# HIGH-EFFICIENCY VACUUM DEGASSING

## NO CHANCE FOR AIR IN HEATING AND COOLING SYSTEMS

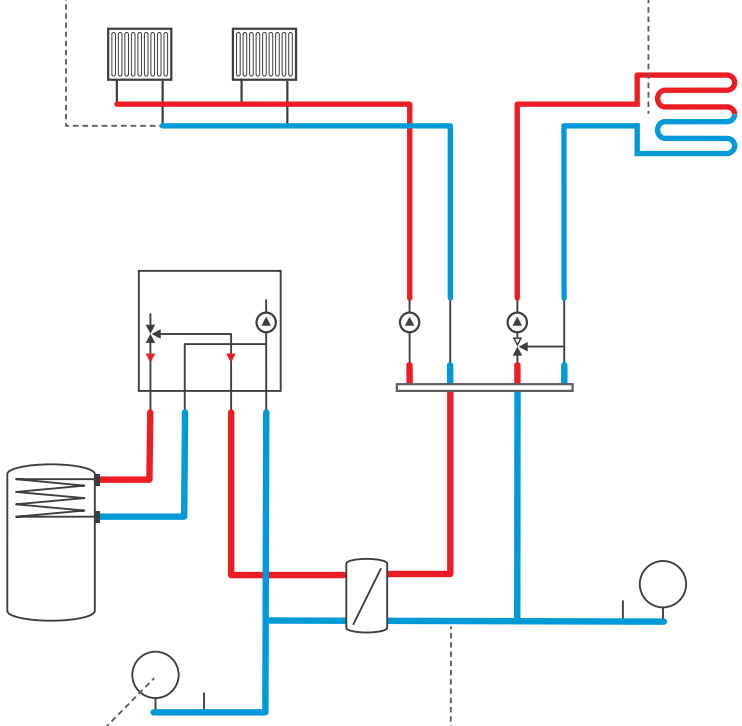

SPIROVENT® SUPERIOR

# WHY IS AIR (ALMOST) UNAVOIDABLE IN HEATING AND COOLING WATER?

Even modern heating and cooling systems are never 100 percent airtight. Just because a system is watertight does not mean that air cannot enter the system. Air and gases enter the system in different ways:

**AIR ENTRY AT**
- Seals
- Insert and press fittings

**AIR ENTRY AT**
- Synthetic piping
- Rubber parts
- Reinforced hoses



Insufficient, incorrectly set or faulty pressure maintenance

Dissolved gases in replenishment water

# HOW DO YOU RECOGNISE AIR PROBLEMS IN A SYSTEM?

Distinct circulation noises and glugging sounds in:

- Pumps
- Heater elements
- Valves
- Pipes

Reduced operational efficiency of:

- Hydraulic valves
- Pumps
- Heath meters
- Heath exchanges

Reduced heath transfer

- Heating elements remain cold or become only lukewarm
- Heat does not reach the user

Increases deposits in:

- Pipes
- Valves
- Pumps
- Heat exchanges due to increased corrosion

## WHAT EFFECTS DOES AIR HAVE ON THE OPERATION OF THE SYSTEM?

- more frequent manual venting, which is time-consuming
- longer commissioning, because adjustment is difficult
- frequent system failures
- increased energy consumption and higher costs
- regular complaints from end users

When a system is regularly non-operational due to these problems, it negatively affects all those responsible for the system: contractor, installer and the designer.

# THE AIR HAS TO GET OUT!
# HOW CAN PRESENT AIR FROM HEATING OR COOLING SYSTEMS BE REMOVED?

AIR VENTS


## SPIROTOP®

Removes free air that collects at the highest point of the system collects. Is especially necessary for filling and emptying the system.

MICROBUBBLES AIR SEPARATORS


## SPIROVENT®

Effectively removes air and micro-bubbles circulating in the circuit. Uses the effect of thermal degassing and is therefore installed at the warmest point in the system. Application limits
At static heights of approximately 10 - 15 m.

VACUUM DEGASSERS


## SPIROVENT® SUPERIOR

Removes, regardless of installation location, pressure and temperature in the system, all dissolved gases from the system water. After degassing, no further air problems can occur at any point in the heating or cooling system. In addition, the deaerator can be installed at almost any point in the system and optionally replenishes the system water deficit.


SPIROTECH
SPIROTECH
SPIROTECH
SPIROVENT

# HOW DOES VACUUM DEGASSING WORK?

Air trapped in a system is often the cause of failures, excessive wear and avoidable process interruptions. Known symptoms are corrosion, poor operation and unnecessary system failure. After being vented, a heating, cooling or process system still contains numerous micro air bubbles and dissolved gases. Moreover, air permanently enters the system through work on the installation, through (micro) leaks and through diffusion in, for example, plastic piping. If gases are not or insufficiently removed, problems occur time after time during adjustment, frequent manual venting is required, pump capacity decreases and energy consumption increases. The presence of air and the permanent ingress of air and gases also causes corrosion products, which circulate through the system as particles. Ultimately, this leads to damage of expensive plant components, plant malfunctions or even complete failure. All avoidable consequences that require permanent monitoring and cause unnecessary costs. microbubbles cannot be removed from the volumetric flow with conventional rapid deaerators. Proper air separation is the only effective method of removing them from the system.

## REMOVING GASES FROM AN INSTALLATION

There are two methods for extracting and removing gases from liquids.

- Thermal degassing using temperature differences. By increasing the temperature in a plant, dissolved gases are naturally released. With a SpiroVent microbubble air separator, such released gases can be extracted from the liquid. There are two methods for extracting gases from liquids and removing them from the installation.

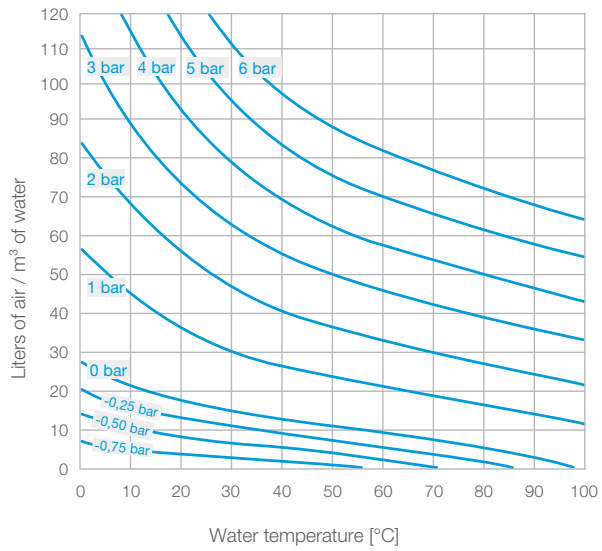
- Vacuum degassing using forced negative pressure. In vacuum degassing, a portion of the plant fluid is temporarily placed in a state of negative pressure (vacuum). The gases dissolved in the fluid are released, separated and removed from the plant. The treated fluid can then reabsorb air into the system for later removal.

## WHEN DOES VACUUM DEGASSING MAKE SENSE?

In installations with many branches and partially low flow rates. The free collected air is often not carried away with the volume flow in such systems. Deaerators cannot be installed at all necessary locations or only at excessive cost. With a vacuum degasser, the collected air disappears by itself thanks to the absorbed liquid.

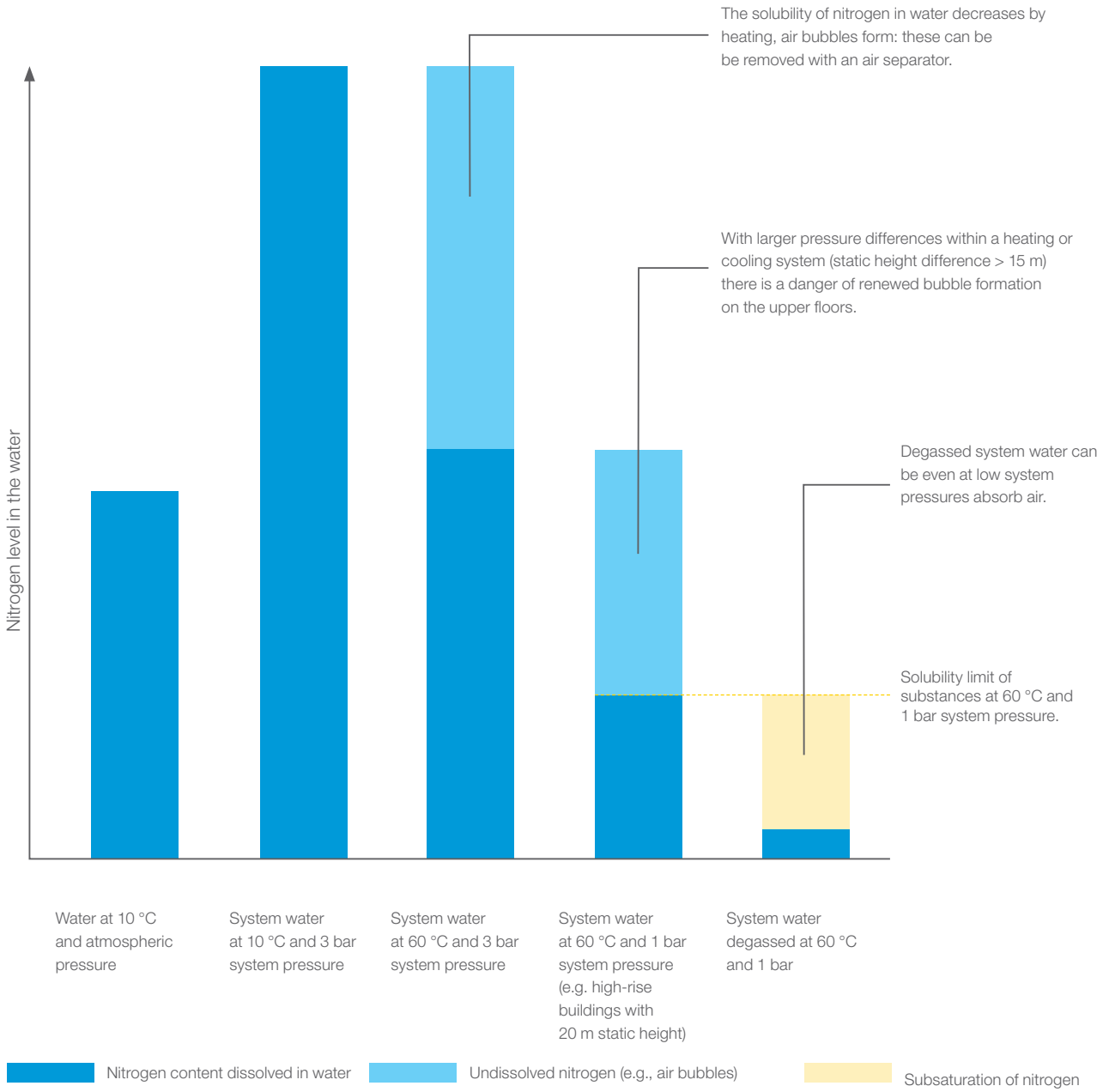
## HENRY'S LAW: DISSOLVED AIR IN WATER DEPENDENT ON TEMPERATURE AND PRESSURE

The diagram clearly shows the differences between thermal degassing and vacuum degassing. If the temperature rises at normal system pressure - which is usually well above 1 bar - even at 100 °C, a considerable amount of air dissolved in water remains. Only at atmospheric pressure (curve 0 bar) are almost all dissolved gases released as the water boils. However, if the water is exposed to a vacuum (below the 0 bar curve), dissolved gases are released in large quantities even at low temperatures. Combined with the temperature increase common in heating systems, dissolved gases can thus be almost completely removed.



# WHY IS VACUUM DEGASSING THE MOST EFFECTIVE METHOD TO REMOVE AIR FROM THE SYSTEM REMOVAL?

The advantage of vacuum degassing is illustrated by the example of nitrogen content in heating water:



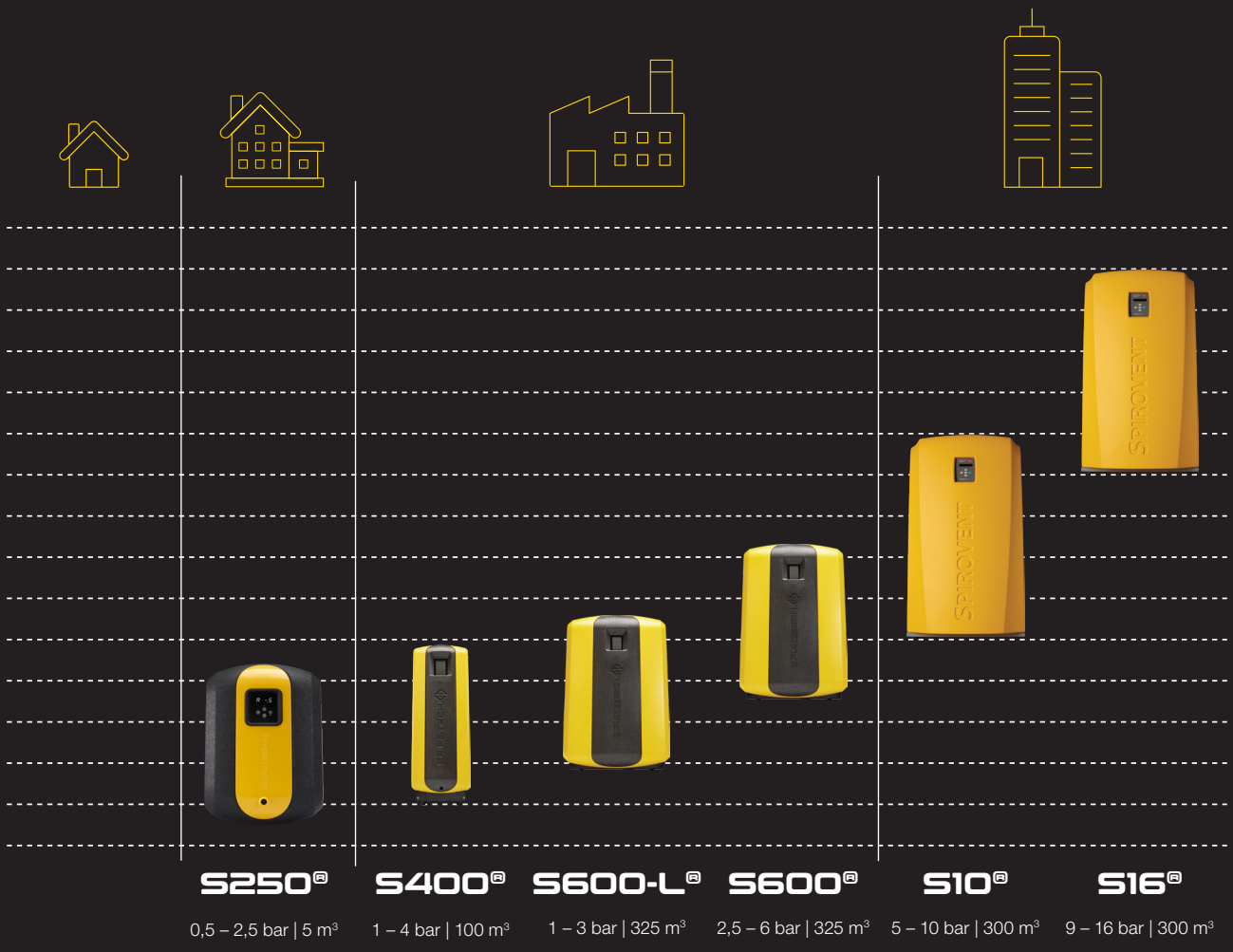
# THE RIGHT PRODUCT AT A GLANCE

## A COMPLETE RANGE

Low-temperature systems in particular benefit from a vacuum degasser because air is released at high temperature or low pressure.

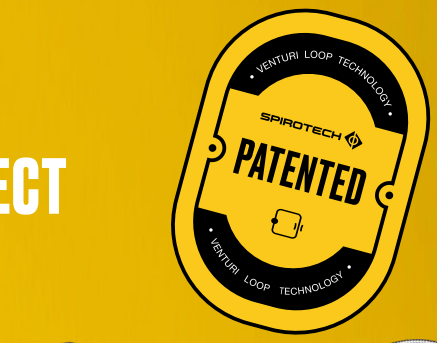
Our SpiroVent Superior range is constantly expanding. So our customers no longer have to compromise during their search for the perfect solution for their system.

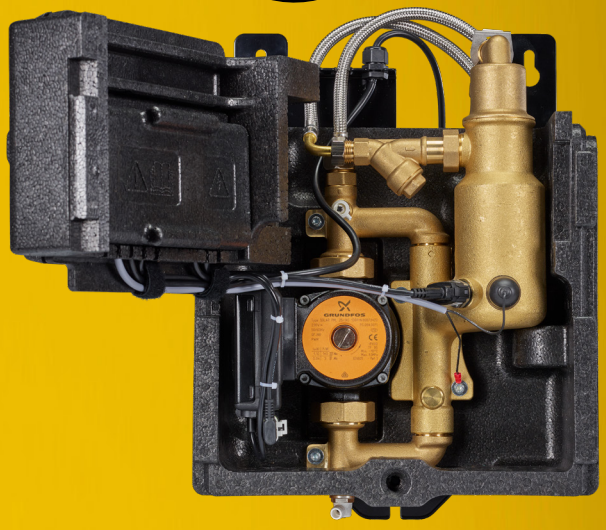
In the chart below you will find all our different vacuum degassers clearly listed. Solutions are available from 0.5 bar to 16 bar and in volumes from 5 $m^3$ to 325 $m^3$. So you can make the right choice at a glance.



# NEW: THE SPIROVENT SUPERIOR S250

## WORKS PERFECTLY, SOUNDS PERFECT



Everyone should know: our newest degasser is quieter than ever. The secret lies in our patented Venturi Loop; consisting of a centrifugal pump combined with a Venturi.

During degassing, a sensor continuously monitors the pressure in the tank and controls the pump accordingly. The result is precise, efficient pressure control in balanced steps.

In practice, this means very low resonance and barely perceptible system noise. The noise level is only 41 dB(A)!

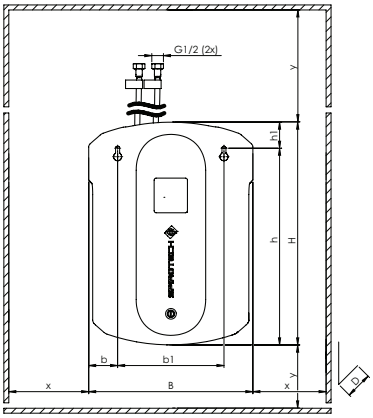
And once all the air is removed from the system, nothing that can make noise remains, either.

# TECHNICAL INFORMATION

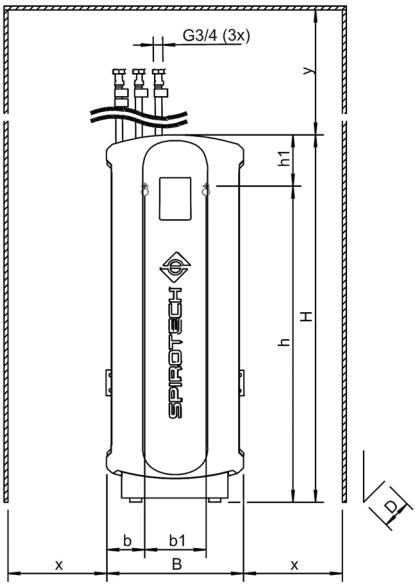
| Article Number | Type | H [mm] | B [mm] | D [mm] | x [mm] | y [mm] | Connecti-on inlet | int. | Connecti-on outlet | int. | Conn-nection main refill | int. | Max system volume [m³] | Temp. range [°C] | Op. pressure [bar] | Weight [kg] | Max. glycol [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SPIROVENT® SUPERIOR S250** | | | | | | | | | | | | | | | | | |
| MV02A50 | S250 | 524 | 386 | 252 | >250 | >250 | G½ | (F) | G½ | (F) | - | - | 5 | 15 - 70 | 0,5 - 2,5 | 11 | - |
| **SPIROVENT® SUPERIOR S400** | | | | | | | | | | | | | | | | | |
| MV04A50 | S400 | 930 | 346 | 334 | >600 | >600 | G¾ | (F) | G¾ | (F) | - | - | 100 | 0 - 90 | 1 - 4 | 34 | 40 |
| MV04B50 | S400B | 930 | 346 | 334 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 100 | 0 - 90 | 1 - 4 | 35 | 40 |
| MV04R50 | S400-R | 930 | 346 | 334 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 100 | 0 - 90 | 1 - 4 | 34 | 40 |
| **SPIROVENT® SUPERIOR S600** | | | | | | | | | | | | | | | | | |
| MV06A50 | S600 | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | - | - | 325 | 0 - 90 | 2,5 - 6 | 62 | 40 |
| MV06AL50 | S600-L | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | - | - | 325 | 0 - 90 | 1 - 3 | 62 | 40 |
| MV06B50 | S600-B | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 2,5 - 6 | 64 | 40 |
| MV06BL50 | S600-BL | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 1 - 3 | 64 | 40 |
| MV06R50 | S600-R | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 2,5 - 6 | 63 | 40 |
| MV06RL50 | S600-RL | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 1 - 3 | 63 | 40 |
| **SPIROVENT® SUPERIOR S10** | | | | | | | | | | | | | | | | | |
| MA10A50 | S10A | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | - | - | 300 | 0 - 90 | 5 - 10 | 79 | 40 |
| MA10R50 | S10A-R | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | G¾ | (F) | 300 | 0 - 90 | 5 - 10 | 79 | 40 |
| **SPIROVENT® SUPERIOR S16** | | | | | | | | | | | | | | | | | |
| MA16A50 | S16A | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | - | - | 300 | 0 - 90 | 9 - 16 | 92 | 40 |
| MA16R50 | S16A-R | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | G¾ | (F) | 300 | 0 - 90 | 9 - 16 | 92 | 40 |

Meaning article numbers: B = With break tank, R = With refill function, I = Insulated, L = Low pressure

S250



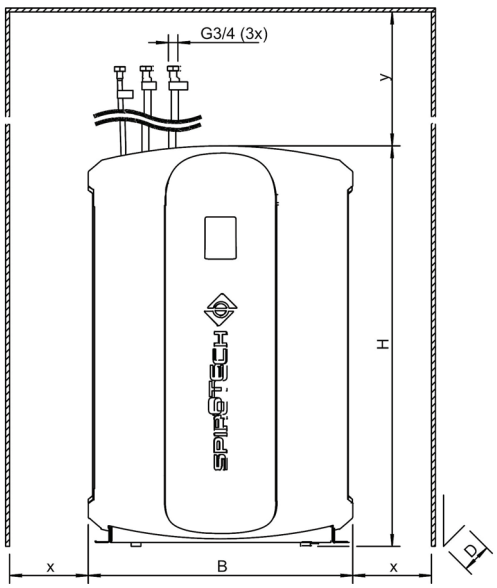

S400



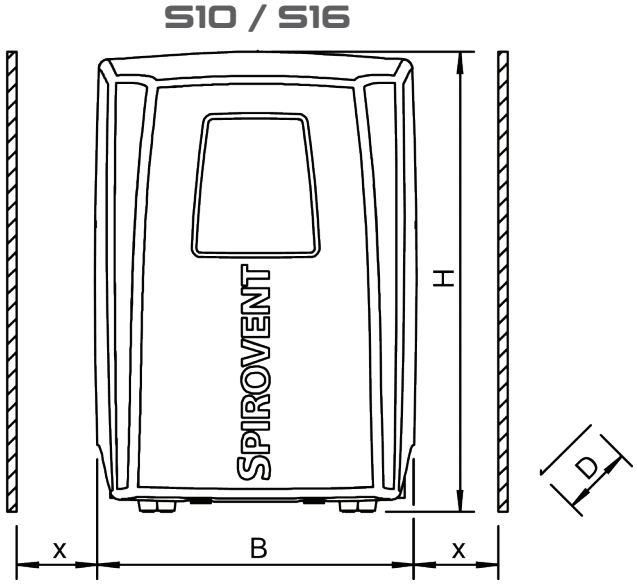
# TECHNICAL INFORMATION

| Article Number | Type | H [mm] | B [mm] | D [mm] | x [mm] | y [mm] | Connecti-on inlet | int. | Connecti-on outlet | int. | Conn-nection main refill | int. | Max system volume [m³] | Temp. range [°C] | Op. pressure [bar] | Weight [kg] | Max. glycol [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SPIROVENT® SUPERIOR S400 ISOLATED** | | | | | | | | | | | | | | | | | |
| MV04A50I | S400-I | 930 | 346 | 334 | >600 | >600 | G¾ | (F) | G¾ | (F) | - | - | 100 | 0 - 90 | 1 - 4 | 34 | 40 |
| MV04B50I | S400-BI | 930 | 346 | 334 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 100 | 0 - 90 | 1 - 4 | 35 | 40 |
| MV04R50I | S400-RI | 930 | 346 | 334 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 100 | 0 - 90 | 1 - 4 | 34 | 40 |
| **SPIROVENT® SUPERIOR S600 ISOLATED** | | | | | | | | | | | | | | | | | |
| MV06A50I | S600-I | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | - | - | 325 | 0 - 90 | 2,5 - 6 | 63 | 40 |
| MV06AL50I | S600-LI | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | - | - | 325 | 0 - 90 | 1 - 3 | 63 | 40 |
| MV06B50I | S600-BI | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 2,5 - 6 | 65 | 40 |
| MV06BL50I | S600-BLI | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 1 - 3 | 65 | 40 |
| MV06R50I | S600-RI | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 2,5 - 6 | 64 | 40 |
| MV06RL50I | S600-RLI | 1.020 | 673 | 360 | >600 | >600 | G¾ | (F) | G¾ | (F) | G¾ | (F) | 325 | 0 - 90 | 1 - 3 | 64 | 40 |
| **SPIROVENT® SUPERIOR S10 ISOLATED** | | | | | | | | | | | | | | | | | |
| MA10A50I | S10AI | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | - | - | 300 | 0 - 90 | 5 - 10 | 79 | 40 |
| MA10R50I | S10A-RI | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | G¾ | (F) | 300 | 0 - 90 | 5 - 10 | 79 | 40 |
| **SPIROVENT® SUPERIOR S16 ISOLATED** | | | | | | | | | | | | | | | | | |
| MA16A50I | S16AI | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | - | - | 300 | 0 - 90 | 9 - 16 | 92 | 40 |
| MA16R50I | S16A-RI | 1.272 | 744 | 400 | - | - | G¾ | (F) | G¾ | (F) | G¾ | (F) | 300 | 0 - 90 | 9 - 16 | 92 | 40 |

## S600




## S10 / S16



# MAXIMISING PERFORMANCE FOR YOU

Spirotech is a leading expert in improving the efficiency of heating and cooling systems. Our family business has over 60 years of experience in developing solutions for removing and preventing the accumulation of air and sludge deposits in energy systems. Our products save energy, increase comfort, avoid wear and tear and maximise operating periods. Reliable and customer-oriented products that help you get top performance and protect investment in capital assets. We develop high-value solutions with our partners, suppliers and investors that improve the operation of residential and commercial properties, as well as industrial processes. Our comprehensive network of selected importers in over 70 countries means there is always a Spirotech expert near to you.

Heating and cooling systems are highly complex, particularly when they are run in conjunction with other systems and installations. So locating and analysing faults when they occur is never easy, especially with the clock ticking in the event of a system failure. Spirotech is here to support you with practical advice and solutions, helping you to pinpoint causes and rectify them. Please feel free to contact us.

## IF YOU WOULD LIKE TO KNOW MORE ABOUT OUR SOLUTIONS, PLEASE VISIT OUR WEBSITE WWW.SPIROTECH.COM OR WWW.SPIROTECH.CO.UK

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