SPIROVENT®

DEAERATORS FOR HEATING, COOLING AND PROCESS SYSTEMS

SPIRO life EXCEPTIONAL GUARANTEE

DOMESTIC | COMMERCIAL | INDUSTRY

SPIROTECH FOR BETTER PERFORMANCE

Air: a disruptive factor in fluid systems

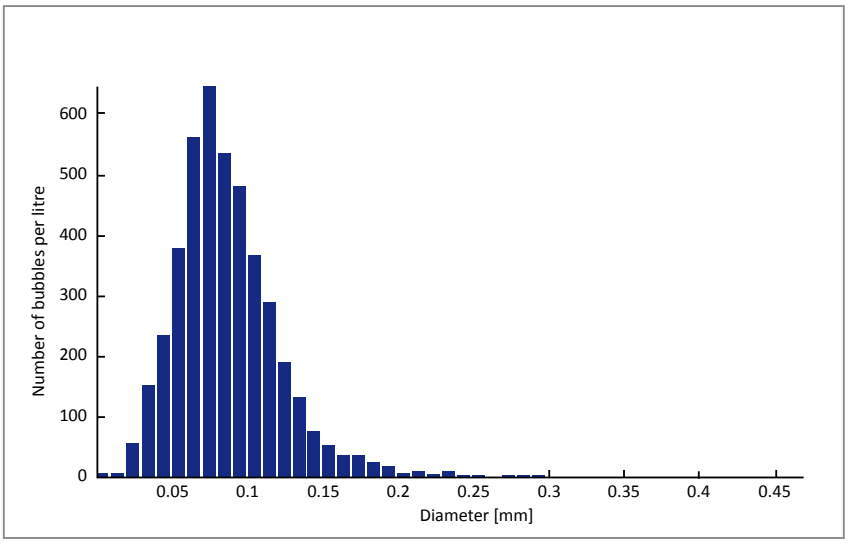
Air in a system is often the cause of unnecessary complaints, excessive wear and avoidable disruption to processes. Familiar symptoms include reduced efficiency and unnecessary system failure.

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:

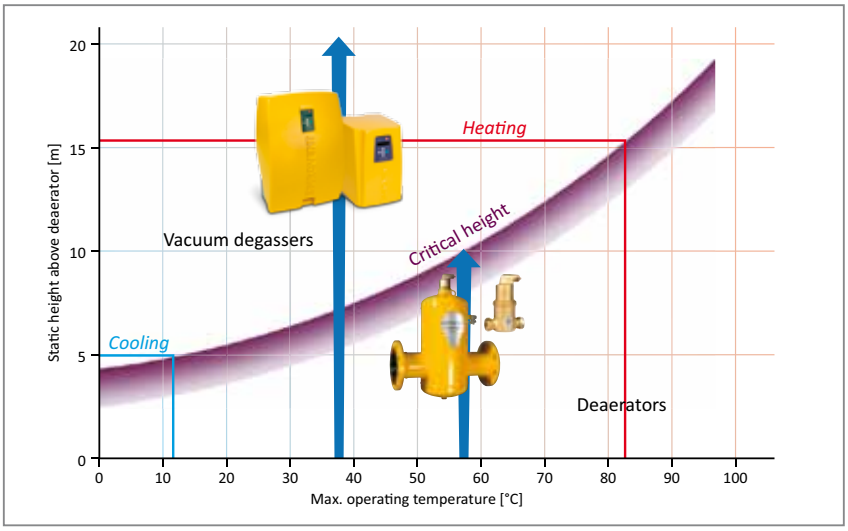
- (re)filling of the system, alterations and maintenance;
- micro leaks and diffusion through glands, gaskets and plastic pipes;
- open expansion systems and cooling towers;
- incorrect expansion volume, incorrect or poor maintenance of pre-set air charge of vessels;
- capacity of water to absorb gases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



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

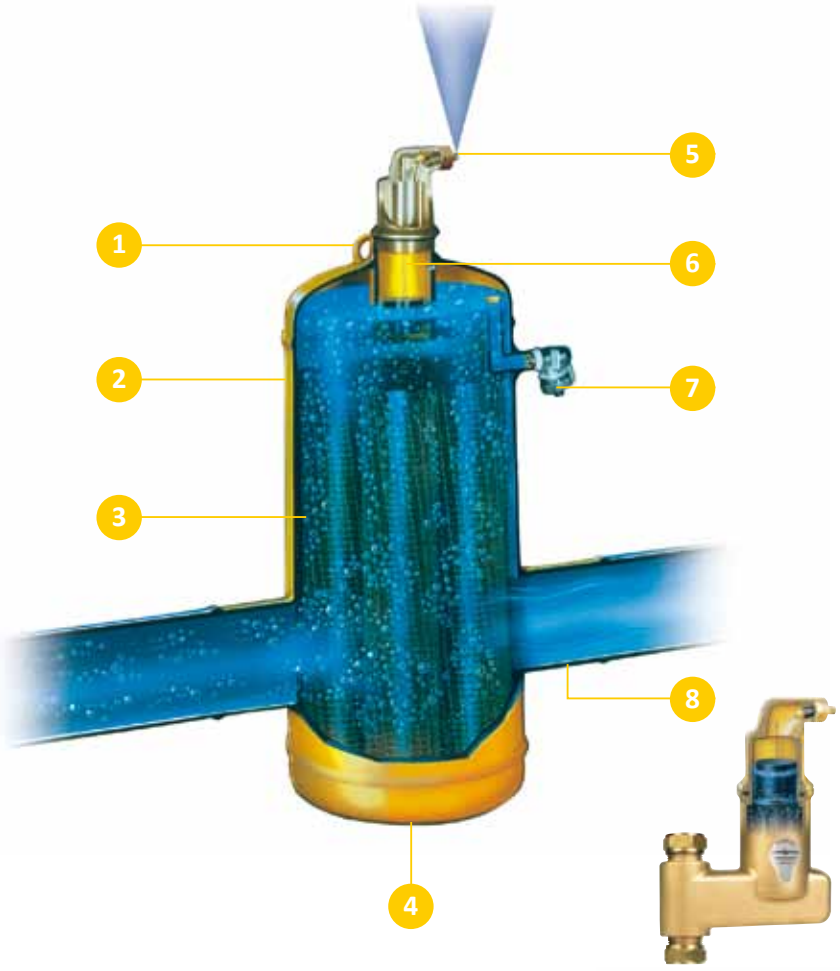
SpiroVent micro bubble deaerators

A separate brochure is available on SpiroVent 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.

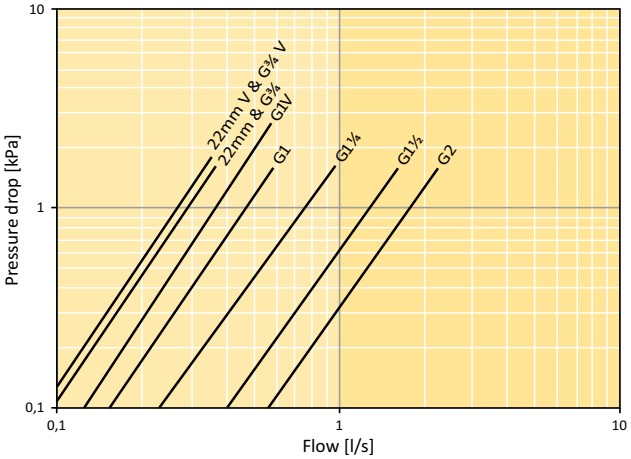
Benefits SpiroVent

- 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 ¾" to DN 600 and above.
- A complete range, suitable for various pressures and temperatures.
- Exceptional guarantee.

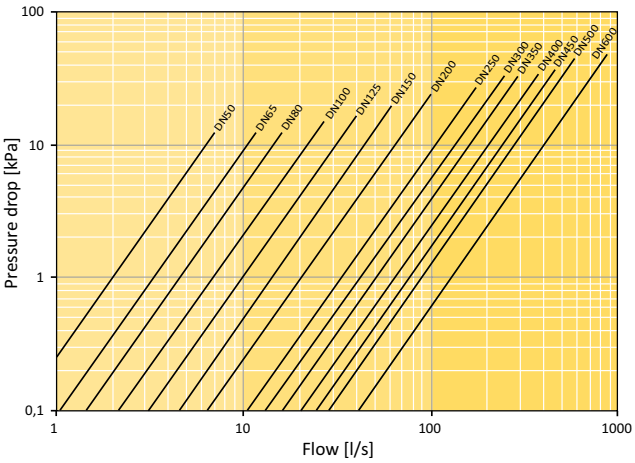
SpiroPlus
Protect and optimize the system and its efficiency with SpiroPlus flushing agents and additives.

Flow resistance graph for SpiroVent

Brass



Steel

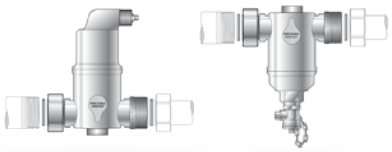


Measured values according to Spirotech standard. Values shown are maximum values. Please contact us for further information.

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 ºC 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" 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 web-site.

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 [m3/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
G1¼	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

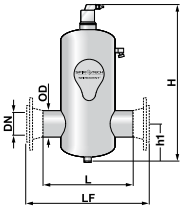
Brass, horizontal: 22 mm up to 2”

Brass, vertical: 22 mm up to 1”

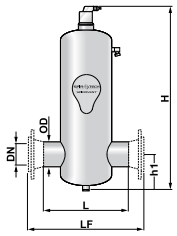
Standard vs. Hi-flow

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.

				Standard; nom. 1.5 m/s								Hi-flow; nom. 3 m/s				
					nom. = 1,5 m/s			max. = 3 m/s								
Connection [DN]	Connection OD [mm]	L [mm]	LF [mm]	H [mm]	Max. flow [l/s]	Max. flow [m3 /h]	Δp at max. flow [kPa]	Max. flow [l/s]	Max. flow [m3 /h]	Δp at max. flow [kPa]	Article number*	H [mm]	Max. flow [l/s]	Max. flow [m3 /h]	Δp at max. flow [kPa]	Article number*
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



Standard



Hi-flow

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)

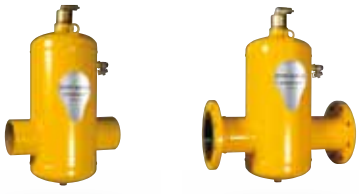
Select the correct SpiroVent:

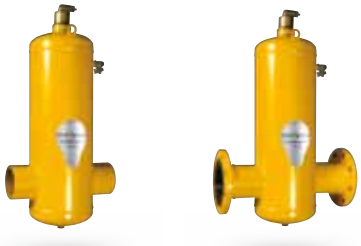
1. Determine the pipe diameter.
2. Determine the flow.
3. Determine the correct model using the table.

	Max. flow m3/h and l/s																													Applicable SpiroVent	
m³/h	12,5	20	25	27	40	47	54	72	94	108	144	180	215	288	360	405	500	575	650	810	850	1000	1060	1300	1530	1700	2120	3000		Standard	Hi-flow
l/s / Ø	3,5	5,5	7	7,5	11	13	15	20	26	30	40	50	60	80	100	113	140	160	180	225	235	280	295	360	425	470	590	835			
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

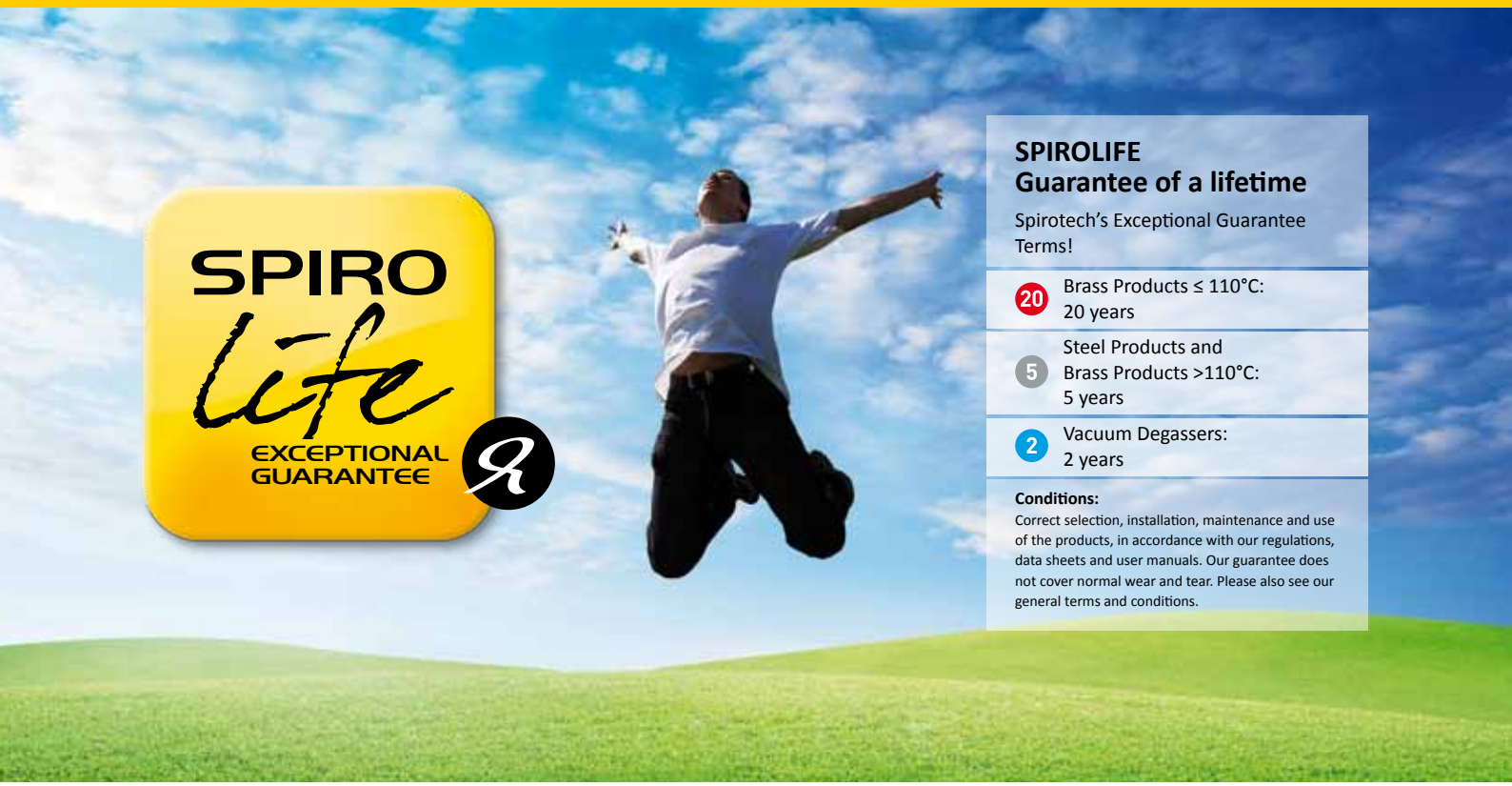
Other sizes, materials, pressures and temperatures are available on request.


Standard: DN50 to DN600


Hi-flow: DN50 to DN600

Choosing a larger connection size allows achieving the same flow rate with a lower flow velocity, resulting in better separation efficiency and a lower pressure drop (less energy loss).

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 ≤ 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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