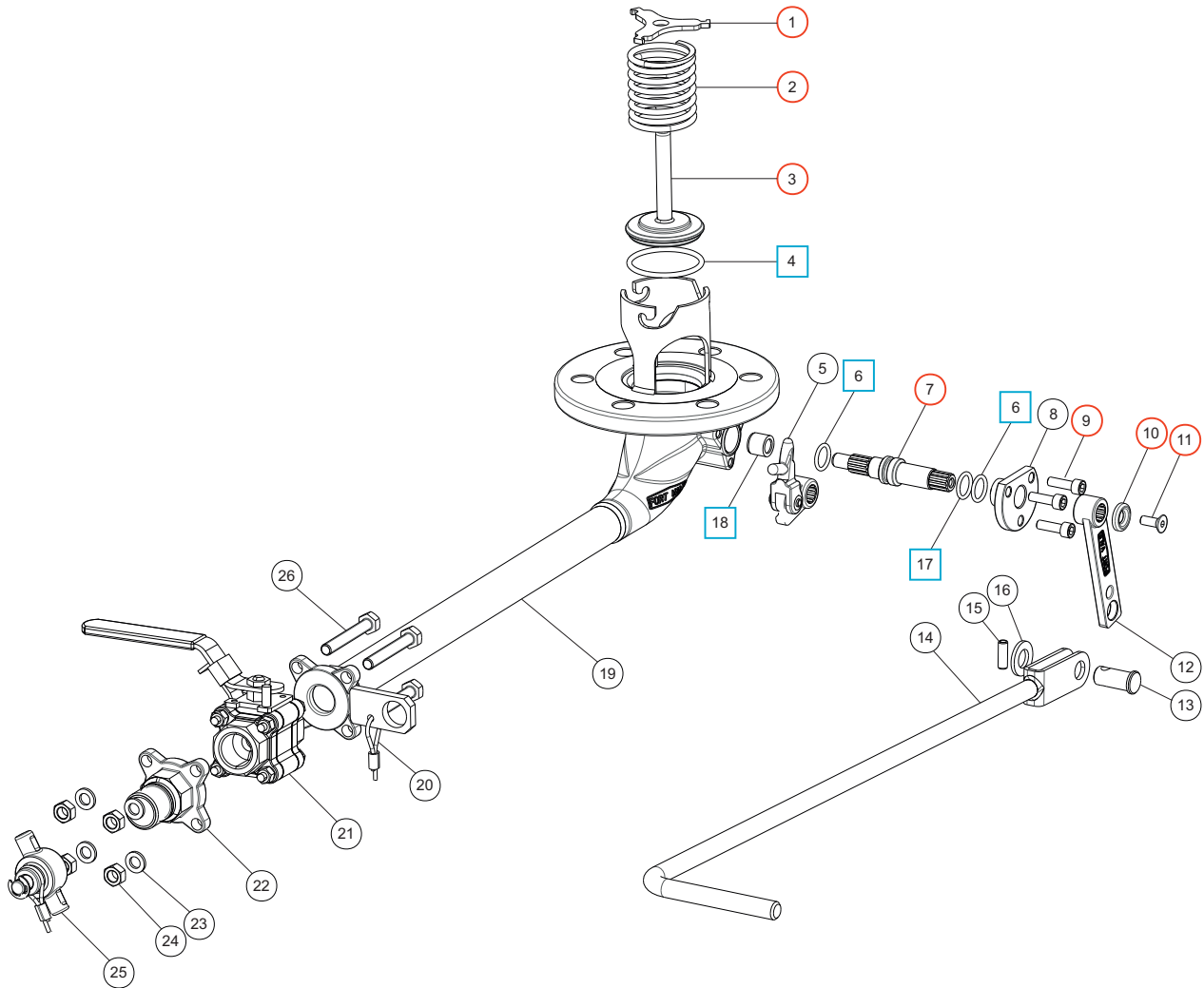




1½"/¾" 90° Sampling Valve Assembly: Offshore

Part No: 338/2800

Parts Drawing





1½"/¾" 90° Sampling Valve Assembly: Offshore

Part No: 338/2800

Parts List

Item	Description	Part No.	
1	Bayonet cap	338/2153	○
2	Spring	5104-718	○
3	Poppet	337/0010AF	○
4	Viton O ring	5005-172	□ ○
5	Crank block	821/0050	
	Lifting finger	821/0049	
	Pivot pin	821/0034	
	Washer	5113-015	
6	PTFE O ring (2)	20363	□ ○
7	Crank shaft	821/0013	○
8	Stuffing clamp	324/1004	
9	M6 socket capscrew (3)	5111-017	○
10	Retaining washer	20370	○
11	M6 countersunk bolt	5111-030	○
12	Splined handle	338/2801	
13	Linkage pin	S0346/4	
14	Handle	290/1032	
15	Seloc pin	5118-001	
16	M2 washer	5123-003	
17	Viton O ring	20361	□ ○
18	PTFE spindle bush	20360	□ ○
19	Extended body assembly *Note	338/2100A	
20	Wire assembly (2)	425/0009	
21	¾" BSP firesafe ball valve	410/500F	
22	¾" BSP outlet	338/2106	
23	M8 flat washer (4)	5113-003	
24	M8 full nut (4)	5112-001	
25	¾" BSP check cap	10306CK	
26	M8 hex head bolt (4)	5111-101	

NOTE: The valve specification changes the Part No.

Seal Kit

Description	Part No.
All parts marked □ in the Parts List	338/00SK

Repair Kit

Description	Part No.
All parts marked ○ in the Parts List	338/00RK



1½" 90° Sampling Footvalve: Offshore

Part No: 338/0000



Specification

Nominal size/body angle

40mm / 90°

Inlet connection

Flanged: 6 x 14mm holes on a 114.3mm PCD

Outlet connection

Flanged: 4 x 12.7mm holes on a 98.6mm PCD

Properties

Left hand operated

Materials

Contact parts: 316 stainless steel

Main seal: Viton

Alternatives are available, please refer to Fort Vale

Design Conditions

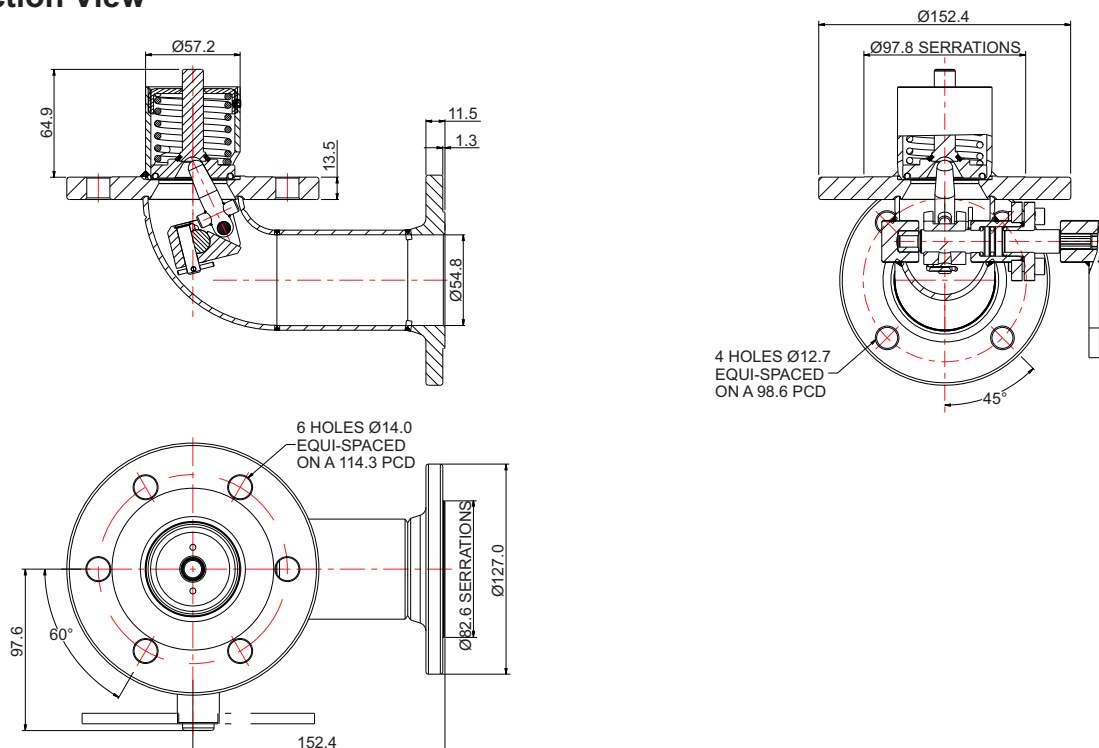
Weight:	4.7 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6.6 Bar
Design Temperature Min:	-20°C
Design Temperature Max:	125°C

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

Related Parts

Description	Part No.
Weld-in flange	20594/T
CNAF/PTFE inlet gasket	5005-050
Stud kit	290/1300
CNAF/PTFE outlet gasket	5005-430

Section View

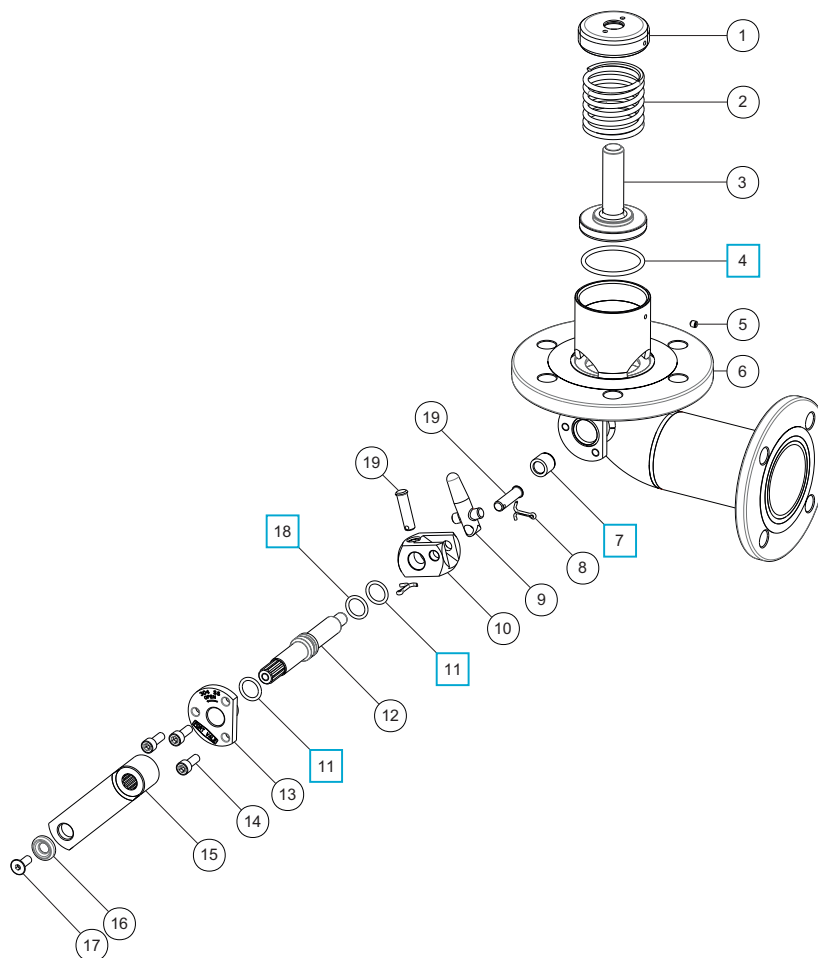




1½" 90° Sampling Footvalve: Offshore

Part No: 338/0000

Parts Drawing



Parts List

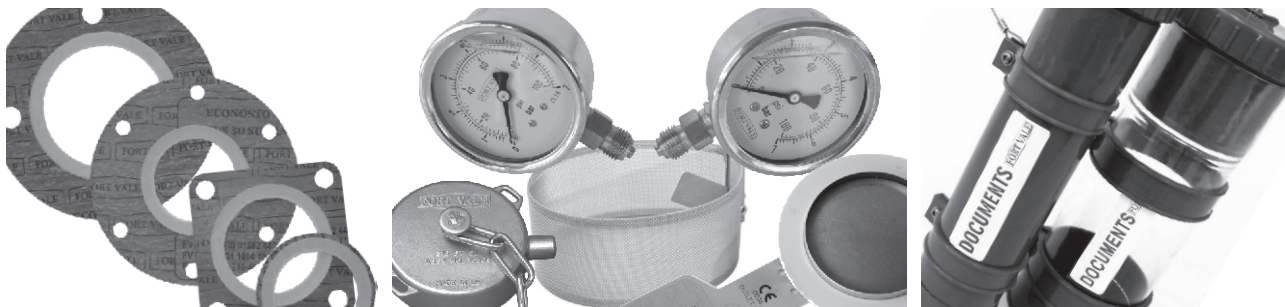
Item	Description	Part No.
1	Top cap	11004
2	Spring	5104-718
3	Closure plate	337/0010
4	Viton O ring	5005-110 ☐
5	Socket head set screw	5121-001
6	Body	337/1000
7	Crankshaft end bush	20360 ☐
8	Split pin (2)	5118-017
9	Con rod assembly	337/0020
10	Crank block	11360
11	PTFE O ring (2)	20363 ☐
12	Crankshaft	20596
13	Stuffing clamp	324/1004
14	M6 cap screw (3)	5111-017
15	Crank arm	20607
16	Retaining washer	20370
17	M6 countersunk bolt	5111-030
18	Viton O ring	20361 ☐
19	Clevis pin (2)	11375

Seal Kit

Description	Part No.
All parts marked ☐ in the Parts List	337/00SK



Accessories





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.



Document Holders

Accessories & Spare Parts



Specification

Nominal sizes

75mm and 110mm

Body material options

Opaque plastic

Transparent plastic

Fixing bracket options

Plastic

Stainless steel

Cap

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

Document Holders

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

Spare Parts - Plastic Caps

All caps are supplied with a stainless steel cable.

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

Spare Parts - Fixing Brackets

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



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

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



Temperature Gauges

Accessories & Spare Parts

Analogue Temperature Gauge - Capillary



Specification: Analogue

Temperature range options

-20°C to 160°C

-20°C to 200°C

NOTE: The temperature range refers to the capillary or probe only

Temperature sensor options

2500mm capillary

250mm stainless steel tube with brass thermowell probe

Gauge fill options

Silicone oil filled

Not filled

Analogue Temperature Gauge - Probe

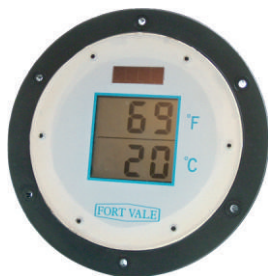


Analogue Temperature Gauges

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

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

Digital Temperature Gauge - Capillary



Specification: Digital

Temperature range options

-200°C to 250°C

NOTE: The temperature range refers to the capillary or probe only

Temperature sensor options

1000mm capillary

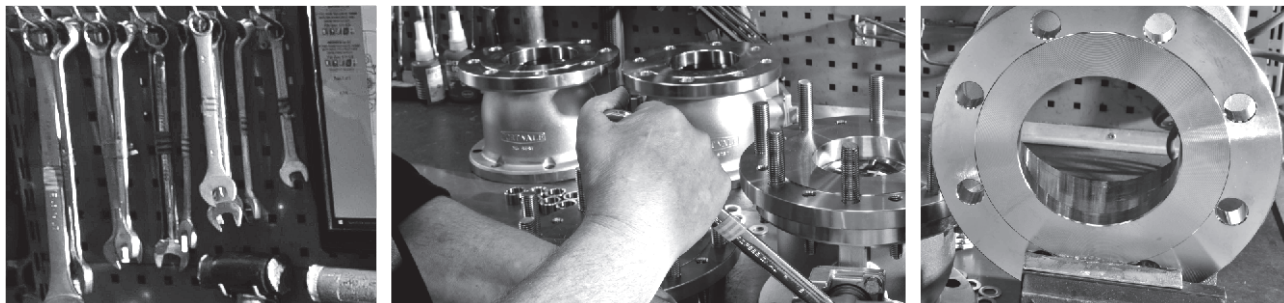
Digital Temperature Gauge

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

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



After Sales Service



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

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



Valve Repair and Maintenance

Accessories & Spare Parts



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

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

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

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

Relief Valve Pressure/Vacuum Test Rig

Part No: 400/8000



Specification

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

Valve connection

2½" BSP.

We supply adaptors to change to other BSP and flanged connections.

Test rig supply connection

¼" BSP female socket

Test range

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

Related documents

Operating Instructions: OPIN26. Please contact us.

Footvalve & Relief Valve Seat Repair Kit

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



Specification

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

Compatible

3" Kit: compatible with 2½" Super Maxi relief valve and 3" Cleanflow and Highlift footvalves

4" Kit: compatible with 4" Cleanflow & Highlift footvalves

Connection

Compatible with power tools with a ½" chuck

Kit contents

Selection of grinding and polishing discs

Selection of face-forming tools

Instruction manual

Related documents

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

Spare Parts: Grinding Discs

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



Valve Repair and Maintenance

Accessories & Spare Parts



Relief Valve Tool Kits

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



Footvalve Tool Kits

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



Ball Valve Tool Kits

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

Butterfly Valve Tool Kits

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



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

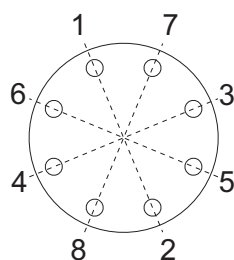
To install flanged parts correctly:

- 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.

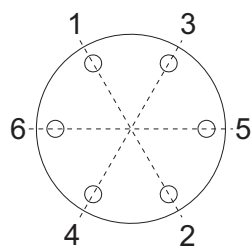
Table BT1

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

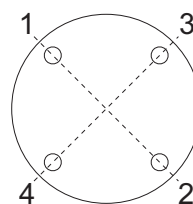
Figure BT1



8 HOLE PATTERN



6 HOLE PATTERN



4 HOLE PATTERN



Bolt Torque Guide & Step Loading Procedure

Installation & Operating Instructions

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

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

Visual checks at regular intervals:

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

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

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

Checks after 2½ years of service:

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

Checks after 5 years of service:

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

Replacement Parts

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

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

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

External Fire

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

Compatibility of Accessories

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

Mis-use

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



Our subsidiaries are located in:

US Office

126 N. Virginia
La Porte
TX 77571
USA

Tel: +1 281 471 8100

Fax: +1 281 471 8116

Email: ussales@fortvale.com

Head Office

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

Tel: +44 (0) 1282 687120

Fax: +44 (0) 1282 687110

Email: sales@fortvale.com

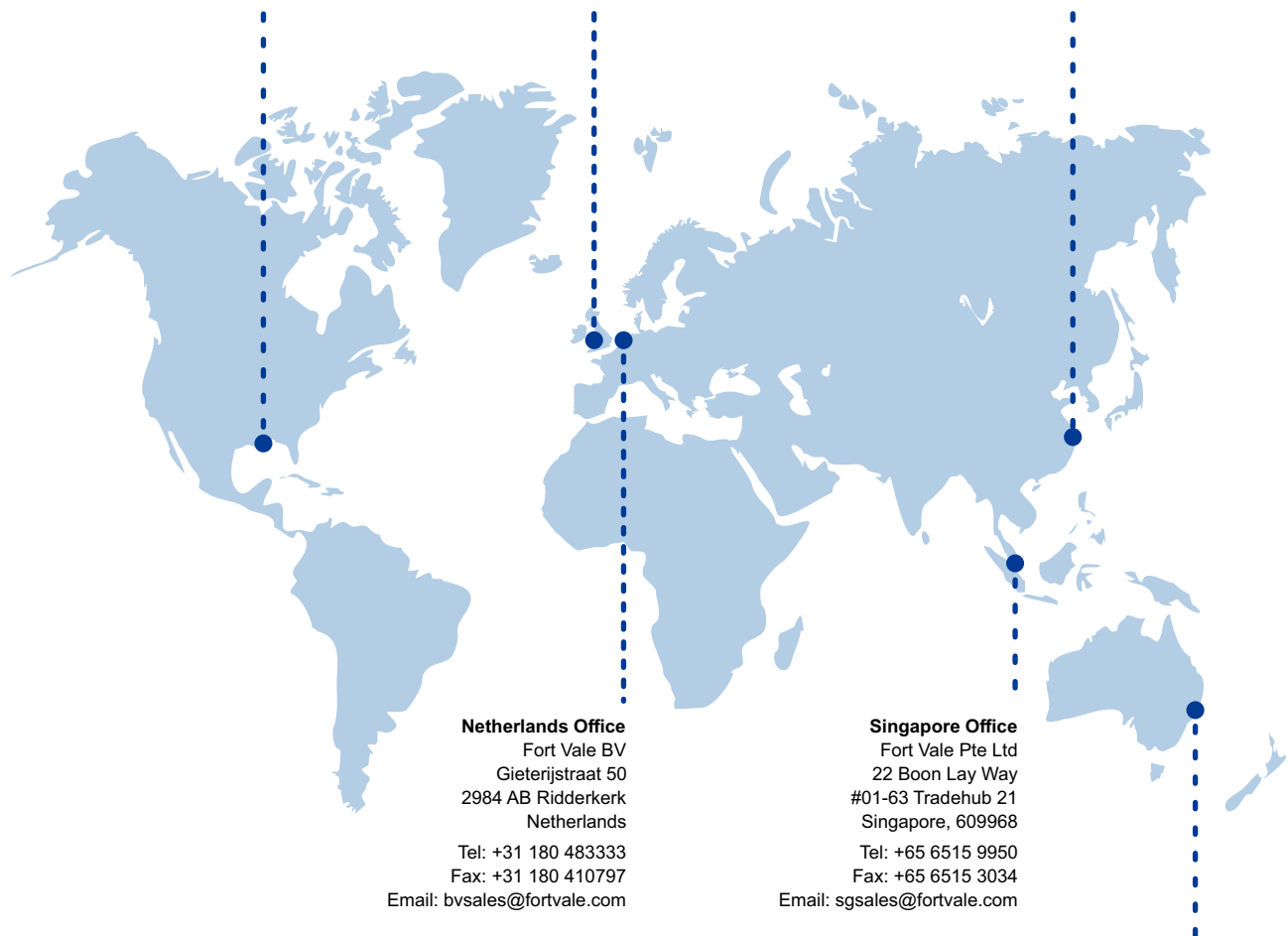
China Office

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

Tel: +86 21 6442 1367

Fax: +86 21 6442 1376

Email: cnsales@fortvale.com



Netherlands Office

Fort Vale BV
Gieterijstraat 50
2984 AB Ridderkerk
Netherlands

Tel: +31 180 483333

Fax: +31 180 410797

Email: bvsales@fortvale.com

Singapore Office

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

Tel: +65 6515 9950

Fax: +65 6515 3034

Email: sgsales@fortvale.com

Australia Office

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

Tel: +61 7 3189 5059

Email: ausales@fortvale.com

We also have Authorised Distributors around the world to provide you with product sales and after-market services.
To find your nearest distributor, please visit our website - www.fortvale.com

