

Points heater Type SMAC1

Switching module for AC 230V / max. 1500 W

SMAC1

ESN

Description

The switching module is the power section of the points heater controller of the latest generation.

Each switching module controls a heating rod and monitors its function.

The switching module communicates with the superordinated controller (part No. 640100) via a three-wire bus (RS485).

The switching module consists of a power section and a control section.

The power section switches the heating rod and monitors the current through the heating rod for being above or below the set values. The heating rod is switched off if impermissible values are found.

A semiconductor switch in combination with two power relays is used as the switching element.

The control section is based on a microprocessor.

This is responsible for communication with the superordinated controller and evaluation of the switching and error states.

If there is a short circuit or a breakage, an error message is created and transmitted to the superordinated controller.

Between 1 and 99 switching modules can be operated at a superordinated controller,



whereby addresses 90-99 are reserved for special functions reserved (e.g. 230 V cabinet heating).

The current amount of current drawn is learned by the switching module with a new heating rod (initial commissioning or replacement). The warning and alarm limits are set from the value that has been taught in and then saved in non-volatile memory.

The connections for the auxiliary power supply and data bus are located in the base of the housing and contact is made via a plug system in the top hat rail during installation.

The high-voltage connections are located in the upper part of the housing and are in the form of plug-in screw terminals. The required safety clearances and distances are maintained as a result of this design.

Technical data

Dimensions	WxHxD 45x99x117 mm
Housing material	Polyamide 6.6, class V0 in accordance with UL94
Installation	Top hat rail in accordance with DIN EN 50022
IP type of protection	Housing: IP 40; connections IP: 10
Ambient temperature	-20°C to +40°C (rel. humidity 5-95%)
Connections	
Supply voltage	DC 24 V +/-10%, 50 mA, residual ripple <100 mVss
Nominal values	
Switching rated voltage	230 V AC
Max. switching current	max. 7A
Power range	<1500 W (< 7 A)
Address range	can be set by 2 rotary switches 1 - 99 (89)
Limiting values	the following values should not be exceeded
Max. overvoltage	600 V (transients)
Max. overcurrent	4500 A (transients), t<30 µs
Max. energy	150 J (transients), t<2 ms
Displays	LED displays for 1 green LED (PWR) supply voltage 1 green LED (SWT) switching state 1 red LED (ERR) error display
Fusing	16 A slow-blow
Electric strength	4 kV _{eff.}

Ordering information

Type	Part No.
SMAC1 (230 V AC)	640103
SMAC2 (400 V AC)	on request

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Status display of the switching modules

6.1 Monitoring LEDs

The monitoring LEDs mounted on the display panel have the following meanings:

- The green LED indicates a correct 5 V supply voltage. This LED flashes during the initialisation phase of the bus system until the switch module is identified by the control unit and addressed correctly.
- The yellow LED indicates the current switching state.
- The red LED signals a partial load break (slow flashing), partial cable short circuit (fast flashing), cable break (on continuously, if the module is switched on) or short circuit break (on continuously, if the module is switched off mandatorily).
- If the LED is on continuously when the green and yellow LEDs are switched off, this indicates a module error.
- Time-limited messages:
 - The three LEDs flash alternately for 2 seconds
 - The red LED flashes rapidly for 2 seconds after a failed teach-in procedure. All the other LEDs are switched off.

green LED	yellow LED	red LED	Load current (heating current) I_s related to I_{snom}	State
On*)	Off	Off	Not specified (n.a.)	Module switched off
On*)	On	On	< 12,5%	Module switched on, cable break
On	On	Flashing slowly (1,2Hz)	12,5%–50%	Module switched on, partial cable break
On*)	On	Off	50%–125%	Module switched on Normal operation
On*)	On	Flashing rapidly (5Hz)	125%–150%	Module switched on Partial overload
On*)	Off	On	> 150%	Module should be switched on but is switched off for self-protection since there is an overload / short circuit
Off	Off	On	Not specified (n.a.)	Module error
Alternately individually on / off for 2 seconds			Not specified (n.a.)	Message: teach-in procedure successful.
Off (2s)	Off (2s)	Flashing rapidly (2s)	Not specified (n.a.)	Message: teach-in procedure failed.

*) The green LED is only on when there is functioning communication with the PLC control unit if the latter is not in „manual“ operating mode. The green LED flashes (slow flashing) in „manual“ operating mode or if there is no communication.

6.2 Address setting

There are two hex coding switches on the display panel to set the address of the switching module. The switch module is addressed and parameterised with this address by the control unit. The control unit addresses two addressing areas separately when doing this.

- Address area 1: Addresses 1 to 69
- Address area 2: Addresses 70 to 79