Engineering Data Sheet

Installation, Operation & Maintenance Instructions for
Fig 35 Bronze Gate Valves

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CE MARKING AND THE PRESSURE EQUIPMENT DIRECTIVE 97/23/EC

This has been implemented in United Kingdom law by the Pressure Equipment Regulations 1999 (SI 1999/2001).

The regulations apply to all valves with a maximum allowable pressure greater than 0.5 bar. Valves with a maximum allowable pressure not exceeding 0.5 bar are outside the scope of the Directive. Valves are categorised in accordance with the maximum working pressure, size and ascending level of hazard, which is dependent on the fluid being transported. Fluids are classified as Group 1, dangerous fluids or Group 2, all other fluids including steam. Categories are SEP (sound engineering practice) and for ascending levels of hazard, I, II, III or IV. All valves designated as SEP do not bear the CE mark nor require a Declaration of Conformity. Categories I, II, III or IV carry the CE mark and require a Declaration of Conformity (Note- all valves up to and including 25mm (1") having a maximum allowable pressure greater than 0.5 bar are designated SEP regardless of fluid group.)

PRODUCT LIFE CYCLE

The life of the valve is dependent on its application, frequency of use and freedom from misuse. Compatibility with the system into which it is installed must be considered. The properties of the fluid being transported such as pressure, temperature and the nature of the fluid must be taken into account to minimise or avoid premature failure or non-operability. A well-designed system will take into consideration all the factors considered in the valve design, but additionally electrolytic interaction between dissimilar metals in the valve and the system must be examined. Before commissioning a system, it should be flushed to eliminate debris and chemically cleaned as appropriate to eliminate contamination, all of which will prolong the life of the valve.

LIMITS OF USE

The valves to which these installation, operation and maintenance instructions apply have been categorised in accordance with the Pressure Equipment Directive.

The fluid to be transported is limited to Group 2 gases i.e. non-hazardous and on no account must these valves be used on any Group 1 gases.

These valves may be used on Group 1 and Group 2 liquids.

Fluid	Group 2 Gases		
Fig No.	PN	DN	Category
35PN16	16	15-25 32-50	SEP SEP

Fluid	Group 2 Gases		
Fig No.	PS	DN	Category
35ANSI	15.5 (Class 150)	½"-1" 1¼"-2"	SEP SEP

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The fluid to be transported is limited to Group 1 liquids i.e. non-hazardous and on no account must these valves be used on any Group 1 gases or Group 2 gases.

These valves may be used on Group 2 liquids

Fluid	Group 1 Liquids		
Fig No.	PN	DN	Category
35PN16	16	65-100	SEP

Fluid	Group 1 Liquids		
Fig No.	PS	DN	Category
35ANSI	15.5 (Class 150)	2½"-4"	SEP

Operating pressures and temperatures

PN rated valves

PN	Non-shock pressure at temperature range	Non-shock pressure at max. temperature
16	16 bar from –10°C to 100°C	7 bar at 170°C

Class rated valves

Class	Non-shock pressure at temperature range	Non-shock pressure at max. temperature
150*	15.5 bar from –10°C to 66°C	10.3 bar at 208°C

*Pressure temperature rating to MSS SP 80 Class 150

Not suitable for fatigue loading, creep conditions, fire testing, fire hazard environment, corrosive or erosive service, transporting fluids with abrasive solids.

PRESSURE/TEMPERATURE RATING

Valves must be installed in a piping system whose normal pressure and temperature do not exceed the above ratings.

If system testing will subject the valve to pressures in excess of the working pressure rating, this should be within the test pressure for the body with the valve open.

The maximum allowable pressure in valves as specified in the standards is for non-shock conditions. Water hammer and impact for example, should be avoided.

If the limits of use specified in these instructions are exceeded or if the valve is used on applications for which it was not designed, a potential hazard could result.

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LAYOUT AND SITING

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

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.

Conventionally, valves are installed in horizontal pipework. This is however, not a constraint and they may be mounted in vertical or inclined pipework, inverted or rotated to clear walls, ceilings and other restrictions.

In the interests of safety, valves installed on end-of-line service in the closed position with infrequent opening should be fitted with a locking device on the operating mechanism. Alternatively, it should be fitted with a blanking flange on the downstream flange of the valve.

INSTALLATION

The Fig 35 is a bronze valve, which has flat face flanges, and therefore the pipework-mating flange must also be flat faced. The flange gasket shall be of full-face design.

Care is needed during installation to provide free access to enable the valve to be fully operated.

Prior to installation, a check of the identification plate and body marking must be made to ensure that the correct valve is being installed.

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 bolting and handwheel operation.

All special packaging material must be removed.

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.

Immediately prior to valve installation, the pipework to which the valve is to be fastened should be checked for cleanliness and freedom from debris.

Valve end protectors should only be permanently removed immediately before installation. The valve interior should be inspected through the end ports to determine whether it is clean and free from foreign matter.
The mating flange (both valve and pipework flanges) should be checked for correct gasket contact face, surface finish and condition and must be flat, full faced design. If a condition is found which might cause leakage, no attempt to assemble should be made until the condition has been corrected.

The gasket should be suitable for the operating conditions or maximum pressure/temperature ratings and when connected to a bronze valve or flange, it must be full faced.

The gaskets should be checked to ensure freedom from defects or damage.

Care should be taken to provide correct alignment of the flanges being assembled. Suitable lubricant on bolt threads should be used. In assembly, bolts are 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.

Parallel alignment of flanges is especially important in the case of the assembly of a valve into an existing system.

Flanged joints depend on compressive deformation of the gasket material between the flange surfaces.

The bolting must be checked for correct size, length, material and that all connection flange bolt holes are utilized.

OPERATING

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.

Wheelkeys or other similar devices should not be used.

Note:- When the valve is closed at extreme high temperature and then cooled, the disk may become tight in the seat and prove difficult to open.
Conversely, a valve closed at room temperature can be difficult to open if there is an increase in fluid temperature causing a linear expansion of the stem, which tightens the disk further into the body seat.

The operator should use suitable hand protection at extreme temperature conditions.

MAINTENANCE

The valve should be at zero pressure and ambient temperature prior to any maintenance.

Maintenance Engineers & Operators are reminded to use correct fitting tools and equipment.
A full risk assessment and methodology statement must be compiled prior to any maintenance.

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.

In systems where corrosion could be a potential hazard, wall thickness checks on the body and bonnet should be made. This requires either the removal of the valve from the pipeline or removal of the bonnet with the system at zero pressure. If the wall thickness has reduced by 25%, the valve must be replaced.

The Fig 35 does not require any routine maintenance. The only item, which may require attention, is the stem seal. This will generally only be an adjustment. Very occasionally the gland may need to be repacked completely.

GLAND ADJUSTMENT

1. Carefully tighten the gland nut.

2. If the gland nut becomes solid and the gland is still leaking. This indicates that the gland needs re-packing.

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GLAND PACKING REPLACEMENT

The valve should be at zero pressure and ambient temperature prior to carrying out the following procedure.

1. Operate the valve to the fully open position and tighten.
2. Remove the handwheel nut, plate and handwheel.
3. Slacken the gland nut and remove.
4. Slide the gland off the stem.
5. Using a sharp tool, dig out all remaining packing.

   Note:- Care should be taken not to damage the stem or stuffing box surfaces.
6. Slide new Hattersley packing over the stem and into the stuffing box.
7. Re-fit the gland and gland nut.
8. Tighten the gland.
9. Fit the handwheel, plate and handwheel nut to the stem.

If gland leakage occurs further gland adjustment may be necessary.

For the supply of genuine Hattersley spares, technical assistance or Hattersley ValveServe contact:

Hattersley Newman Hender
Peel House, Peel Road, West Pimbo, Skelmersdale, Lancashire. WN8 9PT

Telephone : 01695 712800

Facsimile : 01695 712820

Email : uksales@hattersley.com

: export@hattersley.com

Service Freephone : 0500 618205