

# Recess-mounting two-way user satellite for instant domestic water production

## SAT22 series



01206/10 GB



### Specifications

The SAT22 satellite unit regulates the plumbing unit's heat requirement and instantly generates domestic hot water through the same medium, making the general supply network as simple as possible (two pipes only). The SAT22 user satellite is therefore the most complete simplification for individual plumbing units in central systems. The SAT22 user satellite, a two-way system with modulating control of the heating medium, is particularly suitable for centralised systems with condensing boilers, and for centralised systems served by remote heating.

#### - Basic functions

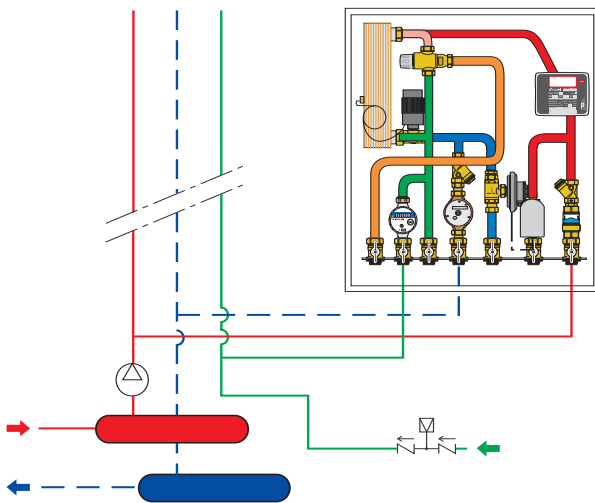
- ON/OFF heating regulation with medium modulation through  $\Delta p$  control valve
- instant hot domestic water production with exchanger/sensor/DHW pre-adjustment valve system and control of primary return temperature
- thermostatic domestic water mixing with anti-scald device
- heat metering in conformity with Directive 2004/22/EC (MI004) with arrangement for centralised transmission

#### - Optional functions

- cold domestic water meter code 794204 in conformity with Directive 2004/22/EC (MI001)
- centralised data transmission code 755010

**Notes: The positioning of the wall box is the first essential and necessary step for installation of the SAT22 user satellite, which can only be installed indoors.**

**Wall box code 794972 is only used for user satellite code SAT22.**



### Technical specifications

#### Materials

**Ball valves:** - body: brass EN 12165 CW617N  
 - valve with non-return (domestic water inlet): non-return EN 13959 type approved

**Box:** Fe360 plate thickness 15/10 mm  
 epoxy polyester powder coating  
 RAL 9010

**Connection pipes:** copper

#### Performance

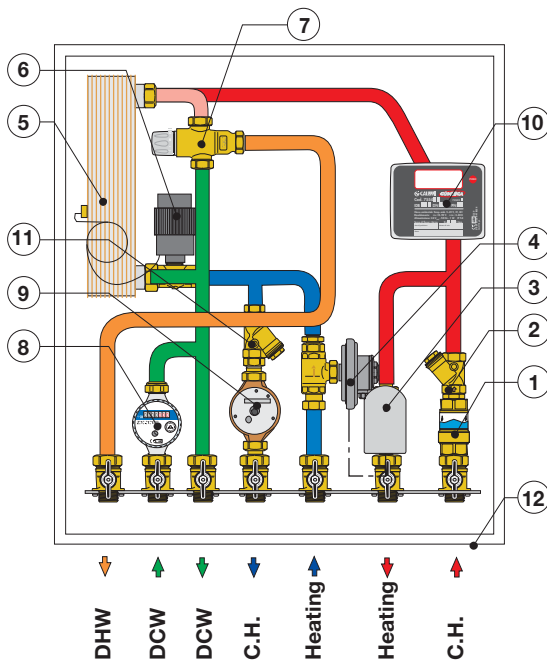
Max. working pressure: 10 bar  
 Working temperature range: 0–90°C  
 Medium: water/glycol solutions, max 30%  
 Connections: 3/4" M

### Characteristic components

- insulated brazed exchanger:  $P_{nom}$  50 kW
- thermostatic mixing valve with adjustable anti-scald function: 30–50°C  $\pm$ 2°C
- two-way ball zone valve and actuator: 230 V (ac) - 6 W
- 7554 series CONTECA® heat meter: 24 V (ac) - 50 Hz - 1 W fitted for RS485/M-bus
- differential pressure regulator with fixed setting: 15 kPa
- 127 series AUTOFLOW®

## SAT22

Two-way user satellite



## LEGEND

- 1) AUTOFLOW® compact automatic flow rate regulator (600-1200 l/h)
- 2) Flow temperature probe pocket (equipped with filter)
- 3) Ball zone valve (6442 series)
- 4) Differential pressure regulator with fixed setting 15 kPa
- 5) Brazed exchanger ( $P_{nom}$  50 Kw)
- 6) DHW pre-adjustment valve with primary return max. temperature control for systems with condensing boilers and remote heating sub-central units
- 7) Anti-scald mixing valve
- 8) DCW positive displacement meter (optional) code 794204

### In conformity with Directive 2004/22/EC (MI001)

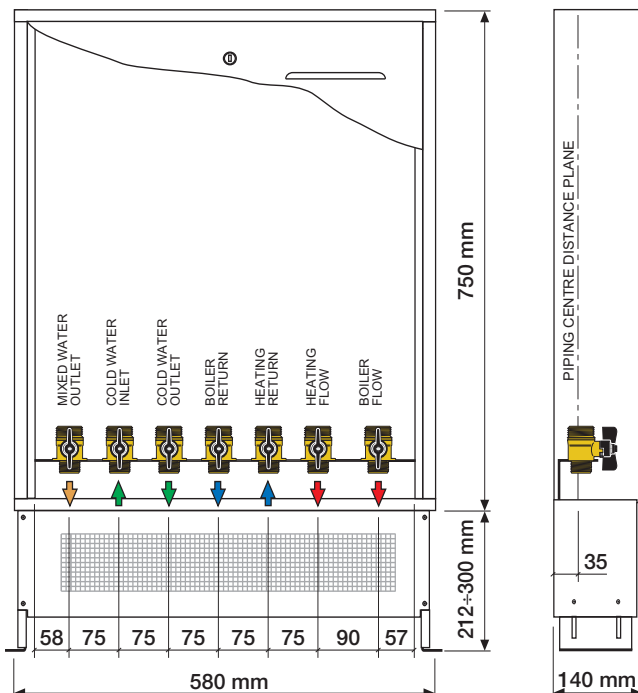
|                                  | COLD WATER   |
|----------------------------------|--|
| <b>Size</b>                      | <b>1/2"</b>  |
| Single jet meter                 | PN 16  |
| Permanent flow rate $Q_3$        | <b>1,600 l/h</b>   |
| Overload flow rate $Q_4$         | 2,000 l/h  |
| Working temperature range        | <b>0,1–30°C</b>  |
| <b>Vertical installation (V)</b> |  |
| Minimum flow rate $Q_1$          | 64 l/h   |
| Transition flow rate $Q_2$       | 160 l/h  |
| Max error percentage             | $\pm 2\%$ for $Q_2 \leq Q \leq Q_4$<br>$\pm 5\%$ for $Q_1 \leq Q \leq Q_2$ |

9-10) CONTECA heat meter in conformity with Directive 2004/22/EC (MI004)

11) Return probe pocket

12) Recess-mounting wall box for interiors

### Dimensions of wall box code 794972



### Operating principle

The heating medium main supply is equipped with an AUTOFLOW® compact automatic flow rate regulator (1) (flow rate 900 l/h, on request 600–1200 l/h).

### Heating function

The ball zone valve (3) equipped with 230 V (ac) (24 V (ac) optional) actuator controls the plumbing unit heat flow and the differential pressure regulator (4) maintains a constant pressure difference throughout the entire heating circuit.

### DHW function

The brazed exchanger (5), equipped with built-in temperature probe, together with pre-adjustment valve (6) and mixing valve (7) with anti-scald function, is responsible for DHW production. The DCW inlet can be fitted with an additional meter (8).

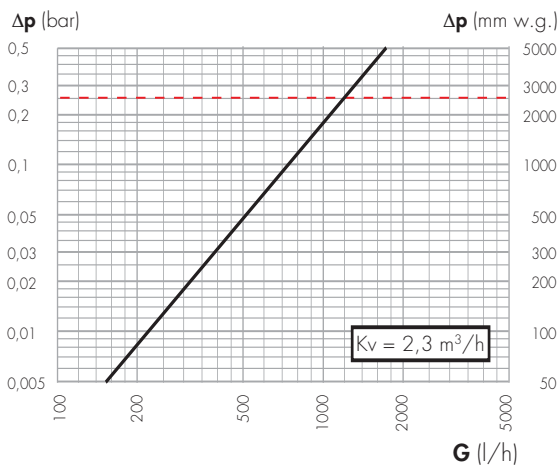
### Heat metering

The 7554 series CONTECA heat meter (10) determines the total user energy requirement through the pair of probes and the flow rate meter (9).

Wallbox code **794972** is supplied with a recess-mounting wall box made of painted sheet metal for interiors (RAL 9010) with door, ball shut-off valves and check valves.

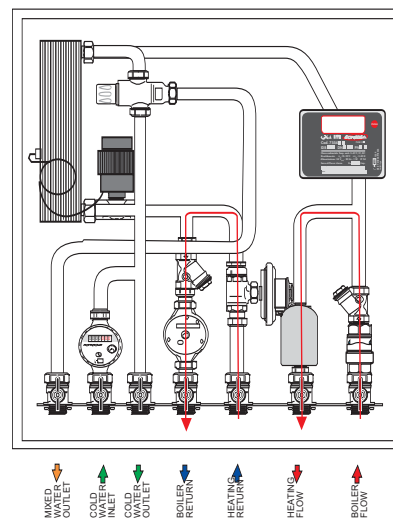
### Hydraulic characteristics

A) Heating function (differential regulator fully open).  
Without AUTOFLOW®

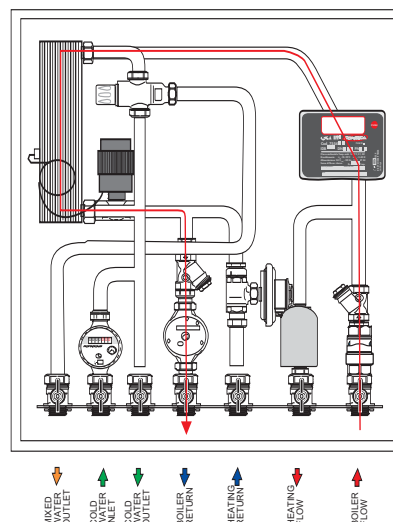
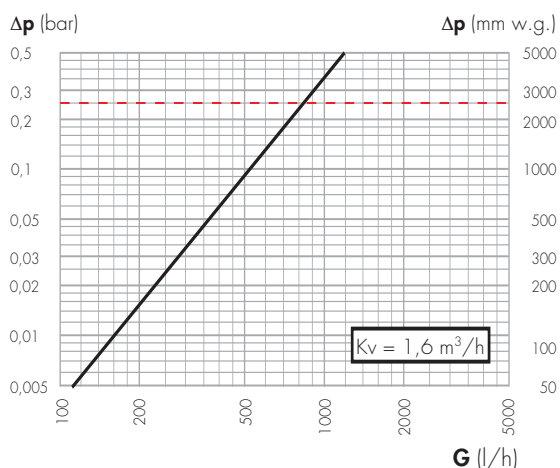


The red lines in the diagrams and in the charts, positioned at the  $\Delta p$  value of 0.25 bar, indicate the precautionary operating limits for preventing noise generation.

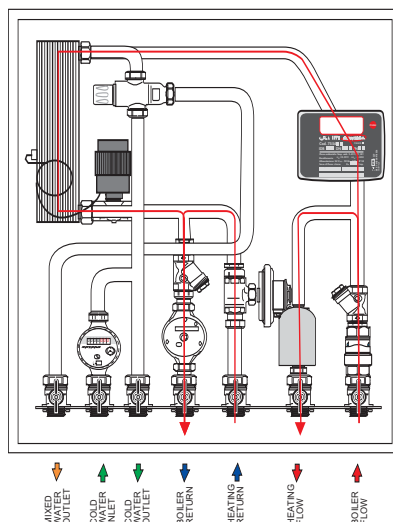
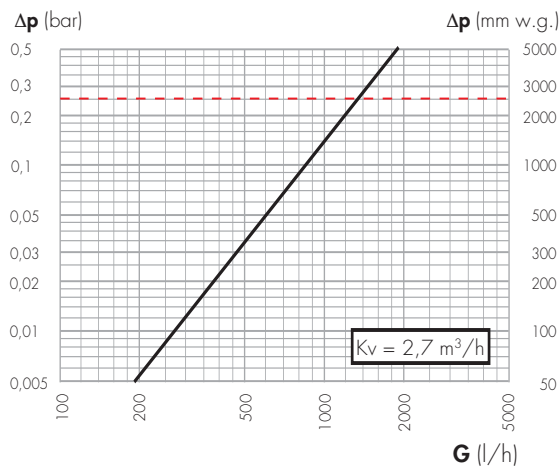
$$G_{work} = kv \sqrt{0,25}$$



B) Exchanger primary hot domestic water function (exchanger regulating valve fully open). Without AUTOFLOW®



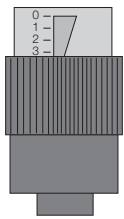
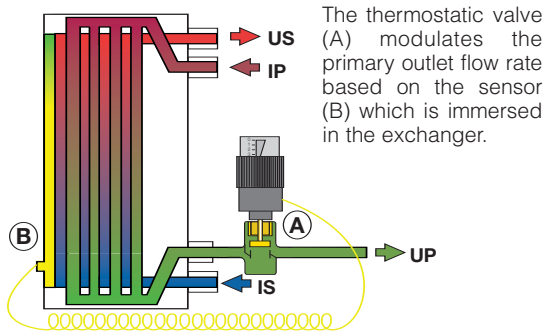
C) Heating and hot domestic water function (differential regulator and exchanger regulating valve fully open). Without AUTOFLOW®



## DHW production

### Operating principle

The performance of the exchanger depends on the primary medium flow rate and on the temperature of the medium.



### Thermostatic valve

The thermostatic valve is equipped with a control knob which allows pre-adjustment of the plumbing unit DHW.

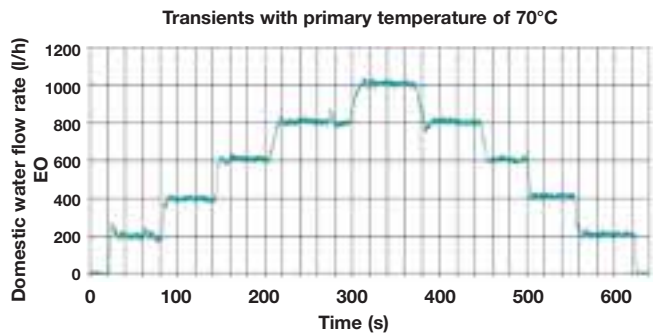
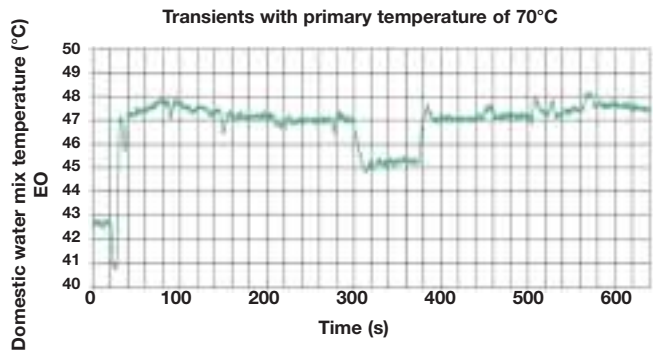
The pre-adjustment values are purely indicative since they depend on the primary flow rate and temperature and the domestic water inlet temperature (factory pre-adjustment 3).

|   |       |      |
|---|-------|------|
| 0 | ----- | 42°C |
| 1 | ----- | 45°C |
| 2 | ----- | 48°C |
| 3 | ----- | 52°C |
| 4 | ----- |      |

An anti-scald mixing valve is installed on the DHW outlet which enables the DHW temperature to be precisely regulated, above all levelling off possible temperature increases due to sudden downward variations of the domestic water flow rate (see fig. 3). This mixing valve incorporates a definable anti-scald function.

## SET temperature fluctuation (48°C) in response to changes in DHW requirement

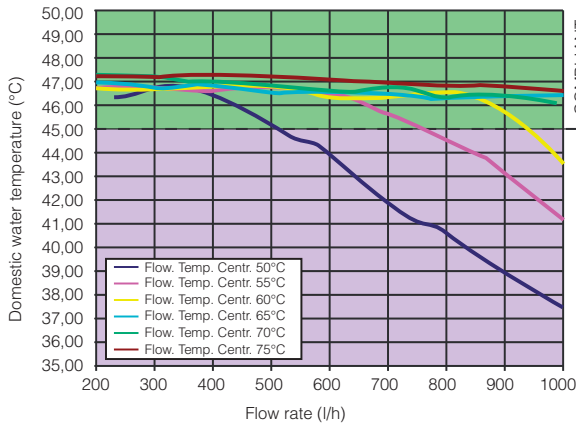
Fig. 3



## DHW function

DHW temperature compared to required flow rate parameterised with boiler flow temperature and AUTOFLOW® 600 l/h.

Fig. 4

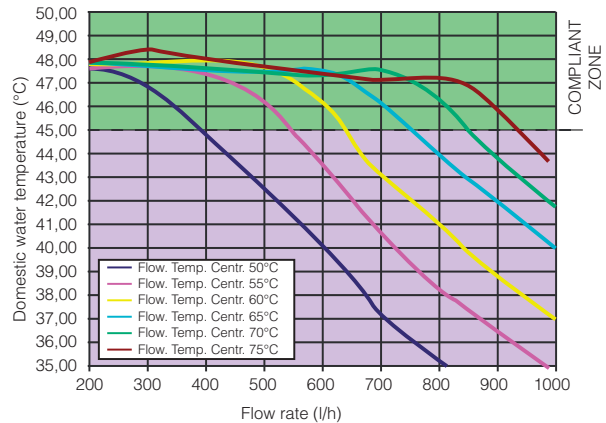


| Flow medium (l/h) (IP) | Primary temperature °C (IP) |      |      |      |
|------------------------|-----------------------------|------|------|------|
|                        | 50                          | 55   | 60   | 65   |
| 600                    | 520                         | 760  | 950  | 1000 |
| 700                    | 580                         | 760  | 920  | 1000 |
| 800                    | 720                         | 940  | 1000 |      |
| 900                    | 720                         | 1000 |      |      |

DHW T inlet DCW = 14°C  
l/h kW T outlet DHW = 47°C (+0 / -2°C)

## Heating and DHW function

DHW temperature compared to required flow rate parameterised with boiler flow temperature and AUTOFLOW® 900 l/h.



| Flow medium (l/h) (IP) | Heating (l/h) (US) | Primary temperature °C (IP) |     |     |     |      |      |
|------------------------|--------------------|-----------------------------|-----|-----|-----|------|------|
|                        |                    | 50                          | 55  | 60  | 65  | 70   | 75   |
| 600                    | 350                |                             |     | 320 | 440 | 500  | 570  |
| 700                    | 400                |                             |     | 320 | 440 | 500  | 570  |
| 800                    | 500                | 250                         | 380 | 480 | 550 | 600  | 670  |
| 900                    | 600                | 300                         | 470 | 540 | 670 | 740  | 800  |
| 1200                   | 720                | 400                         | 550 | 640 | 750 | 860  | 940  |
|                        |                    | 500                         | 650 | 780 | 880 | 1000 | 1050 |

### 127 series Compact automatic flow rate regulator



The heating medium main supply is equipped with an AUTOFLOW® compact automatic flow rate regulator (1) (available flow rate ranges 600–1200 l/h). Unless specified otherwise, the M90 cartridge with flow rate 900 l/h must be installed.

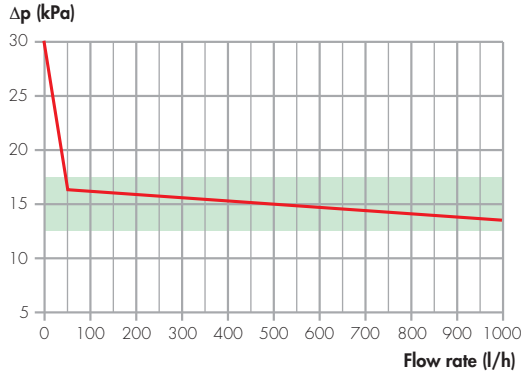
... To complete the code refer to the following table:

| with $\Delta p$ range 15–200 kPa |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|
| m <sup>3</sup> /h                | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,20 |
| ... digit                        | M60  | M70  | M80  | M90  | 1M0  | 1M2  |

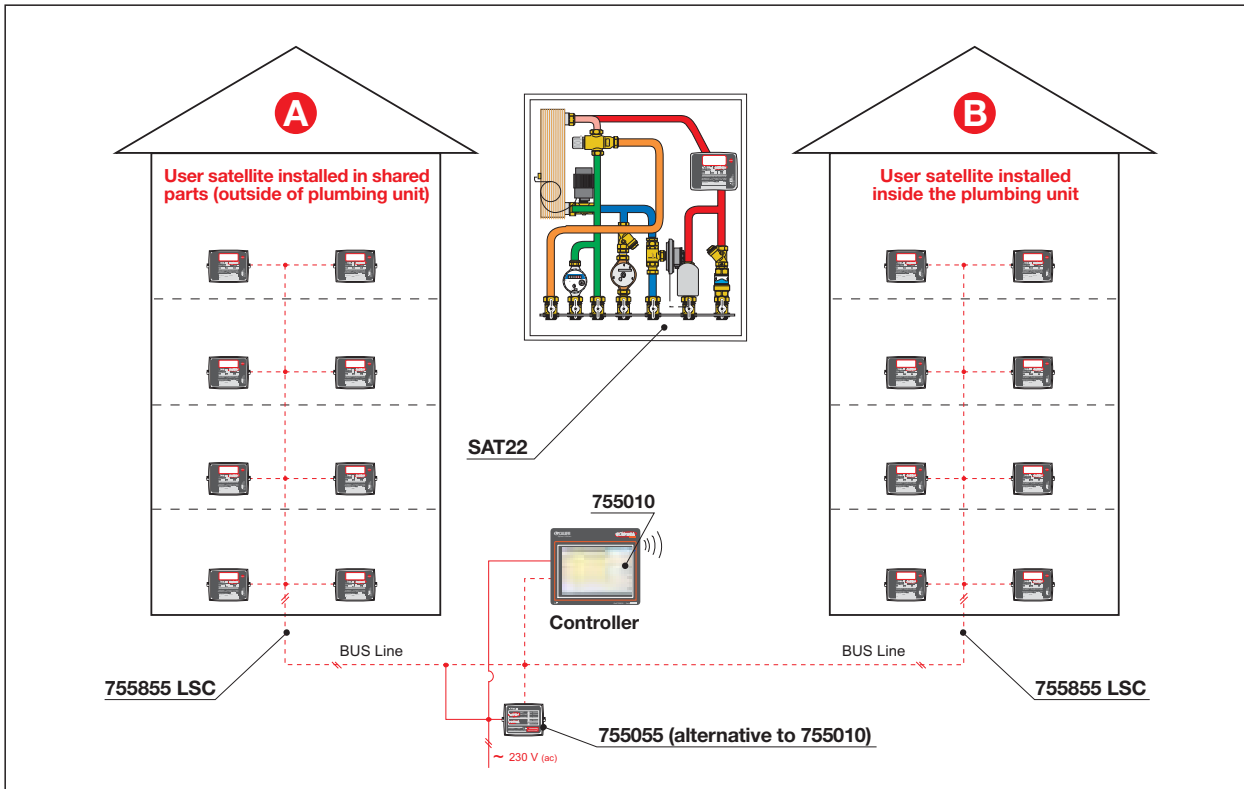
### Heating function:

The ball zone valve (2) equipped with 230/24 V (ac) actuator controls the plumbing unit heat flow and the differential pressure regulator (3) maintains a constant pressure difference throughout the entire heating circuit.

### 140 series Differential pressure regulator (3) Regulation curve



### Central transmission electrical diagram



### Guidelines for hydraulic - electrical installation

- Normally wall box code 794972 is supplied separately in order to ensure correct laying of the system-plumbing unit connection pipes.
- Before installing the SAT22 satellite unit it is advisable to flush the system using a U-connection pipe, if applicable. The satellite includes a positive displacement meter, exchanger and **probe pocket with inlet filter**, components which may fail or become clogged.

### Electric supply:

230 V (ac) line placed under plumbing unit control on activation of thermostat or timer-thermostat

24 V (ac) **centralised** line for CONTECA® heat meter.

**Centralised** transmission line via BUS cable code 755855 LSC (2x1 mm<sup>2</sup> cable inserted in dedicated raceway).

## 755010 CONTECA TOUCH controller

The controller is able to acquire, via bus, all the totalised values of the individual users (heating units / refrigeration units / mass / opening times of the zone valve), user operating status (ON/OFF), totalised values from the supplementary pulse meters (hot/cold domestic water) and operational diagnostics.

All the above-described totalised values are recorded on a daily basis in log files that are useful for analysing consumption and allocating costs.

**Maximum number of plumbing units: 250.**



Comprises:  
- 1 CPU touch screen  
- 1 rack for wall mounting

The controller has the following features:

- 1 touch screen LCD monitor for display of consumption and user data
- 1 RS232 port
- 1 RS485 port
- 2 USB ports
- 1 LAN port
- **GSM modem**

Electric supply:  
230 V (ac)  $\pm 10\%$  - 50 Hz - 60 W.  
Ambient conditions:  
10–35°C with no dust.

**So that the order can be processed, details regarding the plumbing units must be sent to Caleffi.**

## 794204 Pulse domestic water function



If the building has a controller code 755010 and therefore a central transmission line, it is advisable to use the pulse-type cold domestic water meter.

The plumbing unit CONTECA module, suitably connected to the rotary meter, acquires the pulses and makes them available for transmission over the bus, facilitating compression and logging of all plumbing unit consumption. Nominal flow rate:  $Q_{nom}$  1.6 m<sup>3</sup>/h.

## 755055 FAST interface

As an alternative to controller code 755010 it is possible to have RS485/M-bus central transmission via FAST interface.

Using a portable PC **with Windows environment** and complementary software, the operator can transfer the consumption data of the individual units by connecting this interface locally to the portable PC.

**Maximum number of plumbing units: 30.**



Comprises:  
- Data acquisition software.  
- Instruction manual.

Specifications:  
Electric supply: 230 V (ac) - 50 Hz - 5 VA.  
RS232-C interface.  
Dimensions 165 x 120 x 40 mm.

## MAINTENANCE AND FUNCTIONAL DIAGNOSTICS

To ensure correct operation and maximum efficiency of the user satellite, it is necessary to perform the following maintenance operations and functional checks, including during first start-up:

- Inspect and clean the filter mesh in the pocket on the flow pipe (see diagram on page 2)
- Check the clogging of the heat exchanger (5)
- Check the operation of the zone valve (3) by switching the room timer-thermostat.
- Visually check for water leakage from the fittings or shut-off valves

NOTE: it is advisable at the end of the winter heating period to close the plumbing unit distribution valves (second and third ball valve from the right).

## SPECIFICATION SUMMARY

### Code SAT22

Recess-mounting two-way user satellite for heating and instant hot domestic water production equipped with CONTECA heat meter for local display and arranged for RS485/M-bus transmission. Conforms to Directive 2004/22/EC (MID). Fitted for cold domestic water pulse litre counter code 794204. The SAT22 satellite unit comprises: two-way ball zone valve, with 6440 series actuator (230 V (ac)); brazed exchanger with pre-adjustment valve ( $P_{nom}$  50 kW). Adjustable thermostatic mixing valve 30–50  $\pm 2^\circ\text{C}$ , differential pressure valve.

### Code 794972

Wall box for SAT22 user satellite including:

- Recess-mounting wall box for interiors (l=580 mm - h=750–1050 mm - d=140 mm) painted with epoxy polyester powder coating RAL 9010.
- Inlet connections from central heating plant at the bottom 3/4" M.
- Outlet connections to plumbing unit at the bottom 3/4" M.

### Code 794204

Positive displacement meter for plumbing unit cold domestic water with 2004/22/CE (MI001) certification, with direct local display and pulse output  $k=10$ . Connection 1/2" M;  $Q_{nom}$  1.6 m<sup>3</sup>/h. Maximum temperature 30°C.

*We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice.*



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