COMBIFLOW Hydraulic Separtators

Art. 531 - 533

100% MADE IN ITALY

Applications

COMBIFLOW hydraulic separator combines multiple functions within the same device, which are necessary in heating and cooling circuits:

1. **Hydraulic separation**
   The main function of the separator is to decouple, making them autonomous, the primary circuit (heat generator) from the secondary circuit (heating bodies). The separator thus acts on the division of the flow rates and hydraulic system heads and overall it is required when the flow rate of the heat generation circuit assumes values that are not compatible with the distribution circuit to the users.
2. **Deaeration**
   This function guarantees the automatic and continuous evacuation of the air present inside the system.
3. **Dirt separation**
   Thanks to the special filtering mesh placed inside the separator and to the variation of the passage section, the heaviest impurities present in the fluid are conveyed to the lower part of the device, in the settling chamber. Thanks to the presence of a drain valve, all the dirt deposited here can be easily expelled.
4. **Magnetic action (art.533)**
   The powerful magnetic element located in the lower part, near the filter grid, allows the interception of ferrous particles present inside the fluid. These particles can let be settled inside the settling chamber, through the extraction of the magnet from the outside.

The separator is supplied with an **insulation shell** thermoformed with a thickness of 20mm, so as to guarantee excellent thermal insulation.

Product range

Art. 531	1" – 1 1/4" with female swivel nuts	Without magnetic element
Art. 533	1" – 1 1/4" with female swivel nuts	With magnetic element

Technical characteristics

SEPARATOR

Fluids:	Water or glycol solutions
Glycol max:	30%
Operating temperature range:	0-100°C
Max. operating pressure:	10 bar
Threads:	G 1" – G 1 ¼" (EN ISO 228/1)
Magnet (art.533):	12.000 gauss

INSULATION

Density:	30 kg/m³ (internal part) + 80 kg/m³ (External part)
Thickness:	20mm
Operating temperature range:	0-100°C
Thermal conductivity (ISO 2581):	0,0494 W/mK (40°C)
Reaction to fire (DIN4102):	B2 class

Materials

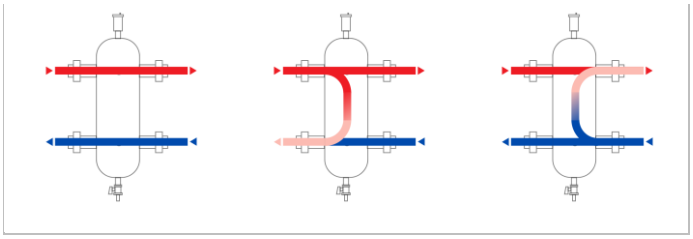
Separator body:	Painted FE360 steel
Body and vent cap:	Brass CW617N
Vent float:	Polymer
O-ring vent seal:	NBR
Drain valve:	Brass CW617N
Valve gasket:	NBR
Nut and 2 pcs fitting:	Brass CW617N
Fitting gasket:	Fiber
Closure cap:	Brass CW617N
Cap gasket:	EPDM
Magnet:	AlNiCo
Magnet holder:	Brass CW617N
Magnet holder gasket:	EPDM
Insulation:	Closed-cell expanded polyethylene

Functioning

In situations where a primary circuit for heat production, equipped with a circulation pump and a secondary distribution circuit, provided with one or more circulation pumps, coexist, then mutual interference may occur during operation, which may abnormally influence the flow rate and hydraulic head of the circuits. In these situations, the separator plays the fundamental role **of making the primary circuit independent from the secondary circuit**, functioning as a sort of by-pass between the flow and return of the system. In this way, a production circuit with a constant flow rate and a distribution circuit with a variable flow rate are created.

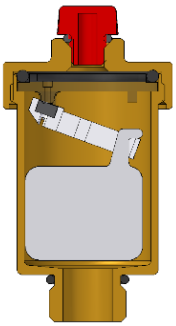
In particular, 3 specific situations can occur:

1. A situation of equilibrium between the distribution circuit and the production circuit;
2. A situation of bigger capacity of the production circuit than the distribution circuit;
3. A situation of bigger capacity of the distribution circuit than the production circuit.



Distinctive elements

AUTOMATIC AIR VENT VALVE



The automatic air vent valve, located in the upper part of the separator, performs the important function of **automatic and continuous expulsion of the air** present in the system.
Air can form for various reasons, such as near the internal surfaces during the combustion processes of the boilers due to high temperatures, or during cavitation events, which can occur near pumps, pressure reducers, and so on.
Thanks to the special metal grid inside the separator and to the variation of the passage section, all the air, up to the level of the microbubbles, is conveyed upwards where it is expelled from the relief valve.

The relief valve is equipped with a check valve for the interception of the fluid, which is automatically activated with the removal of the valve for any maintenance operations.

STANDARD DIRT SEPARATION

The filtration of impurities present inside the circuit is made possible by the action of the **double filter mesh** installed inside the separator and it is made easy by the slowing down of the fluid inside it, caused by the variation of the passage section.
These impurities are thus conveyed to the lower part of the separator, inside the collection chamber.
Thanks to the present drain valve, all impurities can be easily expelled during maintenance operations.
It is recommended to carry out cleaning operations regularly, best with the system turned off.

MAGNETIC DIRT SEPARATION (ART.533)

The separator art.533 is equipped with a **powerful magnetic element** for the collection and removal of ferrous particles that could be present inside the system.
The magnet is inserted inside a magnet holder. In this way it can be easily extracted for the settling of the ferrous particles successively collected in the lower part of the separator where they can be easily expelled thanks to the drain valve.
It is recommended to carry out cleaning operations regularly, best with the system turned off.

PROBE HOLDER CONNECTIONS

The separator is supplied with two 1/2"F female connections at the charge and discharge, in the front area.
These connections can be used to insert **pressure gauges or immersion thermometers** to measure at the most significant points for measurement.

ROTATING PIPE UNIONS

To make the installation of the separator on the charge and discharge circuit easier, it is supplied with female-female rotating pipe unions. Seal is guaranteed by the large flat surface of the connections, through fiber gaskets.

INSULATION

All separators are supplied complete with a special hot-formed shell insulation.
This insulation guarantees the double function of insulating the separator thermally and of blocking the passage of water vapor from the outside to the inside. In this way, avoiding the condensation formation, Pintossi separator can also be used in **chilled water systems**.

Sizing

The hydraulic separator must be sized taking as a reference the maximum recommended flow rate value at the inlet. The chosen value must be the greater between the sum of the primary circuit flow rates and the sum of the secondary circuit flow rates.

ART.	SIZE	FLOW RATE (m^3/h)
531	1"	2,5
	1 1/4"	4
533	1"	2,5
	1 1/4"	4

Installation

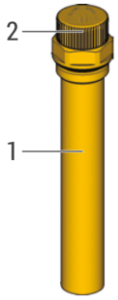
The hydraulic separator must be installed on horizontal pipes.
The various components must be positioned as follows:

1. The automatic air vent valve must be installed in the upper small log;
2. The drain valve must be installed in the lower small log;
3. The magnet, in the specific case of the separator with magnetic dirt separation art.533, must be placed in the front connection in the lower part, near the drain valve. To remove the magnet, a space of at least 150 mm must be left free in the front part.
4. The sealing cap for art.533 must be installed in the front connection in the upper part, near the air vent valve; the sealing caps for art.531 must be installed in the front connections. It is possible to replace the sealing cap with the thermo-manometer art.570, which can be purchased separately.

Maintenance

Maintenance operations can be carried out while the system is running, but for a better cleaning of the separator it is recommended to carry them out with the system turned off.
To carry out maintenance, follow the steps below:

- If you have shut-off valves upstream and downstream of the separator, close them;
- For art.533, remove the magnet from the well by unscrewing clockwise. To avoid the possibility of unscrewing the well inadvertently, the thread of the well (1) is opposite to that of the magnet (2);
- Wait a few minutes for the ferrous particles to settle on the bottom of the separator;
- Open the drain tap by turning the appropriate lever;
- After having discharged all the impurities, close the drain tap;
- For art.533, reinsert the magnet into the well, turning it counterclockwise.



The various components must be positioned as follows:

1. The automatic air vent valve must be installed in the upper small log;
2. The drain valve must be installed in the lower small log
3. The magnet, in the specific case of the separator with magnetic dirt separator art.533, must be placed in the front connection in the lower part, near the drain valve. To remove the magnet a space of at least 140 mm must be left free in the front part.
4. The sealing cap (for art.533) must be installed in the front connection in the upper part, near the air vent valve; the sealing caps (art.531) must be installed in the front connections. It is possible to replace the sealing cap with the thermos-manometer art.570, which can be purchased separately.

Fluid characteristics

The reference standard for the treatment of convector fluid in heating systems is Uni 8065:2019 which regulates the parameters that must be observed to avoid corrosion and limescale formation.
In order to grant the guarantee on a product, the characteristics of the fluid must comply with the regulations in the reference country or at least be no lower than those prescribed by the aforementioned UNI 8065:2019 standard.
In particular, the minimum necessary, but not sufficient, standards that must be met are the following:

Fluid appearance:	Clear
PH:	Including between 7 and 8
Iron (FE):	< 0,5 mg/kg (< 0,1 mg/kg for the steam)
Copper (CU):	< 0,1 mg/kg (< 0,05 mg/kg for the steam)
Antifreeze:	Propylene Glycol
Conditioner:	As per manufacturer's instructions

In any case, when antifreeze liquids and conditioning solutions are used, it is required to check and verify the compatibility between these substances and the construction materials indicated in the Pintossi+C data sheet.