

INSTRUCTION MANUAL

TRIPLE OFFSET VALVE

TRITEC / TT2

TOMOE VALVE CO., LTD.

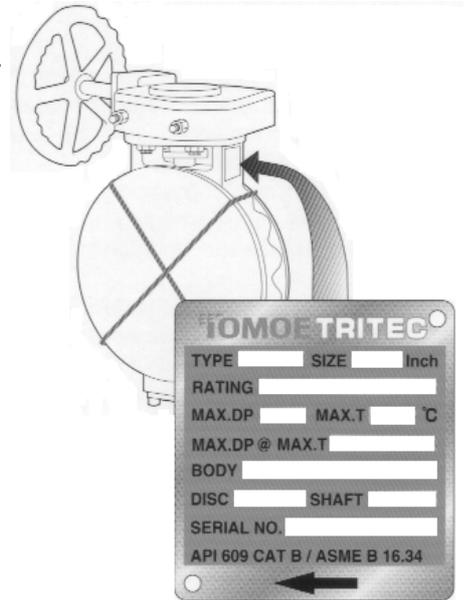
1. INTRODUCTION

This instruction provides general information on the operation, installation and maintenance of the Tritec triple offset valve. The Tritec valves has been designed and manufactured to operate in an aggressive environment under extremes of temperature and pressure for long periods and with minimal maintenance.

2. INSTRUCTIONS

2-1 PACKING

- (a) All valves will be dispatched with protective covers attached to the flange faces to protect the gasket sealing surfaces and internal trim.
- (b) The valve disc is cracked off the seat in the almost closed position
- (c) The Tritec nameplate shown in the picture contains information such as size, pressure class, materials and the unique serial number.



2-2 SPARE PARTS

- (a) When ordering spare parts or discussing matters concerning this valve with the sales office, 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 operator.

2-3 TRANSPORTATION

- (a) Use crates or packing case for ocean transportation.
- (b) For overland transportation, a covered vehicle is recommended with protective sheets covering the valves.

2-4 STORAGE

- (a) Store the valves indoors in a cool temperature between -10 and +60 , humidity at 70% or less.
- (b) Do not remove the protective covers until ready to install valves.
- (c) Machined ferrous surfaces are protected with an approved rust preventative. For long periods of storage, apply the rust preventative once a year to the unpainted surfaces.
- (d) When storing valves unpacked, take care in protecting valves and actuators from excessive loads. Do not stack unpacked valves.
- (e) 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 valve is kept packed until it is to be installed in the pipeline.

2-5 UNPACKING

- (a) Unpack valves just before installation.

3. INSTALLATION

- (a) The valve is designed to seal against bi-directional 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 operator 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.
- (b) Prior to installation, the pipeline must be cleaned from dirt and welding residues to avoid damage to the valve during operation.
- (c) Ensure that the valve is closed prior to installation to avoid the risk of damage to the sealing surface.
- (d) The valve must be lifted by the eyebolt or lifting eyes provided with the valve.
- (e) The valve must not be lifted by the operator or handwheel.
- (f) The valve must not be used for pipework alignment.
- (g) The Lugged or Double flanged type valve is suitable for dead end service i.e. end of line duty, in either direction (in case of valve specified both directions) to the full rating pressure of the piping system.

4. MAINTENANCE

Tomoe Tritec triple offset valves are designed of 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 two years and is subjected to a through visual inspection particularly in the sealing areas for signs of damage or 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 required will be needed. Before carrying out any of the maintenance detailed below, please ensure that a copy of the relevant GA drawing is available to facilitate identification and location of the component parts.

4-1 Adjustment / Replacement of Gland Packing

The Tomoe Tritec triple offset 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 nut²⁹. 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 packings^{33, 34} must be replaced and following procedure followed:-

[Disassembly]

1. Remove the valve operator.
2. Remove the Mounting plate¹⁷.
3. Remove the Key³⁵ on the Shaft⁸.
4. Remove the Set screws anti-blowout³⁸ and slide the Anti-blowout collar³⁷ off the end of the Shaft⁸.
5. Remove the Gland plate¹⁵ and Gland plate spigot¹⁶ by undoing the Gland nuts²⁹ and sliding both parts off the end of the Shaft⁸.
6. Extract the Gland packings^{33, 34} using like a scriber. Do not reuse the Gland packings.

[Assembly]

1. Clean the gland packing hole of all dust and other foreign matters.
2. Insert a new packing set (Standard: both the braided outer rings and the plain inner rings) into the packing hole taking care when sliding the rings over the Shaft not to damage them on the keyway.
3. Replace the Gland plate¹⁵ and Gland plate spigot¹⁶ and tighten the Gland nuts²⁹ to the torque specified on the GA drawing. Do not overtighten as this will increase valve operating torques and may lead to damage to the valve.
4. Replace the Anti-blowout collar³⁷ and tighten the Set screws anti-blowout³⁸.
5. Replace the Mounting plate¹⁷ on the top of the Body¹ ensuring that the Dowel pins¹⁸ are refitted and that the Mounting plate screws²⁵ are secured to the torque specified on the GA drawing.
6. Replace the valve operator ensuring that the Dowel pins¹⁸ are refitted (if supplied) and tighten the fixings. Secure the Key³⁵ on the Shaft⁸.

4-2 Replacement of the Laminated Body Seat and/or Disc Seal

The Tomoe Tritec triple offset valve incorporates several innovative features which ensure long operating life and easy maintenance. The laminated Body seat ³ and the Disc seal ⁶ are readily field replaceable with no special tools meaning that both parts of 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 either independently or as a pair.

Due to the triple offset geometry, the Body seat ³ and Disc seal ⁶ must be fitted into the valve with the correct radial alignment both relative to each other and relative the Shaft.

To facilitate this 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 at 9 o'clock in the view of Disc side.

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 the 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 on the GA drawing.

[Disassembly]

1. The Disc ² should be in the around 20° opened position.
2. Remove the Body seat screws ²⁴.
3. Remove the Body seat retaining ring ⁴, Body seat ³ and Body seat gasket ⁵.

If the Disc seal ⁶ is to be replaced as a result of visual inspection,

- At this point, return the Disc ² to the fully closed position.
- Remove Disc seal screws ²² and then remove the Disc seal ⁶ and the Disc seal gasket ⁷.
- These works should be done in the Disc ² upward position.

[Assembly]

1. Ensure that the Disc ² is in a central float position by pushing the Disc ² as far as possible towards the operator.

If the Disc seal ⁶ was replaced as a result of visual inspection,

- 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 used the new Disc seal gasket ⁷.
- This assembly should be done in the Disc ² upward position.
- The correct radial alignment of these components is achieved using the alignment arrows.
- Tighten the Disc seal screw ²² to the torque as detailed on the GA drawing.

2. Ensure that the gasket sealing surface in the Body ¹ is clean and free from gasket debris etc.
3. Replacement of the Body seat ³ is the reverse of the disassembly described above, but it should be used the new Body seat gasket ⁵.
4. The valve should be in the Disc ² upward position and in the around 20° opened position.
5. Replace the new Body seat gasket ⁵ with correct alignment. Apply a light smear of graphite grease to the topside of the Body seat ³ and the underside of the Seat retaining ring ⁴ and then replace these components.
6. To ensure correct positioning of the Body seat ³, the Body seat screws ²⁴ should be lightly tightened only, which is a load to feel a slight tension through the screw. Close the Disc ² lightly and then open again.
7. Tighten the Body seat screws ²⁴ to about 50% torque of specified on the GA drawing. At this stage close the Disc ² using the operator so that the valve is fully closed and the Disc seal ⁶ is firmly located against the Body seat ³.
8. Ensure that the gap between the Disc ² and the Thrust ring ¹¹ is within the tolerance specified on the GA drawing.

【Note】 If the gap is smaller than the correct tolerance, there is a possibility of the Disc ² moving towards the End cover ¹³. In this case please contact the sales office for the procedure.

9. Then tighten the Body seat screws ²⁴ to the correct torque as detailed on the GA drawing.

5. Expanded View of Component

No	Description	Q'ty
1	Body	1
2	Disc	1
3	Body Seat	1
4	Body Seat Retaining Ring	1
5	Body Seat Gasket	1
6	Disc Seal	1
7	Disc Seal Gasket	1
8	Shaft	1
9	Shaft Pin	2 ~ 4
10	Bearing	4
11	Thrust Ring	1
12	Thrust Pad	1
13	End Cover	1
14	End Cover Gasket	1
15	Gland Plate	1
16	Gland Plate Spigot	1

No	Description	Q'ty
17	Mounting Plate	1
18	Dowel Pin	2 ~ 4
19	Nameplate	1 ~ 2
22	Disc Seal Screw	1set
23	Thrust Pad Screw	2 ~ 3
24	Body Seat Screw	1set
25	Mounting Plate Screw	4 ~ 6
26	End Cover Screw	4
27	Gland Stud	2
29	Gland Nut	2
33	Gland Packing	3
34	Gland Packing	2
35	Key	1
37	Anti-blowout Collar	1
38	Set Screw Anti-blowout	1 ~ 2

: Recommended Spare Parts

