

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

3 pc full bore ball valve, direct mount, with bottom tank flange



GENEBRE Reference: 2052 – 2053

Installation, operation and maintenance instructions

1. Product description.....	3
2. Transport and Storage conditions.....	3
3. Breakdown and valve components.....	4
4. Installation instructions.....	5
4.1) Preparation.....	5
4.2) Assembling.....	5
5. Operating instructions.....	8
5.1) Usage.....	8
5.2) Manual operation.....	8
5.3) Remote operation.....	8
6. Maintenance instructions.....	9
6.1) Stem leaks.....	9
6.2) Body/Caps joints leak.....	9
6.3) Line leaks (through seats).....	9
7. Reparation instructions.....	10
7.2) Reassembling.....	11
8. Torques table:.....	12
9. Hygiene and Safety Instructions:.....	13

1. Product description.

Genebre, S.A. offers a wide range of ball valves (90° 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. Please, refer to the product datasheet.

Art. 2052: Ball valve with bottom tank flange and threaded end ISO 7/1

Art. 2053: Ball valve with bottom tank flange and Butt-Welding end

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 a 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 ball. 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.

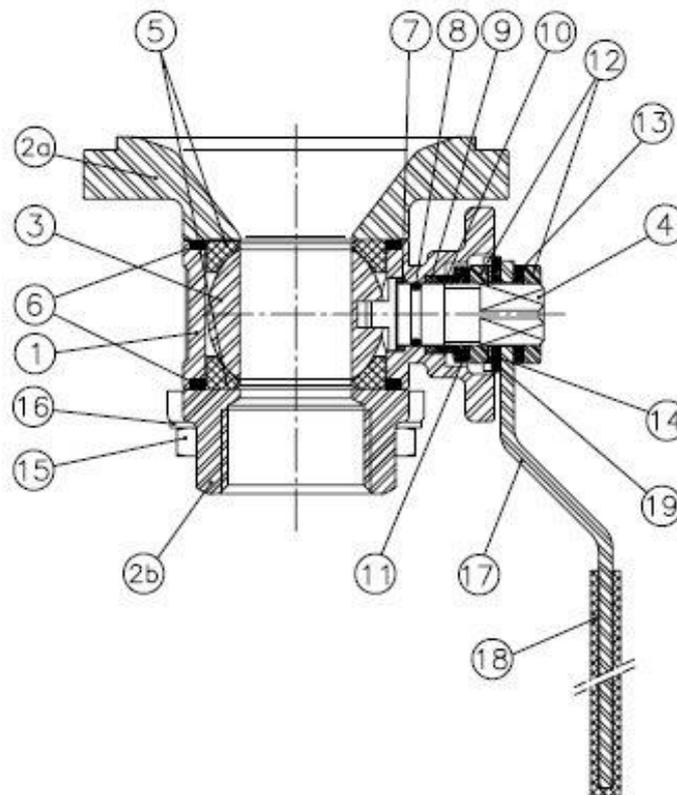
IMPORTANT NOTE:

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	1.4408	----
2 a	Tank flange	1	1.4404 (316L)	----
2 b	Caps	1	1.4408	----
3	Ball	1	1.4408	2907 (2904 f/DN100)
4	Stem	1	Inox AISI 316	2905
5	Seat	2	Teflon + 15% FV	2820
6	Joint	2	Teflon + graphite	2820
7	Friction washer	1	Teflon + graphite	2820
8	O'ring	1	Viton	2820
9	Wrapping	1	PTFE	2820
10	Gland nut	1	Inox AISI 304	----
11	Belleville Washer	2	Inox AISI 301	----
12	Nut	2	Inox AISI 304	----
13	Washer	1	Inox AISI 304	----
14	Stopper	1	Inox AISI 304	----
15	Screw	4 / 6	Inox AISI 304	----
16	Grover washer	4 / 6	Inox AISI 304	----
17	Handle	1	Inox AISI 304	----
18	Caps	1	Vinyl	----
19	Stopper pin	1	Inox AISI 304	----

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.

In case of vibrations in the pipe it is strongly recommended to mount anti-vibration elements to absorb them. Otherwise, the life of the product could be drastically reduced.

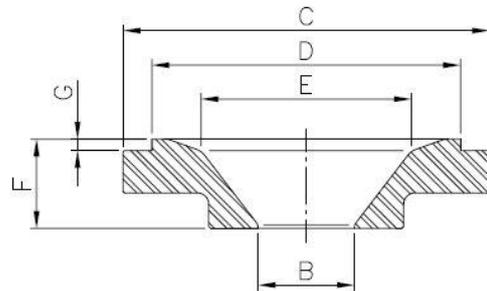
4.2) Assembling

- TANK FLANGE

a) With the valve in OPEN position, remove the *screws* (part 15), *washers* (part 16) and *the connecting caps* (part 2a and 2b).

b) Place the tank flange (part 2a) in the previously location on the deposit bottom, fitting the caps diameter (D) with the deposit diameter. The height G should also fit the thickness of the deposit sheet. Take into account that those measures vary depending on the size of the valve to be installed.

c) Once it is placed in the deposit, proceed to weld it being extremely careful not too rise too much the flange temperature, as it can experiment a deformation. Make sure the opposite side of the flange (part 2a) is protected against welding metal spatters.



d) After welding the tank flange (part 2a), once it is already cold, clean the edges' locking surfaces.

e) Place the valve's body between the 2 edges being careful not to scratch contact surfaces; then, place the *screws* (part 15) and their corresponding washers (part 16) screwing them diagonally opposed to each other and observing the specified torque (see Section 8.3).

- Opposite side to the tank flange

- Threaded end (Article 2052)

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 into the pipes' thread ends and thread the valve.

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 edges, the torque applied being less than 30 Nm.

- Welding cap (Article 2053)

a) With the valve in OPEN position, remove the *screws* (part 15), *washers* (part 16) and the connecting cap (part 2b).

b) Turn the ball until reaching the half-open position and remove the *seats* (part 5) and *joints* (part 6) of 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) Reassemble the valve keeping aligned (if possible) the tank flange (part 2a), body (part 1) and caps (part 2b), using only 2 diagonally opposed screws (part 15). Weld at least in 4 different points (cross-shaped) between the caps (part 2b) and the pipe.

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

When cold, clean the edges' locking surfaces. Place the *ball* (part.3), *seats* (part.5) and *joints* (part.6) on the valve's body and turn the ball into open position.

Place the valve's body between the 2 edges being careful not to scratch the contact surfaces; then, place the screws (part 15) with their corresponding washers (part 16), screwing them diagonally opposed to each other and respecting the specified torque or peer (see *Section 8.3*).

IMPORTANT INFORMATION:

Design of this kind of ball bore 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 piece 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 ball bore 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 ends have to be fully compatible with the fluid circulating through the valve. Otherwise, the 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.

In case you need to remove the handle to automate the valve, the *stem* (part 4) has a mechanized linear mark at the front part that allow us to know its current position (opened or closed).

5.3) Remote operation

When automation of 3 piece valves is required, GENE BRE S.A. can provide a great variety of pneumatic actuators, electric actuators, electropneumatic and electrical positioners to caps a large range of operations.

6. Maintenance instructions

Frequency, place and process of maintenance will be determined by the user by taking into account usage of the product. However,

periodical checks explained below will be useful to extend the service life of the valve and reduce installation problems when necessary.

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 proceed to an operational task of the valve every six months.

6.1) Stem leaks

Remove the handle or actuator, the *lock nut washer* (part 19) and tighten the nut (part 12) of the stem packing (*see Section 8.2*). If the leak persists, valve should be disassembled to replace the stem washers (parts 7,8,9).

See reparation instructions.

6.2) Body/Caps joints leak

Check if the body screws (part 15) are tightened. If they were loose, adjust them up until the recommended torque values (IMPORTANT: adjustment of such screws will have to be done at room temperature). If leak continues, it is probably due to a 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 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 ends when the body is removed.

Remember that the stem has a line in the frontal part to indicate position of the valve:

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

b.- Loosen and remove the 4 / 6 nuts (part 15) that bring together the three different parts of the valve.

Be careful not to damage the edges surfaces.

c.- Remove the central group separating it from the *capss* (part 2a and 2b).

d.- Once the body is out, place the *ball* (part 3) in a half-open position (45°, for example) and remove the *seats* (part 5). 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.

f.-To disassemble the *stem* (part 4), remove the following elements:

Name	Art. 2052 / 2053
Handle nut	Part.12
Dividing washer	Part.13
Handle	Part.17
Lock nut	Part.19
Nut	Part.12
Spring washers	Part.11
Gland nut	Part.10

Push the stem to the inside part of the body and remove it. Later, remove the *packaging* (part 9) located inside the body. Remove the *o'ring* (part 8) from its location and the *friction washer* (part 7).

g.- Once the valve is dismantled you must verify the state of each single piece that compose 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 ends 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 armored again, cleaning is essential for a long life for the valve.

a.- Place a new *friction washer* (part 7) on the stem (part 4) and also the *o'ring* (part 8) 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 9) into its location in the upper cavity of the *body* (part 1), the *gland nut* (part 10) and the *spring washers* (part 11) with external borders together (concave position). Place the *nut* (part 12) 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.

It is convenient to match one of the nut vertexes with one of the stem vertexes to be able to place it later on the lock nut (part 19).

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* (part 1) matching the ball slot with stem milling (part 4). Open the valve so that the ball does not fall.

d.- New seats (part 5) 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 2a and 2b) 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 15) and the Belleville washers (part 16) to bring together the three different parts of the valve.

Now it is important that pieces as the stoppers (part 2a and 2b) the *ball* (part 3) and *seats* (part 5) are completely aligned inside.

f.- Then, proceed to place the nuts (part 15) 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:

SIZE	Activating torque (N·m)
1/4"	4 – 5
3/8"	4 – 5
1/2"	4 – 5
3/4"	7 – 8
1"	9 – 10
1 1/4"	12 – 14
1 1/2"	18 – 20
2"	28 – 30
2 1/2"	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 1/4" - 1 1/2" - 2"	13 - 18
2 1/2" - 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 terminals and the caps.

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 1/4" - 1 1/2" - 2"	M10	22 - 25
2 1/2" - 3" - 4"	1/2" W	74.5 - 81

9. Hygiene and Safety Instructions:

9.1) Fluids that go through a valve can be corrosive, toxic, flammable or pollutant. They can also be found at very high or low temperature. 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.

9.4) Any type of repair or maintenance should be performed in ventilated places.