1. supplement to TYPE APPROVAL CERTIFICATE 08-3575	No.: 08-3761 Issue: 1 Date: 2008-11-13
Expiry date: 2016-12-01	System designation: TS 27.21 027

HEAT COST ALLOCATOR

EXTENTION OF VALIDITY PERIOD

Manufacturer	Brunata a/s, Vesterlundvej 14, DK-2730 Herlev
Applicant	Brunata a/s, Vesterlundvej 14, DK-2730 Herlev
Item	Heat cost allocator with electrical energy supply.
Type	Brunata Futura RME
Field of application	Registration of heat consumed by radiators for the purpose of allocating heating costs.

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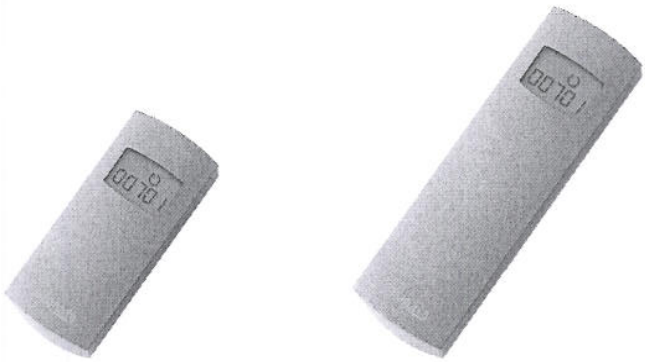
NOTE: This supplement shall be applied in connection with the original Type Approval Certificate which together with this supplement and prospective other supplements constitutes a whole.

This approval is available in several languages. In the event of differences in meaning between the various languages, the Danish text shall apply.

TYPE APPROVAL CERTIFICATE	No.: 08-3575
	Issue: 1
	Date: 2006.09.05
Expiry date : 2008.12.01	System designation: TS 27.21 027

Type approval and checking provisions issued in accordance with the Danish Safety Technology Authority's regulation no. 1137 of 15 December 2003 concerning checks of heat cost allocators used as the means of allocation of heat consumption.

HEAT COST ALLOCATOR



Manufacturer	Brunata a/s, Vesterlundvej 14, DK-2730 Herlev, Denmark
Applicant	Brunata a/s, Vesterlundvej 14, DK-2730 Herlev, Denmark
Item	Heat cost allocator with electrical energy supply
Type	Brunata Futura RME
Field of application	Registration of heat consumed by radiators for the purpose of allocating heating costs.
	Type tested in accordance with DS/EN 834:1995.

NB! Heat cost allocators which are not completely identical with that described in this certificate can only be verified subject to a separate approval by a supplement to this certificate.

This approval is available in several languages. In the event of differences in meaning between the various languages, the Danish text shall apply.

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1. LEGAL METERING DATA

Device

Heat cost allocator (compact meter, 2-sensor meter).
The allocator is also available in a radio communication version.
Radio communication is not part of the type approval.

Method of measurement

2-sensor measurement

Reference conditions

Average radiator water temperature, t_m = 55 °C
Reference room temperature, t_L = 20 °C

Fixing point

The allocator is to be placed in such a way that the sensor directed at the radiator is located at 66.7 % of the height of the radiator.
Deviations from the indicated mounting height may apply to special radiator types. In such cases, the manufacturer's guidelines, which must be documented by the manufacturer, shall be observed.

Range

t_{max} = 105 °C
t_{min} = 20 °C
t_{min} = the heating system's design temperature at an outside temperature of -12 °C.
$t_{m,A}$ = the heating system's average temperature in the dimensioning state.
The condition $t_{min} \leq t_{m,A} \leq t_{max\ m}$ is observed when determining t_{min}.

Battery

Replaceable Li/MnO_2 battery with a voltage of min. 3 V (nominal voltage) and max. 3.2 V and a total capacity of 970 mAh.
Life: 12 years at normal use, but replaced after 11 years' use.

Software identification

Software versions are clearly identified in the allocator's memory through a number indication contained in optically read data. Any later changes to the software and its designations are available in documented form at the manufacturer.

2. CHECKING PROVISIONS

2.1 Declaration of conformity

A declaration of conformity with the type approval shall be made by an authorised allocator supplier, who has a quality assurance system that complies with DS/ISO 9001:2000.

The void label shall state the year of the declaration and the registration number of the allocator supplier.

2.2 Operational checks

In accordance with DS/EN 834 and the manufacturer's instructions.

2.3 Marking

TS-no., t_{max}, t_{min} and CE symbol are printed at the bottom of the allocator. The serial number, which is a unique identification number programmed into the memory of the allocator, is displayed at programmable fixed intervals on the display of the allocator. The serial number is programmed into an EEPROM section, which cannot be altered by the programming equipment of technical personnel (fitters and allocator readers).

A verification symbol and year are visibly attached to the allocator.

2.4 Sealing

The casing of both long and short version of the allocator is sealed by affixing the allocator's front cover, which also acts as a seal.

3. CONSTRUCTION

3.1 Manufacture

Brunata Futura RME is a compact format electronic heat cost allocator based on the 2-sensor measurement principle and is available in two identically functioning versions, with respectively a short casing and a long casing allowing the inclusion of a radio transmitter for remote reading.

The type temperature sensors, along with the other metering electronics and LCD display unit, are located in the sealable allocator casing of the unit. One temperature sensor on the unit measures the radiator temperature via a conducting rear piece, while the other sensor - thermally separated from the first - measures the room temperature.

After connection, the allocator carries out an auto-function test and then commences cyclical measurements of radiator and room temperature and carries out checks, calculations and notation of counter states when required. These measurements and a number of programmed metering data and technical function parameters are stored in the EEPROM type memory, so data loss is avoided in the case of power cuts.

Brunata Futura RME measures the heat transferred to the room by the radiator from the boiler system as the difference between the heat emitted to the room by the radiator and the heat absorbed by the radiator from the room.

In accordance with the measuring principle used, calculations are carried out based on the temperature measurements when the difference between the measured radiator temperature and room temperature (Δt) is other than zero, i.e. has a positive or negative value in calculation terms. This functional principle is described in the first paragraph, last sentence, of Section 3 of DS/EN 834.

In addition, Section 5.3 of DS/EN 834 allows initiated allocator registration of heat consumption on the basis of a start temperature (t_z according to Section 4.8), where the start temperature less the room temperature must be less than or equivalent to 5 K ($t_z - t_L \leq 5$ K), and Brunata Futura RME complies with this norm requirement but does not otherwise operate with such a start Δt: When Δt becomes negative, the allocator changes to registering the heat transfer from room to radiator and from radiator to room over a period of 24 hours.

Brunata Futura RME is also provided with a calendar function, where the billing period can be programmed. The allocator will then show the ongoing registration since the start of the period and save readings/consumption and data about operational states for 52 preceding half month periods.

An LCD display unit shows, in a programmable cycle, units consumed in the current and preceding metering period as well as the identification number and scale.

Using an optical connection at the front of the allocator, all data in Brunata Futura RME can be read with a special reading device also used for programming the scale of the allocator and other technical function parameters.

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3.2 Installation

Installation of the allocator is carried out in accordance with DS/EN 834 and instructions issued by the manufacturer specific to the allocator and radiator. These fitting instructions must be closely complied with to ensure reproducible heat transmission between the radiator and allocator and thus correct recording of heat consumption.

3.3. Comments

Optical reading device and radio, if applicable, are not covered by the type approval.
The unique software designation is stated in the type approval certificate. If any changes are made to the software, the manufacturer/retailer must be able to document these.

4. DOCUMENTATION

WTP test report no. 05144 ("Konformitätsbestätigung", 19.03.2006)

Keld Palner Jacobsen