

TECHNICAL BULLETIN

# **TECHNICAL INFORMATION** **FOR INSTALLERS AND TECHNICIANS**



# INTRODUCTION

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Dear installer and technician,

We send you this first technical bulletin to inform you of the latest developments, changes and useful tips coming from Spirotech.

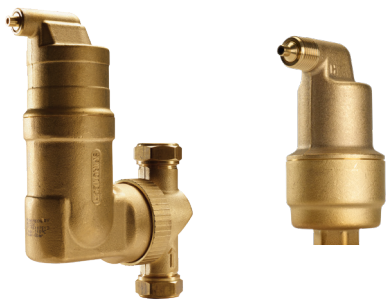
In this edition we update you on the following topics:

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Of course we wish you a lot of reading pleasure, but above all that you can make good use of the information we offer in your daily work.

# 1. DEAERATION AND ATMOSPHERIC AND VACUUM DEGASSING OF HEATING WATER

Whether it's for domestic or commercial hot water or industrial processes, the presence of microbubbles and gasses in the water can significantly impact system performance, overall energy efficiency and increased risk of corrosion within the heating system. Understanding the potential amount of gasses that can exist within water relies on Henry's Law, which states that the amount of gas dissolved in a liquid is directly proportional to the partial pressure of that gas above the liquid. Three commonly employed methods for liberating gases from heating water are deaeration, atmospheric degassing and vacuum degassing.



## DEAERATION

A deaerator removes (already released) micro air bubbles at practically the same pressure as the system pressure. Separation of micro-bubbles can only take place if the right environment is created. SpiroVent deaerators contain a coalescing medium (SpiroTube) to merge small air and micro-bubbles to create a greater rising force. In addition, a laminar flow is created in the vessel, reduces the velocity of the fluid to below the rise rate of the air bubbles. As a result, the air bubbles rise, are released from the fluid and can be removed by an air release valve. This method is used with our brass and steel deaerator units.

## ATMOSPHERIC DEGASSING

With atmospheric degassing, part of the system fluid is temporarily subjected to (maintained at) a lower pressure compared to that of the system: generally atmospheric pressure with 0.5 bar being the maximum pressure. Due to the lowering of the pressure, the stored volume of water will start to liberate the dissolved gases. These liberated gases will rise through the liquid and disperse (release) into the atmosphere above until

equilibrium is reached. However, it cannot guarantee reaching a gas pressure lower than the lowest pressure in the system (gas absorption condition).

**The following SpiroExpand pressurisation machines has standard an atmospheric degassing function integrated:** EPCK, EMCK, EMCM-\_1 (-twin), ETCM-\_1 (-twin) and EMCC. All other (bigger) units need a separate degassing unit.

## VACUUM DEGASSING

Vacuum degassing, also known as closed degassing, as used in the SpiroVent Superiors is a more sophisticated technique that involves creating a vacuum environment in a reservoir to remove dissolved gases from water. By lowering the pressure above the water, the solubility of gases herein is reduced, and they are released in the form of bubbles. They collect at the top of the reservoir and are effectively discharged through the vent valve. The degassed and absorbent water is pumped back into the installation and can absorb gases again.

Deaeration, atmospheric and vacuum degassing are valuable techniques for removing microbubbles and gasses from heating water, and their selection depends on the specific needs of the heating system. While deaeration and atmospheric degassing offers a simple and cost-effective solution that requires minimal equipment, vacuum degassing is the most effective degassing technique applied in HVAC systems and suitable for applications or systems prone to severe corrosion issues.



## 2. LEARN MORE ABOUT WATER QUALITY AND pH LEVELS

**For heating systems, water is one of the most important components of the installation. As soon as the quality of the heating or cooling water is no longer adequate, major failures, serious damage and efficiency losses can occur. There are a few important parameters for defining the water quality in heating or cooling systems. One of them is the pH value.**

The pH value is the measure of acidity or basicity (alkalinity) of an aqueous solution and gives an indication of the probability of corrosion and corrosion rate. It ranges from 0 (very acidic) to 14 (very basic), with 7 being neutral. Certain chemical processes can only take place with a specific degree of acidity or basicity.

Water that is too acidic ( $\leq 6$ ) can corrode metal components in the system, while hard water that is too basic ( $\geq 8$ ) can lead to scale formation and reduced system efficiency. The pH-value of the system water can change over the years, for example due to oxygen entering the system which influences the final corrosion susceptibility of a metal.

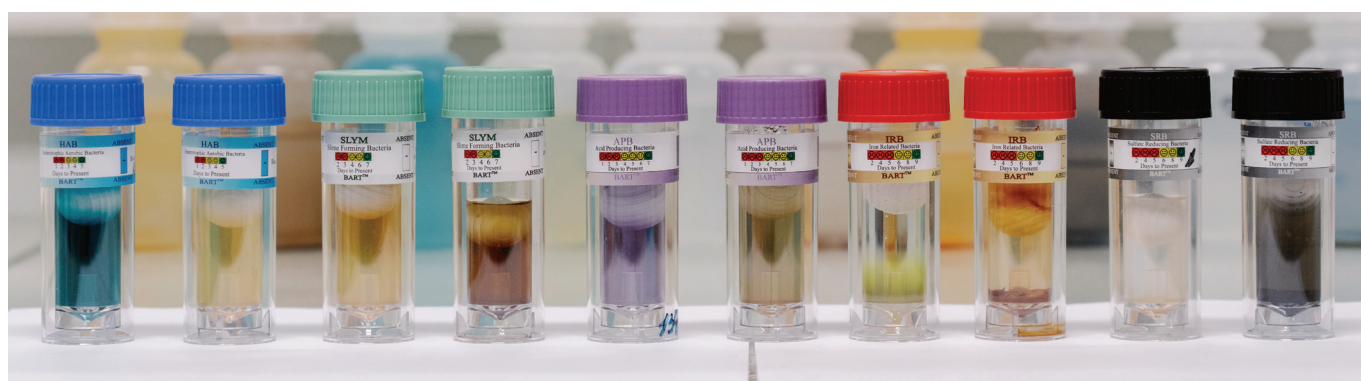
Due to the uniform oxide layer, metals are protected against corrosion, i.e., no active corrosion can take place. However, depending on the metal used, the oxide layer can be damaged at certain pH values and when it comes into contact with oxygen present in water, there is an increased risk of corrosion. For ferrous metals, a pH value of more than 8 is good for reducing the risk of corrosion, while a pH of less than 9 is necessary for aluminium alloys.

In a heating system, a good pH range for the water is between 8.2 and 10. This range is alkaline, which helps prevent corrosion. Therefore, it is important to maintain the right pH balance in a heating system to ensure optimal performance and long life.

For pH control and to meet guidelines, Spirotech recommends deaeration and the use of softened or demineralised water for filling, refilling, or treating the heating system water (softened water is not recommended for systems with aluminium alloys). This prevents scaling and reduces the risk of corrosion.

PH GUIDELINE RANGE	SPIROTECH GUIDELINE	VDI 2035 GUIDELINE
Systems with aluminium alloys	>6.5 to <8.5	8.2 to 9.0
Systems with no aluminium alloys	>6.5 to <9.2	8.2 to 10.0

*Note: Spirotech has adopted the VDI 2035 guideline, however extended with additional standards, and modified where relevant for situations where additives are applied based on our own daily experience and expertise.*





### 3. SPIROTECH ENVIRONMENTAL PACKAGING POLICY

**Packaging management is essential to protect, preserve and improve the quality of the environment, protect human health, make prudent, efficient, and rational use of natural resources, and promote the principle of the circular economy.**

Therefore, Spirotech bv is committed to the continuous improvement of both external and internal environmental performance through effective environmental packaging management.

We are aware that in our business activities, from development, production and distribution, various packaging materials are used directly and indirectly, and their improper use and disposal can cause environmental problems. Therefore, Spirotech promotes systematic packaging management according to the circular economy principle and strives to eliminate problematic or unnecessary packaging materials in the organisation.

Spirotech follows the directives as established by the European Parliament according to 94/62/EC and 2018/852 regarding the management of packaging and packaging waste and the identification system for packaging materials.

Recycling codes used serve to characterize different packaging materials and to facilitate the recycling process so that they can be properly sorted in the waste treatment facility for reuse.

Visit our website for more information.



## 4. FREQUENTLY ASKED QUESTIONS FROM INSTALLERS AND TECHNICIANS

**Q** What is the installer code on the S400 / S600

**A** 5705BK

**Q** How can we prevent the superior from short cycling the PU when the Superior is degassing.

**A** We install a small buffer vessel into the expansion line of the PU- charged to the static height.

**Q** How does the Superior know when to stop degassing.

**A** The smart switch. If the smart switch doesn't see a contact for 10/11 minutes, it will turn stop the superior. A contact (brief closing) of the smart switch is made as the liberated gases (sufficient liberated gases) are expelled through the AAV section. If there are insufficient gases being liberated/expelled, then this contact isn't made.

**Did you know:**

**Superior- If the water is back flowing from the degassing vessel into the break tank, then the culprit is the non-return valve in the refill line, and not the solenoid valve.**

**Q** Why do you test your units at 7 bar when the max working pressure is 10 bar?

**A** Because we perform a leak test, not a structural integrity test. Structural integrity is assured through our work procedures.

**Q** How can a spill vessel not be pressurized?

**A** We use pressureless vessels for our spill systems. The system water crosses the boundary between system pressure and pressureless vessel in the overflow valve (here the pressure is reduced from system pressure to atmospheric pressure) and in the pump (here the pressure is increased from atmospheric pressure to system pressure). Water only crosses this boundary when it is required, so when the system pressure gets too high due to expansion (e.g. temperature increase) the overflow valve opens and lets water by. When the system pressure is reduced (due to contraction, e.g. temperature decrease) the pump will start and put water back into the system from the spill vessel.

**Q** What is the difference between an AAV and an inline Deaerator.

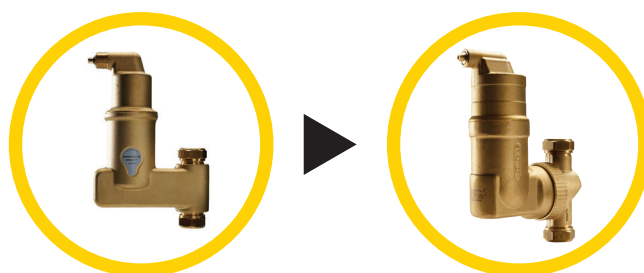
**A** AAV's are good for expelling air when filling systems (in areas where air would otherwise be trapped), and also allow the water to be easily released when draining. However, when there is movement of the water, and that water is carrying microbubble or pockets of air, then the standard AAV will struggle to remove these. The inline Deaerator is the solution in this case. Due to the increased size of the deaeration housing, the velocity is decreased, and separation of the microbubbles or pocket of air from the system water is much easier. The gases will then rise up into the AAV section where they can be released.

## 5. PHASED OUT PRODUCTS

Every year we take a closer look at our product range to check whether it still meets the wishes and needs of installers. As a result, products are sometimes phased out. The list of products below will no longer be sold and produced from January 1st 2024.

### **SPIROVENT®** MICROBUBBLE DEAERATORS

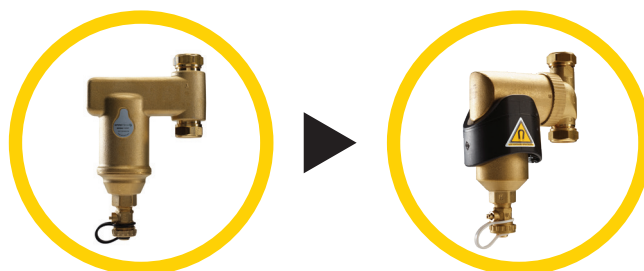
Naturally, we offer a suitable alternative for all phased-out products.



SpiroVent phased out	Article number	SpiroVent alternative	Article number
SpiroVent -22mm -Ver	AA022V	SpiroVent RV2 -22mm -Uni	UA022W
SpiroVent Solar -22mm -Ver -HighT	AA022V/008	SpiroVent Solar -22mm -Uni -HighT	*
SpiroVent -¾" -Ver	AA075V	SpiroVent RV2 -¾" -Uni	UA075W
SpiroVent Solar -¾" -Ver -HighT	AA075V/008	SpiroVent Solar -¾" -Uni -HighT	*
SpiroVent -1" -Ver	AA100V	SpiroVent RV2 -1" -Uni	UA100W
SpiroVent Solar -1" -Ver -HighT	AA100V/008	SpiroVent Solar -1" -Uni -HighT	*

\* Please contact us for the best advice.

### **SPIROTRAP®** DIRT SEPARATORS



SpiroTrap phased out	Article number	SpiroTrap alternative	Article number
SpiroTrap -22mm -Ver	AE022V	SpiroTrap MB3/MBL -22mm -Magnet -Uni	UE022WJ
SpiroTrap -22mm -Ver -Magnet	AE022VM	SpiroTrap MB3/MBL -22mm -Magnet -Uni	UE022WJ
SpiroTrap -¾" -Ver	AE075V	SpiroTrap MB3/MBL -¾" -Magnet -Uni	UE075WJ
SpiroTrap -1" -Ver	AE100V	SpiroTrap MB3/MBL -1" -Magnet -Uni	UE100WJ



# 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](http://WWW.SPIROTECH.COM) OR  
[WWW.SPIROTECH.CO.UK](http://WWW.SPIROTECH.CO.UK)**

