

Catalogue

Railtyt Equipment for Liquid & Gas Wagons



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Railtyt Equipment

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50mm Rail Locomotive Fuel Delivery Coupler

Part No: 860/0000



Specification

Nominal size

50mm

Inlet connection

1½" BSP

Outlet connection

50mm with 3/8" Whitworth thread

Properties

Compatible and interchangeable with all existing rail fuelling fittings and couplers

Materials

Body: 304 stainless steel

Poppet: Brass, aluminium & stainless steel

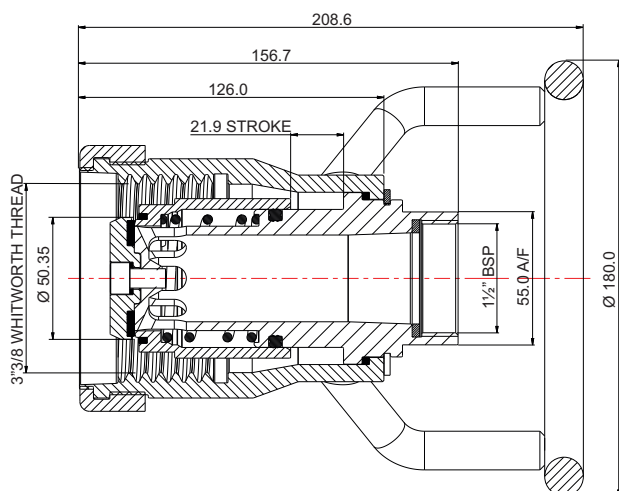
Main seal: Viton

Design Conditions

Weight:	9.27 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	6 Bar
Design Temperature Min:	-10°C
Design Temperature Max:	50°C

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

Section View

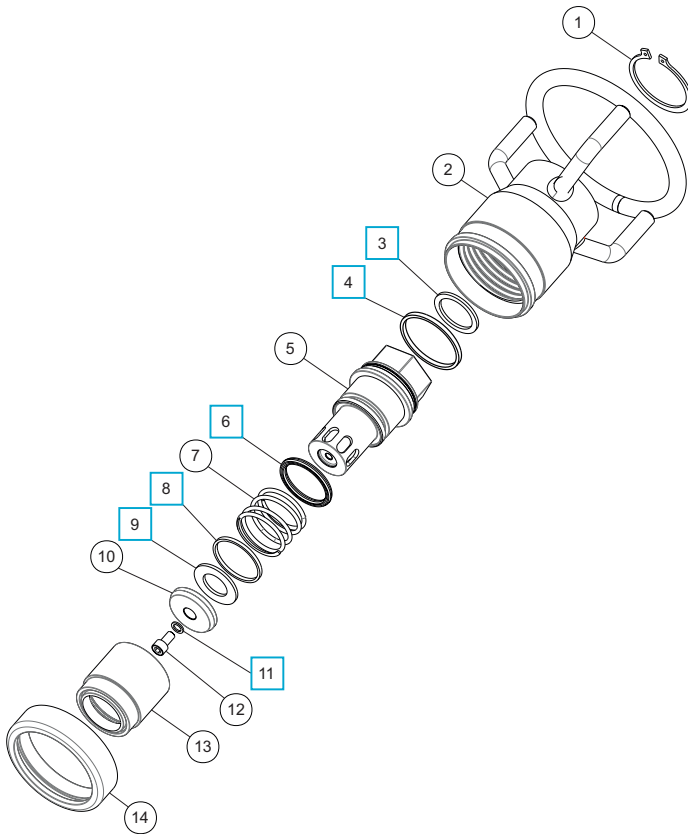




50mm Rail Locomotive Fuel Delivery Coupler

Part No: 860/0000

Parts Drawing



Parts List

Item	Description	Part No.
1	Circlip	5120-060
2	Body	860/0010
3	Viton washer seal	860/0012 <input type="checkbox"/>
4	Thrust bearing	860/0015 <input type="checkbox"/>
5	Poppet	860/0001
6	Nitrile Nu-Lip seal	NU7031 <input type="checkbox"/>
7	Poppet spring	5104-193
8	Viton poppet sleeve seal	860/0007 <input type="checkbox"/>
9	Viton poppet seal	860/0008 <input type="checkbox"/>
10	Poppet head	860/0002
11	Dowty washer	860/0014 <input type="checkbox"/>
12	M8 cap screw	5111-214
13	Poppet sleeve	860/0003
14	Buffer ring	860/0011

Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	860/00SK



Access & Ventilation Equipment: Liquid Wagon

Railtyt Equipment





500mm Manlid Assembly: Railtyt

Part No: 858/5100



Specification

Nominal size

DN500

Cover

4 point

Neckring

Thickness: 10mm

Height: available from 100mm to 250mm

Materials

Contact parts: 316 stainless steel

Fasteners: stainless steel swingbolts and handnuts

Seal: supplied separately. A selection of materials is available

Alternatives are available, refer to Range

Design Conditions

Weight:	79.3Kg
Design Pressure (MAWP):	3 Bar
Test Pressure:	4.5 Bar
Design Temperature Min:	-29°C
Design Temperature Max:	190°C

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

Design Code

BS EN 12561-6

BS EN 14025

Design Approval

Lloyds Register: COV0620226

Range

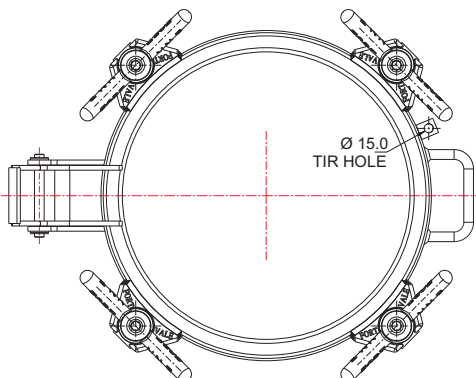
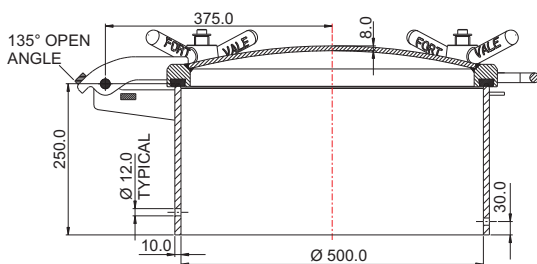
Description	Part No.
Stainless steel assembly	858/5100
St/steel cover, carbon steel neck	858/5100MS
St/steel assembly, cover with DN50 PN16 weld-in & blind flange	858/5200

Related Parts

Description	Part No.
Manlid seal	5005-59XXX

NOTE: The seal material changes the Part No.

Section View

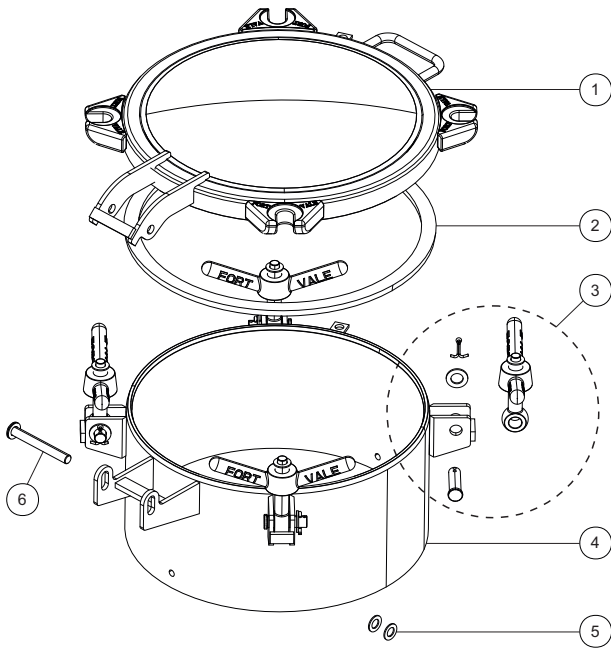




500mm Manlid Assembly: Railtyt

Part No: 858/5100

Parts Drawing



Parts List

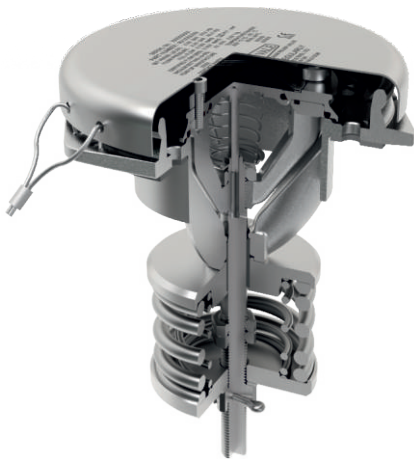
Item	Description	Part No.
1	Manlid cover	605/5120
2	Seal (not included) *Note	5005-59XXX
3	M24 swingbolt assembly (4)	496/FF473
4	Neckring	668/66250
5	M16 plain washer (2)	5113-011
6	Hinge pin	11570

NOTE: The specification changes the Part No.



DN100 Internal Pressure/Vacuum Relief Valve: Railyt

Part No: R01/NXXXXX



Specification

Nominal size

DN100

Tank connection

Flanged: 8 x 10mm holes on a 135mm PCD

Set pressure

From 1.0 Bar to 4.0 Bar

Set vacuum

From 2 kPa to 4 kPa

Properties

With flame arrester and removable cowl

Materials

Contact parts: 316 stainless steel

Pressure O ring: Nitrile

Vacuum O ring: Nitrile

Tank seal: Nitrile

Alternatives are available, please contact Fort Vale

Design Conditions

Weight: 6.9 Kg
 Design Pressure (MAWP): 4.0 Bar
 Test Pressure: 6.8 Bar
 Design Temp. Min/Max: -40°C/150°C (metal parts)
 Design Temp. Min/Max: -30°C/100°C (Nitrile)

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

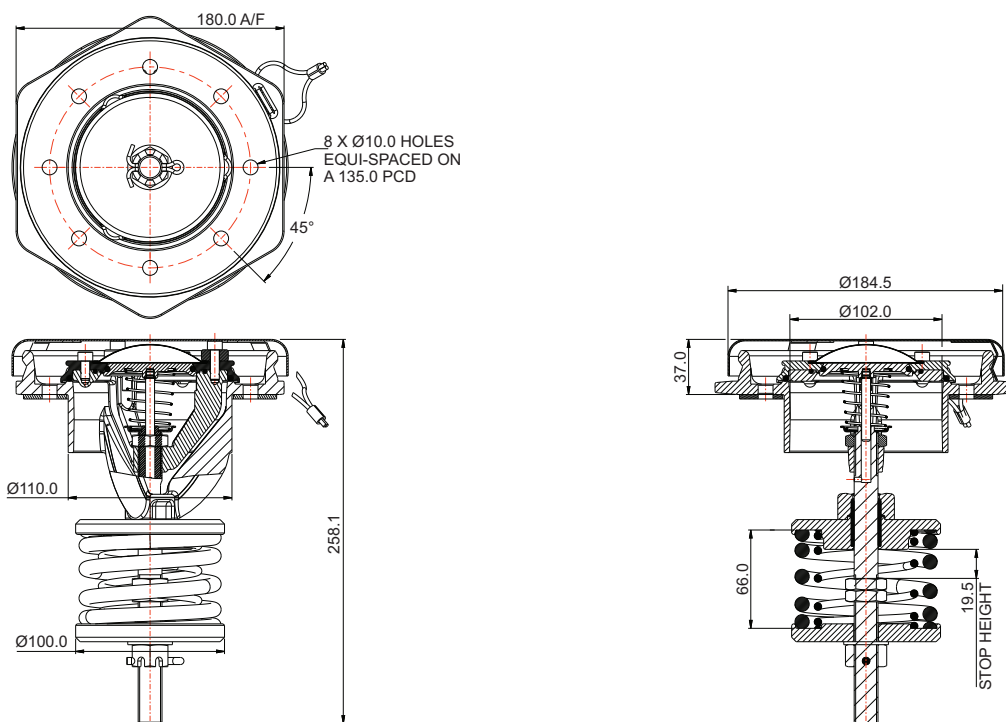
Design Codes

BS EN 14596

Range

Description	Part No.
DN100, flanged connection	R01/XXXXXX
DN100, 4" NPT connection	R01/XXXXXXN

Section View

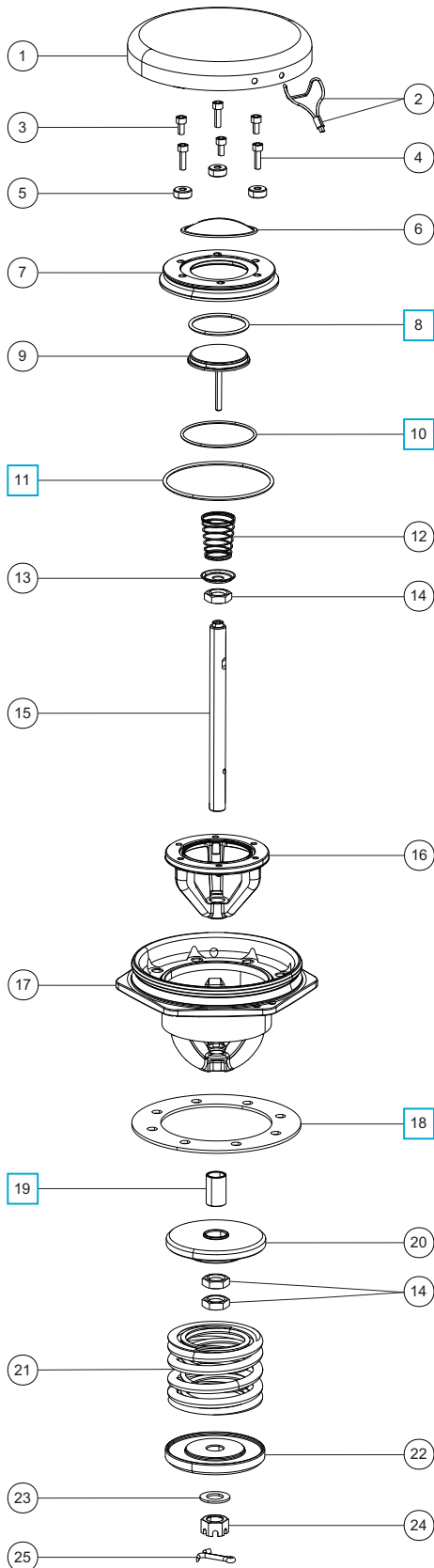




DN100 Internal Pressure/Vacuum Relief Valve: Railtyt

Part No: R01/NXXXXX

Parts Drawing



Parts List

Item	Description	Part No.
1	Cowl	176/9026
2	Stainless steel wire and ferrule	6110-005 & SF2.5
3	M6 x 12mm cap screw (3)	5111-034
4	M6 x 20mm cap screw (3)	5111-017
5	Spacer boss (3)	176/9060
6	Flame arrestor	176/9021
7	Seal clamp plate	176/9053
8	Vacuum O ring	ORB226N <input type="checkbox"/>
9	Vacuum poppet	176/9023
10	Pressure plate O ring	ORB149N <input type="checkbox"/>
11	Pressure O ring	ORB243N <input type="checkbox"/>
12	Vacuum spring *Note	5104-XXX
13	Spring pad	375/9002
14	M16 half nut (3)	5112-021
15	Stem	176/9058
16	Seal clamp cage	176/9040
17	Body	176/9030
18	Nitrile seal	176/9049N <input type="checkbox"/>
19	Stem guide bush	5008-0355 <input type="checkbox"/>
20	Top spring pad	176/9054/2
21	Pressure spring *Note	6104-XXXX
22	Bottom spring pad	176/9054/1
23	3/4" plain washer	5113-011A4
24	M16 castle nut	5112-026WS
25	Split pin	5118-043

NOTE: The valve specification changes the Part No.

Available pressure settings: 1.0 Bar to 4.0 Bar

Available vacuum settings: 2 kPa to 4 kPa

Seal Kit - All parts marked in the Parts List

Pressure/Vacuum Seal Material	Part No.
Nitrile	R01/NPVSK



80mm Flanged Vacuum Vent Valve

Part No: 81BF/X00XX0GZ



Specification

Nominal size

DN80

Tank connection

Flanged: 4 x 18mm holes on a 145mm PCD

Set vacuum

From 0.02 Bar to 0.21 Bar (0.5"Hg to 6.2"Hg)

Properties

With cowl and gauze ring

Materials

Contact parts: 316 stainless steel

Vacuum O ring: Fortyt

Alternatives are available, refer to Fort Vale

Design Conditions

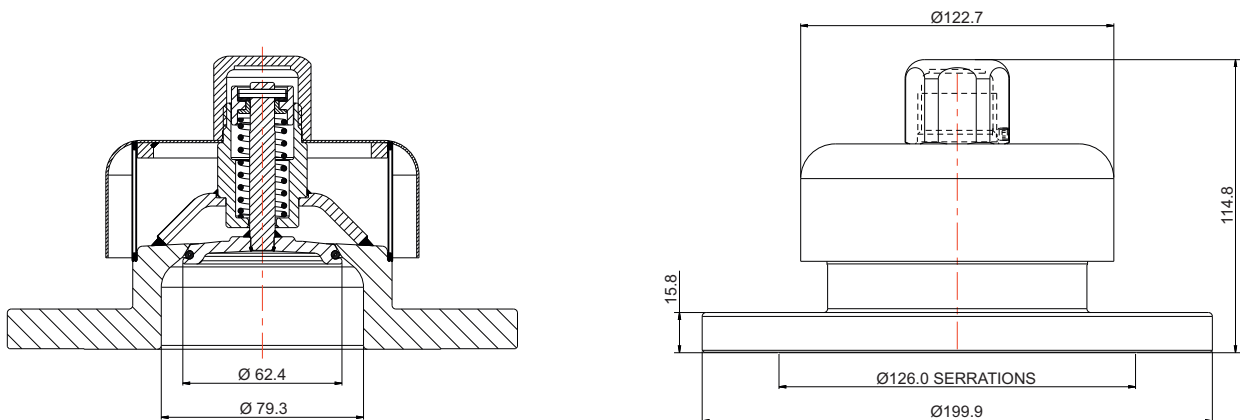
Weight:	4.75 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	7.3 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

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

Design Code

81BF/X00XXXGZ has been end-of-line flame tested to EN 12874:2001 using Group IIA gas to obey clause 6.3.2.1 of the ADR regulations.

Section View

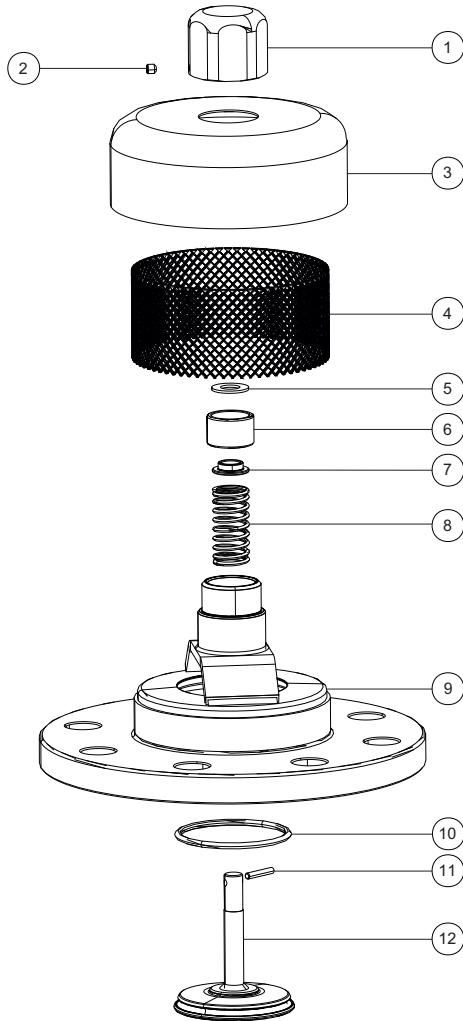




80mm Flanged Vacuum Vent Valve

Part No: 81BF/X00XX0GZ

Parts Drawing



Parts List

Item	Description	Part No.
1	Top cap	1780/0580
2	Sockethead set screw	5121-001
3	Cowl	1780/0560GZ
4	Gauze ring	10206/2
5	Plain washer	5123-007
6	Spring locator	1780/0570
7	Continuity bush	1780/0571
8	Vacuum spring *Note	5104-XXX
9	Body	1780/0800
10	Fortyt main O ring	5005-679
11	Retaining pin	5118-020
12	Poppet	1780/0555

NOTE: The valve specification changes the Part No.



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

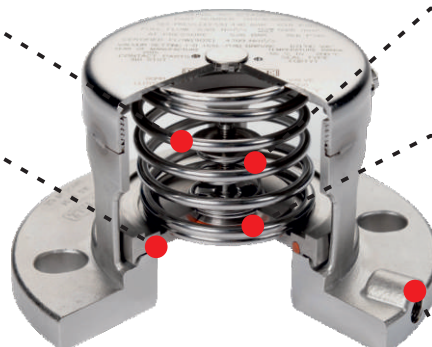
Pressure Setting

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

Pressure Seal

Fortyt

Special service conditions:
A range of seal materials is available



Vacuum Setting

From 2 kPa to 88 kPa

Vacuum Seal

Fortyt

Special service conditions:
A range of seal materials is available

Gauge Connection

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



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:

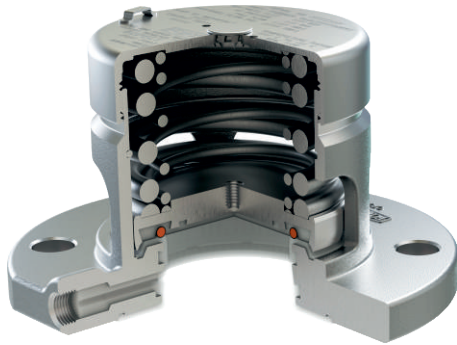
- T50 tank containers for liquefied gas
- Rail tank wagons
- U.S. tank trucks
- IBCs and small capacity tanks
- Steam-heating systems for tanks
- Hygienic service
- Food grade for liquid flow

Please contact us for more information about these valves.



65mm Super Maxi Relief Valve - PFA Lined Pressure Only

Part No: 0U3/1XXX006SL - Metric Setting



Specification

Nominal size

DN65

Tank connection

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

Set pressure

From 0.15 Bar to 5.15 Bar

Options

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

Materials

Body & pressure plate: PFA lined

Springs: Halar® coated

Pressure O ring: Fortyt

Alternatives are available, refer to the Design Options page

Design Conditions

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

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

Design Codes

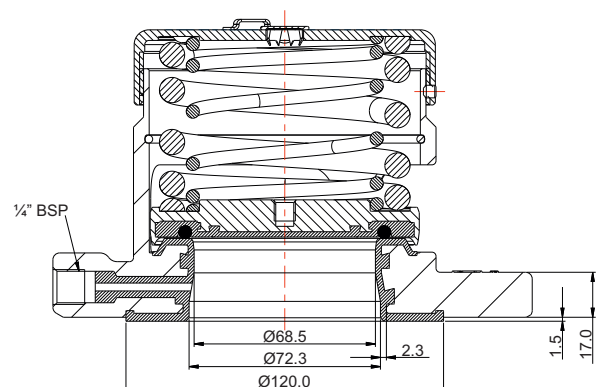
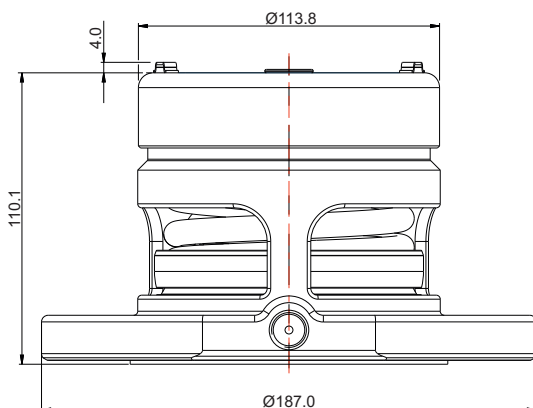
Design Approval by Lloyds Register of Shipping

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

Related Parts

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

Section View

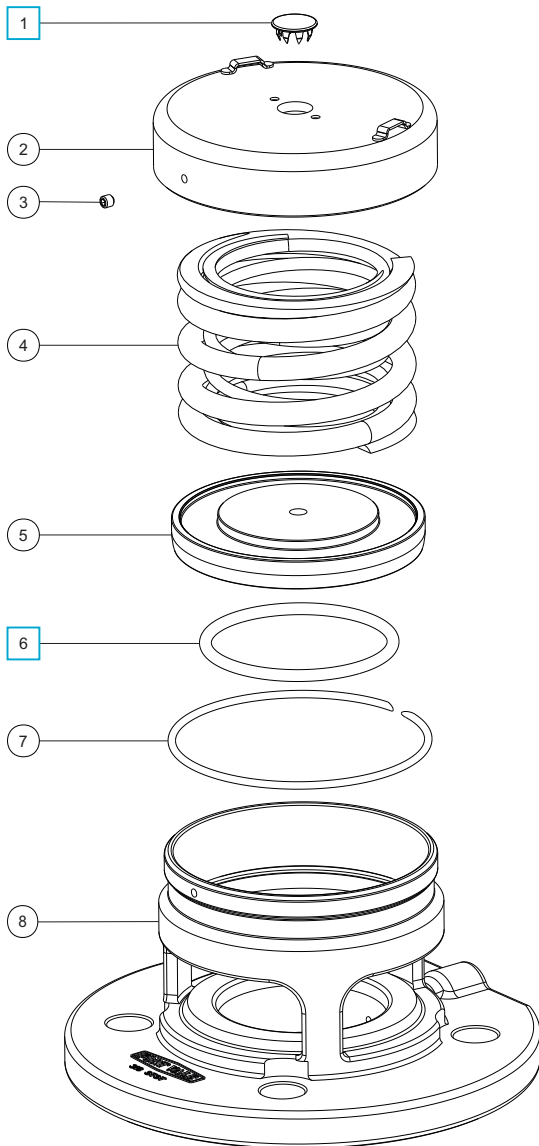




65mm Super Maxi Relief Valve - PFA Lined Pressure Only

Part No: 0U3/1XXX006SL - Metric Setting

Parts Drawing



Parts List

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

NOTE: The valve specification changes the Part No.

Seal Kit

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



3" Vapour Recovery Vent Valve: Railyt

Part No: 856/6500



Specification

Nominal size/body angle
80mm / 90°

Inlet connection

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

Outlet connection

Flanged: 4 x 18mm holes, refer to Section View

Vacuum setting

0.3 to 0.36 Bar

Properties

Operated by a cable connected to the bottom discharge valve

Materials

Contact parts: 316 stainless steel

Main seal: Fortyt

Alternatives are available, refer to Range

Design Conditions

Weight:	9.46 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	7.4 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	200°C

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

Design Code

BS EN14432

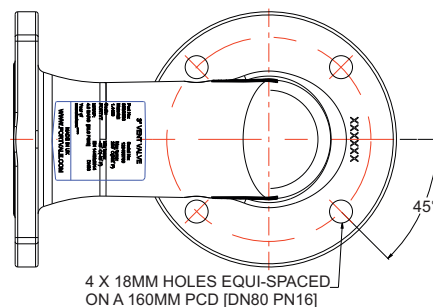
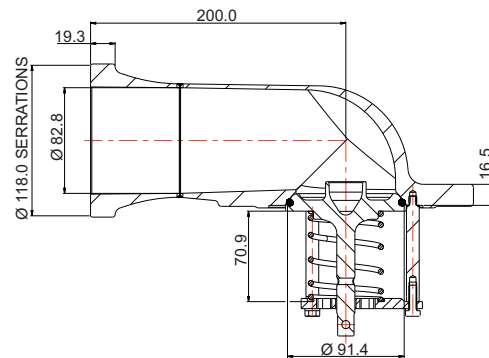
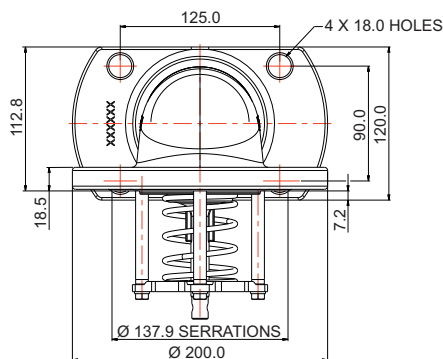
Range

Description	Part No.
Set at 0.3 to 0.36 Bar	856/6500
Set at 0.3 to 0.36 Bar, 8 hole inlet 240 PCD	856/6620
Set at 0.21 to 0.25 Bar	856/6600
Set at 0.4 Bar, flame arrester provision	856/6200

Related Parts

Description	Part No.
Weld-in flange - carbon steel	856/5214MS
CNAF/PTFE inlet gasket	5005-262
Inlet stud kit	856/1100
CNAF/PTFE outlet gasket	5006-0029

Section View

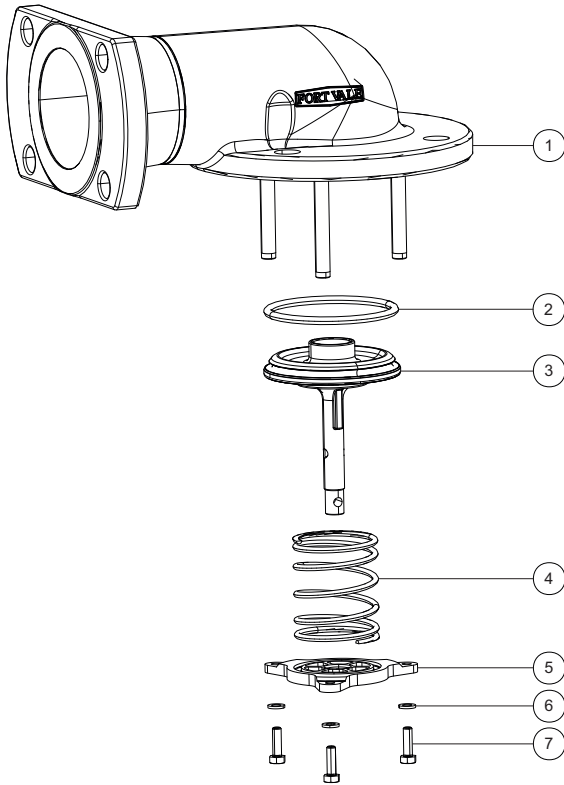




3" Vapour Recovery Vent Valve: Railtyt

Part No: 856/6500

Parts Drawing



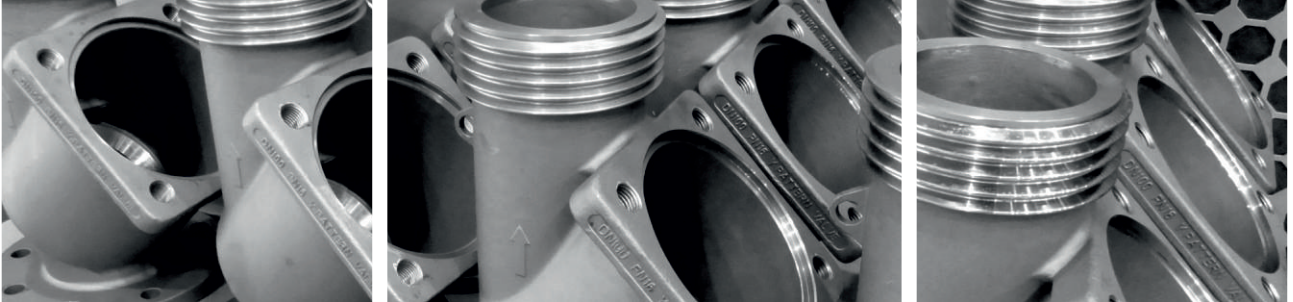
Parts List

Item	Description	Part No.
1	Body	856/6510B
2	Fortyt O ring	5005-104H
3	Poppet	856/6201
4	Spring	5104-075
5	Bayonet top	856/5009
6	M6 spring washer (3)	5113-008
7	M6 hex bolt (3)	5111-076



Discharge Equipment: Liquid Wagon

Railtyt Equipment





Footvalves for Liquid Rail Wagons

Design Options & Accessories

Function

A footvalve is a primary closure valve that is installed at the drain point of the rail wagon. It is connected to a secondary closure valve and is used to load and discharge cargo.

The internal poppet is inside the vessel. It can be connected to the top vent valve by a cable so that the vent valve opens and closes at the same time as the footvalve.

The bottom operator is outside the vessel and connects to the pipework that goes to the secondary valve.

Design Options

The design options below are available on our standard range of footvalves for rail wagons.

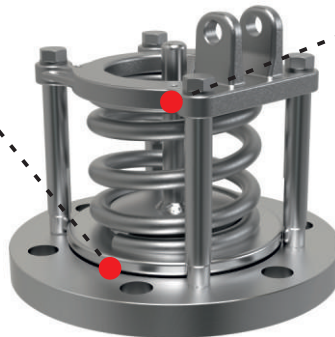
Please contact us for more information about valve options.

Internal Poppet

Main Seal

Standard service conditions:
Fortyt

Special service conditions:
Viton GFLT
Low temp. fluorocarbon



Component Materials

316 stainless steel

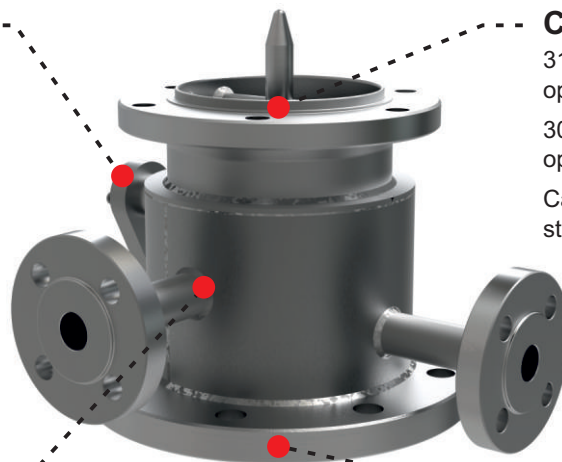
304 stainless steel

Bottom Operator

Operation

Manually operated: A range of handles is available - refer to the next page

Hydraulically actuated



Component Materials

316 stainless steel body and operating mechanism

304 stainless steel body and operating mechanism

Carbon steel body with stainless steel operating mechanism

Special Cargoes

Solidifying cargo:
Body with steam-heating chamber

Body External Finish

Unpainted

Painted



Footvalves for Liquid Rail Wagons

Design Options & Accessories

Manual Operating Handle Assembly

Specification

The operating handle assembly has two handle mechanisms so that the footvalve can be operated from either side of the wagon. Both handles have an open/closed indicator and a safety latch. Each handle operates independently, but moves the open/closed indicator on both sides of the wagon.

Properties

Standard option: Pull-Type assembly - the mechanism pulls the crank arm to open the footvalve. Refer to Range.

Special option: Push-Type assembly - the mechanism pushes the crank arm to open the footvalve. Refer to Range.

Material

Carbon steel with some stainless steel components.

Options

Please refer to the Design Options below, then contact us with your specification.

Range

Description	Part No.
Pull-type assembly *Note	856/59XXXXXX
Push-type assembly *Note	856/595XXXX

NOTE: The handle assembly specification changes the Part No.

Design Options

Footvalve Operation

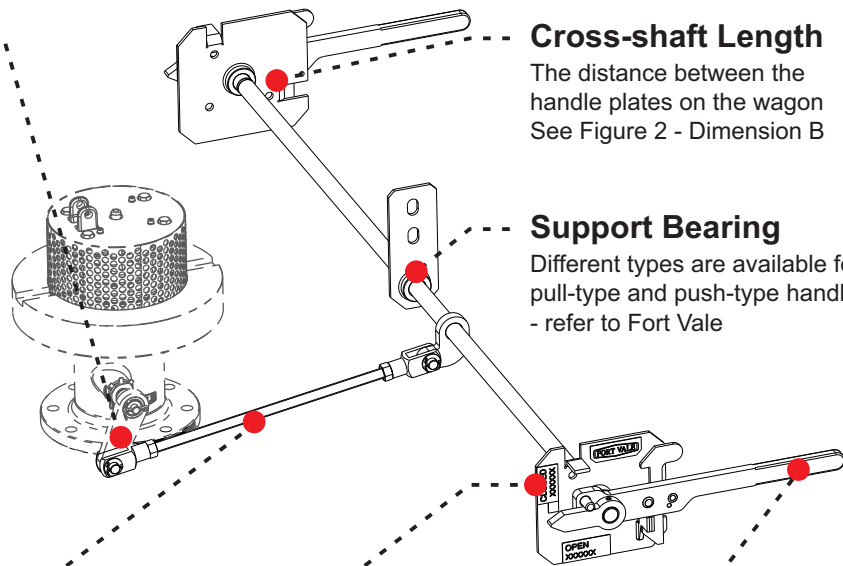
Standard service conditions:

Pull-Type

Special service conditions:

Push-Type

Refer to Properties above



Cross-shaft Length

The distance between the handle plates on the wagon
See Figure 2 - Dimension B

Support Bearing

Different types are available for pull-type and push-type handles
- refer to Fort Vale

Footvalve Offset

The distance between the footvalve & cross-shaft centres
See Figure 1 - Dimension A

Language

A second language option for OPEN and CLOSED is available

Finish

Some components can be supplied painted

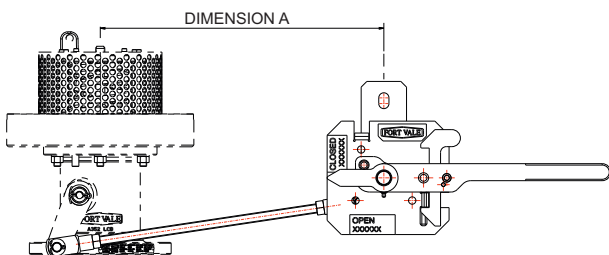


Figure 1 - Footvalve Offset

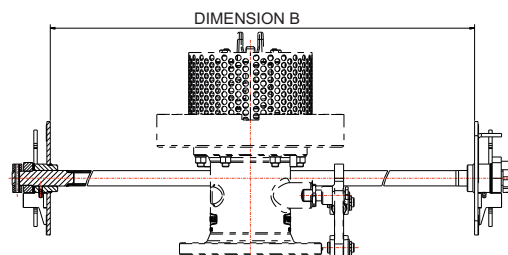


Figure 2 - Cross-shaft Length

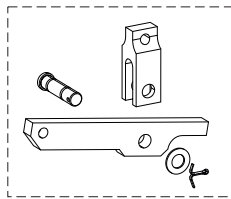


Footvalves for Liquid Rail Wagons

Design Options & Accessories

Accessories

Please contact us for more information about footvalve accessories.



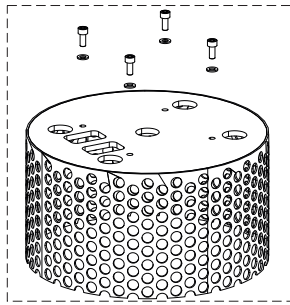
Pivot Arm & Shear Pin Assembly

Used to connect the internal poppet assembly to the vent valve and to connect the roll-over safety cable. With special shear pin.

Material

316 stainless steel

Part No: 856/5220



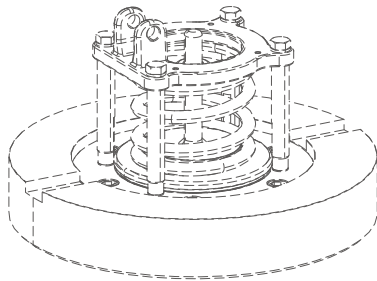
Poppet Mesh Cover Assembly

The assembly covers the internal poppet assembly to prevent debris causing a blockage in the poppet area.

Material

316 stainless steel

Part No: 856/5187K



Cable Assemblies

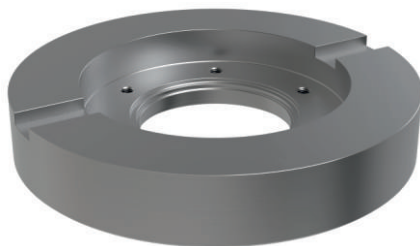
4mm: To connect the internal poppet assembly to the vent valve

6mm: To connect the roll-over safety cable

Material

316 stainless steel

Description	Part No.
4mm poppet/vent valve cable assembly	856/6390
6mm roll-over safety cable	856/6395



Weld-in Flange

Compatible with the inlet poppet and the bottom operator. 6 x M12 holes on a 175mm PCD each side.

Material	Part No.
316 stainless steel	856/5520
Carbon steel	856/5520MS
Aluminium	856/5520AL



5" 180° Footvalve Assembly: Railtyt

Part No: 856/5274X



Internal poppet & bottom operator shown installed to tank weld-in flange

Specification

Nominal size/body angle

125mm / 180°

Internal poppet & bottom operator inlet connection

Flanged: 6 x 13/14mm holes equi-spaced on a 175mm PCD

Bottom operator outlet connection

Flanged: 8 x 18mm holes on a 210mm PCD

Properties

The internal poppet connects to the vent valve by a cable. The handle assembly is supplied separately

Materials

Contact parts: 316 stainless steel

Main seal: PTFE/elastomer

For alternatives, refer to Range & the Design Options page

Design Conditions

Weight:	25.6 Kg
Design Pressure (MAWP):	4 Bar
Test Pressure:	7.1 Bar
Design Temperature Min:	+40°C
Design Temperature Max:	200°C

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

Approvals

BS EN14433

BS EN13445-3

Design Options & Related Parts

For more information about Design Options and Related Parts, please refer to a separate page: Footvalves for Rail Tank Wagons - Design Options & Accessories

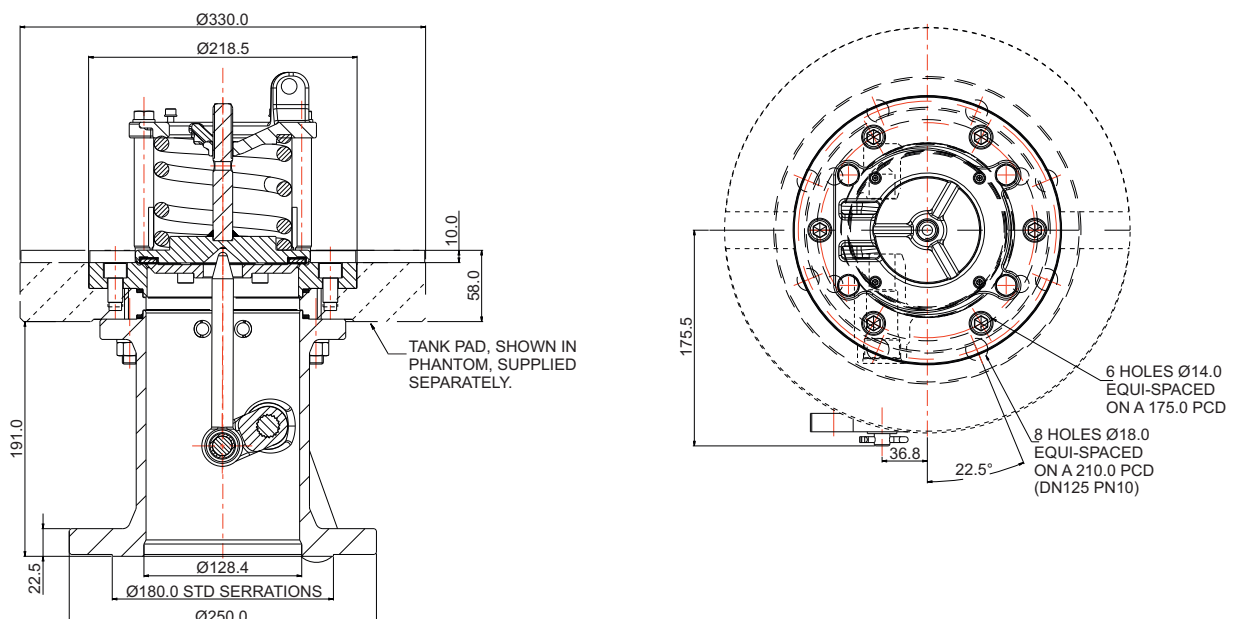
Range: All Stainless Steel

Description	Part No.
Standard specification - 316 st.st.	856/5274X
Standard specification - 304 st.st.	856/5274S1X
Steam heated - flanged ports	856/5274SHX
Steam heated - threaded ports	856/5274SH1X

Range: Stainless Steel Internal Poppet & Carbon Steel Bottom Operator

Description	Part No.
Standard specification	856/5274MS/X
Steam heated - flanged ports	856/5274MSSH/X
Steam heated - threaded ports	856/5274MSSH1X

Section View

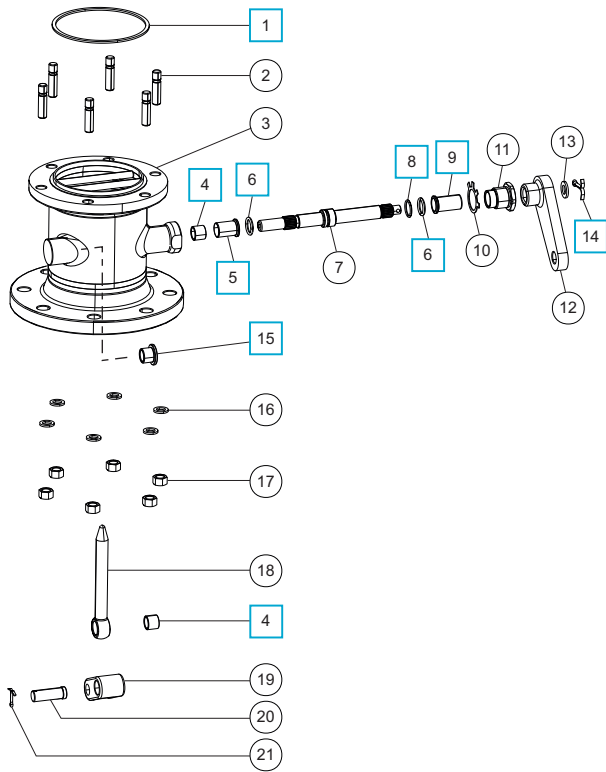




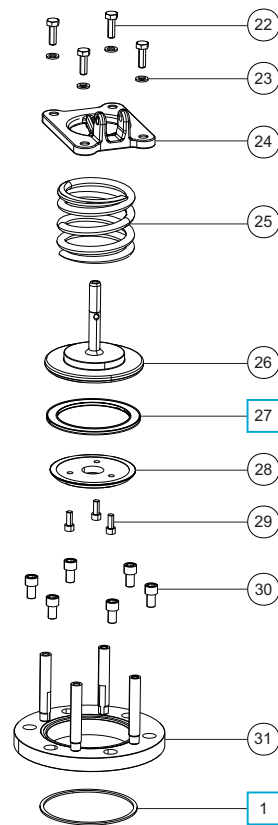
5" 180° Footvalve Assembly: Railtyt

Part No: 856/5274X

Parts Drawing: Bottom Operator



Parts Drawing: Internal Poppet



Parts List

Item	Description	Part No.
1	Intermediary gasket (2)	856/5176 <input type="checkbox"/>
2	M12 stud (6)	312/1007
3	Operator body: stainless steel carbon steel	856/5190 856/5190MS
4	Support bush (2)	856/5004 <input type="checkbox"/>
5	Spindle guide bush	853/7022 <input type="checkbox"/>
6	PTFE O ring (2)	5005-113 <input type="checkbox"/>
7	Spindle	856/5003
8	Low temperature FKM O ring	5005-336MF <input type="checkbox"/>
9	Spindle guide bush	856/5045 <input type="checkbox"/>
10	Locking washer	853/7029
11	Stuffing gland nut	853/7021
12	Crank arm	856/5490
13	M12 washer	5113-006
14	3/16" split pin	5118-043 <input type="checkbox"/>
15	Back guide bush	856/5013 <input type="checkbox"/>
16	M12 spring washer (6)	5113-010A4
17	M12 full nut (6)	5112-045
18	Push rod	856/5115
19	Spline boss	856/5002
20	Clevis pin	856/5007
21	1/8" split pin	5118-010

Parts List

Item	Description	Part No.
22	M10 x 30mm hex bolt (4)	5111-003
23	M10 washer (4)	5113-002A4
24	Spring top plate	856/5017
25	Spring	5104-981
26	Poppet	856/5034
27	Poppet seal *Note	856/5035X <input type="checkbox"/>
28	Seal clamp plate	856/5001
29	M8 cap screw (3)	5111-010A4
30	M12 cap screw (6)	5111-066
31	Poppet seat assembly	856/5182

NOTE: The valve specification changes the Part No.

Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	856/5274PSK



100mm Y Pattern Discharge Valve: Railyt

Part No: 409/0200



Shown with st/st cap. Standard supply: plastic cap.

Specification

Nominal size/body angle

100mm / Y pattern

Inlet connection

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

Outlet connection

Threaded: 5½" BSW

Properties

Manually operated with handwheel. Handwheel with locking pin & padlock hole. With plastic dust cap.

Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Alternatives are available, refer to Range

Design Conditions

Weight: 36.4 Kg

Design Condition 1:

Design Pressure (MAWP): 16 Bar

Test Pressure: 24 Bar

Design Temperature Min: -29°C

Design Temperature Max: 150°C

Design Condition 2:

Design Pressure (MAWP): 10 Bar

Test Pressure: 15 Bar

Design Temperature Min: -29°C

Design Temperature Max: 190°C

Approvals

RID, EN14432, EN12516-2

Thread coupling complies with EN12561-2:2011 Ch8

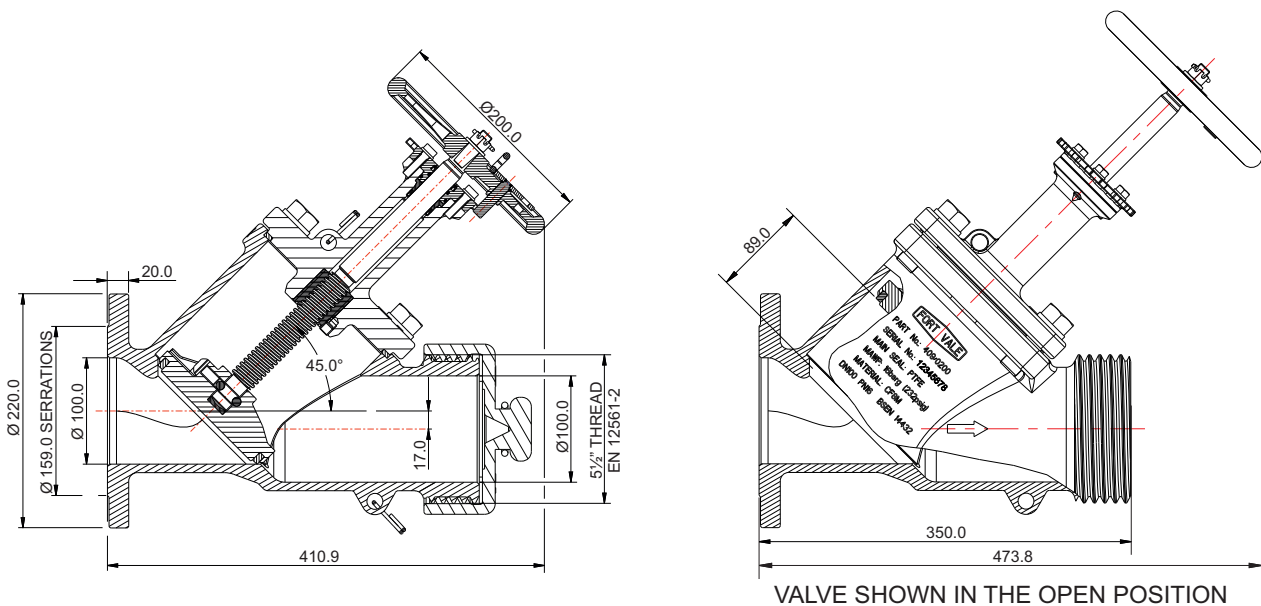
Range

Description	Part No.
Standard valve: stainless steel	409/0200
Standard valve: carbon steel body with st.st shaft & poppet	409/0200MS
As 409/0200MS, external surfaces painted	409/0200MS/0

Related Parts

Description	Part No.
CNAF/PTFE inlet gasket	6005-105
5½" BSW dust cap - carbon steel	10355PSCMS
5½" BSW dust cap - plastic	1035621B
5½" BSW dust cap - aluminium	1035621A

Section View

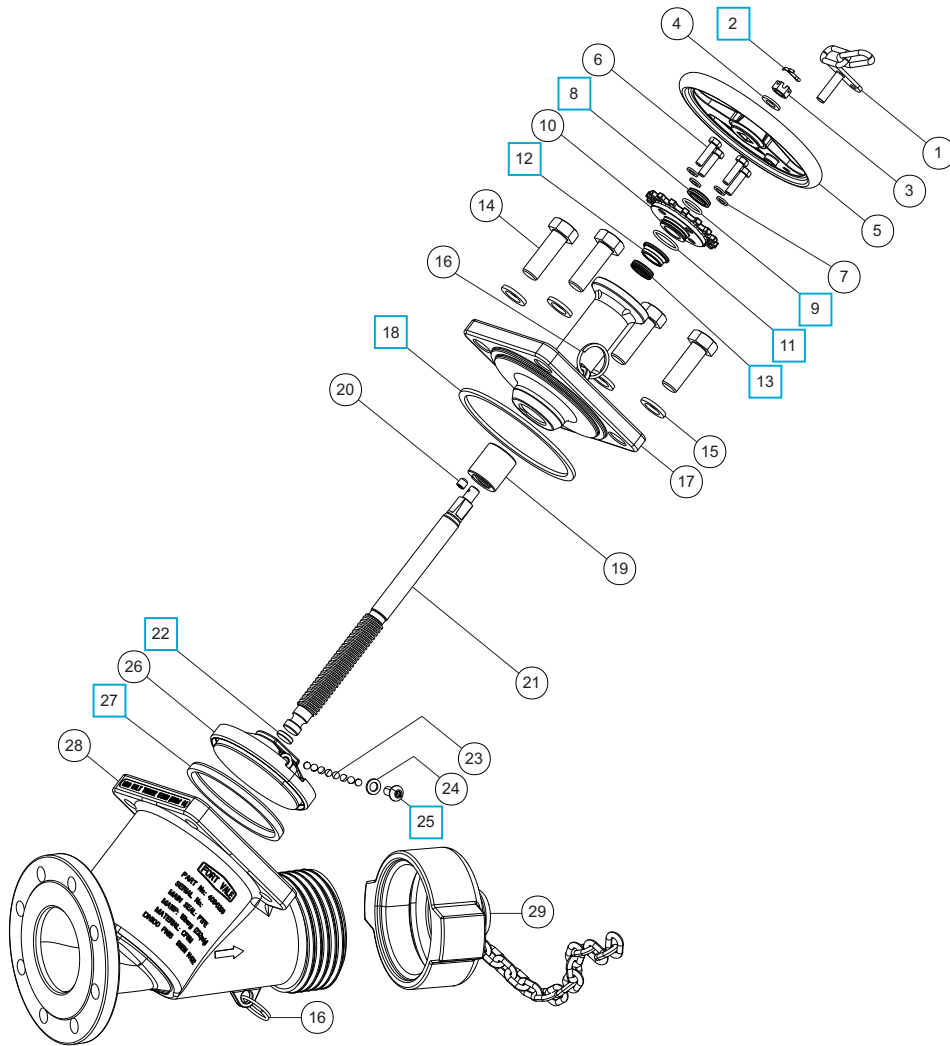




100mm Y Pattern Discharge Valve: Railtyt

Part No: 409/0200

Parts Drawing



Parts List

Item	Description	Part No.
1	Locking pin assembly	409/0218
2	Split pin	5228-010 <input type="checkbox"/>
3	M12 Castle nut	M12-CASTLE
4	M12 A2 washer	5123-003
5	Hand wheel	409/0213
6	M8 hex bolt (4)	5111-038
7	M8 spring washer (4)	5113-003
8	FKM scraper	409/0233 <input type="checkbox"/>
9	Viton low temp. O ring	ORB118VL <input type="checkbox"/>
10	Seal cover: stainless steel (carbon steel)	409/0209 409/0209MS)
11	Viton low temp. O ring	ORB123VL <input type="checkbox"/>
12	Stem seal bearing	409/0232 <input type="checkbox"/>
13	Variseal	409/0231 <input type="checkbox"/>
14	M20 bolt (4)	5111-301
15	M20 spring washer (4)	5113-016
16	Split ring (2)	368/0011
17	Bonnet: stainless steel (carbon steel)	409/0202 409/0202MS)

Parts List

Item	Description	Part No.
18	PTFE gasket	6005-1641484001 <input type="checkbox"/>
19	Thread bush	409/0205
20	Grub screw	5111-070
21	Screw spindle	409/0204
22	Slide pad	409/0252 <input type="checkbox"/>
23	8mm ball (8)	5128-055
24	M10 washer	5113-002A4
25	M10 button head screw	5111-817 <input type="checkbox"/>
26	Piston	409/0246
27	PTFE seal	409/0247 <input type="checkbox"/>
28	Body: stainless steel (carbon steel)	409/0201 409/0201MS)
29	Plastic dust cap, chain, PTFE	1035621B

Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	409/0200SK



Discharge Ball Valves

Design Options

Function

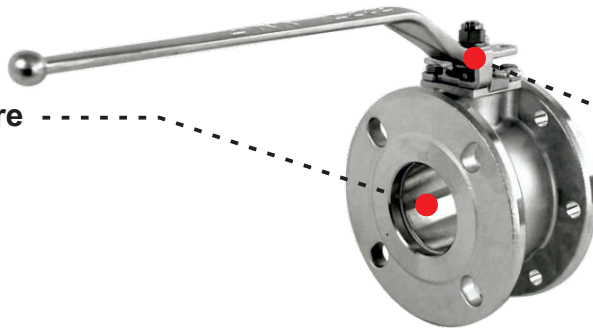
A discharge ball valve is used to load and discharge cargo. It is usually a secondary closure valve that is installed onto a footvalve (primary closure valve) at the drain point of a tank. A ball valve can also be used as a primary closure valve on the top of a tank.

Design Options

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

Nominal Bore

- 50mm (2")
- 80mm (3")
- 100mm (4")

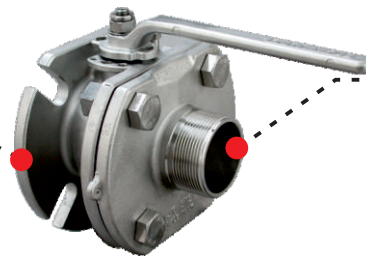


Operation

- Manually operated: A range of handles is available
- Left hand, right hand, ambidextrous
- Pneumatically actuated

Inlet Flange

- 4, 6 and 8 holes/slots drilling patterns
- Flats milled top and bottom

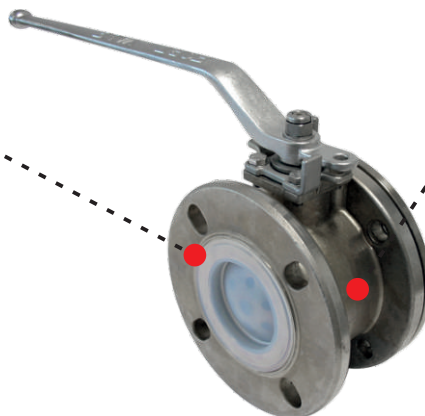


Outlet

- Threaded spigot flange
- Flush fit
- Bobbin flange with a range of drilling patterns
- Flats milled top and bottom
- Camlock

Valve Materials

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

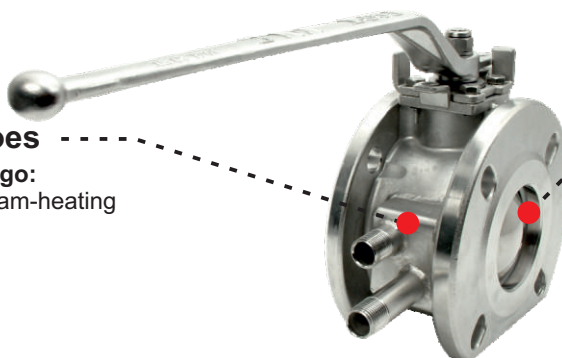


Finish

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

Special Cargoes

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



Main Seal

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



Discharge Ball Valves

Design Options

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.



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

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

Design Codes

BS EN 14432
BS EN 12516-2

Range

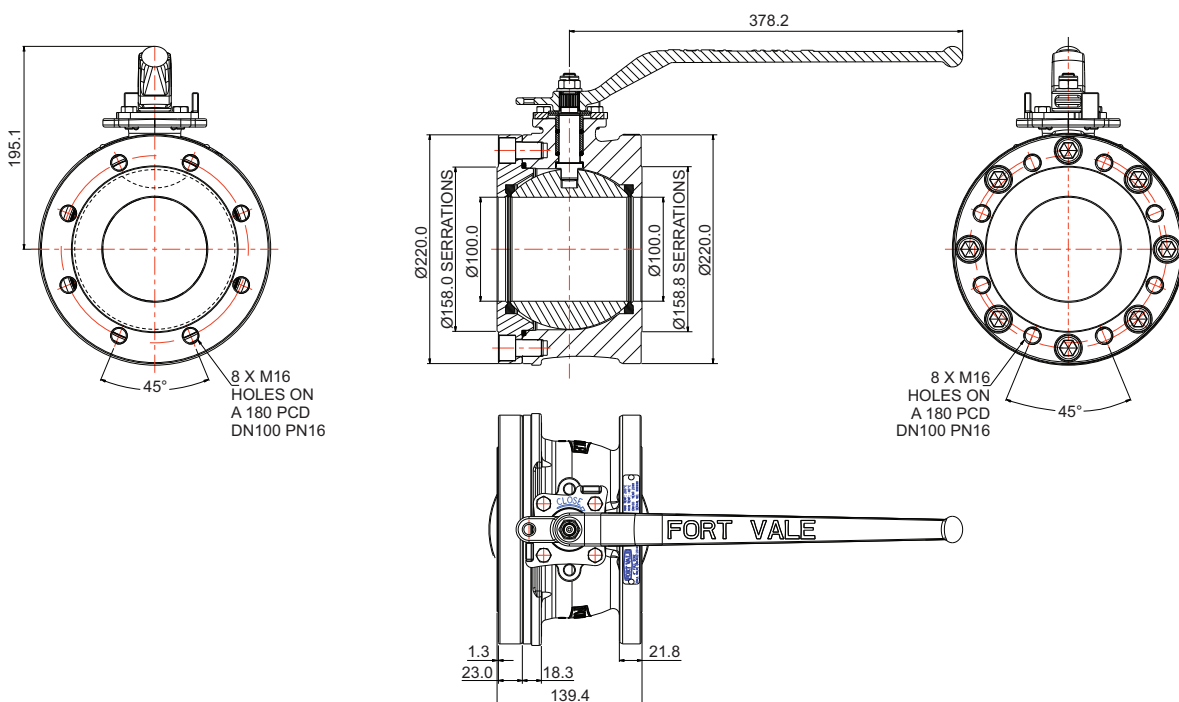
Description	Part No.
Manually operated *Note	460/E000X
Pneumatically actuated	460/E000PN
Carbon steel body *Note	460/E000XM

NOTE: The valve specification changes the part number

Related Parts

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

Section View

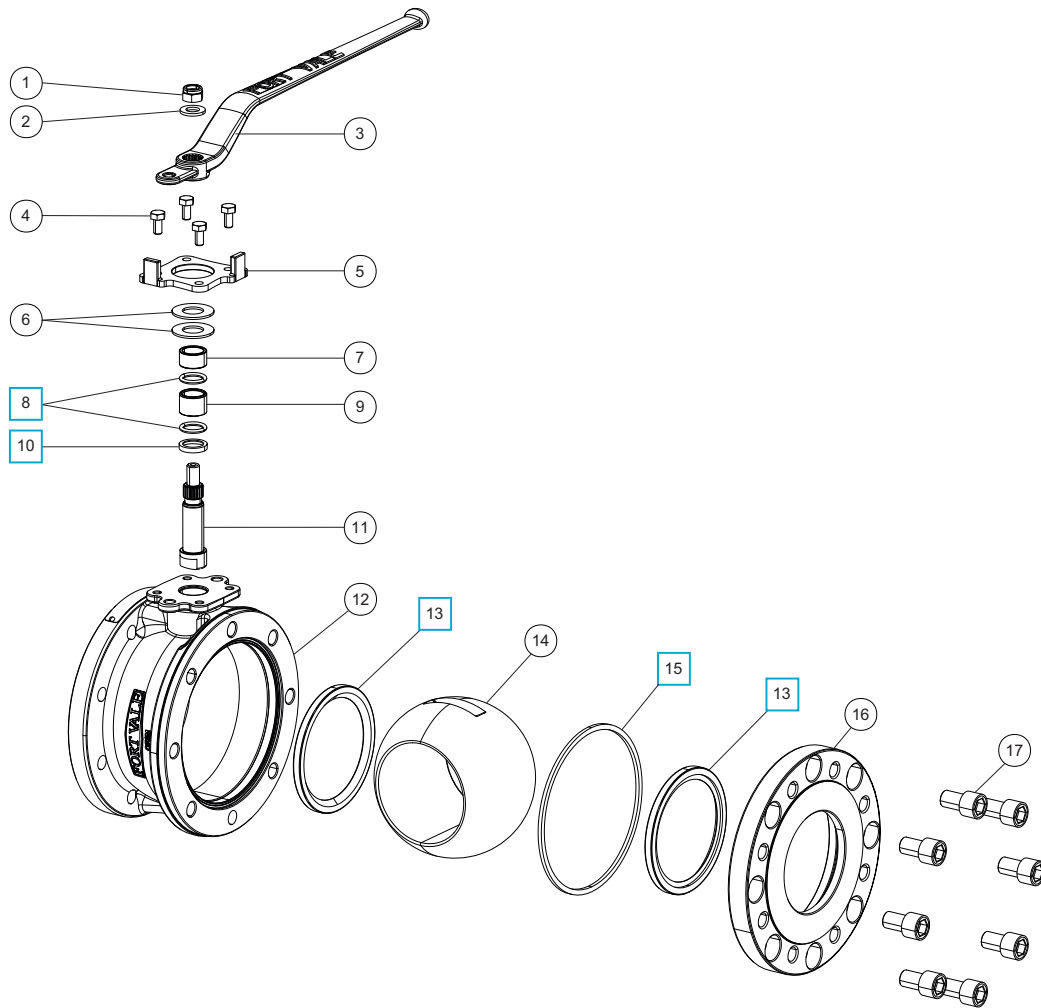




DN100 Ball Valve with Inlet Seal Clamp

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 (4)	5111-822
5	Stop plate	460/A0027X
6	20mm Belleville washer (2)	5113-041
7	Top stuffing collar	360/3412
8	PTFE O ring (2)	5005-113 <input type="checkbox"/>
9	Bottom stuffing collar	460/A0010
10	Bottom bearing	360/3421 <input type="checkbox"/>
11	Spindle	460/A0009
12	Body	460/A0008
13	PTFE main seal (2)	5005-0010 <input type="checkbox"/>
14	4" Ball	460/5051S1
15	PTFE body seal	5005-0011 <input type="checkbox"/>
16	Inlet flange	460/A0002
17	M16 cap screw (8)	5111-079

Seal Kit

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



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

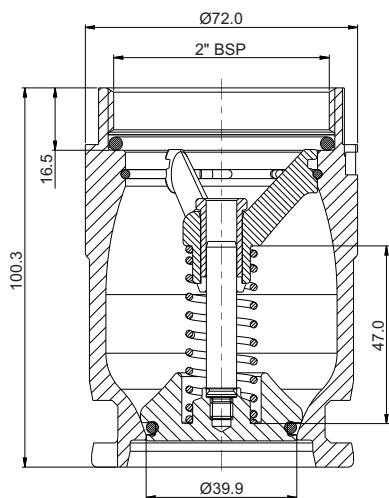
Description	Part No.
2" BSP inlet, Viton seal, no selectivity	376V/B700A00
Flanged inlet, no selectivity *Note	376V/B700X00

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

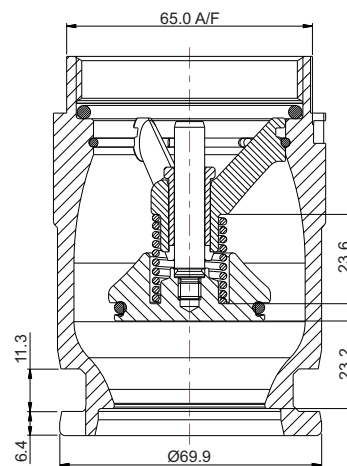
Related Parts

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



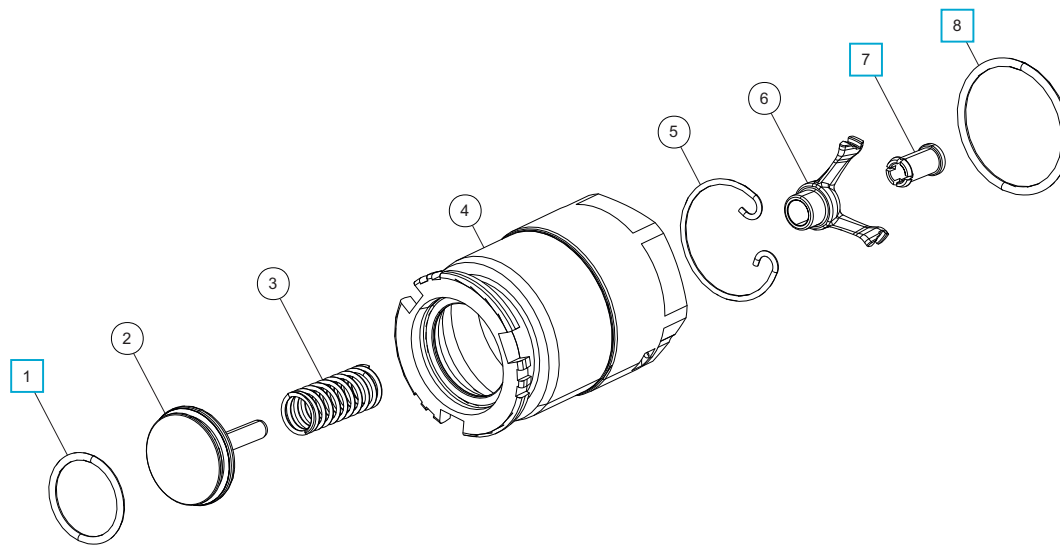
OPEN POSITION



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 <input type="checkbox"/>
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 <input type="checkbox"/>
8	PTFE O ring	ORB832P0 <input type="checkbox"/>

NOTE: The tank unit specification changes the Part No.

Seal Kit

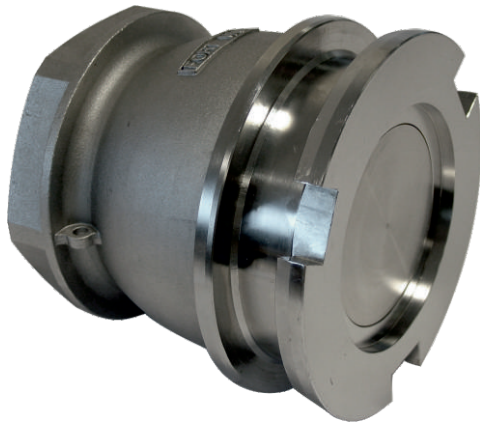
Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	376X/B700XSK

X = The seal material and inlet type change the Part No.



164mm Drytyt Dry Disconnect Tank Unit

Part No: 376V/B640A00



Specification

Nominal size

164mm

Inlet connection

4" BSP

Outlet/process connection

164mm

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:	7.4 Kg
Design Pressure (MAWP):	10 Bar
Test Pressure:	17 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

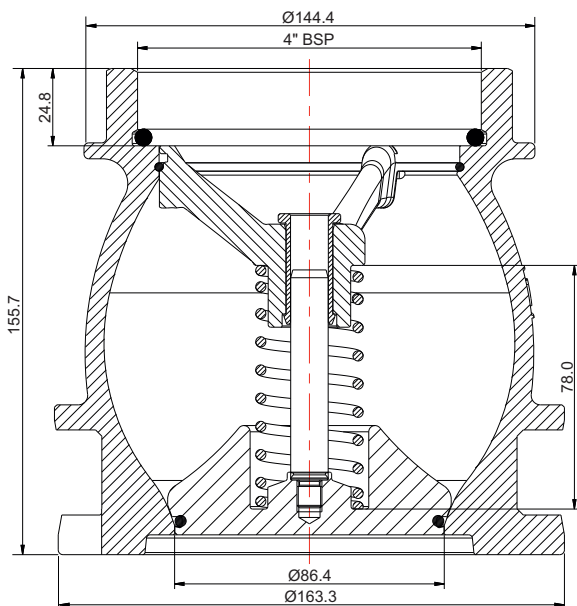
Description	Part No.
4" BSP inlet, Viton seal, no selectivity	376V/B640A00
Flanged inlet, no selectivity *Note	376V/B640X00

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

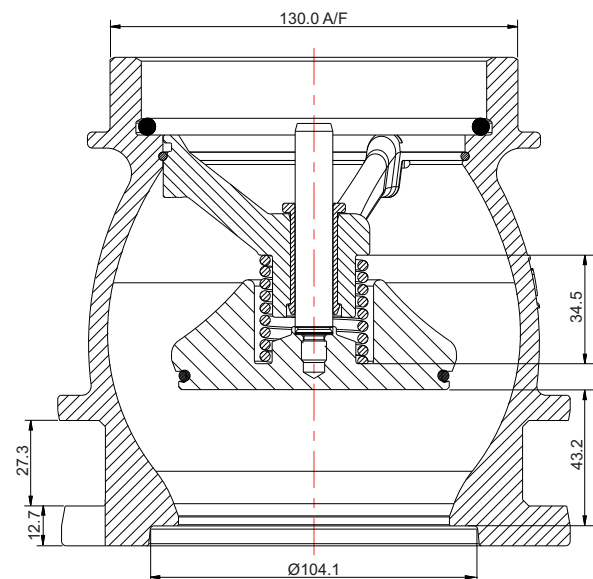
Related Parts

Description	Part No.
164mm pressure-tight cap	915/5490X
164mm/4" BSP hose unit, Viton seal	895V/B164A00
164mm rubber dust cap	915/5176

Section View



CLOSED POSITION



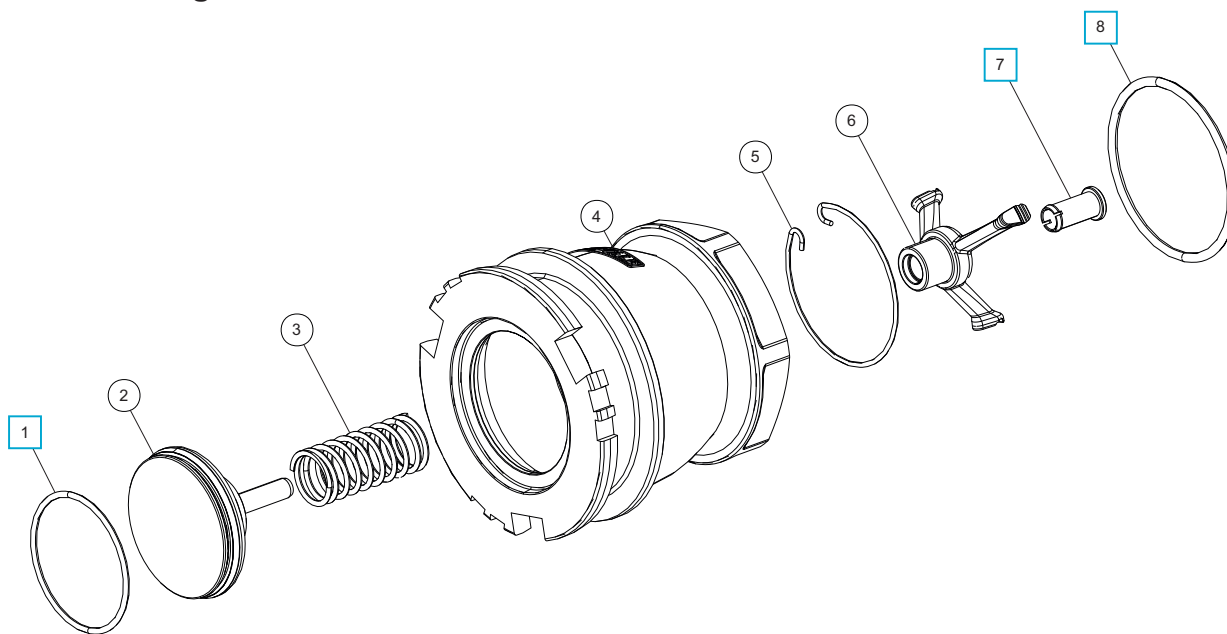
OPEN POSITION



164mm Drytyt Dry Disconnect Tank Unit

Part No: 376V/B640A00

Parts Drawing



Parts List

Item	Description	Part No.
1	Viton poppet O ring *Note	5005-551V <input type="checkbox"/>
2	Poppet assembly	376/B643
3	Poppet spring	5104-807
4	164mm body (no selectivity) *Note	376/B641A00
5	Snap ring	5120-072
6	Spider	376/B642
7	Guide bush	376/1642/2 <input type="checkbox"/>
8	PTFE O ring	ORB345P0 <input type="checkbox"/>

NOTE: The tank unit specification changes the Part No.

Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	376X/B640XSK

X = The seal material and inlet type change the Part No.



Dust Caps & Plugs for Drytyt Dry Disconnect Couplings Accessories & Spare Parts



Specification

Caps for tank units have a ring and tab to attach it to the tank unit.

Plugs for hose units have a 3mm hole to attach a keyring and chain or wire.

Nominal sizes

70mm, 119mm, 164mm

Material

Black EPDM rubber

If the type you need is not shown, please contact us.

Dust Caps - For Tank Units

Size	Part No.
70mm	915/5172
119mm	915/5175
164mm	915/5176

Dust Plugs - For Hose Units

Size	Part No.
70mm	915/5171
119mm	915/5173
164mm	915/5174



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

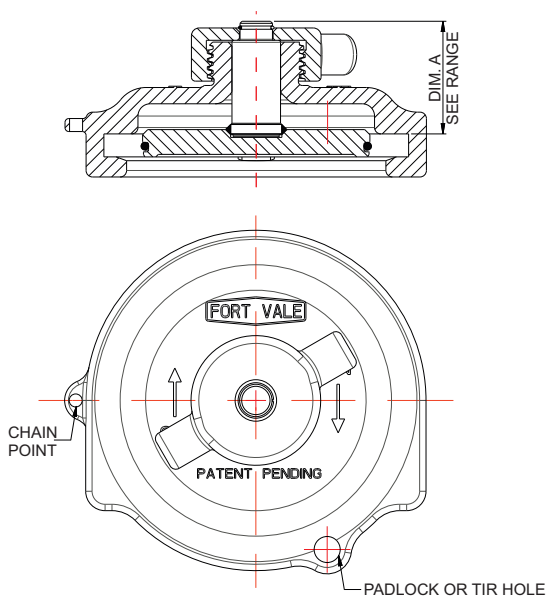
Materials

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

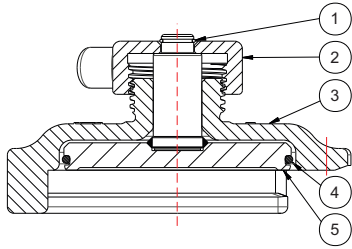


Pressure-Tight Caps for Drytyt Tank Units

Accessories & Spare Parts

Parts Drawing

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



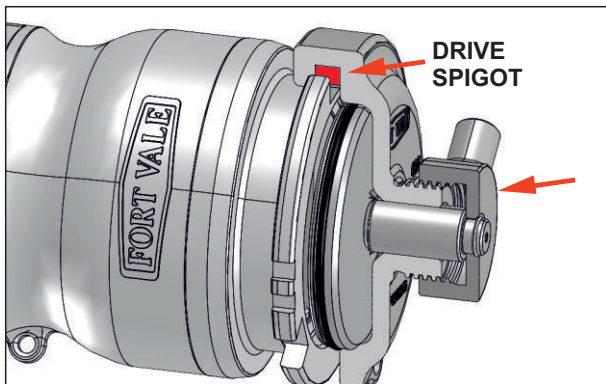
Parts List

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	XXXXXXXX
5	Seal plate *Note	915/54XX

NOTE: The cap specification changes the Part No.

Installation Instructions

Example shown: 119mm cap and tank unit



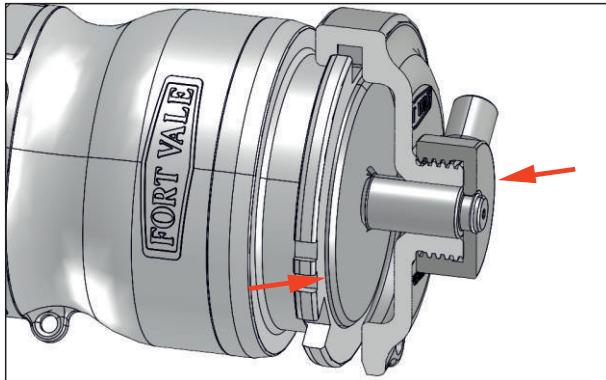
How to install the pressure-tight cap assembly

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.



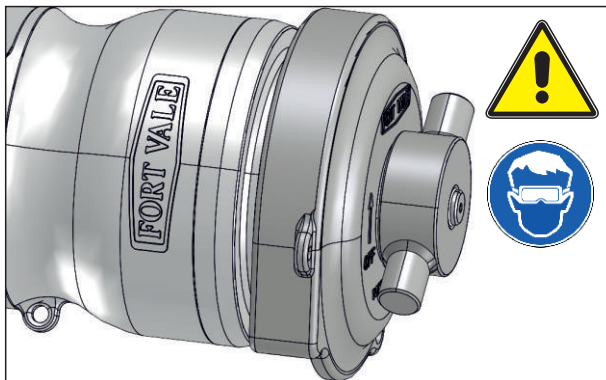
Tighten the top cap.

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.



Discharge Equipment: Gas Wagon

Railtyt Equipment





80mm 90° Hydraulic Gas Footvalve Assembly: Railtyt

Part No: 253/8060



Specification

Nominal size/body angle

80mm / 90°

Internal poppet connection

4 x holes equi-spaced on a 180mm PCD

Body bottom connections

Inlet: 4 x 22mm holes on a 190mm PCD

Outlet: weld prepared

Properties

Hydraulically operated with hydraulic indicators
(Hydraulic adaptors are not included)

Materials

Contact parts: 316 stainless steel

Main seal: Viton

Alternatives are available, refer to Range

Design Conditions

Poppet & Body Bottom

Design Pressure (MAWP): 30 Bar
 Test Pressure: 45 Bar
 Design Temperature Min: -40°C
 Design Temperature Max: 65°C

Design Codes

BS EN 14433, BS EN 12516-2

Indicator Cylinder

Design Pressure (MAWP): 150.0 Bar
 Test Pressure: 214.5 Bar
 Design Temperature Min: -40°C
 Design Temperature Max: 65°C

Design Code

BS EN 13445-3

Range

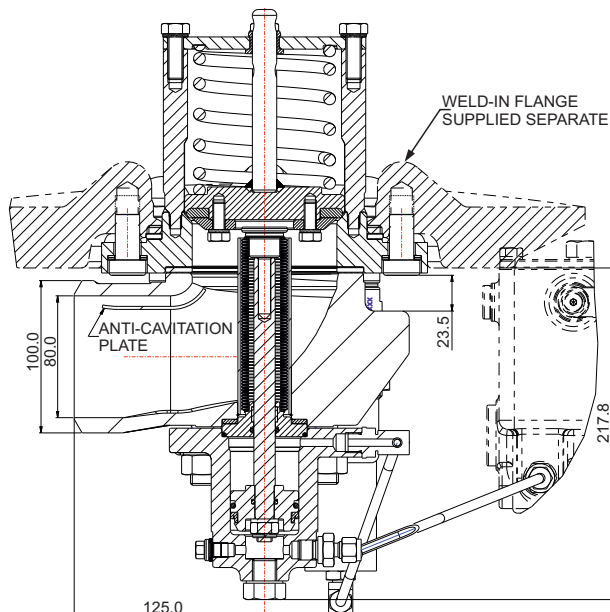
Description	Part No.
With hydraulic open/close indicators	253/8060
With mechanical open/close indicators	253/8000

Related Parts

Description	Part No.
Weld-in flange	854/8001
Quick-close manual pump assembly	167/2100

Section View

NOTE: The open/closed indicators are not shown in this view. The hydraulic pump, pipes and adaptors are supplied separately.

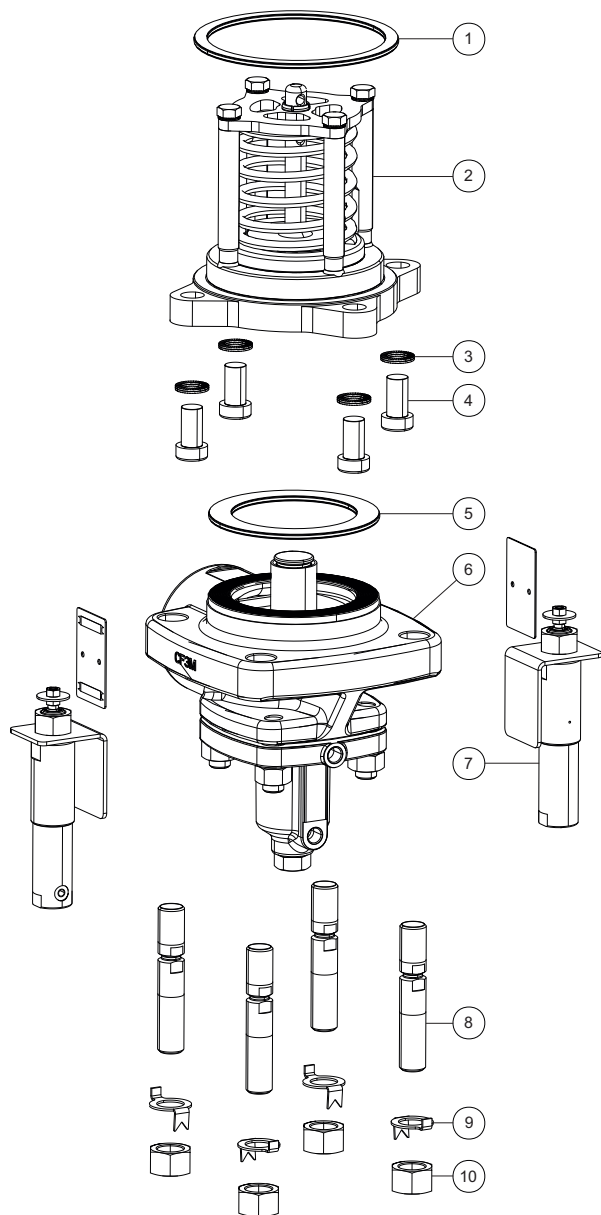




80mm 90° Hydraulic Gas Footvalve Assembly: Railtyt

Part No: 253/8060

Footvalve Assembly: 253/8060 Parts Drawing



Footvalve Assembly: 253/8060 Parts List

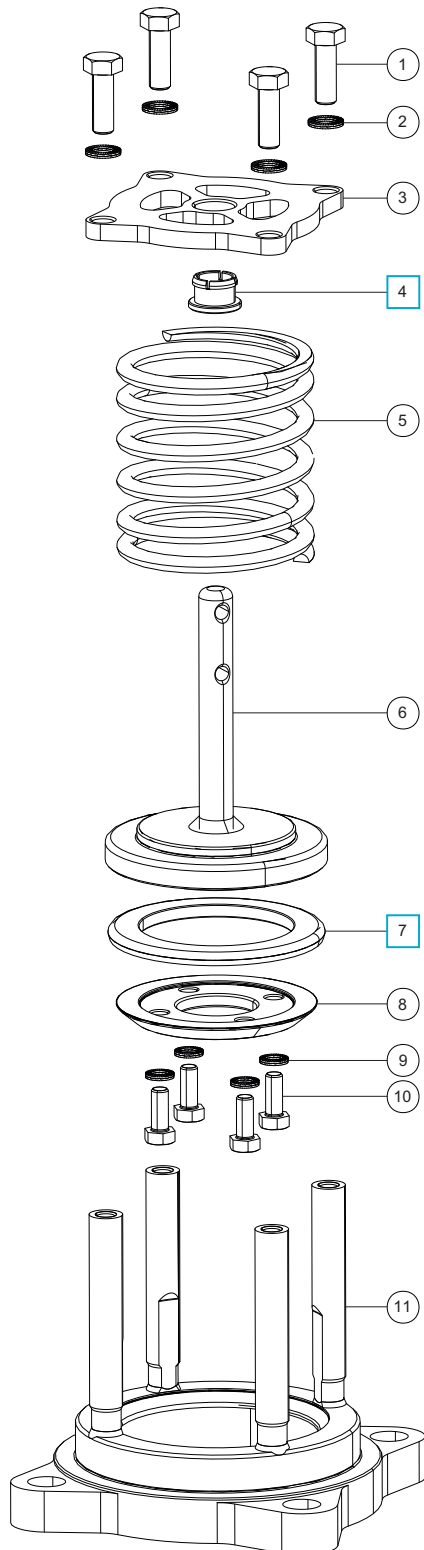
Item	Description	Part No.
1	Kammprofile gasket	253/8057KPN
2	Poppet assembly Refer to page 3 of 5	253/8030
3	M16 Nord Lock washer pair (4)	5113-194
4	M16 cap screw (4)	5111-406
5	Kammprofile gasket	253/8058KPN
6	Body bottom assembly Refer to page 4 of 5	253/8065
7	Indicator cylinder (2) Refer to page 5 of 5	253/8080
8	M20 shear stud (4)	253/8043
9	M20 tab washer (4)	253/8103
10	M20 full nut (4)	5112-011



80mm 90° Hydraulic Gas Footvalve Assembly: Railtyt

Part No: 253/8060

Poppet Assembly: 253/8030 Parts Drawing



Poppet Assembly: 253/8030 Parts List

Item	Description	Part No.
1	M10 hex bolt (4)	5111-003
2	M10 Nord Lock washer pair (4)	5113-191
3	Spring cover plate	253/8038
4	Guide bush	253/8052 <input type="checkbox"/>
5	Spring	5104-973-2
6	Poppet seal housing	253/8033
7	Viton seal	253/8024 <input type="checkbox"/>
8	Poppet seal clamp plate	253/8031
9	M8 Nord Lock washer pair (4)	5113-190
10	M8 hex bolt (4)	5111-046
11	Poppet seat assembly	253/8037

Seal Kit

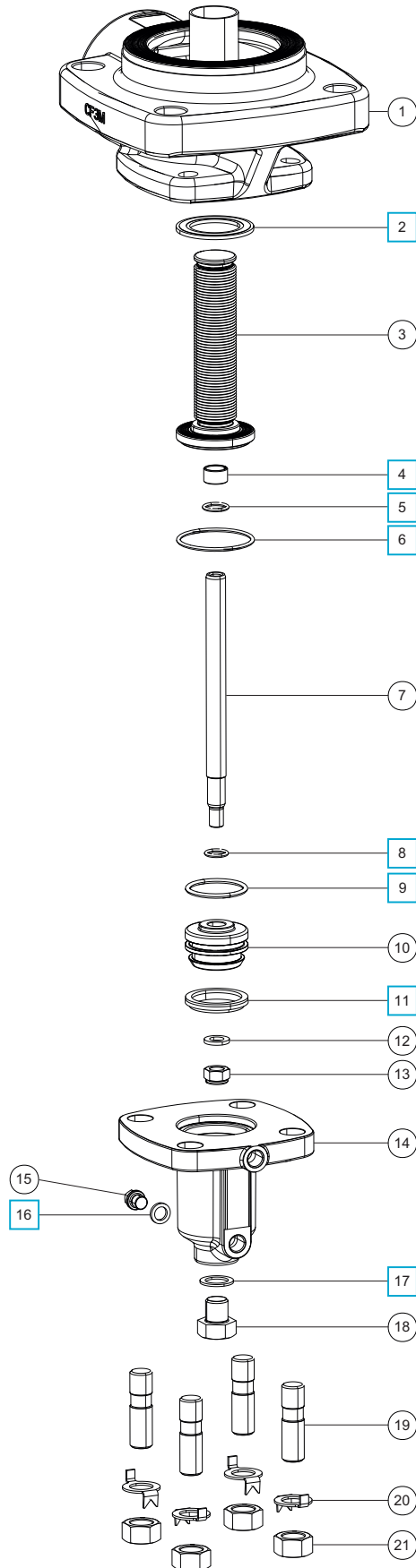
Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	253/8030SK



80mm 90° Hydraulic Gas Footvalve Assembly: Railtyt

Part No: 253/8060

Body Bottom Assembly: 253/8065 Parts Drawing



Body Bottom Assembly: 253/8065 Parts List

Item	Description	Part No.
1	Body	253/8050
2	Spiral wound gasket	253/8056SP <input type="checkbox"/>
3	Bellows assembly	253/8066
4	Split bearing	253/8018 <input type="checkbox"/>
5	Nitrile O ring	5005-355 <input type="checkbox"/>
6	Nitrile O ring	ORB136N <input type="checkbox"/>
7	Plunger shaft	253/8063
8	Low temp. Nitrile O ring	ORB112NL <input type="checkbox"/>
9	Nitrile O ring	5005-123 <input type="checkbox"/>
10	Hydraulic piston head	253/8067
11	Hydraulic piston seal	299/7044 <input type="checkbox"/>
12	M10 spring washer	5113-029
13	M10 self-lock nut	5112-008
14	Hydraulic cylinder	253/8061
15	1/8" BSP plug	5128-0437
16	1/8" Dowty washer	5113-072 <input type="checkbox"/>
17	M16 Dowty washer	5005-696 <input type="checkbox"/>
18	M16 hex bolt	5111-138
19	M16 stud (4)	535/1301
20	M16 tab washer (4)	253/8102
21	M16 full nut (4)	5112-003

Seal Kit

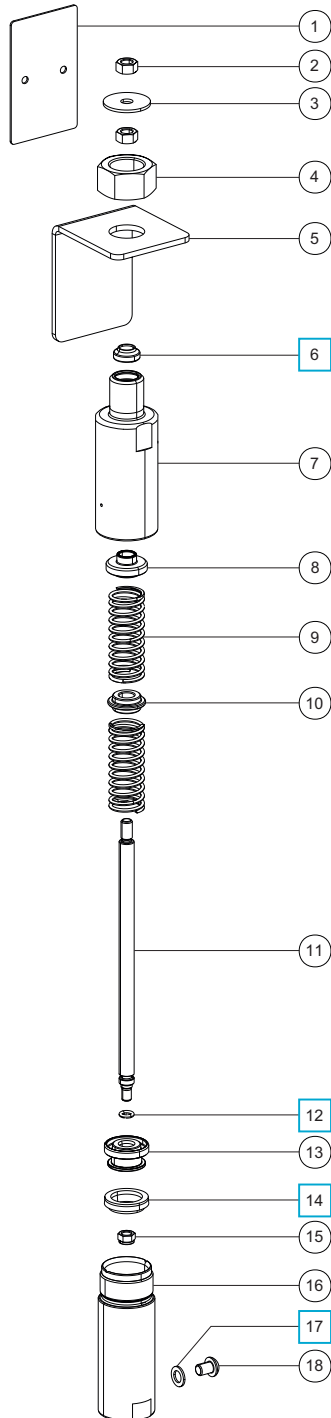
Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	253/8065SK



80mm 90° Hydraulic Gas Footvalve Assembly: Railyt

Part No: 253/8060

Indicator Cylinder: 253/8080 Parts Drawing



Indicator Cylinder: 253/8080 Parts List

Item	Description	Part No.
1	Indicator plate	253/8079
2	M6 full nut (2)	5112-012
3	M6 penny washer	5113-123
4	M18 full nut	5112-063
5	Attachment bracket	253/8078
6	Wiper seal	253/8082 <input type="checkbox"/>
7	Threaded top cap	253/8083
8	Cap guide bush	253/8084
9	Poppet spring (2)	5104-800
10	Stabilising guide bush	253/8085
11	Piston shaft	253/8086
12	Viton O ring	5005-519 <input type="checkbox"/>
13	Piston head	253/8089
14	Piston seal	5005-0002 <input type="checkbox"/>
15	M5 self-lock nut	5112-055
16	Cylinder body	253/8081
17	M6 Dowty washer	5213-0001 <input type="checkbox"/>
18	M6 button screw	5111-611

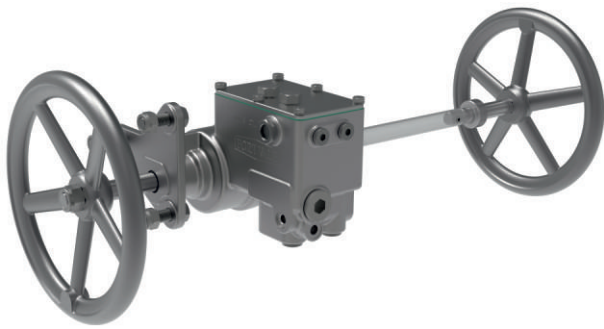
Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	253/8080SK



Quick-Close Hydraulic Pump for Gas Footvalve: Railtyt

Part No: 167/2100



Specification

The quick-close rotary hydraulic pump is compatible with the 90° hydraulic gas footvalve with hydraulic indicators.

Operation

Manually operated by two independent handwheels

Properties

Quick-close mechanism

Materials

Stainless steel with aluminium handwheels

Shown with a short operating shaft, for clarity.

Design Conditions: Pump Only

NOTE: The Design Conditions refer to the pump only, part no. 167/2020.

Weight: 19 Kg (Pump)
28 Kg (Assembly)

Design Pressure (MAWP): 130 Bar
Test Pressure: 195 Bar
Design Temperature Min: -40°C
Design Temperature Max: 80°C

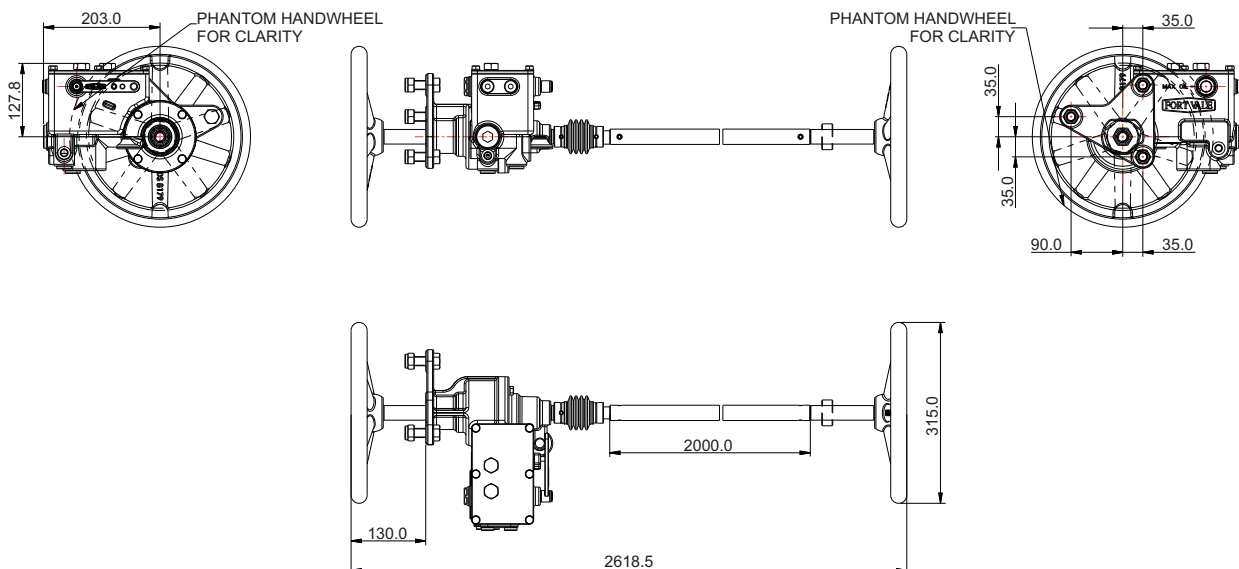
Displacement per Revolution: 17.22 cc

Design Code: Pump Only
BS EN 13445-3

Related Parts

Description	Part No.
80mm 90° hydraulic gas footvalve	253/8060
80mm Y pattern gas discharge valve	409/0100B

Section View

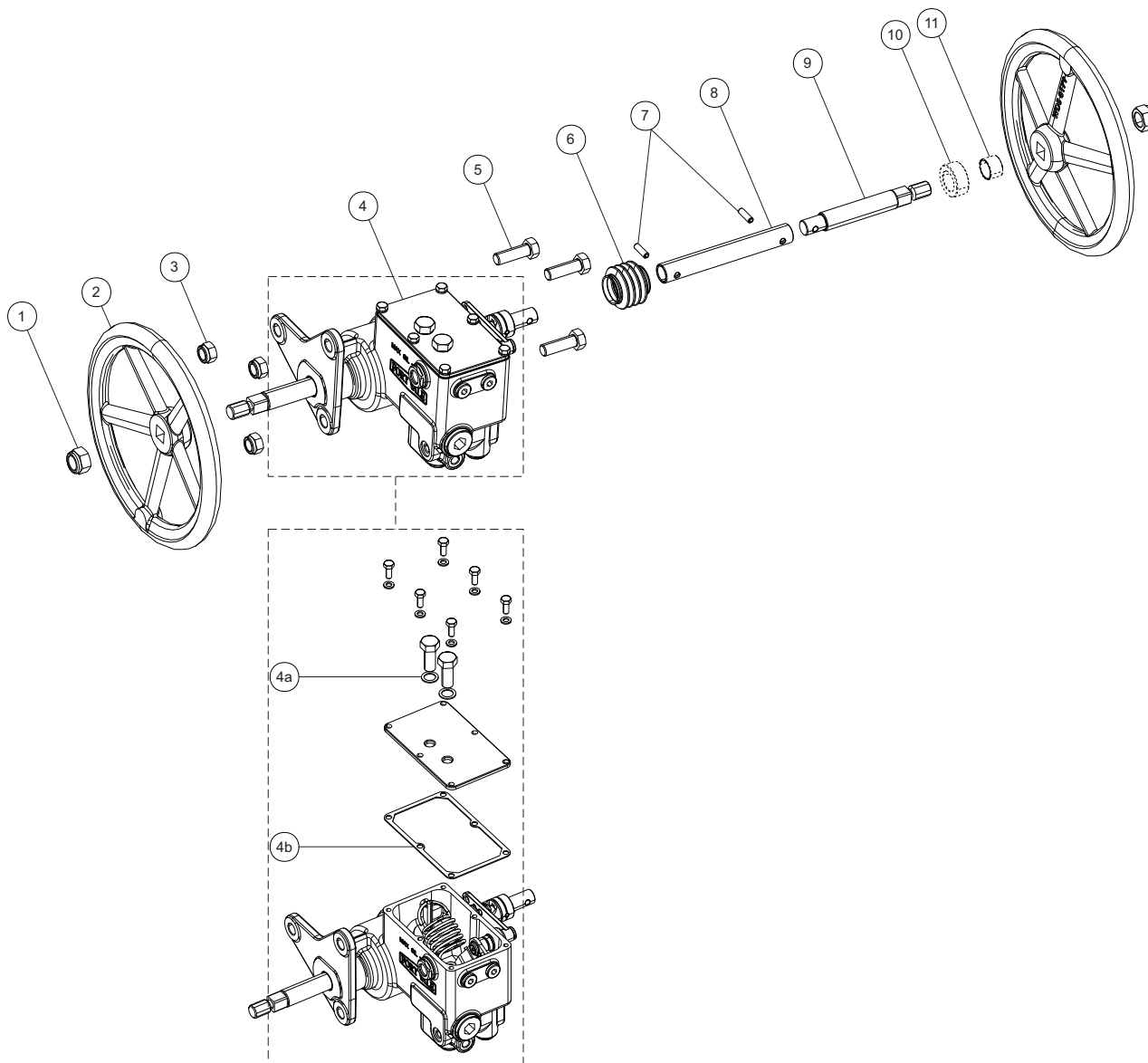




Quick-Close Hydraulic Pump for Gas Footvalve: Railtyt

Part No: 167/2100

Parts Drawing



Parts List

Item	Description	Part No.
1	M20 nyloc nut (2)	5112-212
2	Handwheel (2)	167/2041
3	M16 nyloc nut (3)	5112-015
4	Rotary quick-close pump	167/2020
4a	M16 Dowty washer (2)	5005-696
4b	Reservoir lid gasket	167/2609
5	M16 hex bolt (3)	5111-031
6	Rubber gaiter	167/2042
7	Selok pin (2)	5128-193
8	Extension tube	167/2044
9	Handle axle	167/2046
10	Support boss (supplied separate)	167/2047
11	Split bearing (supplied separate)	167/2002



80mm Y Pattern Gas Discharge Valve: Railtyt

Part No: 409/0100B



Specification

Nominal size/body angle

DN80 / Y pattern

Inlet connection

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

Outlet connection

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

Properties

Manually operated by a handwheel with a locking pin & padlock feature

Materials

Contact parts: 316 stainless steel

Main seal: PTFE

Design Conditions

Weight:	34.3 Kg
Design Pressure (MAWP):	30 Bar
Test Pressure:	45 Bar
Design Temperature Min:	-40°C
Design Temperature Max:	65°C

Design Codes

BS EN 13175
BS EN 13709
BS EN 14432

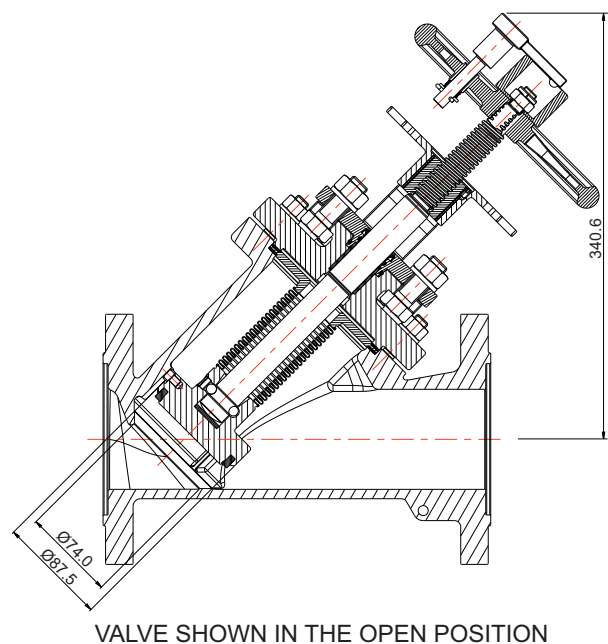
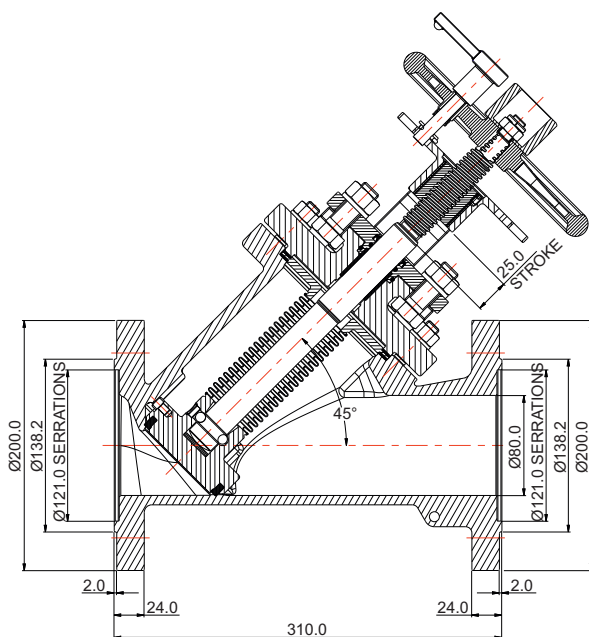
Range

Description	Part No.
Valve with solid poppet	409/0100B
Valve with clamped poppet	409/0100C

Related Parts

Description	Part No.
Graphite/st.st. inlet/outlet gasket	5006-0012
Flanged outlet assembly with seal & cap	113/0028
Electrical continuity strap	324/0006
Warning decal	409/DECAL

Section View

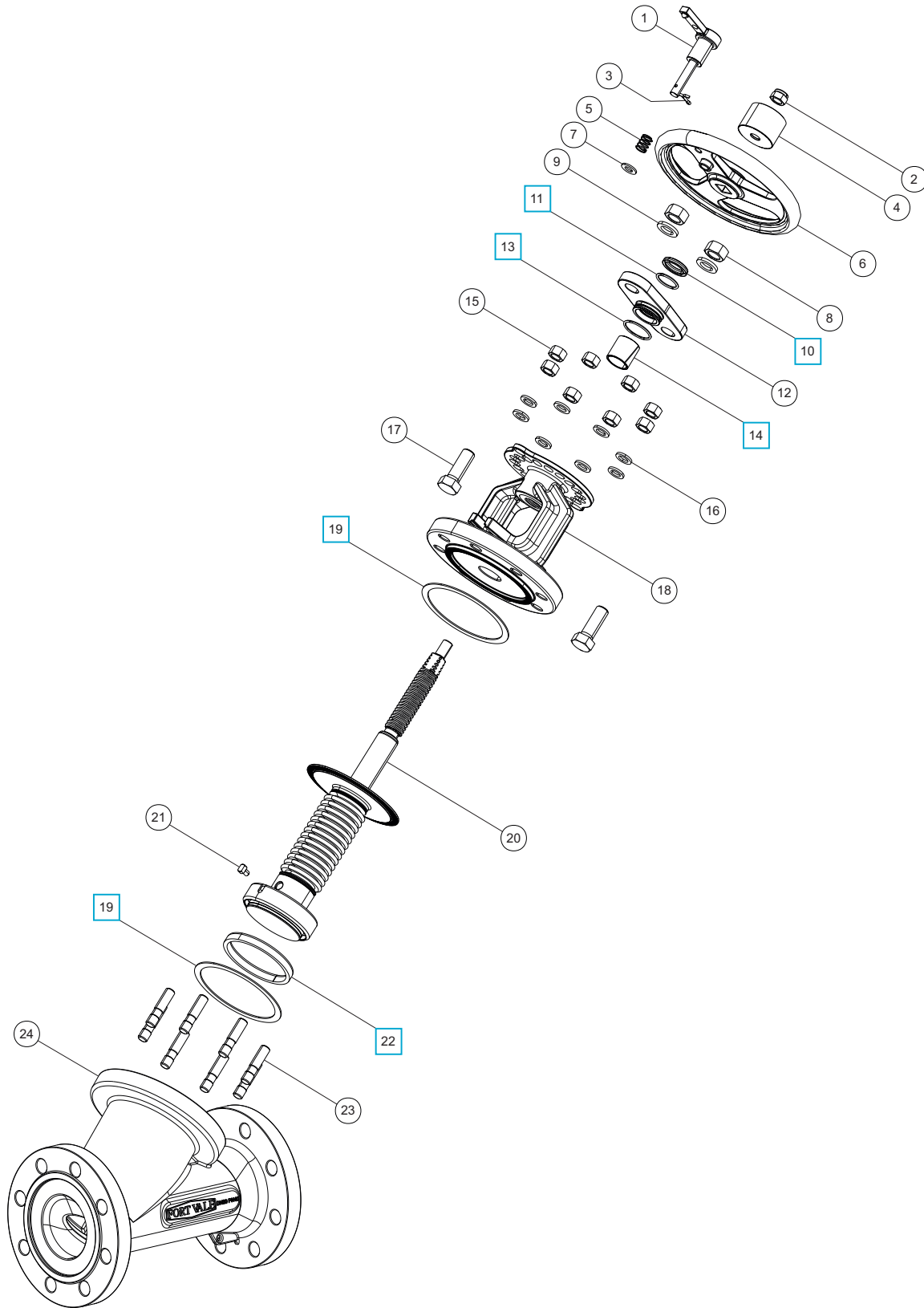




80mm Y Pattern Gas Discharge Valve: Railtyt

Part No: 409/0100B

Parts Drawing





80mm Y Pattern Gas Discharge Valve: Railtyt

Part No: 409/0100B

Parts List

Item	Description	Part No.
1	Locating pin assembly	409/0154
2	M12 self-lock nut	5112-007
3	1/8" split pin	5220-008
4	Anti-theft cap	409/0112
5	Locating spring	409/0119
6	Hand wheel	409/0213
7	M10 plain washer	5113-009
8	M16 full nut (2)	5112-003
9	M16 spring washer (2)	5113-012
10	Scraper seal	409/0133 <input type="checkbox"/>
11	Low temp. O ring	5005-552LT <input type="checkbox"/>
12	Gland plate	409/0107
13	Low temp. O ring	5005-559LT <input type="checkbox"/>
14	Stem seal bearing	409/0132 <input type="checkbox"/>
15	M12 full nut (8)	5112-006
16	M12 spring washer (8)	5113-010
17	M16 hex bolt (2)	5111-036
18	Bonnet assembly	409/0152
19	Gasket (2)	6005-1201041501 <input type="checkbox"/>
20	Piston/bellows assembly	409/0151
21	Anti-rotation pin	409/0174
22	PTFE main seal	409/0121 <input type="checkbox"/>
23	M12 stud (8)	312/1001-B8
24	Body	409/0101

Seal Kit

Description	Part No.
All parts marked <input type="checkbox"/> in the Parts List	409/0100BSK



APPENDIX

Catalogue

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



Bolt Torque Guide & Step Loading Procedure

Installation & Operating Instructions

Flange Bolting

CAUTION: Weld-distortion and too much tightening force will cause damage to a flange.

It is important not to cause damage to weld-in flanges and mating flanges. If a flange is damaged it will not give a satisfactory seal when a gasket and secondary mating flange is installed.

Bolt-stress can decrease after initial tightening. The cause can be deformation of the gasket material, particularly with soft materials such as a CNAF/PTFE envelope gasket.

Best procedure recommends that, after initial bolting, the flange joint is tightened again after a period of time. Most gasket manufacturers advise a period of 24 hours. ASME PCC-1-2000 GUIDELINES FOR PRESSURE BOUNDARY BOLTED FLANGE JOINT ASSEMBLY advises a minimum period of 4 hours.

Bolt torque calculations are based on a flat flange to within 0.15mm.

Recommended bolt torque values will be reduced if a lubrication is used.

Bolt Torque

Bolt Torque Values

Fort Vale bolt torque values are given as a reference guide only and are based on:

- the use of a CNAF/PTFE gasket.
- unlubricated fasteners.
- a flange flat to within 0.15mm.

CAUTION: If you use a different gasket material, a lubricant or a flange with distortion, you must re-calculate the torque value.

Bolt Torque Procedure

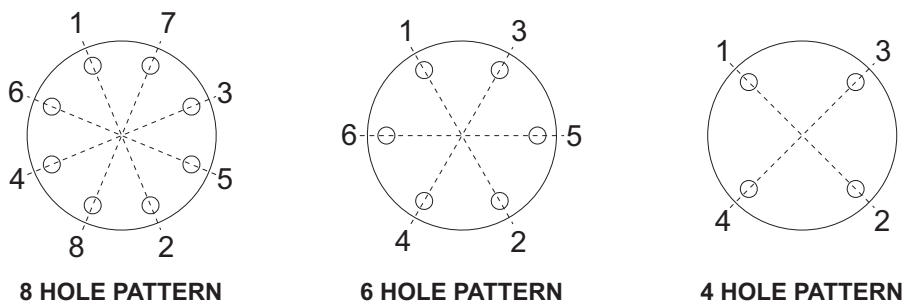
To install flanged parts correctly:

- Examine the mating flange of the part.
- If the flange is marked with a torque value, obey that torque value.
- If there is no torque value marked on the mating flange, obey the bolt torque values given in Table BT1.
- Tighten the bolts evenly in sequence. Refer to Figure BT1.
- Obey the Step Loading Procedure (ASME PCC-1-2000). Refer to the next page.

Table BT1

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

Figure BT1





Bolt Torque Guide & Step Loading Procedure

Installation & Operating Instructions

Step Loading Procedure

To install flanged parts correctly, obey the Step Loading Procedure extract from ASME PCC-1-2000:

Install

Hand tighten, then “snug up” to 15 Nm (10 lbf.ft) to 30 Nm (20 lbf.ft) (not to exceed 20% of Target Torque). Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 1

Tighten to 20% to 30% of Target Torque. Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 2

Tighten to 50% to 70% of Target Torque. Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 3

Tighten to 100% of Target Torque. Check flange gap around circumference for uniformity. If the gap around the circumference is not reasonably uniform, make the appropriate adjustments by selective tightening before proceeding.

Round 4

Continue tightening the bolts, but on a rotational clockwise pattern until no further nut rotation occurs at the Round 3 Target Torque value. For indicator bolting, tighten bolts until the indicator rod retraction readings for all bolts are within the specified range.

Round 5

Time permitting, wait a minimum of 4 hr and repeat Round 4; this will restore the short-term creep relaxation/embedment losses. If the flange is subjected to a subsequent test pressure higher than its rating, it may be desirable to repeat this round after the test is completed.



Client Responsibilities - Valves & Accessories: Railtyt Installation, Operation & Maintenance Instructions

Compatibility

Make sure that the function and technical specification of the valve/accessory is compatible with the vessel service conditions and the cargo. This includes, but is not limited to:

- dimensions.
- pressure/vacuum setting.
- air/vapour/liquid flow capacity.
- maximum allowable working pressure.
- test pressure.
- minimum/maximum design temperatures.
- materials of construction.

Maintenance and Inspection

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

Inspections at regular intervals:

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

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

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

Inspections after 4 years of service or a minor incident:

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

Inspections after 8 years of service or a major incident:

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

Replacement Parts

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

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

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

External Fire

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

Compatibility of Accessories

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

Mis-use

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



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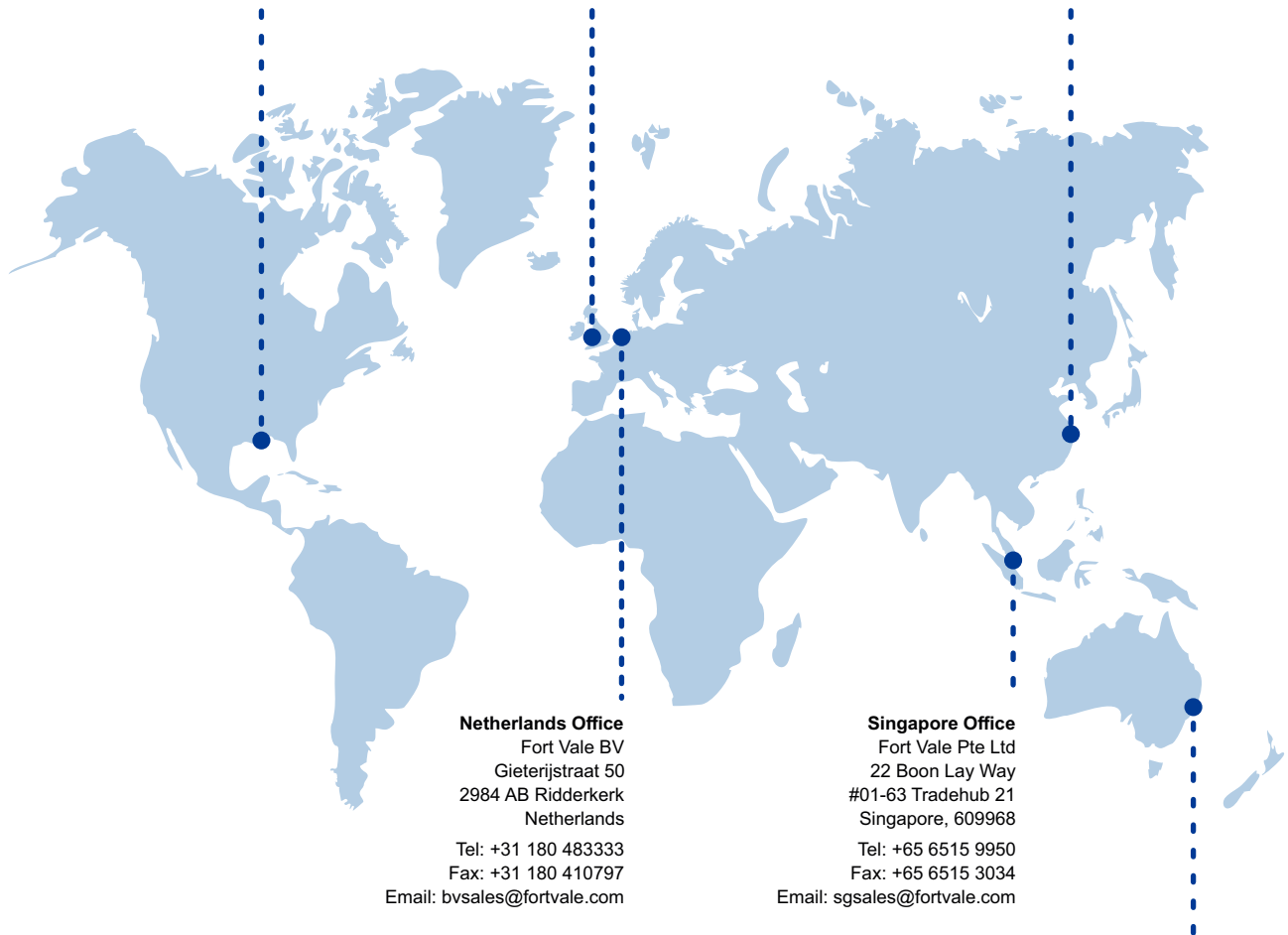
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