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# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

## 3 pieces full bore ball valve
## with threaded caps and socket weld


## GENEBRE Reference: 2034 – 2034N – 2034S

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# Installation, operation and maintenance instructions

## 1. Product description.

**Genebre, S.A.** offers a wide range of ball valves (90º turn), designed and assembled to handle and drive fluids in industrial procedures.

The compatibility of materials used to build the valves (see technical specifications) and the application of valves to the different industrial processes is at user's risk. Valves will have an optimal behavior when working conditions do not exceed pressure and temperature limits (pressure curve) for which they have been designed.

## 2. Transport and Storage conditions

**Transport and storage of this kind of products must be done keeping them in their original package!**

**VISUAL INSPECTION**

Check whether during transport, unloading and placement the products have suffered damages.

Manual valves are provided by default in an open position whereas automated valves usually are offered in a closed position due to the standard error position NC (normally closed). During storage it is recommended to keep them in this same position, with the included protective wrapping to avoid damages or dirt accumulation in the dial. The wrap must not be removed until valve is to be installed.

Valves must be stored in a dry and clean environment.

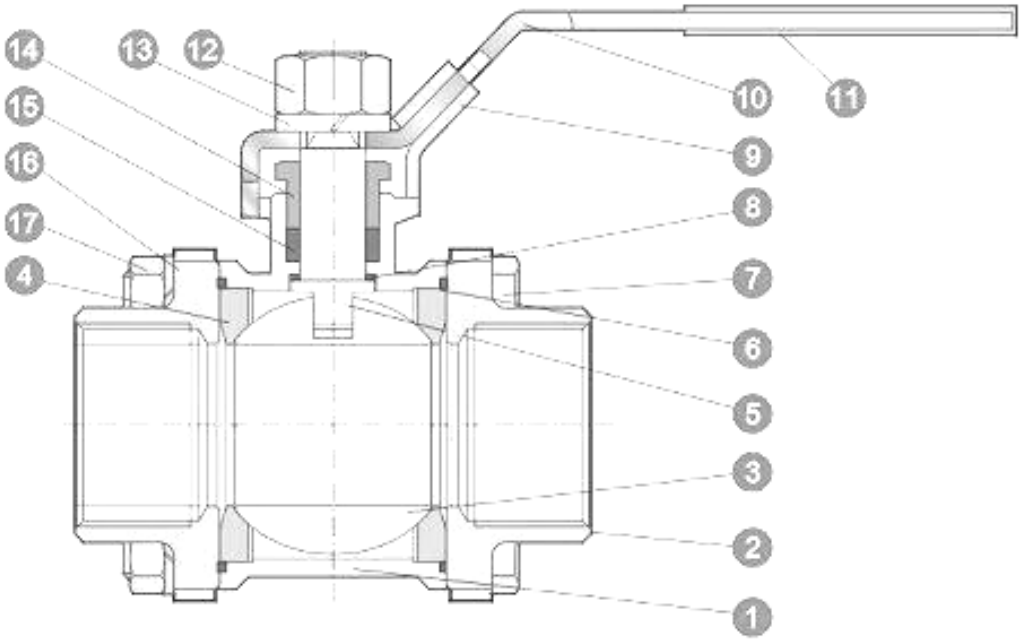
**If you notice any kind of anomaly during reception of the goods, contact immediately with GENEBRE in order to determine the possible responsibilities on the issue.**

**IMPORTANT NOTE:**

**Before installing and/or manipulating these elements, READ CAREFULLY these instructions for use and OBSERVE all contained information. If you fail to understand any of their content, please contact GENEBRE, S.A.**

**User is responsible for the safe use of these products, according to present instructions for use and specific technical documentation of the device.**

## 3. Breakdown and valve components



| Part num. | Description | Quant. | Material | Replacement (ref.) |
|---|---|---|---|---|
| 1 | Body | 1 | WCB | ---- |
| 2 | Cap | 2 | WCB | ---- |
| 3 | Ball | 1 | 316 | ---- |
| 4 | Seat | 2 | PTFE+FV | 2838 |
| 5 | Stem | 1 | 316 | ---- |
| 6 | Joint | 2 | PTFE | 2838 |
| 7 | Screw | 4 | A193-B7 | ---- |
| 8 | Friction washer | 1 | PTFE | 2838 |
| 9 | Safety Stopper | 1 | 304 | ---- |
| 10 | Handle | 1 | 304 | ---- |
| 11 | Handle cover | 1 | Plastic | ---- |
| 12 | Handle nut | 1 | 304 | ---- |
| 13 | Washer | 1 | 304 | ---- |
| 14 | Gland nut | 1 | 304 | ---- |
| 15 | Wrapping | 1 | PTFE | 2838 |
| 16 | Washer | 1 | 304 | ---- |
| 17 | Nut | 4 | A194-8 | ---- |

## 4. Installation instructions

### 4.1) Preparation

Remove any material remains of the valve wrapping.
Serious problems may arise with the installation of a valve in a dirty pipe.
Make sure the pipe is not dirty and doesn't have welding particles, for example, before installing it. This may cause irreparable damages in the valve when the equipment is started → *prepare a clean working area*.
Plan beforehand enough space for future maintenance operations.
Control correct operation of the valve by turning the handle clockwise and making sure the ball closes the fluid flow. If this is not the case, check if there are foreign particles inside the valve and repeat the whole operation.

### 4.2) Assembling

**- Art. 2034 / 2034N (valve with threaded caps)**

*Do not disassemble the valves for their installation.*

Make sure the valve's pipe and thread end are clean and are compatible one with another (type of thread end) Apply an appropriate sealing in the pipes' thread caps and thread the valve being careful not to excessively tighten the conical threaded caps.
Do not use valve's handle as a lever to thread the valve into the pipe.
To tighten the valve it is recommended to use a spanner or monkey wrench only on the hexagonal area of the valves caps, the torque applied being less than 30 Nm.

**- Art. 2034S (valve with welding caps)**

a) With the valve in OPEN position, remove the *screws* (part 7), *washers* (part 16), *nuts* (part 17) and the caps (part 2).

b) Turn the ball until reaching the half-open position and remove the *seats* (part 4) and *joints* (part 6) from the *body* (part 1) carefully. Complete the turn until closing the valve and extract the *ball* (part 3). All components must be stored in a dry and clean environment.

c) Assemble back the valve caps (part 2) into the body, keeping them aligned as much as you can, using only 2 *screws* (part 7) diagonally opposed. Perform at least 4 welding points (cross-shaped).

d) Remove the *body* (part 1) from the valve caps (to avoid welding temperature to damage rod washers) and complete the welding process by making sure the *caps*(part 2) are protected against welding metal spatters.

When cold, clean the caps' locking surfaces. Place the *ball* (part 3), *seats* (part 4) and *joints* (part 6) on the valve's body and turn the ball into open position.
Place the valve's body between the 2 caps being careful not to scratch the contact surfaces; then, place the *screws* (part 7) screwing them diagonally opposed to each other and respecting the specified torque (*see Section 8.3*).

**IMPORTANT INFORMATION:**

***Design of this kind of floating ball valves allows us to install them in any position as they are bidirectional, so the direction of fluid flow does not matter.***

***If possible, it is recommended to install the valve in horizontal position and the stem (handle) upwards.***

***Valves do not have to support pipe's efforts so it is advisable to anticipate a good alignment and parallelism of such pipe.***

***Once installed, it is recommended to open and close it a couple of times to verify its good knowledge and to check if there is any obstruction in the ball that prevents it from closing.***

***It is also recommended to use filters in the pipe to extend lifecycle of the valve.***

# 5. Operating instructions

## 5.1) Usage

3 pieces full bore ball valves provide a leakproof lock when used adjusted to the pressure and temperature values for which they have been designed.
Avoid by all means leaving the valves in partially open position if you are not aware of the pressure drop and flow rate in that position, as the service life of the seat can be reduced and/or it can be damaged due to the floating ball valve.

Any fluid that can be solidified, crystallized or polymerized should not remain in the ball cavity as it is harmful for performance, service life of the valve and it can even render it unusable.

Seats for the valve, joints, body, ball, stem and caps have to be fully compatible with the fluid circulating through the valve. Otherwise, valve could be seriously damaged.

Torques required to operate valves are listed in the table Torques to activate the valves (see Section 8.1).

## 5.2) Manual operation

When operating the valve you must avoid excessive lateral efforts with the handle.
To close it, you must turn the handle 90 degrees clockwise. When the handle is inline with the pipe, valve is open.

# 6. Maintenance instructions

Frequency, place and process of maintenance will be determined by the user by taking into account usage of the product. However, checks explained below will be useful to extend the service life of the valve and reduce installation problems.

Valves must not remain in open or closed position for a long period of time. It is recommended, if the process allows for it, to operate it for control purposes every six months.

## 6.1) Stem leaks

Remove the handle and tighten the gland nut (part 14) of the stem packing *(see Section 8.2)*. If the leak persists, valve should be disassembled to replace the stem washers (part 8,15).

*See reparation instructions.*

## 6.2) Body/Caps joints leak

Check if the body screws (part 7) are tightened. If they were loose, adjust them up until the recommended torques (IMPORTANT: adjustment of such screws will have to be done at room temperature). If leak continues, it is probably due to damage in the body's joint or the locking surface, and it will be necessary to disassemble the valve to repair it.

*See reparation instructions.*

## 6.3) Line leaks (through seats)

Check if the valve is in a completely closed position. If this is the case, leak is due to a seat or locking surface being damaged and it will be necessary to disassemble the valve for repairing it.

*See reparation instructions.*

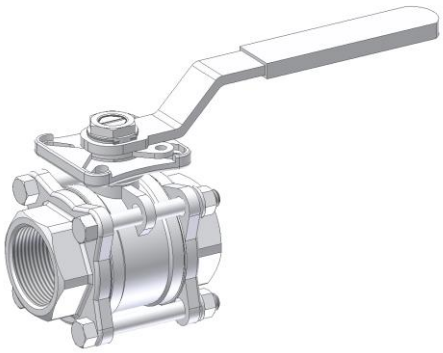
# 7. Reparation instructions

**Before disassembling the pipe's valve to repair or replace it, make sure that line has been closed and depressurized because a bad operational procedure could cause a serious accident to staff and to the installation system**

## 7.1) Disassembling

To proceed to repair it, it is not necessary to remove the valve from the installation as the 3-pieces design for the valve allows us to remove the central part (body with all internal components) without having to disassemble the terminals.

*Prepare a clean working area and adequate tools to perform mechanical tasks.*

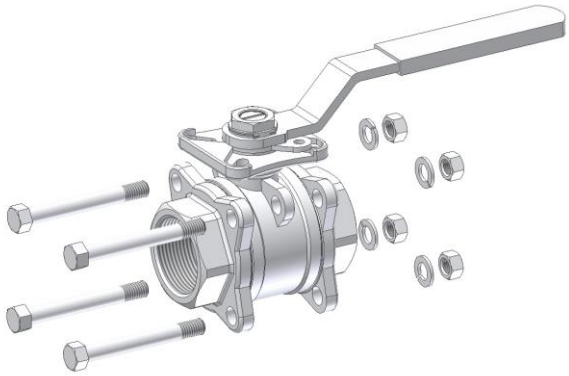


a.- Place the valve in OPEN position to avoid the ball from standing out of the body and interfere with the caps when the body is removed.

The stem has two flat part when:

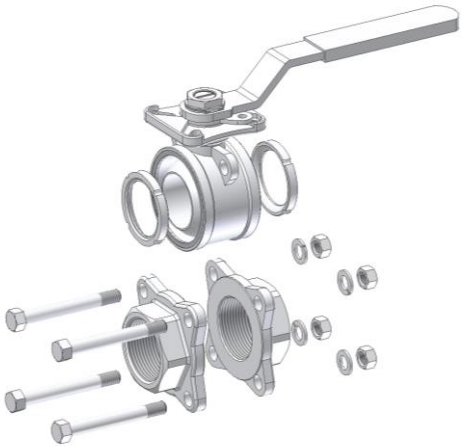
- parallel to pipe → open valve,
- perpendicular to pipe → closed valve,

b.- Loosen and remove the 4 / 6 *nuts* (part 17) of the *screws / studs* (part 7) that bring together the three different parts of the valve. Remove the screws.
Be careful not to damage the caps surfaces.



c.- Remove the central group separating it from the *stoppers* (part 2).

d.- Once the body is out, place the *ball* (part 3) in a half-open position (45º, for example) and remove the *seats* (part 4). Complete the turn of the ball until closed position and then it can be removed. This operation has to be performed carefully, otherwise the ball can be marked against the body.



e.- After this, remove the body's *joints* (part 6). They should be removed being carefully not to scratch or damage the mechanized surfaces over which they are hermetically sealed.

b.- To disassemble the stem, loosen and remove the nut (part 12), remove the washer (part 13) and the handle (part 10). Loosen and remove the gland nut (part 14) and push the stem (part 5) towards the inside part of the body and remove it. Later, remove the *packaging* (part 15) located inside the body. a.- Place a new *friction washer* (part 8).

g.- Once the valve is disassembled you must verify the state of each single piece that composes it. All pieces to be reused have to be cleaned completely and be kept in a safe and clean environment.

All locking surfaces in the ball, seats, joints and sides have to be checked for corrosion, erosion, metallic inlays in the seats and marks. If they were damaged or in case of doubt, they will need to be replaced.

h.- Cleaning of the valve's pieces must be done using an adequate degreasing agent. You must be careful with the locking surfaces, for example, of the ball, locking sides of the caps and joints, because if they were damaged this could cause a bad impact in the valve's performance.

## 7.2) Reassembling

Before proceeding to reassemble the valve, make sure that reparation kit and/or pieces to be used are appropriate and original from the factory. When it is assembled again, cleaning is essential for providing it with a long life.

a.- Place a new *friction washer* (part 8) on the stem (part 5) in its stem corresponding location, lubricate the stem with a thin layer of grease or silicon (for example, Dow Corning 200) and insert it in the valve's *body* (part 1), in the internal cavity, by pushing a bit to fix it.

b.- Place a new packaging (part 15) into its location in the upper cavity of the *body* (part 1). Place the *gland nut* (part 1214) and tighten it. Make the stem turn a couple of times and readjust the nut, respecting the torque specified value *(See Section 8.2).*

*If necessary, fasten with a wrench the internal body of the stem to tighten properly the nut without making the stem turn.*

*Note that if the nut is too tight, the rod torque will increase and service life of its elements will be reduced.*

c.- Place the stem in closed valve position and insert the *ball* (part 3) inside the *body* cavity (part 1) matching the ball slot with stem milling (part 5). Open the valve so that the ball does not fall.

d.- New *seats* (part 4) and body joints (part 6) can be placed now on both sides of the body, taking into account that the flat part of the seat needs to be facing outwards.

e.- Terminals or *caps* (part 2) need to have locking parts cleaned before proceeding to final assembly.

Place the central core of the valve between the terminals and place the corresponding screws (part 7) to bring together the three different parts of the valve.
Now it is important that pieces as the caps (part 2), the *ball* (part 3) and the *seats* (part 4) are completely aligned inside.

f.- Then, proceed to place the washers (part 16) and nuts (part 17) adjusting slowly and alternating diagonal and evenly until obtaining the recommended tightening torque *(see Section 8.3)*.

## 8. Torques table:

8.1) Torques to activate the valves:

| MEASURE | Activating torque (N.m.) |
|---|---|
| 1/4” | 4 – 5 |
| 3/8” | 4 – 5 |
| 1/2" | 4 – 5 |
| 3/4" | 7 – 8 |
| 1” | 9 – 10 |
| 1 ¼” | 12 – 14 |
| 1 ½” | 18 – 20 |
| 2” | 28 – 30 |
| 2 ½” | 34 – 36 |
| 3” | 58 – 60 |
| 4” | 90 – 95 |

8.2) Tightening torque for stem nut:

*Following numerical data is provided as reference only. Torques mentioned are the ones used to activate the assembled stem before ball and seats are assembled.*

| Valve size | Torque value (N.m.) |
|---|---|
| 1/4" - 3/8” - 1/2" | 6 - 9 |
| 3/4" - 1” | 8 - 12 |
| 1 ¼” - 1 ½” - 2” | 13 - 18 |
| 2 ½” - 3” - 4” | 19 - 24.5 |

8.3) Tightening torque for screws/nuts that join the valve's three different parts:

*It is required for all body screws to make contact metal with metal between the body and the cover.*

| Valve size | Screw / Nut | Torque value (N.m.) |
|---|---|---|
| 1/4" - 3/8" - 1/2" | M6 | 8 - 11 |
| 3/4" - 1" | M8 | 13.5 - 16 |
| 1 ¼" - 1 ½" - 2" | M10 | 22 - 25 |
| 2 ½" - 3" - 4" | M12 | 74.5 - 81 |

## 9. Hygiene and Safety Instructions:

9.1) Fluids that go through a valve can be corrosive, toxic, flammable or pollutant. When operating valves, you must follow the security instructions and it is recommended to use personal protection gadgets:

1) Protect your eyes.
2) Wear gloves and appropriate working clothes.
3) Wear safety footwear.
4) Wear a helmet.
5) Have running water at hand.
6) To operate flammable fluids, make sure you have an extinguisher at hand.

**Before removing a valve from a pipe always check if the line is completely drained and depressurized.**

9.2) Operate the valve in open position to make sure there is no pressure in the internal cavity.

9.3) Any valve being used by toxic services department needs to obtain a cleanliness certificate before being operated.