Art. 609

Installation, Use and Maintenance Instructions for anti-freeze valve
art. 609

INDEX

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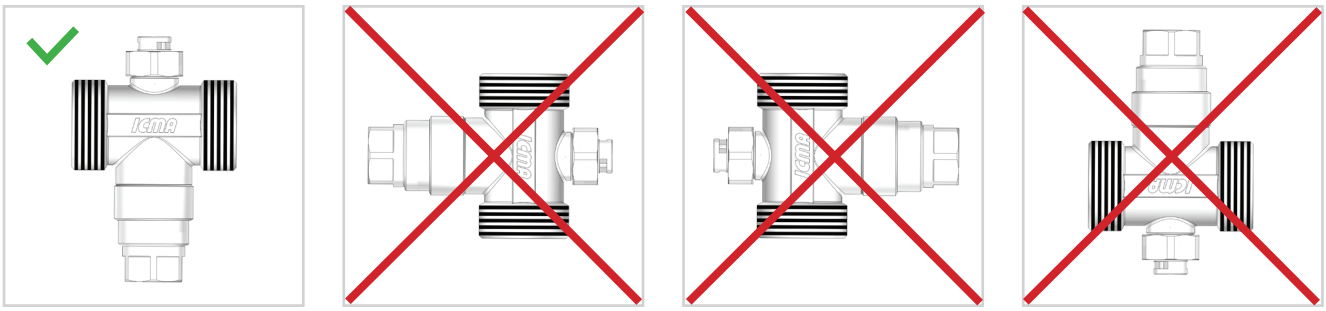
1. FUNCTION

The anti-freeze valve allows the fluid in the circuit to be discharged when the circuit temperature reaches a nominal value of approximately 3 °C.
N.B.: during normal operation of the heat pump, the possibility of the fluid temperature dropping below 3°C is extremely remote. The anti-freeze protection valve comes into operation especially when there is no power supply to the heat pump for long periods (e.g. in the event of a blackout or fault).

⚠ **WARNING:** Following the absence of power supply to the heat pump, check the system pressure.

2. INSTALLATION

The device should only be installed in a vertical position so that the discharged water can flow properly and freely downwards.



Anti-freeze valves should be installed outside, in the coldest part of the system, at risk of frost.
We recommend installing anti-freeze valves on both pipes (flow and return) (fig. 2.1).
They must also be placed away from heat sources that could affect proper functioning, and protected from rain, snow and direct sunlight.

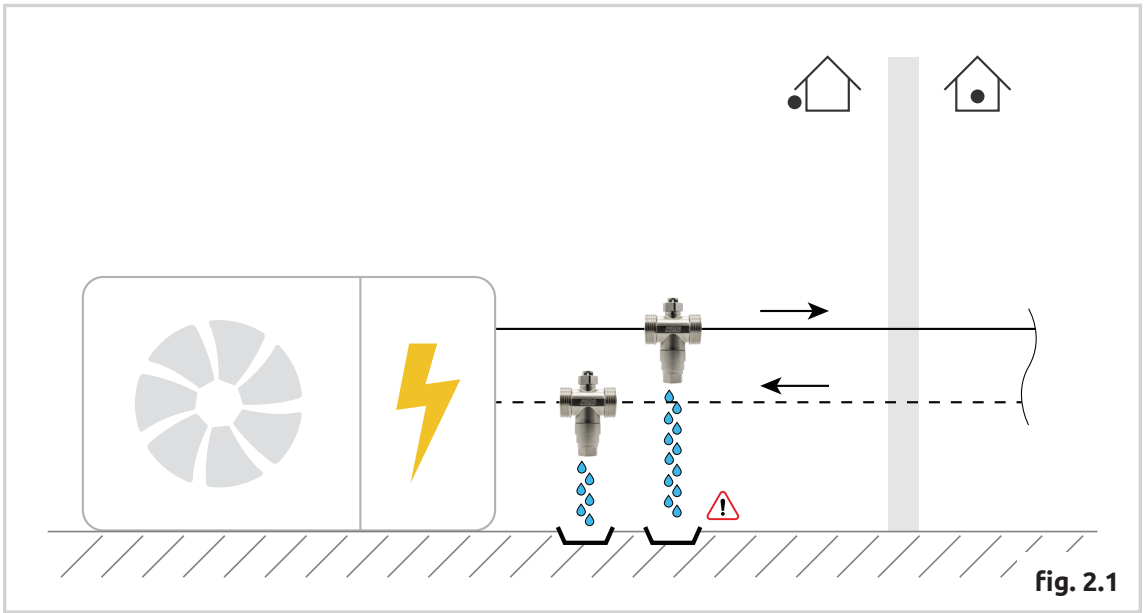


fig. 2.1

⚠ *Convey the drainage fluid to a suitable collection point in order to avoid the formation of ice in areas of pedestrian passage.*

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Maintain a distance of at least 15 cm from the ground in order to prevent the formation of any ice column in the area below from preventing water from escaping from the valve (fig. 2.2). Maintain a distance of at least 10 cm between the anti-freeze valves (fig. 2.3).
In accordance with the regulations in force, the discharge from the safety valve must be conveyed into a suitable collection pipe.

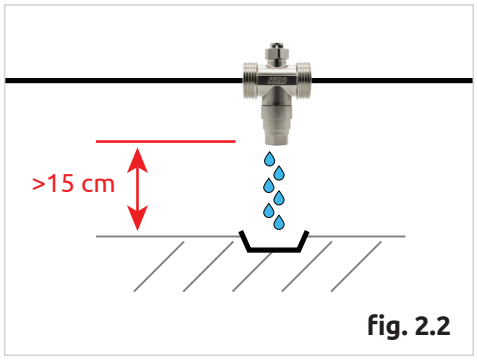

fig. 2.2

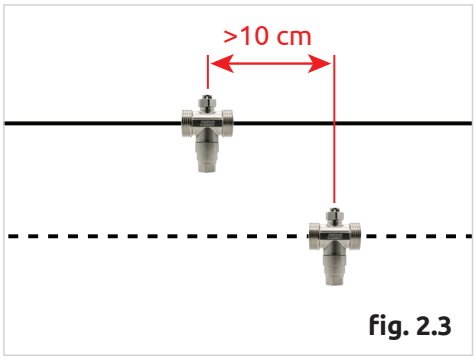

fig. 2.3

Presence of siphons. Avoid siphon connections. If the connection pipe is shaped in such a way as to create a siphon effect (as shown in figure 2.4), the drainage of part of the pipe is prevented and frost protection is no longer guaranteed.

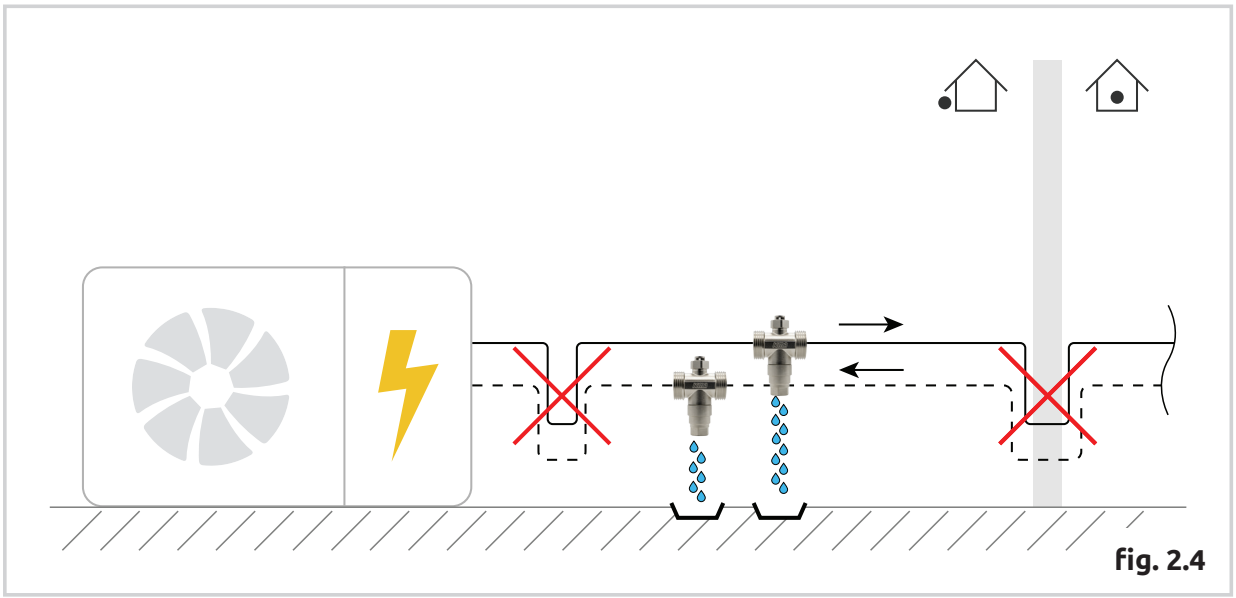
fig. 2.4

⚠ **WARNING:** Installation must be carried out by qualified personnel and following the instructions in the package.
To ensure proper functioning:
- the anti-freeze protection valve must NOT be insulated or covered with other materials.
- provide an automatic filling unit that is always active and open.
- before installation, it is recommended to clean the system piping and to install appropriate filtration devices.

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2.1. Tightening

It is recommended to tighten the valve with an appropriate spanner and not to exceed the tightening torques! Values that are too high may cause over-tightening inside the valve (see tab.2.1).

VALVE MEASUREMENT	MAX. TORSION
G 1”	80 Nm
G 1”1/4	100 Nm

Tab. 2.1

2.2. Insulation

For the system to function properly, the valve must be left free of insulation. If installed in the open, the anti-freeze valve must be protected from rain, snow and direct sunlight. It is recommended to insulate the pipes up to the anti-freeze valve connections (fig. 2.5). Do not insulate the anti-freeze valve in order not to impair its function.

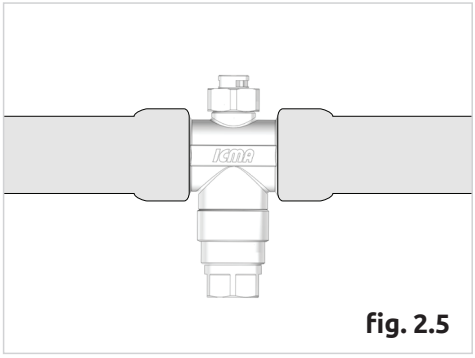


fig. 2.5

3. INSTALLATION VERSION PIPE 28 MM

3.1. Copper pipe specifications

Ensure that the pipe complies with EN 1057 specifications and that the outer diameter of the pipe matches the dimensions of the fitting. Ensure that both the pipe and the fitting are clean, in good condition and free of damage or imperfections.

N.B.: The warranty is only valid when compression fittings are used with the ogive supplied with the fitting.

The fittings are designed to connect EN 1057 for water in heating and sanitary installations.

3.2. Customised copper pipe cutting

Cut the pipe cleanly with a copper pipe tool to the pipe diameter (Fig. 3.2).

N.B.: It is important to cut the pipe perpendicular to the axis of the pipe.

fig. 3.2

3.3. Cleaning the copper pipe connection

Using a deburring tool (fig. 3.3), ensure that the inside of the pipe is smooth and does not interfere with the flow.

Take care not to deform the pipe by applying excessive pressure. If necessary, we recommend using a stiff wire brush (fig. 3.4).

N.B.: It is important that the inside of the pipe is smooth and does not interfere with the flow. Otherwise, corrosion or vibration may occur.

fig. 3.3

3.4. External copper pipe cleaning

Clean the outside of the pipe, ensuring that there is no pipe residue or dirt near the joint.

fig. 3.4

3.5. Mounting the fitting on the copper pipe

Insert the nut on the pipe, followed by the ogive (fig. 3.5). Insert the fitting until it stops. Slide the ogive and the nut up to the body of the fitting. Tighten the nut by hand and then apply the tightening data given in Chapter 3.6.

fig. 3.5

3.6. Guide to tightening the compression fittings

VALVE MEASUREMENT	N. OF TURNS
28 mm	3/4*

Tab. 3.1

⚠ **If achieving a ¾ turn tightening is not possible, LUBRICATE both the cap and the valve body thread. Tightening less than ¾ of a turn does NOT ensure sealing!*

4. USE

The fluid flowing through the valve must be compatible with its materials of construction; the valve is designed for water and glycol solutions. Keep in mind that heat pumps reduce their efficiency when filled with glycol water; in addition, this solution accelerates material degradation. The pressure and temperature conditions must comply with the following parameters: (see tab. 4.1).

PERFORMANCES	
Working fluid:	water
Max. working pressure:	10 bar (with 20 °C water)
Ambient temperature range:	-40 ÷ 60°C
Min. fluid working temperature:	0 °C
Max. fluid working temperature:	90 °C

Tab. 4.1

Ensure that the valve drains in a properly designed sump which avoids the stagnation of water.

5. MAINTENANCE

The valve must be periodically checked to ensure its proper functioning. It is recommended to check it every time maintenance is performed on the heat pump and more frequent checks when the valve works in extreme conditions, for example in particularly cold and/or hot environments (ambient temperature below -10°C and/or over 35°C).

When disassembling the cartridge, check that there are no residues and solid particles in the anti-vacuum (fig. 5.1) or thermostatic element (fig. 5.2).

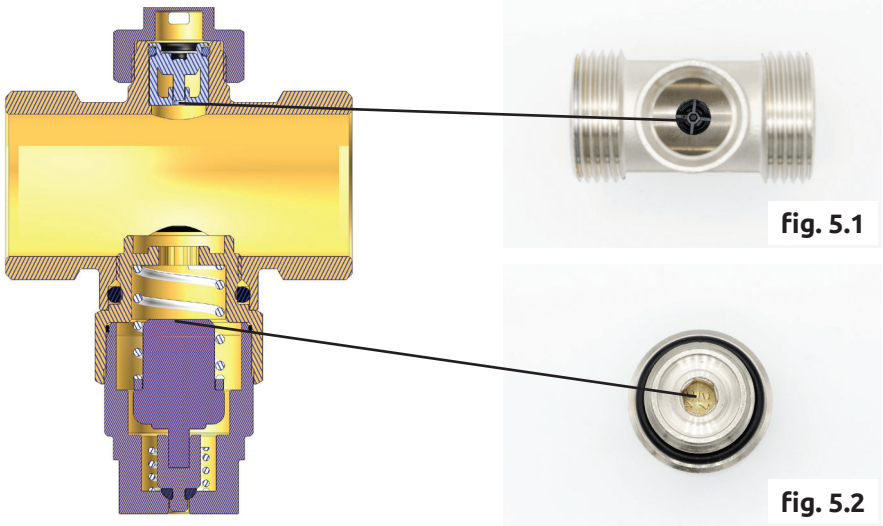


fig. 5.1

fig. 5.2

If residues are present, see chapters 6.1 and 6.2 on page page 7.

6. SPARE PARTS

- **RG0609AF06:** SPARE ANTI-FREEZE CARTRIDGE 609
- **RA4609AF33:** SPARE VACUUM BREAKER VALVE 609

6.1. VACUUM BREAKER REPLACEMENT

In the event of a vacuum breaker malfunction, unscrew the cap (1) (ch. 20), unscrew the cartridge (2) (ch. 20) and remove the vacuum breaker (3) by pushing it from inside the valve (fig. 5.1). Replace it with spare part cod. RA4609AF33.

The replacement vacuum breaker (3) must be inserted from above as shown in figure 5.2. Proceed with screwing in the cap (1) (ch. 20 - up to the stop) and the cartridge (2) (ch. 20 - tightening torque: 40 Nm).

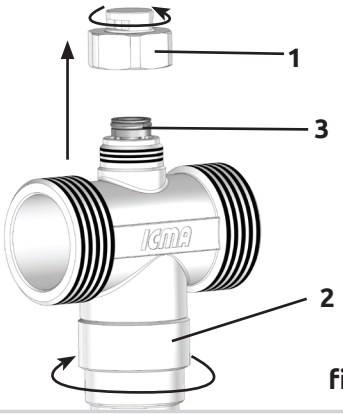


fig. 5.1

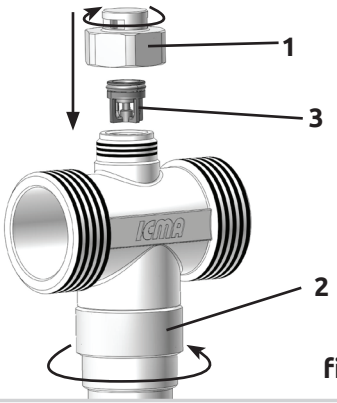


fig. 5.2

6.2. REPLACING THE THERMOSTATIC CARTRIDGE

In case of malfunction, unscrew the thermostatic cartridge (4) (ch. 20 - tightening torque: 40 Nm). Replace it with spare part cod. RG0609AF06.

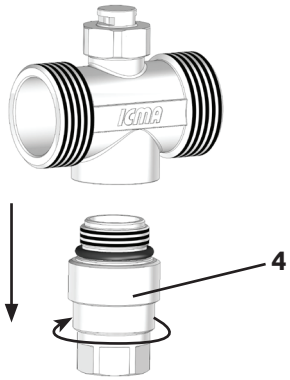


fig. 5.3

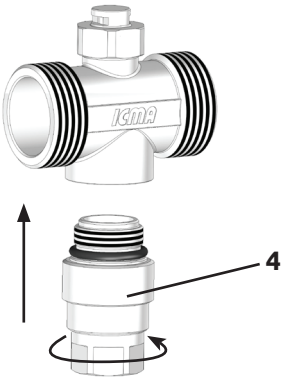
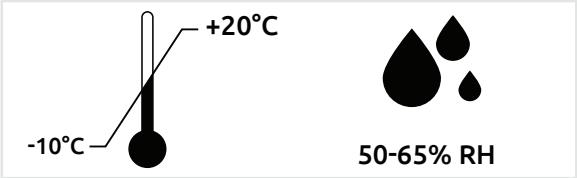


fig. 5.3

7. TRANSPORT, HANDLING AND STORING

The place where the product is conserved must be cool, dry, free from dust and moderately ventilated. The temperature must not exceed the range of -10 °C / + 20 °C.
Non observance of these temperature limits may reduce the life cycle duration of the valve.



If the warehouse is heated, the radiators and pipes must be shielded; the distance between radiators and goods/products must be at least 1 m.

Relative humidity must be between 50% - 65%.

When used, observe the sequence of deliveries as much as possible to ensure rotation of the spares.

8. DETECTION OF FAULTS/RESOLUTION OF PROBLEMS AND REPAIR

Emergency situations (accidents/damage)

After installation, continuous water leaks from the vacuum breaker valve:
- Cause: Leaks can occur due to loose threads.
- Solution: try tightening the retaining plug of the vacuum breaker valve; if the leak continues, replace the vacuum breaker valve.

After installation, water leaks from valve inlet/outlet connection threads:
- Cause: Leaks can occur due to loose threads, poor PTFE tape, etc.
- Solution: Check the seals and tighten the threads.

After installation, water leaks from the cartridge connection area on the valve body:
- Cause: Cartridge not screwed in correctly.
- Solution: Screw the cartridge correctly up to the stop.

After installation, water leaks from the cartridge connection area on the valve body:
- Cause: Damaged/missing OR.
- Solution: Remove the cartridge and check the presence and integrity of the OR, replace the cartridge.

Valve does not drain:
- Cause: The valve may have been installed in a non-vertical position with the drain path not facing downwards.
- Solution: Verify correct installation.

Valve does not drain:
- Cause: The connecting pipe could be shaped in such a way as to create a siphon effect preventing drainage.
- Solution: Verify correct installation.

Water in the pipeline freezes but the valve does not drain:
- Cause: The valve may have been installed near heat sources or in areas where the lowest temperatures are not reached.
- Solution: Anti-freeze valves should be installed outside, where the lowest temperatures can be reached in the event of a heat pump blockage. They must be positioned away from heat sources.

Water in the pipeline freezes but the valve does not drain:
- Cause: The valve may have been insulated.
- Solution: The anti-freeze valve must be protected from rain, snow and direct sunlight but not insulated.

Water in the pipeline freezes even though there is drain flow:
- Cause: The valve may not have been installed on both pipes (flow and return).
- Solution: We recommend installing anti-freeze valves on both pipes (flow and return). Otherwise, a pipe could remain full of water, resulting in the risk of ice formation.

Valve blocks due to ice blocking the drain flow:
- Cause: The valve may have been installed at too low a height from the ground, causing a column of ice to form in the area below.
- Solution: Maintain a distance of at least 15 cm from the ground.

Valve blocked or the drain does not open:
- Cause: The valve could be blocked due to debris or corrosion.
- Solution: Clean or replace the valve.
- Solution: Install adequate filtration products.

Fluid discharge outside the expected temperature range:
- Cause: drain mechanism blocked in open position.
- Solution: Check the valve for debris. It may be necessary to replace the thermostatic cartridge, install suitable filter products to prevent the problem from recurring.

Corrosion or oxidation:
- Cause: The valve may corrode or oxidise over time.
- Solution: Inspect the valve regularly and replace it if it shows signs of deterioration.

Valve drips very little (1 drop every 10 seconds):
- Cause: The anti-vacuum valve may be malfunctioning.
- Solution: Replace the anti-vacuum valve.

Valve drips continuously and the system empties:
- Cause: heat pump in prolonged blockage/no power and no filling unit.
- Solution: provide an automatic filling unit that is always active and open.

9. DISMANTLING, DEACTIVATION AND SCRAPPING

At the end of the life of the valve, before disposing of it permanently, reflect on whether it is possible to use it for other purposes.

If it is necessary to dispose of it, dismantle it when the system is off with the keys indicated in the chapter Installation.

Dismantling and disposing of the valve is only and exclusively responsibility of the owner, who will have to act in compliance with the law of his/her country regarding Safety and protection of the environment. At the end of its life the product must not be recycled with urban waste. It can be brought to specific recycling centres arranged by local administrations, or to re-sellers that provide this service.

To dispose of waste by sorting the product helps to avoid possible negative consequences, resulting from inadequate disposal of waste, for the environment and health. If done correctly, the disposal allows recovery of its material to save energy and resources.