CRANE FLUID SYSTEMS

# PN16 BUTTERFLY VALVES

## F611 / F612 / F614 / F615 / F621 / F622 / F624 / F625 / F626 / F627 / F628 / F629 / F631 / F631B / F632

## INTRODUCTION

- These instructions relate only to Crane rubber lined butterfly valves, which are designed and manufactured to provide isolation, or can be used for flow regulation of suitable fluids.
- Design, manufacture and testing of these valves are subject to a Quality Assurance System and Procedures according to EN ISO 9001.
- Service temperature and pressure indicated on the identification plate or body marking should not be exceeded.
- Valves must be installed into a well-designed system and it is recommended that the system be inspected in accordance with the appropriate member state legislation.

## GENERAL INSTALLATION

### Storage

If valves are to be stored prior to installation ensure that action is taken to protect them:

- Store valves with discs at 5° from fully closed position.
- Protect against frost, contamination, and corrosion.
- Cover valves to prevent ingress of dust and debris.
- Protect faces of valves as these are sealing faces and any damage may result in leaks.

### Preparation

- Before installation, ensure valve is suitable for service conditions e.g. pressure, temperature, and service media.
- Check that the pipe flanges are to the correct size and standard to match the valve flanges.
- Do not remove dust caps/flange protectors until just before the valve is fitted, this is to prevent the ingress of dust and dirt, etc.
- Ensure that pipe flanges are clean to prevent damage to valve flanges/liners on installation as this may create a leek path.
- Check that internal pipe diameter has sufficient clearance for valve disc to be fully operated.
- Check that there are no restrictions to full operation of valve disc in pipework, i.e. internal welding of flanges.
- Check that the pipe flanges are parallel, and on same centreline, before installation.
- All welding and heat treating of flanges must be completed prior to installation of valves to prevent damage to liners from excessive heat.

## GENERAL CONSIDERATIONS

- The valves have been designed for loadings, appropriate to intended use and other reasonably foreseeable operating conditions. Loadings caused by traffic, wind, and earthquake have not been taken into account.
- 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% of the maximum working pressure.
- The piping system shall be so designed to reduce the risk of fatigue due to vibration of pipes.
- The Installation shall 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.
- These products have not been designed to include corrosion, erosion, or abrasion allowances. Any queries regarding service applications should be addressed to the Crane Fluid Systems Technical Enquiries Department.
- A valves rating/maximum operating pressure decreases as the service temperatures increase. Data concerning pressure limitations due to elevated temperature may be found in graphical form on the Crane website, www.cranefs.com, from the Butterfly Valve section in the 'Additional Downloads' page.
- 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 should not exceed the valve rating. A pressure surge, or shock, is usually caused by a sudden reduction in flow rate, such as is caused by the rapid closure of a check or quarter turn valve, and may severely limit design velocities. The value is dependent on the velocity of the liquid, not system pressure, and may increase by up to 4 bar for every 0.3m/sec. increase in fluid velocity.
- The surfaces of valves in service may be subject to extreme temperatures; care should be taken when handling.

## HANDLING

Care should be taken when handling these valves. See valve data sheets for weights and dimensions. It is the responsibility of the installer to ensure that all lifting equipment is rated for the required lifting weight and is properly maintained and safe to use. When unloading, lifting, and positioning of these valves care must be taken to avoid damage to the faces, these are used as sealing faces on the pipe flanges.

## PIPE FLANGES

- Flanged joints depend upon compressive deformation of the integral rubber sealing faces between the flange surfaces until metal to metal contact is achieved.
- The bolting must be checked for correct size, length, material and that all connection flange bolt holes are utilized.



INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS

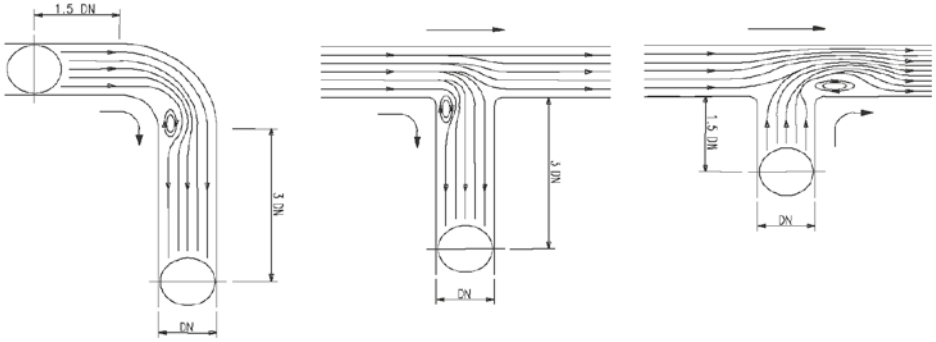
- It is prohibited for these Butterfly Valves to add an additional gasket between the pipe flange and the valve body.
- The Mating flange (both valve and pipework) must be checked for correct sealing face, surface finish, and condition. If either is found in a state which might cause leakage no attempt to assemble should be made until this has been resolved.
- **In order to maintain an effective sealing face it is imperative that all of the rubber lining face and the full flange face are covered completely to ensure correct compression is attained, failure to comply can result in valve failure. If unsure please contact the Crane Fluid Systems Technical Department for assistance.**
- 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, particularly on flanges with raised faces.

## PIPE SUPPORTS

Pipe supports must be carefully aligned and all the correct distance between centres for the size and types of pipe.

## VALVE LOCATION

- Valves should be located to ensure ease and safety of operation and access allowed for subsequent maintenance of the valve, especially where actuators are fitted. Where valves are lever operated ensure there are no obstructions which may prevent full travel of the lever.
- It is also important to ensure that valves are not subject to turbulent flows, and recommendations are shown below:



## END OF LINE SERVICE

- In certain circumstances it may be necessary to use these valves on an End of Line service, in these instances ensure that the system operating pressures do not exceed the following:
  - o DN50 to DN300: 10 bar
  - o DN350 to DN600: 6 bar
- Where valves are used for End of Line service the valve should be protected against unauthorised or unintentional operation to prevent personal injury or damage to equipment.
- Both valve faces must be compressed to ensure correct sealing is achieved, not doing so will void the valves warranty and ultimately lead to the valves failure. Two types of blanking flange are recommended:
  - o Blind/Blanking Flange – A solid flange to block off a section of pipe and provides correct valve sealing.
  - o Backing Flange – A flange with hole to allow for system drainage and provides correct valve sealing.
- **Semi-Lugged valves cannot be used on end of line service; fully lugged valves must be used.**

## OPERATION

- Butterfly Valves are quarter turn for full operation - the valves are closed by turning clockwise, and opened by turning anti-clockwise.
- Check that valves operate fully prior to commissioning and that there are no obstructions to the full travel of the disc. The disc enters the pipeline when the valve is in the fully open position.
- Ensure there are no obstructions upstream or downstream of the valve to prevent correct operation.
- On actuated valves, the end stops and torque limiters will have been adjusted and set prior to dispatch from factory.

### Gearbox

An enclosed worm gear reduction operator (gearbox) is mounted on the valve body with the gear quadrant intimately connected with the valve shaft. The full open and full closed position travel stops are set at the factory and require no further adjustment.

Note: if the gearbox is fitted with a padlock and locking ring, the padlock will require removal prior to operation.

Valve closure is by clockwise rotation of the handwheel until the travel stop restriction is felt. No excessive force is required to effect tight shut off and under no circumstances should a wrench or wheelkey be used.

Counter clockwise rotation of the handwheel will open the valve until the full open travel stop or to the intermediate regulated travel stop (memory stop) if fitted on the double regulating version.

A non-adjustable pointer indicates the actual valve disk position against a fixed scale.

### Lever

Care must be taken when operating the valve by the lever as high rates of flow induce a hydrodynamic torque on the disk which may cause it to move position rapidly, either more open or slamming shut, depending on its initial position. The sudden movement on the lever can cause injury and if closing, water hammer on liquid service may result in system damage.

Valve closing is by clockwise motion of the lever. Squeeze the trigger to disengage the lever from the fully open (or regulated) notch position, the lever can be rotated to the closed position notch, release the trigger to secure. **Ensure the lever is fully depressed before attempting to change the disc position.**

No excessive force is required to effect tight shut off and under no circumstance should additional wrenches be used.



INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS

## MAINTENANCE

- These Butterfly Valves are maintenance free and shall be operated at least once per year to help prevent damage, which can be caused by long periods of inactivity.
- The valve should be at zero pressure and ambient temperature prior to any maintenance inspection.
- 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 program should therefore include checks on the development of unforeseen conditions, which could lead to failure.

## OTHER CONSIDERATIONS

Crane (and its related brands) manufacture hardware (valves, couplings, etc) for the Building Services industry and Utilities industries (including Gas and Water industries) however, we are not system designers or operators.

The use of chemicals for system dosing must be determined by the user as all aspects of system variables (biocides, inhibitors, system medium, raw water condition (where used), existing micro-biological processes within the system, temperature, mechanical configuration, etc) 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 cannot make recommendations regarding chemical compatibility for the system, as a result of the above variables, which includes all components, substances and materials. 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.

## PED CLASSIFICATIONS & LIMITS OF USE

Crane butterfly valves have not been designed as fire safe valves.

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 must these valves be used on any unstable fluids.**

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

| Body Style / Fig. No. | Pressure Rating | Liner Material | Disc Material | PED CATEGORY BY VALVE SIZE | | | | PRODUCT APPLICATIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SEP | 1 | 2 | 3 | GROUP 1 GAS | GROUP 2 GAS | GROUP 1 LIQUID | GROUP 2 LIQUID |
| F611 Lever, Semi Lugged F614 Lever, Fully Lugged | 16 Bar | Nitrile -10 to 90°C | Aluminium Bronze | | 50 | 65-200 | 250-600 | ✓ | ✓ | ✓ | ✓ |
| F612 Gearbox, Semi Lugged F615 Gearbox, Fully Lugged | 16 Bar | Nitrile -10 to 90°C | Aluminium Bronze | | 50 | 65-200 | 250-600 | ✓ | ✓ | ✓ | ✓ |
| F621 Lever, Semi Lugged F624 Lever, Fully Lugged | 16 Bar | EPDM -10 to 100°C (WRAS to 85°C) | Aluminium Bronze | 50-200 | | | | | | | ✓ |
| F621 Gearbox, Semi Lugged F625 Gearbox, Fully Lugged | 16 Bar | EPDM -10 to 100°C (WRAS to 85°C) | Aluminium Bronze | 50-300 | 350-600 | | | | | | ✓ |
| F626 Lever, Semi Lugged F628 Lever, Fully Lugged | 16 Bar | EPDM -10 to 130°C | Aluminium Bronze | 50-200 | | | | | | | ✓ |
| F627 Gearbox, Semi Lugged F629 Gearbox, Fully Lugged | 16 Bar | EPDM -10 to 130°C | Aluminium Bronze | 50-300 | 350-600 | | | | | | ✓ |
| F631 Lever, Fully Lugged | 16 Bar | EPDM -10 to 130°C | Stainless Steel 316 | 50-200 | | | | | | | ✓ |
| F631B Bareshaft, Fully Lugged F632 Gearbox, Fully Lugged | 16 Bar | EPDM -10 to 130°C | Stainless Steel 316 | 50-300 | 350-600 | | | | | | ✓ |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- Designed and manufactured under quality management systems in accordance with BS EN ISO 9001:2008




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