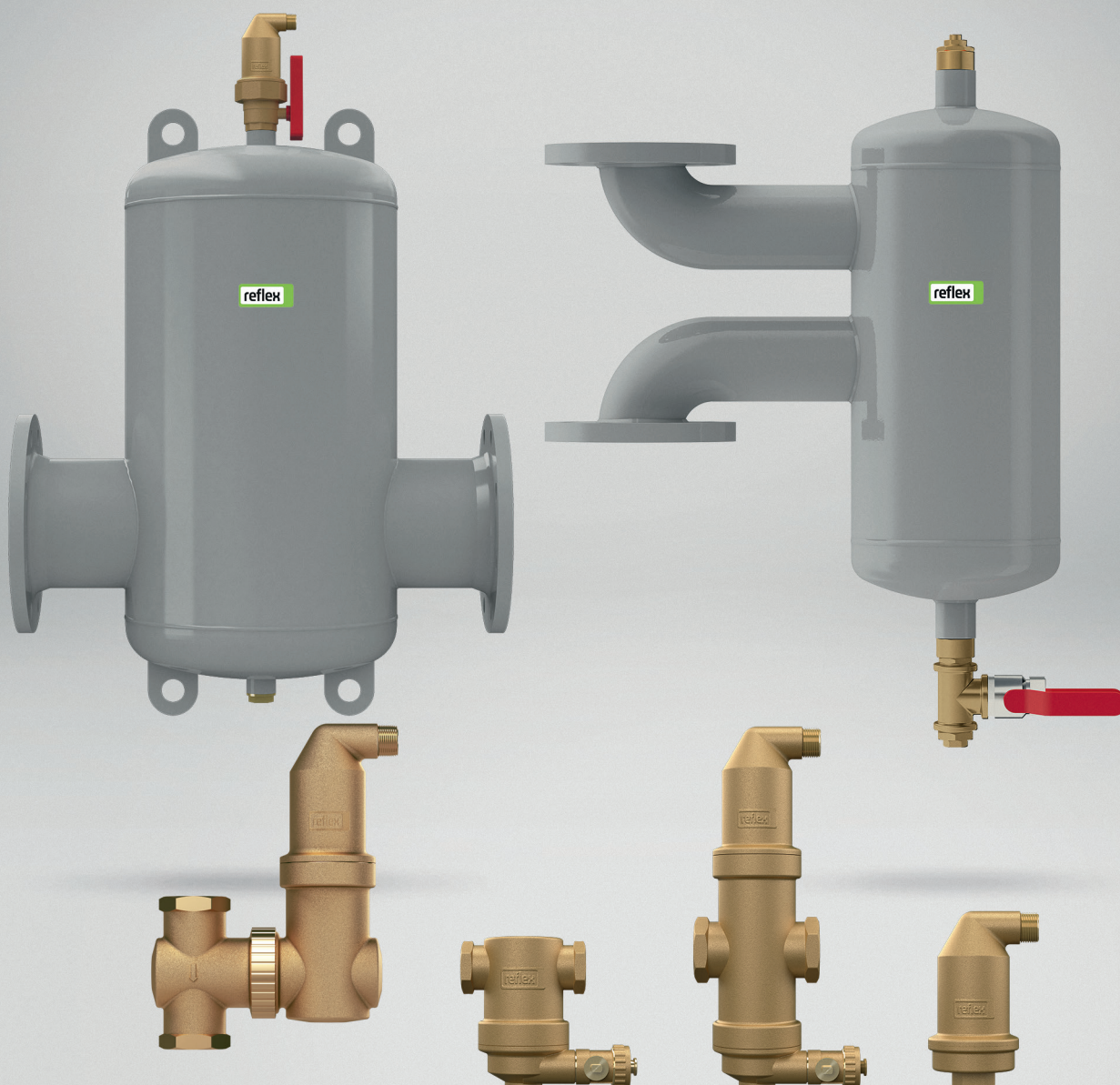


reflex

Thinking solutions.

Separation technology



Exvoid, Exdirt, Extwin

Reflex— a powerful brand for decades

Reflex Winkelmann GmbH—part of the Building+Industry division—is a leading provider of high-quality heating and hot water supply technology systems. Under its Reflex brand, the company, which has its headquarters in Ahlen in the German region of Westphalia, develops, produces and sells not only diaphragm expansion vessels, but also innovative components and holistic solutions for pressure maintenance, water make-up, degassing and water treatment, storage water heaters and plate heat exchangers, as well as hydraulic manifolds and tank components. Reflex Winkelmann GmbH has over 1500 employees worldwide, giving it an international presence in all major markets.

With its energy-efficient and sustainable products, the company is already doing its bit to help the environment, as evidenced by its commitment to sustainability and the climate policy goals agreed by the German Federal Government. This support is built on proven technologies and future-oriented innovations. What's more, Reflex Winkelmann GmbH works together with others as equals, always maintains its focus on the customer and offers additional services such as its own factory service centre fleet and a comprehensive range of training options.



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Reflex City



Exvoid

Extwin Twist

Exdirt V

High-performance air, dirt and sludge separator
Urban areas are incredibly diverse places where people live, shop, work and manufacture. And the demands on supply technology are as individual as the buildings themselves. Whether it's a 5 kW facility in a detached home or a safety-related cooling system in a computer centre—Reflex offers products and solutions for systems of all sizes and complexities. As shown in our Reflex City concept.

The safety and efficiency of the facilities in any type of building can be optimised by removing foreign matter—such as air, micro-bubbles, dirt and sludge from the system water. The Ex separators made by Reflex are an extensive range of high-performance air, dust and sludge separators in the full range of sizes and for any conceivable installation situation. They can be customised to individual requirements, if necessary.

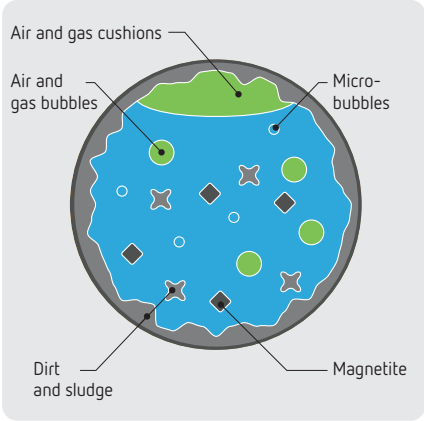
Separation technology

There are a number of factors that contribute to the smooth running of a heating and cooling system. Air, micro-bubbles, dirt and sludge, for example, can have a significant detrimental effect on functional reliability as they reduce energy transmission efficiency and create the risk of corrosion. This inevitably results in further impairment, such as damages to expensive system parts or total

failure of the facility. Reflex venting and separation technologies reliably extract gas bubbles, dirt and sludge particles from the system, thus significantly improving water quality. Resulting in enhanced operational reliability, a longer service life, less maintenance and enhanced energy transmission efficiency. A distinction is made between:

Exvoid T

Venting free gas bubbles and air pockets
Venting is the term used to describe the elimination of air pockets from a system. They can occur, for example, while filling the system during commissioning or after repair work. Analysis has shown that undue care taken during filling can result in doubling the natural oxygen and nitrogen concentration in the water. On the one hand this leads to an increased risk of oxygen corrosion and on the other hand trapped residual air can hinder or entirely block circulation. Since air bubbles collect in high areas, quick air vents are installed in the high parts of a system.



Cross section of a gas-enriched heating pipe

Exvoid

Separating air and micro-bubbles.
Micro-bubbles occur in heating, cooling and solar system wherever heat is generated and temperatures rise and where high flow speeds and pressure reduction coincide (any and all constrictions in a pipeline). If the micro-bubbles are left in the facility system, they collect in areas of low flow speeds and form larger gas and air cushions. Their avoidance is crucial to prevent malfunctions. Micro-bubble separators are predominantly integrated in facilities with low static heights. The basic principle applies that the higher the installation location and the warmer the medium, the better the functional performance.

Exdirt

Separating dirt and sludge. Dirt and sludge occur as a result of corrosion processes, or old, poorly cleaned pipelines. They are transported by the filling or make-up water into the system, or form as limestone during heating. The dirt particles build up inside pipes. They constrict flow cross sections, act as an insulating layer and exacerbate pressure loss, which then has to be compensated by increased pump performance. In addition, suspended particles and loose deposits may damage parts of the system, such as fittings and pumps. Dirt separators are integrated in the return flow of heat generators to prevent impurities from being carried along with the flow and settling in the system.

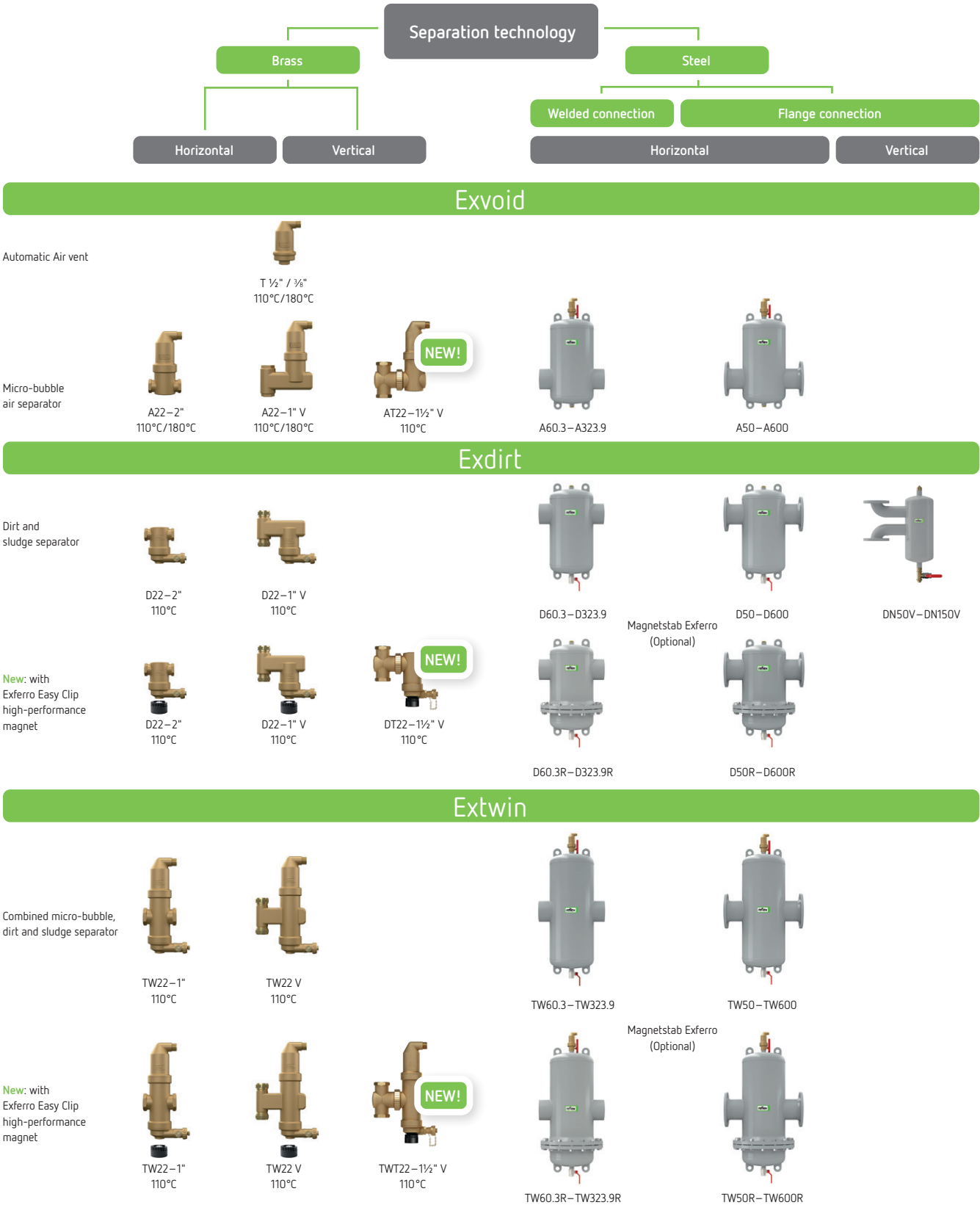
Exferro

Separating magnetic dirt particles (magnetite). Heating networks or piping systems made primarily of iron and steel materials are exposed to a constant risk of corrosion. It can be caused by a low pH value (acid water) or the content of dissolved oxygen. The resulting iron hydroxide $Fe(OH)_2$ ("brown rust") and iron oxide Fe_2O_3 (haematite) is already extracted by the Exdirt. Magnetite forms at the third corrosion level. It can be separated particularly effectively using a special high-performance magnet for Exdirt and Extwin—the Exferro Easy Clip, a clip-on magnet for brass separators, and the Exferro magnetic insert for steel separators.

Extwin

Combined micro-bubble, dirt and sludge separation. Extwin is ideal for eliminating air bubbles, micro-bubbles, dirt and sludge from the system water at the same time. Extwin combines the functions offered by Exdirt and Exvoid in a single, compact unit. Like the micro-bubble separator, Extwin is used in facilities with low static heights.

Separation technology made by Reflex



All horizontal steel separators are also available as Hi Cap version.

Selection and dimensioning

Find the right type quickly and easily

Whether you are looking for Exvoid, Exdirt or Extwin—the selection and dimensioning of the separators depends on the fluid's flow speed. The maximum possible volume flow for each size can be seen from the diagram and the table.

Pressure loss diagram: Exvoid/Exdirt/Extwin,

Standard types

Connection	K _{VS} [m³/h]	V _{max} [m³/h]	Connection	K _{VS} [m³/h]	V _{max} [m³/h]
Twist 22mm and ¾"	10,5	1,25	DN 100	244,3	47,00
Twist 28mm and 1"	12,2	2	DN 125	351,3	72,00
Twist 1 1/4"	18,8	3,7	DN 150	487,9	108,0
Twist 1 1/2"	22,6	5	DN 200	780,6	180,0
IG 22mm and ¾"	10,7	1,25	DN 250	1 096,4	288,0
IG 1"	17,2	2,00	DN 300	1 459,5	405,0
IG 1¼"	31,8	3,70	DN 350	1 790,3	500,0
IG 1½"	40,0	5,00	DN 400	2 242,7	650,0
IG 2"	56,1	7,50	DN 450	2 687,9	850,0
DN 50	72,2	12,50	DN 500	3 196,0	1 060,0
DN 65	121,7	20,00	DN 600	4 416,7	1 530,0
DN 80	158,5	27,00			

Pressure loss calculation for all flow rates

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

Example: Heating circuit 70/55°C; Heat generator output 40 kW

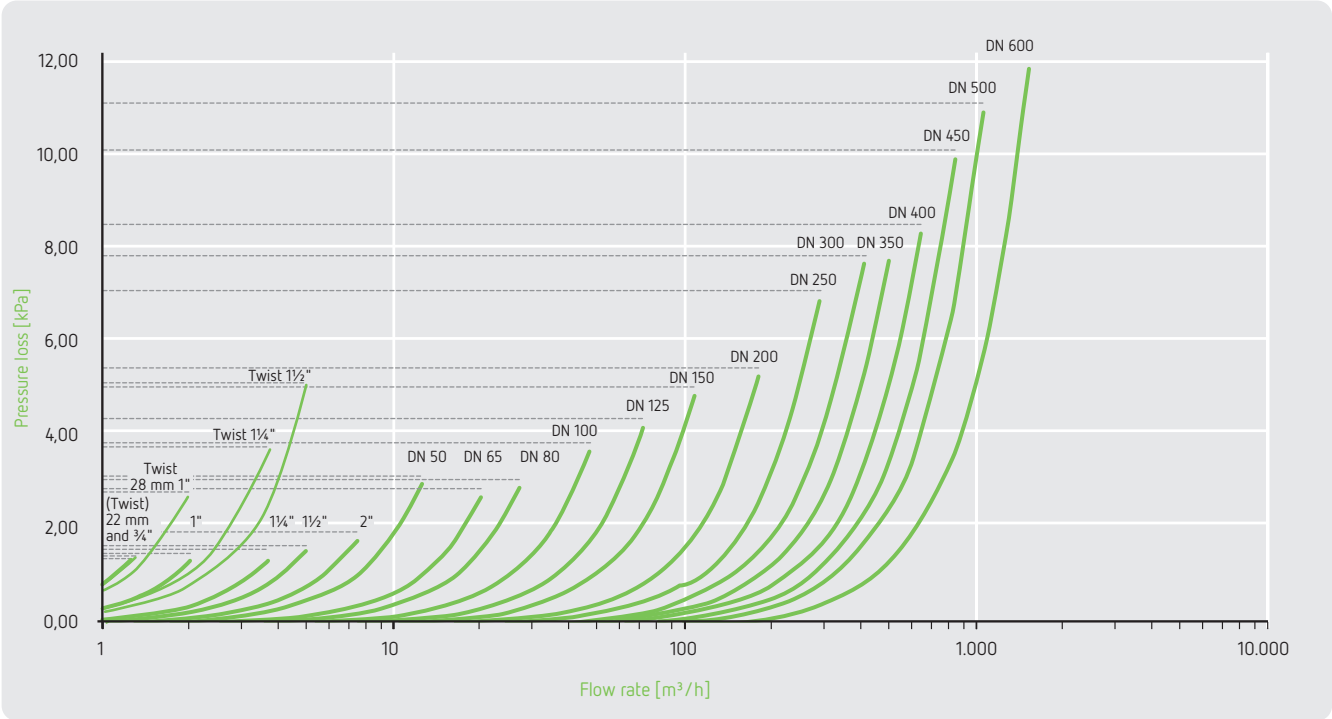
1. Volumetric flow calculation

$$\dot{V} = \frac{40 \text{ kW}}{4.2 \text{ kJ} / (\text{kg} \cdot \text{K}) \cdot (70-55) \text{ K}} \cdot 3600 \frac{\text{s}}{\text{h}} \cdot \frac{1 \text{ m}^3}{1,000 \text{ kg}}$$

= 2.3 m³/h → Selection based on table: FT 1¼"
with K_{VS} = 31.8 m³/h

$$\Delta p = \left(\frac{2.3 \text{ m}^3/\text{h}}{31.8 \text{ m}^3/\text{h}} \right)^2 \cdot 1 \text{ bar} = 5.23 \cdot 10^{-3} \text{ bar} \quad | \quad \cdot 100 \text{ kPa/bar}$$

≅ 0.53 kPa



Pressure loss diagram: Exvoid/Exdirt/Extwin,

Hi-Cap types

- All Reflex steel separators are also available as Hi-Cap versions
- The Hi-Cap types offer high flow rates (Flow speeds between 1.5 m/s and 3.0 m/s)
- The larger body takes account of the change in flow behaviour at higher flow rates

Connection	K _{VS} [m³/h]	V _{max} [m³/h]	Connection	K _{VS} [m³/h]	V _{max} [m³/h]
DN 50	72.2	25.0	DN 250	1,096.4	576.0
DN 65	121.7	40.0	DN 300	1,459.5	810.0
DN 80	158.5	54.0	DN 350	1,790.3	1,000.0
DN 100	244.3	94.0	DN 400	2,242.7	1,300.0
DN 125	351.3	144.0	DN 450	2,687.9	1,700.0
DN 150	487.9	216.0	DN 500	3,196.0	2,120.0
DN 200	780.6	376.0	DN 600	4,416.7	3,060.0

Pressure loss calculation for all flow rates

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

Example: Cooling circuit 7/12°C; Cooling output 200 kW

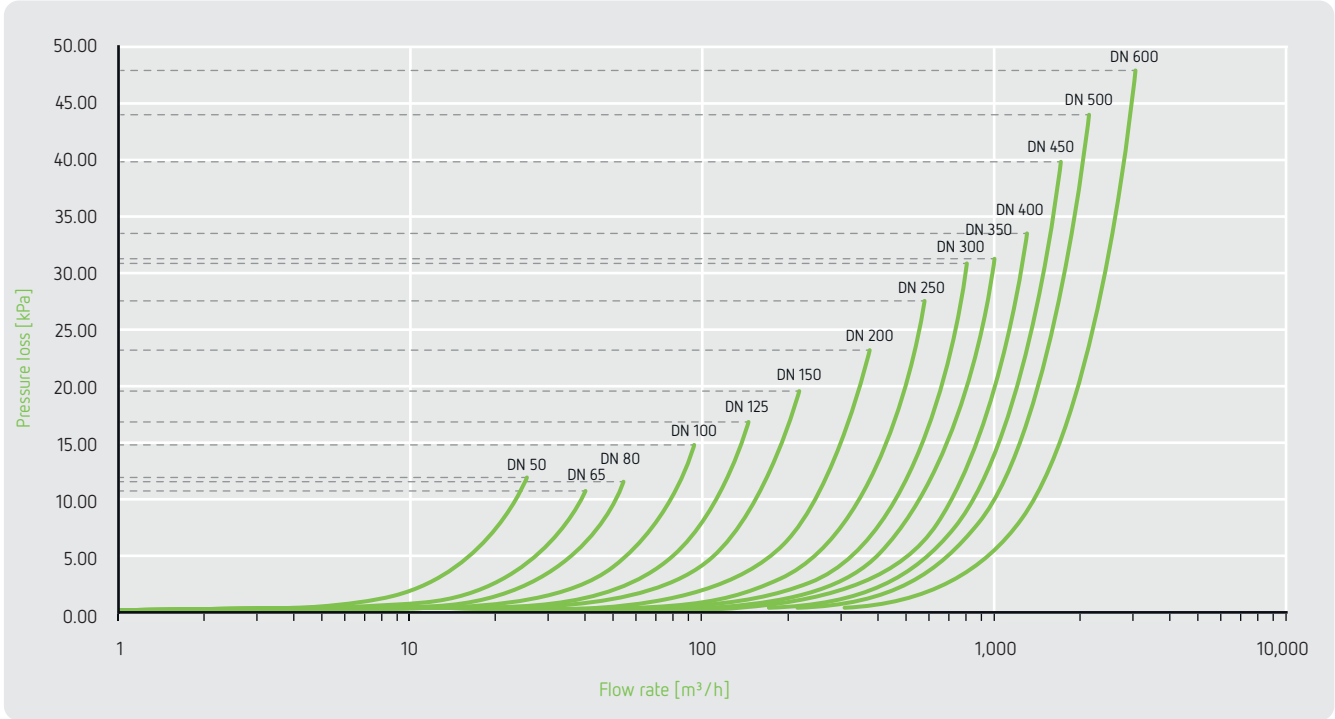
1. Volumetric flow calculation

$$\dot{V} = \frac{200 \text{ kW}}{4.2 \text{ kJ} / (\text{kg} \cdot \text{K}) \cdot (12-7) \text{ K}} \cdot 3600 \frac{\text{s}}{\text{h}} \cdot \frac{1 \text{ m}^3}{1,000 \text{ kg}}$$

= 34.3 m³/h → Selection based on table: DN 65
with K_{VS} = 121.7 m³/h

$$\Delta p = \left(\frac{34.3 \text{ m}^3/\text{h}}{121.7 \text{ m}^3/\text{h}} \right)^2 \cdot 1 \text{ bar} = 7.94 \cdot 10^{-2} \text{ bar} \quad | \quad \cdot 100 \text{ kPa/bar}$$

= 7.94 kPa



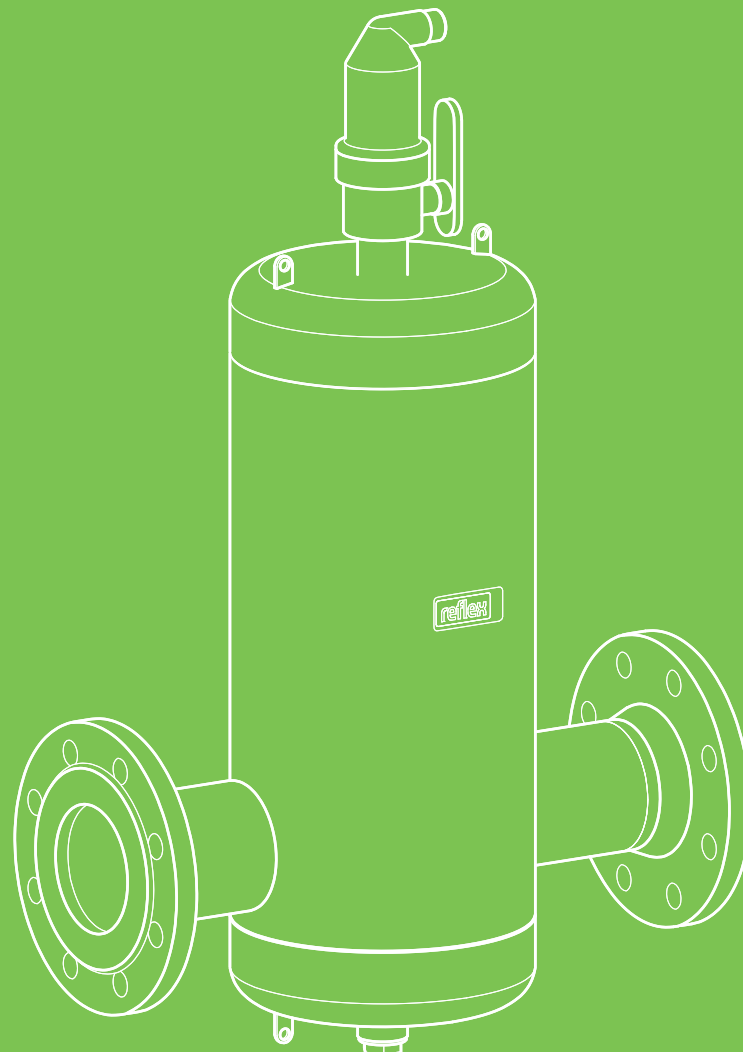
Key advantages

Exvoid T large and quick air vent

- Reliably assures the automatic elimination of air and other gas pockets in heating, solar and cooling systems
- Prevents flow noises, disruptions to circulation, performance impairment and avoidable corrosion damage
- Reduces the need for maintenance
- Suitable for various temperatures and applications

Exvoid air and micro-bubble separator

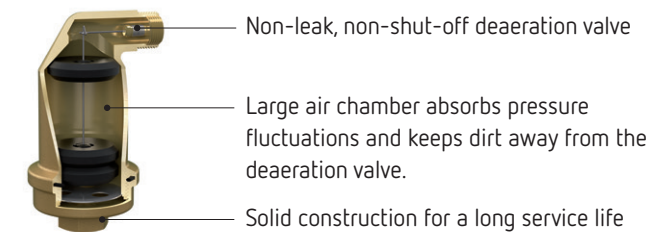
- Extracts circulating free air and gas bubbles from heating, solar and cooling systems and when filling and draining new and existing facilities
- Fully automatic continuous operation
- Generates only a minimal, constant pressure drop
- Enables much faster hydraulic balancing after filling processes
- Protects against noise, corrosion wear and impaired performance caused by the formation of larger air pockets



Construction, function and installation

Exvoid T quick air vent

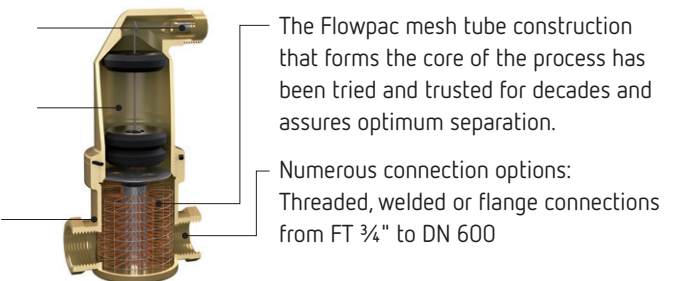
Construction



Exvoid T (brass type)

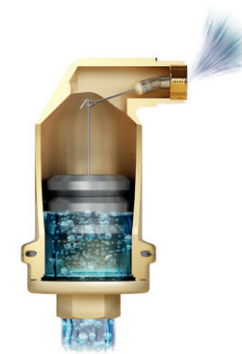
Exvoid micro-bubble separator

Construction



Exvoid (brass type)

Exvoid T function principle



Exvoid T (brass type)

Intelligent design engineering guarantees permanently reliable automatic operation:

- Gas is collected in a large chamber
- As a result, the water level in the chamber drops, taking a float down with it.
- Once the float has sunk to a certain level, it opens the deaeration valve.

The combination of the valve, which is subjected to fourfold testing, and the large air chamber assure reliable operation, even if pressure fluctuates enormously or the medium is very dirty.

Exvoid function principle



Exvoid (steel type)

As micro-bubbles are carried in the flow, special measures are needed to remove them efficiently.

- The cross section of the housing is larger than the connection dimensions, which reduces flow speed in the separator.
- At the same time, the flow is passed through a special wire mesh. The resulting turbulence excites gas bubbles to move in an indeterminate direction.
- Depending on the flow rate, density and volume of the particles, the natural settling of some of the gas bubbles is supported. Micro-bubbles that are moving freely and have settled on the Flowpac mesh tube join, rise and are discharged from the system through the upper vent.

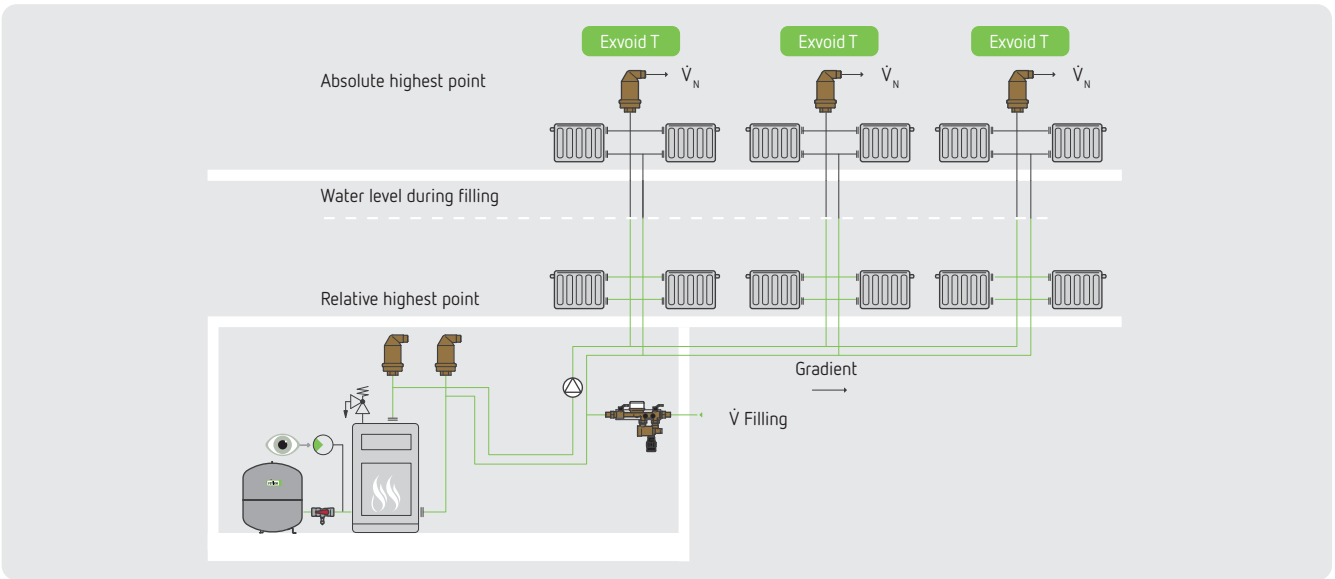
Exvoid T quick air vent

Installation

Installation location

Automatic vents, suitable for any facility, for initial venting or venting after repairs. They are installed at all relative and absolute highest points or in collection areas designed specifically for the purpose.

- Facilities must be carefully vented at the highest points during filling, e.g. using Exvoid T quick air vents. Exvoid T vents help to partially automate the venting process. They are used to vent boilers and ensure that the water is kept free from air and that heat transfer is optimised. At the end of venting, the water level rises sufficiently to automatically close them.
- Exvoid T must always be installed in accessible areas, do not cover them with insulation! Make sure the piping gradient is appropriate.
- The facility must be filled at a flow rate $\dot{V}$ to prevent any noticeable increase in pressure in the system when air is discharged through the vents. The flow rate must be smaller than the rated volumetric flow: $\dot{V} \leq \sum \dot{V}_N$.

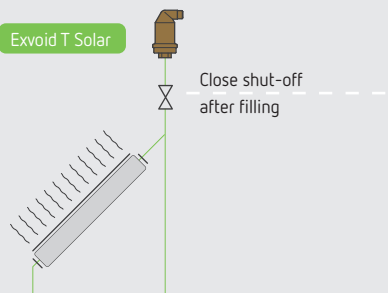


Displacement venting using Exvoid T in a heating system

Special vents with higher permissible temperatures must be used in solar systems. These vents must be shut off during operation to prevent the risk of steam which forms in the collector escaping out through the vent.



The installation of a Reflex Servitec vacuum spray-tube degassing is recommended to ensure an absolutely air- and gas-free system as well as the removal of dissolved gases.



Displacement venting using Exvoid T Solar in a solar system

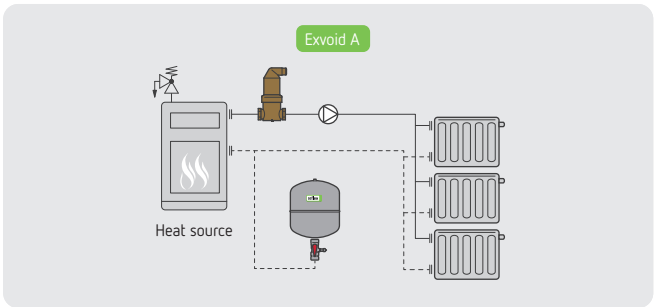
Exvoid air and micro-bubble separator

Installation

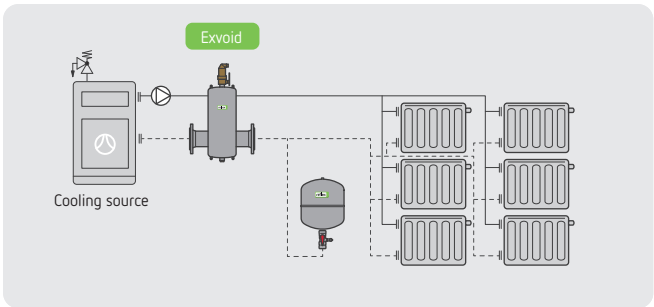
Installation location

In a heating system: right after the boiler upstream of the pump; in a cooling system: upstream of the cold generator in the return flow.

- Gas is released at higher pressures and temperatures. Micro-bubble separators therefore need to be installed at the hottest point; right after the boiler or mixing valve in a heating system and upstream of the cold generator in the return flow in a cooling system. Exvoid must be installed upstream of any bypass.
- It is installed right next to the heat generator or cooling source, in areas such as roof central heating systems or technical centres located in high places, air collecting points and all areas where pressure- or temperature-related degassing processes take place.
- Relative to the gas concentration in the water, installation is ideal at high points where dissolved gases may be released. This is, however, often difficult to implement in practice as rising pressure can cause free gases to dissolve again right beneath the highest point. So the functional reliability of micro-bubble separators can be impaired just 5 metres below the highest point. The basic principle applies that the higher the installation location and the warmer the medium, the better the functional performance.



Exvoid (brass) in a heating system

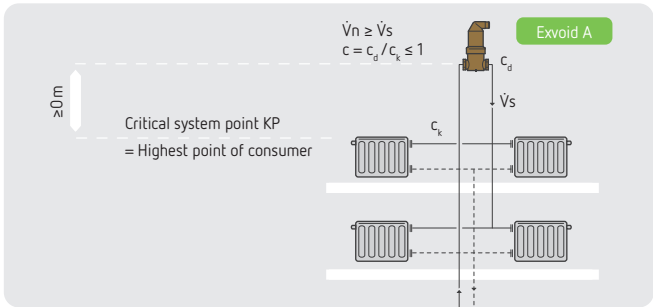


Exvoid (steel) in a cooling system

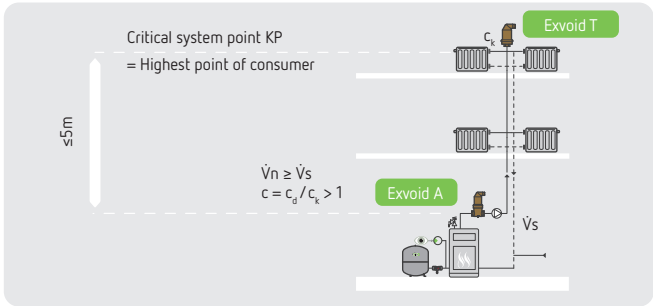
Observe the critical system point during installation
Critical system point (KP) describes the point during operation at which the greatest risk of bubble formation exists, which must, however, be prevented to avoid malfunctions. The pressure at the critical system point has been specified as 0.5 bar, which is equivalent to the minimum requirements for highest points at temperatures < 100 °C. The pressure must be provided via supply pressure p_a by the pressure maintenance system.

Exvoid A micro-bubble separator at the highest point (or higher)
Installing at the level of the critical system point or above it (as shown in the illustration) offers two advantages:
The micro-bubble separator can act as a vent as well when filling the facility, and adherence to the recommended nitrogen limits relevant to stationary gas content in facility water is assured.

Exvoid A micro-bubble separator beneath the highest point
In smaller, compact facilities with short flow paths, installation of the micro-bubble separator up to 5 metres below the critical system point can be tolerated. The installation of Exvoid T at the critical system point is then recommended. The recommended nitrogen limits c_k at installation location where gas content is c_d is then no longer possible.



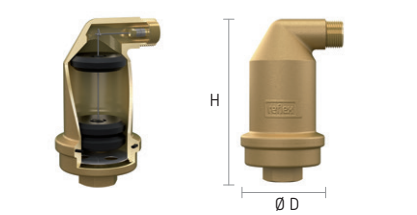
Exvoid A micro-bubble separator at the highest point (or higher)



Exvoid A micro-bubble separator beneath the highest point

Exvoid product range

Exvoid T large and quick air vent



Exvoid T

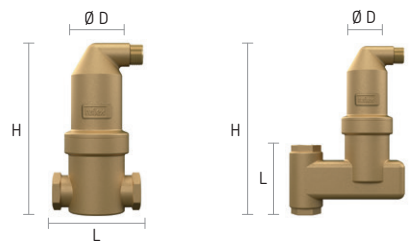


Technical features

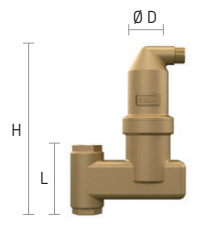
- Fourfold tested venting valve for superb operational reliability
- For vertical installation
- System connection FT ½" and MT ¾" incl. one ½" connecting thread on the venting valve

	Type	Art. no.	Packaging unit	Ø D [mm]	H [mm]	Connection	Weight [kg]
10 bar 110 °C	Brass, 110°C 10 bar						
	Exvoid T ¾"	9250038	12	63	132	MT ¾"	0.7
	Exvoid T ½"	9250000	12	63	122	FT ½"	0.7
10 bar 180 °C	Solar, brass, 180°C 10 bar						
	Exvoid T ¾ S	9250638	12	63	132	MT ¾"	0.7
	Exvoid T ½ S	9250600	12	63	122	FT ½"	0.7

Exvoid air and micro-bubble separator



Exvoid horizontal



Exvoid vertical



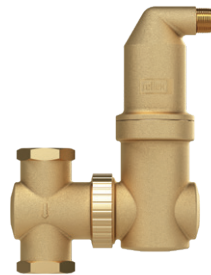
Technical features

- Connection diameter: A22–2" (DN 20–DN 50)
- Flow rate: 1.25–8.0 m³/h (at v ≈ 1.0 m/s)
- Exiso heat insulation A22–2" (DN 20–DN 50)
- Application: up to 110°C or 180°C and 10 bar
- Installation position (solar up to 180°C): horizontal, vertical

	Type	Art. no.	Packaging unit	Connection	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	Weight [kg]
10 bar 110 °C	Brass, horizontal, 110°C 10 bar								
	A 22	9251000	12	22 mm	1.25	63	106	165	1.2
	A ¾	9251010	12	FT ¾"	1.25	63	85	165	1.1
	A 1	9251020	8	FT 1"	2.00	63	88	180	1.3
	A 1 ¼	9251030	8	FT 1¼"	3.75	63	88	202	1.4
	A 1 ½	9251040	8	FT 1½"	5.00	63	88	236	1.6
	A 2	9251050	1	FT 2"	8.00	100	132	277	3.9
10 bar 110 °C	Brass, vertical, 110°C 10 bar								
	A 22 V	9251500	8	22 mm	1.25	63	104	216	2.0
	A ¾ V	9251510	8	FT ¾"	1.25	63	84	206	1.9
10 bar 180 °C	Solar, brass, horizontal, 180°C 10 bar								
	A 22 S	9251600	12	22 mm	1.25	63	106	165	1.2
	A ¾ S	9251610	12	FT ¾"	1.25	63	85	165	1.1
	A 1 S	9251620	8	FT 1"	2.00	63	88	182	1.3
	A 1¼ S	9251630	8	FT 1¼"	3.70	63	88	202	1.4
	A 1½ s	9251640	8	FT 1½"	5.00	63	88	236	1.6
10 bar 180 °C	Solar, brass, vertical, 180°C 10 bar								
	A 22 SV	9251700	8	22 mm	1.25	63	104	216	2.0
	A ¾ SV	9251710	8	FT ¾"	1.25	63	84	206	1.9
	A 1 SV	9251720	8	FT 1"	2.00	63	84	206	1.9

Exvoid Twist (brass) air and micro-bubble separator

NEW!



Exvoid Twist



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.



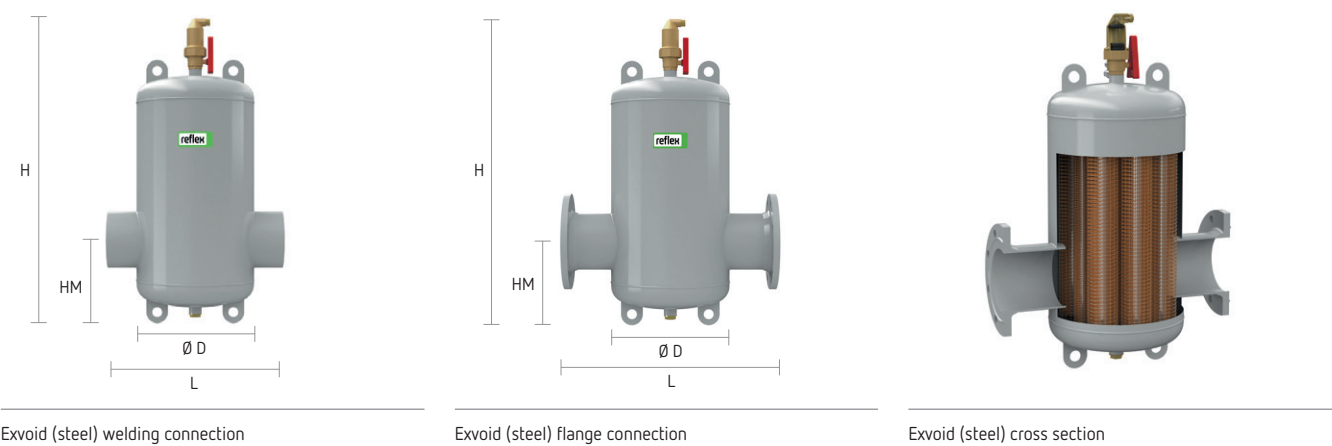
Technical features

- 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 (at 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.	Packaging unit	Connection c	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	Weight [kg]
10 bar 110 °C	Twist, brass, rotatable, 110 °C, 10 bar								
	AT 22	9257200	6	22 mm	1.2	63	109	218	2.01
	AT 28	9257210	6	28 mm	2.0	63	111	208	2.18
	AT ¾	9257220	6	FT ¾"	1.2	63	85	207	1.90
	AT 1	9257230	6	FT 1"	2.0	63	100	214	2.03
	AT 1 ¼	9257240	4	FT 1¼"	3.8	71	100	264	2.64
	AT 1 ½	9257250	4	FT 1½"	5.0	71	100	264	2.48

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

Exvoid (steel) air and micro-bubble separator



Exvoid (steel) welding connection

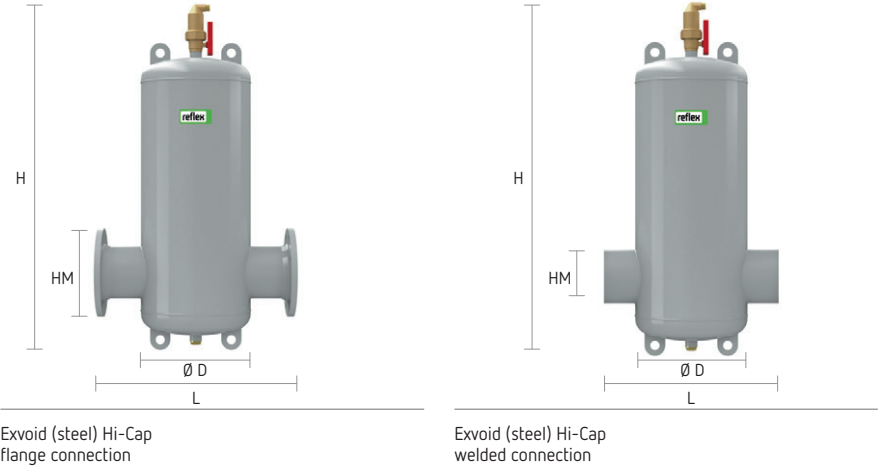
Exvoid (steel) flange connection

Exvoid (steel) cross section

Technical features	▪ Connection: DN 50–DN 600	▪ Steel housing
	▪ Flow rate: 12.5–405 m³/h	▪ Automatic venting with integrated shut-off valve
	▪ Exiso heat insulation: DN 50–DN 150, other types and nominal diameters on request	▪ Application: up to 110°C and 10 bar, further pressure ratings and temperatures on request

	Type	Art. no.	Connection	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	HM [mm]	Weight [kg]
10 bar 110°C	Steel with welded connection, 110°C, 10 bar								
	A 60.3	8251100	60.3	12.5	132	260	625	153	3.0
	A 76.1	8251110	76.1	20	132	260	625	163	6.5
	A 88.9	8251120	88.9	27	206	370	740	159	9.0
	A 114.3	8251130	114.3	47	206	370	740	169	9.0
	A 139.7	8251140	139.7	72	354	525	915	214	22.0
	A 168.3	8251150	168.3	108	354	525	915	229	24.0
	A 219.1	8251160	219.1	180	409	650	1,125	284	44.0
	A 273.0	8251170	273.0	288	480	750	1,402	351	70.0
	A 323.9	8251180	323.9	405	634	850	1,612	406	112.0
10 bar 110°C	Steel with flange connection, 110°C, 10 bar								
	A 50	8251300	DN 50 / PN 16	12.5	132	350	625	153	9.0
	A 65	8251310	DN 65 / PN 16	20	132	350	625	163	10.0
	A 80	8251320	DN 80 / PN 16	27	206	470	740	159	16.0
	A 100	8251330	DN 100 / PN 16	47	206	470	740	169	19.0
	A 125	8251340	DN 125 / PN 16	72	354	635	915	214	35.0
	A 150	8251350	DN 150 / PN 16	108	354	635	915	229	39.0
	A 200	8251360	DN 200 / PN 16	180	409	775	1,125	284	65.0
	A 250	8251370	DN 250 / PN 16	288	480	890	1,402	351	108.0
	A 300	8251380	DN 300 / PN 16	405	634	1,005	1,612	406	156.0
	A 350	8251910	DN 350 / PN 16	500	650	1,128	1,950	501	on request
	A 400	8251920	DN 400 / PN 16	650	750	1,226	2,150	580	on request
	A 450	8251940	DN 450 / PN 16	850	750	1,330	2,360	609	on request
	A 500	8251950	DN 500 / PN 16	1,060	1,000	1,430	2,580	671	on request
	A 600	8251960	DN 600 / PN 16	1,530	1,200	1,630	3,020	832	on request

Exvoid (steel) Hi-Cap air and micro-bubble separator



Exvoid (steel) Hi-Cap flange connection

Exvoid (steel) Hi-Cap welded connection

Technical features	▪ For high flow rates and high flow speeds up to 3 m/s	▪ Steel housing
	▪ Connection: DN 50–DN 600	▪ Application: up to 110°C and 10 bar, further pressure ratings and temperatures on request
	▪ Flow rate: 25–3,000 m³/h	

Higher flow rates cause the flow characteristics to change on entry into the body. The flow and idle zones shift. Enlarging the body enables optimum incorporation of this change in flow behaviour to ensure continued assured maximum separation performance in the high flows.

	Type	Art. no.	Connection	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	HM [mm]	Weight [kg]
10 bar 110°C	Steel with welded connection, 110°C, 10 bar								
	A 60.3 HC	8251105	60.3	25	132	260	810	153	23.0
	A 76.1 HC	8251115	76.1	40	132	260	810	163	23.0
	A 88.9 HC	8251125	88.9	54	206	370	965	159	36.0
	A 114.3 HC	8251135	114.3	94	206	370	965	169	37.0
	A 139.7 HC	8251145	139.7	144	354	525	1,225	214	85.0
	A 168.3 HC	8251155	168.3	215	354	525	1,225	229	86.0
	A 219.1 HC	8251165	219.1	360	409	650	1,495	284	129.0
	A 273.0 HC	8251175	273	575	480	750	1,609	351	175.0
	A 323.9 HC	8251185	323.9	810	634	850	2,225	406	340.0
10 bar 110°C	Steel with flange connection, 110°C, 10 bar								
	A 50 HC	8251305	DN 50 / PN 16	25	132	350	810	153	23.0
	A 65 HC	8251315	DN 65 / PN 16	40	132	350	810	163	23.0
	A 80 HC	8251325	DN 80 / PN 16	54	206	470	965	159	36.0
	A 100 HC	8251335	DN 100 / PN 16	94	206	470	965	169	22.0
	A 125 HC	8251345	DN 125 / PN 16	144	354	635	1,225	214	85.0
	A 150 HC	8251355	DN 150 / PN 16	216	354	635	1,225	229	86.0
	A 200 HC	8251365	DN 200 / PN 16	376	409	775	1,495	284	129.0
	A 250 HC	8251375	DN 250 / PN 16	576	480	890	1,609	351	175.0
	A 300 HC	8251385	DN 300 / PN 16	810	634	1,005	2,225	406	340.0
	A 350 HC	8251915	DN 350 / PN 16	1,000	650	1,128	2,460	501	293.0
	A 400 HC	8251925	DN 400 / PN 16	1,300	750	1,226	2,740	580	540.0
	A 450 HC	8251945	DN 450 / PN 16	1,700	750	1,330	3,030	609	902.0
	A 500 HC	8251955	DN 500 / PN 16	2,120	1,000	1,430	3,310	671	1,000.0
	A 600 HC	8251965	DN 600 / PN 16	3,060	1,200	1,630	3,160	832	2,420.0

Key advantages

Optimum dirt and sludge separation for enhanced operational reliability and efficiency

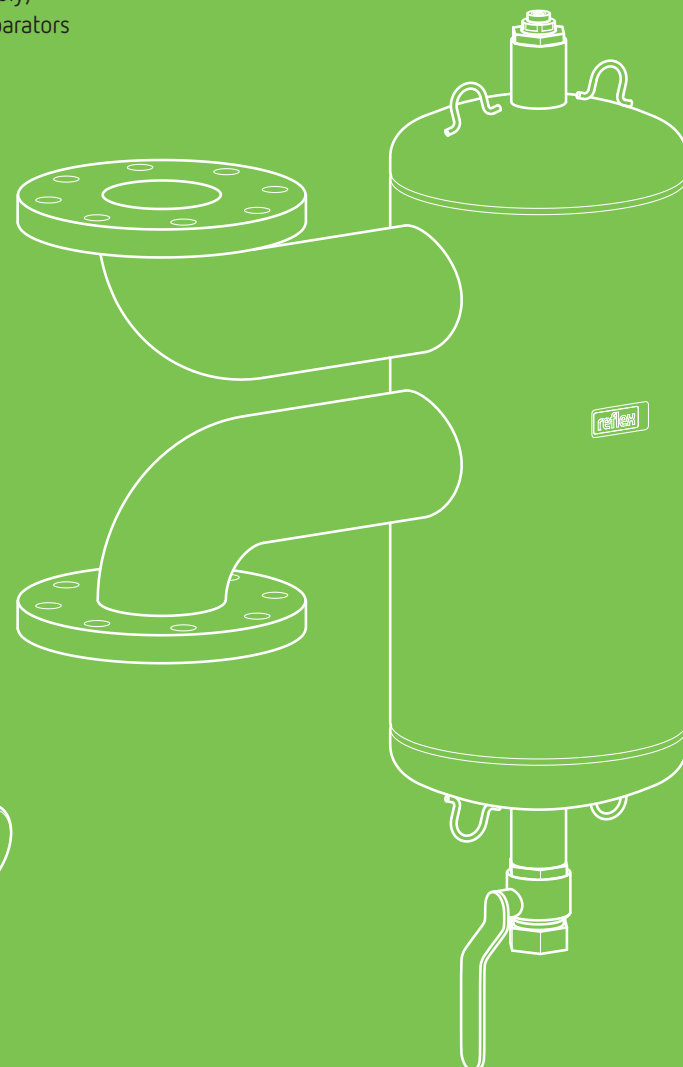
- Reliably removes circulating free dirt and sludge particles measuring up to 5 micrometres without energy consumption
- Ensures that components such as heat generators, thermostatic valves and pumps function perfectly and minimises the risk of defects and breakdowns in the long term
- Particle separation 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

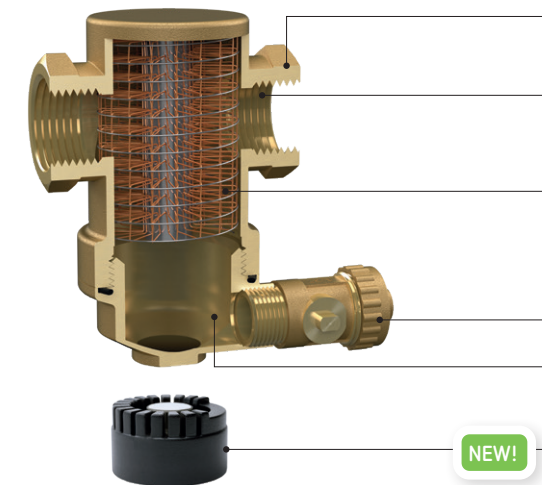
Broad product portfolio for any and all applications

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



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.

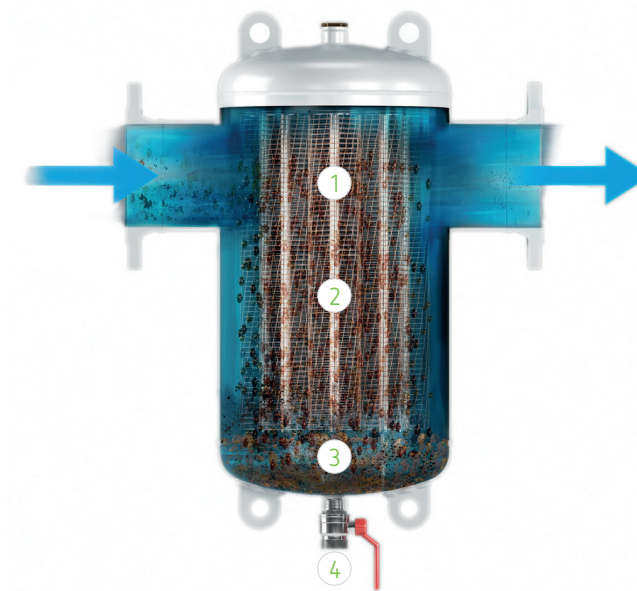
Large sludge trap capacity extends cleaning intervals.

NEW!

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



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

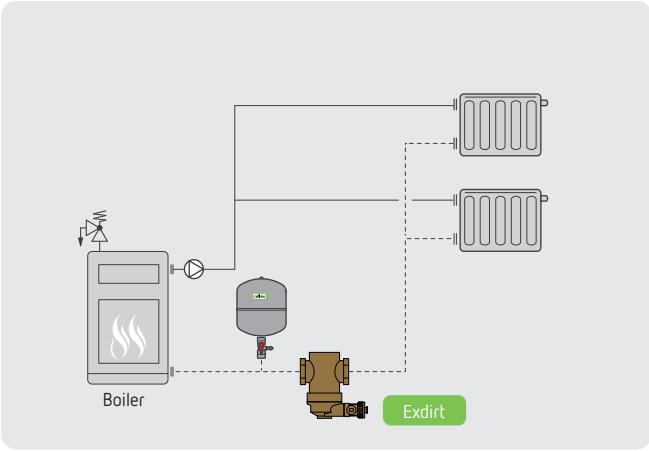
Steel type

Exdirt installation

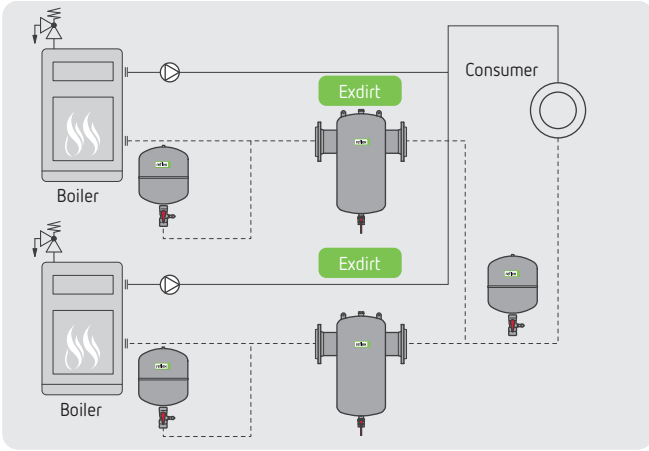
Installation location

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.

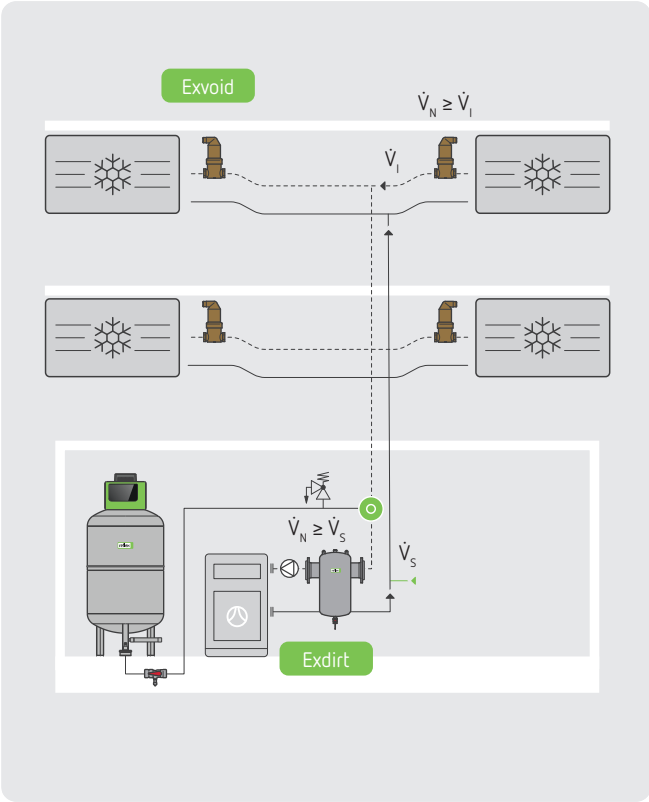
- The maintenance interval depends on the amount of dirt transported in the system. We recommend initial inspection after four weeks and a documented service at least once a year.



Exdirt (brass) in a heating system



Exdirt (steel) in a heating system

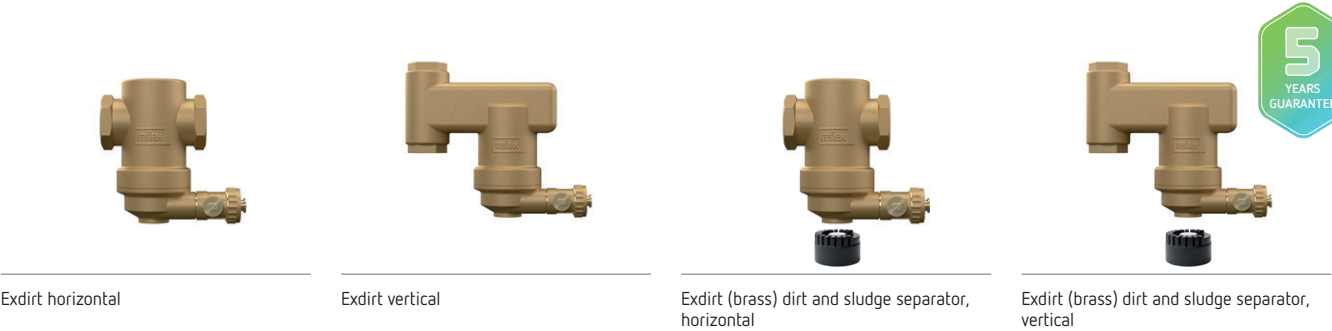


Central sludge separation with Exdirt dirt and sludge separator in a cooling system

- 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 (brass) dirt and sludge separator



Technical features

- Connection diameter: A22–2" (DN 20–DN 50)
- Flow rate: 1.25–7.5 m³/h (at $v \approx 1.0$ 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.	Packaging unit	Connection	V_{max} [m³/h]	Ø D [mm]	H [mm]	L [mm]	Weight [kg]
10 bar 110 °C	Brass, horizontal, 110 °C 10 bar								
	D 22	9252000	12	22 mm	1.25	63	103	106	1.20
	D ¾	9252010	12	FT ¾"	1.25	63	103	85	1.00
	D 1	9252020	12	FT 1"	2.00	63	120	88	1.20
	D 1 ¼	9252030	8	FT 1 ¼"	3.70	63	140	88	1.30
	D 1 ½	9252040	8	FT 1 ½"	5.00	63	174	88	1.50
10 bar 110 °C	D 2	9252050	1	FT 2"	7.50	100	215	132	3.00
	Brass, vertical, 110 °C 10 bar								
	D 22 V	9252500	8	22 mm	1.25	63	154	104	1.90
	D ¾ V	9252510	8	FT ¾"	1.25	63	144	84	1.80
10 bar 110 °C	D 1 V	9252520	8	FT 1"	2.00	63	144	84	1.80
	Brass with clip-on magnet, horizontal, 110 °C, 10 bar								
	D 22 M	9256600	12	22 mm	1.25	63	103	106	1.00
	D ¾ M	9256610	12	FT ¾"	1.25	63	103	85	1.00
	D 1 M	9256620	12	FT 1"	2.00	63	120	88	1.20
	D 1 ¼ M	9256630	8	FT 1 ¼"	3.70	63	140	88	1.30
10 bar 110 °C	D 1 ½ M	9256640	8	FT 1 ½"	5.00	63	174	88	1.50
	D 2 M	9256650	1	FT 2"	7.50	100	215	132	3.02
	Brass with clip-on magnet, vertical, 110 °C, 10 bar								
	D 22 V M	9256700	8	22 mm	1.25	63	154	104	1.90
10 bar 110 °C	D ¾ V M	9256710	8	FT ¾"	1.25	63	144	84	1.80
	D 1 V M	9256720	8	FT 1"	2.00	63	144	84	1.80

Exdirt Twist (brass) air and micro-bubble separator

NEW!



Exdirt Twist with magnet

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.



Technical features

- Infinitely rotatable (non-ratcheting) brass separator for installation in any position
- Connection diameter: A 22–1 1/2" (DN 20–DN 40)
- Volumetric flow: 1,25–5,0 m³/h (bei v ≈ 1,0 m/s)
- Exiso heat insulation: A 22–1 1/2" (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%)

	Typ	Art. no.	Packaging unit	Connection	V _{max} [m³/h]	Ø D [mm]	Height [mm]	Length [mm]	Weight [kg]
10 bar 110°C	Twist, brass with clip-on magnet, rotatable, 110 °C, 10 bar								
	DT 22 M	9257300	6	22 mm	1.2	64	176	109	1.98
	DT 28 M	9257310	6	28 mm	2.0	64	177	111	2.10
	DT ¾ M	9257320	6	FT ¾"	1.2	64	164	85	1.83
	DT 1 M	9257330	6	FT 1"	2.0	64	172	100	1.97
	DT 1 ¼ M	9257340	4	FT 1 ¼"	3.8	71	223	100	2.48
	DT 1 ½ M	9257350	4	FT 1 ½"	5.0	71	223	100	2.32

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

New: Exferro Easy Clip

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.

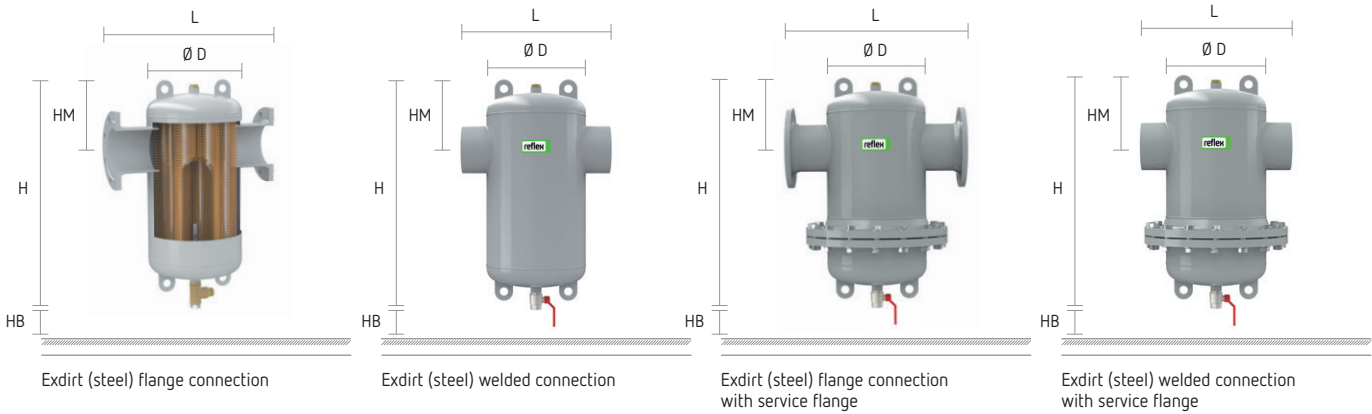
Legend:
■ Separated after 100 cycles [g]/[%]
■ Separated after 50 cycles [g]/[%]
■ Separated after 30 cycles [g]/[%]
■ Separated after 20 cycles [g]/[%]

Models: Exdirt DN22 without magnet, Exdirt DN22 Exferro Easy Clip, Exdirt DN22 M Magnetic sleeve, Separator 01, Separator 02, Separator 03, Separator 04, Separator 05, Separator 06, Separator 07, Separator 08.

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 (steel) dirt and sludge separator



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

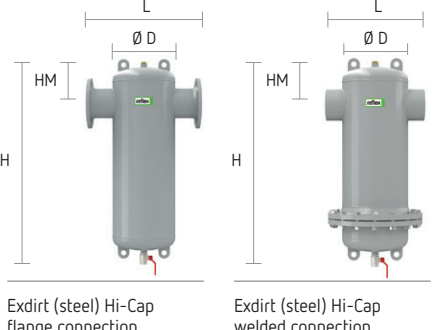
- Optional: High-performance Exferro magnetic insert for optimum efficiency when separating ferromagnetic dirt particles such as magnetite (see Accessories, page 30)
- Application: up to 110°C and 10 bar, further pressure ratings and temperatures on request

	Type	Art. no.	Connection	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	HM [mm]	HB [mm]	Weight [kg]
10 bar 110°C	Steel with welded connection, 110°C, 10 bar									
	D 60.3	8252100	60.3	12.5	132	260	521	165	370	3
	D 76.1	8252110	76.1	20	132	260	521	175	370	3
	D 88.9	8252120	88.9	27	206	370	636	170	370	9
	D 114.3	8252130	114.3	47	206	370	636	180	370	9
	D 139.7	8252140	139.7	72	354	525	811	225	430	22
	D 168.3	8252150	168.3	108	354	525	811	240	430	24
	D 219.1	8252160	219.1	180	409	650	1,021	295	430	44
	D 273.0	8252170	273.0	288	480	750	1,324	358	500	70
10 bar 110°C	D 323.9	8252180	323.9	405	634	850	1,535	413	500	112
	Steel with flange connection, 110°C, 10 bar									
	D 50	8252300	DN 50 / PN 16	12.5	132	350	521	165	370	9
	D 65	8252310	DN 65 / PN 16	20	132	350	521	175	370	10
	D 80	8252320	DN 80 / PN 16	27	206	470	636	170	370	16
	D 100	8252330	DN 100 / PN 16	47	206	470	636	180	370	19
	D 125	8252340	DN 125 / PN 16	72	354	635	811	225	430	35
	D 150	8252350	DN 150 / PN 16	108	354	635	811	240	430	39
	D 200	8252360	DN 200 / PN 16	180	409	775	1,021	295	430	65
	D 250	8252370	DN 250 / PN 16	288	480	890	1,324	358	500	108
	D 300	8252380	DN 300 / PN 16	405	634	1,005	1,535	413	500	156
	D 350	8252910	DN 350 / PN 16	500	650	1,128	1890	509	600	on request
	D 400	8252920	DN 400 / PN 16	650	750	1,226	2090	588	600	on request
	D 450	8252940	DN 450 / PN 16	850	750	1,330	2300	617	600	on request
	D 500	8252950	DN 500 / PN 16	1,060	1000	1,430	2520	679	600	on request
	D 600	8252960	DN 600 / PN 16	1,530	1200	1,630	2960	840	600	on request

Exdirt (steel) (cont.) dirt and sludge separator

	Type	Art. no.	Connection	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	HM [mm]	HB [mm]	Weight [kg]
10 bar 110°C	Steel with welded connection, 110°C, 10 bar, service flange									
	D 60.3 R	8252200	60.3	12.5	132	260	521	165	370	16
	D 76.1 R	8252210	76.1	20	132	260	521	175	370	23
	D 88.9 R	8252220	88.9	27	206	370	636	170	430	32
	D 114.3 R	8252230	114.3	47	206	370	636	180	430	37
	D 139.7 R	8252240	139.7	72	354	525	811	225	550	85
	D 168.3 R	8252250	168.3	108	354	525	811	240	550	78
	D 219.1 R	8252260	219.1	180	409	650	1,021	295	650	101
	D 273.0 R	8252270	273.0	288	480	750	1,324	358	850	158
10 bar 110°C	D 323.9 R	8252280	323.9	405	634	850	1,535	413	1,000	330
	Steel with flange connection, 110°C, 10 bar, service flange									
	D 50 R	8252400	DN 50 / PN 16	12.5	132	350	521	165	370	18
	D 65 R	8252410	DN 65 / PN 16	20	132	350	521	175	370	19
	D 80 R	8252420	DN 80 / PN 16	27	206	470	636	170	430	43
	D 100 R	8252430	DN 100 / PN 16	47	206	470	636	180	430	51
	D 125 R	8252440	DN 125 / PN 16	72	354	635	811	225	550	89
	D 150 R	8252450	DN 150 / PN 16	108	354	635	811	240	550	94
	D 200 R	8252460	DN 200 / PN 16	180	409	775	1,021	295	650	121
	D 250 R	8252470	DN 250 / PN 16	288	480	890	1,324	358	850	255
	D 300 R	8252480	DN 300 / PN 16	405	634	1,005	1,535	413	1,000	390
	D 350 R	8252912	DN 350 / PN 16	500	650	1,128	1890	509	-	on request
	D 400 R	8252922	DN 400 / PN 16	650	750	1,226	2090	588	-	on request
	D 450 R	8252942	DN 450 / PN 16	850	750	1,330	2300	617	-	on request
	D 500 R	8252952	DN 500 / PN 16	1,060	1000	1,430	2520	679	-	on request
	D 600 R	8252962	DN 600 / PN 16	1,530	1200	1,630	2960	840	-	on request

Exdirt (steel) Hi-Cap dirt and sludge separator



Exdirt (steel) Hi-Cap
flange connection

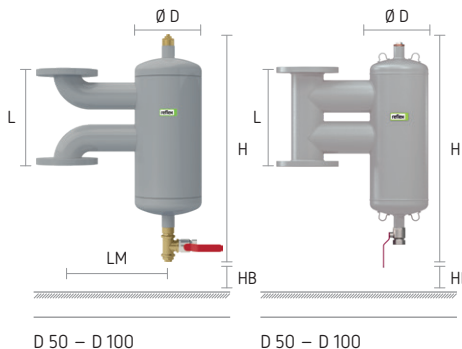
Exdirt (steel) Hi-Cap
welded connection

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	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	HM [mm]	Weight [kg]
10 bar 110°C	Steel with welded connection, 110°C, 10 bar								
	D 60.3 HC	8252105	60.3	25	132	260	706	165	5.0
	D 76.1 HC	8252115	76.1	40	132	260	706	175	23.0
	D 88.9 HC	8252125	88.9	54	206	370	861	170	36.0
	D 114.3 HC	8252135	114.3	94	206	370	861	180	37.0
	D 139.7 HC	8252145	139.7	144	354	525	1,121	225	85.0
	D 168.3 HC	8252155	168.3	215	354	525	1,121	240	86.0
	D 219.1 HC	8252165	219.1	360	409	650	1,391	295	129.0
	D 273.0 HC	8252175	273	575	480	750	1,532	358	175.0
D 323.9 HC	8252185	323.9	810	634	850	2,148	413	340.0	
10 bar 110°C	Steel with welded connection, 110°C, 10 bar, service flange								
	D 60.3 R-HC	8252205	60.3	25	132	260	706	165	23.0
	D 76.1 R-HC	8252215	76.1	40	132	260	706	175	23.0
	D 88.9 R-HC	8252225	88.9	54	206	370	861	170	36.0
	D 114.3 R-HC	8252235	114.3	94	206	370	861	180	37.0
	D 139.7 R-HC	8252245	139.7	144	354	525	1,121	225	85.0
	D 168.3 R-HC	8252255	168.3	216	354	525	1,121	240	86.0
	D 219.1 R-HC	8252265	219.1	376	409	650	1,391	295	129.0
	D 273.0 R-HC	8252275	273	576	480	750	1,532	358	260.0
D 323.9 R-HC	8252285	323.9	810	634	850	2,148	413	460.0	
10 bar 110°C	Steel with flange connection, 110°C, 10 bar								
	D 50 HC	8252305	DN 50 / PN 16	25	132	350	706	165	28.0
	D 65 HC	8252315	DN 65 / PN 16	40	132	350	706	175	29.0
	D 80 HC	8252325	DN 80 / PN 16	54	206	470	861	170	18.0
	D 100 HC	8252335	DN 100 / PN 16	94	206	470	861	180	46.0
	D 125 HC	8252345	DN 125 / PN 16	144	354	635	1,121	225	98.0
	D 150 HC	8252355	DN 150 / PN 16	216	354	635	1,121	240	100.0
	D 200 HC	8252365	DN 200 / PN 16	376	409	775	1,391	295	75.0
	D 250 HC	8252375	DN 250 / PN 16	576	480	890	1,532	358	119.0
	D 300 HC	8252385	DN 300 / PN 16	810	634	1,005	2,148	413	390.0
	D 350 HC	8252915	DN 350 / PN 16	1,000	650	1,128	2,400	509	270.0
	D 400 HC	8259325	DN 400 / PN 16	1,300	750	1,226	2,680	588	on request
D 450 HC	8252945	DN 450 / PN 16	1,700	750	1,330	2,970	617	on request	
D 500 HC	8252955	DN 500 / PN 16	2,120	1,000	1,430	3,100	679	on request	
D 600 HC	8252965	DN 600 / PN 16	3,060	1,200	1,630	3,250	840	on request	
10 bar 110°C	Steel with flange connection, 110°C, 10 bar, service flange								
	D 50 R-HC	8252405	DN 50 / PN 16	25	132	350	706	165	28.0
	D 65 R-HC	8252415	DN 65 / PN 16	40	132	350	706	175	29.0
	D 80 R-HC	8252425	DN 80 / PN 16	54	206	470	861	170	44.0
	D 100 R-HC	8252435	DN 100 / PN 16	94	206	470	861	180	46.0
	D 125 R-HC	8252445	DN 125 / PN 16	144	354	635	1,121	225	98.0
	D 150 R-HC	8252455	DN 150 / PN 16	216	354	635	1,121	240	100.0
	D 200 R-HC	8252465	DN 200 / PN 16	376	409	775	1,391	295	140.0
	D 250 R-HC	8252475	DN 250 / PN 16	576	480	890	1,532	358	246.0
	D 300 R-HC	8252485	DN 300 / PN 16	810	634	1,005	2,148	413	510.0
	D 350 R-HC	8252917	DN 350 / PN 16	1,000	650	1,128	2,400	509	on request
	D 400 R-HC	8252927	DN 400 / PN 16	1,300	750	1,226	2,680	588	on request
	D 450 R-HC	8252947	DN 450 / PN 16	1,700	750	1,330	2,970	617	on request
	D 500 R-HC	8252957	DN 500 / PN 16	2,120	1,000	1,430	3,100	679	on request
D 600 R-HC	8252967	DN 600 / PN 16	3,060	1,200	1,630	3,250	840	on request	

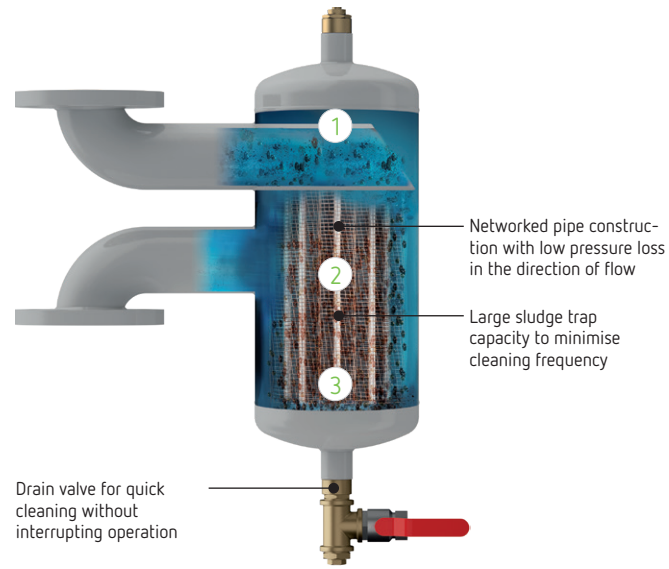
Exdirt V dirt and sludge separator for vertical installation



- 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 (cont.) dirt and sludge separator for vertical installation

	Type	Art. no.	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	DN 50 / PN 6	12.5	206	230	295.5	569	370	13.7
	D 65 V F1	8259511	DN 65 / PN 6	20.0	206	290	305.5	617	370	15.8
	D 80 V F1	8259521	DN 80 / PN 6	27.0	206	310	313	667	370	19.7
	D 100 V F1	8259531	DN 100 / PN 6	47.0	206	350	323	717	370	24.4
	D 125 V F1	8259541	DN 125 / PN 6	72.0	354	400	412	968	430	59.1
	D 150 V F1	8259551	DN 150 / PN 6	108.0	354	480	429.5	1,018	430	67.2
10 bar 110°C	Steel with flange connection, 110°C, 10 bar									
	D 50 V F1	8259500	DN 50 / PN 16	12.5	206	230	295.5	569	370	16.1
	D 65 V F1	8259510	DN 65 / PN 16	20.0	206	290	305.5	617	370	18.3
	D 80 V F1	8259520	DN 80 / PN 16	27.0	206	310	313	667	370	21.7
	D 100 V F1	8259530	DN 100 / PN 16	47.0	206	350	323	717	370	26.6
	D 125 V F1	8259540	DN 125 / PN 16	72.0	354	400	412	968	430	62.2
	D 150 V F1	8259550	DN 150 / PN 16	108.0	354	480	429.5	1,018	430	71.8

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

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

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

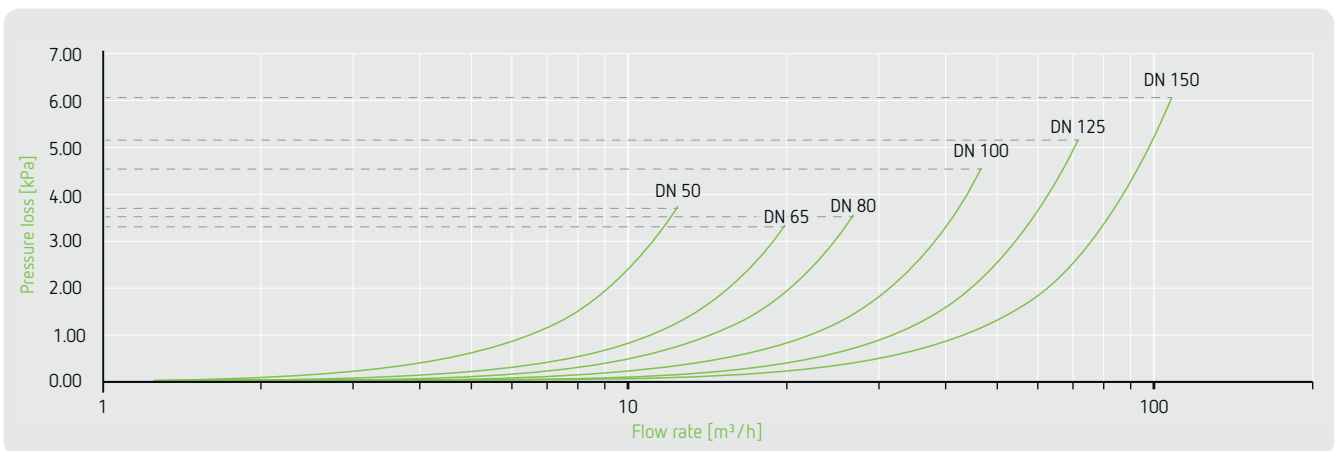
1. Volumetric flow calculation

$$\dot{V} = \frac{80 \text{ kW}}{4.2 \text{ kJ} / (\text{kg} \cdot \text{K}) \cdot (70-55) \text{ K}} \cdot 3600 \frac{\text{s}}{\text{h}} \cdot \frac{1 \text{ m}^3}{1,000 \text{ kg}}$$

$$= 4.6 \text{ m}^3/\text{h} \rightarrow \text{Selection based on table: DN 50 with } K_{vs} = 64.5 \text{ m}^3/\text{h}$$

$$\Delta p = \left(\frac{4.6 \text{ m}^3/\text{h}}{64.5 \text{ m}^3/\text{h}} \right)^2 \cdot 1 \text{ bar} = 5.08 \cdot 10^{-3} \text{ bar} \mid \cdot 100 \text{ kPa/bar}$$

$$= 0.508 \text{ kPa}$$



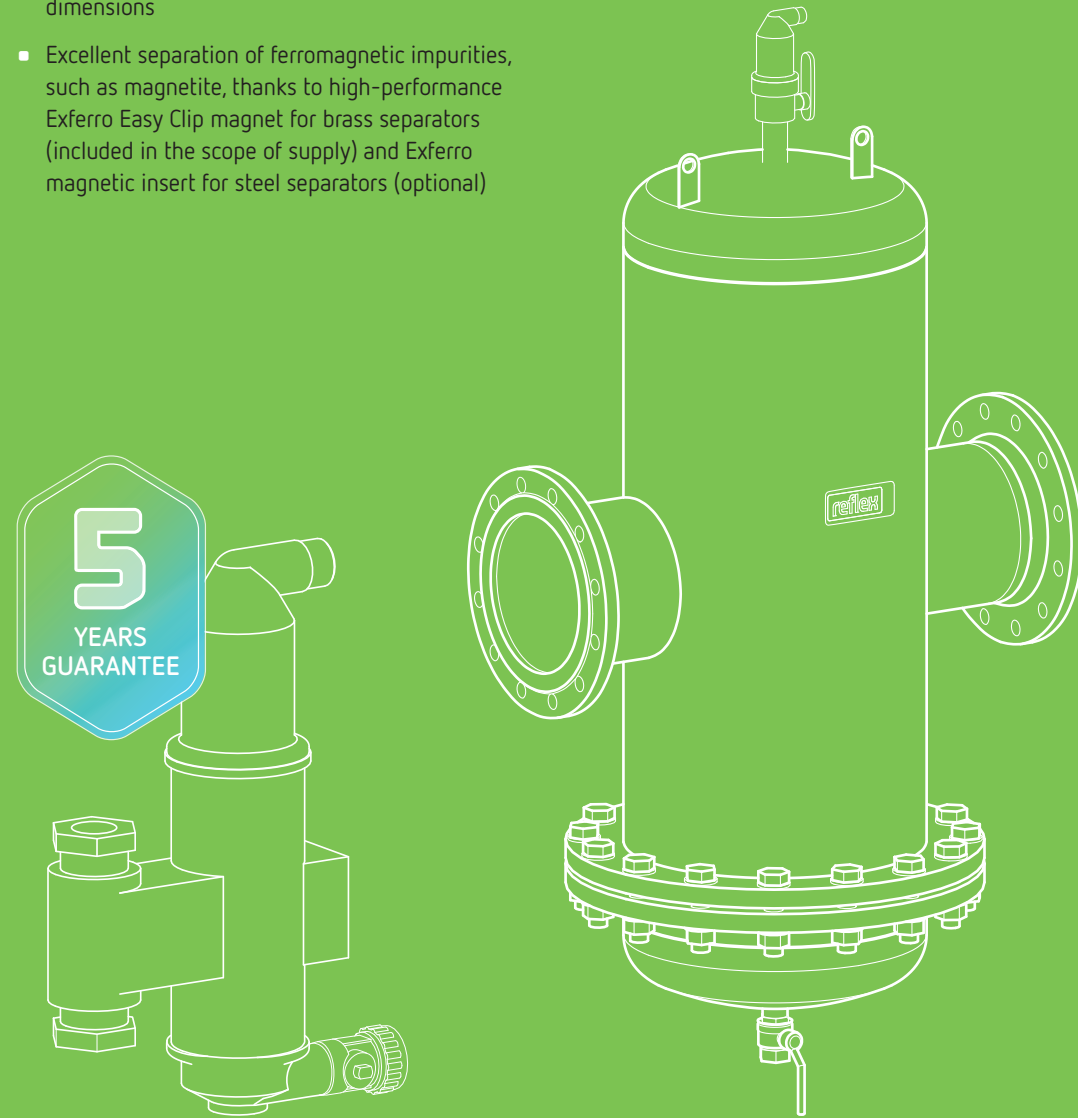
Key advantages

Combines the protective functions of Reflex Exvoid and Exdirt in a single component

- A much cheaper solution compared to the sum of the individual components
- Eliminates circulating air, micro-bubbles, dirt and sludge particles (down to 5 micrometres) for enhanced operational reliability and improved heating and cooling performance
- Assures the flawless functional reliability of heat generators, thermostat valves, etc. over the long term
- Fully automatic continuous operation, generates only a minimal, constant pressure drop
- Types available in brass and steel, depending on the dimensions
- Excellent separation of ferromagnetic impurities, such as magnetite, thanks to high-performance Exferro Easy Clip magnet for brass separators (included in the scope of supply) and Exferro magnetic insert for steel separators (optional)

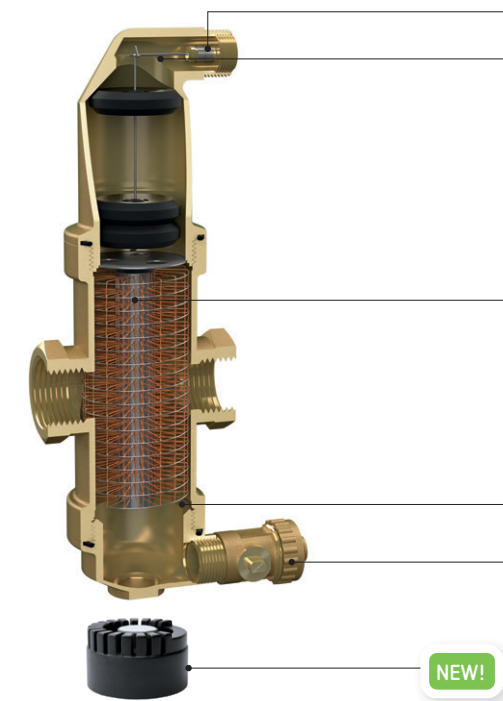
Quick and easy installation and maintenance

- Fast online maintenance and desludging without having to interrupt operation
- No shut-off valves or bypasses needed



Construction, function and installation

Extwin construction



Leakproof venting valve, cannot be shut off.

Special air chamber design: Floating impurities cannot reach the venting valve; high air chamber volume to counter pressure fluctuations

The mesh tube design that forms the core of the process has been tried and trusted for decades. Its pressure loss is extremely low in flow direction but high in transverse direction. As a result, turbulence is greatly reduced and the dirt particles are guided to partly calm areas.

Numerous connection options: Threaded, welded and flange connections from FT 3/4" to DN 600.

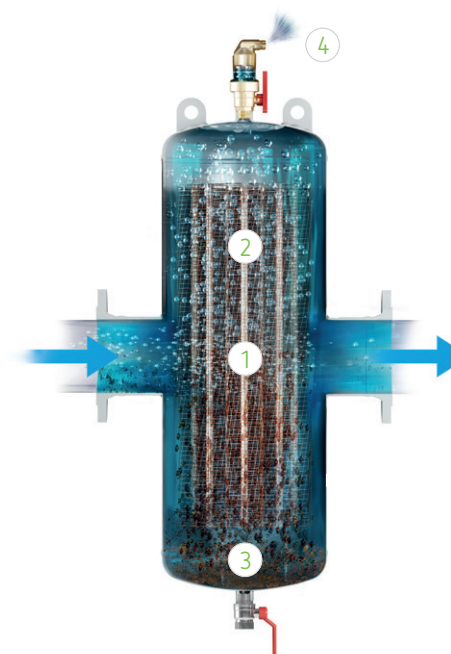
Large sludge trap capacity extends cleaning intervals.

Space-saving drain tap. When opened, the accumulated sludge is pressed out quickly and forcefully so that the tap can be closed again immediately. The whole procedure takes just seconds.

High-performance Exferro Easy Clip magnet for Extwin (brass) separates ferromagnetic particles. Extwin (steel) with optional Exferro magnetic insert.

Brass type

Extwin function principle



Extwin combines the functional modes of Exvoid and Exdirt

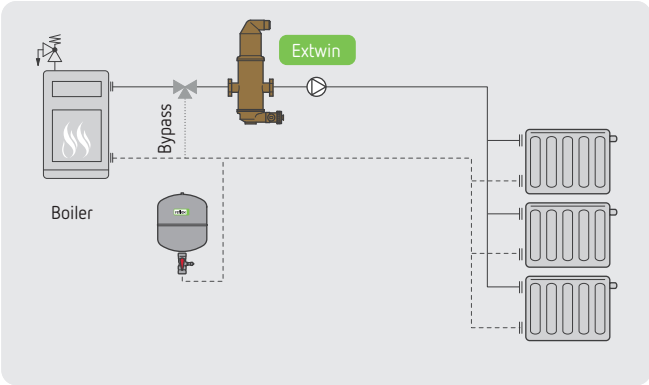
1. The flow is fed through an area with a larger cross section than the connection dimensions to reduce the flow speed.
2. The turbulence caused by the mesh tube excites gas bubbles and heavy solids to move in an indeterminate direction.
3. Depending on the flow rate, density and volume, the natural settling of some of the sludge particles is supported, and the particles are guided to the lower area of the housing.
4. At the same time, micro-bubbles that are moving freely and have settled on the Flowpac mesh tube join, rise and are discharged from the system through the upper vent.

Steel type

Installation Extwin

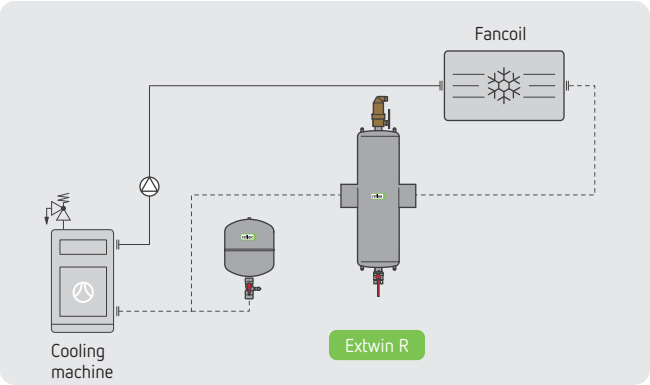
Installation location

Depending on functional prioritisation: If micro-bubble separation is the top priority in heating systems, Extwin must be installed in the delivery flow downstream of heat generators and mixing valves and upstream of the circulation pump. In cooling systems, it must be installed upstream of the cooling machine in the return flow or combined with a heat exchanger.



Extwin (brass) in a heating system where micro-bubble separation is the top priority

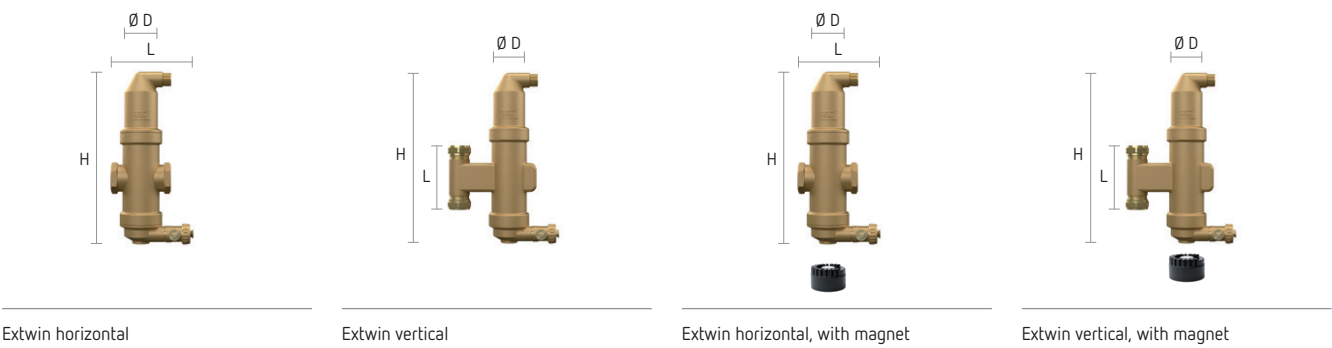
If dirt and sludge separation is the top priority, Extwin must be installed in the return flow. Its use is recommended in facilities with low static heights (facility heights up to 10m). To ensure effective sludge and micro-bubble separation, we recommend the use of both Exvoid and Exdirt.



Extwin (steel) in a cooling system where the top priority is dirt and sludge separation combined with micro-bubble separation.

Extwin product range

Extwin (brass) combined micro-bubble, dirt and sludge separator



- Technical features
- Connection options: Thread and clamping ring
 - Connection diameter A22–1" (DN 20–DN 25)
 - Flow rate: 1.25-2.0 m³/h (at v ≈ 1.0 m/s)
 - Installation position: horizontal, vertical
 - New:** High-performance Exferro Easy Clip magnet for separating ferromagnetic particles is included in the scope of supply (see page 20 for more details).

Extwin (brass) combined micro-bubble, dirt and sludge separator:

	Type	Art. no.	Packaging unit	Connection	V _{max} [m³/h]	Ø D [mm]	H [mm]	L [mm]	Weight [kg]
10 bar 110 °C	Brass, horizontal, 110 °C 10 bar								
	TW 22	9253000	6	22 mm	1.25	65	246	106	1.80
	TW 1	9253010	6	FT 1"	2.00	65	246	88	1.70
10 bar 110 °C	Brass, vertical, 110 °C 10 bar								
	TW 22 V	9253500	6	22 mm	1.25	65	254	97	2.10
10 bar 110 °C	Brass with clip-on magnet, vertical, 110 °C, 10 bar								
	TW 22 M	9257600	6	22 mm	1.25	65	263	106	1.80
	TW 1 M	9257610	6	FT 1"	2.00	65	263	88	1.70
10 bar 110 °C	Twist, brass with clip-on magnet, rotatable, 110 °C, 10 bar								
	TW 22 V M	9257700	6	22 mm	1.25	65	263	106	1.90

Extwin Twist (brass) combined micro-bubble, dirt and sludge separator

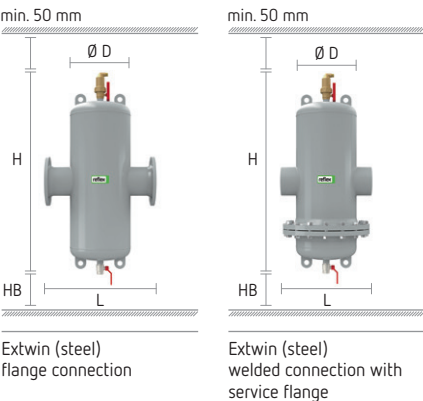
Twist separator connections are infinitely rotatable 360° (non-ratcheting), making them suitable for a wide range of different installation positions. The connection can be rotated by hand.

Extwin Twist with magnet

- 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.	Packaging unit	Connection	V _{max} [m³/h]	Ø D [mm]	H [mm]	L [mm]	Weight [kg]
10 bar 110 °C	Twist, brass with clip-on magnet, rotatable, 110 °C, 10 bar								
	TWT 22 M	9257100	4	22 mm	1.2	64	285	109	2.54
	TWT 28 M	9257110	4	28 mm	2.0	64	285	111	2.67
	TWT ¾ M	9257120	4	FT ¾"	1.2	64	285	85	2.40
	TWT 1 M	9257130	4	FT 1"	2.0	64	285	100	2.50
	TWT 1 ¼ M	9257140	4	FT 1 ¼"	3.8	71	285	100	3.03
	TWT 1 ½ M	9257150	4	FT 1 ½"	5.0	71	285	100	2.87

Extwin (steel) combined micro-bubble, dirt and sludge separator:

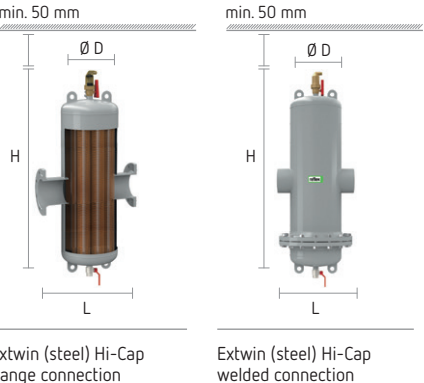


Technical features

- The type with service flange has a removable bottom part for easier maintenance
- Connection: DN 50–DN 300
- Flow rate: 12.5–405 m³/h
- Application: up to 110 °C and 10 bar, further pressure ratings and temperatures on request
- Heat insulation available on request

	Type	Art. no.	Connection	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	HB [mm]	Weight [kg]
10 bar 110°C	Steel with welded connection, 110°C, 10 bar								
	TW 60.3	8253100	60.3	12.5	132	260	785	370	4.0
	TW 76.1	8253110	76.1	20.0	132	260	785	370	5.0
	TW 88.9	8253120	88.9	27.0	206	370	940	370	12.0
	TW 114.3	8253130	114.3	47.0	206	370	940	370	14.0
	TW 139.7	8253140	139.7	72.0	354	525	1,200	430	34.0
	TW 168.3	8253150	168.3	108.0	354	525	1,200	430	31.0
	TW 219.1	8253160	219.1	180.0	409	650	1,470	430	113.0
	TW 273.0	8253170	273.0	288.0	480	750	1,916	500	215.0
	TW 323.9	8253180	323.9	405.0	634	850	2,237	500	265.0
10 bar 110°C	Steel with flange connection, 110°C, 10 bar								
	TW 50	8253300	DN 50 / PN 16	12.5	132	350	785	370	10.0
	TW 65	8253310	DN 65 / PN 16	20.0	132	350	785	370	10.0
	TW 80	8253320	DN 80 / PN 16	27.0	206	470	940	370	18.0
	TW 100	8253330	DN 100 / PN 16	47.0	206	470	940	370	24.0
	TW 125	8253340	DN 125 / PN 16	72.0	354	635	1,200	430	41.0
	TW 150	8253350	DN 150 / PN 16	108.0	354	635	1,200	430	46.0
	TW 200	8253360	DN 200 / PN 16	180.0	409	775	1,470	430	79.0
	TW 250	8253370	DN 250 / PN 16	288.0	480	890	1,916	500	156.0
	TW 300	8253380	DN 300 / PN 16	405.0	634	1,005	2,237	500	325.0
	TW 350	8253910	DN 350 / PN 16	500	650	1,128	2,600	600	on request
	TW 400	8253920	DN 400 / PN 16	650	750	1,226	2,900	600	on request
	TW 450	8253940	DN 450 / PN 16	850	750	1,330	3,150	600	on request
	TW 500	8253950	DN 500 / PN 16	1,060	1,000	1,430	3,500	600	on request
	TW 600	8253960	DN 600 / PN 16	1,530	1,200	1,630	4,100	600	on request
10 bar 110°C	Steel with welded connection, 110°C, 10 bar, service flange								
	TW 60.3 R	8253200	60.3	12.5	132	260	785	370	13.0
	TW 76.1 R	8253210	76.1	20.0	132	260	785	370	13.0
	TW 88.9 R	8253220	88.9	27.0	206	370	940	550	46.0
	W 114.3 R	8253230	114.3	47.0	206	370	940	550	36.0
	TW 139.7 R	8253240	139.7	72.0	354	525	1,200	750	102.0
	TW 168.3 R	8253250	168.3	108.0	354	525	1,200	750	78.0
	TW 219.1 R	8253260	219.1	180.0	409	650	1,470	1,000	182.0
	TW 273.0 R	8253270	273.0	288.0	480	750	1,916	1,350	180.0
	TW 323.9 R	8253280	323.9	405.0	634	850	2,237	1,850	450.0
10 bar 110°C	Steel with flange connection, 110°C, 10 bar, service flange								
	TW 50 R	8253400	DN 50 / PN 16	12.5	132	350	785	370	18.0
	TW 65 R	8253410	DN 65 / PN 16	20.0	132	350	785	370	19.0
	TW 80 R	8253420	DN 80 / PN 16	27.0	206	470	940	550	43.0
	TW 100 R	8253430	DN 100 / PN 16	47.0	206	470	940	550	51.0
	TW 125 R	8253440	DN 125 / PN 16	72.0	354	635	1,200	750	89.0
	TW 150 R	8253450	DN 150 / PN 16	108.0	354	635	1,200	750	94.0
	TW 200 R	8253460	DN 200 / PN 16	180.0	409	775	1,470	1,000	138.0
	TW 250 R	8253470	DN 250 / PN 16	288.0	480	890	1,916	1,350	355.0
	TW 300 R	8253480	DN 300 / PN 16	405.0	634	1,005	2,237	1,850	500.0
	TW 350 R	8253912	DN 350 / PN 16	500	650	1,128	2,600	-	on request
	TW 400 R	8253922	DN 400 / PN 16	650	750	1,226	2,900	-	on request
	TW 450 R	8253942	DN 450 / PN 16	850	750	1,330	3,150	-	on request
	TW 500 R	8253952	DN 500 / PN 16	1,060	1,000	1,430	3,500	-	on request
	TW 600 R	8253962	DN 600 / PN 16	1,530	1,200	1,630	4,100	-	on request

Extwin (steel) Hi-Cap combined micro-bubble, dirt and sludge separator:



Technical features

- For high flow rates
- The type with service flange has a removable bottom part for easier maintenance
- Connection: DN 50–DN 600
- Flow rate: 25–3,000 m³/h
- Steel housing
- Application: up to 110°C and 10 bar, further pressure ratings and temperatures on request

	Type	Art. no.	Connection	V _{max} [m³/h]	Ø D [mm]	L [mm]	H [mm]	HB [mm]	Weight [kg]
10 bar 110°C	Steel with welded connection, 110°C, 10 bar								
	TW 60.3 HC	8253105	60.3	25	132	260	1,050	430	23.0
	TW 76.1 HC	8253115	76.1	40	132	260	1,050	430	23.0
	TW 88.9 HC	8253125	88.9	54	206	370	1,285	430	36.0
	TW 114.3 HC	8253135	114.3	94	206	370	1,285	430	37.0
	TW 139.7 HC	8253145	139.7	144	354	525	1,710	500	85.0
	TW 168.3 HC	8253155	168.3	216	354	525	1,710	500	86.0
	TW 219.1 HC	8253165	219.1	376	409	650	2,035	500	129.0
	TW 273 HC	8253175	273	576	480	750	2,764	600	305.0
	TW 323.9 HC	8253185	323.9	810	634	850	3,330	600	430.0
10 bar 110°C	Steel with flange connection, 110°C, 10 bar								
	TW 50 HC	8253305	DN50/PN16	25	132	350	1,050	430	28.0
	TW 65 HC	8253315	DN65/PN16	40	132	350	1,050	430	29.0
	TW 80 HC	8253325	DN80/PN16	54	206	470	1,285	430	44.0
	TW 100 HC	8253335	DN100/PN16	94	206	470	1,285	430	46.0
	TW 125 HC	8253345	DN125/PN16	144	354	635	1,710	500	98.0
	TW 150 HC	8253355	DN150/PN16	216	354	635	1,710	500	100.0
	TW 200 HC	8253365	DN200/PN16	376	409	775	2,035	500	104.0
	TW 250 HC	8253375	DN250/PN16	576	480	890	2,764	600	156.1
	TW 300 HC	8253385	DN300/PN16	810	634	1,005	3,330	600	480.0
	TW 350 HC	8253915	DN350/PN16	1,000	650	1,128	3,600	700	on request
	TW 400 HC	8253925	DN400/PN16	1,300	750	1,226	4,000	700	on request
	TW 450 HC	8253945	DN450/PN16	1,700	750	1,330	4,500	700	on request
	TW 500 HC	8253955	DN500/PN16	2,120	1,000	1,430	4,900	700	on request
	TW 600 HC	8253965	DN600/PN16	3,060	1,200	1,630	5,800	700	on request
10 bar 110°C	Steel with welded connection, 110°C, 10 bar, service flange								
	TW 60.3 R-HC	8253205	60.3	25	132	260	1,050	640	23.0
	TW 76.1 R-HC	8253215	76.1	40	132	260	1,050	640	23.0
	TW 88.9 R-HC	8253225	88.9	54	206	370	1,285	900	36.0
	TW 114.3 R-HC	8253235	114.3	94	206	370	1,285	900	37.0
	TW 139.7 R-HC	8253245	139.7	144	354	525	1,710	1,300	85.0
	TW 168.3 R-HC	8253255	168.3	216	354	525	1,710	1,300	86.0
	TW 219.1 R-HC	8253265	219.1	376	409	650	2,035	1,600	129.0
	TW 273 R-HC	8253275	273	576	480	750	2,764	2,100	400.0
	TW 323.9 R-HC	8253285	323.9	810	634	850	3,330	2,900	570.0
10 bar 110°C	Steel with flange connection, 110°C, 10 bar, service flange								
	TW 50 R-HC	8253405	DN50/PN16	25	132	350	1,050	640	28.0
	TW 65 R-HC	8253415	DN65/PN16	40	132	350	1,050	640	29.0
	TW 80 R-HC	8253425	DN80/PN16	54	206	470	1,285	900	44.0
	TW 100 R-HC	8253435	DN100/PN16	94	206	470	1,285	900	46.0
	TW 125 R-HC	8253445	DN125/PN16	144	354	635	1,710	1300	98.0
	TW 150 R-HC	8253455	DN150/PN16	216	354	635	1,710	1300	100.0
	TW 200 R-HC	8253465	DN200/PN16	367	409	775	2,035	1600	151.0
	TW 250 R-HC	8253475	DN250/PN16	576	480	890	2,764	2100	435.0
	TW 300 R-HC	8253485	DN300/PN16	810	634	1,005	3,330	2900	620.0
	TW 350 R-HC	8253917	DN350/PN16	1,000	650	1,128	3,600	-	1090.0
	TW 400 R-HC	8253927	DN400/PN16	1,300	750	1,226	4,000	-	on request
	TW 450 R-HC	8253947	DN450/PN16	1,700	750	1,330	4,500	-	on request
	TW 500 R-HC	8253957	DN500/PN16	2,120	1,000	1,430	4,900	-	on request
	TW 600 R-HC	8253967	DN600/PN16	3,060	1,200	1,630	5,800	-	on request

Accessories and add-on products

ExFerro magnetic insert for Exdirt and Extwin steel separators



ExFerro

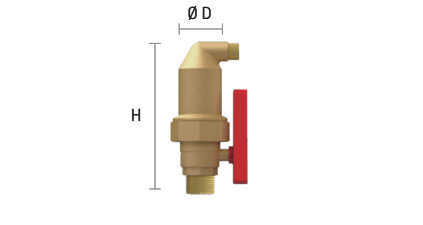
Technical features

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

	Type	Art. no.	Connection	Installation length H [mm]	Space requirement* [mm]	Weight [kg]
10 bar 110°C	Reflex ExFerro D50-65 (60.3-76.1)	9258340	1"	315	365	1.0
	Reflex ExFerro D80-100 (88.9-114.3)	9258350	1"	365	415	1.4
	Reflex ExFerro D125-150 (139.7-168.3)	9258360	1"	465	515	1.9
	Reflex ExFerro D200 (219.1)	9258370	1"	565	615	2.4
	Reflex ExFerro D250-600 (273.0-323.9)	9258380	2"	815	865	4.7

* Space required beneath the separator for installation.

Exvoid T upper venting part for Exvoid air and micro-bubble separator made of steel with 3-way valve bottom part



Exvoid T upper venting part

Technical features

- Can be shut off for easy replacement without having to interrupt operation; optional add-on kit for dirt and sludge separators
- Bypass can be used to flush the separator or for filling and emptying

	Type	Art. no.	Connection	Ø D [mm]	H [mm]	Weight [kg]
10 bar 110°C	Reflex–Exvoid T upper venting part	9255805	1"	82.5	175	1.4

Exiso

Exiso

- Heat insulation for Exvoid A 22– A 1½ and Exdirt D 22–D 2
- Consisting of two dimensionally stable and temperature-resistant, adaptable, friction-locked semi-spheres made of rigid foam, with catch fastener or tightening strap
- Not suitable for vertical separators, separators with service flanges or Extwin

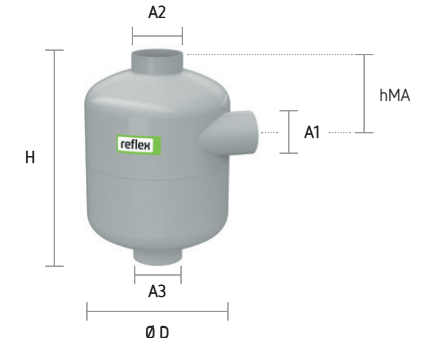
Exiso Twist

- Heat insulation Exiso Twist 22 – 1" and Exiso Twist 1 ¼ – 1 ½" on request
- Thermal conductivity 0.035 W/mK (10 °C)

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Type	Art. no.	Insulation thickness [mm]	Ø D [mm]	H [mm]	Weight [kg]
Heat insulation for Exvoid A22–A2 and Exdirt D22–D2					
A/D 22 – 1½	9254811	15.0	125	225	0.1
A/D 2	9254801	15.0	135	270	0.2
Heat insulation for Exvoid (steel) and Exdirt (steel)					
DN 50–65 (60.3–76.1)	9254831	30.5	196	442	0.4
DN 80-100 (88.9-114.3)	9254841	30.5	270	557	0.6
DN 125-150 (139.7-168.3)	9254851	30.5	420	857	2.2

Expansion trap



Expansion trap 480

Technical features

Expansion traps are installed in the discharge lines of safety valves to separate the water and steam phases. A water drainage line must be connected at the lowest point of the expansion trap to enable leaking heating water to be drained off without danger and under surveillance. The steam discharge line must lead from the highest point of the expansion trap out into the atmosphere.

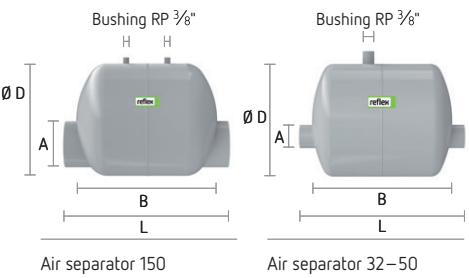
- For connection to safety valves on heat generators
- For separating water-steam mixtures, as per EN 12828
- Is mounted in the discharge line, right next to the safety valve

	Type	Art. no.	Connection A	Ø D [mm]	H [mm]	h _{MA} [mm]	Weight [kg]
10 bar 110°C	T 170	8680000	A1/A2/A3: DN 50/65/65	206	328	55	3.2
	T 270	8681000	A1/A2/A3: DN 65/80/80	280	400	65	5.0
	T 380	8682000	A1/A2/A3: DN 80/100/100	490	528	75	10.1
	T 480	8683000	A1/A2/A3: DN 125/150/150	480	710	115	19.5
	T 550	8684000	A1/A2/A3: DN 150/200/200	634	896	125	32.3

Other sizes available on request

Customised solutions

Air separator



Technical features

Air separators work according to the principle of separation by extreme flow delay. In combination with Exvoid T quick air vents, they are suitable for operational venting of high distribution pipelines and as an air chamber for manual venting during commissioning.

- For separating gas bubbles in liquid circuits
- Especially when static pressure is low
- With welded connection
- Grey coating

	Type	Art. no.	Connection A	Ø D [mm]	L [mm]	B [mm]	h [mm]	Weight [kg]
10 bar 120°C	LA 32	8671000	DN 32	206	300	278	30	2.4
	LA 40	8672000	DN 40	206	300	278	40	2.5
	LA 50	8673000	DN 50	206	300	278	40	2.6
	LA 65	8674000	DN 65	280	395	355	60	4.4
	LA 80	8675000	DN 80	280	395	355	60	4.5
	LA 100	8676000	DN 100	280	395	355	50	5.0
	LA 125	8677000	DN 125	280	390	355	40	5.3
	LA 150	8678000	DN 150	409	590	590	90	12.9
	LA 200	8679000	DN 200	409	590	590	40	13.8

In addition to our standard portfolio, we can also supply customised separators for higher flow rates, operating pressures and operating temperatures on request. We can provide expert, bespoke advice at every step of the way: from project planning and commissioning right through to documentation and maintenance. We have years of experience working in all relevant sectors and all types of buildings.

We can supply separators for

- Higher flow rates
- Higher operating pressures
- Higher operating temperatures
- Special accessories



Example of a real plant for customised sludge collection

Product

Customised Exdirt sludge collector
DN 1200, 3,000 litres



Example of a real customised Exdirt system

Product

Customised Exdirt dirt and sludge separator D 850 Hi-Cap
with flange connection for PN 10/110°C

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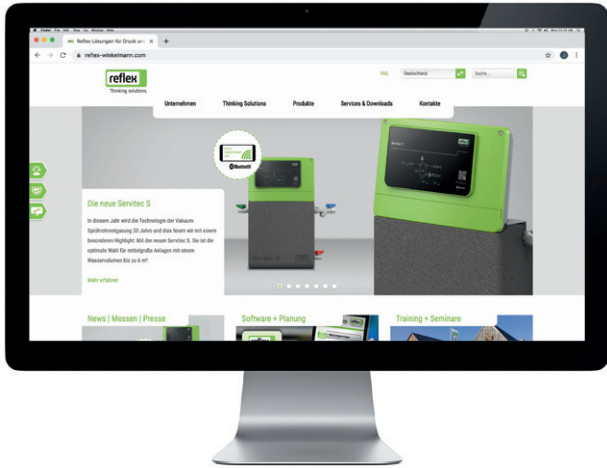


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Advantages through expertise: Reflex training

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seminare@reflex.de

Reflex Training—Expertise gives us the edge

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and practice are effectively combined. The venue represents a perfect symbiosis of traditional and high-tech—the building, ambience and equipment speak for themselves and provide a haven for successful learning far removed from hectic everyday life.

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