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

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM-MSS (1)</td>
<td>24 V AC/DC</td>
<td>1SVR 430 800 R 9100</td>
</tr>
<tr>
<td></td>
<td>220…240 V AC</td>
<td>1SVR 430 801 R 1100</td>
</tr>
</tbody>
</table>

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  Normally energized

Ordering Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM-MSS (2)</td>
<td>24 V AC/DC</td>
<td>1SVR 430 810 R 9300</td>
</tr>
<tr>
<td></td>
<td>24 V AC</td>
<td>1SVR 430 811 R 9300</td>
</tr>
<tr>
<td></td>
<td>110…130 V AC</td>
<td>1SVR 430 811 R 0300</td>
</tr>
<tr>
<td></td>
<td>220…240 V AC</td>
<td>1SVR 430 811 R 1300</td>
</tr>
</tbody>
</table>

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  Normally energized
S1-T2 remote reset = no memory
T1-T2x measuring circuit without short-circuit monitoring
T1-T2x measuring circuit with short-circuit monitoring

Ordering Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM-MSS (3)</td>
<td>24 V AC/DC</td>
<td>1SVR 430 710 R 9300</td>
</tr>
<tr>
<td></td>
<td>110…130 V AC</td>
<td>1SVR 430 711 R 0300</td>
</tr>
<tr>
<td></td>
<td>220…240 V AC</td>
<td>1SVR 430 711 R 1300</td>
</tr>
<tr>
<td></td>
<td>380…440 V AC</td>
<td>1SVR 430 711 R 2300</td>
</tr>
</tbody>
</table>

Approvals: cUS LISTED ATEX approved II (2) G, PTB 02 ATEX 3080

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  Normally energized

Ordering Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM-MSS (3)</td>
<td>24 V AC/DC</td>
<td>1SVR 430 710 R 9300</td>
</tr>
<tr>
<td></td>
<td>110…130 V AC</td>
<td>1SVR 430 711 R 0300</td>
</tr>
<tr>
<td></td>
<td>220…240 V AC</td>
<td>1SVR 430 711 R 1300</td>
</tr>
<tr>
<td></td>
<td>380…440 V AC</td>
<td>1SVR 430 711 R 2300</td>
</tr>
</tbody>
</table>
## Technical Data

**Input**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24 V AC</td>
<td>24 V</td>
<td>110-130 V AC</td>
<td>220-240 V AC</td>
<td>380-440 V AC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>1.5 VA</td>
<td>1.1 VA / 0.6 W</td>
<td>1.5 VA</td>
<td>1.5 VA</td>
<td>1.7 VA</td>
</tr>
<tr>
<td>Supply voltage tolerance</td>
<td>-15 %...+10 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply voltage frequency</td>
<td>AC: 50/60 Hz, or DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Measuring circuit**

<table>
<thead>
<tr>
<th></th>
<th>T1-T2/T2x</th>
</tr>
</thead>
</table>

**Monitoring function**

Temperature monitoring with PTC sensors

**Number of sensor circuits**

1

**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 x 100 m at 0.75 mm², 2 x 400 m at 2.5 mm² |
| Response time | <100 ms |

**Control circuit for memory and hysteresis**

Remote reset: S1-T2

Max. no-load voltage: n/o contact

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**

<table>
<thead>
<tr>
<th></th>
<th>11-12/14, 21-22/24</th>
</tr>
</thead>
</table>

**Number of contacts**

SPDT or DPDT

**Operational principle**

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**

| 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 contact1) |

**Maximum lifetime**

| mechanical | 30 (10⁻¹) x 10⁶ switching cycles |
| electrical (AC-12, 230 V, 4 A) | 0.1 x 10⁶ switching cycles |

**Short circuit proof, n/c contact**

2 A (4 A²) fast acting

**General data**

<table>
<thead>
<tr>
<th></th>
<th>2.5 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire size (stranded wires with wire end ferrule)</td>
<td>2 x 2.5 mm² (14 AWG)</td>
</tr>
<tr>
<td>Weight</td>
<td>150 g</td>
</tr>
<tr>
<td>Degree of protection: housing / terminals</td>
<td>IP50 / IP20</td>
</tr>
<tr>
<td>Operating /Storage temperature</td>
<td>-20 °C ... +60 °C / -40 °C...+80 °C</td>
</tr>
<tr>
<td>Mounting</td>
<td>DIN rail (EN 50022)</td>
</tr>
</tbody>
</table>

**Isolation data**

|          | 250 V |
| Rated voltage between supply, measuring and output circuit | 4 kV / 1.2...50 μs |

| Test voltage between all isolated circuits | 2.5 kV, 50 Hz, 1 min. |

**Load Limit Curves**

**Reduction Factor for Inductive AC Load**

<table>
<thead>
<tr>
<th>F</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
<th>0.7</th>
<th>0.8</th>
<th>0.9</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>0.04</td>
<td>0.05</td>
<td>0.06</td>
<td>0.07</td>
<td>0.08</td>
<td>0.09</td>
<td>0.1</td>
</tr>
</tbody>
</table>

**Contact Lifetime**

<table>
<thead>
<tr>
<th>N</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>50</td>
<td>100</td>
<td>500</td>
<td>1000</td>
<td>5000</td>
<td>10000</td>
<td>50000</td>
<td>100000</td>
</tr>
</tbody>
</table>

**Mechanical View**

See accessory pages for specifications.

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**Panel Mounting Adapter**

P/N: 1SVR 430 029 R 0100

**Marker Insert**

P/N: 1SVR 366 017 R 0100

**Transparent Cover**

P/N: 1SVR 430 005 R 0100

**Temperature Sensor**

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1TRC001009C0201
Thermistor Motor Protection Relays
CM-MSS Wide Voltage Range
Relay Output

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 selectable
- Output contacts: 2 x SPDT
- 3 LEDs for status indication
- ATEX approved
  (pending)
  II (2) G, PTB 02 ATEX 3080

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
  (pending)
  II (2) G, PTB 02 ATEX 3080

CM-MSS (4 & 5), 1 sensor circuit
- 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
  (pending)
  II (2) G, PTB 02 ATEX 3080
- CM-MSS (5): ATEX approval pending

Ordering Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM-MSS (6)</td>
<td>24...240 V AC/DC</td>
<td>1SVR 430 710 R 0200</td>
</tr>
<tr>
<td>CM-MSS (7)</td>
<td>24...240 V AC/DC</td>
<td>1SVR 430 720 R 0500</td>
</tr>
<tr>
<td>CM-MSS (4)</td>
<td>24...240 V AC/DC</td>
<td>1SVR 430 720 R 0400</td>
</tr>
<tr>
<td>CM-MSS (5)</td>
<td>24...240 V AC/DC</td>
<td>1SVR 430 720 R 0300</td>
</tr>
</tbody>
</table>

Ordering Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM-MSS (4)</td>
<td>24...240 V AC/DC</td>
<td>1SVR 430 720 R 0400</td>
</tr>
<tr>
<td>CM-MSS (5)</td>
<td>24...240 V AC/DC</td>
<td>1SVR 430 720 R 0300</td>
</tr>
</tbody>
</table>
Technical Data

**Input**
- Supply voltage - power consumption: A1-A2, 24...240 V AC/DC = 1.4...1.7 W / = 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: 1, 2 or 3, refer to previous page

**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 x 100 m at 0.75 mm², 2 x 400 m at 2.5 mm²
- Response time: <100 ms

**Control circuit for memory and hysteresis**
- Remote reset: S1-T2
- Max. no-load voltage: = 5.5 V
- Max. cable length: ≤50 m, 100...200 m if shielded

**Indication of operational states**
- Supply voltage: green LED
- Fault tripping: red LED

**Output**
- Number of contacts: DPDT, 1 n/c + 1 n/o
- Operational principle: 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, 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)
- Maximum lifetime mechanical electrical (AC-12: 230 V, 4 A) 30 x 10⁶ switching cycles 0.1 x 10⁸ switching cycles
- Short circuit proof, max. fuse rating: n/c contact 2 A (4 A²) fast acting n/o contact 10 A (6 A²) fast acting

**General data**
- Enclosure width: 22.5 mm
- Wire size (stranded wires with wire end ferrule): 2 x 2.5 mm² (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.

**Load Limit Curves**

**Accessories**

- Panel Mounting Adapter
  - 22.5 mm
  - P/N: 1SVR 430 029 R 0100

- Marker Insert
  - P/N: 1SVR 366 017 R 0100

- Transparent Cover
  - 22.5 mm
  - P/N: 1SVR 430 005 R 0100

- Temperature Sensor

See accessory pages for specifications.