



Fail-safe direct starter, 3RM1, 500 V, 0.09 - 0.75 kW, 0.4 - 2 A, 24 V DC, screw terminals

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| 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 |
| equipment variant according to IEC 60947-4-2 | 3 |
| product function | fail-safe direct 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 (switching cycles) typical | 15 000 000 |
| reference code according to IEC 81346-2 | Q |
| Substance Prohibitance (Date) | 03/01/2017 |
| product function | |
| • direct start | Yes |
| • reverse starting | No |
| 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 |

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| electrostatic discharge according to IEC 61000-4-2 | 6 kV contact discharge / 8 kV air discharge |
| conducted HF interference emissions according to CISPR11 | Class B for the domestic, business and commercial environments |
| 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 |
| 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) | 99.4 % |
| 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 according to EN 62061 | 0.00000002 1/h |
| PFDAvg with low demand rate according to IEC 61508 | 0.000018 |
| MTTFd | 75 y |
| 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 y |
| 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 | 0.4 ... 2 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 | 2 A |
| • at AC-3 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 3-phase motors at 400 V at 50 Hz | 0.09 ... 0.75 kW |
| Inputs/ Outputs | |
| input voltage at digital input | |
| • at DC rated value | 24 V |
| • with signal <0> at DC | 0 ... 5 V |

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| <ul style="list-style-type: none"> • for signal <1> at DC | 15 ... 30 |
| input current at digital input | |
| <ul style="list-style-type: none"> • for signal <1> at DC | 8 mA |
| <ul style="list-style-type: none"> • 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 | |
| <ul style="list-style-type: none"> • initial value | 0.8 |
| <ul style="list-style-type: none"> • full-scale value | 1.25 |
| control current at DC | |
| <ul style="list-style-type: none"> • in standby mode of operation | 13 mA |
| <ul style="list-style-type: none"> • when switching on | 150 mA |
| <ul style="list-style-type: none"> • during operation | 57 mA |
| inrush current peak | |
| <ul style="list-style-type: none"> • at DC at 24 V | 300 mA |
| <ul style="list-style-type: none"> • at DC at 24 V at switching on of motor | 130 mA |
| duration of inrush current peak | |
| <ul style="list-style-type: none"> • at DC at 24 V | 80 ms |
| <ul style="list-style-type: none"> • at DC at 24 V at switching on of motor | 20 ms |
| power loss [W] in auxiliary and control circuit | |
| <ul style="list-style-type: none"> • in switching state OFF <ul style="list-style-type: none"> — with bypass circuit | 0.35 W |
| <ul style="list-style-type: none"> • in switching state ON <ul style="list-style-type: none"> — with bypass circuit | 1.37 W |
| Response times | |
| ON-delay time | 65 ... 76 ms |
| OFF-delay time | 30 ... 43 ms |
| Power Electronics | |
| operational current | |
| <ul style="list-style-type: none"> • at 40 °C rated value | 2 A |
| <ul style="list-style-type: none"> • at 50 °C rated value | 2 A |
| <ul style="list-style-type: none"> • at 55 °C rated value | 2 A |
| <ul style="list-style-type: none"> • at 60 °C rated value | 2 A |
| Installation/ mounting/ dimensions | |
| mounting position | vertical, horizontal, standing (observe derating) |
| fastening method | 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 | 0 mm |
| <ul style="list-style-type: none"> <ul style="list-style-type: none"> — backwards | 0 mm |
| <ul style="list-style-type: none"> <ul style="list-style-type: none"> — upwards | 50 mm |
| <ul style="list-style-type: none"> <ul style="list-style-type: none"> — downwards | 50 mm |
| <ul style="list-style-type: none"> <ul style="list-style-type: none"> — at the side | 0 mm |
| <ul style="list-style-type: none"> • for grounded parts <ul style="list-style-type: none"> — forwards | 0 mm |
| <ul style="list-style-type: none"> <ul style="list-style-type: none"> — backwards | 0 mm |

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| — upwards | 50 mm |
| — at the side | 3.5 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 |
| • PROFI-safe protocol | No |
| product function bus communication | No |
| protocol is supported AS-Interface protocol | No |
| Connections/ Terminals | |
| type of electrical connection | screw-type terminals for main circuit, screw-type terminals for control circuit |
| • for main current circuit | screw-type terminals |
| • for auxiliary and control circuit | screw-type terminals |
| wire length for motor unshielded maximum | 100 m |
| type of connectable conductor cross-sections | |
| • for main contacts | |
| — solid | 1x (0,5 ... 4 mm ²), 2x (0,5 ... 2,5 mm ²) |
| — finely stranded with core end processing | 1x (0,5 ... 4 mm ²), 2x (0,5 ... 1,5 mm ²) |
| • at AWG cables for main contacts | 1x (20 ... 12), 2x (20 ... 14) |
| connectable conductor cross-section for main contacts | |
| • solid or stranded | 0.5 ... 4 mm ² |
| • finely stranded with core end processing | 0.5 ... 4 mm ² |
| connectable conductor cross-section for auxiliary contacts | |
| • solid or stranded | 0.5 ... 2.5 mm ² |
| • finely stranded with core end processing | 0.5 ... 2.5 mm ² |
| type of connectable conductor cross-sections | |
| • for auxiliary contacts | |
| — solid | 1x (0,5 ... 2,5 mm ²), 2x (1,0 ... 1,5 mm ²) |
| — finely stranded with core end processing | 1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²) |
| • at AWG cables for auxiliary contacts | 1x (20 ... 14), 2x (18 ... 16) |
| AWG number as coded connectable conductor cross section | |
| • for main contacts | 20 ... 12 |
| • for auxiliary contacts | 20 ... 14 |
| UL/CSA ratings | |
| yielded mechanical performance [hp] | |
| • for single-phase AC motor | |
| — at 230 V rated value | 0.125 hp |
| • for 3-phase AC motor | |
| — at 200/208 V rated value | 0.333 hp |
| — at 220/230 V rated value | 0.333 hp |
| — at 460/480 V rated value | 0.75 hp |
| operating voltage at AC | |
| • according to UL rated value | 480 V |
| • according to CSA rated value | 400 V |
| Certificates/ approvals | |
| General Product Approval | EMC |



[Confirmation](#)



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|--------------------------------|---------------------------------------|---------------------------|-------------------|-------|---------|
| For use in hazardous locations | Functional Safety/Safety of Machinery | Declaration of Conformity | Test Certificates | other | Railway |
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Further information

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=3RM1102-1AA04>

Cax online generator

<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RM1102-1AA04>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3RM1102-1AA04>

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

http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RM1102-1AA04&lang=en

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