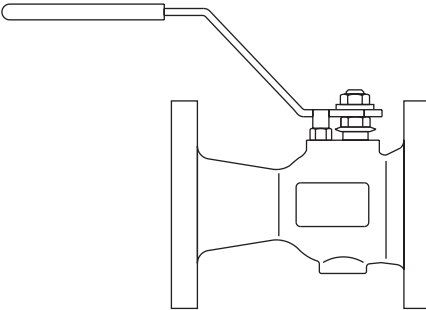


M45 ISO
Ball Valve DN25 to 150
Installation and Maintenance Instructions



1. *General safety information*
2. *General product information*
3. *Installation*
4. *Commissioning*
5. *Operation*
6. *Maintenance*
7. *Spare parts*

— 1. *General safety information* —

Safe operation of the unit can only be guaranteed if it is properly installed, commissioned and maintained by a qualified person (see Section 11 of the attached Supplementary Safety Information) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

Isolation

Consider whether closing isolating valves will put any other part of the system or personnel at risk. Dangers might include; isolation of vents and protective devices or alarms. Ensure isolation valves are turned off in a gradual way to avoid system shocks.

Pressure

Before attempting any maintenance consider what is or may have been in the pipeline. Ensure that any pressure is isolated and safely vented to atmospheric pressure before attempting to maintain the product, this is easily achieved by fitting Spirax Sarco depressurisation valves type DV (see separate literature for details). Do not assume that the system is depressurised even when a pressure gauge indicates zero.

Temperature

Allow time for temperature to normalise after isolation to avoid the danger of burns and consider whether protective clothing (including safety glasses) is required.

Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

— 2. General product information —

2.1 General description

The M45 ISO is a flanged reduced bore single piece ball valve with metal seats. This makes it suitable for working with fluids that contain solids in suspension, high temperature fluids and flow control applications.

The valve has an ISO mounting making it easy and safe to automate.

ISO mounting

The integral ISO body mounting allows the valve to be automated without losing seal integrity, as the body does not require disassembly. Manual to remote control may therefore be safely and easily accomplished by the ISO range of Spirax Sarco ball valves.

Available types

M452V ISO Zinc plated carbon steel body, Viton 'O' ring.

M452K ISO Zinc plated carbon steel body, Kalrez 'O' ring.

M453V ISO Stainless steel body, Viton 'O' ring.

M453K ISO Stainless steel body, Kalrez 'O' ring.

Note: For additional information see the following Technical Information Sheets: TI-P133-47 and TI-P133-48.

2.2 Sizes and pipe connections

DN25, 40, 50, 65, 80, 100 and 150.

Flanged ANSI 150 and ANSI 300.

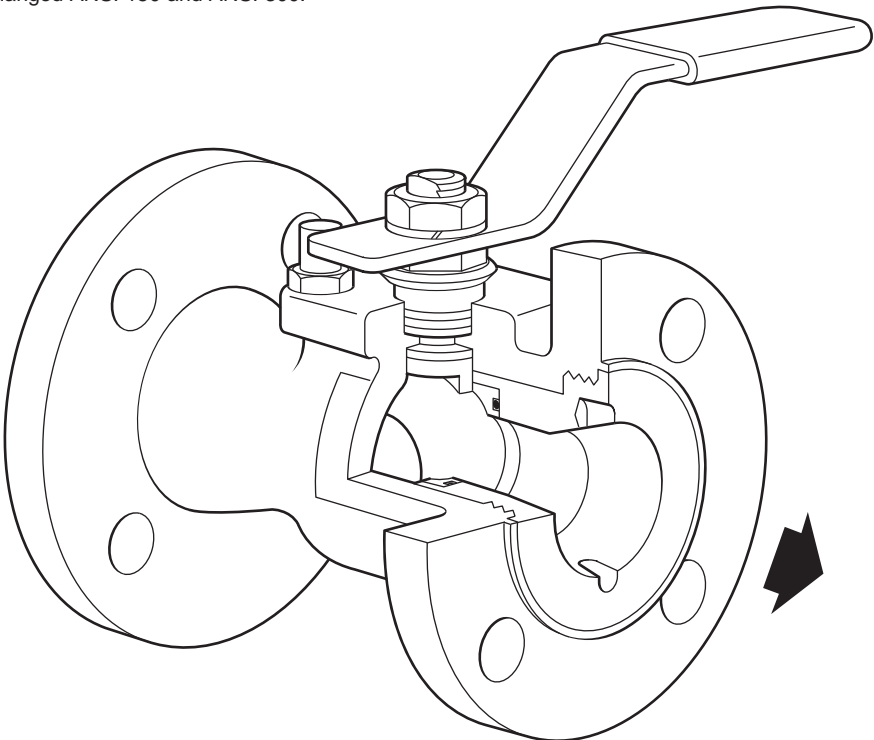
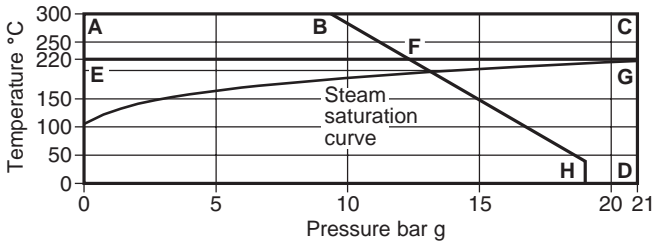


Fig. 1 M45 ISO ball valve

2.3 Limiting conditions

Body design conditions	According to BS 5351	
Maximum operating temperature	M45V	ANSI 150 220°C @ 12 bar g
		ANSI 300 220°C @ 21 bar g
	M45K	ANSI 150 300°C @ 9 bar g
		ANSI 300 300°C @ 21 bar g
Maximum operating pressure (MOP)	M45V	ANSI 150 19 bar g @ 38°C
		ANSI 300 21 bar g @ 220°C
	M45K	ANSI 150 19 bar g @ 38°C
		ANSI 300 21 bar g @ 300°C
Maximum saturation steam pressure	ANSI 150 13 bar g	
	ANSI 300 21 bar g	
Designed for a maximum cold hydraulic test pressure of 1.5 x MOP		

2.4 Operating range



- E-F-H** ANSI 150 Viton
- E-G-D** ANSI 300 Viton
- A-B-H** ANSI 150 Kalrez
- A-C-D** ANSI 300 Kalrez

3. Installation

Note: Before actioning any installation observe the 'Safety information' in Section 1.

Although the valve has great structural integrity, severe misalignment and/or the pulling effect of incorrect pipe length will have a detrimental effect on the valve and must be avoided. Particular attention should be paid to correct pipe alignment such that the inlet pipework and valve are all on the same axis.

Valves are for both on/off and control applications and may be installed with flow in either direction. Wherever practicable, valves should be installed where there is adequate space available so that they can be conveniently operated and maintained.

Before installing a valve, check to ensure that size, pressure rating, materials of construction, end connections, etc. are suitable for the service conditions of the particular application.

Care must be taken to ensure that all dirt which may have accumulated in the valve during storage is removed before installation, maintain cleanliness during installation since the introduction of dirt can result in damage to the valve seats and operating mechanism.

To minimise the danger of abrasive particles damaging the seats, pipeline strainers should be fitted upstream of the valves.

Install the valve with the handle in a suitable position. The preferred position is with the spindle vertical. The valve can be installed from the vertical to the horizontal plane (see Fig. 2 below).

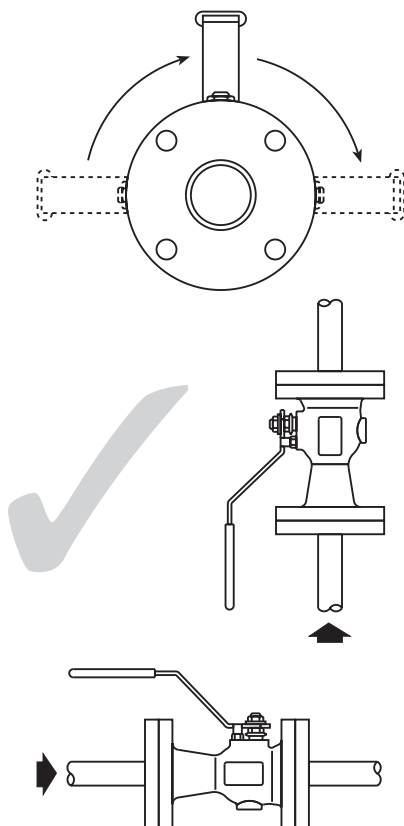


Fig. 2 Correct installation

Do not mount the valve upside down (Fig. 3).

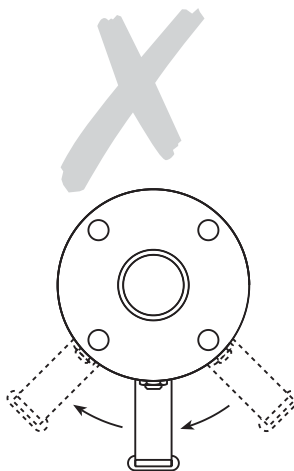


Fig. 3 Incorrect installation

When installed on steam systems a suitable steam trap should be fitted immediately upstream of the isolation valve. This will ensure drainage of the pipe when the valve is closed, and will prevent damage of the valve due to waterhammer. The drain trap should be either a ball float (FT) or thermodynamic (TD) type. Correct condensate drainage of all upstream pipework is also vital.

Valves should be installed into the pipeline in the fully closed position.

Always open valves slowly to avoid system shocks.

4. Commissioning

After installation or maintenance ensure that the system is fully functioning. Carry out tests on any alarms or protective devices.

5. Operation

The valve is operated manually by a handle, or automatically by an actuator. Special care must be taken to ensure that the movement is made in the correct direction.

The valve can be used as an on/off or a modulating flow control valve, and can be operated fully open, fully closed, or at any point in between.

6. Maintenance

Note: Before actioning any maintenance programme observe the 'Safety information' in Section 1.

6.1 General information

As with all mechanical devices, regular maintenance is the most efficient means of ensuring continued operational efficiency.

Regular scheduled inspection of all valves is essential especially on valves which are operated only occasionally.

6.2 General maintenance

When the seats (5) are replaced and the valve is reassembled it is advisable to conduct a hydraulic test to the body at 30 bar g and a seat leakage test using compressed air at 7 bar g.

Note: A special tool is required in order to remove the insert (2). This tool is only available from Spirax Sarco.

6.3 To replace the main stem seals, seats and ball:

1. Remove the valve from the pipeline.
2. Using the special tool: which is available from Spirax Sarco, unscrew the insert (2)
3. It is now possible to remove the seats (5) the 'O' rings (17) and the ball (3). Withdraw the stem (4) and replace the main stem seal (6A).
4. Reassemble the M45 ball valve.
5. Ensure that a PTFE based sealant compound is applied to the thread of the insert (2).
6. The insert (2) should be tightened to the recommended torque. See Table 1 opposite.
7. **After 24 hours in service, retighten body bolts.**

6.4 To replace the secondary stem seals:

1. Remove nuts (9 and 9A).
2. Replace the stem seals (6 and 18).
3. Reassemble the M45 ball valve.
4. **After 24 hours in service, retighten body bolts.**

Note: If leakage is observed through the stem it may be stopped by tightening the gland nut (9A) without requiring the replacement of stem seals.

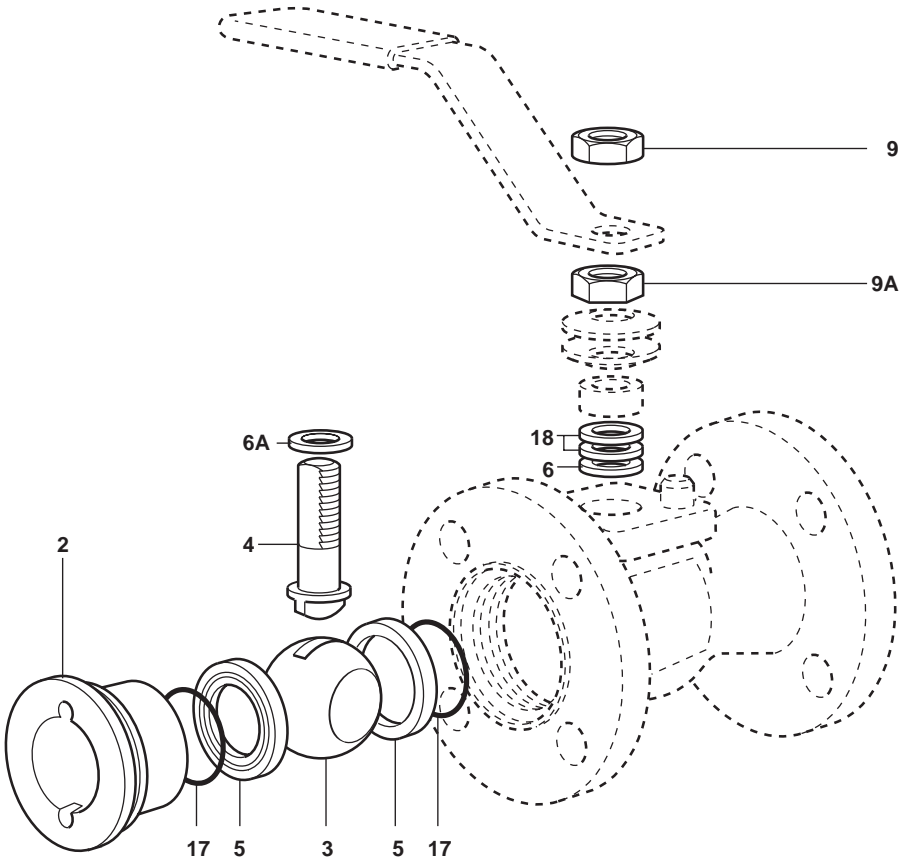


Fig. 4

Table 1 Recommended tightening torques

Item no.	Part	Size	N m	(lbf ft)
2	Insert	DN25	108 - 135	(79 - 99)
		DN40	135 - 160	(99 - 118)
		DN50	215 - 245	(158 - 180)
		DN65	245 - 270	(180 - 199)
		DN80	405 - 605	(298 - 446)
		DN100	540 - 740	(398 - 545)
9A	Gland nut	DN150	1 000 - 1 200	(737 - 885)
		DN25 - DN65	34 - 41	(25 - 30)
		DN80	40 - 47	(29 - 34)
		DN100	54 - 61	(39 - 45)
		DN150	196 - 216	(144 - 159)

7. Spare parts

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Available spares

Ball	3
Seat, stem seal set and 'O' ring	5, 6, 17, 18
Special tool (not shown) for the removal of insert (2)	

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of ball valve.

Example:

1 - Seat, stem seal set and 'O' ring for a DN50 M452V ISO ball valve.

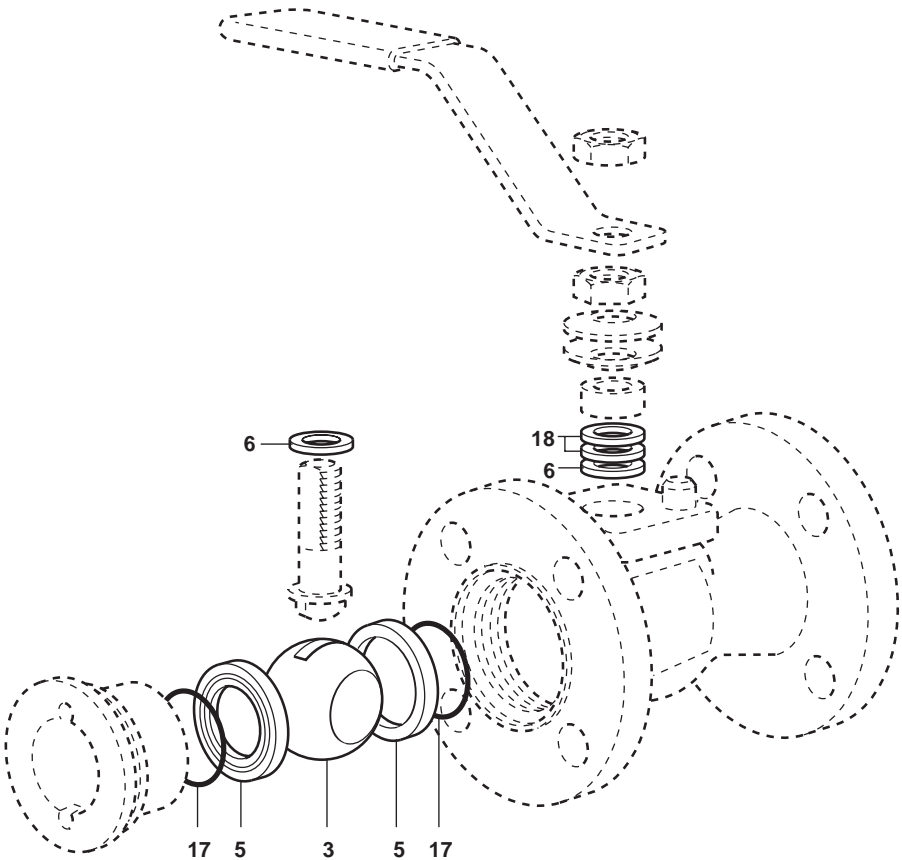


Fig. 5