ANTI-FREEZE VALVE

Description

The anti-freeze valve detects the temperature of the system thermal fluid by means of the thermostatic sensor contained in the body and opens the lower discharge port when the fluid temperature drops to the setting value of 3 °C. The slight discharge flow rate prevents the pipes external to the building from freezing, avoiding damages to the system devices or pipes themselves. It is used in heating and cooling systems, typically with heat pumps.

Product range

Series 04C Thermostatic anti-freeze valve

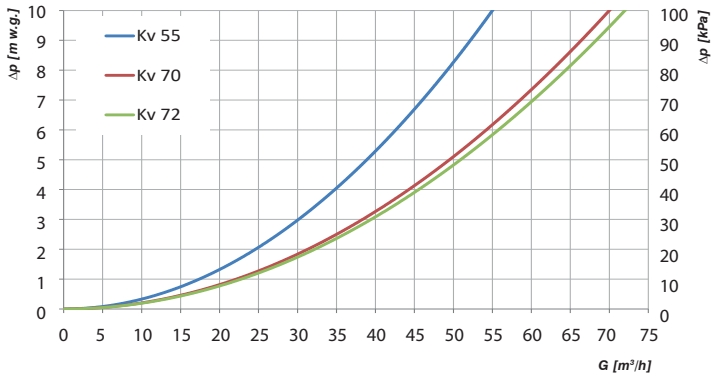
Technical features

Suitable fluids: **water**
Max. working pressure: **10 bar**
Working temperature range (fluid): **0–90 °C**
Ambient temperature range: **-30–60 °C**
Fluid temperature for opening (discharge, Tset): **3 °C**
Fluid temperature for closing: **4 °C**
Accuracy: **±1 °C**
Flow coefficient Kv:
DN 25: **55 m³/h**
DN 32: **70 m³/h**
DN 40: **72 m³/h**
Discharge flow rate (3 °C): **1,13 l/h**
with the following test conditions:
- system OFF,
- outside temperature: **-17 °C**
- water temperature inside the valve body: **3 °C**
- water temperature in the pipes inside the building: **20 °C**

Materials

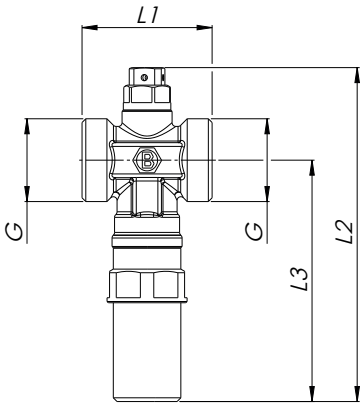
Body: **brass CW617N**
Springs: **stainless steel AISI 302**
Hydraulic seals: **EPDM**
Threaded connections: **male ISO 228-1**

Diagrams



Select the anti-freeze valve with a size equal to the diameter of the installation pipe. Check the head losses at the design flow rate and, if they are excessive, increase the valve size.

Dimensions



Series	Code	DN	G	Kv [m³/h]	L1 [mm]	L2 [mm]	L3 [mm]	Weight [kg]	N. P/B	N. P/C
04C	**04C**025000	25	G 1 M	55	52	133,5	96,5	0,445	1	20
04C	**04C**032000	32	G 1 1/4 M	70	59	142,5	101,5	0,595	1	20
04C	**04C**040000	40	G 1 1/2 M	72	62	142,5	101,5	0,645	1	20

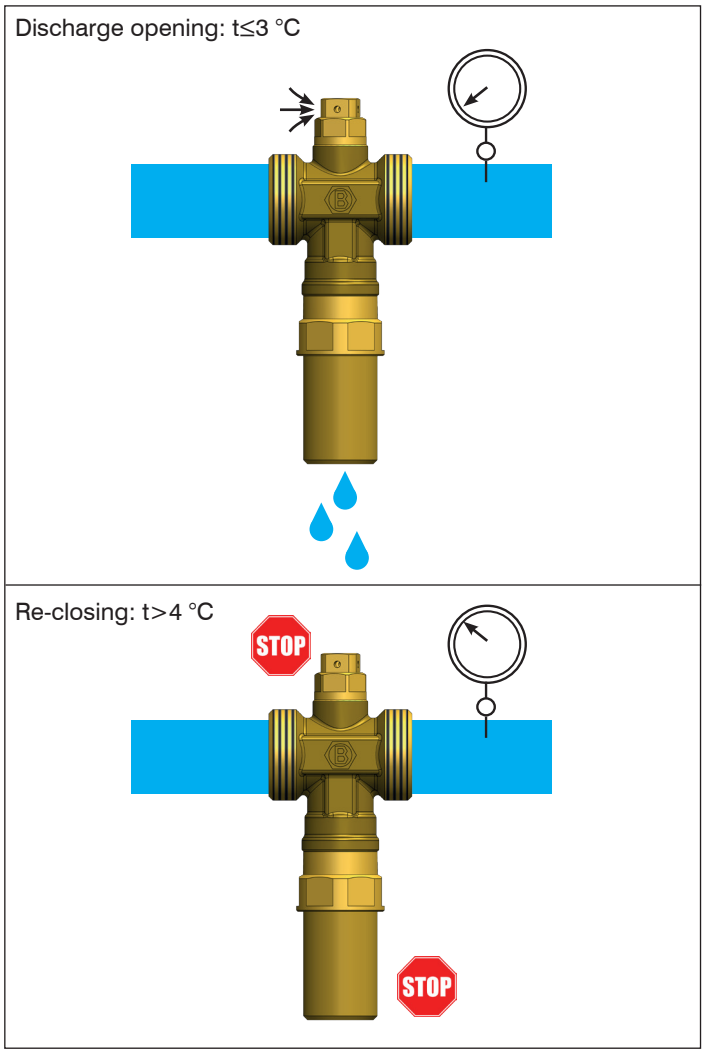
N. P/B: number of pieces in box - N. P/C: number of pieces in carton

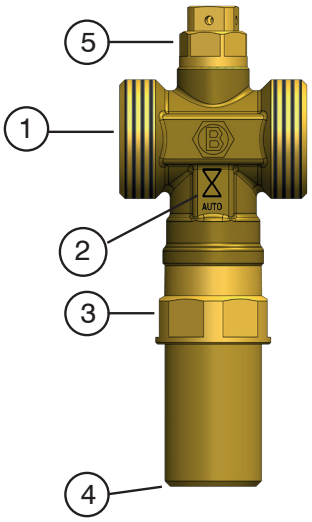
Working way

The anti-freeze valve is composed of: valve body (1), built-in automatic shut-off valve (2, placed inside the valve body in specific models), cartridge with thermostatic sensor (3), discharge port (4), anti-vacuum valve (5).

The sensor holder cartridge (3), screwed to the valve body (1), opens the shut-off valve (2), allowing the system water to come into contact with the thermostatic sensor (3).
When the thermostatic sensor detects a drop in the system water temperature down to 3 °C, the port (4) opens, allowing a slight discharge flow rate, also thanks to the opening of the anti-vacuum valve (5). In this way, especially in case of turned-off systems, freezing of pipes and consequent damage to pipes, devices and connected machines (e.g. heat pump) are avoided.
When the fluid temperature rises to 4 °C, the thermostatic sensor activates the obturator thus closing the discharge port.

Warning: since the valve detects the system water temperature, it is recommended to keep water temperature values greater than 3 °C during summer cooling to avoid undesired fluid discharge. Recommended value ≥5 °C.

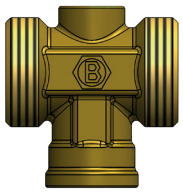




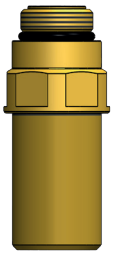
Features

Advantages

Protection always active. The valve prevents the risk of freezing in all the cases of circulation stop: electrical blackout, machine malfunctions, use of other energy sources, etc.



Interchangeable cartridges. The cartridge containing the thermostatic sensor and the anti-vacuum valve can be replaced with their respective spare parts.



Integrated automatic shut-off valve. The valve remains in the open position when the sensor holder cartridge is correctly screwed to the body. When the cartridge is removed (for maintenance or replacement), the shut-off valve automatically closes the discharge, avoiding emptying the system.

Reduced dimensions. The valve body has been designed with the smallest possible dimensions to be installed in narrow spaces.

High Kv. Given the need to install an anti-freeze valve on both the flow and return pipes, the valve body has large passage cross-sections for the fluid to limit head losses.

Wide operating range. The working temperature range for the fluid is 0–90 °C. This allows the use of the anti-freeze valve not only in heat pump systems but in all the situations where there are heating and cooling system pipes outside the building (e.g. boiler room in a remote position) at risk of frost.

Use with water without glycol. The anti-freeze valve allows you to use water without glycol in the system as it prevents the risk of freezing. This means lower costs when purchasing the fluid for filling the system as well as for its disposal in the event of maintenance or emptying.

Installation

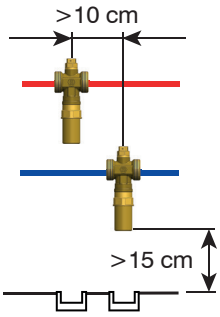
The anti-freeze valve should be installed by paying attention to the following system details.

Vertical installation. The anti-freeze valve must be installed only in vertical position with the discharge port pointing downward to allow the system water to easily flow out (fig. 1).

Outside installation. The valve must be installed only outside the building, on the pipe sections in direct contact with the external environment which are most at risk of freezing in the event of a fluid stop (fig. 2). The valve must be installed at the lowest point of the pipe to facilitate the discharge of the contained water.

Double installation. We recommend installing an anti-freeze valve on both the flow and return pipes to have complete protection of the system outside the building (fig. 2).

Protection from siphons. Pay attention to avoid siphons forming in the external section of the pipes as well as when crossing the external wall of the building. The siphons would prevent the specific section of pipe from emptying, thus nullifying the operation of the anti-freeze valve (fig. 3).



Recommended distances.
- Keep at least 15 cm of distance between the valve discharge port and the ground below to prevent any ice columns from reaching and obstructing the discharge port.
- Keep at least 10 cm of longitudinal distance between two valves, located on the flow and return pipes, to have enough maneuvering space and avoid one valve dripping onto the other.
- Keep adequate distance from heat sources that could prevent correct detection of the water temperature.

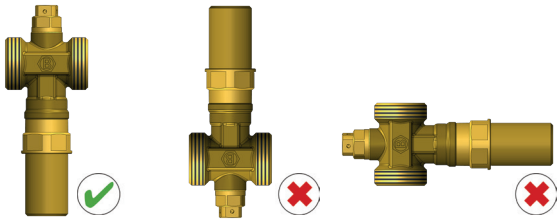
Valve protection. It is recommended to protect the anti-freeze valve using appropriate casings, so that it is not directly exposed to atmospheric agents such as rain and snow which could block the anti-vacuum valve and consequently prevent its correct functioning (fig. 4).

System pressure. Always keep the system under pressure, for example by using an automatic filling unit always open. This allows any discharged water to be refilled and the system to work correctly again, avoiding blockages of the machines due to insufficient pressure (fig. 4).

Insulation. We suggest the use of the valve without insulation. In this way the fluid contained in the valve is in its worst condition of freezing risk and the consequent operation of the valve provides full protection to the whole section of the system exposed outside.
Warning:
- do not obstruct either the anti-vacuum valve or the discharge port (both with any valve insulation and with the insulation of the connected pipes);
- avoid the accumulation of deposits or impurities that could block the components over time.

Discharge conveying. The discharge port of the valve must be kept free so that water can freely drain. Conveying pipes are therefore prohibited because they could generate stagnation of water at risk of freezing with consequent impossibility for the valve to work correctly. It is advisable to convey only the water fallen to the ground into the sewer system through specific devices (fig. 4).

1



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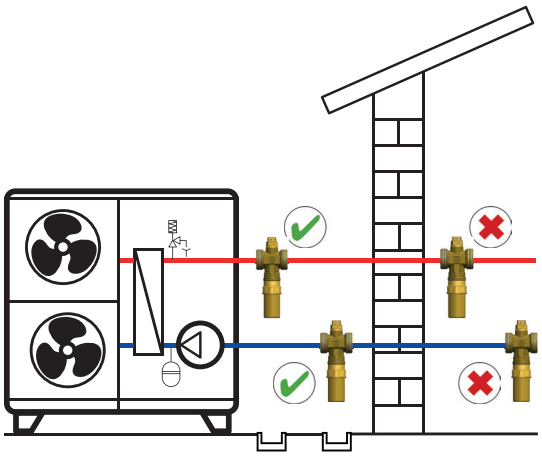

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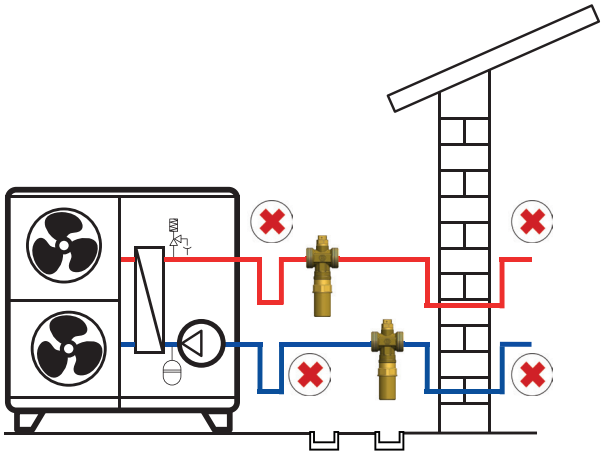

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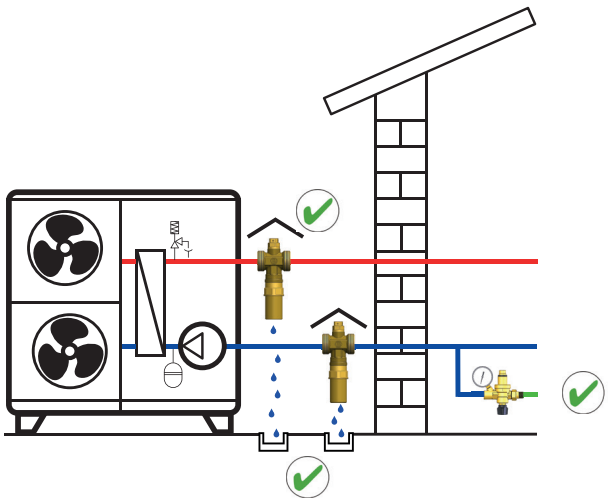


Accessories

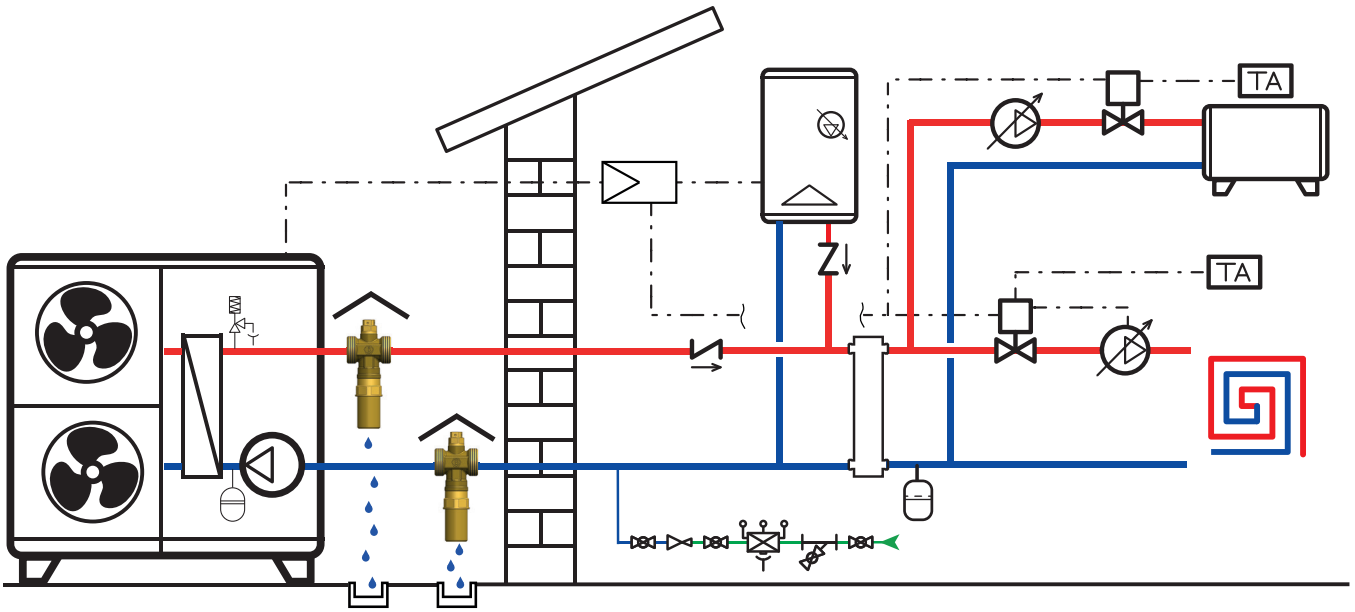
04C.3

Cartridge with spare sensor for thermostatic anti-freeze valve.

Opening temperature: ***3 °C***
Closing temperature: ***4 °C***
Working temperature range: ***0–90 °C***
Ambient temperature: ***-30–60 °C***
Max working pressure: ***10 bar***

Code		
04C 003 000	1	-

Application diagrams



Specifications

Series 04C
Thermostatic anti-freeze valve. Complete with integrated automatic shut-off valve (to remove the sensor holder cartridge) and anti-vacuum valve. Threaded connections G 1 M (from G 1 M to G 1 1/2 M). Brass body. Automatic shut-off valve in plastic. Wax thermostatic sensor. Stainless steel springs. EPDM hydraulic seals. Maximum working pressure 10 bar. Working temperature range (fluid) 0–90 °C, ambient temperature range -30–60 °C. Fluid temperature for opening (discharge) 3 °C, fluid temperature for closing 4 °C. Suitable fluids water.

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