



Flamcomat - Pressureless Expansion System

The Flamcomat balanced pressure expansion equipment is sized according to the total system volume and the boiler / chiller load. The Flamcomat vessel is 80% efficient irrespective of the static height of the system. It is the ideal solution for large installations or tall installation where standard diaphragm expansion equipment is limited.

The Flamcomat is an advanced product that combines a balanced pressure system with an effective pressure step de-aerator function and an inter-link to a top up pressurisation unit.

The real-time LCD display shows the status of the mechanical components while monitoring the vessel contents and the system pressure.

Pump Set	Dimensions			Connections			Approx Weight (Kg)
	Depth (mm)	Width (mm)	Height (mm)	Vessel	System	Top-Up	
D0	680	680	1400	1.1/2"	1.1/2"	1/2"	105
D1	680	680	1400	1.1/2"	1.1/2"	1/2"	110
D2	680	680	1400	1.1/2"	1.1/2"	1/2"	115
D3	680	680	1400	1.1/2"	1.1/2"	1/2"	150
D4	680	680	1600	1.1/2"	1.1/2"	1/2"	215
D5	680	680	1600	1.1/2"	1.1/2"	1/2"	225
D6	680	680	1600	1.1/2"	1.1/2"	1/2"	240



Pump Set	Noise Rating	Pump Model	Full Load Current	Power Consumption	Electrical Supply
Top Up Equipment (Integral)	61 dBA	Pedrollo PQAm60	2.1 amps	0.37 kW	230v 50Hz 1PH
D0	58 dBA	Grundfos CM1-4	6.2 amps	1.0 kW	230v 50Hz 1PH
D1	58 dBA	Grundfos CM3-6	8.8 amps	1.34 kW	230v 50Hz 1PH
D2	65 dBA	Wilo MHI 405	14.4 amps	2.2 kW	230v 50Hz 1PH
D3	52 dBA	Grundfos CR3-15	14.8 amps	2.2 KW	230v 50Hz 1PH
D4	54 dBA	Grundfos CR3-17	6.4 amps	3.0 KW	415v 50Hz 3PH
D5	54 dBA	Grundfos CR3-23	9.0 amps	4.4 KW	415v 50Hz 3PH
D6	55 dBA	Grundfos CR3-31	12.6 amps	6.0 KW	415v 50Hz 3PH

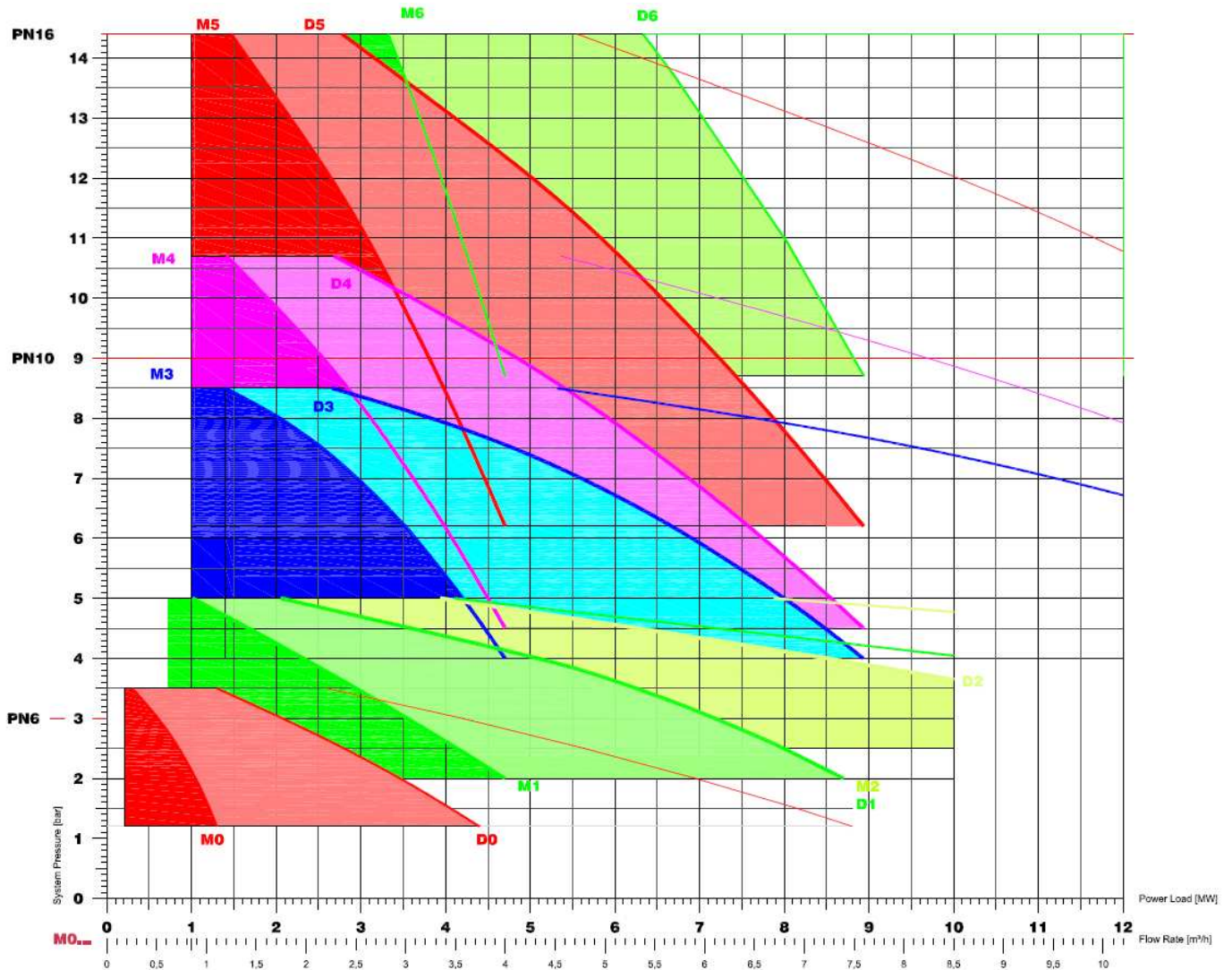
Please note:

The dimensions of the atmospheric expansion vessels are shown separately in this document.

Flamcomat Pumpset D0-D6 FLCs stating the figures for both pumps running at the same time.

FLC for Top up unit shows figure for single pump running only as far as duty/stand by mode is applicable.

Therefore the Flamcomat unit Final Full Load Current will be sum up of the Main Pumpset current draw + Top up unit current draw.



Curve designated with a prefix of 'M' show the normal characteristics of the pump module running as a single pump, curves with a prefix of 'D' show the normal characteristics of the pump module with 2 pumps running in duty assist mode.

For system requirements outside the shaded areas please contact your technical advisor.



Flamcomat - Atmospheric expansion vessels

Flamcomat GB Main Vessels (Control Vessel)

Flamcomat main vessel, manufactured to DIN 4807. The vessel includes a de-aeration cartridge containing Flamco patented Pall ring technology.

Type	Capacity	Dimensions		Dry Weight (Kg)
		Ø (mm)	Height (mm)	
GB 150	150	550	1350	55
GB 200	200	550	1530	70
GB 300	300	550	2030	90
GB 400	400	750	1535	130
GB 500	500	750	1760	151
GB 600	600	750	1955	160
GB 800	800	750	2355	195
GB 1000	1000	750	2855	226
GB 1200	1200	1000	2210	290
GB 1600	1600	1000	2710	345
GB 2000	2000	1200	2440	430
GB 2800	2800	1200	3040	515
GB 3500	3500	1200	3840	625
GB 5000	5000	1500	3570	1240
GB 6500	6500	1800	3500	1710
GB 8000	8000	1900	3650	1830
GB 10000	10000	2000	4050	2025



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Flamcomat BB Auxiliary Vessels

Flamcomat auxiliary vessel, manufactured to DIN 4807. The vessel includes a de-aeration cartridge containing Flamco patented Pall ring technology.

Type	Capacity	Dimensions		Dry Weight (Kg)
		Ø (mm)	Height (mm)	
BB 150	150	550	1350	55
BB 200	200	550	1530	70
BB 300	300	550	2030	90
BB 400	400	750	1535	130
BB 500	500	750	1760	150
BB 600	600	750	1955	160
BB 800	800	750	2355	195
BB 1000	1000	750	2855	226
BB 1200	1200	1000	2210	290
BB 1600	1600	1000	2710	345
BB 2000	2000	1200	2440	430
BB 2800	2800	1200	3040	515
BB 3500	3500	1200	3840	625
BB 5000	5000	1500	3570	1240
BB 6500	6500	1800	3500	1710
BB 8000	8000	1900	3650	1830
BB 10000	10000	2000	4050	2025

Each pump skid also contains a top up unit for connection directly to a mains water supply; the top up unit has the following functionality:





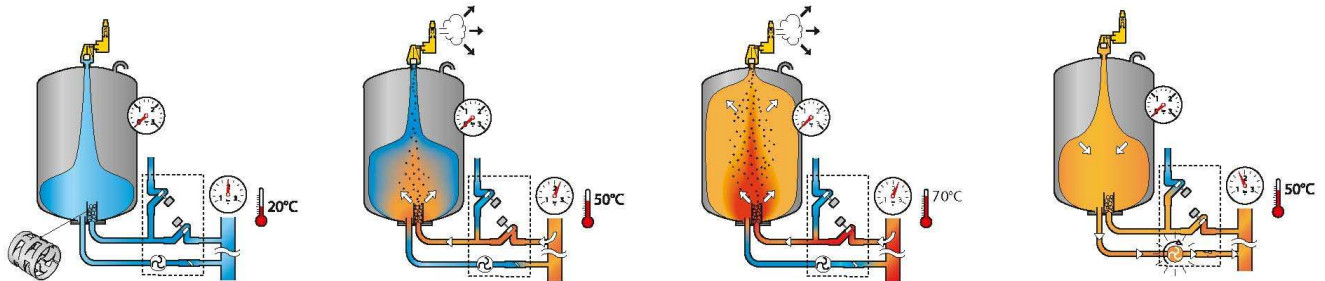
Features:

- On/Off switch, with indicator neon
- WRAS approved break tank
- WRAS approved float valve
- Constructed as type AB air gap with weir overflow, fluid category 5
- Electric pump, 230v 50Hz single phase
- Electronic pressure transducer
- Normally closed, common fault, volt free boiler interlock
- Normally open high pressure, low pressure, transducer health and pump health volt free contacts
- System logging
- Easy setup and commissioning





The Flamcomat is designed to accurately balance system pressure to within (typically) 0.2 bar(g).



Expansion Relief

As the system fluid heats up it expands, during expansion the system pressure attempts to rise. The Flamcomat control equipment senses the pressure rise and opens the connection (solenoid) valve to the expansion vessel. The expanding fluid flows into the vessel, through an orifice (to restrict flow rates) and a system pressure rise is prevented.

Contraction Compensation

As the system cools down, the system fluid contracts, during contraction the system pressure attempts to drop. The Flamcomat control equipment senses the pressure drop and energises the pumps. The fluid is actively from the vessel back into the system, and a system pressure drop is prevented.



Safeguards

Weight sensor to calculate water content of vessel at any one time. The weight sensor is calibrated in the factory with the system dry, this allows for accurate water measurement during normal operation.

Pressure sensor for monitoring system pressure.

Filling interlock for replenishment fluid (via integrated pressurisation unit). System fluid is lost through leaks and evaporation during air removal, fluid top up is required for maintaining the system content and integrity. This is automatically activated if the vessel volume drops below 12%.

Flamcomat self diagnostics. The system holds the most recent alarm conditions in its memory, these can include water top up, excessive pump activation and high / low pressure alarms.

Cascade setting for the pumps allows the second pump to energise in addition to the first, if faster fluid replenishment is required.

Pressureless Vessel and Active De-aeration

The water held in the vessel is at atmospheric pressure. The system effectively spills the expanded water into the Flamcomat vessel. This action creates an active pressure drop between the system and the vessel.



In accordance with Henry's law dissolved air can be released from water by increasing the temperature or dropping the pressure.

The Flamcomat system with its pressure drop design allows dissolved air to be released from the system water. This is enhanced by a cartridge of patented PALL rings in the inlet stream to the vessel. The released air is allowed to vent out of the vessel via an automatic air vent on the top. The air vent is also fitted with a non return valve to prevent air being drawn back into the system.

When the Flamcomat is in passive de-aeration mode air is released during the heating and cooling cycles only.

When the Flamcomat is in turbo de-aeration mode the system water is continually being exchanged with the vessel water by cycling the solenoid and pumps on the skid. This turbo mode operates within the +/-0.2 bar tolerance on the system pressure setting.