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# Engineering Data Sheet

Document No:- 004B00X33D799 rev 4

Installation, Operation & Maintenance Instructions for  
Fig 33X and 33XLS Bronze Gate Valves

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Date 21<sup>st</sup> October 2004

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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.)

## **CE MARKING AND THE ATEX Directive 94/9/EC**

### **Concerning equipment and protection systems intended for use in potentially explosive atmospheres.**

This has been implemented in United Kingdom law by the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996 (SI 1996/192) and amended by The Equipment and Protective Systems (amendment) Regulations 2001 (SI 2001/3766).

The regulations apply to all valves where each valve:

- has its own potential source of ignition.
- operates in a potentially explosive atmosphere created by:
  - o the presence of air / dust mixtures external to the valve.
  - o the presence of gases, vapours, mists released from the valve through leakage.

The regulations will not apply to a valve without a potential source of ignition, which operates in a dust free environment and the fluid being transported is cold, inert gas or non-flammable liquid.

The requisite level of protection for valves not exempt from the regulations is defined as Group II category 2 and shall bear the following marking:

 II 2 GD X

## **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:

- a) categorised in accordance with the Pressure Equipment Directive.
- b) designated with the requisite level of protection in the ATEX Directive as Group II Category 2 non-electrical equipment.

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These products are categorised for Group 1 Liquid, but are not necessarily suitable for all fluids in this group. Refer to Hattersley Technical Application Engineers for advice. Codes of practice, specifications and regulations should be referred to for specific guidance for valve selection on hazardous service. These valves may also be used on Group 2 Gases and Group 2 Liquids.

Fluid	Group 1 Liquids		
Fig No.	PN	DN	Category
33X	20	1/2" - 2" 2 1/2" - 4"	SEP I *

Fluid	Group 1 Liquids		
Fig No.	PS	DN	Category
33XAT	13.8 (Class 125)	1/2"-1" 1 1/4"-2 1/2" 3"-4"	SEP SEP I *

## Operating pressures and temperatures

### PN rated valves

PN	Non-shock pressure at temperature range	Non-shock pressure at max. temperature
20	20 bar from -10°C to 100°C #	9 bar at 180 °C #

### Class rated valves

Class	Non-shock pressure at temperature range	Non-shock pressure at max. temperature
125	13.8 bar from -10°C to 66°C #	8.6 bar at 208 °C #

Not suitable for fatigue loading, creep conditions, fire testing, fire hazard environment, corrosive or erosive service, transporting fluids with abrasive solids, high velocity gases that can cause shock waves.

# The maximum surface temperature under normal use is given in the table. The auto-ignition temperature of a surrounding potentially explosive atmosphere must exceed the equipment surface temperature by at least 25% (BS EN 1127-1 clause 6.4.2).

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## **PRESSURE/TEMPERATURE RATING**

These valves must be installed in a piping system where the 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 in the open position.

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.

## **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.

Heavy valves may need independent support or anchorage.

Gate valves may be installed in:

- a) Horizontal pipework with stem vertical.
- b) Vertical pipework with stem horizontal.

The valve should not be installed in horizontal pipework with the stem horizontal because shut off performance may be impaired.

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 plug on the downstream end connection of the valve.

## **INSTALLATION**

Prior to installation, a check of the identification plate and body marking must be made to ensure that the correct valve is being installed. Any electrical component e.g. actuators, limit switches must be explosion proof and comply with the Directive and Standards as listed in BS EN 1127-1 clause 6.4.5.

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 handwheel operation.

All special packaging material must be removed.

Confirm that the pipe threading length is correct to avoid excessive penetration of the pipe into the valve which would otherwise cause damage.

Thread sealing compounds appropriate to the application must be used but excessive use should be avoided, since this increases thread interference and may cause overstressing of the body ends.

Ensure the threads are properly engaged and proceed to tighten the valve onto the pipe. The wrench must only be located on the valve end into which the pipe is being threaded to avoid distortion of the valve.

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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.

After installation, the valve may be opened and closed fully to confirm satisfactory operation.

## **OPERATION**

### Fig 33X

Open the valve by anti-clockwise rotation of the handwheel until a positive stop is felt. No further effort is necessary when fully open. It is advantageous to rotate the handwheel clockwise 1/2 turn

To close the valve, rotate the handwheel clockwise until a positive stop is felt. Wheelkeys or other similar devices should not be used.

### Fig 33XLS

Open the valve by anti-clockwise rotation of the stem using a suitable lockshield key (refer to Hattersley catalogue) until a positive stop. No further effort is necessary. When fully open, it is advantageous to rotate the key clockwise 1/2 turn.

To close the valve, using the key rotate the stem clockwise until a positive stop is felt.

**Note:-** When the valve is closed at extreme high temperature and then cooled, the wedge may become tight in the valve 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 wedge further into the body seats.

The operator should use suitable hand protection at extreme temperature conditions.  
Gate valves should only be used in the open or closed position.  
Regulating or throttling service should be avoided.

At the conclusion of installation and before operating, all dust deposits shall be removed from the equipment.

## **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, as follows:

Valves within the scope of the ATEX Directive with a protection level defined as Group II category 2 will operate in Zone 1 (gases / vapours) or Zone 21 (dusts) designated in BS EN 1127-1 Explosion prevention and protection. Tools are either 'single spark' e.g. screwdriver, spanner, impact screwdriver or 'shower of sparks' e.g. sawing or grinding. Only steel 'single spark' tools are permissible in Zones 1 and 21.

Tools causing showers of sparks are only permissible if:

- no hazardous explosive atmosphere is present.
- dust deposits have been removed and no dust cloud is present.

The use of tools on equipment in Zones 1 and 21 should be subject to a 'permit to work' system.

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A full risk assessment and methodology statement must be compiled prior to any maintenance. This must include the removal of dust deposits by good housekeeping.

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.

These gate valves should not normally require any maintenance, however, in the event of maintenance being necessary, the following procedure should be followed:

## Gland Packing

Before commencing work, de-pressurize the system.

Slacken the handwheel nut and remove the handwheel, nameplate and nut (if fitted).

Remove the gland nut (or lockshield) and gland.

Using a sharp pointed tool, lift out the existing packing and ensure the stem and stuffing box are clean & free from debris. Take care not to damage the stem or stuffing box.

Fit genuine Hattersley packing into the stuffing box and press down firmly.

Re-fit the gland and gland nut (or lockshield).

Re-fit the handwheel, nameplate and nut (if necessary).

Tighten the gland and confirm stem resistance while operating the valve.

When the valve is re-pressurized check for leak tightness and further adjust the gland as 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**

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