SPIROVENT® Superior

VACUUM DEGASSERS FOR HEATING, COOLING AND PROCESS SYSTEMS

SPIRO Life EXCEPTIONAL GUARANTEE

SPIRTECH FOR BETTER PERFORMANCE

DOMESTIC | COMMERCIAL | INDUSTRY

Air: a disruptive factor in fluid systems

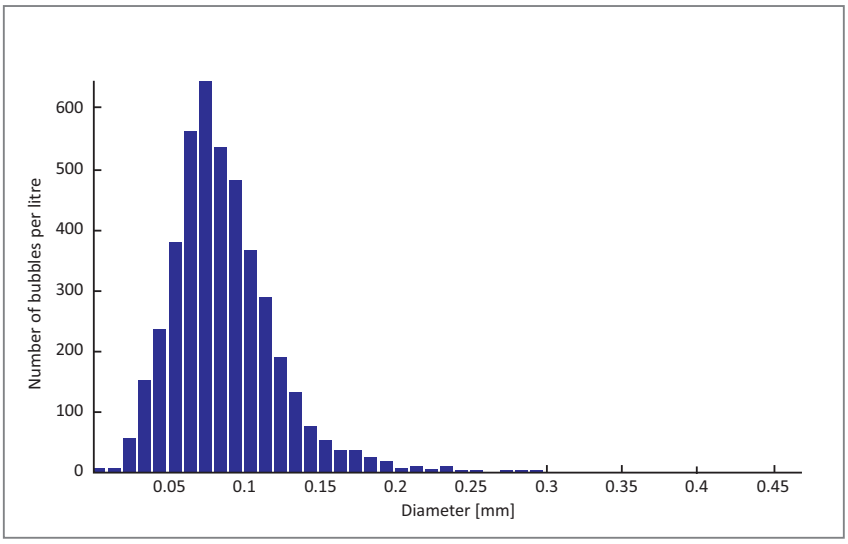
Air in a system is often the cause of unnecessary complaints, excessive wear and avoidable disruption to processes. Familiar symptoms include reduced efficiency and unnecessary system failure.

After initial venting, a fluid system such as a heating, cooling or process system will still contain a lot of micro bubbles and dissolved gases. And what is more, air will continue to get in while work is being carried out on the system and through (micro) leaks. If gases are not removed, or are not removed sufficiently, this will lead to commissioning problems, frequent manual venting, deteriorating pump performance, unnecessary energy consumption and so on. The presence and continuous occurrence of air will also lead to the creation of corrosion products which start to roam around the system in the form of particles. Eventually, this will cause damage to expensive system components and lead to system and process malfunctions or even total failure, things which can be avoided if tackled individually but which need to be followed up and lead to unnecessary costs.

Micro bubbles are impossible to remove with just traditional AAV's. Deaeration equipment is the only effective way to separate them out of the system.

Total solutions

Spirotech offers an extensive range of total solutions for HVAC and process systems: accessories, additives and advice to ensure optimum efficiency and guarantee the quality of the system fluid. These products and services reduce faults, wear and maintenance as well as improve system performance and lower energy consumption. And what is more, these total solutions provide major benefits and save time during the design, installation, start-up and commissioning of systems.



This graph shows the number of air bubbles in water as it leaves the boiler and the size of these bubbles.

"The presence of air also causes dirt-related problems."

How can air get into a system?

There are a number of ways in which air can get into a system. The main ones are listed below:

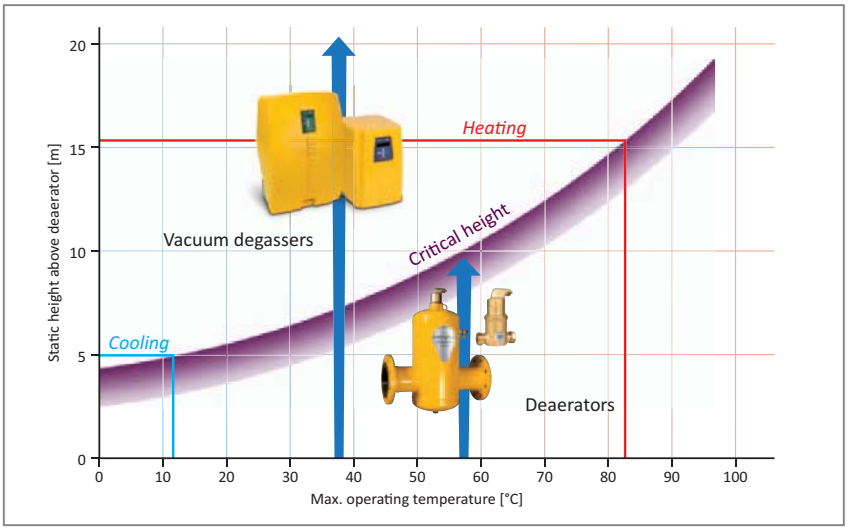
- (re)filling of the system, alterations and maintenance;
- micro leaks and diffusion through glands, gaskets and plastic pipes;
- open expansion systems and cooling towers;
- incorrect expansion volume, incorrect or poor maintenance of pre-set air charge of vessels;
- capacity of water to absorb gases following physical laws, especially Henry's Law.*

* Henry's Law: "Gas will dissolve in a liquid until there is a balance between the partial pressure of the gas and the pressure in the liquid". That means that as the temperature rises or the pressure drops, the mass of gases that dissolves in a liquid will be reduced. Therefore at certain points within a system, the amount of gas absorbed or dissolved gas emitted will depend on the pressure and temperature.

William Henry

Static height and temperature

In case of an excessive static head (pressure) above a deaerator, dissolved air cannot be released from the fluid. In these circumstances it is very hard to predict where in the system air bubbles will emerge from the fluid. Apart from that, the point where micro bubbles emerge can change depending on fluid temperature and hydrostatic pressure (Henry's Law). Rule of thumb for maximal static height: heating ≤ 15 m, cooling ≤ 5 m. Above the critical height, a vacuum degasser generally is a more effective solution. For custom made advice please contact us.



Removing gases from a system

There are two ways to release gases from fluids and remove them from a system.

Thermal degassing: by means of temperature differences

By increasing the temperature in a system, dissolved gases will release themselves. A SpiroVent micro bubble deaerator can then remove these separated gases from the fluid.

Vacuum degassing: by means of forced underpressure

With vacuum degassing, part of the system fluid is temporarily put in an underpressure (vacuum) condition. The gases dissolved in the fluid are released, separated and removed from the system. By reintroducing the degassed fluid into the system it can absorb further free air pockets from the circuit.

When should a vacuum degasser be used?

1. For systems with many branches and a low flow velocity. In such systems, the free accumulated air is often not circulated with the volume flow but will disappear by itself following the installation of a vacuum degasser thanks to the fluid being made absorptive.
2. When there are slight differences in temperature. In these situations, dissolved gases will be released insufficiently. A vacuum degasser is not dependent on the fluid temperature.
3. When an inline degasser cannot be mounted on the system due to practical reasons. A vacuum degasser can be connected to virtually any point within a system.
4. When the static height above the hottest point exceeds the critical height

SpiroVent Superior vacuum degassers

SpiroVent micro bubble deaerators

A separate brochure is available on SpiroVent deaerators.

SpiroVent Superior vacuum degassers: effective and efficient

The SpiroVent Superior is a fully automatic vacuum degasser for heating, cooling and process systems. Because of the fully electronic control system, the Superior offers numerous facilities for reading system information, status and logged data.

The SpiroVent Superior is supplied ready to use, with flexible connection hoses fitted with coupling nuts. The device can be installed, connected and commissioned quickly and easily on any individual installation.

How the SpiroVent Superior works

A continuously operating pump constantly takes a quantity of system fluid from the circulating flow. Closing a solenoid valve creates a vacuum so that the dissolved gases are released. These accumulate at the top of the vessel and are removed via the air vent. The degassed and absorptive fluid is then pumped back into the installation and can start absorbing gases again.

There are various reasons why gas will always be able to enter a system, such as diffusion, micro leaks and expansion system membranes which are never 100% gastight. Because of all this, vacuum degassing is a continuous requirement. It is therefore not a one-off process.

Benefits of SpiroVent Superior

- Removes dissolved gases.
- Absorptive fluid also ensures the removal of trapped gas bubbles.
- Greatly reduces commissioning times and delivery times.
- Plug & play
- Energy-efficient thanks to SmartSwitch.
- Automatically degassed (re)filling and sustained pressure.
- Protected against accidental refilling.
- Ideal for low-temperature systems such as heat pump systems and underfloor heating systems.
- An extensive range for a wide variety of systems.
- Works perfectly in combination with all common expansion systems.
- Exceptional guarantee.

S4, for heating and cooling systems up to 4.5 bar, 25 m³

S6, for heating or cooling systems up to 6 bar, 300 m³

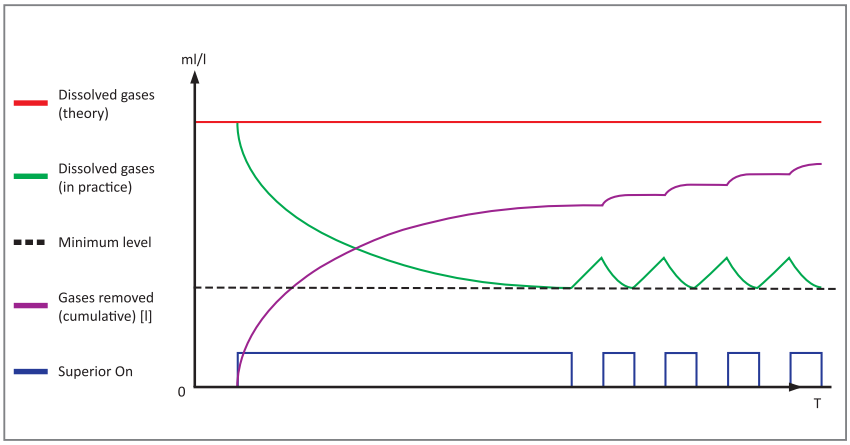
S10, for heating or cooling systems from 5 to 10 bar, 150 - 300 m³
S16, for heating or cooling systems from 9 to 16 bar, 150 - 300 m³

Pressure monitoring and refilling

All SpiroVent Superior vacuum degassers can be supplied with an automatic refill function which continuously monitors the system pressure. As soon as the pressure falls below the set value, the refilling process will start. The refill fluid is degassed before being pumped into the system. Once the desired value has been reached, the refilling process stops and the Superior resumes the normal degassing process.

The Superior can be used as:

- degasser without refilling or pressure maintenance;
- degasser which monitors pressure and refills;
- degasser, which refills based on an external signal.



This is a simplified graph showing measurements taken from various systems in practice. During initial degassing and after initial commissioning or when restarting a system, the gas level is reduced to the minimum level. The Superior then switches itself off and the gas level slowly increases again. By switching on the Superior at set intervals, the gas level is kept at the minimum level so that problems are prevented.

Energy-efficient thanks to SmartSwitch

As soon as any gases are removed, it is registered by the integrated SmartSwitch. If the SmartSwitch has not registered anything for ten minutes, it means that the quantity of dissolved gases in the fluid has reached the minimum value. The degassing process will then stop automatically and start again at the next pre-set time. So the device is only operated when necessary. As a result, energy consumption is reduced considerably and the life of costly components is extended significantly.

A SpiroVent Superior is always connected to the main pipe of a system as a bypass. As the Superior releases, separates and removes dissolved gases, it can be connected virtually anywhere in the system. However, the recommended connection point for the Superior is on the return pipe of the system.

All SpiroVent Superior vacuum degassers have a fully electronic control system with a user-friendly interface. Various parameters can be adjusted quickly and easily including:

- cut-off times;
- refill pressure;
- start time;
- refill alarms;
- maximum system pressure;
- desired system pressure;
- operating time;
- status;
- refill history;
- fault data;
- degassing history.

Special insulated versions of the S6, the S10 and the S16 are available for cooling applications.

An extensive range of SpiroVent Superior Vacuum Degassers

Optimum system and process water quality is achieved when air and dirt is kept to a minimum. If air and dirt is not removed, or is not removed sufficiently, numerous complaints and problems can arise such as annoying noises, frequent manual venting, deteriorating pump performance, an imbalance in the system, unnecessary disturbance and excessive wear. All these things result in higher energy consumption, complaints and failure and often require immediate action.

Spirotech offers an extensive range of SpiroVent Superior vacuum degassers specially for removing air. All products can be used for both new build projects and for renovating heating, cooling and process systems. SpiroVent Superior vacuum degassers are available in a variety of designs, depending on system volume, pressure and desired functionalities.

Multifunctional, for optimal fluid conditioning

- For heating and cooling installations with a volume of up to 150 m³ and a working pressure of up to 16 bar.
- Degassed filling
- Degassing during start-up
- Automatic degassed refill
- Sustained pressure
- Continuous optimal degassing with SmartSwitch
- Protected against unwanted refilling
- Cooperates problem-free with all common expansion systems

	S4A	S4A-R	S6A	S6A-R	S6A-R2P	S10A	S10A-R	S16A	S16A-R
Max. system volume [m³]	25	25	300	300	300	300	300	300	300
System pressure [bar]	1 - 4,5	1 - 4,5	1 - 6	1 - 6	1 - 6	5 -10	5 - 10	9 - 16	9 - 16
Temperature of system fluid [°C]	0 - 90	0 - 90	0 - 90	0 - 90	0 - 90	0 - 90	0 - 90	0 - 90	0 - 90
Fluid treated (degassed) [l/h]	70	70	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Refill volume [l/h] 1)	nvt	50	nvt	450	450	nvt	500	nvt	500
Refill pressure [bar]	nvt	≥ 0,5	nvt	0 - 6	0 - 6	nvt	0 - 10	nvt	0 - 10
Ambient temperature [°C]	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40
Dimensions [HxWxD]	490x340x340	490x340x340	880x590x350	880x590x350	880x590x350	1272x744x400	1272x744x400	1272x744x400	1272x744x400
Noise level [dB(A)]	49	49	57	57	57	60	60	60	60
Empty weight [kg]	16	17	57	59	67	77	79	87	89
Supply voltage [V]	230	230	230	230	230	3 x 400	3 x 400	3 x 400	3 x 400
Power consumption [Watt]	100	100	800	800	1300	1150	1150	2250	2250
Degree of protection [IP]	X 4D	X 4D	44	44	44	X 4D	X 4D	X 4D	X 4D
Article number 50 Hz	MA04A50	MA04R50	MA06A50	MA06R50	MA06P50	MA10A50	MA10R50	MA16A50	MA16R50
Article number 60 Hz	MA04A60	MA04R60	MA06A60	MA06R60	MA06P60	MA10A60	MA10R60	MA16A60	MA16R60

Special insulated versions of the S6, the S10 and the S16 are available for cooling applications.

1) An approved non-return protective device (G¾" male) is available as an option.

SpiroVent Superior vacuum degassers are suitable for water and water/glycol mixtures (S4 max. 50%, S6/S10/S16 max. 40%). Not suitable for drinking water installations.

Reactions of users:

Technical Manager housing and healthcare complex
"Before the Superior was installed we had to vent all radiators every two weeks, especially on the higher floors. Now the SpiroVent Superior provides continuously deaerated water and a maximal heat comfort for the mostly elderly occupants."

Managing Director commissioning firm
"The commissioning of a complicated installation was carried out in a remarkably short time. It was much easier for us to adjust all the parameters correctly, because all air had already been removed. We regularly meet problems that can be traced back directly to the presence of air in the installation. Especially in locations far removed from the boiler room it can be very difficult to reach the required temperatures. In this case it was no problem at all."

Project Leader Housing
"Thanks to the use of a SpiroVent Superior we did not have a single failure caused by air in our installation this winter. Working only a few hours a week, the Superior ensures that many problems that previously occurred every year stay away now. The Superior is worth more than its investment."

Technical Manager Hospital
"The very extensive installation network in our hospital had many air problems. After seeing the results of the first Superior I immediately ordered 7 additional Superiors. A super device!"

Employee Installer
"With other devices you are busy assembling and mounting for a considerable time. The Superior is completely assembled and can be mounted fast and easy. This is much simpler and reduces time considerably."

Degassed well = Clean = Efficiency
Good degassing decreases corrosion and fouling. Because of this, failures and wear and tear will occur less or even not occur at all. In a well degassed system the efficiency of pumps and other installation components will be maintained.

Plug&Play
The Superior is easy to mount and to commission; it comes ready to use, complete with flexible connection hoses and is optimally adjustable for any installation.

Optimal degassing
Large degassing capacity and supplied with a very reliable and leakage-free degassing mechanism.

Energy-saving
Thanks to the SmartSwitch the device is in operation only when really necessary.

Cost reduction
A considerable cost reduction shall be realised because of fast and easy commissioning, fast adjustment of the installation, the switching off of the Superior by the SmartSwitch and the absence of failures and wear.

Custom-made solutions and OEM applications
Spirotech offers not only standard products. If necessary, we work with customers to produce custom-made solutions. These are based on users' specific requirements. If desired, these can also be supplied as OEM products.

Digital support
Product data sheets, standard specification texts, line drawings, CAD symbols, project descriptions, etc. are available via our website.

Also protect against dirt
Dirt in system water can cause problems and heavy wear to components. A filter is often installed in order to rectify problems caused by dirt but this is not the optimal solution. Filters clog up and have to be cleaned and replaced on a regular basis. Spirotech has developed the most effective solution: the SpiroTrap dirt separator. A SpiroTrap dirt separator is virtually maintenance-free and continuously removes all dirt particles.

SpiroPlus
Protect and optimize the system and its efficiency with SpiroPlus flushing agents and additives.

SPIROLIFE
Guarantee of a lifetime

Spirotech's Exceptional Guarantee Terms!

- 20 Brass Products ≤ 110°C: 20 years
- 5 Steel Products and Brass Products >110°C: 5 years
- 2 Vacuum Degassers: 2 years

Conditions:
Correct selection, installation, maintenance and use of the products, in accordance with our regulations, data sheets and user manuals. Our guarantee does not cover normal wear and tear. Please also see our general terms and conditions.

Spirotech: accessories, additives and advice

Spirotech designs and produces innovative total solutions for conditioning fluids in HVAC and process systems. Our products and services reduce faults and wear, less maintenance is required, performance is improved and energy consumption is reduced.

Spirotech is deservedly regarded as the only real specialist in the world. Leading manufacturers of system components recommend Spirotech products on account of their high standard of quality and the company's vision on product development and process improvement.

Thanks to a very extensive international network of suppliers, users all over the world enjoy the benefits of our products and services every day.

Spirotech is a Spiro Enterprises company

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