Flamco

Your reliable partner

Flexcon M-K/U versus Flamcomat

Comparison
Unique Selling Points
Frequently Asked Questions

December 2016

Flamco

Comparison At A Glance

Flexcon M-K/U

Operating principle from 1970's

Compressed air cushion
- Intelligent expansion vessel

Separate Top-Up Required
- Can be costly to meet running pressure

Balanced pressure only

Pressure rated expansion vessel
- Additional insurance & inspection

Noisier, requires local hearing protection

High risk maintenance operations

Cost Higher
- When adding Top-Up & Degassing

Flamcomat

Operating principle from 2000's

Pumped Operation
- Advanced, Sealed Spill & Fill

Top-Up included, integral to cabinet

Balanced pressure and degassing

Atmospheric expansion vessel
- Reduced insurance risk

Quieter, consistent with normal plant

Low risk maintenance operations

Cost Appropriate
- Top-Up & Degassing Included

Flamco

Flexcon M-K/U

Unique Selling Points

Modular, expandable, flexible design
The design principle relies on the use of a pressurised expansion vessel, an intelligent expansion vessel. Multiple vessels can be interlinked to achieve the total system requirement. This also allows for the use of multiple smaller volume vessels where headroom (vertical height) is limited.

Balanced pressure, to +/- 0.2 bar
The M-K/U will maintain the system pressure to +/- 0.2 bar regardless of the position in the thermal cycle. This means that there is no difference between the static pressure (cold) and the running pressure (hot).

Space saving
The M-K/U expansion vessel is 85% efficient, traditional expansion vessels are typically 50% at best (system characteristics may reduce this substantially). As a result the M-K/U system always represents a reduction in space required.

Intelligent Expansion Vessel
The system as a whole sees the equipment as a traditional expansion vessel, comprising of a wet side and a dry (air cushion) side. The ‘intelligent’ difference is that as expanded water enters the vessel, the control system vents air from the gas cushion to allow the expanded fluid into the vessel without changing the pressure as a whole.

Proprietary Control System
The M-K/U is controlled by a custom control panel, the SPC. This controller has multi level access, preventing unauthorised system changes. The controller, currently, will also allow for a duty / standby controller configuration for backup of sensitive or critical systems.

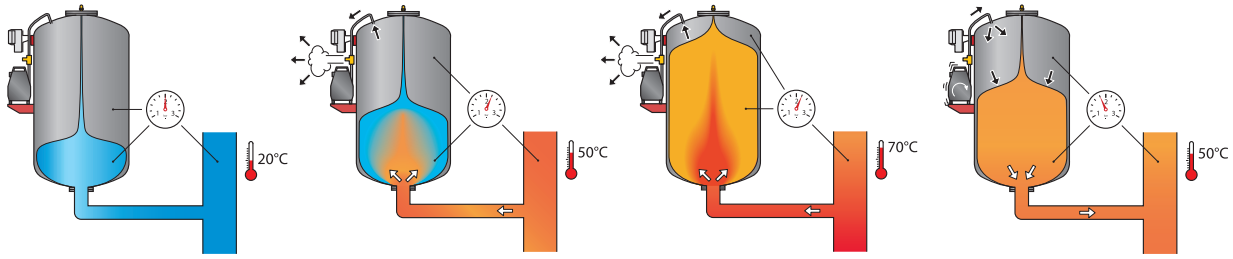
Realtime system information
The control system displays the vessel contents, system pressure and status of the main operating components realtime on the graphical display. This acts as confirmation that compressor(s) or valves are operating and responding as required, while also verifying the system setup.

Flamco

Flexcon M-K/U

Frequently Asked Questions

How does the M-K/U work?
Simply the M-K/U monitors and responds to the system pressure. If the pressure rises, solenoid valves open and vent some of the gas cushion from the vessel. If the pressure drops, the onboard compressor(s) re-pressurise the gas cushion, pushing fluid from the vessel back into the main system restoring the operating pressure.



1. Cold
The automat contains a small amount of water. The automat is at rest.

2. Warming up
The volume of water, and thus the system pressure, increases.
The controller responds to this by discharging air from the vessel and, as a result, the expansion water flows into the bladder.

3. Full power
By storing increasing amounts of water in the vessel the controller keeps the system pressure at a constant level. When the system has warmed up completely, the vessel will be almost full to capacity.

4. Cooling down
When the volume of water and thus the system pressure decreases, the controller will respond by increasing the air-pressure in the vessel with displacement of water back into the system as a result. This restores equilibrium in the system pressure.

How efficient is the M-K/U expansion vessel?
The Flamcomat expansion vessel is 85% efficient, this allows for 5% dry run protection, 5% low limit and 5% high limit. Dependent on the system details, traditional expansion equipment can be as low as 10% efficient. Using the M-K/U by comparison dramatically reduces the space required.

How is the M-K/U sized/selected?
The M-K/U is sized in two parts. As the expansion vessel is of an balanced pressure design, it is calculated using the system volume, fluid makeup (Glycol percentage?) and the maximum operating temperature. The compressor(s) is selected based on the boiler power (or chiller power) and the desired running pressure. Care must be taken to ensure that the compressor(s) is selected against the true system information.

Flamco

Flamcomat

Unique Selling Points

Modular, expandable, flexible design
The design principle relies on the use of a pressureless expansion vessel, a water balloon. Multiple vessels can be interlinked to achieve the total system requirement. This also allows for the use of multiple smaller volume vessels where headroom (vertical height) is limited.

Complete range available with Grundfos pumps onboard
The standard range covers systems up to 12 MW of heating power and 138m of static height. The maximum working pressure of the Flamcomat is 14.4bar +/- 0.2 bar.

Pressureless vessel, Spill and Fill Technology
The expanded water is separated from the main system using solenoid valves and is held a atmospheric pressure regardless of the actual system running pressure.

Active, controlled de-aeration
By exchanging the expanded volume within the expansion vessel and the main system the whole fluid content benefits from the pressure drop and is naturally de-aerated. (Henry's Law)

Balanced pressure, to +/- 0.2 bar
The Flamcomat will maintain the system pressure to +/- 0.2 bar regardless of the position in the thermal cycle. This means that there is no difference between the static pressure (cold) and the running pressure (hot).

Space saving
The Flamcomat expansion vessel is 80% efficient, traditional expansion vessels are typically 50% at best (system characteristics may reduce this substantially). As a result the Flamcomat system always represents a reduction in space required.

Proprietary Control System
The Flamcomat is controlled by a custom control panel, the SPC. This controller has multi level access, preventing unauthorised system changes. The controller, currently, will also allow for a duty / standby controller configuration for backup of sensitive or critical systems.

Realtime system information
The control system displays the vessel contents, system pressure and status of the main operating components realtime on the graphical display. This acts as confirmation that pump(s) or valves are operating and responding as required, while also verifying the system setup.

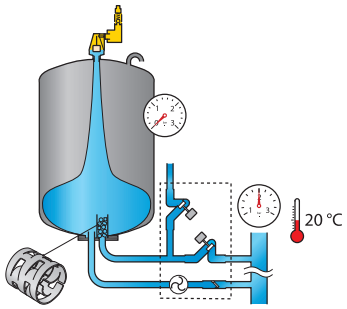
Flamco

Flamcomat

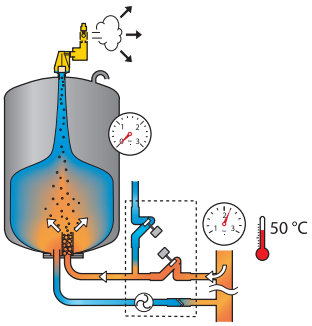
Frequently Asked Questions

How does the Flamcomat work?
Simply the Flamcomat monitors and responds to the system pressure. If the pressure rises, solenoid valves open and 'spill' fluid into the vessel, isolating this expanded volume from the main system. If the pressure drops, the transfer pumps (Grundfos) take fluid from the vessel and re-pressurise the main system.

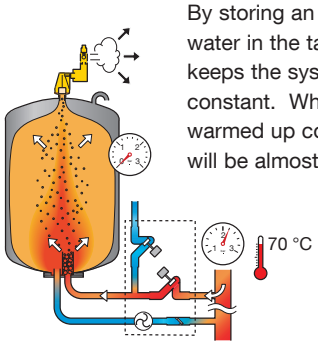
1. Cold
The automat contains a small amount of water. The automat is still at rest.



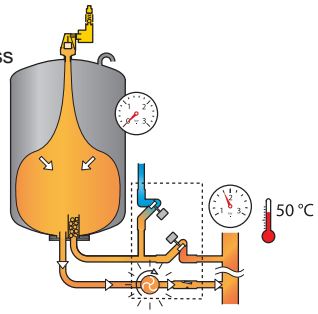
2. Warming up
The volume of water and the system pressure increases. The unit responds to this by opening the solenoid valve. Water flows into the pressureless vessel. The water in the vessel is de-aerated due to both the drop in pressure and the presence of the PALL rings.



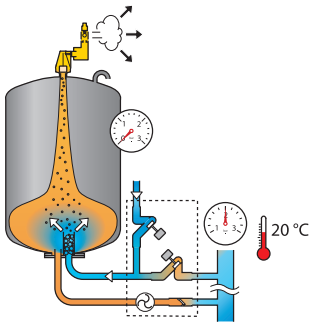
3. Full power
By storing an increasing amount of water in the tank, the automat keeps the system pressure almost constant. When the system has warmed up completely, the vessel will be almost full to capacity.



4. Cooling down
The volume of water and the system pressure decreases. The de-aerated water is pumped from the pressureless vessel back into the system. This restores the system pressure.



5. Topping-up
If the water level in the vessel drops to a critical level, an appropriate amount of water will be carefully pumped into the system from the water mains.
This water will be de-aerated (by pressure loss and the PALL rings), before entering the vessel.



The vessel is tested to 2 bar, however in operation it is an atmospheric vessel, essentially a water balloon in a protective shell. The water within the vessel has no pressure other than its own vertical weight.

Does the Flamcomat onboard safety relief valve protect the entire thermal system?
No, the safety valve is there to protect the expansion vessel in the unlikely event that the vessel overfills and cannot relieve further system expansion.

How does the Flamcomat de-aerate the whole system?
Using a pressureless expansion principle, the expanded system fluid is naturally de-aerated. The Flamcomat then exchanges water from the vessel, with the system, while keeping the system pressure within the operational limits of +/- 0.2 bar. In this way all of the system water is exposed to the pressure drop and is de-aerated.

How efficient is the Flamcomat expansion vessel?
The Flamcomat expansion vessel is 80% efficient, this allows for 5% dry run protection, 5% low limit, 5% high limit and 5% for de-aeration fluid transfer. Dependent on the system details, traditional expansion equipment can be as low as 10% efficient. Using the Flamcomat by comparison dramatically reduces the space required.

How is the Flamcomat sized/selected?
The Flamcomat is sized in two parts. As the expansion vessel is of an atmospheric design, it is calculated using the system volume, fluid makeup (Glycol percentage?) and the maximum operating temperature. The pumpset is selected based on the boiler power (or chiller power) and the desired running pressure. Care must be taken to ensure that the pumpset is selected against the true system information.

If you have any further questions, please contact:

Product Specialists and Service

Flamco Limited
Washway Lane
St. Helens
Merseyside WA10 6PB
United Kingdom

T +44 1744 744 744
F +44 1744 744 700
E info@flamco.co.uk

Flamco is your reliable partner around the world

Flamco is a unit of Aalberts Industries N.V. and engaged in the development, production and sale of high-quality products for heating, ventilation, hot domestic water, air conditioning and cooling systems. All these products are available from technology wholesalers. With 60 years of experience and approximately 650 employees, Flamco is a world leader in its field. Flamco has seven production locations and supplies successful and innovative products to the installation industry in more than 60 countries. Our three basic principles always come first: high quality, excellent service and sound advice.

Australia
Bahrain
Belgium
Chile
Cyprus
Denmark
Germany
Estonia
Finland
France
Greece
Hungary
India
Iceland
Italy
Japan
Jordan
Kuwait
Latvia
Lebanon
Lithuania
The Netherlands
New Zealand
Norway
Ukraine
Oman
Austria
Poland
Portugal
Romania
Russia
Qatar
Saudi Arabia
Singapore
Slovakia
Slovenia
Spain
Syria
Taiwan
Turkey
Czech Republic
UAE
United States
United Kingdom
People's Republic of China
South Africa
Sweden
Switzerland