



OPERATING & MAINTENANCE INSTRUCTIONS

ITEM: STAINLESS STEEL & CARBON STEEL BALL VALVE, 2-PIECE,
CLASS 300 FLANGED ENDS, FIRE-SAFE

MODEL NO.: M30F-NDM

SIZES: 1/2" TO 6"

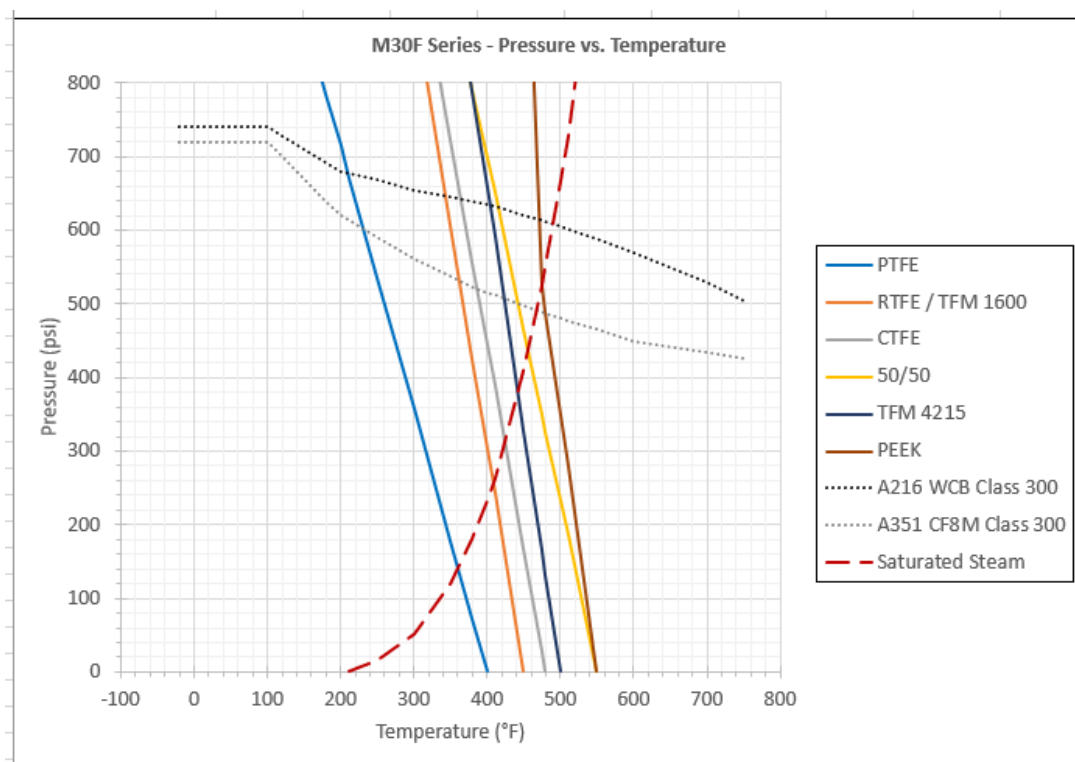
A. BASIC FUNCTIONS OF THE VALVES AND THEIR APPLICATIONS

1. M30F-NDM ball valves are designed for ON-OFF service. They should be used in either fully opened or fully closed position for shut-off service; they are not designed for throttling service, in which the valves are in partially opened or partially closed conditions. Leaving the valves partially opened or closed may cause the balls to deform or to be damaged due to the fluid flow and the leading edge of ball.
2. To open the valve, simply turn the handle in the counterclockwise direction to its fully opened position; the handle will stop at the in-line position to make sure the ball inside the valve is at its fully opened status.
3. To close the valve, simply turn the handle in the clockwise direction to its fully closed position; the handle will appear to be perpendicular to the pipeline to rotate the ball of valve to the fully closed status.

Note: Special attention must be given regarding the movement of handle to its fully opened and closed positions. In case the handle is not stopped at its uttermost position either at the in-line position or at the perpendicular position to pipeline, the valve may not be fully opened or fully closed.

4. The materials used for the construction of M30F-NDM series ball valves are shown in the MATERIALS LIST section in the catalogue. The basic material of valve body & trim (ball and stem) for M30F-S-NDM is Stainless Steel (ASTM Grade CF8M / SS 316), which has good corrosion & erosion resistance. The basic material of valve body for M30F-C-NDM is Carbon Steel (ASTM Grade WCB) and its trim is made of Stainless Steel (Grade CF8 / SS 304). The standard seats are made of TFM 1600 material (Modified PTFE compound; TFM 1600 is a material produced by 3M). TFM 1600 is inert to most chemicals, but its ability to hold pressure decreases as the temperature of flow media rises. The decline starts at 38°C (100°F). At the temperature of 204°C (400°F), the seats are almost incapable to hold any pressure (see the below Pressure-Temperature Ratings chart). Therefore, when the temperature of flow media is higher than 38°C (100°F), special attentions regarding the pipeline pressure must be considered. Valves with TFM 1600 seats are not recommended to be used at the temperature above 180°C (356°F).

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5. Ball valves are Class 300 rated, and are designed for the service under 720 psi (50 bar) working pressure for CF8M valves and 740 psi (51 bar) for WCB valves with the temperature of 38°C (100°F) and below. They should not be used at any working pressure higher than their ratings. Temperatures higher than 38°C (100°F) will decrease the valves' ability to hold pressure due to the nature of seat materials stated above.
6. Ball valves are full port design. Thus, the pressure drop in the system is minimized.
7. For lines with high risk of accidents due to valve operation errors, appropriate markings (tags or color-coded classification) should be attached at the location of valves. It is recommended to use valves with locking device in such applications. The latch lock holes on both the handle stop plate & the mounting pad are designed as a locking device. Simply use a pad lock through the two holes and the valve can be locked in either OPEN or CLOSE position.

B. INSTALLATION OF VALVES TO PIPELINE

SAFETY CAUTION: Before installing or servicing, please ensure the line pressure is relieved and any hazardous fluid is drained or purged from the system. Please also observe the maximum temperature and pressure rating of the valve & the system.

1. **Cleaning:** Prior to connecting ball valves to pipeline, remove sand, mud, rust particles and any other foreign materials from the flange surface of pipe and valve by liquid flushing or blown air.
2. **Spacing:** The Face-to-Face dimensions comply with ASME/ANSI B16.10 (see the dimensional chart in the catalogue). When installing these ball valves into pipelines, be sure to have sufficient and proper space between the pipe flanges for the installation of valves.

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3. **Valve installation:** **First**, hold the pipe in a pipe vice. **Second**, apply proper gaskets between the valve flanges and pipe flanges to prevent leakage between the connection interfaces. **Third**, connect the valve flanges and pipe flanges with bolts & nuts as per the table below. It is important that the flange bolts are tightened evenly.

VALVE SIZE	BOLT SIZE	NUMBER OF BOLTS
1/2"	1/2" - 13 UNC	4
3/4"	5/8" - 11 UNC	4
1"	5/8" - 11 UNC	4
1 1/2"	3/4" - 10 UNC	4
2"	5/8" - 11 UNC	8
2 1/2"	3/4" - 10 UNC	8
3"	3/4" - 10 UNC	8
4"	3/4" - 10 UNC	8
6"	3/4" - 10 UNC	12

- Notes:**
- The valves may be installed in any position on the pipeline.*
 - The pipeline should be free of tension during valve installation.*

C. MAINTENANCE INSTRUCTIONS

M30F-NDM ball valves are designed for high performance and long durability. All components are produced of high-quality materials and are precisely machined, assembled, and tested. Therefore, under normal operation, the valves rarely require regular maintenance. Only after a long period of service time, very frequent ON-OFF operation, or high corrosive flow media service, should the maintenance become necessary and periodic.

The most common problem under the above service conditions is stem leakage due to wear-down of the resilient parts in the stem area. However, these ball valves feature live-loaded packing glands for self-adjustment of stem packing compression, so there is almost no need to manually adjust the packing gland unless after long service hours or under critical conditions.

In the case of stem leakage, the following steps are to be taken:

- First, apply appropriate wrench to evenly fasten the two gland bolts on the top of gland (see the drawing in the catalogue). Tightening the gland bolts will increase pressure to the gland in order to compress the PTFE stem packing (which may have already worn down) to cause tighter contacts with body neck & stem to stop leakage. The sizes of the gland bolts and the fastening torques are per below:

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VALVE SIZE	SIZE OF GLAND BOLTS	FASTENING TORQUES FOR PTFE STEM PACKING	FASTENING TORQUES FOR GRAPHITE STEM PACKING
1/2"	M 6	60 kg-cm (5.9 N-m / 52 In-lbs)	50 kg-cm (4.9 N-m / 43 In-lbs)
3/4"	M 6	60 kg-cm (5.9 N-m / 52 In-lbs)	50 kg-cm (4.9 N-m / 43 In-lbs)
1"	M 8	80 kg-cm (7.8 N-m / 69 In-lbs)	70 kg-cm (6.9 N-m / 61 In-lbs)
1 1/2"	M 10	90 kg-cm (8.8 N-m / 78 In-lbs)	75 kg-cm (7.4 N-m / 65 In-lbs)
2"	M 10	110 kg-cm (10.8 N-m / 95 In-lbs)	95 kg-cm (9.3 N-m / 82 In-lbs)
2 1/2"	M 10	120 kg-cm (11.8 N-m / 104 In-lbs)	100 kg-cm (9.8 N-m / 87 In-lbs)
3"	M 10	130 kg-cm (12.7 N-m / 113 In-lbs)	110 kg-cm (10.8 N-m / 95 In-lbs)
4"	M 12	150 kg-cm (14.7 N-m / 130 In-lbs)	135 kg-cm (13.2 N-m / 117 In-lbs)
6"	M 12	175 kg-cm (17.2 N-m / 152 In-lbs)	160 kg-cm (15.7 N-m / 139 In-lbs)

Note: Tolerances of +/- 10% of the above Fastening Torques are within the acceptable range.

2. If tightening the gland does not stop leakage, the stem packing & thrust washer are probably worn out and require replacement. The steps for replacement are shown in the next section.

The second possible problem under the above service conditions is the seat leakage in close position due to damaged seat. In this case, damaged seats should be replaced with new ones.

M30F-NDM series ball valves are of 2-piece construction. If replacing resilient parts is necessary, we recommend contacting Sesto Valves for technical support. Any replacement of resilient parts such as stem packing, thrust washer, seats, and body joint gasket is suggested to be done at a Sesto Valves facility.

When disassemble the valves, the following steps are to be taken:

- a. Place the valve with its flange facing up. There are four to twelve body joint bolts per valve (see table on next page). Unfasten the bolts in a star-shaped sequence. Take out the bolts to separate the body & cap.
- b. Turn the ball to the closed position, so that the ball can be taken out. New PTFE seats & body joint gaskets can be replaced at this position.
- c. In case there is need to replace stem packing & thrust washer (see the drawing in the catalogue), first apply appropriate wrench and torque counterclockwise to loosen the two gland bolts on the top of gland. Take out the gland. Press the stem from the top toward the inside body and then the stem is free to be removed; the stem packing and thrust washer can then be replaced.

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d. After replacements are done, the valves should be re-assembled and tested. It is important that the gland bolts are tightened properly. The fastening torque is listed in the table below. **The body joint bolts should be tightened when the valve is in the closed position.** Evenly tighten the body joint bolts to keep the body and cap in perfectly parallel position; thus, to prevent any distortion to the end cap that may cause leakage. When tightening the bolts, pay special attention to the tightening sequence – the bolts should be tightened in a cross-corner sequence, to avoid any uneven tightness. The bolts should be tightened evenly until the cap is in contact with the body (metal to metal).

- Notes:**
1. ***The pressure in the pipeline should be relieved before disassembling the valves. Any fully closed or fully opened valves could hold pressure in the body cavity for an extended period of time, especially with high temperature media. Therefore, before removing valves from the pipeline, turn the valves to their partially opened position to relieve pressure.***
 2. ***For valves in hazardous media service, decontamination procedures must be taken before disassembling the valves.***

VALVE SIZE	SIZE OF BODY JOINT BOLTS	NUMBER OF BOLTS	FASTENING TORQUES
1/2"	M 8	4	248 In-lbs (28 N-m)
3/4"	M 8	4	248 In-lbs (28 N-m)
1"	M 10	4	398 In-lbs (45 N-m)
1 1/2"	M 12	4	673 In-lbs (76 N-m)
2"	M 12	4	708 In-lbs (80 N-m)
2 1/2"	M 12	6	885 In-lbs (100 N-m)
3"	M 14	6	885 In-lbs (100 N-m)
4"	M 14	8	974 In-lbs (110 N-m)
6"	M 16	8	1239 In-lbs (140 N-m)

Note: Tolerances of +/- 10% of the above Fastening Torques are within the acceptable range.

D. STORAGE OF VALVE

When storing M30F-NDM ball valves, care should be taken to leave the valves fully opened to protect the surfaces of balls and seats.