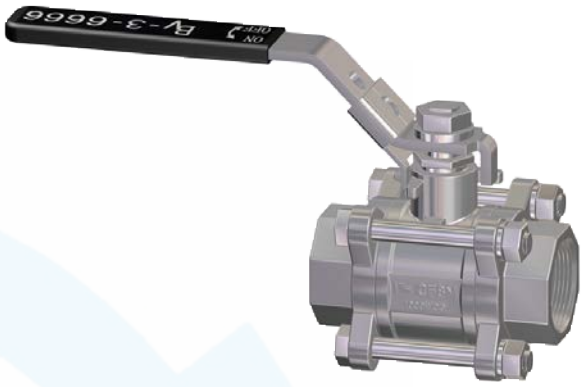
INSTALLATION, OPERATING AND MAINTENANCE MANUAL

2 Pieces Ball Valve



3 Pieces Ball Valve

3 Ways Ball Valve

FLOATING BALL VALVES

Index

1. GENERAL INFORMATION ON THE MANUAL

- This Manual provides information on safely using the product, being binding for preservation, storage, handling, transport, installation, commissioning, operation, maintenance, repair and disposal, and must be thoroughly observed at any step.
- Please contact the supplier or the manufacturer in case of issues which cannot be solved by reference to this Manual.
- Any deviation from this Manual and sound engineering practice or modification on the product shall be notified to manufacturer for advice or approval.
- In addition, regional safety requirements must be always applied and observed at any step.
- All the work related to the product must be carried out, supervised and inspected by specialist personnel. It is the owner's responsibility to define areas of responsibility and competence and to ensure the proper monitoring.
- This Manual is in accordance with Directive 2014/68/EU on Pressure Equipment (PED) and Machinery Directive 2006/42/EC.
- For ATEX applications, please refer to ATEX Specific instructions.
- The manufacturer reserves the right to make technical modifications at any time.

2. NOTES ON POSSIBLE DANGERS

2.1 Significance of symbols

ATTENTION!
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Warning of general danger.

2.2 Explanatory notes on safety information

In this Manual dangers, risks and items of safety information are highlighted to attract special attention.
Information marked with the symbol above describes practices, which if fail to comply with, can result in serious injury or danger of death for users or third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.
The rest of information not specifically emphasized in this Manual, along with Data Sheet and product marking, must also be observed and complied with for safely using the product.

3. PRESERVATION, STORAGE, HANDLING AND TRANSPORT

ATTENTION!

- Protect against external force (impacts, vibrations, etc.).
- Allow only skilled personnel; suitable handling and lifting equipment must be used. See Data Sheet for weights or consult manufacturer.
- During handling make sure that operating device is well attached to the valve or removed to avoid danger of detachment. Levers or actuators must not be used to take up external forces that they are not designed for: e.g. do not use them as climbing aids, or as connecting points for lifting gear, etc.
- Always use suitable protection equipment, and minimize the use of human body force at any step to avoid injuries.
- There is a risk of body member (hand, finger, arm…) crushed against any other solid element (wall, pipe, floor, etc.) during handling. Take this into account and handle with care.
- There is a risk of body member trapped between valve ball and seat during operation of the valve. Make sure no operation / supply to actuator disconnected if access to the interior of the valve.
- There is a risk of body member injury in case there is any exposed moving part between valve and actuator (special arrangements). Take appropriate measures and set warning notes when required.
- Check correct position of nameplate and handle with care to avoid personnel cuttings.

- Use proper packing for transportation.
- Keep storage protection before installation.
- Keep the valves in open position.
- In order to prevent damage, corrosion or rust on the surface, avoid extreme temperatures (keep at 5ºC to 50ºC), avoid high environmental humidity or corrosive environment. Keep the valves away from direct sunlight, dust, flames or rain. Do not pile up excessive weight. In case of severe bumping inspect the material for any damage and replace if necessary.

4. DESCRIPTION

4.1 General Description

The valves are floating ball, split body and side entry design. They offer quick operation and low pressure drop thanks to their full bore design.
Valve diagram with parts can be seen at the last page of the Manual.

4.2 Area of Application

Floating Ball Valves are devices to stop the flow of the service fluid when necessary. BV46666 ball valves are not suitable for regulating purposes. Operation of the valve in intermediate position to be avoided since this would lead to increased wear.

4.3 Operating principles
The valve closes by turning the handle 90º clockwise, with tightness achieved by friction of the ball to the seats. When the handle is parallel to pipe the valve is open. Consult the manufacturer if a change of the actuation device is required. For valves with handle blocking system, it must be raised up to operate the hand lever.

4.4 Technical data - remarks
For data such as main features, duties/limits of use, dimensions, weights, etc. refer also to Data Sheet.

5. INSTALLATION
5.1 General remarks on installation
The following points should be taken into account in addition to the general principles governing installation work:

ATTENTION!

- Before installation, make sure previous chapters are thoroughly followed.
- Ensure safe access and working conditions for proper performance.
- Only operate the valve while observing all the safety measures.
- Remove flange covers or any other remaining packing/storage protection if present.
- Lay pipelines such that damaging transverse, bending and torsional forces are avoided.
- Protect valves from dirt during construction work. The interior of the valve and the pipeline must be free of foreign particles.
- Protect the valve soft parts from heating caused by welding works at the plant during commissioning.
- Avoid mechanical damage to the seats and ball.
- There is not preferred direction of flow. Valve is bidirectional. The preferred installation position is in horizontal pipeline with stem pointing upwards (stem perpendicular to the floor). It is allowed to install the valves in vertical pipelines or in horizontal pipelines with stem not pointing upwards, although this increases stem sealing wearing. In any case, avoid the installation with the stem pointing downwards.
- When using the valve as an end seal, the employers' liability insurance association of the gas and waterworks specifies the use of a safety precaution such as a plug-in disc, blind flange, etc. With a medium jet that freely exists, you must secure the exit area.
- When installing the valve, there is a crushing hazard between valve and pipe system. Mind the hands to avoid it.
- Make sure that counterflanges are compatible with the standard of the valve flanges. When matching up flanges, avoid gradients, rotation and pipe misalignment that could cause pipe and valve stress and leakage once installed. Flanges should fit smoothly. Select the proper flange face gaskets according to duty and centre them on the flange face properly. Do not force the counterflanges and do not try to tighten the bolts when a gap exists between valve and pipe or if misalignment is observed. Tighten in a crosswise, moderate and uniform manner. - When the valve is operated, there is a crushing hazard between the ball and the seats. Ensure the valve is not under operation in case hands are introduced inside the valve.
- We recommend to remove the hand lever blocking system if any before commissioning in case of valve emergency operation needed.

Screwed ends valves:
- Make sure that the pipe screw has the correct finish and compatible cone for the valve.
- Use proper sealant according to duty, such as hemp core, Teflon, etc.
- Check that pipe introduction in the valve does not exceed its thread, leave a safety margin of minimum 1 mm.
- Tighten with a plain or adjustable wrench on the hexagon end of the valve only. Apply force to other area of valve may seriously damage the valve. Do not use hook spanners or other wrenches that could damage the hexagon surface. Valve should be threaded smoothly. If not, do not try to force the thread and avoid wrench extensions since this could lead to breaking the valve or damaging the thread. A general recommendation is not to exceed the tightening torque of 30Nm.

Weldling ends valves:
- Dismount the central body and seats/central gasket. Place all removed parts in a clean and secure place.Welding works must be carried out in accordance with approved procedure and following appropriate safety measures. Check correct pipe alignment. Clean valve and pipe connections carefully, tack-weld each end of the valve on to the pipe in 4 or more points depending on size and weight. Put trim away if containing any soft part to prevent heat exposure. Only put the trim back once the valve is cooled down. Take the necessary precautions to prevent thermal stressing/overheating of the valve.
- In case of PWHT, temperature, gradient and time exposure should be controlled to the minimum required depending on the material. PWHT should be applied firstly to one end and secondly to the other end (not simultaneously), and only to a limited area of each end of the valve, in order to limit the temperature exposure on the welding area, rest of the valve body and trim. An appropriate method is the use of ceramic blankets covering the length of the welding area plus a minimum additional length that is determined by the standard of the pipe, being the heating zone limited to the minimum necessary as mentioned before. Electrical resistances must be set carefully in order to allow uniform heating and avoid too hot points. Permanent control and register of the temperature should be carried out during the process in order not to exceed the established temperature/time cycle. Also the adjacent areas should be monitored to control reached temperatures.
Once the welding process is over, wait till system cools down before inserting the central body back

ATTENTION!

Actuator:

- If the valve requires pneumatic, electric or hydraulic actuator, separate actuator Manual shall be also followed. To avoid unnecessary stress and risk of valve break, consider the weight and the relative position of actuator to evaluate its support. Make sure that the actuator is suitable for service particular requirements, valve adaptability, function needed, adequate torque for the valve, adequate speed, need for limit switches, etc. Contact our Technical Department for advice. In case of actuator mounted, disconnect the energy supply before starting work.

5.2 Assembling additional modules

Optional accessories (limit switches, extensions, etc.) that are supplied with valves must be fitted as required for their functions as shown in the system plan.

5.3 Requirements at the place of installation

- Aggressive environmental conditions may reduce the life span of the product. Consider special construction/protective measures in such a case.
- Consider the interaction between the system and the equipment. Foresee elements to absorb vibrations, pipe dilatations, guides, anchoring and proper support according to the weight of the components.
- The system and operation protocol should be conceived in such a way to avoid high velocities and cavitation. Prevent pulsing flow or water hammers, which are very harmful for valves and the rest of the components.
- Flooding of the product is not recommended.
- Allow enough space for valve installation, operation and maintenance.
- It is recommended to install a proper sized mesh strainer upstream the valve in order to protect seating surfaces from abrasion or erosion that could lead to seat leakage.

- Planners / construction companies or the owner are responsible for positioning and installing products.

6. COMMISSIONING & OPERATION

ATTENTION!

- Before commissioning the valve, check the material, pressure, temperature and other essential parameters. Always use the product within the scope of intended service and operating duties.
- Before commissioning, make sure previous chapters have been thoroughly followed.
- Regional safety instructions should be adhered to.
- It is essential to flush the pipe system thoroughly to eliminate all the particles and impurities which could remain in the pipes and particularly welding residue, chips, tool remains, etc. that could damage the equipment during start-up. Ensure that during cleaning of the pipe system, any chemicals used and temperature are compatible with the valve construction.
- Temperatures above 50ºC or below 0ºC may cause personnel injuries if valves are touched.
- Leakage of media through valve, between counterflanges or at closing (end of pipeline) may also cause scalding, health harm, pollution, fire or damage to other parts of the installation depending on the media. Use suitable protection equipment when approaching the valve, ensure that the corresponding warning signs are displayed on the valve or surrounding area, and/or isolate the equipment in case of danger.
- Before commissioning a new plant or restarting it after repairs or modification, always ensure that:
    - All work has been completed correctly.
    - The valve is in the correct position for its function.
    - Safety devices/measures have been implemented.
- Valve operation, filling, warming-up and starting-up shall be gradual so as to avoid any inadmissible stress. Check for tightness in valve connections, body unions, and stem, and retighten crosswise and gradually if necessary until leakage elimination.
- Packing stem nut (12.1) is tightened moderately in factory and slight retightening at start-up could be necessary in case that packing rings relaxation had occurred. Over tightening this nut will increase operating torque and will reduce life of the packing.

- Once the valve installed, make an initial opening and closing operation to check its proper operability, without additional tools.
- In case of risk of media freezing inside the valve, take due measures to avoid it.

7. CARE AND MAINTENANCE

The operator must define maintenance and maintenance-intervals to meet requirements.

- Check for body, seat and connections tightness, and valve smooth operation without additional tools.

ATTENTION!

- In the event of infrequent use, operate the valve as frequently as possible to avoid deposits of dirt and valve blocking.
- Before disassembling the valve, note chapters 3, 10 & 12.
- When using the valve as an end seal, the employers' liability insurance association specifies the use of a safety precaution such as a plug-in disc, blind flange, Before starting maintenance work on an end valve with a free stem end, you must mount a blind flange.
- When the valve is operated, there is a crushing hazard between the ball and the seats. Ensure the valve is not under operation in case hands are introduced inside the valve.
- Only carry out maintenance work in the pipework when the valve has been secured from operation (in case of actuator, ensure it has been disconnected from the mains supply and secured from reactivation).
- Check the valve surface inside and outside. If advanced corrosion or erosion is observed, double check service and valve features and replace the valve properly.
- Check the valve surface inside and outside. If advanced corrosion or erosion is observed, double check service and valve features and replace the valve properly.

- If leakage is found and cannot be eliminated and/or the operating torque of the valve increases too much, valve should be dismounted for service or replaced by a new one.
- VALVE DISASSEMBLY/ASSEMBLY: Exploded view with parts can be seen at the end of this Manual. Separate body halves (01&02) by removing the body bolting (no.16,17 and18 in 3 pieces ball valve) or by loosening of the cap (2 pieces ball valve and 3 way ball valve). Remove handle or actuator. Once the operation device removed, remove blocking washer (11) and associated washers. Then release stem nut (11) to relieve packing (08) compression. Turn the valve to the close position. Remove the seats (04), gasket (16 in 2 pieces ball valve), and the ball (03) should slide out through the body port with a gentle push. Push stem (05) downwards and remove through the body port. Extract the packing ring (08) upwards. Place all removed parts in a clean and secure place. Parts with symptoms of wear or corrosion should be replaced. Before mounting back, be sure that all parts are free of dirt and in good condition. Follow the above steps in the reverse order to reassemble the valve. Seats should perfectly fit, if necessary slightly strike with a soft hammer. Once mounted, slowly operate the valve to allow perfect adjustment between ball and seats. Operate again once tightened to check that operating torque is not excessive.
- If leakage is detected between the body halves of the valve, check the tightening of union bolting, correct alignment and equal compression in all the contact surface and then retighten union bolts crosswise and gradually until leakage elimination, with ball in open position. If needed, separate the body halves by removing the union bolting, and replace gasket (16) in 2 pieces ball valve or seats (04) in 3 pieces ball valve, clean the seat surfaces of the gasket, or replace the valve.
- If the valve is not tight at closing, open the valve during a while to sweep impurities and close back. Retightening union bolting could be also of help. If needed, dismount the valve and replace seats (04) and also clean and polish or replace ball (03), or replace the complete valve.
- If leakage is detected through the stem, remove handle or actuator and blocking washer (11) and retighten stem nut (11) gradually until leakage elimination. If needed replace the packing rings (08) and also clean and polish or replace the stem (04), or replace the complete valve.

After any maintenance work please refer to chapters 5 and 6 for installation / commissioning.

Recommended Spare parts:

Use only original spare parts.
It is advisable to keep seats, packing rings and gaskets as spare parts. Type and number of each spare part to be stored according to many factors: service level, valves quantity, etc. In many cases a good choice is to keep complete valves as spare part.

8. TROUBLESHOOTING

In the event of malfunction or faulty operating performance, check that the installation and adjustment work has been carried out and completed in accordance with this Manual.

ATTENTION!

- It is essential that the safety regulations are observed when identifying faults.

9. TROUBLESHOOTING TABLE

ATTENTION!

- Read the complete Manual before carrying out installation and repair work.
- Read chapter 6 before recommissioning.

FAULT	POSSIBLE CAUSE	CORRECTING MEASURES
No flow Not enough flow	Flange covers or protection not removed	Clear valve entrances
	Valve closed or almost closed	Check valve position
	Piping clogged	Check piping system
Leakage between body halves	Too much pressure or temperature	Check the system
	Bolts loose or gasket damaged	Check alignment
	Parts not well aligned	Retighten bolts or change gasket
	Metal sealing surfaces damaged	Repair or change damaged surfaces
Leakage through the stem	Too much pressure or temperature	Check the system
	Normal wear after cycles or long time without use	Retighten bolts
	Packing or stem worn out or damaged	Replace parts
	Metal sealing surfaces damaged	Repair or change damaged surfaces
Valve not tight at closing	Valve is not in closed position	Check correct handwheel rotation
	Too much pressure or temperature	Check the system
	Dirt trapped between ball and seats	Open and close the valve under pressure to sweep the dirt trapped Clean the system and set a strainer upstream of the valve Repair or replace the valve if needed
	Seats damaged	Replace seats
	Ball surface damaged	Repair or change ball
Too high operating torque, handle hard to turn	Wrong turn direction (opposite)	Turn in the correct direction Valve open being handle parallel to pipe, clockwise direction to close
	Too much pressure or temperature	Check the system
	Too viscous fluid	
	Packing gland nut too tightened	Check packing gland nut tightening
	Packing rings damaged or with dirt	Inspect and replace/clean parts
	PTFE seats damaged or deformed	Inspect and replace if needed Recheck valve duty
	Body halves union bolts too tightened	Check bolts tightening
	Stem seizure	Clean/lubricate/replace stem
	Stem is bended	Replace stem

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10. DISMANTLING THE VALVE

ATTENTION!

The following points must be observed:
- Pressureless pipe system.
- Medium must be cool.
- Plant must be drained.
- Note chapter 3 for proper handling and lifting.
- Additionally, in case of toxic, corrosive, flammable or caustic media:
- Purge pipe system carefully.
- Use proper protection equipment to avoid health harm.
- Adopt proper actions to avoid pollution of the environment.

11. GOODS RETURN & DISPOSAL

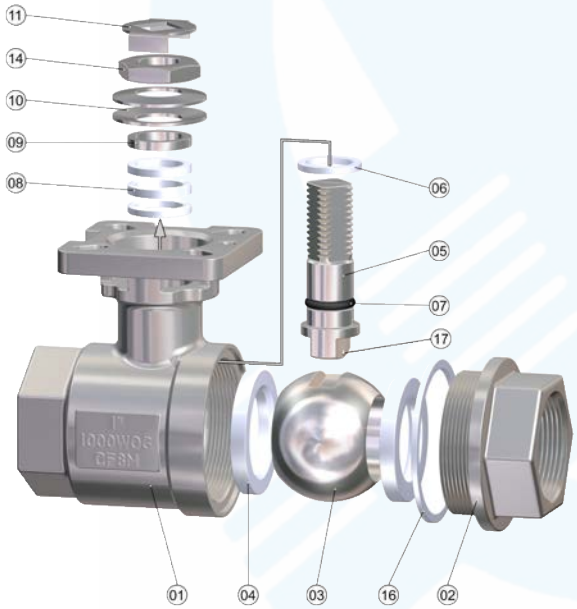
- For any returned goods, the issuing company must provide information in written on any hazards and the precaution in case of potentially polluting or harmful residues, or any mechanical damage that could present a health, safety or environmental risk, as enforced by EU Health, Safety and Environment Law, including the Safety Data Sheet of the substances identified as potentially hazardous.
- Valves are recyclable and not expected hazard to the environment, with the exception of soft parts (PTFE and rubber compounds) that should be disposed separately only by approved procedure, and no incineration is permitted.

12. WARRANTY / GUARANTEE

- The extent and period of warranty cover are specified in the “General Sales Terms” of COMEVAL VALVE SYSTEMS valid at the time of delivery or, by way of departure, in the contract of sale itself.
- We guarantee freedom of faults in compliance with state-of-the-art technology and the confirmed application.
- No warranty claims are accepted for any damage caused as the result of incorrect handling or disregard of this Manual, Data Sheet and relevant regulations.
- This warranty also does not cover any damage which occurs during operation under conditions deviating from those laid down by specifications or other agreements.
- Justified complaints will be eliminated by repair carried out by us or by a specialist appointed by us.
- No claims will be accepted beyond the scope of this warranty. The right to replacement delivery is excluded.
- The warranty shall not cover maintenance work.
- Our guarantee coverage does not cover for any commissioning, maintenance or installation of the product or external parts.
- Our guarantee does not cover products proved to have been tampered with or faulted by material wear and tear.
- The Purchaser is responsible for checking that the incoming product is received in good condition and conforms to the ordered specifications. In case of damage caused during transit it is necessary to immediately complain to the carrier within 24 hours. After this time carriers could not assume the derived costs. In case of any deviation in relation to order specifications, please contact us.

13. PARTS LIST

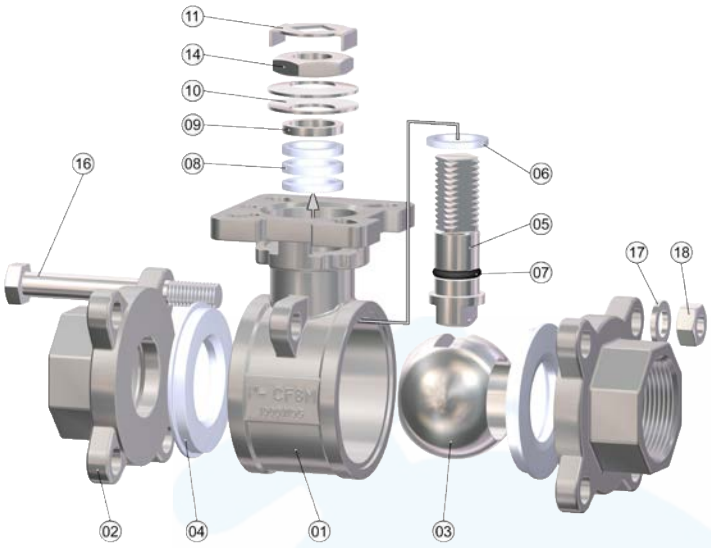
2 Pieces Ball Valve



No.	Part
1	BODY
2	CAP
3	BALL
4	SEAT (qty. 2)
5	STEM
6	THRUST WASHER
7	O-RING
8	STEM PACKING (qty. 1 to 3)
9	GLAND
10	BELLEVILLE WASHER (qty. 1 to 2)
11	BLOCKING WASHER
12	LIMIT STOP
13	METALLIC GASKET
14	STEM NUT
15	HAND LEVER
16	GASKET
17	ANTI-STATIC DEVICE (option)

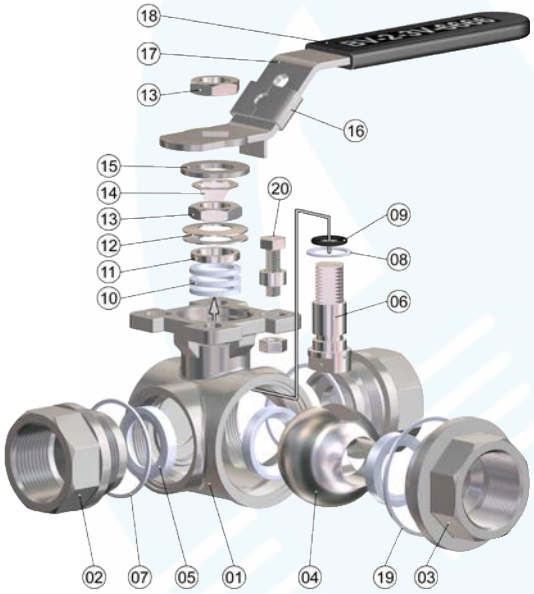
13. PARTS LIST

3 Pieces Ball Valve



No.	Part
1	BODY
2	CAP
3	BALL
4	SEAT (qty. 2)
5	STEM
6	THRUST WASHER
7	O-RING
8	STEM PACKING (qty. 1 to 3)
9	GLAND
10	BELLEVILLE WASHER (qty. 1 to 2)
11	BLOCKING WASHER
14	STEM NUT
16	BOLT
17	WASHER
18	NUT

3 Ways Ball Valve



No.	Part
1	BODY
2a	CAP A
2b	CAP B
3	BALL
4	SEAT
5	STEM
6	THRUST WASHER
7	O-RING
8	STEM PACKING
9	GLAND
10	BELLEVILLE WASHER
11	STOP WASHER
12	LOCKING DEVICE
13	HAND LEVER
14	STEM NUT
15	HANDLE WASHER
16a	GASKET A
16b	GASKET B
17	PLASTIC COVER
18	STOP PIN (BOLT & NUT)

14. ANNEXES

14.1 Declaration of Conformity - DC30EN
14.2 Data Sheet - DS30

Updated documents on www.comeval.es

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