

SPIROCOMBI®



DEAERATOR & DIRT  
SEPARATORS FOR HEATING,  
COOLING AND PROCESS  
SYSTEMS



DOMESTIC | COMMERCIAL | INDUSTRY



## Air and dirt prevent systems from achieving optimum levels of performance

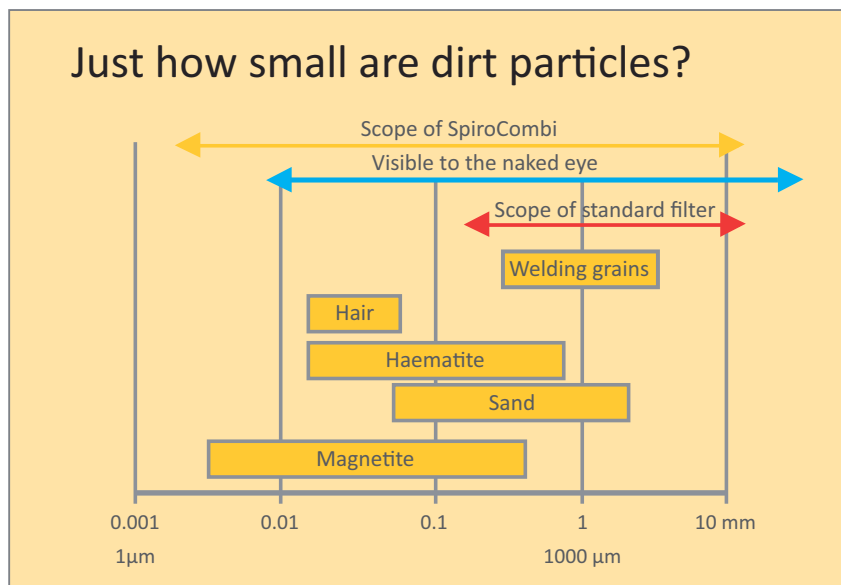
**Air and dirt in system water are causes of disruption. They can cause excessive wear, damage to expensive system components, process disruptions or even total failure. In short, they are things which users often complain about and often require immediate action. Install a SpiroCombi deaerator & dirt separator and these problems will become a thing of the past.**

A SpiroCombi separates gases and dirt from the system water and removes them from the system. Independent tests have shown that even microscopic dirt particles and tiny micro bubbles are removed from the water flow. Often it is these which cause the most damage. The operation of the SpiroCombi is

not affected by the accumulated dirt. The SpiroCombi is virtually maintenance-free and - unlike a filter - has a very low and constant flow resistance. An additional benefit of a system free of air and dirt is the saving made on energy costs.

### 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.



Especially the smallest dirt particles (5-10 μm) cause problems.

“The presence of air can also cause 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.\*

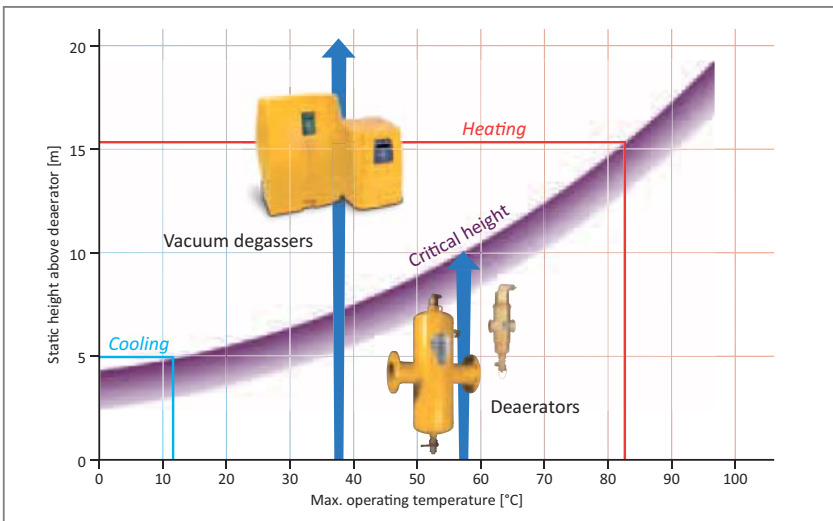
\* Henry's Law: "Gas will dissolve in a liquid until there is a balance between the partial pressure of the gas and the pressure in the liquid". That means that as the temperature rises or the pressure drops, the mass of gases that dissolves in a liquid will be reduced. Therefore at certain points within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



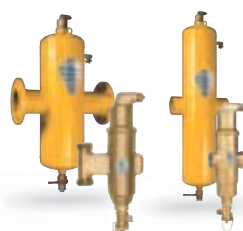
William Henry

## 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 fluid temperature and hydrostatic pressure (Henry's Law). Rule of thumb for maximal static height: heating  $\leq 15$  m, cooling  $\leq 5$  m. Above the critical height, a vacuum degasser generally is a more effective solution. For custom made advice please contact us.



SpiroVent Superior vacuum degassers



SpiroCombi deaerator & dirt separators

## 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.



Separate brochures are available on SpiroVent deaerators and SpiroVent Superior vacuum degassers.

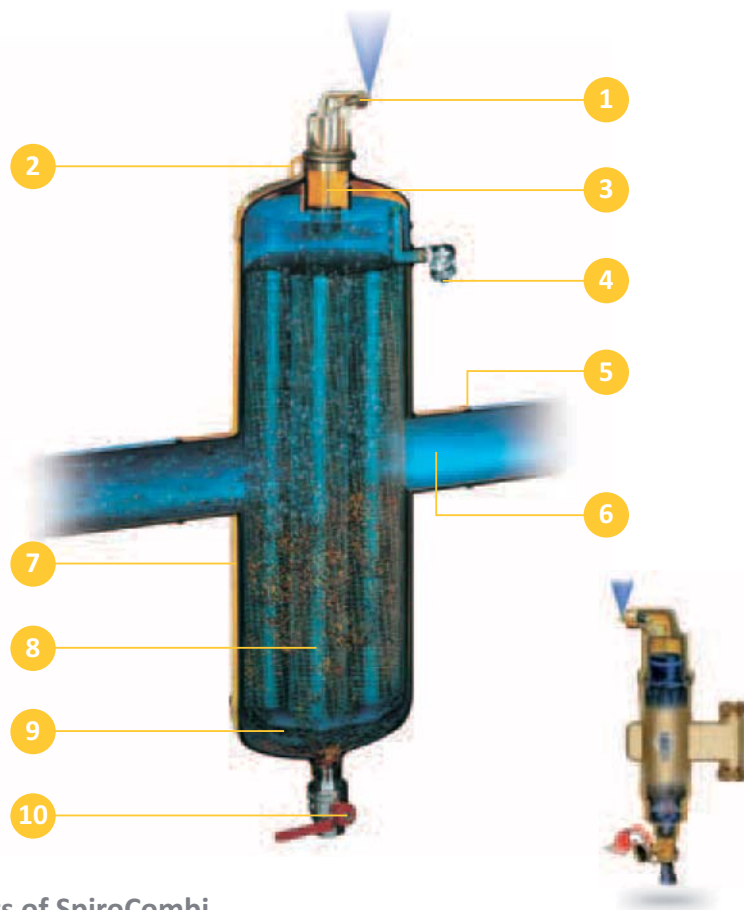
# SpiroCombi deaerator & dirt separators: time-saving and effective

At the heart of the SpiroCombi is a spiral structure through which the fluid flows. This is the "Spirotube", which ensures that micro bubbles rise automatically and dirt particles sink automatically. Although the Spirotube can trap the smallest micro bubbles and dirt particles, it has a very open structure which means that the SpiroCombi does not clog up. The flow and the low pressure drop are not affected by the accumulated dirt, since it is collected outside the main flow.

Trapped dirt can be discharged while the system is in operation. This saves a great deal of time and represents a major advantage over filters, as with standard filters the system would need to be switched off to enable cleaning to be carried out. If no additional shut-off valves are installed, the

system will have to be partially drained before the filter can be cleaned or replaced.

When the drain valve is opened, the collected dirt is discharged quickly and effectively. This action - opening and closing the valve - only takes a few seconds.



1. The automatic air vent will not leak and cannot be closed. Many models come with thread for connecting a vent pipe as standard.
2. Lifting eyes make installation of bigger units very easy.
3. Specially constructed air chamber prevents floating dirt from reaching the valve and provides sufficient volume to absorb pressure fluctuations.
4. Drain plug on steel units for admitting or releasing large amounts of air (when filling or emptying the system) and for removing floating dirt.
5. Many different connection options. Brass with compression fittings or female thread, horizontal and vertical. Steel with welded ends or flanges.
6. The flow is not obstructed by the collected dirt.
7. Solid construction which guarantees an extremely long life.
8. The unique Spirotube is the heart. This component has been specially designed for optimum separation of air and dirt and has a very low flow resistance.
9. Large capacity dirt collection chamber reduces the need for frequent draining.
10. Drain valve for removing accumulated dirt.

## Benefits of SpiroCombi

- Removes circulating air and micro bubbles effectively.
- Very small particles, from 5 µm (= 0.005 mm), are separated and removed.
- Dirt can be discharged while the system is in operation.
- No shut-off valves or bypass required.
- Minimal constant pressure drop.
- Maintenance only takes a few seconds.
- No unnecessary shutdown.
- Connection diameters from ¾" to DN 600 and above.
- A complete range, suitable for various pressures and temperatures.
- Exceptional guarantee.

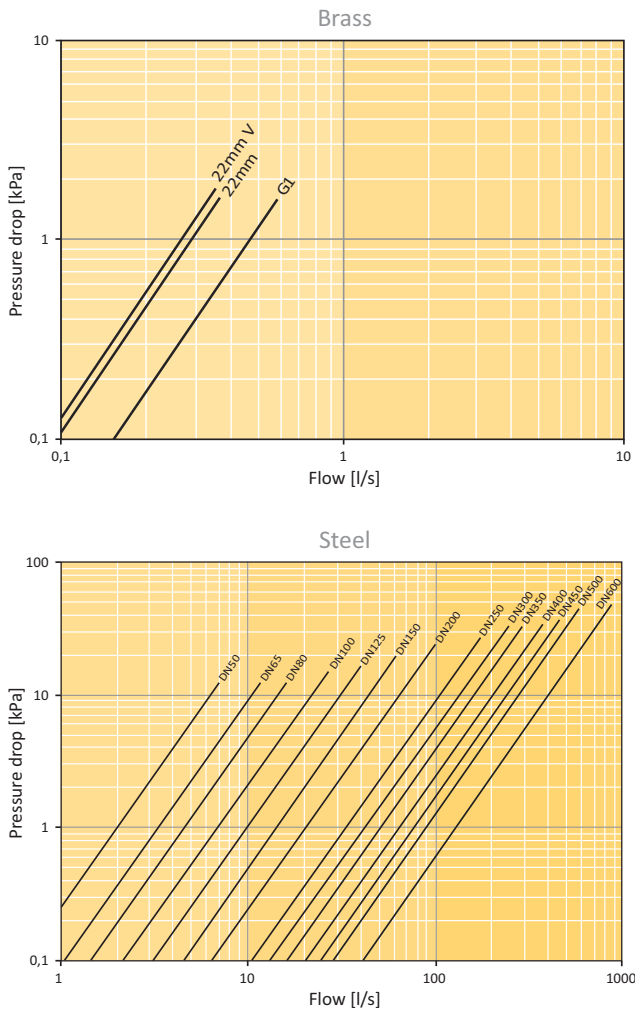


## Installing SpiroCombi

A SpiroCombi deaerator & dirt separator is preferably to be installed at the hottest point within a system. In the case of a heating system, this is the point where the water exits the boiler. In the case of a cooling system, it is in the return before the chiller unit.

## Flow resistance graph for SpiroCombi

Unlike filters, SpiroCombi deaerator & dirt separators have a minimal constant pressure drop.



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

SpiroCombi deaerator & dirt separators 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.

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

## 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 that contains detailed product information. You can also find this information on our website.



## SpiroPlus

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



## An extensive range of SpiroCombi deaerator & dirt separators

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.

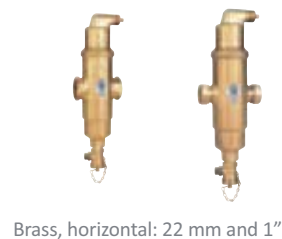
Spirotech offers a extensive range of SpiroCombi deaerator & dirt separators specially designed for the simultaneous removal of air and dirt. All products can be used for both new build projects and for renovating heating, cooling and process systems. SpiroCombi deaerator & dirt

separators 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 and hi-flow designs.

Connection	H [mm]	L [mm]	Max. flow [m³/h]	Max. flow [l/s]	Δp at max. flow [kPa]	Article number
22 mm. comp.	257	106	1,3	0,35	1,3	AC022
22 mm. comp. V	246	97	1,3	0,35	1,7	AC022V
G1	257	88	2,0	0,55	1,3	AC100

V= Vertical connection  
 Operating pressure 0 - 10 bar  
 Other sizes, materials, pressures and temperatures are available on request.

Flow velocity ≤ 1m/s  
 Fluid temperature 0 - 110°C



Brass, horizontal: 22 mm and 1"



Brass, vertical: 22 mm





## SPIROLIFE Guarantee of a lifetime

Spirotech's Exceptional Guarantee Terms!

**20** Brass Products  $\leq 110^{\circ}\text{C}$ :  
20 years

**5** Steel Products and  
Brass Products  $> 110^{\circ}\text{C}$ :  
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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