

Geothermal Product Guide

Altecnic Renewables



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As the UK's leading manufacturer and supplier of superior plumbing equipment, Altecnic is committed to significantly investing in new technology to bring innovative products to market. As part of the global Caleffi organisation, Altecnic offers a comprehensive range of internationally accredited plumbing and heating products which meet all current UK and European standards. The specialist renewables division provides professional installers with the latest solar, geothermal and biomass technology.

Supplying both domestic and commercial buildings, Altecnic's industry wide reputation for high quality manufacturing and environmental awareness is proven by ISO 45001. Trade merchants, original equipment manufacturers, plumbing and heating engineers and specifiers continue to choose Altecnic's outstanding products and services, fully supported by the national sales team and experienced technical and quality departments.



Please note

WRAS Approved Products

Details of the range of products approved can be found in the Water Fittings and Materials online directory:

www.wras.co.uk



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Altecnic

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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.



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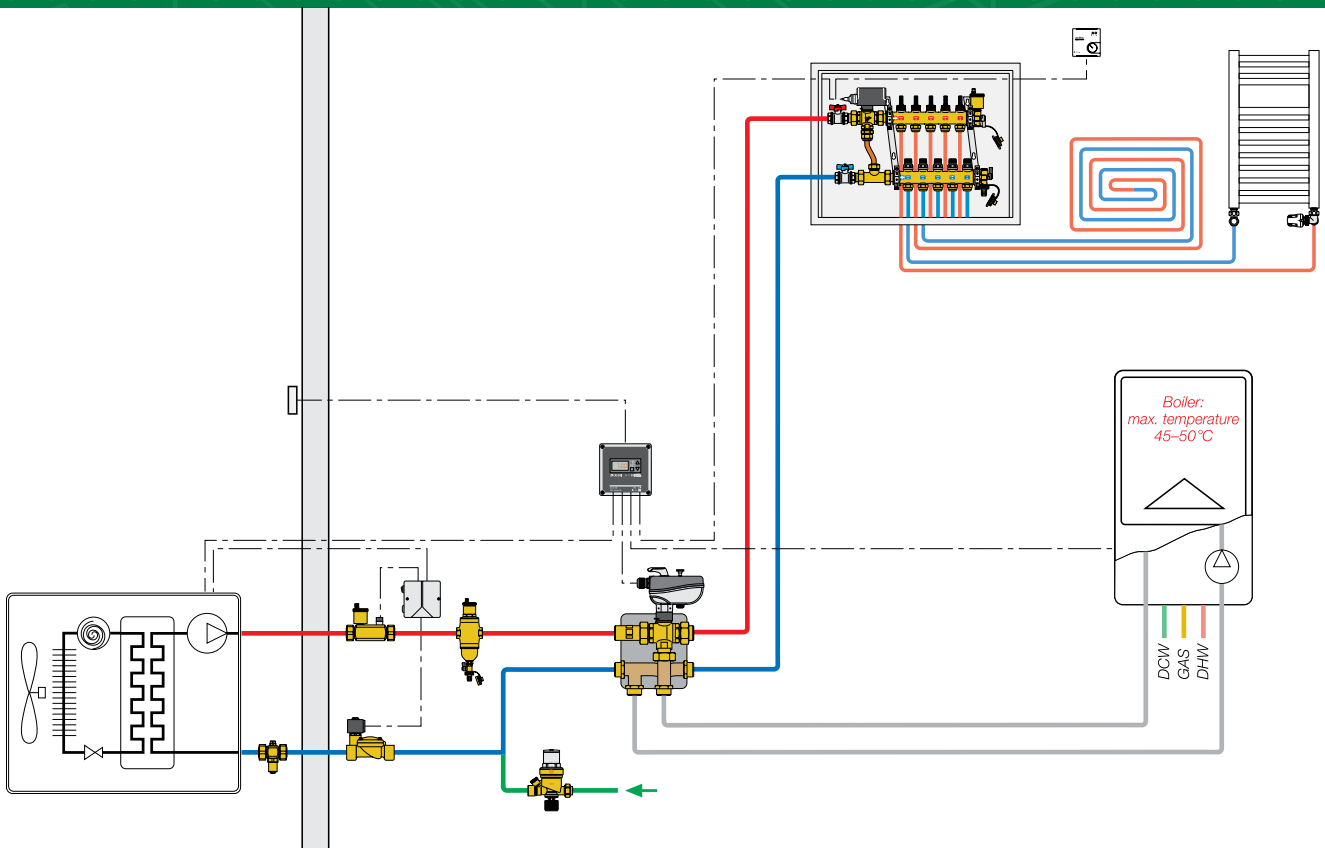
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Geothermal

The products in the CALEFFIGEO® series have been conceived specifically for use in heat pump systems. The thermal medium in circuits with air source heat pump can reach very low temperatures; for this reason the components are made with high-performance materials and special solutions to prevent freezing are offered.



Air source heat pump systems offer huge benefits compared to the use of geothermal energy: they don't need any outside ground, any specific permits and any expensive digging work to bury the heat exchangers.

Nevertheless, there are some limits to be taken into consideration, such as the huge fluctuations in the temperature of the outside air.

The outside air can reach very low temperatures, making the pump work with somewhat limited COP values and overly high system running costs.

For these reasons, when the temperature of the air is very low, we recommend using boilers alongside the air-water heat pump, when necessary or as an alternative. The boilers can

then switch on when the heat produced by the heat pumps is no longer cost-efficient.

The integration unit joins the two different heat generation systems (boiler and air-water heat pump) with a simple, compact unit that can be also easily housed in a wall-mounting box. With this system, it is not forced the use of the same manufacturer for both the boiler and the heat pump: in fact, these two devices are technologically very different.



Components needed for air source heat pump system

Energy from the air

The outside air is a free source of energy that does not need to be extracted and is extremely easy to find: it is also heated directly by the sun. Systems that draw thermal energy from the air can be made with air-air or air-water heat pumps.



Energy from the ground

Soil contains an enormous amount of heat which comes from the earth's hot core or from other renewable sources, such as sun, wind and rain.

A water/heat pump working in combination with geothermal probes will use low enthalpy geothermal energy for heating.

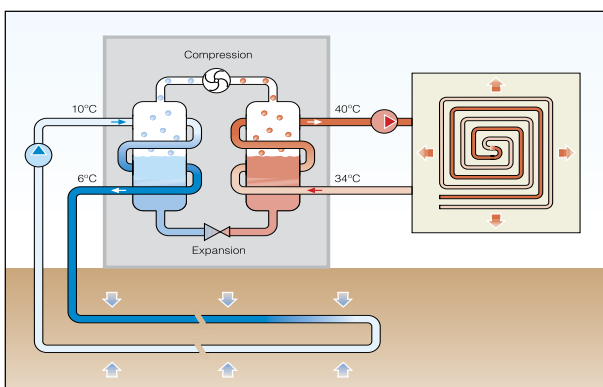


Energy from water

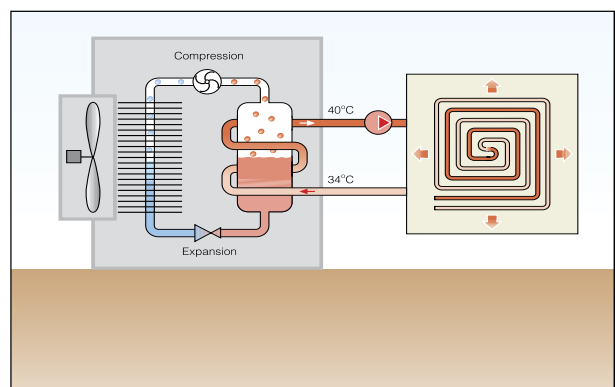
Groundwater temperature is usually between 8°C to 12°C and is particularly suitable for use with hydrothermal heat pumps. However, systems drawing heat from groundwater are subject to restrictions regarding both how the water is collected and how it is subsequently disposed of: for this reason, specific permits must be obtained.



WATER-WATER heat pump operating principle



AIR-WATER heat pump operating principle



We reserve the right to modify our products, make technical improvements and develop them further. None of illustrations, numerical data, ect are binding.

INTEGRATION UNIT

106 HYBRICAL® HEAT PUMP-BOILER INTEGRATION UNIT WITH INSULATION



- Consisting of:
- diverter valve,
 - connection kit,
 - electronic regulator,
 - outside probe.

Ref no	Connections
106160	1"

PERFORMANCE

Diverter valve

Medium: water, glycol solutions.
 Max. percentage of glycol: 50%.
 Max. working pressure: 10 bar.
 Max. differential pressure: 10 bar.
 Connections: 1" M (ISO 228-1).

Technical specifications of insulation

Material: closed cell expanded PE-X.
 Thickness: 15 mm.
 Density: - inner part: 30 kg/m³.
 - outer part: 80 kg/m³.
 Thermal conductivity (DIN52612): - 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: -10 to 110°C.
 Reaction to fire (DIN 4102): class B2.

Technical specifications of actuator

Synchronous motor.
 Electric supply: 230 V (ac).
 Power consumption: 6 VA.
 Auxiliary microswitch: 6 (2) A (230 V).
 Protection class: IP 65.
 Operating time: 50 s (rotation 90°).
 Supply cable length: 0,8 m.
 Dynamic torque: 9 N·m.

Technical specifications of electronic regulator

Electric supply : 230 V (ac).
 Power consumption: 7 VA.
 Contact rating on switch-over: 2 A (230 V).
 Protection class: IP 54.
 Protection class: II.
 Selectable temperature range: -60 to 150°C.
 Intervention hysteresis: 2 K.
 Intervention hysteresis range: 0,1 to 20 K.

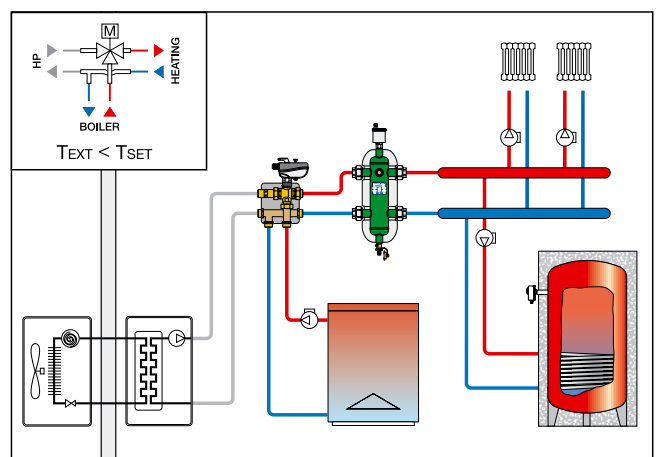
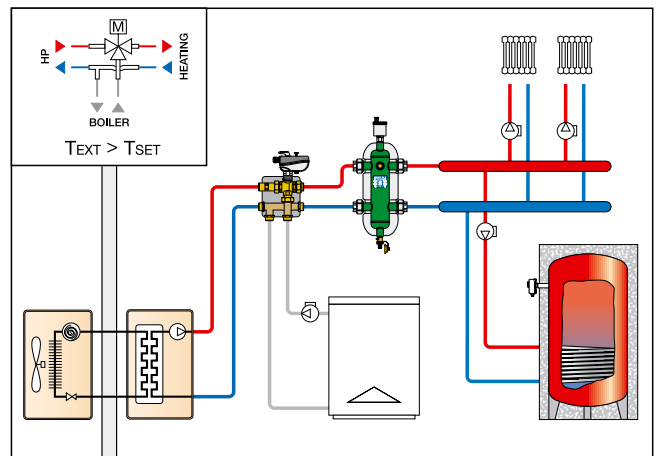
FUNCTION

The integration unit provides a simple means of connecting the hydraulic circuits of the heat pump and boiler to the heating system terminals, using a special fitting that allows the three circuits to be joined together in a compact way.

Function is controlled by the electronic regulator which automatically activates and manages the heat pump or the boiler depending on the temperature of the outside air measured by the probe.

The regulator activates the heat pump when requested by the ambient regulator and the outside air temperature has risen above the preset switching temperature (setpoint temperature). It activates the boiler when requested by the ambient regulator and the outside air temperature is below the switching temperature.

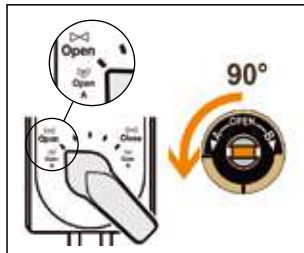
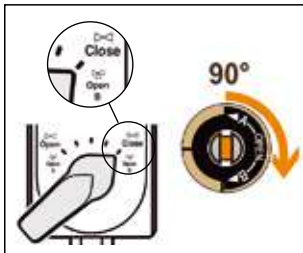
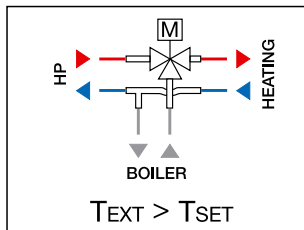
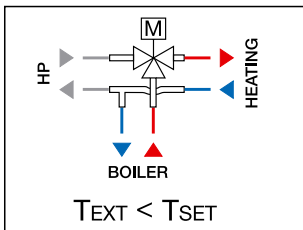
The switching over is made by means of a diverter switch that closes the contact of the thermostat towards the boiler or the heat pump, through a relay if needed.



INTEGRATION UNIT

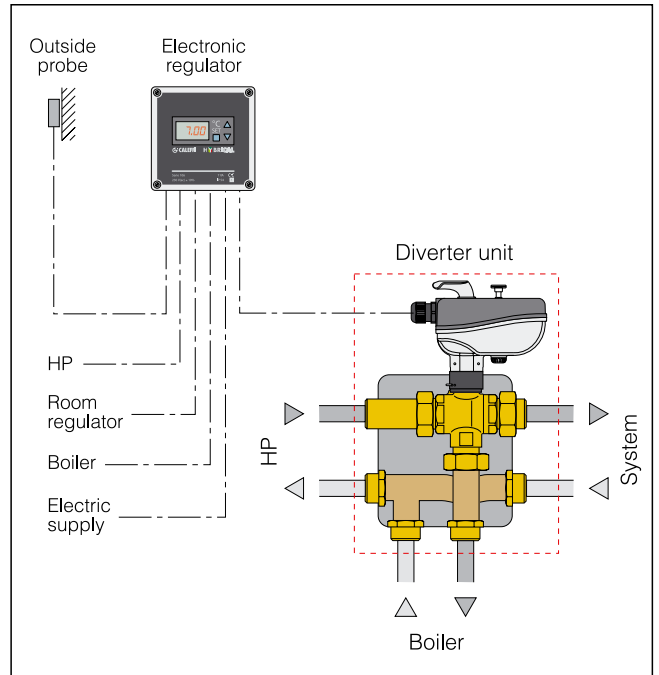
Manual opening/closing of the actuator

The actuator is equipped with a control lever (2), that can be operated by pressing the button (1). The control lever can be used to actuate the switching valve manually: depending on the position of the valve, the lever can be used to switch between the two sources.

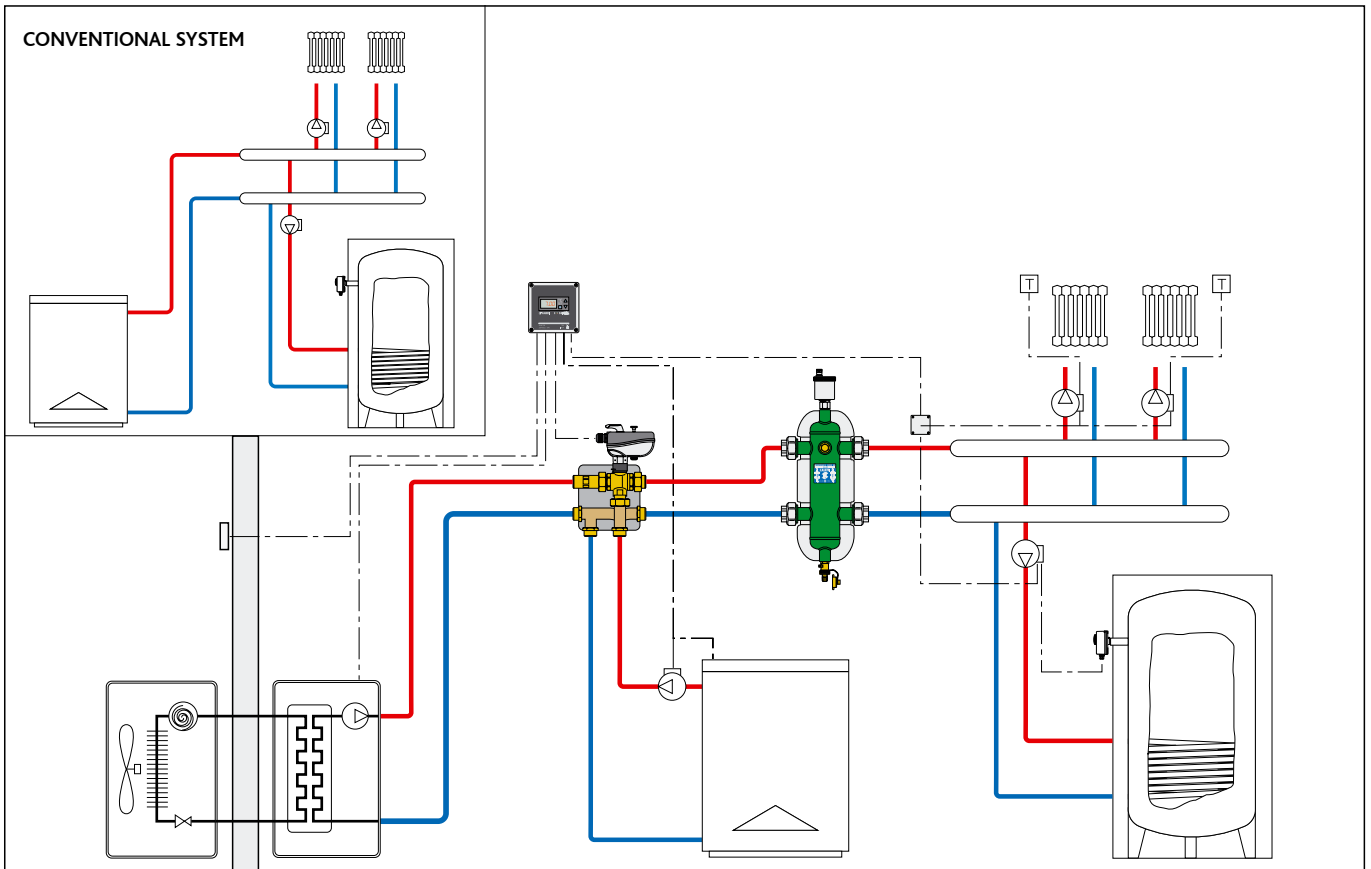


Electronic regulator

The regulator manages all operating aspects of the system. It has a terminal board with six connections for the electric supply, outside probe, diverter kit, heat pump, boiler and ambient heat regulator. From the display, you can set the switching temperature and view the temperature read by the outside probe.



Conversion example of a conventional system into a hybrid system with dual air source heat pump and boiler



DIVERTER KIT



106 HYBRICAL® DIVERTER KIT FOR HEAT PUMP WITH INSULATION

Consisting of:
- diverter valve,
- connection kit.

Ref no	Connections
106060	1"

FUNCTION

The diverter kit allows to easily connect the 3 circuits together (2 inlets and 1 outlet) without having to overcome pipes. The diverter valve has very low head losses, in relation to the rated flow rates normally used, and features short operating times: it allows therefore a fast system commissioning and prevents any water-hammer. The valve is coupled to an actuator fitted with microswitches that can be used to activate and deactivate devices according to the working position of the valve.

PERFORMANCE

Diverter valve

Medium: water, glycol solutions.
Max. percentage of glycol: 50%.
Max. working pressure: 10 bar.
Max. differential pressure: 10 bar.
Connections: 1" M (ISO 228-1).

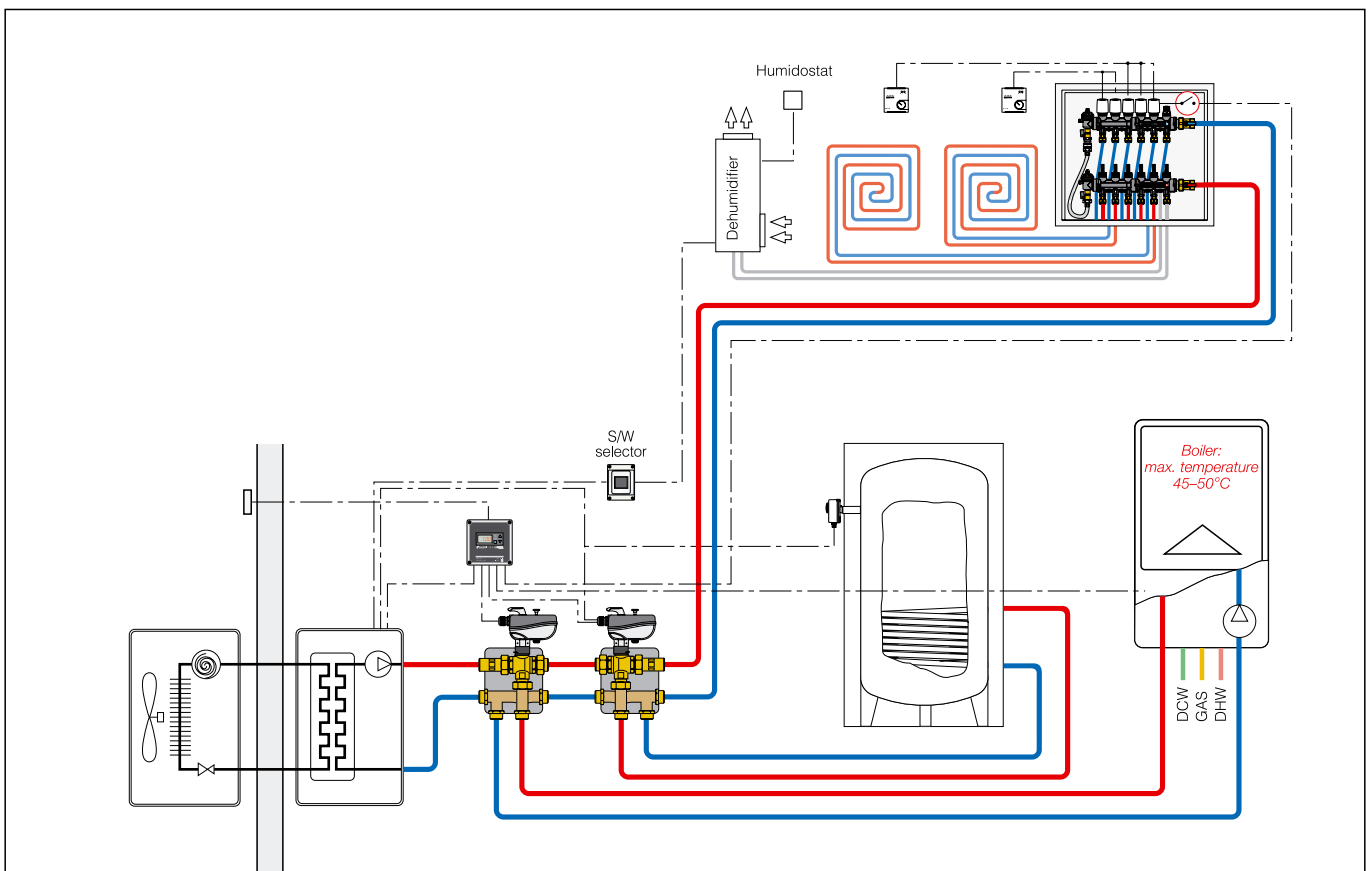
Technical specifications of insulation

Material: closed cell expanded PE-X.
Thickness: 15 mm.
Density: - inner part: 30 kg/m³.
- outer part: 80 kg/m³.
Thermal conductivity (DIN52612): - 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: -10 to 110°C.
Reaction to fire (DIN 4102): class B2.

Technical specifications of actuator

Synchronous motor.
Electric supply: 230 V (ac).
Power consumption: 6 VA.
Auxiliary microswitch: 6 (2) A (230 V).
Protection class: IP 65.
Operating time: 50 s (rotation 90°).
Supply cable length: 0,8 m.
Dynamic torque: 9 N·m.

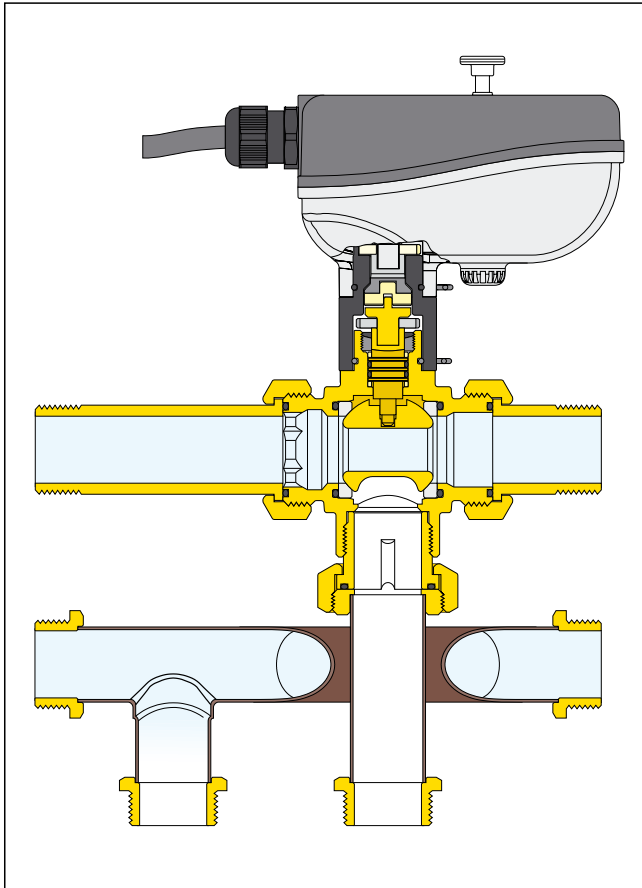
Example of a hybrid system with dual reversible air source heat pump and boiler equipped with domestic hot water storage



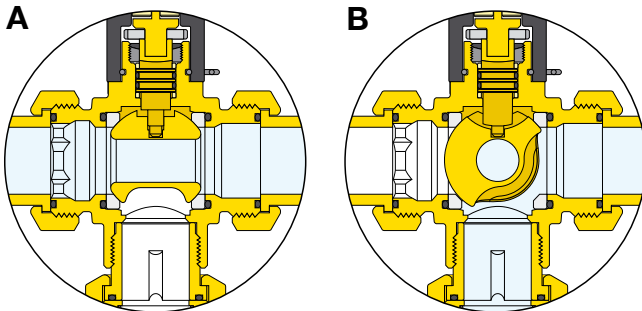
INTEGRATION UNIT AND DIVERTER KIT SPECIFICATIONS

CONSTRUCTION DETAILS

The diverter kit was designed to be compact and easily adaptable to existing systems. More than one kit can be connected in series to meet the needs of more complex systems.



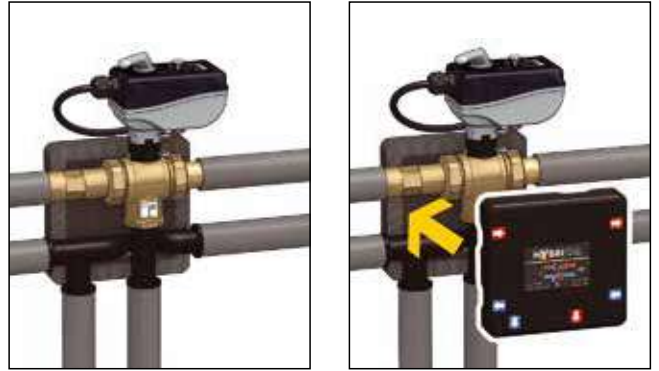
The ball inside the diverter valve was designed to optimize and balance the flow passage in both the working configurations. Even though the passage in position A is more efficient ($K_v = 13$) compared to the passage in position B ($K_v=8$), the difference is minimal in standard system configurations.



Pre-formed insulation

Thanks to the hot pre-formed shell insulation, supplied in the package, that prevents condensation build-up on the valve body surface, the kit can also be used in cooling systems.

This system, moreover, ensures not only perfect thermal insulation, but also the resistance to the diffusion of water vapour from the ambient toward inside.



Thermal decoupler

Between the valve body and the actuator there is a polymer thermal decoupler, which contains two stainless steel stems and a central insulating ring. This prevents the transmission of heat from/to the electric actuator. This heat is generated by the flow of the thermal medium in the valve. This prevents condensation build-up inside the actuator.



ANTI-FREEZE PROTECTION

109 ANTI-FREEZE KIT



Max. hydraulic test pressure: 10 bar.
Max. working pressure: 3 bar.
Max. differential pressure: 3 bar.
Working temperature range: 0 to 65°C.
Ambient temperature range: -20 to 60°C.

Ref no	Connection
109600	1"

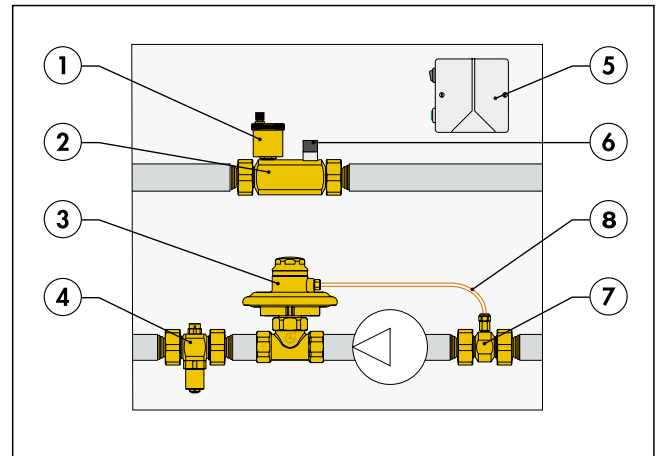
108 ANTI-FREEZE VALVE



Brass body.
Max. working pressure: 10 bar.
Working temperature range: 0 to 65°C.
Ambient temperature range: -30 to 60°C.
Opening temperature: 3°C.
Closing temperature: 4°C.

Ref no	Connection
108601	1"

Characteristic components



The unit is consisting of:

- 1) Automatic air vent valve.
- 2) Check valve fitted for air vent and minimum thermostat, 1" male connections.
- 3) Differential valve, 1" female connections.
- 4) Anti-freeze valve, 1" male connections.
- 5) Control unit.
- 6) Sensor for connection to control unit.
- 7) Fitting with pressure point, 1" male connections.
- 8) 8 mm copper pipe.

OPERATING PRINCIPLE

The anti-freeze protection unit code 109600 can only be installed when the heat pump has an external circulator.

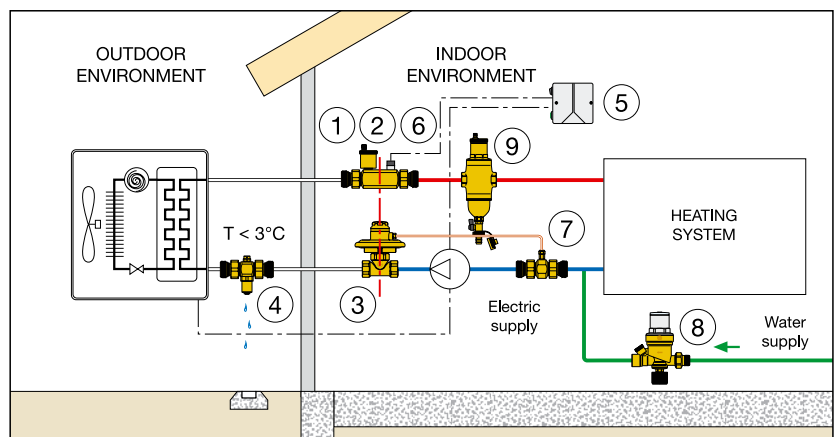
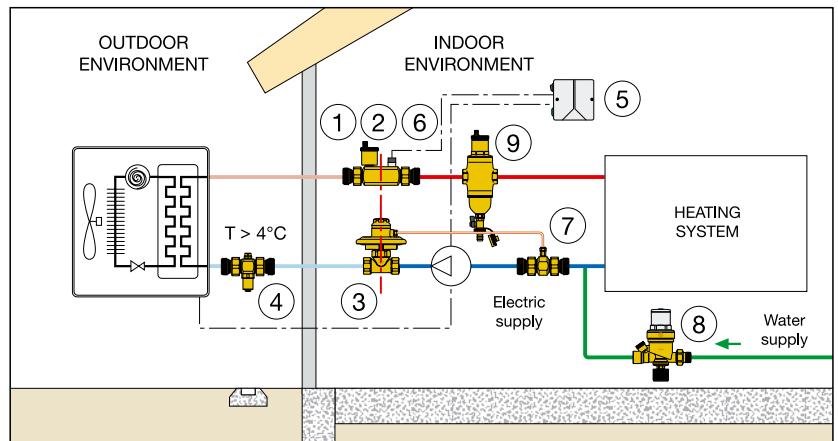
The system operates in the event of failure of electric supply to the heating system or should the heat pump malfunction.

In the event of a blackout, the system separates the internal part from the outside part of the system at the level of the check valve (2) and differential valve (3): the obturator mechanically closes due to the missing of the pump suction at the pressure port (7). When the outside condition are not freezing ($T > 4^{\circ}\text{C}$) the water in the outside part of the system is not discharged so that when electric supply returns, the circulator restarts, the differential valve obturator (3) opens and the system recommence normal operation.

If the outside conditions makes the water temperature be $< 3^{\circ}\text{C}$, after any electric supply failure, the group separates the outside part from the internal part of the system and the anti-freeze valve (4) comes into operation thus draining the outside part of the system. When electric supply returns, the circulator starts again, the differential valve obturator (3) opens, the anti-freeze valve (4) closes, since the temperature of the water inside the building is above 3°C , and the filling unit (8) recharges the system to the nominal pressure value. In this phase the air vent (1) and deaerator (9) remove any air from the system.

In the event of a heat pump failure, with subsequent drop in the water temperature within the system (the circulation pump keeps running but there is no longer any heat exchange in the machine), the safety thermostat (6) would operate.

When the water reaches a temperature of 10°C , the thermostat (6) actuates and via the regulator (5) stops the circulation pump, thereby triggering the procedure described above for electric supply failures.



ANTI-FREEZE PROTECTION

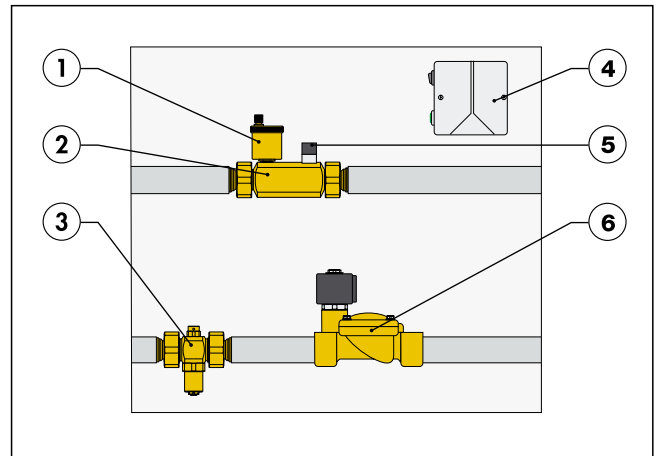
109 ANTI-FREEZE KIT

Max. hydraulic test pressure: 10 bar.
Max. working pressure: 10 bar.
Max. differential pressure: 3 bar.
Working temperature range: 0 to 65°C.
Ambient temperature range: -20 to 60°C.



Ref no	Connections
109610	1"

Characteristic components



The unit is consisting of:

- 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) Control unit.
- 5) Sensor for connection to control unit.
- 6) NC solenoid valve, 230 V - 50 Hz.

OPERATING PRINCIPLE

The anti-freeze protection unit code 109610 can be installed when the heat pump has an internal circulator.

The system actuates in the event of failure of electric supply to the heating system or should the heat pump malfunction.

In the event of a electric supply failure, the system separates the internal part of the system from the outside part at the level of the check valve (2) and the normally-closed solenoid valve (3).

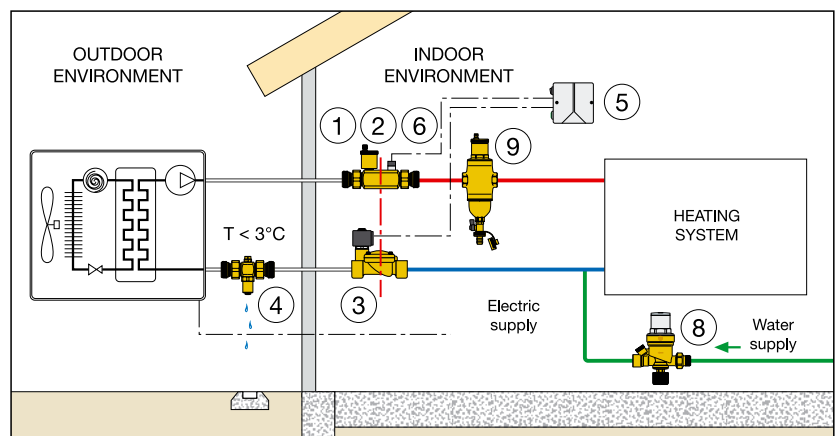
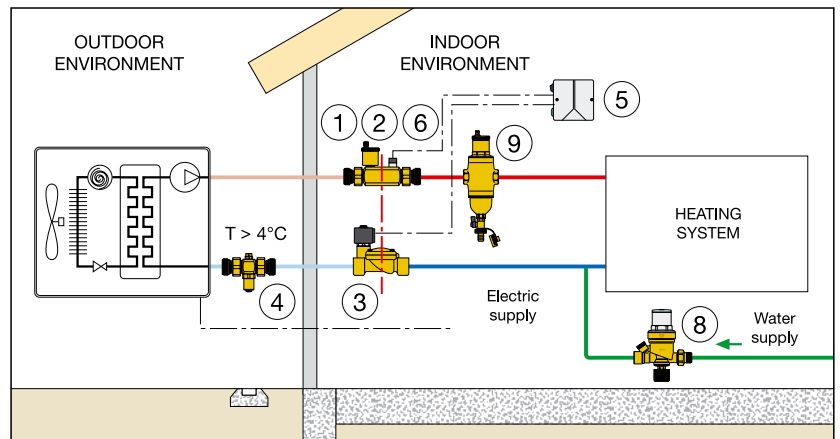
If the water temperature inside the pipes remains above 4°C, the anti-freeze valve obturator stays closed and the pipe remains in pressure.

When the water temperature in the pipes reaches 4°C, the thermostat in the anti-freeze valve (4) allows the obturator to open and drain the water in the outside part of the pipes.

When electric supply returns, the solenoid valve opens, the filling unit recharges the system to the nominal pressure setting and the anti-freeze valve closes, allowing circulation in the system to restart: the air vent (1) and deaerator-dirt separator (9) remove any excess air.

In the event of a heat pump failure, with subsequent drop in the water temperature within the system (the circulation pump keeps running but there is no longer any heat exchange in the machine), the safety thermostat (6) would operate.

When the water reaches a temperature of 10°C, the thermostat (6) actuates and via the regulator (5) stops the electric supply to the solenoid valve, thereby triggering the procedure described above for electric supply failures.



COMPONENTS FOR GROUND SOURCE HEAT PUMP SYSTEMS

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.

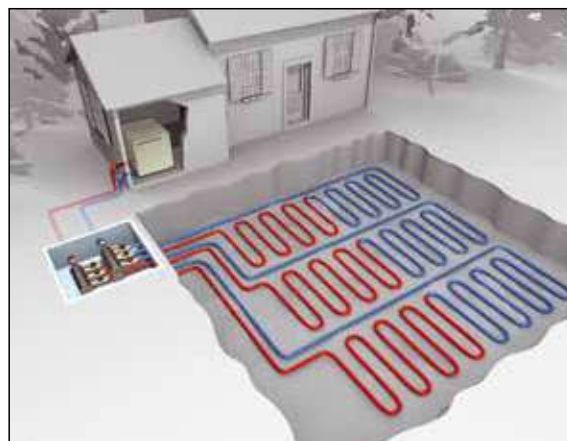
Systems with horizontal probes

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.

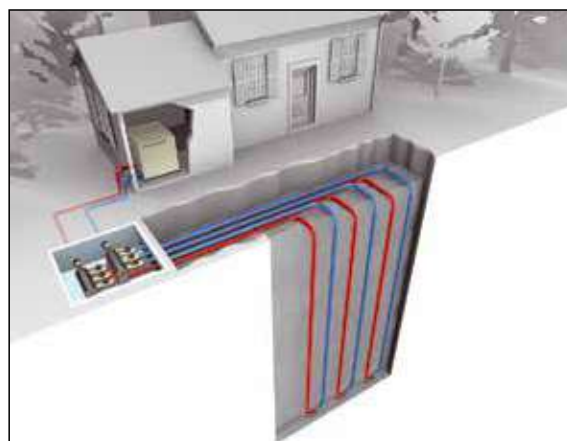
It is necessary to pay attention to the sizing to prevent not only malfunctioning and low output of the heat pump, but also to prevent harmful consequences for vegetation such as freezing roots.



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.

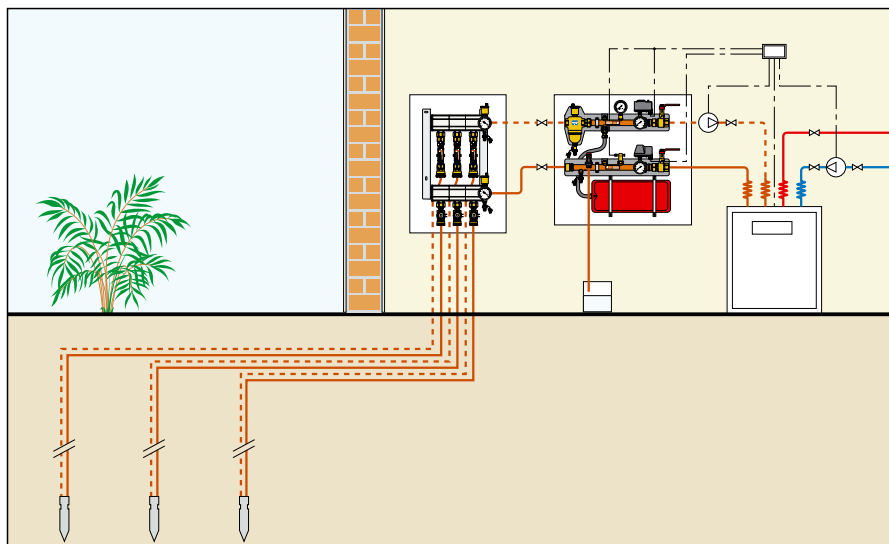
Vertical probes, varying in length from 20 to 150 m, and configured in either one or two U-circuits are inserted into the ground. They are made with high resistance PE pipes (generally with the following diameters: DN 25, DN 32 and DN 40) specific for ground source applications. To aid their insertion 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.



Geothermal system components

Usually, geothermal probes are connected to the system via a manifold fitted with balancing valves: in fact, system balancing is necessary to guarantee proper heat exchange in the ground.

It is advisable to install all safety and control devices, normally used in closed circuit systems, between the geothermal manifold and the heat pump, to guarantee proper system and machine operation.



DISTRIBUTION MANIFOLDS

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.



DISTRIBUTION MANIFOLDS

110

PREASSEMBLED GROUND SOURCE MANIFOLD

Complete with:

- automatic air vents;
- temperature gauges Ø 80 mm;
- fill/drain cocks;
- flow and return manifolds;
- blind end plugs with insulation;
- stainless steel 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.

Max. hydraulic test pressure: 10 bar.

Working temperature range: -10 to 60°C.

Ambient temperature range: -20 to 60°C.

Medium: water, glycol solutions, saline solutions.

Max. percentage of glycol: 50%.

Manifold DN 50.

Max. flow rate: 7 m³/h.

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

For more than 8 outlet circuits, see the modular manifold

110

MODULAR MANIFOLD SINGLE MODULE IN POLYMER



Body made of polymer PA66G30.

Max. working pressure: 6 bar.

Max. hydraulic test pressure: 10 bar.

Working temperature range: -10 to 60°C.

Ambient temperature range: -20 to 60°C.

Medium: water, glycol solutions, saline solutions.

Max. 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.

Outlet connection: 42 p.2,5 TR.

Ref no	Description
110700	Modular manifold single module

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
110019	for manifold with 9 circuits
110020	for manifold with 10 circuits
110021	for manifold with 11 circuits
110022	for manifold with 12 circuits

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 (-30 to 50°C);
- No. 2 seals gaskets.

Max. working pressure: 6 bar.

System test max. pressure: 10 bar.

Working temperature range: -10 to 60°C.

Ambient temperature range: -20 to 60°C.

Medium: water, glycol solutions, saline solutions.

Max. percentage of glycol: 50%.

Connections: 1 1/4" F.



Ref no	Description
110750	Assembly kit for modular manifolds



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	Brackets (pair)

SYSTEM COMPOSITION EXAMPLE WITH CALEFFI 110 SERIES GEOTHERMAL MANIFOLD

111 series	112 series			113 series	871 series	110 series																																			
Ball shut-off valve  Fitted for sensor with Vortex effect for integrated flow rate measuring <table border="1"> <tr> <td>DN 25</td> <td>DN 32</td> <td>DN 40</td> </tr> <tr> <td>Code 111620</td> <td>Code 111630</td> <td>Code 111640</td> </tr> </table> Connection to manifold 42 p. 2,5 TR Pipe connection <table border="1"> <tr> <td>Ø 25</td> <td>Ø 32</td> <td>Ø 40</td> </tr> </table>	DN 25	DN 32	DN 40	Code 111620	Code 111630	Code 111640	Ø 25	Ø 32	Ø 40	Balancing valve with flow meter  With fitting for polyethylene pipe <table border="1"> <tr> <td>DN 25</td> <td>DN 32</td> <td>DN 40</td> </tr> <tr> <td>Code 112621</td> <td>Code 112631</td> <td>Code 111641</td> </tr> </table> Connection to manifold 42 p. 2,5 TR Pipe connection <table border="1"> <tr> <td>Ø 25</td> <td>Ø 32</td> <td>Ø 40</td> </tr> </table>	DN 25	DN 32	DN 40	Code 112621	Code 112631	Code 111641	Ø 25	Ø 32	Ø 40	Balancing valve with flow meter  With ball valve and fitting for polyethylene pipe <table border="1"> <tr> <td>DN 25</td> <td>DN 32</td> </tr> <tr> <td>Code 112622</td> <td>Code 112632</td> </tr> </table> Connection to manifold 42 p. 2,5 TR Pipe connection <table border="1"> <tr> <td>Ø 25</td> <td>Ø 32</td> </tr> </table>	DN 25	DN 32	Code 112622	Code 112632	Ø 25	Ø 32	Float flow meter  With fitting for polyethylene pipe <table border="1"> <tr> <td>DN 25</td> <td>DN 32</td> </tr> <tr> <td>Code 113621</td> <td>Code 113631</td> </tr> </table> Manifold connection 42 p. 2,5 TR Pipe connection <table border="1"> <tr> <td>Ø 25</td> <td>Ø 32</td> </tr> </table>	DN 25	DN 32	Code 113621	Code 113631	Ø 25	Ø 32	Ball valve  With fitting for polyethylene <table border="1"> <tr> <td>DN 25</td> <td>DN 32</td> </tr> <tr> <td>Code 871025</td> <td>Code 871032</td> </tr> </table> Manifold connection 42 p. 2,5 TR Pipe connection <table border="1"> <tr> <td>Ø 25</td> <td>Ø 32</td> </tr> </table>	DN 25	DN 32	Code 871025	Code 871032	Ø 25	Ø 32	Union  Union fitting with gasket Code 110060 Manifold conn. 42 p. 2,5 TR Outlet conn. 1"
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Control lever Code 111002 																																									
Flow rate measuring sensor Code 111010 																																									
Flow rate electronic measuring station Code 130010 																																									

SHUT-OFF AND BALANCING DEVICES



111 BALL SHUT-OFF VALVE FITTED FOR INTEGRATED FLOW RATE MEASURING SENSOR

Complete with fitting for polyethylene pipe.
Brass body. Polymer top plug.
Connection to manifold:
female connection with captive nut 42 p.2.5 TR.
Max. working pressure: 6 bar.
Max. hydraulic test pressure: 10 bar.
Working temperature range: -10 to 60°C.
Ambient temperature range: -20 to 60°C.
Medium: water, glycol solutions, saline solutions.
Max. percentage of glycol: 50%.

Ref no	Connections
111620	42 p.2,5 TR x Ø 25
111630	42 p.2,5 TR x Ø 32
111640	42 p.2,5 TR x Ø 40



111 PRE-FORMED INSULATION FOR SHUT-OFF VALVES

Material: closed cell expanded PE-X.
Thickness: 10 mm.
Density: inner part 30 kg/m³, outer part 80 kg/m³.
Thermal conductivity (DIN 52612):
at 0°C: 0,038 W/(m·K); at 40°C: 0,045 W/(m·K).
Coefficient of resistance (DIN 52615): > 1.300.
Working temperature range: 0 to 100°C.
Reaction to fire (DIN 4102): class B2.

Ref no	Description
111001	For Ø 25mm - Ø 32mm
111003	For Ø 40mm

130 FLOW RATE ELECTRONIC MEASURING STATION FOR CONNECTING SENSOR WITH VORTEX EFFECT



Complete with:
- box;
- power supply unit;
- control lever;
- measuring sensor with Vortex effect;
- connecting cable;
- seal ring sensor.
Rechargeable battery NiMh 9 V.
Complete with battery charger.
Flow rate scale: l/h - l/min - GPM.
Flow rate range: 300 to 1400 l/h.
Accuracy direct reading of flow rate and sensor with Vortex effect: ±10%.
Protection class: IP 44.

Ref no	Description
130010	Flow rate electronic measuring station



111 INTEGRATED FLOW RATE MEASURING SENSOR WITH VORTEX EFFECT

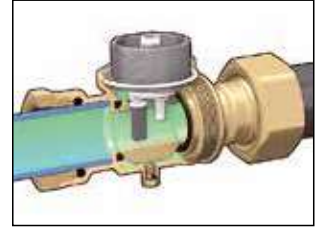
Accuracy reading of flow rate: ±10%.

Ref no	Description
111010	Integrated flow rate measuring sensor

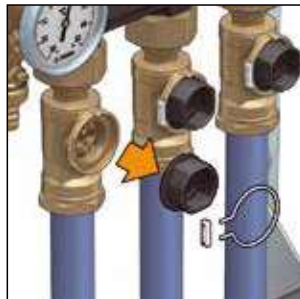
Using Vortex effect sensor

Sensors use the "von Kármán vortex tail" effect that allow to measure the average speed of a circulating medium.
The shut-off valve is fitted for installing the integrated flow-rate measuring Vortex-effect sensor.

The sensor is fitted to a body in composite material, similar to the cap that can be therefore replaced with the sensor during flow-rating reading and balancing phase. The ball was in fact designed to accommodate the sensor.



The cap can be replaced with the sensor while the system is still running: close the valve using the provided knob, remove the lock and the clip then pull out the cap.



This is an innovative measurement system:

- the measurement and regulation device does not remain installed in the system but can be removed once the system has been balanced and can be kept by the installer;
- during normal operation, there are no moving parts subject to wear over time, and there are negligible head losses;
- the measuring device is not affected by changes in temperature, pressure or viscosity;
- the accuracy of flow rate measurement is greater than in other balancing systems.

The measuring device contains details of the passage surface of the medium and conversion factors, allowing the instantaneous flow rate to be calculated.

The device has an easy-grip and non-slip handle, and was designed to make it easy to use and configure.

The LCD display shows flow rate during measurement, configuration menus and other information needed for the correct use of the device.

By browsing the menu, it's possible to select the unit of measure for flow rate (l/h - l/min - GPM) and the type of liquid circulating inside the pipe (water or glycol solutions in different percentages).



111 CONTROL LEVER FOR SHUT-OFF VALVES

Polymer body.

Ref no	Description
111002	Control lever for shut-off valves

SHUT-OFF AND BALANCING DEVICES



112 BALANCING VALVE WITH FLOW METER

Complete with fitting for polyethylene pipe.
Direct reading of flow rate.
Ball valve for flow rate balancing.
Graduated scale flow meter with magnetic movement flow rate indicator.
Brass valve body and flow meter.
Connection to manifold:
female connections with captive nut 42 p.2.5 TR.
Max. working pressure: 10 bar.
Working temperature range: -10 to 40°C.
Ambient temperature range: -20 to 60°C.
Medium: water, glycol solutions, saline solutions.
Max. percentage of glycol: 50%.

Ref no	Connection	Scale (m ³ /h)
112621	Ø 25mm	0,3 - 1,2
112631	Ø 32mm	0,3 - 1,2
112641	Ø 40mm	0,3 - 1,2



112 BALANCING VALVE WITH FLOW METER WITH BALL SHUT-OFF VALVE AND FITTING FOR POLYETHYLENE PIPE

Direct reading of flow rate and balancing via upper ball valve.
Graduated scale flow meter with magnetic movement flow rate indicator.
Brass valve body and flow meter.
Connection to manifold:
female connection with captive nut 42 p.2.5 TR.
Max. working pressure: 10 bar.
Working temperature range: -10 to 40°C.
Ambient temperature range: -20 to 60°C.
Medium: water, glycol solutions, saline solutions.
Max. percentage of glycol: 50%.
Accuracy: ±10%.

Ref no	Scale (m ³ /h)	Connections
112622	0,3 - 1,2	42 p.2,5 TR x Ø 25
112632	0,3 - 1,2	42 p.2,5 TR x Ø 32



112 PRE-FORMED INSULATION FOR BALANCING VALVES

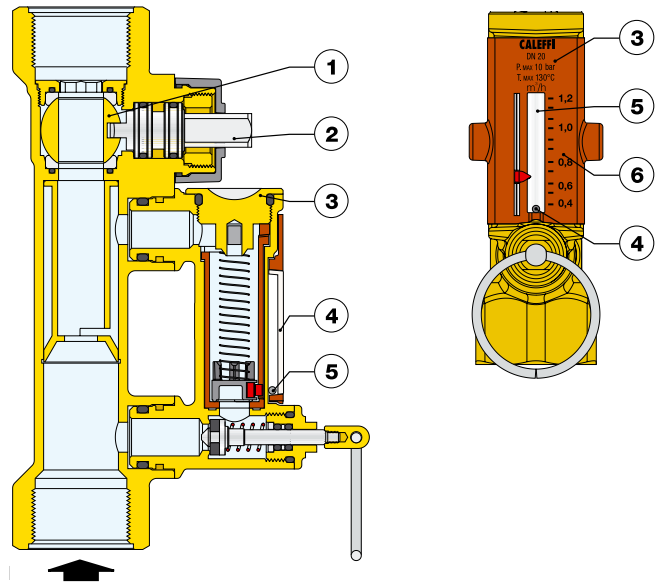
Material: closed cell expanded PE-X. Thickness: 10 mm.
Density: inner part 30 kg/m³, outer part: 80 kg/m³.
Thermal conductivity (DIN 52612):
at 0°C: 0,038 W/(m·K); at 40°C: 0,045 W/(m·K).
Coefficient of resistance to water vapour (DIN 52615): > 1.300.
Working temperature range: 0 to 100°C.
Reaction to fire (DIN 4102): class B2.

Ref no	Description
112001	For Ø 25mm - Ø 32mm
112003	For Ø 40mm

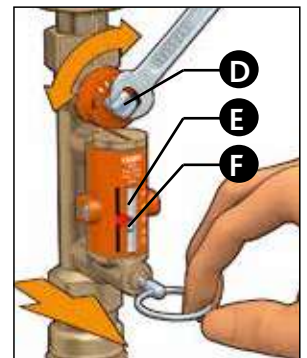
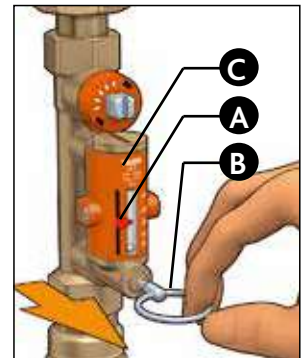


OPERATING PRINCIPLE

The balancing valve is an hydraulic device that allows to regulate the medium flow rate passing through.
The regulating action is made by a ball obturator (1), operated by a control stem (2). The flow rate is controlled by means of a flow meter (3) housed in a by-pass circuit, on the valve body, that can be shut off during normal functioning. The flow rate value is indicated by a metal ball (4), sliding within a transparent guide (5), marked alongside by a graduated scale (6).



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 m³/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 memory, in case checks need to be made over time.

Version code 112.2, complete with ball valve, allows to shut off the individual outlet while maintaining the flow rate balancing: this is an advantage for system maintenance.

SHUT-OFF AND BALANCING DEVICES



113 FLOAT FLOW METER

Complete with fitting for polyethylene pipe.
Direct reading of flow rate.
Ball valve for flow rate balancing.
Brass body.
Connection to manifold:
female connection with captive nut 42 p.2.5 TR.
Max. working pressure: 10 bar.
Working temperature range: -10 to 40°C.
Ambient temperature range: -20 to 60°C.
Medium: water, glycol solutions, saline solutions.
Max. percentage of glycol: 50%.
Accuracy: ±10%.

Ref no	Scale (m ³ /h)	Connections
113621	0,3 - 1,2	42 p.2,5 TR x Ø 25
113631	0,3 - 1,2	42 p.2,5 TR x Ø 32

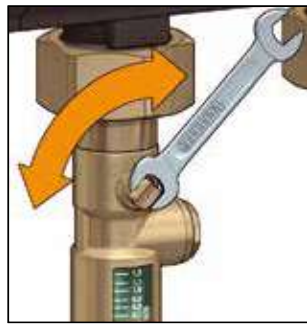


113 PRE-FORMED INSULATION FOR FLOAT FLOW METER

Material: closed cell expanded PE-X.
Thickness: 10 mm.
Density: inner part 30 kg/m³, outer part 80 kg/m³.
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 to 100°C.
Reaction to fire (DIN 4102): class B2.

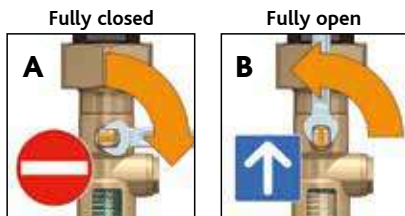
Ref no	Description
113001	For Ø 25 - Ø 32

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 and closed.
A slot on the obturator stem indicates the status of the valve.



Correction for liquids with different densities

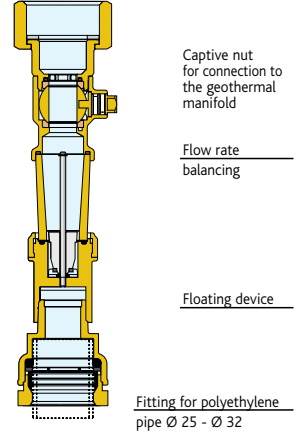
To have the actual flow rate when using glycol solutions at low temperature it is necessary to multiply the reading of the float flow meter by a corrective factor of:
- 0.9 for concentrations of 20-30%
- 0.8 for concentrations of 40-50%

OPERATING PRINCIPLE

The flow meter (or variable cross-section flow meter) consists of a transparent, longitudinal tapered cross-section PSU pipe, containing a cylindrical-tapered floating device featuring a slightly smaller diameter than the pipe's minimum diameter.

Operation is only permitted when the flow meter is vertical, with the widest internal diameter at the top. The medium flows vertically from the bottom toward the top, exerting a pressure on the floating device, pushing it upwards until a balance is reached.

The flow rate is indicated by the upper edge of the float and can be read using the graduated scale printed on the plastic pipe.



Since the flow meter must only be installed vertically, the geothermal manifold cannot be installed horizontally.



871 BALL VALVE COMPLETE WITH FITTING FOR POLYETHYLENE PIPE

Brass body.
Connection to manifold:
female connection with captive nut 42 p.2.5 TR.
Max. working pressure: 16 bar.
Max. working temperature: 40°C.
Ambient temperature range: -20 to 60°C.
Medium: water, glycol solutions, saline solutions.
Max. percentage of glycol: 50%.
Fitted for 111 series insulation.

Ref no	Connections
871025	42 p.2,5 TR x Ø 25
871032	42 p.2,5 TR x Ø 32

110 UNION WITH GASKET

Max. working pressure: 16 bar.
Max. working temperature: 40°C.

Ref no	Connections
110060	42 p.2,5 TR x 1"

DEVICES FOR GENERIC GEOTHERMAL MANIFOLDS



112 BALANCING VALVE WITH FLOW METER

Direct reading of flow rate.
Ball valve for flow rate balancing.
Graduated scale flow meter with magnetic movement flow rate indicator.
Brass body valve and flow meter.
Connection to manifold:
female connection with captive nut.
Max. working pressure: 10 bar.
Working temperature range: -10 to 110°C.
Ambient temperature range: -20 to 60°C.
Medium: water, glycol solutions, saline solutions.
Max. percentage of glycol: 50%.
Accuracy: ±10%.

Ref no	Connection	Scale (m3/h)
112660	1" F x 1" F	0,3 - 1,2
112670	1 1/4" F x 1" F	0,3 - 1,2



861 MALE FITTING

In brass. For polyethylene pipes.
Max. working pressure: 16 bar.
Max. working temperature: 40°C.



Ref no	Connection
861625	Ø 25mm x 1" M
861632	Ø 32mm x 1" M



862 REDUCED MALE FITTING

In brass. For polyethylene pipes.
Max. working pressure: 16 bar.
Max. working temperature: 40°C.



Ref no	Connection
862640	Ø 40mm x 1" M



942 SLEEVE FITTING

Ref no	Connection
942560	3/4" x 1"



871 FITTING WITH BALL VALVE

In brass.
For polyethylene pipes.
Max. working pressure: 16 bar.
Max. working temperature: 40°C.

Ref no	Connection
871525	Ø 25mm x 3/4" F
871532	Ø 32mm x 3/4" F

System Composition Example with Generic Geothermal Manifolds

112 series

Balancing valve with flow meter



Code
112660

Code
112670

Connection
1" F x 1" F

Connection
1 1/4" F x 1" F

Fitting for polyethylene pipe



DN 25

DN 32

DN 40

Code
861625

Code
861632

Code
862640

Balancing valve connection
1" M

Piping connection

Ø 25

Ø 32

Ø 40

Fitting for extra shut-off valve



Code
942560

Balancing valve connection
1" M

Shut-off valve connection
3/4" M

Insulation for balancing valve

DN 25

DN 32

DN 40

Code
112001

Code
112003



Ball valve complete with fitting for polyethylene pipe



DN 25

DN 32

Code
871525

Code
871532

Balancing valve connection
3/4" F

Piping connection

Ø 25

Ø 32

INSTRUMENT HOLDER

115

INSTRUMENT AND ACCESSORIES HOLDER FOR HEAT PUMPS COMPLETE WITH STEEL ANCHORING BASE

Connections: 1 1/4" F.
 Max. working pressure: 2.5 bar.
 Working temperature range:
 -20–90°C (temperature gauges 50°C).
 Ambient temperature range: -10 to 55°C.
 Medium: water, glycol solutions, saline solutions.
 Max. 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	Size
115700	1 1/4"

115

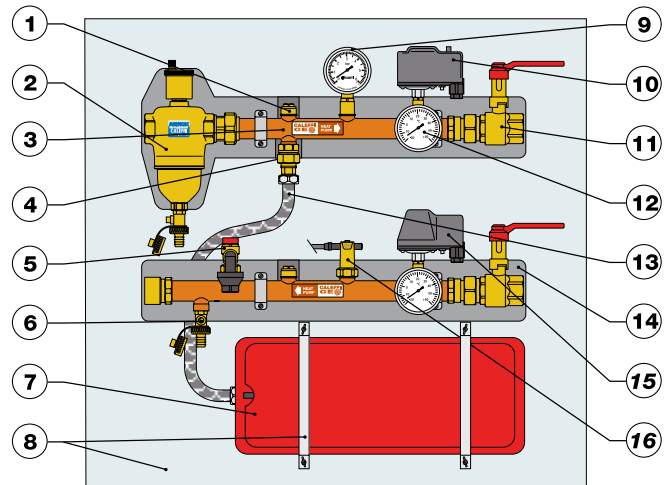
BOX FOR COUPLING WITH INSTRUMENT HOLDER ANCHORING BASE 115 SERIES

In painted steel.
 Consisting of outer case and frame.



Ref no	Dimensions (h x w x d)
115080	900 x 860 x 175

Characteristic components



The unit is consisting of:

- 1) No. 2, 1/2" pockets for temperature probes
- 2) Dirt separator with automatic air vent valve and drain cock
- 3) Copper instrument holder
- 4) Automatic shut-off cock, for expansion vessel
- 5) Safety valve with adjustable outlet
- 6) Fill/drain cocks
- 7) Expansion vessel capacity 7,5 litres
- 8) Anchoring plate (box bottom) complete with support brackets
- 9) Pressure gauge conforming to INAIL
- 10) INAIL approved minimum pressure switch
- 11) No. 2 shut-off valves with extended lever to facilitate use when there is insulation
- 12) No. 2 temperature gauges Ø 80 mm
- 13) Hose for connecting expansion vessel
- 14) Pre-formed shell insulation
- 15) Safety pressure switch 625 series (optional)
- 16) Flow switch 315 series (optional)

ACCESSORIES FOR INSTRUMENT HOLDER



315 FLOW SWITCH FOR HEAT PUMP INSTRUMENT HOLDER

Magnetic control contacts.
Electric supply: 230 V - 0,02 A.
Max. working pressure: 6 bar.
Working temperature range: -20 to 100°C.
3/4" female connection.
Protection class: IP 65.

Ref no	Flow Rate (m³/h)	Contact opening (m3/h)	Contact closing (m3/h)
315050	0.5	0,44	0,53
315060	0.6	0,57	0,59
315070	0.7	0,64	0,70



625 SAFETY PRESSURE SWITCH WITH MANUAL RESET

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



INAIL

Ref no	Adjustment range
625000	1 - 5 bar



625 PRESSURE SWITCH FOR BOOSTING SETS

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



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



553 PRE-ADJUSTABLE AUTOMATIC FILLING UNIT

Anti-scale, with pressure setting indicator, manual cock, strainer, check valve.
Setting pressure range: 0.2 to 4 bar.
Pmax: 16 bar.
Max. working temperature: 65°C.

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



688 TEMPERATURE GAUGE

1/2" back connection.
Galvanized steel body.
With brass pocket, length 40 mm.
Accuracy class: UNI 2.

Ref no	Size	Temperature
688005	80mm Ø dial	-30°C to 50°C



557 PRESSURE GAUGE

3/8" radial connection.
Accuracy class: UNI 2.5.
Conforms to INAIL standards .

Ref no	Size	Pressure
557706	80mm Ø dial	0 - 6 bar



557 PRESSURE GAUGE

Stainless steel body.
3/8" radial connection.
Accuracy class: UNI 1.6.
Suitable for saline solutions.

Ref no	Size	Pressure
557596	63mm Ø dial	0 - 6 bar



546 DISCAL^{DIRT}® DEAERATOR-DIRT SEPARATOR

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

Ref no	Connections
546005	3/4"
546006	1"
546007	1 1/4"



PRE-FORMED INSULATION FOR DEAERATORS-DIRT SEPARATORS 546 SERIES

Ref no	Size	Description
CBN546002	3/4" - 1"	Use with 546005-546006
CBN546007	1 1/4"	Use with 546007

General information

Office hours:

Monday to Friday 8.30am - 5.00pm.

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

Full details of Altecnic's Returns Policy are available at www.altecnic.co.uk

Useful contacts

Accounts enquiries: 01785 218203

Customer care line: 01785 218207

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