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## Data sheet 3RT2045-1AL24

power contactor, AC-3e/AC-3, 80 A, 37 kW / 400 V, 3-pole, 230 V AC, 50/60 Hz, auxiliary contacts: 2 NO + 2 NC, screw terminal, size: S3, removable auxiliary switch

| | |
|---|---|
| **product brand name** | SIRIUS |
| **product designation** | Power contactor |
| **product type designation** | 3RT2 |
| **General technical data** | |
| **size of contactor** | S3 |
| **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 | 15.9 W |
| ● at AC in hot operating state per pole | 5.3 W |
| ● without load current share typical | 25 W |
| **type of calculation of power loss depending on pole** | quadratic |
| **insulation voltage** | |
| ● of main circuit with degree of pollution 3 rated value | 1 000 V |
| ● of auxiliary circuit with degree of pollution 3 rated value | 690 V |
| **surge voltage resistance** | |
| ● of main circuit rated value | 8 kV |
| ● of auxiliary circuit rated value | 6 kV |
| maximum permissible voltage for protective separation between coil and main contacts according to EN 60947-1 | 690 V |
| **shock resistance at rectangular impulse** | |
| ● at AC | 10.3g / 5 ms, 6,.g / 10 ms |
| **shock resistance with sine pulse** | |
| ● at AC | 16.3g / 5 ms, 10.g / 10 ms |
| **mechanical service life (operating cycles)** | |
| ● of contactor typical | 10 000 000 |
| ● 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)** | 03/01/2017 |
| **Weight** | 1.761 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 % |


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| **Environmental footprint** | |
| Environmental Product Declaration(EPD) | Yes |
| global warming potential [CO2 eq] total | 405 kg |
| global warming potential [CO2 eq] during manufacturing | 7.66 kg |
| global warming potential [CO2 eq] during operation | 399 kg |
| global warming potential [CO2 eq] after end of life | -1.19 kg |
| **Main circuit** | |
| **number of poles for main current circuit** | 3 |
| **number of NO contacts for main contacts** | 3 |
| **number of NC contacts for main contacts** | 0 |
| **operating voltage** | |
| ● at AC-3 rated value maximum | 1 000 V |
| ● at AC-3e rated value maximum | 1 000 V |
| **operational current** | |
| ● at AC-1 at 400 V at ambient temperature 40 °C rated value | 125 A |
| ● at AC-1 | |
| — up to 690 V at ambient temperature 40 °C rated value | 125 A |
| — up to 690 V at ambient temperature 60 °C rated value | 105 A |
| ● at AC-3 | |
| — at 400 V rated value | 80 A |
| — at 500 V rated value | 80 A |
| — at 690 V rated value | 58 A |
| — at 1000 V rated value | 30 A |
| ● at AC-3e | |
| — at 400 V rated value | 80 A |
| — at 500 V rated value | 80 A |
| — at 690 V rated value | 58 A |
| — at 1000 V rated value | 30 A |
| ● at AC-4 at 400 V rated value | 66 A |
| ● at AC-5a up to 690 V rated value | 110 A |
| ● at AC-5b up to 400 V rated value | 80 A |
| ● at AC-6a | |
| — up to 230 V for current peak value n=20 rated value | 80 A |
| — up to 400 V for current peak value n=20 rated value | 80 A |
| — up to 500 V for current peak value n=20 rated value | 80 A |
| — up to 690 V for current peak value n=20 rated value | 58 A |
| ● at AC-6a | |
| — up to 230 V for current peak value n=30 rated value | 54 A |
| — up to 400 V for current peak value n=30 rated value | 54 A |
| — up to 500 V for current peak value n=30 rated value | 54 A |
| — up to 690 V for current peak value n=30 rated value | 54 A |
| minimum cross-section in main circuit at maximum AC-1 rated value | 50 mm² |
| **operational current for approx. 200000 operating cycles at AC-4** | |
| ● at 400 V rated value | 34 A |
| ● at 690 V rated value | 24 A |
| **operational current** | |
| **● at 1 current path at DC-1** | |
| — at 24 V rated value | 100 A |
| — at 60 V rated value | 60 A |
| — at 110 V rated value | 9 A |
| — at 220 V rated value | 2 A |
| — at 440 V rated value | 0.6 A |
| — at 600 V rated value | 0.4 A |
| **● with 2 current paths in series at DC-1** | |
| — at 24 V rated value | 100 A |
| — at 60 V rated value | 100 A |
| — at 110 V rated value | 100 A |


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| — at 220 V rated value | 10 A |
| — at 440 V rated value | 1.8 A |
| — at 600 V rated value | 1 A |
| **● with 3 current paths in series at DC-1** | |
| — at 24 V rated value | 100 A |
| — at 60 V rated value | 100 A |
| — at 110 V rated value | 100 A |
| — at 220 V rated value | 80 A |
| — at 440 V rated value | 4.5 A |
| — at 600 V rated value | 2.6 A |
| **● at 1 current path at DC-3 at DC-5** | |
| — at 24 V rated value | 40 A |
| — at 60 V rated value | 6 A |
| — at 110 V rated value | 2.5 A |
| — at 220 V rated value | 1 A |
| — at 440 V rated value | 0.15 A |
| — at 600 V rated value | 0.06 A |
| **● with 2 current paths in series at DC-3 at DC-5** | |
| — at 24 V rated value | 100 A |
| — at 60 V rated value | 100 A |
| — at 110 V rated value | 100 A |
| — at 220 V rated value | 7 A |
| — at 440 V rated value | 0.42 A |
| — at 600 V rated value | 0.16 A |
| **● with 3 current paths in series at DC-3 at DC-5** | |
| — at 24 V rated value | 100 A |
| — at 60 V rated value | 100 A |
| — at 110 V rated value | 100 A |
| — at 220 V rated value | 35 A |
| — at 440 V rated value | 0.8 A |
| — at 600 V rated value | 0.35 A |
| **operating power** | |
| ● at AC-2 at 400 V rated value | 37 kW |
| ● at AC-3 | |
| — at 230 V rated value | 22 kW |
| — at 400 V rated value | 37 kW |
| — at 500 V rated value | 45 kW |
| — at 690 V rated value | 55 kW |
| — at 1000 V rated value | 37 kW |
| ● at AC-3e | |
| — at 230 V rated value | 22 kW |
| — at 400 V rated value | 37 kW |
| — at 500 V rated value | 45 kW |
| — at 690 V rated value | 55 kW |
| — at 1000 V rated value | 37 kW |
| **operating power for approx. 200000 operating cycles at AC-4** | |
| ● at 400 V rated value | 17.9 kW |
| ● at 690 V rated value | 21.8 kW |
| **operating apparent power at AC-6a** | |
| ● up to 230 V for current peak value n=20 rated value | 31 kVA |
| ● up to 400 V for current peak value n=20 rated value | 55 kVA |
| ● up to 500 V for current peak value n=20 rated value | 69 kVA |
| ● up to 690 V for current peak value n=20 rated value | 69 kVA |
| **operating apparent power at AC-6a** | |
| ● up to 230 V for current peak value n=30 rated value | 21.5 kVA |
| ● up to 400 V for current peak value n=30 rated value | 37.4 kVA |
| ● up to 500 V for current peak value n=30 rated value | 46.7 kVA |
| ● up to 690 V for current peak value n=30 rated value | 64.5 kVA |
| **short-time withstand current in cold operating state up to 40 °C** | |


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| ● limited to 1 s switching at zero current maximum | 1 500 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 5 s switching at zero current maximum | 1 186 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 10 s switching at zero current maximum | 851 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 30 s switching at zero current maximum | 538 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 60 s switching at zero current maximum | 423 A; Use minimum cross-section acc. to AC-1 rated value |
| **no-load switching frequency** | |
| ● at AC | 5 000 1/h |
| **operating frequency** | |
| ● at AC-1 maximum | 900 1/h |
| ● at AC-2 maximum | 400 1/h |
| ● at AC-3 maximum | 1 000 1/h |
| ● at AC-3e | |
| — maximum | 1 000 1/h |
| ● at AC-4 maximum | 300 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 | 348 VA |
| ● at 60 Hz | 296 VA |
| **inductive power factor with closing power of the coil** | |
| ● at 50 Hz | 0.62 |
| ● at 60 Hz | 0.55 |
| **apparent holding power of magnet coil at AC** | |
| ● at 50 Hz | 25 VA |
| ● at 60 Hz | 18 VA |
| **inductive power factor with the holding power of the coil** | |
| ● at 50 Hz | 0.35 |
| ● at 60 Hz | 0.41 |
| **closing delay** | |
| ● at AC | 13 ... 50 ms |
| **opening delay** | |
| ● at AC | 10 ... 21 ms |
| **arcing time** | 10 ... 20 ms |
| **control version of the switch operating mechanism** | Standard A1 - A2 |
| **Auxiliary circuit** | |
| number of NC contacts for auxiliary contacts instantaneous contact | 2 |
| number of NO contacts for auxiliary contacts instantaneous contact | 2 |
| operational current at AC-12 maximum | 10 A |
| **operational current at AC-15** | |
| ● at 230 V rated value | 6 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 | 3 A |
| ● at 125 V rated value | 2 A |
| ● at 220 V rated value | 1 A |
| ● at 600 V rated value | 0.15 A |
| **operational current at DC-13** | |


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| ● at 24 V rated value | 6 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 | 77 A |
| ● at 600 V rated value | 62 A |
| **yielded mechanical performance [hp]** | |
| ● for single-phase AC motor | |
| — at 110/120 V rated value | 7.5 hp |
| — at 230 V rated value | 15 hp |
| ● for 3-phase AC motor | |
| — at 200/208 V rated value | 25 hp |
| — at 220/230 V rated value | 30 hp |
| — at 460/480 V rated value | 60 hp |
| — at 575/600 V rated value | 60 hp |
| **contact rating of auxiliary contacts according to UL** | A600 / P600 |
| **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: 250 A (690 V, 100 kA), aM: 160 A (690 V, 100 kA), BS88: 200 A (415 V, 80 kA) |
| — with type of coordination 2 required | gG: 160 A (690 V, 100 kA), aM: 80 A (690 V, 100 kA), BS88: 125 A (415 V, 80 kA) |
| ● 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 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** | 140 mm |
| **width** | 70 mm |
| **depth** | 195 mm |
| **required spacing** | |
| ● with side-by-side mounting | |
| — forwards | 20 mm |
| — upwards | 10 mm |
| — downwards | 10 mm |
| — at the side | 0 mm |
| ● for grounded parts | |
| — forwards | 20 mm |
| — upwards | 10 mm |
| — at the side | 10 mm |
| — downwards | 10 mm |
| ● for live parts | |
| — forwards | 20 mm |
| — upwards | 10 mm |
| — downwards | 10 mm |
| — at the side | 10 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 |


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| **type of connectable conductor cross-sections** | |
| ● for main contacts | |
| — finely stranded with core end processing | 2x (2.5 ... 35 mm²), 1x (2.5 ... 50 mm²) |
| ● for AWG cables for main contacts | 2x (10 ... 1/0), 1x (10 ... 2/0) |
| **connectable conductor cross-section for main contacts** | |
| ● solid | 2.5 ... 16 mm² |
| ● stranded | 6 ... 70 mm² |
| ● finely stranded with core end processing | 2.5 ... 50 mm² |
| **connectable conductor cross-section for auxiliary contacts** | |
| ● solid or stranded | 0.5 ... 2.5 mm² |
| ● finely stranded with core end processing | 0.5 ... 2.5 mm² |
| **type of connectable conductor cross-sections** | |
| ● for auxiliary contacts | |
| — solid or stranded | 2x (0.5 ... 1.5 mm²), 2x (0.75 ... 2.5 mm²) |
| — finely stranded with core end processing | 2x (0.5 ... 1.5 mm²), 2x (0.75 ... 2.5 mm²) |
| ● for AWG cables for auxiliary contacts | 2x (20 ... 16), 2x (18 ... 14) |
| **AWG number extended as coded connectable conductor cross section for main contacts** | 10 ... 2/0 |
| **AWG number as coded connectable conductor cross section for auxiliary contacts** | 20 ... 14 |
| **Safety related data** | |
| **product function** | |
| ● mirror contact according to IEC 60947-4-1 | Yes |
| ● positively driven operation according to IEC 60947-5-1 | No |
| ● suitable for safety function | Yes |
| suitability for use safety-related switching OFF | Yes |
| **service life maximum** | 20 a |
| **test wear-related service life necessary** | Yes |
| **proportion of dangerous failures** | |
| ● with low demand rate according to SN 31920 | 40 % |
| ● with high demand rate according to SN 31920 | 73 % |
| **B10 value with high demand rate according to SN 31920** | 1 000 000 |
| **failure rate [FIT] with low demand rate according to SN 31920** | 100 FIT |
| ISO 13849 | |
| **device type according to ISO 13849-1** | 3 |
| **overdimensioning according to ISO 13849-2 necessary** | Yes |
| IEC 61508 | |
| **safety device type according to IEC 61508-2** | Type A |
| Electrical Safety | |
| **protection class IP on the front according to IEC 60529** | IP20 |
| **touch protection on the front according to IEC 60529** | finger-safe, for vertical contact from the front |
| **Approvals Certificates** | |
| **General Product Approval** | |

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| EMV | Test Certificates | Maritime application |
|---|---|---|

Special Test Certific-ate

| Maritime application | other | Railway | Dangerous goods | Environment |
|---|---|---|---|---|


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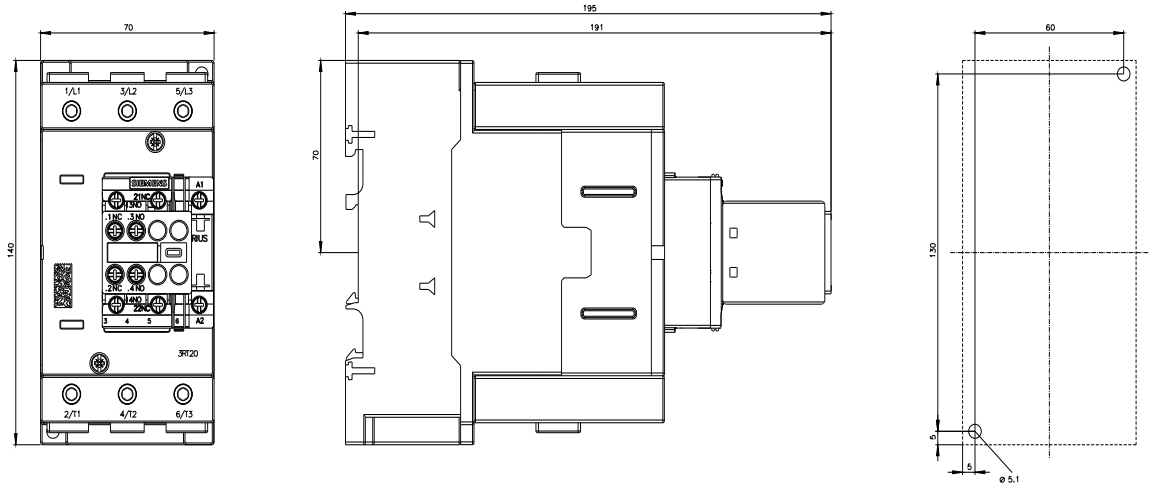
Confirmation | Special Test Certific-ate | Transport Information

## Environment

Environmental Con-firmations

## Further information

**Information on the packaging**
https://support.industry.siemens.com/cs/ww/en/view/109813875
**Information for data generation and storage**
https://support.industry.siemens.com/cs/ww/en/view/109995012
**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=3RT2045-1AL24
**Cax online generator**
https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RT2045-1AL24
**Service&Support (Manuals, Certificates, Characteristics, FAQs,...)**
https://support.industry.siemens.com/cs/ww/en/ps/3RT2045-1AL24
**Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)**
https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RT2045-1AL24&lang=en
**Characteristic: Tripping characteristics, I²t, Let-through current**
https://support.industry.siemens.com/cs/ww/en/ps/3RT2045-1AL24/char
**Further characteristics (e.g. electrical endurance, switching frequency)**
https://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RT2045-1AL24&objecttype=14&gridview=view1





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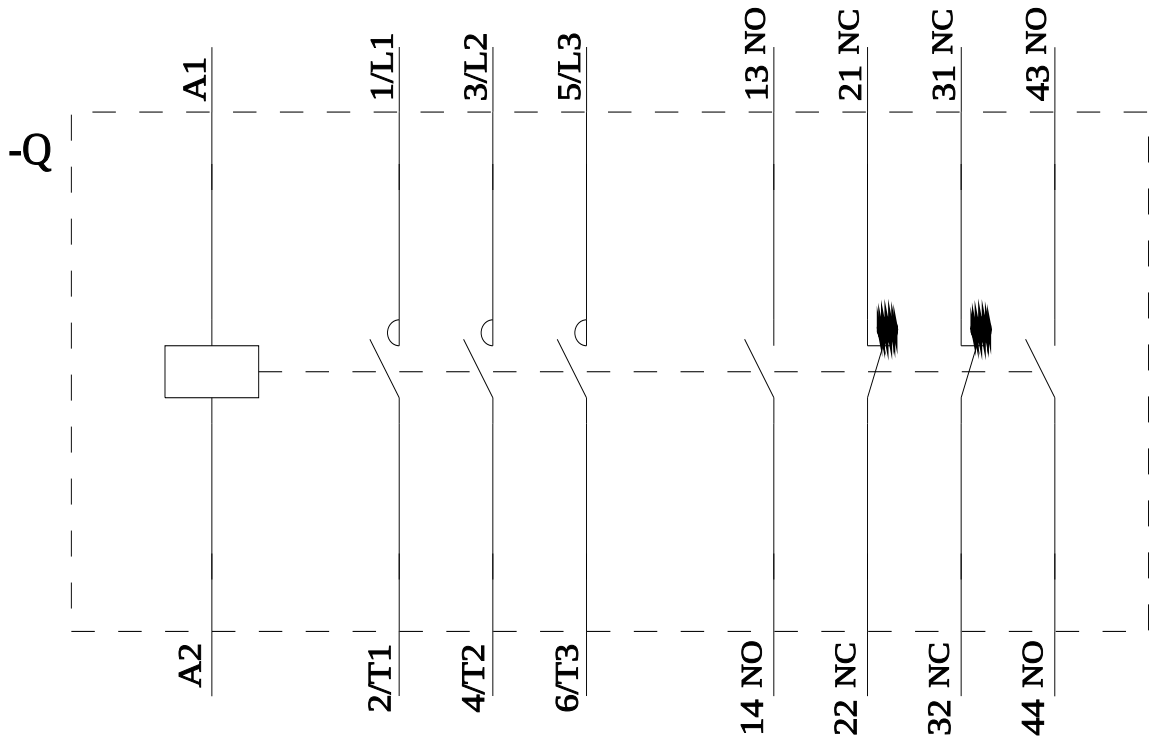


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