



**PULSER-M is an electric heating controller for controlling electric heating batteries, electric panels etc. The controller can be connected to single phase or two phase.**

- \* PULSER-M is a complete controller with built-in sensor and setpoint adjustment.
- \* Function for minimum / maximum limitation.
- \* For loads up to 3.6kW (230 V) or 6.4kW (400 V).
- \* Automatic adaption of control function, P or PI-control.
- \* Automatic adaption to connected supply voltage 200 - 415 V.
- \* Adjustable night set-back 0...10K.

## Function

PULSER-M is an electric heating controller (triac control) for single phase or two phase (200 - 415 V) electric heating. It is intended primarily for wall mounting and is connected in series between power supply and an electric heater, for example an electric heating battery or electric panel.

PULSER-M has a built-in temperature controller with input for an external main sensor and for the sensor for minimum or maximum limitation.

For controlling room temperature the built-in sensor in PULSER-M can be used as main sensor.

### Function

The controller pulses the entire power output ON/OFF. The controller utilises time-proportional control, the ratio between On-time and Off-time is varied to fit the prevailing heating requirement e.g. ON = 30 s and OFF = 30 s gives 50% output power. The cycle-time (the sum of on-time and off-time) is fixed approx 60s.

This control accuracy contributes to reduced energy costs and to the increased comfort of an even temperature. Since the current is switched by a semiconductor (triac) there are no moving parts that can wear out. The current is switched at zero phase angle, to eliminate network disturbance.

PULSER-M automatically adapts control mode to suit the dynamics of the controlled object.

### Supply air temperature control

For rapid temperature changes, PULSER-M will work as a PI-controller with a fixed proportional band of 20K and a fixed reset time of 6 minutes.

### Room temperature control

For slow temperature changes PULSER-M will work as a P-controller with a fixed proportional band of 1,5 K.

### Function for minimum/maximum limitation

The temperature in a supply air duct, for example, can be limited to a maximum set value.

### Night set-back

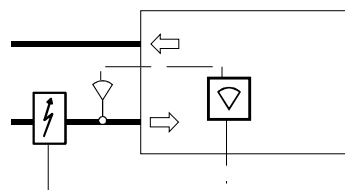
PULSER-M can, via an external time switch, provide an adjustable night set-back. On closure of the time-switch contact the PULSER-M set-point is lowered by the set value, 0...10K.

### Controlling larger electric heaters

When the electric heater is larger than the capacity of PULSER-M the load can be split and controlled by PULSER-M in combination with the ancillary unit PULSER-ADD, see separate leaflet.

## Application example

A room is heated by an electric duct-heater and the room temperature is controlled by the PULSER-M. On raising room temperature due to other heat sources, the room sensor will decrease the supply air heater. The prevent cold draughts due to low supply air temperature, the sensor in the duct will minimum limit the supply air temperature e.g. 17°C.



## Technical data

### General

Supply voltage	200... 415 V AC 50-60 Hz, single or two phase. Automatic adaption.
Power output	Maximum 16A, minimum 1A.
Ambient temperature	Maximum 30°C with no condensation. N.B. Pulsar generates 20W.
Storage temperature	-40 ... +50°C
Ambient humidity	90% RH maximum
Dimension (w x h x d)	94 x 150 x 43 mm
Form of protection	IP20



This product conforms with the requirements of European EMC standards CENELEC EN 50081-1 and EN 50082-1, European LVD standards IEC 669-1 and IEC 669-2-1 and carries the CE mark.

### Control unit parameters

Proportional band	20K, fixed (Rapid temperature changes i.e. supply air control).
Reset time	6 minutes, fixed (Rapid temperature changes i.e. supply air control).
Proportional band	1,5 K, fixed (Slow temperature change i.e. room control).
Pulse period	60 seconds, fixed
Indicator	LED that is lit when power is pulsed to the heater.

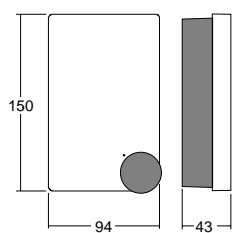
### Inputs

Sensor	Two (2) inputs for main and limiting sensor. See Section 6-100 for choice of sensor.
Setpoint	Selectable, either internal setpoint potentiometer or external setting device.

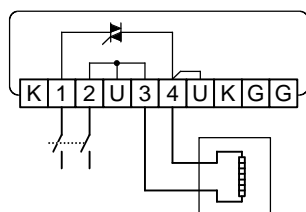
### Settings

Setpoint	0...30°C. The choice of sensor determines the controller setpoint range.
MIN/MAX limitation	Depending on connected sensor. Sensor type TG-K330 means 0...30°C.
Night set-back	0...10K

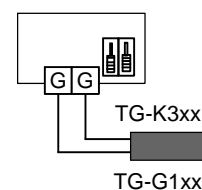
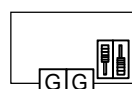
## Wiring



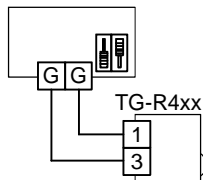
### Supply voltage and load



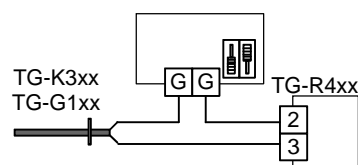
### Internal setpoint and sensor



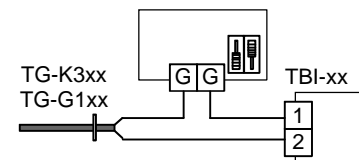
### Room control using TG-R4XX as sensor and setpoint



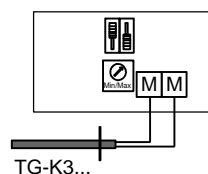
### External separate sensor and TG-R4XX as setpoint



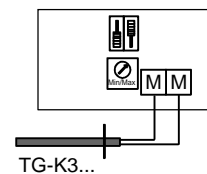
### External separate sensor and potentiometer TBI-XX as setpoint



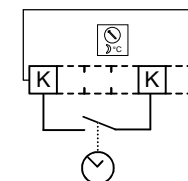
### Minimum limit sensor



### Maximum limit sensor



### Night set-back function



FOR INDOOR CLIMATE WITH OPTIMUM CONTROL

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