緯凡金屬股份有限公司
TRANSWORLD STEEL ENTERPRISE CO., LTD

Operation
&
Maintenance
Manual

Product Name: Multi Port Ball Valve

Product Type: Series M202 / M203

Version: 2.0
Status: Released on February 27, 2025)

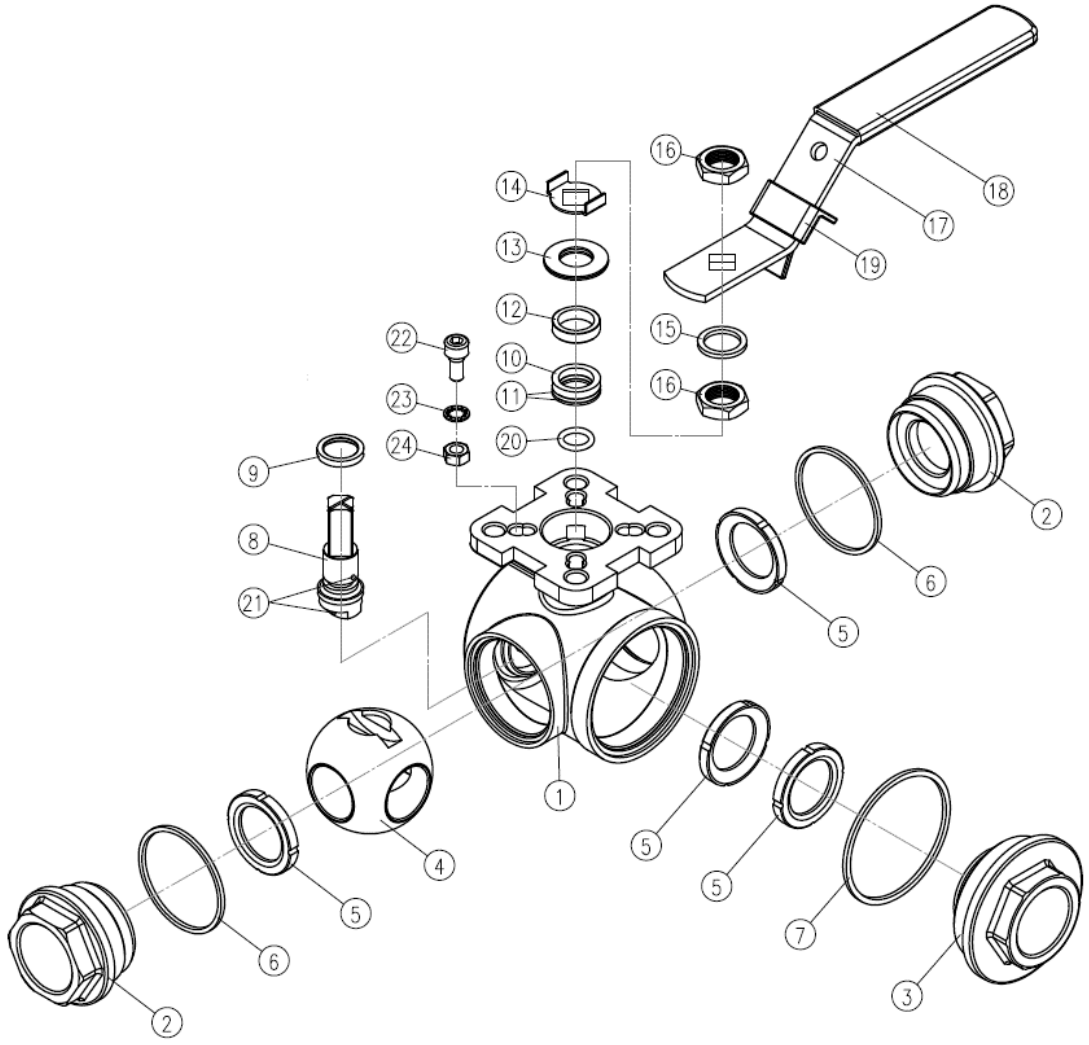
Headquarters: No. 34, Gongye 14th Rd., Taichung City, 412038, Taiwan (R.O.C.)
TEL: +886-04-22716107 | Email: info@tawdvalve.com

INSTALLATION & MAINTENANCE MANUAL

For Series M202 / M203

1. Product Structure

TAWD multi-port ball valve has a main body and more than two end caps connecting pipes, available in full-bore and reduced-bore specifications.



No.	Part Name	No.	Part Name	No.	Part Name
1	Body	**9**	Thrust Washer	**17**	Handle
2	End cap-A	**10**	Gland Packing	**18**	Handle Cover
3	End cap-B	**11**	Gland Packing	**19**	Locking Device
4	Ball	**12**	Gland Bush	**20**	O-Ring
5	Seat	**13**	Belleville Washer	**21**	Anti-static Device
6	Joint gasket-A	**14**	Stop Washer	**22**	Stop Pin
7	Joint gasket-B	**15**	Stem washer	**23**	Washer
8	Stem	**16**	Stem Nut	**24**	Pin Nut

2. USE

Life of valve can be prolonged if the valve is used within the rated range, in accordance with pressure, temperature, and corrosion parameters.

3. Manual Operation

- To change flow direction, turn handle 1/4" turn (90 degrees)
- Both T port and L port are available
- Both Full port and Reduced Port are available.

4. General Information for Installation

- To avoid damaging the internal components, such as the seats and ball, the pipeline must be flushed, free of dirt, burrs, and welding residues before installing the valve.
- Before installation, carefully check the nameplate to ensure valve type, size, seat material and the pressure-temperature grade are suitable to the condition of pipeline.
- The valve installed on the pipeline. For media flow requirements of the valve, confirm the upstream and downstream accordance with the direction of valve to be installed.
- Use suitable thread sealing material such as Teflon, and screw ball valve body to the pipeline.
- Apply wrench only on the hexagon of the valve ends. Tightening by using the valve body or lever can seriously damage the valve.
- In some applications, screwed valves are back welded on site, these valves must be treated as per instructions for weld end valves before back welding.
- After installation, the valve should be operated several times before being put into service.

5. Maintenance and Normal Trouble

Most ball valve problems are caused by incorrect installation of the valve or incorrectly installed parts, but causes of ball valve failure may also include:

No.	Problem	Cause Analysis	Solution
1	Valve leaks during installation	Improper transportation and lifting may result in valve damage.	Only transport the ball valve by suitable means, do not drop it.
2	Valve leaks during installation	Both ends of the valve are lacking blind flanges.	According to the requirements of pipeline design.
3	Valve leaks during installation	The valve is misaligned with the pipeline.	According to the plant and pipeline installation standards.
4	Leakage between the sealing surface	Dirty sealing surface or the sealing surface damaged.	Remove dirt or replace it.
5	Leakage at stem packing	Insufficient packing pressure or prolonged use can lead to damage to the packing material.	Tighten the bolts evenly to compact the packing or replace packing.

(Table 1)

6. Maintenance and Repair

	**OPENING THE VALVE UNDER PRESSURE CAN BE DEADLY. DISMANTLING THE VALVE MUST BE COOLED DOWN AND PRESSURE-FREE. HEAD PROTECTION, PROTECTION GLASSES AND SAFETY SHOES ARE MANDATORY.**

6.1 Caution ! Ball valve may be residual fluid in the ball cavity when closed.

If the valve has been used to control hazardous media, it must be decontaminated before disassembly. It is recommended that the following steps are taken for safe removal and reassembly.

- Relieve the line pressure.
- Place valve in half-open position and flush the line to remove any hazardous material from the valve.
- All persons involved in the removal and disassembly of the valve should wear the proper Protective clothing, such as face shield, gloves, etc.

6.2 Repair Kit Replacement and Reassembly

Note: when reassembling, a standard repair kit designated for each size and style valve is available, each repair kit to contain all the soft parts.

Note: When replacing Teflon parts, please replace all seats and seals at the same time. Replace Thrust Washer, Packing and O-Ring according to actual needs.

- Relieve the pipe line pressure.
- Stem leakage may be corrected without replacing the stem packing. Tighten the stem gland nut until leakage stops, if leakage continues or valve's operating torque becomes excessive, the stem seal is worn and must be replaced.
- Remove valve from pipeline.
- Remove end caps, body seal, seats, and ball.
- Remove stem nut, gland, stop, etc. and push stem into valve cavity. Remove stem seats and thrust washer.
- All Components have been cleaned, inspected, and replaced as necessary.
- Put new Stem Seal and O-ring on stem, insert the stem through body cavity into stem hole, install ball in the position. Assemble new stem packing, gland, Belleville washer, and stem nut. Tighten stem nut so that stem will feel snug and firm. Do not overtighten (Refer Table 2) .
- Assemble the seat into body, then insert body joint gasket on seal surface.
- Apply wrench on the hexagonal ends of the valve only. Tightening using the valve body or handle can seriously damage the valve.

6.3 Torque of Stem Nut

Size		With O-ring			Without O-ring		
Full port	Red port	lbf-in	kgf-cm	N-m	lbf-in	kgf-cm	N-m
1/4"		60.8	70	6.9	69.4	80	7.8
3/8"	1/2"	60.8	70	6.9	69.4	80	7.8

1/2"	**3/4"**	69.4	80	7.8	78.1	90	8.8
3/4"	**1"**	95.5	110	10.8	121.5	140	13.7
1"	**1.1/4"**	95.5	110	10.8	121.5	140	13.7
1.1/4"	**1.1/2"**	138.9	160	15.7	164.9	190	18.6
1.1/2"	**2"**	164.9	190	18.6	191	220	21.6
2"		164.9	190	18.6	191	220	21.6

(Table 2)

7. Safety Notice

	**THE EQUIPMENT IS SUBJECT TO PRESSURE, RISK OF SEVERE INJURY OR DEATH. HANDLE CAREFULLY.**
	**DO NOT EXCEED THE MAXIMUM PERMISSIBLE PRESSURE.**

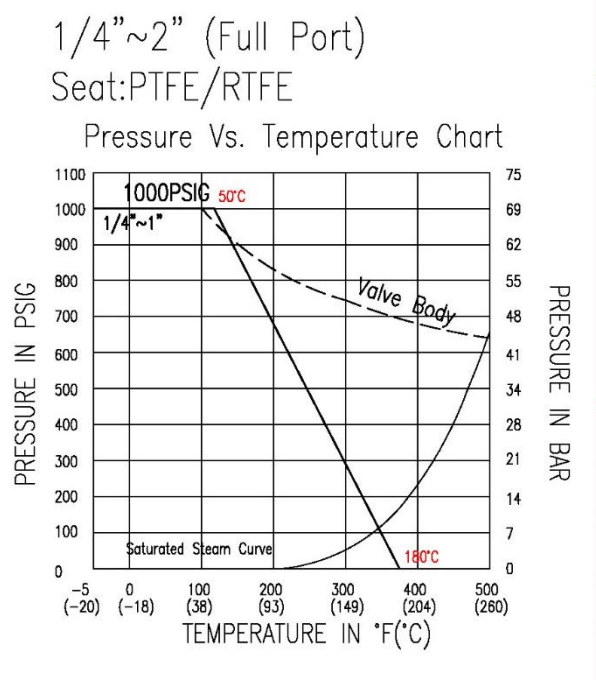
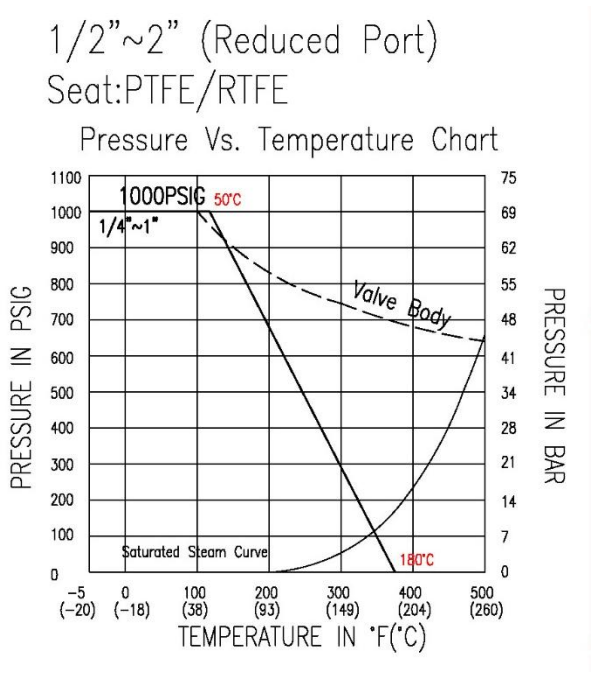
- Installation work must only be performed by trained personnel.
- Use appropriate protective gear as specified in plant operator's guidelines.
- Choose the installation location and suitable means, the ball valve cannot be used as a foothold or climbing aid.
- Do NOT apply external force to the ball valve.
- Inside diameter of the piping must correspond to the nominal diameter of the ball valve.
- When laying pipelines, it is essential to protect the ball valve body from lateral and bending forces, as well as the influence of vibrations and tension.
- Only mount the ball valve between matching aligned pipelines.
- Do NOT connect the system before valve pipeline installation to the earthing connection has been inspected, examined, and approved by the client.
- The pipeline should be free of any potentially explosive environments.
- Do NOT allow dust layers on the transportation media as it could charge the valve during high velocity of transportation. The flammable material shall be prohibited to be used on the valve.
- Use only in accordance with the specifications. (Refer Table 3)
- Any servicing work and repairs not described in the installation, operating and maintenance instructions must not be performed without consulting the manufacturer first.

8. Transportation and Storage

- Transport the ball valve using appropriate methods; throwing or dropping is prohibited.
- Dispose of packaging materials in accordance with relevant local or national disposal regulations/environmental protection laws.

9. Appendix

Pressure-Temperature Chart

Series M202	Series M203
	

(Table 3)