



**OPERATING AND MAINTENANCE INSTRUCTIONS FOR
BALL CHECK VALVE
Art. C067 - C068 - C069**





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0. General

Observing these operation and maintenance instructions, helps you to improve the operational safety and useful life of the equipment, prevent hazards and reduce repair costs and down-time of the valve.

ANY OPERATION PERFORMED NOT RESPECTING THIS OPERATION AND MAINTENANCE INSTRUCTIONS, COULD GIVE RISE TO DANGERS AND INVALIDATE MANUFACTURER'S WARRANTY.

For any deviating operating conditions and applications,
manufacturer's written approval must be obtained.

TECHNICAL DESCRIPTION OF VALVES		
VALVES ART.	FLANGED END: C067, C068	THREADED END: C069
FACE-TO-FACE DIMENSIONS	EN 558 SERIES 48 (C067-C068)	
FLANGE TYPE	EN 1092-2 (PN10, PN16)	
NOMINAL DIAMETER SIZE	C067 - C068	FROM DN50 TO DN500
	C069	FROM 1" TO 3"
WORKING PRESSURE	FLANGED TYPE: PN10, PN16	THREADED TYPE: PN10
MIN BACK-PRESSURE	0,3 / 0,5 bar	
WORKING TEMPERATURE	MAX. +70°C	
MAX FLOW VELOCITY	PN10 = 3 m/s, PN16 = 4m/s	
COATING	EPOXY	
APPLICATION	PUMPING STATION FOR CLEAN WATER OR VISCOUS FLUIDS.	
TEST STANDARDS	EN 12266-1	
OPERATING	AUTOMATIC	



1. Introduction

Ball check valve is a non return valve, mono-directional type, composed by a ductile iron body, inside of that is housed a metal NBR coated ball that moves guided by some internal body ribs. In conditions of absence of flow the ball is constantly held in closed position by the back-pressure of the fluid which pushes in the opposite direction.

The valve will be opened with a minimum pressure, whereas when the flow fails, for example, to the sudden shutdown of a pump, the ball reacts closing the passage to the fluid according to the back flow and back pressure.

2. Safety instructions

La TIS Service S.p.A. valves are designed and manufactured to the highest standards and their safety of operation is generally ensured. However, valves may be potentially dangerous if they are operated improperly or are not installed for their intended use. Arbitrary alterations of this product and the parts supplied with it are not allowed. La TIS Service S.p.A. will not assume any liability for consequential damage due to non-compliance with these instructions. When using this valve, the generally acknowledged rules of technology have to be observed.

Before removing any protective devices and/or performing any work on the valves, depressurize the pipeline section and ensure it is free of hazards. Unauthorized, unintentional and unexpected actuation, as well as any hazardous movements caused by stored energy (pressurized air, water under pressure), must be prevented. When a valve needs to be dismantled from a duct, fluid may emerge from the pipeline (or the valve), so the pipeline must be emptied completely before the valve dismantling (special care needs to be taken in case of residue which may continue flowing).

In case of hot working pipelines, the fluid must be cooled down. After completing the maintenance and before operation, check all connections for tightness. Couplings and connections must never be disassembled when they are under pressure.

Service and inspection work must only be done by qualified staff. The plant manager is responsible for determining the suitability and relevant qualifications of the staff. In addition to this needs to ensure that all employees have understood these Operation and Maintenance Instructions.

Protective equipment such as safety boots, safety helmets, goggles, protective gloves etc. must be worn during all work requiring such protective equipment or for which such protective equipment is prescribed.

3. Identification

According to EN19, on all valve bodies is casted the nominal diameter (DN), the nominal pressure (PN), the body material and the casting number.

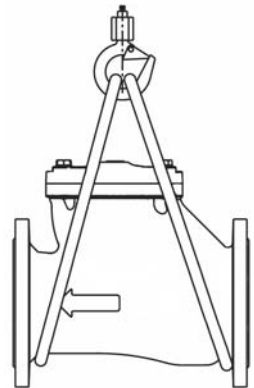


4. Storage

The elastomeric parts (coating of the ball) must be protected against direct sunlight and/or UV light as otherwise its long-term sealing function cannot be guaranteed. Store the valve in a dry and well aerated place and avoid direct heat. Protect important parts for proper function against dust and other dirt by adequate covering. The valve can be stored in ambient temperatures ranging from -10°C to $+50^{\circ}\text{C}$ (protected by adequate covers). If the valve is stored at temperatures below 0°C , it should be warmed up to at least $+5^{\circ}\text{C}$ before installation / operation.

5. Lifting

It's preferable that the lifting equipment such as ropes and belts should only be connected to the body or to the appropriate lifting devices present on the valve. Check the weight on datasheets before lift up any item.



6. Transport

For transportation to its installation site, the valve must be packed in stable packaging material suitable for the size of the valve. It must be ensured that the valve is protected against atmospheric influences and external damage. When the valve is shipped under specific climatic conditions (e.g. overseas transport), it must be specially protected and wrapped in plastic film and a desiccant must be added. Valve coating must be protected against damage by external influences during transport and storage. For the weight of the valves, please refer to the weight chart for lifting.

For transport purposes and also to support assembly, lifting devices such as cables and belts must only be attached to the valve body, bearing lugs or the lifting devices provided for that purpose.



7. Installation

Before putting the valve and the equipment into operation, perform a visual inspection of all functional parts. Possible damages may occur during transport and storage.

Prior to installation, the valve should be checked for trouble-free operation.

Welding works on the pipeline must be performed before the valves installation to prevent damage to the coated ball and to the coating protection surface. Welding residue must be removed before the equipment will be put into operation. La TIS Service S.p.A. does not assume any liability for consequential damage caused by dirt, shot-blasting, gravel residues, etc. When installing the valve between two pipeline flanges, these must be coplanar and in alignment. If the pipes and flanges are not in alignment, they must be aligned before installation of the valve, as otherwise this may result in impermissibly high loads acting on the valve body during operation, which may eventually even lead to fracture. Do not use the valve as the anchor point of the pipeline.

The space between the flanges must be large enough to not damage the coating of the raised faces of the flanges during installation. The flanges of the pipeline must not be pulled towards the valve during installation. If the gap between valve and flange be too wide, this should be compensated by thicker seals or by dismantling joint. For assembly in drinking water pipelines, suitable sealing materials, lubricants and process materials must be approved for drinking water use. When connecting the valve with the pipeline flanges, hexagon bolts and nuts with washers from flange to flange must be used in the through holes. Fasten the bolts evenly and crosswise to prevent unnecessary tension and the resulting cracks or breaks. Do not over-tighten the bolts of the flanges as this may result in the flanges cracking.

Newly installed pipeline systems should first be thoroughly purged to remove all foreign particles. Residue (or particles) of dirt present in the pipeline may impair the operation of the valve. In particular after repair work or upon the commissioning of new equipment, the pipeline system should be purged; if detergents (or disinfectants) are used it must be ensured that they do not attack the valve parts.

7.1 Place of installation

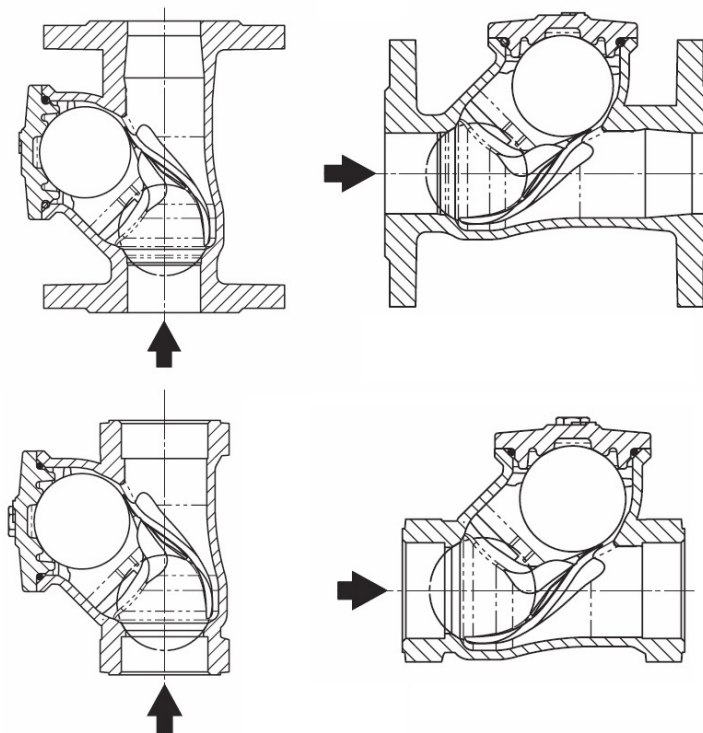
The place of installation for the valve must be selected in a way that ensures enough space to allow proper operation (lifting operations), later function checks and maintenance work (e.g. cleaning of the valve). For open-air installation, the valve must be protected against extreme weather conditions, such as the formation of ice, by covering it appropriately. To ensure proper function and a long service life of the non-return valve, several factors need to be consider for the best place installation.

The valve can be installed in horizontal or ascending pipelines up to angle of inclination of 90° (observe flow arrow on valve body). The valve will not operate in any other position (see image on next page).

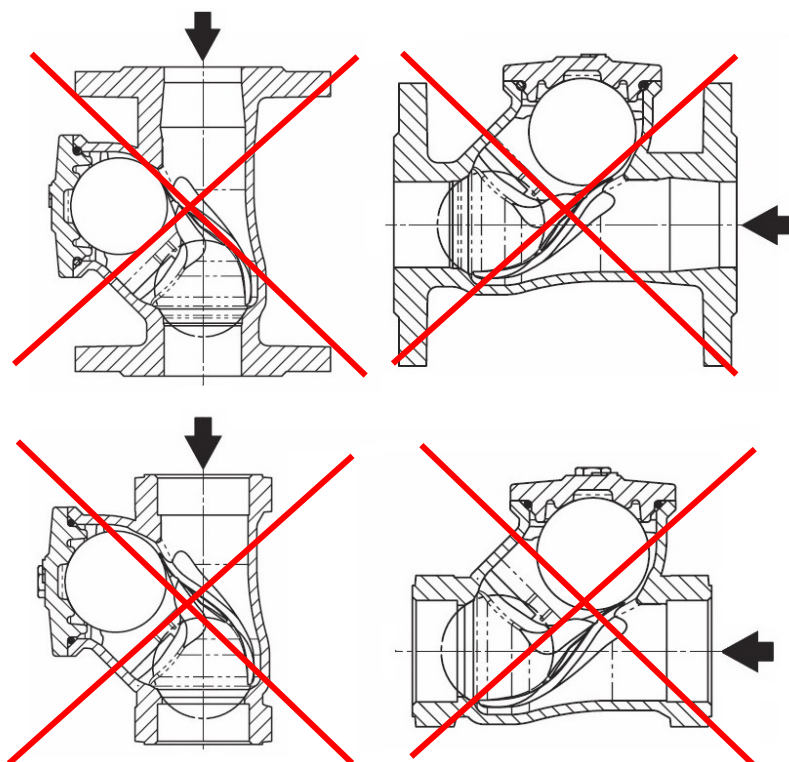
When used in pipelines conveying water containing suspended solids, horizontal installation is advisable as this will prevent the valve from being clogged by deposits.



ALLOWED INSTALLATION POSITION



FORBIDDEN INSTALLATION POSITION





8. Commissioning and operation

Before putting the valve and the equipment into operation, all functional parts must be subjected to visual inspection. All screwed connections need to be checked as to whether they are tightly fastened. Before the installation of the valve, its function parts (ball) should be checked. For vertical installation position, the valve arrow and the flow direction must be from bottom upwards. To correctly work, the valve needs a BACKPRESSURE $\geq 0.3/0.5$ (bar) to push the ball against the seal and ensure a perfect closure.

!CAUTION!

Do not exceed the maximum admissible temperature of the equipment.

Do not exceed the maximum admissible operating overpressure.

Do not install the valve as an end line valve

(see TECHNICAL DESCRIPTION OF VALVES table page.3 or DATASHEET of the product).

User is responsible for ensuring with appropriate safety devices to not exceed the maximum design pressure of the valve.

9. Maintenance

Ball check valve has a very simple design and does not need any special maintenance.

Before any inspection and maintenance work to be performed on the valve or mounted parts and attachments, the pressurized pipeline must be shut off, the pressure must be relieved and the system must be secured against unintentional switching on.

In case of high temperature of the pipeline, it has to be cooled down to the room temperature.

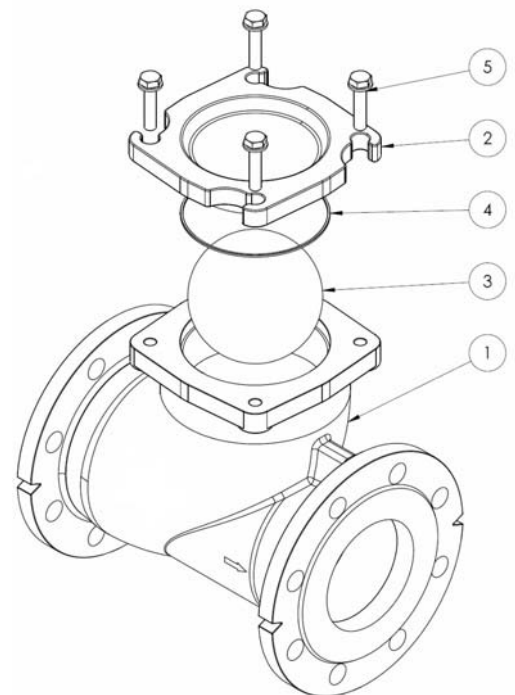
After completion of the maintenance work and prior to resuming operation, all connections must be checked for proper fastening and leak-freeness.

The individual steps as stated under Part.2 need to be performed.

In case of leaking of the valve or ball damaged:

- Remove the valve from the duct;
- unscrews the bolts of the cover (part No. 5);
- Remove the cover (part No. 2);
- Remove the O-ring (part No. 4);
- Remove the ball and substitute it (part. No.3);

The valve should be checked for tightness, proper operation and corrosion protection "at least once per year". In case of extreme operating conditions, inspection should be performed more frequently. In event of problem please contact directly La T.I.S. Service S.p.A.





10. Trouble-shooting

Problem	Cause	Action
Ball does not seal properly.	Foreign particle (s) jammed in the seat area.	Purge valve, dismantle, if necessary and remove foreign particle (s).
	Deposits from the medium have settled on the seat.	Dismantle valve and clean the seat area.
	Back-pressure too low.	To achieve the specified leak rate, the back-pressure must be at least 3/5 water column meter.
	Unfavourable flow and obstruction of the closing movement.	Change installation position.
Ball slams.	Unfavourable installation position and thus unfavourable flow (e.g. installed too closely behind an elbow).	Change installation position.
		Check the hydraulic conditions in relation to water hammer
Valve soils too fast.	Unfavourable installation position (e.g. vertical installation).	Change installation position (see Par.7.2).
	Change installation position (see Par.7.2).	Install valve with a smaller nominal diameter or increase flow velocity in the system observing the
Body leaks.	Deteriorated seals.	Replace seals.

11. Disposal and recycling

TIS valves are designed and constructed to ensure extremely long lifetime.

At the end of their life, they have to be removed/replaced so the valve must be disassembled and each component separated and sorted according to materials, i.e. :

- various metals
- plastics components
- greases and oils
- electronic components.

Generally applies the following:

- During disassembly phase, carefully collect greases and oils; these substances are hazardous to water and must not be released into the environment
- Arrange for controlled waste disposal or for separate recycling according to materials

! **Observe the regional regulations for waste disposal/recycling.**



12. Contacts

Spare parts can be obtained from La T.i.S. Service S.p.A. Sales departments.

LA T.I.S. SERVICE S.P.A.

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We reserve the right to technical modifications of the data contained in these Operating instructions in case this should be necessary for improving the valves.

Illustrations and drawings concerning the products in this catalogues are merely indicative. They are shown for the only purpose of rendering an exemplified and indicative configurations of the valve.