

INSTALLATION AND MAINTENANCE MANUAL FOR ED-305 3-PIECE BALL VALVES

INTRODUCTION

The BI-TORQ InstruPak IS-3PT series uses the ED-305 3-piece ball valve, which provides easy replacement of gaskets, seals and seats without any special tools. The swing-out design of the valve allows for the center section of the valve body to be replaced while leaving the ends threaded or welded in place.

The ED-305 uses a floating ball design, which means that the ball is free to move horizontally inside the valve body. The valve is capable of tight shutoff with flow in either direction or dead-end regardless of the position of the valve in line. The downstream seat (opposite the pressurized side of a closed valve) carries the load exerted by the line pressure on the ball, while the upstream seat is subject to lesser load and wear. It is sometimes possible to increase the seat life by turning the valve 180° in the pipeline, although BI-TORQ recommends replacing all seats and seals at one time.

1. USE

1.1 The life of the valve can be maximized if valve use is within the stated pressure, temperature and corrosion ranges.

2. MANUAL OPERATION

2.1 To open or close the valve, turn the handle 90° (1/4 turn).

- a. Valve in OPEN position: the handle is 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

3.1 Valves with actuators should be checked for stem alignment. Most applications of the IS-3PT valve are direct mount to the actuator, greatly reducing any sideload or increased torque. Make sure that all insert adapters are properly placed on the valve stem and fully engaged in the actuator.

4. GENERAL INFORMATION FOR ON-SITE INSTALLATION

4.1 The valve may be fitted in any position in the pipeline. For automated operation, BI-TORQ does recommend that the valve and actuator be installed vertically in case of valve leakage, although this is not necessary for proper operation of the valve.

4.2 To prevent damage to the seats and ball surface, the pipeline must be flushed so that it is free of dirt, burrs and welding residues before installing the valve.

5. INSTALLATION OF THREADED VALVES

5.1 Use a conventional thread sealant such as hemp core, TFE, etc.

5.2 Apply the wrench on the hexagon end of the valve only. **CAUTION:** Tightening by using the valve body of handle can seriously damage the valve.

5.3 For applications where screwed end valves are back-welded on site, the valves must be dismantled according to the instructions for weld end valves.

6. INSTALLATION OF SOCKET WELD VALVES

NOTE: If the valve being welded into place has an electric or pneumatic actuator, remove the actuator before proceeding. All "soft parts" (seats, seals, gaskets) must be removed before welding. See CHART 1.1 FOR COMPLETE PARTS BREAKDOWN

6.1 Tack-weld the valve on the pipe in four points on both end caps.

6.2 With the valve in the open position (with the lever or actuator parallel to the axis of the pipe), loosen all nuts on the body bolts. Remove all bolts except one. Swing the body outside the pipe. (SEE ILLUSTRATION 1.1)

6.3 Turn the handle or valve stem to the half-open position to assist in the removal of the seats and gaskets.

6.4 Turn the handle or valve stem to the closed position and remove the ball.

6.5 Place all the removed parts in a clean and secure area.

6.6 Replace the body and the removed bolts onto the valve ends. Tighten all nuts by hand. DO NOT OVERTIGHTEN. To prevent any leakage to the body joints after welding, make sure that the body and the end caps remain perfectly parallel.

6.7 Finish welding both end caps onto the pipe.

6.8 After the pipeline and the valve cool, clean the end caps and remove the previously replaced bolts and swing the body out.

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6.9 Turn the valve to the closed position, then replace the ball. Turn the valve to the open position to replace the seats and seals.

6.10 After the seats and the ball are replaced, swing the body back into place, install all the bolts and tighten according CHART 1.2.

7. DISSASSEMBLING AND CLEANING THE VALVE

NOTE: If the valve being socket welded into place has an electric or pneumatic actuator, remove the actuator before proceeding.

CAUTION: Ball valves can trap fluids in the ball cavity when it is in the closed position. If the valve has been used with hazardous media, it must be decontaminated before disassembly or handling.

WARNING: All persons involved in the removal or disassembly of the valve should wear protective gear such as eye and face protection, gloves, etc.

7.1 Relieve the line pressure.

7.2 Place the valve in the half-open position and flush the line to remove any hazardous material(s) from the valve.

8. REPLACING THE THRUST WASHER, PACKING AND SEATS

NOTE: The IS-3PT series valve is designed with belleville washers for automatic wear compensation. If there are signs of leakage from the stem, it is time to replace the stem packing and thrust washer.

NOTE: If the valve being socket welded into place has an electric or pneumatic actuator, remove the actuator before proceeding.

8.1 Before replacing the thrust washer and the packing, the pipeline must be depressurized.

8.2 Maintenance, removal and replacement of seats and seals is simple even if the valve is installed in line. By removing three of the body bolts and loosening the fourth bolt, the valve body can be swung out of line (SEE ILLUSTRATION 1.1). Seats, seals, gaskets and balls can be replaced without disturbing the pipe alignment.

10. BOLT TIGHTENING SPECIFICATIONS

The body bolts on the valve must be tightened evenly. Tighten the bolts by hand, then use a wrench to tighten bolts in diagonal opposition.

**CHART 1.1:
Bill of Materials**

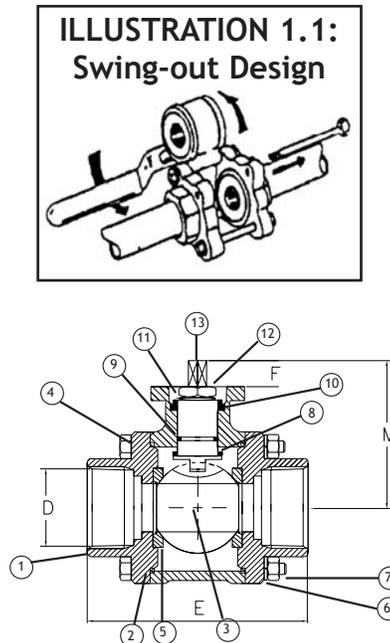
PART #	NAME	MATERIAL	QTY	ORDER REFERENCE #
1	ENDS	CF8M	2	ED-305-***-ENDS
2	BODY SEAL	TFE	2	ED-305-***-RK ¹
3	BALL	316SS	1	ED-305-***-BALL
4	BODY	CF8M	1	ED-305-***-BODY
5	SEAT	TFE	1	ED-305-***-RK ¹
6	WASHER	304SS	4	N/A
7	NUT	304SS	1	N/A
8	STEM SEAL	TFE	1	ED-305-***-RK ¹
9	O-RING	VITON	1	ED-305-***-RK ¹
10	STEM PACKING	TFE	1	ED-305-***-RK ¹
11	BELLEVILLE WASHER	304SS	2	N/A
12	STEM NUT	304SS	1	N/A
13	STEM	304SS	1	N/A

COMPLETE VALVE PART NUMBER: ED-305-***

***=VALVE SIZE (002=1/4", 003=3/8", 005=1/2", 007=3/4", 010=1", 012=1-1/4", 015=1-1/2", 020=2", 025=2-1/2", 030=3")

¹ COMPLETE REPAIR KIT INCLUDES SEATS, SEALS AND O-RINGS

**ILLUSTRATION 1.1:
Swing-out Design**



**CHART 1.2:
Bolt Torques**

VALVE SIZE	BODY BOLT TORQUE (IN LBS)
1/4"	44
3/8"	44
1/2"	53
3/4"	62
1"	89
1-1/4"	124
1-1/2"	186
2"	230
2-1/2"	336
3"	487

To order a complete new valve, please refer to BI-TORQ price list for InstruPak valve replacement.