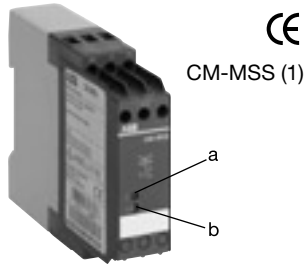


Thermistor Motor Protection Relays

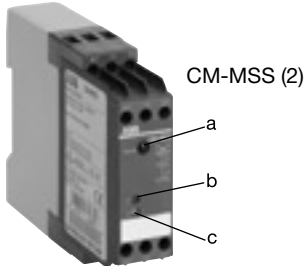
CM-MSS Single Sensor Circuit

Relay Output



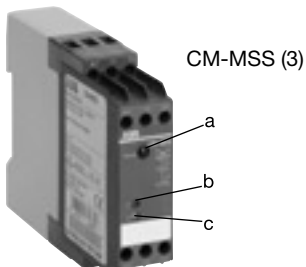
CM-MSS (1)

- a F: red LED - fault tripping
- b U: green LED - supply voltage
- Automatic reset
- Connection of several sensors
- Monitoring of bimetals
- SPDT contact
- 2 LEDs for status indication



CM-MSS (2)

- a Reset button
- b F: red LED - fault tripping
- c U: green LED - supply voltage
- Selectable fault memory
- Reset button
- Remote reset
- DPDT contacts
- 2 LEDs for status indication



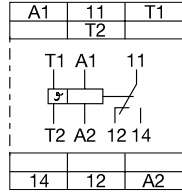
CM-MSS (3)

- a Reset button
- b F: red LED - fault tripping
- c U: green LED - supply voltage
- Selectable fault memory
- Memory reset button
- Remote reset
- Short-circuit monitoring of the sensor circuit selectable
- DPDT contacts
- 2 LEDs for status indication
- ATEX approved (Ex) II (2) G, PTB 02 ATEX 3080

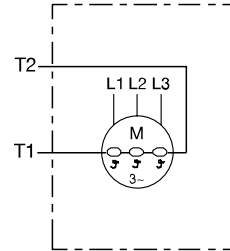
Approvals: c us LISTED

CM-MSS, SPDT output with automatic reset

Connection CM-MSS (1)



- A1-A2 Supply voltage
- T1-T2 Sensor circuit
- 11-12/14 Output contact - Normally energized

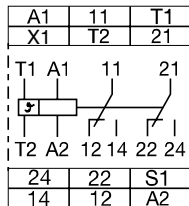


Ordering Table

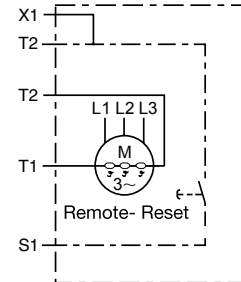
Type	Supply voltage	Part number
CM-MSS (1)	24 V AC/DC	1SVR 430 800 R 9100
	220...240 V AC	1SVR 430 801 R 1100

CM-MSS, DPDT output with reset button

Connection CM-MSS (2)



- A1-A2 Supply voltage
- T1-T2 Sensor circuit
- S1-T2 Remote reset
- X1-T2 Jumper = no memory
- 11-12/14 Output contacts - Normally energized
- 21-22/24



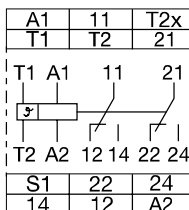
Ordering Table

Type	Supply voltage	Part number
CM-MSS (2)	24 V AC/DC ¹⁾	1SVR 430 810 R 9300
	24 V AC	1SVR 430 811 R 9300
	110...130 V AC	1SVR 430 811 R 0300
	220...240 V AC	1SVR 430 811 R 1300

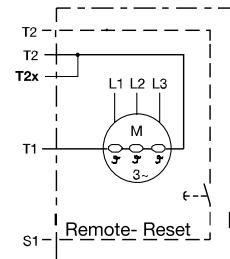
¹⁾ not electrically isolated

CM-MSS, DPDT contacts with reset button and selectable short-circuit monitoring

Connection CM-MSS (3)



- A1-A2 Supply voltage
- 11-12/14 Output contacts - Normally energized
- 21-22/24
- S1-T2 remote reset = no memory
- T1-T2x measuring circuit without short-circuit monitoring
- T1-T2 measuring circuit with short-circuit monitoring



Ordering Table

Type	Supply voltage	Part number
CM-MSS (3)	24 V AC/DC	1SVR 430 710 R 9300
	110...130 V AC	1SVR 430 711 R 0300
	220...240 V AC	1SVR 430 711 R 1300
	380...440 V AC	1SVR 430 711 R 2300

Thermistor Motor Protection Relays CM-MSS Single Sensor Circuit Relay Output

Technical Data

Input			
Supply voltage	A1-A2	24 V AC	≅ 1.5 VA
- power consumption	A1-A2	24 V AC/DC	≅ 1.1 VA / 0.6 W
	A1-A2	110-130 V AC	≅ 1.5 VA
	A1-A2	220-240 V AC	≅ 1.5 VA
	A1-A2	380-440 V AC	≅ 1.7 VA
Supply voltage tolerance		-15 %...+10 %	
Supply voltage frequency		AC: 50/60 Hz, or DC	
Measuring circuit			
Monitoring function		T1-T2/T2x	
Number of sensor circuits		Temperature monitoring with PTC sensors	
Sensor circuit			
Temperature switch-off resistance (relay de-energizes)		3.6 kΩ +/- 5 %	
Temperature switch-on resistance (relay energizes)		1.6 kΩ +/- 5 %	
Short-circuit switch-off resistance (relay de-energizes)		<20 Ω	
Short-circuit switch-on resistance (relay energizes)		>40 Ω	
Total resistance of sensors in series (cold)		≤1.5 kΩ	
Max. cable length for short-circuit detection ²⁾		2 x 100 m at 0.75 mm ² , 2 x 400 m at 2.5 mm ²	
Response time		<100 ms	
Control circuit for memory and hysteresis			
Remote reset	S1-T2	n/o contact	
Max. no-load voltage		≅ 25 V, 5.5 V	
Max. cable length		≤50 m, 100...200 m if shielded	
Indication of operational states			
Supply voltage		U: green LED	
Fault tripping		F: red LED	
Output			
Number of contacts		11-12/14, 21-22/24	
Operational principle		SPDT or DPDT	
		output relay de-energizes if the resistance exceeds/drops below set point	
Contact material		AgCdO	
Rated voltage acc. to VDE0110, IEC664-1, IEC947-1		250 V	
Max. switching voltage		250 V	
Rated switching current acc. to IEC 60947-5-1	AC-12 (resistive)	230 V	4 A
	AC-15 (inductive)	230 V	3 A
	DC-12 (resistive)	24 V	4 A
	DC-13 (inductive)	24 V	2 A (1.5 A - n/c contact ¹⁾)
Maximum lifetime	mechanical	30 (10 ¹¹) x 10 ⁶ switching cycles	
	electrical (AC-12, 230 V, 4 A)	0.1 x 10 ⁶ switching cycles	
Short circuit proof, max. fuse rating	n/c contact	2 A (4 A ¹⁾) fast acting	
	n/o contact	10 A (6 A ¹⁾) fast acting	
General data			
Enclosure width		22.5 mm	
Wire size (stranded wires with wire end ferrule)		2 x 2.5 mm ² (14 AWG)	
Weight		≅ 150 g	
Degree of protection: housing / terminals		IP50 / IP20	
Operating /Storage temperature		-20 °C ... +60 °C / -40 °C...+80 °C	
Mounting		DIN rail (EN 50022)	
Isolation data			
Rated voltage between supply, measuring and output circuit		250 V	
Rated impulse withstand voltage between all isolated circuits		4 kV / 1.2...50 μs	
Test voltage between all isolated circuits		2.5 kV, 50 Hz, 1 min.	

- 1) Applies to CM-MSS (1) & (2)
- 2) Applies to CM-MSS (3)

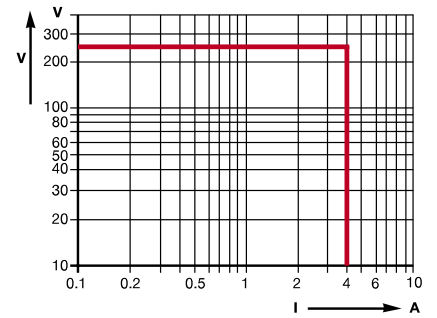
Accessories



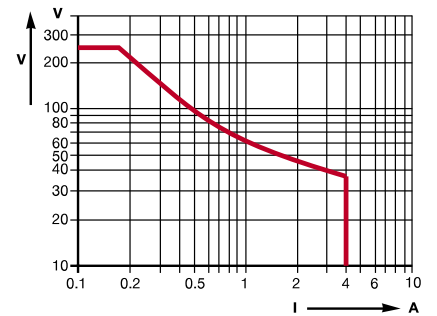
See accessory pages for specifications.

Load Limit Curves

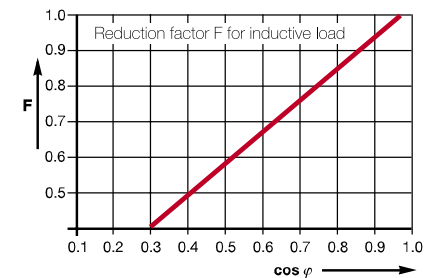
AC Load (Resistive)



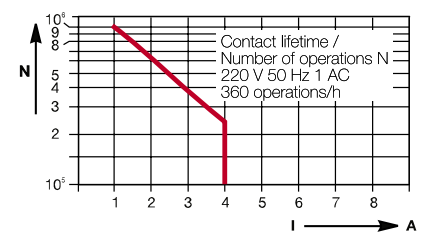
DC Load (Resistive)



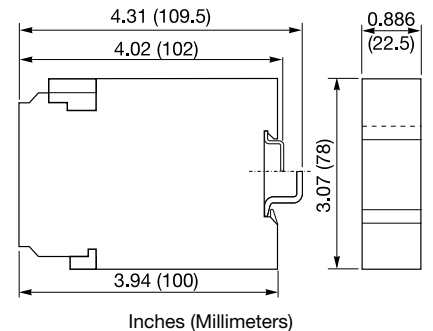
Reduction Factor for Inductive AC Load



Contact Lifetime



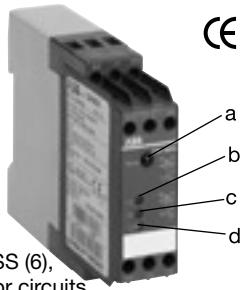
Mechanical View



Thermistor Motor Protection Relays

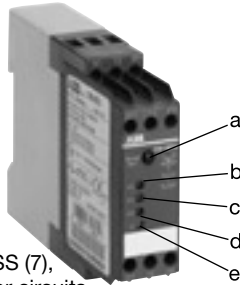
CM-MSS Wide Voltage Range

Relay Output



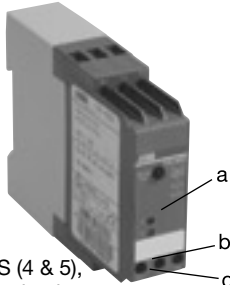
CM-MSS (6),
2 sensor circuits

a Reset / Test button
b to c F1-F2: red LEDs - fault tripping 1 to 2
d U: green LED - supply voltage



CM-MSS (7),
3 sensor circuits

a Reset / Test button
b to d F1-F3: red LEDs - fault tripping 1 to 3
e U: green LED - supply voltage



CM-MSS (4 & 5),
1 sensor circuit

a Reset / Test button
b F: red LED - fault tripping
c U: green LED - supply voltage

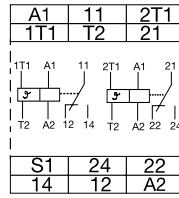
- Short-circuit monitoring of the sensor circuit
- Wide voltage range: 24...240 V AC/DC
- Non-volatile fault memory selectable
- Memory reset and test button
- Remote reset
- Automatic reset selectable
- Output contacts: 1 n/c and 1 n/o or 2 DPDT
- 2 LEDs for status indication
- CM-MSS (4): ATEX approved
- CM-MSS (5): ATEX approval (pending)

Approvals: c us LISTED

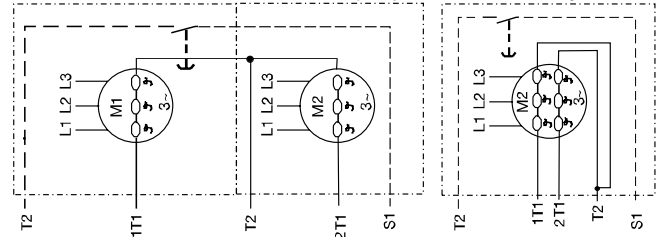
CM-MSS (6), 2 sensor circuits, single evaluation

- Short-circuit monitoring for the sensor circuits
- Wide supply voltage range: 24...240 V AC/DC
- 2 separate sensor circuits for monitoring of two motors or one motor with 2 sensor circuits (prewarning and shut down)
- Memory selectable reset and test button
- Automatic reset configurable
- Output contacts: 2 x SPDT
- 3 LEDs for status indication
- ATEX approved

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A1-A2 Supply voltage
11-12/14, Output contacts -
21-22/24 Normally energized
1T1-T2 Sensor circuit 1
2T1-T2 Sensor circuit 2
S1-T2 Remote reset
S1-T2 jumpered = no memory



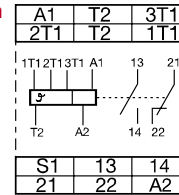
Ordering Table

Type	Supply voltage	Part number
CM-MSS (6)	24...240 V AC/DC	1SVR 430 710 R 0200

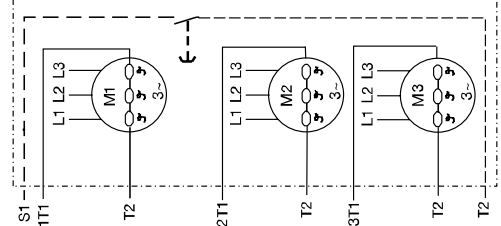
CM-MSS (7), 3 sensor circuits, accumulative evaluation

- Short-circuit monitoring for the sensor circuits
- Wide supply voltage range 24...240 V AC/DC
- Non-volatile memory selectable
- Remote reset
- Automatic reset selectable
- Memory reset and test button
- Output contacts: 1 n/c, 1 n/o
- 4 LEDs for status indication
- ATEX approved

II (2) G, PTB 02 ATEX 3080



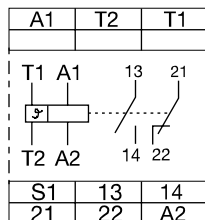
A1-A2 Supply voltage
13-14 Output contacts -
21-22 Normally energized
1T1-T2 Sensor circuits 1
2T1-T2 Sensor circuits 2
3T1-T2 Sensor circuits 3
S1-T2 Remote reset
S1-T2 jumpered = no memory



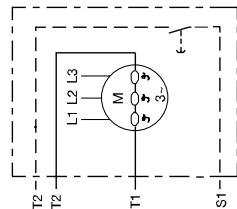
Ordering Table

Type	Supply voltage	Part number
CM-MSS (7)	24...240 V AC/DC	1SVR 430 720 R 0500

Connection CM-MSS (4), 1 sensor circuit, 1 n/c, 1 n/o



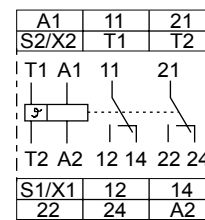
A1-A2 Supply voltage
T1-T2 Sensor circuit
S1-T2 Remote reset
S1-T2 jumpered = no memory
13-14 Output contacts -
21-22 Normally energized



Ordering Table

Type	Supply voltage	Part number
CM-MSS (4) 1n/c, 1n/o	24...240 V AC/DC	1SVR 430 720 R 0400
CM-MSS (5) DPDT	24...240 V AC/DC	1SVR 430 720 R 0300

Connection diagram CM-MSS (5), 1 sensor circuit, DPDT



A1-A2 Supply voltage
T1-T2 Sensor circuit
S1/X1-S2/X2 Reset
11-12/14 Output contacts -
21-22/24 Normally energized

Thermistor Motor Protection Relays CM-MSS Wide Voltage Range Relay Output

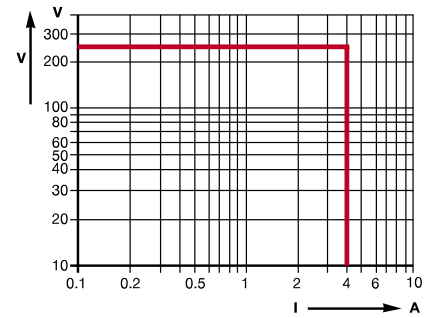
Technical Data

Input		
Supply voltage - power consumption	A1-A2	24...240 V AC/DC - $\approx 1.4...1.7$ W / $\approx 3.5...5.7$ VA
Supply voltage tolerance		-15 %...+10 %
Supply voltage frequency		15...400 Hz
Measuring circuit		
Monitoring function		T1-T2, 1T1...3T1-T2
Number of sensor circuits		Temperature monitoring with PTC sensors 1, 2 or 3, refer to previous page
Sensor circuit		
Temperature switch-off resistance (relay de-energizes)		3.6 k Ω +/-5 %
Temperature switch-on resistance (relay energizes)		1.6 k Ω +/-5 %
Short-circuit switch-off resistance (relay de-energizes)		<20 Ω
Short-circuit switch-on resistance (relay energizes)		>40 Ω
Total resistance of sensors in series (cold)		≤ 1.5 k Ω
Max. cable length for short-circuit detection		2 x 100 m at 0.75 mm ² , 2 x 400 m at 2.5 mm ²
Response time		<100 ms
Control circuit for memory and hysteresis		
Remote reset	S1-T2	n/o contact
Max. no-load voltage		≈ 5.5 V
Max. cable length		≤ 50 m, 100...200 m if shielded
Indication of operational states		
Supply voltage		U: green LED
Fault tripping		F: red LED
Output		
Number of contacts		11-12/14, 21-22/24, 13-14, 21-22
Operational principle		DPDT, 1 n/c + 1 n/o output relay de-energizes if the resistance exceeds/drops below the set point
Contact material		AgCdO
Rated voltage acc. to VDE0110, IEC664-1, IEC947-1		250 V
Max. switching voltage		250 V
Rated switching current	AC-12 (resistive)	230 V 4 A
acc. to IEC 60947-5-1	AC-15 (inductive)	230 V 3 A
	DC-12 (resistive)	24 V 4 A
	DC-13 (inductive)	24 V 2 A (1.5 A - n/c contact ¹⁾)
Maximum lifetime	mechanical	30 (10 ¹¹) x 10 ⁶ switching cycles
	electrical (AC-12, 230 V, 4 A)	0.1 x 10 ⁶ switching cycles
Short circuit proof,	n/c contact	2 A (4 A ¹) fast acting
max. fuse rating	n/o contact	10 A (6 A ¹) fast acting
General data		
Enclosure width		22.5 mm
Wire size (stranded wires with wire end ferrule)		2 x 2.5 mm ² (14 AWG)
Weight		≈ 150 g
Degree of protection: housing / terminals		IP50 / IP20
Operating /Storage temperature		-20 °C ... +60 °C / -40 °C...+80 °C
Mounting		DIN rail (EN 50022)
Isolation data		
Rated voltage between supply, measuring and output circuit		250 V
Rated impulse withstand voltage between all isolated circuits		4 kV / 1.2...50 μ s
Test voltage between all isolated circuits		2.5 kV, 50 Hz, 1 min.

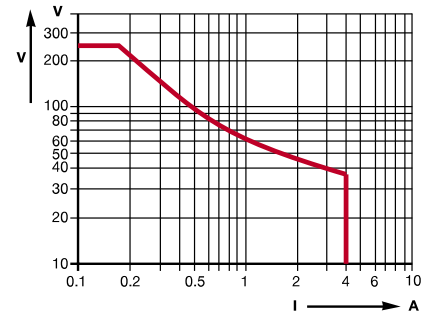
1) Applies to CM-MSS (6)

Load Limit Curves

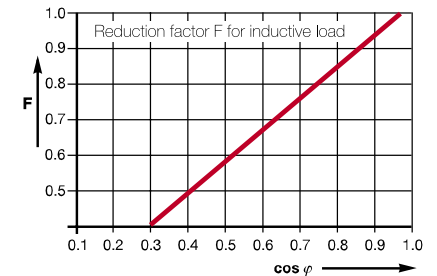
AC Load (Resistive)



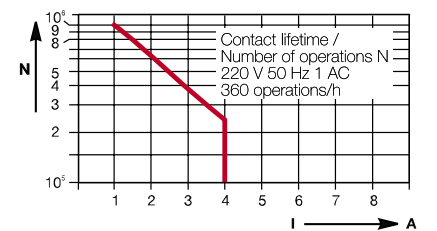
DC Load (Resistive)



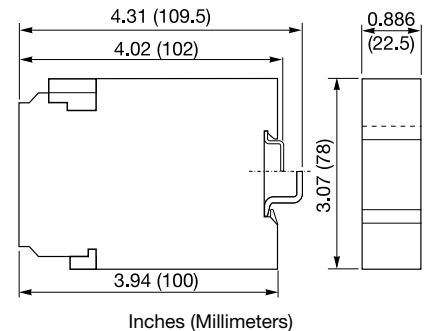
Reduction Factor for Inductive AC Load



Contact Lifetime



Mechanical View



Accessories



See accessory pages for specifications.