

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 ² , 500 Hz
Operating frequency maximum	1 1/s
Mechanical service life (switching cycles)	
• typical	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	
• direct start	No
• reverse starting	Yes
Product function Short circuit protection	No

Electromagnetic compatibility

Conducted interference	
• due to burst acc. to IEC 61000-4-4	3 kV / 5 kHz
• due to conductor-earth surge acc. to IEC 61000-4-5	4 kV signal lines 2 kV
• due to conductor-conductor surge acc. to IEC 61000-4-5	2 kV
• due to high-frequency radiation acc. to IEC 61000-4-6	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; 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; 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]	
• at rate of recognizable hazardous failures (λ_{dd})	1 400 FIT
• at rate of non-recognizable hazardous failures (λ_{du})	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	
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<ul style="list-style-type: none"> • at DC rated value • with signal <0> at DC • for signal <1> at DC 	110 V 0 ... 40 V 79 ... 121
Input voltage at digital input <ul style="list-style-type: none"> • at AC rated value • with signal <0> at AC • for signal <1> at AC 	110 V 0 ... 40 V 93 ... 253 V
Input current at digital input <ul style="list-style-type: none"> • with signal <0> typical • for signal <1> typical 	0.0004 A 0.002 A
Input current at digital input <ul style="list-style-type: none"> • for signal <1> at DC • with signal <0> at DC 	1.5 mA 0.25 mA
Input current at digital input with signal <0> at AC <ul style="list-style-type: none"> • at 110 V • at 230 V 	0.2 mA 0.4 mA
Input current at digital input for signal <1> at AC <ul style="list-style-type: none"> • at 110 V • at 230 V 	1.1 mA 2.3 mA
Number of CO contacts for auxiliary contacts	1
Operating current of auxiliary contacts at AC-15 at 230 V maximum	3 A
Operating current of auxiliary contacts at DC-13 at 24 V maximum	1 A

Control circuit/ Control

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

Operating range factor control supply voltage rated value at AC at 60 Hz	
<ul style="list-style-type: none"> • initial value • Full-scale value 	<p>1.1</p> <p>0.85</p>
Control current at AC	
<ul style="list-style-type: none"> • at 110 V in standby mode • at 230 V in standby mode • at 110 V when switching on • at 230 V when switching on • at 110 V during operation • at 230 V during operation 	<p>8 mA</p> <p>6 mA</p> <p>40 mA</p> <p>25 mA</p> <p>25 mA</p> <p>14 mA</p>
Control current at DC	
<ul style="list-style-type: none"> • in standby mode • when switching on • during operation 	<p>4 mA</p> <p>13 mA</p> <p>30 mA</p>

Response times	
Switch-on delay time	90 ... 120 ms
Off-delay time	60 ... 90 ms

Installation/ mounting/ dimensions	
Mounting position	vertical, horizontal, standing (observe derating)
Mounting type	screw and snap-on mounting onto 35 mm standard mounting rail
Height	100 mm
Width	22.5 mm
Depth	141.6 mm
Required spacing	
<ul style="list-style-type: none"> • with side-by-side mounting <ul style="list-style-type: none"> — forwards — Backwards — upwards — downwards — at the side • for grounded parts <ul style="list-style-type: none"> — forwards — Backwards — upwards — at the side — downwards 	<p>0 mm</p> <p>0 mm</p> <p>50 mm</p> <p>50 mm</p> <p>0 mm</p> <p>0 mm</p> <p>0 mm</p> <p>50 mm</p> <p>3.5 mm</p> <p>50 mm</p>

Ambient conditions	
Installation altitude at height above sea level	
<ul style="list-style-type: none"> • maximum 	2 000 m
Ambient temperature	

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

Communication/ Protocol

Product function Bus communication	No
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Connections/ Terminals

Type of electrical connection <ul style="list-style-type: none"> • for main current circuit • for auxiliary and control current circuit 	PUSH-IN connection (spring-loaded connection) for main circuit, spring-loaded terminals (push-in) for control circuit PUSH-IN connection (spring-loaded connection) spring-loaded terminals (push-in)
Type of connectable conductor cross-sections <ul style="list-style-type: none"> • for main contacts <ul style="list-style-type: none"> — solid — finely stranded with core end processing — finely stranded without core end processing • at AWG conductors for main contacts 	1x (0.5 ... 4 mm ²) 1x (0.5 ... 2.5 mm ²) 1x (0.5 ... 4 mm ²) 1x (20 ... 12)
Connectable conductor cross-section for main contacts <ul style="list-style-type: none"> • single or multi-stranded • finely stranded with core end processing • finely stranded without core end processing 	0.5 ... 4 mm ² 0.5 ... 2.5 mm ² 0.5 ... 4 mm ²
Connectable conductor cross-section for auxiliary contacts <ul style="list-style-type: none"> • single or multi-stranded • finely stranded with core end processing • finely stranded without core end processing 	0.5 ... 1.5 mm ² 0.5 ... 1 mm ² 0.5 ... 1.5 mm ²
Type of connectable conductor cross-sections <ul style="list-style-type: none"> • for auxiliary contacts <ul style="list-style-type: none"> — solid — finely stranded with core end processing — finely stranded without core end processing • at AWG conductors for auxiliary contacts 	1x (0.5 ... 1.5 mm ²), 2x (0.5 ... 1.5 mm ²) 1x (0,5 ... 1,0 mm ²), 2x (0,5 ... 1,0 mm ²) 1x (0.5 ... 1.5 mm ²), 2x (0.5 ... 1.5 mm ²) 1x (20 ... 16), 2x (20 ... 16)
AWG number as coded connectable conductor cross section <ul style="list-style-type: none"> • for main contacts • for auxiliary contacts 	20 ... 12 20 ... 16

Certificates/ approvals

General Product Approval	EMC	For use in hazardous locations
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Functional Safety/Safety of Machinery	Declaration of Conformity	Test Certificates	other	Railway
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[Type Examination Certificate](#)



[Miscellaneous](#)

[Type Test Certificates/Test Report](#)

[Confirmation](#)

[Special Test Certificate](#)

Further information

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

www.siemens.com/ic10

Industry Mall (Online ordering system)

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

Cax online generator

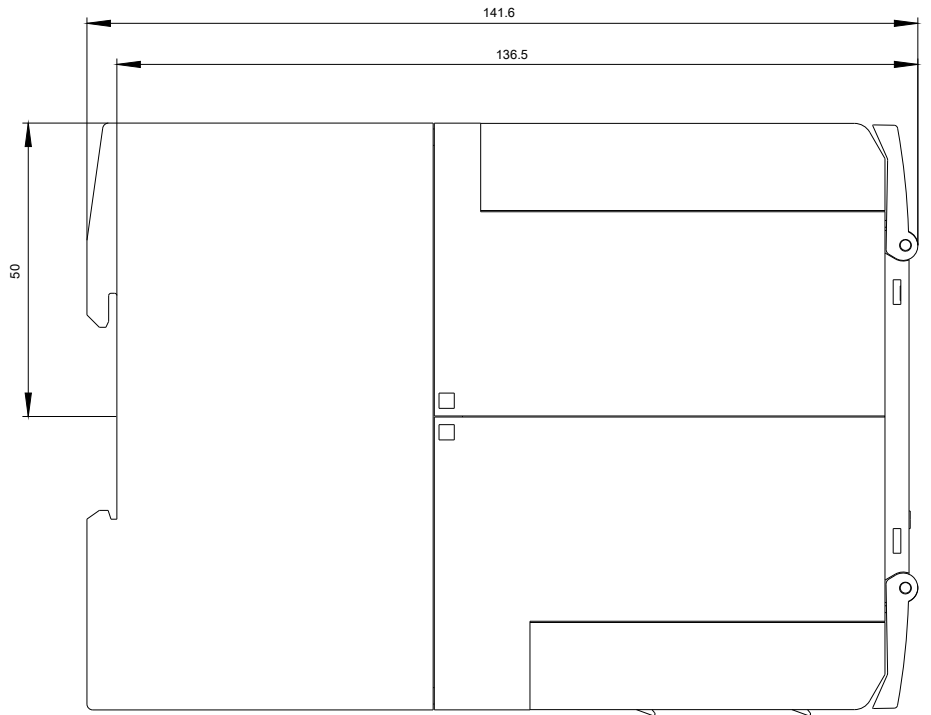
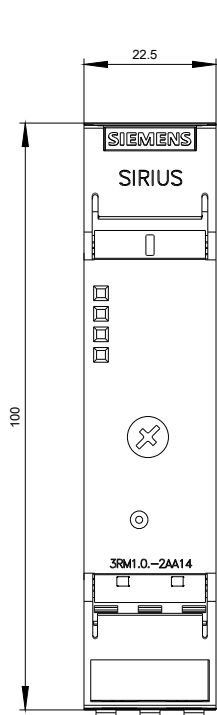
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mfb=3RM1301-2AA14>

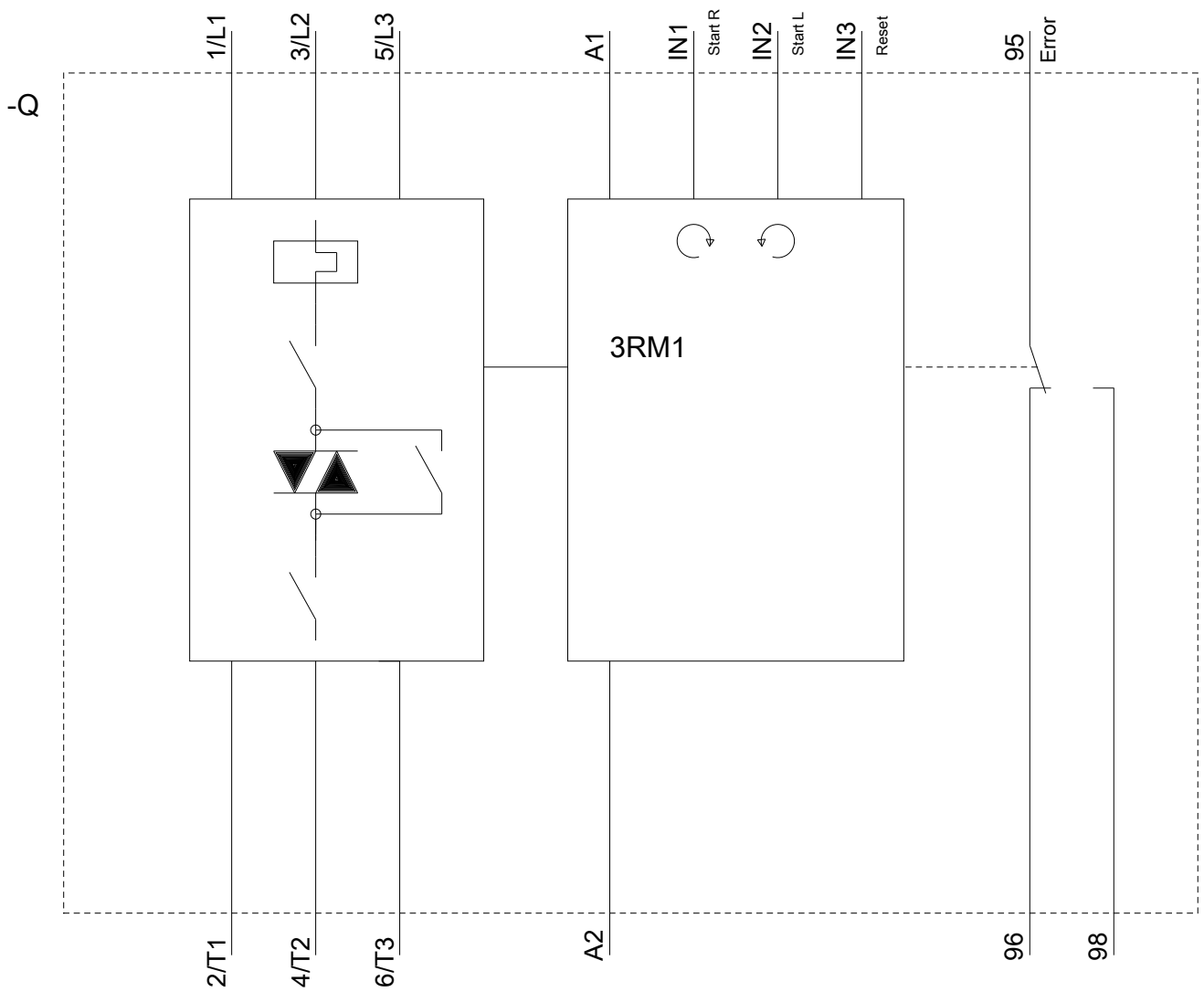
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

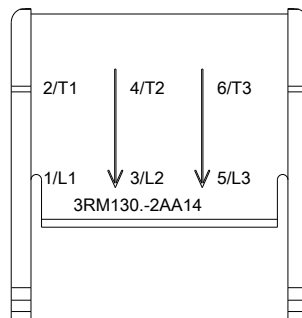
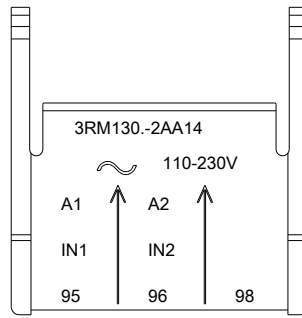
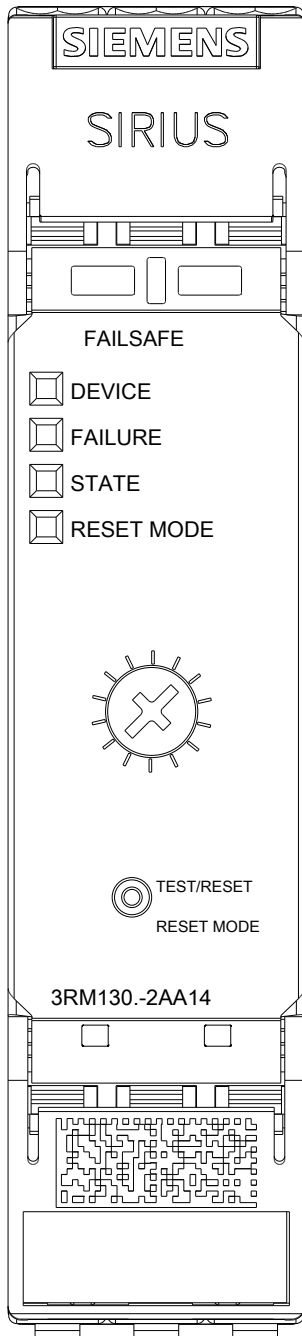
<https://support.industry.siemens.com/cs/ww/en/ps/3RM1301-2AA14>

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

http://www.automation.siemens.com/bilddb/cax_de.aspx?mfb=3RM1301-2AA14&lang=en







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