SIEMENS

Data sheet

3RT2016-1AP01



power contactor, AC-3e/AC-3, 9 A, 4 kW / 400 V, 3-pole, 230 V AC, 50/60 Hz, auxiliary contacts: 1 NO, screw terminal, size: S00

| product brand name | SIRIUS |
|---|----------------------------|
| product designation | Power contactor |
| product type designation | 3RT2 |
| General technical data | |
| size of contactor | S00 |
| product extension | |
| function module for communication | No |
| auxiliary switch | Yes |
| power loss [W] for rated value of the current | |
| at AC in hot operating state | 0.9 W |
| at AC in hot operating state per pole | 0.3 W |
| without load current share typical | 1.1 W |
| type of calculation of power loss depending on pole | quadratic |
| insulation voltage | |
| of main circuit with degree of pollution 3 rated value | 690 V |
| of auxiliary circuit with degree of pollution 3 rated value | 690 V |
| surge voltage resistance | |
| of main circuit rated value | 6 kV |
| of auxiliary circuit rated value | 6 kV |
| maximum permissible voltage for protective separation between coil and main contacts according to EN 60947-1 | 400 ∨ |
| shock resistance at rectangular impulse | |
| • at AC | 6,7g / 5 ms, 4,2g / 10 ms |
| shock resistance with sine pulse | |
| • at AC | 10,5g / 5 ms, 6,6g / 10 ms |
| mechanical service life (operating cycles) | |
| of contactor typical | 30 000 000 |
| of the contactor with added electronically optimized auxiliary switch block typical | 5 000 000 |
| of the contactor with added auxiliary switch block typical | 10 000 000 |
| reference code according to IEC 81346-2 | Q |
| Substance Prohibitance (Date) | 10/01/2009 |
| Weight | 0.23 kg |
| Ambient conditions | |
| installation altitude at height above sea level maximum | 2 000 m |
| ambient temperature | |
| during operation | -25 +60 °C |
| during storage | -55 +80 °C |
| relative humidity minimum | 10 % |
| relative humidity at 55 °C according to IEC 60068-2-30 maximum | 95 % |

| Environmental footprint | |
|--|-------------------|
| Environmental Product Declaration(EPD) | Yes |
| global warming potential [CO2 eq] total | 39.6 kg |
| global warming potential [CO2 eq] during manufacturing | 1.18 kg |
| global warming potential [CO2 eq] during operation | 38.5 kg |
| global warming potential [CO2 eq] after end of life | -0.155 kg |
| Main circuit | |
| number of poles for main current circuit | 3 |
| number of NO contacts for main contacts | 3 |
| operating voltage | |
| at AC-3 rated value maximum | 690 V |
| • at AC-3e rated value maximum | 690 V |
| operational current | |
| at AC-1 at 400 V at ambient temperature 40 °C rated value at AC-1 | 22 A |
| up to 690 V at ambient temperature 40 °C rated value | 22 A |
| — up to 690 V at ambient temperature 60 °C rated value | 20 A |
| • at AC-3 | |
| — at 400 V rated value | 9 A |
| — at 500 V rated value | 7.7 A |
| — at 690 V rated value | 6.7 A |
| • at AC-3e | |
| — at 400 V rated value | 9 A |
| — at 500 V rated value | 7.7 A |
| - at 690 V rated value | 6.7 A |
| at AC-4 at 400 V rated value at AC 5a up to 690 V rated value | 8.5 A 19.4 A |
| at AC-5a up to 690 V rated value at AC-5b up to 400 V rated value | 19.4 A 7.4 A |
| at AC-6a | |
| at AC-ba — up to 230 V for current peak value n=20 rated value | 5.3 A |
| — up to 400 V for current peak value n=20 rated value | 5.3 A |
| — up to 500 V for current peak value n=20 rated value | 5.3 A |
| — up to 690 V for current peak value n=20 rated value | 5 A |
| ● at AC-6a | |
| — up to 230 V for current peak value n=30 rated value | 3.5 A |
| — up to 400 V for current peak value n=30 rated value | 3.5 A |
| — up to 500 V for current peak value n=30 rated value | 3.6 A |
| — up to 690 V for current peak value n=30 rated value | 3.3 A |
| minimum cross-section in main circuit at maximum AC-1 rated value | 4 mm ² |
| operational current for approx. 200000 operating cycles at AC-4 | 4.1.0 |
| at 400 V rated value at 690 V rated value | 4.1 A 3.3 A |
| operational current | |
| • at 1 current path at DC-1 | |
| - at 24 V rated value | 20 A |
| — at 60 V rated value | 20 A |
| — at 110 V rated value | 2.1 A |
| — at 220 V rated value | 0.8 A |
| — at 440 V rated value | 0.6 A |
| — at 600 V rated value | 0.6 A |
| with 2 current paths in series at DC-1 | |
| — at 24 V rated value | 20 A |
| — at 60 V rated value | 20 A |
| — at 110 V rated value | 12 A |
| — at 220 V rated value | 1.6 A |
| — at 440 V rated value | 0.8 A |
| — at 600 V rated value | 0.7 A |

| with 3 current paths in series at DC-1 | 20.4 |
|--|---|
| — at 24 V rated value | 20 A |
| — at 60 V rated value | 20 A |
| — at 110 V rated value | 20 A |
| — at 220 V rated value | 20 A |
| — at 440 V rated value | 1.3 A |
| — at 600 V rated value | 1 A |
| • at 1 current path at DC-3 at DC-5 | |
| — at 24 V rated value | 20 A |
| — at 60 V rated value | 0.5 A |
| — at 110 V rated value | 0.15 A |
| • with 2 current paths in series at DC-3 at DC-5 | |
| — at 24 V rated value | 20 A |
| — at 60 V rated value | 5 A |
| — at 110 V rated value | 0.35 A |
| with 3 current paths in series at DC-3 at DC-5 | |
| — at 24 V rated value | 20 A |
| — at 60 V rated value | 20 A |
| — at 110 V rated value | 20 A |
| — at 220 V rated value | 1.5 A |
| — at 440 V rated value | 0.2 A |
| — at 600 V rated value | 0.2 A |
| operating power | |
| • at AC-3 | |
| — at 230 V rated value | 2.2 kW |
| — at 400 V rated value | 4 kW |
| — at 500 V rated value | 4 kW |
| — at 690 V rated value | 5.5 kW |
| • at AC-3e | |
| — at 230 V rated value | 2.2 kW |
| — at 400 V rated value | 4 kW |
| — at 500 V rated value | 4 kW |
| — at 690 V rated value | 5.5 kW |
| operating power for approx. 200000 operating cycles at AC- | |
| 4 | 0.1444 |
| at 400 V rated value | 2 kW |
| • at 690 V rated value | 2.5 kW |
| operating apparent power at AC-6a | 0.11/4 |
| • up to 230 V for current peak value n=20 rated value | 2 kVA |
| • up to 400 V for current peak value n=20 rated value | 3.6 kVA |
| • up to 500 V for current peak value n=20 rated value | 4.6 kVA |
| • up to 690 V for current peak value n=20 rated value | 5.9 kVA |
| operating apparent power at AC-6a | 4.013/4 |
| • up to 230 V for current peak value n=30 rated value | 1.3 kVA |
| • up to 400 V for current peak value n=30 rated value | 2.4 kVA |
| • up to 500 V for current peak value n=30 rated value | 3.1 kVA |
| up to 690 V for current peak value n=30 rated value | 4 kVA |
| short-time withstand current in cold operating state up to 40 °C | |
| Imited to 1 s switching at zero current maximum | 155 A; Use minimum cross-section acc. to AC-1 rated value |
| Imited to 5 s switching at zero current maximum | 111 A; Use minimum cross-section acc. to AC-1 rated value |
| Imited to 10 s switching at zero current maximum | 86 A; Use minimum cross-section acc. to AC-1 rated value |
| Imited to 30 s switching at zero current maximum | 66 A; Use minimum cross-section acc. to AC-1 rated value |
| Imited to 60 s switching at zero current maximum | 55 A; Use minimum cross-section acc. to AC-1 rated value |
| no-load switching frequency | |
| • at AC | 10 000 1/h |
| operating frequency | |
| • at AC-1 maximum | 1 000 1/h |
| • at AC-2 maximum | 750 1/h |
| • at AC-3 maximum | 750 1/h |
| at AC-3e maximum | 750 1/h |

| • at AC-4 maximum | 250 1/h |
|--|---|
| Control circuit/ Control | |
| type of voltage of the control supply voltage | AC |
| control supply voltage at AC | |
| at 50 Hz rated value | 230 V |
| at 60 Hz rated value | 230 V |
| operating range factor control supply voltage rated value of | |
| magnet coil at AC | |
| • at 50 Hz | 0.8 1.1 |
| • at 60 Hz | 0.85 1.1 |
| apparent pick-up power of magnet coil at AC | |
| • at 50 Hz | 27 VA |
| • at 60 Hz | 24.3 VA |
| inductive power factor with closing power of the coil | |
| • at 50 Hz | 0.8 |
| • at 60 Hz | 0.75 |
| apparent holding power of magnet coil at AC • at 50 Hz | 4.2 VA |
| • at 50 Hz | 4.2 VA 3.3 VA |
| inductive power factor with the holding power of the coil | |
| at 50 Hz | 0.25 |
| • at 60 Hz | 0.25 |
| closing delay | |
| • at AC | 9 35 ms |
| opening delay | |
| • at AC | 4 15 ms |
| arcing time | 10 15 ms |
| control version of the switch operating mechanism | Standard A1 - A2 |
| Auxiliary circuit | |
| number of NO contacts for auxiliary contacts instantaneous contact | 1 |
| operational current at AC-12 maximum | 10 A |
| operational current at AC-15 | |
| • at 230 V rated value | 10 A |
| • at 400 V rated value | 3 A |
| • at 500 V rated value | 2 A |
| • at 690 V rated value | 1 A |
| operational current at DC-12 | |
| at 24 V rated value | 10 A |
| • at 48 V rated value | 6 A |
| at 60 V rated value | 6 A |
| at 110 V rated value at 125 V rated value | 3 A 2 A |
| at 125 V rated value at 220 V rated value | 1A |
| at 220 V rated value at 600 V rated value | 0.15 A |
| operational current at DC-13 | |
| at 24 V rated value | 10 A |
| at 48 V rated value | 2 A |
| • at 60 V rated value | 2 A |
| at 110 V rated value | 1 A |
| • at 125 V rated value | 0.9 A |
| • at 220 V rated value | 0.3 A |
| • at 600 V rated value | 0.1 A |
| contact reliability of auxiliary contacts | 1 faulty switching per 100 million (17 V, 1 mA) |
| UL/CSA ratings | |
| full-load current (FLA) for 3-phase AC motor | |
| • at 480 V rated value | 7.6 A |
| • at 600 V rated value | 9 A |
| yielded mechanical performance [hp] | |
| for single-phase AC motor | |
| — at 110/120 V rated value | 0.33 hp |

| — at 230 V rated value | 1 hp | | |
|---|---|--|--|
| for 3-phase AC motor | | | |
| — at 200/208 V rated value | 2 hp | | |
| — at 220/230 V rated value | 3 hp | | |
| — at 460/480 V rated value | 5 hp | | |
| — at 575/600 V rated value | 7.5 hp | | |
| contact rating of auxiliary contacts according to UL | A600 / Q600 | | |
| Short-circuit protection | | | |
| design of the miniature circuit breaker for short-circuit protection of the auxiliary circuit up to 230 V | C characteristic: 10 A; 0.4 kA | | |
| design of the fuse link | | | |
| for short-circuit protection of the main circuit | | | |
| — with type of coordination 1 required | gG: 35A (690V,100kA), aM: 20A (690V,100kA), BS88: 35A (415V,80kA) | | |
| — with type of assignment 2 required | gG: 20A (690V,100kA), aM: 16A (690V, 100kA), BS88: 20A (415V, 80kA) | | |
| for short-circuit protection of the auxiliary switch required | gG: 10 A (500 V, 1 kA) | | |
| Installation/ mounting/ dimensions | | | |
| mounting position | +/-180° rotation possible on vertical mounting surface; can be tilted forward and | | |
| inouning poolion | backward by +/- 22.5° on vertical mounting surface | | |
| fastening method side-by-side mounting | Yes | | |
| fastening method | screw and snap-on mounting onto 35 mm DIN rail according to DIN EN 60715 | | |
| height | 58 mm | | |
| width | 45 mm | | |
| depth | 73 mm | | |
| required spacing | | | |
| with side-by-side mounting | | | |
| — forwards | 10 mm | | |
| — upwards | 10 mm | | |
| — downwards | 10 mm | | |
| — at the side | 0 mm | | |
| | 0 11111 | | |
| for grounded parts | 10 mm | | |
| — forwards | | | |
| — upwards | 10 mm | | |
| — at the side | 6 mm | | |
| — downwards | 10 mm | | |
| • for live parts | | | |
| — forwards | 10 mm | | |
| — upwards | 10 mm | | |
| — downwards | 10 mm | | |
| — at the side | 6 mm | | |
| Connections/ Terminals | | | |
| type of electrical connection | | | |
| for main current circuit | screw-type terminals | | |
| for auxiliary and control circuit | screw-type terminals | | |
| at contactor for auxiliary contacts | Screw-type terminals | | |
| • of magnet coil | Screw-type terminals | | |
| type of connectable conductor cross-sections | | | |
| for main contacts | | | |
| — solid | 2x (0.5 1.5 mm²), 2x (0.75 2.5 mm²), 2x 4 mm² | | |
| — solid or stranded | 2x (0,5 1,5 mm²), 2x (0,75 2,5 mm²), 2x 4 mm² | | |
| finely stranded with core end processing | 2x (0.5 1.5 mm ²), 2x (0.75 2.5 mm ²) | | |
| for AWG cables for main contacts | 2x (20 16), 2x (18 14), 2x 12 | | |
| connectable conductor cross-section for main contacts | | | |
| solid | 0.5 4 mm² | | |
| stranded | 0.5 4 mm² | | |
| finely stranded with core end processing | 0.5 4 mm | | |
| | 0.0 2.0 mm | | |
| connectable conductor cross-section for auxiliary contacts solid or stranded | 0.5 4 mm² | | |
| | | | |
| finely stranded with core end processing | 0.5 2.5 mm ² | | |
| type of connectable conductor cross-sections | | | |
| for auxiliary contacts | | | |
| — solid or stranded | 2x (0.5 1.5 mm²), 2x (0.75 2.5 mm²), 2x 4 mm² | | |

| finely stranded with core end process | ing 2x (0 | 0.5 1.5 mm²), 2x (0.75 2.5 mm²) | | |
|--|----------------------------------|--|--|--|
| for AWG cables for auxiliary contacts | 2x (2 | 2x (20 16), 2x (18 14), 2x 12 | | |
| AWG number as coded connectable conducto section | or cross | | | |
| for main contacts | 20 | 20 12 | | |
| for auxiliary contacts | 20 | 20 12 | | |
| Safety related data | | | | |
| product function | | | | |
| mirror contact according to IEC 60947-4-1 | Yes; | ; with 3RH29 | | |
| positively driven operation according to IEC | C 60947-5-1 No | | | |
| suitable for safety function | Yes | | | |
| suitability for use safety-related switching OFF | Yes | | | |
| service life maximum | 20 a | 1 | | |
| test wear-related service life necessary | Yes | | | |
| proportion of dangerous failures | proportion of dangerous failures | | | |
| with low demand rate according to SN 319 | 20 40 % | 6 | | |
| with high demand rate according to SN 319 | 920 73 % | 73 % | | |
| B10 value with high demand rate according to | SN 31920 1 00 | 1 000 000 | | |
| failure rate [FIT] with low demand rate accordi 31920 | ing to SN 100 | 100 FIT | | |
| ISO 13849 | | | | |
| device type according to ISO 13849-1 | 3 | | | |
| overdimensioning according to ISO 13849-2 n | ecessary Yes | Yes | | |
| IEC 61508 | | | | |
| safety device type according to IEC 61508-2 | | Туре А | | |
| Electrical Safety | | | | |
| protection class IP on the front according to I | EC 60529 IP20 | IP20 | | |
| touch protection on the front according to IEC 60529 | | finger-safe, for vertical contact from the front | | |
| Approvals Certificates | | | | |
| General Product Approval | | | | |
| CCC CCC EG-Konf. | UK CA | Confirmation KC | | |
| General Product Approval EMV | Test Certificates | Marine / Shipping | | |

| General Product Ap- proval | EMV | Test Certificates | | Marine / Shipping | |
|-------------------------------|----------------------------|---|-------------------------------|----------------------------------|----------------------|
| EHC | RCM | Type Test Certific- ates/Test Report | Special Test Certific- ate | ABS | BUREAU VERITAS |
| Marine / Shipping | | | | | other |
| | Lloyds Register Lirs | PRS | RINA | RMRS | <u>Miscellaneous</u> |
| other | | Railway | Environment | | |
| <u>Confirmation</u> | <u>Confirmation</u> | <u>Special Test Certific-</u> <u>ate</u> | EPD | Environmental Con- firmations | |

| Further information | |
|---|----------|
| Information on the packaging | |
| https://support.industry.siemens.com/cs/ww/en/view/10981387 | <u>i</u> |

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=3RT2016-1AP01

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RT2016-1AP01

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

https://support.industry.siemens.com/cs/ww/en/ps/3RT2016-1AP01

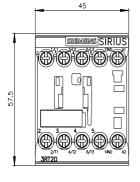
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)

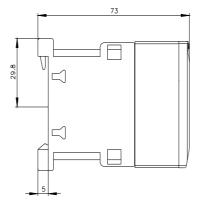
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RT2016-1AP01&lang=en

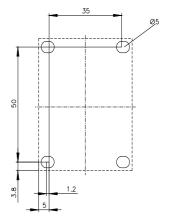
Characteristic: Tripping characteristics, I²t, Let-through current

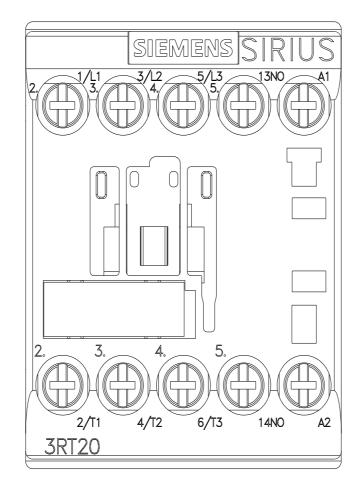
https://support.industry.siemens.com/cs/ww/en/ps/3RT2016-1AP01/char

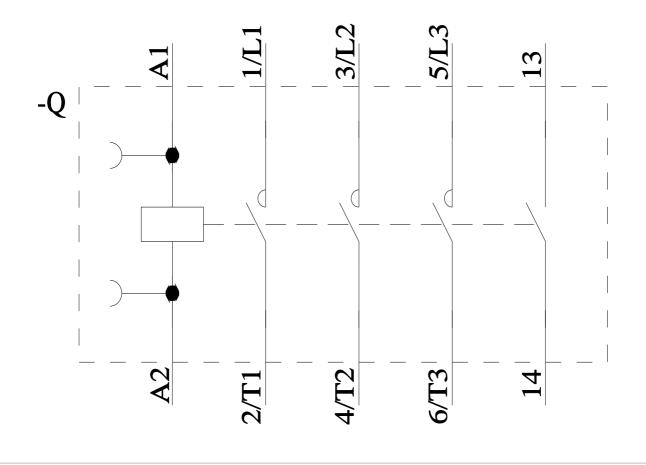
Further characteristics (e.g. electrical endurance, switching frequency) http://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RT2016-1AP01&objecttype=14&gridview=view1











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