Data sheet

Current monitoring relays CM-SRS.1
For single-phase AC/DC currents

The CM-SRS.1 is an electronic current monitoring relay that monitors single-phase mains (DC or AC) for over- and undercurrent from 3 mA to 15 A.

All devices are available with two different terminal versions. You can choose between the proven screw connection technology (double-chamber cage connecting terminals) and the completely tool-free Easy Connect Technology (push-in terminals).

Characteristics

- Monitoring of DC and AC currents (3 mA to 15 A)
- TRMS measuring principle
- One device includes 3 measuring ranges
- Over- or undercurrent monitoring configurable
- Hysteresis adjustable (3-30 %)
- 3 control supply voltage versions
- Precise adjustment by front-face operating controls
- Screw connection technology or Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 1 c/o (SPDT) contact
- 22.5 mm (0.89 in) width
- 3 LEDs for status indication

Approvals / Marks

Classifcations:

EN 50155, IEC 60571, NF F 16-101/102, EN 45545-2

EN 50155, IEC 60571

Temp. class	Voltage supply				Vibration and shock acc to IEC/EN 61373	Coated pcb.
	S1	S2	C1	C2		
T3	■	■	■	-	Cat 1, Class B	no

NF F 16-101/102		EN 45545-2
Flammability index	Opticity and toxicity of smoke index	Risk level achieved
I2	F2	HL3

Order data

Current monitoring relays

Type	Rated control supply voltage	Connection technology	Measuring ranges	Order code
CM-SRS.11P	24-240 V AC/DC	Push-in terminals	3-30 mA, 10-100 mA, 0.1-1 A	1SVR740840R0200
	110-130 V AC			1SVR740841R0200
	220-240 V AC			1SVR740841R1200
CM-SRS.11S	24-240 V AC/DC	Screw type terminals	3-30 mA, 10-100 mA, 0.1-1 A	1SVR730840R0200
	110-130 V AC			1SVR730841R0200
	220-240 V AC			1SVR730841R1200
CM-SRS.12S	24-240 V AC/DC	Screw type terminals	0.3-1.5 A, 1-5 A, 3-15 A	1SVR730840R0300
	110-130 V AC			1SVR730841R0300
	220-240 V AC			1SVR730841R1300

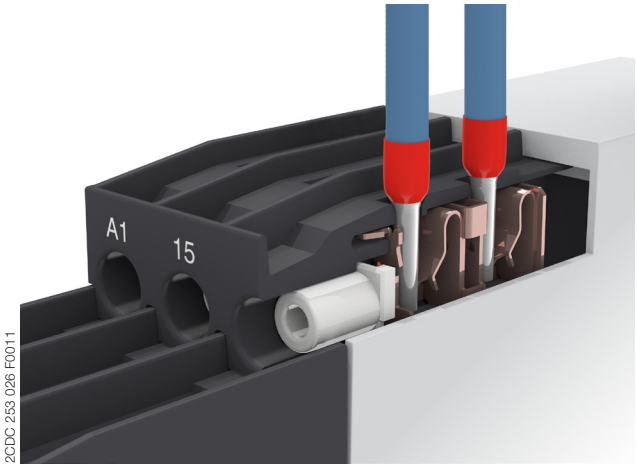
Accessories

Type	Description	Order code
ADP.01	Adapter for screw mounting	1SVR430029R0100
MAR.12	Marker label for devices with DIP switches	1SVR730006R0000
COV.11	Sealable transparent cover	1SVR730005R0100

Connection technology

Maintenance free Easy Connect Technology with push-in terminals

Type designation CM-xxS.yyP



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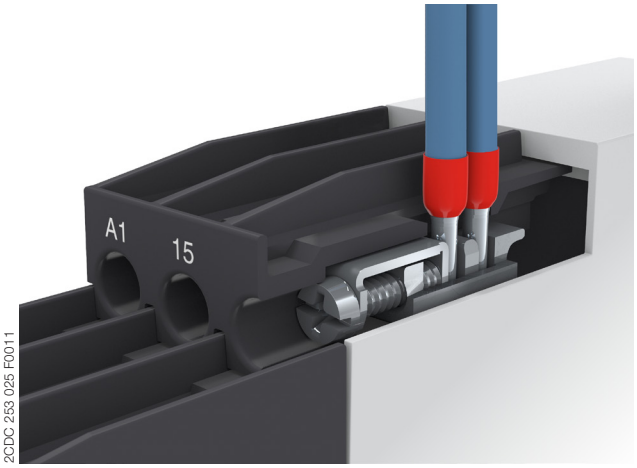
Push-in terminals

- Tool-free connection of rigid and flexible wires with wire end ferrule
- Easy connection of flexible wires without wire end ferrule by opening the terminals
- No retightening necessary
- One operation lever for opening both connecting terminals
- For triggering the lever and disconnecting of wires you can use the same tool (Screwdriver according to DIN ISO 2380-1 Form A 0.8 x 4 mm (0.0315 x 0.157 in), DIN ISO 8764-1 PZ1 ø 4.5 mm (0.177 in))
- Constant spring force on terminal point independent of the applied wire type, wire size or ambient conditions (e. g. vibrations or temperature changes)
- Opening for testing the electrical contacting
- Gas-tight

Approved screw connection technology with double-chamber cage connecting terminals

Type designation CM-xxS.yyS



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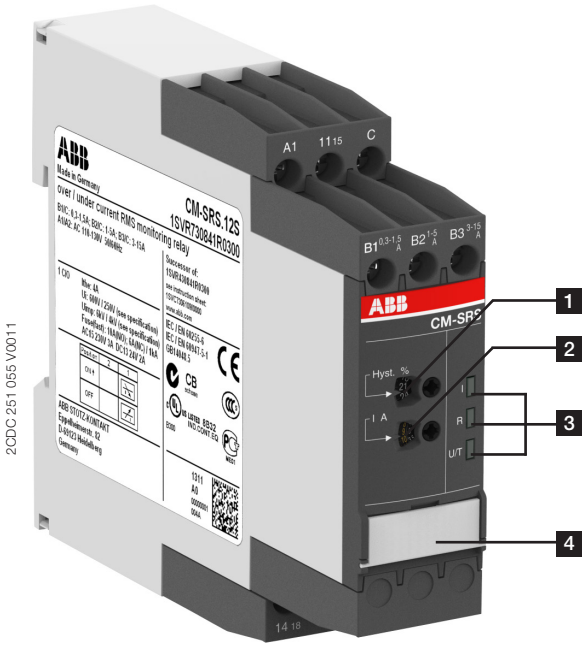
Double-chamber cage connecting terminals

- Terminal spaces for different wire sizes
- One screw for opening and closing of both cages
- Pozidrive screws for pan- or crosshead screwdrivers according to DIN ISO 2380-1 Form A 0.8 x 4 mm (0.0315 x 0.157 in), DIN ISO 8764-1 PZ1 ø 4.5 mm (0.177 in)

Both the Easy Connect Technology with push-in terminals and screw connection technology with double-chamber cage connecting terminals have the same connection geometry as well as terminal position.

Functions

Operating controls



1 **Adjustment of the hysteresis (MIN = Default)**

2 **Adjustment of the threshold value (MIN = Default)**

3 **Indication of operational states**

U/T: green LED – control supply voltage

R: yellow LED – relay status

I: red LED – over- / undercurrent

4 **DIP switches (see DIP switch functions)**

Application

The current monitoring relays CM-SRS.1 are designed for use in single-phase AC and/or DC systems for over- or undercurrent monitoring. The devices are available with different supply voltage ranges and work according to the open-circuit principle.

Operating mode

The CM-SRS.1 with 1 c/o (SPDT) contact are available in 2 versions with 3 measuring ranges: 3-30 mA, 10-100 mA, 0.1-1 A (CM-SRS.11) and 0.3-1.5 A, 1-5 A, 3-15 A (CM-SRS.12). The measuring range is selected by connecting the monitored wire to the corresponding terminal B1/B2/B3-C.

The units are adjusted with front-face operating controls. The selection of over- or undercurrent monitoring is made with a DIP switch. Potentiometers, with direct reading scale, allow the adjustment of the threshold value I and of the hysteresis %. The hysteresis % is adjustable within a range of 3 to 30 % of the threshold value.

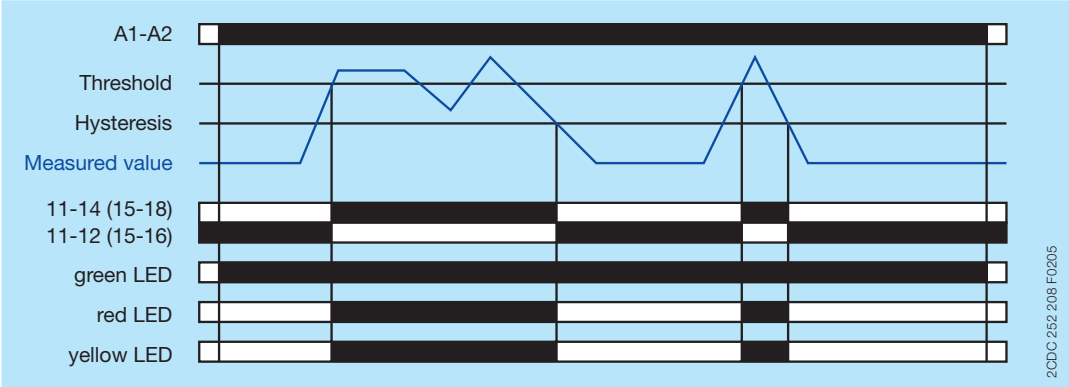
Function diagrams

Overcurrent monitoring

The current to be monitored (measured value) is applied to terminals B1/B2/B3-C. The control supply voltage applied to terminals A1-A2 is displayed by the glowing green LED.

If the measured value exceeds the adjusted threshold value, the output relay energizes and the red LED (overcurrent) and the yellow LED (relay energized) glow.

If the measured value drops below the threshold value minus the adjusted hysteresis, the output relay de-energizes and the red and yellow LEDs turn off.

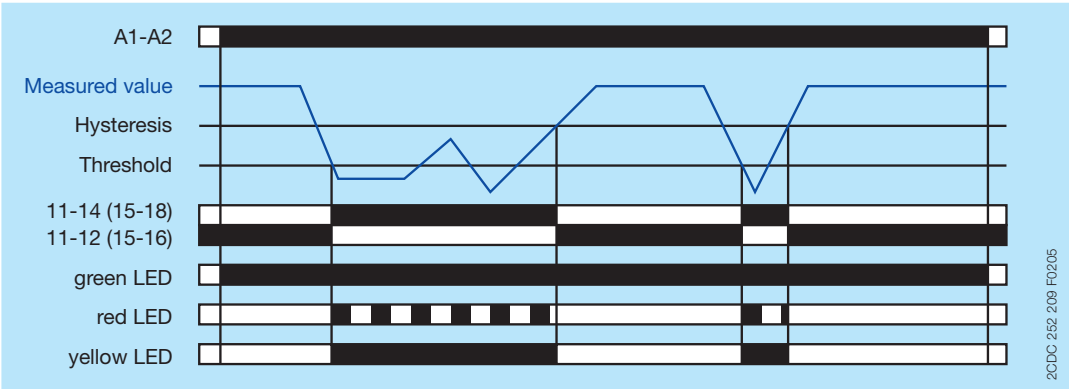


Undercurrent monitoring

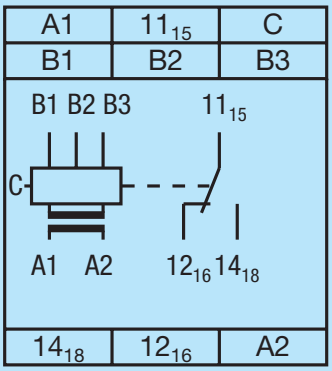
The current to be monitored (measured value) is applied to terminals B1/B2/B3-C. The control supply voltage applied to terminals A1-A2 is displayed by the glowing green LED.

If the measured value drops below the adjusted threshold value, the output relay energizes, the red LED flashes (undercurrent) and the yellow LED (relay energized) glows.

If the measured value exceeds the threshold value plus the adjusted hysteresis, the output relay de-energizes and the red and yellow LEDs turn off.



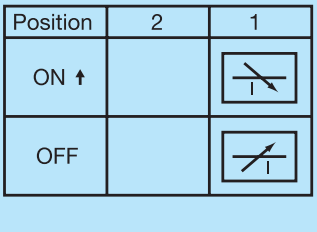
Electrical connection



Connection diagram

A1-A2	Rated control supply voltage
B1-C	Measuring range 1: CM-SRS.11: 3-30 mA CM-SRS.12: 0.3-1.5 A
B2-C	Measuring range 2: CM-SRS.11: 10-100 mA CM-SRS.12: 1-5 A
B3-C	Measuring range 3: CM-SRS.21: 0.1-1 A CM-SRS.21: 3-15 A
11_{15}-12_{16}/14_{18}	Output contact - open-circuit principle

DIP switches



1	ON Undercurrent monitoring OFF Overcurrent monitoring

OFF = Default

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

Input circuits

Supply circuit		**A1-A2**		
Rated control supply voltage U_s		110-130 V AC	220-240 V AC	24-240 V AC/DC
Rated control supply voltage U_s tolerance		-15...+10 %		
Rated frequency		50/60 Hz		50/60 Hz or DC
Typical current / power consumption	24 V DC	-	-	30 mA / 0.75 W
	115 V AC	24 mA / 2.6 VA	-	17 mA / 1.9 VA
	230 V AC	-	12 mA / 2.6 VA	11 mA / 2.6 VA
Power failure buffering time		20 ms		
Transient overvoltage protection		varistors		

Measuring circuit		**B1/B2/B3-C**					
Monitoring function		over- or undercurrent monitoring configurable					
Measuring method		TRMS measuring principle					
Measuring inputs		CM-SRS.11			CM-SRS.12[1)]		
	terminal connection	B1-C	B2-C	B3-C	B1-C	B2-C	B3-C
	measuring range	3-30 mA	10-100 mA	0.1-1 A	0.3-1.5 A	1-5 A	3-15 A
	input resistance	3.3 Ω	1 Ω	0.1 Ω	0.05 Ω	0.01 Ω	0.0025 Ω
	pulse overload capacity t < 1 s	500 mA	1 A	10 A	15 A	50 A	100 A
	continuous capacity	50 mA	150 mA	1.5 A	2 A	7 A	17 A
Threshold value		adjustable within the indicated measuring range					
Tolerance of the adjusted threshold value		10 % of the range end value					
Hysteresis related to the threshold value		3-30 % adjustable					
Measuring signal frequency range		DC / 15 Hz - 2 kHz					
Rated measuring signal frequency range		DC / 50-60 Hz					
Maximum response time	AC	80 ms					
	DC	120 ms					
Accuracy within the rated control supply voltage tolerance		ΔU ≤ 0.5 %					
Accuracy within the temperature range		ΔU ≤ 0.06 % / °C					

Timing circuit	
Time delay T_V	none
Repeat accuracy (constant parameters)	±0.07 % of full scale

User interface

Indication of operational states		
Control supply voltage	U/T: green LED	⎍: control supply voltage applied
Measured value	I: red LED	⎍: overcurrent ⎍⎍: undercurrent
Relay status	R: yellow LED	⎍: output relay energized

[1)] For usage of the current monitoring relays according to UL, following limitations for the measuring circuits are applicable: The load on any single measuring circuit should not exceed 15 A at 51-150 V, 10 A at 151-300 V or 5 A at 301-600 V.
This limitation is only valid for application according to UL and not for IEC applications.

Output circuits

Kind of output	11_{15}-12_{16}/14_{18}	relay, 1 c/o (SPDT) contact
Operating principle		open-circuit principle (output relay energizes if the measured value exceeds ◪ / falls below ◪ the adjusted threshold value)
Contact material		AgNi
Rated operational voltage U_e		250 V
Minimum switching voltage / Minimum switching current		24 V / 10 mA
Maximum switching voltage / Maximum switching current		250 V AC / 4 A AC
Rated operational current I_e	AC-12 (resistive) at 230 V	4 A
	AC-15 (inductive) at 230 V	3 A
	DC-12 (resistive) at 24 V	4 A
	DC-13 (inductive) at 24 V	2 A
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300
	max. rated operational voltage	300 V AC
	max. continuous thermal current at B 300	5 A
	max. making/breaking apparent power at B 300	3600/360 VA
Mechanical lifetime		30 x 10^6 switching cycles
Electrical lifetime	AC-12, 230 V, 4 A	0.1 x 10^6 switching cycles
Maximum fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting
	n/o contact	10 A fast-acting

General data

MTBF				on request	
Duty time				100 %	
Dimensions (W x H x D)			product dimensions	22,5 x 85,6 x 103,7 mm (0,89 x 3,37 x 4,08 in)	
			packaging dimensions	97 x 109 x 30 mm (3,82 x 4,29 x 1,18 in)	
Weight				**Screw connection technology**	**Easy Connect Technology (Push-in)**
	net weight	CM-SRS.11	Version 24-240 V AC/DC	0.145 kg (0.320 lb)	0.137 kg (0.302 lb)
			Version 110-130 V AC	0.161 kg (0.355 lb)	0.153 kg (0.337 lb)
			Version 220-240 V AC	0.161 kg (0.355 lb)	0.153 kg (0.337 lb)
		CM-SRS.12	Version 24-240 V AC/DC	0.137 kg (0.302 lb)	-
			Version 110-130 V AC	0.168 kg (0.370 lb)	-
			Version 220-240 V AC	0.168 kg (0.370 lb)	-
	gross weight	CM-SRS.11	Version 24-240 V AC/DC	0.147 kg (0.324 lb)	0.159 kg (0.351 lb)
			Version 110-130 V AC	0.183 kg (0.403 lb)	0.175 kg (0.386 lb)
			Version 220-240 V AC	0.183 kg (0.403 lb)	0.175 kg (0.386 lb)
		CM-SRS.12	Version 24-240 V AC/DC	0.159 kg (0.351 lb)	-
			Version 110-130 V AC	0.200 kg (0.441 lb)	-
			Version 220-240 V AC	0.200 kg (0.441 lb)	-
Mounting				DIN rail (IEC/EN 60715), snap-on mounting without any tool	
Mounting position				any	
Minimum distance to other units				10 mm (0.39 in) at measured current > 10 A	
Material of housing				UL 94 V-0	
Degree of protection			housing	IP50	
			terminals	IP20	

Electrical connection

		Screw connection technology	Easy Connect Technology (Push-in)
Connecting capacity	fine-strand with(out) wire end ferrule	1 x 0.5-2.5 mm² (1 x 18-14 AWG) 2 x 0.5-1.5 mm² (2 x 18-16 AWG)	2 x 0.5-1.5 mm² (2 x 18-16 AWG)
	rigid	1 x 0.5-4 mm² (1 x 20-12 AWG) 2 x 0.5-2.5 mm² (2 x 20-14 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	
Tightening torque		0.6 - 0.8 Nm (7.08 lb.in)	-

Environmental data

Ambient temperature ranges	operation	-25...+60 °C (-13...+140 °F)
	storage	-40...+85 °C (-40...+185 °F)
Damp heat, cyclic (IEC/EN 60068-2-30)		55 °C, 6 cycles
Vibration, sinusoidal		Class 2
Shock		Class 2

Isolation data

Rated insulation voltage U_i	supply / measuring circuit / output	600 V
	output 1 / output 2	250 V
Rated impulse withstand voltage U_{imp}	supply / measuring circuit / output	6 kV 1.2/50 µs
	output 1 / output 2	4 kV 1.2/50 µs
Pollution degree		3
Overvoltage category		III

Standards / Directives

Standards	IEC/EN 60947-5-1, IEC/EN 60255-27, EN 50178
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

Railway application standards

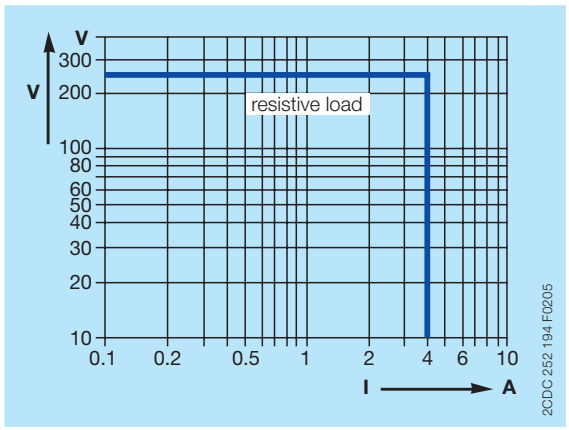
EN 50155, IEC 60571 “Railway applications – Electronic equipment used on rolling stock”	temperature class	T3
	supply voltage category	S1, S2, C1
IEC/EN 61373 “Railway applications – Rolling stock equipment – Shock and vibration tests”		Category 1, Class B
EN 45545-2 Railway applications – Fire protection on railway vehicles – part 2: Requirements for fire behavior of materials and components		HL3
	ISO 4589-2	LOI 32.3 %
	NF X-70-100-1	C.I.T. (T12) 0.45
	EN ISO 5659-2	Ds max (T10.03) 104
NF F 16-101: Rolling stock. Fire behaviour. Materials choosing NF F 16-102: Railway rolling stock. Fire behaviour. Materials choosing, application for electric equipment		I2 / F2
DIN 5510-2 Preventive fire protection in railway vehicles. Part 2: Fire behaviour and fire side effects of materials and parts		fullfilled

Electromagnetic compatibility

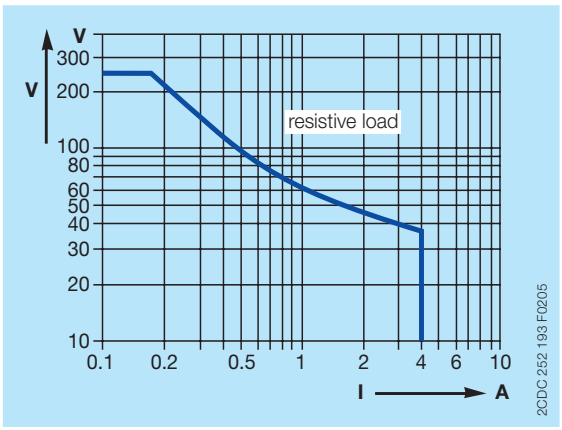
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3
surge	IEC/EN 61000-4-5	Level 3
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3
Interference emission		IEC/EN 61000-6-3
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B

Technical diagrams

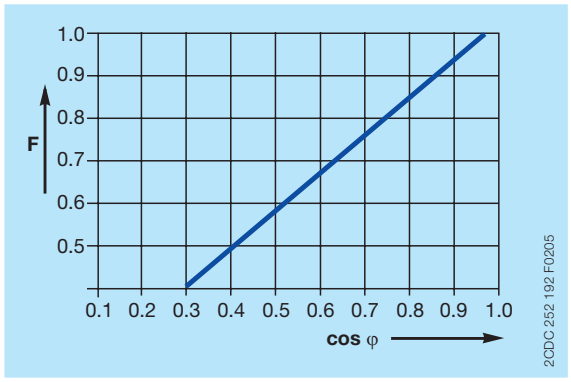
Load limit curves



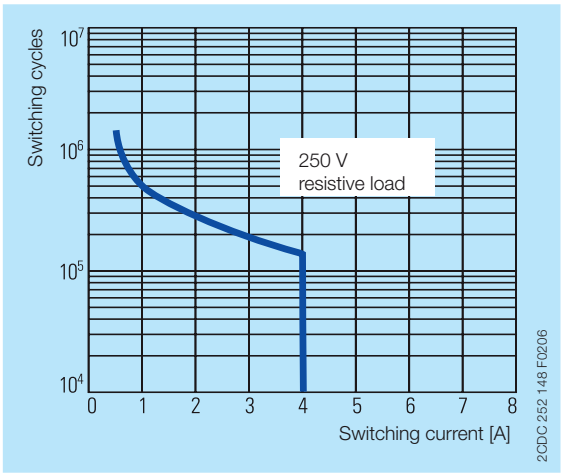
AC load (resistive)



DC load (resistive)



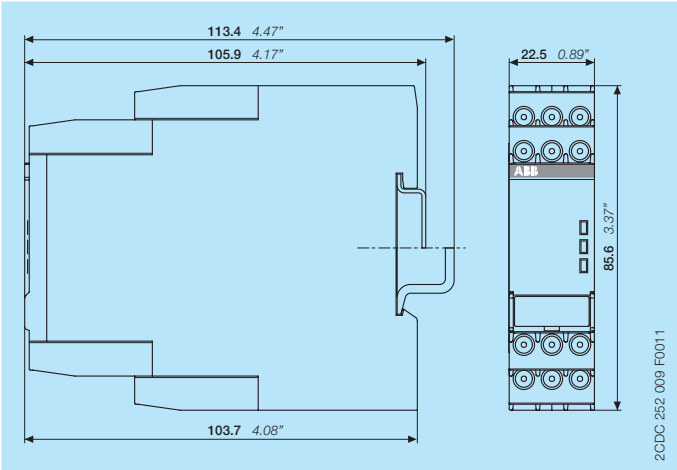
Derating factor F for inductive AC load



Contact lifetime

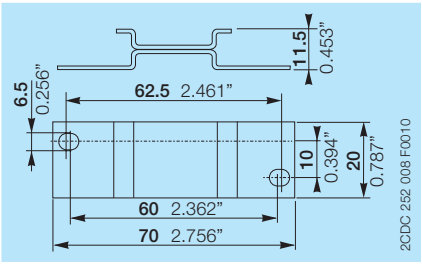
Dimensions

in **mm** and inches

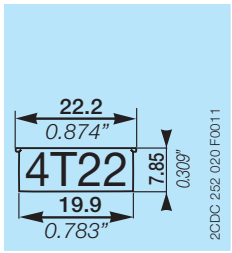


Accessories

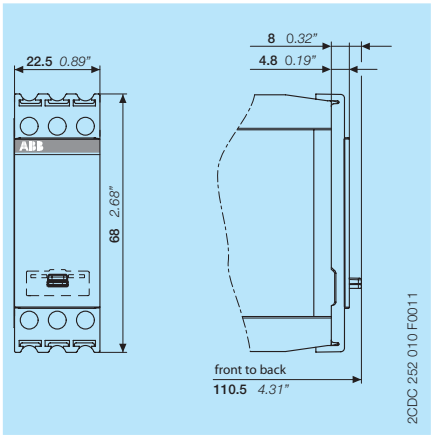
in **mm** and inches



ADP.01 - Adapter for screw mounting



MAR.12 - Marker label for devices with DIP switches



COV.11 - Sealable transparent cover

Further documentation

Document title	Document type	Document number
Electronic products and relays	Technical catalogue	2CDC 110 004 C02xx
CM-SRS.1, CM-SRS.2	Instruction manual	1SVC 730 610 M0000

You can find the documentation on the internet at www.abb.com/lowvoltage
-> Automation, control and protection -> Electronic relays and controls -> Measuring and monitoring relays.

CAD system files

You can find the CAD files for CAD systems at http://abb-control-products.partcommunity.com
-> Low Voltage Products & Systems -> Control Products -> Electronic Relays and Controls.

Contact us

ABB STOTZ-KONTAKT GmbH
P. O. Box 10 16 80
69006 Heidelberg, Germany
Phone: +49 (0) 6221 7 01-0
Fax: +49 (0) 6221 7 01-13 25
E-mail: info.desto@de.abb.com

You can find the address of your
local sales organisation on the
ABB home page
http://www.abb.com/contacts
-> Low Voltage Products and Systems

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