

Fail-safe reversing starter, 3RM1, 500 V, 0 - 0.12 kW, 0.1 - 0.5 A, 110-230 V AC, spring-type terminals



|                          |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Product brand name       | SIRIUS                                                               |
| Product category         | Motor starter                                                        |
| Product designation      | Failsafe reversing starters                                          |
| Design of the product    | With electronic overload protection and safety-related disconnection |
| Product type designation | 3RM1                                                                 |

| General technical data                                                              |           |
|-------------------------------------------------------------------------------------|-----------|
| Trip class                                                                          | CLASS 10A |
| Product function                                                                    |           |
| • Intrinsic device protection                                                       | Yes       |
| Suitability for operation Device connector 3ZY12                                    | No        |
| Power loss [W] for rated value of the current at AC in hot operating state per pole | 0.01 W    |
| Insulation voltage                                                                  |           |
| • rated value                                                                       | 500 V     |
| Surge voltage resistance rated value                                                | 6 kV      |
| maximum permissible voltage for safe isolation                                      |           |
| • between main and auxiliary circuit                                                | 500 V     |
| • between control and auxiliary circuit                                             | 250 V     |

|                                                                                                               |                                                 |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Protection class IP                                                                                           | IP20                                            |
| 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 (switching cycles) <ul style="list-style-type: none"> <li>• typical</li> </ul>        | 30 000 000                                      |
| Reference code acc. to DIN 40719 extended according to IEC 204-2 acc. to IEC 750                              | Q                                               |
| Reference code acc. to DIN EN 81346-2                                                                         | Q                                               |
| Reference code acc. to DIN EN 61346-2                                                                         | Q                                               |
| Product function <ul style="list-style-type: none"> <li>• direct start</li> <li>• reverse starting</li> </ul> | No<br>Yes                                       |
| Product function Short circuit protection                                                                     | No                                              |

#### Electromagnetic compatibility

|                                                                                                                                                                                                                                                                                                                |                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Conducted interference <ul style="list-style-type: none"> <li>• due to burst acc. to IEC 61000-4-4</li> <li>• due to conductor-earth surge acc. to IEC 61000-4-5</li> <li>• due to conductor-conductor surge acc. to IEC 61000-4-5</li> <li>• due to high-frequency radiation acc. to IEC 61000-4-6</li> </ul> | 3 kV / 5 kHz<br>4 kV signal lines 2 kV<br>2 kV<br>10 V                                                         |
| Electrostatic discharge acc. to IEC 61000-4-2                                                                                                                                                                                                                                                                  | 6 kV contact discharge / 8 kV air discharge                                                                    |
| Conducted HF-interference emissions acc. to CISPR11                                                                                                                                                                                                                                                            | Class B for domestic, business and commercial environments;<br>Class A for industrial environments at 110 V DC |
| Field-bound HF-interference emission acc. to CISPR11                                                                                                                                                                                                                                                           | Class B for domestic, business and commercial environments;<br>Class A for industrial environments at 110 V DC |

#### Safety related data

|                                                                                                                                                                                                                                     |                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Safety device type acc. to IEC 61508-2                                                                                                                                                                                              | Type B              |
| Safety Integrity Level (SIL) acc. to IEC 61508                                                                                                                                                                                      | 3                   |
| Performance level (PL) acc. to EN ISO 13849-1                                                                                                                                                                                       | e                   |
| Category acc. to EN ISO 13849-1                                                                                                                                                                                                     | 4                   |
| Stop category acc. to DIN EN 60204-1                                                                                                                                                                                                | 0                   |
| Safe failure fraction (SFF)                                                                                                                                                                                                         | 99.4 %              |
| Average diagnostic coverage level (DCavg)                                                                                                                                                                                           | 99 %                |
| Diagnostics test interval by internal test function maximum                                                                                                                                                                         | 600 s               |
| Function test interval maximum                                                                                                                                                                                                      | 1 y                 |
| Failure rate [FIT] <ul style="list-style-type: none"> <li>• at rate of recognizable hazardous failures (<math>\lambda_{dd}</math>)</li> <li>• at rate of non-recognizable hazardous failures (<math>\lambda_{du}</math>)</li> </ul> | 1 400 FIT<br>16 FIT |

|                                                                                     |                   |
|-------------------------------------------------------------------------------------|-------------------|
| PFHD with high demand rate acc. to EN 62061                                         | 0.00000002 1/h    |
| PFDavg with low demand rate acc. to IEC 61508                                       | 0.000018          |
| MTTFd                                                                               | 75 y              |
| Hardware fault tolerance acc. to IEC 61508                                          | 1                 |
| T1 value for proof test interval or service life acc. to IEC 61508                  | 20 y              |
| Safe state                                                                          | Load circuit open |
| Protection against electrical shock                                                 | finger-safe       |
| Off-delay time with safety-related request                                          |                   |
| • when switched off via control inputs maximum                                      | 90 ms             |
| • when switched off via supply voltage maximum                                      | 120 ms            |
| Hardware fault tolerance acc. to IEC 61508 relating to ATEX                         | 0                 |
| PFDavg with low demand rate acc. to IEC 61508 relating to ATEX                      | 0.0005            |
| PFHD with high demand rate acc. to EN 62061 relating to ATEX                        | 0.00000005 1/h    |
| Safety Integrity Level (SIL) acc. to IEC 61508 relating to ATEX                     | SIL2              |
| T1 value for proof test interval or service life acc. to IEC 61508 relating to ATEX | 3 y               |

#### Main circuit

|                                                                            |               |
|----------------------------------------------------------------------------|---------------|
| Number of poles for main current circuit                                   | 3             |
| Adjustable pick-up value current of the current-dependent overload release | 0.1 ... 0.5 A |
| Minimum load [%]                                                           | 20 %          |
| Type of the motor protection                                               | solid-state   |
| Operating voltage                                                          |               |
| • rated value                                                              | 48 ... 500 V  |
| Relative symmetrical tolerance of the operating voltage                    | 10 %          |
| Operating frequency 1 rated value                                          | 50 Hz         |
| Operating frequency 2 rated value                                          | 60 Hz         |
| Relative symmetrical tolerance of the operating frequency                  | 10 %          |
| Operating current                                                          |               |
| • at AC at 400 V rated value                                               | 0.5 A         |
| • at AC-53a at 400 V at ambient temperature 40 °C rated value              | 0.5 A         |
| Ampacity when starting maximum                                             | 4 A           |
| Operating power for three-phase motors at 400 V at 50 Hz                   | 0 ... 0.12 kW |

#### Inputs/ Outputs

|                                |  |
|--------------------------------|--|
| Input voltage at digital input |  |
|--------------------------------|--|

|                                                                                                                                                                                          |                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <ul style="list-style-type: none"> <li>• at DC rated value</li> <li>• with signal &lt;0&gt; at DC</li> <li>• for signal &lt;1&gt; at DC</li> </ul>                                       | 110 V<br>0 ... 40 V<br>79 ... 121   |
| <b>Input voltage at digital input</b> <ul style="list-style-type: none"> <li>• at AC rated value</li> <li>• with signal &lt;0&gt; at AC</li> <li>• for signal &lt;1&gt; at AC</li> </ul> | 110 V<br>0 ... 40 V<br>93 ... 253 V |
| <b>Input current at digital input</b> <ul style="list-style-type: none"> <li>• with signal &lt;0&gt; typical</li> <li>• for signal &lt;1&gt; typical</li> </ul>                          | 0.0004 A<br>0.002 A                 |
| <b>Input current at digital input</b> <ul style="list-style-type: none"> <li>• for signal &lt;1&gt; at DC</li> <li>• with signal &lt;0&gt; at DC</li> </ul>                              | 1.5 mA<br>0.25 mA                   |
| <b>Input current at digital input with signal &lt;0&gt; at AC</b> <ul style="list-style-type: none"> <li>• at 110 V</li> <li>• at 230 V</li> </ul>                                       | 0.2 mA<br>0.4 mA                    |
| <b>Input current at digital input for signal &lt;1&gt; at AC</b> <ul style="list-style-type: none"> <li>• at 110 V</li> <li>• at 230 V</li> </ul>                                        | 1.1 mA<br>2.3 mA                    |
| Number of CO contacts for auxiliary contacts                                                                                                                                             | 1                                   |
| <b>Operating current of auxiliary contacts at AC-15 at 230 V maximum</b>                                                                                                                 | 3 A                                 |
| <b>Operating current of auxiliary contacts at DC-13 at 24 V maximum</b>                                                                                                                  | 1 A                                 |

#### Control circuit/ Control

|                                                                                                                                                                               |                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <b>Type of voltage of the control supply voltage</b>                                                                                                                          | AC/DC                          |
| <b>Control supply voltage 1 at AC</b> <ul style="list-style-type: none"> <li>• at 50 Hz</li> <li>• at 60 Hz</li> </ul>                                                        | 110 ... 230 V<br>110 ... 230 V |
| <b>Control supply voltage frequency</b> <ul style="list-style-type: none"> <li>• 1 rated value</li> <li>• 2 rated value</li> </ul>                                            | 50 Hz<br>60 Hz                 |
| <b>Control supply voltage 1</b> <ul style="list-style-type: none"> <li>• at DC rated value</li> </ul>                                                                         | 110 V                          |
| <b>Operating range factor control supply voltage rated value at DC</b> <ul style="list-style-type: none"> <li>• initial value</li> <li>• Full-scale value</li> </ul>          | 0.85<br>1.1                    |
| <b>Operating range factor control supply voltage rated value at AC at 50 Hz</b> <ul style="list-style-type: none"> <li>• initial value</li> <li>• Full-scale value</li> </ul> | 0.85<br>1.1                    |

|                                                                                 |       |
|---------------------------------------------------------------------------------|-------|
| <b>Operating range factor control supply voltage rated value at AC at 60 Hz</b> |       |
| • initial value                                                                 | 1.1   |
| • Full-scale value                                                              | 0.85  |
| <b>Control current at AC</b>                                                    |       |
| • at 110 V in standby mode                                                      | 8 mA  |
| • at 230 V in standby mode                                                      | 6 mA  |
| • at 110 V when switching on                                                    | 40 mA |
| • at 230 V when switching on                                                    | 25 mA |
| • at 110 V during operation                                                     | 25 mA |
| • at 230 V during operation                                                     | 14 mA |
| <b>Control current at DC</b>                                                    |       |
| • in standby mode                                                               | 4 mA  |
| • when switching on                                                             | 13 mA |
| • during operation                                                              | 30 mA |

#### Response times

|                             |               |
|-----------------------------|---------------|
| <b>Switch-on delay time</b> | 90 ... 120 ms |
| <b>Off-delay time</b>       | 60 ... 90 ms  |

#### Installation/ mounting/ dimensions

|                              |                                                              |
|------------------------------|--------------------------------------------------------------|
| <b>Mounting position</b>     | vertical, horizontal, standing (observe derating)            |
| <b>Mounting type</b>         | screw and snap-on mounting onto 35 mm standard mounting rail |
| <b>Height</b>                | 100 mm                                                       |
| <b>Width</b>                 | 22.5 mm                                                      |
| <b>Depth</b>                 | 141.6 mm                                                     |
| <b>Required spacing</b>      |                                                              |
| • with side-by-side mounting |                                                              |
| — forwards                   | 0 mm                                                         |
| — Backwards                  | 0 mm                                                         |
| — upwards                    | 50 mm                                                        |
| — downwards                  | 50 mm                                                        |
| — at the side                | 0 mm                                                         |
| • for grounded parts         |                                                              |
| — forwards                   | 0 mm                                                         |
| — Backwards                  | 0 mm                                                         |
| — upwards                    | 50 mm                                                        |
| — at the side                | 3.5 mm                                                       |
| — downwards                  | 50 mm                                                        |

#### Ambient conditions

|                                                        |         |
|--------------------------------------------------------|---------|
| <b>Installation altitude at height above sea level</b> |         |
| • maximum                                              | 2 000 m |
| <b>Ambient temperature</b>                             |         |

|                                                                                                                            |                                                    |
|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <ul style="list-style-type: none"> <li>• during operation</li> <li>• during storage</li> <li>• during transport</li> </ul> | -25 ... +60 °C<br>-40 ... +70 °C<br>-40 ... +70 °C |
| Relative humidity during operation                                                                                         | 10 ... 95 %                                        |
| <b>Air pressure</b>                                                                                                        |                                                    |
| <ul style="list-style-type: none"> <li>• acc. to SN 31205</li> </ul>                                                       | 900 ... 1 060 hPa                                  |

#### Communication/ Protocol

|                                           |    |
|-------------------------------------------|----|
| <b>Product function Bus communication</b> | No |
|-------------------------------------------|----|

#### Connections/ Terminals

|                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of electrical connection</b>                                                                                                                                                                                                                                                                 | PUSH-IN connection (spring-loaded connection) for main circuit, spring-loaded terminals (push-in) for control circuit                                                                                                                                  |
| <ul style="list-style-type: none"> <li>• for main current circuit</li> <li>• for auxiliary and control current circuit</li> </ul>                                                                                                                                                                    | PUSH-IN connection (spring-loaded connection)<br>spring-loaded terminals (push-in)                                                                                                                                                                     |
| <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 conductors for main contacts</li> </ul>           | 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)                                                                                                                              |
| <b>Connectable conductor cross-section for main contacts</b>                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>• single or multi-stranded</li> <li>• finely stranded with core end processing</li> <li>• finely stranded without core end processing</li> </ul>                                                                                                              | 0.5 ... 4 mm <sup>2</sup><br>0.5 ... 2.5 mm <sup>2</sup><br>0.5 ... 4 mm <sup>2</sup>                                                                                                                                                                  |
| <b>Connectable conductor cross-section for auxiliary contacts</b>                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>• single or multi-stranded</li> <li>• finely stranded with core end processing</li> <li>• finely stranded without core end processing</li> </ul>                                                                                                              | 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>                                                                                                                                                                |
| <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 conductors for auxiliary contacts</li> </ul> | 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) |
| <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>                                                                                                                                                                                              | 20 ... 12<br>20 ... 16                                                                                                                                                                                                                                 |

#### Certificates/ approvals

|                          |     |                                |
|--------------------------|-----|--------------------------------|
| General Product Approval | EMC | For use in hazardous locations |
|--------------------------|-----|--------------------------------|



|                                       |                           |                   |       |         |
|---------------------------------------|---------------------------|-------------------|-------|---------|
| Functional Safety/Safety of Machinery | Declaration of Conformity | Test Certificates | other | Railway |
|---------------------------------------|---------------------------|-------------------|-------|---------|

[Type Examination Certificate](#)



[Miscellaneous](#)

[Type Test Certificates/Test Report](#)

[Confirmation](#)

[Special Test Certificate](#)

#### Further information

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

[www.siemens.com/ic10](http://www.siemens.com/ic10)

**Industry Mall (Online ordering system)**

<https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RM1301-2AA14>

**Cax online generator**

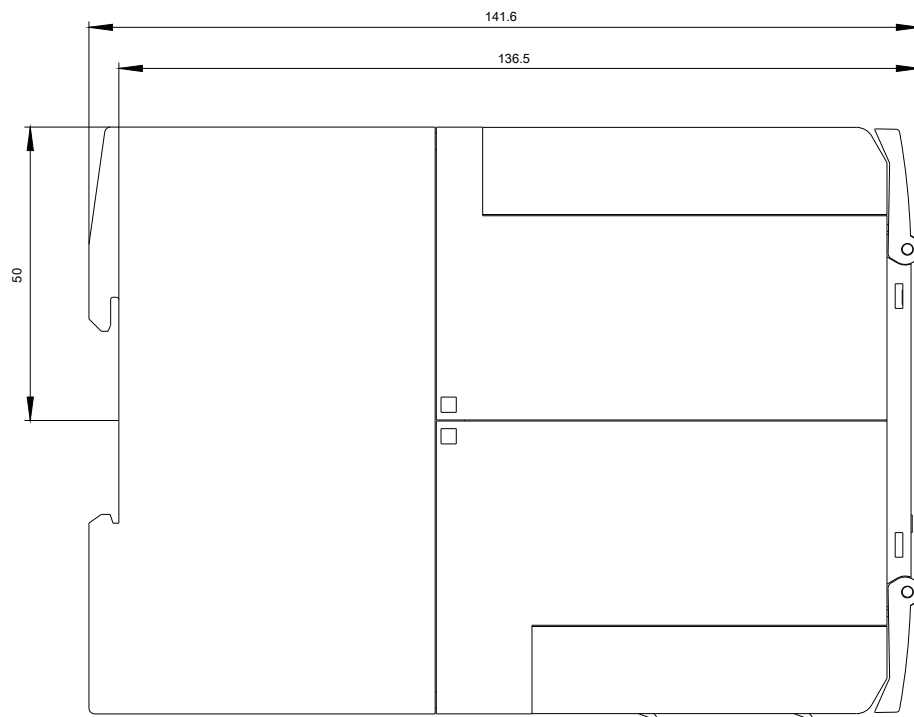
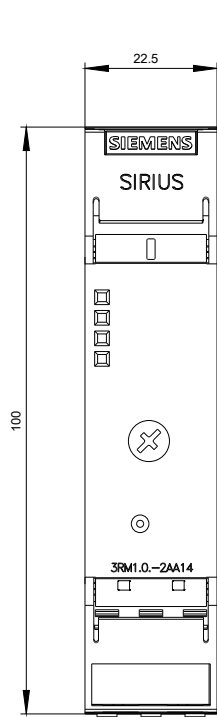
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RM1301-2AA14>

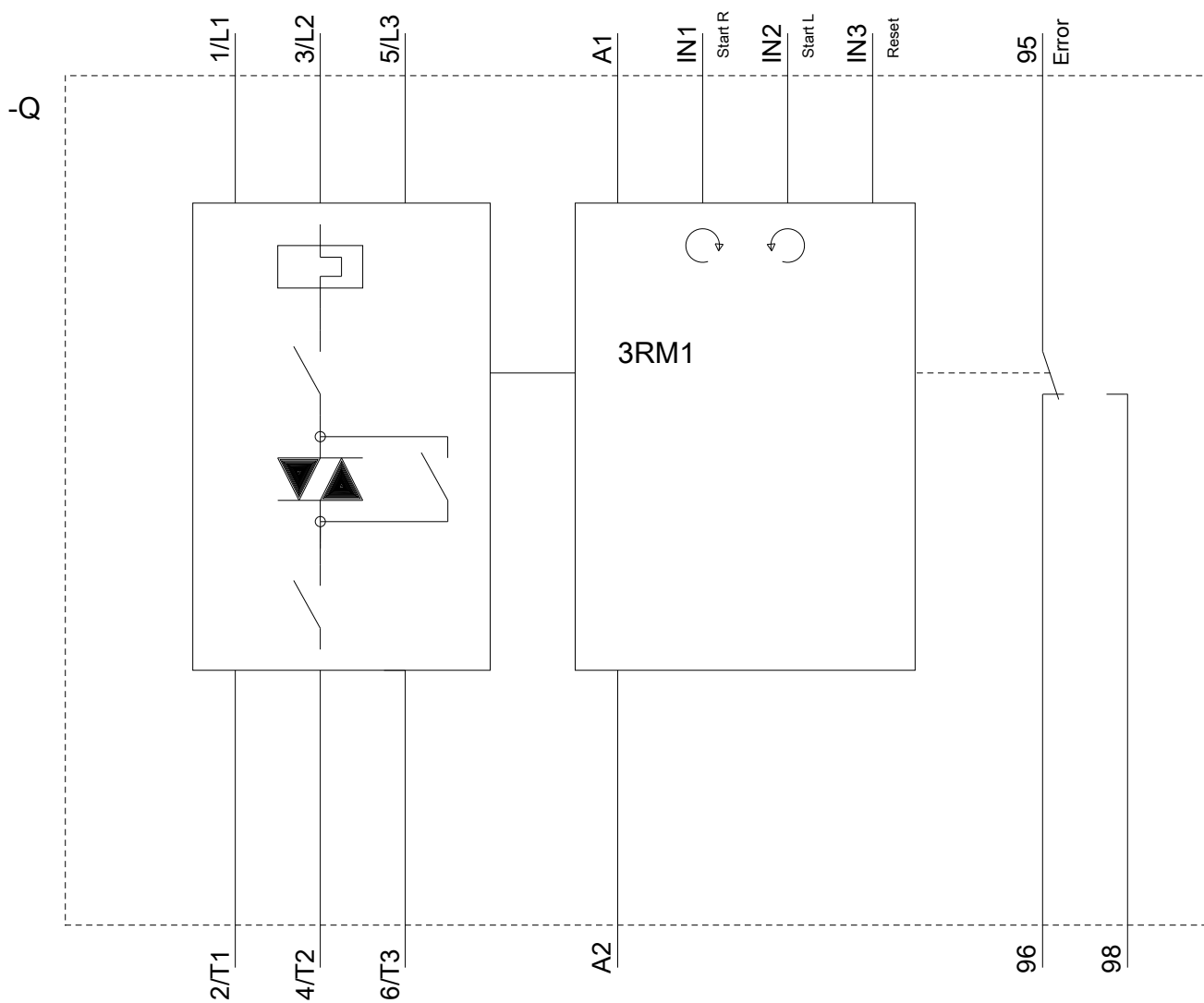
**Service&Support (Manuals, Certificates, Characteristics, FAQs,...)**

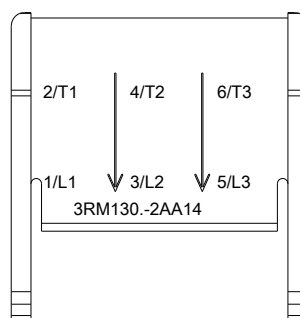
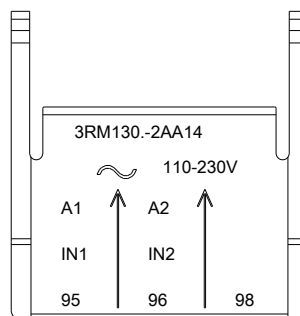
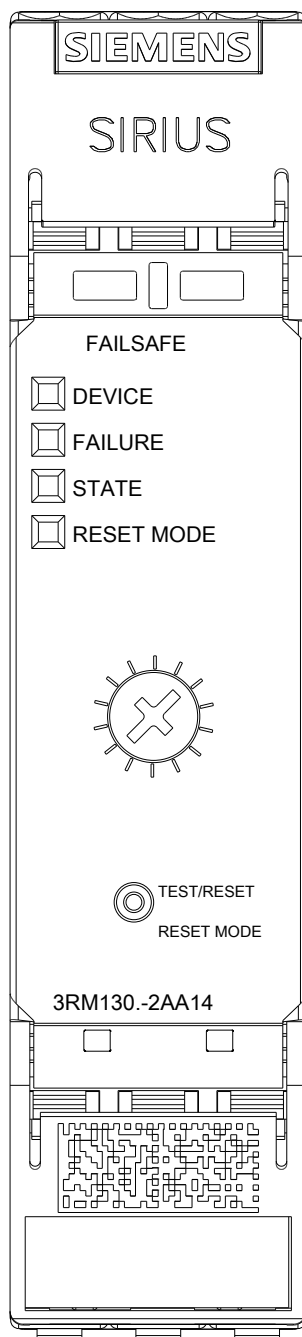
<https://support.industry.siemens.com/cs/ww/en/ps/3RM1301-2AA14>

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

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RM1301-2AA14&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RM1301-2AA14&lang=en)







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