

Fail-safe direct starter, 3RM1, 500 V, 0.09 - 0.75 kW, 0.4 - 2 A, 24 V DC, screw/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
Product function	
• Intrinsic device protection	Yes
Suitability for operation Device connector 3ZY12	Yes
Power loss [W] for rated value of the current at AC in hot operating state per pole	0.1 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>	Yes No
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 4 kV signal lines 2 kV 2 kV 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 the domestic, business and commercial environments
Field-bound HF-interference emission acc. to CISPR11	Class B for the domestic, business and commercial environments

### 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 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	43 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	0.4 ... 2 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	2 A
• at AC-53a at 400 V at ambient temperature 40 °C rated value	2 A
Ampacity when starting maximum	16 A
Operating power for three-phase motors at 400 V at 50 Hz	0.09 ... 0.75 kW

#### Inputs/ Outputs

Input voltage at digital input	
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<ul style="list-style-type: none"> <li>• at DC rated value</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• with signal &lt;0&gt; at DC</li> </ul>	0 ... 5 V
<ul style="list-style-type: none"> <li>• for signal &lt;1&gt; at DC</li> </ul>	15 ... 30
<b>Input current at digital input</b>	
<ul style="list-style-type: none"> <li>• with signal &lt;0&gt; typical</li> </ul>	0.001 A
<ul style="list-style-type: none"> <li>• for signal &lt;1&gt; typical</li> </ul>	0.008 A
<b>Input current at digital input</b>	
<ul style="list-style-type: none"> <li>• for signal &lt;1&gt; at DC</li> </ul>	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>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>	DC
<b>Control supply voltage 1</b>	
<ul style="list-style-type: none"> <li>• at DC rated value</li> </ul>	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</li> </ul>	13 mA
<ul style="list-style-type: none"> <li>• when switching on</li> </ul>	150 mA
<ul style="list-style-type: none"> <li>• during operation</li> </ul>	57 mA

### Response times

<b>Switch-on delay time</b>	65 ... 76 ms
<b>Off-delay time</b>	30 ... 43 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>	
<ul style="list-style-type: none"> <li>• with side-by-side mounting <ul style="list-style-type: none"> <li>— forwards</li> <li>— Backwards</li> <li>— upwards</li> <li>— downwards</li> </ul> </li> </ul>	0 mm 0 mm 50 mm 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>	
• during operation	-25 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity during operation	10 ... 95 %
<b>Air pressure</b>	
• acc. to SN 31205	900 ... 1 060 hPa

#### Communication/ Protocol

<b>Product function Bus communication</b>	No
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#### Connections/ Terminals

<b>Type of electrical connection</b>	screw-type terminals for main circuit, spring-loaded terminals (push-in) for control circuit
• for main current circuit	screw-type terminals
• for auxiliary and control current circuit	spring-loaded terminals (push-in)
<b>Type of connectable conductor cross-sections</b>	
• for main contacts	
— solid	1x (0,5 ... 4 mm <sup>2</sup> ), 2x (0,5 ... 2,5 mm <sup>2</sup> )
— finely stranded with core end processing	1x (0,5 ... 4 mm <sup>2</sup> ), 2x (0,5 ... 1,5 mm <sup>2</sup> )
• at AWG conductors for main contacts	1x (20 ... 12), 2x (20 ... 14)
<b>Connectable conductor cross-section for main contacts</b>	
• single or multi-stranded	0.5 ... 4 mm <sup>2</sup>
• finely stranded with core end processing	0.5 ... 4 mm <sup>2</sup>
<b>Connectable conductor cross-section for auxiliary contacts</b>	
• single or multi-stranded	0.5 ... 1.5 mm <sup>2</sup>
• finely stranded with core end processing	0.5 ... 1 mm <sup>2</sup>
• finely stranded without core end processing	0.5 ... 1.5 mm <sup>2</sup>
<b>Type of connectable conductor cross-sections</b>	
• for auxiliary contacts	
— solid	1x (0.5 ... 1.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )

- finely stranded with core end processing
- finely stranded without core end processing
- at AWG conductors for auxiliary contacts

1x (0,5 ... 1,0 mm<sup>2</sup>), 2x (0,5 ... 1,0 mm<sup>2</sup>)  
 1x (0.5 ... 1.5 mm<sup>2</sup>), 2x (0.5 ... 1.5 mm<sup>2</sup>)  
 1x (20 ... 16), 2x (20 ... 16)

**AWG number as coded connectable conductor cross section**

- for main contacts
- for auxiliary contacts

20 ... 12  
 20 ... 16

**UL/CSA ratings**

**Yielded mechanical performance [hp]**

- for single-phase AC motor
  - at 230 V rated value
- for three-phase AC motor
  - at 200/208 V rated value
  - at 220/230 V rated value
  - at 460/480 V rated value

0.125 hp  
 0.333 hp  
 0.333 hp  
 0.75 hp

**Certificates/ approvals**

**General Product Approval**

**EMC**

**For use in hazardous locations**



**Functional Safety/Safety of Machinery**

**Declaration of Conformity**

**other**

[Type Examination Certificate](#)



[Miscellaneous](#)

[Confirmation](#)

**Further information**

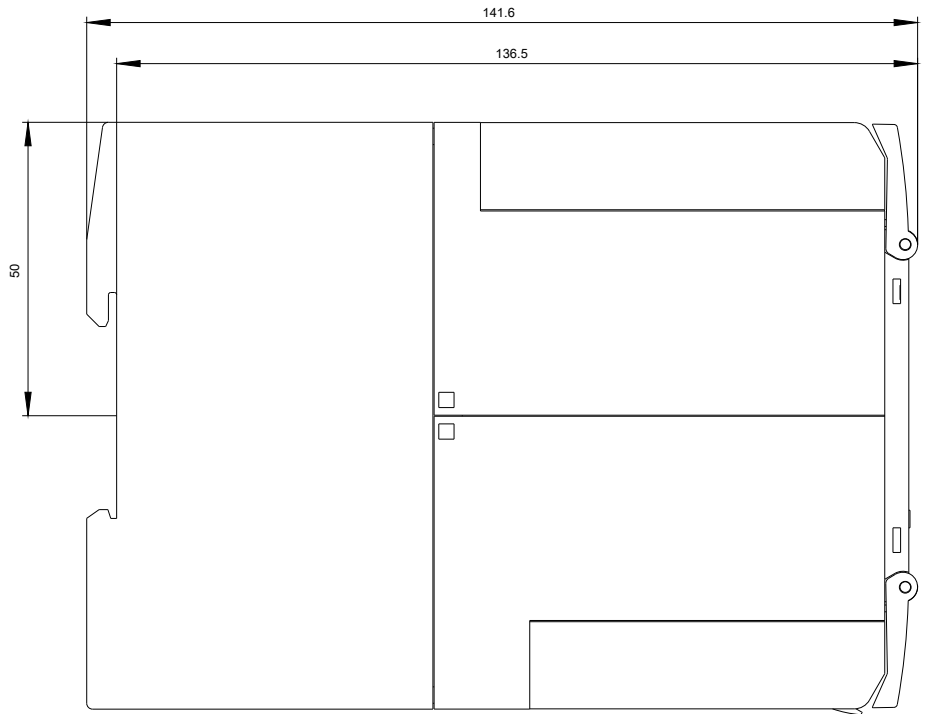
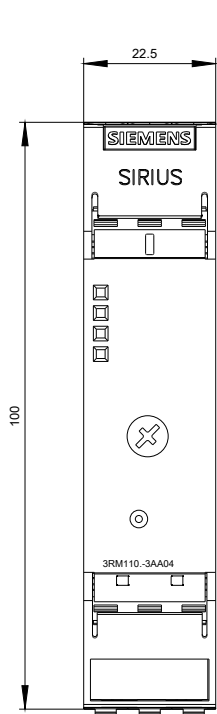
**Information- and Downloadcenter (Catalogs, Brochures,...)**  
[www.siemens.com/ic10](http://www.siemens.com/ic10)

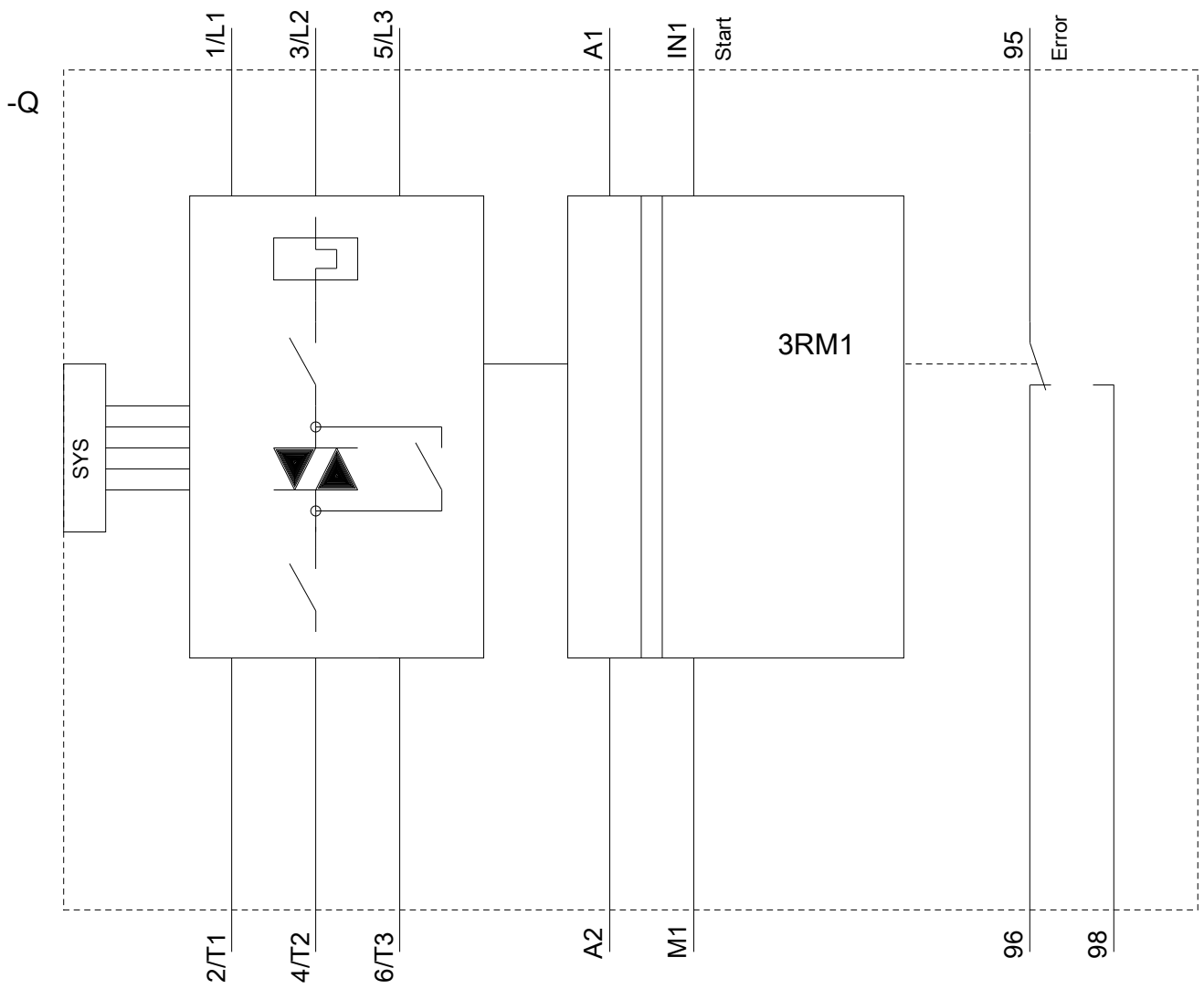
**Industry Mall (Online ordering system)**  
<https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RM1102-3AA04>

**Cax online generator**  
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RM1102-3AA04>

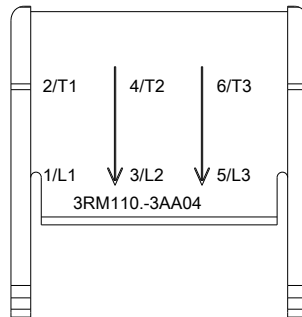
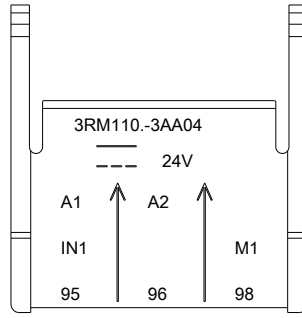
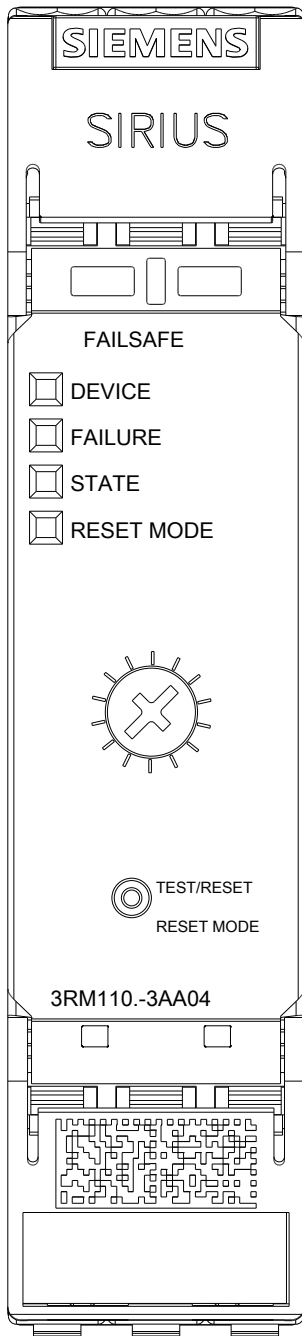
**Service&Support (Manuals, Certificates, Characteristics, FAQs,...)**  
<https://support.industry.siemens.com/cs/ww/en/ps/3RM1102-3AA04>

**Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)**  
[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RM1102-3AA04&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RM1102-3AA04&lang=en)









last modified:

12/20/2019