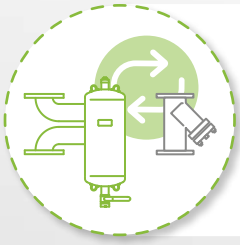
reflex
Thinking solutions.

Reflex Exdirt V

Dirt and sludge separator for vertical pipes

- Vertical, space-saving and straightforward installation – even in existing systems
- Increased operational safety and optimised heating and cooling performance thanks to particle separation
- Optional Exferro magnetic insert available to separate ferromagnetic particles



A dirt trap can be replaced like for like with an Exdirt V thanks to the standard F1 installation length in accordance with DIN EN 558:2017-05.*

The advantages: No filter, no clogging, and the ability to clean without interrupting operation.

* Prior to replacing a dirt trap with an Exdirt V, all installed apparatus must be checked with regard to the new technology to be used.

Find out more at: **www.reflex.de/en**

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Background

There are a number of factors that contribute to a heating system's ability to run smoothly. Debris and sludge, for example, can have a significant detrimental effect on functionality. Over time, they build up inside pipes and ultimately constrict flow cross sections, increase pressure losses within the pipelines, and act as an insulating layer. What's more, suspended particles and loose deposits can impair or even damage the functionality of system components such as brace parts and pumps.
The Exdirt V reliably removes dirt particles and prevents floating impurities from being carried along with the flow and settling in the system. This results in greater operational reliability, a longer service life, less maintenance, and a more efficient transfer of heat and cold throughout the entire system.

Ferromagnetic particles (magnetite)

Heating and cooling water networks consisting primarily of iron and steel materials are exposed to a constant risk of corrosion. One of the causes of corrosion is a low pH value (acidic water). At an appropriate pH value, however, the acid corrosion can be ignored and the content of dissolved oxygen in the water determines the corrosion.
The resulting iron hydroxide Fe $(OH)_2$ ("brown rust") and iron oxide Fe_2O_2 (haematite) is already separated with the Exdirt. The third corrosion level is where magnetite forms. To remove this increased potential risk from the water as quickly as possible, it is advisable to install a sludge separator with magnet within the system. The Exdirt V uses the Exferro magnetic insert to permanently and reliably separate and fix even ferromagnetic particles from the heat transfer medium.

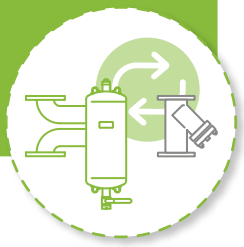
Advantages at a glance

+ Reliably removes freely circulating dirt and sludge particles measuring up to 5 micrometres without energy consumption
+ Allows components such as heat generators, thermostatic valves and pumps to function perfectly and minimises the risk of defects and breakdowns in the long term
+ Offers long-term improvements to heating & cooling performance
+ Ensures maintenance and de-sludging work can be carried out in no time while the system is running so that operation does not have to be interrupted
+ Optional: Exferro high-performance magnetic insert for optimal efficiency when separating ferromagnetic dirt particles such as magnetite

* All installed apparatus must be checked with regard to the new technology to be used according to individual system circumstances prior to replacing a dirt trap with an Exdirt V.

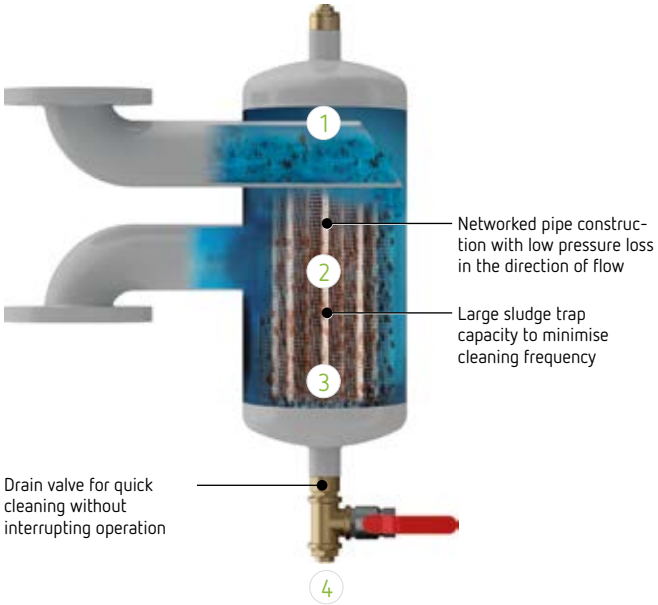
Replacing a dirt trap

Thanks to its standard F1 installation length in accordance with EN 558:2015-05, the Exdirt V can be installed simply and cost-effectively in place of existing dirt traps.*
Dirt traps are relatively high-maintenance compared to dirt separators, as the filters quickly clog up and operation has to stop for cleaning work to take place. The Exdirt V functions without any clogging filter elements. The Flowpac wire mesh reinforces and potentiates the natural separation effect of dirt and mud particles in the separation chamber, which is extended to fit the nominal connection.
The separated particles do not remain within the main volume flow, which offers the advantage of constantly low resistances and pressure losses during operation without compromising on separation quality.



Functionality

1. The flow is fed through an area with a larger cross section than the connection dimensions to reduce the flow speed. The dirt particles sink to the bottom as a result of the extended retention time in the separator and the force of gravity.
2. The Flowpac flow element potentiates the separation effect in the steady-flow chamber. The impulses exerted on the dirt and sludge particles in this way promote their natural settling movement This is how freely circulating particles down to a minimum of 5 µm are released.
3. Some of the recorded sludge particles are supported in their natural settling movement and guided to the lower area of the housing depending on the flow rate, density and volume.
4. The deposits collected here can be discharged from the separator via the de-sludging tap without interrupting operation.



Exdirt V pressure loss diagram

Connection	K_{VS} m³/h	V_{max} m³/h
DN 50	64.5	12.50
DN 65	109.5	20.00
DN 80	142.7	27.00
DN 100	219.8	47.00
DN 125	316.2	72.00
DN 150	439.1	108.00

Pressure loss calculation for all flow rates

$$\Delta p = \left(\frac{\dot{V}}{K_{VS}} \right)^2 \cdot 1\ \text{bar};\ \dot{V} \le \dot{V}_{max}$$

Example: Heating circuit 70/55°C;
Heat generator output 80 kW

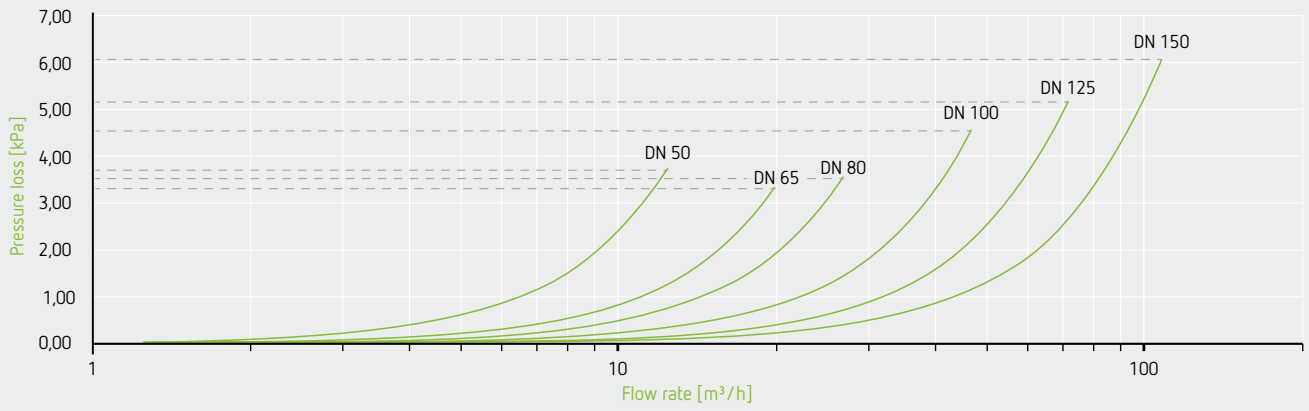
1. Volumetric flow calculation

$$\dot{V} = \frac{80\ \text{kW}}{4.2\ \text{kJ / (kg} \cdot \text{K)} \cdot (70\text{-}55)\ \text{K}} \cdot 3600\ \frac{\text{s}}{\text{h}} \cdot \frac{1\ \text{m}^3}{1000\ \text{kg}}$$

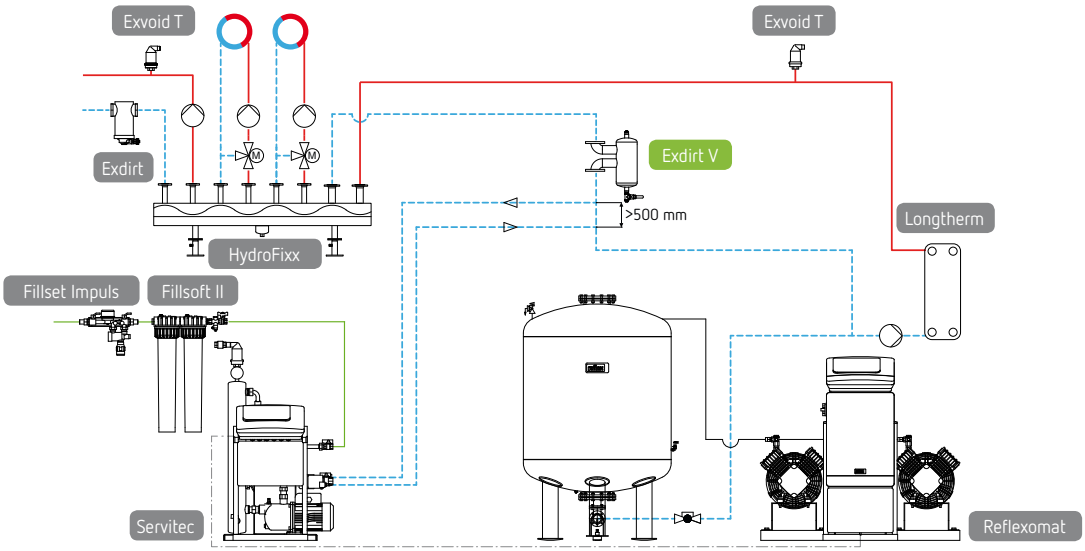
$= 4.6\ \text{m}^3/\text{h} \rightarrow$ Selection based on table: DN 50

$$\Delta p = \left(\frac{4.6\ \text{m}^3/\text{h}}{64.5\ \text{m}^3/\text{h}} \right)^2 \cdot 1\ \text{bar} = 5.08 \cdot 10^{-3}\ \text{bar}$$

$= 0.508$ kPa

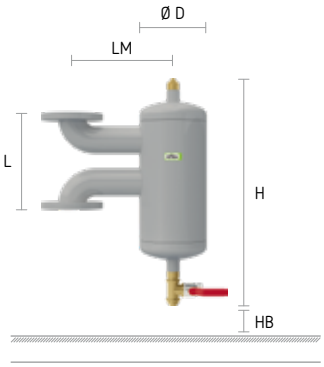


Installation



Installation is carried out in the return flow – preferably in the main volume flow – upstream of the heat generators, heat exchangers and sensitive consumers

Exdirt V Dirt and sludge separator for vertical installation



D 50 – D 100

Technical features

- System connection: Flanged pipe socket from DN 50 to DN 150, PN 16 / PN 6
- Standard installation length F1 in acc. with DIN EN 558:2015-05
- Drain connection, venting connection: G 1"
- Permissible operating pressure: 6/10 bar
- Permissible operating temperature: 110°C
- Max. flow rate: 12.5 – 108 m³/h
- Water/glycol mixture up to a mixing ratio of 50/50 (glycol 12% minimum)
- Removal of particles up to 5 micrometres in size

	Model	Product no.	WG	Connection	V_{max} [m³/h]	Ø D [mm]	L [mm]	LM [mm]	H [mm]	HB [mm]	Weight [kg]
6 bar 110°C	Steel with flange connection, 110°C, 6 bar										
	D 50 V F1	8259501	83	DN 50 / PN 6	12.5	206	230	295.5	489	370	16.0
	D 65 V F1	8259511	83	DN 65 / PN 6	20.0	206	290	305.5	538	370	18.0
	D 80 V F1	8259521	83	DN 80 / PN 6	27.0	206	310	313	588	370	22.0
	D 100 V F1	8259531	83	DN 100 / PN 6	47.0	206	350	323	638	370	24.0
	D 125 V F1	8259541	83	DN 125 / PN 6	72.0	354	400	412	889	430	38.0
	D 150 V F1	8259551	83	DN 150 / PN 6	108.0	354	480	429.5	939	430	44.0
10 bar 110°C	Steel with flange connection, 110 °C, 10 bar										
	D 50 V F1	8259500	83	DN 50 / PN 16	12.5	206	230	295.5	489	370	16.0
	D 65 V F1	8259510	83	DN 65 / PN 16	20.0	206	290	305.5	538	370	18.0
	D 80 V F1	8259520	83	DN 80 / PN 16	27.0	206	310	313	588	370	22.0
	D 100 V F1	8259530	83	DN 100 / PN 16	47.0	206	350	323	638	370	24.0
	D 125 V F1	8259540	83	DN 125 / PN 16	72.0	354	400	412	889	430	38.0
	D 150 V F1	8259550	83	DN 150 / PN 16	108.0	354	480	429.5	939	430	44.0

Special designs for higher flow rates, operating pressures and operating temperatures available on request along with specific installation options.

Exferro Magnetic insert for Exdirt V steel separator

Exferro

Technical features

- Magnetic insert for Exdirt V made of steel for collecting ferromagnetic particles during sludge and dirt separation
- Magnetic rod screwed into thermowell / t-piece

	Model	Product no.	WG	Connection	Installation length H [mm]	Weight [kg]
10 bar 110°C	Reflex Exferro D50-65 (60.3-76.1)	9258340	83	G 1"	300	1.0
	Reflex Exferro D80-100 (88.9-114.3)	9258350	83	G 1"	350	1.4
	Reflex Exferro D125-150 (139.7-168.3)	9258360	83	G 1"	450	1.9

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Subject to technical modifications