

SPIROVENT®



DEAERATORS FOR HEATING,
COOLING AND PROCESS
SYSTEMS



DOMESTIC | COMMERCIAL | INDUSTRY

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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.

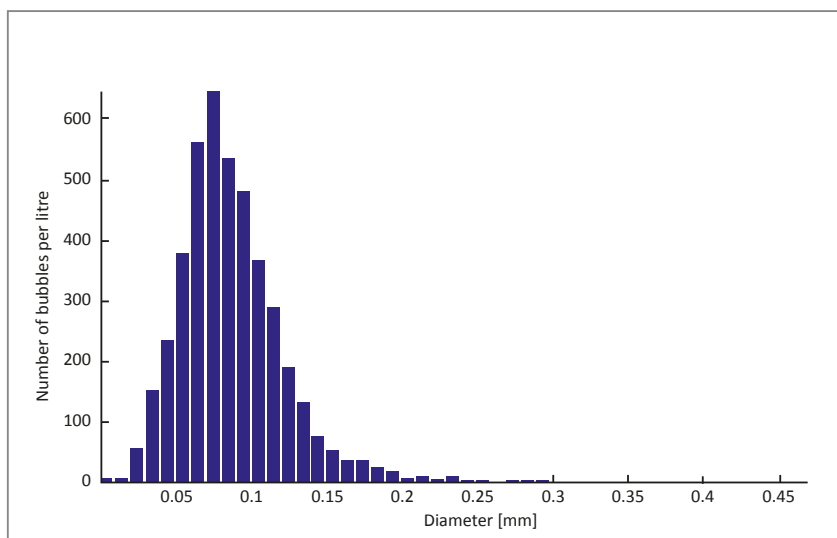
After initial venting, a fluid system such as a heating, cooling or process system will still contain a lot of micro bubbles and dissolved gases. And what is more, air will continue to get in while work is being carried out on the system and through (micro) leaks. If gases are not removed, or are not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

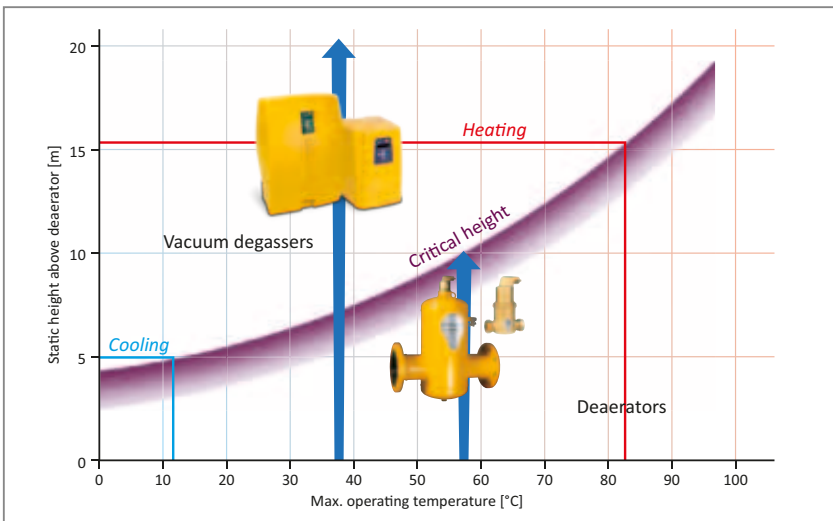
* Henry's Law: "Gas will dissolve in a liquid until there is a balance between the partial pressure of the gas and the pressure in the liquid". That means that as the temperature rises or the pressure drops, the mass of gases that dissolves in a liquid will be reduced. Therefore at certain points within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



SpiroVent Superior vacuum degassers



SpiroVent micro bubble deaerators

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.



A separate brochure is available on SpiroVent Superior vacuum degassers.

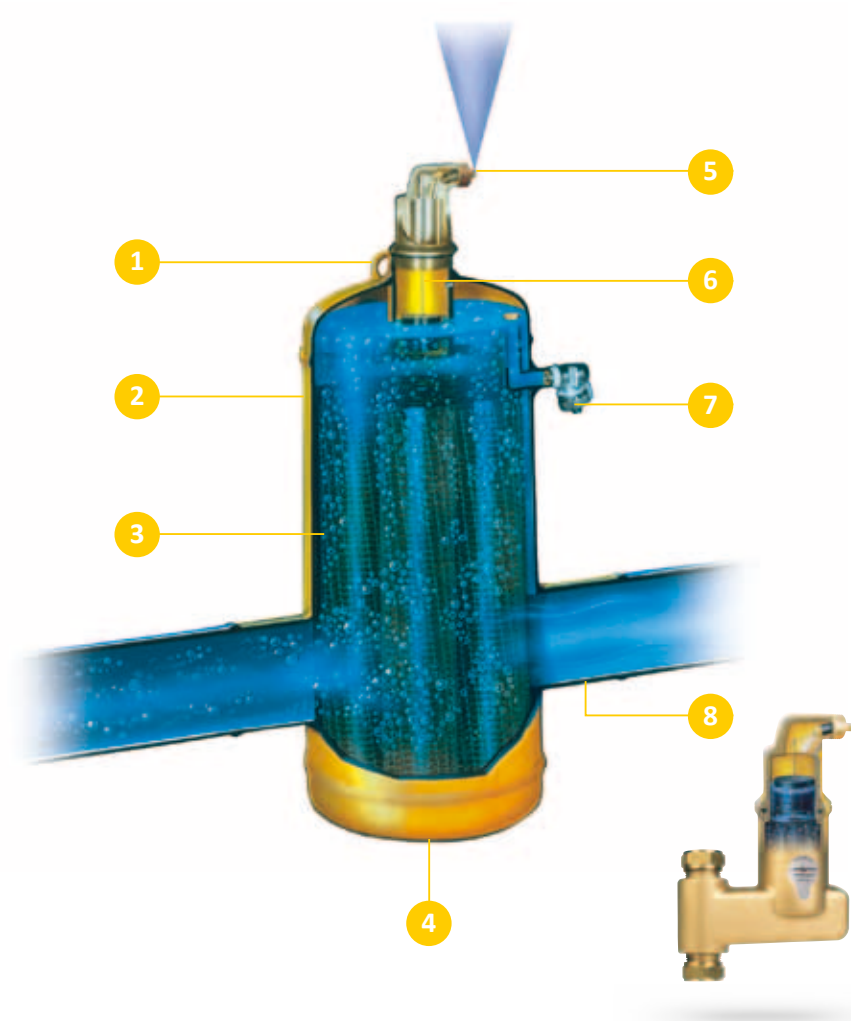
SpiroVent deaerators: time-saving and effective

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 of bigger units 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 on steel units. Also suitable for connecting a drain valve, temperature sensor or pressure sensor.
5. The automatic air vent will not leak and cannot be closed. Many models come 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 on steel units 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 weld ends or flanges.



Benefits SpiroVent

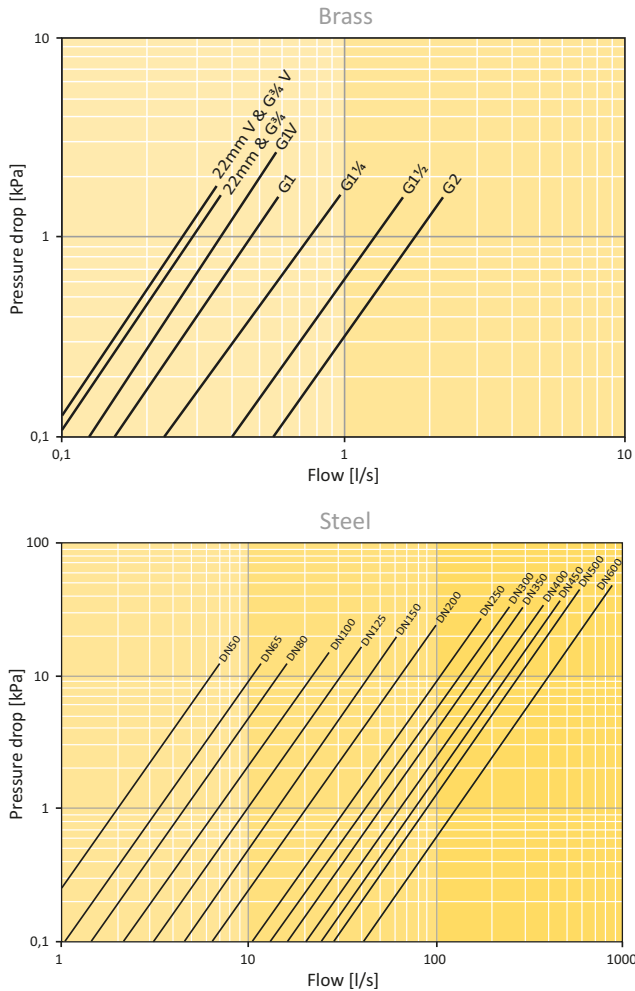
- Removes circulating air and micro bubbles effectively.
- Removes trapped air.
- Greatly reduces commissioning times and manual venting is much less time consuming.
- Minimal, constant pressure drop.
- No unnecessary shutdown.
- Connection diameters from 3/4" to DN 600 and above.
- A complete range, suitable for various pressures and temperatures.
- Exceptional guarantee.



SpiroPlus

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

Flow resistance graph for SpiroVent



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

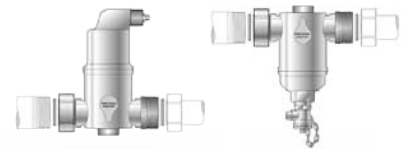
SpiroVent deaerators are suitable for water and water/glycol mixtures (max. 50%). They can be used in combination with locally approved chemical additives and inhibitors that are compatible with the materials applied within the system. Not suitable for drinking water installations.

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, 3/4", 1", 1 1/4", 1 1/2" and 2" is made of brass. Other sizes, materials, pressures and temperatures are available on request.



Solar applications

Spirotech also offers an extensive range of automatic 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.



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.



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.

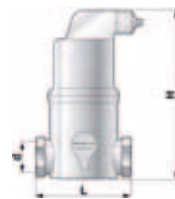
Spirotech offers an extensive range of SpiroVent deaerators specially for removing air. All products can be used for both new build projects and for renovating heating, cooling and process systems. SpiroVent deaerators are available in brass and in

(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 and hi-flow designs.

| 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 ¾V | 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
 Other sizes, materials, pressures and temperatures are available on request

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



Brass, horizontal: 22 mm up to 2"



Brass, vertical: 22 mm up to 1"

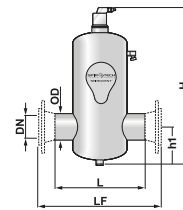
Standard vs. Hi-flow

Standard steel SpiroVent products are designed for a nominal flow velocity up to 1.5 m/s. At higher velocities the increased turbulence will not always leave sufficient separation zone in a standard unit for optimal separation. Exceeding the nominal flow will also lead to a substantially increased pressure drop. For structural higher flow velocities (up to 3 m/s) a Hi-flow type is recommended.

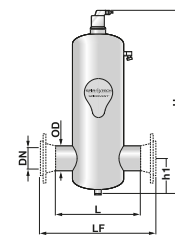
| Connection [DN] | Connection OD [mm] | L [mm] | LF [mm] | Standard; nom. 1.5 m/s | | | | | | | Hi-flow; nom. 3 m/s | | | | | |
|-----------------|--------------------|--------|---------|------------------------|-----------------|-------------------------------|-----------------------|-----------------|-------------------------------|-----------------------|---------------------|-----------------|-------------------------------|-----------------------|-----------------|-------|
| | | | | H [mm] | nom. = 1,5 m/s | | | max. = 3 m/s | | | H [mm] | Max. flow [l/s] | Max. flow [m ³ /h] | Δp at max. flow [kPa] | Article number* | |
| | | | | | Max. flow [l/s] | Max. flow [m ³ /h] | Δp at max. flow [kPa] | Max. flow [l/s] | Max. flow [m ³ /h] | Δp at max. flow [kPa] | | | | | | |
| 050 | 60 | 260 | 350 | 470 | 3,5 | 12,5 | 3,0 | 7 | 25 | 11,8 | BA050 | 630 | 7 | 25 | 11,8 | HA050 |
| 065 | 76 | 260 | 350 | 470 | 5,5 | 20 | 2,7 | 11 | 40 | 11,6 | BA065 | 630 | 11 | 40 | 11,6 | HA065 |
| 080 | 89 | 370 | 470 | 590 | 7,5 | 27 | 2,9 | 15 | 54 | 12,4 | BA080 | 785 | 15 | 54 | 12,4 | HA080 |
| 100 | 114 | 370 | 475 | 590 | 13 | 47 | 3,7 | 26 | 94 | 14,6 | BA100 | 785 | 26 | 94 | 14,6 | HA100 |
| 125 | 140 | 525 | 635 | 765 | 20 | 72 | 4,2 | 40 | 144 | 16,8 | BA125 | 1045 | 40 | 144 | 16,8 | HA125 |
| 150 | 168 | 525 | 635 | 765 | 30 | 108 | 4,9 | 60 | 215 | 19,4 | BA150 | 1045 | 60 | 215 | 19,4 | HA150 |
| 200 | 219 | 650 | 775 | 975 | 50 | 180 | 5,8 | 100 | 360 | 23,1 | BA200 | 1315 | 100 | 360 | 23,1 | HA200 |
| 250 | 273 | 750 | 890 | 1215 | 80 | 288 | 6,9 | 160 | 575 | 27,7 | BA250 | 1715 | 160 | 575 | 27,7 | HA250 |
| 300 | 324 | 850 | 1005 | 1430 | 113 | 405 | 7,7 | 225 | 810 | 31,0 | BA300 | 2025 | 225 | 810 | 31,0 | HA300 |
| 350 | 356 | n/a | 1128 | 1910 | 140 | 500 | 7,8 | 280 | 1000 | 31,0 | BA350 | 2400 | 280 | 1000 | 31,0 | HA350 |
| 400 | 406 | n/a | 1226 | 2120 | 180 | 650 | 8,4 | 360 | 1300 | 34,0 | BA400 | 2680 | 360 | 1300 | 34,0 | HA400 |
| 450 | 457 | n/a | 1330 | 2320 | 235 | 850 | 10,0 | 470 | 1700 | 39,0 | BA450 | 2960 | 470 | 1700 | 39,0 | HA450 |
| 500 | 508 | n/a | 1430 | 2540 | 295 | 1060 | 11,0 | 590 | 2120 | 43,0 | BA500 | 3250 | 590 | 2120 | 43,0 | HA500 |
| 600 | 610 | n/a | 1630 | 2980 | 425 | 1530 | 12,0 | 835 | 3000 | 47,0 | BA600 | 3830 | 835 | 3000 | 47,0 | HA600 |

Operating pressure: 0 - 10 bar Fluid temperature 0 - 110 °C
Other sizes, materials, pressures and temperatures are available on request.

* for weld ends add L (e.g. HA200L)
for flanges add F (e.g. HA200F)



Standard



Hi-flow

Select the correct SpiroVent:

1. Determine the pipe diameter.
2. Determine the flow.
3. Determine the correct model using the table.

| m ³ /h | Max. flow m ³ /h and l/s | | | | | | | | | | | | | | | | Applicable SpiroVent | | | | | | | | | | | |
|-------------------|-------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------|------|------|------|------|------|------|------|----------|---------|-------|-------|
| | 12,5 | 20 | 27 | 40 | 54 | 72 | 94 | 144 | 180 | 215 | 288 | 360 | 405 | 500 | 575 | 650 | 810 | 1000 | 1300 | 1530 | 1700 | 2120 | 2835 | 3000 | Standard | Hi-flow | | |
| DN050 | | | | | | | | | | | | | | | | | | | | | | | | | | BA050 | HA050 | |
| DN065 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA065 | HA065 |
| DN080 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA080 | HA080 |
| DN100 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA100 | HA100 |
| DN125 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA125 | HA125 |
| DN150 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA150 | HA150 |
| DN200 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA200 | HA200 |
| DN250 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA250 | HA250 |
| DN300 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA300 | HA300 |
| DN350 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA350 | HA350 |
| DN400 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA400 | HA400 |
| DN450 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA450 | HA450 |
| DN500 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA500 | HA500 |
| DN600 | | | | | | | | | | | | | | | | | | | | | | | | | | | BA600 | HA600 |

= standard model at nominal flow
 = standard model at maximum flow, hi-flow recommended
 = choose bigger Ø or lower the flow

Other sizes, materials, pressures and temperatures are available on request.



Standard: DN50 to DN600



Hi-flow: DN50 to DN600

By choosing a larger connection size the same flow rate will be achieved but with a lower flow velocity resulting in better separation efficiency and a lower pressure drop (less energy consumption).

A SpiroVent deaerator must always be installed at the hottest point within a system. In the case of a heating system, for example, 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.



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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