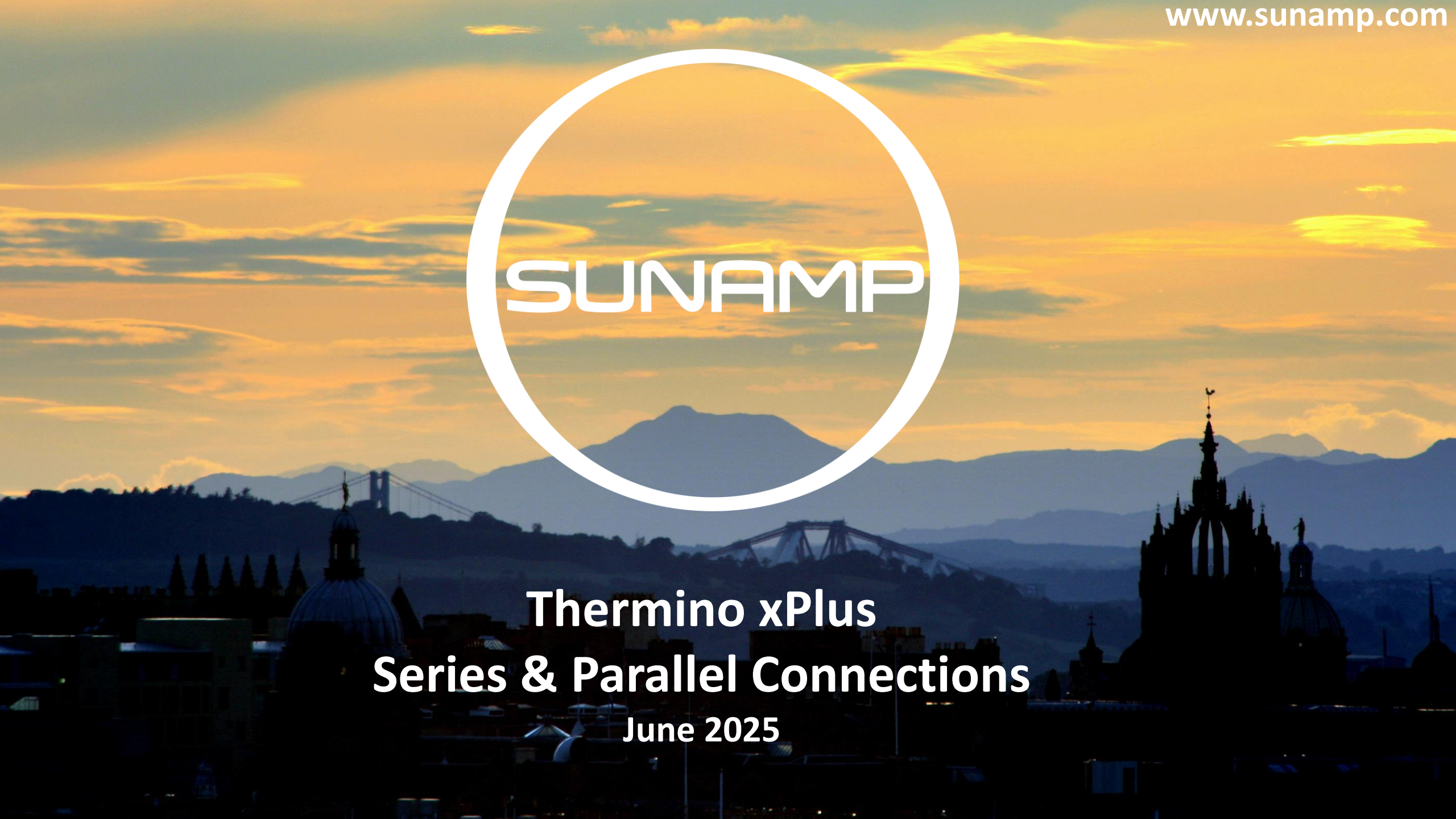


Thermino xPlus
Series & Parallel Connections

June 2025

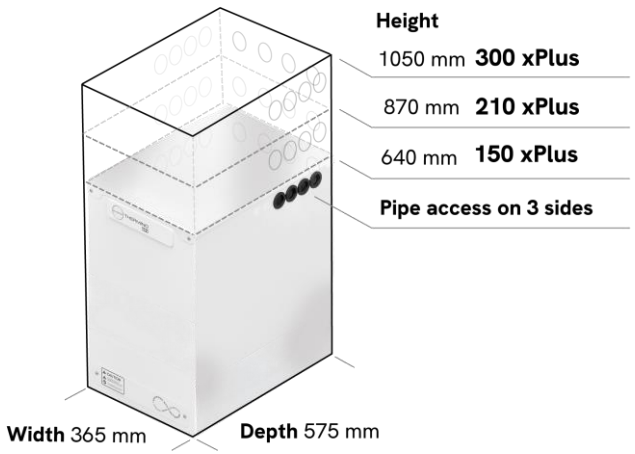
Thermino xPlus Technical Specification

1.3 ABBREVIATIONS

The following abbreviations are used in the manual:

- ASHP – Air Source Heat Pump
- BERV – Back-Expansion Relief Valve
- DHW – Domestic Hot Water
- DSR – Demand Side Response
- EV – Expansion Vessel
- GSHP – Ground-Source Heat Pump
- HP – Heat Pump
- HW – Hot Water
- PCBA – Printed Circuit Board Assembly
- PCM – Phase Change Material
- PRV – Pressure Reducing Valve
- TMV – Thermostatic Mixing Valve
- VIP – Vacuum Insulation Panel

Thermino xPlus Dimensions



3.1 TECHNICAL SPECIFICATIONS

	Unit	Thermino 150 xPlus	Thermino 210 xPlus	Thermino 300 xPlus
Water content Primary Circuit	L	3.7	5.3	6.4
Fresh water content Secondary Circuit[1]	L	3.7	5.3	6.4
Equivalent Hot Water Cylinder Size[2]	L	142	212	284
Volume of hot water available at 40°C (V40)[3]	L	199	301	402
Equivalent Hot Water Cylinder Size[4]	L	128	192	256
Volume of hot water available at 40°C (V40)[5]	L	167	271	333
Heat loss	kWh/24h (W)	0.67 / (28.1)	0.77 / (32.1)	0.84 / (34.9)
Energy label class[6]	-	A+	A+	A+
Recommended maximum charging flow rate	L/Min	15	20	25
Recommended maximum HW flow rate[7]	L/Min	15	20	25
Minimum supply pressure at Heat Battery inlet	MPa (Bar)	0.15 (1.5)	0.15 (1.5)	0.15 (1.5)
Recommended operating pressure/PRV set point	MPa (Bar)	0.3 (3)	0.3 (3)	0.3 (3)
Maximum operating pressure/PRV set point	MPa (Bar)	0.5 (5)	0.5 (5)	0.5 (5)
BERV recommended set point	MPa (Bar)	0.6 (6)	0.6 (6)	0.6 (6)
Maximum design pressure/BERV maximum set point	MPa (Bar)	1.0 (10)	1.0 (10)	1.0 (10)
Maximum Heat source flow temperature[8]	°C	80		
Minimum Heat source return temperature[9]	°C	63		
Pressure loss characteristics	-	See Figures 3 & 4		
Recommended TMV setting	°C	45-55		
Connected load at ~ 230 V, 50Hz	W	2800*/1800**		
Minimum MCB requirement (type A or B only)	A	16*/10**		
Power supply | Standby consumption	W	1 PH AC 230 V | 7		

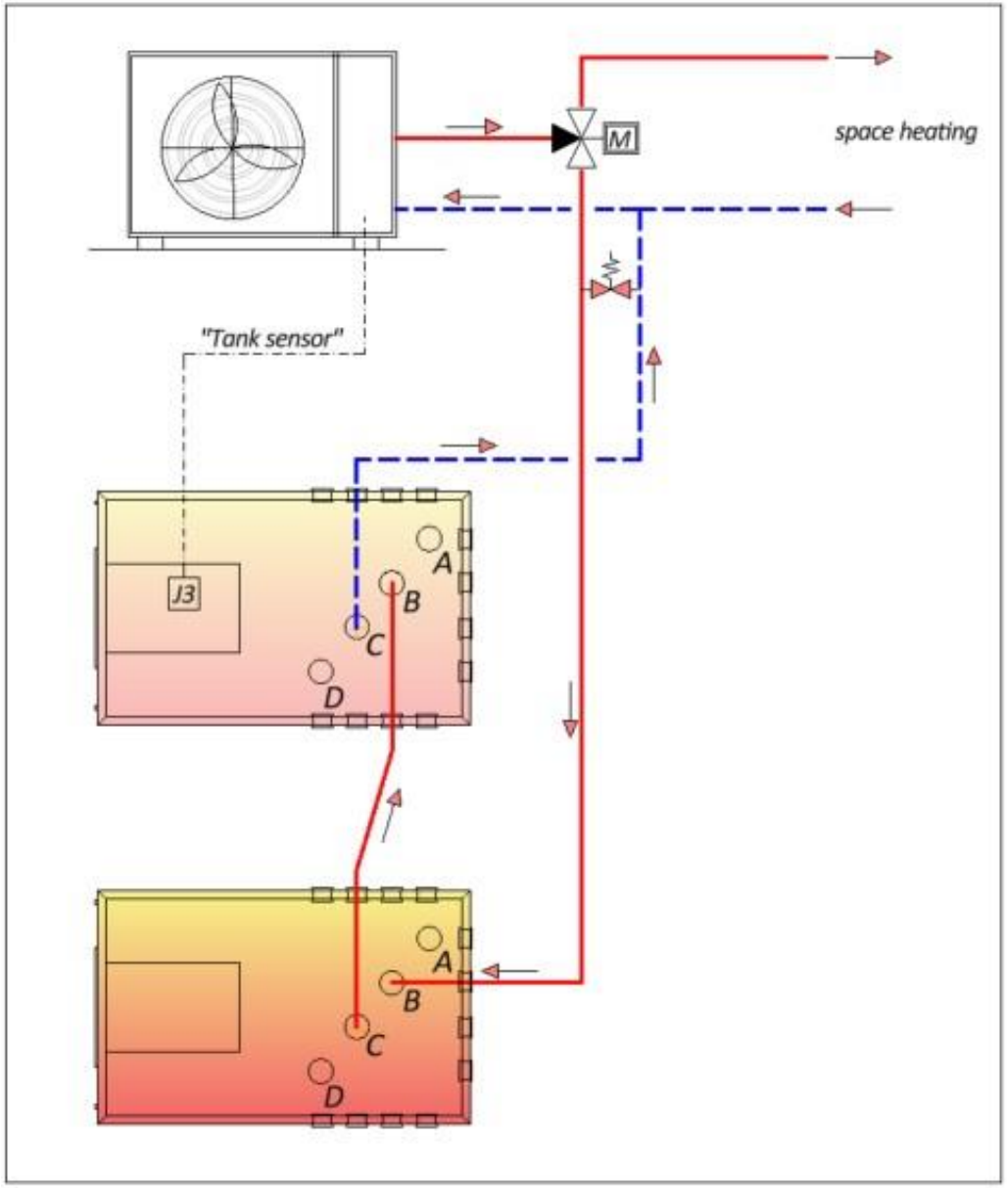
Thermino xPlus Technical Specification

- **Since the heat batteries can be physically excluded, mandatory safety equipment (including plumbing components) must be installed on each unit.**

- **Refer to the installation manual for a comprehensive list of all mandatory components which must be installed:**

Mandatory plumbing components for all Sunamp Thermino Products Please check the following components have been installed				
				
Mains cold water pressure reducing valve (PRV)	Mains back-expansion relief valve (BERV)	Expansion vessel	Hot water tempering valve	Heat battery isolation valve

Thermino xPlus Connected in Series



Charging side only

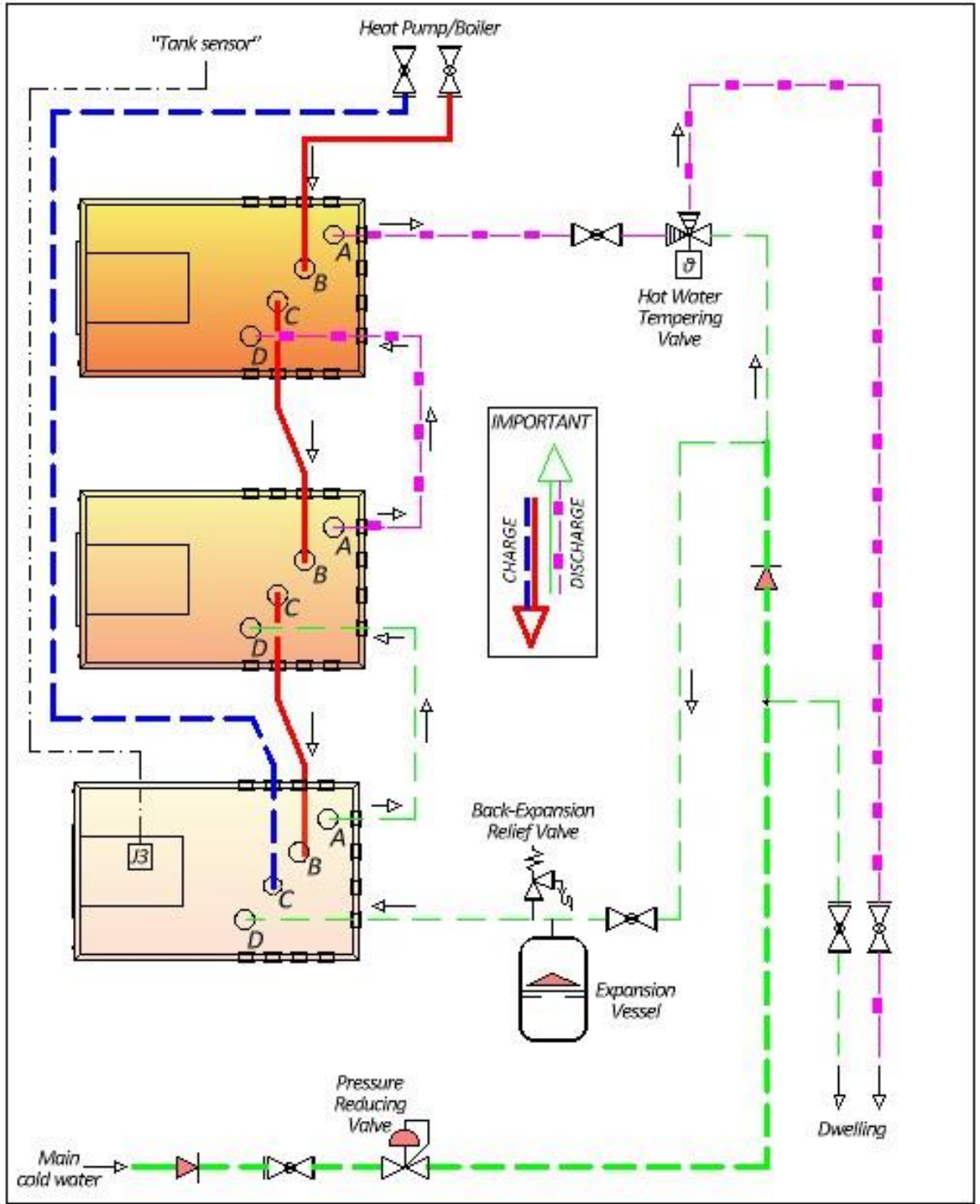
The communication between the heat pump and the OPTB (J3 connector) should be made only on the last Thermino in the series (See: Thermino-xPlus-Manual D0084).

Pros:

- Same flow rate for all heat batteries.
- The series configuration offers the advantage of maximising the heat battery utilisation coefficient.
- When one heat battery is charged, the system can be discharged to provide DHW faster than a parallel layout.

Cons:

- The heat batteries cannot be physically isolated: If one heat battery fails, the system fails.
- Until the first heat battery in the series is fully charged, It is likely that the subsequent ones will not receive the minimum temperature sufficient to melt the PCM.
  The resulting Heat Pump dT can also be too big.



3 Thermino xPlus Connected in Series

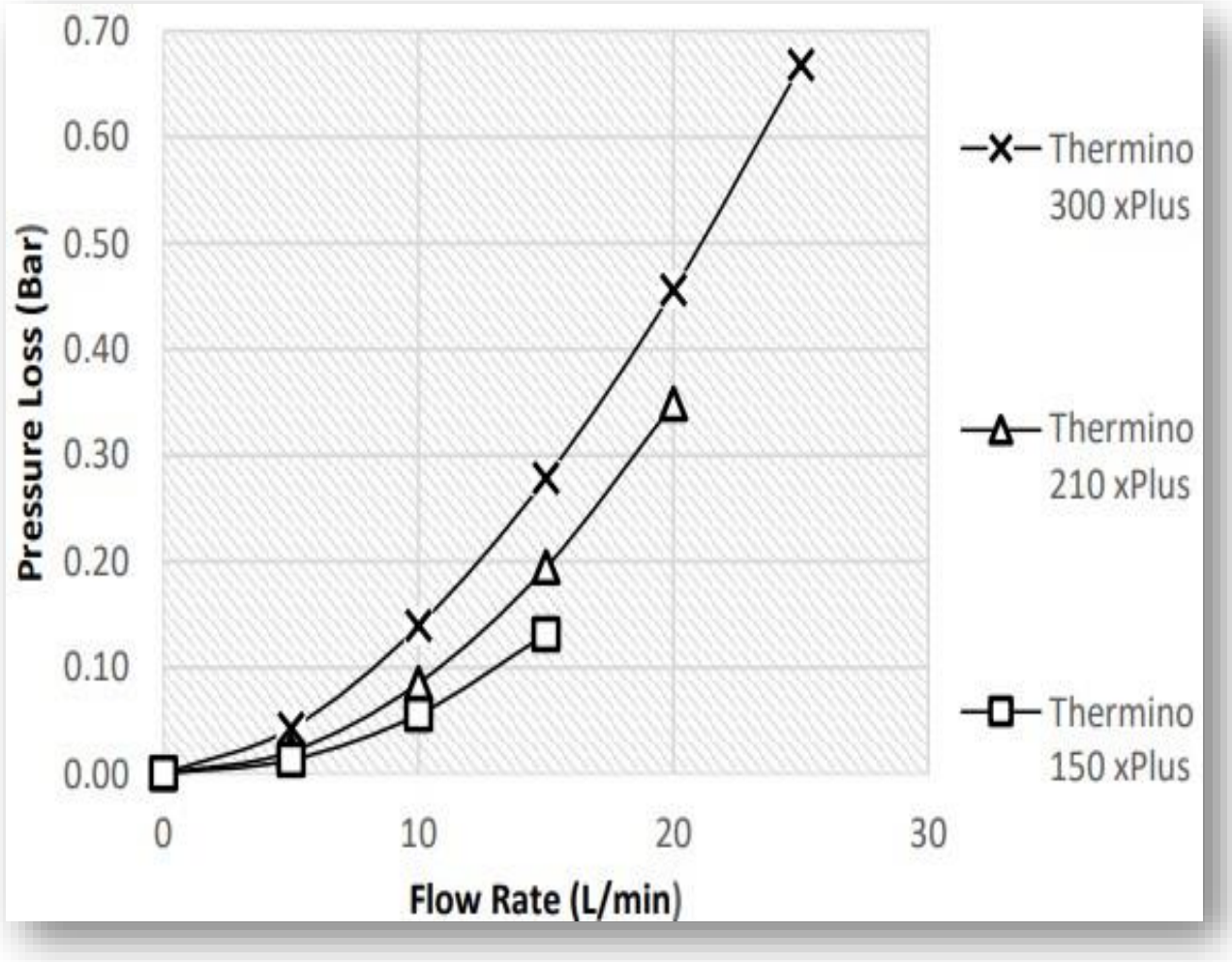
IMPORTANT:

- The primary circuit (CHARGE) and sanitary water circuit (DISCHARGE) must be implemented in counterflow to prevent energy transfer between the thermal batteries through the domestic water circuit.
- Expansion and safety devices can be merged.
  They must be sized for the water content of the entire circuit.
- Pay attention to pressure losses (see the following table).

Thermino xPlus Connected in Series - Pressure Losses

SAME SIZE	150 xPlus	210 xPlus	300 xPlus
Max Flow rate (L/min)	15	20	25
1 unit	0.14 bar (14 kPa)	0.35 bar (35 kPa)	0.7 bar (70 kPa)
2 units	1.15*(14+14) = 30.1 kPa	1.15*(35+35) = 80.5 kPa	1.15*(70+70) = 161 kPa
3 units	1.15*(14x3) = 48 kPa	1.15*(35x3) = 121 kPa	1.15*(70x3) = 242 kPa

MIXED SIZE	150 + 210	150 + 300	210 + 300
Max Flow rate considering the smallest size **(L/min)**	15	15	20
Pressure loss	0.14 + 0.20 (1.15*24 kPa) = **28 kPa**	0.14 + 0.29 (1.15*43 kPa) = **49 kPa**	0.35 + 0.46 (1.15*81 kPa) = **93 kPa**

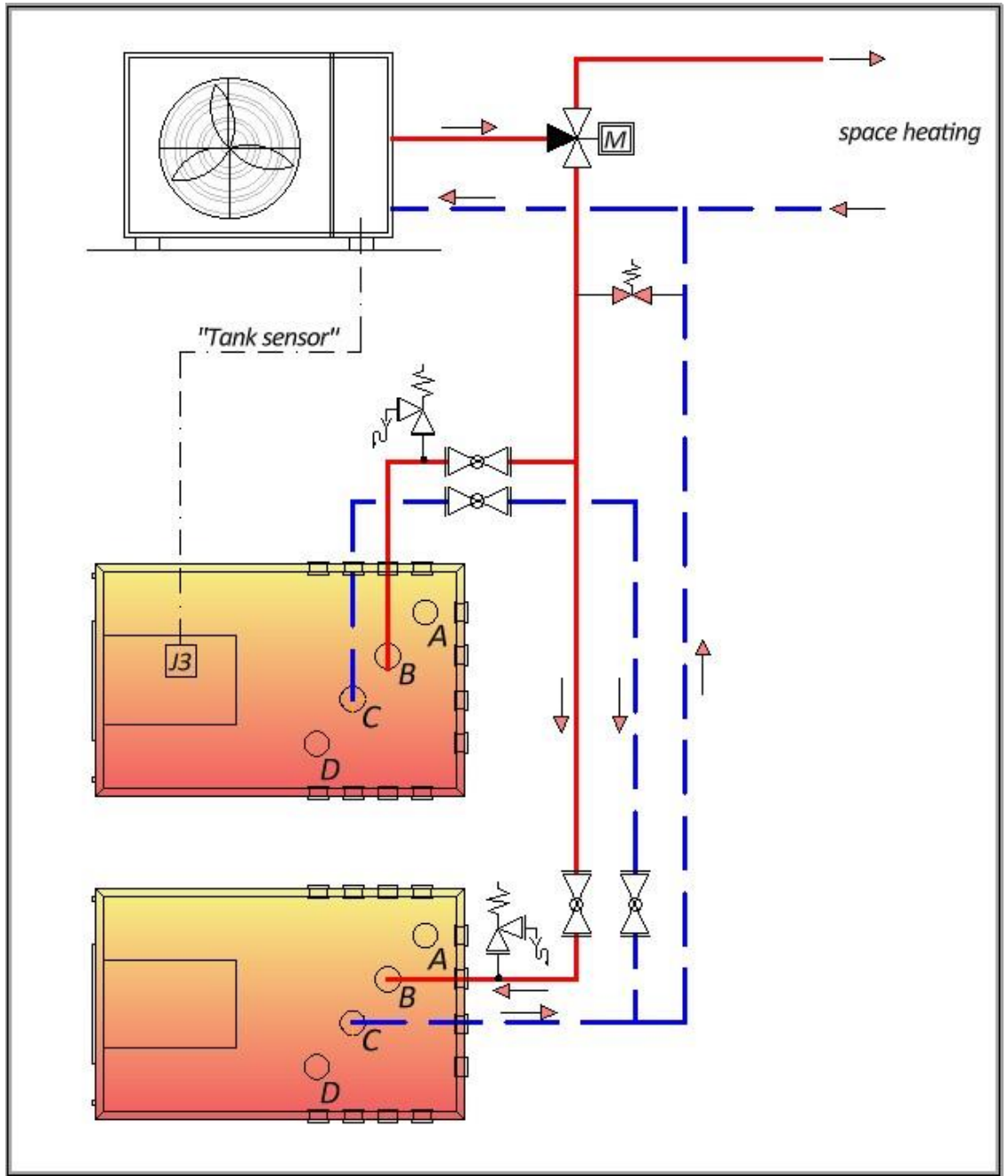


The indicated pressure losses, even if increased by a 15% safety margin, refer only to the units.

Other pressure losses (e.g., pipe length, valves..) are not included and must be added.

Check the available charging circuit pump head and resulting dT before proceeding with the series connection.

Thermino xPlus Connected in Parallel



Charging side only

The communication between the heat pump and the OPTB (J3 connector) can be made in any Thermino xPlus unit in the system (See: Thermino-xPlus-Manual D0084).

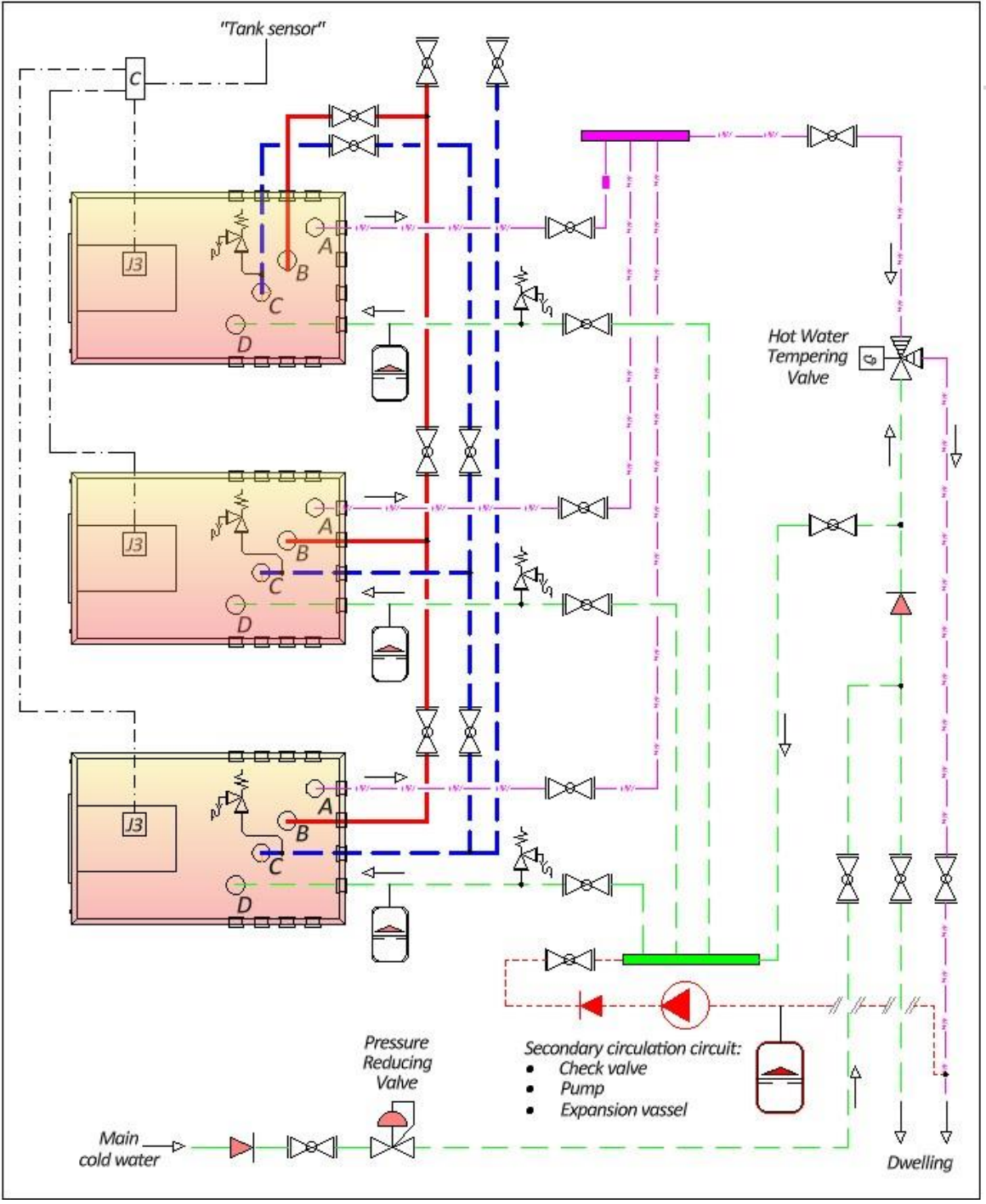
Pay attention to the heat pump relation between:
Power - Flow Rate - dT
(See: Thermino xPlus with Heat Pumps - Wiring & Settings D0086)

Pros:

- The Heat Pump flow rate is split in all the heat batteries.
- Greater reliability, as the failure of one heat battery does not significantly impact the system (the heat batteries can be physically isolated).

Cons:

- All the heat batteries are charged at the same time.
- The system can only provide DHW when all the batteries are charged.



3 Thermino xPlus Connected in Parallel

In this layout, the following points must be considered:

- The sanitary water circuit (DISCHARGE) should be designed to minimize pressure losses and balance the circuits (e.g., using manifolds).
- If a Secondary Circulation Circuit is required, take all precautions to minimize energy losses (e.g., pipe insulation, timer…). Provide a dedicated expansion vessel and add sufficient check valves and position them to ensure proper circulation and prevent unwanted backflows.
- Consider the power and water flow rates at different delta T by dividing the total power and flow rate by the number of installed units.
- Verify their compatibility (see the following table)

Thermino xPlus Connected in Parallel

Sunamp Manual: Thermino xPlus with Heat Pumps - Wiring & Settings (D0086)

Heat Battery Size	Heat Pump Capacity Range (kW)			
	(3 to 5)	(5.5 to 7.5)	(8 to 10.5)	(11 to 14)
Thermino 150 xPlus	o	o	o	Δ
Thermino 210 xPlus	!	o	o	Δ
Thermino 300 xPlus	!	!	o	o

! – Caution: Special consideration must be given to heat up and reheat times when combining low powered heat pumps with high capacity heat batteries.
o – fully compatible sizing.
Δ – compatible with the use of an Autobypass valve to ensure the flow rate of the heat pump is within the recommended flow rate for the Heat Battery sizing.

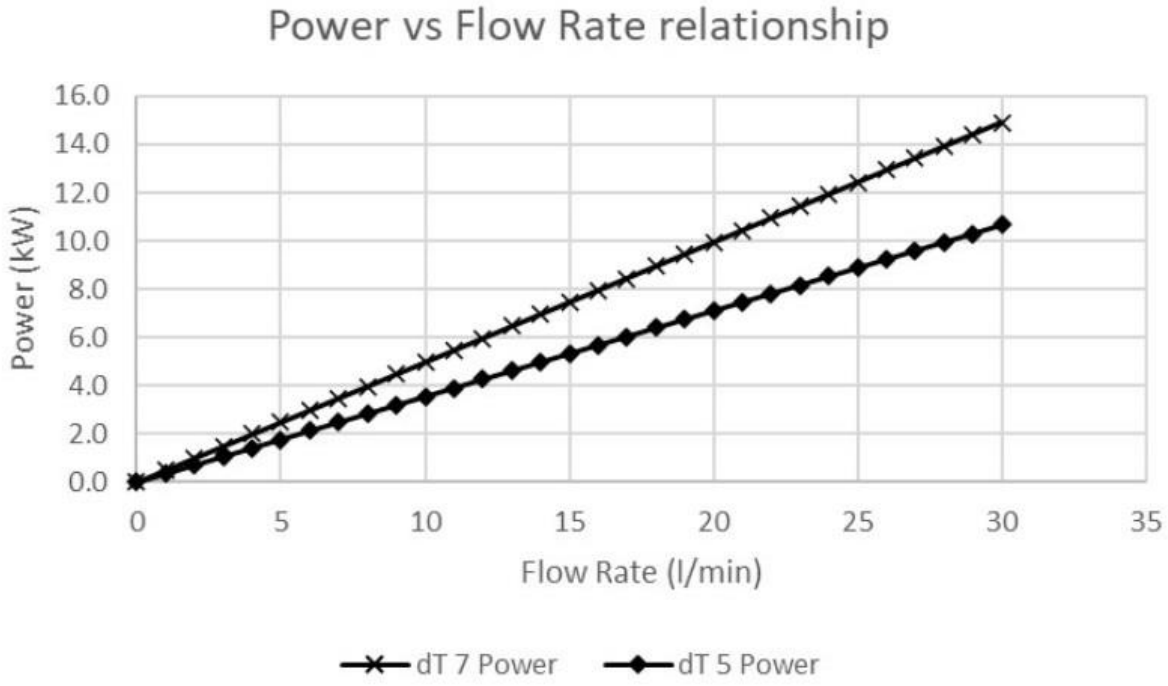


Figure 1 – Power vs Flow Rate relationship

Please note: we **do not** recommend installing units of different sizes in parallel due to different pressure losses & flow rates required to discharge products in the same timeframe – appropriate measures to balance flow, charge and discharge times need to be taken, but Sunamp cannot advise on this.

Self-Consumption Device/ Power diversion controller

If two heat batteries are joined (in series or parallel) and connected to a self-consumption device like a Myenergi eddi PDC,

Please note the following:

- Myenergi eddi is rated at 16A which is ~ 3 kW connected load
- Both heat batteries will require separate independent fuses with their dedicated isolator.
- Therefore, a **Myenergi eddi can be connected to ONE heat battery only!**
- If connecting both heat batteries in parallel – the connected load will be 6kW, fuses will go, and electricity from one isolator will feed into the second isolator resulting in a **VERY UNSAFE and Dangerous installation**.
- If you treat them as two immersion heaters in a tank, there will be cross-feed power from one heat battery controller to the second heat battery controller.

USE OF THIS DOCUMENT IS SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

PLEASE NOTE THAT ANY DIAGRAM OR GUIDANCE PROVIDED IN THIS DOCUMENT IS FOR GENERAL INFORMATION PURPOSES ONLY. THE ADVICE AND INPUT OF A PROFESSIONAL, QUALIFIED AND LICENSED INSTALLER, ENGINEER OR DESIGNER MUST BE SOUGHT. SUNAMP IS NOT RESPONSIBLE FOR INSTALLATIONS OR FOR THE PROFESSIONAL DESIGN OF THE SYSTEM.

1. All applicable local and federal codes, regulations and safety standards must be followed.

2. The diagram or guidance in this document may be subject to alteration at any time.

3. Sunamp is not responsible for any inaccuracies or omissions in the information and drawings provided to it and upon which it relies when constructing the diagrams or guidance in this document.

4. Any reproduction of this document must have the prior permission of Sunamp.

5. During the planning, design, installation and later use of the system, all operating instructions must be followed.

6. Under no circumstances shall Sunamp be liable to you or any other third parties for any loss or damage (including, without limitation, damage for loss of business or loss of profits) arising directly or indirectly from your use of or inability to use, the diagram or guidance in this document.

7. Sunamp makes no representations or warranties of any kind, express or implied about the completeness, accuracy, reliability or suitability of the information in this document for any purpose. Any reliance you place on the information in this document is therefore strictly at your own risk.

8. These disclaimers and exclusions shall be governed by and construed in accordance with Scottish law.

Sunamp Ltd disclaimer: This document is supplied for information and general guidance only.
No responsibility is accepted for any errors or omissions contained within or for any cost incurred in rectifying any work relating to it.