5464

DISCAL*DIRTMAG*

altecnic
CALEFFI group

5464 discal dirtmag

Application

The DISCALDIRTMAG continually eliminates air and debris contained in the hydraulic circuits of heating and cooling systems

The air discharge capacity of these devices is very high.

The automatic air vent at the top of the collection chamber allows more air to be collected and automatically discharges to atmosphere.

The hydroscopic cap allows air to be released during system filling and automatically closes when in contact with water.

The DISCALDIRTMAG automatically eliminate all the air present in the circuit, down to the level of micro-bubbles and at the same time separates the debris present in the circuit water.

The debris collects in the bottom of the valve body from where it can be discharged via the drain valve at the bottom of the valve body.

The removable magnet ensures high efficiency for the separation of ferrous impurities.

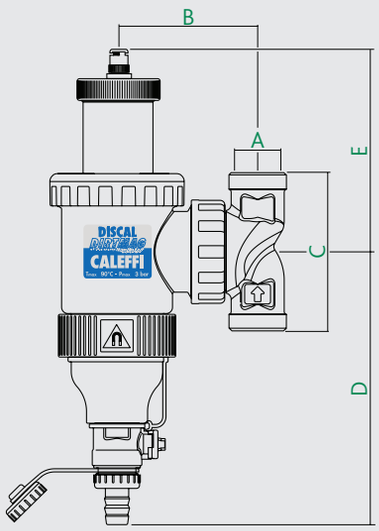
Construction Details

Component	Material	Grade
Body	Polymer	PA66G30
Dirt separation chamber	Polymer	PA66G30
Locking nut for 'T' fitting	Polymer	PPSG40
Tee fitting	Brass	BS EN 1982 CB735S
Automatic air vent body	Polymer	PA66G30
Float	Polymer	PP
Float guide and stem	Brass	BS EN 12164 CW614N
Float lever and spring	Stainless st.	BS EN 10270-3 (AISI 302)
Air vent with hydroscopic cap		
Seals	Elastomer	EPDM
Drain valve	Brass	BS EN12165 CW617N

Technical Specification

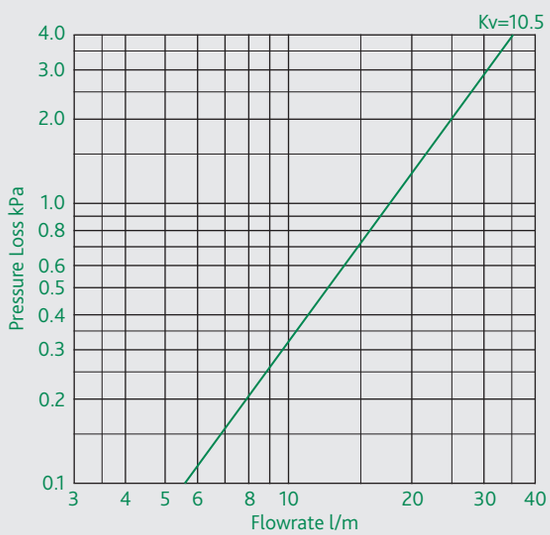
Medium:	water, glycol solution
Max. percentage of glycol:	30%
Max. working pressure:	3 bar
Max. discharge pressure:	3 bar
Working temperature range:	0 to 90°C
Particle separation rating:	up to 5 µm
Ring system magnetic induction:	2 x 0.31

Dimensions



Ref No	Size	A	B	C	D	E	kg
546405	DN20	¾"	87.5	96	172.5	125	1.3
546406	DN25	1"	87.5	110	172.5	125	1.3
546402	DN20	Ø18	87.5	115	172.5	125	1.3
546403	DN25	Ø22	87.5	116.6	172.5	125	1.3

Hydraulic Characteristic



DN	20	25	20	25
Connection	¾"	1"	Ø22	Ø28
Code	546405	546405	546405	546405
Kv - m^3/hr	10.5	10.5	10.5	10.5
l/min MAX	21.67	21.67	21.67	21.67
l/min MIN	1.3	1.3	1.3	1.3

The maximum recommended flow velocity inside the pipe is 1.2 m/s. The following shows the maximum flow rates to meet this requirement.

Size	Ø22	Ø28
l/min	23.1	38.8

Based on BS EN 1057 copper tube

Solubility of Air in Water

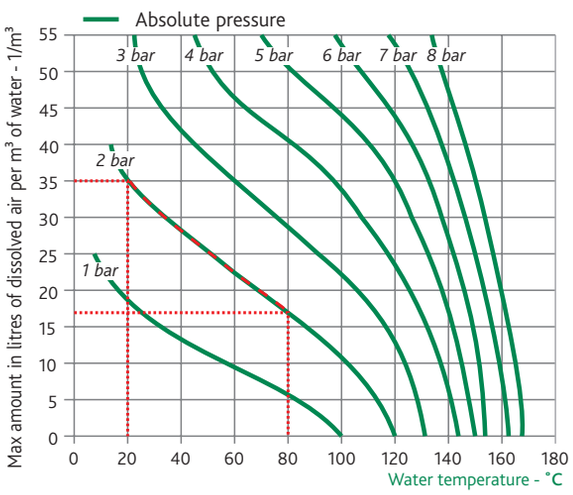
The amount of air which can remain dissolved in a water solution is a function of pressure and temperature.

This relationship is governed by Henry's Law and the graph shows the physical phenomenon of the volume of air released by the fluid to be quantified.

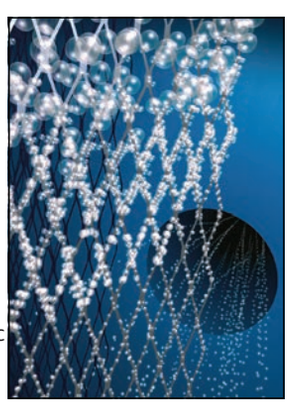
As an example, at a constant absolute pressure of 2 bar, if the water is heated from 20°C to 80°C, the amount of air released by the solution is equal to 18 litres per m3 of water.

According to this law it can be seen that the amount of air released increases with temperature rise and pressure reduction.

The air comes in the form of micro-bubbles, a fraction of a millimetre in diameter.



Operating Principle



De-aerator part of the DISCALDIRTMAG uses the combined action of several physical principles.

The active part consists of an assembly of concentric metal mesh surface

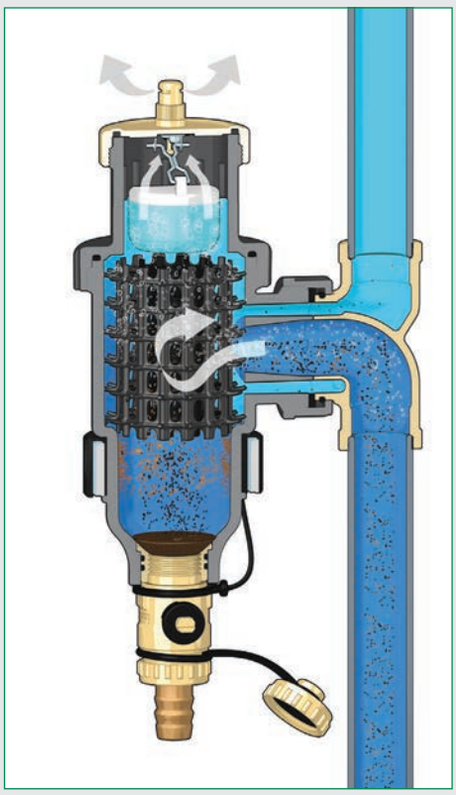
These elements create the whirling movement required to facilitate the release of micro-bubbles and their adhesion to these surfaces.

The bubbles, fusing with each other, increase in volume until the hydrostatic thrust is such as to overcome the adhesion force to the structure.

They rise towards the top of the chamber from which they are released through a float-operated automatic air release valve.

The flow through the DISCALDIRTMAG is uni-directional and must follow the direction arrow on the body.

Construction and Flow Details

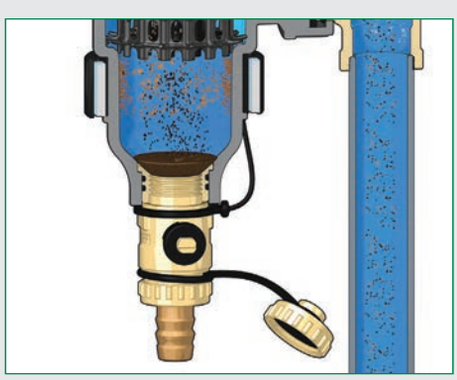


Dirt separators operate by a combination of physical principles.

The internal element is constructed to form a radial net shaped element.

Debris in the water strikes the element, causing it to drop to the bottom of the body.

The larger internal volume of the DISCALDIRTMAG compared with the area of the pipe, reduces the velocity of flow and with the aid of gravity and the magnetic element helps to collect the debris.



The collected debris can be discharge from the DISCALDIRTMAG whilst the system is in operation by removing the magnet, opening the blow down valve and flushing through the debris.

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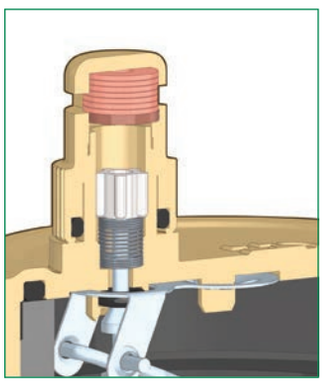
Air Collection and Release

The DISCALDIRTMAG collects and eliminates all the air present in the circuit down to the level or micro-bubbles.

The air collects in the automatic air vent at the top of the collection chamber from where it is continuously discharges via the hydroscopic safety cap.



The operating principle of the hydroscopic cap is based on the properties of the cellulose fibre discs forming part of the retaining cartridge.

These discs increase in volume by 50% when they come into contact with water thus closing the air release valve.

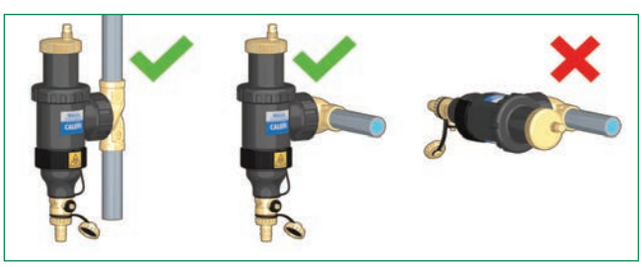
This avoids any damage in the event of water leakage.

Installation

The DISCALDIRTMAG must be installed in a vertical position and ideally upstream of the pump.

Manually turn the Tee fitting to adapt the connections for horizontal or vertical pipe.

The flow through the DISCALDIRTMAG must be in accordance with flow direction indicated by the arrow on the body.



Dirt Separation Efficiency

The effectiveness of any device to separate and collect particles of debris from a flowing liquid depends upon:-

1. The larger the particles the more effective the device.
2. If the flow velocity reduces the particles separate and fall more easily.
3. The number of times the liquid re-circulates through the device

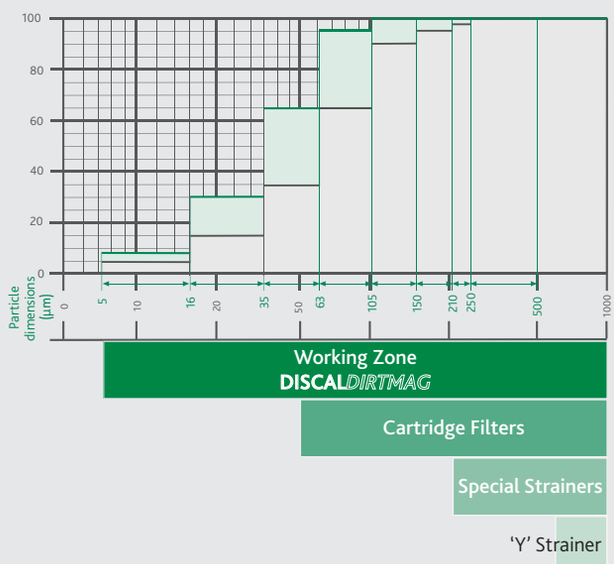
The design of the DISCALDIRTMAG dirt separator enables it to collect particles down to a minimum size of 5 µm = 0.005 mm.

The chart summarises tests conducted to illustrate how quickly particles are collected .

After only 50 circulations, approximately one day of operation, 100% of particles 100 µm = 0.1mm in size and approximately 80% of all particles had been collected.

Continued circulation gradually leads to the virtual removal of all particles.

Dirt Separation Efficiency - Particle Size



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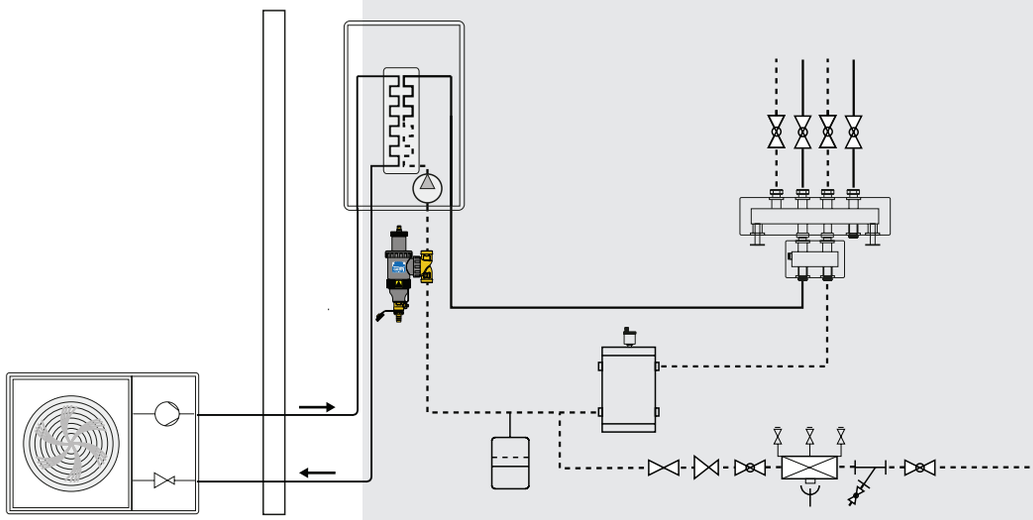
Typical Application

- Isolation valve
- Ball valve
- Expansion vessel
- Backflow preventer
- Pressure reducing valve
- 'Y' filter
- Pump
- Discal *DIRTMAG* air and dirt separator



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