

## Installation and Operation Instructions

# Electronic Clock Thermostat easy 3s



### Warning!

This unit must not be opened and installed except by authorized persons and in compliance with the circuit diagram provided inside the cover. It is mandatory in all work on the unit to observe the current safety regulations.

In order to classify for protection class II it is necessary to take adequate installation measures.

This separately mounted unit is designed for temperature control exclusively in dry and closed rooms with standard environment. The unit features radio-interference suppression in compliance with VDE 0875 T.14 and EN 55014, respectively and works according to operating principle 1C (EN 60730).

## 1. Applications

The easy 3s electronic clock thermostat is designed for room temperature control in conjunction with:

- heating systems, e.g. hot-water heaters, convector heaters or floor heating
- electric convector heaters, ceiling and storage heating
- night-storage heaters
- chillers
- circulation pumps
- burners and boilers
- heat pumps, etc.
- airconditioning applications (cooling only)

### Features

- very simple operation
- comfort and setback temperature adjustable
- 5 operating modes (by rotary switch) for:
  - permanent comfort temperature (5...30°C)
  - permanent setback temperature (5...30°C)
  - clock mode (automatic)
  - frost protection (5°C fixed)
  - OFF
- indicator lamps for:
  - heat demand → setback mode
  - setback mode
- available with daily or weekly timer
- control by phone remote switch possible
- output signal PWM or ON/OFF regulation (adjustable via jumper)
- relay output, 1 x changeover contact
- remote sensor optional
- emergency operation at sensor failure
- hinged cover
- new design 2000

## 2. Function description

The clock thermostat is designed to control the room temperature.

In the automatic mode, a changeover is effected between comfort and setback mode by the built in timer. Optionally remote sensor can be used instead of built-in sensor.

In setback mode the green indicator lamp lights up.

If room temperature drops below set value, heating will start, the red indicator lamp will light up.

### Indicator lamps

- Red indicates when controller demands heat,
- Green indicates when setback mode is activated.
- Red flashing for failure. Operating voltage to be switched OFF and ON again.

### Controller heat demand at PWM

If room temperature drops below the set value, heating mode will start. The controller output is in the form of pulses of varying length (PWM). The length of the pulses depends on the difference between set and actual room temperature.

The sum of pulse and pause times can be selected with J4 (between 10 or 25 min.).

If there are large temperature differences, the controller will switch ON or OFF permanent, e.g. when changing over to temperature setback mode. PWM should only be used for current  $\leq 10$  A

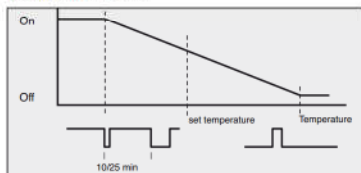


Fig. 1: Characteristic of impulse pause ratio depending on temperature

### Cycle time setting

For inert applications (e.g. burners) we recommend the long cycle time.

For quick applications (e.g. electric direct heaters) we recommend the short cycle time.

Plug-in jumper J4 (right side of board)	Time
Double-pole jumper connection	25 min (as-delivered condition)
Single-pole jumper connection	10 min

### Heat demand of the controller at ON/OFF regulation

When room temperature drops below set temperature the output will be switched on, whereas it will be switched off, when set value is exceeded.

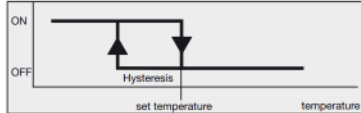


Fig. 2: ON/OFF regulation

Plug-in jumper J3 (right side of board)	Regulation
Double-pole jumper connection	ON/OFF
Single-pole jumper connection	PWM (as delivered condition)

### Phone remote switch (only available at special variants)

Via an external phone switching device the controller can be put into mode of comfort or setback temperature. As long as contact (terminal 19) is closed, the comfort temperature will be "used". This function is activated in the modes ☉ automatic, ☾ setback temperature permanent and ☼ Frostprotection.

## 3. Installation

The controller should be arranged in a place within the room which:

- is easily accessible for operation
- is free from curtains, cupboards, shelves, etc.
- enables free air circulation
- is free from direct sun radiation
- is free from draughts (e.g. opening of windows and doors)
- is not affected directly by the source of heat
- is not located on an external wall
- is located approx. 1.5 m above floor level

**Mounting directly on conduit box or with adapter frame ARA easy.**

### Electric connection

Warning! Disconnect electric circuit from supply.

Proceed as follows:

- pull off temperature setting knob
- push retaining hook outwards using screwdriver
- remove housing cover
- make connection in compliance with wiring diagram (see housing cover).
- watch notes

### Remote sensor

Having connected the remote sensor, the integral sensing component will be switched off automatically. The sensor cable is extendable up to a length of max. 50 m. Please use a two-core 230 V cable with a cross section of 1.5 mm<sup>2</sup>.

The sensor cable (F 193720) should be installed into a protection tube (pocket). This facilitates later replacement. In case of failure (break or short-circuit) the controller switches into emergency operation:

- at PWM: 30% heating capacity
- at ON/OFF: Relay OFF

**Warning! Sensor cables carry operating voltage.**

## 4. Technical data

Temperature setting range:	5...30°C
comfort temperature	5...30°C
setback temperature	5...30°C
frost protection	approx. 5°C fixed
Regulation	proportional controller (due to PWM quasi-continuous, see Fig. 1)
Cycle period	adjustable 10 or 25 min. (sum of PWM ON and OFF times)
Proportional band	1.5 K
Hysteresis	-0.5 K, $\leq 10$ A see Fig. 2
ON/OFF regulation	relay, 1 volt-free* changeover contact
Output	-2.5 K, at 16 A without remote sensor adjustable via jumper
Switching current	10 mA...16 A $\cos \varphi = 1$ max. 4 A $\cos \varphi = 0.6$ max. 10 electro-thermal actuators
Switching voltage	24...250 V AC
Mode selector switch	comfort / automatic / setback / frost protection / OFF
Phone remote switch (as variant)	Input for 230 V AC (via an external phone switching device)
Indicator lamp:	red controller demands heat
	green setback mode
Temperature sensor:	internal
Remote sensor	type F 190 021 (wall mounting) type F 193 720 length 4 m both extendable up to 50 m
Sensor characteristics	42 k $\Omega$ at 20°C 26 k $\Omega$ at 30°C
Range limitation	inside setting knob
Clock:	
accuracy	< 10 min./year
switching time setting	every 15 min. with daily timer every hour with weekly timer approx. 100 h
power reserve	
Protection class of housing	IP 30
Degree of protection	II (see Warning 1)
Ambient temperature	-10...40°C, without condensation
Storage temperature	-25...65°C
Dimensions	160 x 80 x 36 mm
Weight	approx. 220 g

\* The volt-free contact of this mains-operated unit does not ensure the requirement for the use of safety extra-low voltage (SELV).

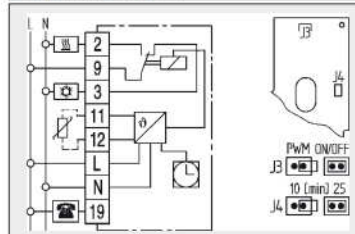
### For units with 230 V supply voltage

Type	easy 3st with daily timer easy 3sw with weekly timer
Article-Nr.	easy 3st 517 2701 51 100 easy 3sw 517 2702 51 100
Operating voltage	195...253 V AC 50/60 Hz
Power consumption	< 1.5 W

### For units with low voltage output

Type	easy 3st 1mA with daily timer easy 3sw 1mA with weekly timer
Article No.	easy 3st 1mA 517 2711 51 100 easy 3sw 1mA 517 2712 51 100
Operating voltage	195...253 V AC 50/60 Hz
Switching current	> 1 mA, > 1 V or max. 10(4) A AC
Power consumption	< 1.5 W

## 5. Wiring diagram



### Symbol explanation

- Heating
- Cooling
- Remote sensor
- Phone remote switch

### Note

#### For heating applications

- connect n/c actuators to terminal 2.
- connect n/o actuators to terminal 3.

#### For cooling applications

- connect n/c actuators to terminal 3
- connect n/o actuators to terminal 2
- To use the red lamp as indicator for "cooling ON", connect n/o actuators to terminal 2
- When mode selector switch is in OFF position ☉ n/c and n/o actuators will be closed logically.

## 6. Operation

### Temperature setting

- Comfort temperature (daytime temperature) is set by means of externally visible setting knob (1)
- Setback temperature (night temperature) is set by means of adjustment knob (2) beneath cover.

### Time setting

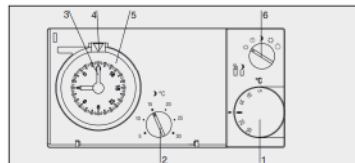
- By putting one finger on dial (3) and turning in any direction, you can set the time.
- Arrow (4) points to the selected time.

### Switching time setting

- Bring movable tappets (5) into required position using a pointed object.
  - Outer ring = comfort temperature
  - Inner ring = setback temperature

### Mode selector switch (6) - externally

- ☉ Comfort temperature, permanent
- ☼ Automatic mode, time-controlled changeover between comfort and setback temperature
- ☾ Setback temperature, permanent
- ☼ Frost protection, permanent (5°C)
- ☉ OFF, there is no control activity. The controller itself is not disconnected from operating voltage.



## Batteries

- In compliance with the EU Directive 2006/66/EC, the button cell battery located on the printed circuit board inside this product, can be removed at the end of the product life, by professional personnel only.