

## 1. Scope

This instruction applies to 3-pcs body, full port, 1000 WOG (PN63), screwed, socket weld, butt-weld, extended butt-weld end, ball valve and directly mounted ISO 5211 flange ball valve.

## 2. Warning (Operation Limitation)

### 1). Temperature and pressure limit

- The normal maximum operating pressure at maximum or minimum operating temperature is shown on nameplate.
- The operating temperature is within  $-29^{\circ}\text{C}$  to  $200^{\circ}\text{C}$  for TFM1600 and  $-29^{\circ}\text{C}$  to  $240^{\circ}\text{C}$  for TFM4215 seat and sealing. Other seats and sealing operating temperature shall be checked with TUNING.
- The nominal pressure (PN) rating describe maximum working pressure in cold working temperature. e.g. PN63 (B 63) describe maximum working pressure 63 bar at  $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$

### 2). Fluids limit:

With soft-seat, fluids containing particles or coagulable are not acceptable. Please refer to the anti-corrosion table and choose different anti-corrosive materials for body and sealing.

### 3). Don't throttling operation

- Don't leave the ball partly open (throttling operation), where the pressure drop and/or flow rate damage to the valve seats and/or ball.

## 3. Installation

1). Remove the protective plastic cap on 2-threaded end, and clean or flush the valves.

2). Prior to mounting, flush and/or clean the pipeline to remove all accumulated extraneous matters, which matters shall damage to the seats and ball surface.

3). Installation of threaded ends.

3-1). Use conventional sealant (e.g. PTFE tapes) to seal threaded ends on the pipeline.

3-2). Apply pipe wrench on the hexagon end of valve only, while tightening. Tightening by using the valve body or handle can seriously damage the valve.

4). Installation of weld ends.

4.1). Tack-weld the valve on the pipe in four points on both end caps, with the ball valve in open position, Extended butt-weld end ball valve allows direct welding. For short butt-weld or socket-weld end process the next steps.

4.2). Removed all body bolts except one and loosening the remaining one, and valve body can be swung out. Secure seats from falling with tape.

4.3). Finish welding both end caps on the pipe.

4.4). When cooled down, clean both end caps and body surface.

4.5). Swing the body back to original position and replace the bolts (if necessary),

Tighten all nuts slightly. This operation is very important to keep body and end caps perfectly parallel, thus, preventing distortion of the end caps.

4.6). Tighten body bolts evenly. Make sure that maximum tightening torque is observed per bolting torque data.

4.7). Check proper operation of the valve.

5). After installation, make sure there is no stress left on the pipeline.

#### 4. Operation

- 1). Prior to operation, make sure to clean and flush the whole pipeline completely.
- 2). The operation of the valve consists of turning the stem (by manual or automated means) 1/4 turn (90°) clockwise to close, and 1/4 turn counter-clockwise to open.
- 3). When the handle (if used) and/or stem flats or groove are in line with the pipeline, the valve is open.
- 4). Besides operating by handle, the 200930/200940 series can be operated by a pneumatic or electric actuator mounted on the ISO5211 flange/plate (please refer to our catalogue to check flange size).
- 5). Operating torque requirements will vary depending on the length of time between cycles, media in the system, line pressure and type of valve seat. The figures in table A are based on TFM1600 seats with clean water as the media.

Table A: Max Break-away torque value

size	In-lb	n.m
DN6~DN10	30	3.4
DN 15	35	4.0
DN 20	46	5.2
DN 25	77	8.7
DN 32	91	10.3
DN 40	126	14.3
DN 50	231	26.1
DN 65	364	41.2
DN 80	504	57.1
DN 100	840	95.1

Table B: Torque figure for stem nut tighten

size	In-lb	n.m
DN6~DN10	70~80	8.0~9.0
DN 15	70~80	8.0~9.0
DN 20	70~80	8.0~9.0
DN 25	90~100	9.0~11.3
DN 32	90~100	9.0~11.3
DN 40	140~160	15.8~18.1
DN 50	140~160	15.8~18.1
DN 65	180~200	20.4~22.6
DN 80	180~200	20.4~22.6
DN100	250~270	28.3~30.6

#### 5. Maintenance

Long life and maintenance-free of valves can be maintained under normal working conditions and in accordance with pressure/temperature and corrosion data chart

- Warning:**
- Ball valves can trap pressurized fluid in ball cavity when closed position.
  - Prior to maintenance, relieve the line pressure.

##### 1) Re-tighten Packing

For maximum stem packing life, proper packing adjustment procedure must be followed:

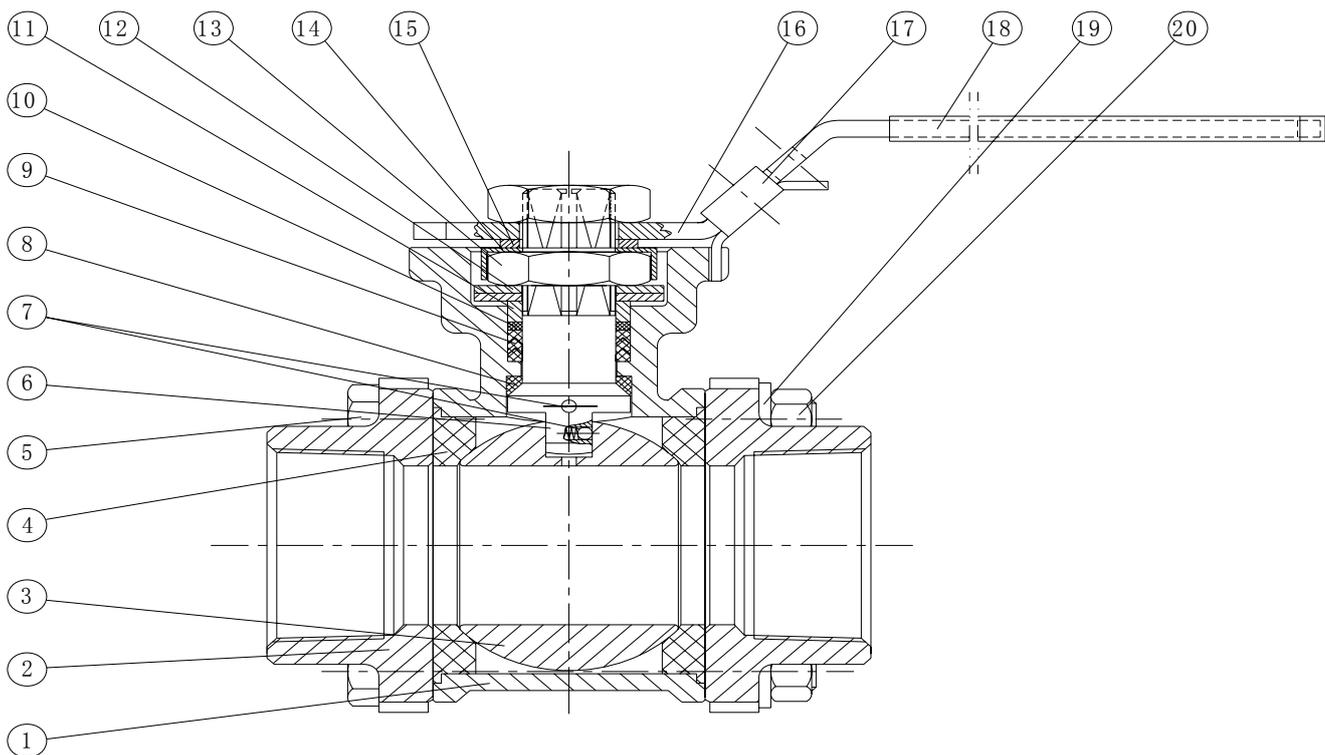
- Should a leakage occur at the gland packing, retighten the stem nut (13).
- Take care that the stem nut (13) is not tighten too much. Normally the leakage can be stopped by simply turning the stem nut or gland by 30° to 60° .

## 2) Replacement of seats and seals

### a) Disassembly of parts is easy, even if the valve is installed in the pipeline:

- Before disassembly, make sure to discharge any hazardous media from the valve inside body cavity.
- Removed all body bolts except one and loosening the remaining one, and valve body can be swung out, and place valve in close position.
- Remove Body gasket and Ball seat (4), and Ball (3). Inspect the ball closely for scratches, if any, the ball should be replaced.
- Whenever the stem seal needs to be replaced, remove parts of upper part in the following order: Handle nut (21), Handle (16), Washer (15), Stop-lock-cap (14), Stem nut (13), Belleville washer (12), Gland (11), Bushing (10).
- Push the stem (6) down into the body cavity & remove it, then remove the stem seal ring (8) and the V-ring packing (9) from the body (1).

**Caution:** Use care to avoid scratching the surface of the stem and packing chamber.



### b) Reassembly

- Clean and inspect all parts, Reassembly processes is the reverse sequence of disassembly.
- Reassemble the Ball Valve by using new Seats, Gaskets and Packing Seals is strongly recommended.
- Follows 4-5) procedures and swings the Body back to original position. Tighten body bolts evenly as per Torque Data in Table C
- Tighten the stem nut (12), using table B stipulated torque figure.
- If possible, test the valve, then cycle valve several times before resuming service.

Table C: Torque figure for flange bolt tighten

Material Bolt Size / Unit	Alloy Steel (B7)		Stainless Steel (B8)	
	IN-LB	N.M	IN-LB	N.M
1/4-20UNC / M6	160	18.1	70	7.9
5/16-18UNC / M8	240	27.2	100	11.3
3/8-16UNC	420	47.5	160	18.1
7/16-14UNC / M10	660	74.7	280	31.7
1/2-13 UNC / M12	1000	113.2	400	45.3

Material Bolt Size / Unit	Alloy Steel (B7)		Stainless Steel (B8)	
	IN-LB	N.M	IN-LB	N.M
5/8-11UNC / M16	2010	227.4	800	90.5
3/4-10UNC / M20	3580	405.1	1400	158.4
7/8-9UNC / M22	5770	652.9	2250	254.6
1-8UNC / M24	8650	978.7	3250	367.7
1,1/8-8UNC / M28	12700	1437.0	4000	452.6