CRANE FLUID SYSTEMS

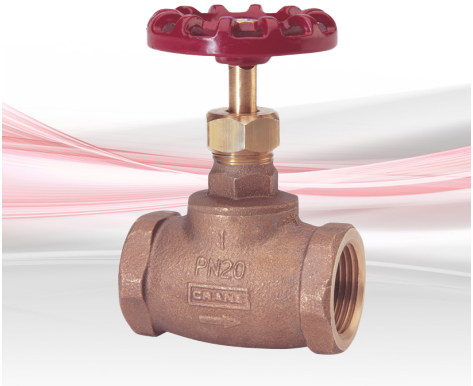
OUR GENIUS IS VALVES

GLOBE VALVES

D4 / D7 / D10 / D14 / D15 / D16 / D46 / D52 / D71 / D72 / DM6 / DM11 / F372 / FM369 Bronze and Iron Globe Valves

INTRODUCTION

Globe valves are mainly used to connect or disconnect the medium in the pipeline and are generally not used to regulate the flow. They usually require fewer turns to operate than a gate valve and the seats do not slide against each other, so are less prone to wear. They are recommended where frequent operation is required.



D4 GLOBE VALVE

GENERAL INSTALLATION

Preparation

- Ensure valve is suitable for service conditions e.g. pressure, temperature, service media.
- Remove dust caps/flange protectors, where fitted.
- Prior to installation, a check of the identification plate and body marking must be made to ensure that the correct valve is being installed.
- The complete piping system must be flushed through prior to commissioning to ensure all foreign matter is removed. Subsequent valve failure is frequently caused by dirt and other matter left in the pipeline.
- Valves are precision manufactured items and as such, should not be subjected to misuse such as careless handling, allowing dirt to enter the valve through the end ports, lack of cleaning both valve and system before operation and excessive force during assembly.

ORDERING CODES

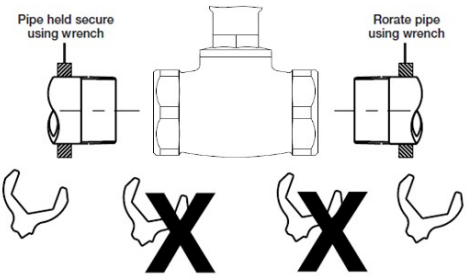
Flanged Joints

Flanges may be damaged by over tightening the bolts. The following procedures will reduce this risk:

- Full-face gaskets reduce the stresses in flat face flanges.
- Low strength carbon steel bolting has traditionally been used to restrict the load imposed on grey iron flanges, but should not be used for temperatures above 200° C.
- Always use the correct size and number of bolts.
- Find out the correct assembly torque for the specific gasket and conditions applicable, and use a torque wrench to achieve this. Use the correct tightening sequence.
- Do not match a flat-faced flange to a raised face flange.
- The flange gaskets should be suitable for operating conditions or maximum pressure/ temperature ratings.
- The flange gaskets should be checked to ensure freedom from defects or damage.
- Care should be taken to provide correct alignment of the flanges being assembled. The valve should not be used to correct mis-aligned pipework. A suitable lubricant on bolt threads is recommended. In assembly, flange bolts should be tightened sequentially to make the initial contact of flanges and gaskets flat and parallel followed by gradual and uniform tightening in an opposite bolting sequence to avoid bending one flange relative to the other, particularly on flanges with raised faces.
- Flanged joints depend on compressive deformation of the gasket material between the flange surfaces.

Threaded Joints

- Confirm that the pipe threading length is correct to avoid excessive penetration of the pipe into the valve which would otherwise cause damage.
- The valves are supplied with taper threads and, with the use of a thread sealant will give a pressure tight seal.
- To avoid distortion of the valve, when fitting and tightening the pipe, the valve must be gripped using the flats provided at the same end as the pipe is being fitted.
- Care should be taken to avoid ‘pipe ending’. This is a condition that occurs when the pipe is screwed in too far resulting in distortion of the valve seat. The use of a thread gauge is recommended to check the thread dimensions.
- The male thread on the pipe must have fully formed, correctly gauged, undamaged threads.
- Screw the pipe into valve and hand tighten, then tighten by the number of turns shown below (up to one additional turn is permitted for alignment).



Valve Size	Turns	Valve Size	Turns	Valve Size	Turns
¼" – 1½"	1.5	2"	2	2½" – 4"	2.5

Valve Location

- It should be considered at the design stage where valves will be located to give access for operation, cleaning and maintenance.

Layout and Sitting

- Globe Valves are not designed for use as “end of line” services, where mounted on the end of a pipeline we strongly recommend the use of a blanking flange.
- It is bad practice to install valves with the hand wheels pointing downwards, as damage may be caused to the gland packing and stem seal, by debris in the system.
- The valve must be installed with the direction arrow on the body coincident with the direction flow in the pipeline.
- Conventionally, valves are installed in horizontal pipework. This is however, not a constraint and they may be mounted in vertical or inclined pipework.

Piping Supports

- Valves must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the valve body, which would impair its performance.
- These must be carefully aligned and at the correct distance between centres for the size and type of pipe. Please refer to the current best practice for details of correct spans and installation details.

OPERATION

- The operating conditions shall be consistent with the requirements in the performance specification.
- Handwheels cannot be used for lifting.
- Globe valves are designed to seat with the Crane standard handwheel. Levers, wrenches or other tools should not generally be used to operate a valve. Excessive torque can cause damage to seating faces and/or stem/handwheel. With valves DN200 and above, the use of a ‘pinch bar’ is acceptable providing the bar length does not exceed 1.5 x the handwheel diameter.
- The valve is opened by anti-clockwise rotation of the handwheel to a positive stop. Further effort is not necessary. When fully open it is advantageous to rotate the handwheel clockwise 1/2 turn. To close the valve, the handwheel is rotated clockwise to a positive stop.
- Operators should use suitable personal protective equipment when operating the valve.
- The maximum pressure rating is that on a closed valve.
- Flow direction is usually with pressure under the disc on closure, but may be reversed on hard seated valves to help guarantee a tight shut off. This may be advantageous if the valve is subject to extreme temperature variations, or if its condition deteriorates with time.

INSPECTION AND MAINTENANCE

- For enhanced life of the valve and better operability, it is recommended to do a periodic inspection and maintenance of the valves as explained below:

  The frequency of observation depends on its application. Crane recommends that valve shall be inspected every 50 cycles or three months (whichever earlier) for smooth operation and leak free performance. This is recommended even for stored valves also. It is advisable to maintain a record of the performance of the valve.
- Where the handwheel, and therefore the identification plate, is removed for maintenance they must be refitted after the work is completed. The absence of the identification plate invalidates the valve's CE status.
- The valve should be at zero pressure and ambient temperature prior to any inspection.
- Maintenance Engineers & Operators should have the appropriate level of competence and are reminded to use correct fitting tools and equipment.
- The risk assessment must take into account the possibility of the limits of use being exceeded whereby a potential hazard could result.
- A maintenance programme should therefore include checks on the development of unforeseen conditions which could lead to failure.
- Occasionally operate valves that remain open or closed for long periods to ensure they are in good working order, thus avoiding the possibility of being inoperable in a time of emergency.

Gland Adjustment

The gland may need adjustment during installation and then periodically thereafter to maintain a stem gland seal. Check for leaks at gland. If gland is leaking, the following procedure is recommended:

- Tighten the gland nut(s) - if more nuts are present, tighten a part turn at a time, alternating from one to the other, in a clockwise direction until increased resistance to operate the valve is obtained, or if leakage is present until the leakage stops. The gland nut(s) should be tightened only enough to prevent stuffing box leakage. Over-tightening can cause excessive wear on stem and packing and make valve difficult to operate.

Other than gland adjustment, Crane Globe Valves are maintenance free. For any technical queries, please contact Crane Technical Department.

- Crane Fluid Systems do not offer spares for this product.
- If product is disassembled, warranty is void.

GENERAL CONSIDERATIONS

- The surfaces of valves in service may be subject to extreme temperatures; care should be taken when handling.

LIMITS OF USE

These valves have been categorised in accordance with the Pressure Equipment Directive 2014/68/EU.

The fluid to be transported is limited to those shown in the product table below. On no account can these valves be used on any unstable fluids, or for the fluids groups not specified in the product table.

Note: Valves that are classified as SEP (Sound Engineering Practice) are not CE marked and therefore do not require a Declaration of Conformity.

Products conforming to Cat I of the PED 2014/68/EU shall include the CE Mark.

Products conforming to Cat II and above of the PED 2014/68/EU shall include the CE Mark and applicable Notified Body Number.

Fig. No.	Material	PED category by valve size (DN)			Product Applications			
		SEP	1	2	Group 1 Gas	Group 2 Gas	Group 1 Liquid	Group 2 Liquid
D4 / D4.AT	Bronze	8-50	-	-	-	✓	✓	✓
D7 / D7.AT	Bronze	8-32	40-50	65-80	-	✓	✓	✓
D10	Bronze	15-50	65-80	-	-	✓	✓	✓
D14 / D14.AT	Bronze	8-32	40-80	-	-	✓	✓	✓
D15 / D15.AT	Bronze	8-32	40-80	-	-	✓	✓	✓
D16 / D16.AT	Bronze	8-32	40-80	-	-	✓	✓	✓
D46 / D46.AT	Bronze	8-32	40-50	65-80	-	✓	✓	✓
D52 / D52.AT	Bronze	15-25	-	32-50	✓	✓	✓	✓
D71	Bronze	6-20	-	-	-	✓	✓	✓
D71.AT	Bronze	6-20	-	-	-	✓	✓	✓
D72	Bronze	6-20	-	-	-	✓	✓	✓
D72.AT	Bronze	6-20	-	-	-	✓	✓	✓
DM6	Bronze	15-50	-	-	-	✓	✓	✓
DM11	Bronze	15-40	50-80	-	-	✓	✓	✓
F372	Cast Iron	50-65	80-125	150	-	✓	✓	✓
FM369	Cast Iron	50	65-125	150	-	✓	✓	✓

- Valves must be installed into a well-designed system and it is recommended that the system be inspected in accordance with the appropriate national and regional legislation.
- Valves must be installed by trained personnel only.
- Maximum operating pressure reduces as service temperature increases. Service temperature and pressure indicated on the identification plate or body marking should not be exceeded – please refer to example below.
- The installation should be designed to provide adequate means of draining and venting to avoid harmful effects such as water hammer, vacuum collapse, corrosion and uncontrolled chemical reactions and to permit cleaning, inspection and maintenance in the correct manner.

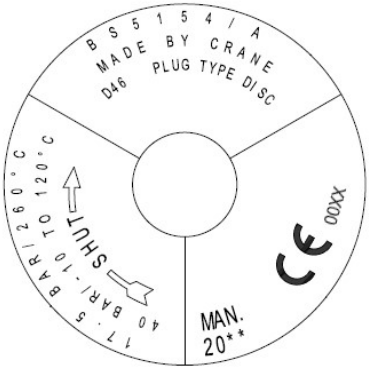
LIMITS OF USE (CONTINUED)

- Valves are not designed to operate under high shock loadings. Where pressure increases occur due to shock loading (water hammer), they should be added to the working pressure to obtain the total pressure acting on the valve. The total must not exceed the pressure rating of the valve. A pressure surge, or shock, is usually caused by the rapid closure of a check valve or quarter turn valve resulting in a sudden reduction in flow rate.
- It is the responsibility of the installer to ensure that the valves do not exceed the allowable limits of pressure. However, the equipment is designed to withstand a momentary pressure surge of up to 10% above the maximum working pressure.
- The product has not been designed to include corrosion, erosion or abrasion allowances. Any queries regarding service applications should be addressed to the Crane Fluid Systems - Technical Sales Department.
- The valves have been designed for loadings, appropriate to its intended use and other reasonably foreseeable operating conditions. Loadings caused by traffic, wind and earthquake have not been taken into account.
- Not suitable for fatigue loading, creep conditions, fire testing, fire hazard environment, corrosive or erosive service, transporting fluids with abrasive solids.
- The piping system shall be designed to reduce the risk of fatigue due to vibration of pipes.
- Crane valves have not been designed as fire safe valves.

OPERATING PRESSURE AND TEMPERATURE

Fig. No.	Maximum Operating Pressure Conditions	Maximum Operating Temperature Conditions
D4 / D4.AT	20.0 Bar / 100°C	9.0 Bar / 180°C
D7 / D7.AT	32.0 Bar / 100°C	14.0 Bar / 198°C
D10	15.5 Bar / 66°C	11.1 Bar / 186°C
D14 / D14.AT	DN8-DN50: 32.0 Bar / 120°C DN65-DN80: 25.0 Bar / 180°C	DN8-DN50: 14.0 bar / 260°C DN65-DN80: 10.5 bar / 260°C
D15 / D15.AT	DN8-DN50: 32.0 Bar / 100°C DN65-DN80: 25.0 Bar / 100°C	DN8-DN50: 14.0 bar / 198°C DN65-DN80: 10.5 bar / 186°C
D16 / D16.AT	DN8-DN50: 32.0 Bar / 120°C DN65-DN80: 25.0 Bar / 180°C	DN8-DN50: 14.0 bar / 260°C DN65-DN80: 10.5 bar / 260°C
D46 / D46.AT	40.0 Bar / 120°C	17.5 Bar / 260°C
D52 / D52.AT	64.0 Bar / 66°C	20.7 Bar / 288°C
D71	32.0 Bar / 100°C	14 Bar / 198°C
D71.AT	27.6 Bar / 66°C	13.8 Bar / 198°C
D72	32.0 Bar / 100°C	14 Bar / 198°C
D72.AT	27.6 Bar / 66°C	13.8 Bar / 198°C
DM6	16.0 Bar / 100°C	7.0 Bar / 170°C
DM11	25.0 Bar / 100°C	10.5 Bar / 186°C
F372	13.8 Bar / 65°C	8.6 Bar / 230°C
FM369	16.0 Bar / 120°C	12.1 Bar / 220°C

*Insulation is essential for external temperatures up to 10°C.



Example of Identification plate showing service pressure and temperature limitations.

STRESS CORROSION CRACKING

The use of chemicals for system dosing must be determined by the user as all aspects of the system must be established and considered, and the effect of the chemicals used (including compounds arising from chemical combinations) must also be established in order to accurately determine compatibility.

Crane (and its related brands) manufacture hardware (valves, couplings, etc) for the Building Services industry and Utilities industries. However, we are not system designers or operators and cannot make recommendations regarding chemical compatibility for the system, as a result of the above variables. Any comments from Crane regarding chemical compatibility shall relate solely to the Crane product and does not constitute a recommendation on compatibility for the wider system, resultant chemical compounds, components, substances or materials, in whole or in part.

For reference, and not exhaustive, certain austenitic stainless steels and aluminium alloys crack in the presence of chlorides, mild steel cracks in the presence of alkali and nitrates, copper alloys crack in ammoniacal solutions and iron with almost any caustic species (hydrogen presence notwithstanding).

For more information on how SCC can occur, please visit www.cranefs.com

YouTube To visit our Video Library go to:
www.youtube.com/user/CraneBSU

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