

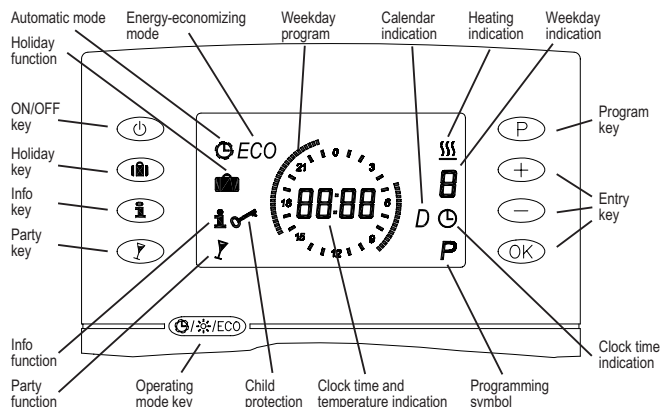
Operating instructions

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1. Information on the operation of the device

- The direct select keys for ON/OFF, holiday and party settings, operating mode switchover and the entry of programs enable to manipulate the device in a very simple manner, even after longer pauses during which no operation took place.
- The devices of the HTRRBu series are, in order to gain a fast overview of the actually adjusted values, all equipped with a separate information mode, the selection of which is possible also directly by means of a key. In this mode, no values can be misadjusted in error.
- The adjusting knob with the °C imprint on it enables to set and read the desired set temperature in an uncomplicated manner.
- The setting of the times for both comfort and ECO mode operation has been modelled on the example of shift segments or so-called "shiftable stops" (well-known from the setting of mechanical switch clocks). The term "handling without studying" best describes the idea behind this concept.
- Pressing for something longer during the entry of data on one of the keys (+) or (-) activates a scroll function.



2. Functions allocated to the direct select keys (P, ECO, OFF, Holiday, Info, Party)

The device disposes of 6 direct select keys that enable to select and quit the desired function. All keys are deactivated that are not required while remaining in one of the functions. The selection of another function is enabled only after having quitted the currently selected function.

2.1 Entry of programs by means of the direct select key (P)

The program entry function serves for the adjustment of the ECO temperature, the time, the date and the different weekday programs. Once activated, it works according to the principle that is commonly known as "compelled guidance". When confirming a certain value by actuating the (OK) key, the display will change over to the next entry to be made. The letter "P" is being displayed to indicate the active state of the function. Depending on the entry step to be made, the function allocated to the next value to be entered is being represented through easily comprehensible symbols while the fields for the value to be entered are flashing. When confirming the Sunday program, the program entry mode is being quit all automatically. Actuating the direct select key (P) at any time can also terminate the program entry. Once no key is actuated for any longer than 2 minutes, the entry mode function is terminated all automatically. Entries will be imported only after confirmation with the (OK) key. After termination of the program entry function, the display changes again back to the previously indicated operating display.

Entry procedure:

- Press the direct select key (P) first, then enter the ECO temperature (the logogram "ECO" appears on the display); factory setting: 17°C.
 - After confirmation with the (OK) key, the clock time can be entered (the clock symbol ⌚ is shown on the display). Enter the hours first and then the minutes.
 - After confirmation with the (OK) key, the date can be entered (the letter "D" appears on the display). First enter the year, then confirm with (OK). After that, enter both the corresponding month and weekday.
 - Then press the (OK) key to enter the weekday programs. To do so, select the corresponding weekday first. For Monday, the number 1 appears flashing on the display. The selection of all other weekdays is made by means of the (+) and (-) keys.
 - After confirmation of the selected weekday with the (OK) key, the shift segments or "shiftable stops" can be set (beginning at 0.00 o'clock). In addition to the time to be adjusted, the position at which the related "shiftable stop" can be set starts flashing too. Any actuation of the (+) key sets a shiftable comfort temperature stop (equivalent to a quarter of an hour), while actuating the (-) key enables to advance by another quarter without setting any shift segments. Pressing the (+) or the (-) key for some time longer activates the scroll function. Repeating the entry step and replacing it by a new one can correct misentries. This can be realised without leaving the actually selected weekday simply by overstepping the 0.00 o'clock marker and repeating the related entry step.
 - After confirmation with the (OK) key, the next weekday starts flashing for selection.
 - After selection of the next day by means of the (OK) key, the copy function is enabled and the system suggests continuing with the program that has been entered for the previous day. The suggestion can either be imported by means of the (OK) key or another program can be entered instead. After confirmation with the (OK) key, the next weekday flashes for selection, etc. The copy function is stopped when selecting Saturday. In this case, the program chosen for Saturday is again suggested by the system for use on Sunday.
- Regarding other setting options, please see section 3., "Adjustment functions" herein.

2.2 Switchover between the operating modes "automatic", "comfort", and "energy-economizing mode" (ECO)

This function has been implemented for switchover between the three operating modes "automatic", "comfort" and "energy-economizing" (ECO). Special shift segments, so-called shiftable stops (known from mechanical switch clocks) that have been arranged in a corona-like manner represent the actually adjusted operating mode on the display. Shift segments ("shiftable stops") indicate the comfort mode times visibly, while energy-economizing times are indicated through missing segments. The operating modes "automatic" and "energy-economizing" are indicated additionally through the clock program symbol ⌚ and the logogram "ECO". The operating mode "comfort" is exclusively indicated through the circumferentially arranged corona of shiftable stops. Once the device operates in comfort mode, the controller controls all operations permanently in dependence on the comfort temperature value that has been set at the adjusting knob beforehand. If operating in energy-economizing mode (ECO mode), the controller regulates all operations subject to the ECO temperature value entered beforehand. If operating in automatic mode, the system toggles all automatically between comfort and energy-economizing mode operation.

2.3 The ON/OFF function

The ON/OFF function serves for the complete deactivation of the control system. Actuating the (OFF) key deactivates the control system. When actuating the (OFF) key again, the control system returns to the previous operating mode. Once the control system is in OFF condition, "OFF" is being indicated on the display in order to delimit this condition against a supply voltage breakdown. Within a master-slave installation, the OFF switching is not effective with regard to the slave controllers.

Caution! In case the valve and pump protection has been activated by the installation company charged with the execution of these works, said protection remains active even after the deactivation of the control system.

2.4 Holiday function

The holiday function has been implemented for energy saving purposes. It serves for the economization of energy during longer absences and for the timely heating up to the desired temperature prior to the time the return of a person was scheduled. When actuating the (Holiday) key, the date of the next day is being displayed. After the setting of the return date by means of the keys (+), (-) and (OK), the holiday time temperature is being displayed (factory setting 17°C). This holiday time temperature too can be changed within a range from 5 to 30°C. After confirmation of the holiday time temperature by means of the (OK) key, the holiday function is rendered active and both the return date and the holiday symbol (H) are being displayed. Actuating the direct select key (P) at any time cancels the holiday function. If not terminated this way, the function is cancelled all automatically at 0.00 o'clock of the actually entered return day. Once the holiday function has been cancelled, the control operations are being continued in the previously selected operating mode and the related indications are being displayed again.

2.5 Info function ⓘ

The info function enables to indicate all actually adjusted values. No inadvertent misadjustment can take place while doing so. Once this function is active, the symbol ⓘ is being indicated on the display. After actuation of the ⓘ key, the actually adjusted ECO temperature is indicated first. Actuating the keys + and - enables to inquire all actually adjusted values. Within this function, values can neither wilfully nor inadvertently be misadjusted. Actuating the direct select key ⓘ at any time cancels the info function. If not terminated this way, the function is cancelled all automatically 2 minutes after the last keystroke was made. The selection of the info function does not impair any of the control operations currently performed. Once the info function has been cancelled, the display returns to the previously indicated operating screen.

2.6 Party function ⌚

The party function serves, independent of the actually adjusted program or operating mode, for the one-time triggering of a comfort heating time as of the moment this time is entered. Actuating the key ⌚ displays the next possible end of the comfort heating time (party end). After the adjustment of the end time by means of the keys +, - and OK, the party function is active. Once it is active, the end time and the party symbol ⌚ are being displayed until to the end of the adjusted comfort heating time. Actuating the direct select key ⌚ at any time cancels the party function. If not terminated this way, the function is cancelled all automatically after the attaining of the adjusted end time. Once the party function has been cancelled, the control system returns to the previously operated operating mode and shows the corresponding display features.

3. Adjustment function J.1 ... J.4, OK, P

The adjustment functions serve for the usually only one-time adjustment to the individual user requirements. They have, in support of an easier operation, been taken from the normal operator control interface and are being displayed in a special menu. Pressing the OK key first and pressing the key P afterwards in addition accesses the adjustment mode. After that, the first adjustment function (J.1) appears on the display. Actuating the keys +, - and OK enables to select the desired adjustment function. The desired settings too are realised by means of the keys + and - and need to be confirmed by means of the OK key. Actuating the key P cancels the adjustment function at any time. If not terminated this way, the function is cancelled all automatically 2 minutes after the last keystroke was made. Entries that have not been confirmed by striking the OK key, will not be imported. The selection of the adjustment function does not impair any of the control operations currently performed. Once the holiday function has been cancelled, the control operations are being continued in the previously selected operating mode and the related indications are being displayed again. Regarding further setting options and the adjustment functions available in "craftsman mode", please refer to section 10. herein.

3.1 J.1 Indication during service: time, temperature and time / temperature (alternately)

A1 = permanent indication of the time (factory setting)
A2 = permanent indication of the temperature
A3 = alternating indication of time and temperature
(indication in each case: 5 seconds)

3.2 J.2 Program indication via shift segments (shiftable stops arranged in a corona-like manner), ON/OFF

ON (factory setting)
OFF

3.3 J.3 Child protection ⚡, ON/OFF

The child protection realised with the device serves to prevent against an inadvertent misadjustment or the misadjustment through unauthorized third persons during operation. After activation of the child protection function all keys and all change options available via the temperature-setting knob are locked 3 minutes after the last keystroke was made and the key symbol ⚡ appears on the display. The keys can be reactivated by pressing the OK key for approx. 10 seconds until the key symbol disappears from the display. The key symbol blinks while pressing the OK key. The keys are locked again all automatically 3 minutes after the last keystroke was made. In the event the set temperature was changed via the adjusting knob during the time the keylock is active, this adjustment becomes valid only after the reactivation of the control elements.

ON
OFF (factory setting)

3.4 J.4 Automatic change to daylight saving and standard time, ON/OFF

The harmonised daylight saving time in the European Union takes effect as of the last Sunday in March, i.e. as of 2.00 o'clock a.m. CET and lasts until to 3.00 o'clock a.m. on the last Sunday in October (CEST) each year (directive 2000/84/EG of the European Council and Parliament). The radio room temperature sensor changes the time all automatically at these dates. The automatic change to daylight saving and standard time can also be deactivated to enable the changing of the time at other dates or to meet with the time conditions in other regions.

ON (factory setting)
OFF

4. Reset function OK, ⌚

The reset function serves for the restoration of the delivered condition and resets all possibly entered program times, ECO and holiday temperature values and adjustment settings to the original factory settings. The clock time, the calendar indication and the values entered while operating in craftsman mode, however, will not be reset. To prevent against an inadvertent reset, this function can be triggered only by means of a combination of 2 keys that need to be operated in the following order: First depress the OK key and then the ⌚ key permanently for approx. 10 seconds until the indication stops blinking. After that, the delivered condition is, with the exception of the above-mentioned restrictions, restored again.

5. Special indications at the room temperature controller display

Indication: Fbr

Sensor breakdown. The controller needs to be checked by the manufacturer (see section 12.).

Indication: FScH

Sensor short-circuit. The controller needs to be checked by the manufacturer (see section 12.).

Indication: Shift segments ("shiftable heating stops") appear flashing

Shift segments, if flashing during the time the system is operated in automatic mode, indicate the antedated point at which the systems changes over from ECO to comfort mode operation. The room temperature controller itself is identifying the antedated switchover point, provided however, the self-learning function has been activated while operating in craftsman mode (see section 10.3).

Display indication: 🔥

Indicates that the heating is active.

Installation instructions

Safety information

No persons other than expert electricians only must open this device in due compliance with the wiring diagram shown in the housing cover / on the housing / represented in the corresponding operating instructions. All expert electricians committed to the execution of any such works must comply with the relevant safety regulations currently operative and in force. **Caution!** The operation of the controller in the vicinity of other devices that do not comply with the EMC directives may affect its functions. The company charged with the installation of the device must, after the completion of the installation works, instruct the user of the control system into its functions and in how to operate it correctly. Settings or changes of the adjustments made while operating in craftsman mode may affect the control system and may therefore only be made by an accordingly qualified expert. The company charged with the installation of the device must, after the completion of the installation works, instruct the user of the control system into its functions and in how to operate it correctly. These operating instructions must be kept at a place that can be accessed freely by the operating and/or servicing personnel in charge.

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6. Application

The heating controller with time-controller energy-economization function described herein has been specially devised for the control or supervision of room temperatures in offices, living spaces and hotels. Electric floor heating systems need to be controlled by an additional power contactor. Care must be taken thereby to ensure that the performance of the controlled system cannot, even if the system is

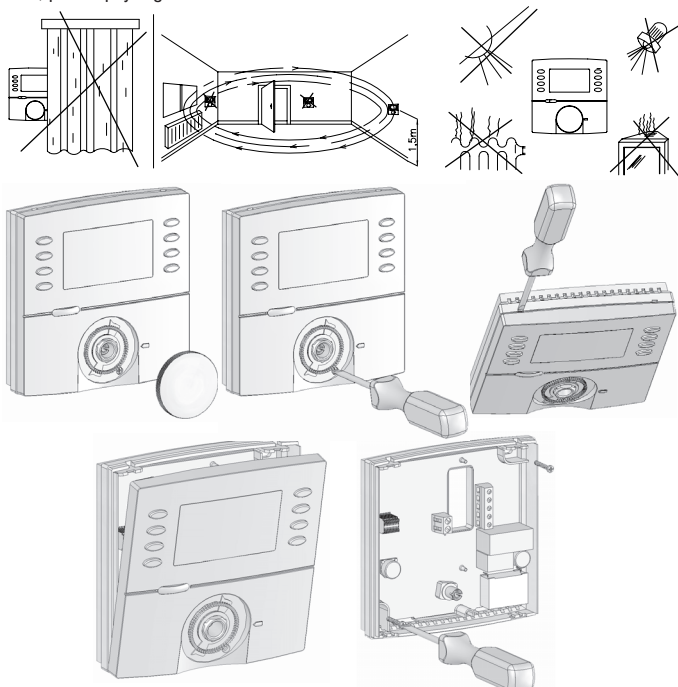
operated continuously, result in an overheating of the pavement. With hot water heating systems, no more than 10 normally closed valves must be used. Where applicable, temperature limiters need to be installed in addition. Regarding other applications not to be foreseen by the manufacturer of this device, the safety standards these applications need to be followed and adhered to. Regarding the aptitude of the device for any such application, please refer to section 17. herein.

7. Functional description

The room temperature controller models described herein are equipped with an internal bimetal sensor that captures the currently existing room temperature. The device controls the related heating or cooling operations in accordance with the adjusted set value. The active state of the heating is indicated by the symbol  that appears on the display.

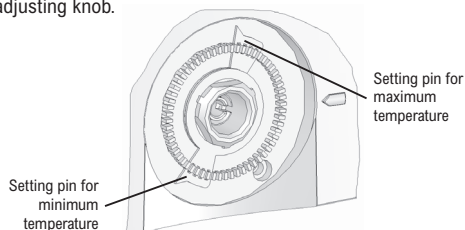
8. Installation

The controller is, depending on the type version of the device or size of the package used for it, either delivered in closed or, in order to facilitate its fast installation, also in opened condition. **Caution!** The controller must not be installed on a conductive surface. This applies in particular when metalliferous wallpapers or wall claddings of a similar nature have been used. After its installation on the wall surface or on an UP box using the adapter plate JZ-17 and after completion of its electrical connection (see section 15.), the housing cover is hooked up using the hooks at the bottom and then swivelled in upward direction until it snaps in. After that, the housing cover must be secured by means of the enclosed screw. The controller must not be exposed to direct cold or heat sources. Also care must be taken to ensure that the device is not exposed to the influence of foreign heat or cold sources that warm or cool the device at its back (through air flows in cavity walls or the temperatures radiated by ascending pipelines, f. ex.). In the event a permanently unchanging affectation of the controller at the place of installation cannot be avoided, please pay regard to section 10.4 herein.



8.1 Suppression of the temperature setting range







The temperature setting range can, in order to avoid a setting that is either too high or too low, be restricted mechanically by means of the setting pins that exist underneath of the adjusting knob.



9. First start-up and commissioning

After supply voltage ON, the room temperature controller performs a self-test first that lasts only some seconds. During this self-test all display symbols appear on the display. Once the self-test is over, the software version used with the device is being displayed for some seconds. After that, the fields for the entry of the clock time and the date start blinking and the operator is asked to enter these data. If no clock time and no date are entered, the automatic mode is activated after the expiry of 2 minutes time. **Caution!** If no clock time and date is entered, time begins running as of 00.00 o'clock and the comfort heating times do not accord with the actual daytime. The setting of the clock time and of date after the activation of the automatic mode is described in section 2.1, "Entry of programs by means of the direct select key (P)". In the event the recommissioning takes place while the power reserve is still active, the controller returns all automatically to the operating mode that has been active beforehand and shows the actual time of the day thereby.

10. Adjustment function J.5 ... J.8 "craftsman mode" J.4 → then and

Caution! Control settings can be made within the limits of these adjustment functions that may only be performed by a qualified heating specialist or an expert electrician. The settings made while operating in this mode cannot be reset via the reset function and have to be made knowingly, therefore. Clear proof that any such settings have been made by one person only is thus ensured. The activation of the craftsman mode takes place while operating within the normal adjustment mode (see section 3.). This is enabled only if "J.4" is being indicated on the display. After that, press the key  first and then the key  shortly: the first adjustment function that is available in craftsman mode (J.5) is being displayed now. After activation of the craftsman mode, all 8 adjustment functions can be selected by means of the  and  keys. Actuating the key  enables to cancel the craftsman mode at any time. If otherwise, the craftsman mode is terminated all automatically 2 minutes after the last keystroke was made. Entries will be imported only after confirmation with the  key. After termination of the program entry function, the display changes again back to the previously indicated operating display.

10.1 J.5 Temperature unit °C or °F

The system enables to display the temperatures in the units Celsius or Fahrenheit. Depending on what unit has been selected, these are being displayed directly in °C or °F (factory setting: °C).

10.2 J.6 Valve and pump protection function ON/OFF

The valve and pump protection function serves to prevent the valve seat and/or the pump from corroding up during longer stop times. Whenever warm-water heating systems are to be controlled, it is recommended to activate the valve protection function. Once the valve and pump protection has been activated, the controller actuates the related valve or triggers, at each time, a heating pump every Monday at 11.00 o'clock a.m. a 5 minute time. The valve and pump protection is rendered active only if no heating operation has been performed in the course of the last week. An unnecessary additional heating up during the heating season is thus avoided to the result that the overall control system is not affected thereby.

ON
OFF (factory setting)

10.3 J.7 Self-learning function ON/OFF

The self-learning function serves for the autonomous attaining of the comfort temperature at the adjusted time. The antedated point at which the system switches from ECO over to comfort temperature sets itself all autonomously and is being indicated by a blinking shift segment („shiftable heating stop"). Depending on the calorific output and the prevailing outside temperature, the switchover point will vary.
ON (factory setting)
OFF

10.4 J.8 Correction function for the adaptation of the actual value recording to the room temperature (± 5K) (indication ± 5.0°C or -8.9 ... +9.0°F)

This correction function serves for the adaptation of the actual value recording to the room temperature (objective: set value scale / actual value indication = room temperature). This adaptation is always required whenever a permanent and unchanging affectation of the room temperature controller through foreign heat or cold sources is unavoidable. If, for instance, the room temperature controller is influenced by foreign heat source, a room temperature will result that is cooler than the one adjusted with the set value adjusting button. The correction of the actual value recording can take place in 0.1K steps. However, the adaptation may only take place after the controller has approximated itself to the prevailing room temperature (after approx. 1 hour).

Example in case the sensor is affected by a foreign heat source:

Assumption: A room temperature of 20°C occurs at an initially indicated and adjusted set temperature of 22°C.

In order to attain a room temperature of 22°C at a set value setting of 22°C, the actual value correction function must subtract the necessary difference of 2K → subtractor: -2.0°. Based on this computing operation, the radio temperature sensor corrects the actually measured set value by a value of -2K, which results in an elevation of the room temperature to 22°C → set value scale / actual value indication = room temperature.

Example in case is sensor is affected by a foreign cold source:

Assumption: A room temperature of 24°C occurs at an initially indicated and adjusted set temperature of 22°C.

In order to attain a room temperature of 22°C at a set value setting of 22°C, the actual value correction function must add the necessary difference of 2K → augments: +2.0°. Based on this computing operation, the radio temperature sensor corrects the actually measured actual value by a value of +2K, which results in the lowering of the room temperature to 22°C → set value scale / actual value indication = room temperature.

10.5. J.9 Entry of the connected heating wattage

The self-heating level of the controller varies on account of the connected wattage of the system that has to be controlled and, as a result of it, affects the control accuracy of the device. Entering the value of the connected wattage beforehand helps compensating this influence to the result that the initial control accuracy of the device is being maintained. The value of the actually connected load is indicated in kW (kilowatt) on the display and can be set within a range from 0.0 to 1.8. If the connected load refers to intermediate values that cannot be set directly, the nearest lower value needs to be adjusted instead (factory setting 0.0).

11. Master-slave control (automatic multiple room operation piloted by one central clock-equipped controller)

11.1 Explanation of technical terms

The master controller (also referred to as main or pilot controller) – defines as a superordinated controller of higher priority than the so-called slave controller. The master controller which does not only influence the control of the temperature in the room in which it installed but which is also responsible for the control of all energy-economizing times and the execution of all special functions in all rooms within which slave controllers have been installed that are wired to it.

The slave controller (also referred to as follow-up or satellite controller) – defines as a lower-order controller of a priority level that is inferior to the one of the master controller. It influences only the control of the temperature in the room in which it is installed.

Energy-economizing times – define as times during which the system regulates, in order to economize the consumption of energy, down to a lower room temperature. Usually, energy-economizing times typically fall into periods of regular absence or rest times of persons. They can thus be entered at the master controller as a customised clock program.

ECO temperature – the abbreviation ECO (also known as ECON) originates from the English word “economy” and stands for “economizing”. The ECO temperature enables to save energy during the control of individual rooms. To realise this, the system performs – during the absence and during rest times of persons – its control operations no longer in order to meet the so-called comfort temperature value, but performs it to meet a value instead at which the related consumers are less frequently actuated or triggered (ECO temperature). An enhanced economization of energy is thus achieved.

Special functions – define as functions that are triggered by the HTRRBu as master controller. The holiday-, the party- and the self-learning function too form part of these special functions.

11.2 Installation of a master-slave control system

To install a master-slave control system, the clock output ⌚ of the HTRRBu (master controller) must be wired to the clock entries ⌚ of the corresponding slave controllers. The HTRRBu switches, during the energy-economizing time, a voltage of 230 V AC to the clock outlet. Once this voltage is present, the slave controllers switch over to temperature decrease mode (ECO mode).

11.3 Master-slave functions

Energy-economizing function – the energy economizing times entered at the HTRRBu master-controller have validity in all rooms within which a master-slave control system has been installed. During comfort heating times, the temperatures adjusted at the individual slave controllers are effective. During energy-economizing times, the ECO temperature adjusted in the room in which the HTRRBu has been installed, is effective. Depending on the design of the related slave controller, the ECO temperatures adjusted at the related slave controllers are effective. The clock output of the HTRRBu is rendered active also if the ECO temperature adjusted at it exceeds the comfort temperature value. In the room in which the HTRRBu has been installed, however, the temperature is always regulated down to the lower temperature value. Concerning all rooms that have been equipped with slave controllers, the energy-economizing function is triggered also if the operating mode ECO has been set at the HTRRBu.

Holiday function – the holiday time entered at the HTRRBu has validity for all rooms in which a master-slave control system has been installed. During holiday times, the individual ECO temperatures are valid as described hereinabove with regard to the energy-economizing function.

Party function – the party time entered at the HTRRBu is valid in all rooms in which a master-slave control system has been installed. The system performs, until to the end of the party time, its control operations in such manner that the comfort temperature values adjusted at the individual controllers are met.

Self-learning function – in the event the self-learning function has been activated via the adjusting menu of the master controller, the antedated point at which the switchover from ECO to comfort temperature mode operation takes place is effective with regard to all rooms in which a master-slave control system has been installed. The main principle of the self-learning function is based on the assumption that the individual room heat-up times do not essentially differ from each other.

12. Emergency operation function

In the event of a sensor breakdown or sensor short-circuit, the system is driven at a level that is equivalent to 30% of the normal working time in order to prevent the related room from cooling down thoroughly or to prevent it from the occurrence of frost damages. Temperatures below a value of -20°C will also be considered as sensor breakdown. Consequently, the emergency operation function is triggered in this case as well.

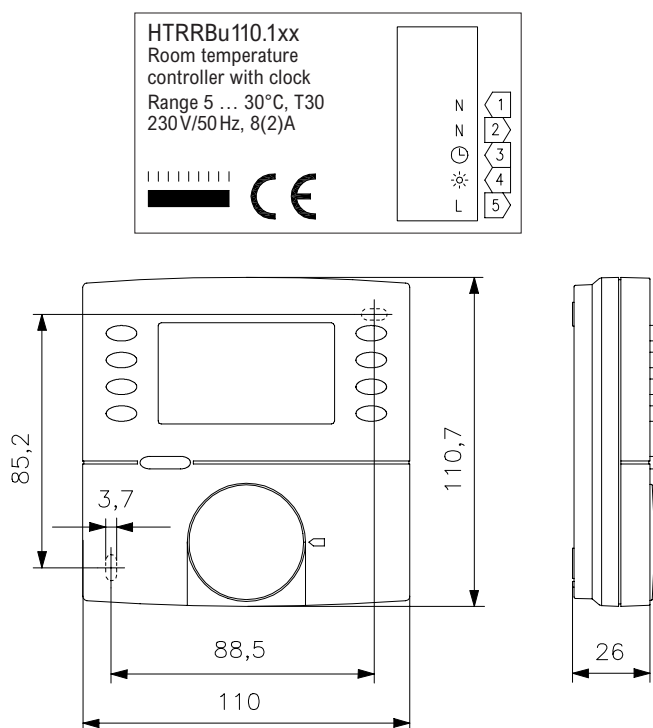
13. Accessories

JZ-17 – adapter plate for installation on an UP box.

14. Technical data

Supply and switching voltage:	230 V~
Switching capacity, contact:	8(2)A, make contact, 230 V~ potential Caution: The connected heating wattage needs be entered at the controller, see section 10.5
Clock output for slave controller triggering:	230 V~, max. 100 mA
Control range:	5 ... 30°C
Scale:	$^{\circ}\text{C}$ scale
Switching difference:	<1K
Power consumption:	approx. 1,2W (approx. 11VA)
Sensor tolerance:	$\pm 1\text{K}$
Terminal capacity (wire cross section):	0.5 ... 1.5 mm ²
Protection class:	II (after according installation)
Degree of protection:	IP30 (after according installation)
Operating temperature:	0 ... 30°C
Storage temperature:	$-20 \dots +70^{\circ}\text{C}$
Power reserve:	approx. 4 ... 7 days
Emergency operation characteristics in the event of a sensor breakdown or short-circuit:	emergency operation (duty cycle equivalent to 30% of the normal operating time)
Housing design:	Berlin 3000
Housing material and colour:	plastic (ABS), pure white (similar to RAL 9010)
Installation:	on the wall by means of screws or on an UP box by means of an adapter plate

15. Dimensioned drawing and connection diagram



16. Explanation of symbols

Terminal	Wiring diagram symbols	Explanation
1	N	Neutral conductor (heating)
2	N	Neutral conductor (supply voltage)
3	⌚	Clock output
4	⚡	Heating output
5	L	Supply voltage (phase)

17. Warranty

The technical data specified herein have been determined under laboratory conditions and in compliance with generally approved test regulations, in particular DIN standards. Technical characteristics can only be warranted to this extent. The testing of the device with regard to the qualification and suitability for the client's intended application or the use under service conditions shall be the client's own duty. We refuse to grant any warranty with regard thereto. Subject to change without notice.