

TECHNICAL BULLETIN

TECHNICAL INFORMATION

FOR INSTALLERS AND TECHNICIANS



INTRODUCTION

Dear installer and technician,

We send you this 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. PRODUCT DEVELOPMENT

DISPLAY SPIROEXPAND SYSTEMS

INTRODUCING THE SPIROEXPAND TOUCHSCREEN DISPLAY

The SpiroExpand pressurisation machines have been updated with a touchscreen control display. The touchscreen takes SpiroExpand machine control to the next level with a fresh look & feel by providing an intuitive, visually appealing, and user-friendly interface. Operators can interact directly with the machine or process by touching the screen, eliminating the need for physical buttons, and simplifying the operation of the pressurisation machines.

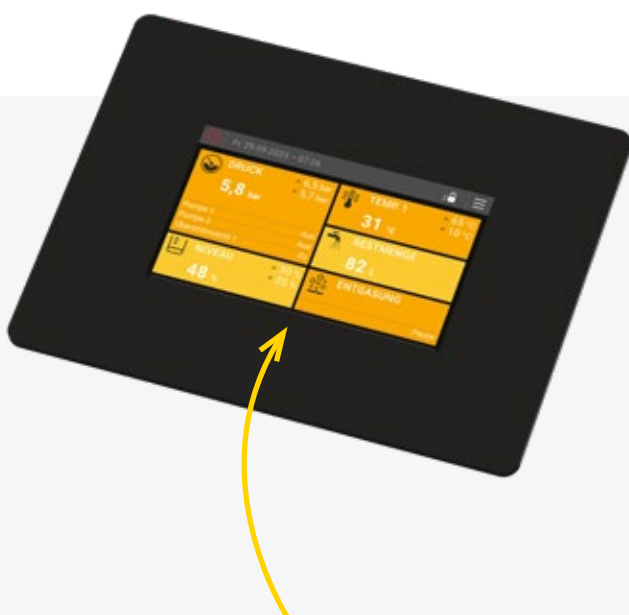
ADVANTAGES OF THE TOUCHSCREEN CONTROLS

- An intuitive interface compared to the current button controls. Operators can navigate menus, adjust settings, and control processes by simply tapping or swiping the screen.
- Fresh and modern look, matching the benchmark of the time.
- Specific settings can be customized. Operators can access only the relevant information and controls, reducing the risk of errors.

- Real-time feedback, such as process data, errors, and alerts, making it easier for operators to monitor and react to changing conditions.
- Supports multiple languages, making the SpiroExpand suitable for global markets.
- Different colour layouts for the user interfaces are possible, such as a Spirotech or Eder brand identity layout.
- One-to-one replaceable with the current key foil controls with the same functions.
- In the future, remote access will be possible, for example, for monitoring, control, and connection with other devices. Simply upload a new software version to add new functions.

MACHINES WITH TOUCHSCREEN CONTROLS

Since October 2023, the following SpiroExpand pressurisation machines have/will receive the new touchscreen (EMCK, EMCM, ETCM and EMCC), including the Autofill (EMCA).



New touchscreen display for SpiroExpand systems



2. LATEST PRODUCT MODIFICATIONS CHANGES TO BRASS UNIVERSAL PRODUCTS

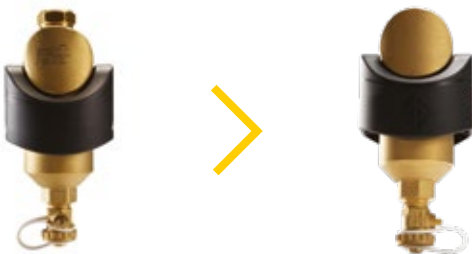
We're excited to share some enhancements we've made to our air- and dirt separator products at Spirotech, driven by our commitment to delivering top-notch quality and efficiency.

Our recent changes, including standardising swivels, magnet jackets, vent caps, and houses, as well as transitioning to more durable O-ring connections, aim to streamline processes and

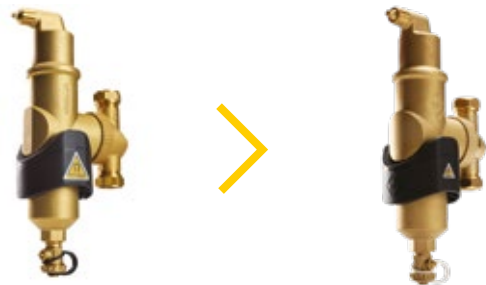
elevate overall product quality. By reducing component complexity and optimising installation times, we're not only improving the functionality of our separators but also enhancing the look and feel of the products. These modifications contribute to easier handling, quicker installations, and more efficient logistics, ultimately ensuring a superior experience for you, our valued customers.

AFFECTED PRODUCTS

SpiroTrap UE_WJ + UE_WH range



SpiroCombi UC_WJ range



SpiroVent UA_W range



IMPROVED QUALITY DUE TO LOGO CHANGE

We changed the logo on our brass separators to further increase the quality of these products. The new design will show the Spirotech avatar on the brass house of the separator. Next to the brass house, the logo on the magnet jacket has also been changed. This change has been implemented to show the current Spirotech avatar. This change does not affect the way of working or any of the product specs of these product ranges.

INCREASED SUSTAINABILITY DUE TO CHANGE IN CONNECTION

To increase the sustainability of our production process, we changed the connection type of the socket of SpiroTrap UE_WJ, UE_WH products and the vent cap of the SpiroVent UA_W products from glue to O-rings. This change does not affect the way of working or any of the product specs of these product ranges.

IMPROVED PRODUCTION EFFECTIVENESS THANKS TO STANDARDISATION OF PRODUCT PARTS

To further improve the production efficiency and consistency we implemented various standardisation changes to SpiroTrap, SpiroCombi and SpiroVent products. These small changes include using one house for all SpiroTrap UE_WJ and one house for SpiroTrap UE_WH separators, creating one vent cap for all SpiroVent UA_W separators and creating one swivel for all brass universal separators.

It's crucial to note that these standardisation adjustments have been carefully executed to maintain and enhance the quality of our separators. Importantly, these modifications have absolutely no impact on the operation or functionality of the affected products. They do however have a small impact on some product dimensions. On the next page you can view an overview of all relevant product dimensions. The highlighted numbers are the updated dimensions of this product. Make sure to always consult the quick installation guide, before installing an air or dirt separator. The quick installation guide always contains the latest information for correctly installing the separators.

Want to learn more about our microbubble deaerators and magnetic dirt separators?

Go to <https://www.spirotech.com/products/>

Listed below are all the implemented technical changes.

One **swivel** for all universal separators:



One **vent cap** for all SpiroVent UA_W separators:

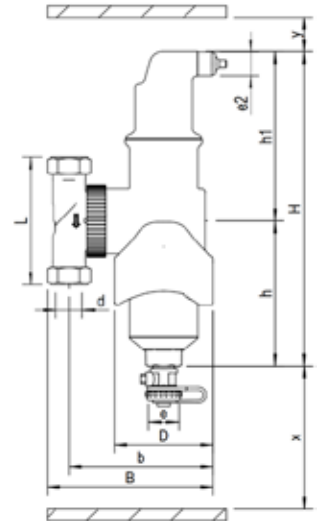


One **house** for SpiroTrap UE_WJ and one for UE_WH separators:



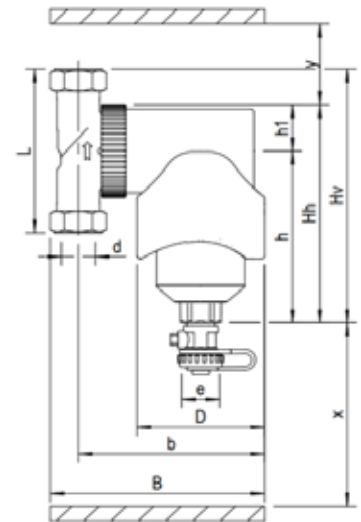
SpiroCombi MB3 UC..WJ Product dimensions

	UC022WJ		UC028WJ		UC075WJ		UC100WJ	
	old	new	old	new	old	new	old	new
d	22	22	28	28	Rp¾"	Rp¾"	Rp1"	Rp1"
H	272	277	272	277	272	277	272	277
h	123	128	123	128	123	128	123	128
h1	149	149	149	149	149	149	149	149
L	120	112	120	112	100	92	100	92
D	84	84	84	84	84	84	84	84
B	141	141	149	149	142	142	152	152
b	123	123	126	126	125	125	129	129
x	>110	>110	>110	>110	>110	>110	>110	>110
y	>75	>75	>75	>75	>75	>75	>75	>75
e	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G¾
e2	R½	R½	R½	R½	R½	R½	R½	R½



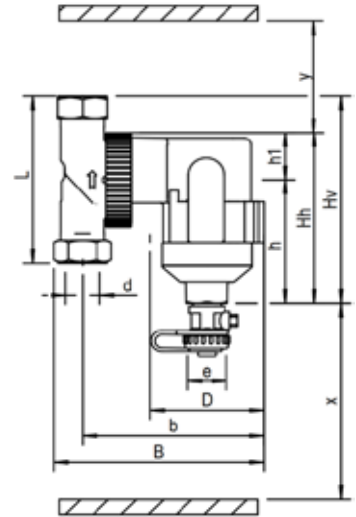
SpiroTrap MB3 UE..WJ product dimensions

	UE022WJ		UE028WJ		UE075WJ		UE100WJ	
	old	new	old	new	old	new	old	new
d	22	22	28	28	Rp¾"	Rp¾"	Rp1"	Rp1"
h	117	117	117	117	117	117	117	117
Hh	149	149	149	149	149	149	149	149
Hv	177	173	177	173	177	163	162	163
h1	32	32	32	32	32	32	32	32
L	112	112	112	112	90	92	90	92
D	84	84	84	84	84	84	84	84
B	141	141	149	149	142	142	152	152
b	123	123	127	127	125	125	129	129
x	>110	>110	>110	>110	>110	>110	>110	>110
y	>50	>50	>50	>50	>50	>50	>50	>50
e	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G¾



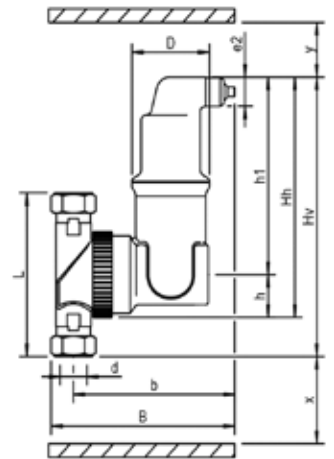
SpiroTrap MBC UE..WH product dimensions

	UE022WH		UE028WH		UE075WH		UE100WH		UE022WHA01	
	old	new	old	new	old	new	old	new	old	new
d	22	22	28	28	Rp¾"	Rp¾"	Rp1"	Rp1"	22	22
h	90	83	90	83	90	83	90	83	90	83
Hh	121	115	121	115	121	115	121	115	121	115
Hv	150	139	150	139	140	129	140	129	150	139
h1	32	32	32	32	32	32	32	32	32	32
L	120	112	120	112	100	92	100	92	120	112
D	71	81	81	81	71	81	81	81	87	87
B	128	136	144	144	129	137	147	147	136	136
b	110	117	121	121	112	119	124	124	117	117
x	>110	>110	>110	>110	>110	>110	>110	>110	>110	>110
y	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50
e	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G¾



SpiroVent RV2 UA..W product dimensions

	UA022W		UA028W		UA075W		UA100W	
	old	new	old	new	old	new	old	new
d	22	22	28	28	Rp¾"	Rp¾"	Rp 1"	Rp 1"
h	32	32	32	32	32	32	32	32
Hh	177	177	177	177	177	177	177	177
Hv	205	201	205	201	195	191	195	191
h1	145	145	145	145	145	145	145	145
L	120	112	120	112	100	92	100	92
D	62	64	62	64	62	64	62	64
B	143	152	151	160	144	153	154	163
b	125	134	128	137	127	136	131	140
x	>50	>50	>50	>50	>50	>50	>50	>50
y	>50	>50	>50	>50	>50	>50	>50	>50
e2	M4	R½	M4	R½	M4	R½	M4	R½



3. HOW TO AVOID FUTURE PROBLEMS IN HVAC SYSTEMS

Up and down the country many heating systems – some relatively new – are running inefficiently and requiring more and more maintenance work to keep them going.... just because the initial design was not thought out sufficiently.

A very common problem Spirotech UK comes across is that of a poorly installed and maintained pressurisation system. Mike Pitt, Technical Advisor UK, commented: “In a sealed system it is vital to ensure that there is a positive pressure at all points throughout the system and that the static height of the building is taken into consideration along with any other minimum pressure requirements. Negative or low pressures can cause air to be drawn into a system, along with increasing the effects and likelihood of cavitation.

“Such elements should be factored into consideration at design phase. If the numbers and principles are not given proper consideration from the outset, then the system will likely start with basic design flaws resulting in often unexpected and sometimes costly retrospective corrections. I’m a firm believer that more input should be taken from consultants, specialists such as ourselves, and also the engineers whom install and maintain the equipment from the very start of the process to give the best possible outcome.

“We have a very experienced technical sales team who will take the time to sort out the detail and issues that have not been covered. Key values need to be identified and incorporated at the design stage to deliver a solution that meets the needs of the building. The resulting recommendations need to be close to 100% and that is why we encourage clients to provide us with all the relevant information.

“Often companies don’t specify a reserve volume in their fixed gas vessel calculation. At Spirotech we follow the requirements laid out in BS12828 which is to say our fixed gas vessel sizing is calculated to have a reserve fluid volume. This means that even when at cold fill pressure the system will still have a pressure resilience greater than just the static height of the building. It’s not just a matter of sizing the vessel

correctly, it’s about sizing the vessel to allow a stable working pressure hysteresis. You do not want large or erratic fluctuations in pressure!

“Basic principles tell us that bar is related to pressure and metres in height. Therefore a change in height within the system will mean a change in static pressure seen. This is why it is vital to know at design phase what the static height of the building is, the location of equipment and any minimum or maximum pressure requirements. A common problem we come across is equipment being installed in the wrong position within a system. Pressurisation units and fixed gas expansion vessels need to be fitted on the return leg and on the suction side of circulating pumps. However, from time-to-time, we find them incorrectly installed on the discharge side of circulating pumps. In such cases, the pressurisation units see the discharge pressure of the pumps, not the true pressure of the neutral point in the system. This would give the impression that there was a positive pressure in the system - however, due to the delta pressure created by the pumps, we may actually be seeing a pressure deficit on the suction side. Of course there are exceptions to all rules but deviations to these should be carefully thought out and given the proper considerations”.



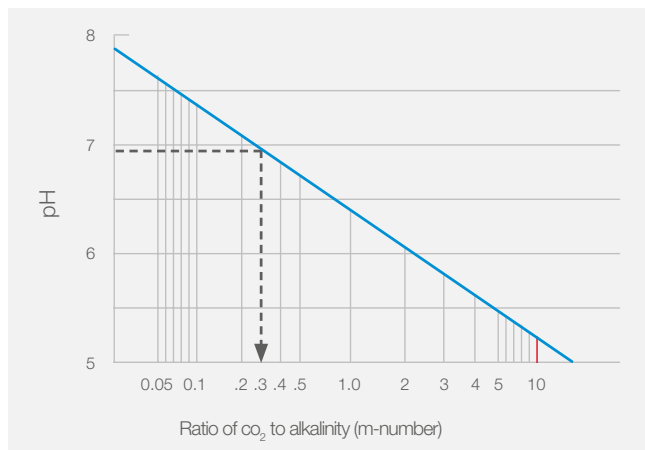
4. SYSTEM WATER QUALITY - ALKALINITY

ALKALINITY

In relation to acidity and alkalinity, the following facts are important:

- Acidity is a measure of the ability of water to neutralise bases.
- Acids are substances that release protons [H+] into water.
- Alkalinity means that the water contains minerals that neutralise acids.
- Alkalinity is a combination of all bases reacting with protons in the water and consuming them (i.e. neutralising acids).

Acidity intensifies corrosion, alkalinity causes oversaturation of materials.



Ratio of carbon dioxide to total alkalinity

Acidity and alkalinity are important for water quality because they amplify the main water-related problems (corrosion and boiler scale). Higher acidity intensifies corrosion by increasing the solubility of metal ions and accelerating electrochemical corrosion reactions. An increase in alkalinity can lead to oversaturation of the water with calcium carbonate or other minerals. Since most cooling and heating systems operate under alkaline conditions, in most cases only the term alkalinity is used. In tap water, alkalinity is mainly determined by the dissolved carbonate salts (carbon dioxide-bicarbonate-carbonate relationship). Usually, a certain excess of CO₂ remains in the water. This creates an equilibrium between pH and alkalinity. For this, see the diagram above. The diagram shows the relationship

between carbon dioxide and total alkalinity as a function of pH. This means that the pH value indicates the ratio between CO₂ and alkalinity, but not the concentration of alkaline substances per se: Water with 1 ppm CO₂ and 10 ppm alkaline substances has the same pH value as water with 10 ppm CO₂ and 100 ppm alkaline substances. The above diagram shows that there is an equilibrium between CO₂, alkalinity and the pH of water. This balance depends on several conditions such as water temperature, partial pressure of CO₂ and total alkalinity.

ALKALINITY BALANCE

The relationship between pH, carbon dioxide and alkalinity describes the general state of water. However, it is also important to know the amount of individual alkaline substances in the water. This is because bicarbonate reacts with both hydrogen and hydroxide:



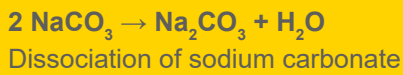
Bicarbonate, phosphate, silicate and borate increase the buffering capacity of water.

As a result, the change in pH is limited. This is also known as the buffer capacity of water. Other components such as phosphate, silicate and borate have the same effect on pH as bicarbonate. These substances are often used in addition to bicarbonate and enhance the buffering capacity of water. In hot water systems, the temperature in particular increases. This affects the concentration of dissolved carbon dioxide. In an open system, the free carbon dioxide in the air evaporates. In closed systems, however, the carbon dioxide is converted into bicarbonate. In the first case, the pH value remains the same; in the second, it increases. When the CO₂ is fully converted into bicarbonate, the pH of the water rises to 8.3, regardless of the initial concentration of CO₂. This process,

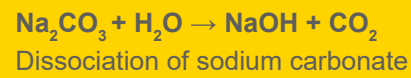
which often occurs in closed hot water systems, is also known as self-reinforcing alkalisation. In evaporative systems, for example in open cooling systems, pure water evaporation decreases the water and increases alkalinity. As a result, the pH also increases. This can have significant effects on the solubility of minerals such as calcium carbonate. By determining the p- and m-number of alkalinity, the different types of alkalinity can be calculated.

DISSOCIATION OF BICARBONATE

When softened water is used in closed hot water and steam systems, pH plays a special role. If fully softened water is used, alkalinity is linked to sodium. Due to the higher temperature, the following chemical reaction takes place:



This reaction starts at ambient temperature and reaches 100% at temperatures of about 100 °C. The sodium carbonate dissociates into sodium hydroxide (caustic soda):



This sodium formation is strongly dependent on the system pressure and, depending on the operating pressure, reaches a value between 25 and 90%.

SYSTEM PRESSURE [bar]	CARBONATE DISSOLUTION [%]
0 - 1	25
1 - 4	40
4 - 7	60
7 - 10	75
10 - 20	80
> 20	85

The pH can therefore rise above 8.3 if softened water is used. While this reduces the corrosion pressure on unalloyed steel and stainless steel, the risk of corrosion of aluminium in the system increases.



5. FREQUENTLY ASKED QUESTIONS FROM INSTALLERS AND TECHNICIANS

- Q** How to update the software of a SpiroVent Superior vacuum degasser?
- A** On our website: www.spirotech.com/products/spirovent-superior/
- Q** Is it possible to use the standard S600 at lower pressures with out the need of purchasing a whole new unit?
- A** Yes. Remove the flow restrictor (silver fitting) and brass ½” socket connected into it from the inlet line (so braided hose connects directly onto the y-strainer). Then replace the S600 HMI for the S600L version.
- Q** My client is struggling to connect to the Modbus through the S400/S600 units. Client can only read a status of 0. What can be done?
- A** The client can upgrade the software which can be obtained on the website. The current software version can be seen by pressing the “I” icon in the bottom left corner on the main screen.
- Q** I'm seeing pressure fluctuations in the system when the Superior is degassing. This is causing the PU to short cycle. Is this common? And can this be correct?
- A** Yes, when using Spill sets (mechanical valves or solenoid valves) the pressures created by the superior while degassing cannot be absorbed by the expansion vessel set- as the valve remains closed until a set pressure is reached. The solution is to install a small, fixed gas vessel (buffer vessel) onto the expansion line to the PU (gas charged to static height) which will absorb the pressure fluctuations created by the superior, before they reach the PU.



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**

