

INSTALLATION & MAINTENANCE MANUAL

SERIES 33 3-WAY/4-WAY/5-WAY MULTI-PORT BALL VALVES

BRIEF INTRODUCTION

Mars Multi-Port ball valves have been designed and engineered to provide long lasting and trouble free service when used in accordance with the instructions and specifications mentioned herein.

INSTALLATION

Mars Series 33 3-Way/4-Way/5-Way ball valves, **the end cap without a insert into Valve body**, which allow easy replacement of gasket, seal, and seats without special tools, and the valve body can be easily removed from pipeline for repairing when needed.

1. Use-Long Life

- 1.1 Life of valve can be maximized if the valve is used within the rated range, in accordance with pressure/temperature and corrosion data chart.

2. Manual Operation

- 2.1 Mars Multi-Port Ball Valves are allowed for 0 - 90 - 180 - 360 degree by turning the handle based on different flow paths.
- 2.2 Flow path is clearly marked on the stem top.

3. Automation Operation

- 3.1 Direct Mount of Pneumatic or Electric Actuator to Valves, No Brackets and Couplings are required

4. General Information for On-Site Installation

- 4.1 The valve may be fitted in any position on the pipe line
- 4.2 To prevent damage to the seats and ball surface, the pipeline must be flushed, free of dirt, burrs, and welding residues before installing the valve.

5. Instead of threaded end valves

- 5.1 Use conventional sealant, such as hemp core, Teflon tape, etc. on the threads.
- 5.2 Apply pipe wrench on the end cap of the ball valve only, tightening by using the valve body or handle can seriously damage the valve.

6. Installation of weld end valves

- 6.1 Tack weld the valve on the pipe in 4 points on all end caps.
- 6.2 Complete the full welding. To prevent the body seal from damaging, the heat in the end cap sealing area to be controlled under 400°F during the welding process.
- 6.3 When cooled down, clean all end caps and body surface
- 6.4 Tighten body bolts evenly, make sure that maximum tightening torque is observed per bolting torque data.
- 6.5 Check properly operation of the valve.

7. Installation of Flanged End Valves

7.1 When installing, user must supply flange gasket suitable for the service intended, tighten flange bolts or studs evenly.

MAINTENANCE

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

When ordering, be sure to specify size, valve code, valve seat, seal and stem packing materials. Optional components such as ball, stem and handle are also available.

1. Before disassembly, be sure to discharge the hazardous media that might be entrapped inside valve cavity.
2. Remove valves from pipeline
3. Loosen bolts on the end caps.
4. Remove end caps, seals, seats, ball and stem
5. Clean and inspect all components to be sure that they are free from foreign matter and pit marks, paying particular attention to the areas that must maintain a seal. Areas such as finished diameter on stem, inside pipe end surface, ball and stuffing box should be free from scratches and pitting.
6. Once all components have been cleaned, inspected, and replaced as necessary, the valve can be rebuilt using the factory repair kit recommended.
7. Reassemble stem with new stem seals, raised stem thru stuffing box, replace follower, Belleville washer, stem nut. Adjust stem packing to feel snug and firm (refer to torque for stem nut torque)
8. Reassembly ball into valve body.
9. Insert new seats and seals into end caps and cover.
10. Mount ends and cover on body with bolts or nuts by alternating equal adjustment to secure end caps and cover to the body, un-even force applied to body will cause the seat compression either too tight or too loose and effect the ball valve performance. The step by step feeding for each ball seats compression should be controlled the same during assembly.
11. Reassembly into line following installation procedure.
12. Cycle valve several times before resuming service.

(R-PTFE SEATS) Break Away Torque

Inch	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
DN	DN8	DN10	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100
In/Lb	75	75	75	150	325	370	600	840	1100	1750	2250
Nm	8	8	8	17	36	42	68	94	125	198	250

30% safety factor included.

Torque figure to tight **stem nut**

Non O-ring

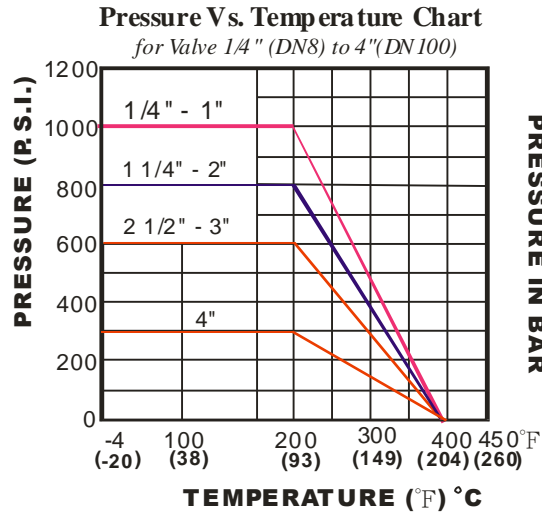
O-ring

Size	Series 33			Size	Series 33		
	In-lbs	Nm	kg-cm		In-lbs	Nm	kg-cm
1/4"	78	9.2	90	1/4"	69	8.2	80
3/8"	78	9.2	90	3/8"	69	8.2	80
1/2"	78	9.2	90	1/2"	69	8.2	80
3/4"	122	14.3	140	3/4"	95	11.2	110
1"	122	14.3	140	1"	95	11.2	110
1 1/4"	165	19.4	190	1 1/4"	139	16.3	160
1 1/2"	191	22.4	220	1 1/2"	165	19.4	190
2"	191	22.4	220	2"	165	19.4	190
2 1/2"	191	22.4	220	2 1/2"	165	19.4	190
3"	278	32.7	320	3"	234	27.6	270
4"	278	32.7	320	4"	234	27.6	270

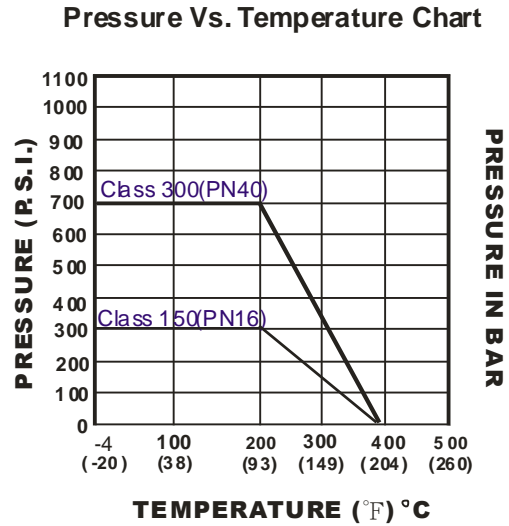
Torque of Body Bolt **3-way / 4 -way / 5- way BV**

SIZE	Threads	lbf-in		kgf-cm		N-m	
1/4"	M6x12	130	~ 182	150	~ 210	14.7	~ 20.6
3/8"	M6x12	130	~ 182	150	~ 210	14.7	~ 20.6
1/2"	M6x12	130	~ 182	150	~ 210	14.7	~ 20.6
3/4"	M6x16	148	~ 200	170	~ 230	16.7	~ 22.5
1"	M8x20	200	~ 278	230	~ 320	22.5	~ 31.4
1.1/4"	M8x20	200	~ 278	230	~ 320	22.5	~ 31.4
1.1/2"	M10x25	347	~ 451	400	~ 520	39.2	~ 51.0
2"	M12x25	477	~ 608	550	~ 700	53.9	~ 68.6
2.1/2"	M14x30	781	~ 911	900	~ 1050	88.2	~ 102.9
3"	M16x30	1042	~ 1172	1200	~ 1350	117.6	~ 132.3
4"	M20x35	1259	~ 1389	1450	~ 1600	142.1	~ 156.8

33-10 Threaded Ball Valve
33-20 Socket Welded Ball Valve
33-30 Butt Welded Ball Valve
Seat : RPTFE



33-40/50 ANSI # 150/# 300
33-60/70 PN10/16/25/40
Flange Ball Valve
Seat : RPTFE



MATERIAL LIST

NO.	PART NAME	QTY	MATERIAL
1	BODY	1	CF8M/WCB
2	END CAP-A	3	CF8M/WCB
3	END CAP-B	2	CF8M/WCB
4	SEAT RETAINER	5	CF8M/WCB
5	BALL	1	SS316
6	SEAT	5	PTFE/RPTFE
7	JOINT GASKET	5	PTFE
8	STEM SEAL	1	PTFE/RPTFE
9	STEM	1	SS316
10	STEM PACKING	1SET	25% GLASS FIBER FILLED+PTFE
11	GLAND	1	SS304
12	BELLEVILLE WASHER	2	SS301
13	LOCK SADDLE	1	SS304
14	STEM NUT	2	SS304
15	STEM WASHER	1	SS304
16	RETAINER SEAL	5	PTFE
17	HANDLE	1	SS304
18	HANDLE SLEEVE	1	VINYL
19	LOCKING DEVICE	1	SS304
20	BOLT NUT	20	SS304
21	PIN NUT	1	SS304
22	STOP PIN	1	SS304
23	O-RING	1	VITON
24	Antistatic Device	2	SS316
25	WASHER	1	SS304

