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Operation and Maintenance Manual

Floating Ball Valves FF/FC Series



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CONTENTS:

- 1: Application Scope and Technical Parameters
- 2: Valve Structure
- 3: Main Parts and Materials of construction
- 4: Working Principle and Valve Structure Description
- 5: Disassembly
- 6: Reassembly
- 7: Valve Storage, Maintenance, Installation and Application
- 8: Troubleshooting
- 9: Quality Warranty and Servicing

1 Application Scope and Technical Parameters

1.1 Application scope

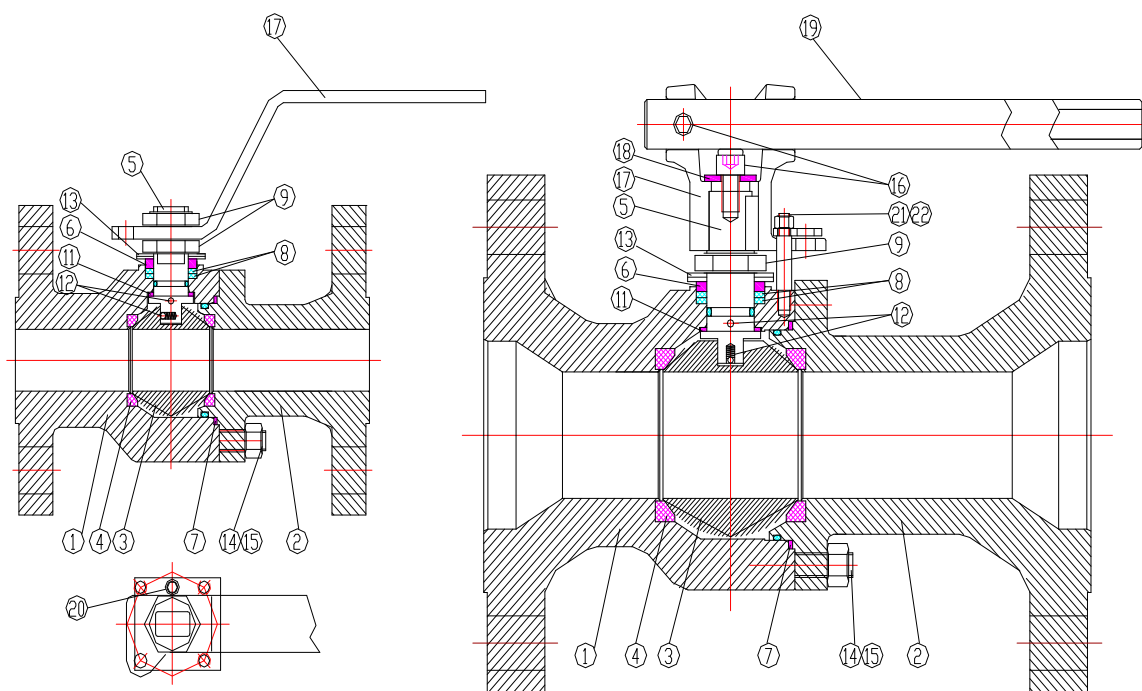
The series FF/FC floating ball valves are widely used in petroleum, chemical, power plant and allied industries for normal operation of the associated pipeline systems.

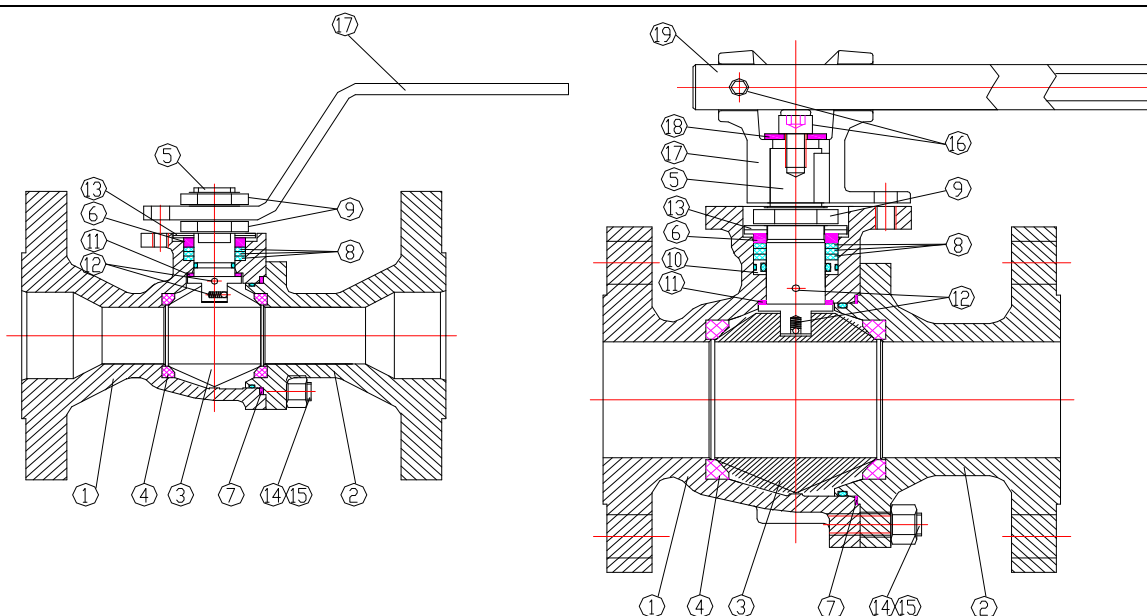
1.2 Technical Parameters:

Nominal pipeline size:	1/2"~12"
Nominal pressure:	FC series: 150~300LB; FF series: 150-2500LB
Basic Design:	ANSI B16.34/ BS5351
Face to Face:	ASME B16.10
End Flange:	ASME B16.5
Temperature range:	≤300°F
Fluid:	Water, oil, steam and other kinds of fluid
Body material:	Material as specified in ANSI B16.34
Trim material:	Material as specified in BS 5351
Valve testing:	API598

2 Valve Structure:

Please refer to Fig 1 and Fig 2 below for Series FF and FC valve structure.





- Valve dimensions and weight please contact the seller.

Main Parts and Materials of construction

No	Parts	Materials				
1	Body	A216 WCB	A351CF8	A351CF8M	A105	A350 LF2
2	End Adaptor	A216 WCB	A351CF8	A351CF8M	A105	A350 LF2
3	Ball	See trim material				
4	Seat Ring	PTFE/Nylon				
5	Stem	See trim material				
6	Gland	A276-410	A276 304	A276 316	A276 -410	A276-410
7	Gasket	Stainless Steel & Flexible Graphite				
8	Packing	PTFE/GRAPHITE				
9	Nut	A194-8M				
10	Oring Nog	A276 316				
11	Thrust Plate	PTFE				
12	Antisistatic	Stainless Steel				
13	Dished Spring	Alloy Steel				
14	Bolt	A193-B7	A193-B8		A193-B7	A320-L7
15	Nut	A194-2H	A194-8		A194-2H	A194-4
16	Screw	A193-B7	A193-B8		A193-B7	A320-L7
17	Wrench	Carbon Steel				
19	Pipe	Carbon Steel				
20	Position Screw	Alloy Steel				
21	Nut	Stainless Steel				
22	Position Pin	Alloy Steel				

Trim Material

Ball	Stem
F6a	F6a
F304	F304
F316	F316
A105/ENP	A105/ENP
LF2/ENP	LF2/ENP

Working Principle and Valve Structure Description

2.1 Working Principle:

The function of the ball valve is to isolate the flow through the pipeline. Ball valves are not suitable for flow control. When the valve is operated by the wrench or other actuator, it rotates through 90 degrees and the valve opens/closes.

2.2 Structure Description:

This series uses Shaft seal packing using PTFE/GRAPHITE as the stem packing material. Sealing between the Body and End adaptor is achieved using a flexible graphite gasket.

The stem head design is Double "D" providing mounting of the wrench operator parallel to the pipeline and hence the flow of the media. The stem has an integral collar at the lower end of the stem to ensure that it is blowout-proof. An antistatic feature is provided to ensure electrical continuity between ball, stem and body.

The valves are firesafe design. In the event of fire the soft seals will be damaged.

The design includes secondary metal seals that maintain the integrity of the pressure envelope by ensuring:

Sealing between ball and body;

Sealing between stem and body;

Sealing between coupling flanges of the split body design.

End connections are flanged.

3 Disassembly

When disassembly of the valve is required (for example for periodical maintenance or for the installation of replacement seals) refer to the structural drawing and follow the procedure detailed below. Ensure a risk assessment has been conducted before attempting any work.

3.1 Gear Operator / Actuator

3.1.1 Remove the bolts attaching the gearbox or actuator and remove the gear operator or power actuator

3.1.2 Remove the bolts attaching any mounting bracket.

3.1.3 Remove the mounting bracket

Move to 5.3 – Gland removal

3.2 Lever

3.2.1 Remove the screw and washer fastening the Lever / Tbar adaptor and Keyway

3.2.2 Remove the Lever / Tbar adaptor and Keyway

3.2.3 If applicable remove the nut and the stop plate

Move to 5.3 – Gland removal

3.3 Gland removal

3.3.1 Remove the gland

Move to 5.4 – End Adaptor

3.4 *End Adaptor*

- 3.4.1 Loosen the bolts that join the end adaptor and body
- 3.4.2 Remove the End Adaptor.
- 3.4.3 Carefully remove the seat from the end adaptor and check the seat for any damage
- 3.4.4 Check the end adaptor O-Ring and gasket for damage
Move to 5.5 – Ball

3.5 *Ball*

- 3.5.1 To aid removal of the ball, rotate the ball to the closed position
- 3.5.2 Remove the ball from the body and check the ball for any damage
- 3.5.3 Ensure that the Antistatic device is not damaged.
- 3.5.4 Carefully remove the seat from the valve body and check the seat for any damage
Move to 5.6 - Stem

3.6 *Stem*

- 3.6.1 Remove the stem and PTFE thrust washer from the body
- 3.6.2 Ensure that the Antistatic device is not damaged.
- 3.6.3 Check the stem for any damage
- 3.6.4 Remove the Packing from the stuffing box and check it for damage.
- 3.6.5 If present remove the O Ring box and check both O rings.

This completes the disassembly

4 Reassembly

Parts should be cleaned carefully prior to reassembly. Refer to the structural drawing, and check that all parts are available and not damaged. It is recommended that a soft parts kit with new seats, o rings and gaskets is used when reassembling the valve. Valves should be pressure tested prior to them being returned to service. It is recommended that the valve is reassembled in this order.

4.1 *Body Assembly*

Ensure that the body cavity is clean and free from any agents that may damage the seats, O ring material or gaskets.

- 4.1.1 Press the seat into the recess machined in the body
- 4.1.2 Slide the thrust washer on to the stem
- 4.1.3 Slide the stem through the top hole machined in the body from the inside. Be careful to not damage the thrust washer.
- 4.1.4 Align the groove on the top of the ball with the stem and allow the ball to rest in the body cavity.
- 4.1.5 Thread the body studs into the tapped holes.

4.2 *End Adaptor*

- 4.2.1 Press the seat into the End Adaptor
- 4.2.2 Install the gasket and O ring on the End Adaptor
- 4.2.3 Carefully align the End Adaptor on the body and press into place. Make sure that the stem moves freely. Tighten nuts around the body. If there are 12 nuts,

imagining a clock face they should be tightened in the order 12, 6, 9, 3, 11, 5, 2, 8, 7, 1, 4, 10. Note that nuts are tightened in opposites to ensure even compression of the gasket.

4.3 Gland

- 4.3.1 Put O rings into the O ring box and put this into the stuffing box when installed.
- 4.3.2 Put the packing rings into the stuffing box
- 4.3.3 Put the dished spring/washer onto the stem. Ensure that the washer is installed with the outer edges in contact and the inner edge on the gland and retaining nut when installed.
- 4.3.4 Install retaining nut on the stem and tighten

4.4 Gear operator / Tbar Operator

- 4.4.1 Install the mounting plate, tighten the bolts (Not for Tbar Operator)
- 4.4.2 Install keyway on the stem
- 4.4.3 Install gear operator on top flange and tighten the bolts or install T Bar operator fix with washer and fixing screw.

4.5 Lever

- 4.5.1 Install stop plate
- 4.5.2 Install retainer/thrust washer
- 4.5.3 Install lever
- 4.5.4 Install washer and tighten the screw

This completes the reassembly – *Pressure test the valve prior to use.*

5 Valve Storage, Maintenance, Installation and Application

- 5.1 Valve should be stored in a suitable environment free from moisture. The bore should be blanked and the flange sealing surface protected.
- 5.2 Valves stored for more than 2 years should re-inspected and tested prior to use.
- 5.3 Care should be taken to ensure that sealing surfaces are not damaged if valves require cleaning prior to use. If necessary, valves shall be re-pressure tested prior to use.
- 5.4 Ensure that that valve supplied is suitable for the line media, pressure and temperature prior to installation and use.
- 5.5 Verify the Test Certificates match the valve and verify materials.
- 5.6 Check that the valve identification tag matches the certificates and verify suitability for operation requirements
- 5.7 Check the bore and the sealing surface prior to installation, foreign media should be removed with a clean soft cloth.

5.8 If the valve is acutated verify suitability for the application

5.9 After installation the valve must be fully opened prior to the pressure test of the pipeline or the system.

5.10 The valve must be fully opened or fully closed during operation. It is not recommended to partly open the valve for adjustment of flow rate. Regular maintenance to remove excessive dust, grease and fluid residues on the surfaces of the body and stem should be completed to prevent premature wear or corrosion

6 Troubleshooting

The valves supplied are manufactured to the highest standards and should provide trouble free performance. In the event that there are issues, please check the following:

Failure	Cause	Troubleshooting
Leakage from packing	Gland nuts/nut loose	Tighten Nut
	Packing shortage	Add packing
	Packing failure due to age.	Replace with new packing.
	Stem damaged.	Check the stem during pipeline maintenance, repair or replace the damaged stem.
Leakage on seats	Foreign matter on Sealing surface	Clean the seats.
	Seating surface damaged.	Repair or replace the Seating surface.
Operational failure	Packing too tight	Loosen gland flange nuts
	Bent Stem	Rectify or replace the stem.
	Foreign body between stem, gland / gland flange.	Investigate and remove.
Leakage between Body / End Adaptor flanges	Body / End Adaptor flange bolts loose	Tighten nuts in accordance with procedure 6.2.3
	Gasket failure	Replace the gasket.

7 Quality Warranty and Servicing

7.1 Quality Warranty

7.1.1 The manufacturer warrants its valves to the original purchaser for a period of 18 months from and after the date of delivery to the original customer

7.1.2 The manufacturer will repair or replace valves that are found to have a quality

problem resulting from manufacture.

- 7.1.3 Any issues resulting from misuse through improper application or usage, improper installations, improper maintenance and repairs, modifications or alterations will invalidate any warranty and any costs incurred will be to the purchasers account.

7.2 *Servicing*

- 7.2.1 Where contractually specified, the manufacturer may provide field installation and adjustment. The terms for this must be agreed in writing prior to sale.
- 7.2.2 The manufacturer maintain the quality of the valve and provide servicing to customer requirements.