geothermal

march 2011

altecnic
RENEWABLES

General information

Office hours:
Monday to Friday 8.30am - 5.00pm.

Prices:
Prices are exclusive of VAT, and are subject to change without notice.
All prices displayed are recognised as list.

Terms:
A copy of altecnic's terms and conditions is available on request.

Property of goods:
Until full payment has been received, all goods supplied remain the property of altecnic ltd.

Delivery:
Carriage paid 3 day service, UK mainland only. (minimum order value of £100 applies or £7.50 small order charge applies)

customer care notice

In-warranty claims and authorised good stock returns.

- collected and processed within 28 days of written notification.
- warranty is 12 months from date of installation / 18 months from date of manufacture (date of manufacture stamped onto the product) and is limited to replacement (product) value only.
- please note. rehandling charges are applicable on good stock returns.

useful contacts

Accounts enquiries: 01785 218203

Customer care line: 01785 218207

Merchant sales: 01785 218200
sales@altecnic.co.uk

Important notes

1. The standard rehandling charge is 20% of the nett value of the product authorised for good stock return.
2. Goods returned to altecnic without authorisation or correct paperwork, may not be accepted for processing.
3. Warranty claims are subject to proof that the product has been correctly installed, in accordance with the installation instructions and good working practice.
4. Warranty claims exceeding £50 can only be authorised by the altecnic customer care department.
5. As part of our quality procedure, we validate a warranty claim by product test procedures.
6. All short shipments to be advised within 7 days of receipt.
7. All returns must be packaged securely; otherwise they may not be processed for credit.

E &OE

CarbonNeutral®
Environmentally positive

THE CARBON NEUTRAL COMPANY

To Altecnic, being CarbonNeutral® since 2007, doesn't mean resting on our laurels. We donate money to environmental projects which we can see making a big difference to communities - from reforestation in Wales to wind farms in New Zealand or energy-saving lightbulbs in Jamaica.

But this mindset also means we approach new legislation positively in our product design. We were first to meet the Part G legislation of the Building Regulations with our patented Calflow Plus water flow regulator and isolation valve. Closely linked with our manufacturing partners we are constantly working towards increased product efficiency to anticipate future standards.

Working with The CarbonNeutral® company and the Edinburgh centre for Carbon Management, we followed a 3 phase process, in turn assessing our carbon footprint, taking steps to reduce it, then investing in 'carbon offset projects' world-wide.

We were the first in our industry to become CarbonNeutral®, and our reduced energy bills are the evidence that environmental responsibility wins in several ways. Many of the Altecnic workforce have carried these principles into their homes, where they're saving carbon and cost.

We are continuing to work actively to reduce our environmental impact while producing products that save resources and energy. Products, therefore, with a future.

Purpose-designed components for geothermal systems

Developed and thoroughly proven by our parent company in Italy, Altecnic's geothermal product range is purpose-designed for use in geothermal systems. The range includes components for ground loops, heat pumps and heat distribution systems.

The Altecnic name guarantees purpose-designed products, eliminating any risk of installing fittings adapted from traditional applications which may not be able to cope with the ultra high temperatures and demands of a geothermal system.

Our quality and environmental standards are proven by our ISO 9001:2008 and 14001:2004 certification.

If you have any questions about product choice or installation, we'd be happy to help.

Contents

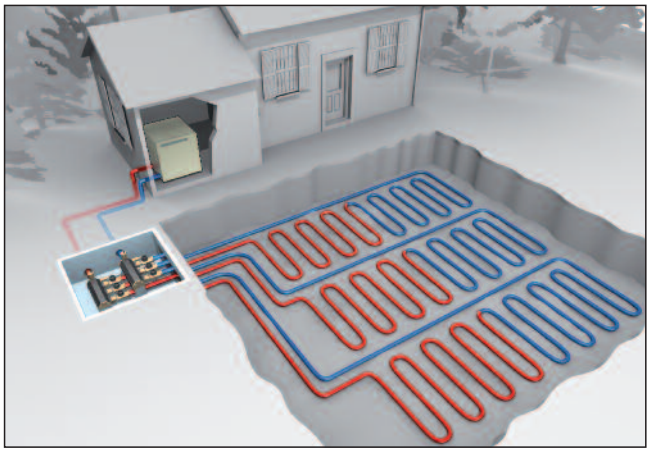
heat pump systems

HEAT PUMP SYSTEMS WITH HORIZONTAL PROBES

Heat pump systems with horizontal probes use heat that accumulates in the earth. To be installed, they need large areas clear of construction, paving or vegetation.

Pipes made of polyethylene (or reticulated polyethylene, depending on the type of ground) are inserted horizontally into the ground in an excavation from 1 to 3 m deep with a centre distance of 50 to 80 cm. After laying, the excavated ground is put back and compacted.

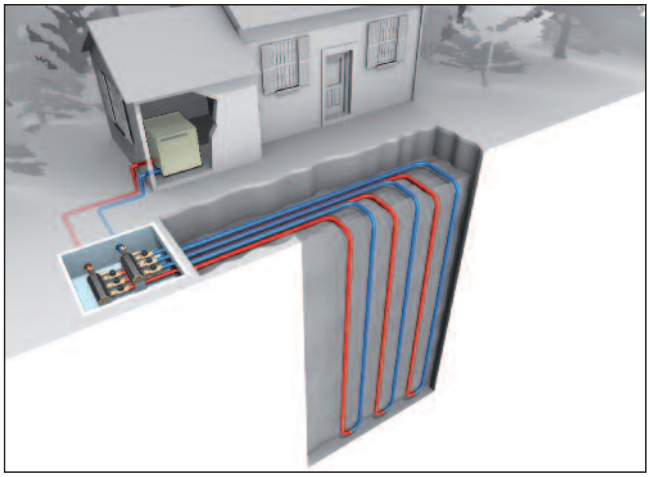
The sizing of the manifolds is performed according to the thermal efficiency of the ground, which is affected by its composition, compactness and the quantity of water it contains. It is necessary to pay attention to the sizing to prevent not only malfunctioning and low output of the heat pump, but also to prevent harmful consequences for vegetation such as freezing roots.



HEAT PUMP SYSTEMS WITH VERTICAL PROBES

Systems with vertical ground source probes are based on the fact that, below a depth of 20 m, the temperature of the subsoil is constant; below 20 m, the temperature of the ground increases by approximately 3°C every 100 m in depth.

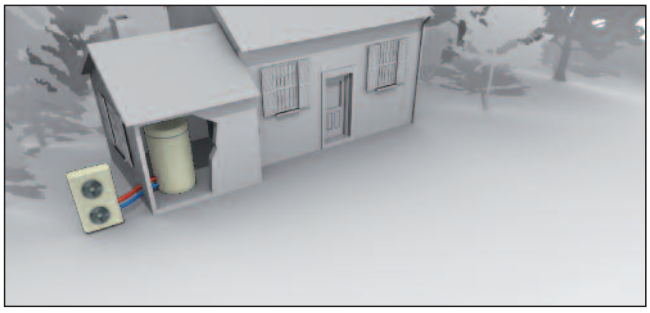
Vertical probes, varying in length from 20 to 150 m, and configured in either one or two U-circuits are inserted into the ground. They are made with high resistance PE pipes (generally with the following diameters: DN 25, DN 32 and DN 40) specific for ground source applications. To aid their insertion in the holes, these circuits are ballasted with special disposable weights of 15 – 20 kg. After laying the circuits, the gap between the wall of the hole and the pipe is filled.



AIR SOURCE HEAT PUMP SYSTEMS

The outside air is a source of energy. Systems that draw thermal energy from the air can be made with air-air and air-water heat pumps. The working principle is the same as for heat pumps that draw energy from the ground; in this case neither drilling nor digging are necessary. These systems, in comparison to GSHP' s, are the best solutions from the point of view of plant engineering and installation costs but have a lower output. When the temperature drops the output of heat pumps decrease significantly. A lower efficiency can be accepted when considering the economic savings in the cost of the system.

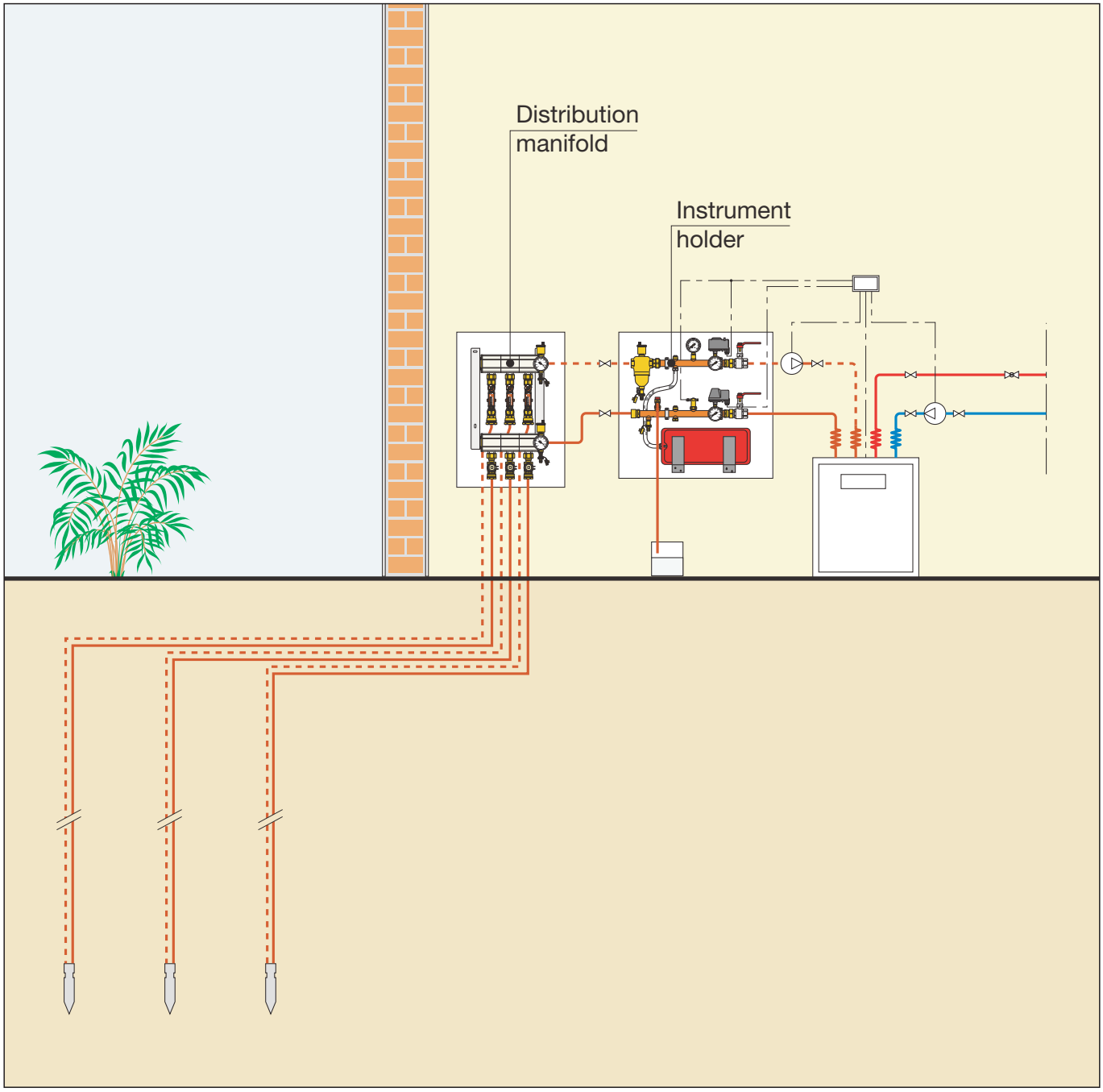
In a conventional installation, the heat pump is usually located outside the dwelling, to have better thermal exchange and to prevent problems associated with noise during operation. The design must take into account the possibility of the system freezing, between the heat pump and the internal system.



We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice.

The products in the CALEFFI GEO® series have been conceived specifically for use in heat pump systems. In **ground source heat pumps** a mixture of water and anti-freeze fluid is generally used to protect against freezing temperatures. The components are made with high-performance materials for this type of applications.

The following is an example of a ground source heat pump system with vertical probes.

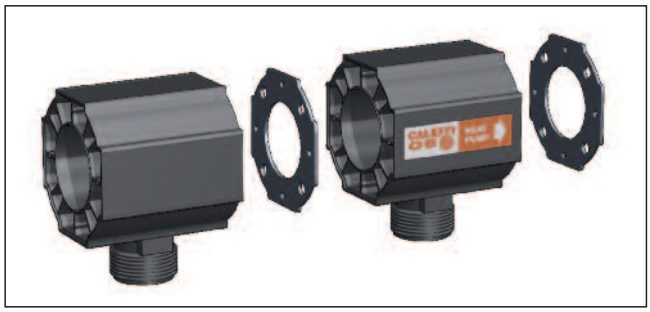


The distribution manifold and the instrument holder must be installed correctly to allow the medium to flow in the probes at the specified pressure and with appropriate instruments (for control, safety and expansion) to assure correct operation of the heat pump.

distribution manifold

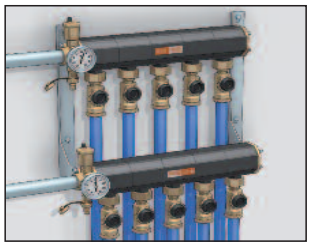
The entire modular distribution manifold has been designed to be easily assembled on a bench and afterwards hooked onto wall brackets.
This feature facilitates preparation of the probes and simple connection to the manifold.
The manifold is modular to allow it to be adapted to small residential systems in which the number of probes generally vary from 2 to 8.
The number of single modules used is defined by the number of probes.
The manifold is also available in a preassembled version.

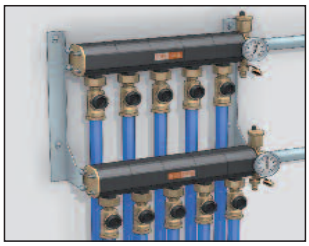
The modules have been designed to limit condensation. An air gap isolates the medium from the outside environment.



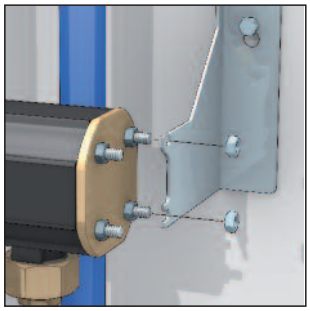
Two brass blind end plugs and four tie-rods permit compaction of the modules. A seal in between isolates the water duct and the single air chambers.

The manifold is reversible to adapt the position of the probes with respect to the heat pump.



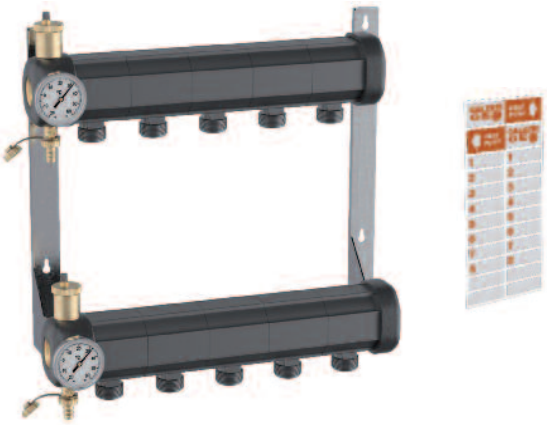


The bracket can be secured to a wall with no manifold so as to facilitate connecting the probes.



110 preassembled ground source manifold

Complete with:
- automatic air vents;
- temperature gauges Ø80 mm;
- fill/drain cocks;
- flow and return manifolds;
- blind end plugs with insulation;
- wall brackets;
- set of labels for direction of flow and circuit identification;
- wall fixing anchors.



Body made of polymer PA66G30.
Max. working pressure: 6 bar.
Pmax system test: 10 bar.
Working temperature range: -10– 60°C.
Ambient temperature range: -20– 60°C.
Medium: water, glycol solutions, saline solutions.
Maximum percentage of glycol: 50%.
Manifold DN 50.
End connection: 1 1/4".
Outlet connection: 42 p.2,5 TR.
Outlet centre distance: 100 mm.
Outlet connections with mechanical seal for shut-off valves 111 series, balancing valves 112 series and flow meters 113 series.

Ref. no	Description
1107B5	2 circuits
1107C5	3 circuits
1107D5	4 circuits
1107E5	5 circuits
1107F5	6 circuits
1107G5	7 circuits
1107H5	8 circuits

110 modular manifold single module

Body made of polymer PA66G30.
Max. working pressure: 6 bar.
Pmax system test: 10 bar.
Working temperature range: -10– 60°C.
Ambient temperature range: -20– 60°C.
Medium: water, glycol solutions, saline solutions
Maximum percentage of glycol: 50%.
Manifold DN 50.
Outlet connections with mechanical seal for shut-off valves 111 series, balancing valves 112 series and flow meters 113 series.

Ref. no	Description
110700	modular manifold single module

110 assembly kit for modular manifolds

Complete with:
- brass end fitting with automatic air vent, fill/drain cock;
- brass blind end plug;
- pre-formed shell insulation;
- screws and bolts for tie-rods and brackets;
- set of labels for direction of flow and circuit identification;
- temperature gauge with pocket (-20– 60°C);
- No. 2 seals gaskets.

Max. working pressure: 6 bar.
Pmax system test: 10 bar.
Working temperature range: -10– 60°C.
Ambient temperature range: -20– 60°C.
Medium: water, glycol solutions, saline solutions.
Maximum percentage of glycol: 50%.

Ref. no	Description
110750	assembly kit for modular manifolds

110 stainless steel tie-rods

For assembling modular manifolds.
M8 threaded stainless steel bar.

Ref. no	Description
110012	for manifold with 2 circuits
110013	for manifold with 3 circuits
110014	for manifold with 4 circuits
110015	for manifold with 5 circuits
110016	for manifold with 6 circuits
110017	for manifold with 7 circuits
110018	for manifold with 8 circuits

110 pair of stainless steel brackets to secure modular manifolds

Rapid wall coupling system.
System for rapidly coupling the manifold on the brackets.
With screws and plugs.

Ref. no	Description
110001	stainless steel brackets (pair)

shut-off and balancing devices

111 ball shut-off valve fitted for integrated flow rate measuring sensor

Brass body. Polymer top plug.
Female connections with captive nut
and fitting for polyethylene pipe.
Max. working pressure: 6 bar.
Pmax system test: 10 bar.
Working temperature range: -10– 60°C.
Ambient temperature range: -20– 60°C.
Medium: water, glycol solutions, saline solutions.
Maximum percentage of glycol: 50%.
Connection to manifold: 42 p.2,5 TR.

Patent application No. MI2010A000476.

Ref. no	Connection
111620	Ø25
111630	Ø32

111 pre-formed insulation for shut-off valves

Material: closed cell expanded PE-X.
Thickness: 10 mm.
Density: inner part 30 kg/m^3, outer part 80 kg/m^3.
Thermal conductivity (DIN 52612):
at 0°C: 0,038 W/(m· K); at 40°C: 0,045 W/(m· K).
Coefficient of resistance
to water vapour (DIN 52615): > 1.300.
Working temperature range: 0÷100°C.
Reaction to fire (DIN 4102): class B2.

Ref. no	Description
111001	for Ø25 - Ø32

111 integrated flow rate measuring sensor

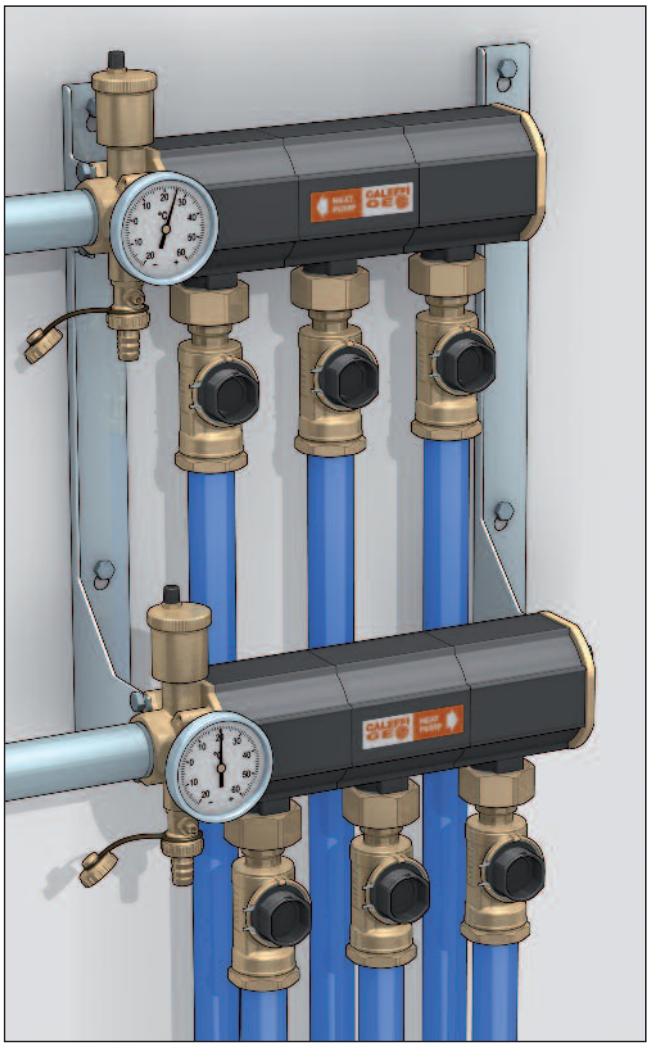
With Vortex effect.
Accuracy: ±10%.

Ref. no	Description
111010	integrated flow rate measuring sensor

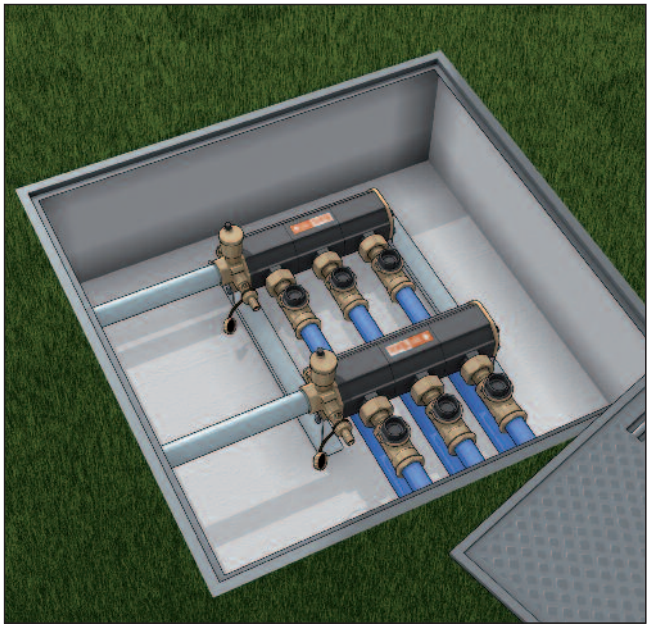
111 control lever for shut-off valves

Polymer body.

Ref. no	Description
111002	control lever for shut-off valves



The manifold has been designed for both vertical use, anchored to a wall, and horizontal use, for example in a pit.

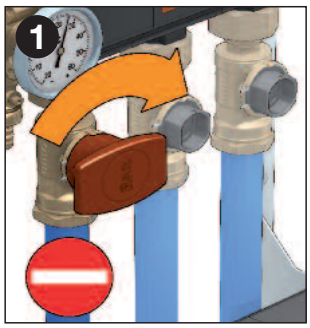


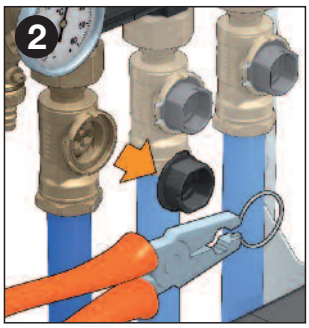
Circuit balancing

Flow rate balancing in the probes is essential to ensure correct thermal exchange. Before balancing it is necessary to insert the flow rate measuring sensor into each shut-off valve of the flow manifold. Each single valve is provided with a plug, anchored with an elastic ring that isolates the holes made in the ball.

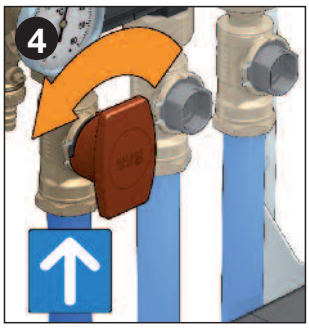
ATTENTION: The plug and sensor can be removed with the valve in closed position only.
In case of horizontal installations, drain pressure using the back cock, after valve closure.

To swap this plug with the sensor you need to:
1. Close the valve with the knob.
2. Remove the seal and extract the plug.

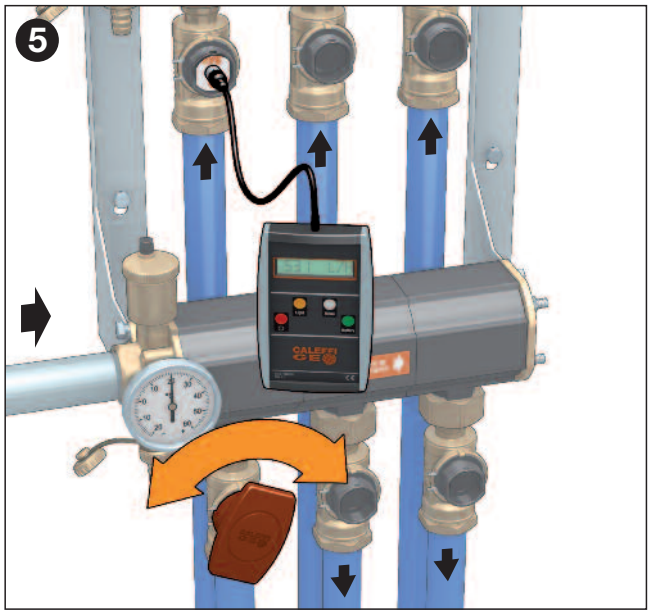




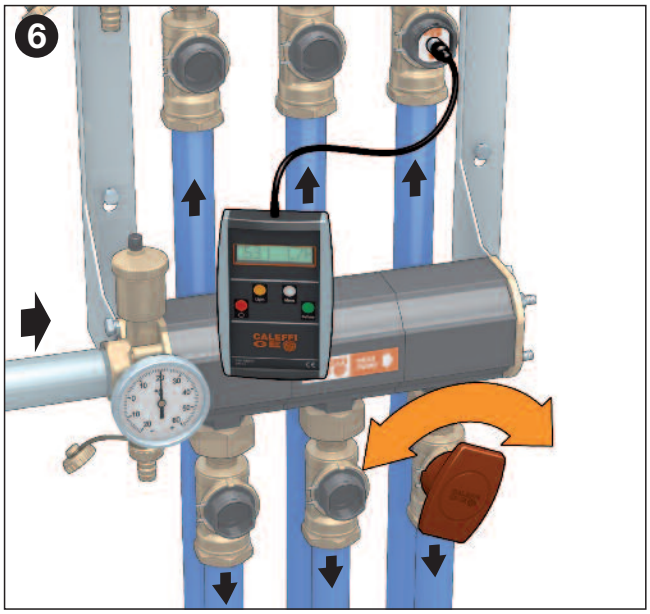
3. Insert the measuring sensor and retain it with the seal.
4. Reopen the valve with the knob.



5. After carrying out these operations on all the outlets it is possible to connect the electronic measurer to the sensor of the first branch and measure the corresponding flow rate.
   The flow rate is adjusted with the special knob to adjust the shut-off valve on the return manifold in correspondence with the same circuit until the instrument indicates the design setting.



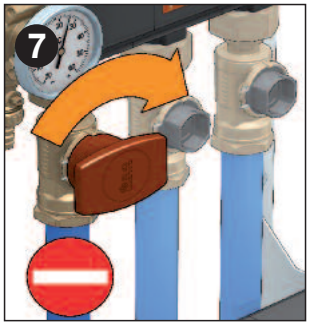
6. This operation must be repeated on the following branches to obtain the desired flow rate.

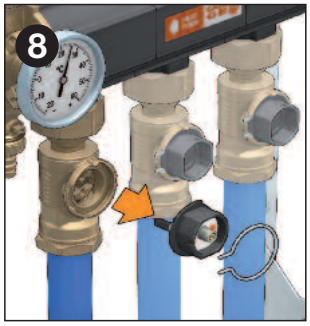


During the flow rate mesurement, the sensor creates no significant head losses and therefore causes no significant changes in the actual flow rate.

After balancing, disconnect the electronic measurer and put the shut-off valves back into their standard operating condition as follows:

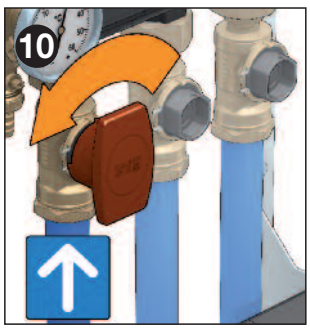
7. Close the valve with the knob.
8. Remove the seal and extract the sensor.





9. Fit the plug back in and secure it with the seal.
10. Reopen the valve with the knob.

Repeat the process for all the circuits.



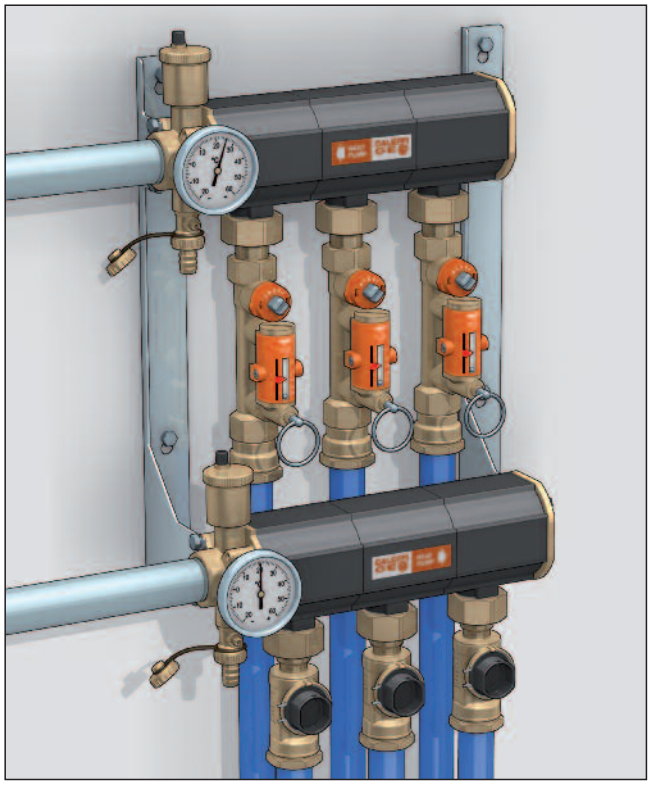
112 balancing valve with flow meter

Direct reading of flow rate.
Ball valve for flow rate adjustment.
Graduated scale flow meter with magnetic movement flow rate indicator.
Brass valve body and flow meter.
Female connections with captive nut and fitting for polyethylene pipe.
Max. working pressure: 10 bar.
Working temperature range: -10 - 110°C.
Ambient temperature range: -20 - 60°C.
Medium: water, glycol solutions, saline solutions.
Maximum percentage of glycol: 50%.
Accuracy: ±10%.
Connection to manifol: 42 p.2,5 TR.

Ref. no	Connection	Scale (m3/h)
112621	Ø25	0,3 - 1,2
112631	Ø32	0,3 - 1,2

Construction details

On 112 series valves, the flow rate reading is given directly by a flow meter, obtained with a by-pass on the body of the device, which can be automatically cut off during normal operation.



The use of a flow meter greatly simplifies the process of system balancing, since the flow rate can be measured and controlled at any time and there is no need for differential pressure gauges or reference charts.

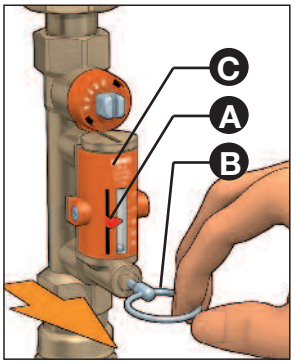
112 pre-formed insulation for balancing valves

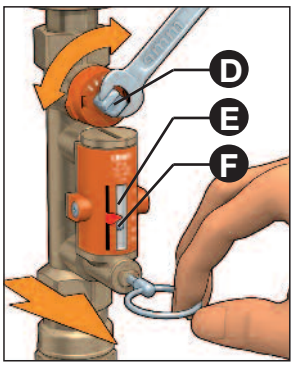
Material: closed cell expanded PE-X.
Thickness: 10 mm.
Density: inner part 30 kg/m^3, outer part 80 kg/m^3.
Thermal conductivity (DIN 52612):
at 0°C: 0,038 W/(m· K); at 40°C: 0,045 W/(m· K).
Coefficient of resistance
to water vapour (DIN 52615): > 1.300.
Working temperature range: 0÷100°C.
Reaction to fire (DIN 4102): class B2.

Ref. no	Description
112001	for Ø25 - Ø32

Flow rate adjustment

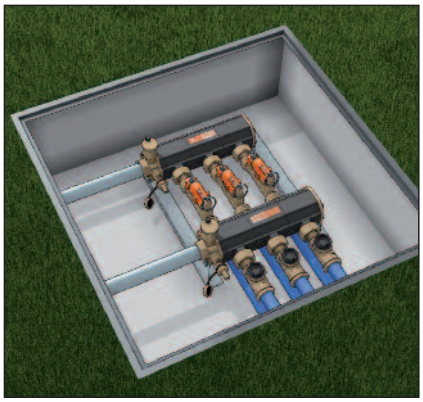
1. With the aid of the indicator (A), mark the reference flow rate at which the valve is to be set.
2. Use the ring (B) to open the obturator that shuts off the flow of medium in the flow meter (C) under normal operating conditions.
3. Keeping the obturator open, use a wrench on the valve' s control stem (D) to adjust the flow rate.
   It is indicated by a metal ball (E) that runs inside a transparent guide (F) next to which there is a graduated scale in m^3/h.
4. After completing the balancing, release the ring (B) of the flow meter obturator which, thanks to an internal spring, will automatically go back into the closed position.





5. On completing the adjustment, the indicator (A) can be used to keep the setting in memory, in case checks need to be made over time.

The versatility of the balancing valve in no way impairs installation with a horizontal manifold.



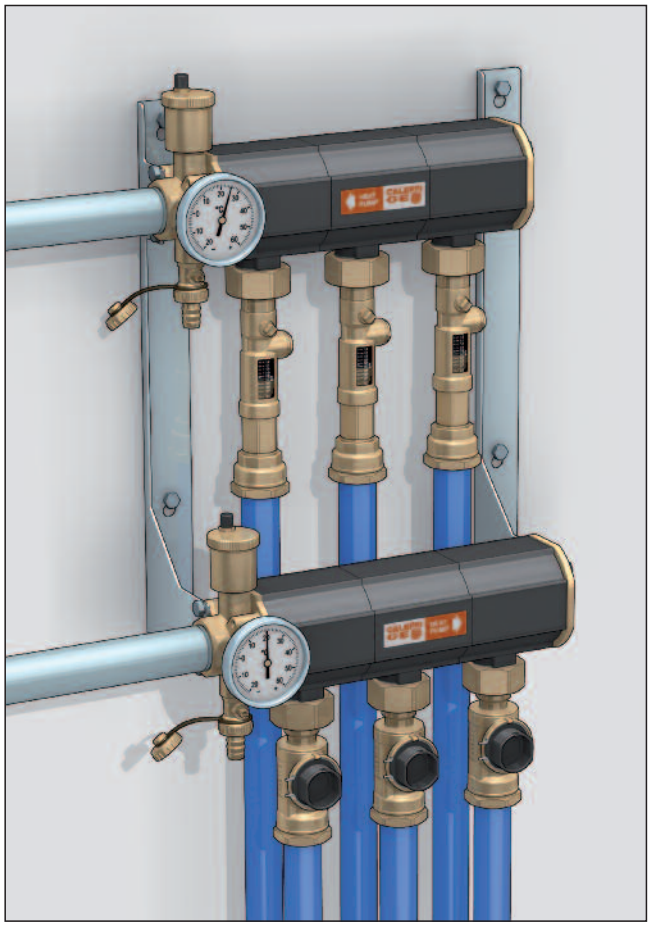
113 float flow meter

Brass body.
Female connections with captive nut and fitting for polyethylene pipe.
Max. working pressure: 10 bar.
Working temperature range: -10– 110°C.
Ambient temperature range: -20– 60°C.
Medium: water, glycol solutions, saline solutions.
Maximum percentage of glycol: 50%.
Connection to manifold: 42 p.2,5 TR.

Ref. no	Connection	Scale (m3/h)
113621	Ø25	0,3 - 1,2
113631	Ø32	0,3 - 1,2

Flow meter

The flow meter is a floating gauge that measures fluid movement, and has a built-in adjustable flow limiter.
It works within a range of 0,3– 1,2 m^3/h.
The flow meter must be fitted in a vertical position only.

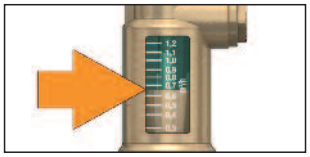


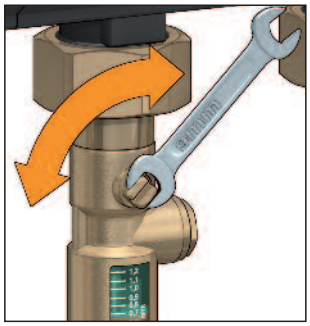
113 pre-formed insulation for float flow meter

Ø25 and Ø32 mm.
Material: closed cell expanded PE-X.
Thickness: 10 mm.
Density:
inner part 30 kg/m^3, outer part 80 kg/m^3.
Thermal conductivity (DIN 52612):
at 0°C: 0,038 W/(m· K); at 40°C: 0,045 W/(m· K).
Coefficient of resistance
to water vapour (DIN 52615): > 1.300.
Working temperature range: 0÷100°C.
Reaction to fire (DIN 4102): class B2.

Ref. no	Description
113001	for Ø25 - Ø32

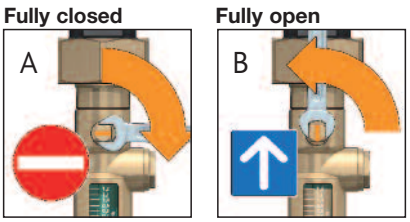
The flow rate in each probe is indicated by the top edge of the float and can be modified by turning a 9 mm spanner on the ball valve.





Full closing and opening of the valve

The valve can be fully opened or closed.
A slot on the obturator stem indicates the status of the valve.



Correction for liquids with different densities

To have the actual flow rate when using glycol solutions at low temperature it is necessary to multiply the reading of the float flow meter by a corrective factor of:
- 0,9 for concentrations of 20-30%
- 0,8 for concentrations of 40-50%

Horizontal installation of the manifold is not allowed when flow meters are used.

instrument holder

115 instrument and accessories holder for heat pumps complete with steel anchoring base

Connections: female.
Max. working pressure: 3,5 bar.
Working temperature range: -20– 90°C (temperature gauges 60°C).
Ambient temperature range: -10– 55°C.
Medium: water, glycol solutions, saline solutions.
Maximum percentage of glycol: 50%.
A saline solution can be used as the medium, changing the provided pressure gauge with the steel one code 557596.

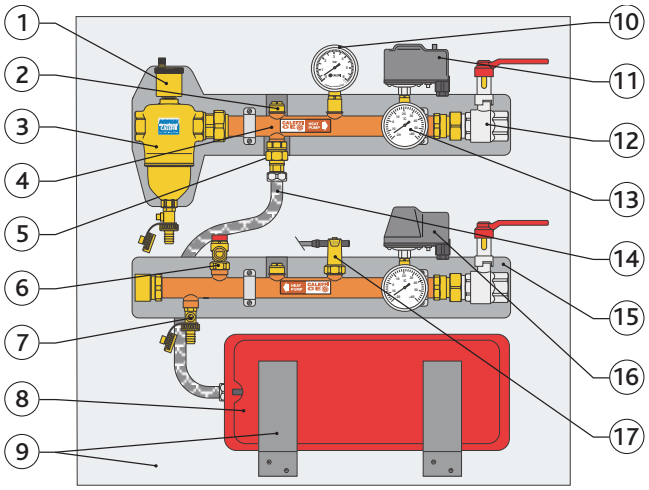
Ref. no	Description
115700	1 1/4"

115 box for coupling with instrument holder anchoring base 115 series

In painted steel.
Inspection box and frame in white painted sheet steel,

Ref. no	Dimensions (hxwxd)
115080	900 x 860 x 175

Characteristic components



1) Automatic air vent
2) No. 2 1/2" pockets for temperature probes
3) Dirt separator with automatic air vent and drain cock
4) Copper instrument holder
5) Automatic shut-off cock, for expansion vessel
6) Safety valve with adjustable outlet
7) Fill/drain cocks
8) Expansion vessel capacity 7,5 litres
9) Anchoring plate (box bottom) complete with support brackets
10) Pressure gauge conforming to I.S.P.E.S.L.
11) I.S.P.E.S.L. approved minimum pressure switch
12) No. 2 shut-off valves with extended lever to facilitate use when there is insulation
13) No. 2 temperature gauges Ø80 mm
14) Hose for connecting expansion vessel
15) Pre-formed shell insulation
16) *Safety pressure switch 625 series (optional)*
17) *Flow switch 315 series (optional)*

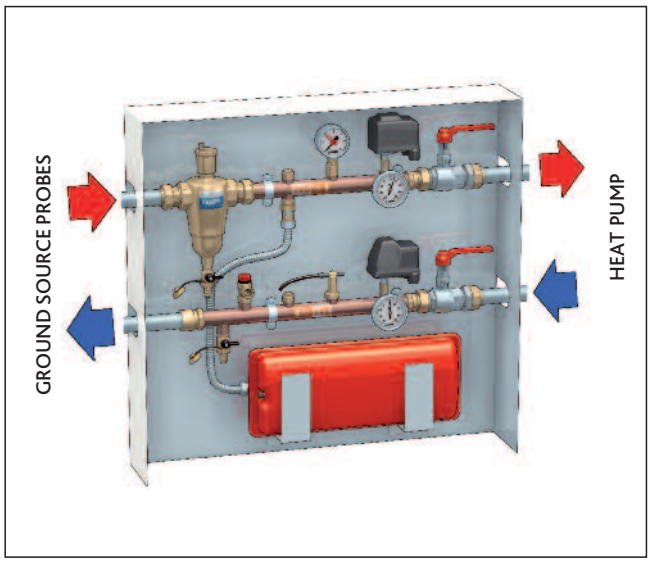
Construction details

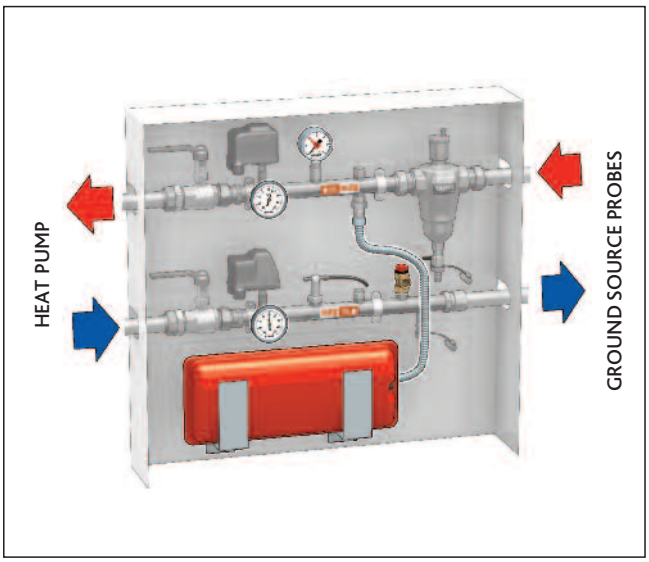
Compact unit to check and ensure the safety and correct operation of the heat pump and ground source probe system.
Insulation with two shells completely encloses all the metal parts from condensation.
Easy system filling and draining.
The manifold can be shut off for maintenance.
The manifold can be installed on a wall or in an exposed box.

Thanks to the combination of the dirt separator and the air vent it is possible to keep the medium circulating in the probes constantly clean and deaerated. This protects the heat exchanger from drops in output due to accumulated dirt and corrosion caused by the presence of air.

The manifold has been designed to be reversible to ensure right-hand or left-hand installation according to the position of the heat pump in relation to the probes.

It is sufficient to turn through 180° the installation of pressure gauge, temperature gauges, safety valve and expansion vessel.





625 safety pressure switch

Up to 500 V three-pole - 16 A.
Max. working pressure: 15 bar.
Ambient temperature range: -10– 55°C.
Medium temperature range: 0– 110°C.
1/4" female connection.
Protection class: IP 44.

Ref. no	Adjustment range
625005	1 - 5 bar
625010	3 - 12 bar

557 pressure gauge

3/8" radial connection.
Accuracy class: UNI 2,5.
Conforms to I.S.P.E.S.L. standards.

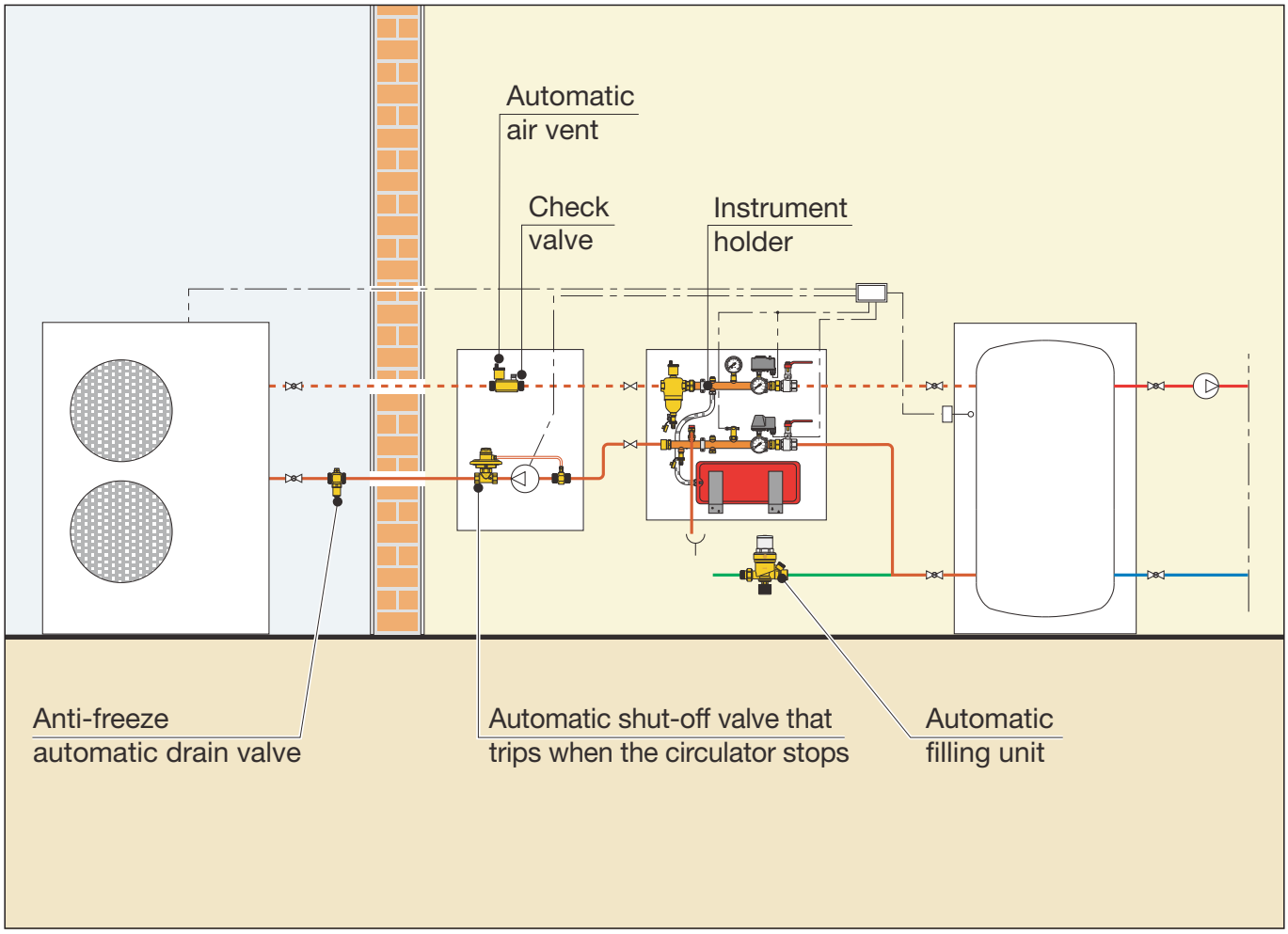
Ref. no	Bar	Ø (mm)
557706	0 - 6	80

components for air source heat pump systems

The products in the CALEFFI GEO® series have been conceived specifically for use in heat pump systems. A system with an **air source heat pump**, in case of malfunctioning and outside conditions with temperature below 3°C, risks ice forming in the pipes.

The components are made with high-performance materials for this type of application.

The following in an example of an air source heat pump system.



In the event of the pump malfunctioning or an electric supply failure, the external pipes are exposed to potential frost damage.
To avoid this, it is possible to use anti-freeze solutions, heating cable protection or hydraulic systems.

Anti-freeze solutions significantly increase head losses of the medium. In addition, they require constant checks and servicing to prevent both the loss of the anti-freeze action and corrosion.

Heating cable protection, in this specific case, is not recommended because without electric power there can be no anti-freeze function.

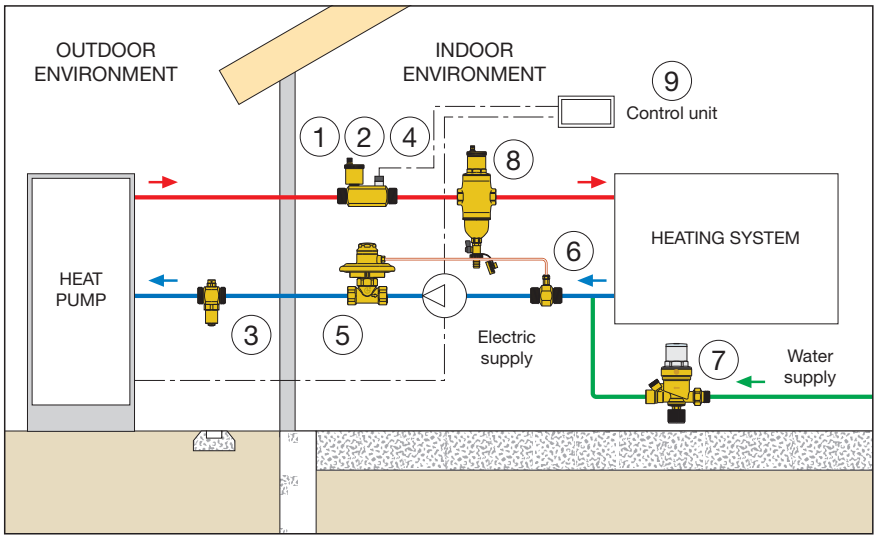
Hydraulic anti-freeze systems do not increase the head losses of the medium, do not require constant checking and servicing and they are not made ineffective by electric power failure.

Operating principle

The anti-freeze protection unit comes into effect in the event of failure of the electric supply of the heating system and heat pump, for an extended period, when the outside temperature is below 0°C.

Here we show the functional diagram of the protection unit composed of:

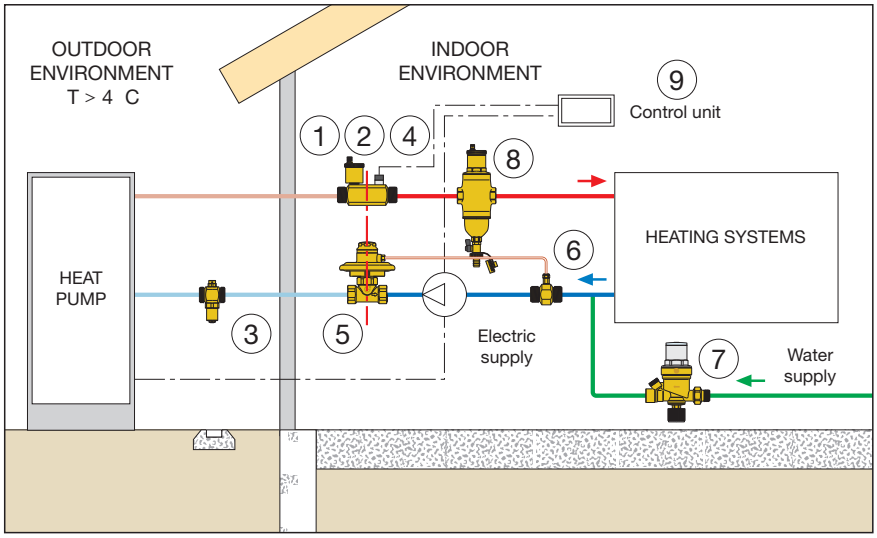
1. Air vent with dual function:
   besides the conventional use of venting air, it is also used to draw air into the system when the protection unit triggers.
2. Check valve with the function of isolating the system branch on the outside.
3. Anti-freeze valve sensitive to the system water temperature.
4. "Minimum temperature" safety thermostat.
5. Differential valve with the function of isolating the system branch on the outside.
6. Fitting acting as a pressure test point.
7. Filling unit to maintain the static pressure of the system and recharge the circuit after the protection unit has triggered.
8. Deaerator-dirt separator that continuously eliminates the air and debris contained in the circuit.
9. Control unit.



If there is no electric current but the outside conditions are not freezing (T > 4°C), the system will separate the internal part of the system from the external part at the differential valve (5) and check valve (2).

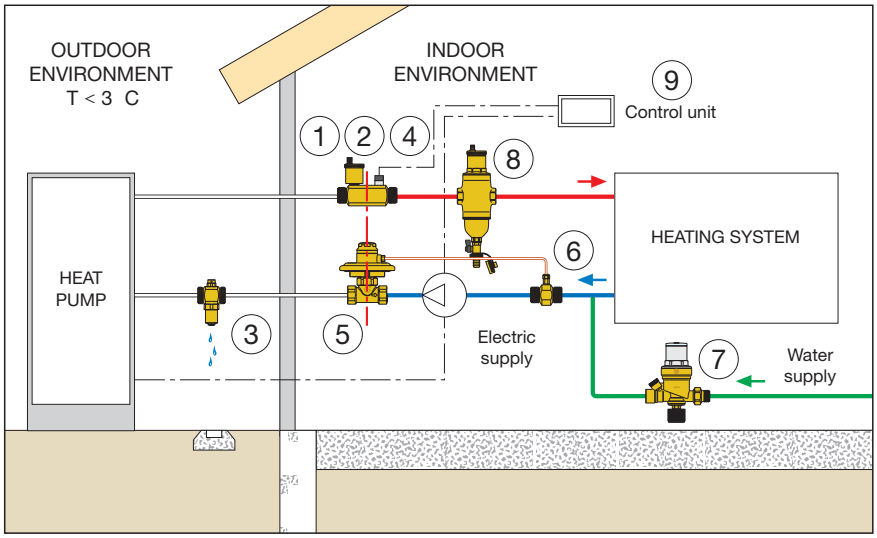
The water contained in the external part of the system is not discharged.

When the electric supply returns, the circulator will restart and the system recommence normal operation.



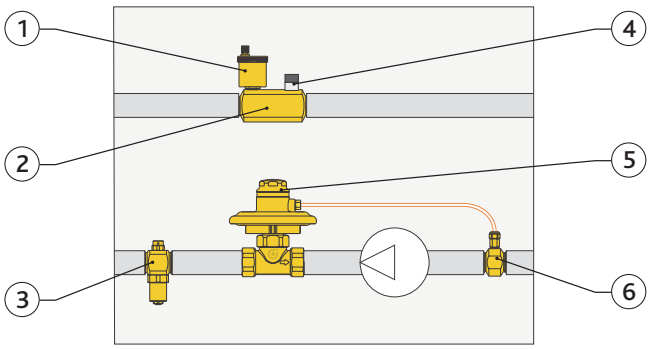
If there is no electric current and the water temperature is < 3°C the unit will separate the external part from the internal one and the anti-freeze valve (3) will come into operation and drain the system.

When the electric supply returns, the circulator will restart and the filling unit will recharge the system to the nominal pressure setting.



anti-freeze protection

Characteristic components



1) Automatic air vent valve.
2) Check valve fitted for air vent and minimum thermostat, 1" male connections.
3) Anti-freeze valve, 1" male connections.
4) Sensor for connection to control unit.
5) Differential valve complete with capillary pipe for connecting to the pressure test point, 1" female connections.
6) Fitting with pressure point, 1" male connections.

109 anti-freeze kit

Max. working pressure:
3 bar
Working temperature range:
0 - 65°C
Ambient temperature range:
-20 - 60°C
Patent pending.

Ref. no	Connection
109600	1"

108 anti-freeze valve

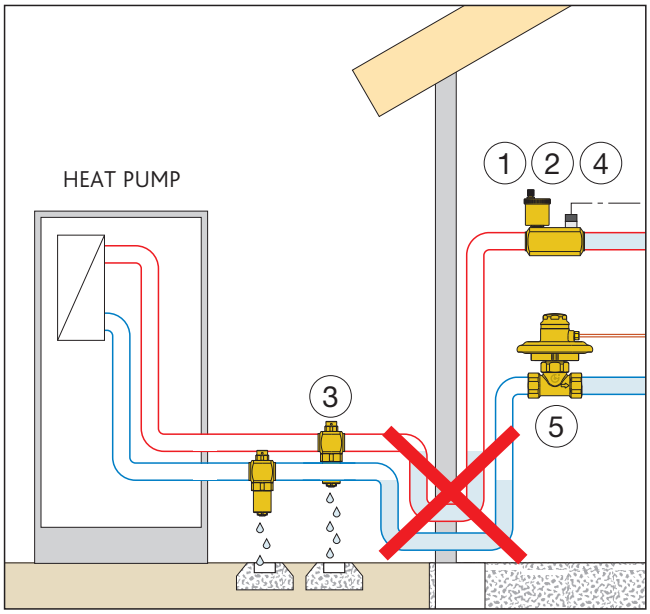
Brass body.
Max. working pressure: 3 bar.
Working temperature range: 0– 65°C.
Ambient temperature range: -20– 60°C.
Opening temperature: 3°C.
Closing temperature: 4°C.
Patent pending.

Ref. no	Connection
108600	1"

If the heat pump has both circuit connections at the bottom. Installing just one anti-freeze valve will not ensure complete drainage of the external part of the system since the connections with the exchanger are at the top of the machine.

With this configuration it is necessary to install two anti-freeze valves at the bottom of each branch so as to ensure correct operation of the protection unit.

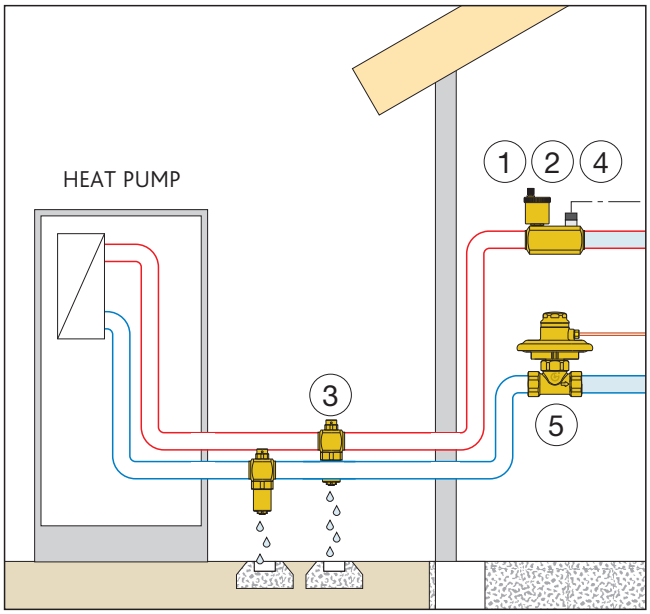
The pipe connecting the anti-freeze valve and the air vent must not create a siphon effect and prevent draining part of the piping.



For optimal operation of the protection unit it is advisable to use a buffer vessel upstream from the circulator to aid filling the external part of the system that may have been drained by the protection unit coming into operation.

The anti-freeze valves must be positioned in the coldest part of the system or well away from any sources of heat that could impair operation and at least 15 cm off the ground.

The pressure point must be positioned immediately upstream from the circulator while the differential valve is installed immediately downstream.



115 instrument and accessories holder for heat pumps complete with steel anchoring base

Connections: female.
Max. working pressure: 3.5 bar.
Working temperature range: -20– 90°C (temperature gauges 60°C).
Ambient temperature range: -10– 55°C.
Medium: water, glycol solutions, saline solutions.
Maximum percentage of glycol: 50%.
A saline solution can be used as the medium, changing the provided pressure gauge with the steel one code 557596.

Ref. no	Description
115700	1 1/4"

115 box for coupling with instrument holder anchoring base 115 series

In painted steel.
Composed of outer casing and door.

Ref. no	Dimensions (hxwxd)
115080	900 x 860 x 175

546 deaerator-dirt separator

DISCALDIRT®

Brass body.
Female connection.
Drain cock with hose connection.
Max. working pressure: 10 bar.
Max. discharge pressure: 10 bar.
Temperature range: 0– 110°C.
Particle separation rating down to 5 μm.
Patented.

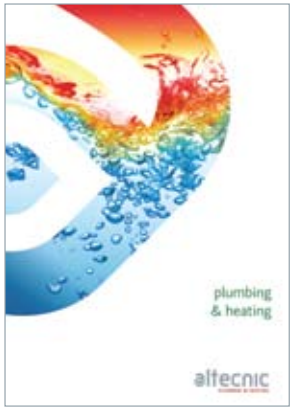
Ref. no	Description
546005	3/4"
546006	1"

553 pre-adjustable automatic filling unit

Anti-scale, inspectionable with pressure setting indicator, manual cock, strainer and check valve.
Setting pressure range range: 0,2– 4 bar.
Max. inlet pressure: 16 bar.
Max. working temperature: 65°C.

Ref. no	Description
553540	1/2" with pressure gauge connection
553640	1/2" with pressure gauge

notes



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