Data sheet

Measuring and monitoring relays CM-MSS (4), CM-MSS (5)

Thermistor motor protection relays

The devices CM-MSS (4) and (5) are used to monitor the overload of motors by the wiring temperature. The motors have to be fitted with PTC sensors.

2CDC 251 077 F0007

2CDC 251 047 F0004

Features

- One sensor circuit with short-circuit monitoring
- Continuous voltage range: 24-240 V AC/DC
- Non-volatile fault storage configurable
- Reset/test button
- Remote reset
- Automatic reset configurable
- Output contacts
  - CM-MSS (4): 1 n/o, 1 n/c
  - CM-MSS (5): 2 c/o
- 2 LEDs for status indication

Approvals

CM-MSS (4)

- UL 508, CAN/CSA C22.2 No.14
- GL
- II (2) G D, PTB 02 ATEX 3080
- GOST
- RMRS

CM-MSS (5)

- UL 508, CAN/CSA C22.2 No.14 pending
- GL
- GOST
- RMRS

Marks

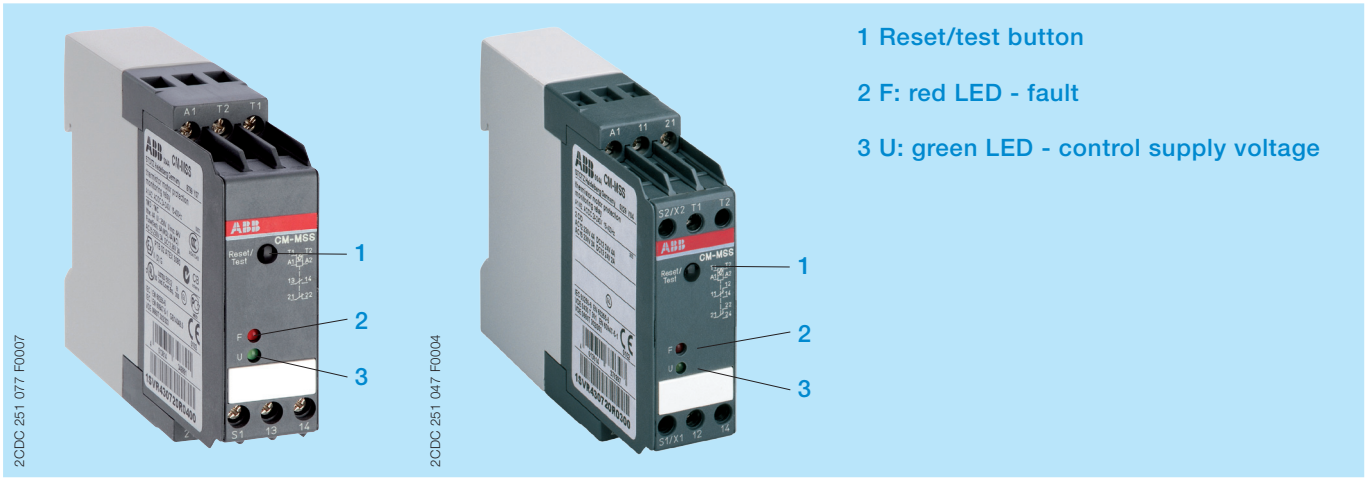
- CE
- C-Tick

Order data

Type	Rated control supply voltage	Output contacts	Order code
CM-MSS (4)	24-240 V AC/DC	1 n/o, 1 n/c	1SVR 430 720 R0400
CM-MSS (5)	24-240 V AC/DC	2 c/o	1SVR 430 720 R0300

Functions

Operating controls



1 Reset/test button

2 F: red LED - fault

3 U: green LED - control supply voltage

Application

The devices CM-MSS (4) and (5) are used to monitor the overload of motors by the wiring temperature. The motors have to be fitted with PTC sensors.

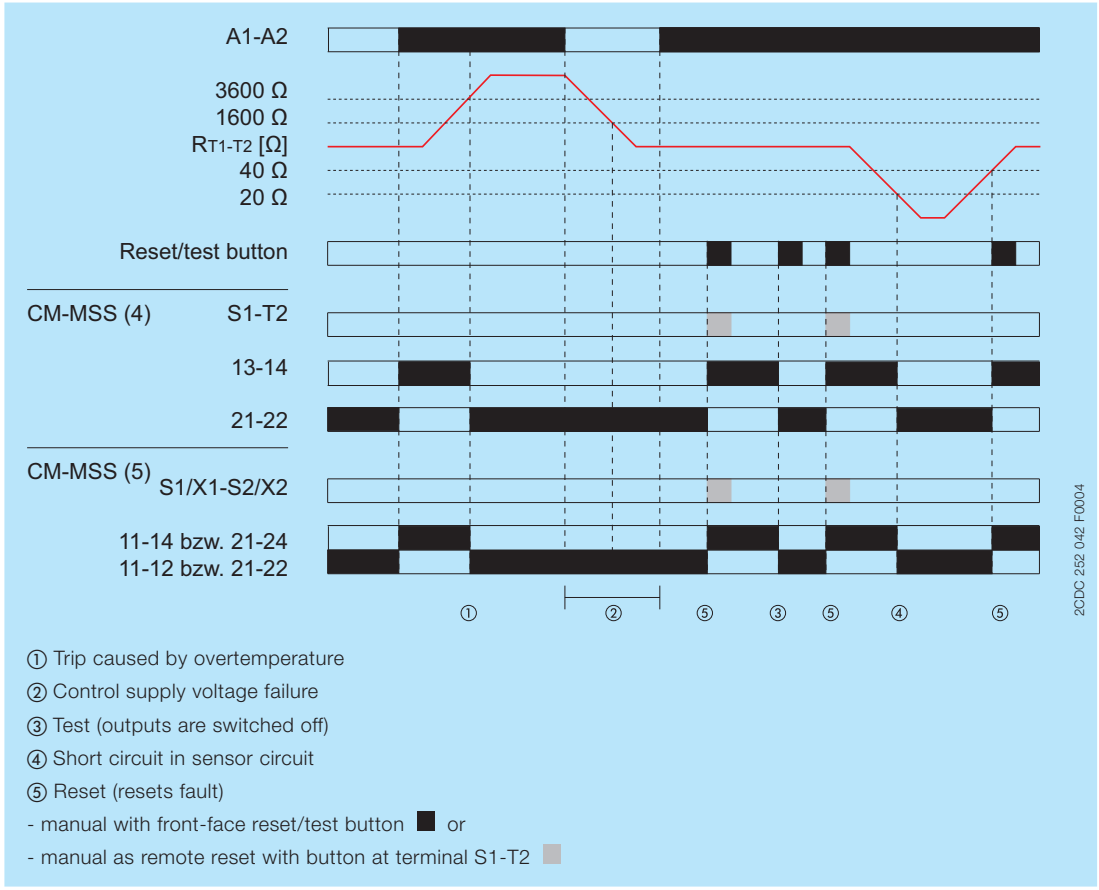
Operating mode

If the motor heats-up excessively (sensor resistance > 3600 Ω) the output relays de-energize and the red LED displays the overtemperature. Wire interruption or a short circuit within the sensor circuit (sensor resistance < 20 Ω) will also cause a disconnection of the output relays and the red LED flashes.

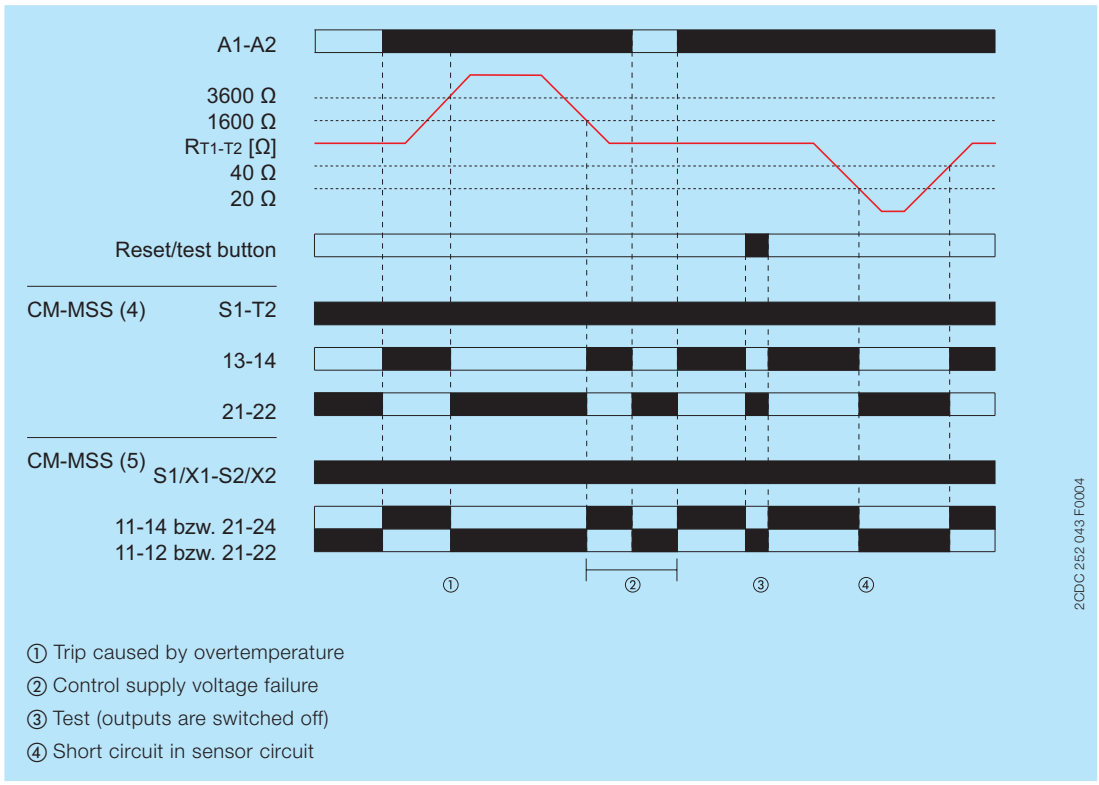
A fault reset is only possible after the cooling down of the motor (sensor resistance < 1600 Ω) or after the wire interruption or the short circuit within the sensor circuit has been removed (sensor resistance > 40 Ω). The reset can be made by operating the front-face reset/test button.

By terminal assignment remote reset (= non-volatile fault storage) or auto reset can be configured. Details see "Example of application" on page 4.

Function diagrams



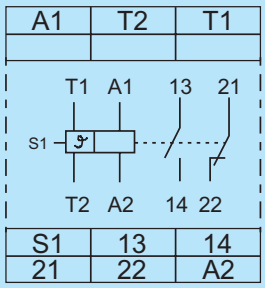
Manual or remote reset (= non-volatile fault storage)



Auto reset (= no fault storage)

Connection and wiring

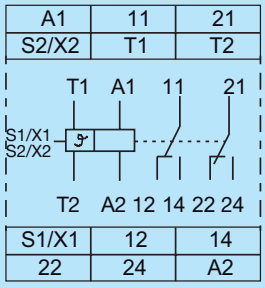
Position of connection terminals



2CDC 252 016 F0004-a

A1-A2	Control supply voltage
T1-T2	Thermistor connection
S1-T2	Reset input
13-14 21-22	1 n/o, 1 n/c - closed-circuit principle

CM-MSS (4)

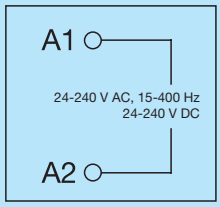


2CDC 252 147 F0b06

A1-A2	Control supply voltage
T1-T2	Thermistor connection
S1/X1-S2/X2	Reset input
11-12/14 21-22/24	2 c/o - closed-circuit principle

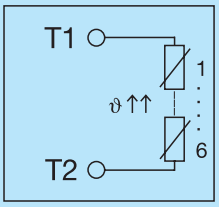
CM-MSS (5)

Example of application



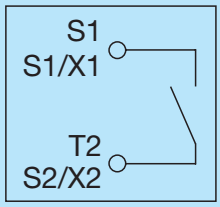
2CDC 252 073 F0003-a

Connection of the control supply voltage



2CDC 252 003 F0004-a

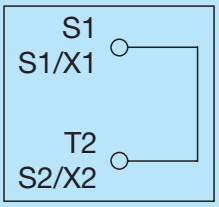
Sensor circuit, Thermistor connection



2CDC 252 074 F0003-a

(= non-volatile fault storage)
CM-MSS (4): S1-T2
CM-MSS (5): S1/X1-S2/X2

Remote reset



2CDC 252 075 F0003-a

(= no fault storage)
CM-MSS (4): S1-T2
CM-MSS (5): S1/X1-S2/X2

Auto reset

Technical data

Input circuit		A1-A2
Rated control supply voltage U_S - power consumption	A1-A2	24-240 V AC/DC - ca. 1.7 W or 3.5 VA
Rated control supply voltage tolerance		-15...+10 %
Rated frequency		15-400 Hz
Duty time		100 %

Measuring circuit - Sensor circuit		T1-T2
Monitoring function		Temperature monitoring by means of PTC sensor
Number of sensor circuits		1
Short-circuit monitoring		yes
Non-volatile fault storage		yes
Reset/test function		yes
Temperature	switch-off resistance (relays de-energize)	3600 Ω ±5 %
	switch-on resistance (relays energize)	1600 Ω ±5 %
Short circuit	switch-off resistance (relays de-energize)	< 20 Ω
	switch-on resistance (relays energize)	> 40 Ω
Max. total resistance of sensors connected in series cold states		≤ 1500 Ω
Max. sensor cable length	0.75 mm²	2 x 100 m
for short-circuit detection	2.5 mm²	2 x 400 m
Response time		< 100 ms

Control circuit - Reset function		S1-T2 or S1/X1-S2/X2
Remote reset		1 n/o
Max. no-load voltage		ca. 5.5 V
Max. cable length	unshielded	≤ 50 m
	shielded	100-200 m

Indication of operating states		
Control supply voltage		U: green LED
Fault message	output relays de-energized	F: red LED

Output circuits		13-14, 21-22 bzw. 11-12/14, 21-22/24
Kind of output	CM-MSS (4)	Relay: 1 n/o, 1 n/c
	CM-MSS (5)	Relay: 2 c/o
Operating principle	output relays de-energize in case of fault	closed-circuit principle
Contact material		Cd-free, AgNi alloy
Rated voltage	VDE 0110, IEC 664-1, IEC 60947-1	250 V
Min. switching voltage / min. switching current		- / -
Max. switching voltage		250 V AC
Rated operational current I_e	AC12 (resistive) at 230 V	4 A
(IEC/EN 60947-5-1)	AC15 (inductive) at 230 V	3 A
	DC12 (resistive) at 24 V	4 A
	DC13 (inductive) at 24 V	2 A
AC rating	Utilization category (Control Circuit Rating Code)	B 300
(UL 508)	max. rated operational voltage	300 V AC
	max. continuous therminal 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	AC12, 230 V, 4 A	0.1 x 10^6 switching cycles
Max. fuse rating to achieve short-	n/c contact	4 A fast-acting
circuit protection	n/o contact	6 A fast-acting

General data		
Dimensions (W x H x D)		22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 in)
Weight		0.150 kg (0.33 lb)
Mounting		DIN rail (IEC/EN 60715)
Mounting position		any
Degree of protection	enclosure / terminal	IP50 / IP20

Electrical connection		
Wire size	fine-strand with(out) wire end ferrule	2 x 0.75-2.5 mm² (2 x 18-14 AWG)
	rigid	2 x 0.5-4 mm² (2 x 20-12 AWG)
Stripping length		7 mm (0.28 in)
Tightening torque		0.6-0.8 Nm (5.31-7.08 lb.in)

Environmental data		
Ambient temperature ranges	operation	-20...+60 °C
	storage	-40...+85 °C
Operational reliability	IEC/EN 60068-2-6	4 g
Mechanical shock resistance	IEC/EN 60068-2-6	6 g
Environmental tests	IEC/EN 60068-2-30	24 h cycle, 55 °C, 93 % rel., 96 h

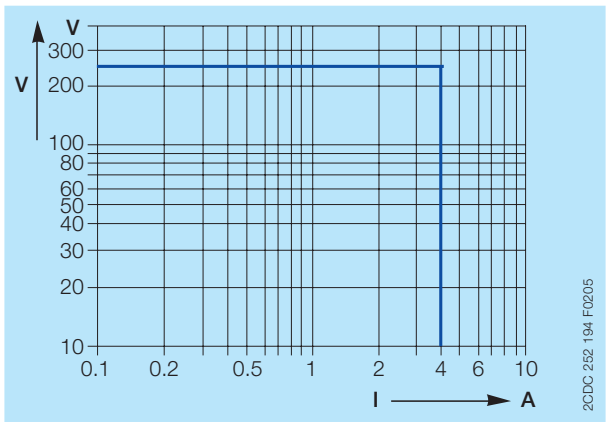
Isolation data	
Rated insulation voltage between all isolated circuits (VDE 0110-1, IEC/EN 60947-1)	250 V
Rated impulse withstand voltage U_{imp} between all isolated circuits (VDE 0110-1, IEC 664)	4 kV / 1.2-50 µs
Test voltage between all isolated circuits, routine test (IEC/EN 60255-5, IEC/EN 61010-1)	2.5 kV, 50 Hz, 1 min
Pollution degree (VDE 0110, IEC 664, IEC 255-5)	3
Overvoltage category (VDE 0110, IEC 664, IEC 255-5)	III

Standards / directives	
Product standard	IEC/EN 60255-6
Low Voltage Directive	2006/95/EC
EMC Directive	2004/108/EC

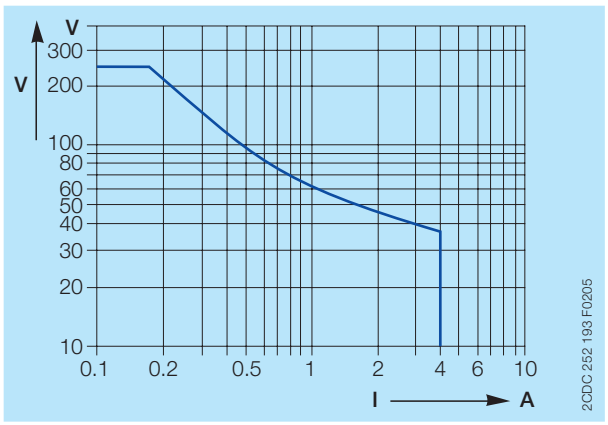
Electromagnetic compatibility		
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3, 6 kV / 8 kV
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3, 10 V/m
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3, 2 kV / 5 kHz
surge	IEC/EN 61000-4-5	Level 3, installation class 3, supply circuit and measuring circuit 1 kV or 2 kV
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3, 10 V
Interference emission		IEC/EN 61000-6-4

Technical diagrams

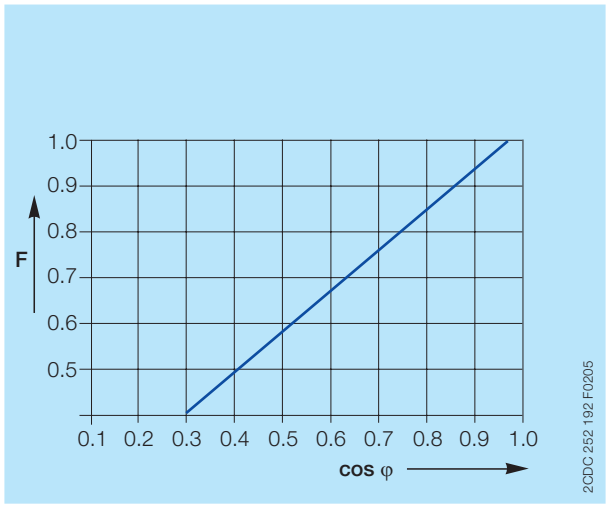
Load limit curves



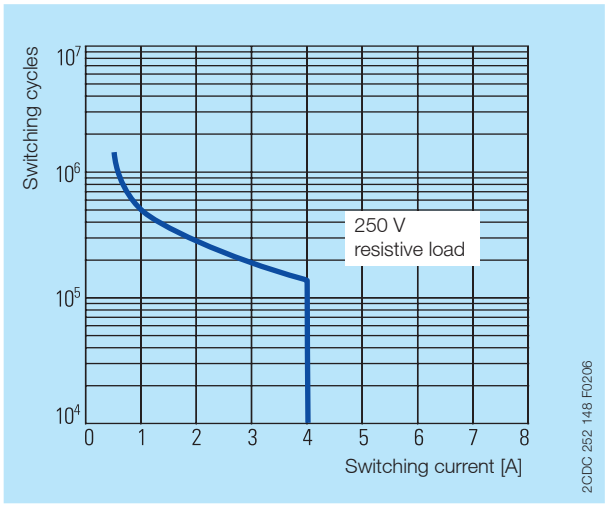
AC load (resistive)



DC load (resistive)



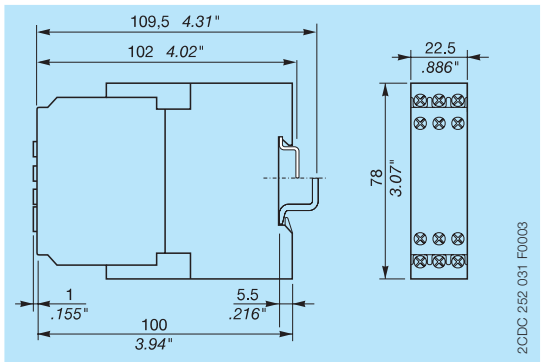
Reduction factor F for inductive AC load



Contact life time / number of operations N
220 V 50 Hz 1 AC, 360 operations/h

Dimensions

in **mm** and *inches*



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