SIEMENS

Data sheet 3RM1301-2AA14

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
equipment variant according to IEC 60947-4-2	3
product function	fail-safe reversing starter
● intrinsic device protection	Yes
● for power supply reverse polarity protection	Yes
suitability for operation device connector 3ZY12	No
insulation voltage rated value	500 V
overvoltage category	III
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
shock resistance	6g / 11 ms
vibration resistance	1 ... 6 Hz, 15 mm; 20 m/s², 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	
● direct start	No
● reverse starting	Yes
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	
● due to burst according to IEC 61000-4-4	3 kV / 5 kHz
● due to conductor-earth surge according to IEC 61000-4-5	4 kV signal lines 2 kV
● due to conductor-conductor surge according to IEC 61000-4-5	2 kV
● due to high-frequency radiation according to IEC 61000-4-6	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 domestic, business and commercial environments; Class A

CISPR11	for industrial environments at 110 V DC
field-bound HF interference emission according 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 according to IEC 61508-2	Type B
B10d value	1 300 000
Safety Integrity Level (SIL) according to IEC 61508	3
SIL Claim Limit (subsystem) according to EN 62061	SILCL 3
performance level (PL) according to EN ISO 13849-1	e
category according to EN ISO 13849-1	4
stop category according to EN 60204-1	0
Safe failure fraction (SFF)	99 %
average diagnostic coverage level (DCavg)	99 %
diagnostics test interval by internal test function maximum	600 s
function test interval maximum	1 a
failure rate [FIT]	
● at rate of recognizable hazardous failures (λdd)	1 400 FIT
● at rate of non-recognizable hazardous failures (λdu)	16 FIT
PFHD with high demand rate according to EN 62061	0.00000002 1/h
PFDavg with low demand rate according to IEC 61508	0
MTTFd	75 a
hardware fault tolerance according to IEC 61508	1
safe state	Load circuit open
protection class IP on the front according to IEC 60529	IP20
touch protection on the front according to IEC 60529	finger-safe
hardware fault tolerance according to IEC 61508 relating to ATEX	0
PFDavg with low demand rate according to IEC 61508 relating to ATEX	0.0005
PFHD with high demand rate according to EN 62061 relating to ATEX	0.00000005 1/h
Safety Integrity Level (SIL) according to IEC 61508 relating to ATEX	SIL2
T1 value for proof test interval or service life according to IEC 61508 relating to ATEX	3 a
Main circuit	
number of poles for main current circuit	3
design of the switching contact	Hybrid
adjustable current response value current of the current-dependent overload release	0.1 ... 0.5 A
minimum load [%]	20 %; from set rated current
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 %
operational current	
● 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
ampacity when starting maximum	4 A
operating power for 3-phase motors at 400 V at 50 Hz	0 ... 0.12 kW
Inputs/ Outputs	
input voltage at digital input	
● at DC rated value	110 V
● with signal <0> at DC	0 ... 40 V
● for signal <1> at DC	79 ... 121
input voltage at digital input	
● at AC rated value	110 V

● with signal <0> at AC	0 ... 40 V
● for signal <1> at AC	93 ... 253 V
input current at digital input	
● for signal <1> at DC	1.5 mA
● with signal <0> at DC	0.25 mA
input current at digital input with signal <0> at AC	
● at 110 V	0.2 mA
● at 230 V	0.4 mA
input current at digital input for signal <1> at AC	
● at 110 V	1.1 mA
● at 230 V	2.3 mA
number of CO contacts for auxiliary contacts	1
operational current of auxiliary contacts at AC-15 at 230 V maximum	3 A
operational 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 at AC	
● at 50 Hz rated value	110 ... 230 V
● at 60 Hz rated value	110 ... 230 V
relative negative tolerance of the control supply voltage at AC at 60 Hz	15 %
relative positive tolerance of the control supply voltage at AC at 60 Hz	10 %
control supply voltage 1 at AC	
● at 50 Hz	110 ... 230 V
● at 60 Hz	110 ... 230 V
control supply voltage frequency	
● **1 rated value**	50 Hz
● **2 rated value**	60 Hz
relative negative tolerance of the control supply voltage at DC	15 %
relative positive tolerance of the control supply voltage at DC	10 %
control supply voltage 1 at DC rated value	110 V
operating range factor control supply voltage rated value at DC	
● initial value	0.85
● full-scale value	1.1
operating range factor control supply voltage rated value at AC at 50 Hz	
● initial value	0.85
● full-scale value	1.1
operating range factor control supply voltage rated value at AC at 60 Hz	
● initial value	0.85
● full-scale value	1.1
control current at AC	
● at 110 V in standby mode of operation	8 mA
● at 230 V in standby mode of operation	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
control current at DC	
● in standby mode of operation	4 mA
● during operation	30 mA
inrush current peak	
● at AC at 110 V	1 200 mA
● at AC at 230 V	2 900 mA
● at AC at 110 V at switching on of motor	1 200 mA
● at AC at 230 V at switching on of motor	2 900 mA
duration of inrush current peak	
● at AC at 110 V	1 ms

● at AC at 230 V	1 ms
● at AC at 110 V at switching on of motor	1 ms
● at AC at 230 V at switching on of motor	1 ms
power loss [W] in auxiliary and control circuit	
● in switching state OFF	
— with bypass circuit	1.4 W
● in switching state ON	
— with bypass circuit	3.22 W
Response times	
ON-delay time	90 ... 120 ms
OFF-delay time	60 ... 90 ms
Power Electronics	
operational current	
● at 40 °C rated value	0.5 A
● at 50 °C rated value	0.5 A
● at 55 °C rated value	0.5 A
● at 60 °C rated value	0.5 A
Installation/ mounting/ dimensions	
mounting position	vertical, horizontal, standing (observe derating)
fastening method	screw and snap-on mounting onto 35 mm DIN rail
height	100 mm
width	23 mm
depth	142 mm
required spacing	
● 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	4 mm
— downwards	50 mm
Ambient conditions	
installation altitude at height above sea level maximum	4 000 m; For derating see manual
ambient temperature	
● during operation	-25 ... +60 °C
● during storage	-40 ... +70 °C
● during transport	-40 ... +70 °C
environmental category during operation according to IEC 60721	3K6 (no ice formation, only occasional condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6
relative humidity during operation	10 ... 95 %
air pressure according to SN 31205	900 ... 1 060 hPa
Communication/ Protocol	
protocol is supported	
● PROFINET IO protocol	No
● PROFIsafe protocol	No
product function bus communication	No
protocol is supported AS-Interface protocol	No
Connections/ Terminals	
type of electrical connection	spring-loaded terminals (push-in) for main circuit, spring-loaded terminals (push-in) for control circuit
● for main current circuit	spring-loaded terminals (push-in)
● for auxiliary and control circuit	spring-loaded terminals (push-in)
wire length for motor unshielded maximum	100 m
type of connectable conductor cross-sections	
● for main contacts	
— solid	1x (0.5 ... 4 mm²)
— finely stranded with core end processing	1x (0.5 ... 2.5 mm²)
— finely stranded without core end processing	1x (0.5 ... 4 mm²)

● at AWG cables for main contacts	1x (20 ... 12)
connectable conductor cross-section for main contacts	
● solid or stranded	0.5 ... 4 mm²
● finely stranded with core end processing	0.5 ... 2.5 mm²
● finely stranded without core end processing	0.5 ... 4 mm²
connectable conductor cross-section for auxiliary contacts	
● solid or stranded	0.5 ... 1.5 mm²
● finely stranded with core end processing	0.5 ... 1 mm²
● finely stranded without core end processing	0.5 ... 1.5 mm²
type of connectable conductor cross-sections	
● for auxiliary contacts	
— solid	1x (0.5 ... 1.5 mm²), 2x (0.5 ... 1.5 mm²)
— finely stranded with core end processing	1x (0,5 ... 1,0 mm²), 2x (0,5 ... 1,0 mm²)
— finely stranded without core end processing	1x (0.5 ... 1.5 mm²), 2x (0.5 ... 1.5 mm²)
● at AWG cables for auxiliary contacts	1x (20 ... 16), 2x (20 ... 16)
AWG number as coded connectable conductor cross section	
● for main contacts	20 ... 12
● for auxiliary contacts	20 ... 16

UL/CSA ratings

operating voltage at AC rated value	480 V

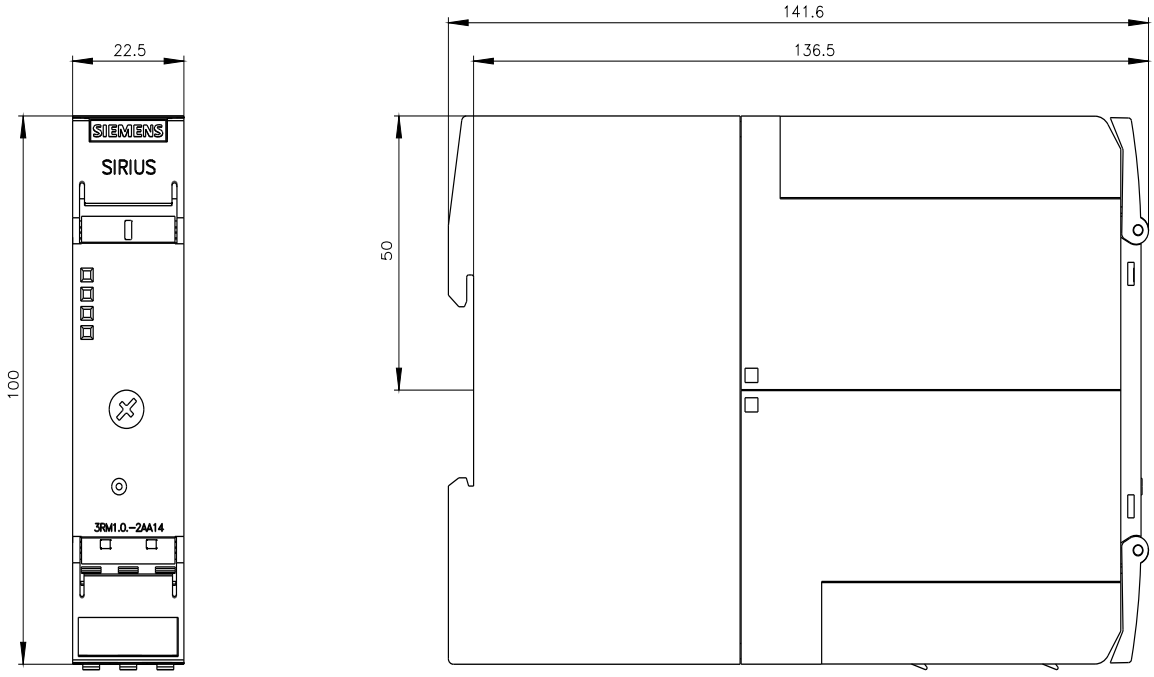
Certificates/ approvals

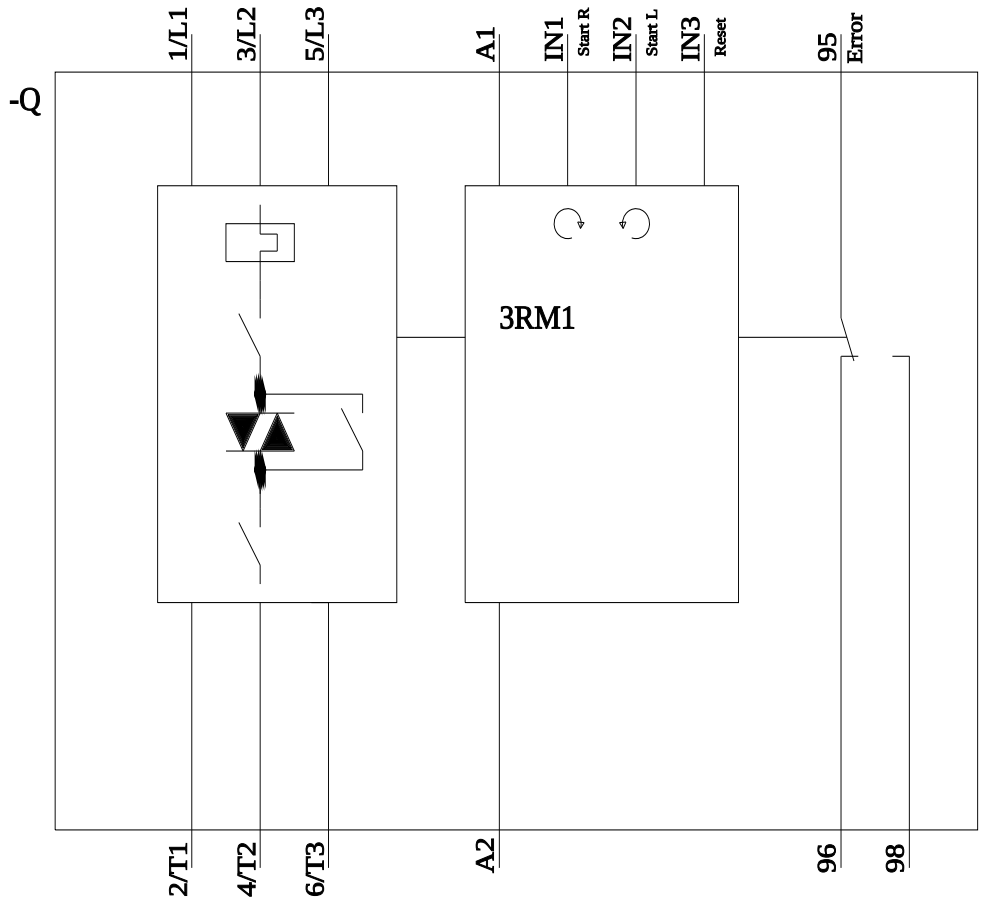
General Product Approval					EMC
CSA	Confirmation	CCC	UL	EAC	RCM

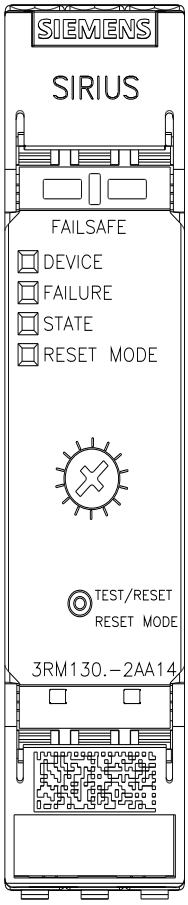
For use in hazardous locations	Functional Safety/Safety of Machinery	Declaration of Conformity	Test Certificates	other	Railway
ATEX	Type Examination Certificate	EG-Konf.	Type Test Certificates/Test Report	Confirmation	Special Test Certificate

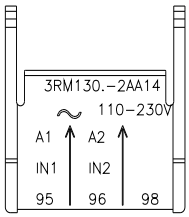
Further information

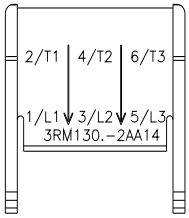
Information on the packaging
https://support.industry.siemens.com/cs/ww/en/view/109813875
Information- and Downloadcenter (Catalogs, Brochures,…)
https://www.siemens.com/ic10
Industry Mall (Online ordering system)
https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RM1301-2AA14
Cax online 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











last modified: 11/21/2022