SATK32

heat interface unit

CALEFFI Hydronic Solutions

CE

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SATK32 heat interface unit with advanced electronic functions

Introduction

The SATK32 heat interface unit with advanced electronic functions is the latest 'intelligent' range of HIU from Altecnic.

The SATK32 is the complete solution for instantaneous hot water production and space heating control.

Design

The indirect twin plate design hydraulically separates both domestic and space heating from the central primary supply.

The advanced electronic features of the SATK32 can protect the heat network from inefficiency.

Maximum Allowable Primary Return Temperature

The unit has the ability for the maximum allowable primary return temperature to be set independently for both heating and DHW.

As an example, when the unit is producing space heating, the maximum allowable primary return could be set to 40 C. Once set, the unit will modulate the secondary output temperature to ensure that the primary return never exceeds the 40 C set point.

In this way, the network is protected from low delta T's and therefore inefficiency.

The maximum allowable primary return when the unit is in DHW production mode can also be set. In doing so, a primary return of just 20C for example can be set. The unit will automatically ensure that it's never exceeded.

Maximum Primary Flow Rate

To further protect the network from inefficiency and failure, the maximum primary flow rate that the unit can take, when in heating mode, can be set on the HIU controller. Once set, this will ensure that the apartment space heating demand can never exceed the designers intended load. This protects the network from failure, should cold weather, DHW peak demand and multiple apartments on maximum space heating coincide.

Design Continued

Integral Room Controller and Preheat

The integral room controller allows the tenant to set his preheat to ON, OFF or to program the preheat in a similar way to programming his heating, so that the preheat only comes on when needed, such as half an hour in the morning, a couple of hours in the evening, for example. The tenants then not paying for preheat when he doesn't need it and only uses it when he needs the benefit.

Wiring Centre

The unit is supplied as standard with a room controller and thermostat that can be mounted away from the HIU, in a hall or living room for example. If the controller is mounted within the HIU cover, the thermostat function can be disabled.

Spool Piece

A spool piece allows a heat meter to be fitted later on site.

Insulated Cover

The unit has an insulated and partitioned rear enclosure, as does the front cover. Once the cover is fitted to the HIU, the unit is totally insulated and the cooler components are isolated from the hot components. The outer surface of the cover is metal and features a cut-out for the controller (if mounted with the HIU) and a window to allow the tenant to read the integral energy meter (if fitted) without removing the cover.

MODbus

The integral HIU controller has the option for MODbus connection to a BMS or separate MODbus network. Once connected, all settings are checked, set and changed remotely.

The MODbus network can also be used for remote fault diagnosis.

Once connected, all settings can be checked, set and changed accordingly.

Reversible Mounting

The SATK32 is extremely compact in design and lightweight allowing the unit to be reversible allowing the primary connections to be at the bottom or top of the unit.

Product Range

Code	Heating Temp. Range	DHW Output
SATK32103	25 to 75˚C	50 kW
SATK32105	25 to 75˚C	75 kW

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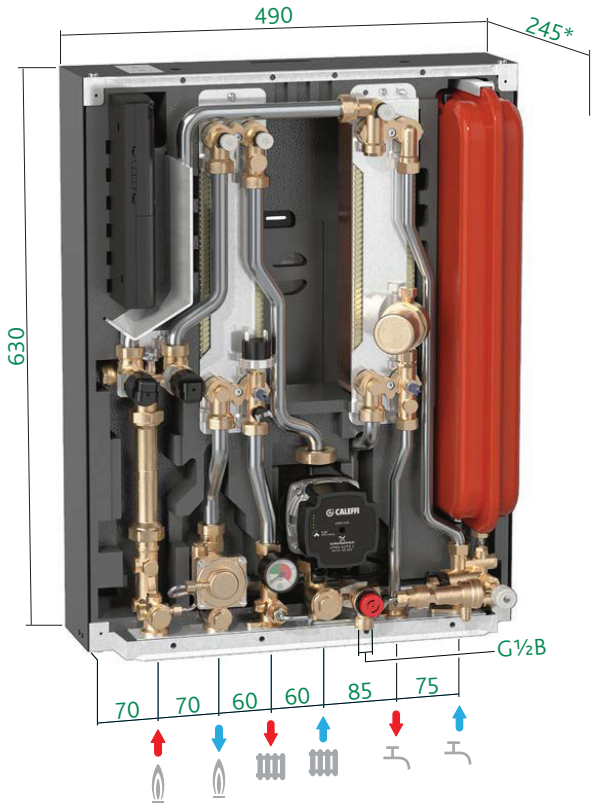
Dimensions



All connections G¾B
* includes the front cover

Technical Specification

Component	Materials
Frame:	Painted steel with expanded insulation
Front cover:	Expanded insulation with room controller mounted and tenant meter window
Expansion vessel;	Steel
Connecting pipework:	Stainless steel
Pump:	UPM3 15-70
Electronic controller:	230 V -50 Hz

Performance

Maximum static working pressure:	16 bar - primary 3 bar - secondary
Max. primary differential pressure:	600 kPa
Min. differential pressure:	50 kPa
Maximum temperature:	85˚C
Medium:	Water

Optional Features

The flowing features are available if specified.

- Primary flushing bypass - product code 789110
- Secondary ball valve kit
- Energy meter
- First fix bracket - product code 789023
- Weather compensation (available soon)

Return Temperature Limitation (RTL)

A significant change in the protocol of the SATK32 is the ability to set the maximum allowable primary return temperature when the unit is in either heating or DHW mode.

If set when the unit is in heating mode, the HIU will automatically adjust the space heating flow temperature to ensure that the primary return temperature stays below the set point. In this way, the delta T on the primary system can be ensured.

The same function can be set in DHW mode. When set in DHW mode, the HIU will ensure that the primary return remains below the set point, by limiting the maximum DHW output of the HIU. In this way, the HIU can be configured for smaller apartments where the demand is say 35 or 40kW for example.

Conventional HIU

Conventional HIUs provide the secondary heating system with water at a set temperature and relies on the thermostatic radiator valves within the space heating to modulate the flow through the emitters to maintain the desired room temperature.

If radiators have not been balanced, the higher than required flow rate results in a higher return temperature than in the design calculations, especially at low heat demand.

Higher return temperatures result in greater energy losses.

HIU with RTL

With an HIU designed to provide return temperature limitation (RTL) the return temperature is also specified and set on the controller ensuring a low primary return temperature at all times.

Even as the apartment approaches the required temperature, the HIU will ensure that the primary return remains at the low set point temperature.

Covering the radiators with washing or radiator covers etc. will also not affect the HIU and the low primary return will be maintained, the efficiency of the network therefore is protected.

At low heat requirements, the space heating output temperature is controlled (reduced) to ensure that the primary return temperature never exceeds the set point.

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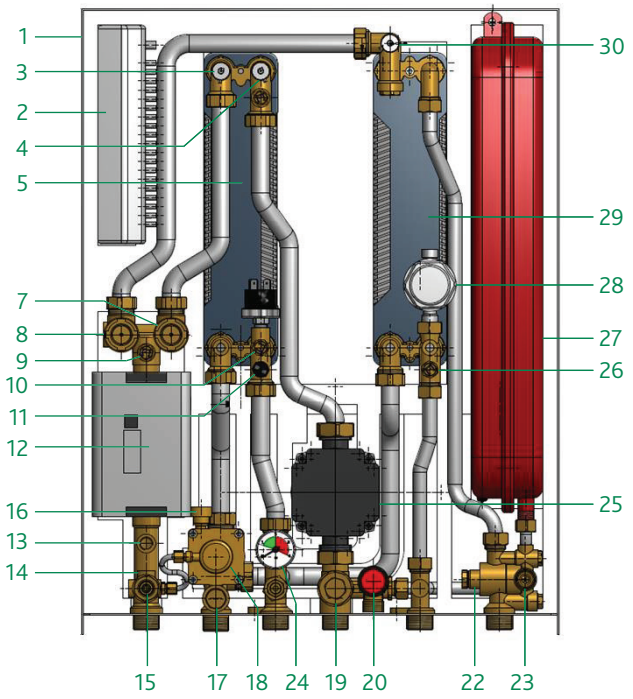
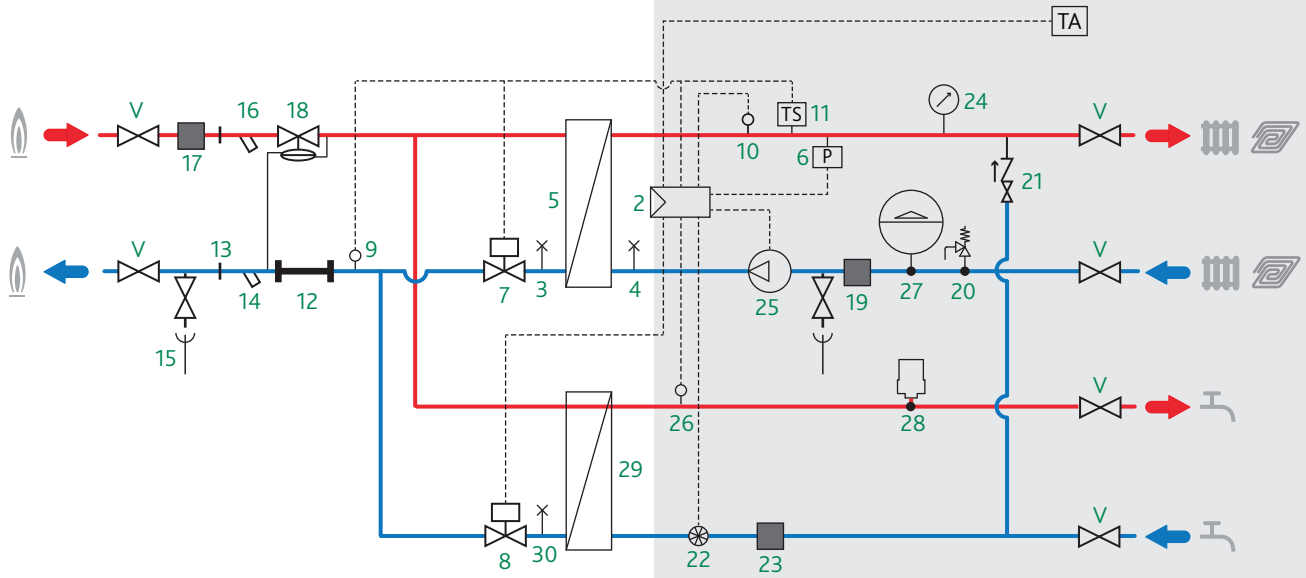
Components



Components

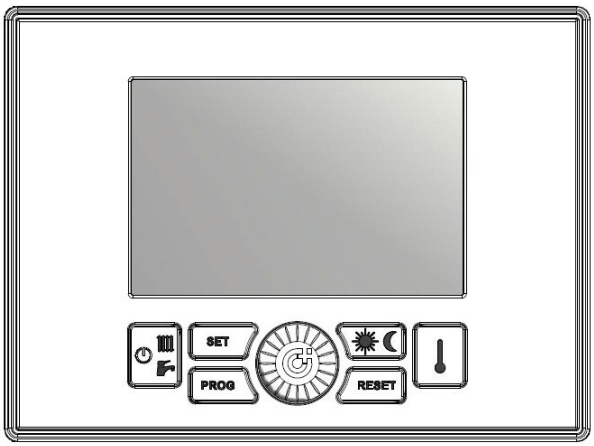
Item	Component
1	Frame
2	Wiring centre
3	Air vent/drain (primary heating PHE)
4	Air vent/drain (secondary heating)
5	Heating plate heat exchanger (PHE)
6	Pressure switch
7	2-port modulating valve (heating)
8	2-port modulating valve (DHW)
9	Return temperature probe
10	Heating flow temperature probe
11	Safety thermostat
12	130 mm space for heat meter
13	¼"F pressure port
14	M10 x 1 connection for heat meter return temp. probe
15	Primary drain cock
16	M10 x 1 connection for heat meter flow temp. probe
17	Strainer with mesh + ¼"F pressure port
18	DPCV
19	Secondary drain cock + strainer with mesh
20	Safety relief valve
21*	Filling loop with backflow preventer (optional)
22	Flow meter
23	Strainer with mesh
24	Pressure gauge
25	Pump
26	DHW temperature probe
27	Expansion vessel
28	Water hammer arrester
29	DHW plate heat exchanger
30	Air vent/drain (primary DHW PHE)
*	Not shown on Components illustration

Components



Room Controller

This is a tenant programmer similar to those used with a gas boiler.



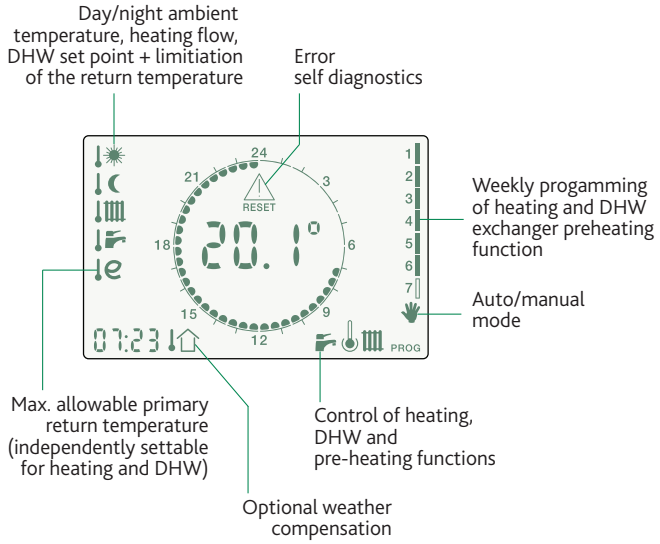
The room controller can function as;

1. As the HIU control device only.
2. HIU control device, programmable time clock to limit the heating and pre-heat hours during the day/night (weekly programming).
3. HIU control device, programmable time clock to limit the heating and pre-heat hours during the day/night (weekly programming) and thermostat.

   Note: HIU controller should be mounted remotely from the HIU.

NOTE: When used as 1 an external room controller is required.

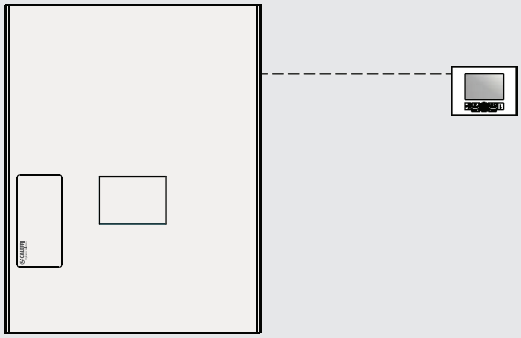
Information display window



Remote Installation

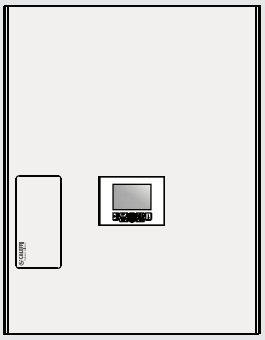
The programmer can be used as a chronothermostat (time clock and thermostat) when the function is enabled.

A completely separate controller/thermostat such Hive, Nest or other mobile telephone application can also be used.



Direct Mounted

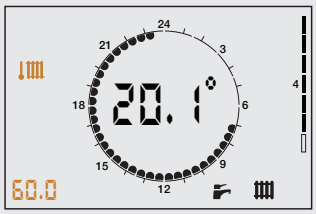
If the programmer is mounted in the HIU cover it can only be used as a time clock and HIU controller, not as a thermostat.



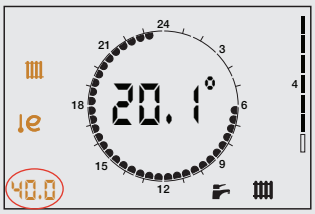
Advanced Electronic Functions

Return Temperature Limitation (RTL)

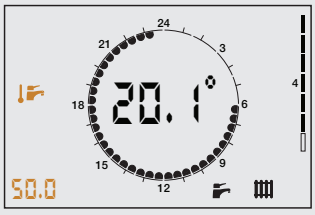
When enabled, it is possible to set limits on the primary return temperature for DHW and heating mode so that efficiency of the heating network is always kept under control.



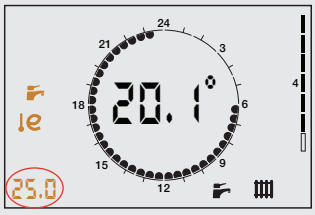
Heating set point



Setting the max. allowable primary return temperature - Heating



DHW set point



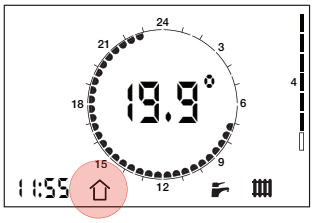
Setting the max. allowable primary return temperature - DHW

A logic based on the return temperature is used to control the keep warm function

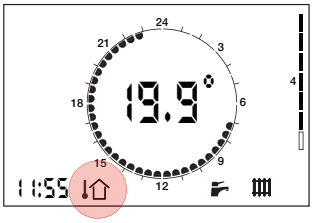
Advanced Electronic Functions

«Ecomode» and Weather Compensation

- «Ecomode» (flow temperature compensation based on the return) is still available (to be used with underfloor heating only).
- Weather compensation has been introduced (using an additional external temperature sensor).



Compensation based on return



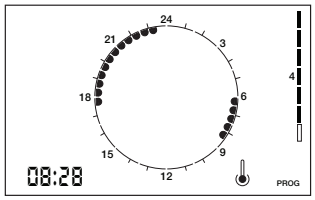
Weather compensation

Weekly programming of the Keep Warm Function

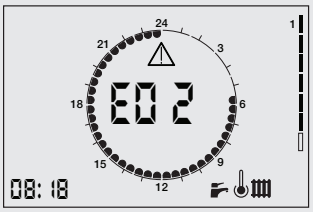
The preheating function can be set as follows:

- Always OFF.
- Always ON.
- Programmable to come on and off during the day, only at the times required by the tenant.

When the preheat is set to come on timed, as per the requirements of the tenant, the preheat is still controlled to ensure that the primary return temperature stays below the DHW set point for maximum efficiency.

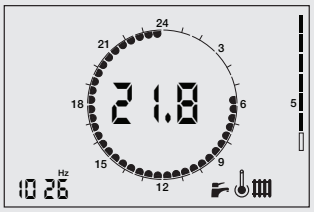


Diagnostics and Status



The product detects the source of the fault, which is identified by a code.

The number of occurrences of the faults will be accessible via MODbus to understand whether there are issues with the HIU or with the installation.

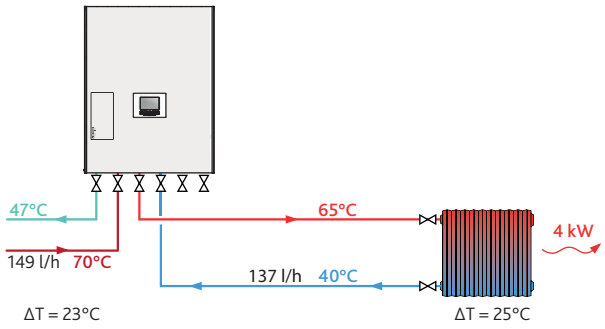


From both the user interface and MODbus it is possible to have a deeper overview of the operating condition of the HIU.

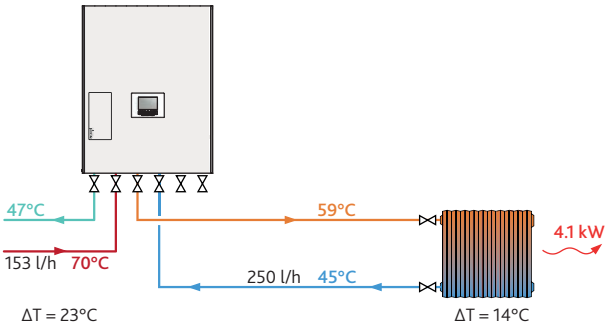
- Rotation frequency of the turbine.
- Position of the DHW stepper motor.
- Position of the heating stepper motor.

The above are a few examples, a large number of additional parameters and data is also available via MODbus or in the engineer menu on the integral controller.

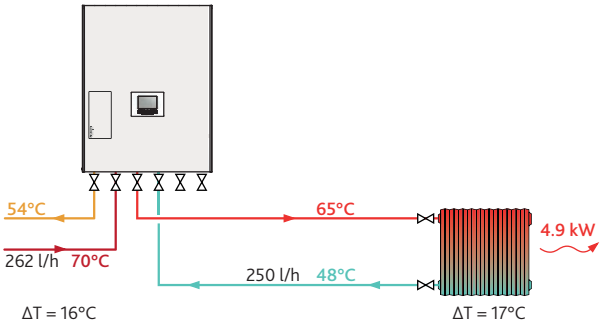
Return Temperature Limitation (RTL) - Heating Functionality



Design conditions

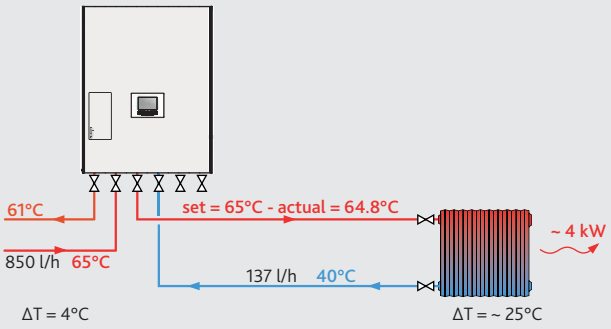


RTL intervention (steady state conditions)

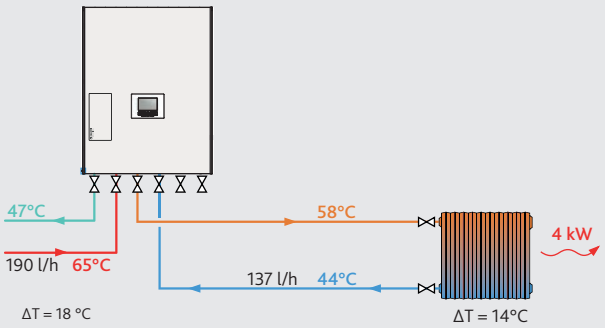


Real condition (radiator not balanced correctly)

Incorrect Temperature Setting



Wrong temperature setting / Low primary flow temperature



RTL intervention (steady state conditions)

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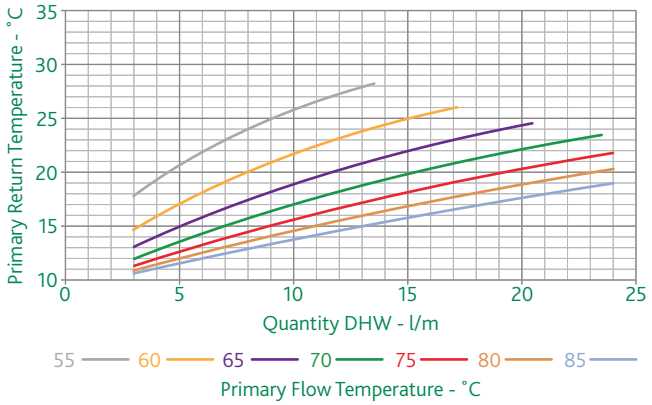
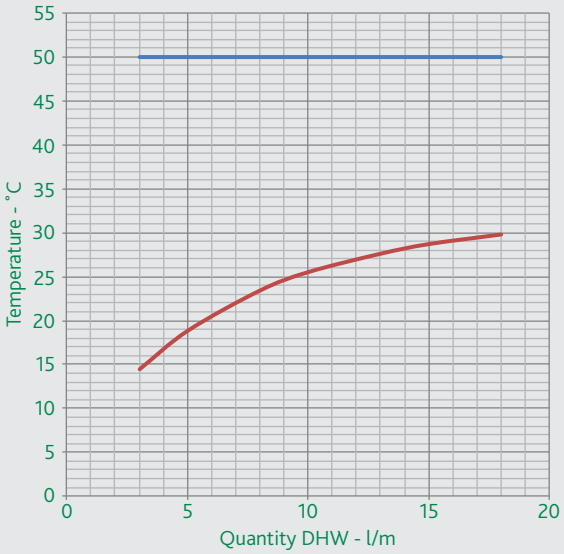
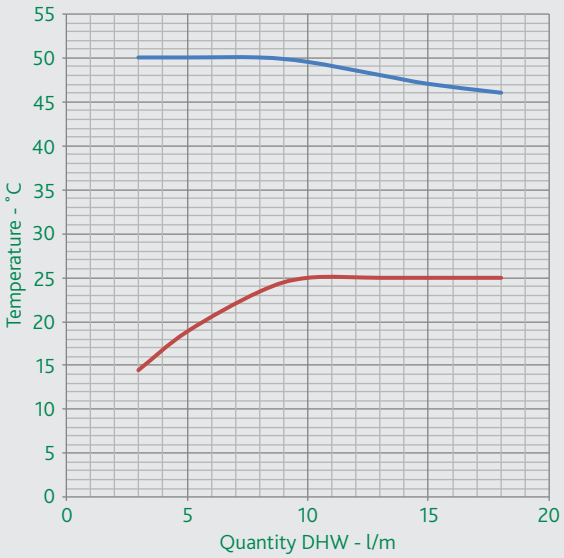
DHW PHE Performance Chart - 36 Plates (DHW 10 to 48˚C)



Return Temperature Limitation (RTL) - DHW (Optional)



DHW 10 to 50˚C, Primary Flow 65˚C
No RT Control



DHW 10 to 50˚C, Primary Flow 65˚C
With RT Control

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