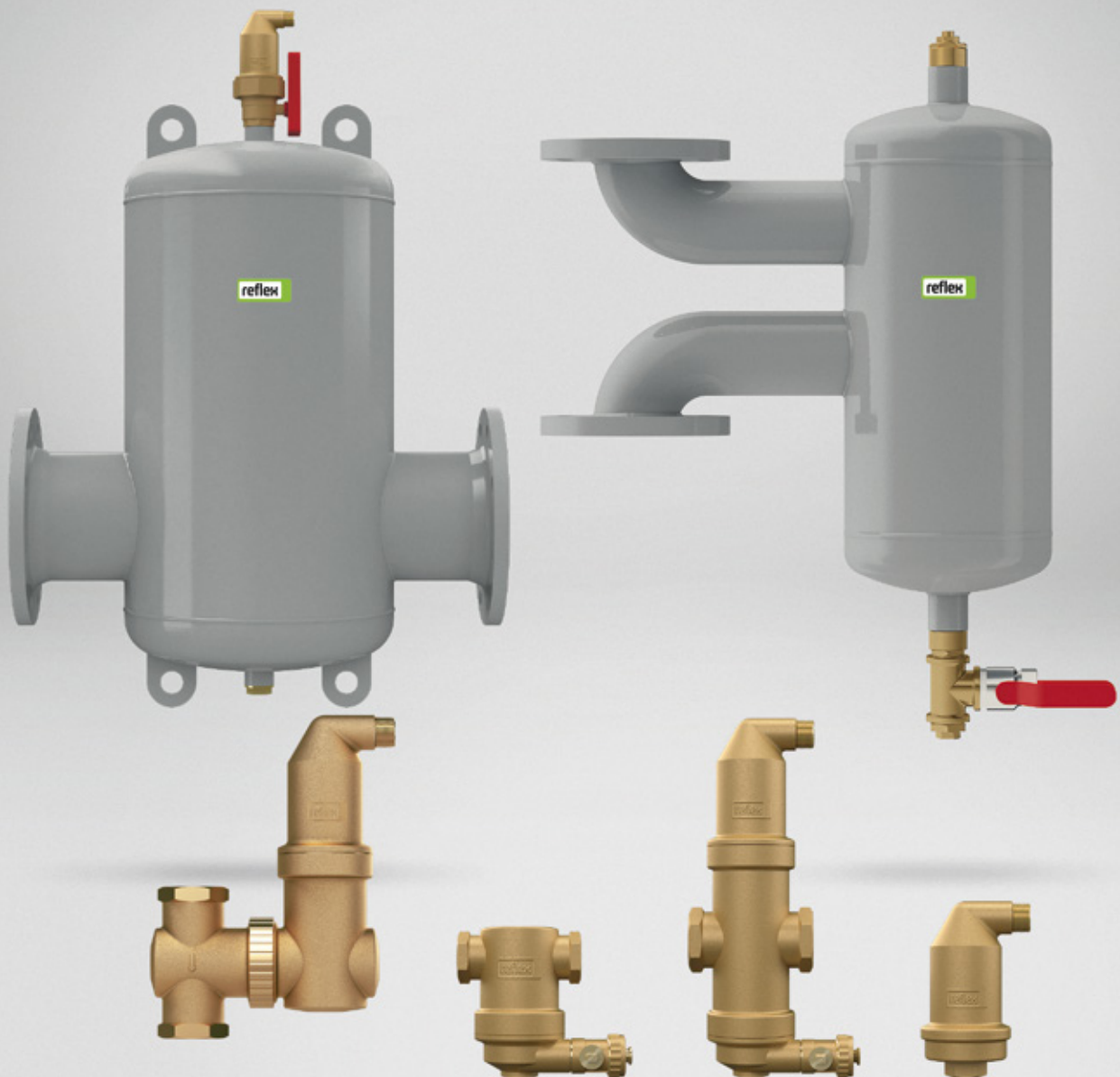




Thinking solutions.

Separation technology



Exvoid, Exdirt, Extwin

Key advantages

Optimum dirt and sludge separation for enhanced operational reliability and efficiency

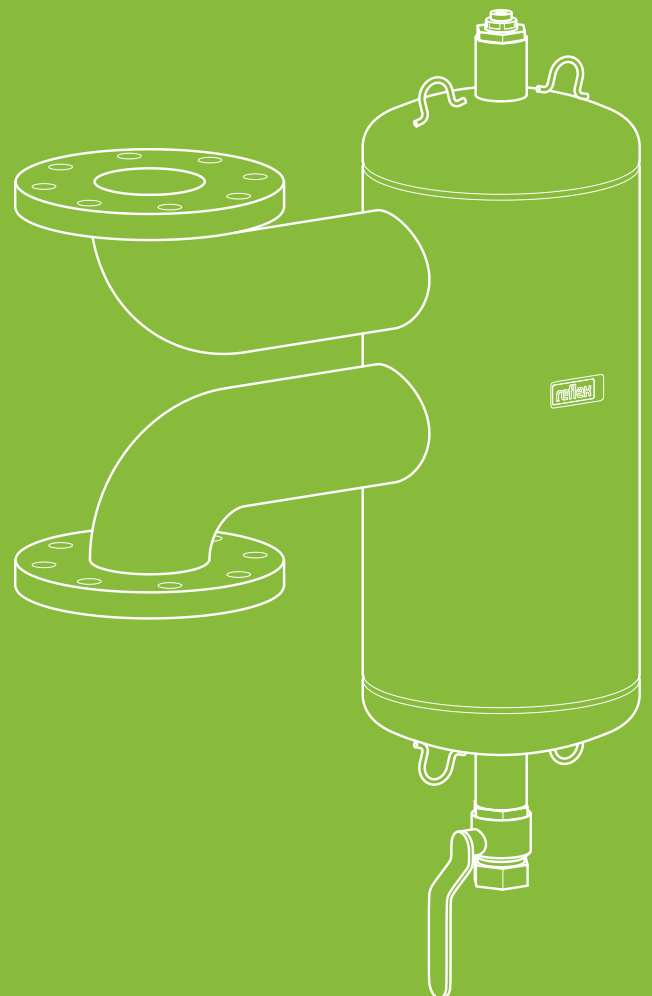
- Reliably removes circulating free dirt and sludge particles measuring up to 5 micrometres without energy consumption
- Ensures that components such as heat generators, thermostatic valves and pumps function perfectly and minimises the risk of defects and breakdowns in the long term
- Particle separation improves heating and cooling performance
- Fully automatic continuous operation, generates only a minimal, constant pressure drop
- Excellent separation of ferromagnetic impurities, such as magnetite, thanks to high-performance Exferro Easy Clip clip-on magnet for brass separators (included in the scope of supply) and Exferro magnetic insert for steel separators (optional)

Less maintenance compared to conventional dirt traps

- Fast online maintenance and desludging without having to interrupt operation
- No shut-off valves or bypasses needed
- No clogging, unlike filters. Instead: permanently free opening for the water to flow through

Broad product portfolio for any and all applications

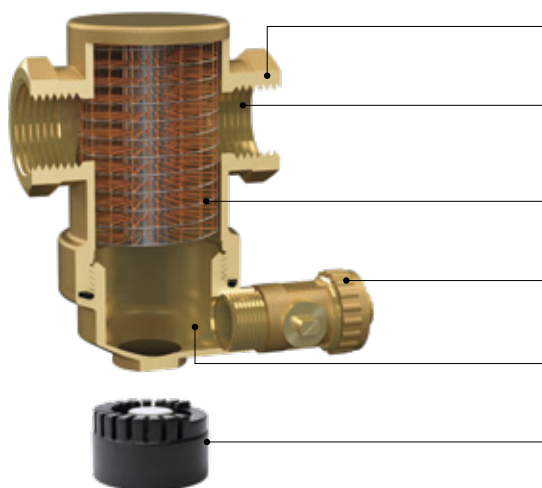
- Full range of operating pressures, temperatures and materials
- Special designs for higher flow rates, operating pressures and operating temperatures available on request



* 5 years guarantee for brass separators from date of manufacture.
Please consider the guarantee conditions and guidelines at www.reflex-winkelmann.com/en

Construction, function and installation

Exdirt construction



Numerous connection options: Threaded, welded and flange connections from FT ¾ to DN 600.

Flow is not hindered by sludge.

The mesh tube design that forms the core of the process has been tried and trusted for decades.

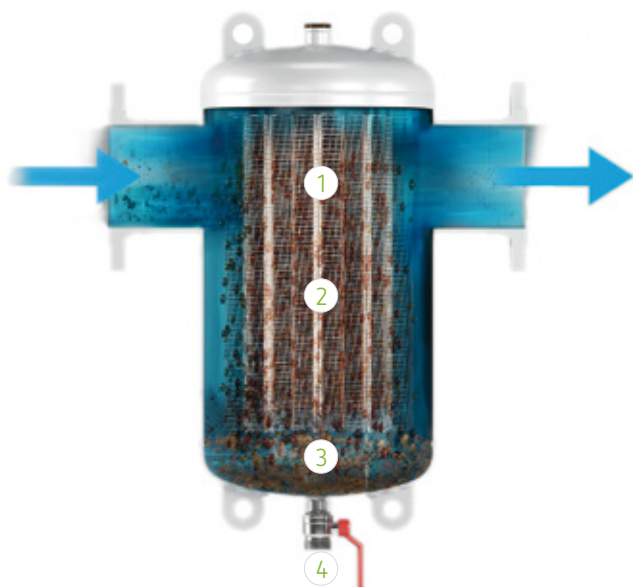
Drain valve for quick cleaning without interrupting operation.

Large sludge trap capacity extends cleaning intervals.

Exferro Easy Clip high-performance magnet for Exdirt (brass). The strength of the magnetic field exerts maximum impact on the fluid in the separator, enabling the optimum separation of ferromagnetic dirt particles, such as magnetite.

Brass type

Exdirt function principle



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 flow element potentiates the separation effect. The impulses exerted on the dirt and sludge particles in this way promote their natural settling movement, resulting in separation of freely circulating particles down to a minimum of 5 µm.
3. Depending on the flow rate, density and volume, the natural settling of some of the sludge particles is supported, and the particles are guided to the lower area of the housing.
4. The deposits collected here can be discharged from the separator via the desludging tap without interrupting operation.

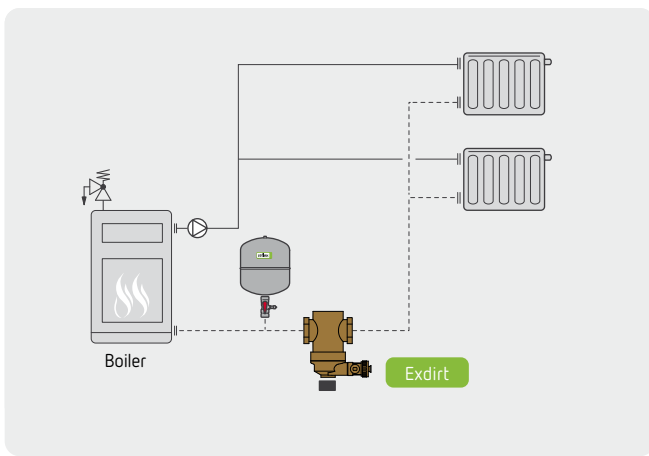
Steel type

Exdirt installation

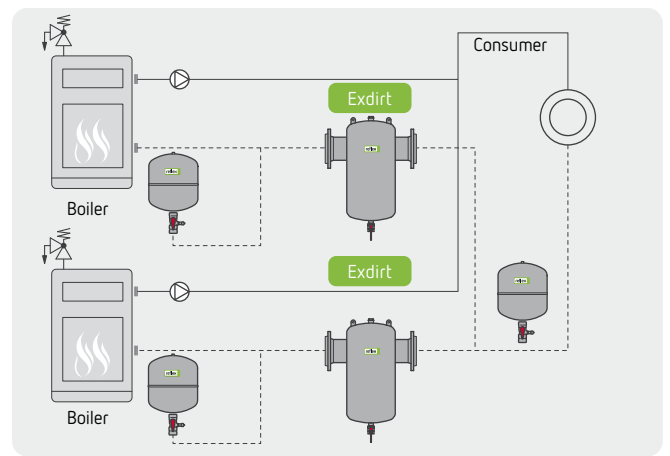
Installation location

In heating and cooling systems in the return flow upstream of the heat generators, heat exchangers, bypasses, sensitive consumers and circulating pumps that require protection.

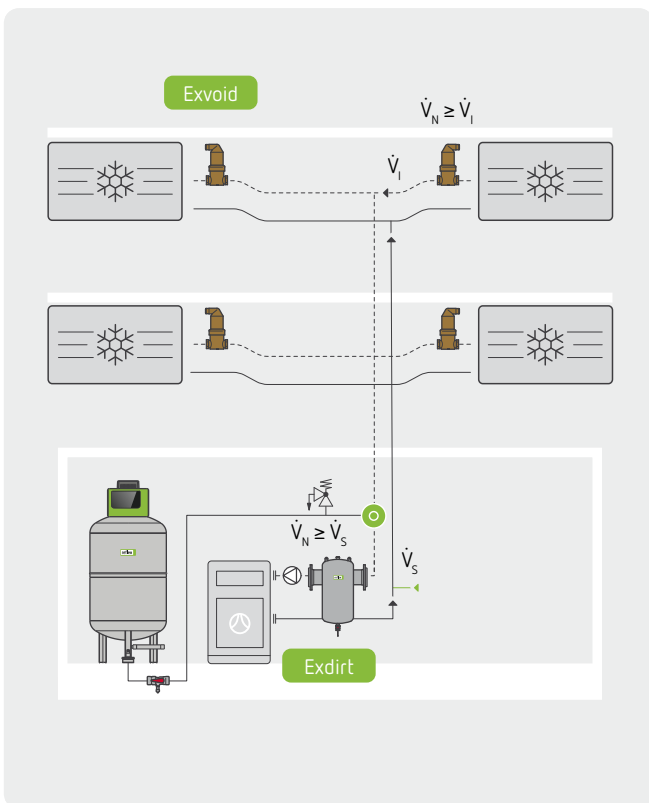
- The maintenance interval depends on the amount of dirt transported in the system. We recommend initial inspection after four weeks and a documented service at least once a year.



Exdirt (brass) in a heating system



Exdirt (steel) in a heating system

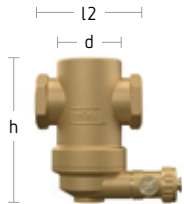


Central sludge separation with Exdirt dirt and sludge separator in a cooling system

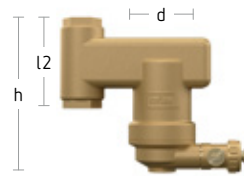
- Decentralised separation of micro-bubbles (Exvoid A) in conjunction with centralised separation of dirt particles by an Exdirt D in the main volume flow \dot{V}_S upstream of the cooler.
- Both separators are located in the return flow for "cooling" applications.
- A decentralised separator layout like this can make sense in an open system exposed to increased risk of corrosion. In this case, brass would be the material of choice (brass separators are available up to DN 50).
- Alternatively, the Exdirt dirt and sludge separator in this configuration could be replaced with an Extwin combined dirt and micro-bubble separator. In all configurations, accessibility of the installed parts must be assured and the greater operating workload considered.

Exdirt product range

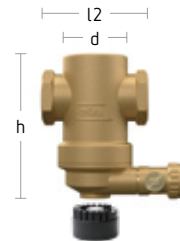
Exdirt Dirt and sludge separator



Exdirt horizontal



Exdirt vertical



Exdirt (brass) dirt and sludge separator, horizontal



Exdirt (brass) dirt and sludge separator, vertical



Technical features

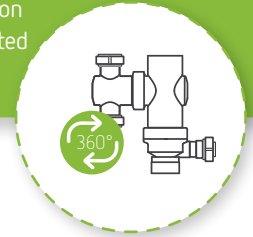
- Connection diameter: A22–2" (DN 20–DN 50)
- Flow rate: 1.25–7.5 m³/h (at v ≈ 1.0 m/s)
- Exiso heat insulation: A22–2" (DN 20–DN 50)
- Brass housing
- Application: up to 110 °C and 10 bar, further pressure ratings and temperatures on request
- Installation position: horizontal, vertical
- Removes circulating free dirt and sludge particles of up to 5 µm

	Type	Art. No.	DG	PQ [pce]	Connection c	V _{max} [m ³ /h]	Ø d [mm]	Height h [mm]	Length l2 [mm]	Weight [kg]
Plug-in magnet, Brass, Horizontal										
10 bar 110 °C	D 22 M	9256600	0082	12	22 mm	1.2	63	122	106	1.00
	D ¾ M	9256610	0082	12	IG ¾"	1.2	63	122	85	1.00
	D 1 M	9256620	0082	12	IG 1"	2.0	63	139	88	1.20
	D 1 ¼ M	9256630	0082	8	IG 1 ¼"	3.7	63	159	88	1.30
	D 1 ½ M	9256640	0082	8	IG 1 ½"	5.0	63	193	88	1.50
	D 2 M	9256650	0082	1	IG 2"	7.5	100	234	132	3.02
Plug-in magnet, Brass, Vertical										
10 bar 110 °C	D 22 VM	9256700	0082	8	22 mm	1.2	63	173	104	1.90
	D ¾ VM	9256710	0082	8	IG ¾"	1.2	63	163	84	1.80
	D 1 VM	9256720	0082	8	IG 1"	2.0	63	163	84	1.80
Brass, Horizontal										
10 bar 110 °C	D 22	9252000	0082	12	22 mm	1.2	63	103	106	0.92
	D ¾	9252010	0082	12	IG ¾"	1.2	63	103	85	1.00
	D 1	9252020	0082	12	IG 1"	2.0	63	120	88	1.20
	D 1 ¼	9252030	0082	8	IG 1 ¼"	3.7	63	140	88	1.12
	D 1 ½	9252040	0082	8	IG 1 ½"	5.0	63	174	88	1.32
	D 2	9252050	0082	1	IG 2"	7.5	100	215	132	3.10
Brass, Vertical										
10 bar 110 °C	D 22V	9252500	0082	8	22 mm	1.2	63	154	104	1.52
	D ¾V	9252510	0082	8	IG ¾"	1.2	63	144	84	1.80
	D 1V	9252520	0082	8	IG 1"	2.0	63	144	84	1.61

Exdirt Twist Dirt and sludge separator



Twist separator connections are infinitely rotatable 360° (non-ratcheting), making them suitable for a wide range of different installation positions. The connection can be rotated by hand.



Exdirt Twist

Technical features

- Infinitely rotatable (non-ratcheting) brass separator for installation in any position
- Connection diameter: A 22–1 ½" (DN 20–DN 40)
- Volumetric flow: 1,25–5,0 m³/h (bei v ≈ 1,0 m/s)
- Exiso heat insulation: A 22–1 ½" (DN 20–DN 40)
- Brass casing
- Area of application: up to 110 °C
- Installation position: 360° infinitely rotatable (non-ratcheting)
- Water/glycol mixture up to a mixing ratio of 50 :50 (at least 25%)

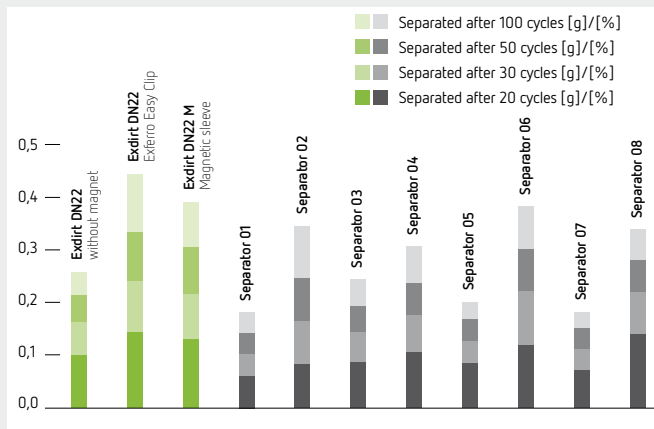
	Type	Art. No.	DG	PQ [pce]	Connection c	V _{max} [m³/h]	Ø d [mm]	Height h [mm]	Length l2 [mm]	Weight [kg]
Twist, Plug-in magnet, Brass, Rotatable										
10 bar 110 °C	DT 22 M	9257300	0092	8	22 mm	1.2	63	176	109	1.98
	DT 28 M	9257310	0092	8	28 mm	2.0	63	177	111	2.10
	DT ¾ M	9257320	0092	8	IG ¾"	1.2	63	164	85	1.83
	DT 1 M	9257330	0092	8	IG 1"	2.0	63	171	100	1.97
	DT 1 ¼ M	9257340	0092	6	IG 1 ¼"	3.8	63	221	100	2.48
	DT 1 ½ M	9257350	0092	6	IG 1 ½"	5.0	63	221	100	2.32

The Exiso heat insulation for the above separators can be found under accessories on page 35.

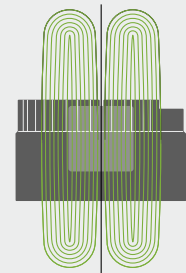


Exferro EasyClip

All Exdirt and Extwin brass separators are fitted with a high-performance Exferro Easy Clip magnet. The axially aligned neodymium magnet can hold 14.4 kg and is simply clipped on from below.

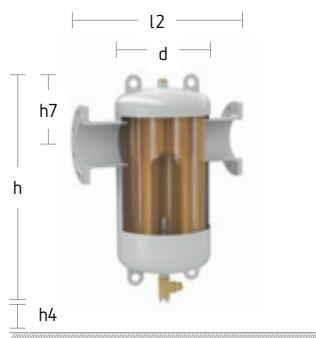


Field line curve of Exferro Easy Clip

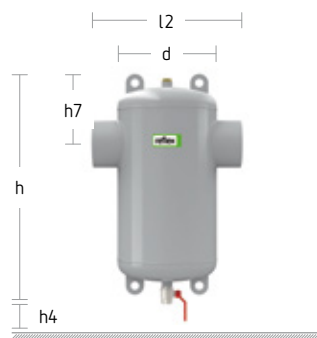


The strength of the magnetic field exerts maximum impact on the fluid in the separator, enabling the optimum separation of ferromagnetic dirt particles.

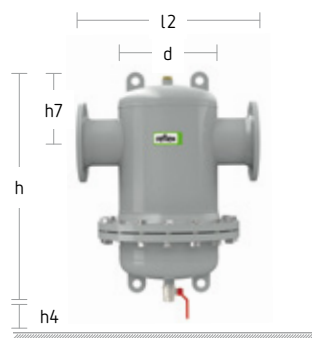
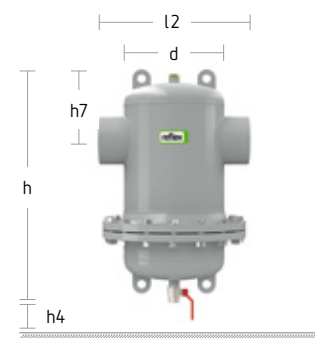
Exdirt Dirt and sludge separator



Exdirt (steel) flange connection



Exdirt (steel) welded connection

Exdirt (steel) flange connection
with service flangeExdirt (steel) welded connection
with service flange

Technical features

- Types with service flange
- Connection: DN 50–DN 600
- Exiso heat insulation: DN 50–DN 150 for model without service flange
- Optional: High-performance Exferro magnetic insert for optimum efficiency when separating ferromagnetic dirt particles such as magnetite (see Accessories, page 30)
- Application: up to 110 °C and 10 bar, further pressure ratings and temperatures on request

	Type	Art. No.	DG	Connection c	V_{max} [m ³ /h]	\emptyset d [mm]	Height h [mm]	Height h7 [mm]	Height h4 [mm]	Length L2 [mm]	Weight [kg]
Painted steel, Flange											
10 bar 110 °C	D 50	8252300	0083	DN50/PN16	12.5	132	521	165	370	350	9.00
	D 65	8252310	0083	DN65/PN16	20.0	132	521	175	370	350	10.00
	D 80	8252320	0083	DN80/PN16	27.0	206	636	170	370	470	16.00
	D 100	8252330	0083	DN100/PN16	47.0	206	636	180	370	475	19.00
	D 125	8252340	0083	DN125/PN16	72.0	354	811	225	430	635	35.00
	D 150	8252350	0083	DN150/PN16	108.0	354	811	240	430	635	39.00
	D 200	8252360	0083	DN200/PN16	180.0	409	1,021	295	430	775	65.00
	D 250	8252370	0083	DN250/PN16	288.0	480	1,324	385	500	890	108.00
D 300	8252380	0083	DN300/PN16	405.0	634	1,535	413	500	1,005	156.00	
Painted steel, Flange, Service flange											
10 bar 110 °C	D 50 R	8252400	0083	DN50/PN16	12.5	132	521	165	370	350	18.00
	D 65 R	8252410	0083	DN65/PN16	20.0	132	521	175	370	350	19.00
	D 80 R	8252420	0083	DN80/PN16	27.0	206	636	170	430	470	43.00
	D 100 R	8252430	0083	DN100/PN16	47.0	206	636	180	430	475	51.00
	D 125 R	8252440	0083	DN125/PN16	72.0	354	811	225	550	635	89.00
	D 150 R	8252450	0083	DN150/PN16	108.0	354	811	240	550	635	94.00
	D 200 R	8252460	0083	DN200/PN16	180.0	409	1,021	295	650	775	121.00
	D 250 R	8252470	0083	DN250/PN16	288.0	480	1,324	358	850	890	255.00
D 300 R	8252480	0083	DN300/PN16	405.0	634	1,535	413	1,000	1,005	390.00	

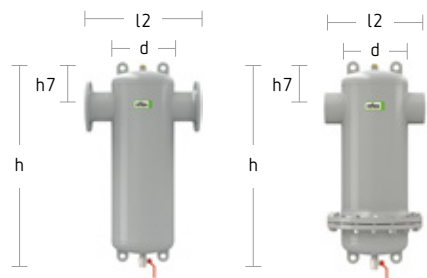
Other designs (higher operating temperatures, higher operating pressures) are available upon request.

Exdirt Dirt and sludge separator

	Type	Art. No.	DG	Connection c	V _{max} [m ³ /h]	Ø d [mm]	Height h [mm]	Height h7 [mm]	Height h4 [mm]	Length l2 [mm]	Weight [kg]
Painted steel, Welded connector											
10 bar 110 °C	D 60.3	8252100	0083	60.3	12.5	132	521	165	370	260	3.00
	D 76.1	8252110	0083	76.1	20.0	132	521	175	370	260	3.00
	D 88.9	8252120	0083	88.9	27.0	206	636	170	370	370	9.00
	D 114.3	8252130	0083	114.3	47.0	206	636	180	370	370	9.00
	D 139.7	8252140	0083	139.7	72.0	354	811	225	430	525	22.00
	D 168.3	8252150	0083	168.3	108.0	354	811	240	430	525	24.00
	D 219.1	8252160	0083	219.1	180.0	409	1,021	295	430	650	44.00
	D 273.0	8252170	0083	273.0	288.0	480	1,324	358	500	750	70.00
	D 323.9	8252180	0083	323.9	405.0	634	1,535	413	500	850	112.00
Painted steel, Welded connector, Service flange											
10 bar 110 °C	D 60.3 R	8252200	0083	60.3	12.5	132	521	165	370	260	16.00
	D 76.1 R	8252210	0083	76.1	20.0	132	521	175	370	260	23.00
	D 88.9 R	8252220	0083	88.9	27.0	206	636	170	430	370	32.00
	D 114.3 R	8252230	0083	114.3	47.0	206	636	180	430	370	37.00
	D 139.7 R	8252240	0083	139.7	72.0	354	811	225	550	525	85.00
	D 168.3 R	8252250	0083	168.3	108.0	354	811	240	550	525	78.00
	D 219.1 R	8252260	0083	219.1	180.0	409	1,021	295	650	650	101.00
	D 273.0 R	8252270	0083	273.0	288.0	480	1,324	358	850	750	158.00
	D 323.9 R	8252280	0083	323.9	405.0	634	1,535	413	1,000	850	330.00

Other designs (higher operating temperatures, higher operating pressures) are available upon request.

Exdirt Hi-Cap Dirt and sludge separator



Exdirt (steel) Hi-Cap
flange connection

Exdirt (steel) Hi-Cap
welded connection

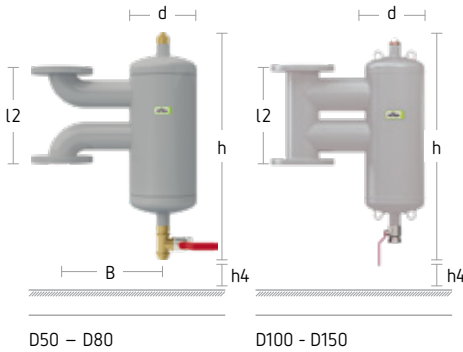
Technical
features

- For high flow rates and high flow speeds up to 3 m/s
- Connection: DN 50 – DN 600
- Flow rate: 25 – 3,060 m³/h
- Steel housing
- Application: up to 110 °C and 10 bar, further pressure ratings and temperatures on request

	Type	Art. No.	Connection c	V _{max} [m ³ /h]	Ø d [mm]	Height h [mm]	Height h7 [mm]	Length L2 [mm]	Weight [kg]
Steel with welded connection, 110 °C, 10 bar									
10 bar 110 °C	D 60.3 HC	8252105	60,3	25	132	706	165	260	5,0
	D 76.1 HC	8252115	76,1	40	132	706	175	260	23,0
	D 88.9 HC	8252125	88,9	54	206	861	170	370	36,0
	D 114.3 HC	8252135	114,3	94	206	861	180	370	37,0
	D 139.7 HC	8252145	139,7	144	354	1.121	225	525	85,0
	D 168.3 HC	8252155	168,3	216	354	1.121	240	525	86,0
	D 219.1 HC	8252165	219,1	376	409	1.391	295	650	129,0
	D 273.0 HC	8252175	273	576	480	1.532	358	750	175,0
	D 323.9 HC	8252185	323,9	810	634	2.148	413	850	340,0
Steel with welded connection, 110 °C, 10 bar, service flange									
10 bar 110 °C	D 60.3 R-HC	8252205	60,3	25	132	706	165	260	23,0
	D 76.1 R-HC	8252215	76,1	40	132	706	175	260	23,0
	D 88.9 R-HC	8252225	88,9	54	206	861	170	370	36,0
	D 114.3 R-HC	8252235	114,3	94	206	861	180	370	37,0
	D 139.7 R-HC	8252245	139,7	144	354	1.121	225	525	85,0
	D 168.3 R-HC	8252255	168,3	216	354	1.121	240	525	86,0
	D 219.1 R-HC	8252265	219,1	376	409	1.391	295	650	129,0
	D 273.0 R-HC	8252275	273	576	480	1.532	358	750	260,0
	D 323.9 R-HC	8252285	323,9	810	634	2.148	413	850	460,0
Steel with flange connection, 110 °C, 10 bar									
10 bar 110 °C	D 50 HC	8252305	DN 50 / PN 16	25	132	706	165	350	28,0
	D 65 HC	8252315	DN 65 / PN 16	40	132	706	175	350	29,0
	D 80 HC	8252325	DN 80 / PN 16	54	206	861	170	470	18,0
	D 100 HC	8252335	DN 100 / PN 16	94	206	861	180	470	46,0
	D 125 HC	8252345	DN 125 / PN 16	144	354	1.121	225	635	98,0
	D 150 HC	8252355	DN 150 / PN 16	216	354	1.121	240	635	100,0
	D 200 HC	8252365	DN 200 / PN 16	376	409	1.391	295	775	75,0
	D 250 HC	8252375	DN 250 / PN 16	576	480	1.532	358	890	119,0
	D 300 HC	8252385	DN 300 / PN 16	810	634	2.148	413	1.005	218,0
	D 350 HC	8252915	DN 350 / PN 16	1.000	650	2.400	509	1.128	270,0
	D 400 HC	8259325	DN 400 / PN 16	1.300	750	2.680	588	1.226	on request
	D 450 HC	8252945	DN 450 / PN 16	1.700	750	2.970	617	1.330	on request
	D 500 HC	8252955	DN 500 / PN 16	2.120	1.000	3.100	679	1.430	on request
	D 600 HC	8252965	DN 600 / PN 16	3.060	1.200	3.250	840	1.630	on request
Steel with flange connection, 110 °C, 10 bar, service flange									
10 bar 110 °C	D 50 R-HC	8252405	DN 50 / PN 16	25	132	706	165	350	28,0
	D 65 R-HC	8252415	DN 65 / PN 16	40	132	706	175	350	29,0
	D 80 R-HC	8252425	DN 80 / PN 16	54	206	861	170	470	44,0
	D 100 R-HC	8252435	DN 100 / PN 16	94	206	861	180	470	46,0
	D 125 R-HC	8252445	DN 125 / PN 16	144	354	1.121	225	635	98,0
	D 150 R-HC	8252455	DN 150 / PN 16	216	354	1.121	240	635	100,0
	D 200 R-HC	8252465	DN 200 / PN 16	376	409	1.391	295	775	140,0
	D 250 R-HC	8252475	DN 250 / PN 16	576	480	1.532	358	890	246,0
	D 300 R-HC	8252485	DN 300 / PN 16	810	634	2.148	413	1.005	510,0
	D 350 R-HC	8252917	DN 350 / PN 16	1.000	650	2.400	509	1.128	on request
	D 400 R-HC	8252927	DN 400 / PN 16	1.300	750	2.680	588	1.226	on request
	D 450 R-HC	8252947	DN 450 / PN 16	1.700	750	2.970	617	1.330	on request
	D 500 R-HC	8252957	DN 500 / PN 16	2.120	1.000	3.100	679	1.430	on request
	D 600 R-HC	8252967	DN 600 / PN 16	3.060	1.200	3.250	840	1.630	on request



Exdirt V Dirt and sludge separator for vertical installation

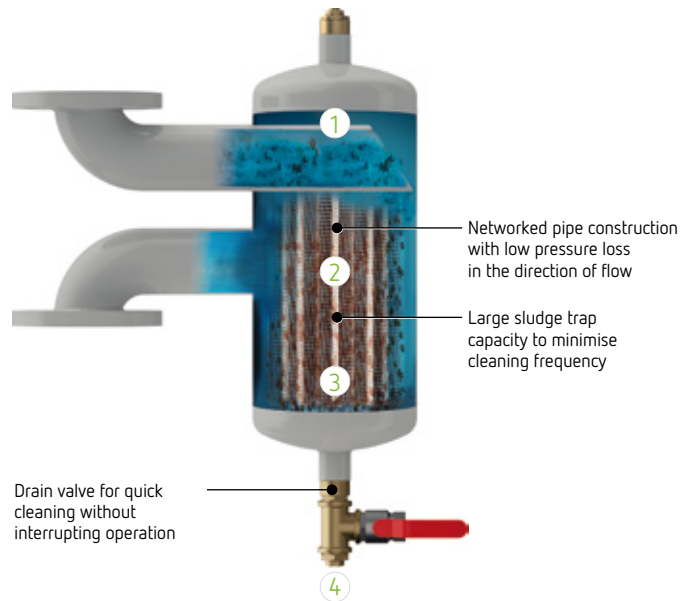


Technical features

- Standard installation length F1 in acc. with DIN EN 558:2017-05
- Desludging and venting connection: 1"
- Water/glycol mixture up to a mixing ratio of 50/50 (25% minimum)
- Removal of particles down to 5 µm in size
- Insulation must be supplied by the installer
- Optional: High-performance Exferro magnetic insert (see Accessories, p. 30)
- Further pressure ratings and temperatures on request

Functionality

- 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.
- 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.
- 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.
- The deposits collected here can be discharged from the separator via the de-sludging tap without interrupting operation.



Replacing a dirt trap

Thanks to its standard F1 installation length in accordance with EN 558:2017-05, the Exdirt V can be installed simply and cost-effectively in place of existing dirt traps. Exdirt V functions without any filter elements. The benefits: instead of clogging, permanently free opening for the facility water to flow through; cleaning is possible without having to interrupt operation.

* 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.



Exdirt V Dirt and sludge separator for vertical installation

	Type	Art. No.	DG	Connection c	V _{max} [m ³ /h]	Ø d [mm]	Height h [mm]	Height h4 [mm]	Length l2 [mm]	Length l3 [mm]	Weight [kg]
Painted steel, Flange											
6 bar 110 °C	D 50V F1	8259501	0083	DN50/PN6	12.5	206	569	370	230	296	13.70
	D 65V F1	8259511	0083	DN65/PN6	20.0	206	617	370	290	306	15.80
	D 80V F1	8259521	0083	DN80/PN6	27.0	206	667	370	310	313	19.70
	D 100V F1	8259531	0083	DN100/PN6	47.0	206	717	370	350	323	24.40
	D 125V F1	8259541	0083	DN125/PN6	72.0	354	968	430	400	412	59.10
	D 150V F1	8259551	0083	DN150/PN6	108.0	354	1,018	430	480	430	67.20
10 bar 110 °C	D 50V F1	8259500	0083	DN50/PN16	12.5	206	569	370	230	296	16.10
	D 65V F1	8259510	0083	DN65/PN16	20.0	206	617	370	290	306	18.30
	D 80V F1	8259520	0083	DN80/PN16	27.0	206	667	370	310	313	21.70
	D 100V F1	8259530	0083	DN100/PN16	47.0	206	717	370	350	323	26.60
	D 125V F1	8259540	0083	DN125/PN16	72.0	354	968	430	400	412	62.20
	D 150V F1	8259550	0083	DN150/PN16	108.0	354	1,018	430	480	430	71.80

Other designs (higher operating temperatures, higher operating pressures) are available upon request.

Exdirt V pressure loss diagram

Connection	K _{V5} [m ³ /h]	V _{max} [m ³ /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

$$\Delta p = \left(\frac{\dot{V}}{K_{V5}} \right)^2 \cdot 1 \text{ bar}; \dot{V} \leq \dot{V}_{\text{max}}$$

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

1. Volumetric flow calculation

$$\dot{V} = \frac{80 \text{ kW}}{4,2 \text{ kJ} / (\text{kg} \cdot \text{K}) \cdot (70 - 55) \text{ K}} \cdot 3.600 \frac{\text{s}}{\text{h}} \cdot \frac{1 \text{ m}^3}{1.000 \text{ kg}}$$

$$= 4,6 \text{ m}^3/\text{h} \rightarrow \text{Selection based on table: DN 50 with } K_{V5} = 64,5 \text{ m}^3/\text{h}$$

$$\Delta p = \left(\frac{4,6 \text{ m}^3/\text{h}}{64,5 \text{ m}^3/\text{h}} \right)^2 \cdot 1 \text{ bar} = 5,08 \cdot 10^{-3} \text{ bar} \mid \cdot 100 \text{ kPa}/\text{bar} \\ = 0,508 \text{ kPa}$$

