

April 2011

## Tartarini™ Floating Ball Valve

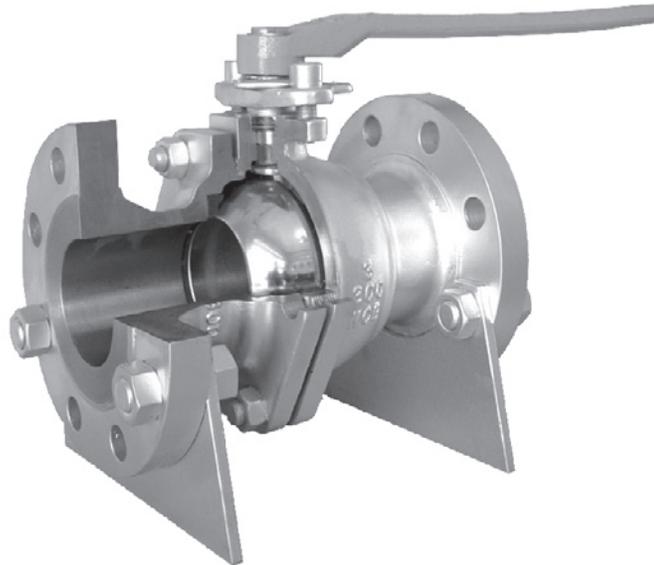


Figure 1. Tartarini™ Floating Ball Valve

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### WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire, and/or chemical contamination causing property damage and personal injury or death.

Tartarini™ valves must be installed, operated, and maintained in accordance with federal, state, and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. (Regulator Technologies) instructions.

# Floating Ball Valve

## Specifications

### Body Sizes

DN 25, 50, 80, 100, and 150 /  
1, 2, 3, 4, and 6-inches

### End Connections

CL150, CL300, and CL600<sup>(1)</sup>

### General Design Standard

Meets API608 / API6D standards

### Pressure-Temperature Rating

Meets ASME B16.34 standards

### Face-to-Face Dimensions

Meet ASME B16.10 standards

### Flange Type and Dimensions

Meet ASME B16.5 standards

### Construction Materials

Refer to Tables 1 and 2

### Inspections and Test

Meet API598 / API6D standards

### Flow Coefficient ( $C_v$ value)

Refer to Table 3

### Working Temperature

-20° to 60°C / -4° to 140°F

### Approximate Weights

Refer to Table 6

1. CL600 is available for DN 25 and 50 / 1 and 2-inch bodies only

**If the valve vents fluid or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.**

**Installation, operation, and maintenance procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Use qualified personnel when installing, operating, and maintaining the Tartarini™ Floating Ball Valve.**

## Introduction

### Scope of the Manual

This instruction manual provides valve installation, assembly, disassembly, and maintenance instructions, troubleshooting guide, and parts ordering information of Tartarini Floating Ball Valve.

### Description

Floating Ball Valve is a general-purpose valve. It is used for long range oil and gas pipelines, petrochemical, oil refining, gas, metallurgy, chemical, food, and other related industries. Its primary function is to cut off the flow along the pipeline.

## Principle of Operation

The main function of floating ball valve is to cut off or allow the flow passage along the pipeline. It is manually operated using a hand lever which drives the ball to cut off or allow the flow passage. The valve is open when the hand lever is parallel with the flow passage or the pipeline. The valve is closed when the hand lever is perpendicular with the pipeline. See Figure 2.

Rotate hand lever 90 degrees clockwise to close the valve and cut off the flow. Turn the hand lever 90 degrees counterclockwise to open the valve and allow the flow. When using handwheel as driving device, use the same rotational direction. Refer to Figure 3.

## Installation



### WARNING

**Personal injury or system damage may result if this ball valve is installed where service conditions could exceed the limits given in the Specifications section.**

**Additionally, physical damage to the ball valve may result in personal injury or property damage due to escaping of accumulated fluid. To avoid such**

# Floating Ball Valve

**Table 1. Construction Materials for Floating Ball Valve Forged Steel Body**

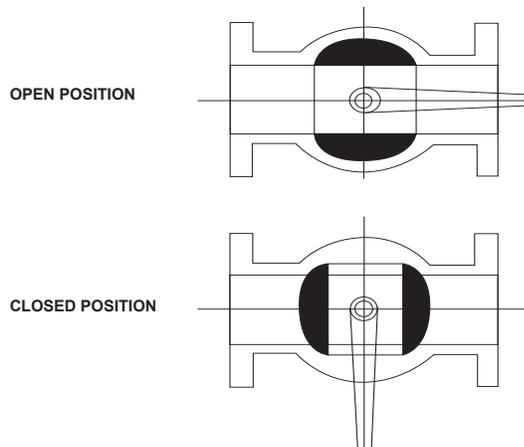
PART	CAST STEEL SERIES	NACE SERIES	STAINLESS STEEL SERIES		LF2 SERIES
	A105	A105N	A182-F304 / F304L	A182-F316 / F316L	A350LF2
Body	A105	A105N	A182-F304 / F304L	A182-F316 / F316L	A350LF2
Ball	A105+HCr	A105N+ENP	A182-F304 / F304L / +HCr (Nitriding)	A182-F316 / F316L / +HCr (Nitriding)	A350LF2+HCr
Stem	F6A / F304	F304 / 316	A182-F304 / F304L	A182-F316 / F316L	A182-F304
Seat	RPTFE ( <i>standard</i> ) / NYLON (High-pressure) / PPL (High-temperature)				
Packing	PTFE / PPL				
Gasket	PTFE / NYLON / PPL				
Bearing	PTFE / PPL				
Stud	A193-B7	A193-B7M	A193-B8	A193-B8 / B8M	A320-L7
Nut	A194-2H	A194-2HM	A194-8	A194-8 / 8M	A194-4

NOTES:  
 1. All materials conform to ASTM specifications.  
 2. Materials above are general valve design standards. Other materials not listed above may be provided. Please contact your local sales office for availability.

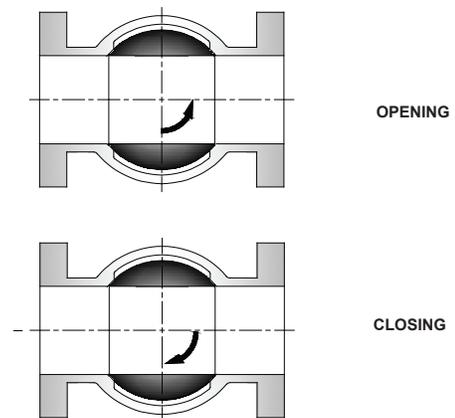
**Table 2. Construction Materials for Floating Ball Valve Cast Steel Body**

PART	CAST STEEL SERIES	NACE SERIES	STAINLESS STEEL SERIES		LCC, LCB SERIES
	WCB	WCB	CF8, CF3	CF8M, CF3M	LCC, LCB
Body	A216-WCB	A216-WCB	A351-CF8 / CF3	A351-CF8M / CF3M	A352-LCB / LCC
Ball	A105-1025+HCr	A105N+ENP	F304 / F304L	F316 / F316L	F304
Stem	F6A / F304	F304 / 316	A183-F304 / F304L	A182-F316 / F316L	A182-F304
Seat	RPTFE ( <i>standard</i> ) / NYLON (High-pressure) / PPL (High-temperature)				
Packing	PTFE / PPL				
Gasket	PTFE / NYLON / PPL				
Bearing	PTFE / PPL				
Stud	A193-B7	A193-B7M	A193-B8	A193-B8 / B8M	A320-L7
Nut	A194-2H	A194-2HM	A194-8	A194-8 / 8M	A194-4

NOTES:  
 1. All materials conform to ASTM specifications.  
 2. Materials above are general valve design standards. Other materials not listed above may be provided. Please contact your local sales office for availability.



**Figure 2. Open and Closed Position Indicator**



**Figure 3. Ball Valve Opening and Closing Direction**

# Floating Ball Valve

**Table 3.  $C_v$  Flow Coefficients**

BODY SIZE		REDUCED BORE	FULL BORE
DN	Inches		
25	1	----	100
50	2	165	490
80	3	350	1160
100	4	550	2200
150	6	765	5100

**NOTE:**  $C_v$  indicates the gallons of water at 16°C / 60°F flowing through the valve bore in 0.069 bar / 6.9 KPa differential pressure.

**Table 4. Recommended Distance of the Weld Seam from the Valve Seal**

VALVE SIZE		DISTANCE TO WELD SEAM	
DN	Inches	mm	Inches
25 to 80	1 to 3	50	1.97
100 to 150	4 to 6	70	2.76

**NOTE:** These data also apply to the preheating work before welding.

### **injury and damage, install the ball valve in a safe location.**

Before installing the ball valve, thoroughly check the specifications stamped in the nameplate of the valve body and other documents that come with it. Make sure that it matches the specifications being ordered and is consistent with the installation requirements.

Inspect the valve chamber and the sealing surface for any shipment damage and make sure that it is free of any dirt or foreign material that may have collected during shipment. Use clean soft cloth to remove any dirt before installation.

#### **Note**

**Do not turn the driving device or switch the valve from open to closed position without making sure that the valve chamber is clean. Doing so may cause the valve and the valve seat to be damaged by the dirt, rust, and other residual impurities.**

Check if the operation of the valve's driving device moves freely from the fully open to fully closed position. Make sure that it is not jammed and its bolts and nuts are tight.

The ball valve is in the fully open position at the time of delivery. When installing the valve in the pipeline, make sure it is in the fully open position.

When installing large-diameter ball valve, place the valve on a separate platform to serve as a support in order to allow horizontal movement of the valve during installation. Do not let the pipeline bear the entire weight of the valve to avoid deformation of the pipeline.

The ball valve may be installed either horizontally or vertically and in any location. However, make sure that the valve can be accessed easily during maintenance, repair, and operation.

The valve can be flanged or welded to the pipeline. The customer can choose whether to connect both or either ends with bolts (flanged) or with weld.

#### *For Welded Connection*

#### **Note**

**Do not install the valve while welding pipe fittings or connections or immediately after any welding activity within the pipelines.**

The valve's body is coated with anti-corrosion material. Remove this material before welding.

When welding the valve to the pipe, make sure that the temperature of the sealing inside the valve should not exceed 140°C / 284°F. The safe distance between the weld and the valve seat sealing is shown in Table 4.

Do not allow any welding slag or foreign materials to enter the valve during the welding process. This might clog the seat and can cause damage to the valve seat during operation.

## For Flanged Connection

When installing the ball valve to the pipelines, tighten all the bolts evenly in a crisscross pattern.

## Commissioning

The ball valve has been pre-commissioned at the factory. Confirm with your engineering department if secondary commissioning of the valve is necessary.

## Hydraulic Pressure Test



### WARNING

**The test pressure should not exceed 1.5 times of the rated or allowable operating pressure of the ball valve. However, do not exceed the maximum allowable pressure rating of the pipeline system or any equipment attached to it during Hydraulic Pressure Test.**

#### Note

**Use only clean water when performing hydraulic pressure test. Ensure that the entire pipeline system is free from dirt and impurities before the pressure test of the valve.**

Ensure that the valve is in the fully open position and the pipeline and ball valve are clean.

After filling the pipe with clean water, rotate the driving device clockwise to turn the ball valve to the closed position. Check for any leaks.

Slowly open the valve again to about 10 degrees by rotating the driving device counterclockwise. Through this, the pressure can evenly act on the valve seat. This will also protect the ball valve when test pressure exceeds the rated pressure of the valve.

After the hydraulic pressure test, turn the ball valve to the fully open position and empty out the water in the pipeline.

If the ball valve is equipped with test connection port, use this to drain the remaining water in the valve chamber. Open the test connection port then open the ball valve once or twice to ensure that all remaining water inside are drained. After draining, close the test connection port. If the ball valve is not equipped with test connection port, open the valve once or twice to ensure full drainage.

## Startup



### WARNING

**To avoid possible personal injury, equipment damage, or leakage due to escaping fluid, make certain the ball valve is installed as instructed in the Installation section.**

**If the ball valve is equipped with test connection port, make sure that it is fully closed before pressurizing the valve.**

#### Note

**The valve is only intended to block or allow flow through the pipeline. The valve should only be used in either fully open or fully closed position. Do not use this valve to regulate flow by partially opening or partially closing the valve. The valve should not stay in a semi-open or semi-closed state for more than two minutes.**

Do not use the ball valve in process conditions where the pressure, temperature, media conveyed, and other technical conditions that exceed the limitations set by the valve's specifications.

Do not use the valve as a ladder or pedestal when reaching equipment located above the valve. Do not hang additional weights to the stem, drive, or other related accessory of the valve. Do not use wrenches or any lever to operate as the driving device of the valve.

1. Check that proper installation is completed and any downstream equipment has been properly adjusted.
2. Ensure that the pipeline system is free of foreign materials before the startup.
3. Make sure that the ball valve is fully turned to the open position before allowing fluid to pass through the valve.

# Floating Ball Valve

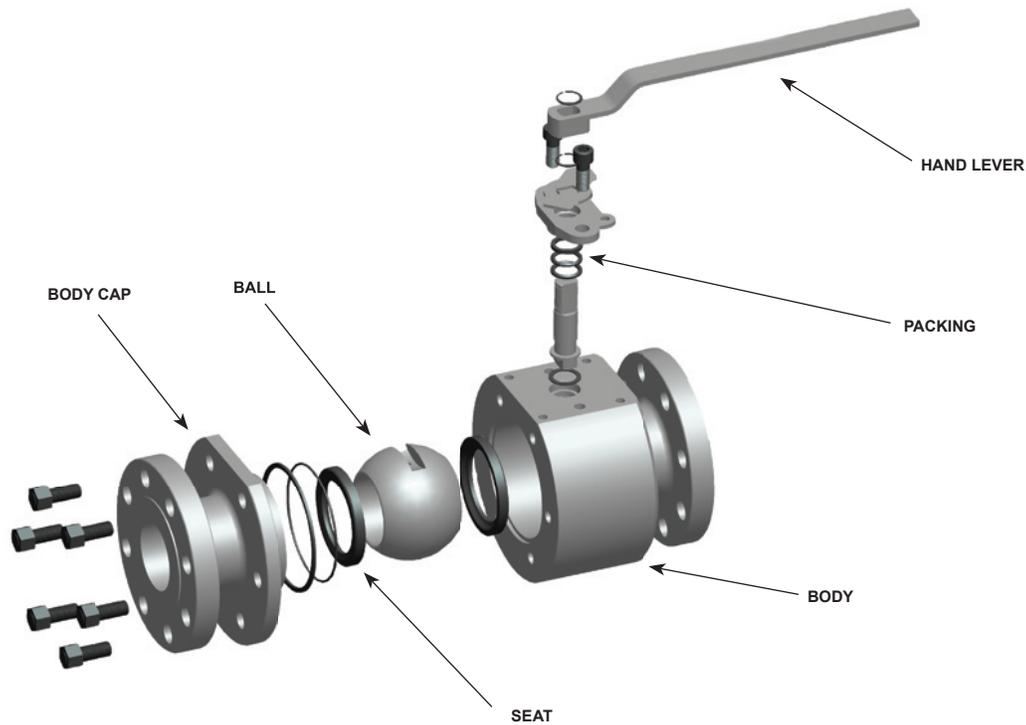


Figure 4. Exploded View of Tartarini™ Floating Ball Valve Assembly

## Maintenance

Floating Mounted Ball Valve does not need special care under normal conditions. However, the following pointers help maximize the valve's life.



### WARNING

**Personal injury, equipment damage, or leakage due to escaping fluid may result if seals are not properly lubricated or maintained. Due to normal part wear or damage that may occur from external sources, this ball valve should be inspected and maintained periodically. The frequency of inspection, maintenance, and replacement of parts depend upon the severity of service conditions or the requirements of local, state, and federal regulations.**

**Ball valves that have been disassembled for repair must be tested for proper**

**operation before being returned to service. Only parts manufactured by Regulator Technologies should be used for repairing Tartarini™ ball valves.**

### Note

**In the repair or maintenance process, take appropriate protective measures, such as protective clothing, oxygen masks, and gloves. Discharge the residual materials inside the valve body before doing repair or maintenance procedure.**

- Switch hand lever position from fully open to fully closed or vice versa 2 to 3 times during long time service or operation and return it back to its original position. This should be done for at least once a year and/or during overhauling of the pipelines.
- Regularly check if the ball valve is set at the desired position whether fully open or fully closed. If the ball valve cannot be switched to either fully open or fully closed position, valve service is required.

# Floating Ball Valve

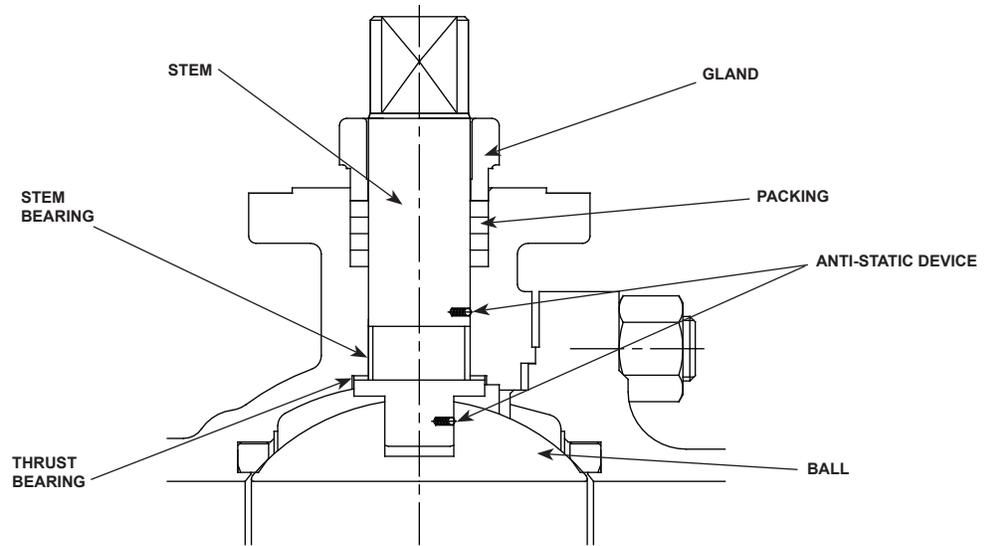


Figure 5. Detailed Stem Construction Assembly

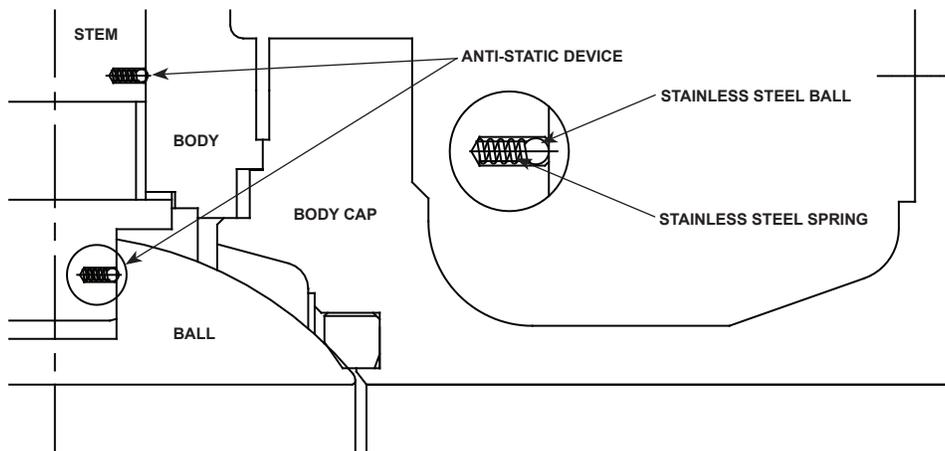


Figure 6. Anti-static Device Setup

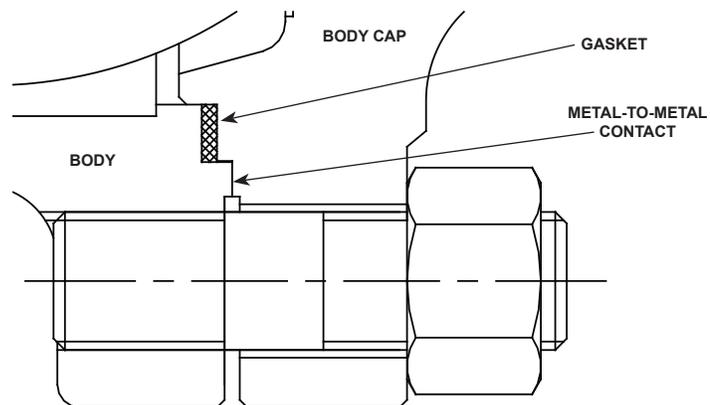


Figure 7. No Leakage Design

# Floating Ball Valve

If the ball valve's drive device needs replacement, simply remove the drive from the body. It is not necessary to disassemble the whole valve.

## Note

**When the ball valve has been opened or closed in place, do not continue to operate forcibly to avoid damage to the valve or drive.**

- If the commodity conveyed in the pipeline contains residues and impurities, periodically discharge through the valve's drain. Water deposits for non-water service should also be drained out of the valve prior to winter season to avoid freezing.
- In order to avoid the dirt and residual substances to be carried downstream, set up a blow-off line in the valve's middle chamber to discharge the dirt and residues. If no blow-off line is installed, open the valve into half for discharging. Make sure that pipeline is under maintenance and there is no pressure on it when opening the valve and discharging the dirt.
- Regularly inject sealing grease into the valve stem to avoid it from being stacked.
- The valve stem and connected parts should be cleaned regularly to ensure normal working condition. Refer to assembly or disassembly section to access the valve parts that need servicing or maintenance.
- After every operation, make sure to check valve parts for signs of wearing and corrosion especially the sealing surfaces or O-rings, seat, packing, and the body. Replace parts if necessary.
- For water or oil service, parts inspection should be done every three months while for highly corrosive service, inspection should be done every month.
- Lubricate valve body and moving parts annually.
- If the valve is equipped with other driving device, conduct maintenance work as per the maintenance instructions for such driving device.

## Disassembly

To disassemble the valve, start disassembling with the last part mentioned in assembly section.



## WARNING

**When disassembling ball valves, discharge the media inside the pipelines and the valve chambers first and release contained pressure, otherwise the media will be released uncontrollably, resulting to personal injury or valve damage.**

Ensure that the middle chamber of the valve is fully depressurized before dismantling or maintaining the valve. Pressure inside the pipe may be released, but the middle chamber may still have residual pressure. Open and then close the valve several times to ensure that the pressure in the valve is completely released.

If the media conveyed by the valve is toxic, inflammable, or explosive make sure that there are no residual media left in the valve especially in the middle chamber. Flush the valve with water or the appropriate cleaning solvent to ensure the complete removal of the residual media. Open and then close the valve several times while flushing the valve.

## Assembly



## WARNING

**Failure to properly follow the Assembly procedures could result in ball valve damage, personal injury, and property damage from escaping process fluid during testing or after reinstallation in the pipeline.**

## Note

**Before performing the assembly work, clean all components of the ball valve and the working area. Ensure that there are no metal burrs, rust, welding slag, and other debris inside the valve.**

**Keep all valve parts and the working area clean all throughout the assembly process. The working area must be padded with any soft material or insulation. Do not allow the valve body, its components, or any of its assembled parts to have direct contact with the ground.**

## Troubleshooting Guide

**Table 5. Troubleshooting Guide**

PROBLEM	POSSIBLE CAUSES	POSSIBLE CORRECTIVE MEASURES
The stem and the driving device do not rotate.	Gear and Bearing defect	Refer to disassembly section to access the bearing and check for any damage. Replace parts if necessary. Remove gear cover and check for damage.
	Low frequency of operation and/or lack of lubricating oil	Lubricate the valve seat. Use appropriate and recommended industrial lubricating grease for the gear.
	Frozen gear or valve	Heat or inject anti-freeze solution to the gear.
	Overtight packing	Loosen the stud that compresses the gland flange.
	Rough stem surface or dirt accumulation on the trim of the stem	Refer to disassembly section to access the stem. Clean stem and add lubricant.
	Bent or damaged stem	Repair or replace the valve stem.
Sealing surface is leaking.	Loose studs and nuts	Tighten nuts and studs.
	Damaged sealing surface	Replace the sealing materials (O-rings, gaskets, seats) of the leaking part.
	Clogged sealing surface with dirt	Refer to disassembly section to access the sealing surfaces and flush the dirt.
	Improper placing of the switch	Place the switch in the proper position.
Packing is leaking.	Uncompressed packing	Recompress the packing evenly.
	Some missing packing	Add more packing to suffice the required quantity.
	Damaged packing	Replace the packing.
	Deformed stem, uneven stem roundness, or presence of scratches, groove, galling, and other defects	Replace stem.
There is leaking at the middle flange.	Uneven bolt tightness	Retighten the bolts evenly.
	Damaged gasket	Replace the gasket.
	Rough and uneven flange sealing surface	Smoothen the flange sealing surface.
Valve does not close completely.	Improper installation of the limit switch of gear	Reinstall the limit switch.
	Inappropriate installation of the driving device	Reinstall the driving device in the proper position.
Valve body passage is poor.	Improper alignment of the ball opening with the flow passage	Adjust the ball to its proper position. Make sure that the valve stem is properly connected to the slot of the ball.

**Table 6. Approximate Weights**

BODY SIZE		APPROXIMATE WEIGHTS					
		CL150		CL300		CL600	
DN	Inch	kg	Pounds	kg	Pounds	kg	Pounds
25	1	6.5	14	7.0	15	10	22
50	2	12	26	15	33	18	40
80	3	25	55	40	88	----	----
100	4	36	79	45	99	----	----
150	6	75	165	115	254	----	----

# Floating Ball Valve

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The following procedure describes how to completely assemble the ball valve. When part replacement or inspection is required, complete only those steps necessary to accomplish the job. Key numbers are shown in Figure 8.

Be careful when lifting and moving of the valve's components. Excessive force applied to the assembly may damage or deform the valve, related parts, and components which may cause the valve to malfunction.

1. Place one seat (key 5) into the valve body (key 1) and place gasket (key 6), O-ring (key 20) and another seat (key 5) into the valve body cap (key 2) according to the position shown in Figure 8.
2. Place anti-static spring (key 18) and anti-static steel ball (key 17) into the stem (key 4) at their corresponding location. Refer to Figure 6 for the proper setup of the anti-static device which includes the anti-static spring and the anti-static ball. Insert thrust washer (key 7), bearing (key 8) and O-ring (key 19) onto the valve stem (key 4) and install valve stem to the body (key 1) from the inside or using the largest opening of the body (key 1). Position the stem (key 4) with the lower flat head below and should be parallel with the flow passage.
3. Rotate ball (key 3) to the fully closed position or ball flow holes positioned sideways and against the flow passage and place the ball into the body (key 1). Make sure that the flat head portion of stem (key 4) slides through the slotted portion of the ball and is firmly connected.
4. Connect body cap (key 2) to the valve body (key 1) and screw bolt (key 15) into the valve body (key 1) through the flange hole in the body cap (key 2). Screw nut (key 16) into the other end of the bolt to compress body cap and body tightly.
5. Insert packing (key 9) and gland flange (key 10) onto the valve stem (key 4) and make sure it is properly fitted into the body (key 1). Screw in stud (key 11) to hold the packing, gland flange and valve stem together then tighten.
6. Place stopper (key 12) on top of the gland flange (key 10) then use a special tool to splay one snap ring (key 13) and place it on the lower slot of the upper flat head of the stem to lock the stopper in its position.
7. Place the hand lever (key 14) onto the valve stem (key 4). Make sure that the hand lever hole is properly inserted to the upper flat head of the valve stem. Hand lever should be parallel with the flow passage or the pipeline for fully open position and should be perpendicular with the pipeline for fully closed position (see Figure 2).
8. Secure hand lever position by locking it with another snap ring (key 13). Use special tool to splay the snap ring. Insert washer (key 21) and screw in stud (key 22) tightly onto the valve stem.
9. Rotate hand lever (key 14) to fully open and fully closed position and vice versa to make sure that the ball (key 3) rotates as the hand lever rotates.

## Parts Ordering

When corresponding with your local Sales Office about this valve, always reference the equipment serial number found on the nameplate.

When ordering replacement parts, reference the key number of each part as found in the following parts list.

### Note

**Use only genuine Tartarini™ replacement parts. Components that are not supplied by Regulator Technologies should not, under any circumstances, be used in any Tartarini ball valves, because they will void your warranty, might adversely affect the performance of the valve, and could give rise to personal injury and property damage.**

# Floating Ball Valve

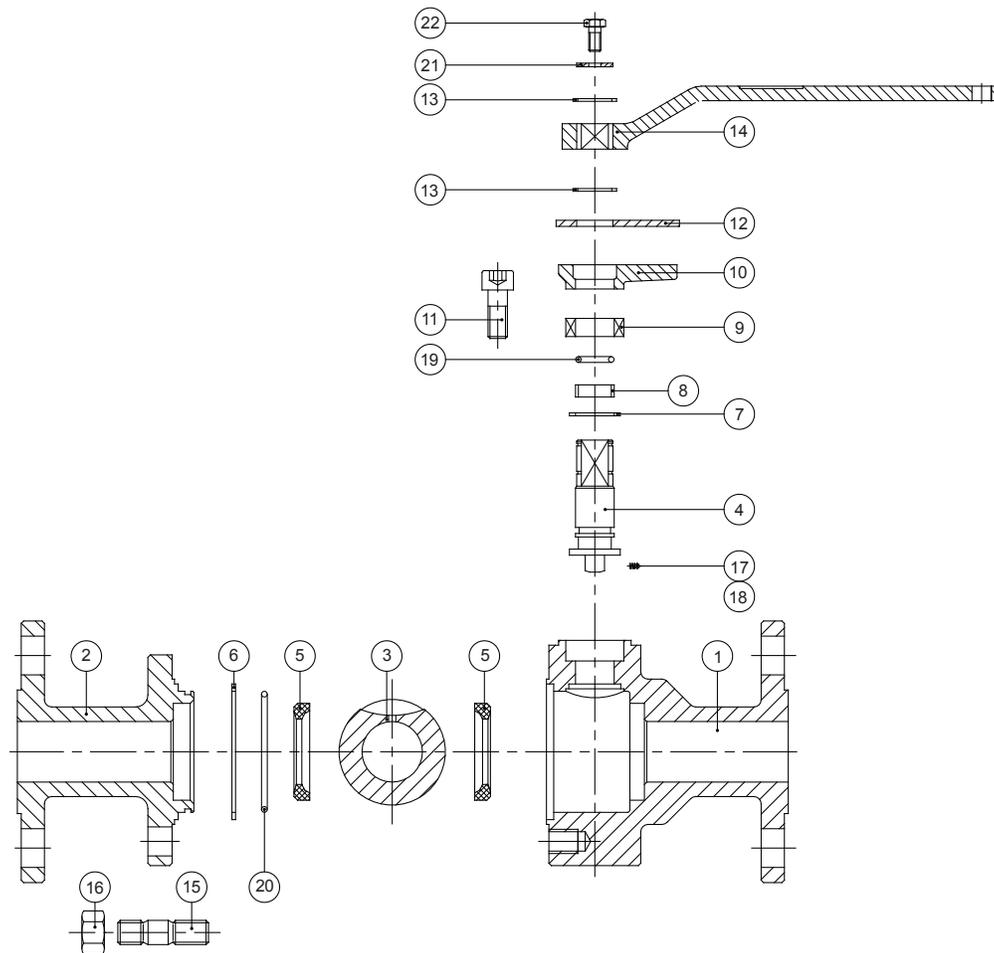


Figure 8. Tartarini™ Floating Ball Valve Assembly

## Parts List

Key	Description	Key	Description
1	Body	12	Stopper
2	Body Cap	13	Snap Ring
3	Ball	14	Hand Lever
4	Valve Stem	15	Bolt
5	Seat	16	Nut
6	Gasket	17	Anti-static Ball
7	Thrust Washer	18	Anti-static Spring
8	Bearing	19	O-ring
9	Packing	20	O-ring
10	Gland Flange	21	Washer
11	Stud	22	Stud

# Floating Ball Valve

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