



Fail-safe reversing starter, 3RM1, 500 V, 0 - 0.12 kW, 0.1 - 0.5 A, 24 V DC, 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	Yes
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/s ² , 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 the domestic, business and commercial environments

CISPR11

field-bound HF interference emission according to CISPR11

Class B for the domestic, business and commercial environments

Safety related data

safety device type according to IEC 61508-2	Type B
B10d value	2 500 000
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 (λ_{dd})	1 400 FIT
• at rate of non-recognizable hazardous failures (λ_{du})	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	24 V
• with signal <0> at DC	0 ... 5 V
• for signal <1> at DC	15 ... 30
input current at digital input	
• for signal <1> at DC	8 mA

• with signal <0> at DC	1 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	DC
control supply voltage at DC rated value	19.2 ... 30 V
relative negative tolerance of the control supply voltage at DC	20 %
relative positive tolerance of the control supply voltage at DC	25 %
control supply voltage 1 at DC rated value	24 V
operating range factor control supply voltage rated value at DC	
• initial value	0.8
• full-scale value	1.25
control current at DC	
• in standby mode of operation	13 mA
• during operation	57 mA
inrush current peak	
• at DC at 24 V	300 mA
• at DC at 24 V at switching on of motor	140 mA
duration of inrush current peak	
• at DC at 24 V	80 ms
• at DC at 24 V at switching on of motor	80 ms
power loss [W] in auxiliary and control circuit	
• in switching state OFF — with bypass circuit	0.35 W
• in switching state ON — with bypass circuit	1.37 W
Response times	
ON-delay time	65 ... 76 ms
OFF-delay time	30 ... 43 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 — backwards — upwards — downwards — at the side	0 mm 0 mm 50 mm 50 mm 0 mm
• for grounded parts — forwards — backwards — upwards — at the side — downwards	0 mm 0 mm 50 mm 4 mm 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 - during transport environmental category during operation according to IEC 60721relative humidity during operationair pressure according to SN 31205	-40 ... +70 °C -40 ... +70 °C 3K6 (no ice formation, only occasional condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6 10 ... 95 % 900 ... 1 060 hPa				
Communication/ Protocol					
protocol is supported - PROFINET IO protocol - PROFIsafe protocol product function bus communication protocol is supported AS-Interface protocol	No No No No				
Connections/ Terminals					
type of electrical connection - for main current circuit - for auxiliary and control circuit wire length for motor unshielded maximum type of connectable conductor cross-sections - for main contacts - solid - finely stranded with core end processing - finely stranded without core end processing - at AWG cables for main contacts connectable conductor cross-section for main contacts - solid or stranded - finely stranded with core end processing - finely stranded without core end processing connectable conductor cross-section for auxiliary contacts - solid or stranded - finely stranded with core end processing - finely stranded without core end processing type of connectable conductor cross-sections - for auxiliary contacts - solid - finely stranded with core end processing - finely stranded without core end processing - at AWG cables for auxiliary contacts AWG number as coded connectable conductor cross section - for main contacts - for auxiliary contacts	spring-loaded terminals (push-in) for main circuit, spring-loaded terminals (push-in) for control circuit spring-loaded terminals (push-in) spring-loaded terminals (push-in) 100 m 1x (0.5 ... 4 mm ²) 1x (0.5 ... 2.5 mm ²) 1x (0.5 ... 4 mm ²) 1x (20 ... 12) 0.5 ... 4 mm ² 0.5 ... 2.5 mm ² 0.5 ... 4 mm ² 0.5 ... 1.5 mm ² 0.5 ... 1 mm ² 0.5 ... 1.5 mm ² 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) 20 ... 12 20 ... 16				
UL/CSA ratings					
operating voltage at AC rated value	480 V				
Certificates/ approvals					
General Product Approval					
EMC					
 CSA Confirmation  CCC  UL   RCM					
For use in hazard- ous locations	Functional Safety/Safety of Machinery	Declaration of Conformity	Test Certificates	other	Railway
 ATEX	Type Examination Certificate	 EG-Konf.	Type Test Certific- ates/Test Report	Confirmation	Special Test Certific- ate

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=3RM1301-2AA04>

Cax online generator

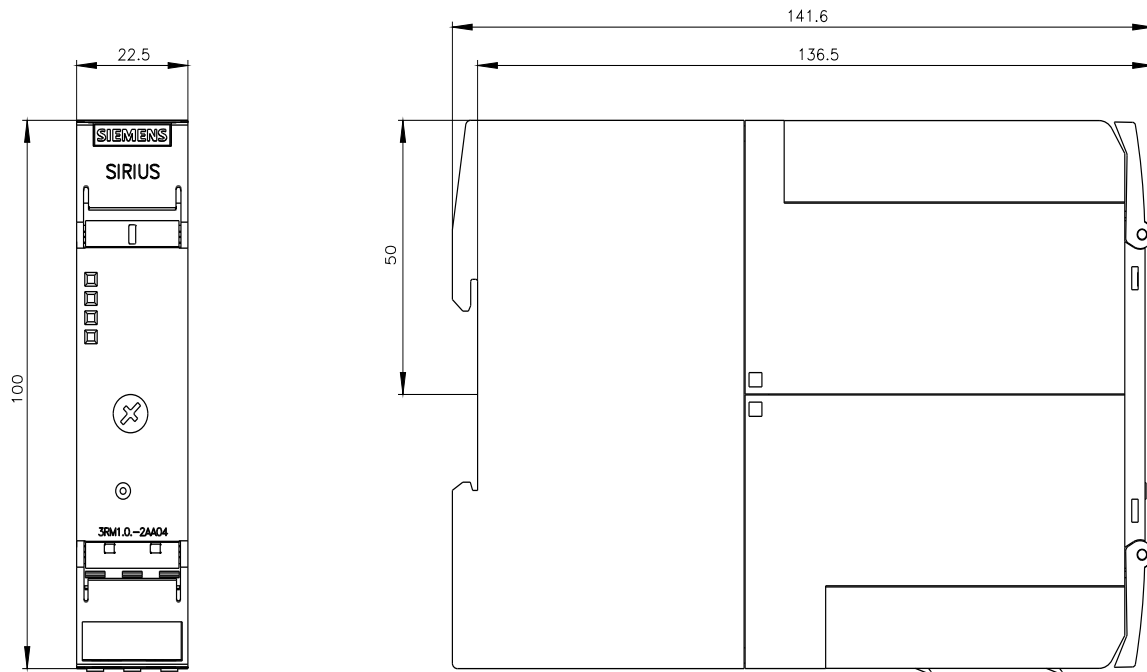
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RM1301-2AA04>

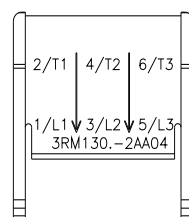
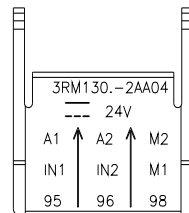
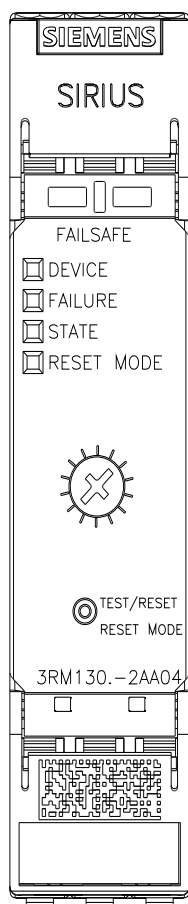
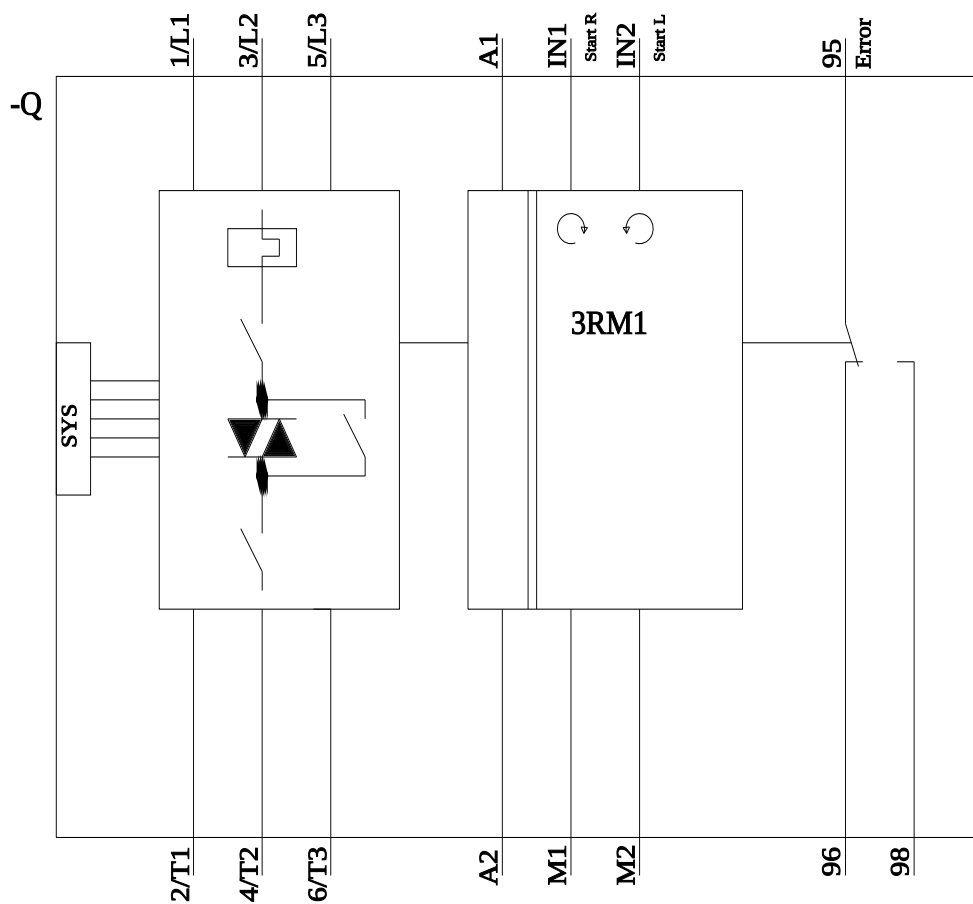
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RM1301-2AA04>

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

http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RM1301-2AA04&lang=en





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