

VIRA

USER MANUAL



ENGLISH LANGUAGE

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1. PREFACE

1.1. About The Device

This Viratech product improves the quality of your complete installation.

- For an overview of the product, refer to section 2.1.
- For the intended use, refer to section 2.3.

This Vira product is designed and manufactured according to the Sound Engineering Practice as stated in the Pressure Equipment Directive (2014/68/EU).

This manual applies to product types starting with the codes shown below:




SC	F-K-V	M-T-H	50...600
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Code	Description
SV	ViraVent
SVH	
SC	ViraPlus
SCH	
SD	ViraClean
SDH	
SCX	ViraFix
SB	ViraBalance

Code	Description
...	Connections size (DN) code: <ul style="list-style-type: none"> • 050: DN50 • 065: DN65 • 080: DN80 • 100: DN100 • 125: DN125 • 150: DN150 • 200: DN200 • 250: DN250 • 300: DN300
F	Flanged
K	Welded ends
V	Victaulic (grooved)
M	Magnet
H	High-Flow
T	Demountable

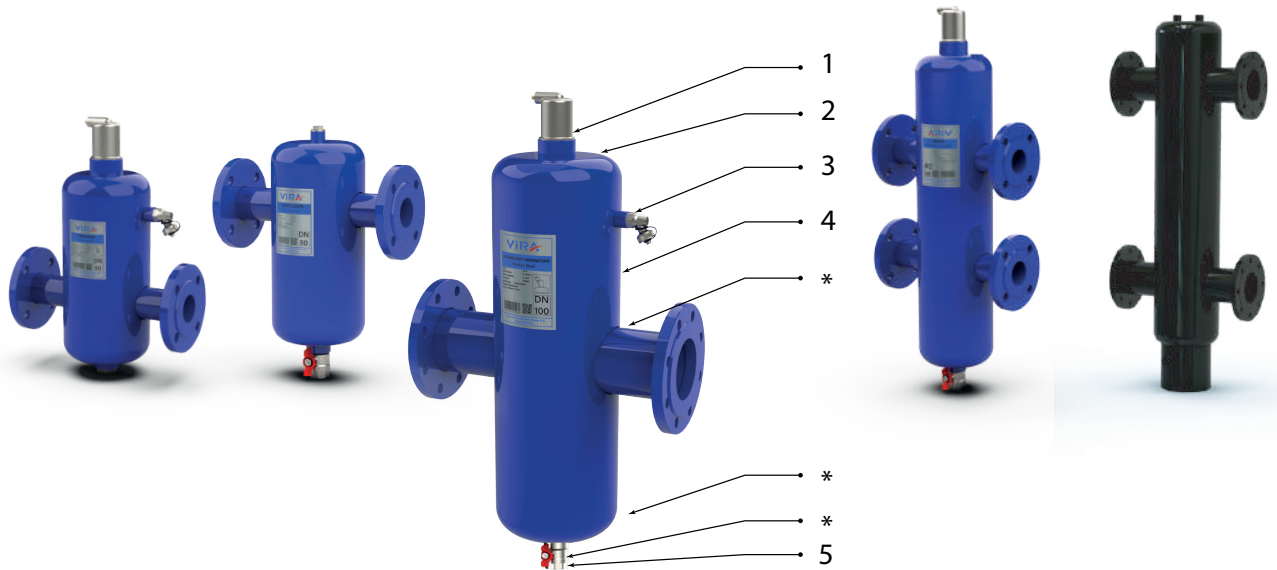
1.2. Symbols

Throughout the instructions the following symbols are used:

	Warning (risk of injury) or caution (risk of damage)
	Note
	Risk of burns

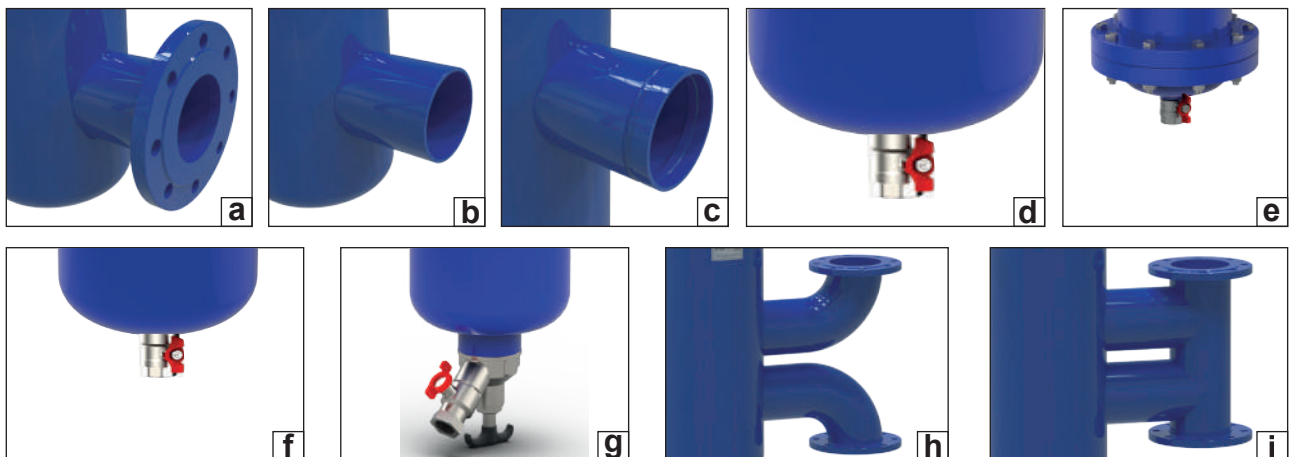
2. INTRODUCTION

2.1. Overview Of The Unit



- | | |
|---|--|
| 1. Automatic air vent / manual air vent | 4. Main body |
| 2. Lifting lugs | 5. Safety plug |
| 3. Scum valve | * Product variation. Refer to section 2.2. |

2.2. Overview Of The Product Variations



- | | |
|-------------------------|---|
| a. Flange | f. Drain valve |
| b. Welded ends | g. Rotatable dry pocket (with magnet and drain valve) |
| c. Victaulic connection | h. Separated vertical connection |
| d. Fixed bottom | i. Unified vertical connection |
| e. Demountable bottom | |

2.3. Intended Use

- ViraVent: the unit (fully) automatically removes all available bubbles and microbubbles from the water and water/glycol mixtures.
- ViraClean: the unit (fully) automatically removes (magnetic) dirt that has a higher specific weight than the system fluid from the water and water/glycol mixtures.
- ViraPlus: the unit (fully) automatically removes air, gasses, and (magnetic) dirt from water and water/glycol mixtures.
- ViraFix: the unit hydraulically balances and separates the primary and secondary flow in the installation, in combination with the (fully) automatic removal of air, gasses, and (magnetic) dirt from water and water/glycol mixtures.
- ViraBalance : the unit hydraulically balance the primary and secondary flow in the installation.

2.4. Operating Conditions

The unit is suitable for use in systems filled with water or mixtures of water and glycol up to 40%. The unit can be used in combination with chemicals / inhibitors approved according to local directives. Please check that the materials in the unit are compatible with the materials and fluid used in your system. For more information contact your supplier. Operation in combination with other fluids may result in irreparable damage.



WARNING

The unit is not suitable for demineralised water, and cannot be used for drinking water, and dangerous or flammable substances.

The unit should be used within the limits of the technical specifications as given in chapter 3. In case of doubt, always contact the supplier.

The unit is not suited for outdoor use.

2.5. Scope Of Delivery

- 1x Unit
- 1x Quick reference guide*
- 1x Drain valve for the dry pocket

* Each Quick reference guide has a QR-scan code with a direct link to this user manual.

2.6. Identification Sticker

Example:



Example:



- A. Company Logo
- B. Article Number
- C. Fluid
- D. Working Temperature
- E. Working Pressure
- F. Connection
- G. Serial Number
- H. Design & Manufacturing
- I. Barcode Number
- J. Purjor Angle
- K. International Standard
- L. Square Code
- M. Website

3. TECHNICAL SPECIFICATIONS

3.1. Operating Characteristics

Item	All types
Working pressure [bar-g]	0 - 10
Working temperature [°C]	0 - 110
Nominal flow velocity [m/s]	1.5
Maximum flow velocity of high-flow speed units [m/s]	3.0
Flange type of flanged units	PN16 (DIN2633) (EN1092)

3.2. Quality Control Specifications

NOTE

These are the specifications of the quality control at Vira.

3.2.1. Leak Test Specifications

Item	All types
Test pressure [bar-g]	>15
Test medium	Water & Air
Test time [sec.]	240
Approval criterion	No leakage

3.2.2. Functional Test Of The Automatic Air Vent

Item	All types (except for SD - SB ...)
Valve opening test	Full bore venting
Valve closing test	Positive valve closure

3.2.3. Standards

Item	All types
Construction	Pressure Equipment Directive 2014/68/EU - Sound Engineering Practice
Quality, safety and environmental aspects	NEN-EN-ISO 9001
	NEN-EN-ISO 14001
	NEN-EN-ISO 45001

4. SAFETY

4.1. Safety Instructions



WARNING

- Installation and maintenance may only be carried out by a qualified installer.
- When working on the unit, always ensure there is no pressure in the unit, let it cool down and remove the water from the unit. This is not applicable when draining dirt from the unit.



WARNING

Do not touch the unit or the pipework when the system is in operation. The surfaces may be hot and touching them may cause burns.



CAUTION

- Do not use the scum valve or drain valve for (re)filling.
- Always install the unit body vertically, with the automatic air vent (if available) on top and the dry pocket or drain valve (if available) at the bottom.

5. INSTALLATION AND COMMISSIONING

5.1. Installation Conditions

- Install the unit in a frost-free, well-ventilated place.
- Install the unit in accordance with the local guidelines and rules.
- Install the unit stress free and with the body in vertical position.
- Do not use the unit as a support for pipework.
- It is not allowed to weld the unit to the pipework or other external items unless the unit is specifically designed to be welded into the pipework.
- It is not allowed to modify the unit.
- Apply the separately supplied product labels if the labels on the product are not visible; for instance after the unit has been insulated.
- The lifting lugs may only be used during the installation.
- The unit operates independent of the flow direction.
- Do not obstruct the automatic air vent (if available) and make sure that the automatic air vent is always easily accessible.
- A tube can be fitted to the air vent (1/2" female thread on the outlet) to lead away the released (smelly) air. Excessive dirt particles or foam forming might cause a temporary leakage of the automatic air vent.
- If a drain pipe is fitted, make sure that this pipe is fitted stress and vibration free to the drain valve. Preferably, a flexible pipe or pipe parts should be used (e.g. a hose).
- Do not obstruct the vent valve and keep all valves accessible.

- The scum valve and the manual air valve are designed to blow off and let in large quantities of air during the filling and emptying of the installation and to remove floating dirt.

5.2. Install the unit

5.2.1. Mount The Unit

Example:



- Attach the pipework to the to the unit. Make sure that the unit is installed stress free.

NOTE

For ViraFix and ViraBalance (SCX and SB) : Make sure that the warmest water enters the unit at the top flanges. The coldest water should enter the unit at the lower flanges. This is necessary to prevent unwanted mixing of warm and cold water.

- Tighten the fasteners to the correct torque value of the pipework.

5.2.2. Install The Drain Valve (Not For SV / SVH Units)

NOTE

For units with a drain valve and / or magnetic dirt separator: Make sure that there is enough space to operate the valve. In case there is not enough space and the unit has a rotatable dirt separator, rotate the dry pocket.

5.3. Commissioning



CAUTION

If a cap R $\frac{1}{2}$ was installed on the automatic air vent for the system test, make sure that cap R $\frac{1}{2}$ is removed before the commissioning of the system.

The system must be commissioned and running to verify if the unit works properly.

At the first use, the automatic air vent (if applicable) might temporarily drip a bit of moist, but that is not a problem.

When the system is running, do the checks as follows:

- Leak check

6. PREVENTIVE MAINTENANCE

6.1. Maintenance Schedule For SXC..M/SD..M/SC..M.

Task	Interval	Section
Drain the dirt from the unit	<p>The first month after installation and after that on a regular basis, dependent on the amount of dirt in the system:</p> <ul style="list-style-type: none"> • Normal amount of dirt: every 6 months • Heavy amount of dirt: every 1 or 2 months 	6.2

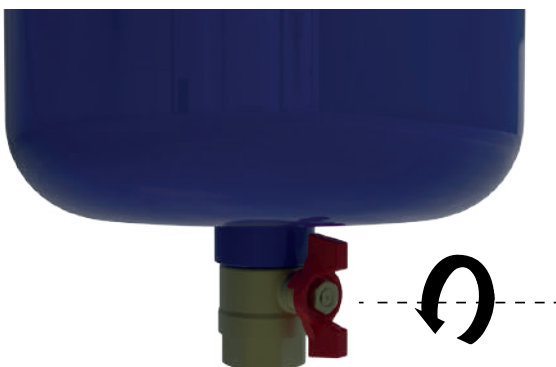
6.2. Drain The Dirt From The Unit

6.2.1. Drain The Dirt From The Unit (For Units With A Standard Drain Valve)



WARNING

- The main body and the piping may be hot.
- Hot water or steam may escape during the procedure.



1. Remove the safety plug.
2. Connect a hose to the drain valve. Make sure that the hose is connected to a drain or leads to a suitable place to collect the drained dirt.

NOTE

For the screw thread size, refer to section 3.4.

3. Gradually open the drain valve fully until the dirt is drained out. An indication is when clear water comes out of the unit.

NOTE

Restrict the amount of water that gets drained off.

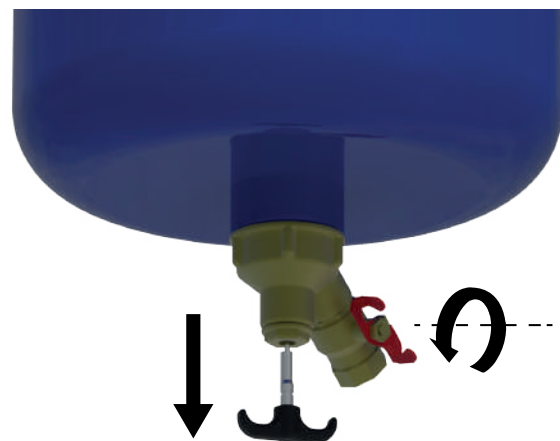
4. Close the drain valve.
5. Disconnect the hose from the drain valve.
6. Install the safety plug.
7. Check the system pressure. If it is necessary, refill the system.

6.2.2. Drain The Dirt From The Unit (For Units Magnetic Dirt Separator)



WARNING

- The main body and the piping may be hot.
- Hot water or steam may escape during the procedure.



1. Remove the safety plug.
2. Pull down the magnet's rope
3. Connect a hose to the drain valve. Make sure that the hose is connected to a drain.
4. Move the magnet through the unit.

- Gradually pull down the magnet in the dry pocket.



CAUTION

Do not use force.

- Gradually let the handle return to the original position.
 - Repeat the steps one or two times for the best result.
5. Gradually open the drain valve for a short period.

NOTE

Restrict the amount of water that gets drained off.

- 6. Close the drain valve.
- 7. Disconnect the hose from the drain valve.
- 8. Install the safety plug.
- 9. Check the system pressure. If it is necessary, refill the system.

6.3. Clean Or Replace The ViraTube Bundle (Only For SC/SCH And SD/SDH)



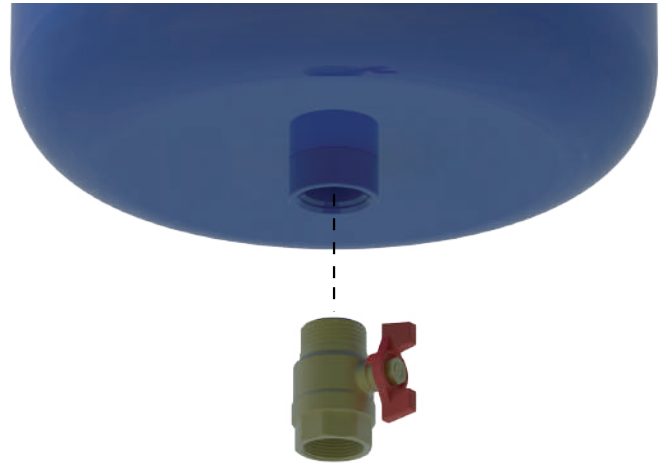
CAUTION

- Make sure that there is no pressure in the unit.
- Make sure that the unit is cooled down.
- Make sure that the unit is drained prior to opening the unit.
- Do not use corrosive chemicals.
- Make sure that the unit is correctly supported.
 - The ViraTube is supported by the bottom of the separator.
 - The ViraTube bundle may tumble over.
 - In some cases the ViraTube bundle may be affected by corrosion or fouling, which may reduce the mechanical strength.
 - ViraTube bundles and bottoms of the separator may be considerably heavier due to clogging dirt.

6.3.1. Prepare The Unit For Cleaning Or Replacement

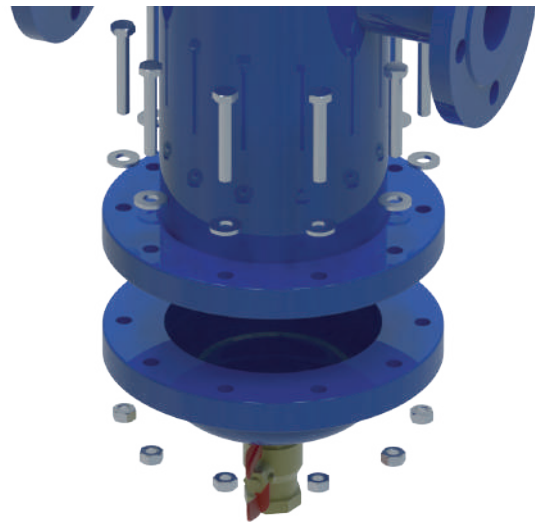
1. Remove the pressure from the unit.
2. Let the unit cool down.
3. Support the bottom and ViraTube bundle with appropriate supports, hoisting or lifting devices.

6.3.2. Remove The Drain Valve



1. Drain the unit.
2. Remove the drain valve.

6.3.3. Remove The Demountable Bottom / Demountable Top

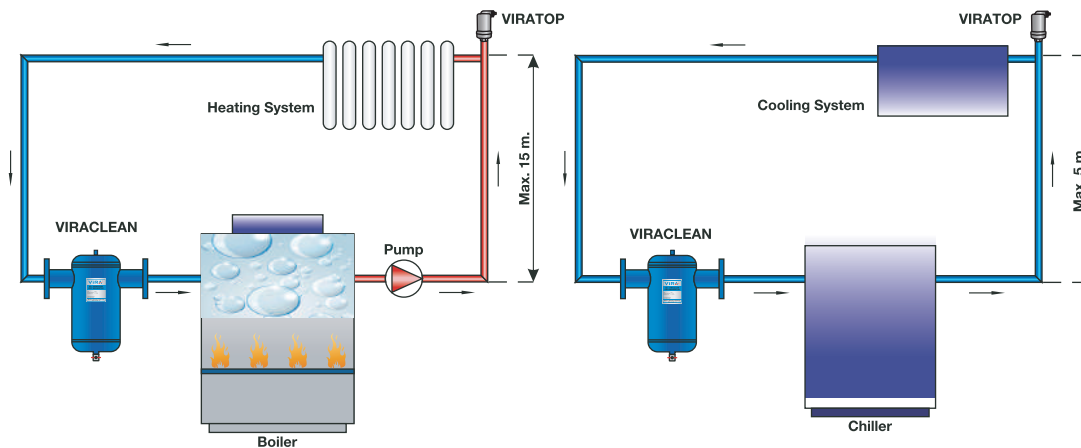


1. Remove the fasteners.
2. Remove the demountable bottom / demountable top.
3. Make sure that the bottom is supported and cannot fall.

7. INSTALLATIONS

7.1. Viraclean

Dirt Separator should always be installed before equipment (ie. boilers, chillers, control valves, pumps, etc.) That needs protection from dirt, sludge, etc. In heating systems this should be in the return. In chilled water systems the unit must be located in the return close to the chiller.



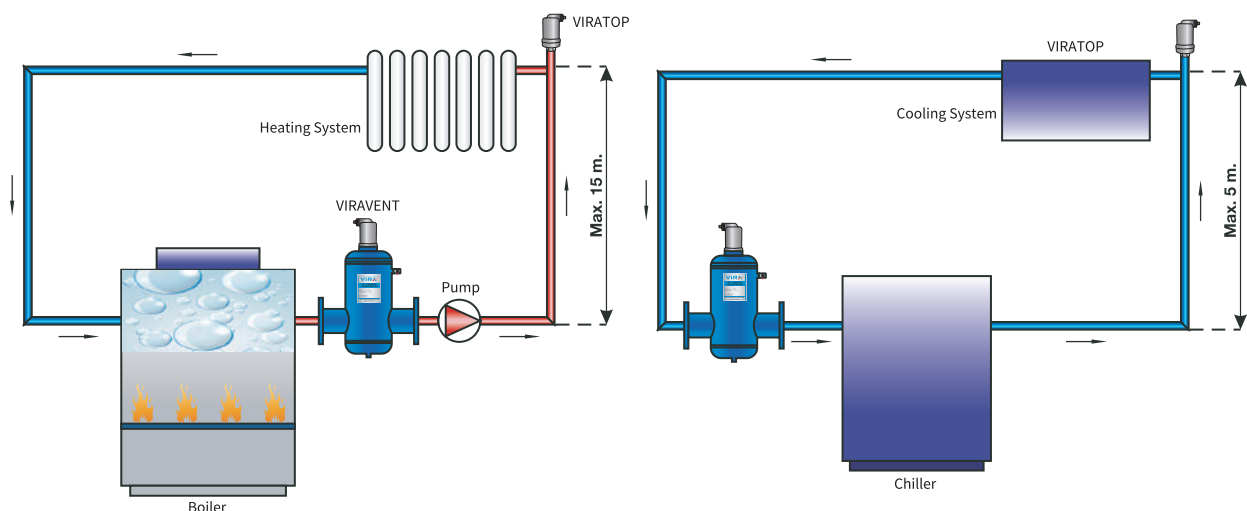
7.2. Viravent

Viravent unit must be installed at the hottest part of the system for optimum performance. The static head must not exceed 15m for heating system and 5m for cooling system.

The efficiency of the unit will be reduced if;

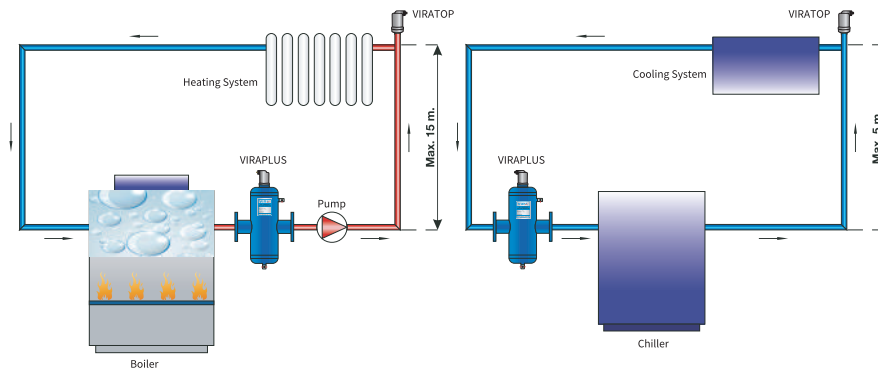
- The static head is exceeded.
- The maximum flow velocity of 3m/s is exceeded.

In heating systems the deaerator should be in the flow, preferably at the highest temperature (next to the heat source) and low pressure if possible. Viravent, Deaerator should be installed after the boiler and on the pump suction side, as these are the points where the formation of micro bubbles is greatest. In chilled water systems the unit must be located in the return close to the chiller.



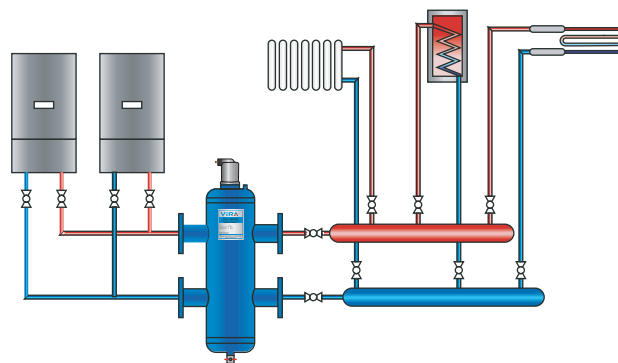
7.3. Viraplus

Viraplus is a combination of deaerator and dirt separator which removes circulating air and micro bubbles also dirt effectively. In heating systems the Viraplus should be in the flow and installed after the boiler. In chilled water systems the unit must be located in the return close to the chiller.



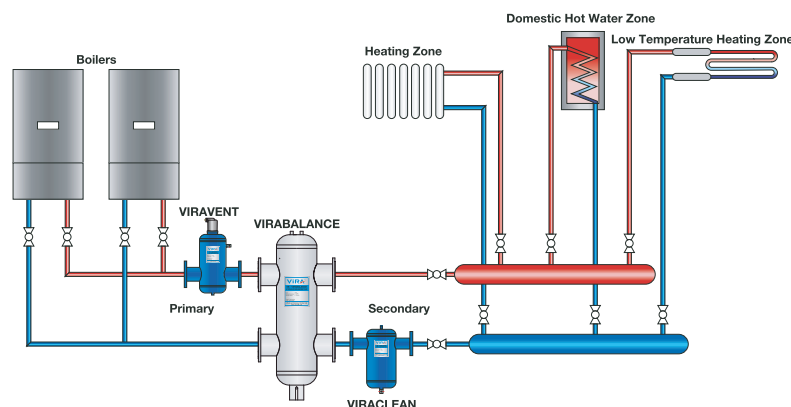
7.4. Virafix

Installation of a hydraulic separator in a heating system provides proper mixing, when flow in the boiler circuit is different from flow in the distribution circuit. Also Virafix is a combination of deaerator, dirt separator and hydraulic separator which removes circulating air and micro bubbles also dirt effectively



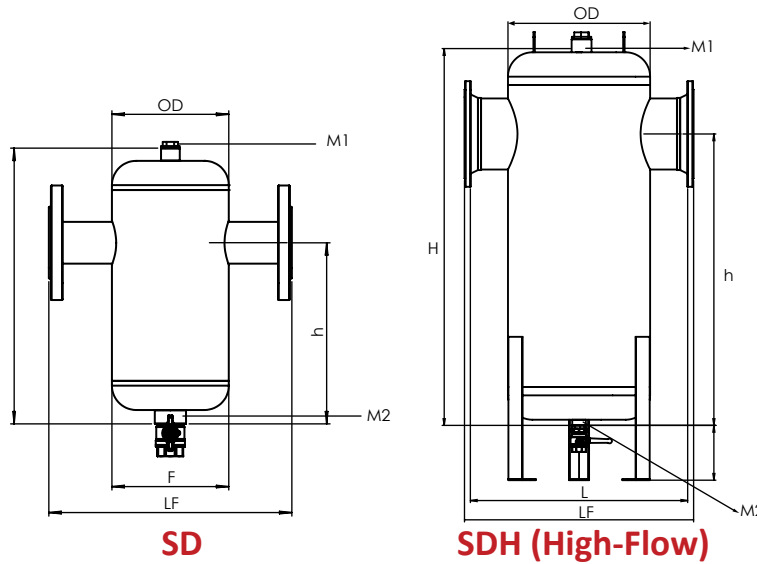
7.5. Virabalance

Installation of a hydraulic balance tank in a heating system provides proper mixing, when flow in the boiler circuit from flow in the distribution circuit.



8. PRODUCT DIMENSIONS

SD-F / SD-K / SD-V / SD-D

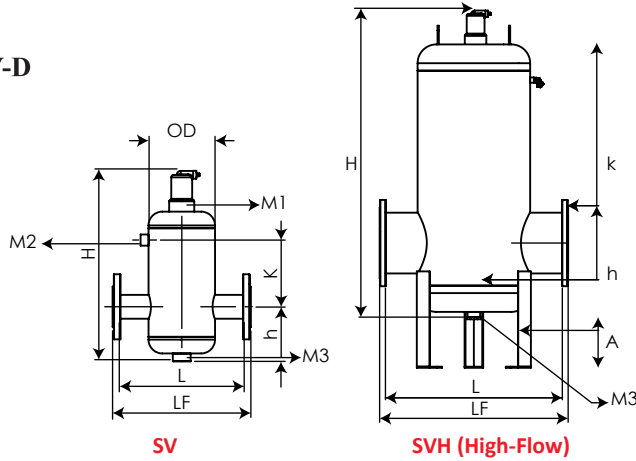


	Connection DN	Standart; Nom. 1,5 m/s								Hi-flow; nom. 3 m/s						M1	M2	
		OD (mm)	L (mm)	LF (mm)	H (mm)	h (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)	Leg A (mm)	H (mm)	h (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)			Leg A (mm)
SD	50	168,3	330	350	398	261	3,3	12	3		565	417	5,8	21	11,8		1/2"	1"
SD	65	168,3	330	350	398	261	6,3	22,5	2,7		565	417	10,0	36	11,6		1/2"	1"
SD	80	219,1	450	470	522	347	8,3	30	2,9		645	447	15,0	54	12,4		1/2"	1"
SD	100	219,1	455	475	522	347	12,5	45	3,7		645	447	23,3	84	14,6		1/2"	1"
SD	125	323,9	615	635	712	447	20,8	75	4,2		982	734	36,7	132	16,8		1/2"	1"
SD	150	323,9	615	635	712	447	31,3	11,5	4,9		982	734	52,8	190	19,4		1/2"	1"
SD	200	400	745	775	911	617	52,1	187,5	5,8		1233	934	94,2	339	23,1		1/2"	1"
SD	250	500	860	890	1152	804+	83,3	300	6,9		1592	1242	146,9	529	27,7		1/2"	2"
SD	300	600	975	1005	1472	1087	114,6	412,5	7,7		1947	1547	211,9	763	31		1/2"	2"
SD	350	700	1098	1128	1855	1434	143,8	517,5		270	2345	1812	288,3	1038		270	1/2"	2"
SD	400	800	1194	1226	2085	1614	188,3	678		270	2622	2023	376,7	1356		270	1/2"	2"
SD	450	900	1300	1330	2303	1773	238,3	858		270	2915	2275	476,7	1716		270	1/2"	2"
SD	500	1000	1400	1430	2595	2015	294,2	1059		270	3135	2442	588,6	2119		270	1/2"	2"
SD	600	1200	1600	1630	2935	2265	423,8	1525,5		270	3785	2975	847,8	3052		270	1/2"	2"

Operating pressure : 0 - 10 bar

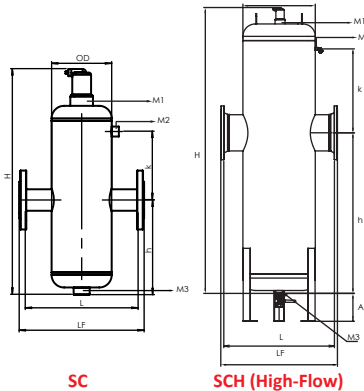
Fluid Temperature : 0 - 110 C

SV-F / SV-K / SV-V / SV-D



Connection DN	OD (mm)	L (mm)	LF (mm)	Standart; Nom. 1,5 m/s nom. = 1,5 m/s						Hi-flow; nom. 3 m/s max. = 3 m/s						M1	M2	M3
				H (mm)	h (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)	Leg A (mm)	H (mm)	h (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)	Leg A (mm)			
SV 50	168,3	330	350	482	138	3,3	12	3		650	150	5,8	21	11,8		1 3/4"	1/2" HM	1"
SV 65	168,3	330	350	482	138	6,3	22,5	2,7		650	150	10,0	36	11,6		1 3/4"	1/2" HM	1"
SV 80	219,1	450	470	607	177	8,3	30	2,9		730	200	15,0	54	12,4		1 3/4"	1/2" HM	1"
SV 100	219,1	455	475	607	177	12,5	45	3,7		730	200	23,3	84	14,6		1 3/4"	1/2" HM	1"
SV 125	323,9	615	635	797	267	20,8	75	4,2		1067	250	36,7	132	16,8		1 3/4"	1/2" HM	1"
SV 150	323,9	615	635	797	267	31,3	112,5	4,9		1067	250	52,8	190	19,4		1 3/4"	1/2" HM	1"
SV 200	400	745	775	997	297	52,1	187,5	5,8		1317	300	94,2	339	23,1		1 3/4"	1/2" HM	1"
SV 250	500	860	890	1237	357	83,3	300	6,9		1677	360	146,9	529	27,7		1 3/4"	1/2" HM	2"
SV 300	600	975	1005	1557	395	114,6	412,5	7,7		2032	410	211,9	763	31	270	1 3/4"	1/2" HM	2"
SV 350	700	1098	1128	1940	430	143,8	517,5		270	2430	543	288,3	1038		270	1 3/4"	1/2" HM	2"
SV 400	800	1194	1226	2170	480	188,3	678		270	2707	609	376,7	1356		270	1 3/4"	1/2" HM	2"
SV 450	900	1300	1330	2388	540	238,3	858		270	3000	650	476,7	1716		270	1 3/4"	1/2" HM	2"
SV 500	1000	1400	1430	2680	590	294,2	1059		270	3220	703	588,6	2119		270	1 3/4"	1/2" HM	2"
SV 600	1200	1600	1630	3020	680	423,8	1525,5		270	3870	820	847,8	3052		270	1 3/4"	1/2" HM	2"

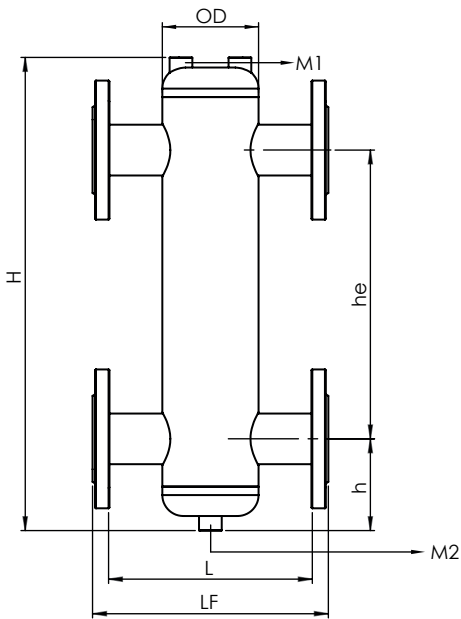
SC-F / SC-K / SC-V / SC-D



Connection DN	OD (mm)	L (mm)	LF (mm)	Standart; Nom. 1,5 m/s nom. = 1,5 m/s						Hi-flow; nom. 3 m/s max. = 3 m/s						M1	M2	M3
				H (mm)	h (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)	Leg A (mm)	H (mm)	h (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)	Leg A (mm)			
SC 50	168,3	330	350	632	265	3,3	12	3		880	370	5,8	21	11,8		1 3/4"	1/2" HM	1"
SC 65	168,3	330	350	632	265	6,3	22,5	2,7		880	370	10,0	36	11,6		1 3/4"	1/2" HM	1"
SC 80	219,1	450	470	791	345	8,3	30	2,9		1110	480	15,0	54	12,4		1 3/4"	1/2" HM	1"
SC 100	219,1	455	475	791	345	12,5	45	3,7		1110	480	23,3	84	14,6		1 3/4"	1/2" HM	1"
SC 125	323,9	615	635	1064	480	20,8	75	4,2		1540	700	36,7	132	16,8		1 3/4"	1/2" HM	1"
SC 150	323,9	615	635	1064	480	31,3	112,5	4,9		1540	700	52,8	190	19,4		1 3/4"	1/2" HM	1"
SC 200	400	745	775	1307	615	52,1	187,5	5,8		1960	920	94,2	339	23,1		1 3/4"	1/2" HM	1"
SC 250	500	860	890	1578	815	83,3	300	6,9		2650	1250	146,9	529	27,7	270	1 3/4"	1/2" HM	2"
SC 300	600	975	1005	1902	1120	114,6	412,5	7,7		3160	1510	211,9	763	31	270	1 3/4"	1/2" HM	2"
SC 350	700	1098	1128	2709	1553	143,8	517,5		270	3570	1580	288,3	1038		270	1 3/4"	1/2" HM	2"
SC 400	800	1194	1226	3030	1691	188,3	678		270	3900	1790	376,7	1356		270	1 3/4"	1/2" HM	2"
SC 450	900	1300	1330	3334	1877	238,3	858		270	4330	2000	476,7	1716		270	1 3/4"	1/2" HM	2"
SC 500	1000	1400	1430	3641	2065	294,2	1059		270	4800	2230	588,6	2119		270	1 3/4"	1/2" HM	2"
SC 600	1200	1600	1630	4240	2438	423,8	1525,5		270	5690	2680	847,8	3052		270	1 3/4"	1/2" HM	2"

Operating pressure : 0 - 10 bar

Fluid Temperature : 0 - 110 C

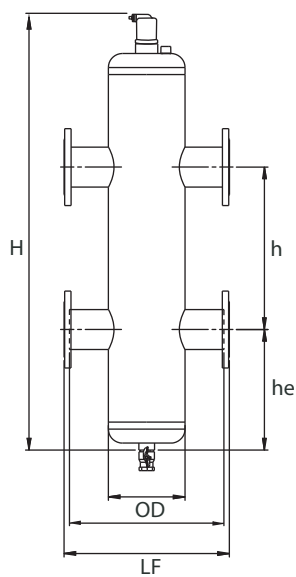


SB

Standart; nom. 1,5 m/s

nom. = 1,5 m/s

	Connection DN	OD (mm)	L (mm)	LF (mm)	H (mm)	h (mm)	he (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)	Flanged Weight	Welded Weight	M1	M2
SB	50	114,3	260	280	562	109	343	3,3	12	3	10	10	1/2"	1"
SB	65	168,3	330	350	862	179	505	6,3	22,5	2,7	30	18	1/2"	1"
SB	80	219,1	450	470	1242	357	657	8,3	30	2,9	43	30	1/2"	1"
SB	100	219,1	455	475	1242	357	657	12,5	45	3,7	45	31	1/2"	1"
SB	125	323,9	615	635	1535	423	819	20,8	75	4,2	72	52	1/2"	1"
SB	150	323,9	615	635	1793	478	972	31,3	112,5	4,9	120	80	1/2"	1"
SB	200	400	745	775	2197	554	1219	52,1	187,5	5,8	210	150	1/2"	1"
SB	250	500	860	890	2694	650	1523	83,3	300	6,9	350	270	1/2"	2"
SB	300	600	975	1005	3300	900	1800	114,6	412,5	7,7	420	315	1/2"	2"
SB	350	700	1098	1128	3914	1000	2103	143,8	517,5		580	460	1/2"	2"
SB	400	800	1194	1226	4320	1100	2404	188,3	678		620	496	1/2"	2"
SB	450	900	1300	1330	4830	1200	2700	238,3	858		950	786	1/2"	2"
SB	500	1000	1400	1430	5330	1300	3000	294,2	1059		1350	1165	1/2"	2"
SB	600	1200	1600	1630	6300	1500	3600	423,8	1525,5		1800	1620	1/2"	2"



SCX

Hi-flow; nom. 3 m/s

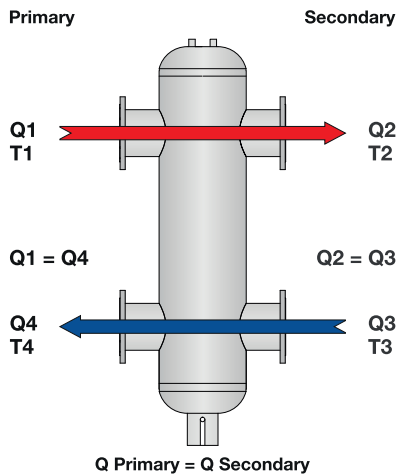
max. = 3 m/s

	Connection DN	OD (mm)	L (mm)	LF (mm)	Leg A (mm)	H (mm)	h (mm)	he (mm)	Max.Flow (L/s)	Max.Flow (m3/h)	Max.Flow (kPa)	Flanged Weight	Welded Weight	Leg A (mm)	M1	M2	M3
SCX	50	168,3	330	350		812	248	240	3,3	12	3	25	17		1 3/4"	1/2"	1"
SCX	65	168,3	330	350		927	273	305	6,3	22,5	2,7	36	28		1 3/4"	1/2"	1"
SCX	80	219,1	450	470		982	273	360	8,3	30	2,9	45	33		1 3/4"	1/2"	1"
SCX	100	219,1	455	475		1232	345	465	12,5	45	3,7	56	38		1 3/4"	1/2"	1"
SCX	125	323,9	615	635		1532	448	560	20,8	75	4,2	94	77		1 3/4"	1/2"	1"
SCX	150	323,9	615	635		1832	543	670	31,3	112,5	4,9	106	84		1 3/4"	1/2"	1"
SCX	200	400	745	775		2336	695	870	52,1	187,5	5,8	158	117		1 3/4"	1/2"	1"
SCX	250	500	860	890	270	2886	860	1100	83,3	300	6,9	279	216	270	1 3/4"	1/2"	2"
SCX	300	600	975	1005	270	3402	1020	1296	114,6	412,5	7,7	390	310	270	1 3/4"	1/2"	2"
SCX	350	700	1098	1128	270	3970	1130	1420	143,8	517,5		490	400	270	1 3/4"	1/2"	2"
SCX	400	800	1194	1226	270	4470	1280	1620	188,3	678		570	460	270	1 3/4"	1/2"	2"
SCX	450	900	1300	1330	270	4860	1365	1830	238,3	858		660	520	270	1 3/4"	1/2"	2"
SCX	500	1000	1400	1430	270	5400	1540	2030	294,2	1059		890	715	270	1 3/4"	1/2"	2"
SCX	600	1200	1600	1630	270	6395	1825	2445	423,8	1525,5		1080	890	270	1 3/4"	1/2"	2"

9. HYDRAULIC BALANCE TANK

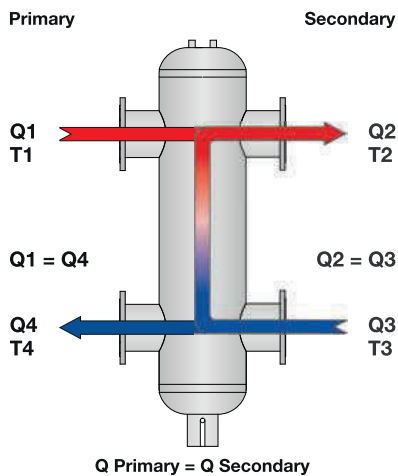
9.1. How Works Hydraulic Balance Tank

Three operating situation can occur if a hydraulic balance tank is installed in a heating system.



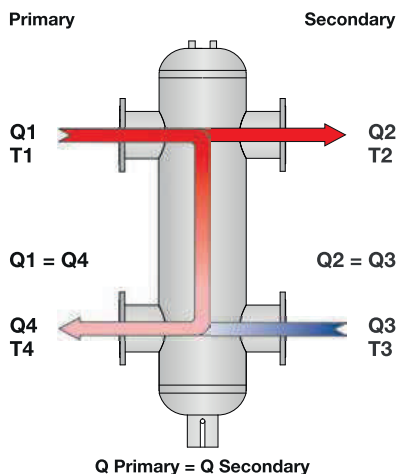
Primary Flow Equal to Secondary Flow

When the system flow is equal to the secondary flow, all the primary water is directed to the zones and all the return water goes back to the heat source. The temperature of the zone water is the same as that supplied by the heat source and the return water temperature to the heat source equals the return water temperature from the zones. In this situation, supply and demand are equal. $Q_{\text{primary}} = Q_{\text{secondary}}$



The Primary Flow Rate Less Than Secondary Flow Rate

When the system flow is equal to the secondary flow, all the primary water is directed to the zones and all the return water goes back to the heat source. The temperature of the zone water is the same as that supplied by the heat source and the return water temperature to the heat source equals the return water temperature from the zones. In this situation, supply and demand are equal. $Q_{\text{primary}} = Q_{\text{secondary}}$



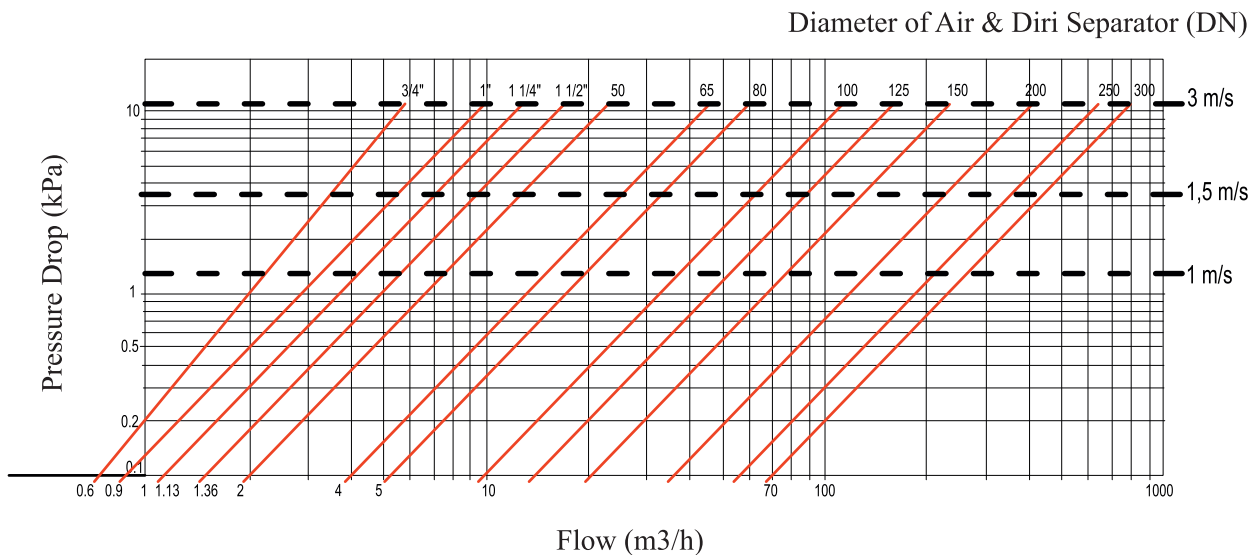
The Primary Flow Rate Greater Than Secondary Flow Rate

When the primary flow rate is greater than the secondary flow rate, the supply temperature from the heat source will be the temperature of the water to the zone. The return water to the heat source will be a mix of the heat source water and zone return water. In this situation, the power of the boiler will be modulated downwards. $Q_{\text{primary}} > Q_{\text{secondary}}$

10. PRESSURE DROP

Resistance graph to flow various diameters of Smartvent Air and Dirt Separators as below.

PRESSURE DROP CHART



Example:

When the water flow is 70 m³/h pressure drop for the DN 150 Smartvent Air and Dirt Separators :

1. From the 'Flow' axis at 70 m³/h at the point A, move vertically to the "Smartvent Dimension" DN 150 curve at point B.
2. Move left from point B to meet the "Pressure Drop" axis at point C, for this example Pressure Drop will be 1 kPa.



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