

Fail-safe direct starter, 3RM1, 500 V, 0.55 - 3 kW, 1.6 - 7 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	1.13 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	1.6 ... 7 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	7 A
• at AC-53a at 400 V at ambient temperature 40 °C rated value	7 A
Ampacity when starting maximum	56 A
Operating power for three-phase motors at 400 V at 50 Hz	0.55 ... 3 kW
Derating temperature	40 °C

#### 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>	
• with signal <0> typical	0.001 A
• for signal <1> typical	0.008 A
<b>Input current at digital input</b>	
• for signal <1> at DC	8 mA
• with signal <0> at DC	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

<b>Control circuit/ Control</b>	
<b>Type of voltage of the control supply voltage</b>	DC
<b>Control supply voltage 1</b>	
• at DC rated value	24 V
<b>Operating range factor control supply voltage rated value at DC</b>	
• initial value	0.8
• Full-scale value	1.25
<b>Control current at DC</b>	
• in standby mode	13 mA
• when switching on	150 mA
• during operation	57 mA

<b>Response times</b>	
<b>Switch-on delay time</b>	65 ... 76 ms
<b>Off-delay time</b>	30 ... 43 ms

<b>Installation/ mounting/ dimensions</b>	
<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>	
• 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
---	----

#### 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	1x (0,5 ... 1,0 mm <sup>2</sup> ), 2x (0,5 ... 1,0 mm <sup>2</sup> )
— finely stranded without core end processing	1x (0.5 ... 1.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )
• at AWG conductors for auxiliary contacts	1x (20 ... 16), 2x (20 ... 16)
<b>AWG number as coded connectable conductor cross section</b>	
• for main contacts	20 ... 12
• for auxiliary contacts	20 ... 16

### UL/CSA ratings

<b>Yielded mechanical performance [hp]</b>	
• for single-phase AC motor	
— at 110/120 V rated value	0.25 hp
— at 230 V rated value	0.5 hp
• for three-phase AC motor	
— at 200/208 V rated value	1 hp
— at 220/230 V rated value	1.5 hp
— at 460/480 V rated value	3 hp

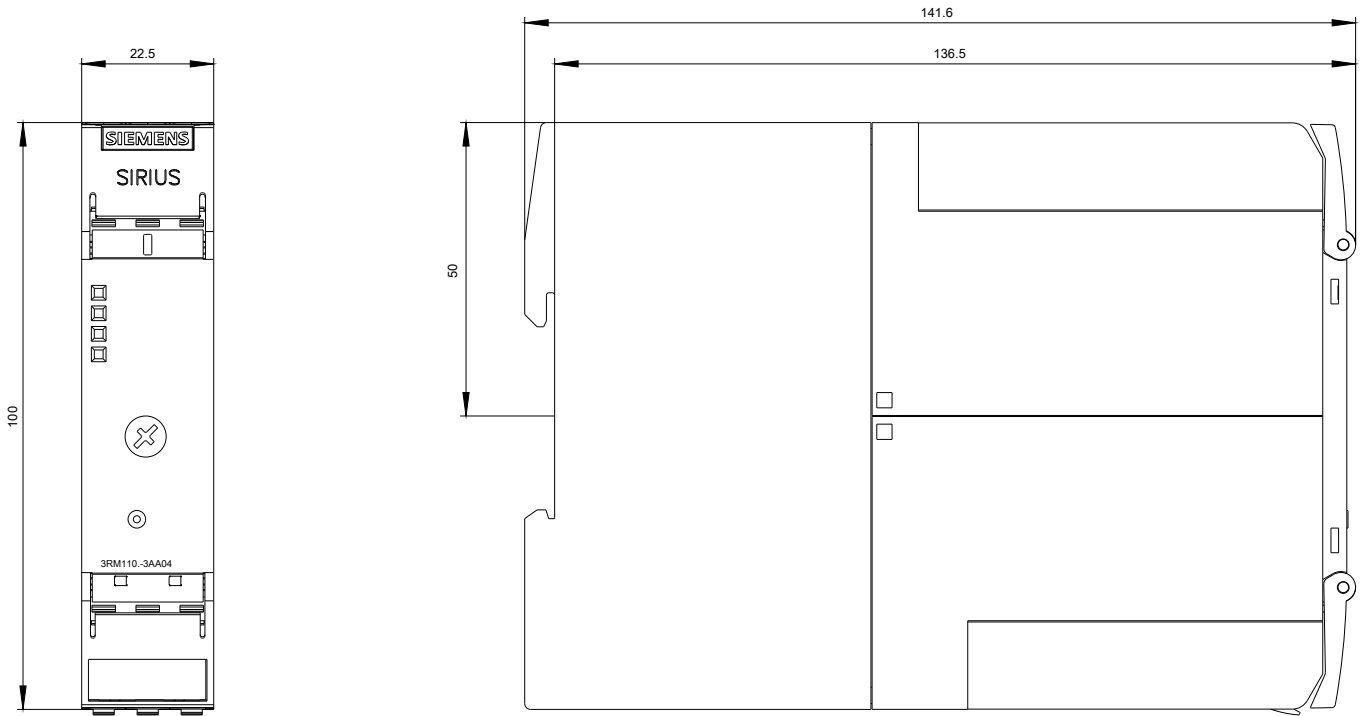
### Certificates/ approvals

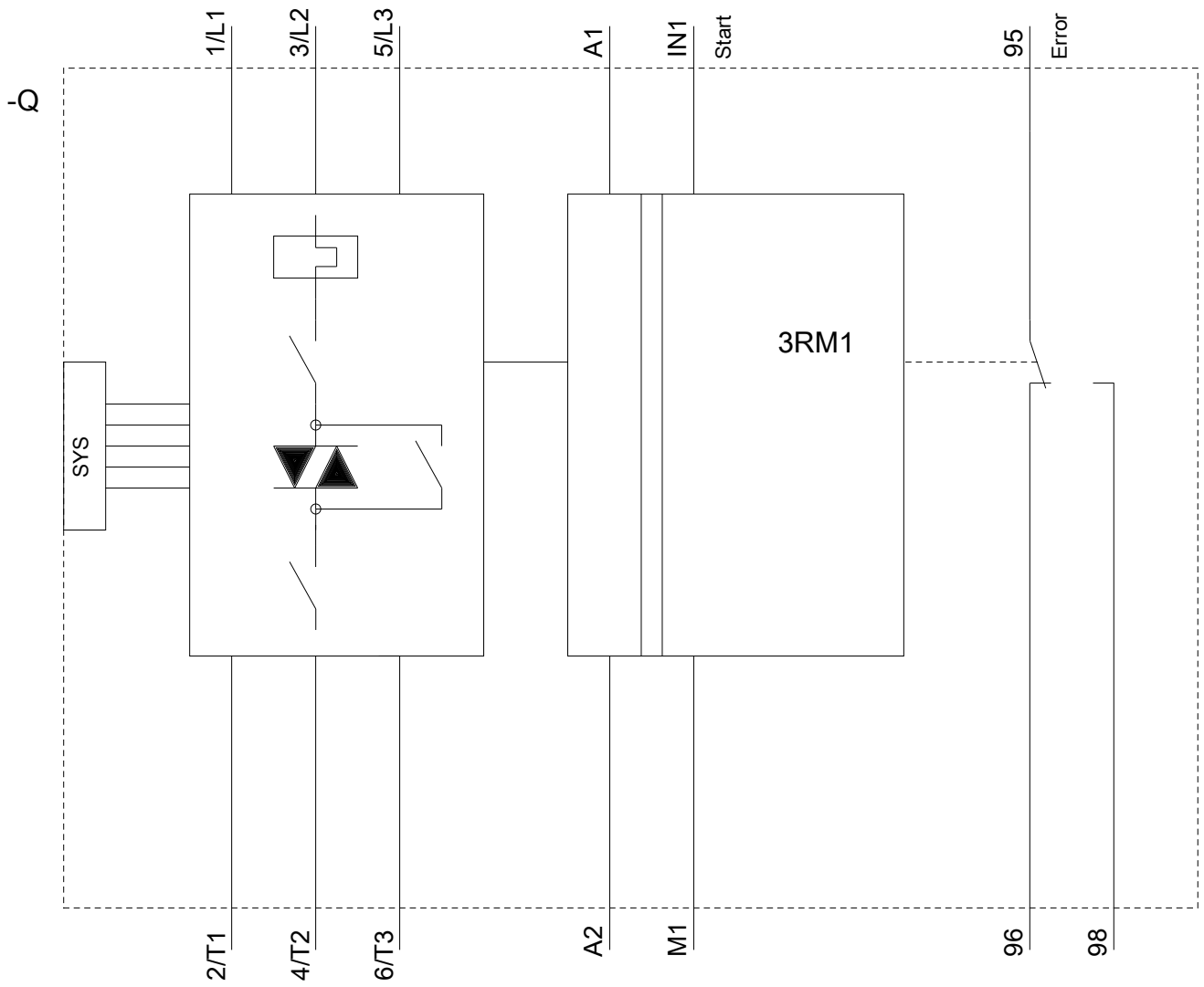
<b>General Product Approval</b>	<b>EMC</b>	<b>For use in hazardous locations</b>
 CCC	 EAC	 ATEX
 CSA	 RCM	
 UL		

<b>Functional Safety/Safety of Machinery</b>	<b>Declaration of Conformity</b>	<b>other</b>
<a href="#">Type Examination Certificate</a>	 EG-Konf.	<a href="#">Miscellaneous Confirmation</a>

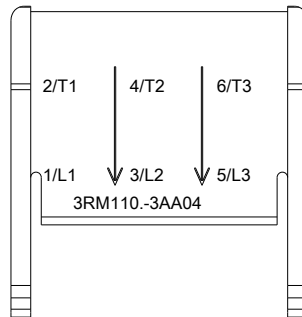
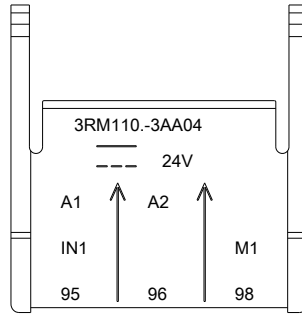
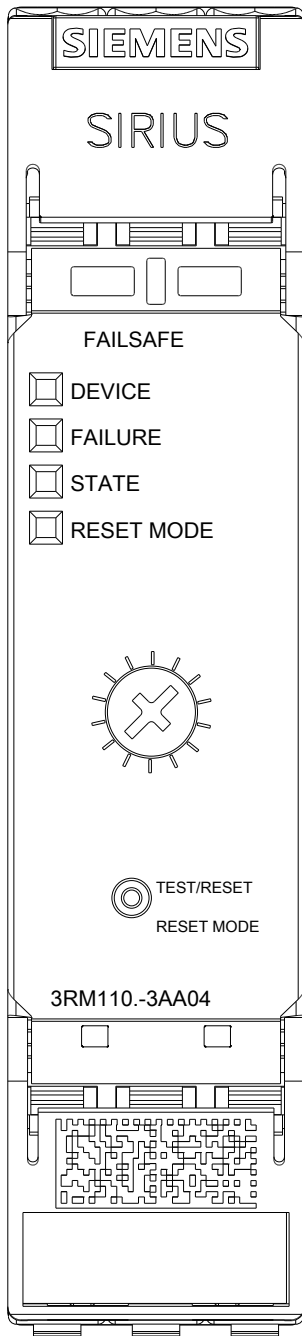
### Further information

- 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=3RM1107-3AA04>
- Cax online generator**  
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RM1107-3AA04>
- Service&Support (Manuals, Certificates, Characteristics, FAQs,...)**  
<https://support.industry.siemens.com/cs/ww/en/ps/3RM1107-3AA04>









last modified:

12/20/2019