



2" & 3" PFA Lined Top Discharge Ball Valves AAR Specification

Part Number Series: 370/P5XX, 370/P59XX
360/P5XX, 360/P59XX

Installation & Operating Instructions

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General Installation Precautions - Valves & Accessories

Installation, Operation & Maintenance Instructions

Important

Read all the information and instructions before you start the procedure. Keep this manual.

WARNING: Vessels and systems operate under pressure and can contain dangerous cargo (liquid and vapour) that can cause death or serious injury to personnel.

CAUTION: If you do not obey the installation precautions, you can cause damage to the valve/accessory. Damage will cause the valve/accessory to malfunction.

General Installation Precautions

- Make sure that the vessel is empty (liquid and vapour).
- Make sure that the vessel has been correctly cleaned and is safe for human entry.
- Make sure that the vessel/system pressure is at zero and that all residual pressure has been released.
- You must have experience and qualifications related to valve installation on pressure vessels and systems.
- Obey all applicable in-company, regional and national regulations.
- Obey the design conditions and limits of the valve/accessory.
- We recommend that you install a compatible Fort Vale weld-in flange and gasket (where necessary). These have been designed with the necessary clearance for the valve in the open position.
- Make sure that the internal surface of the vessel is clean and that there is no debris before you install the valve/accessory.
- If the vessel is repaired after you have installed the valve/accessory, make sure that there is no debris inside the vessel before you close the valve/accessory.
- Keep the valve/accessory in a clean area until you install it.
- Examine the valve/accessory for signs of damage. Do not install a damaged part.
- Do not install an accessory item that will cause an increased load on the valve, i.e. mechanical, static, dynamic, thermal.
- Obey the recommended bolting sequence, bolt torque and step loading procedure when you install or remove a valve/accessory. Read **Bolt Torque Guide & Step Loading Procedure** (See Appendix if applicable or refer to Fort Vale).
- Read **Client Responsibilities - Valves & Accessories** (See Appendix if applicable or refer to Fort Vale).
- Use the applicable PPE (Personal Protective Equipment).
- Use the correct tools.

Tools

You will need torque spanners that are compatible with the stud kits and bolting kits.

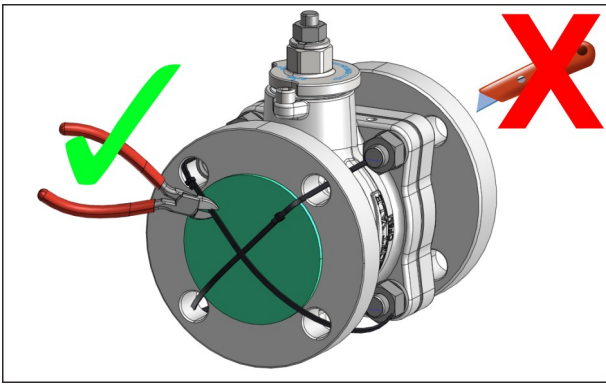
Technical Support

If you have a problem that you cannot correct using these instructions, please contact Fort Vale.

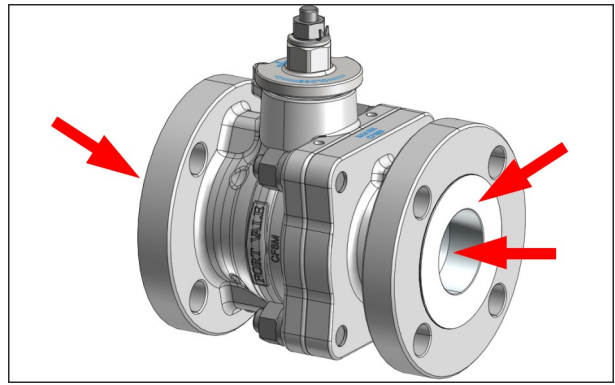
Disclaimer

Fort Vale reserve all rights to make technical modifications and improvements at any time. Fort Vale accept no responsibility for any consequences arising from the use of the valve/accessory and these instructions.

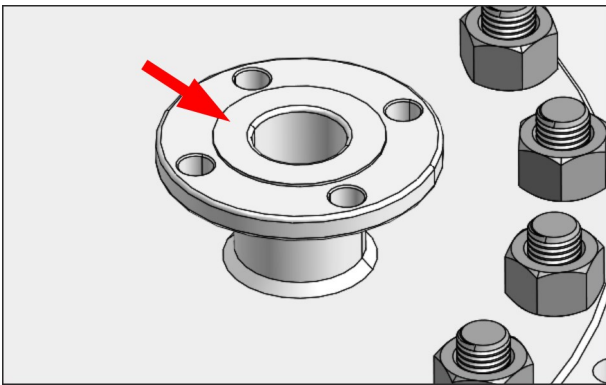
Errors and omissions excepted.



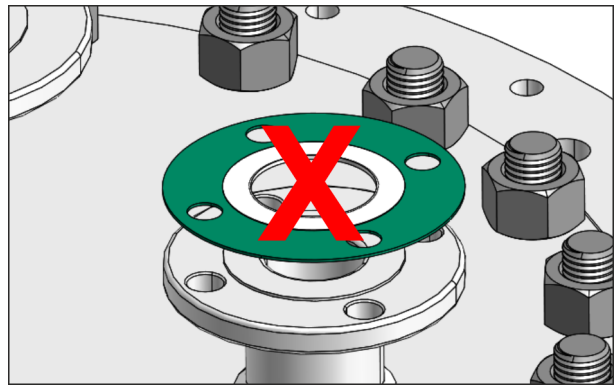
Step 1. When you remove the "parts protection" items, be careful not to cause damage the flange face or the PFA lined area.



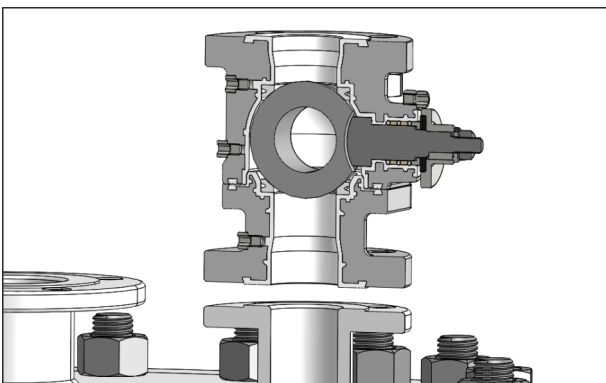
Step 2. Examine the valve to make sure it is clean and there is no damage or debris. Check the inlet and outlet flange sealing faces and PFA lined areas. **CAUTION: If there is damage, contact Fort Vale. Do not install a damaged valve.**



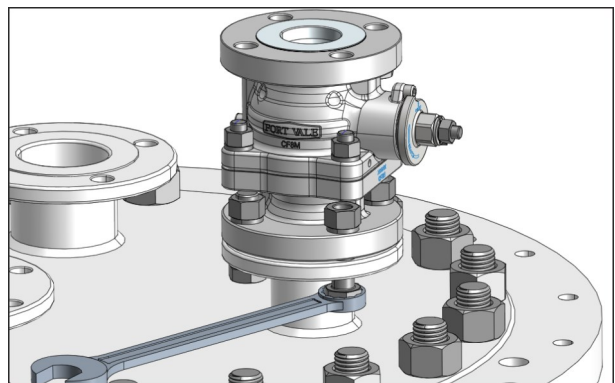
Step 3. Examine the mating flange. Make sure that it is clean and flat and that there is no damage or debris.
NOTE: To illustrate this procedure clearly, the tank car protective housing is not shown.



Step 4. Do not install an inlet gasket.



Step 5. Make sure the valve is in the closed position. Orient the valve correctly. Align the mating flange holes with the inlet flange holes.

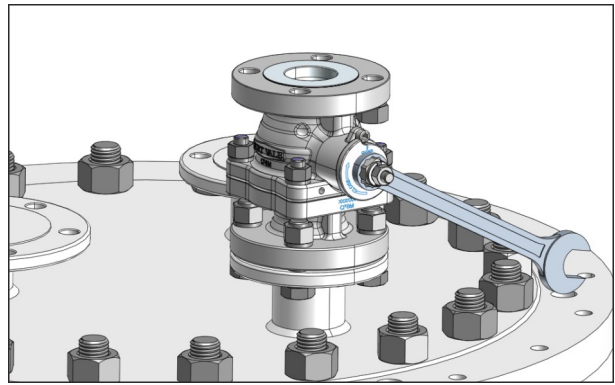


Step 6. Install the recommended bolts, washers and nuts. Tighten the nuts in a diametrically opposite sequence. Obey the Step Loading Procedure (ASME PCC-1-2000). [See Appendix]

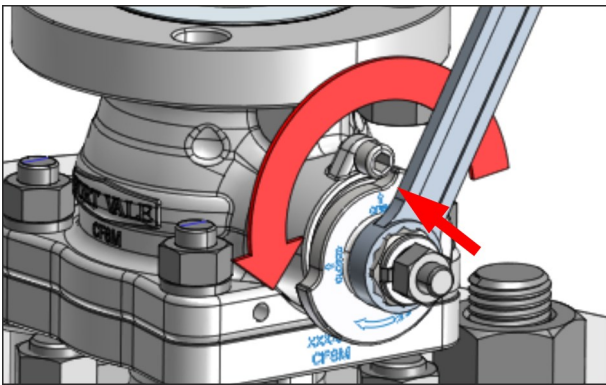


Information

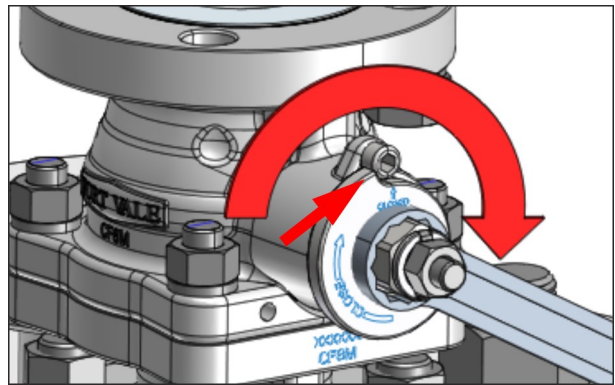
Step 7. If the valve inlet flange is marked with a torque value, obey it. If there is no torque value, refer to Table BT1 of the Bolt Torque Guide & Step Loading Procedure (US). [See Appendix]



Step 8. If the valve does not have a handle installed, use a 1" A/F box-end wrench to open and close the valve.



Step 9. Open and close the valve to make sure it is operating correctly.
To open: Turn the handle through 90° to the vertical position, or turn the spanner until the notch on the handle stop plate touches the stop bolt. Look at the valve bore to make sure the valve is fully open.

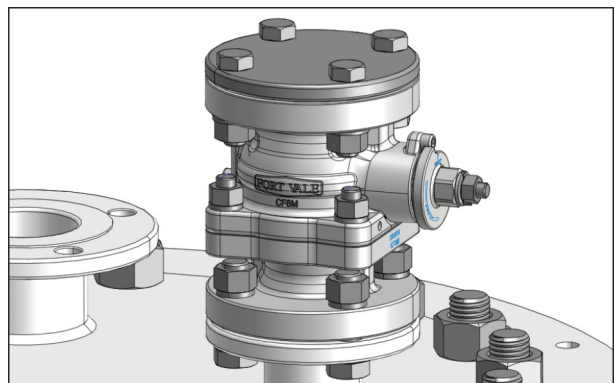


Step 10. To close: Turn the handle through 90° to the horizontal position, or turn the spanner until the notch on the handle stop plate touches the stop bolt. Look at the valve bore to make sure the valve is fully closed.



Information

Step 11. Do an AAR approved leak test.



Step 12. Install a compatible lined blank flange to prevent damage to the outlet flange or debris from going into the tank. Do not install a gasket.
The installation procedure is complete.



APPENDIX

Installation & Operating Instructions

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



Bolt Torque Guide & Step Loading Procedure (US)

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 0.006".

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 0.006".

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

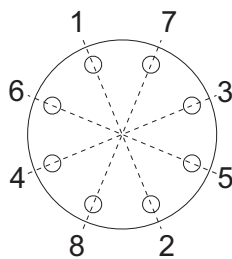
To install flanged parts correctly:

- 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.

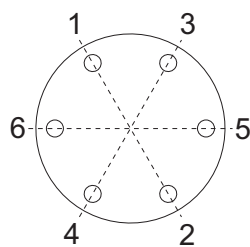
Table BT1

Thread	Torque Value
3/8"	22 lbf.ft
1/2"	48 lbf.ft
5/8"	60 lbf.ft

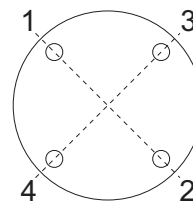
Figure BT1



8 HOLE PATTERN



6 HOLE PATTERN



4 HOLE PATTERN



Bolt Torque Guide & Step Loading Procedure (US)

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 10 lbf.ft to 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 for AAR 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/vapor/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 maintenance at intervals that obey AAR's specification.

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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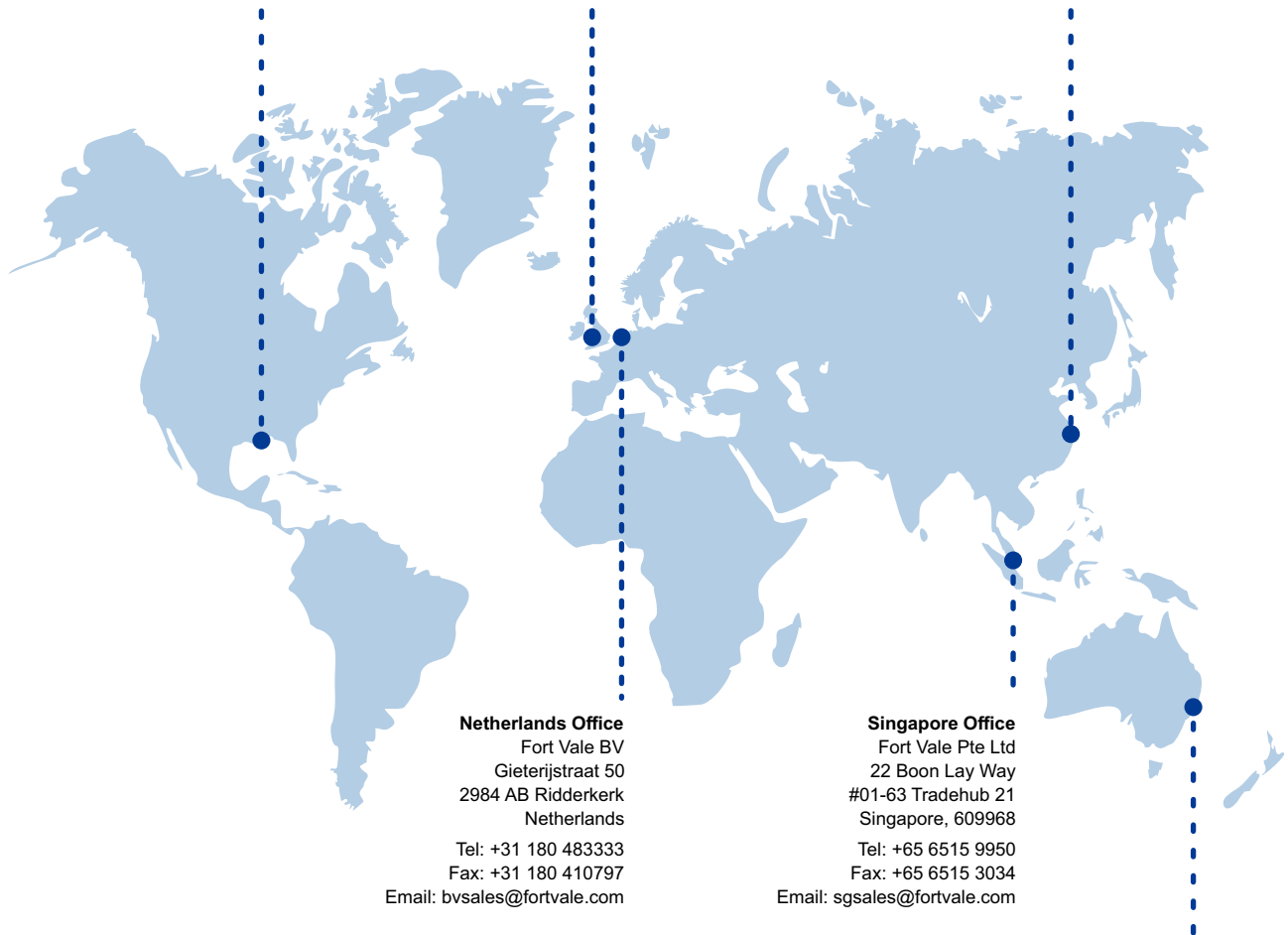
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