HIGH PERFORMANCE VACUUM DEGASSING

Eliminates air in heating and cooling systems

SPIROVENT®
SUPERIOR S400

SPIROVENT®
SUPERIOR S600

SPIROTECH

Maximising Performance for You

Why is air (almost) unavoidable in the water of heating and cooling installations?

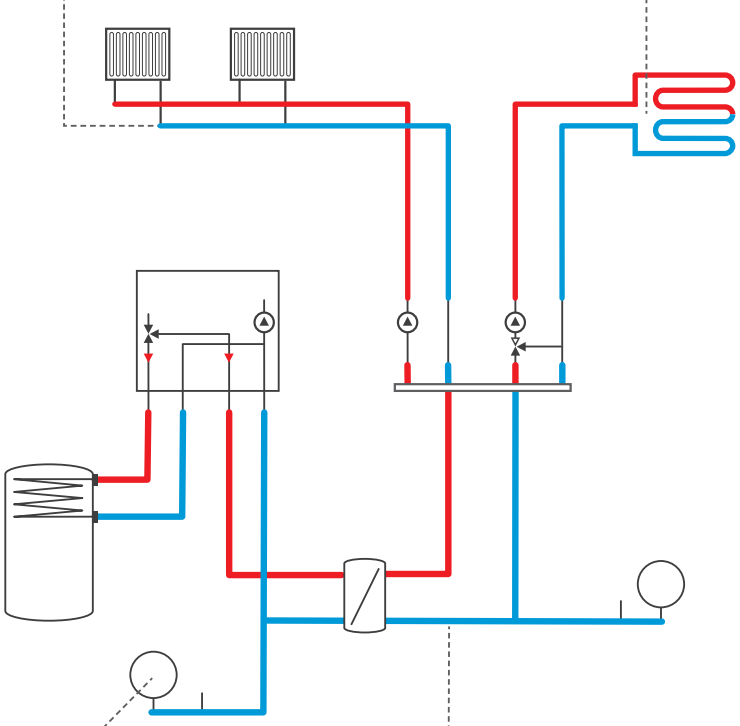
Even modern heating and cooling systems are never 100% airtight. Just because an installation is watertight, it doesn't mean that air or oxygen can't get in. There are a number of different ways in which air and gases can enter the system:

Diffusion in:

- seals
- hemp joints
- socket and crimp connections

Diffusion in:

- synthetic piping
- rubber parts
- reinforced hoses



Insufficient, incorrectly set or faulty pressure maintenance

Dissolved gases in replenishment water

Water purification in accordance with VDI2035 (for softening or desalination) has no influence on the amount of air or oxygen in the water.

SPIROVENT® SUPERIOR S400

SPIROVENT® SUPERIOR S600

How do air and oxygen manifest themselves in the system?

Distinct circulation noises and glugging sounds in:

- pumps
- radiators
- valves
- pipes

Reduced operational efficiency of:

- hydraulic valves
- pumps
- heat meters

Reduced heat transfer:

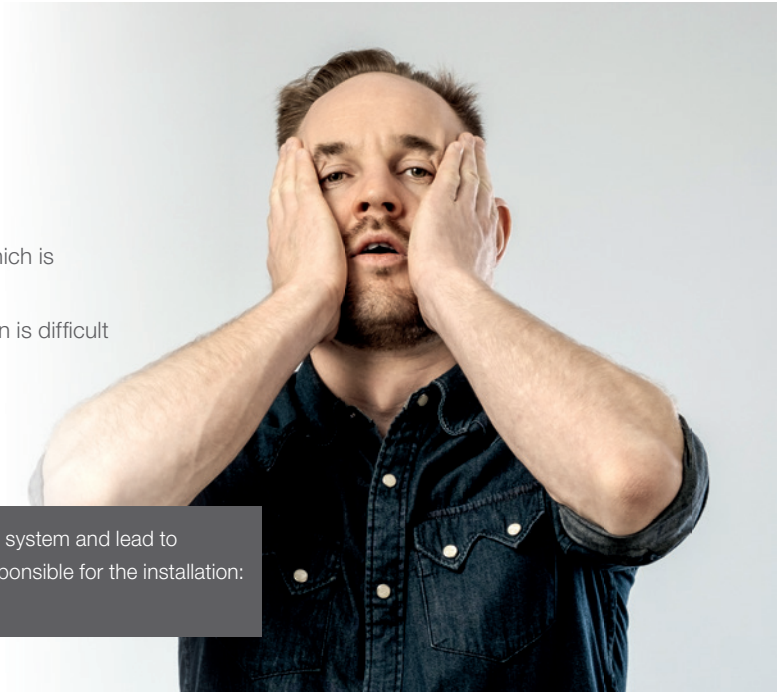
- radiators stay cold or tepid
- cooling effect does not reach the user

Encrustation of:

- piping
- valves
- pumps
- heat exchangers due to increased corrosion

What effects does air have on the operation of the system?

- It makes a regular manual bleeding of the system necessary, which is time-consuming
- The start-up process is extended because a hydraulic calibration is difficult
- Frequent malfunctioning of the system
- Higher energy requirements and therefore increased costs
- Regular complaints from the users / customers



If these undesirable effects reduce the operating times of the system and lead to negative feedback, then this reflects badly on all of those responsible for the installation: the operator, the contractor and the planner.

The air has got to go!

How can unwanted air be removed from heating or cooling systems?

AIR VENTS

SPIROTOP®

Air that gathers at the highest point of the system is removed with this air vent. It is mainly used when filling or draining a system.

MICROBUBBLE DEAERATOR

SPIROVENT®

Effectively removes air and microbubbles from the water circulating in the system. It works using the principle of thermal gas venting and is therefore installed at the warmest point within the system. It can be used up to a static height limit of 10-15 metres.

VACUUM DEGASSERS

SPIROVENT® SUPERIOR

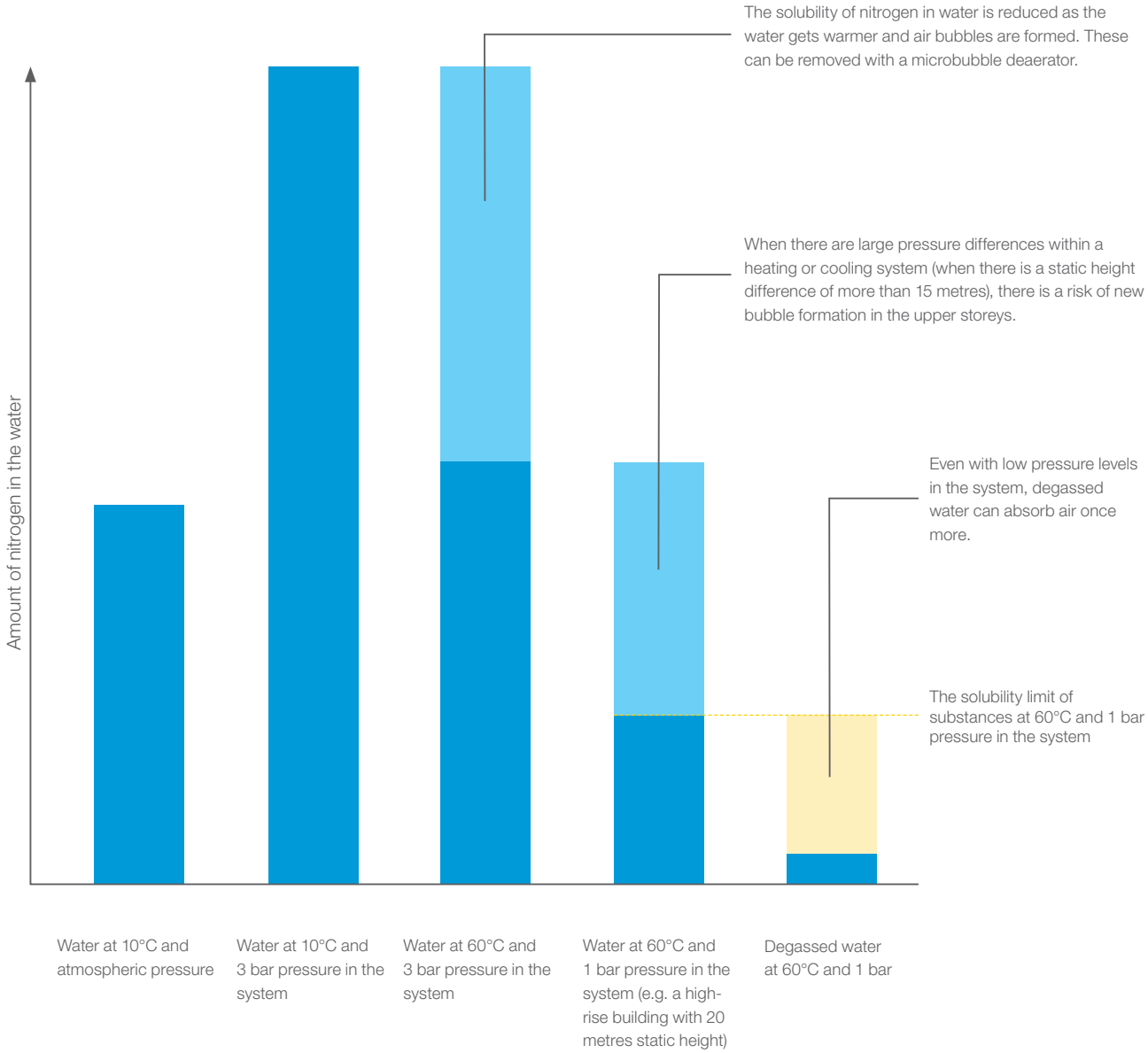
Removes all dissolved gases from the water in the system, no matter where it is installed and no matter what the pressure and temperature. After degassing, no further air problems can occur at any point of the heating or cooling system.
The degasser can be installed at just about any location in the system. Optionally, it can top up the system to maintain optimum water levels.

The use of a Superior vacuum degasser makes most sense when:

- the system has many branches and when there are large differences in pressure within the system. In these cases, it is especially difficult to say where air bubbles are formed
- the system has a small temperature differential (e.g. systems with heat pumps), because here the effect of thermal degassing is reduced
- the system has been extended after the initial installation
- the system has a high risk of corrosion

Why is vacuum degassing the most effective method to remove air from the system?

The advantages of vacuum degassing can be shown by looking at the nitrogen content of the water in heating systems:



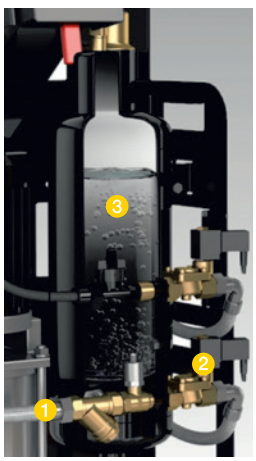
Vacuum degassers and oxygen: why is the degassing of replenishment water so important?

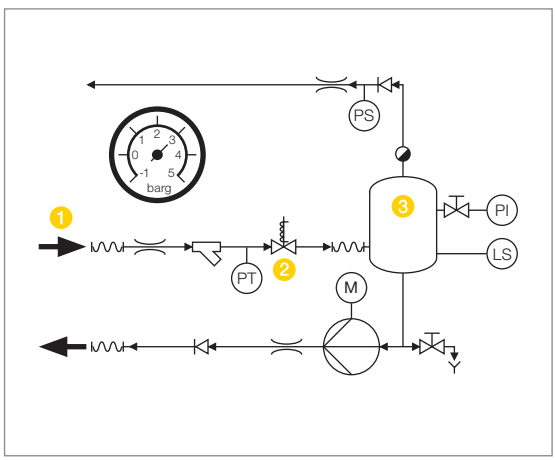
Unlike nitrogen, any oxygen that enters the heating or cooling system reacts very quickly with metal surfaces (causing corrosion), before the oxygen can be removed by the vacuum degasser. Normally the biggest source of additional oxygen comes via the replenishment water. It is therefore important to completely degas the replenishment water using the Superior, ensuring that no oxygen can enter the system.

It makes no difference whether the oxygen is dissolved in the water or if it has formed bubbles: corrosion reaction is going to happen anyway. By degassing the replenishment water, an important requirement of the directive VDI 2035 Page 2 for an enclosed corrosion-proof system is fulfilled: “A system which, when in operation, allows virtually no oxygen to enter.”

How do the Superior vacuum degassers work?

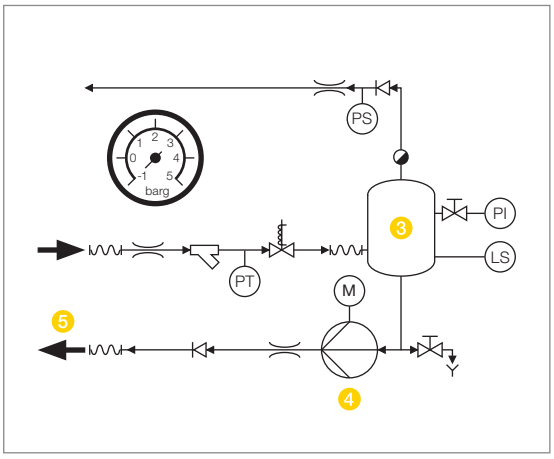
PHASE 1:
Some of the water in the system is fed via a bypass 1 into the degassing tank 3. When the tank is completely filled, the feed valve 2 closes. The pressure in the degassing tank is now the same as in the rest of the system.





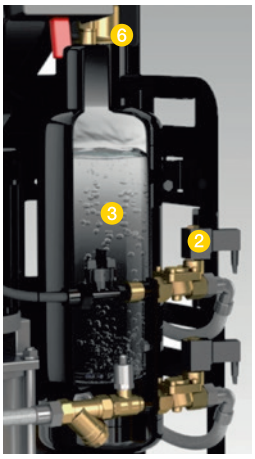
PHASE 2:

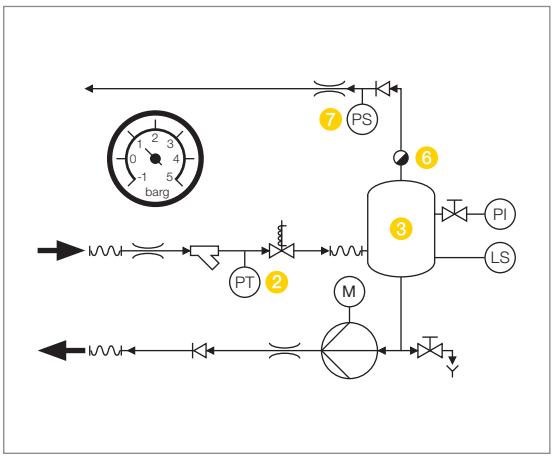
The integrated pump 4 continually draws water out of the degassing tank 3, causing underpressure (a vacuum) in the tank. The air that was dissolved in the water forms bubbles and rises to the top of the tank. The degassed water is pumped back into the system 5.



PHASE 3:

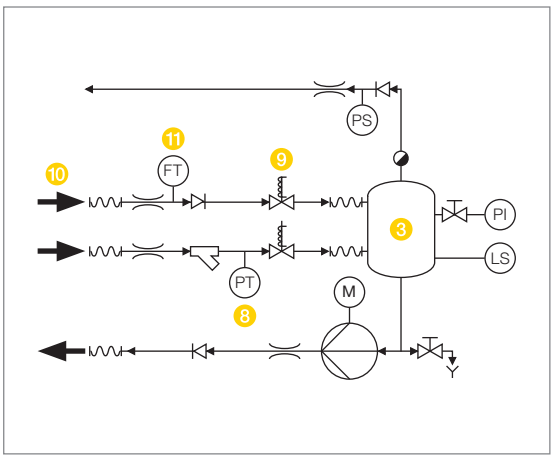
The feed valve 2 is opened and the degassing tank 3 is once more filled with water from the system. At the same time, the air that collected at the top of the tank is expelled via the venting mechanism 6.
The Smart Switch 7 detects that air has been expelled and regulates the ongoing degassing process.





WATER REPLENISHMENT (OPTIONAL):

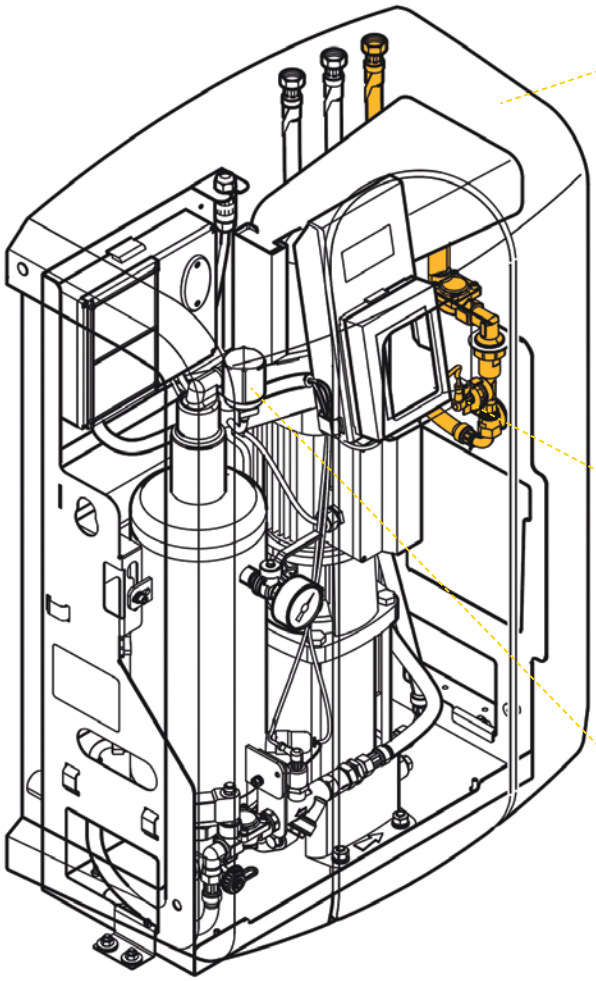
Should the pressure in the system fall below the minimum set level, this will be registered by the pressure controller 8. The degassing process is stopped and the replenishment process is started.
The solenoid valve 9 is opened automatically and fresh water (or treated water) is fed into the degassing tank 3 via the inlet pipe 10.
This replenishment water is degassed as described above. The replenishment process is stopped either when the pre-set pressure level is reached, or when the maximum amount of replenishment water (measured by the in-built water meter 11) has entered the tank.
Once the replenishment process is completed, the inlet pipe is closed 9 and the degassing process continues as before.



The degassed water that returns to the system after each degassing cycle is undersaturated and is therefore able to absorb gases once more. In this way, any gases that may have entered the system can be collected and transported to the vacuum degasser. This guarantees the trouble-free operation of the system.

What makes the new Superior S400 and S600 so special?

- **THE SHORT INSTALLATION PROCESS SAVES TIME: SET UP, CONNECT, YOU'RE DONE!**
  All components (also the optional ones) are contained in one compact unit – no assembly necessary
- **THE INITIAL START-UP IS QUICK AND EASY, SAVING TIME**
  Menu-driven EasyStart function, no hydraulic adjustment necessary



Only a minimal gas content in the water of the system (less than 1 %)

A high degassing performance is achieved using the specific principle of pressure-scaled degassing

Problem-free connection to existing building control technology

RS485 interface (Modbus RTU), isolated outlets

Fully compliant with the requirements of the directive VDI 2035

Water replenishment can be combined with water softening or desalination cartridges. Continuous logging and reporting of the replenishment amounts

Energy and cost savings – degassing only occurs when it is necessary

SmartSwitch technology detects when degassing is needed

No water damage caused by uncontrolled replenishment e.g. when leaks occur

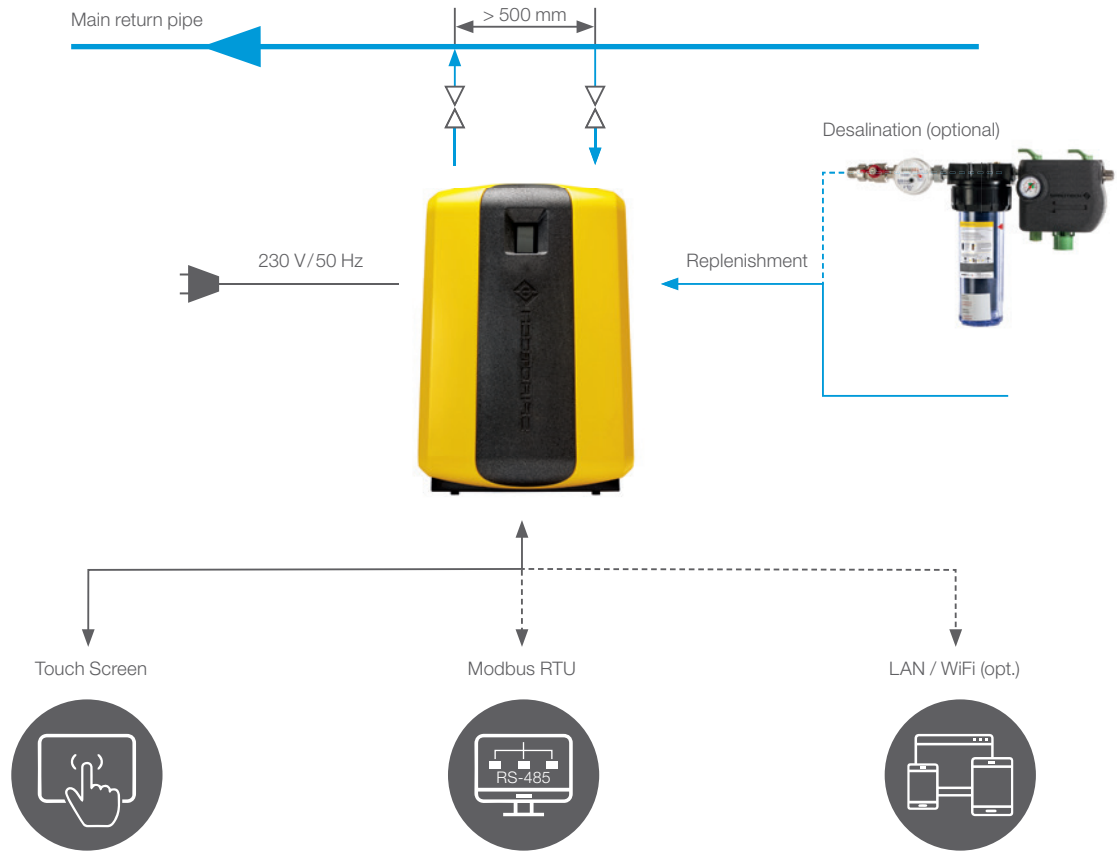
Possibility to control the amount of replenishment water[1]

Easy remote handling

Online remote monitoring and even system operation (Remote Control) are possible using a PC, tablet or smartphone[2]

1 only for degassers with optional replenishment function
2 via LAN or an optional WLAN-Stick

Connection and operation of the S400 and S600 vacuum degassers



Manual operation

Range of functions:

- Start-up / first-time operation
- Display and changing the system parameters
- Automatic or manual operation
- Status information
- Operating log
  - Degassing timings
  - Replenishment timings
  - Replenishment amounts
- Fault log
- Error acknowledgment
- Software updates

Building control technology

Range of functions:

- Notification of the current system parameters
- Status information
  - Degassing timings
  - Replenishment timings
  - Replenishment amounts
- Fault log
- Error acknowledgment

Web module

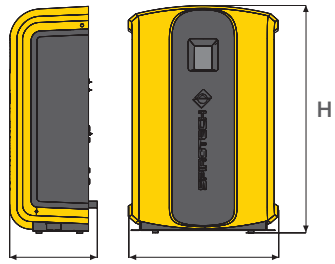
Range of functions:

- Start-up / first-time operation
- Display and changing the system parameters
- Automatic or manual operation
- Status information
- Operating log
  - Degassing timings
  - Replenishment timings
  - Replenishment amounts
- Fault log
- Error acknowledgment
- Software updates

Which unit types are available?

Superior S400	type	**S400**	**S400-R**	**S400-B**	**S400-I**	**S400-RI**	**S400-BI**
	article number.	MV04A50	MV04**R**50	MV04**B**50	MV04A50**I**	MV04**R**50**I**	MV04**B**50**I**
Superior S600	type	**S600**	**S600-R**	**S600-B**	**S600-I**	**S600-RI**	**S600-BI**
	article number.	MV06A50	MV06**R**50	MV06**B**50	MV06A50**I**	MV06**R**50**I**	MV06**B**50**I**
Degassing of water in the system		x	x	x	x	x	x
Automatic water replenishment (external backflow preventer)		–	x	–	–	x	–
Automatic water replenishment using category 5 system separating tank (integrated)		–	–	x	–	–	x
Insulation (impermeable)		–	–	–	x	x	x

Technical details



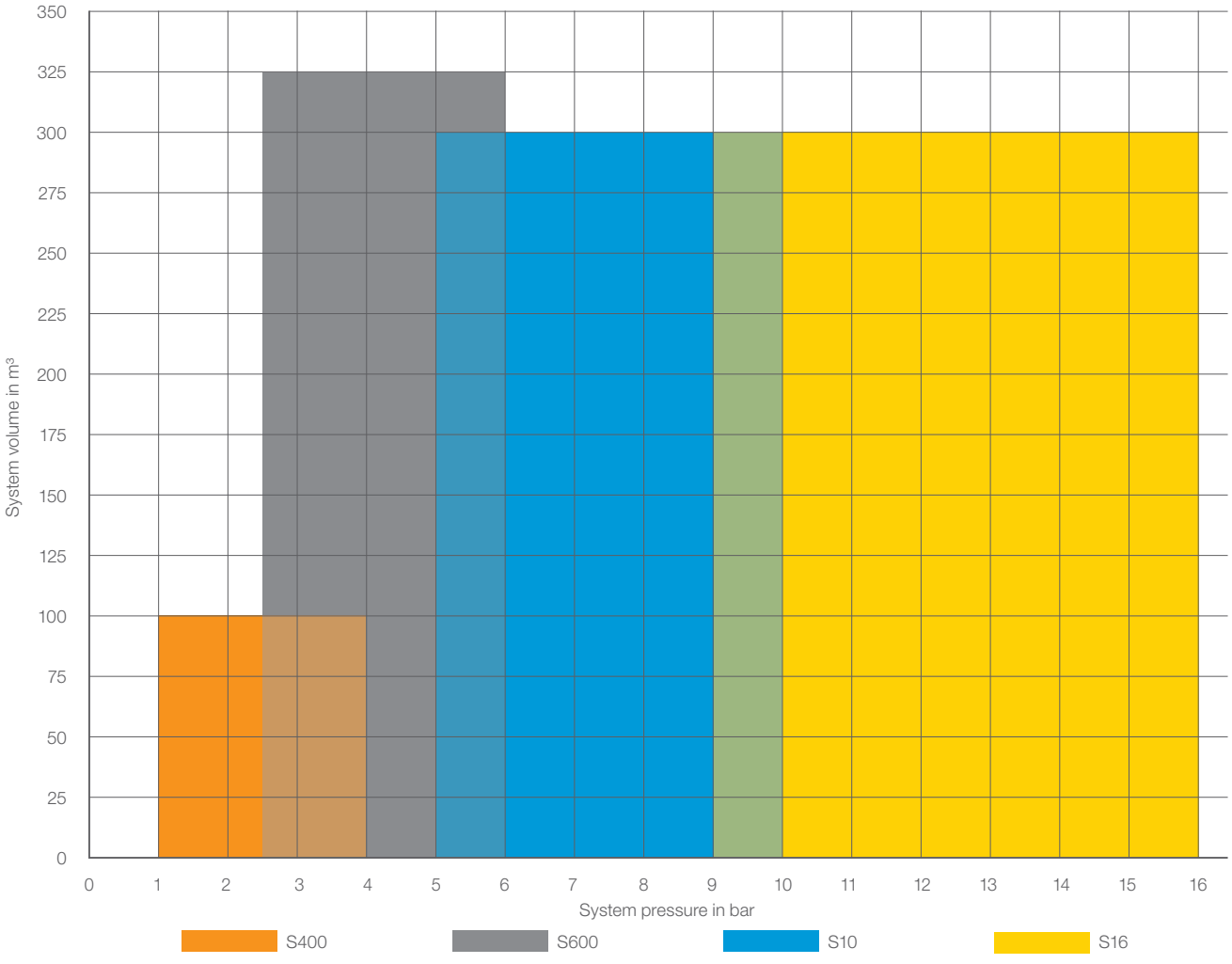
		SpiroVent Superior S400	SpiroVent Superior S600
Medium	-	water / glycol (max. 40%)	water / glycol (max. 40%)
Processing capacity	*l/h*	500	1.000
Maximum system volume	*m^3*	100	325
Minimum pressure	*bar-g*	1,0	2,5
Maximum pressure	*bar-g*	4,0	6,0
Minimum temperature	*°C*	0	0
Maximum operating temperature	*°C*	90	90
Ambient temperature	*°C*	0 – 40	0 – 40
Replenishment flow*	*l/h*	200**/250***	400**/300***
Replenishment pressure*	*bar-g*	0 – 10**/1 – 10***	0 – 10**/1 – 10***
Replenishment temperature*	*°C*	0 – 65**/0 – 60***	0 – 65**/0 – 60***
Measurements and weight			
Height (H)	*mm*	930	1.020
Width (B)	*mm*	346	673
Depth (T)	*mm*	334	360
Dry weight (approx.)	*kg*	34/35***	62/63**/64***
Noise level	*dB (A)*	< 55	< 57
Interfaces			
Display and operation		Touch display	
Fault message contact (24V/NO)		yes	
Boiler stop (24V/NO)		yes	
External approval for replenishment*		yes	
RS485 interface (Modbus RTU)		yes	
LAN connection		yes	
WLAN		optional (with WLAN-stick)	
Remote operation		yes	
SSL data encryption		yes	

* only for units with automatic replenishment; ** valid for S400-R / S600-R; *** valid for S400-B / S600-B

The Spirovent Superior range of products

		S400	S600	S10	S16
Operating ranges					
System volume	m^3	100	325	300	300
Pressure range	*bar*	1 – 4	2,5 – 6	5 – 10	9 – 16
Operating temperature	*°C*	Maximum 90			
Glycol content	-	Maximum 40 %			
Replenishment		optional			
Insulation (for cooling systems)		optional	optional	optional	optional

Quick selection overview for Superior vacuum degassers



www.spirotech.com

MAXIMISING PERFORMANCE FOR YOU

Spirotech is a leading expert in improving the quality of water in heating and cooling systems. Our family business has over 60 years of experience in the development of solutions for removing and avoiding air and sludge deposits in energy equipment. Our products save energy, increase comfort, avoid wear and tear and maximise operating periods. Reliable and customer-oriented, we help enable top performance and the protection of capital assets. Together with our partners, suppliers and investors, we develop high-value solutions with products that add value to residential and commercial buildings, as well as industrial processes. With a comprehensive network of selected importers, Spirotech is present in over 70 countries.

YOU CAN FIND OUT MORE ABOUT OUR SPIROVENT PRODUCTS ON OUR WEBSITE.

Heating, cooling and air-conditioning systems are complex, especially when they are operated in conjunction with other systems and installations. This makes fault location and analysis more difficult, especially in the event of a breakdown. Spirotech can offer you competent advice and solutions, making it possible to identify the causes and rectify any problems. Please feel free to contact us …

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