

# SATK22

heat interface unit



 **CALEFFI**  
Hydronic Solutions



**altecnic**  
Caleffi group

# SATK22 heat interface unit with advanced electronic functions



## Introduction

The SATK22 heat interface unit with advanced electronic functions is the latest 'intelligent' range of HIU from Altecnic.

The SATK22 is the complete solution for instantaneous hot water production and space heating control.

## Design

The SATK22 range is available for low, medium and high temperature systems.

## 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 the 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 is 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.

## Design Continued

### 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 SATK22 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.

**NOTE:** The SATK22103 & SATK22105 are not reversible.

## Product Range

Code	Heating Temp. Range	Max. DHW Capacity	DHW Heat Exchanger
SATK22103	25 to 45°C	50 kW <sup>1</sup>	A
SATK22105	25 to 45°C	60 kW <sup>1</sup>	B
SATK22203	45 to 75°C	50 kW <sup>1</sup>	A
SATK22205	45 to 75°C	60 kW <sup>1</sup>	B
SATK22303	max. 90°C	50 kW <sup>1</sup>	A
SATK22305	max. 90°C	60 kW <sup>1</sup>	B
SATK22403*	max. 90°C	50 kW <sup>1</sup>	A
SATK22405*	max. 90°C	60 kW <sup>1</sup>	B

\* with primary pump

<sup>1</sup> Primary side head > 50 kPa, primary flow temperature 70°C, DHW 10 to 50°C.

## DHW Heat Exchanger Performance

### Heat exchanger A - performance table (DHW 10 to 48°C)

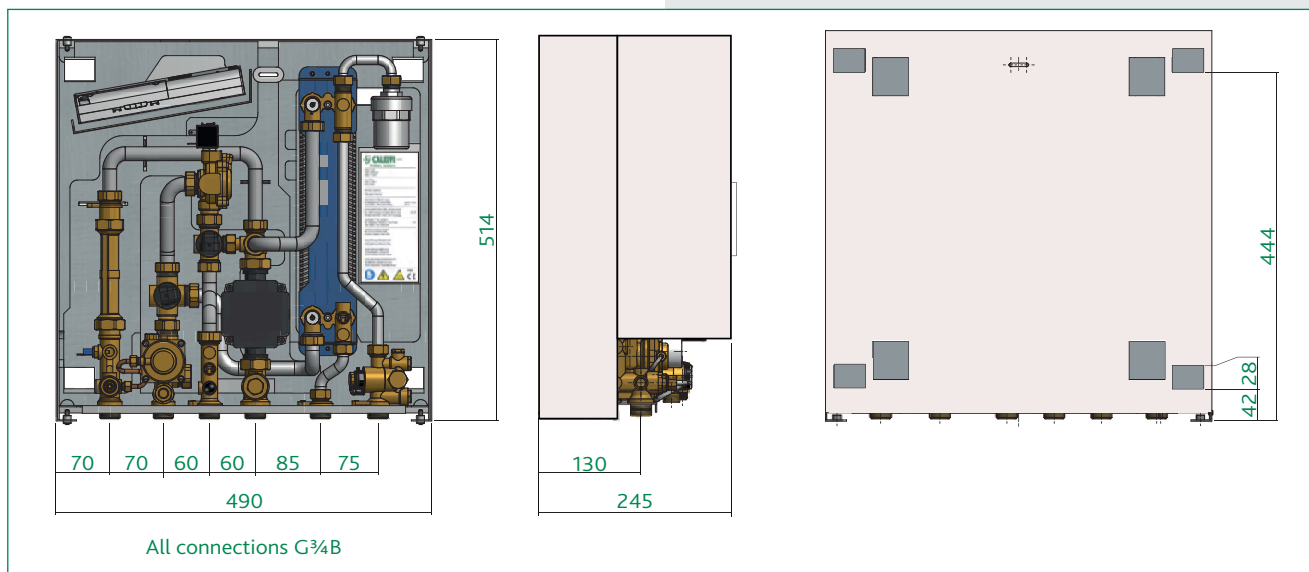
Power	DHW Flow Rate	Primary Return Temperature	Primary Flow Rate
35 kW	13.2 l/min	60 to 29°C	970 l/h
35 kW	13.2 l/min	70 to 24°C	620 l/h
50 kW	18.8 l/min	70 to 27°C	1000 l/h

### Heat exchanger B - performance table (DHW 10 to 48°C)

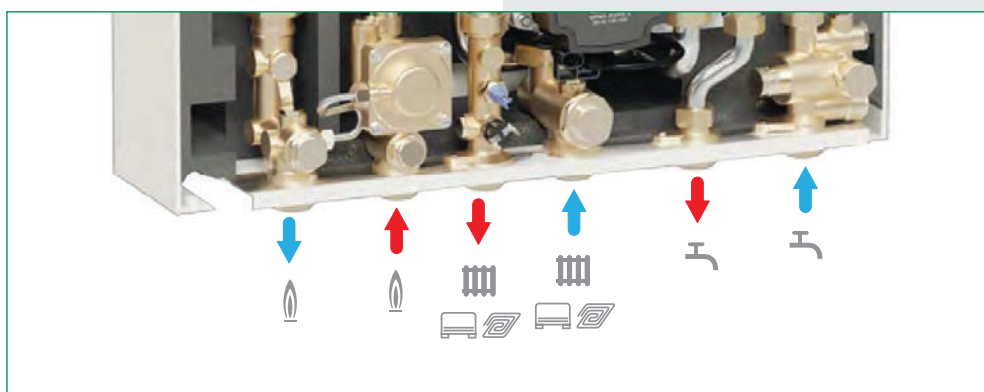
Power	DHW Flow Rate	Primary Return Temperature	Primary Flow Rate
35 kW	13.2 l/min	55 to 28°C	970 l/h
35 kW	13.2 l/min	60 to 24°C	830 l/h
50 kW	18.8 l/min	70 to 22°C	890 l/h
60 kW	22.6 l/min	70 to 23°C	1100 l/h

# SATK22 heat interface unit with advanced electronic functions

## Dimensions



## Connections



## Technical Specification

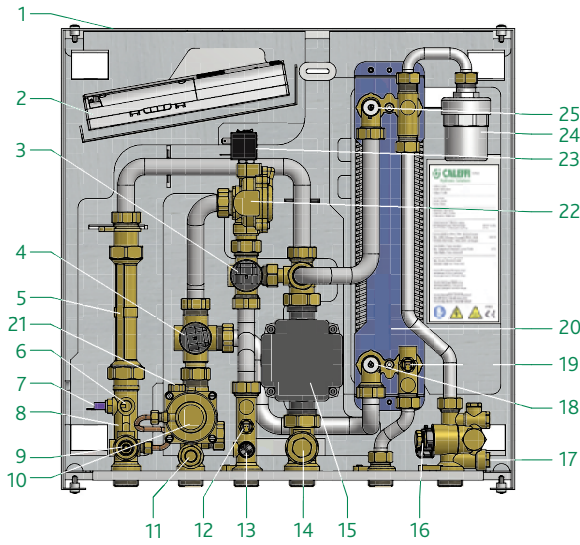
Medium:	Water
Max. percentage of glycol:	30%
Max. temperature:	90°C
Max. static working pressure:	Primary: 10 bar
	Secondary: 10 bar
	Domestic hot water: 10 bar
Primary circuit Nominal flow rate:	1.2 m <sup>3</sup> /h
Nominal pressure loss on primary circuit:	0.5 bar
Max. differential pressure:	6 bar
Domestic water circuit max. flow rate:	24 l/min (0.4 l/s)
Min. flow rate to activate domestic flow sensor:	2.0 l/min $\pm$ 0.3
Power supply:	230 V (ac) $\pm$ 10% 50 Hz
Max. power consumption:	80 W
	SATK2230 20W
Protection class:	IP 40
Pump:	UPM3 15-70
Actuator:	stepper 24 V
Probes:	NTC 10 k $\Omega$
Safety relief valve setting:	3 bar
Safety thermostat - SAK2210:	55°C $\pm$ 3

## Material

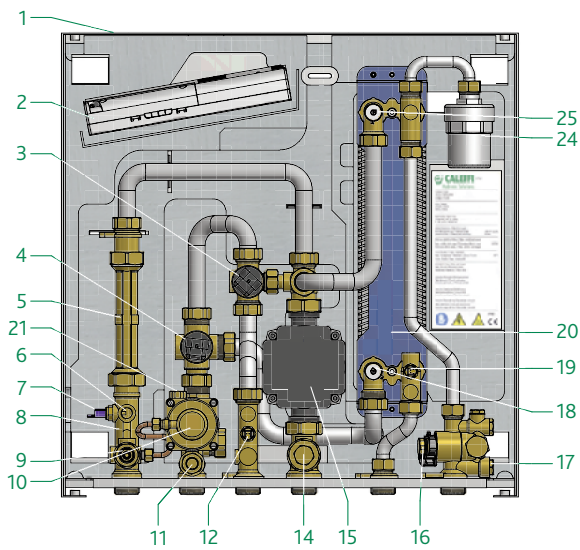
Components:	brass BS EN 12165 CW617N
Pipes:	stainless steel
Frame:	RAL 9010 sprayed steel
Exchanger:	brazed stainless steel
<b>Insulation</b>	
Protective shell cover:	EPP
Density:	45 kg/m <sup>3</sup>
Working temperature range:	3 to 90°C
Thermal conductivity:	0.04 W/mK

# SATK22 heat interface unit with advanced electronic functions

## Components - SATK2210 (LOW temperature)



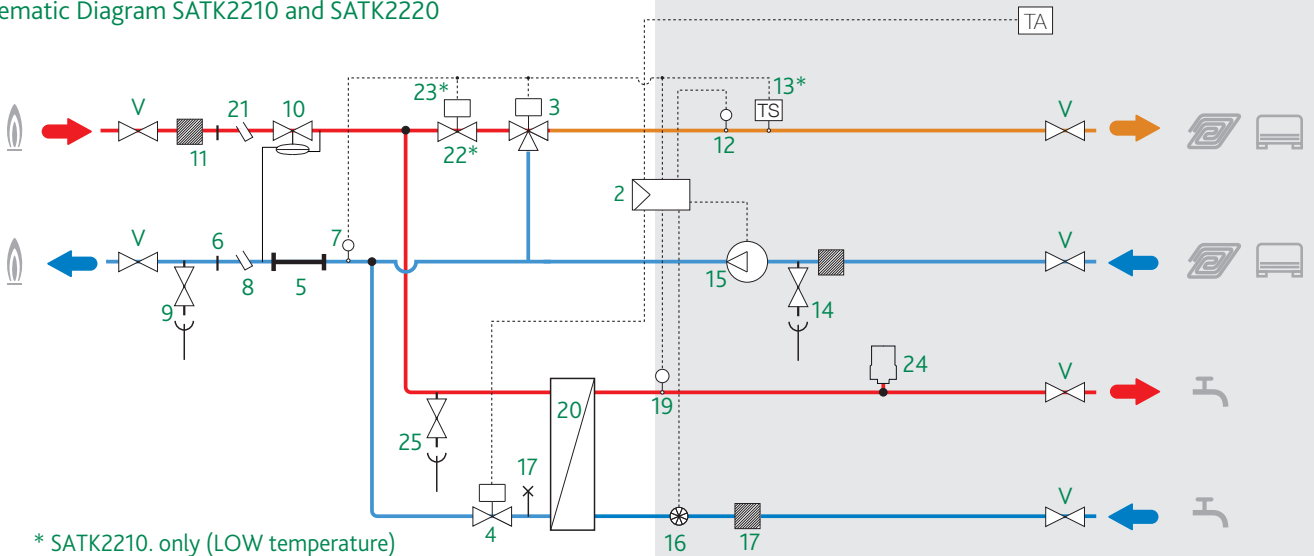
## Components - SATK2220 (MEDIUM temperature)



## Components - SATK2210 & SATK2220

Item	Component
1	Frame
2	Electronic regulator
3	2-way modulating valve - heating
4	2-way modulating valve - DHW
5	130 mm space for heat meter
6	1/4" F pressure port
7	Return temperature probe
8	Connection for M10 x 1 heat meter return probe
9	Primary drain cock
10	Differential pressure control valve
11	Mesh strainer + 1/4" F pressure port
12	Heating flow temperature probe
13*	Safety thermostat
14	Secondary drain cock + mesh strainer
15	Pump
16	Flow meter (turbine + sensor)
17	Mesh strainer
18	Heating exchanger primary drain
19	DHW temperature probe
20	DHW heat exchanger
21	Connection for M10 x 1 heat meter flow probe
22*	Thermal safety solenoid valve (normally closed)
23*	Thermal safety valve actuator
24	Water hammer arrester
25	Heat exchanger primary circuit air vent

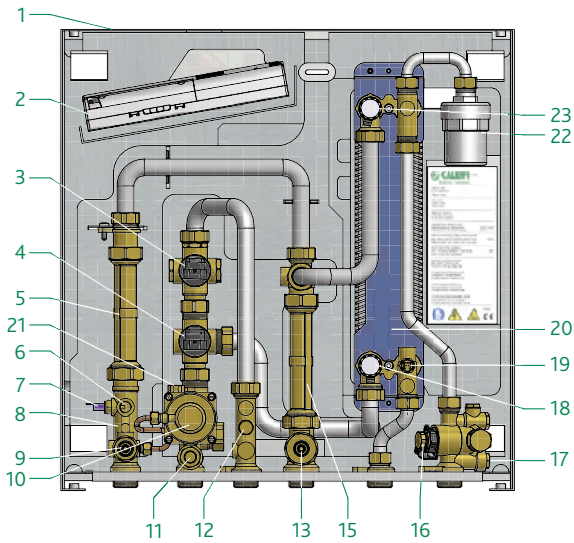
## Schematic Diagram SATK2210 and SATK2220



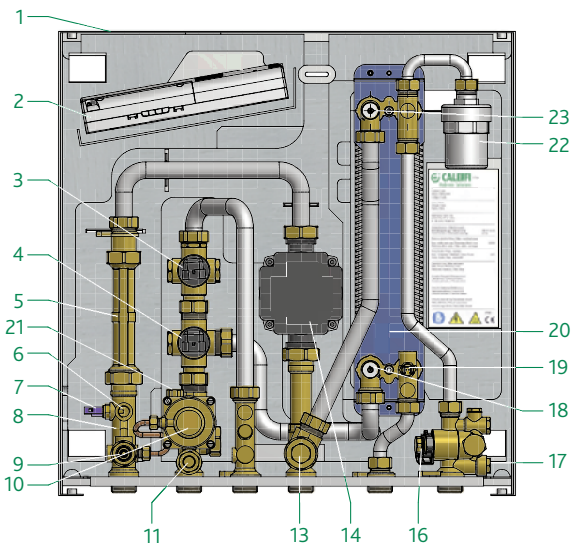
\* SATK2210. only (LOW temperature)

# SATK22 heat interface unit with advanced electronic functions

## Components - SATK2230 (HIGH temperature)



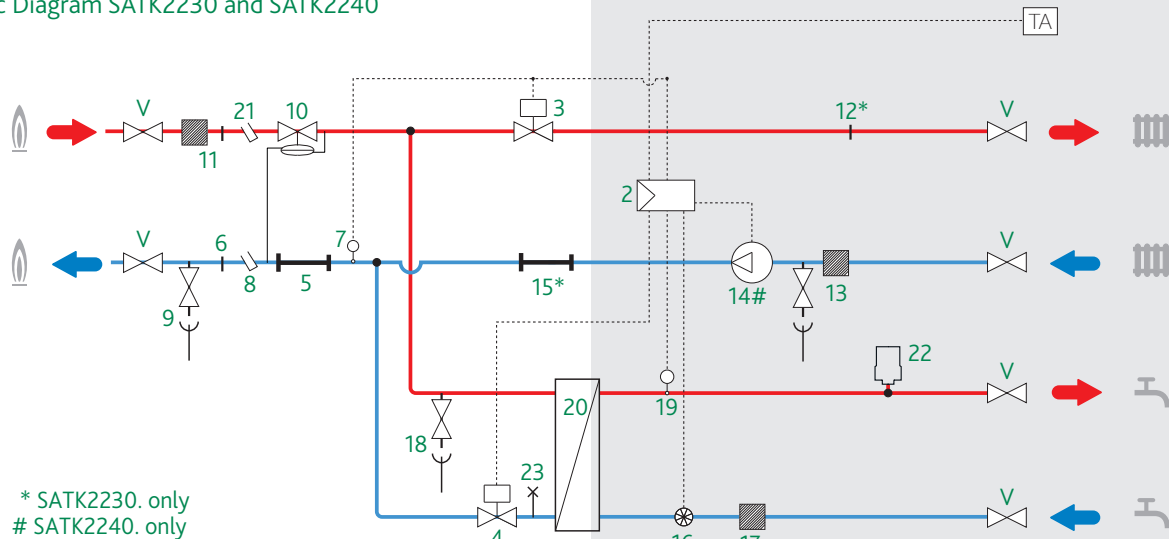
## Components - SATK2240 (HIGH temperature with pump)



## Components - SATK2230 & SATK2240

Item	Component
1	Frame
2	Electronic regulator
3	2-way modulating valve - heating
4	2-way modulating valve - DHW
5	130 mm space for heat meter
6	1/4" F pressure port
7	Return temperature probe
8	Connection for M10 x 1 heat meter return probe
9	Primary drain cock
10	Differential pressure control valve
11	Mesh strainer + 1/4" F pressure port
12*	1/8" connection for DPCV code 789122
13	Secondary drain cock + mesh strainer
14#	Pump
15*	Spool piece
16	Flow meter (turbine + sensor)
17	Mesh strainer
18	Heating exchanger primary drain
19	DHW temperature probe
20	DHW heat exchanger
21	Connection for M10 x 1 heat meter flow probe
22	Water hammer arrester
23	Heat exchanger primary circuit air vent

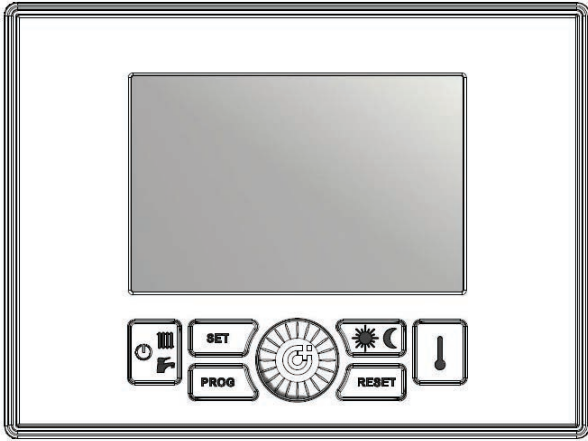
## Schematic Diagram SATK2230 and SATK2240



# SATK22 heat interface unit with advanced electronic functions

## Room Controller

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



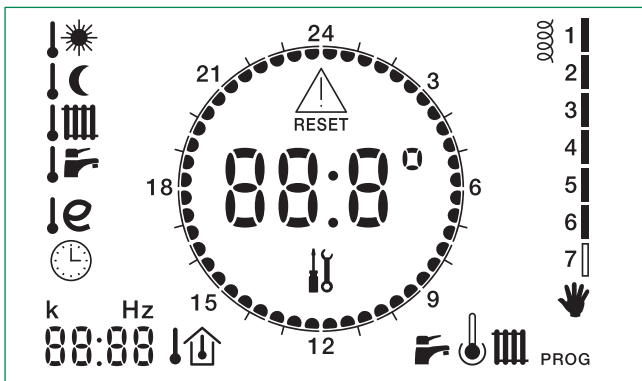
The room controller can function as;

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

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

**NOTE:** When used as 1 or 3 an external room controller is required.

## Room Controller Interface Quick Guide



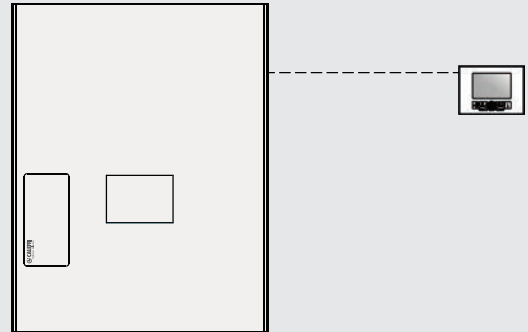
The digits in the centre of the display show the current ambient temperature, if the thermostat function is enabled.

In case the latter is disabled, the digits show DHW temperature and heating flow temperature when the HIU is in operation, "--. "-- when in stand-by.

## Remote Installation

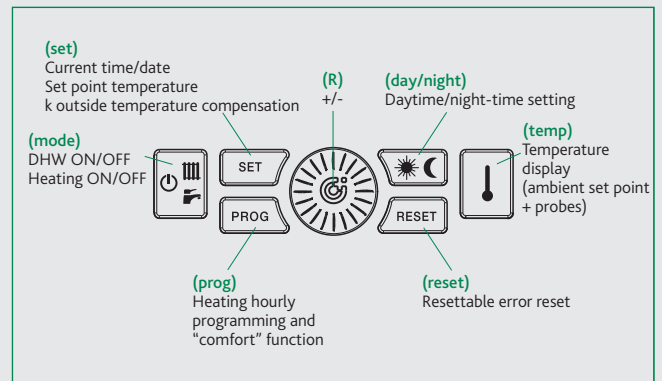
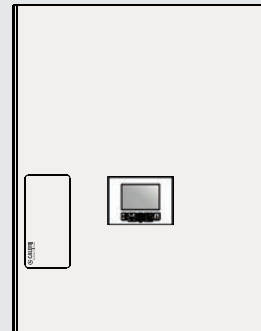
The programmer can be used as a chronothermostat (time clock and thermostat) when the function is enabled.

A completely separate controller/thermostat such as 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.



# SATK22 heat interface unit with advanced electronic functions

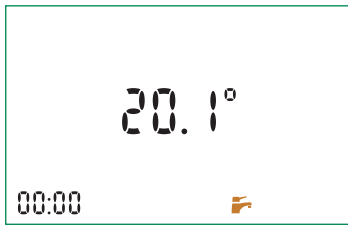
## Room Controller Interface Quick Guide Continued

### Selecting the active services

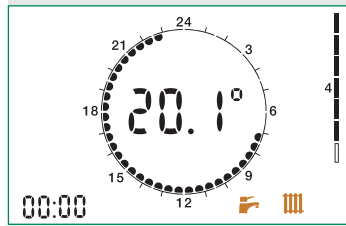
(DHW/heating) Press the <mode> key repeatedly to scroll through the various available operating modes.



OFF



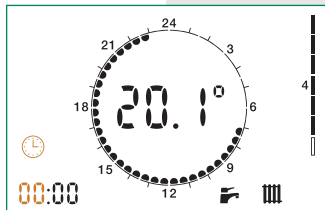
DHW only ("summer mode")



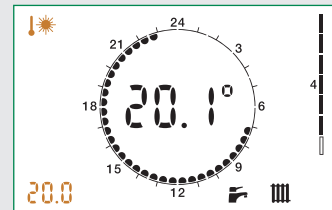
Heating + DHW ("winter mode")

### Selecting set points, current time and comfort function

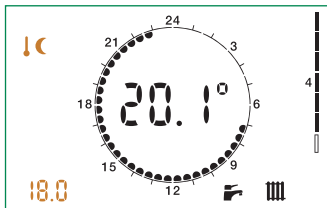
Press the <set> key repeatedly to set the current time, set point temperatures and comfort function. The value can be modified by turning knob <R>.



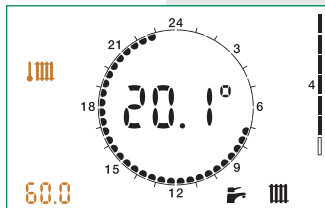
Current hours, minutes and day



Daytime ambient temperature (\*)



Night-time ambient temperature (\*)



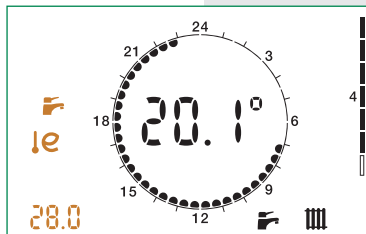
Heating flow temperature (SATK2210 & SATK2220)



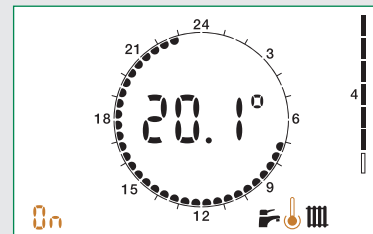
DHW temperature



Primary limit/set return temperature in Heating mode (\*\*)



Primary limit/set return temperature in DHW mode (\*\*)



Comfort function (ON/OFF or according to weekly program)

(\*) if the thermostat function of the remote user interface is enabled.

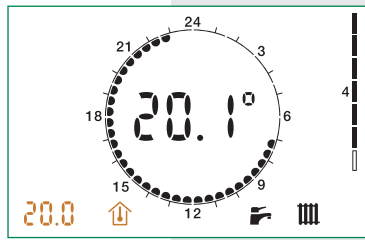
(\*\*) if these set points cannot be changed you must set parameter t07 to value 0 in the technical menu (see "access to technical menu" below). Parameter t07= 1 "freezes" the operating set points to prevent inadvertent modifications by the user.

# SATK22 heat interface unit with advanced electronic functions

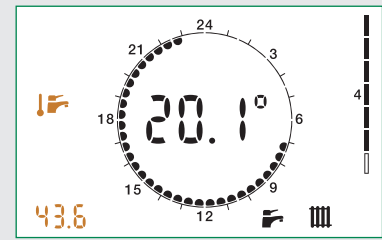
## Room Controller Interface Quick Guide Continued

### Temperature display

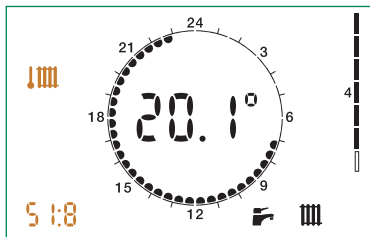
Press the <temp> key repeatedly to display the current ambient temperature set point and the temperature values read by the three probes of the HIU.



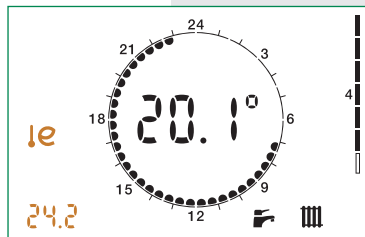
Current ambient temperature set point (\*)



DHW probe temperature



Heating flow probe temperature #



Primary return probe temperature

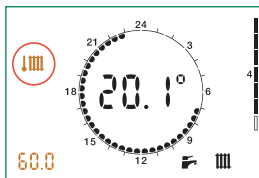
# SATK2210 & SATK2220

(\*) if the thermostat function of the remote user interface is enabled.

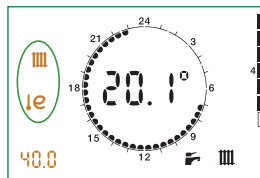
### Advanced Electronic Functions

#### Return Temperature Limitation (RTL)

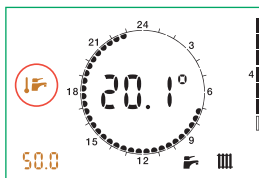
When enabled, it is possible to set limits on the primary return temperature for DHW and heating mode so that efficiency of the heating network is always kept under control.



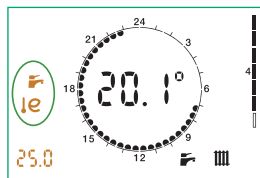
Heating set point



Setting the max. allowable primary return temperature - Heating



DHW set point



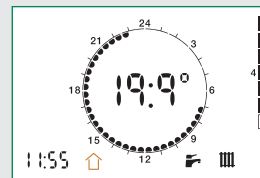
Setting the max. allowable primary return temperature - DHW

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

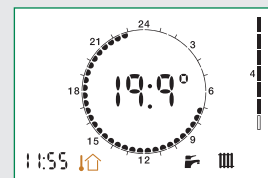
### Advanced Electronic Functions

#### «Ecomode» and Weather Compensation

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



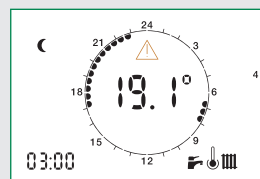
Compensation based on return



Weather compensation

#### Anti-legionella function

- Enabling the anti-legionella function the unit will operate in time band 3:00 - 3:30:
- the DHW set point will be temporarily increased to the maximum value (60°C) - the comfort/recirculation function will be forced ON.



Anti-legionella function starting from 3am



# SATK22 heat interface unit with advanced electronic functions

## Modbus

The HIU offers a remote connectivity solution by means an RS-485 wired network and Mod-Bus communication protocol.

On request, Altecnic will supply a map of the Mod-Registers and data transmission specifications so the product can be integrated in an existing BMS system.

The RS-485 communication network should be preferably constructed in compliance with the prescriptions of standard EIA RS-485.

Any other configuration of the physical layer is at the discretion of the BMS system operator, which will assume responsibility for checking the implications in terms of transmission quality.

In particular, it is essential to use a two-wire twisted cable. Compliance with this requirement becomes even more significant the more extensive the RS-485 network.

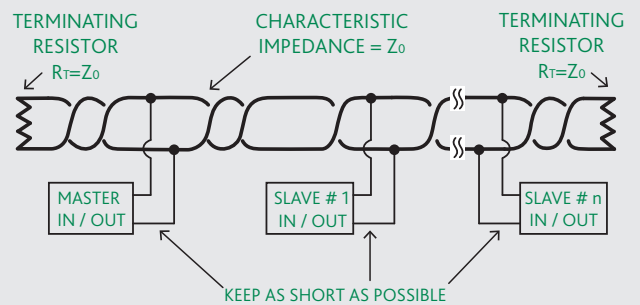
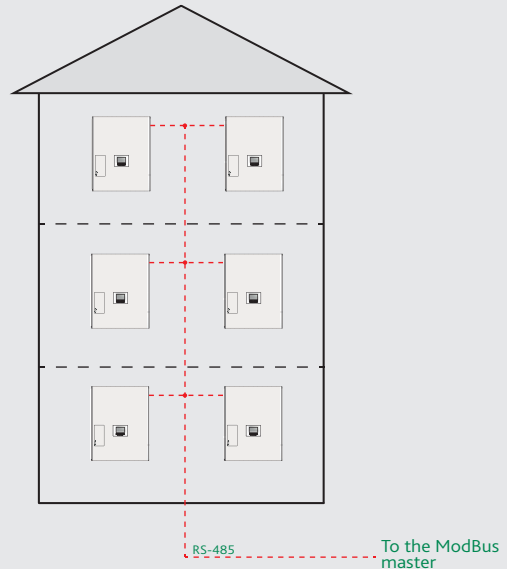
If, alternatively, a shielded wire is used, the shield must be connected solely on the master side.

As a guideline, take account of the following general prescriptions to ensure optimal transmission quality:

- use a BUS cable with impedance of around 120 Ohm;
- connect a terminal resistor, having same impedance as the cable, at each end of the RS-485 cable;
- keep the length of side branches as short as possible.


The device is configured by default to support a communication speed of 9600 baud/s with parity "none".

The communication speed can be changed via Modbus, to the following values: 2400, 4800, 9600, 19200 baud/s.



# SATK22 heat interface unit with advanced electronic functions

## Safety and Alarms

If the electronic circuit board detects a fault, the display shows the error code concerned and the symbol .

### Heating probe fault (SATK2210 & SATK2220)

Error code: 5



### Domestic water probe fault

Error code: 6



### Return probe fault

Error code: 15



### External sensor fault

Error code: 15



### Corrective action

Normal operating conditions are restored automatically once the faulty probe is working properly again.

### Thermal safety solenoid valve (SATK2210)

Error code: 76



### Corrective action

Normal operating conditions are restored automatically once the faulty safety valve works properly again.

### Safety thermostat cut-out (SATK2210)

Error code: 69



HIUs configured to support low temperature heating continuously monitor the safety thermostat controlling the flow temperature.

If the safety thermostat is activated during a general cycle, the heating circulation pump immediately comes to a stop and the modulating valve is completely closed.

After the user has removed the block imposed by the safety thermostat, operation can only be re-enabled when the modulating valves are completely closed again.

This means that if a domestic water cycle is in progress, the activation of the shut-off valve will be postponed until the end of that domestic water cycle.

### Corrective action

To restore the operating mode press the manual **RESET** button.



### Heat interface unit disabled

Error code: 80



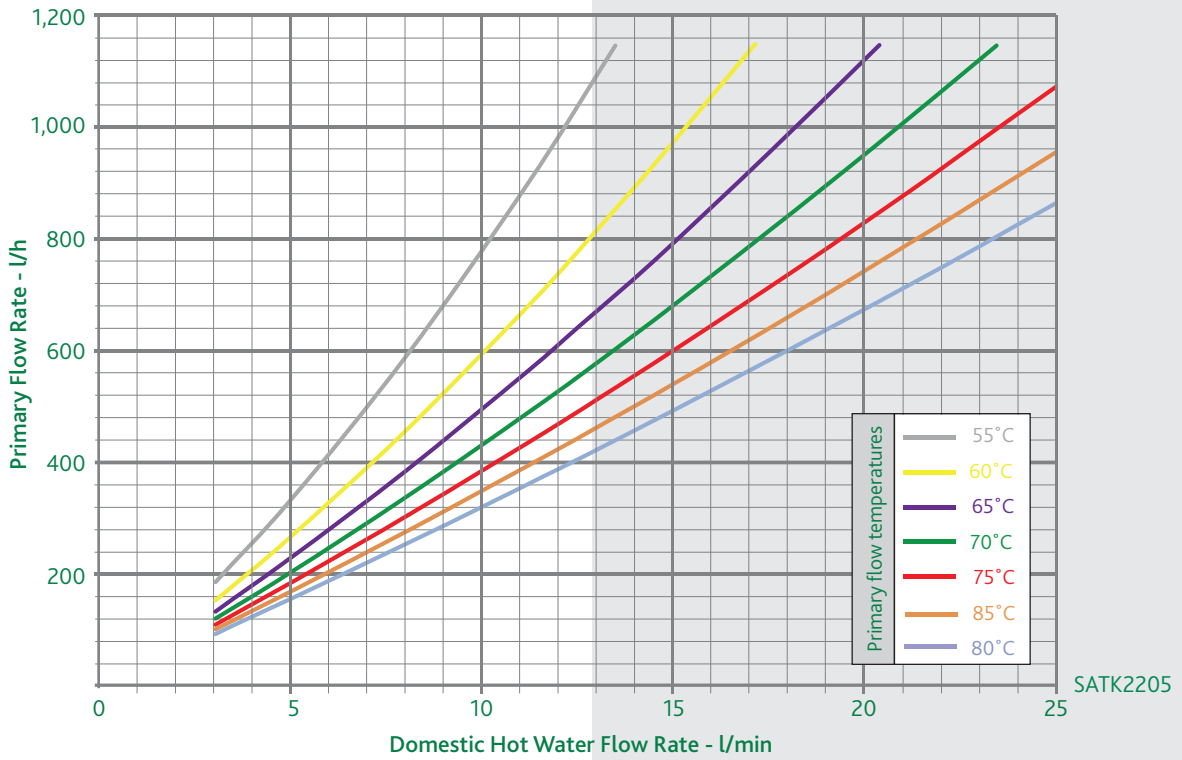
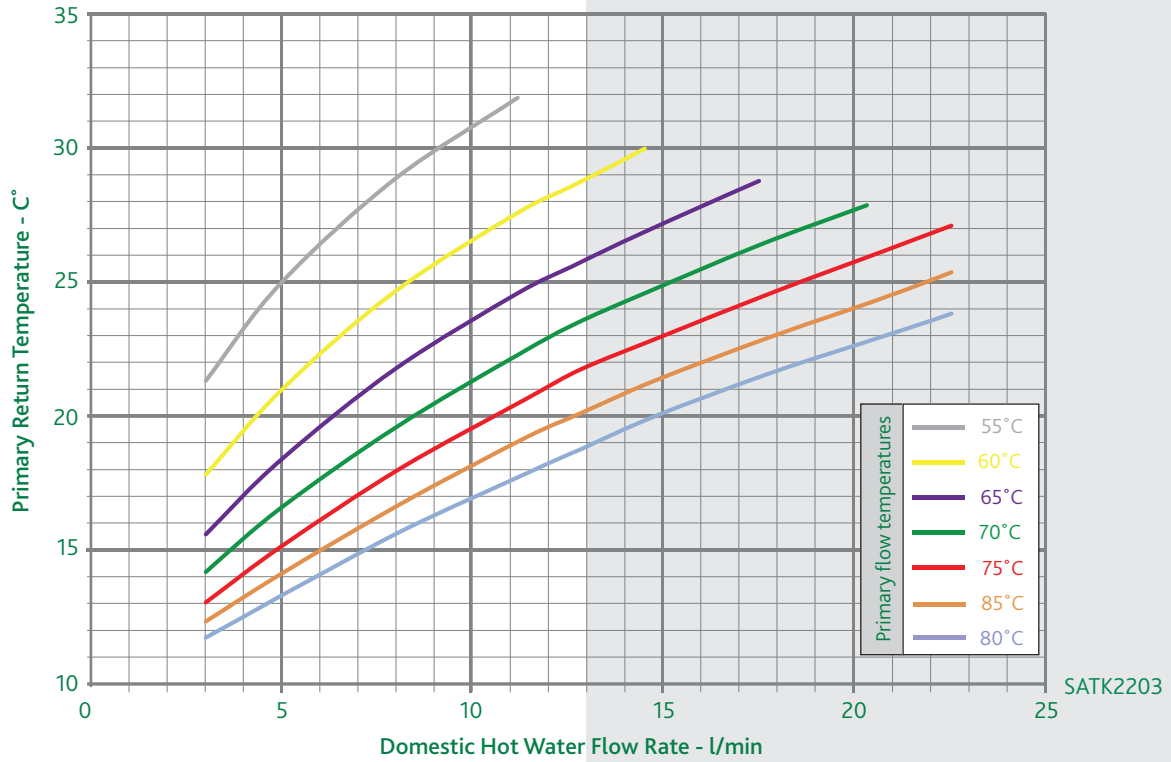
The HIU is disabled due to an incorrect connection on the circuit board front terminals or due to an input from an external device indicating zero credit.

### Corrective action

Check the electrical connections or, in the case of zero credit, top-up the external device/contact the service supplier.

# SATK22 heat interface unit with advanced electronic functions

## Domestic Hot Water Output



# SATK30 heat interface unit with advanced electronic functions

## Key to Symbols



Primary circuit flow



Primary circuit return



Domestic hot water outlet



Domestic cold water inlet



Low temperature circuit flow



Low temperature circuit return



Medium temperature circuit flow



Medium temperature circuit return



High temperature circuit flow



High temperature circuit return

E & O.E  
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AL 311 06-09-18

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