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Engineering Data Sheet
INSTALLATION, OPERATION & MAINTENANCE
INSTRUCTIONS FOR ECCENTRIC
PLUG VALVES

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Date 18th January 1996

PRESSURE/TEMPERATURE RATING

These valves can be suitable for PN16, PN25, ANSI 125 and ANSI 250 pressure ratings.

The temperature rating is restricted due to the elastomeric trim material as follows:-

Nitrile	- 90°C
EPDM	- 120°C
Viton	- 200°C

These valves must be installed in a piping system whose normal pressure and temperature do not exceed these ratings.

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 may impair its performance.

Heavy valves may need independent support or anchorage.

The Eccentric Plug Valve can be fitted in either vertical or horizontal lines.

HANDLING

A basic consideration in handling protected valves should be to avoid damaging the protection and valves should never be thrown or dropped. Valves whose size requires handling by crane or lift truck should be slung or rigged carefully to avoid damage to exposed valve parts. Handwheels and stems, in particular, should not be used as lifting or rigging points for valves.

STORAGE

Valve end protectors should not be removed unless necessary for inspection and installation.

Protection against weather should be provided. Ideally, valves should be kept indoors, with the actual valve temperature always higher than the dew point, particularly for valves fitted with actuators.

If outdoor storage is unavoidable, valves should be supported off the ground and protected by a weatherproof cover.

Rubber components in valves, or provided as spares, should not be exposed to heat or direct sunlight where this can be avoided, as this accelerates the aging of the rubber. Ozone in the air around electrical appliances also accelerates the aging of certain elastomeric materials.

INSTALLATION

All special packing material must be removed.

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When large valves are provided with lifting lugs, plates or eyebolts, these should be used to lift the valve.

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. As far as is practicable, inspect the valve interior through the end ports to determine whether it is reasonably clean and free from foreign matter.

Check the mating flange facings (both valve and pipework flanges) for correct gasket contact face, surface finish and condition. If a condition is found which might cause leakage, do not attempt to assemble until the condition has been corrected.

Check the gasket material. For flange joints using low strength bolting, such as may be provided for iron flanges, metal gaskets (flat, grooved, jacketed, corrugated or spiral wound) should not be used. Check the gaskets for freedom from injurious defects or damage.

Prior to installing the valve, note which is the 'Seat End'. For ease of identification it is cast into the flange edge.

Generally, the valve will be installed with the pressure applied from the opposite end to the 'Seat End' i.e. with the seat downstream. This will cause pressure-assisted closure. If the valve is required for reverse flow conditions, i.e. pressure assisted opening, then this should be stated at the time of order.

In cases where shut-off is required in both directions, the valve should be installed so that the highest differential pressure at shut-off is that which assists closure.

Where the fluid is a slurry likely to cause material build up in the valve body, it is preferable to install the valve in reverse flow (pressure assisted opening). For heavy duties, the valve should be installed with the valve stem horizontal with the plug rotating to the top of the body during opening.

FLANGED JOINT ASSEMBLY

Certain sizes of valves have tapped bolt holes in the connecting flanges where there is no room for nuts behind the flanges.

Take care to provide good alignment of the flanges being assembled. Use suitable lubricants on bolt threads. In assembly, ensure sequence bolt tightening to make the initial contact of flanges and gaskets as flat and parallel as possible. Tighten gradually and uniformly to avoid the tendency to twist 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. It should be recognized in such instances that, if the flanges are not parallel, it will be necessary to introduce bending to make the flange joint tight. Simply forcing the flanges together with the bolting may bend the pipe, or it may bend the valve.

Flanged joints depend on compressive deformation of the gasket material between the flange surfaces. It should be recognized that the bolting force used for brute forced alignment of misaligned flanges will not be available to sustain gasket loading and may result in a joint leakage problem.

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Check the bolting for correct size, length and material.

Note:- Cast Iron Flanges

Cast Iron Flanges are less forgiving of improper installation than flanges made from ductile material. The use of lower strength steel bolting is recommended to reduce the possibility of overstressing.

Greater care should be taken when tightening raised face flanges than flat-faced flanges using full face faced gaskets which offer some protection against overtightening.

FLUSHING

It is common practice after the installation of pipework systems to clean the system by blowing with gas or steam or flushing with a liquid to remove debris.

OPERATION

Wrench Operated Valves

This closes by a 90° turn in a clockwise motion and operation is by a lever or wrench head on the 2" (50mm) square drive torque collar.

Note:- The torque collar component should not be removed from the valve except for maintenance.

An indicator cap is provided on the torque collar to confirm plug position. The lever or wrench head may be fitted in any position to suit local conditions without impairing operation of the valve. The most common position being with the lever/wrench along the axis of the pipeline with the valve in the open position.

The torque collar provides an adjustable, closed position travel stop which is factory set and when the valve is closed, contacts the fixed stop on the bonnet.

Under some flow and pressure conditions, it will be necessary to retain the plug stationary.

The adjusting clamp feature on the torque collar should be tightened sufficiently to hold the plug in the desired position either

- a) with the plug open or partially open in the forward flow direction.
- b) with the plug closed or partially open in the reverse flow direction

For regulating duties, an adjustable memory stop is provided and is factory set in the full open position. When the required regulated position is established the stop may be moved along the slot until it touches the fixed bonnet stop then tighten. The valve may now be fully closed and re-opened to the regulated position without the need to re-set. As described above, it is recommended to tighten the torque collar in the regulated position.

Gear Operated Valves

Millcentric valves are available with optional gear operation up to 8" (200mm) and as standard on 10" (250mm) and larger.

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The gearbox is supplied with a fixed handwheel. Clockwise motion of the handwheel closes the valve and counter clockwise will open.

The valve may be operated to its fullest extent against factory set open and closed position travel stops in the gearbox. Excessive force is not necessary. Valve position is shown by an indicator plate against a fixed graduated scale. (**Note:** Buried service gearboxes do not have this indicator feature).

Because of the wormwheel and gear arrangement the valve may be operated at any point through its travel without the need for positive clamping as in the wrench operated version.

MAINTENANCE

The Eccentric plug valve is designed and manufactured to be maintenance free and provide a long life under normal operating conditions.

Periodic replacement of the grease in the gearbox (if fitted) with a lithium based grease should be carried out.

However, if maintenance is required due to unusual wear or simply to change the valves elastomeric trim, the following procedures should be followed:

General

1. The Eccentric plug valve is a top entry design and therefore can normally remain installed in the pipeline during maintenance.
2. De-pressurize and drain the system.
3. For the removal of the valve operator, please refer to the appropriate removal procedures. For maintenance purposes the plug is more easily removed when in the half to full open position.

Plug and Stem Seal Replacement

1. Mark an alignment point on the edge of the body and bonnet for later positioning.
2. Remove the hexagon headed bonnet bolts and lift the bonnet clear of the valve leaving the plug in place. It may be convenient to lift the bonnet and plug together in certain circumstances.
3. Remove the bonnet 'O' ring seal, this may be attached to the underside of the bonnet or in the recess in the valve body.
4. Grasp the plug stem and with an oscillating motion lift the plug from its lower bearing and out of the body.
5. Examine the two P.T.F.E. washers and bonnet 'O' ring seal. Replace if necessary.

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6. Before re-fitting the new plug ensure that the lower bearing bush is correctly in place and that the bearing cavity is free from debris.
 7. When inserting the plug into the body ensure that the P.T.F.E. thrust washers are clean and have been fitted. Inserting the plug in the half to full open position will ease fitting.
 8. Clean the bonnet 'O' ring seal and body/bonnet sealing faces.
 9. Taking the bonnet aside remove the stem seals as follows:
 - a) Using internal circlip pliers, remove the circlip and thrust washer.
- Note:-** Care should be taken as this may spring into the air during removal. Please wear safety glasses as a precaution.
- b) From the underside of the bonnet carefully slide the stem seals out of the top, preventing any damage occurring.
10. Align the bonnet ensuring the correct orientation. On sizes 2.1/2" (65mm) to 12" (300mm), the body V-location should coincide with a notch on the edge of the bonnet. Ensure the alignment mark for (1) is aligned for the larger sizes.
11. When re-fitting the bonnet, the bolt set should be tightened down diagonally to give metal to metal contact with the body.
12. Re-fit the stem seals over the stem carefully assisting entry of the seal lips into the packing box thus preventing damage. Silicone grease may be used to assist assembly of stem seals.
13. Replace the thrust washer and circlip.
14. Re-fit the valve operator; please refer to appropriate procedures.

Stem Seal Replacement Only

1. Using internal circlip pliers, remove the circlip and thrust washer. A small secondary sharp tool (e.g. screwdriver) may assist this operation
- Note:-** Care should be taken as the circlip may spring into the air during removal. Please wear safety glasses as a precaution.
2. Lift out the two stem seals using a sharp tool (e.g. screwdriver).
 3. Ensure the stem and the packing box are clean.
 4. Re-fit the new stem seals over the stem carefully assisting entry of the seal lips into the packing box thus preventing damage. Silicone grease may be used to assist assembly of stem seals.
 5. Replace the thrust washer and circlip.