reflex
Thinking solutions.

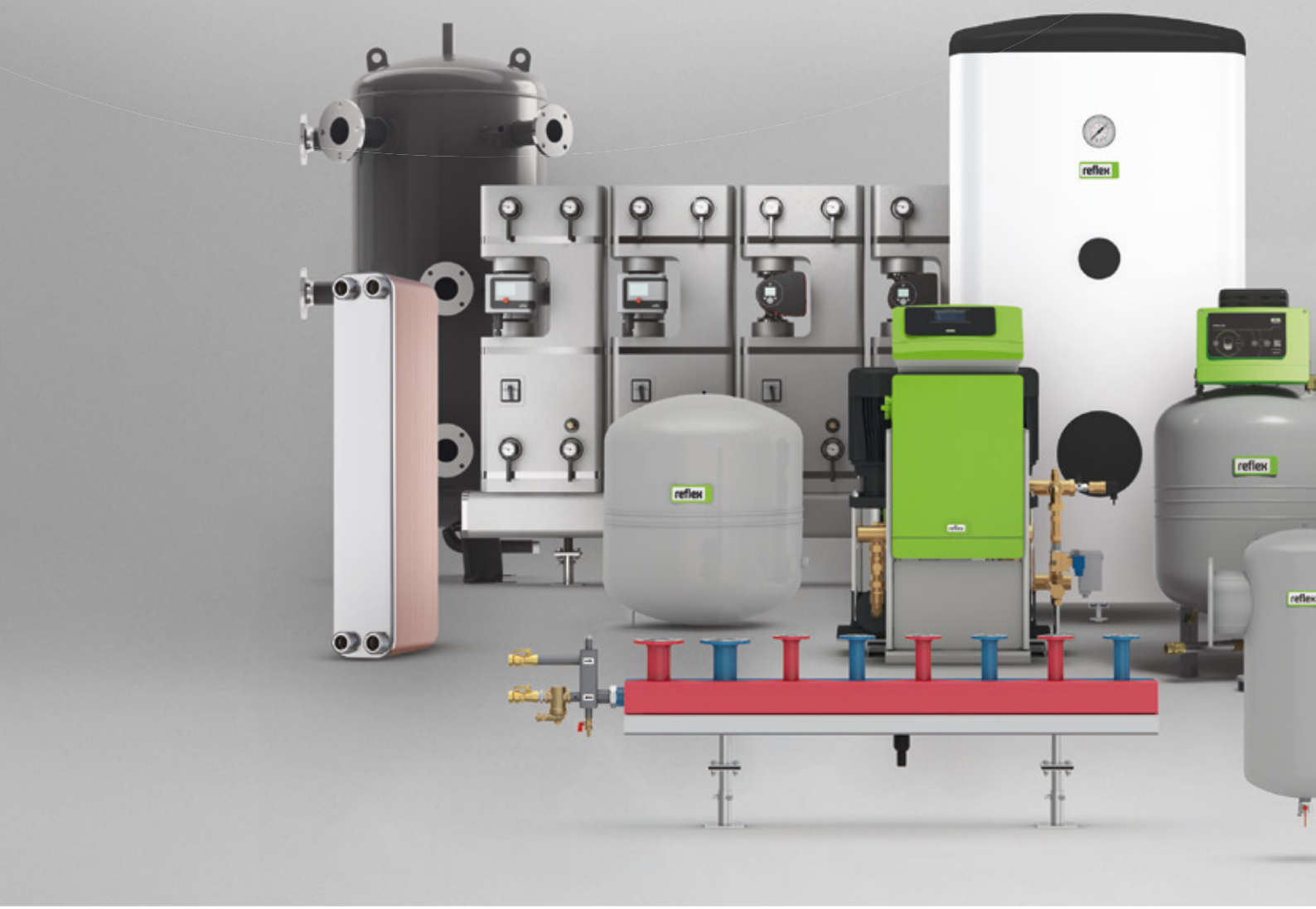
Separation technology

Exdirt
Exvoid
Extwin

Reflex—
a powerful brand for decades

Reflex Winkelmann GmbH is a leading provider of highquality 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 tanks and plate heat exchangers, as well as hydraulic manifold and tank components. Reflex Winkelmann GmbH has about 2,000 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.



Contents

New configuration software

Reflex Solutions **Pro**

rsp.reflex.de/en

→ read more on page 46

Reflex City

High-performance air, dirt and sludge separator
Living, shopping, working, manufacturing: cities are synonymous with diversity. The requirements for 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.

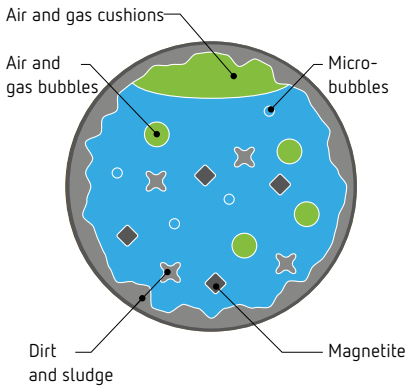
The safety and efficiency of the facilities in any type of building can be optimised by removing foreign matter—such as air, micro-bubbles, dirt and sludge from the system water.
The Ex separators made by Reflex are an extensive range of high-performance air, dust and sludge separators in the full range 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.

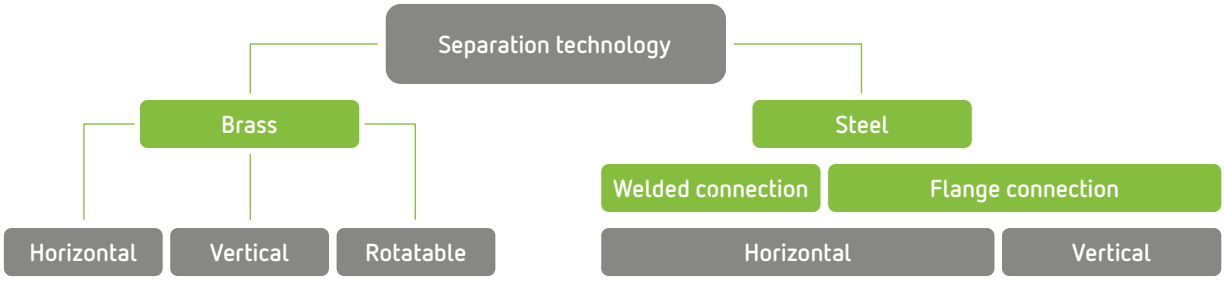
Exferro

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



Exvoid

Automatic vent

T ½" / ⅜"
110 °C/180 °C

Micro-bubble trap

A 22 mm – 2"
110 °C/180 °C

A 22 mm – 1" V
110 °C/180 °C

AT 22 mm – 1 ½" V
110 °C

A 60.3 – A 323.9

A 50 – A 600

Exdirt

Dirt and sludge separator

D 22 mm – 2"
110 °C

D 22 mm – 1" V
110 °C

D 60.3 – D 323.9

D 50 – D 600

D 50 V – D 150 V

With **Exferro Easy Clip** high-performance magnet

D 22 mm – 2"
110 °C

D 22 mm – 1" V
110 °C

DT 22 mm – 1 ½" V
110 °C

Exferro magnetic insert (optional)

D 60.3 R – D 323.9 R

D 50 R – D 600 R

Extwin

Combined micro-bubble, dirt and sludge separator

TW 22 mm – 1"
110 °C

TW 22 mm V
110 °C

TW 60.3 – TW 323.9

TW 50 – TW 600

With **Exferro Easy Clip** high-performance magnet

TW 22 mm – 1"
110 °C

TW 22 mm V
110 °C

TWT 22 mm – 1 ½" V
110 °C

Exferro magnetic insert (optional)

TW 60.3 R – TW 323.9 R

TW 50 R – TW 600 R

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]
Twist 22 mm & ¾"	10.5	1.25
Twist 28 mm & 1"	12.2	2.00
Twist 1 ¼"	18.8	3.70
Twist 1 ½"	22.6	5.00
IG 22 mm & ¾"	10.7	1.25
IG 1"	17.2	2.00
IG 1¼"	31.8	3.70
IG 1½"	40.0	5.00
IG 2"	56.1	7.50
DN 50	72.2	12.50
DN 65	121.7	20.00
DN 80	158.5	27.00

Connection	K_{VS} [m³/h]	V_{max} [m³/h]
DN 100	244.3	47.00
DN 125	351.3	72.00
DN 150	487.9	108.00
DN 200	780.6	180.00
DN 250	1,096.4	288.00
DN 300	1,459.5	405.00
DN 350	1,790.3	500.00
DN 400	2,242.7	650.00
DN 450	2,687.9	850.00
DN 500	3,196.0	1,060.00
DN 600	4,416.7	1,530.00

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 40 kW

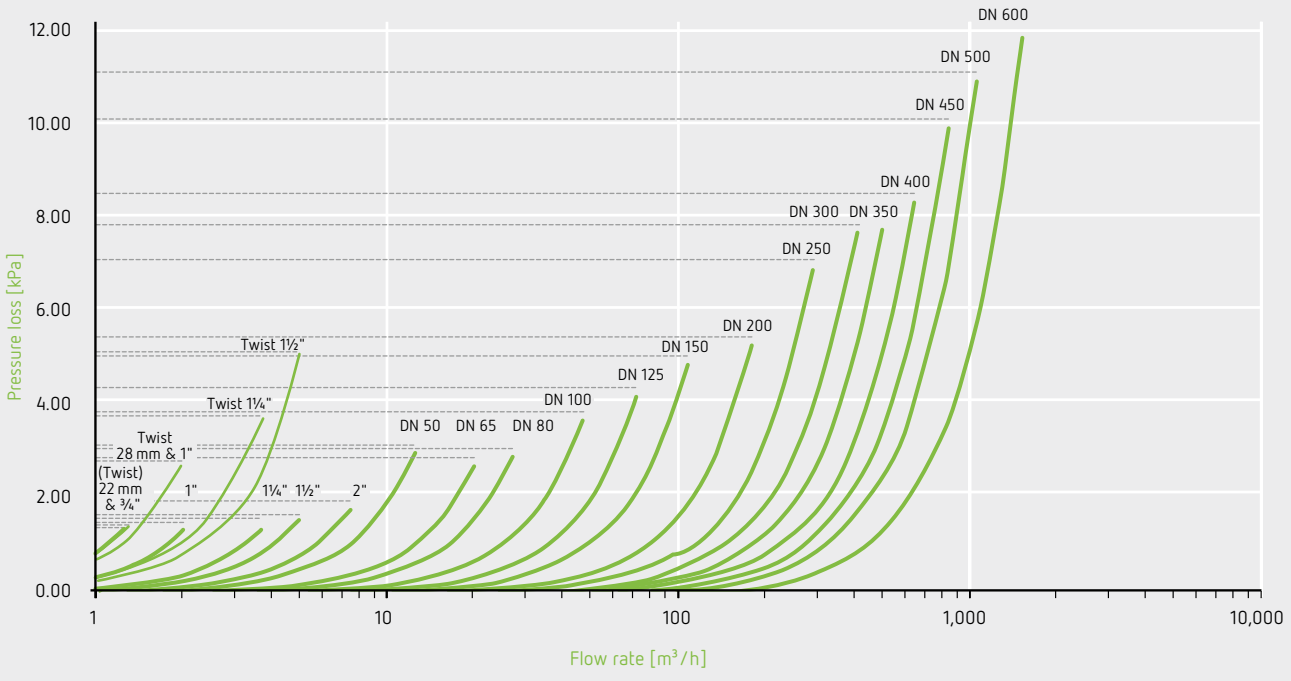
1. Volumetric flow calculation

$$\dot{V} = \frac{40\,\text{kW}}{4.2\,\text{kJ/(kg·K)} \cdot (70-55)\,\text{K}} \cdot 3{,}600\,\frac{\text{s}}{\text{h}} \cdot \frac{1\,\text{m}^3}{1{,}000\,\text{kg}}$$

$= 2.3\ \text{m}^3/\text{h} \rightarrow$ Selection based on table: IG 1¼" with $K_{VS} = 31.8\ \text{m}^3/\text{h}$

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

$\triangleq 0.52\,\text{kPa}$



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]
DN 50	72.2	25.0
DN 65	121.7	40.0
DN 80	158.5	54.0
DN 100	244.3	94.0
DN 125	351.3	144.0
DN 150	487.9	216.0
DN 200	780.6	376.0

Connection	K_{VS} [m³/h]	V_{max} [m³/h]
DN 250	1,096.4	576.0
DN 300	1,459.5	810.0
DN 350	1,790.3	1,000.0
DN 400	2,242.7	1,300.0
DN 450	2,687.9	1,700.0
DN 500	3,196.0	2,120.0
DN 600	4,416.7	3,060.0

Pressure loss calculation for all flow rates

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

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

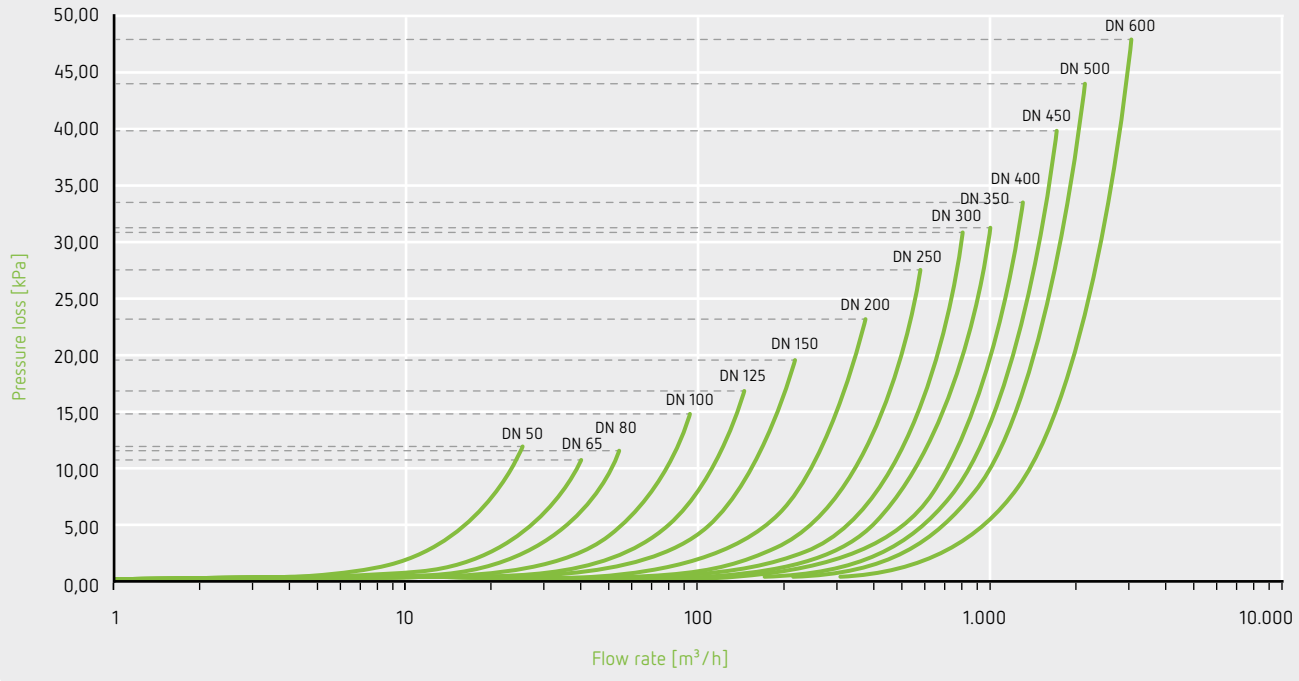
1. Volumetric flow calculation

$$\dot{V} = \frac{200\,\text{kW}}{4{,}2\,\text{kJ/kg} \cdot (12-7)\,\text{K}} \cdot 3{,}600\,\frac{\text{s}}{\text{h}} \cdot \frac{1\,\text{m}^3}{1{,}000\,\text{kg}}$$

$= 34.3\,\text{m}^3/\text{h} \rightarrow$ Selection based on table: DN 65
with $K_{VS} = 121.7\,\text{m}^3/\text{h}$

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

$= 7.94\,\text{kPa}$



Exvoid

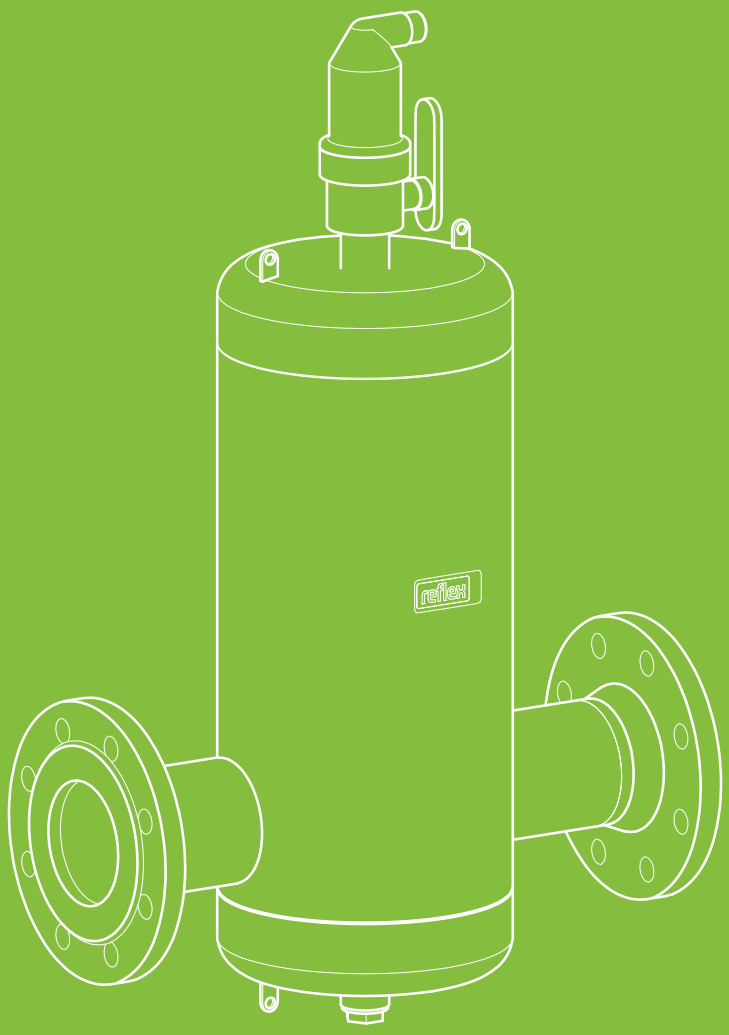
Key advantages

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

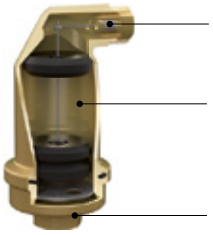
- Extracts circulating free air and gas bubbles from heating, solar and cooling systems and when filling and draining new and existing facilities
- Fully automatic continuous operation
- Generates only a minimal, constant pressure drop
- Enables much faster hydraulic balancing after filling processes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



Construction, function and installation

Exvoid T Large and quick vent valves

Construction



Non-leak, non-shut-off deaeration valve

Large air chamber absorbs pressure fluctuations and keeps dirt away from the deaeration valve.

Solid construction for a long service life

Exvoid T (brass type)

Exvoid T function principle

Exvoid T (brass type)

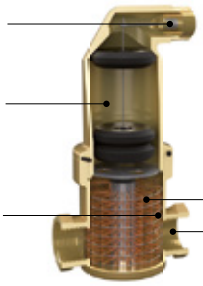
Intelligent design engineering guarantees permanently reliable automatic operation:

1. Gas is collected in a large chamber.
2. As a result, the water level in the chamber drops, taking a float down with it.
3. 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 Air and microbubble separator

Construction

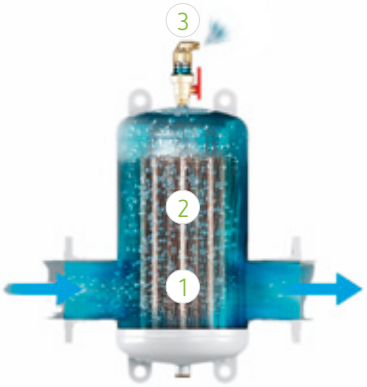


The Flowpac mesh tube construction that forms the core of the process has been tried and trusted for decades and assures optimum separation.

Numerous connection options: Threaded, welded or flange connections from FT ¾" to DN 600

Exvoid (brass type)

Exvoid function principle



Exvoid (steel type)

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

1. The cross section of the housing is larger than the connection dimensions, which reduces flow speed in the separator.
2. 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.
3. 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.

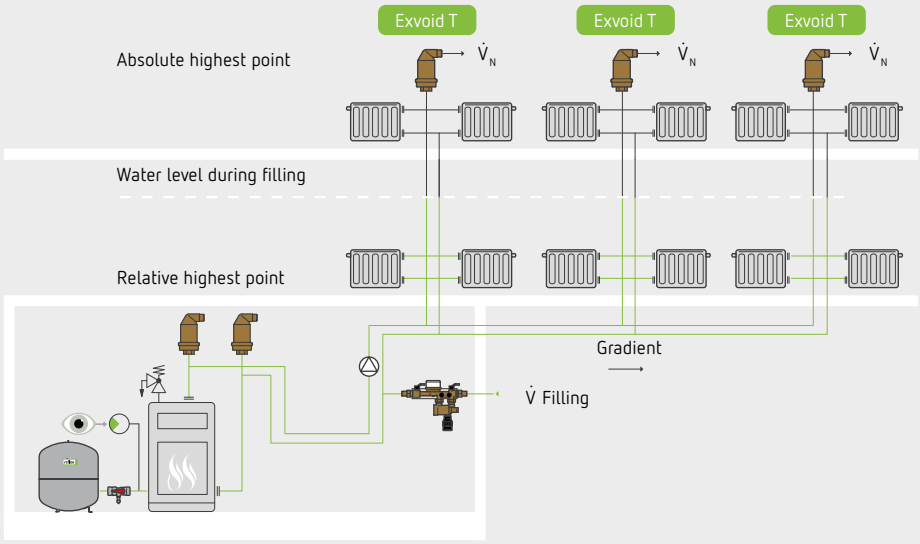
Exvoid T Large and quick vent valves

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.

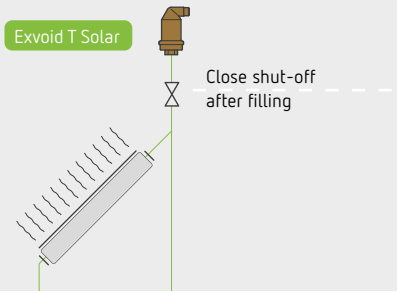
- Facilities must be carefully vented at the highest points during filling, e.g. using Exvoid T quick air vents. Exvoid T vents help to partially automate the venting process. They are used to vent boilers and ensure that the water is kept free from air and that heat transfer is optimised. At the end 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 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 spraytube 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

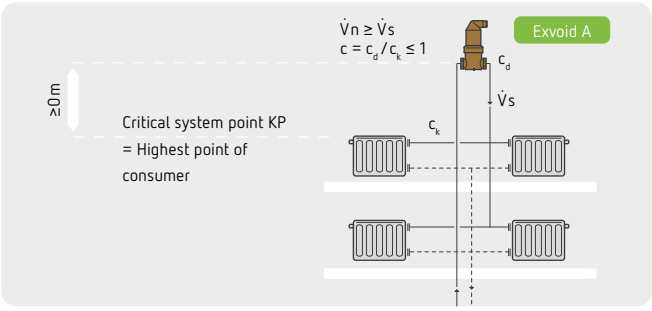
Exvoid T Large and quick vent valves

Installation

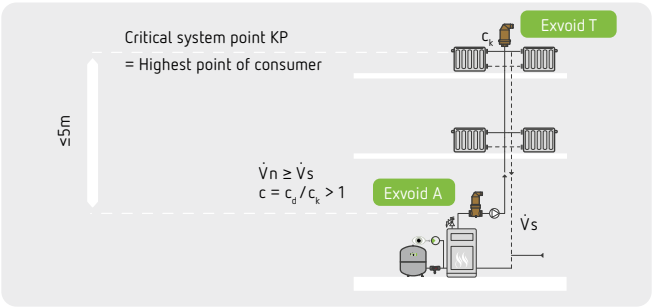
Installation location

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.

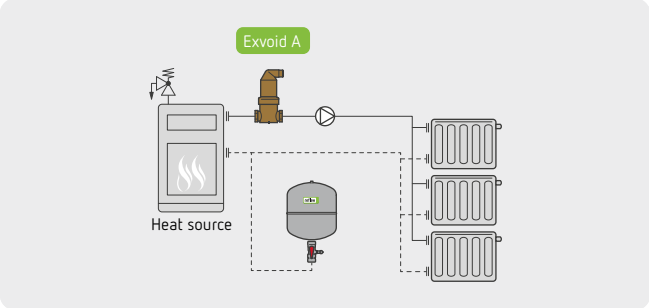
- Gas is released at higher pressures and temperatures. Micro-bubble separators therefore need to be installed at the hottest point; right after the boiler or mixing valve in a heating system and upstream of the cold generator in the return flow in a cooling system. Exvoid must be installed upstream 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.



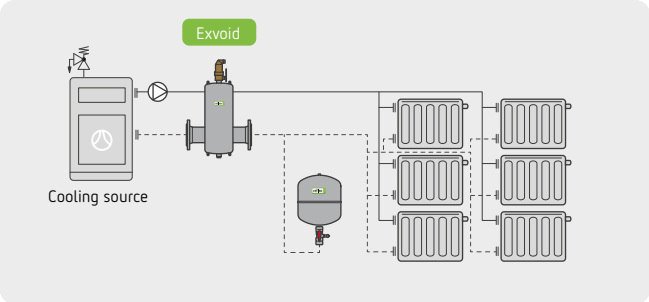
Exvoid A micro-bubble separator at the highest point (or higher)



Exvoid A micro-bubble separator beneath the highest point



Exvoid (brass) in a heating system



Exvoid (steel) in a cooling system

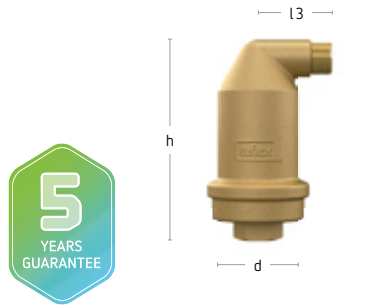
Observe the critical system point during installation
Critical system point (KP) describes the point during operation at which the greatest risk of bubble formation exists, which must, however, be prevented to avoid malfunctions. The pressure at the critical system point has been specified as 0.5 bar, 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 product portfolio

Exvoid T Large and quick vent valves



Exvoid T

Exvoid T function diagram

Technical Features

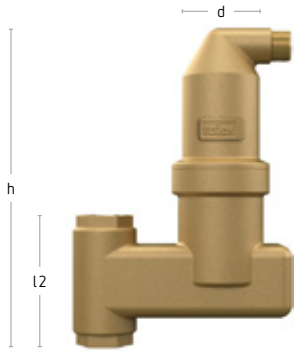
- brass casing
- venting valve tested four times for high operational safety
- for vertical assembly
- with ½" female thread and ⅜" male thread system connection, including a ½" male thread connection vent valve
- area of application: 110/180 °C & 10 bar
- water/glycol mixture up to a mixing ratio of 50/50 (min. 25 %)

	Type	Art. No.	Connection c	Ø d [mm]	Height h [mm]	Length l3 [mm]	Weight [kg]
Brass, vertical							
10 bar 110 °C	T ½	9250000	IG ½"	63	122	46	0,63
	T ⅜	9250038	AG ⅜"	63	132	46	0,73
solar, brass, vertical							
10 bar 180 °C	T ½ S	9250600	IG ½"	63	122	46	0,64
	T ⅜ S	9250638*	AG ⅜"	63	132	46	0,70

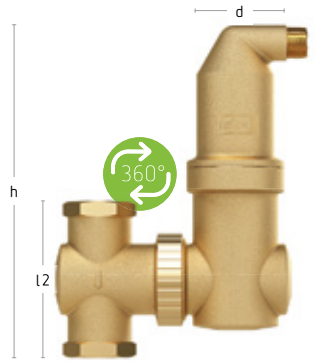
* on request

Exvoid air and microbubble separatror

Exvoid horizontal



Exvoid vertical



Exvoid Twist

Exvoid Brass cutaway model

Technical Features

- connection diameter: A 22 mm – 2" (DN 20 – DN 50)
- volume flow: 1,25 – 8,0 m^3/h (v ~ 1,0 m/s)
- Exiso heat insulation 22 mm – 2" (DN 20 – DN 50)
- brass casing
- area of application: 110/180 °C/10 bar (solar up to 180 °C)
- installation position:
  → horizontal/vertical
  → 360 ° variable rotation (non-ratcheting) by hand
- water/glycol mixture up to a mixing ratio of 50/50 (min. 25 %)

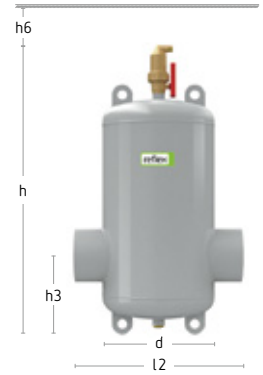
Exvoid air and microbubble separatror

CE

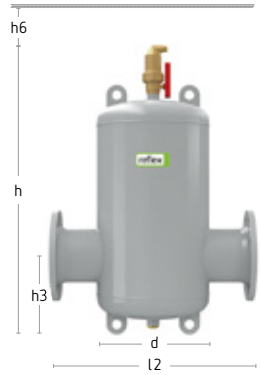
	Type	Art. No.	Connection c	V_{max} [m^3/h]	Ø d [mm]	Height h [mm]	Installation length l2 [mm]	Weight [kg]
Brass, horizontal								
10 bar 110 °C	A 22	9251000	22 mm	1,2	63	165	99	1,08
	A ¾	9251010	IG ¾"	1,2	63	165	85	1,03
	A 1	9251020	IG 1"	2,0	63	182	88	1,12
	A 1 ¼	9251030	IG 1 ¼"	3,8	63	202	88	1,23
	A 1 ½	9251040	IG 1 ½"	5,0	63	236	88	1,44
	A 2	9251050	IG 2"	7,5	100	277	112	3,18
Brass, vertical								
10 bar 110 °C	A ¾ V	9251510	IG ¾"	1,2	63	206	84	1,60
	A 1 V	9251520	IG 1"	2,0	63	206	84	1,57
solar, brass, horizontal								
10 bar 180 °C	A 22 S	9251600*	22 mm	1,2	63	165	99	1,14
	A ¾ S	9251610	IG ¾"	1,2	63	165	85	0,94
	A 1 S	9251620*	IG 1"	2,0	63	182	88	1,10
	A 1 ¼ S	9251630	IG 1 ¼"	3,7	63	202	88	1,40
	A 1 ½ S	9251640	IG 1 ½"	5,0	63	236	88	1,43
solar, brass, vertical								
10 bar 180 °C	A 22 S V	9251700	22 mm	1,2	63	216	104	1,67
	A ¾ S V	9251710	IG ¾"	1,2	63	206	84	1,90
	A 1 S V	9251720	IG 1"	2,0	63	206	84	1,90
Twist, brass, rotatable								
10 bar 110 °C	AT 22	9257200*	22 mm	1,2	63	218	109	1,88
	AT 28	9257210	28 mm	2,0	63	219	111	2,20
	AT ¾	9257220*	IG ¾"	1,2	63	207	85	1,90
	AT 1	9257230*	IG 1"	2,0	63	214	100	1,88
	AT 1 ¼	9257240*	IG 1 ¼"	3,8	63	264	100	2,60
	AT 1 ½	9257250*	IG 1 ½"	5,0	63	264	100	2,48

* on request

Exvoid air and microbubble separatror



Exvoid Steel welded connection



Exvoid Steel flange connection

Exvoid Steel cutaway model

Exvoid Steel cutaway model

Technical Features

- connection DN 50 – DN 300
- volume flow: 12,5 – 405 m^3/h
- Exiso heat insulation DN 50 – DN 150
- steel casing
- automatic venting with Exvoid T large and quick vent valve with integrated 3-way bottom part
- area of application: 110 °C / 10 bar, other sizes upon request
- water / glycol mixture up to a mixing ratio of 50 / 50 (min. 25 %)

Exvoid air and microbubble separatror

CE

	Type	Art. No.	Connection c	V_{max} [m^3/h]	Ø d [mm]	Height h [mm]	Height h3 [mm]	Height h6 [mm]	Installation length l2 [mm]	Weight [kg]
Steel, flange										
10 bar 110 °C	A 50	8251300	DN 50/PN 16	12,5	132	625	153	50	350	9,00
	A 65 *	8251310	DN 65/PN 16	20,0	132	625	163	50	350	10,00
	A 65	8251348	DN 65/PN 16	20,0	132	625	163	50	350	10,00
	A 80	8251320	DN 80/PN 16	27,0	206	740	159	50	470	16,00
	A 100	8251330	DN 100/PN 16	47,0	206	740	169	50	470	19,00
	A 125	8251340	DN 125/PN 16	72,0	354	915	214	50	635	35,00
	A 150	8251350	DN 150/PN 16	108,0	409	915	229	50	635	39,00
	A 200	8251360	DN 200/PN 16	180,0	409	1.125	284	50	775	65,00
	A 250	8251370	DN 250/PN 16	288,0	480	1.402	351	50	890	108,00
	A 300	8251380	DN 300/PN 16	405,0	634	1.612	406	50	1.005	158,00
Steel, welded connector										
10 bar 110 °C	A 60.3	8251100	60,3	12,5	132	625	153	50	260	3,00
	A 76.1	8251110	76,1	20,0	132	625	163	50	260	3,00
	A 88.9	8251120	88,9	27,0	206	740	159	50	370	9,00
	A 114.3	8251130	114,3	47,0	206	740	169	50	370	9,00
	A 139.7	8251140	139,7	72,0	354	915	214	50	525	22,00
	A 168.3	8251150	168,3	108,0	354	915	229	50	525	24,00
	A 219.1	8251160	219,1	180,0	409	1.125	284	50	650	44,00
	A 237.0	8251170	273,0	288,0	480	1.402	351	50	750	70,00
	A 323.9	8251180	323,9	405,0	634	1.612	406	50	850	112,00

other designs (higher operating temperatures, higher operating pressures) are available upon request.
* 4-hole flange connection

Exvoid Accessories

Exiso

- Exiso thermal insulation for brass separators
- comprising two shape-stable and temperature-stable, adaptable, form-fitting rigid foam semi-shells, with a snap closure

Exiso

- thermal insulation for Exvoid and Exdirt steel models
- comprising two shape-stable and temperature-stable, adaptable, form-fitting rigid foam semi-shells, with a snap closure
- not suitable for vertical separators, separators with a service flange and Extwin units

Type	Art. No.	Weight [kg]
Exiso for horizontal/vertical separators		
Exiso A/D 22 – 1 ½	9254811	0,07
Exiso A/D 2	9254801	0,14
Exiso for turnable separators Ex-Twist		
Exiso AT/DT/TWT 22 – 1	9583510	0,17
Exiso AT/DT 1 ¼ – 1 ½	9583530	0,25
thermal insulation for Exvoid and Exdirt steel models		
Exiso DN 50 – 65 (60.3 – 76.1)	9254831	0,40
Exiso DN 80 – 100 (88.9 – 114.3)	9254841	0,55
Exiso DN 125 – 150 (139.7 – 168.3)	9254851	2,20

Exdirt

Key advantages

Optimum dirt and sludge separation for enhanced operational reliability and efficiency

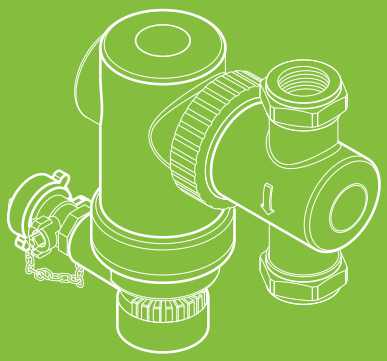
- Reliably removes circulating free dirt and sludge particles measuring up to 5 micrometres without energy consumption
- Ensures that components such as heat generators, thermostatic valves and pumps function perfectly and minimises the risk of defects and breakdowns in the long term
- Particle separation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

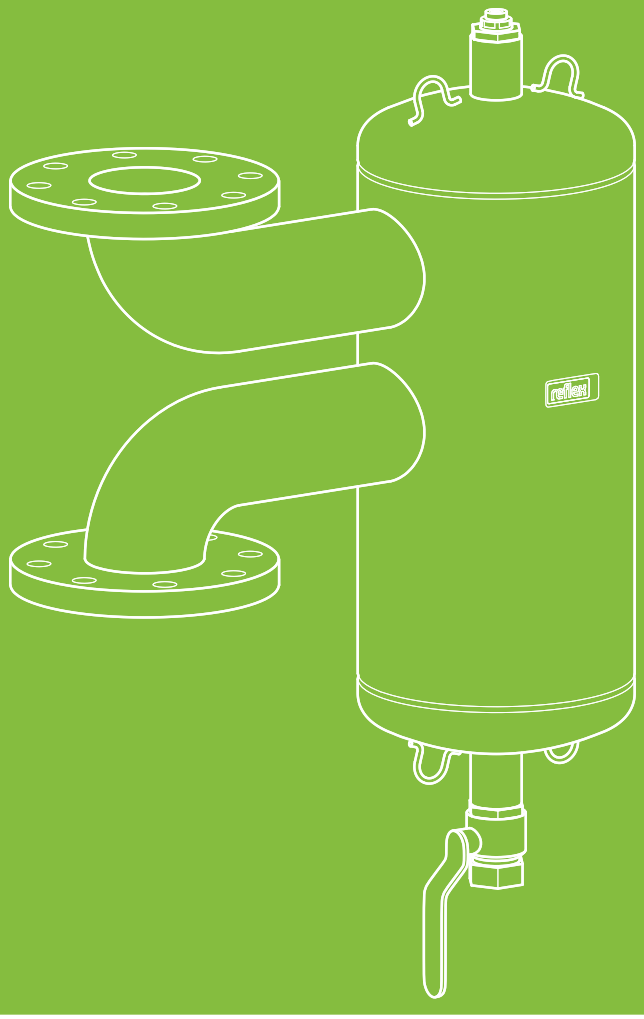
Less maintenance compared to conventional dirt traps

- 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

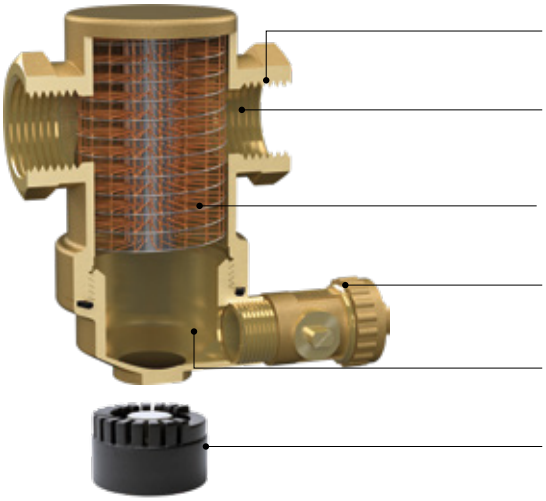
- Full range of operating pressures, temperatures and materials
- Special designs for higher flow rates, operating pressures and operating temperatures available on request





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.

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

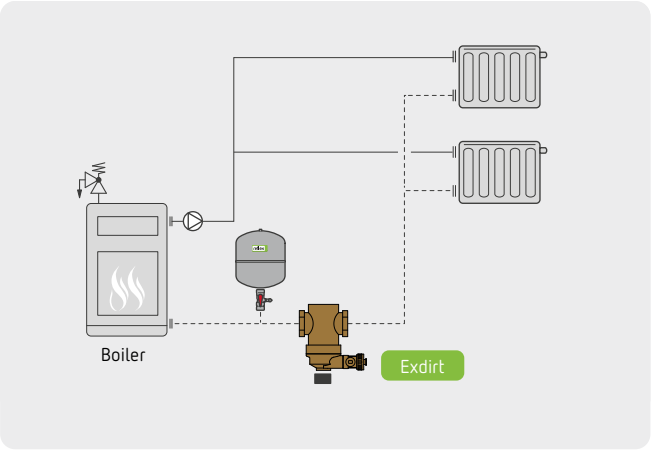
Exdirt dirt and sludge separator

Installation

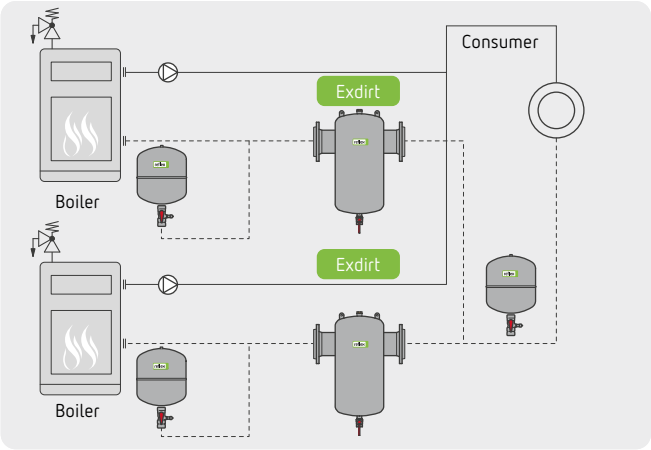
Installation location

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.

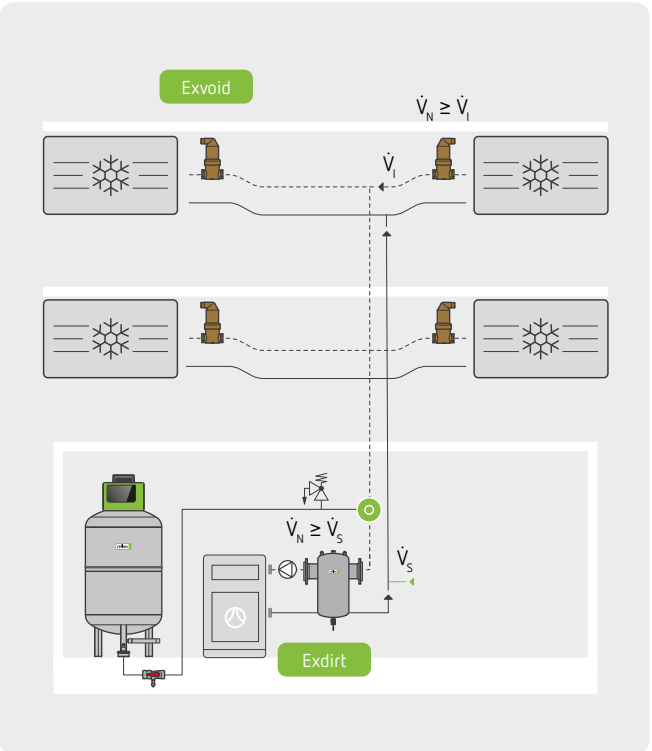
- The maintenance interval depends on the amount of dirt transported in the system. We recommend initial inspection after four weeks and a documented service at least once a year.



Exdirt (brass) in a heating system



Exdirt (steel) in a heating system



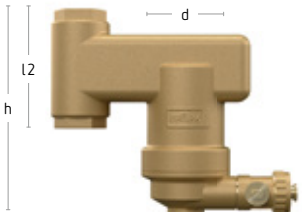
Central sludge separation with Exdirt dirt and sludge separator in a cooling system.

- 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.

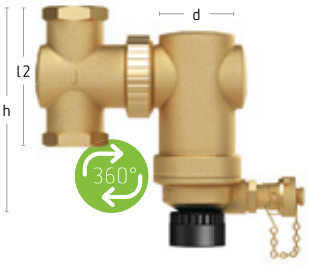
Exdirt product portfolio

Exdirt dirt and sludge separator CE

Exdirt M horizontal with EasyClip



Exdirt vertical



Exdirt Twist M with EasyClip

Exdirt Brass with EasyClip cutaway model

Technical Features

- connection diameter: 22 mm – 2" (DN 20 – DN 50)
- volume flow: 1,25 – 8,0 m^3/h (v ~ 1,0 m/s)
- Exiso heat insulation: 22 mm – 2" (DN 20 – DN 50)
- brass casing
- area of application: 110 °C/10 bar
- installation position:
  → horizontal/vertical
  → 360 °, variable rotation (non-ratcheting) by hand
- water/glycol mixture up to a mixing ratio of 50/50 (min. 25 %)
- removes circulating free dirt and sludge particles down to 5 µm
- **Exferro Easy Clip high-performance magnet:** 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

Exdirt dirt and sludge separator

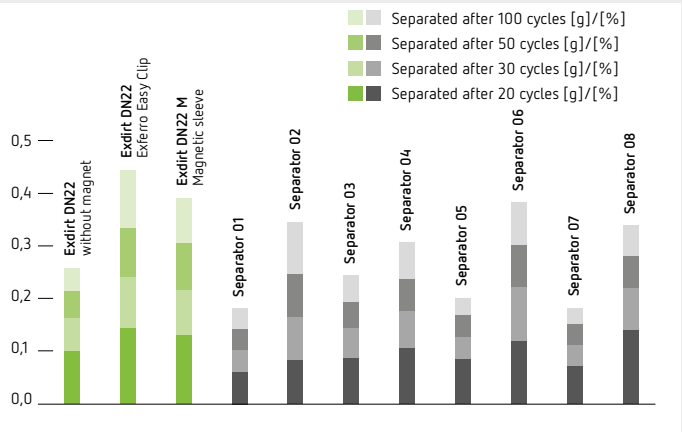
CE

	Type	Art. No.	Connection c	V_{max} [m³/h]	Ø d [mm]	Height h [mm]	Installation length l2 [mm]	Weight [kg]
Plug-in magnet, brass, horizontal								
10 bar 110 °C	D 22 M	9256600*	22 mm	1,2	63	122	106	0,90
	D ¾ M	9256610	IG ¾"	1,2	63	122	85	1,00
	D 1 M	9256620	IG 1"	2,0	63	139	88	1,20
	D 1 ¼ M	9256630	IG 1 ¼"	3,7	63	159	88	1,30
	D 1 ½ M	9256640	IG 1 ½"	5,0	63	193	88	1,50
	D 2 M	9256650	IG 2"	7,5	100	234	132	3,02
Plug-in magnet, brass, vertical								
10 bar 110 °C	D ¾ VM	9256710	IG ¾"	1,2	63	163	84	1,80
	D 1 VM	9256720	IG 1"	2,0	63	163	84	1,80
Brass, horizontal								
10 bar 110 °C	D 22	9252000	22 mm	1,2	63	103	106	0,92
	D ¾	9252010	IG ¾"	1,2	63	103	85	1,00
	D 1	9252020	IG 1"	2,0	63	120	88	1,20
	D 1 ¼	9252030	IG 1 ¼"	3,7	63	140	88	1,12
	D 1 ½	9252040	IG 1 ½"	5,0	63	174	88	1,32
	D 2	9252050	IG 2"	7,5	100	215	132	3,10
Brass, vertical								
10 bar 110 °C	D 22 V	9252500*	22 mm	1,2	63	154	104	1,58
	D ¾ V	9252510	IG ¾"	1,2	63	144	84	1,80
	D 1 V	9252520	IG 1"	2,0	63	144	84	1,61
Twist, plug-in magnet, brass, rotatable								
10 bar 110 °C	DT 22 M	9257300*	22 mm	1,2	63	176	109	1,98
	DT 28 M	9257310	28 mm	2,0	63	177	111	2,10
	DT ¾ M	9257320	IG ¾"	1,2	63	164	85	1,83
	DT 1 M	9257330	IG 1"	2,0	63	171	100	1,97
	DT 1 ¼ M	9257340	IG 1 ¼"	3,8	63	221	100	2,32
	DT 1 ½ M	9257350	IG 1 ½"	5,0	63	221	100	2,48

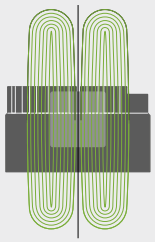
* on request

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.

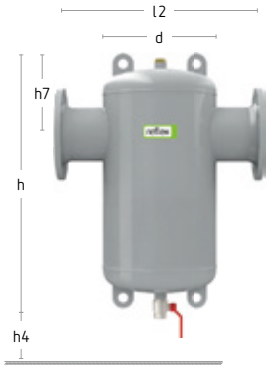


Field line curve of Exferro Easy Clip

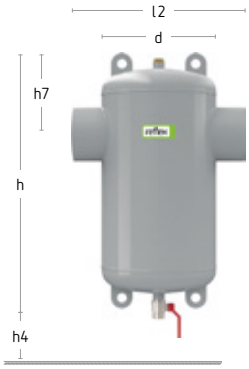


The strength of the magnetic field exerts maximum impact on the fluid in the separator, enabling the optimum separation of ferromagnetic dirt particles.

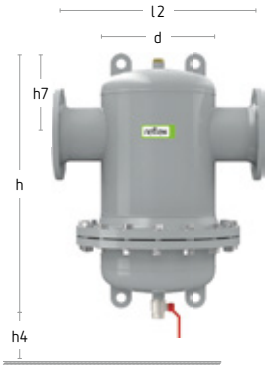
Exdirt dirt and sludge separator



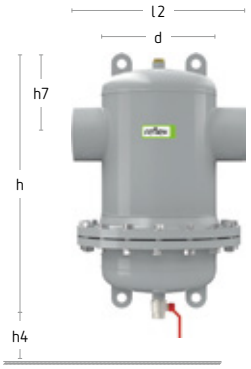
Exdirt Steel flange connection



Exdirt Steel welded connection



Exdirt R Steel flange connection with service flange



Exdirt R Steel welded connection with service flange

Exdirt Steel cutaway model

Exdirt Steel function diagram

Technical Features

- connection: DN 50 – DN 300
- volume flow: 12,5 – 405 m³/h
- Exiso heat insulation DN 50 – DN 150, for models without service flange
- steel casing
- optional: Exferro high-power magnet for optimum separation of ferromagnetic dirt particles such as magnetite
- area of application: 110 °C/10 bar, other sizes upon request
- water/glycol mixture up to a mixing ratio of 50/50 (min. 25 %)

Exdirt dirt and sludge separator

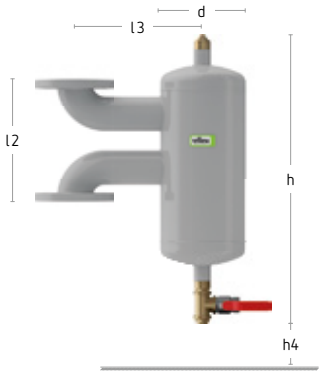
CE

	Type	Art. No.	Connection c	V_{max} [m³/h]	Ø d [mm]	Height h [mm]	Height h7 [mm]	Height h4 [mm]	Installation length l2 [mm]	Weight [kg]
Steel, flange										
10 bar 110 °C	D 50	8252300	DN 50/PN 16	12,5	132	521	165	370	350	9,10
	D 65 *	8252310	DN 65/PN 16	20,0	132	521	175	370	350	10,30
	D 65	8252318	DN 65/PN 16	20,0	132	521	175	370	350	10,30
	D 80	8252320	DN 80/PN 16	27,0	206	636	170	370	470	17,60
	D 100	8252330	DN 100/PN 16	47,0	206	636	180	370	470	19,00
	D 125	8252340	DN 125/PN 16	72,0	354	811	225	430	635	35,00
	D 150	8252350	DN 150/PN 16	108,0	354	811	240	430	635	39,00
	D 200	8252360	DN 200/PN 16	180,0	409	1.021	295	430	775	65,00
	D 250	8252370	DN 250/PN 16	288,0	480	1.324	385	500	890	108,00
	D 300	8252380	DN 300/PN 16	405,0	634	1.535	413	500	1.005	156,00
Steel, flange, service flange										
10 bar 110 °C	D 50 R	8252400	DN 50/PN 16	12,5	132	521	165	370	350	18,00
	D 65 R*	8252410	DN 65/PN 16	20,0	132	521	175	370	350	19,00
	D 65 R	8252418	DN 65/PN 16	20,0	132	521	175	370	350	19,00
	D 80 R	8252420	DN 80/PN 16	27,0	206	636	170	430	470	43,00
	D 100 R	8252430	DN 100/PN 16	47,0	206	636	180	430	470	51,00
	D 125 R	8252440	DN 125/PN 16	72,0	354	811	225	550	635	89,00
	D 150 R	8252450	DN 150/PN 16	108,0	354	811	240	550	635	94,00
	D 200 R	8252460	DN 200/PN 16	180,0	409	1.021	295	650	775	121,00
	D 250 R	8252470	DN 250/PN 16	288,0	480	1.324	358	850	890	255,00
	D 300 R	8252480	DN 300/PN 16	405,0	634	1.535	413	1.000	1.005	390,00
Steel, welded connector										
10 bar 110 °C	D 60.3	8252100	60,3	12,5	132	521	165	370	260	4,10
	D 76.1	8252110	76,1	20,0	132	521	175	370	260	4,30
	D 88.9	8252120	88,9	27,0	206	636	170	370	370	9,70
	D 114.3	8252130	114,3	47,0	206	636	180	370	370	10,20
	D 139.7	8252140	139,7	72,0	354	811	225	430	525	25,50
	D 168.3	8252150	168,3	108,0	354	811	240	430	525	26,80
	D 219.1	8252160	219,1	180,0	409	1.021	295	430	650	44,00
	D 273.0	8252170	273,0	288,0	480	1.324	358	500	750	70,00
	D 323.9	8252180	323,9	405,0	634	1.535	413	500	850	112,00
Steel, welded connector, service flange										
10 bar 110 °C	D 60.3 R	8252200	60,3	12,5	132	521	165	370	260	16,00
	D 76.1 R	8252210	76,1	20,0	132	521	175	370	260	23,00
	D 88.9 R	8252220	88,9	27,0	206	636	170	430	370	32,00
	D 114.3 R	8252230	114,3	47,0	206	636	180	430	370	37,00
	D 139.7 R	8252240	139,7	72,0	354	811	225	550	525	85,00
	D 168.3 R	8252250	168,3	108,0	354	811	240	550	525	78,00
	D 219.1 R	8252260	219,1	180,0	409	1.021	295	650	650	111,00
	D 273.0 R	8252270	273,0	288,0	480	1.324	358	850	750	158,00
	D 323.9 R	8252280	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.

* 4-hole flange connection

Exdirt V dirt and sludge separator for vertical installation



Exdirt V

Technical Features

- connection: DN 50 – DN 150 PN 6/PN 16
- standard installation length F1 according to DIN EN 558:2017-05
- an existing dirt trap can be replaced on a one-to-one basis (before replacement, all the installed devices must be checked for the technology to be used)
- drain connection/venting connection: G 1"
- max. permissible operating overpressure: 10 bar
- max. permissible operating temperature: 110 °C
- other sizes upon request
- volume flow: 12,5 – 108 m^3/h
- water/glycol mixture up to a mixing ratio of 50/50 (min. 25 %)
- removal of particles up to 5 micrometres in size
- works without filter elements
- no clogging, rather permanently free flow opening for the system water
- cleaning without interruption of operation
- optional: Exferro high-power magnet for optimum separation of ferromagnetic dirt particles such as magnetite

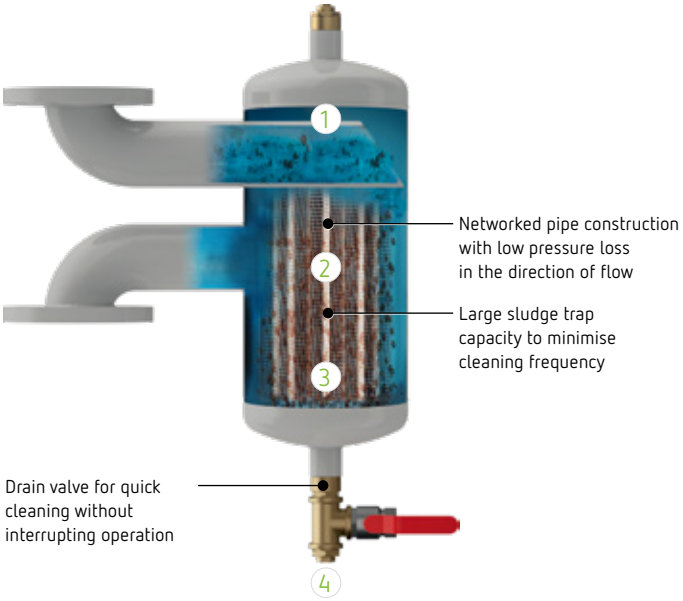
Exdirt V dirt and sludge separator for vertical installation CE

	Type	Art. No.	Connection c	V_{max} [m³/h]	Ø d [mm]	Height h [mm]	Height h4 [mm]	Installation length l2 [mm]	Length l3 [mm]	Weight [kg]
Steel, flange										
6 bar 110 °C	D 50 V F1	8259501	DN 50/PN 6	12,5	206	569	370	230	296	12,20
	D 65 V F1	8259511	DN 65/PN 6	20,0	206	617	370	290	306	15,80
	D 80 V F1	8259521	DN 80/PN 6	27,0	206	667	370	310	313	19,70
	D 100 V F1	8259531	DN 100/PN 6	47,0	206	717	370	350	323	24,40
	D 125 V F1	8259541	DN 125/PN 6	72,0	354	968	430	400	412	59,10
	D 150 V F1	8259551	DN 150/PN 6	108,0	354	1.018	430	480	430	67,20
10 bar 110 °C	D 50 V F1	8259500	DN 50/PN 16	12,5	206	569	370	230	296	16,10
	D 65 V F1	8259510	DN 65/PN 16	20,0	206	617	370	290	306	16,90
	D 80 V F1	8259520	DN 80/PN 16	27,0	206	667	370	310	313	21,70
	D 100 V F1	8259530	DN 100/PN 16	47,0	206	717	370	350	323	26,60
	D 125 V F1	8259540	DN 125/PN 16	72,0	354	968	430	400	412	62,20
	D 150 V F1	8259550	DN 150/PN 16	108,0	354	1.018	430	480	430	71,80

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

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.



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 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

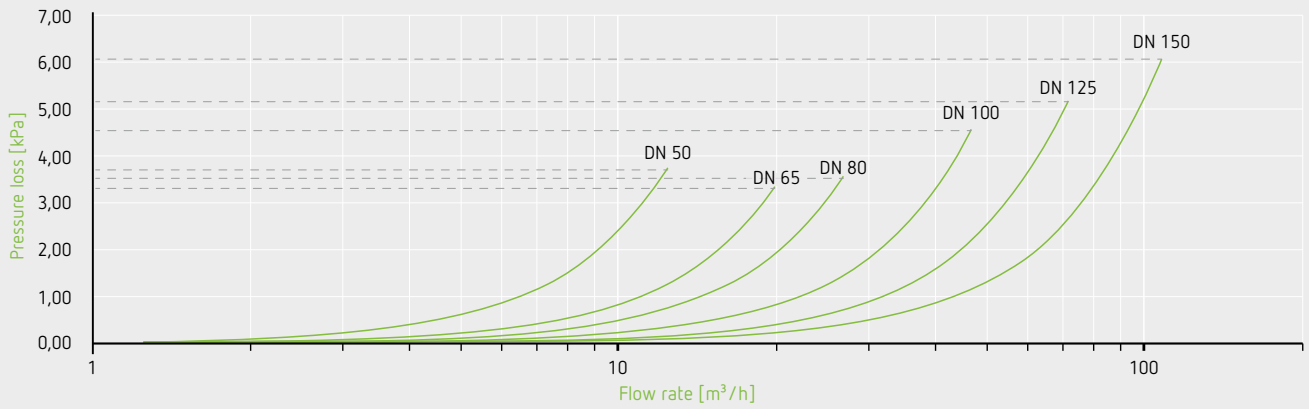
1. Volumetric flow calculation

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

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

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

$= 0{,}508\,\text{kPa}$



Exdirt Accessories

Exiso

- Exiso thermal insulation for brass separators
- comprising two shape-stable and temperature-stable, adaptable, form-fitting rigid foam semi-shells, with a snap closure

Exferro

- magnetic insert for Exdirt and Extwin made of steel for collecting ferromagnetic particles during sludge and dirt separation
- magnetic rod screwed into immersion coupling/T-piece

Exiso

- thermal insulation for Exvoid and Exdirt steel models
- comprising two shape-stable and temperature-stable, adaptable, form-fitting rigid foam semi-shells, with a snap closure
- not suitable for vertical separators, separators with a service flange and Extwin units

Exvoid

- for Exvoid air and microbubble separator made from steel with 3-way valve bottom part
- can be shut off for easy replacement without having to interrupt operation; optional supplementary kit for dirt and sludge separators
- bypass can be used to flush the separator or as a filling and emptying connection

Type	Art. No.	Weight [kg]
Exiso for horizontal/vertical separators		
Exiso A/D 22 – 1 ½	9254811	0,07
Exiso A/D 2	9254801	0,14
Exiso for turnable separators Ex-Twist		
Exiso AT/DT/TWT 22 – 1	9583510	0,17
Exiso AT/DT 1 ¼ – 1 ½	9583530	0,25
Exvoid T		
Exvoid T 1	9255805	1,40
Exferro magnetic insert for steel Exdirt and Extwin		
Exferro D/TW 50 – 65 (60.3 – 76.1)	9258340	0,93
Exferro D/TW 80 – 100 (88.9 – 114.3)	9258350	1,40
Exferro D/TW 125 – 150 (139.7 – 168.3)	9258360	0,74
Exferro D/TW 200 (219.1)	9258370	0,80
Exferro D/TW 250 – 300 (273.0 – 323.9)	9258380	4,70
thermal insulation for Exvoid and Exdirt steel models		
Exiso DN 50 – 65 (60.3 – 76.1)	9254831	0,40
Exiso DN 80 – 100 (88.9 – 114.3)	9254841	0,55
Exiso DN 125 – 150 (139.7 – 168.3)	9254851	2,20

Extwin

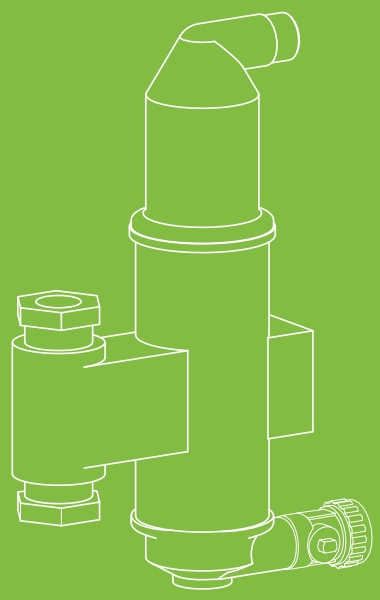
Key advantages

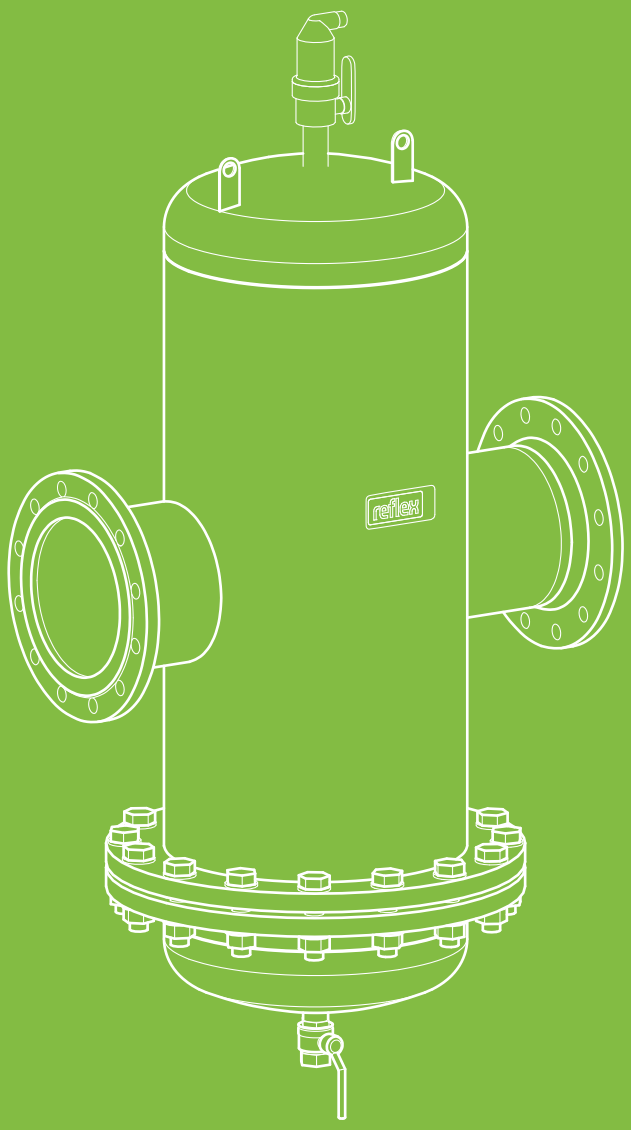
Combines the protective functions of Reflex Exvoid and Exdirt in a single component

- 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

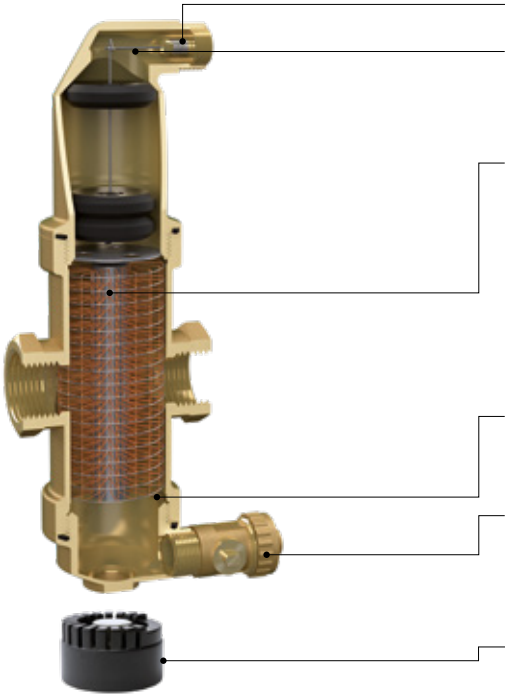
- Fast online maintenance and desludging without having to interrupt operation
- No shut-off valves or bypasses needed





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 ¾" to DN 600.

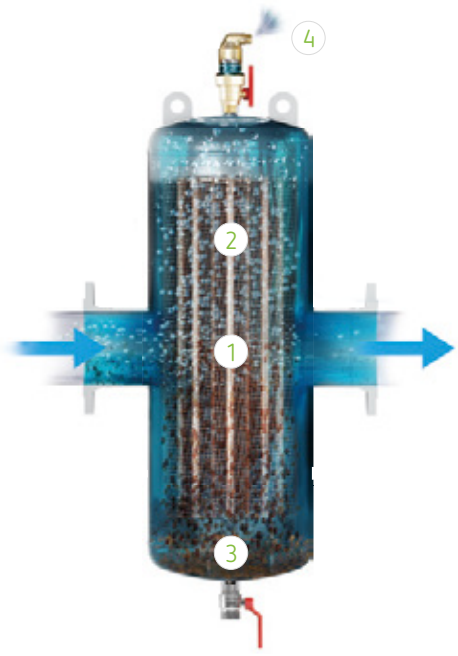
Large sludge trap capacity extends cleaning intervals.

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



Steel type

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.

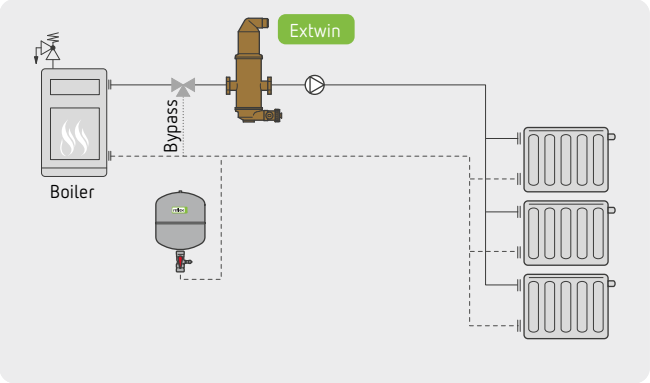
Extwin combined microbubble, dirt and sludge separator

Installation

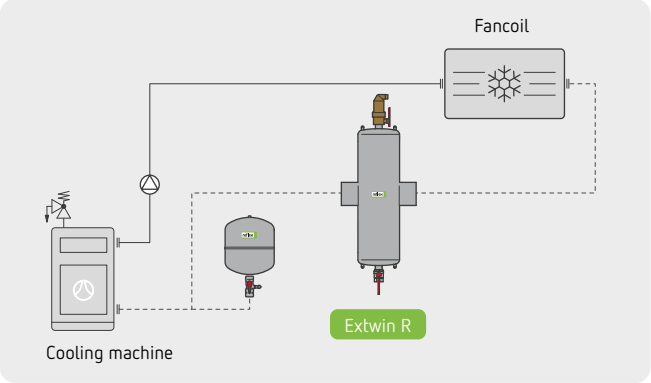
Installation location

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.

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 10 m). To ensure effective sludge and micro-bubble separation, we recommend the use of both Exvoid and Exdirt.



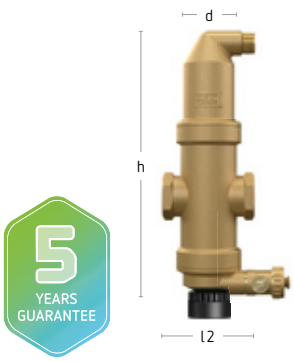
Extwin (brass) in a heating system where micro-bubble separation is the top priority



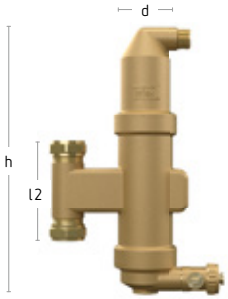
Extwin (steel) in a cooling system where the top priority is dirt and sludge separation combined with micro-bubble separation.

Extwin product portfolio

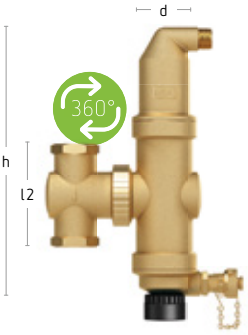
Extwin combined microbubble, dirt and sludge separator CE



Extwin M horizontal with EasyClip



Extwin vertical



Extwin Twist M with EasyClip

Extwin Brass with EasyClip cutaway model

Technical Features

- connection variants: thread/clamping ring
- connection diameter: 22 mm – 1" (DN 20 – DN 25)
- volume flow: 1,25 – 2,0 m^3/h (v ~ 1,0 m/s)
- brass casing
- installation position:
  → horizontal/vertical
- area of application: 110 °C/10 bar
- water/glycol mixture up to a mixing ratio of 50/50 (min. 25 %)
- **Exferro Easy Clip high-performance magnet:** 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

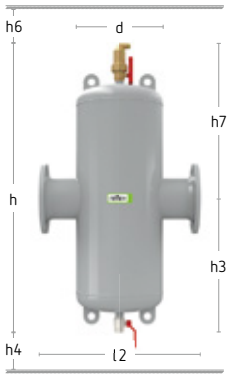
Extwin combined microbubble, dirt and sludge separator

CE

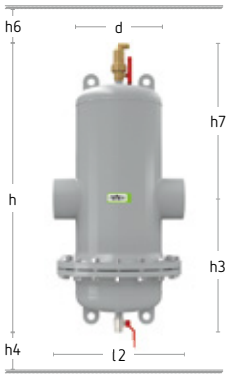
	Type	Art. No.	Connection c	V_{max} [m³/h]	Ø d [mm]	Height h [mm]	Installation length l2 [mm]	Weight [kg]
Plug-in magnet, brass, horizontal								
10 bar 110 °C	TW 22 M	9257600	22 mm	1,2	63	275	106	1,80
	TW 1 M	9257610	IG 1"	2,0	63	275	88	1,70
Plug-in magnet, brass, vertical								
10 bar 110 °C	TW 22 V-M	9257700	22 mm	1,2	63	285	98	1,90
Brass, horizontal								
10 bar 110 °C	TW 22	9253000	22 mm	1,2	63	256	106	1,80
	TW 1	9253010	IG 1"	2,0	63	259	88	1,63
Brass, vertical								
10 bar 110 °C	TW 22 V	9253500	22 mm	1,2	65	266	98	2,10
Twist, plug-in magnet, rotatable								
10 bar 110 °C	TWT 22 M	9257100*	22 mm	1,2	63	285	109	2,54
	TWT 28 M	9257110*	28 mm	2,0	63	285	111	2,67
	TWT ¾ M	9257120	IG ¾"	1,2	63	285	85	2,40
	TWT 1 M	9257130	IG 1"	2,0	63	285	100	2,50
	TWT 1 ¼ M	9257140	IG 1 ¼"	3,8	63	285	100	2,87
	TWT 1 ½ M	9257150	IG 1 ½"	5,0	63	285	100	3,03

* on request

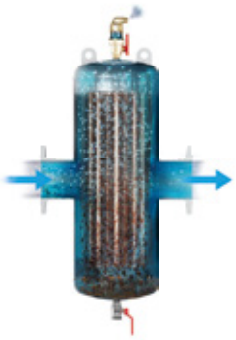
Extwin combined microbubble, dirt and sludge separator



Extwin Steel flange connection



Extwin Steel welded connection with service flange



Extwin function diagram

Technical Features

- models with service flange have a removable bottom part for easier maintenance
- connection: DN 50 – DN 300
- volume flow: 12,5 – 405 m³/h
- area of application: 110 °C/10 bar
- automatic venting with Exvoid T large and quick vent valve with integrated 3-way bottom part
- optional: Exferro high-power magnet for optimum separation of ferromagnetic dirt particles such as magnetite
- water/glycol mixture up to a mixing ratio of 50/50 (min. 25 %)

	Type	Art. No.	Connection c	V_{max} [m³/h]	Ø d [mm]	Height h [mm]	Height h3 [mm]	Height h7 [mm]	Height h6 [mm]	Height h4 [mm]	Installation length l2 [mm]	Weight [kg]
Steel, flange												
10 bar 110 °C	TW 50	8253300	DN 50/PN 16	12,5	132	785	450	335	50	370	350	10,00
	TW 65 *	8253310	DN 65/PN 16	20,0	132	785	450	335	50	370	350	10,00
	TW 65	8253319	DN 65/PN 16	20,0	132	785	450	335	50	370	350	10,00
	TW 80	8253320	DN 80/PN 16	27,0	206	940	527	413	50	370	470	19,50
	TW 100	8253330	DN 100/PN 16	47,0	206	940	527	413	50	370	470	32,50
	TW 125	8253340	DN 125/PN 16	72,0	354	1.200	658	542	50	430	635	41,00
	TW 150	8253350	DN 150/PN 16	108,0	354	1.200	658	542	50	430	635	47,40
	TW 200	8253360	DN 200/PN 16	180,0	409	1.470	792	678	50	430	775	79,00
	TW 250	8253370	DN 250/PN 16	288,0	480	1.916	1.001	915	50	500	890	156,00
	TW 300	8253380	DN 300/PN 16	405,0	634	2.237	1.161	1.076	50	500	1.005	229,00

Extwin combined microbubble, dirt and sludge separator

CE

	Type	Art. No.	Connection c	V_{max} [m³/h]	Ø d [mm]	Height h [mm]	Height h3 [mm]	Height h7 [mm]	Height h6 [mm]	Height h4 [mm]	Installation length l2 [mm]	Weight [kg]
Steel, flange, service flange												
10 bar 110 °C	TW 50 R	8253400	DN 50/PN 16	12,5	132	785	450	335	50	370	350	18,00
	TW 65 R *	8253410	DN 65/PN 16	20,0	132	785	450	335	50	370	350	19,00
	TW 65 R	8253418	DN 65/PN 16	20,0	132	785	450	335	50	370	350	19,00
	TW 80 R	8253420	DN 80/PN 16	27,0	206	940	527	413	50	550	470	43,00
	TW 100 R	8253430	DN 100/PN 16	47,0	206	940	527	413	50	550	470	51,00
	TW 125 R	8253440	DN 125/PN 16	72,0	354	1.200	658	542	50	750	635	89,00
	TW 150 R	8253450	DN 150/PN 16	108,0	354	1.200	658	542	50	750	635	94,00
	TW 200 R	8253460	DN 200/PN 16	180,0	409	1.470	792	678	50	1.000	775	138,00
	TW 250 R	8253470	DN 250/PN 16	288,0	480	1.916	1.001	915	50	1.350	890	355,00
	TW 300 R	8253480	DN 300/PN 16	405,0	634	2.237	1.161	1.076	50	1.850	1.005	500,00
Steel, welded connector												
10 bar 110 °C	TW 60.3	8253100	60,3	12,5	132	785	450	335	50	370	260	4,00
	TW 76.1	8253110	76,1	20,0	132	785	450	335	50	370	260	5,00
	TW 88.9	8253120	88,9	27,0	206	940	527	413	50	370	370	12,00
	TW 114.3	8253130	114,3	47,0	206	940	527	413	50	370	370	14,00
	TW 139.7	8253140	139,7	72,0	354	1.200	658	542	50	430	525	34,00
	TW 168.3	8253150	168,3	108,0	354	1.200	658	542	50	430	525	31,00
	TW 219.1	8253160	219,1	180,0	409	1.470	792	678	50	430	650	113,00
	TW 273.0	8253170	273,0	288,0	480	1.916	1.001	915	50	500	750	215,00
	TW 323.9	8253180	323,9	405,0	634	2.237	1.161	1.076	50	500	850	265,00
Steel, welded connector, service flange												
10 bar 110 °C	TW 60.3 R	8253200	60,3	12,5	132	785	450	335	50	370	260	13,00
	TW 76.1 R	8253210	76,1	20,0	132	785	450	335	50	370	260	13,00
	TW 88.9 R	8253220	88,9	27,0	206	940	527	413	50	550	370	34,00
	TW 114.3 R	8253230	114,3	47,0	206	940	527	413	50	550	370	38,00
	TW 139.7 R	8253240	139,7	72,0	354	1.200	658	542	50	750	525	102,00
	TW 168.3 R	8253250	168,3	108,0	354	1.200	658	542	50	750	525	78,00
	TW 219.1 R	8253260	219,1	180,0	409	1.470	792	678	50	1.000	650	182,00
	TW 273.0 R	8253270	273,0	288,0	480	1.916	1.001	915	50	1.350	750	180,00
	TW 323.9 R	8253280	323,9	405,0	634	2.237	1.161	1.076	50	1.850	850	450,00

other designs (higher operating temperatures, higher operating pressures) are available upon request.
* 4-hole flange connection

Extwin Accessories

Exiso

- Exiso thermal insulation for brass separators
- comprising two shape-stable and temperature-stable, adaptable, form-fitting rigid foam semi-shells, with a snap closure

Exferro

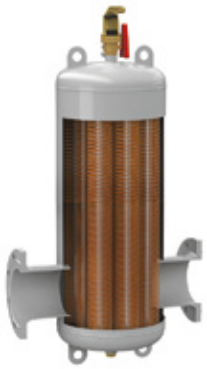
- magnetic insert for Exdirt and Extwin made of steel for collecting ferromagnetic particles during sludge and dirt separation
- magnetic rod screwed into immersion coupling/T-piece

Exvoid

- for Exvoid air and microbubble separator made from steel with 3-way valve bottom part
- can be shut off for easy replacement without having to interrupt operation; optional supplementary kit for dirt and sludge separators
- bypass can be used to flush the separator or as a filling and emptying connection

Type	Art. No.	Weight [kg]
Exiso for turnable separators Ex-Twist		
Exiso AT/DT/TWT 22 – 1	9583510	0,17
Exiso TWT 1 ¼ – 1 ½	9583520	0,16
Exvoid T		
Exvoid T 1	9255805	1,40
Exferro magnetic insert for steel Exdirt and Extwin		
Exferro D/TW 50 – 65 (60.3 – 76.1)	9258340	0,93
Exferro D/TW 80 – 100 (88.9 – 114.3)	9258350	1,40
Exferro D/TW 125 – 150 (139.7 – 168.3)	9258360	0,74
Exferro D/TW 200 (219.1)	9258370	0,80
Exferro D/TW 250 – 300 (273.0 – 323.9)	9258380	4,70

Exvoid HC, Exdirt HC and Extwin HC

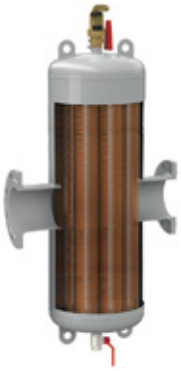


Exvoid HC flange connection cutaway model

Exvoid HC welded connection

Exdirt HC flange connection cutaway model

Exdirt HC welded connection with service flange



Extwin HC flange connection cutaway model

Extwin HC welded connection with service flange

Technical Features

- all Reflex steel separators are available as a Hi-Cap version in addition to the standard configuration
- the Hi-Cap configuration delivers high volumetric flows and is used for flow speeds of 1.5 m/s to 3.0 m/s
- higher flow speeds and thus higher flow rates cause the flow characteristics to change on entry into the body. The flow and idle zones shift. Enlarging the body enables the best possible consideration of this change in flow behaviour to ensure that continued maximum separation performance is still guaranteed in the high flows
- prices and delivery times available on request

Accessories and add-on products

Separation technology accessories

Expansion trap

- expansion traps are installed in the discharge pipe of safety valves and are used to separate the steam and water phases. A water drain pipe must be connected at the low point of the expansion trap that can safely and easily remove escaping heating water. The steam discharge pipe must be routed from the high point of the expansion trap to the outside.
- for the connection to the safety valves of heat generators to separate water/vapour mixtures according to DIN EN 12828
- area of application: 110 °C/10 bar
- for installation in the blow-off line directly alongside the safety valve

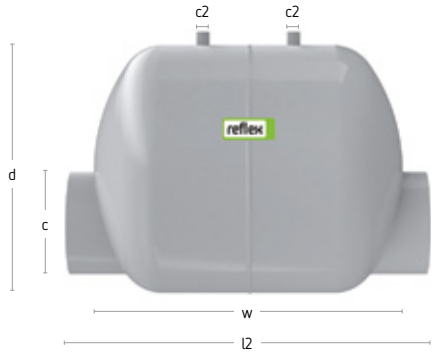
	Type	Art. No. grey	Volume [l]	Connection c/c2/c3	Ø d [mm]	Height h [mm]	Weight [kg]
10 bar 110 °C	T 170	8680000	8	DN 50/65/65	206	328	3,15
	T 270	8681000	17	DN 65/80/80	280	400	5,00
	T 380	8682000	42	DN 80/100/100	409	528	11,00
	T 480	8683000	93	DN 125/150/150	480	710	19,45
	T 550	8684000	199	DN 150/200/200	634	896	32,30

other sizes upon request

Separation technology accessories

Air separator

- for the separation of gas bubbles in fluid circuits
- for low static pressures in particular
- with welded connection
- grey-coated
- max. permissible operating temperature: 110 °C
- max. permissible operating overpressure: 10 bar
- number of sleeves:
  → LA 32 – 50: 1 sleeve
- LA 65 – 200: 2 sleeves

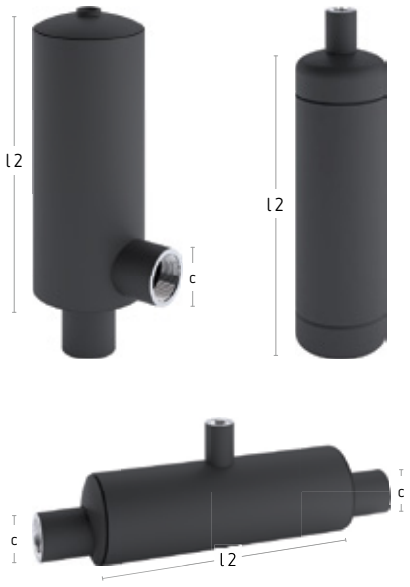


	Type	Art. No. grey	Number of couplings [pce]	Connection c	Connection c2	Ø d [mm]	Width w [mm]	Installation length l2 [mm]	Weight [kg]
10 bar 110 °C	LA 32	8671000	1	DN 32/PN 16	Rp ⅜"	206	278	300	2,40
	LA 40	8672000	1	DN 40/PN 16	Rp ⅜"	206	278	300	2,50
	LA 50	8673000	1	DN 50/PN 16	Rp ⅜"	206	278	300	2,60
	LA 65	8674000	2	DN 65/PN 16	Rp ⅜"	280	355	395	4,40
	LA 80	8675000	2	DN 80/PN 16	Rp ⅜"	280	355	395	4,50
	LA 100	8676000	2	DN 100/PN 16	Rp ⅜"	280	355	395	5,00
	LA 125	8677000	2	DN 125/PN 16	Rp ⅜"	280	355	395	5,30
	LA 150	8678000	2	DN 150/PN 16	Rp ⅜"	409	550	590	12,90
	LA 200	8679000	2	DN 200/PN 16	Rp ⅜"	409	550	590	13,80

Separation technology accessories CE

Air separator

- air pots in different versions
  → with connections
  → without connections for on-site adaptation by welding
- optionally for vertical or horizontal installation
- 100 % factory-checked for leak tightness and primed



	Type	Art. No.	Volume [l]	Connection c	Chamber size	Installation length l2 [mm]
Air separator with connections for vertical installation						
6 bar 110 °C	LT DN 50	4204721	0,5	Rp 1"	DN 50	200
	LT DN 65	4203514	0,8	Rp 1"	DN 65	250
	LT DN 80	4203515	1,3	Rp 1¼"	DN 80	250
	LT DN 100	4203516	2,5	Rp 1½"	DN 100	300
	LT DN 125	4203490	3,8	Rp 2"	DN 125	300
	LT DN 150	6316055	6,2	Rp 2½"	DN 150	350
	LT DN 200	6316065	15,7	Rp 3"	DN 200	500
	LA DN 250	6315075	24,5	114,3	DN 250	500
	LA DN 300	6315085	34,4	139,7	DN 300	500
	LA DN 350	6315095	50,6	168,3	DN 350	600
	LA DN 400	4202386	77,7	219,1	DN 400	700

Separation technology accessories CE

	Type	Art. No.	Volume [l]	Connection c	Chamber size	Installation length l2 [mm]
Air separator with connections for horizontal installation						
6 bar 110 °C	LT DN 50	4205369	0,5	Rp 1"	DN 50	200
	LT DN 65	4203491	0,8	Rp 1"	DN 65	250
	LT DN 80	4203493	1,3	Rp 1¼"	DN 80	250
	LT DN 100	4203494	2,5	Rp 1½"	DN 100	300
	LT DN 125	4203495	3,8	Rp 2"	DN 125	300
	LT DN 150	6316050	6,2	Rp 2½"	DN 150	350
	LT DN 200	6316060	15,7	Rp 3"	DN 200	500
	LA DN 250	6315070	24,5	114,3	DN 250	500
	LA DN 300	6315105	34,4	139,7	DN 300	500
	LA DN 350	6315090	50,6	168,3	DN 350	600
	LA DN 400	6315100	77,7	219,1	DN 400	700
Air separator for on-site connections						
6 bar 110 °C	LT DN 40	4202875	0,2	–	DN 40	200
	LT DN 50	4200981	0,5	–	DN 50	200
	LT DN 65	4200891	0,8	–	DN 65	250
	LT DN 80	4202391	1,3	–	DN 80	250
	LT DN 100	4200838	2,5	–	DN 100	300
	LT DN 125	4200839	3,8	–	DN 125	300
	LT DN 150	4200840	6,2	–	DN 150	350
	LT DN 200	4202269	15,7	–	DN 200	500
	LT DN 250	4200841	24,5	–	DN 250	500
	LT DN 300	6316072	35,3	–	DN 300	500
	LT DN 350	6316073	57,5	–	DN 350	600
	LT DN 400	6316074	83	–	DN 400	700
16 bar 110 °C	LT DN 50	4202806	0,5	–	DN 50	200
	LT DN 65	4202807	0,8	–	DN 65	250
	LT DN 80	4202808	1,3	–	DN 80	250
	LT DN 100	4202810	2,5	–	DN 100	300
	LT DN 125	4202811	3,8	–	DN 125	300
	LT DN 150	4202809	5,5	–	DN 150	350
	LT DN 200	4202795	15,7	–	DN 200	500
	LT DN 250	4202796	24,5	–	DN 250	500

Separation technology accessories CE

Desludging vessels & magnetite desludging vessel

- for the installation in fluid circuits
- to precipitate oozes and suspended solids
- 100 % factory-checked for leak tightness and primed
- material S235JR
- max. permissible operating temperature -10 °C – 110 °C
- max. permissible operating overpressure 0 bar – 6 bar
- optionally with magnetite separation module

Type	Art. No.	Volume [l]	Connection c	Height h [mm]
Desludging vessels				
EB DN 400	6505350	60	DN 50	870
EB DN 500	6540000	90	DN 65	870
EB DN 500	6540001	120	DN 80	1.020
EB DN 600	6540100	180	DN 100	1.060
EB DN 600	6540101	300	DN 125	1.490
EB DN 800	6540200	400	DN 150	1.240
EB DN 800	6540201	750	DN 200	1.930
Magnetite desludging vessel				
M-EB DN 400	4206071	60	DN 50	870
M-EB DN 500	4206072	90	DN 65	870
M-EB DN 500	4206073	120	DN 80	1.020
M-EB DN 600	4206074	180	DN 100	1.060
M-EB DN 600	4206075	300	DN 125	1.490
M-EB DN 800	4206076	400	DN 150	1.240
M-EB DN 800	4206077	750	DN 200	1.930

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

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Product

Customised Exdirt sludge collector
DN 1,200, 3,000 litres

Example of a real customised Exdirt system

Product

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Hi-Cap with flange connection for PN 10/110 °C

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- Compliance with statutory regulations and therefore also with liability and warranty provisions
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