

Heat Pumps Product Guide

Altecnic Renewables



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CALEFFI group

Authentic Accredited Altecnic



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 Ltd
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Purpose-designed components for heat pump systems

Developed and thoroughly proven by our parent company in Italy, Altecnic's heat pump 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

6 Geothermal

8 Integration Unit

9 Diverter Kit

10 Anti-freeze Protection

10 Instrument Holder

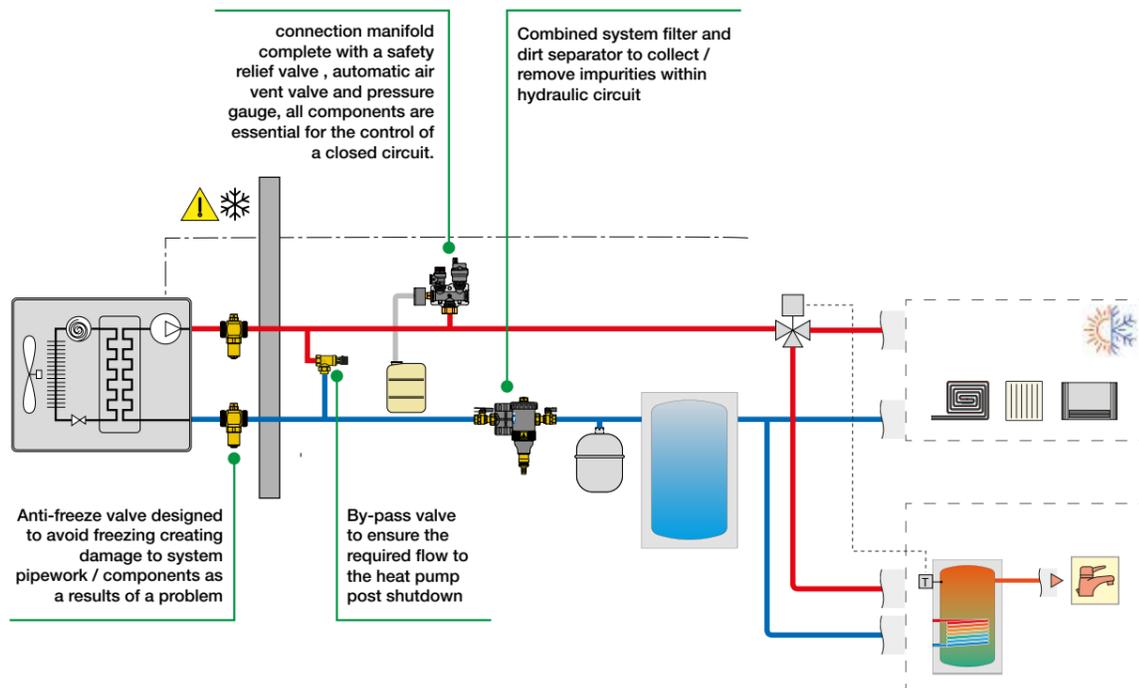
11 DIRTMAC®

Heat Pumps

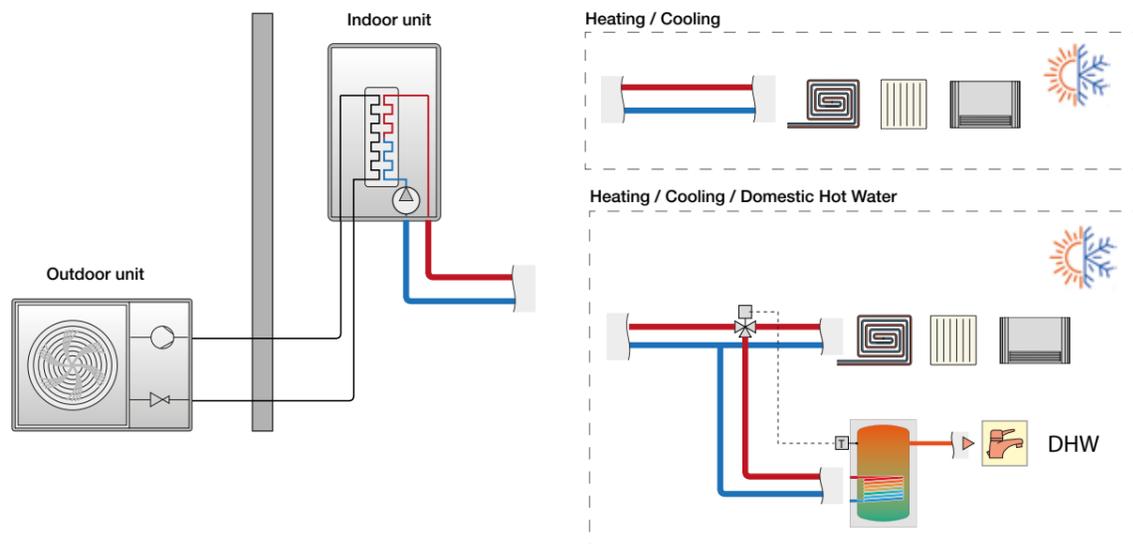
The products in the CALEFFIGEO® series have been conceived specifically for use in heat pump systems. The thermal medium in circuits with air source heat pump can reach very low temperatures; for this reason the components are made with high-performance materials and special solutions to prevent freezing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

Monobloc air source heat pump

Air-source heat pump systems have numerous advantages among renewable energies: they do not require land or outdoor space, nor specific authorizations and do not require expensive excavation or installation of heat exchangers. However, they also have limits that must be adequately taken into account: these limits are related to the strong thermal variations of the outside air temperature. The external air can in fact reach very low temperatures and therefore make the heat pump work with very limited COP values, values that can make the system work with too high costs.

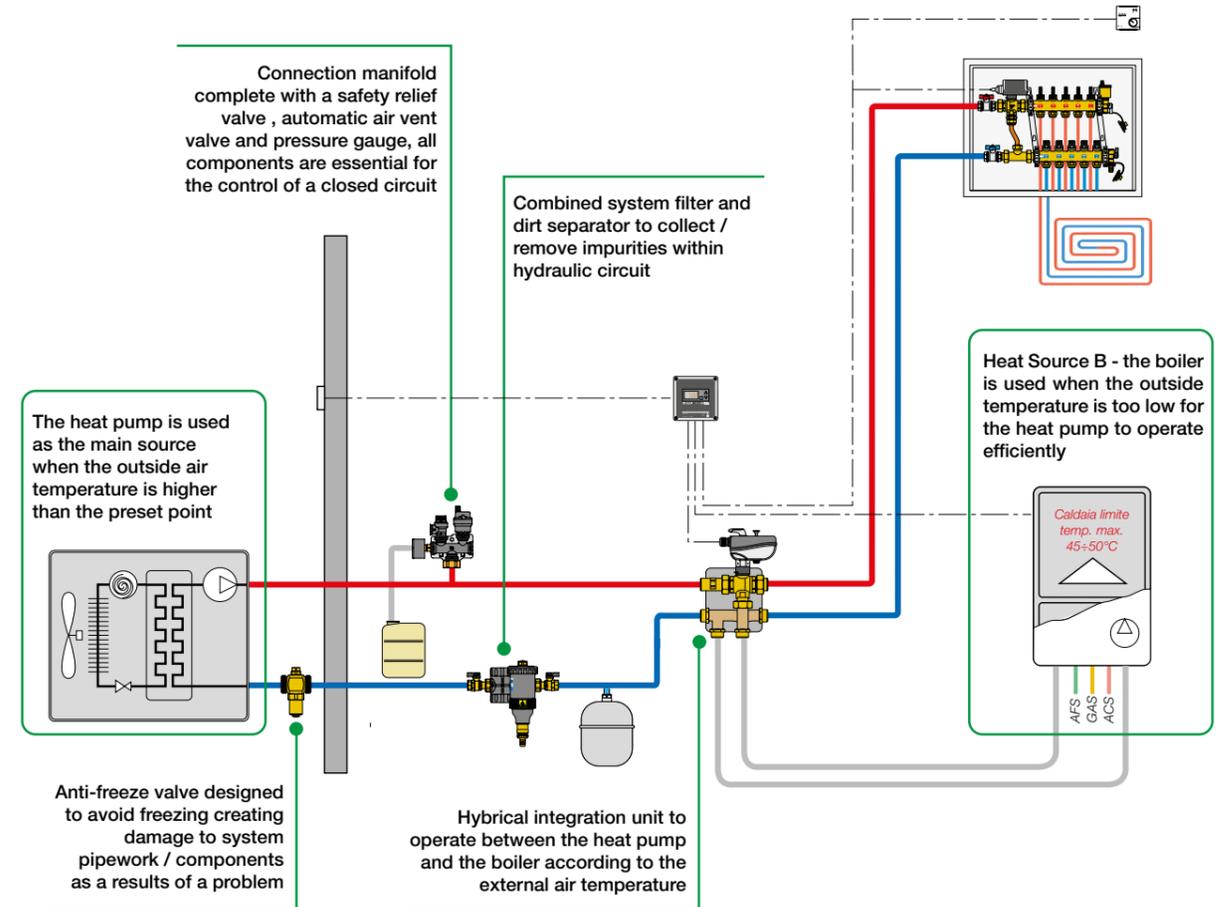


Air source heat pump with outdoor unit and indoor unit



Air source heat pump combined with condensing boiler

With low air temperatures, it is advisable to provide for the use of boilers that can intervene, as an aid or as an alternative, to the air-water PDCs. In practice, the boilers come into operation when the cost of the heat that can be produced by the PDC is no longer convenient.



When is it convenient to use the heat pump?

A PDC produces thermal energy at lower cost than a boiler only if: $COP > R$

COP = coefficient that expresses the performance of the PDC
R = ratio between electric kWh and gas kWh

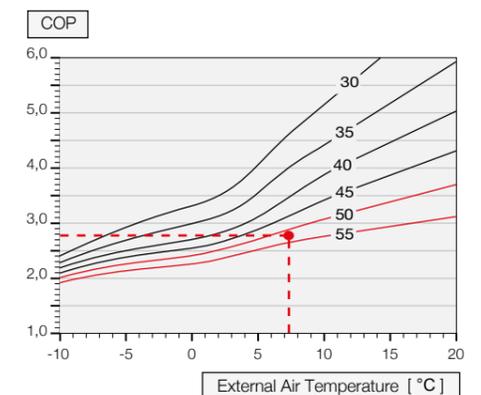
$$R = \frac{C(\text{kWh.e}) \cdot PCI \cdot \eta}{C_{\text{gas}}}$$

The cost per kW hour that gas can be calculated as:

$$C(\text{kWh.g}) = \frac{C_{\text{gas}}}{PCI \cdot \eta}$$

C_{gas} = cost Nm³ gas
PCI = lower calorific value of gas [kWh/Nm³]
 η = combustion efficiency:
 $\eta = 0,70 \div 0,80$ old boiler
 $\eta = 0,90 \div 0,95$ new non condensing boiler
 $\eta = 0,95 \div 1,05$ new condensing boiler

The alternation temperature of the generators (or setpoint temperature) is then determined, with the COP / temperature diagram of the PDC manufacturer, based on the design temperature of the PDC and the minimum COP to be assumed equal to the value of the coefficient R.



INTEGRATION UNIT



106 HYBRICAL® HEAT PUMP-BOILER INTEGRATION UNIT WITH INSULATION

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

Supply: 230 V (AC).
Max. working pressure: 10 bar.
Temperature range: -10–110 °C.
Medium: water, glycol solutions.
Max. percentage of glycol: 50 %.



Ref no	Connections
106160	1"



106 HYBRICAL® HEAT PUMP-BOILER INTEGRATION UNIT WITH INSULATION

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

Supply: 230 V (AC).
Max. working pressure: 16 bar.
Temperature range: -10–110 °C.
Medium: water, glycol solutions.
Max. percentage of glycol: 50 %.



Ref no	Connections
106170	1¼"
106180	1½"
106190	2"

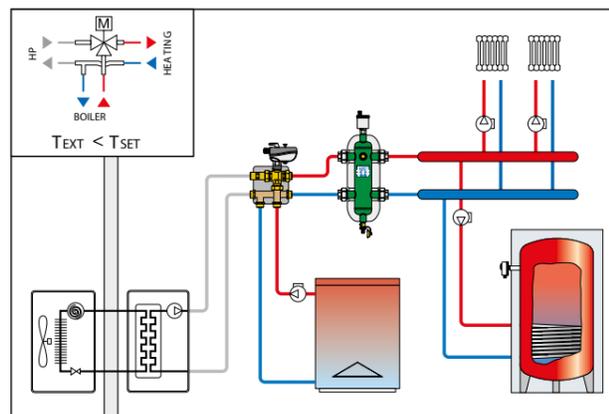
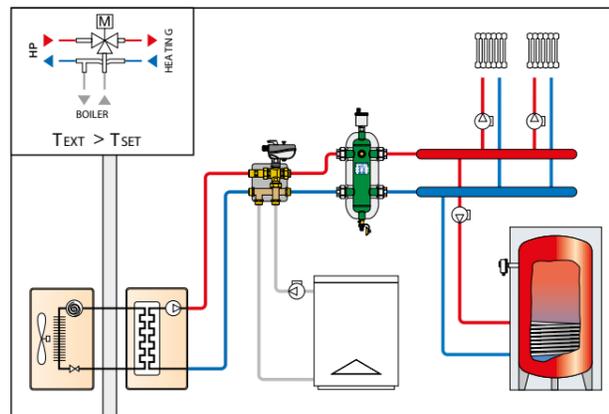
FUNCTION

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 relays if needed.



DIVERTER KIT



106 HYBRICAL® DIVERTER KIT FOR HEAT PUMP WITH INSULATION

Consisting of:
- diverter valve,
- connection kit.

Supply: 230 V (AC).
Max. working pressure: 10 bar.
Temperature range: -10–110 °C.
Medium: water, glycol solutions.
Max. percentage of glycol: 50 %.



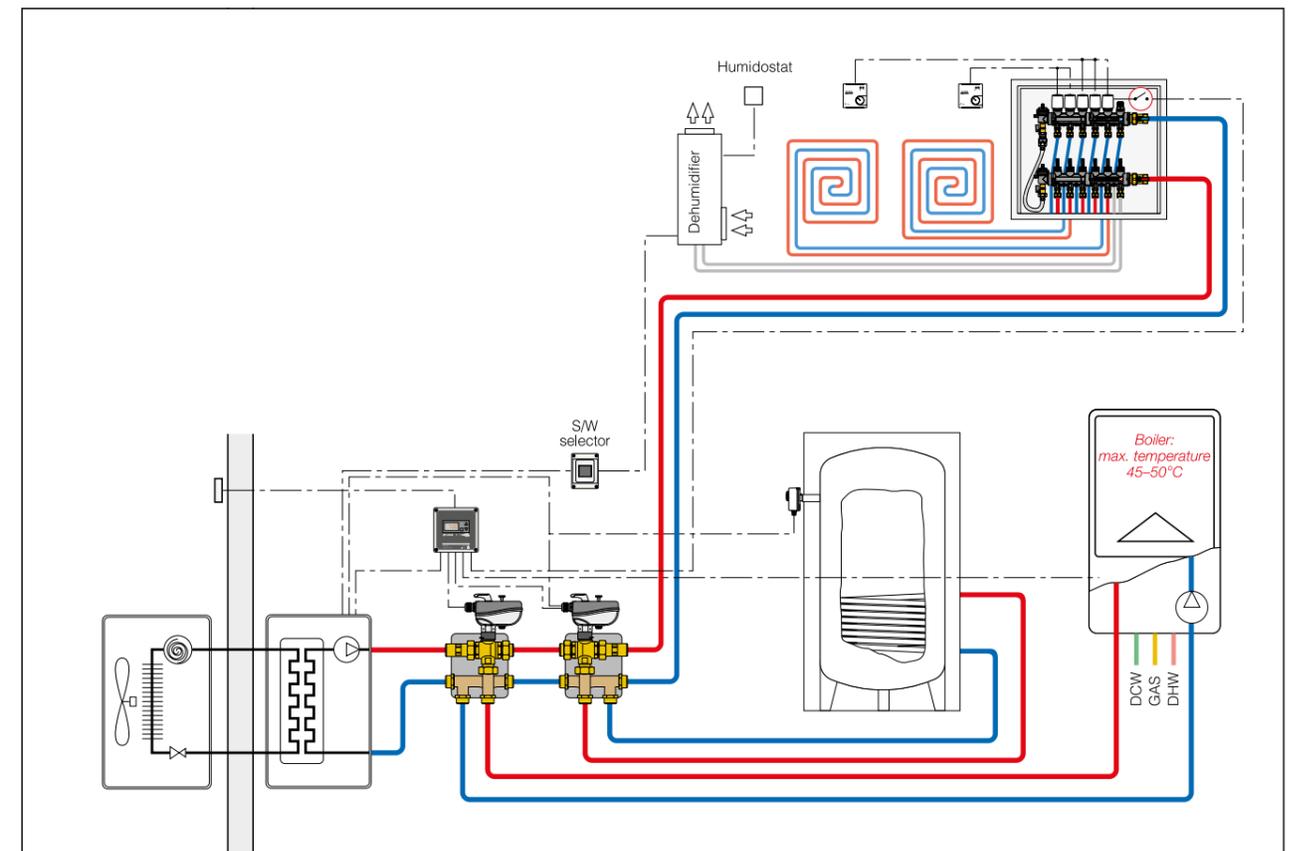
Ref no	Connections
106060	1"

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.

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



ANTI-FREEZE PROTECTION & INSTRUMENT HOLDER



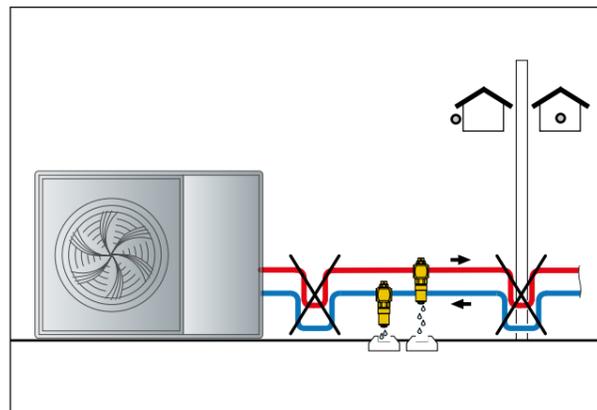
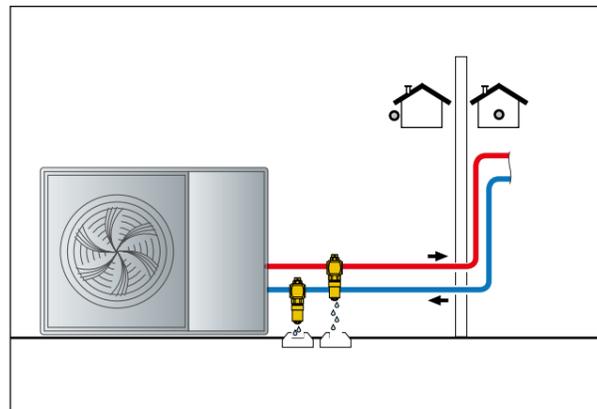
108 ANTI-FREEZE VALVE

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



Ref no	Connections
108601	1"
108701	1¼"
108801	1½"

Application diagrams of anti-freeze valve 108 series

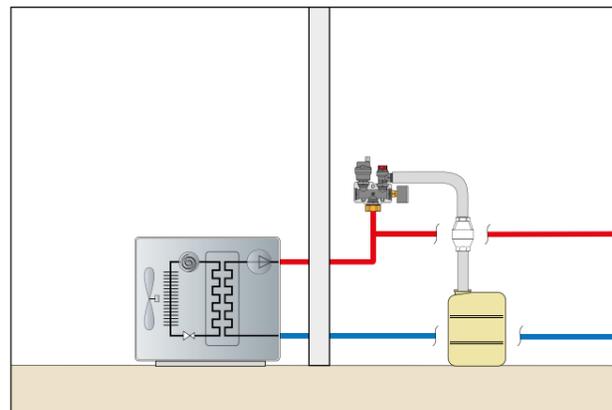
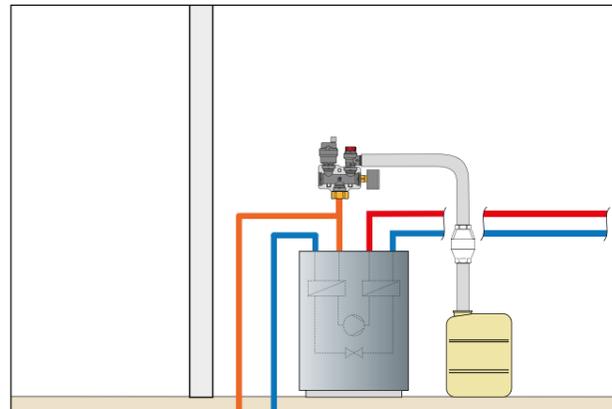


305 INSTRUMENT HOLDER IN COMPOSITE MATERIAL FOR HEATING SYSTEMS

Equipped with air vent, safety relief valve in composite material and pressure gauge.
With insulation.
Temperature range: 5 - 90 °C.
Up to 50 kW.

Ref no	Connections
305663	1" 3 bar TÜV

Application diagrams of instrument holder 305 series



DIRTMAG®



5453 DIRTMAG® MULTIFUNCTION DEVICE WITH DIRT SEPARATOR AND STRAINER

Specific for the complete cleaning of the hydraulic circuit, to protect continuously generator and components.

Technopolymer body.
Dirt separator with tecnopolimer internal element, **with magnet.**

Two inspectable strainers with stainless steel mesh: 1 for initial cleaning (blue colour) already installed, 1 for maintenance (grey colour) in package.

Shut-off valves with nuts, brass body.
Female connections and Ø 22 and Ø 28 mm with compression ends. Adjustable for horizontal, vertical or 45° pipes.

Drain cock with hose connection.

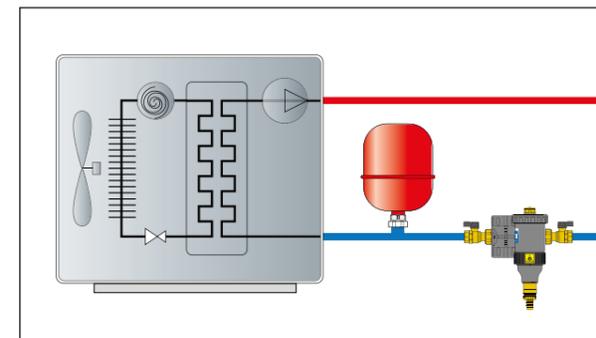
Max. working pressure: 3 bar.
Temperature range: 0 - 90 °C.

Ref no	Connections
545375	¾"
545376	1"
545377	1¼"
545372	Ø 22
545373	Ø 28

Problems caused by impurities in hydraulic circuits

The components of a heating and air conditioning system are exposed to degradation caused by the impurities contained in the system's circuit. If the impurities in the thermal medium are not removed, they can impair operation of the units or components, such as boilers or heat exchangers, especially in the commissioning stage, already from the initial passage. This latter problem must not be underestimated because boiler manufacturers will frequently reject warranty claims if their product is not adequately protected by a strainer from the time of commissioning onwards.

Application diagrams of multifunction device 5453 series

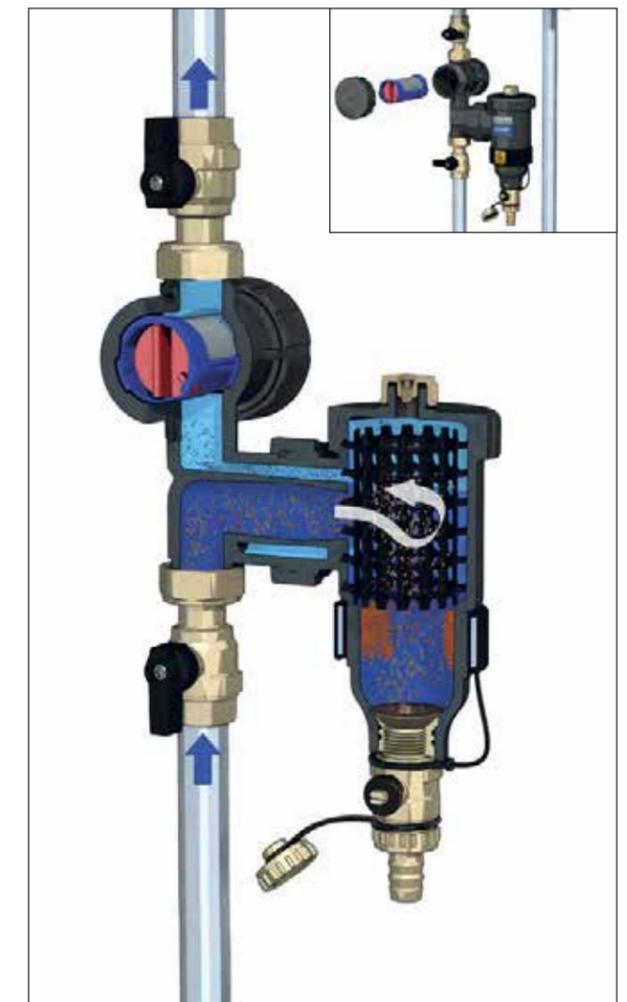


FUNCTION

The multifunction device is obtained by coupling a dirt separator and a cartridge strainer arranged in series.

The water circulating in the system flows, in sequence, first through the dirt separator and then through the cartridge strainer.

1. Elimination of particles even of small diameters (sizes of a few hundredths of a millimetre) is handled by the dirt separator due to the effect of collision of the particles with the internal element and gravity decantation of sludge in the collection chamber. This result can be obtained only after some circulations of the medium and hence during operation of the system in steady-state conditions.
2. The total elimination of particles of diameters measured in tenths of a millimetre, right from the first passage of the medium (system commissioning), is guaranteed by the mesh strainer, which mechanically intercepts impurities carried by the thermal medium.



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

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