Composite dirt separators with magnet DIRTMAG®

5453 series

01240/15 GB
replaces 01240/12 GB

ISO 9001 FM 21654

Function

The dirt separator separates the impurities, which are mainly made up of sand and rust particles, circulating within the closed circuit systems, with very low head losses. The impurities are collected in a large decantation chamber, that requires low frequency cleaning procedures, from which they can be removed even while the system is in operation.
The DIRTMAG® dirt separator series are also equipped with a removable magnetic ring for the separation of ferrous impurities.
Made using a composite material specifically designed for use in air-conditioning systems, this dirt separator is especially versatile as it can be installed on both horizontal and vertical pipes.

PCT INTERNATIONAL APPLICATION PENDING

Product range

Code 5453.. DIRTMAG® composite dirt separator with magnet for horizontal and vertical pipes with threaded connections sizes DN 20 (3/4") and DN 25 (1")

Code 5453.. DIRTMAG® composite dirt separator with magnet for horizontal and vertical pipes with compression ends sizes DN 20 (Ø 22) and DN 25 (Ø 28) with fittings for copper pipe

Cod. 5453.. DIRTMAG® composite dirt separator with magnet for horizontal and vertical with shut-off valves sizes DN 20 (3/4"), DN 25 (1") and DN 32 (1 1/4")

Technical specifications

Materials

Body:	PA66G30
Dirt separator cover:	PA66G30
Top plug:	brass EN 12164 CW614N
Drain screw:	brass EN 12164 CW614N
Tee fitting:	- code 545305, 545306, 545302 and 545303: brass EN 12420 CW617N - cod. 545345, 545346 and 545347: PPSG40
Locking nut for tee fitting:	- code 545305, 545306, 545302 and 545303: brass EN 1982 CB 753S - code 545345, 545346 and 545347: PA66G30
Internal element:	HDPE
Hydraulic seals:	EPDM
Drain cock with hose connection:	brass EN 12165 CW617N
Drain valve:	- code 545345, 545346 and 545347: brass EN 12165 CW617N

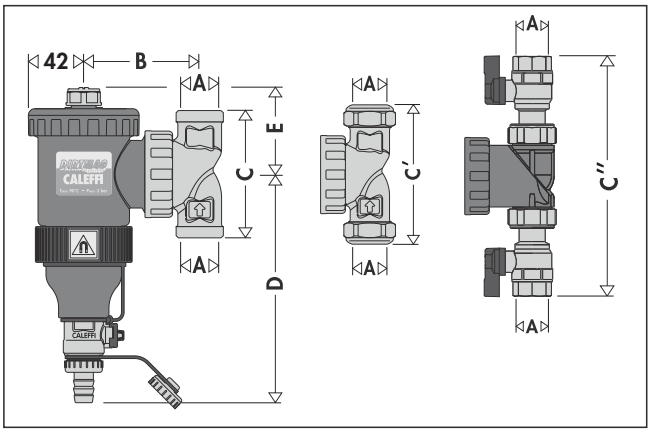
Performance

Medium:	water, glycol solutions
Max. percentage of glycol:	30%
Max. working pressure:	3 bar
Working temperature range:	0–90°C
Ring system magnetic induction:	2 x 0,3 T

Connections

Body:	3/4", 1" F (ISO 228-1) Ø 22 and Ø 28 mm for copper pipe 3/4", 1", 1 1/4" F (ISO 228-1) with shut-off valves

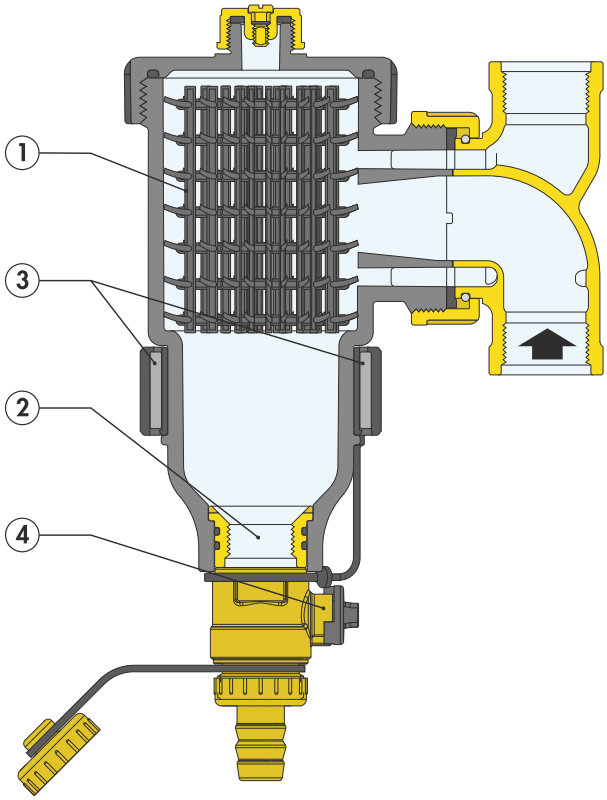
Dimensions



Code	DN	A	B	C	C'	C''	D	E	Mass (kg)
545305	20	3/4"	87,5	96	-	-	172,5	65,5	1,5
545306	25	1"	87,5	141	-	-	172,5	65,5	1,5
545302	20	Ø 22	87,5	-	115	-	172,5	65,5	1,5
545303	25	Ø 28	87,5	-	117	-	172,5	65,5	1,5
545345	20	3/4"	106,5	-	-	214	172,5	65,5	1,2
545346	25	1"	106,5	-	-	221	172,5	65,5	1,3
545347	32	1 1/4"	106,5	-	-	243	172,5	65,5	1,4

Operating principle

The operating principle of the dirt separator with magnet is based on the combined action of a number of physical phenomena.
The internal element (1) consists of a set of radial reticular surfaces. The impurities in the water, on striking these surfaces, get separated, dropping into the bottom of the body (2) where they are collected.
Ferrous impurities are also trapped inside the dirt separator body, thanks to the action of the two magnets (3) inserted into a special removable outer ring. The large internal volume of the DIRTMAG® slows down the flow speed of the medium thus helping, by gravity, to separate the contained particles.
The collected impurities are discharged, even with the system running, by opening the drain cock (4); this procedure can even be performed while the system is in operation.



Construction details

Technopolymer

The dirt separator is made using a polymer specifically selected for heating and cooling system applications. The main features of the technopolymer are:
- high strength to strain, while maintaining good ultimate elongation
- good resistance to crack propagation
- very low humidity absorption, for consistent mechanical behaviour
- high resistance to abrasion caused by continuous medium flow
- performance maintained over temperature variation
- compatibility with glycols and additives used in circuits.

These basic material characteristics, combined with the appropriate shaping of the most highly stressed areas, enable a comparison with the metals typically used in the construction of dirt separators.

Low head losses and performance maintained over time

The high performance of the dirt separator is based on the use of the internal element with reticular surfaces. The principle of collision and decantation of particles makes the dirt separation action more efficient if compared to the common strainers. This performance is constant over time, unlike common strainers which instead get clogged by the trapped sludge, thus changing the functional features.

Geometric structure and large dirt collection chamber

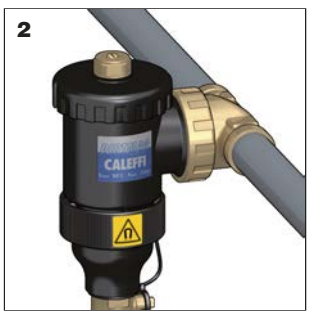
The dirt collection chamber has the following features:
- it is located at the bottom of the device, at such a distance from the connections that the collected impurities are not affected by the swirling of the flow through the mesh;
- it is large enough to offer an increased amount of collected dirt, which means emptying/discharging procedures are required less often (in contrast to strainers, which need to be frequently cleaned);
- it is easy to inspect, by unscrewing it from the valve body for any servicing of the internal element required in the event of obstruction by fibres or large dirt particles.

Separation of ferrous impurities

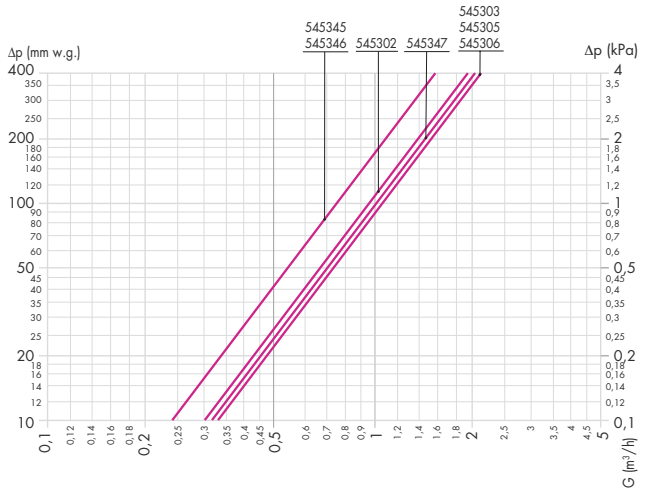
This series of dirt separators, fitted with a magnet, offer greater efficiency in the separation and collection of ferrous impurities. The impurities are trapped inside the dirt separator body by the strong magnetic field created by the magnets inserted in the special outer ring.
The outer ring can also be removed from the body to allow their decantation and subsequent expulsion while the system is still running.
Since the magnetic ring is positioned outside the dirt separator body, the hydraulic characteristics of the device are not altered.

Adjusting the body to horizontal and vertical pipes

Thanks to the special coupling between the locking nut and the tee fitting, the DIRTMAG® dirt separator can be adjusted (1) for installation to both horizontal (2) and vertical (3) pipes, keeping the same operating features.



Hydraulic characteristics



DN	20			25			32
Connections	Ø 22	3/4"	3/4"	Ø 28	1"	1"	1 1/4"
Code	545302	545305	545345	545303	545306	545346	545347
Kv (m³/h)	9,5	10,3	7,5*	10,6	10,5	7,5*	9,9*

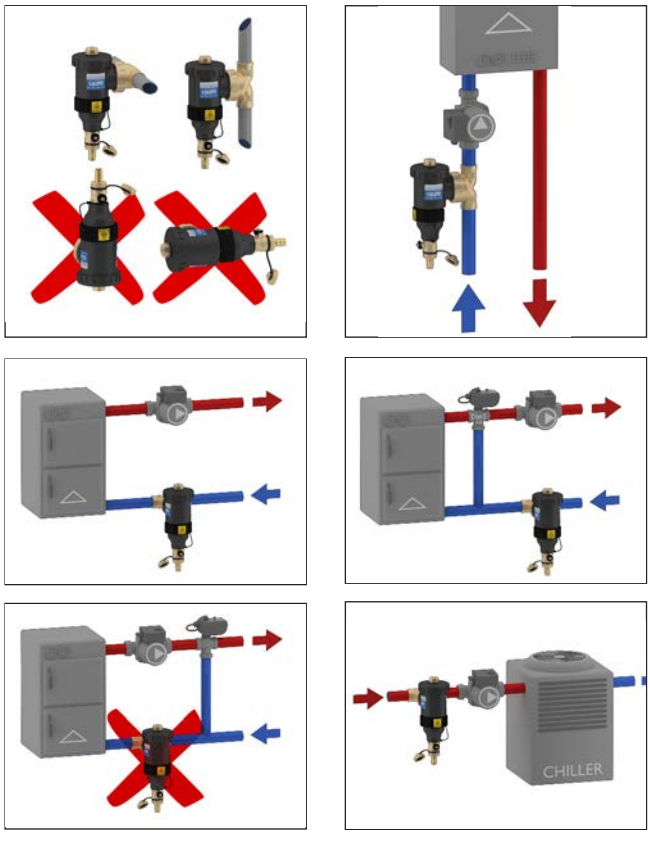
*with shut-off valves

The maximum recommended speed of the medium at the device connections is ~ 1,2 m/s. The following table gives the maximum flow rates to meet this condition.

	l/min	m³/h
DN 20	21,67	1,3
DN 25	21,67	1,3
DN 32	35	2,1

Installation

The dirt separator should be installed in accordance with the flow direction indicated by the arrow on the tee fitting and, preferably, on the return circuit upstream of the boiler.
The dirt separator should always be installed upstream of the pump and always with its body in vertical position.



Air vent

Use a screwdriver or a butterfly key to undo the screw on the top plug in order to purge any air that has collected at the top of the body.

Sludge discharge

Remove the ring in which the magnets are housed (1) and drain the impurities, even while the system is running, using the special key provided (2).

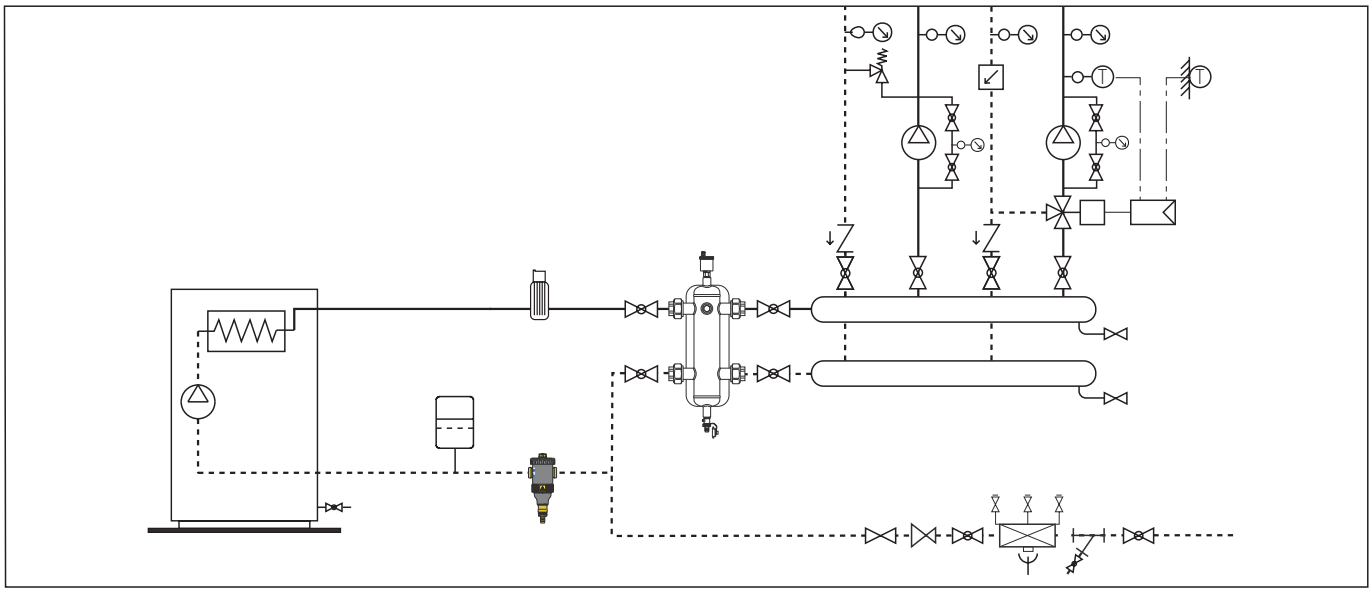
Maintenance

In case of maintenance to the dirt collection chamber, simply unscrew the top cover using the provided key, then extract the internal element, which is attached in the proper way to be removed for cleaning.

Additives dosing

The device can also be used as an access point to inject into the circuit chemical additives designed to protect the system.

Application diagram



SPECIFICATION SUMMARY

5453 series Dirt separator in composite material DIRTMAG®

Dirt separator with magnet. Size DN 20 (and DN 25). Adjustable connections 3/4" (and 1") F (ISO 228-1). Brass tee fitting. Brass drain valve with hose connection. PA66G30 body and cover. HDPE internal element. EPDM hydraulic seals. Medium water and glycol solutions; maximum percentage of glycol 30%. Maximum working pressure 3 bar. Working temperature range 0–90°C. PCT INTERNATIONAL APPLICATION PENDING.

5453 series Dirt separator in composite material DIRTMAG®

Dirt separator with magnet. Size DN 20 (and DN 25). Adjustable connections with compression ends for Ø 22 mm (and Ø 28 mm) copper pipe. Brass tee fitting. Brass drain valve with hose connection. PA66G30 body and cover. HDPE internal element. EPDM hydraulic seals. Medium water and glycol solutions; maximum percentage of glycol 30%. Maximum working pressure 3 bar. Working temperature range 0–90°C. PCT INTERNATIONAL APPLICATION PENDING.

5453 series Dirt separator in composite material DIRTMAG®

Dirt separator with magnet. Size DN 20 (from DN 20 to DN 32). Adjustable connections 3/4" (from 3/4" to 1 1/4") F (ISO 228-1). Composite tee fitting. Brass shut-off valves. Brass drain valve with hose connection. Drain cock with hose connection. PA66G30 body and cover. HDPE internal element. EPDM hydraulic seals. Medium water and glycol solutions; maximum percentage of glycol 30%. Maximum working pressure 3 bar. Working temperature range 0–90°C. PCT INTERNATIONAL APPLICATION PENDING.

Caleffi S.p.A.
S.R. 229 n. 25 · 28010 Fontaneto d'Agogna (NO) · Italy
Tel. +39 0322 8491 · Fax +39 0322 863723
info@caleffi.com · www.caleffi.com