INSTALLATION & MAINTENANCE MANUAL
SERIES 99 UNI-BODY, FLANGED, FULL PORT VALVE

Brief Introduction

Series 99 is uni-body (1-piece) valve, with "floating ball" design. Induced by the line pressure the ball is free to move horizontally inside the valve body.

1. USE:

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.

2. MANUAL OPERATION:

2.1 To open or close the valve, turn the handle ¼ turn (90 degrees).

A. Valve in Open Position – the handle is in parallel (in-line) with the valve or pipeline.

B. Valve in Closed Position – the handle is perpendicular (crossed) with the valve or pipeline.

3. AUTOMATED OPERATION:

Direct Mount of Pneumatic or Electric Actuator to Valve, no bracket and couplings are required.

4. GENERAL INFORMATION FOR ON-SITE INSTALLATION:

4.1 The valve may be fitted in any position on the pipeline.

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. DISASSEMBLING & CLEANING THE VALVE:

5.1 If the valve has been used in hazardous media, it must be decontaminated before disassembly.

5.2 As shipped from the factory, valves contain lubricant. If silicon is unacceptable for your particular application, you may disassemble the valve and wash the parts in solvent.

6. REPLACING THE THRUST WASHER AND PACKING

6.1 Before replacing the thrust washer and the packing, the pipeline must be de-pressurized.

Note: Stem seal leakage may be corrected without replacing the seal and/or packing. Tighten the stem nut to flatten the belleville washers. If leakage continues or valve's operating torque becomes excessive, the seals are worn and must be replaced.

A. Remove nuts and lift the valve from the line. Care should be taken to avoid scratching or damaging serrated gasket. The valves are heavy, and they should be adequately supported before removing it from the line.

B. Loosen the handle nut and remove handle and stop pin. Next, loosen the stem nut and remove belleville washers and gland.

C. Remove end cap using proper machine (equipment).

D. Remove body seal, Seat and ball.

E. To take out the ball, rotate stem so ball is in fully closed position. Lift ball from the body, using a strap and lift device, if necessary. Extreme caution should be taken to avoid damage to the ball.

F. Take out the other seat.

G. Stem must be removed from inside the body. A tap to the top of the stem should loosen it. The thrust washer should come out with the stem. Then, remove the stem packing.

7. VISUAL INSPECTION:

7.1 Clean and inspect metal parts. It is not necessary to replace neither ball nor stem unless the surface has signs of abrasion or corrosion. We strongly recommend replacement of all soft parts whenever the valve is disassembled for reconditioning. We provide replacement kits that contain all the replaceable parts.

Note: The valve may be assembled and operated dry with any lubricant. However, a light lubrication will aid in assembly and reduce initial operating torque. Lubricant used must be acceptable with the intended line fluid.

8. Assembly

8.1 Install one seat in the body cavity with the spherical curvature facing the ball.
8.2 Install the thrust washer on stem and slide the stem up through the body. Install packing, gland, belleville washers. Screw the stem nut into the stem.
8.3 Install handle and washer.
8.4 Screw the stem nut into the stem until the handle is secure.
8.4 Turn handle to the closed position. Line up the ball slot with the stem end and slide the ball into position. Turn the handle to the open position to hold the ball in place.
8.5 Install the remaining seat into body side.
8.6 Put body gasket into body and seat into the valve. Be careful not to damage body seal when putting cap end into body.
8.8 Install end cap by proper machine (equipment). Extreme care must be exercised during adjustment of end cap.
8.9 Cycle the valve slowly, with a gentle back and forth motion, to build gradually to the full quarter turn. By cycling slowly, the seat lips will assume a permanent seal shape against the ball. A fast turning motion, at this point, may cut the seats before they have a chance to form the proper seal.
8.10 Test valve, if possible, prior to placing valve back into line position. If not properly secured, the valve can separate from the pressure source, resulting in possible injury.

TEST AS FOLLOWS:

A. Secure valve to a test fixture by means of a mating flange with full bolting and a suitable gasket. Orient valve so seat to be tested is facing up.
B. Introduce 50 to 100 psig air. Partially cycle the valve, under pressure, then slowly close to make sure the cavity is pressurized (use hearing protection). Pour water into the upper port to cover the ball and visually check for bubbles. If bubbles appear, pour the water out, cycle the valve several times and recheck. To check for leakage in the other port, reverse the valve and introduce air pressure to the port just checked.
C. Check stem seal at this time by coating the stem top area with a water/soap solution. If leakage occurs, tighten stem seal just until leakage stops.
D. Make sure the handle is in correct position.

99 SERIES

With Grease (R-PTFE SEATS)

Valve Size		Break Away Torque		Cv
Inch	DN	In/Lb	Nm	G.M.P
1/2"	15	53	6	28
3/4"	20	62	7	50
1"	25	140	16	95
11/4"	32	160	18	132
11/2"	40	255	29	260
2"	50	328	37	485
21/2"	65	532	60	800
3"	80	656	74	1250
4"	100	800	90	2250

30% safety factor included.

SIZE	In-lbs	Nm	Kg/cm
1/2"	69	8.2	80
3/4"	69	8.2	80
1"	95	11.2	110
1.1/4"	95	11.2	110
1.1/2"	139	16.3	160
2"	139	16.3	160
2.1/2"	165	19.4	190
3"	182	21.4	210
4"	200	23.5	230

Torque of Stem Nut O-Ring
Non-fire safe

Pressure to tighten end cap of Series 99

SIZE	kg/cm^2
1/2"	**25**
3/4"	**25**
1"	**30**
1.1/4"	**30**
1.1/2"	**35**
2"	**40**
2.1/2"	**50**
3"	**55**
4"	**60**

Remark: The torque figure is subject to hydraulic machine torque.

Media and Service Factors:

Media Factors	Multiplier
Clean, particle free, non-lubricating (water, alcohol, etc)	1.00
Clean, particle free, non-lubricating (oils, hydraulic fluid, etc)	0.80
Slurries or heavily corroded and contaminated systems	2.00
Gas or saturated steam, clean and wet	1.00
Gas or superheated steam, clean and dry	1.30
Gas, dirty unfiltered e.g. natural gas, Chlorine	1.50

Service Factors	Multiplier
Simple On and Off Operations	1.00
Throttling	1.20
Positioner Control	1.50
Once per day Operations	1.20
Once every two days or a "Plant Critical" Operation	1.50

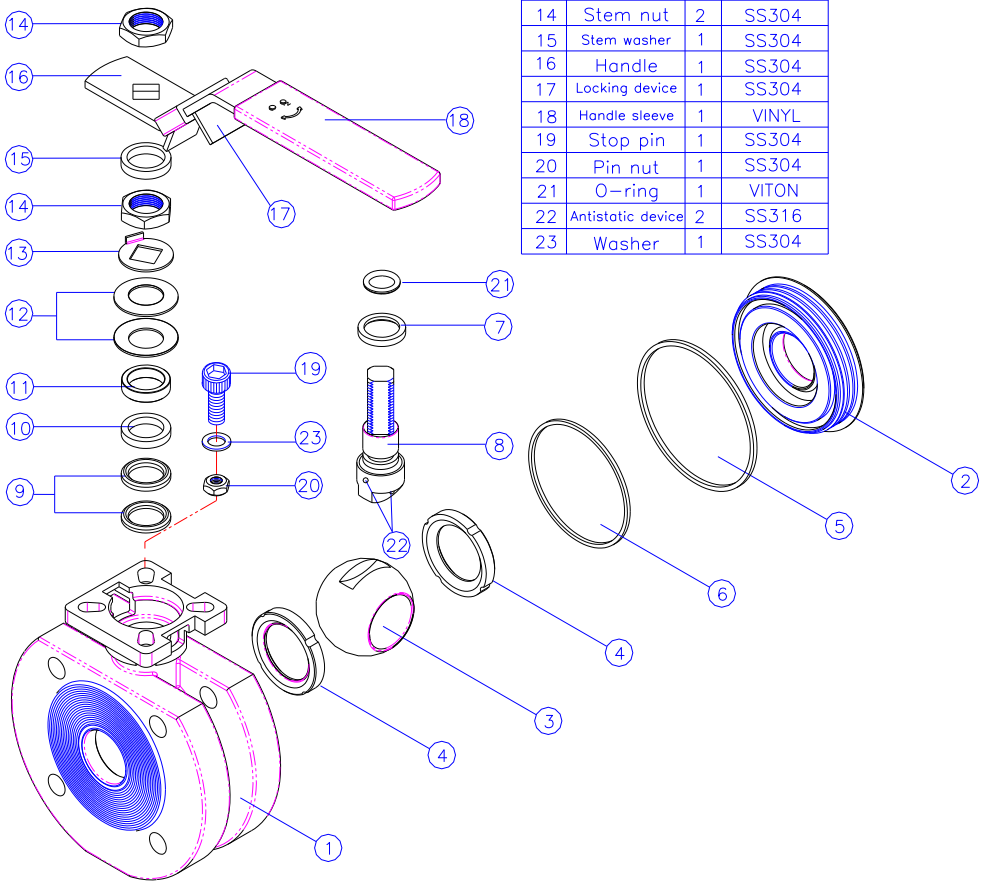
Torque Determination:

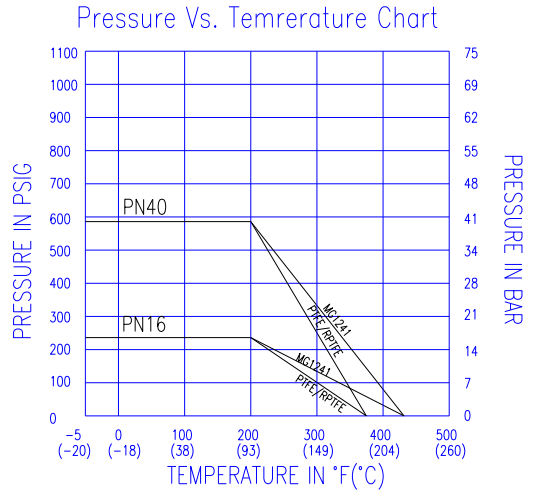
Basic Torque * Media Factor * Service Factor = Sizing Torque

SERIES 99 1/2"~3"

MATERIALS LIST

NO.	PART NAME	QTY	MATERIAL
1	Body	1	1.4408
2	End cap	1	1.4408
3	Ball	1	SS316
4	Seat	2	PTFE/RTFE
5	Joint gasket	1	PTFE
6	Joint gasket	1	PTFE
7	Stem seal	1	RTFE
8	Stem	1	SS316
9	Stem packing	2	PTFE
10	Stem packing	1	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	Handle	1	SS304
17	Locking device	1	SS304
18	Handle sleeve	1	VINYL
19	Stop pin	1	SS304
20	Pin nut	1	SS304
21	O-ring	1	VITON
22	Antistatic device	2	SS316
23	Washer	1	SS304





SERIES 99 4”

MATERIALS LIST

NO.	PART NAME	QTY	MATERIAL
1	Body	1	1.4408
2	End cap	1	1.4408
3	Ball	1	SS316
4	Seat	2	PTFE/RTFE
5	Joint gasket	1	PTFE
6	Washer	1	SS304
7	Stem seal	1	RTFE
8	Stem	1	SS316
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