Points heater
Type SMDC2

Switching module for 750 V DC up to 1500 W

SMDC2

Description

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

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

The switching module communicates with a storage programmable control (SPC) via three control lines. The SPC must have available one digital output and two digital inputs.

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 exceeding the upper and lower values. The heating rod is switched off if impermissible values are identified. An IGBT is used as a switching element.

The control section is based on a microcontroller. It is responsible for communication with the superordinated controller and for evaluation of the switching and error states.

In the event of a short circuit or interruption, an error message is generated and transmitted to the superordinated controller.

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

The high-voltage connections are located in the upper part of the housing and are made in the form of plug-in screw terminals.

This design allows to maintain the required safety distances.

Technical data

Dimensions	WxHxD 35x99x17 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	750 V DC +20% -30%
Nom. switching current	2A
Power range	≤1500 W
Limiting values	the following values may not be exceeded
Max. switching current	3A
Max. overvoltage	1600 V (transients)
Max. overcurrent	4500 A (transients)
Max. energy	150 J (transients)
Displays	LED displays for 1 green LED (PWR) supply voltage 1 green LED (SWT) switching state 1 red LED (ERR) error display
Electric strength	4 $kV_{eff.}$

Ordering information

Type	Part No.
SMDC2	**640102**

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Points heater Type SMDC2

1. Limiting values

(absolute maximum ratings!)

Parameter	Symbol	Maximum value	Condition	Additional description
Supply voltage	UVmax	27 V	Residual ripple<100mVSS	
Switching current	ISmax	3 A		Sustained short-circuit resistant
Continuous switching voltage	USmax	900 Vdc		
Transient voltage surge	UTMAX	1700 V		
Transient switching current	ITMAX	4500 A	t < 30 us	
Transient energy	WTMAX	150 J	t < 2 ms	
Ambient temperature	Ta(B)	40°C	rel. humidity 5-95%	During operation
Storage temperature	Ta(L)	70°C	rel. humidity 5-95%	
Digital in/outputs:Voltage level		UE/Amax	27 V	

2. Electrical data

Parameter	Symbol	Value	Condition	Additional description
Supply voltage	UV	24 Vdc	Tolerance ±10%	
Current consumption	IV	<80 mA	UV=24 Vdc	
Switching voltage	USnom	750 Vdc	Tolerance +20/-30%	
Nominal switching current	ISnom	2 A		
Power loss	PV	<7 W	US=750 Vdc	Normal operation, module switched on, IS = ISrated = 2 A
Working range 1	ILB	IS <12.5% x ISnom	Tolerance ±5%	Cable break
Working range 2	PTLBITLB	12.5% x ISnom < IS <50% x ISnom	Tolerance ±5%	Partial cable break
Working range 3	PNIN	50% x ISnom < IS <125% x ISnom	Tolerance ±5%	Normal operation
Working range 4	PTLKITLK	125% x ISnom < IS <150% x ISnom	Tolerance ±5%	Partial cable short circuit
Working range 5	PLKILK	IS > 150% x ISnom	Tolerance ±5%	Cable short circuit/overload
Short-circuit detection	TSC	<90 us	IS>6 A	Duration until short circuit is detected
Short-circuit pulsing	fSC	<0.1 Hz		Reclosing rate after short-circuit detection
Short circuit current limitat.	ISCmax	<10 A	t<TSC	Maximum current during error detection phase
Short circuit current limitat.	ISCa	0 A	t>1/fSC	Mean short circuit current
Galv. separation	kV	4 kVeff	1 s	24 V supply (Bus) for operation voltage (circuits)

3. Electrical data for the control signals

Parameter	Symbol	Value	Condition	Additional description
Input: signal level „switch off module“	UESoff	0 V ... 3 V		or blank
Input: signal level „switch on module“	UESon	6 V ... 24 V	UV=24 Vdc	
Status output: output impedance „module switched off“	RASoff	220 Ω	±10%	Measured against earth
Status output: output impedance „module switched on“	RASon	470 kΩ	±10%	Measured against earth
Error exit: output impedance „module/load error“	RFSerr	220 Ω	±10%	Measured against earth
Error exit: output impedance „no error“	RFSok	470 kΩ	±10%	Measured against earth

4. Meaning of the display LEDs

Three LEDs (red, yellow, green) are mounted on the front panel of the module. They are used to indicate various operating modes and error statuses in accordance with the table below:

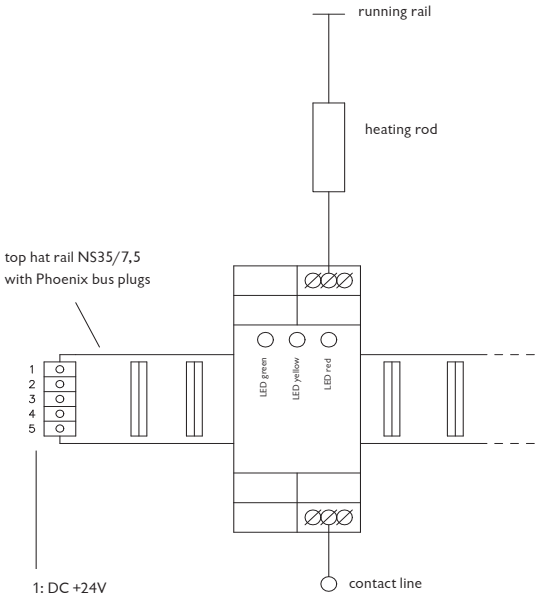
greenLED	yellowLED	redLED	Load current (heating current)IS related to ISnom	State
On	Off	Off	0%	Module switched off
On	On	On	< 12.5 %	Module switched on, cable break
On	On	Flashing slowly (1.2 Hz)	12.5% - 50%	Module switched on, partial cable break
On	On	Off	50% - 125%	Module switched on, normal operation
On	On	Flashing quickly(5 Hz)	125% - 150%	Module switched on, partial overload
On	Off	On	> 150%	Module should be switched on butis switched off for self-protectionsince there is an overload/shortcircuit
Off	Off	On	Not specified (n.a.)	Module error

5. Additional description

The error exit is activated (low-resistance) if:
- the module is operating in short-circuit or overload mode (IS > 3 A) or
- a load break has occurred (IS < 250 mA) or
- the module detects an error during the self-test. The self-test is performed cyclically while the module is switched off.

The advance malfunction warnings issued by the LEDs (partial load break or partial overload) are not evaluated as errors!
The status output indicates whether the module is switched on or off. In overload or short-circuit mode, the module always indicates the „switched off“ status, even if a command to switch on was received!

6. Pin assignment



1: DC +24V
2: GND
3: input signal »module on/off
4: output module switch status
5: output module / load-error status