

SPIROVENT®



SPIROVENT® | DEAERATORS AND
VACUUM DEGASSERS
FOR HEATING, COOLING
AND PROCESS SYSTEMS



SPIRO  **TECH**
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.

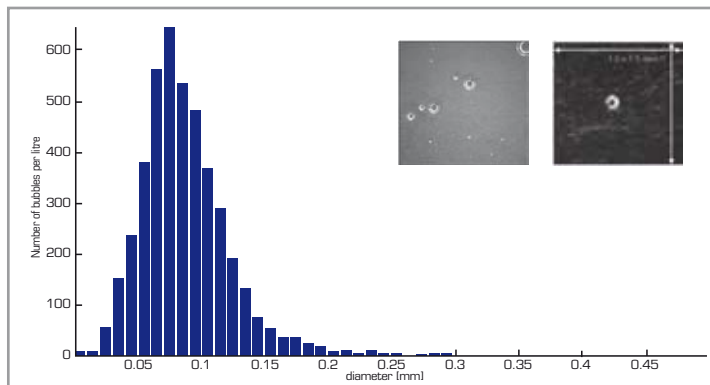
After initial venting, a fluid system such as a heating, cooling or process system will still contain a lot of micro bubbles and dissolved gases. And what is more, air will continue to get in while work is being carried out on the system and through (micro) leaks. If gases are not removed, or are not 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 difficult to trap, and that is precisely the reason why there are so many of them.

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 or incorrect initial pressure;
- physical laws, in particular 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

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.

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, partially dissolved gases will be released. An inline degasser will not be effective in this type of situation but a vacuum degasser will because it 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.



SpiroVent micro bubble deaerators

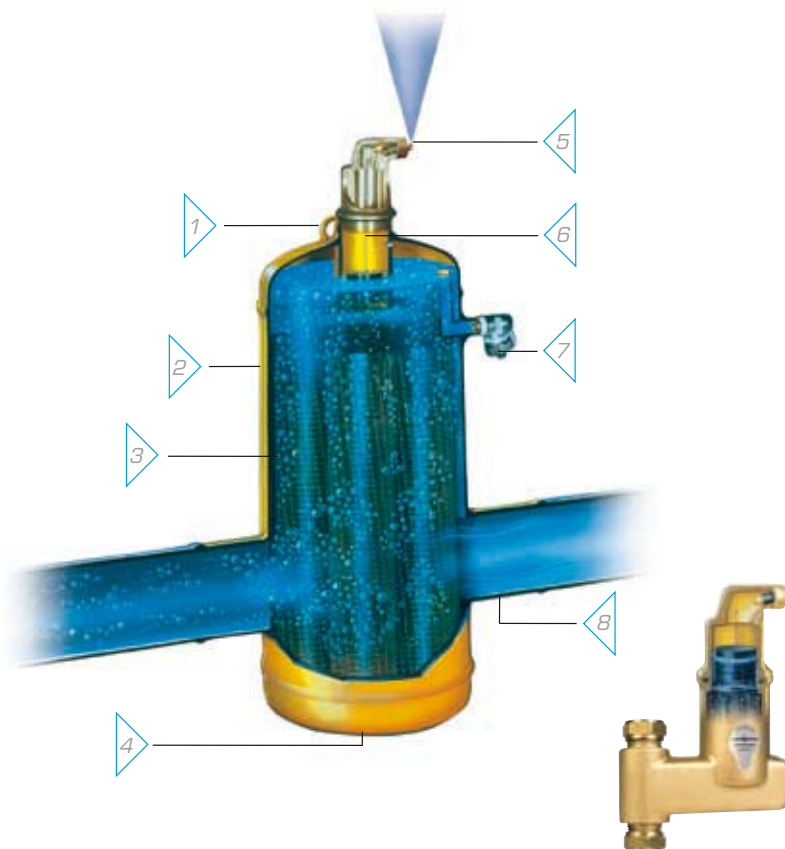


SpiroVent Superior vacuum degassers

SpiroVent deaerators: time-saving and effective

At the heart of the SpiroVent is a spiral structure through which the fluid flows. This is the "Spirotube", which ensures that micro bubbles rise automatically. Although the Spirotube can trap the smallest micro bubbles, it has a very open structure which results in a very low pressure drop.

Because the SpiroVent removes the countless micro bubbles effectively, the system fluid becomes absorptive. That means that the fluid can then be returned to the system and can absorb gases and discharge them into the SpiroVent again. Air-related problems become a thing of the past. The main test and measurement set-up used by Spirotech to develop deaerators is TÜV-approved.

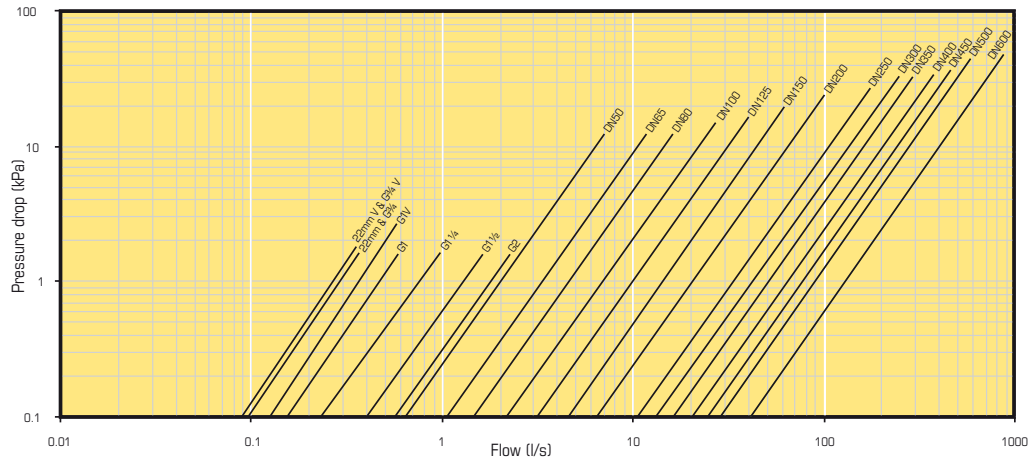


1. Lifting eyes make installation very easy.
2. Solid construction guarantees a very long life.
3. The unique Spirotube is the heart. This component has been specially designed for optimum separation of air and micro bubbles and yet offers very low flow resistance.
4. Drain plug. Also suitable for connecting a drain valve, temperature sensor or pressure sensor.
5. The automatic air vent is guaranteed not to leak and cannot be closed. Comes with thread for connecting a vent pipe as standard.
6. Specially constructed air chamber prevents floating dirt from reaching the valve and provides sufficient volume to absorb pressure fluctuations.
7. Drain valve for admitting or releasing large amounts of air (when filling or emptying the system) and for removing floating dirt.
8. Many different connection options. Brass with compression fittings or female thread, horizontal and vertical. Steel with welded ends or flanges.

Benefits of SpiroVent

- Removes circulating air and micro bubbles effectively.
- Removes trapped air.
- Greatly reduces commissioning times and manual venting is much less time consuming.
- Minimal constant pressure drop.
- No unnecessary shutdown.
- Connection diameters from ¾" to DN 600 and above.
- A complete range, suitable for various pressures and temperatures.
- Three-year guarantee.

Flow resistance graph for SpiroVent



Measured values according to Spirotech standard. Values shown are maximum values. Please contact us for further information.

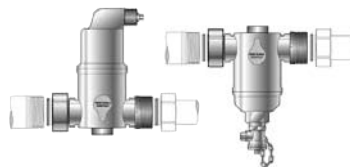
SpiroVent deaerators are suitable for water and water/glycol mixtures (max. 50%). They can be used in combination with locally approved chemical additives and inhibitors that are compatible with the materials applied within the system. Not suitable for drinking water installations.

The standard SpiroVent is suitable for a temperature range of 0 to 110 °C and for an operating pressure of 0 to 10 bar. From DN 050, the SpiroVent housing is made of unalloyed steel. The flange connection is PN 16. The housing of the SpiroVent 22 mm compression, ¾", 1", 1¼", 1½" en 2" is made of brass. Other sizes, materials, pressures and temperatures are available on request.



Solar applications

Spirotech also offers an extensive range of air vents and deaerators for solar applications.



Add-on sets

Spirotech provides complete add-on sets for vertical oil and gas boilers with distributors and mixing groups which are ready for use. These can be installed between the boiler and the mixing group.



Insulation

Specially made insulation sets are available for most deaerators.

Separate literature is available which contains detailed product information. You can also find this information on our website.



An extensive range of SpiroVent deaerators

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 deaerators specially for removing air. All products can be used for both new build projects and for renovating heating, cooling and process systems. SpiroVent deaerators are available in brass and in (stainless) steel. The brass separators, suitable for a flow velocity of up to 1 m/s, can be installed in horizontal and vertical pipes. The steel models are available in standard (flow velocity ≤ 1.5 m/s) and hi-flow designs (flow velocities ≤ 3 m/s).

Connection	H (mm)	L (mm)	Max. flow [m ³ /h]	Max. flow [l/s]	Δp at max. flow [kPa]	Article number
22 mm. comp.	153	106	1.3	0.35	1.3	AA022
22 mm. comp.V	220	104	1.3	0.35	1.5	AA022V
G ¾"	153	85	1.3	0.35	1.3	AA075
G ¾"V	210	84	1.3	0.35	1.5	AA075V
G1	180	88	2.0	0.55	1.3	AA100
G1V	210	84	2.0	0.55	2.4	AA100V
G1½"	200	88	3.6	1.0	1.3	AA125
G1½"	234	88	5.0	1.4	1.3	AA150
G2	275	132	7.5	2.1	1.4	AA200

V = Vertical connection
 Operating pressure: 0 - 10 bar
 Flow velocity ≤ 1 m/s
 Fluid temperature 0 - 110 °C
 Other sizes, materials, pressures and temperatures are available on request



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.
- Plug & play.
- Greatly reduces commissioning times and delivery times.
- 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.
- Two-year guarantee.



S3, for heating or cooling systems up to 3.5 bar, up to 15 m³



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



S10, for heating or cooling systems from 5 to 10 bar, up to 300 m³

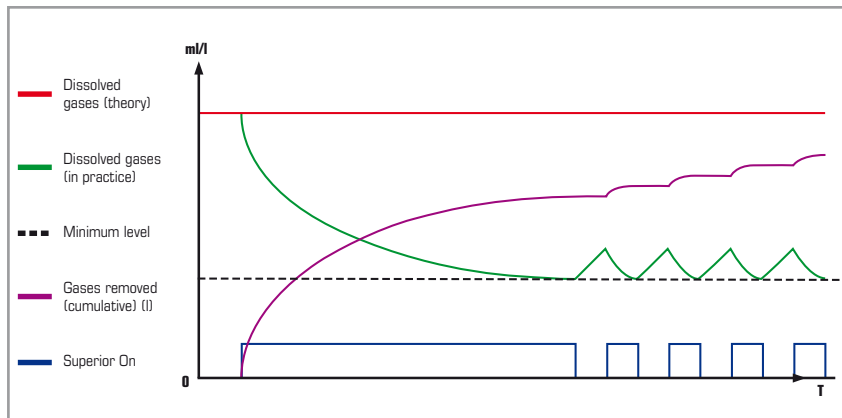
S16, for heating or cooling systems from 9 to 16 bar, up to 300 m³

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.

Refilling can be started and stopped via:

- the built-in pressure sensor in the Superior;
- the building management system;
- an external device such as an expansion system.



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. Superior vacuum degassers are available in a variety of designs, depending on system volume, pressure and desired functionalities.

Type	S3A	S3A-R	S6A	S6A-R	S6A-R2P	S10A	S10A-R	S16A	S16A-R
Max. system volume [m ³]	15	15	300	300	300	300	300	300	300
System pressure [bar]	1 - 3.5	1 - 3.5	1 - 6	1 - 6	1 - 6	5 - 10	5 - 10	9 - 16	9 - 16
Temperature of system fluid [°C]	0 - 70	0 - 70	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 - 50	0 - 50	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]	40	40	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	MA03A	MA03R	MA06A50	MA06R50	MA06P50	MA10A50	MA10R50	MA16A50	MA16R50

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 (max. 40%).
Not suitable for drinking water.

Real-life examples

The use of Spirotech products ensures fewer problems and disruptions and consequently fewer complaints. The products also protect the system so that it will have a longer life.



A comfortable environment for artistes, animals and the public.

Spirotech steals the show in Moscow

During a comprehensive renovation of the prestigious 'Moscow State Circus', the extensive heating system was also worked on. In the process, a number of situations arose which presented the management with problems. A specialist who was called in had had good experience of Spirotech products and recommended that they should be used here too. The head of the technical department at the circus is very happy with the solution: "The system has never been so quiet and problem-free."



SpiroVent deaerators protect critical engine cooling process.

Reliable power generation thanks to SpiroVent deaerators

At a power station, large generators are driven by gigantic diesel engines. Reliability and continuity are of paramount importance to this process. An ingenious cooling water system was created for cooling the cylinders, a critical process. It is extremely important for the cooling water to be continuously deaerated effectively, as air in the cooling water system will lead to problems and sometimes to the complete failure of a generator. The result: damage to the costly installation and time-consuming repairs. SpiroVent deaerators prevent this. They provide effective protection for the engine cooling process and help to ensure a continuous flow through the system.



Occupants are happy now that the SpiroVent Superior S3 has been installed.

Diminutive Superior solves major problem

In a three-storey apartment complex, air was causing a lot of problems in the systems. In particular on the top floors, occupants had been complaining about discomfort caused by poorly heated radiators. The installer lost a lot of time in continuously having to deal with complaints. Installing a SpiroVent Superior S3 rectified the problems and the occupants are now able to enjoy a significantly higher level of comfort.

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.

Separate literature is available which contains detailed product information. You can also find this information on our website.



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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