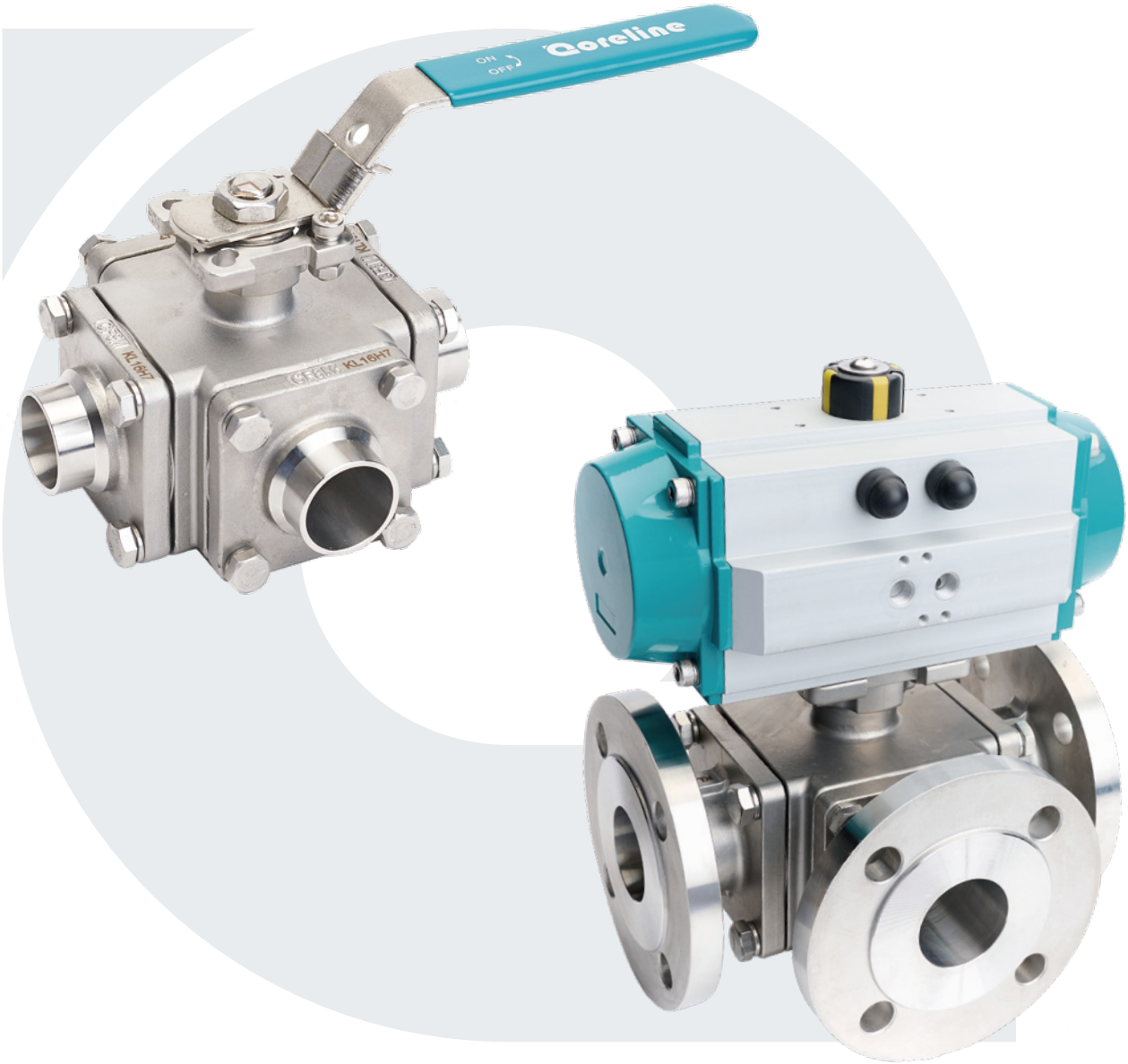
Coreline

Installation-Operation-Maintenance Manual

3/4 way ball valve

Fig.165



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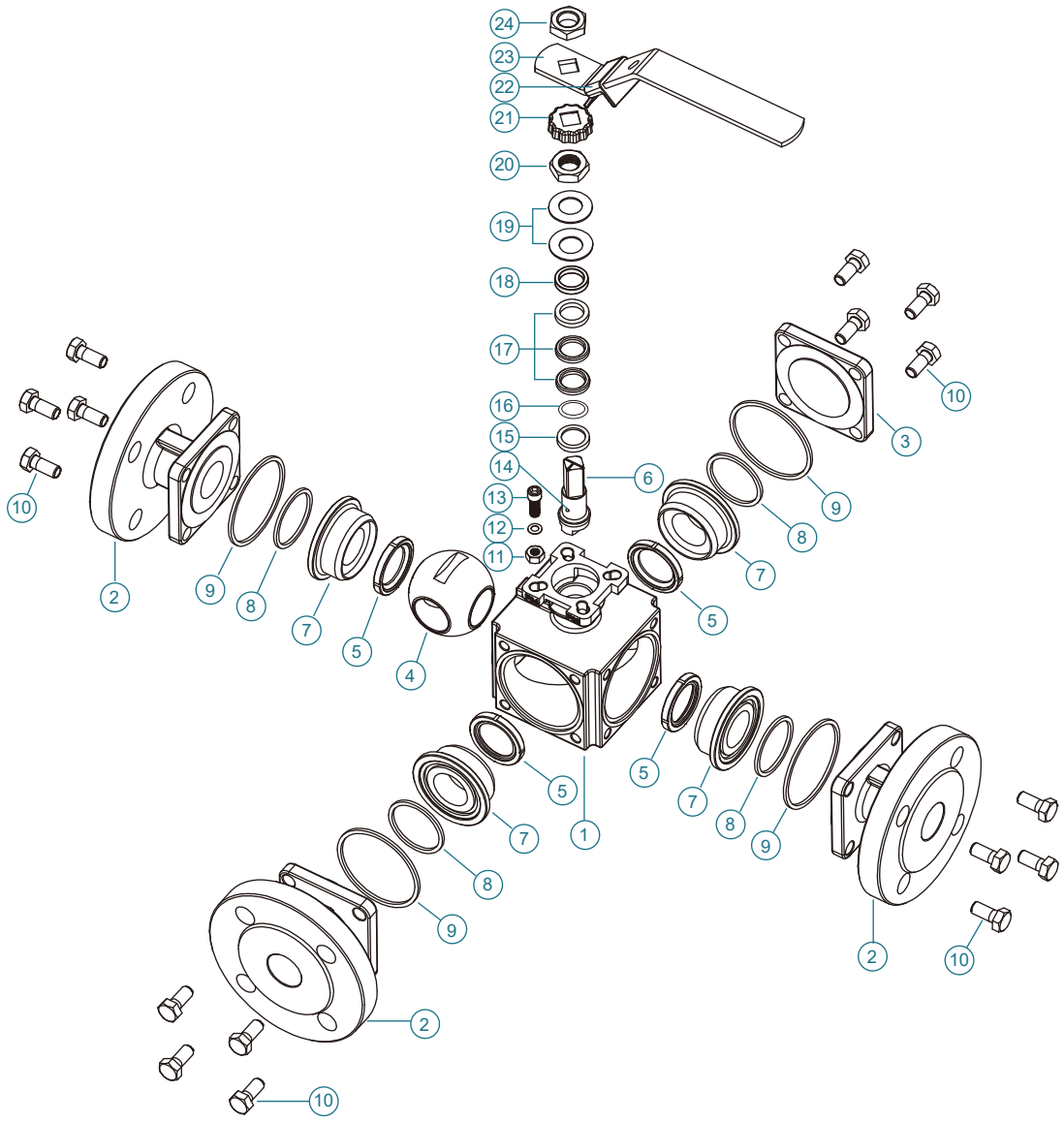

Material part list

No.	Part name	Material			No.	Part name	Material		
1	Body	A351 CF8M	A351 CF8	A216 WCB	13	Stop bolt	SS304		
2	1) End cap	A351 CF8M	A351 CF8	A216 WCB	14	Anti-static device	SS316	SS304	SS304
3	2) End cap	A351 CF8M	A351 CF8	A216 WCB	15	Stem seal	PTFE		
4	Ball	SS316	SS304	SS304	16	O-ring	FPM		
5	Seat	PTFE			17	V-packing	PTFE		
6	Stem	SS316	SS304	SS304	18	Packing gland	SS304		
7	Support ring	A351 CF8M	A351 CF8	A216 WCB	19	Belleville washer	SS301		
8	Gasket 1	PTFE			20	Stem nut	SS304		
9	Gasket 2	PTFE			21	Stop lock cap	SS304		
10	End cap bolt	SS304			22	Handle lock device	SS304		
11	Nut	SS304			23	Hand lever	SS304		
12	Washer	SS304			24	Stem nut	SS304		

1) End caps can be exchangable between flanged type and butt welded type.
2) 4-way valve: change this part to be No. 2 end.
3) CF3M end cap is standard for a SS316 butt welded ball valve.

Preparation

- The valve may be installed in any position on the pipeline.
- Make sure the pipeline is correct. Angular or linear misalignment will result in high operational torque and leakage between the body and end caps.
- The pipeline should be supported and the space between the pipe endings must corrospond to the face-to-face dimension of the ball valve.
- 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. Make sure the ball valve is in full open position and must not be operated before rinsing completed.

Disassembling the valve from the pipeline

- If the valve has been used with hazardous media, it must be decontaminated before disassembly.
- As shipped from the factory, some of the valve internal parts contain silicone-free lubricant.
- Before replacing the stem sealing and packing, the pipeline must be de-pressurized as follows:

  1) Open the valve to completely drain the media in the pipeline.

  2) Before removing the valve from the pipeline, carefully close and open the valve to release any pressure that may remain in the valve.

  3) Remove the flange bolts and the nuts, and then carefully lift the valve from the line to avoid scratching or damaging the serrated gasket. The valve can be heavy and it should be adequately supported before removing it from the pipeline.

  4) Place the valve vertically after removing it from the pipeline, then open and close the valve repeatedly to discharge the residual media in the ball cavity.

Disassembly of the valve

1) Fix the ball valve body (1) on the workbench with the flange surface downwards, and turn the valve stem (6) to close the valve.
2) Loosen the handle lock nut (24) and remove the handle (23), then remove the stop lock cap (21) and stem nut (20), and then remove the belleville washer (19) and packing gland (18).
3) Use a proper wrench to remove the end bolts / end cap bolts(10), then slide off all ends (2) and the end cap (3).
4) Press and pull inside of the support ring (7) to remove it from the valve body. The gaskets (8, 9) and the seats (5) should come out with the support rings. Remove the gaskets and the seats from the support rings.

IMPORTANT: Once the end caps and support rings are removed, the ball can be removed from the valve body. Caution should be taken to avoid damaging the ball.

5) Carefully take out the ball (4) from the valve body cavity to avoid any scratches to the ball surface.
6) Take the valve stem (6) out of the valve body cavity.
7) Slightly tap to the bottom of the stem packing (17) to release the packing gland (18) and packing from the recess of the stem hole.
8) Remove the O-ring (16) and stem sealing (15) from the valve stem.
9) Clean and inspect the metal parts. It is not necessary to replace neither ball nor stem unless the surface has signs of abrasion or corrosion.
10) Coreline strongly recommend replacing all soft parts (seats, gaskets, packing, stem seal, O-ring) whenever the valve is disassembled for reconditioning. We provide replacement kits that contain all the replaceable parts.

Assembly of the valve

1) Put the stem sealing ring (15) and O-ring (16) on the valve stem (6).
2) Fix the ball valve body (1) on the workbench with the flange surface downwards, install the valve stem (6) from the valve body cavity up into valve stem hole.
3) Install the stem packing (17) in the center recess of the body stem hole from the top, then install the packing gland (18).
4) Install the belleville washer (19) and slightly tight the stem nut (20).

5) Turn the valve stem (6) so the flat-machined side of the stem is in line with the valve channel, then carefully place the ball (4) into the valve body so the ball groove matches with the flat stem end.
6) Install the seats (5), gaskets 1 (8) on the support ring (7), then carefully attached it to the valve body. Then install gaskets 2 (9) into the groove between the support ring and the valve body.
7) Carefully attach ends / the end cap (2, 3) to the valve body (1). Properly pre-tighten the end cap bolts (10).
8) Turn the valve stem to open and close the valve several times, so that the ball is in the closed position, tighten all the end cap bolts (10) in “star” pattern with proper torque.

Size	15	20	25	32	40	50	65	80	100
End cap bolts Torque [Nm]	6-8	15-18	15-18	28-39	28-39	50-60	80-110	120-140	120-140

9) Turn the valve stem to open and close the valve several times again, so we can feel the open and close process is flexible and free from jamming.

IMPORTANT: 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.

10) Tighten the stem nut (20) with proper torque, install the stop lock cap (21).

Size	15	20	25	32	40	50	65	80	100
Stem nut Torque [Nm]	18-22	25-35	25-35	25-35	45-60	45-60	45-60	70-100	70-100

11) Install the handle (23) and tight the handle lock nut (24).
12) Adjust the stop bolt (11, 12, 13).
13) If possible test valve before placing it back into pipeline.

Troubleshooting

Problem	Corrective solutions
Leakage between the body and end caps	Repair and clean the sealing surface; and/or replace seats and gaskets; and/or tighten bolts evenly in “star” pattern
Leakage by stem packing	Tighten stem nut or replace packing and stem sealing
Stem operation is not flexible	Properly loosen the stem nut; and/or evenly loosen the end cap bolts; and/or try thicker gaskets and reduce the preload tight force of the end cap bolts (Be careful to avoid leakage between body and end caps)
Leakage by seat sealing	Tighten end cap bolts evenly and crosswise to increase the pre-tightening force; and/or replace the seats and gaskets.
The valve cannot be operated/turned	Important: Not to use force to operate the valve in this situation. Loosen the stem nuts and remove the stem stress before operation; and/or loosen the packing if it is too tight

Maintenance

- Routine maintenance

  Regularly inspections are required to ensure that the valves are operating properly. This includes regular tightening of the stem nut so that it can compensate the wear of sealing by valve stem.
- Overhaul maintenance

  It requires replacement of all soft parts (seats, gaskets, packing, stem seal, O-ring). Coreline provide replacement kits that contain all the replaceable parts.

Coreline
Add: No.4 Wangjiang Road, Muqiao Town, Zhengpugang New District, 238200 Hexian, Ma'anshan City, Anhui Province, China
Http: // www.coreline.dk E-mail : mail@coreline.cn