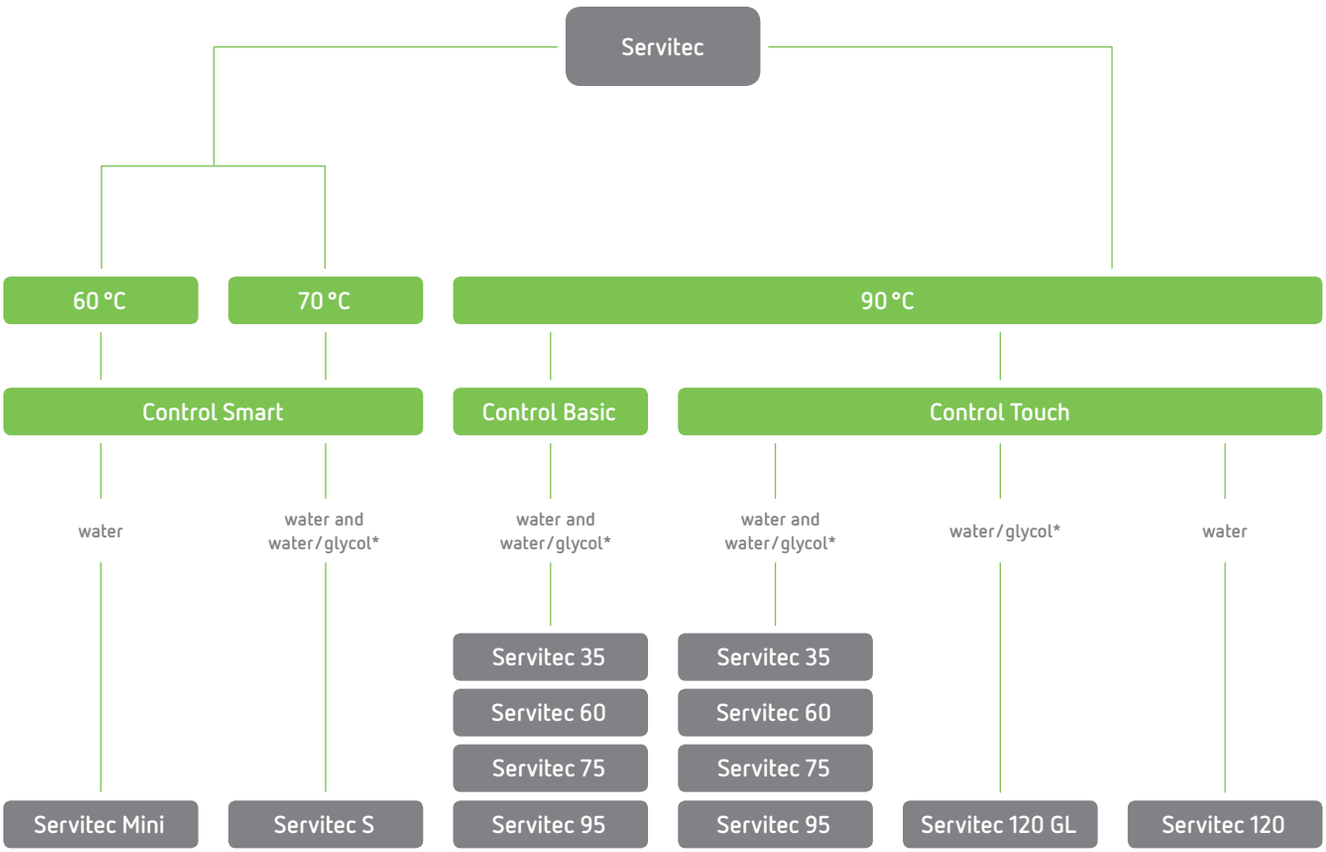
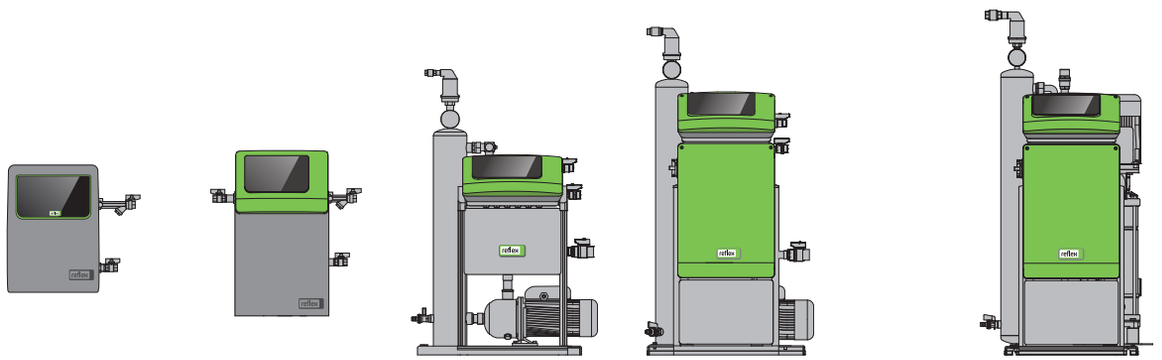
# Degassing systems & separation technology



**All Servitec units now with a new, wider range of applications:**

→ all in one: Servitec S to 95 immediately suitable for water-glycol applications

→ operating temperature now permitted up to 90 °C (Servitec 35– 120)

* Max. glycol content: 50 %

Separation technology

- Brass
  - Horizontal
  - Vertical
  - Rotatable
- Steel
  - Welded connection
    - Horizontal
    - Vertical
  - Flange connection
    - Horizontal
    - Vertical

## 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 – 1½" 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 – 1½" 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 – 1½" V
110 °C

Exferro magnetic insert (optional)



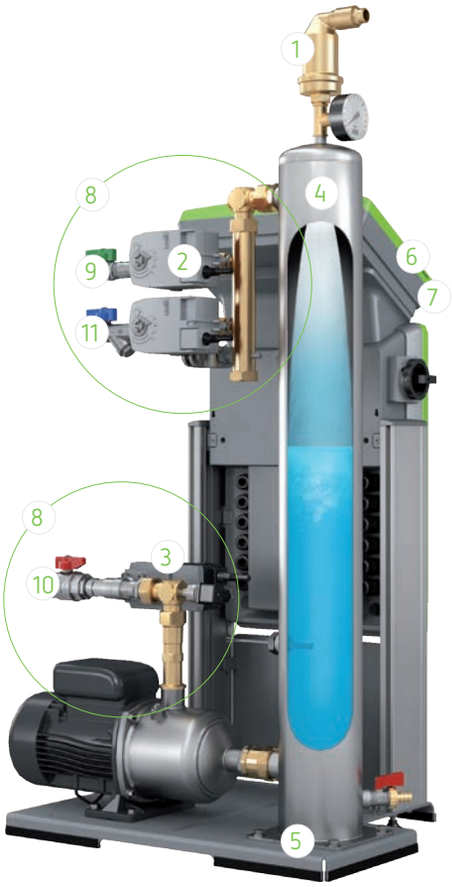
TW 60.3 R – TW 323.9 R



TW 50 R – TW 600 R

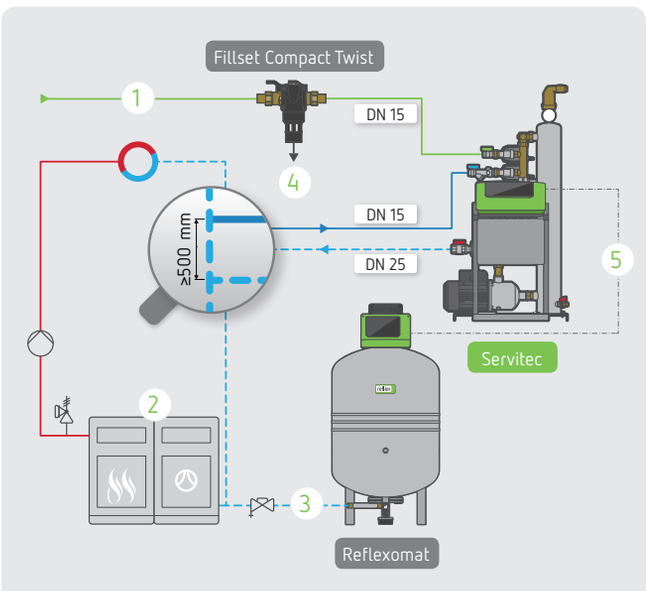
# Theoretical principles

## Servitec — construction




1. Level tube degassing
   allows gases to escape and is vacuum-tight
2. Fully independent protection of water make-up with own 2-way motor ball valve for maximum operating safety
3. Patented valve switch
   for fully automated hydraulic balancing
4. The vacuum spray tube
   Height and diameter are coordinated to guarantee atomisation of the water in a large free vacuum as soon as the degassing cycle starts
5. Spray tube with 4-point-fastening – robust, according to industry standard
6. Controller
   The degassing cycles are performed at optimised intervals
7. Hydraulics
   Integrated plug-and-play management by the controller adjusts the control ball valves to align the hydraulics automatically to the pressure conditions in the system
8. Simple installation, maintenance and accessibility
   thanks to new arrangement of connections
9. Make-up water G ½"
10. Low-gas circuit water G 1"
11. High-gas circuit water G ½"

## Servitec — integration

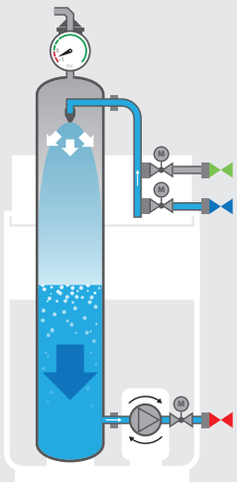



Servitec products actively degas even dissolved gases.
To achieve this a partial flow of water in the system is extracted, then degassed in the Servitec under vacuum and fed back into the system virtually gas-free. Automatically controlled ball valves guarantee a constant partial flow, regardless of the pressure ratios in the system.

1. Make-up water
2. Heating or cooling source
3. Expansion line
4. Drainage on-site
5. Control signal

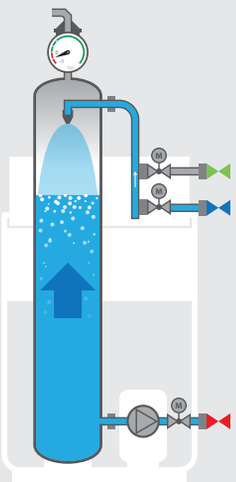
# Servitec — operating principle

1



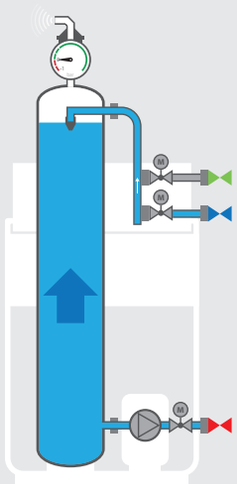
1. Vacuum generation (create vacuum)
   The pump switches on, the water level drops and a vacuum is produced in the vacuum spray-tube. The circuit water (optionally make-up water) is sprayed as a fine mist into the resulting vacuum and the dissolved gases are released due to the vacuum and large contact surface.

2



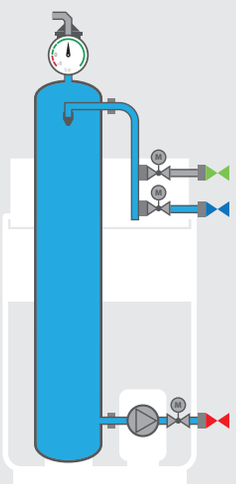
2. Degassing start
   The pump switches off. Water continues to be sprayed until the vacuum spray-tube is completely full again. In the event of an active request for make-up water, a switch-over enables the degassing of gas-rich make-up water in the vacuum spray-tube.

3



3. Discharge
   All released gases are discharged safely by the automatic fan.

4



4. Idling time
   System pressure prevails again in the spray tube.
   The system water located in the tube contains virtually no gas and is pumped back into the network in the next cycle.

Video clips demonstrating the function of this and other products are available under
**www.youtube.com/@ReflexWinkelmannUnitedKingdom**

# Servitec

## Servitec Mini




Servitec Mini




Servitec Mini – with Control Smart controller

### Technical Features

- max. permissible operating overpressure 4 bar
- operating pressure 0,5 – 2,5 bar
- max. permissible operating temperature 60 °C
- permissible ambient temperature 0 – 45 °C
- power supply 230 V / 50 Hz
- electric power consumption 60 W
- electric rated current ≤ 3 A
- connection pressure side G ½"
- connection downstream side G ½"
- dissolved gas separation efficiency of up to 90 %
- max. system volume 1 m³ (applies only to the water content of heating surfaces and distribution lines, can be supplemented by a buffer tank of up to 1 m³)
- **Control Smart controller** via Bluetooth with lots of digital functions:
  → operating assistant for fault diagnosis, commissioning, service and maintenance

| | Type | Art. No. | DG | System volume $V_A$ up to* [m³] | Operating pressure [bar] | Electric power [kW] | Height h [mm] | Width w [mm] | Depth D [mm] | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|
| 60 °C W, GL | Mini | 8835800 | 0028 | 1 | 0,5 – 2,5 | 0,06 | 420 | 295 | 220 | 5,60 |

* Max. system volumes for system degassing / max. make-up quantities must be taken into account for the specific system.

### Commissioning

- **7945725**: Reflex commissioning Cat. 3 for Reflexomat Silent Compact / Reflexomat XS / Servitec Mini / Servitec S with one compressor / one pump or Reflex Hydroflow freshwater station and Reflex Greenbox
- **7945726**: Reflex commissioning add. Cat. 3 for each additional system at the same location and on the same day – one compressor / one pump

| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| Commissioning Cat. 3 | 7945725 | 0095 | – |
| Commissioning add. Cat. 3 | 7945726 | 0095 | – |

# Servitec S




Servitec S




Servitec S – with a multiplicity of pre-installed digital functions

## Technical Features

- max. permissible operating temperature 70 °C
- max. make-up output 0,080 m³/h
- power supply 230 V/50 Hz
- connections for the make-up, pressure, outflow side G ½"
- dissolved gas separation efficiency of up to 90 %
- max. partial volume flow network 0,050 m³/h
- minimum inlet pressure makeup 0,10 bar
- sound pressure level 55 dB(A)
- **Control Smart controller** via Bluetooth with numerous digital functions:
  - → Integrated $p_0$ wizard for fault-free commissioning
  - → RS-485 interface and factory-fitted Modbus RTU
  - → Operating assistant for fault diagnosis, commissioning, service and maintenance

| | Type | Art. No. | DG | System volume $V_A$ up to* [m³] | System volume $V_A$ GL up to* [m³] | Operating pressure [bar] | Electric power [kW] | Height h [mm] | Width w [mm] | Depth D [mm] | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Smart controller, suitable for water and water-glycol mixtures | | | | | | | | | | | |
| 70 °C GL, W | S | 8832000 | 0028 | 6 | 4 | 0,5–4,5 | 0,20 | 572 | 340 | 211 | 13,80 |

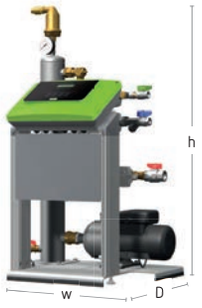
* Max. system volumes for system degassing / max. make-up quantities must be taken into account for the specific system.

## Commissioning

- **7945725**: Reflex commissioning Cat. 3 for Reflexomat Silent Compact/Reflexomat XS/Servitec Mini/Servitec S with one compressor/one pump or Reflex Hydroflow freshwater station and Reflex Greenbox
- **7945726**: Reflex commissioning add. Cat. 3 for each additional system at the same location and on the same day – one compressor/one pump

| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| Commissioning Cat. 3 | 7945725 | 0095 | – |
| Commissioning add. Cat. 3 | 7945726 | 0095 | – |

# Servitec




Servitec 35 Control Basic




Servitec 60 Control Touch




Servitec 95 Control Basic

## Technical Features

- vacuum spray tube degassing with integrated water make-up for systems with membrane expansion vessels or pressurisation systems
- max. permissible operating overpressure
  → type 35, 60: 8 bar
  → type 75, 95, 120: 10 bar
- max. make-up output
  → type 35: 0,350 $m^3/h$
  → type 60, 75, 95, 120: 0,550 $m^3/h$
- microprocessor controller with plain text display for pressure
- floating contact for group message
- easy commissioning thanks to Auto Setup
- Safe Control (make-up via motor ball valve, except Servitec 120)
- optional water make-up from a reservoir (user-supplied)
- flexible adjustment of the operating modes Servitec Magcontrol (for diaphragm expansion vessels) or Levelcontrol (for pressurisation units)
- centralised degassing of content and make-up water

| | Type | Art. No. | DG | System volume $V_A$ up to* [$m^3$] | System volume $V_A$ GL up to* [$m^3$] | Operating pressure [bar] | Electric power [kW] | Height h [mm] | Width w [mm] | Depth D [mm] | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Control Basic controller, suitable for water and water-glycol mixtures** | | | | | | | | | | | |
| 90 °C GL, W | 35 | 8831100 | 0053 | 220 | 50 | 0,5–2,5 | 0,75 | 965 | 569 | 486 | 31,40 |
| | 60 | 8831200 | 0053 | 220 | 50 | 0,5–4,5 | 1,10 | 1.150 | 653 | 486 | 35,80 |
| | 75 | 8831300 | 0053 | 220 | 50 | 1,3–5,4 | 1,10 | 1.150 | 573 | 672 | 50,60 |
| | 95 | 8831400 | 0053 | 220 | 50 | 1,3–7,2 | 1,10 | 1.150 | 573 | 672 | 51,40 |
| **Control Touch control unit, suitable for water and water-glycol mixtures** | | | | | | | | | | | |
| 90 °C GL, W | 35/T | 8832100 | 0053 | 220 | 50 | 0,5–2,5 | 0,85 | 965 | 569 | 486 | 34,40 |
| | 60/T | 8832200 | 0053 | 220 | 50 | 0,5–4,5 | 1,10 | 1.150 | 653 | 486 | 38,80 |
| | 75/T | 8832300 | 0053 | 220 | 50 | 1,3–5,4 | 1,10 | 1.150 | 556 | 669 | 53,60 |
| | 95/T | 8832400 | 0053 | 220 | 50 | 1,3–7,2 | 1,10 | 1.150 | 556 | 672 | 54,40 |
| **Control Touch control unit, suitable for water-glycol mixtures** | | | | | | | | | | | |
| 90 °C GL | Mag. 120/TGL | 8832550 | 0053 | – | 50 | 1,3–9,0 | 1,50 | 1.150 | 578 | 598 | 53,00 |
| **Control Touch control unit, suitable for water** | | | | | | | | | | | |
| 90 °C W | Mag. 120/T | 8832500 | 0053 | 220 | – | 1,3–9,0 | 1,50 | 1.150 | 578 | 598 | 53,00 |

Custom designs upon request: System volume > 220 $m^3$ and working pressure > 9,0 bar
* Max. system volumes for system degassing / max. make-up quantities must be taken into account for the specific system.

# Servitec Accessories

CE

## Busmodule



- for exchanging data between controller and central building management system
- only bus modules type Ethernet and Profibus DP are suitable for a Control Basic controller

## I/O module



- two additional analogue outputs for pressure and level control
- six freely programmable digital inlets
- six freely programmable floating outputs

## Commissioning



- **7945600**: Reflex commissioning Cat. 1 for Reflexomat, Variomat, Servitec with one compressor / one pump
- **7945704**: Reflex commissioning add. Cat. 1 for each additional system at the same location and on the same day – one compressor / pump

| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| Busmodule BACnet MS/TP Touch* | 8860600 | 0086 | 0,10 |
| Busmodule BACnet-IP Touch* | 8860500 | 0086 | 0,40 |
| Busmodule Ethernet* | 8860300 | 0086 | 1,90 |
| Busmodule Modbus RTU Touch* | 9125592 | 0086 | 0,20 |
| Busmodule Profibus DP* | 8860200 | 0086 | 3,00 |
| Busmodule Profibus DP Touch* | 9118042 | 0086 | 0,10 |
| Commissioning Cat. 1 | 7945600 | 0095 | – |
| Commissioning add. Cat. 1 | 7945704 | 0095 | – |
| I/O module SE* | 8860400 | 0071 | 1,00 |

* Cannot be used with a Servitec Mini and Servitec S

# Theoretical principles

## Brass separators — pressure loss diagram

**Pressure loss calculation for all flow rates:** $\Delta p = \left(\frac{\dot{V}}{K_{VS}}\right)^2 \times 1\,\text{bar};\ \dot{V} \le \dot{V}_{max}$

| Connection | $K_{VS}$ [m³/h] | $\dot{V}_{max}$ [m³/h] |
|---|---|---|
| IG 22 mm & ¾" | 10,7 | 1,25 |
| IG 1" | 17,2 | 2,00 |
| IG 1 ¼" | 31,8 | 3,70 |
| IG 1 ½" | 40,0 | 5,00 |
| IG 2" | 56,1 | 7,50 |

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



**1. Volumetric flow calculation**

$$\dot{V} = \frac{40\,\text{kW}}{4{,}2\,\text{kJ/(kg}\times\text{K)}\times(70-55)\,\text{K}} \times 3.600\,\frac{\text{s}}{\text{h}} \times \frac{1\,\text{m}^3}{1.000\,\text{kg}}$$

$= 2{,}3\,\text{m}^3/\text{h}$

→ Range presented in a table: **IG 1 ¼" with $K_{VS}$ = 31,8 m³/h** e.g. Exvoid A 1 ¼

$$\Delta p = \left(\frac{2{,}3\,\text{m}^3/\text{h}}{31{,}8\,\text{m}^3/\text{h}}\right)^2 \times 1\,\text{bar} = 5{,}23\times10^{-3}\,\text{bar} \quad | \times 100\,\text{kPa/bar}$$

$= 0{,}52\,\text{kPa}$

| Connection | $K_{VS}$ [m³/h] | $\dot{V}_{max}$ [m³/h] |
|---|---|---|
| **Twist separators** | | |
| 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 |

**Example:** Heating circuit 40/30 °C; Heat generator output 50 kW



**1. Volumetric flow calculation**

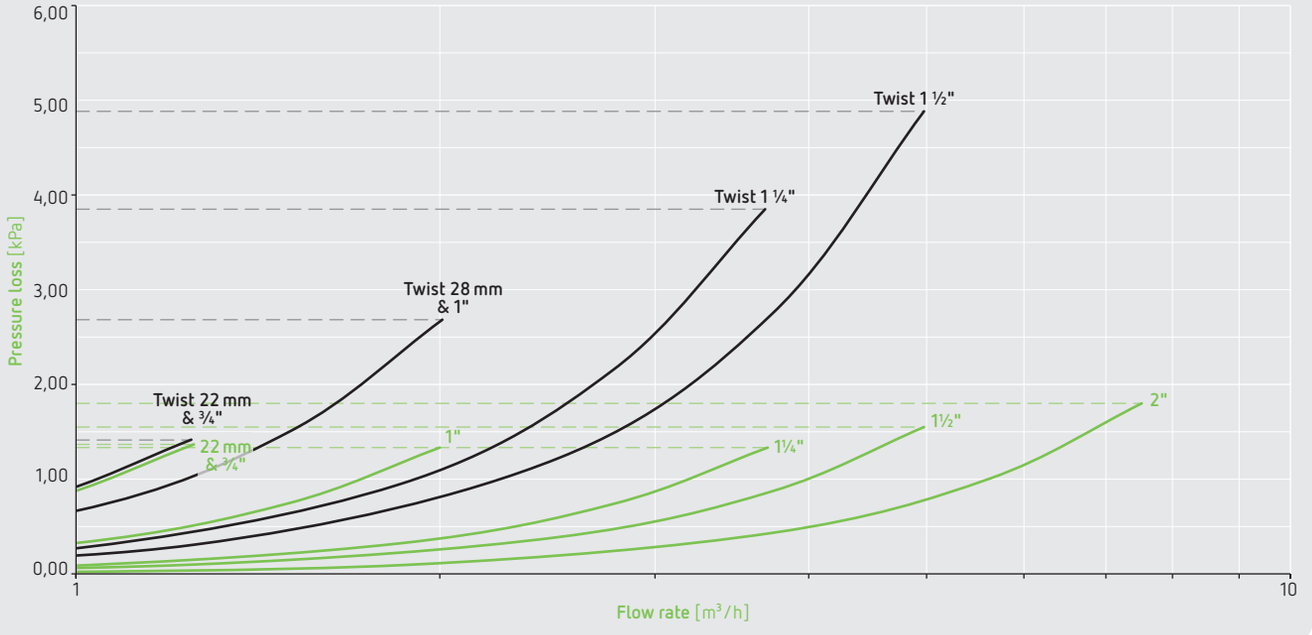
$$\dot{V} = \frac{50\,\text{kW}}{4{,}2\,\text{kJ/(kg}\times\text{K)}\times(40-30)\,\text{K}} \times 3.600\,\frac{\text{s}}{\text{h}} \times \frac{1\,\text{m}^3}{1.000\,\text{kg}}$$

$= 4{,}3\,\text{m}^3/\text{h}$

→ Range presented in a table: **Twist 1 ½" with $K_{VS}$ = 22,6 m³/h** e.g. Extwin TWT 1 ½

$$\Delta p = \left(\frac{4{,}3\,\text{m}^3/\text{h}}{22{,}6\,\text{m}^3/\text{h}}\right)^2 \times 1\,\text{bar} = 36{,}2\times10^{-3}\,\text{bar} \quad | \times 100\,\text{kPa/bar}$$

$= 3{,}62\,\text{kPa}$



# Brass separators

## Exvoid T large and quick vent valves

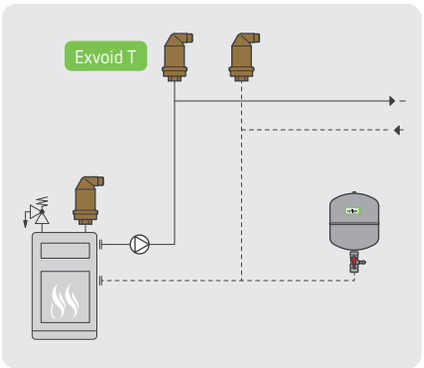
CE




Exvoid T



Exvoid T function diagram




Exvoid T system – 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 %)

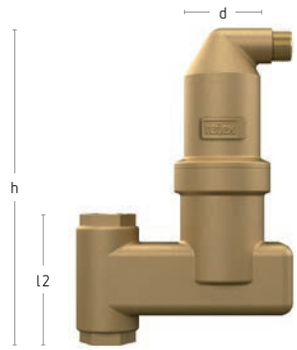
| | Type | Art. No. | DG | PQ [pce] | Connection c | Ø d [mm] | Height h [mm] | Length l3 [mm] | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|
| **Brass, vertical** | | | | | | | | | |
| 10 bar 110 °C | T ½ | 9250000 | 0082 | 12 | IG ½" | 63 | 122 | 46 | 0,63 |
| | T ⅜ | 9250038 | 0082 | 12 | AG ⅜" | 63 | 132 | 46 | 0,73 |
| **solar, brass, vertical** | | | | | | | | | |
| 10 bar 180 °C | T ½ S | 9250600 | 0082 | 12 | IG ½" | 63 | 122 | 46 | 0,64 |
| | T ⅜ S | 9250638* | 0082 | 12 | AG ⅜" | 63 | 132 | 46 | 0,70 |

* on request

# Exvoid air and microbubble separator




Exvoid horizontal



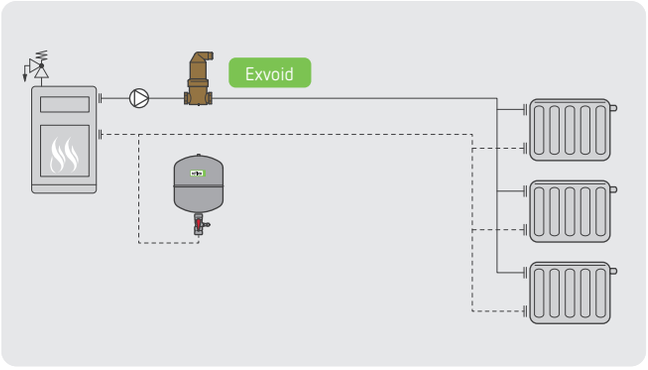

Exvoid vertical




Exvoid Twist



Exvoid Brass cutaway model




Exvoid brass system – schematic diagram

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 separator

CE

| | Type | Art. No. | DG | PQ [pce] | Connection c | $V_{max}$ [m³/h] | Ø d [mm] | Height h [mm] | Installation length l2 [mm] | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Brass, horizontal** | | | | | | | | | | |
| 10 bar 110 °C | A 22 | 9251000 | 0082 | 12 | 22 mm | 1,2 | 63 | 165 | 99 | 1,08 |
| | A ¾ | 9251010 | 0082 | 12 | IG ¾" | 1,2 | 63 | 165 | 85 | 1,03 |
| | A 1 | 9251020 | 0082 | 8 | IG 1" | 2,0 | 63 | 182 | 88 | 1,12 |
| | A 1¼ | 9251030 | 0082 | 8 | IG 1¼" | 3,8 | 63 | 202 | 88 | 1,23 |
| | A 1½ | 9251040 | 0082 | 8 | IG 1½" | 5,0 | 63 | 236 | 88 | 1,44 |
| | A 2 | 9251050 | 0082 | 1 | IG 2" | 7,5 | 100 | 277 | 112 | 3,18 |
| **Brass, vertical** | | | | | | | | | | |
| 10 bar 110 °C | A ¾ V | 9251510 | 0082 | 8 | IG ¾" | 1,2 | 63 | 206 | 84 | 1,60 |
| | A 1 V | 9251520 | 0082 | 8 | IG 1" | 2,0 | 63 | 206 | 84 | 1,57 |
| **solar, brass, horizontal** | | | | | | | | | | |
| 10 bar 180 °C | A 22 S | 9251600* | 0082 | 12 | 22 mm | 1,2 | 63 | 165 | 99 | 1,14 |
| | A ¾ S | 9251610 | 0082 | 12 | IG ¾" | 1,2 | 63 | 165 | 85 | 0,94 |
| | A 1 S | 9251620* | 0082 | 8 | IG 1" | 2,0 | 63 | 182 | 88 | 1,10 |
| | A 1¼ S | 9251630 | 0082 | 8 | IG 1¼" | 3,7 | 63 | 202 | 88 | 1,40 |
| | A 1½ S | 9251640 | 0082 | 8 | IG 1½" | 5,0 | 63 | 236 | 88 | 1,43 |
| **solar, brass, vertical** | | | | | | | | | | |
| 10 bar 180 °C | A 22 S V | 9251700 | 0082 | 8 | 22 mm | 1,2 | 63 | 216 | 104 | 1,67 |
| | A ¾ S V | 9251710 | 0082 | 8 | IG ¾" | 1,2 | 63 | 206 | 84 | 1,90 |
| | A 1 S V | 9251720 | 0082 | 8 | IG 1" | 2,0 | 63 | 206 | 84 | 1,90 |
| **Twist, brass, rotatable** | | | | | | | | | | |
| 10 bar 110 °C | AT 22 | 9257200* | 0092 | 6 | 22 mm | 1,2 | 63 | 218 | 109 | 1,88 |
| | AT 28 | 9257210 | 0092 | 6 | 28 mm | 2,0 | 63 | 219 | 111 | 2,20 |
| | AT ¾ | 9257220* | 0092 | 6 | IG ¾" | 1,2 | 63 | 207 | 85 | 1,90 |
| | AT 1 | 9257230* | 0092 | 6 | IG 1" | 2,0 | 63 | 214 | 100 | 1,88 |
| | AT 1¼ | 9257240* | 0092 | 4 | IG 1¼" | 3,8 | 63 | 264 | 100 | 2,60 |
| | AT 1½ | 9257250* | 0092 | 4 | IG 1½" | 5,0 | 63 | 264 | 100 | 2,48 |

* on request

# 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

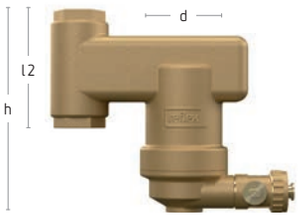



| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| **Exiso for horizontal/vertical separators** | | | |
| Exiso A/D 22 – 1½ | 9254811 | 0082 | 0,07 |
| Exiso A/D 2 | 9254801 | 0082 | 0,14 |
| **Exiso for turnable separators Ex-Twist** | | | |
| Exiso AT/DT/TWT 22 – 1 | 9583510 | 0082 | 0,17 |
| Exiso AT/DT 1¼ – 1½ | 9583530 | 0082 | 0,25 |

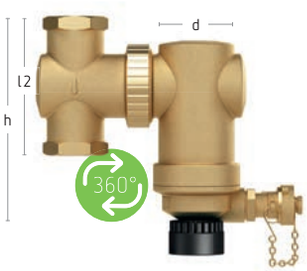
# Exdirt dirt and sludge separator




Exdirt M horizontal with EasyClip



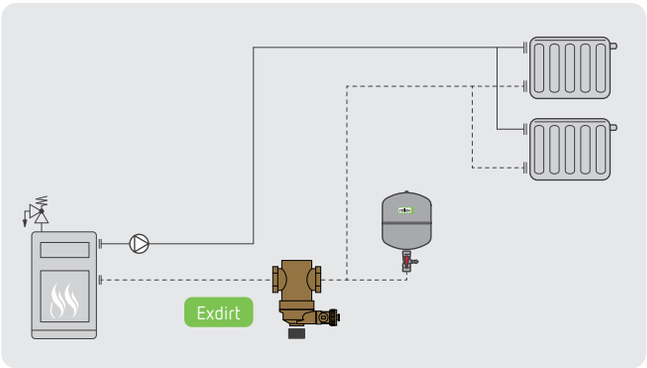

Exdirt vertical



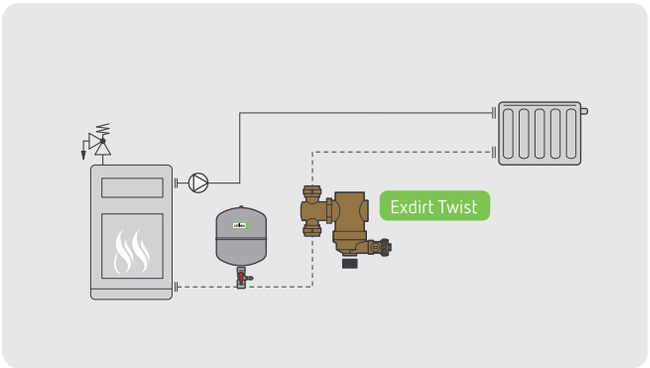

Exdirt Twist M with EasyClip



Exdirt Brass with EasyClip cutaway model




Exdirt brass system – schematic diagram




Exdirt Twist brass system – schematic diagram

## 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

# Exvoid Accessories air and microbubble separator

CE

| | Type | Art. No. | DG | PQ [pce] | 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* | 0082 | 12 | 22 mm | 1,2 | 63 | 122 | 106 | 0,90 |
| | D ¾ M | 9256610 | 0082 | 12 | IG ¾" | 1,2 | 63 | 122 | 85 | 1,00 |
| | D 1 M | 9256620 | 0082 | 12 | IG 1" | 2,0 | 63 | 139 | 88 | 1,20 |
| | D 1¼ M | 9256630 | 0082 | 8 | IG 1¼" | 3,7 | 63 | 159 | 88 | 1,30 |
| | D 1½ M | 9256640 | 0082 | 8 | IG 1½" | 5,0 | 63 | 193 | 88 | 1,50 |
| | D 2 M | 9256650 | 0082 | 1 | IG 2" | 7,5 | 100 | 234 | 132 | 3,02 |
| **Plug-in magnet, brass, vertical** | | | | | | | | | | |
| 10 bar 110 °C | D ¾ VM | 9256710 | 0082 | 8 | IG ¾" | 1,2 | 63 | 163 | 84 | 1,80 |
| | D 1 VM | 9256720 | 0082 | 8 | IG 1" | 2,0 | 63 | 163 | 84 | 1,80 |
| **Brass, horizontal** | | | | | | | | | | |
| 10 bar 110 °C | D 22 | 9252000 | 0082 | 12 | 22 mm | 1,2 | 63 | 103 | 106 | 0,92 |
| | D ¾ | 9252010 | 0082 | 12 | IG ¾" | 1,2 | 63 | 103 | 85 | 1,00 |
| | D 1 | 9252020 | 0082 | 12 | IG 1" | 2,0 | 63 | 120 | 88 | 1,20 |
| | D 1¼ | 9252030 | 0082 | 8 | IG 1¼" | 3,7 | 63 | 140 | 88 | 1,12 |
| | D 1½ | 9252040 | 0082 | 8 | IG 1½" | 5,0 | 63 | 174 | 88 | 1,32 |
| | D 2 | 9252050 | 0082 | 1 | IG 2" | 7,5 | 100 | 215 | 132 | 3,10 |
| **Brass, vertical** | | | | | | | | | | |
| 10 bar 110 °C | D 22V | 9252500* | 0082 | 8 | 22 mm | 1,2 | 63 | 154 | 104 | 1,58 |
| | D ¾ V | 9252510 | 0082 | 8 | IG ¾" | 1,2 | 63 | 144 | 84 | 1,80 |
| | D 1V | 9252520 | 0082 | 8 | IG 1" | 2,0 | 63 | 144 | 84 | 1,61 |
| **Twist, plug-in magnet, brass, rotatable** | | | | | | | | | | |
| 10 bar 110 °C | DT 22 M | 9257300* | 0092 | 8 | 22 mm | 1,2 | 63 | 176 | 109 | 1,98 |
| | DT 28 M | 9257310 | 0092 | 8 | 28 mm | 2,0 | 63 | 177 | 111 | 2,10 |
| | DT ¾ M | 9257320 | 0092 | 8 | IG ¾" | 1,2 | 63 | 164 | 85 | 1,83 |
| | DT 1 M | 9257330 | 0092 | 8 | IG 1" | 2,0 | 63 | 171 | 100 | 1,97 |
| | DT 1¼ M | 9257340 | 0092 | 6 | IG 1¼" | 3,8 | 63 | 221 | 100 | 2,32 |
| | DT 1½ M | 9257350 | 0092 | 6 | IG 1½" | 5,0 | 63 | 221 | 100 | 2,48 |

* on request

# Exdirt Accessories

CE

## 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

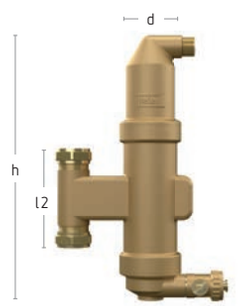



| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| **Exiso for horizontal/vertical separators** | | | |
| Exiso A/D 22 – 1½ | 9254811 | 0082 | 0,07 |
| Exiso A/D 2 | 9254801 | 0082 | 0,14 |
| **Exiso for turnable separators Ex-Twist** | | | |
| Exiso AT/DT/TWT 22 – 1 | 9583510 | 0082 | 0,17 |
| Exiso AT/DT 1¼ – 1½ | 9583530 | 0082 | 0,25 |

# Extwin combined microbubble, dirt and sludge separator




Extwin M horizontal with EasyClip



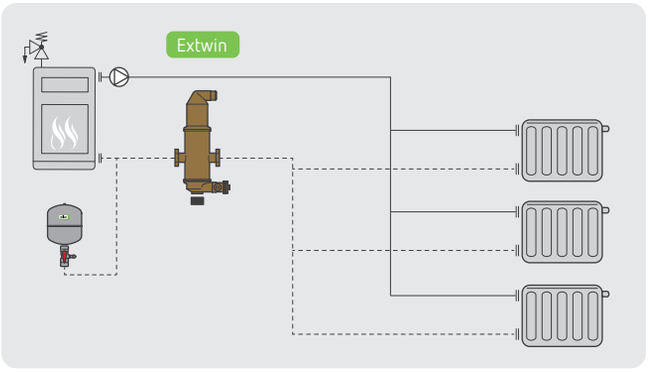

Extwin vertical




Extwin Twist M with EasyClip



Extwin Brass with EasyClip cutaway model




Extwin brass system – schematic diagram

## 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. | DG | PQ [pce] | Connection c | $V_{max}$ [$m^3/h$] | 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 | 0082 | 6 | 22 mm | 1,2 | 63 | 275 | 106 | 1,80 |
| | TW 1 M | 9257610 | 0082 | 6 | IG 1" | 2,0 | 63 | 275 | 88 | 1,70 |
| **Plug-in magnet, brass, vertical** | | | | | | | | | | |
| 10 bar 110 °C | TW 22V-M | 9257700 | 0082 | 6 | 22 mm | 1,2 | 63 | 285 | 98 | 1,90 |
| **Brass, horizontal** | | | | | | | | | | |
| 10 bar 110 °C | TW 22 | 9253000 | 0082 | 6 | 22 mm | 1,2 | 63 | 256 | 106 | 1,80 |
| | TW 1 | 9253010 | 0082 | 6 | IG 1" | 2,0 | 63 | 259 | 88 | 1,63 |
| **Brass, vertical** | | | | | | | | | | |
| 10 bar 110 °C | TW 22V | 9253500 | 0082 | 6 | 22 mm | 1,2 | 65 | 266 | 98 | 2,10 |
| **Twist, plug-in magnet, rotatable** | | | | | | | | | | |
| 10 bar 110 °C | TWT 22 M | 9257100* | 0092 | 4 | 22 mm | 1,2 | 63 | 285 | 109 | 2,54 |
| | TWT 28 M | 9257110* | 0092 | 4 | 28 mm | 2,0 | 63 | 285 | 111 | 2,67 |
| | TWT ¾ M | 9257120 | 0092 | 4 | IG ¾" | 1,2 | 63 | 285 | 85 | 2,40 |
| | TWT 1 M | 9257130 | 0092 | 4 | IG 1" | 2,0 | 63 | 285 | 100 | 2,50 |
| | TWT 1¼ M | 9257140 | 0092 | 4 | IG 1¼" | 3,8 | 63 | 285 | 100 | 2,87 |
| | TWT 1½ M | 9257150 | 0092 | 4 | IG 1½" | 5,0 | 63 | 285 | 100 | 3,03 |

* on request

## 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




| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| **Exiso for turnable separators Ex-Twist** | | | |
| Exiso AT / DT / TWT 22 – 1 | 9583510 | 0082 | 0,17 |
| Exiso TWT 1¼ – 1½ | 9583520 | 0082 | 0,16 |

# Theoretical principles

## Steel separators — pressure loss diagram

| Connection | $K_{VS}$ [m³/h] | $V_{max}$ [m³/h] |
|---|---|---|
| DN 50 | 72,2 | 12,50 |
| DN 65 | 121,7 | 20,00 |
| DN 80 | 158,5 | 27,00 |
| 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 |

**Example:** Heating circuit 70/55 °C; Heat generator output 600 kW

**1. Volumetric flow calculation**

$$\dot{V} = \frac{600\ \text{kW}}{4{,}2\ \text{kJ}/(\text{kg}\times\text{K})\times(70-55)\ \text{K}} \times 3.600\,\frac{\text{s}}{\text{h}} \times \frac{1\ \text{m}^3}{1.000\ \text{kg}}$$

$$= 34{,}3\ \text{m}^3/\text{h}$$

→ Range presented in a table: **DN 100 with $K_{VS}$ = 244,3 m³/h** e.g. Exdirt D 100



$$\Delta p = \left(\frac{34{,}3\ \text{m}^3/\text{h}}{244{,}3\ \text{m}^3/\text{h}}\right)^2 \times 1\ \text{bar} = 19{,}7\times10^{-3}\ \text{bar} \qquad | \times 100\ \text{kPa/bar}$$

$$= 1{,}97\ \text{kPa}$$

| Connection | $K_{VS}$ [m³/h] | $V_{max}$ [m³/h] |
|---|---|---|
| **Exdirt V** | | |
| DN 50 V | 64,5 | 12,50 |
| DN 65 V | 109,5 | 20,00 |
| DN 80 V | 142,7 | 27,00 |
| DN 100 V | 219,8 | 47,00 |
| DN 125 V | 316,2 | 72,00 |
| DN 150 V | 439,1 | 108,00 |

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

**1. Volumetric flow calculation**

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

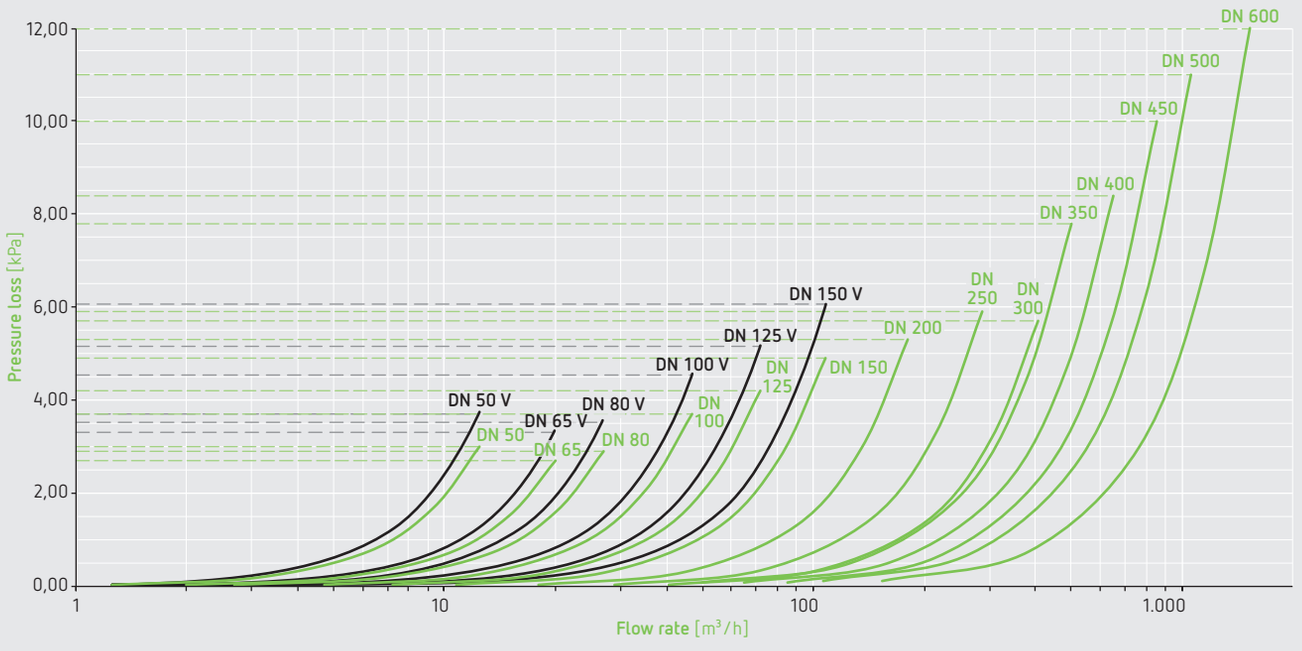
$$= 4{,}6\ \text{m}^3/\text{h}$$

→ Range presented in a table: **DN 50 V with $K_{VS}$ = 64,5 m³/h** e.g. Exdirt D 100



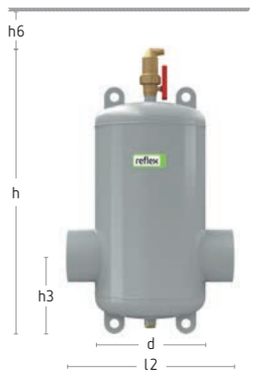
$$\Delta p = \left(\frac{4{,}6\ \text{m}^3/\text{h}}{64{,}5\ \text{m}^3/\text{h}}\right)^2 \times 1\ \text{bar} = 5{,}09\times10^{-3}\ \text{bar} \qquad | \times 100\ \text{kPa/bar}$$

$$= 0{,}509\ \text{kPa}$$

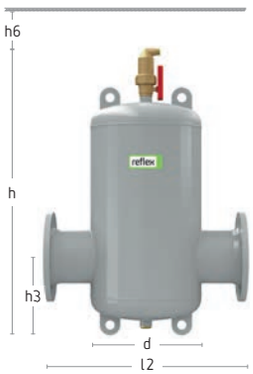


# Steel separators

## Exvoid air and microbubble separator




Exvoid Steel welded connection



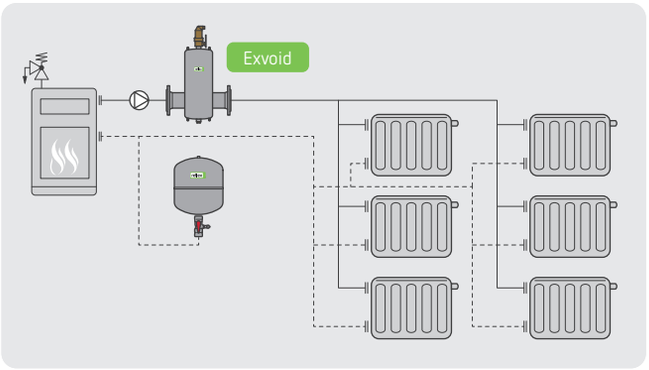

Exvoid Steel flange connection



Exvoid Steel cutaway model



Exvoid Steel cutaway model




Exvoid steel system – schematic diagram

**Technical Features**

- connection DN 50 – DN 300
- volume flow: 12,5 – 405 m³/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 separator

CE

| | Type | Art. No. | DG | 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 | 0083 | DN 50/PN 16 | 12,5 | 132 | 625 | 153 | 50 | 350 | 9,00 |
| | A 65* | 8251310 | 0083 | DN 65/PN 16 | 20,0 | 132 | 625 | 163 | 50 | 350 | 10,00 |
| | A 65 | 8251348 | 0083 | DN 65/PN 16 | 20,0 | 132 | 625 | 163 | 50 | 350 | 10,00 |
| | A 80 | 8251320 | 0083 | DN 80/PN 16 | 27,0 | 206 | 740 | 159 | 50 | 470 | 16,00 |
| | A 100 | 8251330 | 0083 | DN 100/PN 16 | 47,0 | 206 | 740 | 169 | 50 | 470 | 19,00 |
| | A 125 | 8251340 | 0083 | DN 125/PN 16 | 72,0 | 354 | 915 | 214 | 50 | 635 | 35,00 |
| | A 150 | 8251350 | 0083 | DN 150/PN 16 | 108,0 | 409 | 915 | 229 | 50 | 635 | 39,00 |
| | A 200 | 8251360 | 0083 | DN 200/PN 16 | 180,0 | 409 | 1.125 | 284 | 50 | 775 | 65,00 |
| | A 250 | 8251370 | 0083 | DN 250/PN 16 | 288,0 | 480 | 1.402 | 351 | 50 | 890 | 108,00 |
| | A 300 | 8251380 | 0083 | 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 | 0083 | 60,3 | 12,5 | 132 | 625 | 153 | 50 | 260 | 3,00 |
| | A 76.1 | 8251110 | 0083 | 76,1 | 20,0 | 132 | 625 | 163 | 50 | 260 | 3,00 |
| | A 88.9 | 8251120 | 0083 | 88,9 | 27,0 | 206 | 740 | 159 | 50 | 370 | 9,00 |
| | A 114.3 | 8251130 | 0083 | 114,3 | 47,0 | 206 | 740 | 169 | 50 | 370 | 9,00 |
| | A 139.7 | 8251140 | 0083 | 139,7 | 72,0 | 354 | 915 | 214 | 50 | 525 | 22,00 |
| | A 168.3 | 8251150 | 0083 | 168,3 | 108,0 | 354 | 915 | 229 | 50 | 525 | 24,00 |
| | A 219.1 | 8251160 | 0083 | 219,1 | 180,0 | 409 | 1.125 | 284 | 50 | 650 | 44,00 |
| | A 237.0 | 8251170 | 0083 | 273,0 | 288,0 | 480 | 1.402 | 351 | 50 | 750 | 70,00 |
| | A 323.9 | 8251180 | 0083 | 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

CE

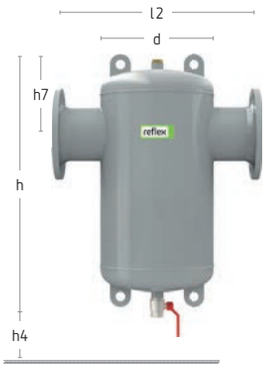
## Exiso



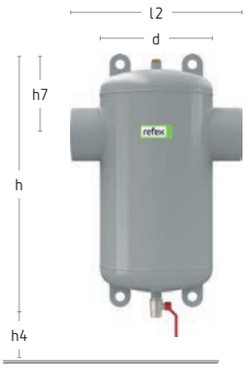

- thermal insulation for Exvoid and Exdirt steel models
- comprising two shape-stable and temperature-stable, adaptable, form-fitting rigid foam semi-shells, with a snap closure
- not suitable for vertical separators, separators with a service flange and Extwin units

| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| thermal insulation for Exvoid and Exdirt steel models | | | |
| Exiso DN 50 – 65 (60.3 – 76.1) | 9254831 | 0083 | 0,40 |
| Exiso DN 80 – 100 (88.9 – 114.3) | 9254841 | 0083 | 0,55 |
| Exiso DN 125 – 150 (139.7 – 168.3) | 9254851 | 0083 | 2,20 |

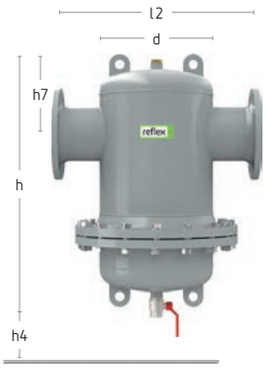
# Exdirt dirt and sludge separator



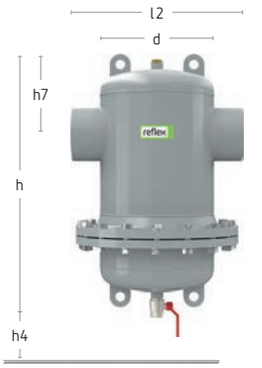

Exdirt Steel flange connection




Exdirt Steel welded connection




Exdirt R Steel flange connection with service flange



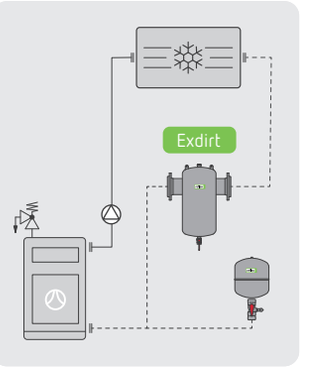

Exdirt R Steel welded connection with service flange



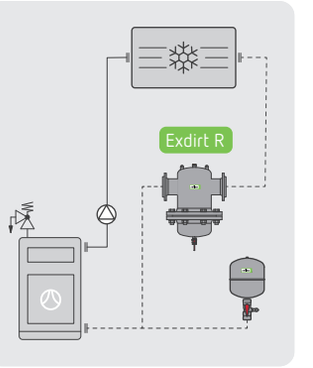
Exdirt Steel cutaway model



Exdirt Steel function diagram




Exdirt steel system – schematic diagram




Exdirt R steel system – schematic diagram

## Technical Features

- connection: DN 50 – DN 300
- volume flow: 12,5 – 405 $m^3/h$
- 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. | DG | 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 | 0083 | DN 50/PN 16 | 12,5 | 132 | 521 | 165 | 370 | 350 | 9,10 |
| | D 65* | 8252310 | 0083 | DN 65/PN 16 | 20,0 | 132 | 521 | 175 | 370 | 350 | 10,30 |
| | D 65 | 8252318 | 0083 | DN 65/PN 16 | 20,0 | 132 | 521 | 175 | 370 | 350 | 10,30 |
| | D 80 | 8252320 | 0083 | DN 80/PN 16 | 27,0 | 206 | 636 | 170 | 370 | 470 | 17,60 |
| | D 100 | 8252330 | 0083 | DN 100/PN 16 | 47,0 | 206 | 636 | 180 | 370 | 470 | 19,00 |
| | D 125 | 8252340 | 0083 | DN 125/PN 16 | 72,0 | 354 | 811 | 225 | 430 | 635 | 35,00 |
| | D 150 | 8252350 | 0083 | DN 150/PN 16 | 108,0 | 354 | 811 | 240 | 430 | 635 | 39,00 |
| | D 200 | 8252360 | 0083 | DN 200/PN 16 | 180,0 | 409 | 1.021 | 295 | 430 | 775 | 65,00 |
| | D 250 | 8252370 | 0083 | DN 250/PN 16 | 288,0 | 480 | 1.324 | 385 | 500 | 890 | 108,00 |
| | D 300 | 8252380 | 0083 | 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 | 0083 | DN 50/PN 16 | 12,5 | 132 | 521 | 165 | 370 | 350 | 18,00 |
| | D 65 R* | 8252410 | 0083 | DN 65/PN 16 | 20,0 | 132 | 521 | 175 | 370 | 350 | 19,00 |
| | D 65 R | 8252418 | 0083 | DN 65/PN 16 | 20,0 | 132 | 521 | 175 | 370 | 350 | 19,00 |
| | D 80 R | 8252420 | 0083 | DN 80/PN 16 | 27,0 | 206 | 636 | 170 | 430 | 470 | 43,00 |
| | D 100 R | 8252430 | 0083 | DN 100/PN 16 | 47,0 | 206 | 636 | 180 | 430 | 470 | 51,00 |
| | D 125 R | 8252440 | 0083 | DN 125/PN 16 | 72,0 | 354 | 811 | 225 | 550 | 635 | 89,00 |
| | D 150 R | 8252450 | 0083 | DN 150/PN 16 | 108,0 | 354 | 811 | 240 | 550 | 635 | 94,00 |
| | D 200 R | 8252460 | 0083 | DN 200/PN 16 | 180,0 | 409 | 1.021 | 295 | 650 | 775 | 121,00 |
| | D 250 R | 8252470 | 0083 | DN 250/PN 16 | 288,0 | 480 | 1.324 | 358 | 850 | 890 | 255,00 |
| | D 300 R | 8252480 | 0083 | 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 | 0083 | 60,3 | 12,5 | 132 | 521 | 165 | 370 | 260 | 4,10 |
| | D 76.1 | 8252110 | 0083 | 76,1 | 20,0 | 132 | 521 | 175 | 370 | 260 | 4,30 |
| | D 88.9 | 8252120 | 0083 | 88,9 | 27,0 | 206 | 636 | 170 | 370 | 370 | 9,70 |
| | D 114.3 | 8252130 | 0083 | 114,3 | 47,0 | 206 | 636 | 180 | 370 | 370 | 10,20 |
| | D 139.7 | 8252140 | 0083 | 139,7 | 72,0 | 354 | 811 | 225 | 430 | 525 | 25,50 |
| | D 168.3 | 8252150 | 0083 | 168,3 | 108,0 | 354 | 811 | 240 | 430 | 525 | 26,80 |
| | D 219.1 | 8252160 | 0083 | 219,1 | 180,0 | 409 | 1.021 | 295 | 430 | 650 | 44,00 |
| | D 273.0 | 8252170 | 0083 | 273,0 | 288,0 | 480 | 1.324 | 358 | 500 | 750 | 70,00 |
| | D 323.9 | 8252180 | 0083 | 323,9 | 405,0 | 634 | 1.535 | 413 | 500 | 850 | 112,00 |
| **Steel, welded connector, service flange** | | | | | | | | | | | |
| 10 bar 110 °C | D 60.3 R | 8252200 | 0083 | 60,3 | 12,5 | 132 | 521 | 165 | 370 | 260 | 16,00 |
| | D 76.1 R | 8252210 | 0083 | 76,1 | 20,0 | 132 | 521 | 175 | 370 | 260 | 23,00 |
| | D 88.9 R | 8252220 | 0083 | 88,9 | 27,0 | 206 | 636 | 170 | 430 | 370 | 32,00 |
| | D 114.3 R | 8252230 | 0083 | 114,3 | 47,0 | 206 | 636 | 180 | 430 | 370 | 37,00 |
| | D 139.7 R | 8252240 | 0083 | 139,7 | 72,0 | 354 | 811 | 225 | 550 | 525 | 85,00 |
| | D 168.3 R | 8252250 | 0083 | 168,3 | 108,0 | 354 | 811 | 240 | 550 | 525 | 78,00 |
| | D 219.1 R | 8252260 | 0083 | 219,1 | 180,0 | 409 | 1.021 | 295 | 650 | 650 | 111,00 |
| | D 273.0 R | 8252270 | 0083 | 273,0 | 288,0 | 480 | 1.324 | 358 | 850 | 750 | 158,00 |
| | D 323.9 R | 8252280 | 0083 | 323,9 | 405,0 | 634 | 1.535 | 413 | 1.000 | 850 | 330,00 |

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

# Exdirt Accessories

## 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



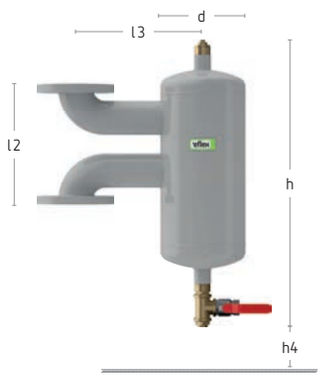

## Exvoid

- 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

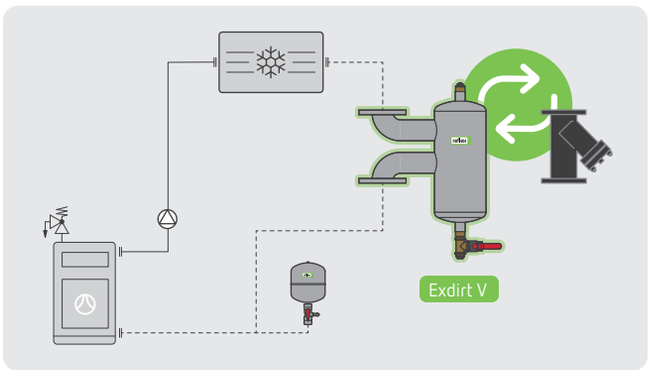


| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| **Exvoid T** | | | |
| Exvoid T 1 | 9255805 | 0082 | 1,40 |
| **Exferro magnetic insert for steel Exdirt and Extwin** | | | |
| Exferro D/TW 50–65 (60.3–76.1) | 9258340 | 0083 | 0,93 |
| Exferro D/TW 80–100 (88.9–114.3) | 9258350 | 0083 | 1,40 |
| Exferro D/TW 125–150 (139.7–168.3) | 9258360 | 0083 | 0,74 |
| Exferro D/TW 200 (219.1) | 9258370 | 0083 | 0,80 |
| Exferro D/TW 250–300 (273.0–323.9) | 9258380 | 0083 | 4,70 |
| **thermal insulation for Exvoid and Exdirt steel models** | | | |
| Exiso DN 50–65 (60.3–76.1) | 9254831 | 0083 | 0,40 |
| Exiso DN 80–100 (88.9–114.3) | 9254841 | 0083 | 0,55 |
| Exiso DN 125–150 (139.7–168.3) | 9254851 | 0083 | 2,20 |

# Exdirt V dirt and sludge separator for vertical installation




Exdirt V




Exdirt V as replacement for a dirt trap thanks to standard installation length – schematic diagram

## 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

| | Type | Art. No. | DG | Connection c | $V_{max}$ [$m^3/h$] | 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 | 0083 | DN 50/PN 6 | 12,5 | 206 | 569 | 370 | 230 | 296 | 12,20 |
| | D 65 V F1 | 8259511 | 0083 | DN 65/PN 6 | 20,0 | 206 | 617 | 370 | 290 | 306 | 15,80 |
| | D 80 V F1 | 8259521 | 0083 | DN 80/PN 6 | 27,0 | 206 | 667 | 370 | 310 | 313 | 19,70 |
| | D 100 V F1 | 8259531 | 0083 | DN 100/PN 6 | 47,0 | 206 | 717 | 370 | 350 | 323 | 24,40 |
| | D 125 V F1 | 8259541 | 0083 | DN 125/PN 6 | 72,0 | 354 | 968 | 430 | 400 | 412 | 59,10 |
| | D 150 V F1 | 8259551 | 0083 | DN 150/PN 6 | 108,0 | 354 | 1.018 | 430 | 480 | 430 | 67,20 |
| 10 bar 110 °C | D 50 V F1 | 8259500 | 0083 | DN 50/PN 16 | 12,5 | 206 | 569 | 370 | 230 | 296 | 16,10 |
| | D 65 V F1 | 8259510 | 0083 | DN 65/PN 16 | 20,0 | 206 | 617 | 370 | 290 | 306 | 16,90 |
| | D 80 V F1 | 8259520 | 0083 | DN 80/PN 16 | 27,0 | 206 | 667 | 370 | 310 | 313 | 21,70 |
| | D 100 V F1 | 8259530 | 0083 | DN 100/PN 16 | 47,0 | 206 | 717 | 370 | 350 | 323 | 26,60 |
| | D 125 V F1 | 8259540 | 0083 | DN 125/PN 16 | 72,0 | 354 | 968 | 430 | 400 | 412 | 62,20 |
| | D 150 V F1 | 8259550 | 0083 | 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.

# Exdirt V Accessories

## 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

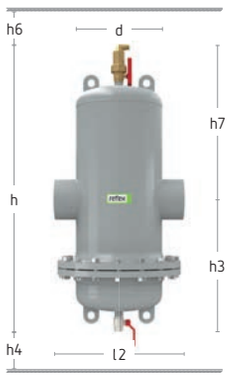


| Type | Art. No. | DG | Weight [kg] |
|---|---|---|---|
| **Exvoid T** | | | |
| Exvoid T 1 | 9255805 | 0082 | 1,40 |
| **Exferro magnetic insert for steel Exdirt and Extwin** | | | |
| Exferro D/TW 50–65 (60.3–76.1) | 9258340 | 0083 | 0,93 |
| Exferro D/TW 80–100 (88.9–114.3) | 9258350 | 0083 | 1,40 |
| Exferro D/TW 125–150 (139.7–168.3) | 9258360 | 0083 | 0,74 |

# Extwin combined microbubble, dirt and sludge separator



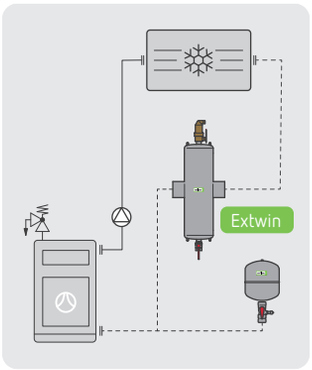

Extwin Steel flange connection




Extwin Steel welded connection with service flange



Extwin function diagram




Extwin R steel system – schematic 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. | DG | 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 | 0083 | DN 50/PN 16 | 12,5 | 132 | 785 | 450 | 335 | 50 | 370 | 350 | 10,00 |
| | TW 65* | 8253310 | 0083 | DN 65/PN 16 | 20,0 | 132 | 785 | 450 | 335 | 50 | 370 | 350 | 10,00 |
| | TW 65 | 8253319 | 0083 | DN 65/PN 16 | 20,0 | 132 | 785 | 450 | 335 | 50 | 370 | 350 | 10,00 |
| | TW 80 | 8253320 | 0083 | DN 80/PN 16 | 27,0 | 206 | 940 | 527 | 413 | 50 | 370 | 470 | 19,50 |
| | TW 100 | 8253330 | 0083 | DN 100/PN 16 | 47,0 | 206 | 940 | 527 | 413 | 50 | 370 | 470 | 32,50 |
| | TW 125 | 8253340 | 0083 | DN 125/PN 16 | 72,0 | 354 | 1.200 | 658 | 542 | 50 | 430 | 635 | 41,00 |
| | TW 150 | 8253350 | 0083 | DN 150/PN 16 | 108,0 | 354 | 1.200 | 658 | 542 | 50 | 430 | 635 | 47,40 |
| | TW 200 | 8253360 | 0083 | DN 200/PN 16 | 180,0 | 409 | 1.470 | 792 | 678 | 50 | 430 | 775 | 79,00 |
| | TW 250 | 8253370 | 0083 | DN 250/PN 16 | 288,0 | 480 | 1.916 | 1.001 | 915 | 50 | 500 | 890 | 156,00 |
| | TW 300 | 8253380 | 0083 | DN 300/PN 16 | 405,0 | 634 | 2.237 | 1.161 | 1.076 | 50 | 500 | 1.005 | 229,00 |

# Exdirt V Accessories dirt and sludge separator for vertical installation

CE

| | Type | Art. No. | DG | 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 | 0083 | DN 50/PN 16 | 12,5 | 132 | 785 | 450 | 335 | 50 | 370 | 350 | 18,00 |
| | TW 65 R* | 8253410 | 0083 | DN 65/PN 16 | 20,0 | 132 | 785 | 450 | 335 | 50 | 370 | 350 | 19,00 |
| | TW 65 R | 8253418 | 0083 | DN 65/PN 16 | 20,0 | 132 | 785 | 450 | 335 | 50 | 370 | 350 | 19,00 |
| | TW 80 R | 8253420 | 0083 | DN 80/PN 16 | 27,0 | 206 | 940 | 527 | 413 | 50 | 550 | 470 | 43,00 |
| | TW 100 R | 8253430 | 0083 | DN 100/PN 16 | 47,0 | 206 | 940 | 527 | 413 | 50 | 550 | 470 | 51,00 |
| | TW 125 R | 8253440 | 0083 | DN 125/PN 16 | 72,0 | 354 | 1.200 | 658 | 542 | 50 | 750 | 635 | 89,00 |
| | TW 150 R | 8253450 | 0083 | DN 150/PN 16 | 108,0 | 354 | 1.200 | 658 | 542 | 50 | 750 | 635 | 94,00 |
| | TW 200 R | 8253460 | 0083 | DN 200/PN 16 | 180,0 | 409 | 1.470 | 792 | 678 | 50 | 1.000 | 775 | 138,00 |
| | TW 250 R | 8253470 | 0083 | DN 250/PN 16 | 288,0 | 480 | 1.916 | 1.001 | 915 | 50 | 1.350 | 890 | 355,00 |
| | TW 300 R | 8253480 | 0083 | 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 | 0083 | 60,3 | 12,5 | 132 | 785 | 450 | 335 | 50 | 370 | 260 | 4,00 |
| | TW 76.1 | 8253110 | 0083 | 76,1 | 20,0 | 132 | 785 | 450 | 335 | 50 | 370 | 260 | 5,00 |
| | TW 88.9 | 8253120 | 0083 | 88,9 | 27,0 | 206 | 940 | 527 | 413 | 50 | 370 | 370 | 12,00 |
| | TW 114.3 | 8253130 | 0083 | 114,3 | 47,0 | 206 | 940 | 527 | 413 | 50 | 370 | 370 | 14,00 |
| | TW 139.7 | 8253140 | 0083 | 139,7 | 72,0 | 354 | 1.200 | 658 | 542 | 50 | 430 | 525 | 34,00 |
| | TW 168.3 | 8253150 | 0083 | 168,3 | 108,0 | 354 | 1.200 | 658 | 542 | 50 | 430 | 525 | 31,00 |
| | TW 219.1 | 8253160 | 0083 | 219,1 | 180,0 | 409 | 1.470 | 792 | 678 | 50 | 430 | 650 | 113,00 |
| | TW 273.0 | 8253170 | 0083 | 273,0 | 288,0 | 480 | 1.916 | 1.001 | 915 | 50 | 500 | 750 | 215,00 |
| | TW 323.9 | 8253180 | 0083 | 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 | 0083 | 60,3 | 12,5 | 132 | 785 | 450 | 335 | 50 | 370 | 260 | 13,00 |
| | TW 76.1 R | 8253210 | 0083 | 76,1 | 20,0 | 132 | 785 | 450 | 335 | 50 | 370 | 260 | 13,00 |
| | TW 88.9 R | 8253220 | 0083 | 88,9 | 27,0 | 206 | 940 | 527 | 413 | 50 | 550 | 370 | 34,00 |
| | TW 114.3 R | 8253230 | 0083 | 114,3 | 47,0 | 206 | 940 | 527 | 413 | 50 | 550 | 370 | 38,00 |
| | TW 139.7 R | 8253240 | 0083 | 139,7 | 72,0 | 354 | 1.200 | 658 | 542 | 50 | 750 | 525 | 102,00 |
| | TW 168.3 R | 8253250 | 0083 | 168,3 | 108,0 | 354 | 1.200 | 658 | 542 | 50 | 750 | 525 | 78,00 |
| | TW 219.1 R | 8253260 | 0083 | 219,1 | 180,0 | 409 | 1.470 | 792 | 678 | 50 | 1.000 | 650 | 182,00 |
| | TW 273.0 R | 8253270 | 0083 | 273,0 | 288,0 | 480 | 1.916 | 1.001 | 915 | 50 | 1.350 | 750 | 180,00 |
| | TW 323.9 R | 8253280 | 0083 | 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

CE

## 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



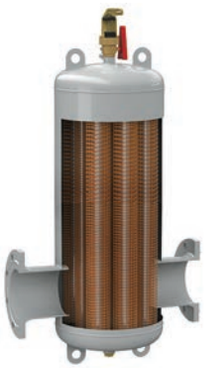
## Exvoid

- 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. | DG | Weight [kg] |
|---|---|---|---|
| **Exvoid T** | | | |
| Exvoid T 1 | 9255805 | 0082 | 1,40 |
| **Exferro magnetic insert for steel Exdirt and Extwin** | | | |
| Exferro D/TW 50–65 (60.3–76.1) | 9258340 | 0083 | 0,93 |
| Exferro D/TW 80–100 (88.9–114.3) | 9258350 | 0083 | 1,40 |
| Exferro D/TW 125–150 (139.7–168.3) | 9258360 | 0083 | 0,74 |
| Exferro D/TW 200 (219.1) | 9258370 | 0083 | 0,80 |
| Exferro D/TW 250–300 (273.0–323.9) | 9258380 | 0083 | 4,70 |

# Exvoid HC, Exdirt HC and Extwin HC



Exvoid HC flange connection cutaway model



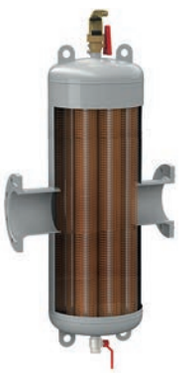
Exvoid HC welded connection



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

# Separation technology accessories

CE

## 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 | DG | Volume [l] | Connection c/c2/c3 | Ø d [mm] | Height h [mm] | Weight [kg] |
|---|---|---|---|---|---|---|---|---|
| 10 bar 110 °C | T 170 | 8680000 | 0073 | 8 | DN 50/65/65 | 206 | 328 | 3,15 |
| | T 270 | 8681000 | 0073 | 17 | DN 65/80/80 | 280 | 400 | 5,00 |
| | T 380 | 8682000 | 0073 | 42 | DN 80/100/100 | 409 | 528 | 11,00 |
| | T 480 | 8683000 | 0073 | 93 | DN 125/150/150 | 480 | 710 | 19,45 |
| | T 550 | 8684000 | 0073 | 199 | DN 150/200/200 | 634 | 896 | 32,30 |

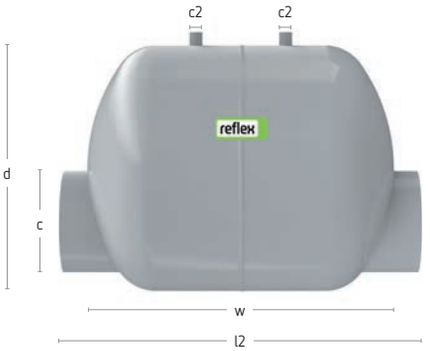
other sizes upon request

# Separation technology accessories

CE

## 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



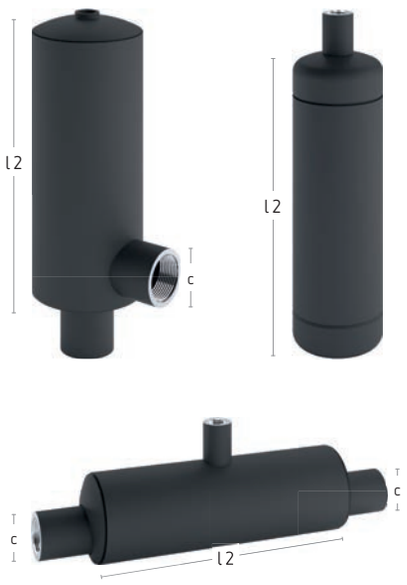

| | Type | Art. No. grey | DG | Number of couplings [pce] | Connection c | Connection c2 | Ø d [mm] | Width w [mm] | Installation length l2 [mm] | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 bar 110 °C | LA 32 | 8671000 | 0072 | 1 | DN 32/PN 16 | Rp 3/8" | 206 | 278 | 300 | 2,40 |
| | LA 40 | 8672000 | 0072 | 1 | DN 40/PN 16 | Rp 3/8" | 206 | 278 | 300 | 2,50 |
| | LA 50 | 8673000 | 0072 | 1 | DN 50/PN 16 | Rp 3/8" | 206 | 278 | 300 | 2,60 |
| | LA 65 | 8674000 | 0072 | 2 | DN 65/PN 16 | Rp 3/8" | 280 | 355 | 395 | 4,40 |
| | LA 80 | 8675000 | 0072 | 2 | DN 80/PN 16 | Rp 3/8" | 280 | 355 | 395 | 4,50 |
| | LA 100 | 8676000 | 0072 | 2 | DN 100/PN 16 | Rp 3/8" | 280 | 355 | 395 | 5,00 |
| | LA 125 | 8677000 | 0072 | 2 | DN 125/PN 16 | Rp 3/8" | 280 | 355 | 395 | 5,30 |
| | LA 150 | 8678000 | 0072 | 2 | DN 150/PN 16 | Rp 3/8" | 409 | 550 | 590 | 12,90 |
| | LA 200 | 8679000 | 0072 | 2 | DN 200/PN 16 | Rp 3/8" | 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. | DG | Volume [l] | Connection c | Chamber size | Installation length l2 [mm] |
|---|---|---|---|---|---|---|---|
| Air separator with connections for vertical installation | | | | | | | |

# Separation technology accessories

CE

| | Type | Art. No. | DG | Volume [l] | Connection c | Chamber size | Installation length l2 [mm] |
|---|---|---|---|---|---|---|---|
| 6 bar 110 °C | LT DN 50 | 4204721 | 0001 | 0,5 | Rp 1" | DN 50 | 200 |
| | LT DN 65 | 4203514 | 0001 | 0,8 | Rp 1" | DN 65 | 250 |
| | LT DN 80 | 4203515 | 0001 | 1,3 | Rp 1¼" | DN 80 | 250 |
| | LT DN 100 | 4203516 | 0001 | 2,5 | Rp 1½" | DN 100 | 300 |
| | LT DN 125 | 4203490 | 0001 | 3,8 | Rp 2" | DN 125 | 300 |
| | LT DN 150 | 6316055 | 0001 | 6,2 | Rp 2½" | DN 150 | 350 |
| | LT DN 200 | 6316065 | 0001 | 15,7 | Rp 3" | DN 200 | 500 |
| | LA DN 250 | 6315075 | 0001 | 24,5 | 114,3 | DN 250 | 500 |
| | LA DN 300 | 6315085 | 0001 | 34,4 | 139,7 | DN 300 | 500 |
| | LA DN 350 | 6315095 | 0001 | 50,6 | 168,3 | DN 350 | 600 |
| | LA DN 400 | 4202386 | 0001 | 77,7 | 219,1 | DN 400 | 700 |
| Air separator with connections for horizontal installation | | | | | | | |
| 6 bar 110 °C | LT DN 50 | 4205369 | 0001 | 0,5 | Rp 1" | DN 50 | 200 |
| | LT DN 65 | 4203491 | 0001 | 0,8 | Rp 1" | DN 65 | 250 |
| | LT DN 80 | 4203493 | 0001 | 1,3 | Rp 1¼" | DN 80 | 250 |
| | LT DN 100 | 4203494 | 0001 | 2,5 | Rp 1½" | DN 100 | 300 |
| | LT DN 125 | 4203495 | 0001 | 3,8 | Rp 2" | DN 125 | 300 |
| | LT DN 150 | 6316050 | 0001 | 6,2 | Rp 2½" | DN 150 | 350 |
| | LT DN 200 | 6316060 | 0001 | 15,7 | Rp 3" | DN 200 | 500 |
| | LA DN 250 | 6315070 | 0001 | 24,5 | 114,3 | DN 250 | 500 |
| | LA DN 300 | 6315105 | 0001 | 34,4 | 139,7 | DN 300 | 500 |
| | LA DN 350 | 6315090 | 0001 | 50,6 | 168,3 | DN 350 | 600 |
| | LA DN 400 | 6315100 | 0001 | 77,7 | 219,1 | DN 400 | 700 |
| Air separator for on-site connections | | | | | | | |
| 6 bar 110 °C | LT DN 40 | 4202875 | 0001 | 0,2 | – | DN 40 | 200 |
| | LT DN 50 | 4200981 | 0001 | 0,5 | – | DN 50 | 200 |
| | LT DN 65 | 4200891 | 0001 | 0,8 | – | DN 65 | 250 |
| | LT DN 80 | 4202391 | 0001 | 1,3 | – | DN 80 | 250 |
| | LT DN 100 | 4200838 | 0001 | 2,5 | – | DN 100 | 300 |
| | LT DN 125 | 4200839 | 0001 | 3,8 | – | DN 125 | 300 |
| | LT DN 150 | 4200840 | 0001 | 6,2 | – | DN 150 | 350 |
| | LT DN 200 | 4202269 | 0001 | 15,7 | – | DN 200 | 500 |
| | LT DN 250 | 4200841 | 0001 | 24,5 | – | DN 250 | 500 |
| | LT DN 300 | 6316072 | 0001 | 35,3 | – | DN 300 | 500 |
| | LT DN 350 | 6316073 | 0001 | 57,5 | – | DN 350 | 600 |
| | LT DN 400 | 6316074 | 0001 | 83 | – | DN 400 | 700 |
| 16 bar 110 °C | LT DN 50 | 4202806 | 0001 | 0,5 | – | DN 50 | 200 |
| | LT DN 65 | 4202807 | 0001 | 0,8 | – | DN 65 | 250 |
| | LT DN 80 | 4202808 | 0001 | 1,3 | – | DN 80 | 250 |
| | LT DN 100 | 4202810 | 0001 | 2,5 | – | DN 100 | 300 |
| | LT DN 125 | 4202811 | 0001 | 3,8 | – | DN 125 | 300 |
| | LT DN 150 | 4202809 | 0001 | 5,5 | – | DN 150 | 350 |
| | LT DN 200 | 4202795 | 0001 | 15,7 | – | DN 200 | 500 |
| | LT DN 250 | 4202796 | 0001 | 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. | DG | Volume [l] | Connection c | Height h [mm] |
|---|---|---|---|---|---|
| **Desludging vessels** | | | | | |
| EB DN 400 | 6505350 | 0001 | 60 | DN 50 | 870 |
| EB DN 500 | 6540000 | 0001 | 90 | DN 65 | 870 |
| EB DN 500 | 6540001 | 0001 | 120 | DN 80 | 1.020 |
| EB DN 600 | 6540100 | 0025 | 180 | DN 100 | 1.060 |
| EB DN 600 | 6540101 | 0025 | 300 | DN 125 | 1.490 |
| EB DN 800 | 6540200 | 0025 | 400 | DN 150 | 1.240 |
| EB DN 800 | 6540201 | 0025 | 750 | DN 200 | 1.930 |
| **Magnetite desludging vessel** | | | | | |
| M-EB DN 400 | 4206071 | 0001 | 60 | DN 50 | 870 |
| M-EB DN 500 | 4206072 | 0001 | 90 | DN 65 | 870 |
| M-EB DN 500 | 4206073 | 0001 | 120 | DN 80 | 1.020 |
| M-EB DN 600 | 4206074 | 0001 | 180 | DN 100 | 1.060 |
| M-EB DN 600 | 4206075 | 0001 | 300 | DN 125 | 1.490 |
| M-EB DN 800 | 4206076 | 0001 | 400 | DN 150 | 1.240 |
| M-EB DN 800 | 4206077 | 0001 | 750 | DN 200 | 1.930 |