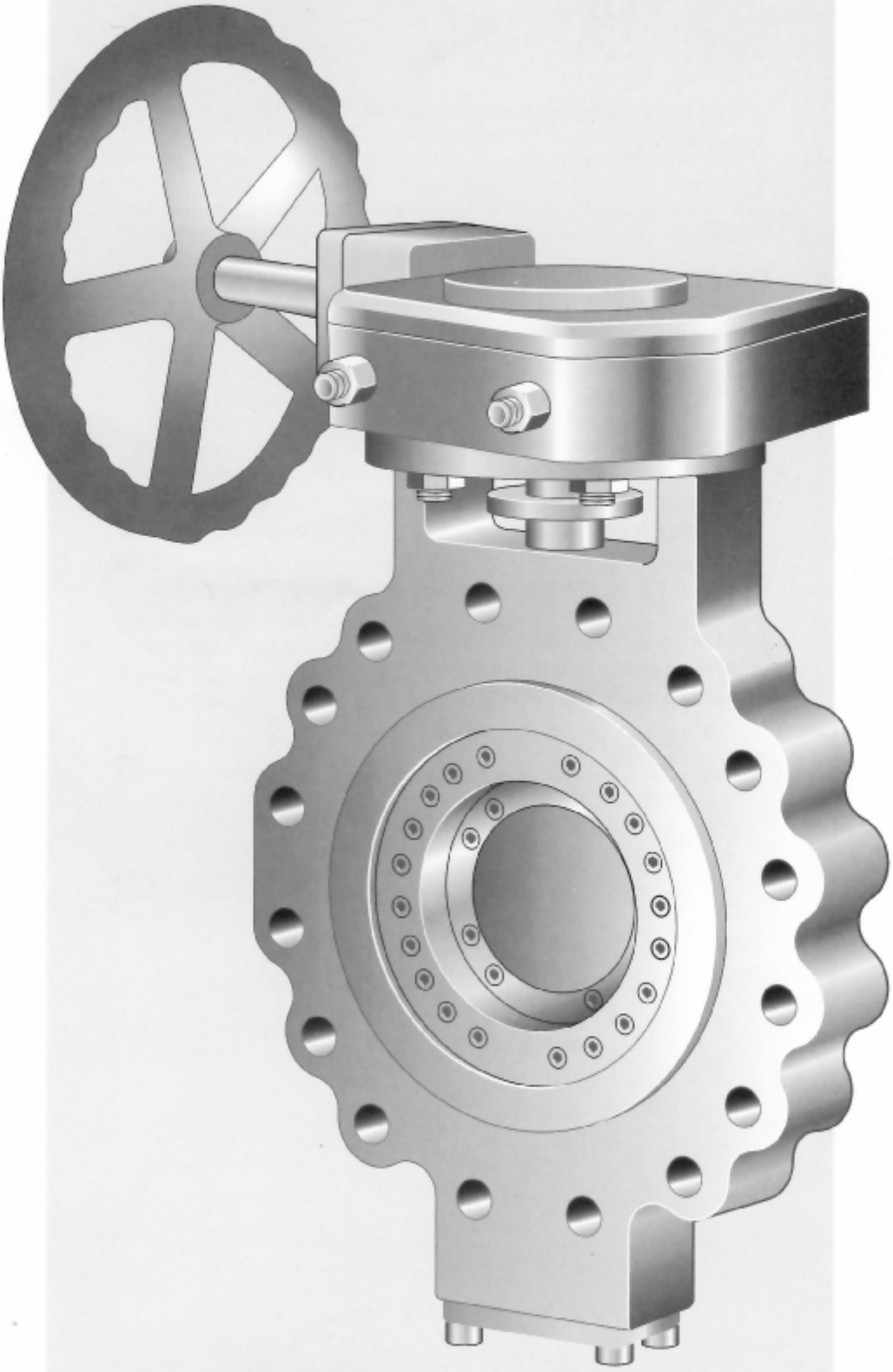
OPERATING AND MAINTENANCE INSTRUCTION MANUAL

Tritec 150, 300, 600, 900 & 1500lb range.



TOMOETRITEC

THE ULTIMATE PROCESS VALVE

INTRODUCTION

This instruction manual provides general information on the installation, inspection and maintenance of the Tritec triple offset butterfly valve. These high performance valves have been designed and manufactured to operate in an aggressive environment under extremes of temperature and pressure for long periods and with minimal maintenance.

CONTENTS

This manual covers all pressure ranges 150 - 1500lb pressure classes.

STORAGE

The Tritec butterfly valve is despatched with the disc cracked off the seat and the flange faces and valve internals protected with covers. Machined ferrous surfaces are protected with an approved rust preventative. If the valve is for clean gas duty and is being supplied "degreased", a label is attached stating this and the valve sealed in a polythene covering. It is suggested that the valve is kept packed until it is to be installed in the pipeline.

INSTALLATION

Tomoe Tritec valves must not be put into service until the machinery into which they are to be incorporated has been declared in conformity with the provisions of the Machinery Directive.
Tomoe Tritec valves must not be used as Safety Components (Emergency Shutdown Valves) within the meaning of the Machinery Directive without prior notification to Tomoe Tritec.

The valve is designed to seal against bidirectional flow and can therefore be installed with flow in either direction. However enhanced sealing life will be obtained with upstream flow against the shaft side of the disc. This preferred flow direction is shown on the nameplate attached to the valve body adjacent to the operating gear and also on the GA drawing. The valve may be installed in the pipeline with the valve shaft in a horizontal, vertical or intermediate position.

Prior to installation the pipeline must be cleaned from dirt and welding residues to avoid damage to the valve during operation.

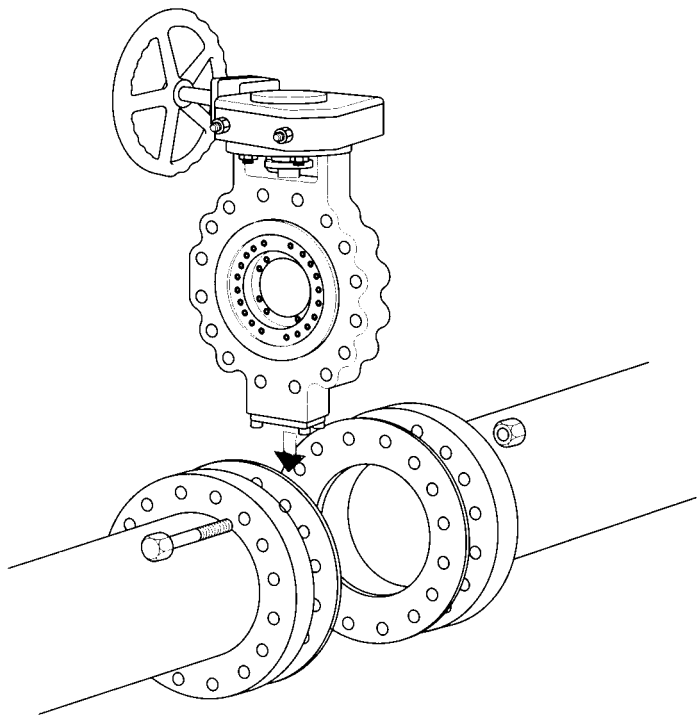
Ensure that the valve is closed prior to installation to avoid the risk of damage to the sealing surfaces.

The valve must only be lifted by the eyebolt or lifting eyes provided with the valve.

The valve must not be lifted by the gearbox, actuator or handwheel.

The valve must not be used for pipework alignment.

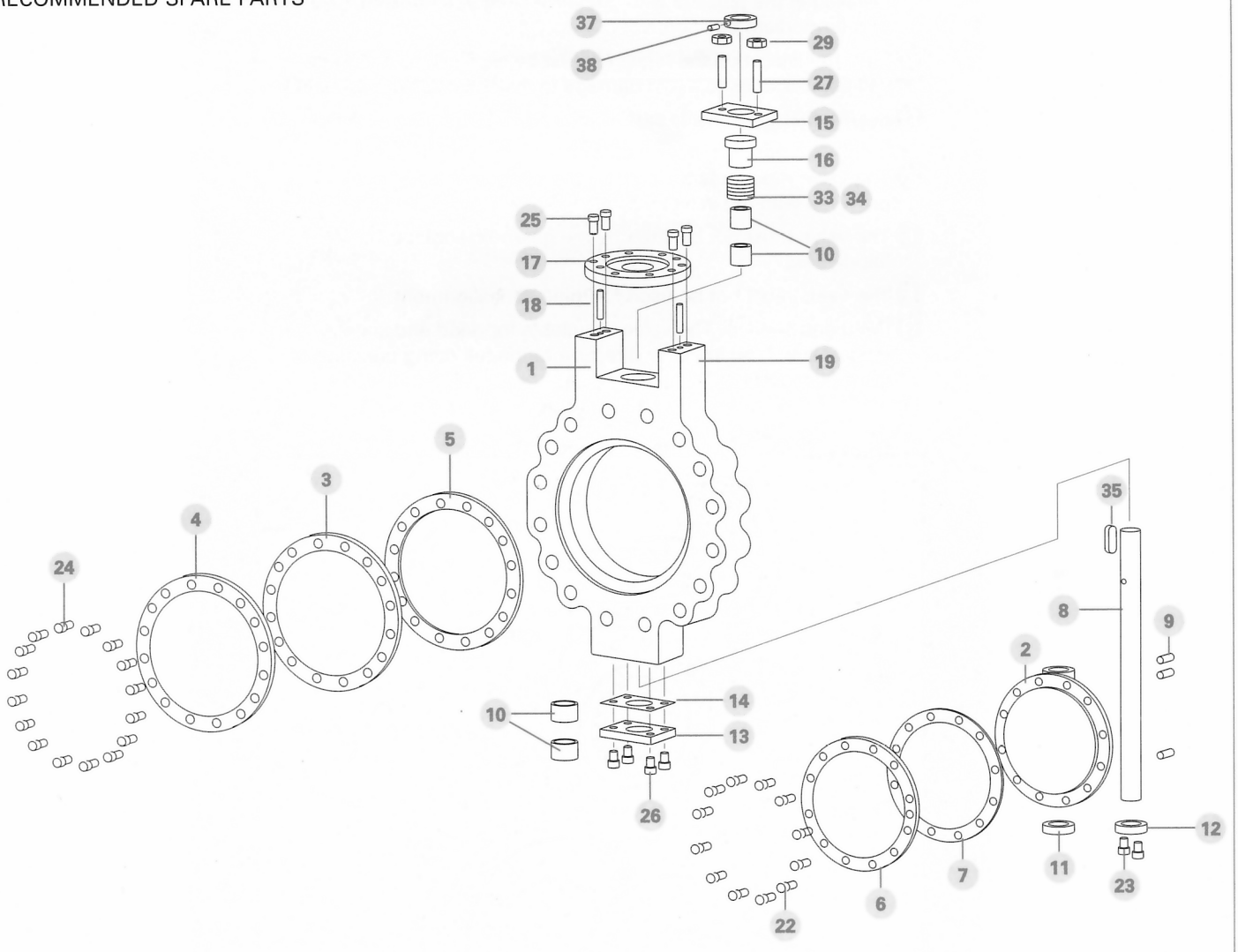
Dead end service- The valve is suitable for dead end service (end of line duty) in either direction to the full rating pressure of the piping system.



3. EXPANDED VIEW OF VALVE

1. BODY
2. DISC
- 3. BODY SEAT
4. BODY SEAT RETAINING RING
- 5. BODY SEAT GASKET
6. DISC SEAL
7. DISC SEAL GASKET
8. SHAFT
9. SHAFT PIN
10. BEARING
11. THRUST RING
12. THRUST PAD
13. END COVER
14. END COVER GASKET
15. GLAND PLATE
16. GLAND PLATE SPIGOT
17. MOUNTING PLATE
18. DOWEL PIN
19. NAMEPLATE
22. DISC SEAL SCREW
23. THRUST PAD SCREW
25. MOUNTING PLATE SCREW
26. END COVER SCREW
27. GLAND STUD
29. GLAND NUT
- 33. GLAND PACKING (3-OFF)
- 34. GLAND PACKING (2-OFF)
35. KEY
37. ANTI-BLOWOUT COLLAR
38. SET SCREWS ANTI-BLOWOUT

- RECOMMENDED SPARE PARTS

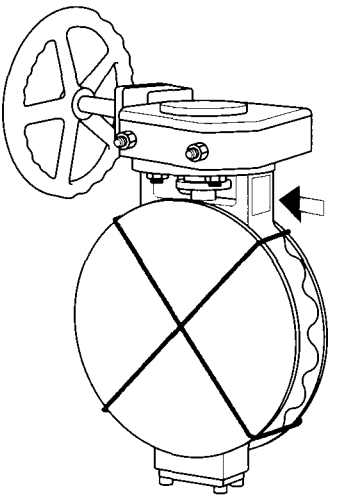


INSTRUCTIONS

1) All valves will be despatched with wooden covers attached to the flange faces to protect the gasket sealing surfaces and internal trim.

2) The valve disc is cracked off the seat in the almost closed position.

3) The Tritec nameplate shown in the picture contains information such as size, pressure class, materials and the unique serial number which must be quoted when ordering spare parts.



1) Use crates or packing cases for ocean transportation.

2) For overland Transportation a covered vehicle is recommended with protective sheets covering the valves.

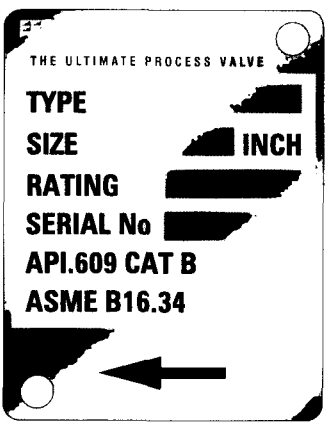
1) Store the valves indoors in a cool temperature between -10°C to +60°C. Do not remove the wooden covers until ready to install valves.

2) When storing valves unpacked, take care in protecting valves and actuators from excessive loads. Do not stack unpacked valves.

1) Unpack valves just before installation.

SPARE PARTS

When ordering spare parts or discussing matters concerning this valve with the factory, it is essential to quote the unique serial number of the valve which is to be found on the stainless steel nameplate attached to the valve body adjacent to the operating gear.



MAINTENANCE

Tomoe Tritec triple offset butterfly valves are designed for minimum maintenance, however, it is recommended that the valve is cycled several times from fully open to fully closed every 3 months. In addition it is recommended that the valve is removed from the pipeline every 2 years and is subjected to a thorough visual inspection particularly in the sealing areas for signs of damage and wear.
To carry out maintenance as detailed below, no special tools are required, but it should be noted that a torque wrench covering the torque range required will be needed. (refer to torque table opposite for details) Before carrying out any of the maintenance detailed below, please ensure that a copy of this operating and maintenance instruction manual or relevant GA drawing is available to facilitate identification and location of the component parts.

(refer to expanded view of valve in section 3)
The Tritec range of triple offset butterfly valves incorporates several innovative features which ensure long operating life and easy maintenance. The laminated body seat (3) and disc seal (6) are readily field replaceable with no special tools meaning that both parts of the sealing mechanism can be replaced without sending the valve back to the factory. The body seat (3) and disc seal (6) are accurately machined on special fixtures so that they are not matched pairs and can be replaced individually or as a pair.
Due to the triple offset geometry, the body seat (3) and the disc seal (6) must be fitted into the valve with the correct radial alignment, the body seat (3) body seat retaining ring (4), disc seal (6), body (1) and disc (2) all have an alignment arrow stamped on the component. These components must be assembled with the alignment arrows in the same position. To aid initial alignment of these components and also correct alignment of the body seat gasket (5) and disc seal gasket (7), the drillings are of an irregular spacing and can only be aligned in 1 orientation. It is essential to tighten the body seat screws (24) and disc seal screws (22) to the torque detailed in the torque table opposite.

Open the valve so that the disc (2) is cracked off the body seat (3) Remove the body seat screws (24) Remove the body seat retaining ring (4), body seat (3) and body seat gasket(5)
If the disc seal (22) is to be replaced, at this point remove the disc seal screws (22) and remove the disc seal (6) and disc seal gasket (7)
Before replacement ensure that the disc (2) is in a central float position by pushing the disc as far as possible towards the valve operator.
Prior to replacing the disc seal (6) ensure that the gasket sealing surface on the disc (2) is clean and free from gasket debris etc.
Replacement of the disc seal (6) is the reverse of the above but it should be noted that the new disc seal gasket (7) supplied with the disc seal (6) should be used and that the correct radial alignment is achieved using the alignment arrow and that the disc seal screws (22) are tightened to the correct torque as detailed in the torque table opposite.
Prior to replacing the body seat (3) ensure that the gasket sealing surface in the body(1) is clean and free from gasket debris etc. and apply a light smear of graphite grease to the top side of the body seat (3) and the underside of the body seat retaining ring (4).
Replacement of the body seat (3) is the reverse of the removal procedure described above, highlighting that the correct radial alignment is achieved using the alignment arrow and that the new body seat gasket (5) is used. To ensure correct centralising of the body seat (3), the body seat screws (24) should be lightly tightened only. At this stage, close the valve using the operator see that the valve is fully closed and the disc seal (6) is firmly located against the body seat (3). Tighten the body seat screws (24) to the correct torque as detailed in the torque table opposite.

The Tomoe Tritec butterfly valve is supplied with a graphite adjustable gland packing which has been packed and adjusted for immediate use. However, during service, leakage may occur and it may be necessary to tighten the gland nuts (29). This can be done with the operator on the valve. Do not overtighten the nuts however as this may cause damage to the valve and may lead to increased operating torque. If leakage persists then the gland packing (33 & 34) must be replaced and the following procedure followed:-

Remove the valve operator
Remove the mounting plate (17), anti blowout collar (37) and key (38)
Remove the gland plate (15) and gland plate spigot (16) by undoing the 2 gland nuts (29) and sliding both parts off the shaft (8)
Remove the gland packing rings (33 & 34). Do not re-use
Replace with a new gland packing set (33 & 34) taking care when sliding over the shaft (8) not to damage the rings on the keyway
Replace the 2 piece gland (15 & 16) and tighten the gland nuts (29) Do not overtighten as this will lead to increased valve operating torques.
Replace the anti blow-out collar (37), key (35) and mounting plate (17), ensuring the dowel pins are (18) refitted.
Replace the valve operator ensuring the dowel pins (18) are refitted (if supplied).

Screw Size	Torque St.Stl A4 Grade 80 (N/mm2)	Torque ST.STL 17/4PH (N/mm2)
M4	3.2	3.9
M5	6.5	7.9
M6	11.1	13.4
M8	26.9	32.5
M10	53.2	64.3
M12	92.9	112.2
M16	230.6	278.6
M20	449.8	543.5
M24	777.7	939.8
M30	1545.0	1866.9
M36	2700.0	3262.5

Torques given are the maximum allowable for the screw size. It is acceptable to use these maximum torques at all times, however if the GA is available, use the torques given on the drawing.

All other components are available as spares. Please contact Tomoe Tritec for details quoting the valve serial number. Such spares will be despatched with specific instructions on fitting.

Agents in:
- **Holland**
- **Kuwait**
- **Norway**
- **Qatar**
- **Saudi Arabia**
- **U.A.E.**
- **U.S.A.**

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TOMOE TRITEC

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