Separation Technology

Deaeration Systems & Separation Technology

Brass

Horizontal

Vertical

Steel

Welded Connection

Flanged Connection

HiCap
HiCap R

Exvoid

Automatic Air Vent

T 1/2"
110°C/180°C

Micro Bubble Air Separator

A22-1 1/2"
110°C/180°C

A22-2" V
110°C/180°C

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A60.3-A329.9
Hi-cap Version

A50-A600
Hi-cap Version

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Exdirt

Dirt and Sludge Separator

D22-2"
110°C

D22-1" V
110°C

Dirt and Sludge Separator With Magnet

D22-2" M
110°C

D22-1" V-M
110°C

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D60.3-D329.9
Hi-cap Version

D50-D600
Hi-cap Version

Magnet Insert
(Option)

D60.3-D329.9
Hi-cap Version R

D50-D600
Hi-cap Version R

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Extwin

Combined Micro Bubble Dirt and Sludge Separator

TW22-1"
110°C

TW22 V
110°C

Combined Micro Bubble Dirt and Sludge Separator With Magnet

TW22-1" M
110°C

TW22 V-M
110°C

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TW60.3-TW329.9
Hi-cap Version

TW50-TW600
Hi-cap Version

Magnet Insert
(Option)

TW60.3-TW329.9
Hi-cap Version R

TW50-TW600
Hi-cap Version R

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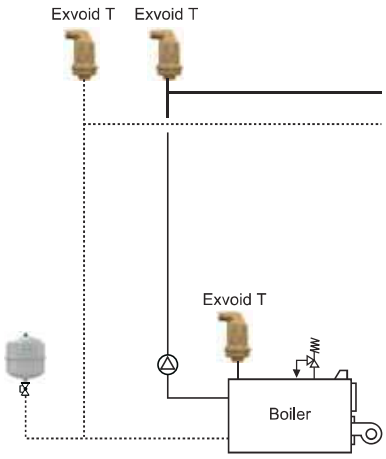
Exvoid T

Non-leak, non-shut-off deaeration valve

Air chamber with special design: floating impurities do not reach the deaeration valve; high air chamber volume to counteract pressure fluctuations

Solid construction for an extra-long service life



Exvoid T system air venting sketch

Overview
- Brass casing
- Multiple testing procedure on the deaeration valve
- Vertical installation
- Rp 1/2 system connection and a G 1/2 connection thread on the deaeration valve
- Application limits 110 / 180°C and 10 bar
- Reflex Extop, now with it's new name Reflex Exvoid

Exvoid T Automatic Air Vent

Fields of application

The automatic air vent in the reflex Exvoid T series is an ongoing and effective way of removing air and other gases from heating, solar, and cooling systems, including under constant operating conditions, in filling processes after having emptied the system, and in new installations. The vents are applied at high points within the system or at specially identified collection points

Mode of operation

In order to ensure ongoing safe and automatic operation, Reflex Exvoid T automatic air vents follow a sound engineering design formula: Gases collect in a generously sized chamber. This causes the water level in the chamber to drop and a float to fall, which opens the deaeration valve once it reaches a certain depth. The combination of a multiple-tested valve and a generously sized air chamber ensures flawless operation, even in extreme pressure fluctuations

T, brass
- 110°C 10 bar

Type	Article No	Weight kg	Material Group	Connection	Ø (mm)	H (mm)
T 1 / 2	9250000	0.7	82	Rp 1/2	63	120

T Solar, brass
- 180°C 10 bar

Type	Article No	Weight kg	Material Group	Connection	Ø (mm)	H (mm)
T 1 / 2 S	9250600	0.7	82	Rp 1/2	63	120

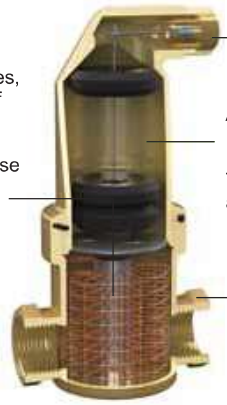
Benefits in brief
- Reliable, automatic deaeration
- Reduces flow noise, circulation problems, drop in performance and helps to avoid corrosion damage
- Optimum function reliability, even in tough conditions
- Reduces maintenance requirements
- Suitable for a variety of temperatures and applications

Exvoid

The core element is a tube mesh construction that has proven itself over the decades, with an extremely low rate of pressure loss in the flow direction and a high rate of pressure loss in the transverse direction. This drastically reduces the amount of turbulence and guides the gas bubbles to a part-stabilized area

Volumetric flow:
1.25 - 8 m³/h

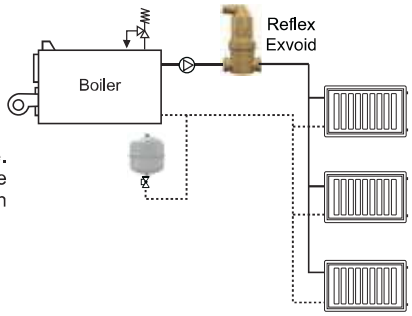
Exiso thermal insulation:
A22 - 2”



Non-leak, non-shut-off deaeration valve

Air chamber with special design: its large volume means that driving impurities do not reach the deaeration valve. The large distance between the water surface and the valve ensures flawless operation, even in high pressure fluctuations

Several connections are available from A22 to 2”



Exvoid “brass” system deaeration sketch

Exvoid (Brass) Micro Bubble Air Seperator

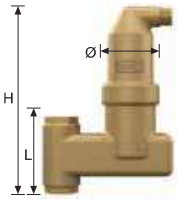
Brass, 110°C 10 bar
- Horizontal

Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø mm	H mm
A 22	9251000	1.1	22 mm[1)]	1.25	106	63	165
A 3/4	9251010	1.0	Rp 3/4	1.25	85	63	165
A 1	9251020	1.1	Rp 1	2.00	88	63	180
A1 1/4	9251030	1.3	Rp 1 1/4	3.70	88	63	202
A1 1/2	9251040	1.5	Rp 1 1/2	5.00	88	63	236
A 2	9251050	3.2	Rp 2	8.00	132	100	277

Material Group : 82
[1)] Clamp ring

Brass, 110°C 10 bar
- Vertical

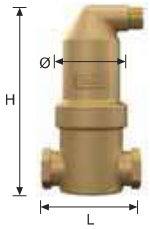
Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø mm	H mm
A 22 V	9251500	1.7	22 mm[1)]	1.25	84	63	206
A 3/4 V	9251510	1.6	Rp 3/4	1.25	84	63	206
A 1 V	9251520	1.6	Rp 1	1.25	84	63	206



Material Group : 82
[1)] Clamp ring

Brass, 180°C 10 bar
- For solar systems

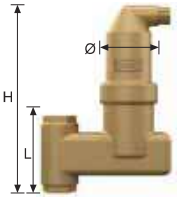
Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø D mm	H mm
A 22 S	9251600	1.2	22 mm[1)]	1.25	106	63	165
A 3/4 S	9251610	1.1	Rp 3/4	1.25	85	63	165
A 1 S	9251620	1.2	Rp 1	2.00	88	63	185
A 1 1/4 S	9251630	1.4	Rp 1/4	3.70	88	63	202
A 1 1/2 S	9251640	1.6	Rp 1/2	5.00	88	63	236



Material Group : 82
[1)] Clamp ring

Brass, 180°C 10 bar
- For solar systems

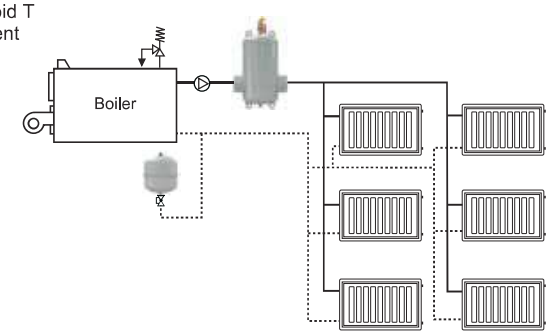
Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø D mm	H mm
A 22 S	9251700	1.8	22 mm[1)]	1.25	104	63	220
A 3/4 SV	9251710	1.7	Rp 3/4	1.25	84	63	206
A 1 SV	9251720	1.7	Rp 1	2.00	84	63	206



Material Group : 82
[1)] Clamp ring

Exvoid

Because micro-bubbles are carried along by the flow, special measures are required in order to remove them from the system efficiently. The casings of Reflex Exvoid micro-bubble separators have a larger cross-section than the connection dimensions, which reduces the flow speed in the separator. At the same time, the volume flow is guided by a special wire mesh. The ensuing turbulence causes gas bubbles to move in an undetermined direction. Depending on the volume flow, density, and volume of the particles, parts of these gas bubbles are supported in their natural breakaway motion and removed from the system via the deaeration top section



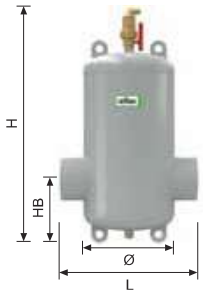
Exvoid "steel" system deaeration sketch

Overview
- Connection: DN 50 - DN 600
- Volumetric flow: 12.5 - 1530 m³/h
- Exiso thermal insulation: DN 50 - DN 150

Exvoid (Steel) Micro Bubble Air Seperator

Steel, 110°C 10 bar
- Welded connection

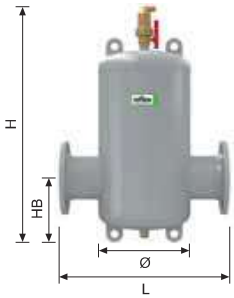
Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø D mm	H mm	HB mm
A 60.3	8251100	5	60.3	12.5	260	132	629[1)]	145
A 76.1	8251110	5	76.1	20.0	260	132	629[1)]	155
A 88.9	8251120	11	88.9	27.0	370	206	743[1)]	151
A 114.3	8251130	11	114.3	47.0	370	206	743[1)]	161
A 139.7	8251140	24	139.7	72.0	525	354	767[1)]	206
A 168.3	8251150	26	168.3	108.0	525	354	767[1)]	221
A 219.1	8251160	70	219.1	180.0	650	409	1050	276
A 273.0	8251170	108	273.0	288.0	750	480	1157	338
A 323.9	8251180	150	323.9	405.0	850	634	1426	393



Material Group : 83
[1)] Thermal insulation available

Steel, 110°C 10 bar
- Flange connection

Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø D mm	H mm	HB mm
A 50	8251300	11	DN 50/PN 16	12.5	350	132	629[1)]	145
A 65	8251310	12	DN 65/PN 16	20.0	350	132	629[1)]	155
A 80	8251320	18	DN 80/PN 16	27.0	470	206	743[1)]	151
A 100	8251330	21	DN 100/PN 16	47.0	475	206	743[1)]	161
A 125	8251340	60	DN 125/PN 16	72.0	635	354	767[1)]	206
A 150	8251350	64	DN 150/PN 16	108.0	635	354	767[1)]	221
A 200	8251360	90	DN 200/PN 16	180.0	775	409	1050	276
A 250	8251370	146	DN 250/PN 16	288.0	890	480	1157	338
A 300	8251380	194	DN 300/PN 16	405.0	1005	634	1426	393
A 350	8251910	Upon request	DN 350/PN 16	500.0	1128	634	1950	Upon request
A 400	8251920	Upon request	DN 400/PN 16	650.0	1226	750	2150	Upon request
A 450	8251940	Upon request	DN 450/PN 16	850.0	1330	750	2360	Upon request
A 500	8251950	Upon request	DN 500/PN 16	1060.0	1430	1000	2580	Upon request
A 600	8251960	Upon request	DN 600/PN 16	1530.0	1630	1200	3020	Upon request

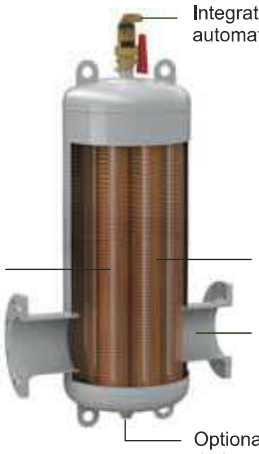


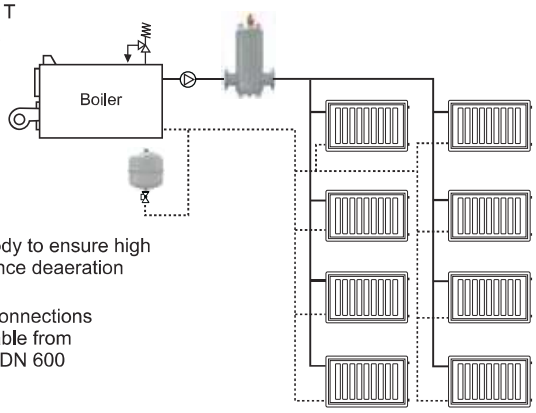
Material Group : 83
[1)] Thermal insulation available

Benefits in brief
- Removes free circulating air and gas bubbles
- Robust heavy gauge steel construction
- Functions in fully automated, continuous operation
- Produces just a minimal, constant drop in pressure
- Enables much faster hydraulic balancing after filling processes
- Prevents development of noise, wear through corrosion, and loss in performance through the formation of larger air bubbles
- Full range in terms of operating pressures, temperatures, and materials

Exvoid HC

Because micro-bubbles are carried along by the flow, special measures are required in order to remove them from the system efficiently. The casings of Reflex Exvoid HC micro-bubble separators have a larger cross-section than the connection dimensions, which reduces the flow speed in the separator. At the same time, the volume flow is guided by a special wire mesh. The ensuing turbulence causes gas bubbles to move in an undetermined direction. Depending on the volume flow, density, and volume of the particles, parts of these gas bubbles are supported in their natural breakaway motion and removed from the system via the deaeration top section





Exvoid "steel" HiCap system deaeration sketch

Overview

- Connection: DN 50 - DN 600
- Volumetric flow: 25 - 3000 m³/h

Exvoid HiCap (Steel) Micro Bubble Air Seperator

Steel, 110°C 10 bar

- Welded connection

Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø D mm	H mm	HB mm
A 60.3 HC	9251105	5	60.3	25.0	260	132	810	145
A 76.1 HC	9251115	5	76.1	40.0	260	132	810	155
A 88.9 HC	9251125	11	88.9	54.0	370	206	965	151
A 114.3 HC	9251135	11	114.3	94.0	370	206	965	161
A 139.7 HC	9251145	24	139.7	144.0	525	354	1205	206
A 168.3 HC	9251155	26	168.3	215.0	525	354	1205	221
A 219.1 HC	9251165	70	219.1	360.0	650	409	1495	276
A 273.0 HC	9251175	108	273.0	575.0	750	480	1895	338
A 323.9 HC	9251185	150	323.9	810.0	850	634	2205	393

Material Group : 83

Steel, 110°C 10 bar

- Flange connection

Type	Article No	Weight kg	Connection	V̇max m³/h	L mm	Ø D mm	H mm	HB mm
A 50 HC	9251305	11	DN 50/PN 16	25.0	350	132	810	145
A 65 HC	9251315	12	DN 65/PN 16	40.0	350	132	810	155
A 80 HC	9251325	18	DN 80/PN 16	54.0	470	206	965	151
A 100 HC	9251335	21	DN 100/PN 16	94.0	475	206	965	161
A 125 HC	9251345	60	DN 125/PN 16	144.0	635	354	1205	206
A 150 HC	9251355	64	DN 150/PN 16	215.0	635	354	1025	221
A 200 HC	9251365	90	DN 200/PN 16	360.0	775	409	1495	276
A 250 HC	9251375	146	DN 250/PN 16	575.0	890	480	1895	338
A 300 HC	9251385	194	DN 300/PN 16	810.0	1005	634	2205	393
A 350 HC	9251915	Upon request	DN 350/PN 16	1000.0	1128	634	2460	Upon request
A 400 HC	9251925	Upon request	DN 400/PN 16	1300.0	1226	750	2740	Upon request
A 450 HC	9251945	Upon request	DN 450/PN 16	1700.0	1330	750	3030	Upon request
A 500 HC	9251955	Upon request	DN 500/PN 16	2120.0	1430	1000	3310	Upon request
A 600 HC	9251965	Upon request	DN 600/PN 16	3000.0	1630	1200	3160	Upon request

Material Group : 83

Benefits in brief

- Removes free circulating air and gas bubbles
- Functions in fully automated, continuous operation
- Produces just a minimal, constant drop in pressure
- Enables much faster hydraulic balancing after filling processes
- Prevents development of noise, wear through corrosion, and loss in performance through the formation of larger air bubbles
- Full range in terms of operating pressures, temperatures, and materials
- Specially designed for bigger systems with longer heights and higher volumetric flow

Accessories

Exferro

- Solenoid insert for sludge separator
- 110°C/10 bar
- Magnetic bar screwed into thermowell/T-piece
- For uptake of ferromagnetic substances

Type	Article No	Area Of Application	Installation Length (mm)
DN 50/114.3	9258300	DN 50 - DN 100	300
D 125/219.1	9258310	DN 125 - DN 200	350
D 250/323.9	9258320	DN 250 - DN 300	400
D 350/600	9258330	> DN 100	500

Material Group : 83

Exiso

- Brass Exvoid, A 22-A 1 1/2 - 2"
- Brass Exdirt D 22-D 1 1/2 - 2"

Type	Article No	Material Group	Insulation thick-ness (mm)	Ø mm	H mm
A/D 22-1 1/2	9254811	82	15	125	215-275
A/D 2"	9254801	82	15	Upon request	

- Thermal insulation for Exvoid and Exdirt, steel version

Type	Article No	Material Group	Insulation thick-ness (mm)	Ø mm	H mm
50-76.1	9254831	83	30.5	228	447
80-114.1	9254841	83	30.5	290	567
125-168.3	9254851	83	30.5	395	742

Pressure Loss Chart

- Exvoid, Exdirt, Extwin

Connection	kvs, m^3/h	V max. m^3/h
Rp 3/4	10.7	1.25
Rp 1	17.2	2.00
Rp 1 1/4	31.8	3.70
Rp 1 1/2	40.0	5.00
Rp 2	56.1	7.50
DN 50	72.2	12.50
DN 65	121.7	20.00

Connection	kvs, m^3/h	V max. m^3/h
DN 80	158.5	27.0
DN 100	244.3	47.0
DN 125	351.3	72.0
DN 150	487.9	108.0
DN 200	780.6	180.0
DN 250	1185.7	288.0
DN 300	1696.4	405.0

Pressure loss calculation for all volume flows

$$\Delta p = \left(\frac{\dot{V}}{Kvs}\right)^2 \times 1\ \text{bar},\ \dot{V} \leq \dot{V}\ max$$

Example:

Heating circuit 70/55°C, heat generator output 40 kW

$$\Delta p = \left(\frac{2.3\ m./h}{31.8\ m^3/h}\right)^2 \times 1\ \text{bar} = 5.23 \times 10^{-3}\ \text{bar}$$

$$\dot{V} = \frac{40\ kW}{4.2\ kJ\ /\ (kg\ K)\ .\ (70\text{-}55)\ K} \times 3.600\ \frac{s}{h} \times \frac{1\ m^3}{1.000\ kg}$$

= 2.3 m^3/h ⟶ selected size Rp 1 1/4