



Fail-safe direct starter, 3RM1, 500 V, 0 - 0.12 kW, 0.1 - 0.5 A, 24 V DC, spring-type terminals

|                          |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| product brand name       | SIRIUS                                                               |
| product category         | Motor starter                                                        |
| product designation      | Fail-safe direct starter                                             |
| design of the product    | With electronic overload protection and safety-related disconnection |
| product type designation | 3RM1                                                                 |

### General technical data

|                                                                                                |                                                 |
|------------------------------------------------------------------------------------------------|-------------------------------------------------|
| trip class                                                                                     | CLASS 10A                                       |
| equipment variant according to IEC 60947-4-2                                                   | 3                                               |
| product function                                                                               | fail-safe direct starter                        |
| <ul style="list-style-type: none"> <li>intrinsic device protection</li> </ul>                  | Yes                                             |
| <ul style="list-style-type: none"> <li>for power supply reverse polarity protection</li> </ul> | Yes                                             |
| suitability for operation device connector 3ZY12                                               | Yes                                             |
| insulation voltage rated value                                                                 | 500 V                                           |
| overvoltage category                                                                           | III                                             |
| surge voltage resistance rated value                                                           | 6 kV                                            |
| maximum permissible voltage for safe isolation                                                 |                                                 |
| <ul style="list-style-type: none"> <li>between main and auxiliary circuit</li> </ul>           | 500 V                                           |
| <ul style="list-style-type: none"> <li>between control and auxiliary circuit</li> </ul>        | 250 V                                           |
| shock resistance                                                                               | 6g / 11 ms                                      |
| vibration resistance                                                                           | 1 ... 6 Hz, 15 mm; 20 m/s <sup>2</sup> , 500 Hz |
| operating frequency maximum                                                                    | 1 1/s                                           |
| mechanical service life (operating cycles) typical                                             | 15 000 000                                      |
| reference code according to IEC 81346-2                                                        | Q                                               |
| Substance Prohibitance (Date)                                                                  | 03/01/2017                                      |
| product function                                                                               |                                                 |
| <ul style="list-style-type: none"> <li>direct start</li> </ul>                                 | Yes                                             |
| <ul style="list-style-type: none"> <li>reverse starting</li> </ul>                             | No                                              |
| product function short circuit protection                                                      | No                                              |

### Electromagnetic compatibility

|                                                                                                               |                                                                |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| EMC emitted interference according to IEC 60947-1                                                             | class A                                                        |
| EMC immunity according to IEC 60947-1                                                                         | Class A                                                        |
| conducted interference                                                                                        |                                                                |
| <ul style="list-style-type: none"> <li>due to burst according to IEC 61000-4-4</li> </ul>                     | 3 kV / 5 kHz                                                   |
| <ul style="list-style-type: none"> <li>due to conductor-earth surge according to IEC 61000-4-5</li> </ul>     | 4 kV signal lines 2 kV                                         |
| <ul style="list-style-type: none"> <li>due to conductor-conductor surge according to IEC 61000-4-5</li> </ul> | 2 kV                                                           |
| <ul style="list-style-type: none"> <li>due to high-frequency radiation according to IEC 61000-4-6</li> </ul>  | 10 V                                                           |
| field-based interference according to IEC 61000-4-3                                                           | 10 V/m                                                         |
| electrostatic discharge according to IEC 61000-4-2                                                            | 6 kV contact discharge / 8 kV air discharge                    |
| conducted HF interference emissions according to                                                              | Class B for the domestic, business and commercial environments |

**CISPR11**

field-bound HF interference emission according to CISPR11

Class B for the domestic, business and commercial environments

**Safety related data**

|                                                                                                 |                   |
|-------------------------------------------------------------------------------------------------|-------------------|
| <b>safety device type according to IEC 61508-2</b>                                              | Type B            |
| <b>B10d value</b>                                                                               | 2 500 000         |
| Safety Integrity Level (SIL) according to IEC 61508                                             | 3                 |
| <b>SIL Claim Limit (subsystem) according to EN 62061</b>                                        | SILCL 3           |
| performance level (PL) according to EN ISO 13849-1                                              | e                 |
| category according to EN ISO 13849-1                                                            | 4                 |
| <b>stop category according to EN 60204-1</b>                                                    | 0                 |
| <b>Safe failure fraction (SFF)</b>                                                              | 99 %              |
| <b>average diagnostic coverage level (DCavg)</b>                                                | 99 %              |
| <b>diagnostics test interval by internal test function maximum</b>                              | 600 s             |
| <b>function test interval maximum</b>                                                           | 1 a               |
| <b>failure rate [FIT]</b>                                                                       |                   |
| • at rate of recognizable hazardous failures ( $\lambda_{dd}$ )                                 | 1 400 FIT         |
| • at rate of non-recognizable hazardous failures ( $\lambda_{du}$ )                             | 16 FIT            |
| PFHD with high demand rate according to EN 62061                                                | 0.00000002 1/h    |
| <b>PFDavg with low demand rate according to IEC 61508</b>                                       | 0                 |
| <b>MTTFd</b>                                                                                    | 75 a              |
| <b>hardware fault tolerance according to IEC 61508</b>                                          | 1                 |
| <b>safe state</b>                                                                               | Load circuit open |
| <b>protection class IP on the front according to IEC 60529</b>                                  | IP20              |
| <b>touch protection on the front according to IEC 60529</b>                                     | finger-safe       |
| <b>hardware fault tolerance according to IEC 61508 relating to ATEX</b>                         | 0                 |
| <b>PFDavg with low demand rate according to IEC 61508 relating to ATEX</b>                      | 0.0005            |
| <b>PFHD with high demand rate according to EN 62061 relating to ATEX</b>                        | 0.00000005 1/h    |
| <b>Safety Integrity Level (SIL) according to IEC 61508 relating to ATEX</b>                     | SIL2              |
| <b>T1 value for proof test interval or service life according to IEC 61508 relating to ATEX</b> | 3 a               |

**Main circuit**

|                                                                                            |                              |
|--------------------------------------------------------------------------------------------|------------------------------|
| <b>number of poles for main current circuit</b>                                            | 3                            |
| <b>design of the switching contact</b>                                                     | Hybrid                       |
| <b>adjustable current response value current of the current-dependent overload release</b> | 0.1 ... 0.5 A                |
| <b>minimum load [%]</b>                                                                    | 20 %; from set rated current |
| <b>type of the motor protection</b>                                                        | solid-state                  |
| <b>operating voltage rated value</b>                                                       | 48 ... 500 V                 |
| <b>relative symmetrical tolerance of the operating voltage</b>                             | 10 %                         |
| <b>operating frequency 1 rated value</b>                                                   | 50 Hz                        |
| <b>operating frequency 2 rated value</b>                                                   | 60 Hz                        |
| <b>relative symmetrical tolerance of the operating frequency</b>                           | 10 %                         |
| <b>operational current</b>                                                                 |                              |
| • at AC at 400 V rated value                                                               | 0.5 A                        |
| • at AC-3 at 400 V rated value                                                             | 0.5 A                        |
| • at AC-53a at 400 V at ambient temperature 40 °C rated value                              | 0.5 A                        |
| <b>ampacity when starting maximum</b>                                                      | 4 A                          |
| <b>operating power for 3-phase motors at 400 V at 50 Hz</b>                                | 0 ... 0.12 kW                |

**Inputs/ Outputs**

|                                       |           |
|---------------------------------------|-----------|
| <b>input voltage at digital input</b> |           |
| • at DC rated value                   | 24 V      |
| • with signal <0> at DC               | 0 ... 5 V |
| • for signal <1> at DC                | 15 ... 30 |
| <b>input current at digital input</b> |           |
| • for signal <1> at DC                | 8 mA      |

|                                                                                                                                                     |                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <ul style="list-style-type: none"> <li>• with signal &lt;0&gt; at DC</li> </ul>                                                                     | 1 mA                                              |
| number of CO contacts for auxiliary contacts                                                                                                        | 1                                                 |
| <b>operational current of auxiliary contacts at AC-15 at 230 V maximum</b>                                                                          | 3 A                                               |
| <b>operational current of auxiliary contacts at DC-13 at 24 V maximum</b>                                                                           | 1 A                                               |
| <b>Control circuit/ Control</b>                                                                                                                     |                                                   |
| <b>type of voltage of the control supply voltage</b>                                                                                                | DC                                                |
| control supply voltage at DC rated value                                                                                                            | 19.2 ... 30 V                                     |
| <b>relative negative tolerance of the control supply voltage at DC</b>                                                                              | 20 %                                              |
| <b>relative positive tolerance of the control supply voltage at DC</b>                                                                              | 25 %                                              |
| control supply voltage 1 at DC rated value                                                                                                          | 24 V                                              |
| <b>operating range factor control supply voltage rated value at DC</b>                                                                              |                                                   |
| <ul style="list-style-type: none"> <li>• initial value</li> </ul>                                                                                   | 0.8                                               |
| <ul style="list-style-type: none"> <li>• full-scale value</li> </ul>                                                                                | 1.25                                              |
| <b>control current at DC</b>                                                                                                                        |                                                   |
| <ul style="list-style-type: none"> <li>• in standby mode of operation</li> </ul>                                                                    | 13 mA                                             |
| <ul style="list-style-type: none"> <li>• during operation</li> </ul>                                                                                | 57 mA                                             |
| <b>inrush current peak</b>                                                                                                                          |                                                   |
| <ul style="list-style-type: none"> <li>• at DC at 24 V</li> </ul>                                                                                   | 300 mA                                            |
| <ul style="list-style-type: none"> <li>• at DC at 24 V at switching on of motor</li> </ul>                                                          | 130 mA                                            |
| <b>duration of inrush current peak</b>                                                                                                              |                                                   |
| <ul style="list-style-type: none"> <li>• at DC at 24 V</li> </ul>                                                                                   | 80 ms                                             |
| <ul style="list-style-type: none"> <li>• at DC at 24 V at switching on of motor</li> </ul>                                                          | 20 ms                                             |
| <b>power loss [W] in auxiliary and control circuit</b>                                                                                              |                                                   |
| <ul style="list-style-type: none"> <li>• in switching state OFF <ul style="list-style-type: none"> <li>— with bypass circuit</li> </ul> </li> </ul> | 0.35 W                                            |
| <ul style="list-style-type: none"> <li>• in switching state ON <ul style="list-style-type: none"> <li>— with bypass circuit</li> </ul> </li> </ul>  | 1.37 W                                            |
| <b>Response times</b>                                                                                                                               |                                                   |
| <b>ON-delay time</b>                                                                                                                                | 65 ... 76 ms                                      |
| <b>OFF-delay time</b>                                                                                                                               | 30 ... 43 ms                                      |
| <b>Power Electronics</b>                                                                                                                            |                                                   |
| <b>operational current</b>                                                                                                                          |                                                   |
| <ul style="list-style-type: none"> <li>• at 40 °C rated value</li> </ul>                                                                            | 0.5 A                                             |
| <ul style="list-style-type: none"> <li>• at 50 °C rated value</li> </ul>                                                                            | 0.5 A                                             |
| <ul style="list-style-type: none"> <li>• at 55 °C rated value</li> </ul>                                                                            | 0.5 A                                             |
| <ul style="list-style-type: none"> <li>• at 60 °C rated value</li> </ul>                                                                            | 0.5 A                                             |
| <b>Installation/ mounting/ dimensions</b>                                                                                                           |                                                   |
| <b>mounting position</b>                                                                                                                            | vertical, horizontal, standing (observe derating) |
| <b>fastening method</b>                                                                                                                             | screw and snap-on mounting onto 35 mm DIN rail    |
| <b>height</b>                                                                                                                                       | 100 mm                                            |
| <b>width</b>                                                                                                                                        | 23 mm                                             |
| <b>depth</b>                                                                                                                                        | 142 mm                                            |
| <b>required spacing</b>                                                                                                                             |                                                   |
| <ul style="list-style-type: none"> <li>• with side-by-side mounting <ul style="list-style-type: none"> <li>— forwards</li> </ul> </li> </ul>        | 0 mm                                              |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— backwards</li> </ul> </li> </ul>                                   | 0 mm                                              |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— upwards</li> </ul> </li> </ul>                                     | 50 mm                                             |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— downwards</li> </ul> </li> </ul>                                   | 50 mm                                             |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— at the side</li> </ul> </li> </ul>                                 | 0 mm                                              |
| <ul style="list-style-type: none"> <li>• for grounded parts <ul style="list-style-type: none"> <li>— forwards</li> </ul> </li> </ul>                | 0 mm                                              |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— backwards</li> </ul> </li> </ul>                                   | 0 mm                                              |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— upwards</li> </ul> </li> </ul>                                     | 50 mm                                             |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— at the side</li> </ul> </li> </ul>                                 | 4 mm                                              |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— downwards</li> </ul> </li> </ul>                                   | 50 mm                                             |
| <b>Ambient conditions</b>                                                                                                                           |                                                   |
| installation altitude at height above sea level maximum                                                                                             | 4 000 m; For derating see manual                  |
| <b>ambient temperature</b>                                                                                                                          |                                                   |
| <ul style="list-style-type: none"> <li>• during operation</li> </ul>                                                                                | -25 ... +60 °C                                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------|-------|---------|
| <ul style="list-style-type: none"><li>during storage</li><li>during transport</li></ul> environmental category during operation according to IEC 60721relative humidity during operationair pressure according to SN 31205                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -40 ... +70 °C<br>-40 ... +70 °C<br>3K6 (no ice formation, only occasional condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6<br>10 ... 95 %<br>900 ... 1 060 hPa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| Communication/ Protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| <b>protocol is supported</b> <ul style="list-style-type: none"><li>PROFINET IO protocol</li><li>PROFIsafe protocol</li></ul> <b>product function bus communication</b><br>protocol is supported AS-Interface protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | No<br>No<br>No<br>No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                   |       |         |
| Connections/ Terminals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| <b>type of electrical connection</b> <ul style="list-style-type: none"><li>for main current circuit</li><li>for auxiliary and control circuit</li></ul> <b>wire length for motor unshielded maximum</b><br><b>type of connectable conductor cross-sections</b> <ul style="list-style-type: none"><li>for main contacts<ul style="list-style-type: none"><li>solid</li><li>finely stranded with core end processing</li><li>finely stranded without core end processing</li></ul></li><li>at AWG cables for main contacts</li></ul> <b>connectable conductor cross-section for main contacts</b> <ul style="list-style-type: none"><li>solid or stranded</li><li>finely stranded with core end processing</li><li>finely stranded without core end processing</li></ul> <b>connectable conductor cross-section for auxiliary contacts</b> <ul style="list-style-type: none"><li>solid or stranded</li><li>finely stranded with core end processing</li><li>finely stranded without core end processing</li></ul> <b>type of connectable conductor cross-sections</b> <ul style="list-style-type: none"><li>for auxiliary contacts<ul style="list-style-type: none"><li>solid</li><li>finely stranded with core end processing</li><li>finely stranded without core end processing</li></ul></li><li>at AWG cables for auxiliary contacts</li></ul> <b>AWG number as coded connectable conductor cross section</b> <ul style="list-style-type: none"><li>for main contacts</li><li>for auxiliary contacts</li></ul> | spring-loaded terminals (push-in) for main circuit, spring-loaded terminals (push-in) for control circuit<br>spring-loaded terminals (push-in)<br>spring-loaded terminals (push-in)<br>100 m<br><br>1x (0.5 ... 4 mm <sup>2</sup> )<br>1x (0.5 ... 2.5 mm <sup>2</sup> )<br>1x (0.5 ... 4 mm <sup>2</sup> )<br>1x (20 ... 12)<br><br>0.5 ... 4 mm <sup>2</sup><br>0.5 ... 2.5 mm <sup>2</sup><br>0.5 ... 4 mm <sup>2</sup><br><br>0.5 ... 1.5 mm <sup>2</sup><br>0.5 ... 1 mm <sup>2</sup><br>0.5 ... 1.5 mm <sup>2</sup><br><br>1x (0.5 ... 1.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )<br>1x (0.5 ... 1,0 mm <sup>2</sup> ), 2x (0,5 ... 1,0 mm <sup>2</sup> )<br>1x (0.5 ... 1.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )<br>1x (20 ... 16), 2x (20 ... 16)<br><br>20 ... 12<br>20 ... 16 |                           |                   |       |         |
| UL/CSA ratings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| operating voltage at AC rated value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 480 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                           |                   |       |         |
| Certificates/ approvals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| General Product Approval                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| EMC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| <div><div><br/>CSA</div><div><a href="#">Confirmation</a></div><div><br/>CCC</div><div><br/>UL</div><div></div><div><br/>RCM</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |
| For use in hazardous locations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Functional Safety/Safety of Machinery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Declaration of Conformity | Test Certificates | other | Railway |
| <div><div><br/>ATEX</div><div><a href="#">Type Examination Certificate</a></div><div><br/>EG-Konf.</div><div><a href="#">Type Test Certificates/Test Report</a></div><div><a href="#">Confirmation</a></div><div><a href="#">Special Test Certificate</a></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                   |       |         |

## Further information

### Information on the packaging

<https://support.industry.siemens.com/cs/ww/en/view/109813875>

### Information- and Downloadcenter (Catalogs, Brochures,...)

<https://www.siemens.com/ic10>

### Industry Mall (Online ordering system)

<https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RM1101-2AA04>

### Cax online generator

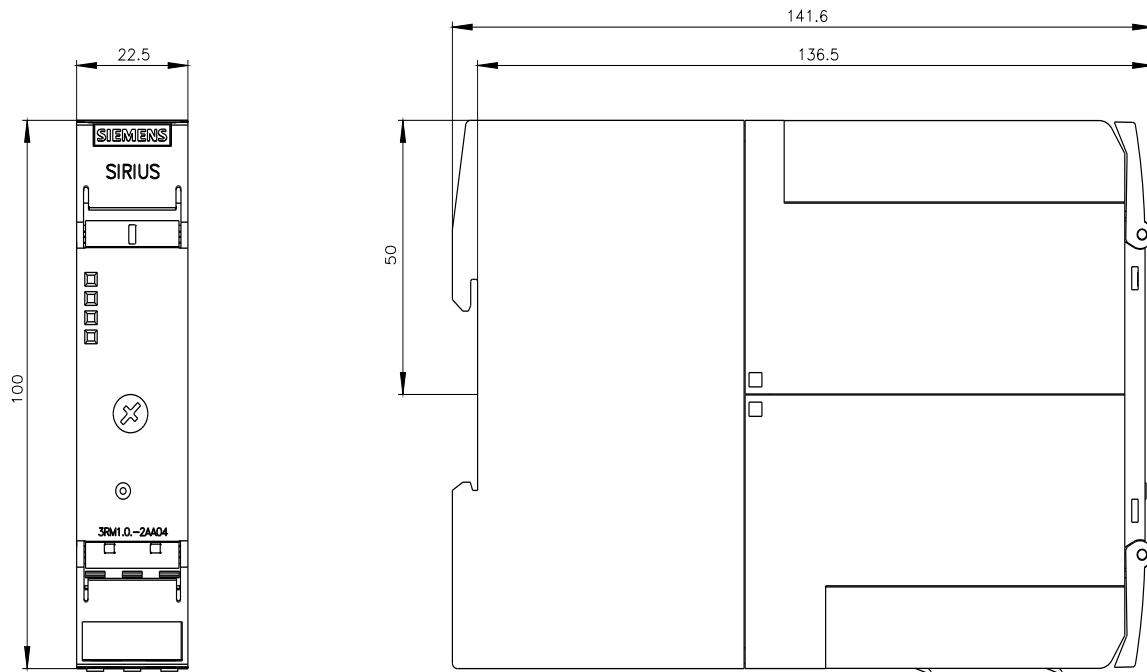
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RM1101-2AA04>

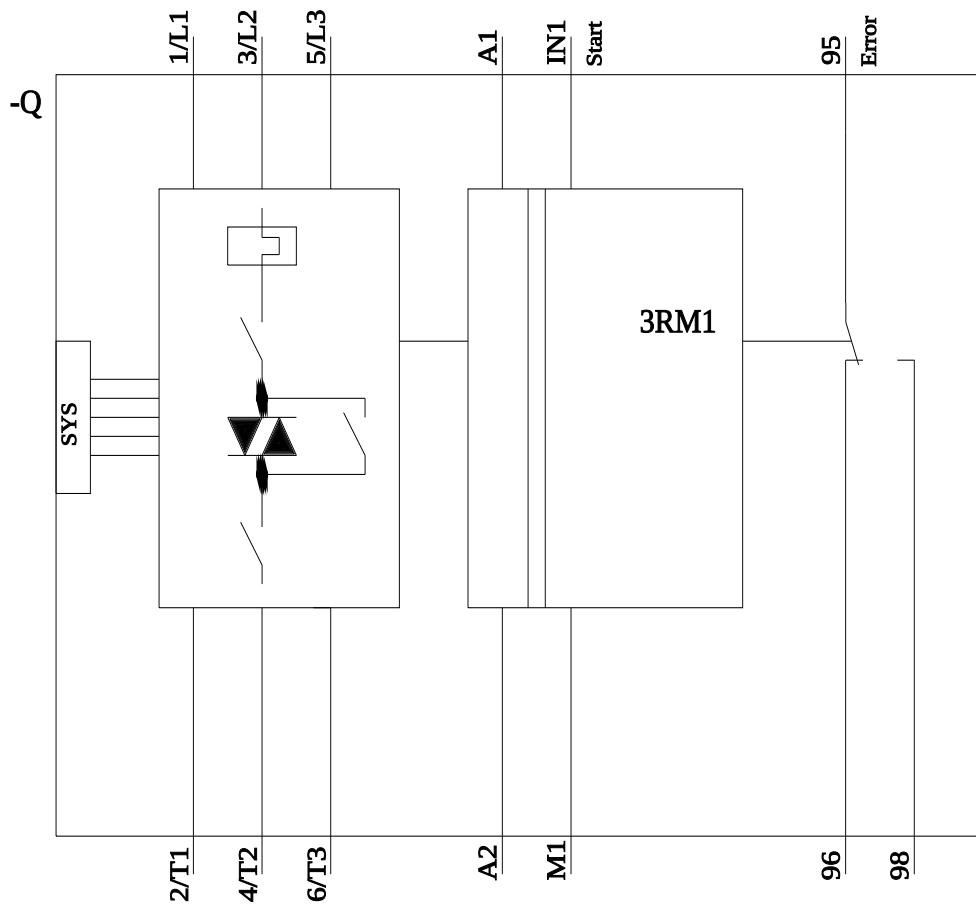
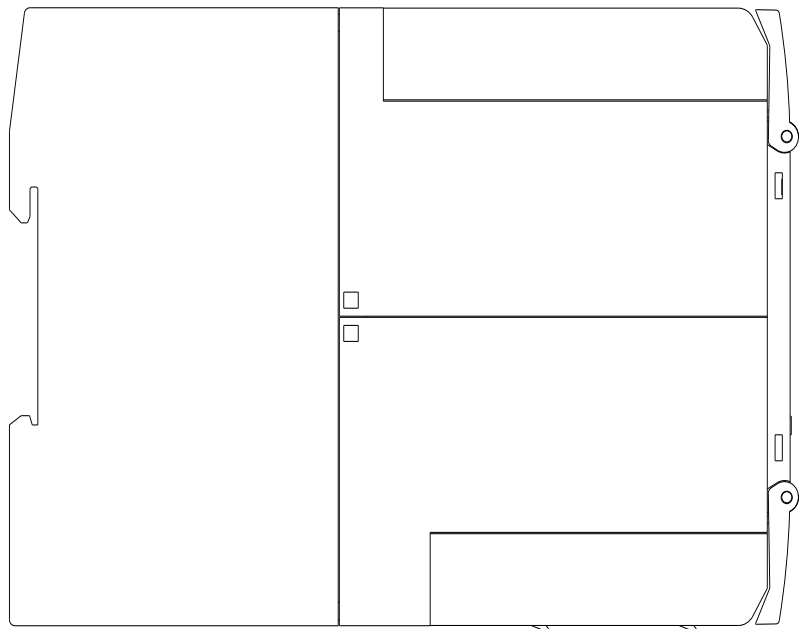
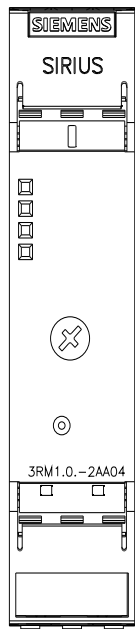
### Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RM1101-2AA04>

### Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RM1101-2AA04&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RM1101-2AA04&lang=en)





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