SIEMENS

## Data sheet 3RT2023-1AG20




power contactor, AC-3e/AC-3, 9 A, 4 kW / 400 V, 3-pole, 110 V AC, 50/60 Hz, auxiliary contacts: 1 NO + 1 NC, screw terminal, size: S0

| | |
|---|---|
| **product brand name** | SIRIUS |
| **product designation** | Power contactor |
| **product type designation** | 3RT2 |
| **General technical data** | |
| **size of contactor** | S0 |
| **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 | 0.6 W |
| ● at AC in hot operating state per pole | 0.2 W |
| ● without load current share typical | 2 W |
| **type of calculation of power loss current-dependent** | 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 V |
| **shock resistance at rectangular impulse** | |
| ● at AC | 7,5 g / 5 ms, 4,7 g / 10 ms |
| **shock resistance with sine pulse** | |
| ● at AC | 11,8 g / 5 ms, 7,4 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 (day/month/year)** | 10/01/2009 |
| **Net Weight** | 0.385 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** | 95 % |


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| **maximum** | |
| **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 | 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 | 40 A |
| ● at AC-1 | |
| — up to 690 V at ambient temperature 40 °C rated value | 40 A |
| — up to 690 V at ambient temperature 60 °C rated value | 35 A |
| ● at AC-3 | |
| — at 400 V rated value | 9 A |
| — at 500 V rated value | 9 A |
| — at 690 V rated value | 9 A |
| ● at AC-3e | |
| — at 400 V rated value | 9 A |
| — at 500 V rated value | 9 A |
| — at 690 V rated value | 9 A |
| ● at AC-4 at 400 V rated value | 8.5 A |
| ● at AC-5a up to 690 V rated value | 35.2 A |
| ● at AC-5b up to 400 V rated value | 7.4 A |
| ● at AC-6a | |
| — up to 230 V for current peak value n=20 rated value | 11.4 A |
| — up to 400 V for current peak value n=20 rated value | 11.4 A |
| — up to 500 V for current peak value n=20 rated value | 9.1 A |
| — up to 690 V for current peak value n=20 rated value | 9 A |
| ● at AC-6a | |
| — up to 230 V for current peak value n=30 rated value | 7.6 A |
| — up to 400 V for current peak value n=30 rated value | 7.6 A |
| — up to 500 V for current peak value n=30 rated value | 6.1 A |
| — up to 690 V for current peak value n=30 rated value | 6.1 A |
| minimum cross-section in main circuit at maximum AC-1 rated value | 10 mm² |
| **operational current for approx. 200000 operating cycles at AC-4** | |
| ● at 400 V rated value | 4.1 A |
| ● at 690 V rated value | 3.3 A |
| **operational current** | |
| **● at 1 current path at DC-1** | |
| — at 24 V rated value | 35 A |
| — at 60 V rated value | 20 A |
| — at 110 V rated value | 4.5 A |
| — at 220 V rated value | 1 A |
| — at 440 V rated value | 0.4 A |
| — at 600 V rated value | 0.25 A |
| **● with 2 current paths in series at DC-1** | |
| — at 24 V rated value | 35 A |
| — at 60 V rated value | 35 A |
| — at 110 V rated value | 35 A |
| — at 220 V rated value | 5 A |
| — at 440 V rated value | 1 A |
| — at 600 V rated value | 0.8 A |
| **● with 3 current paths in series at DC-1** | |
| — at 24 V rated value | 35 A |


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| — at 60 V rated value | 35 A |
| — at 110 V rated value | 35 A |
| — at 220 V rated value | 35 A |
| — at 440 V rated value | 2.9 A |
| — at 600 V rated value | 1.4 A |
| **● at 1 current path at DC-3 at DC-5** | |
| — at 24 V rated value | 20 A |
| — at 60 V rated value | 5 A |
| — at 220 V rated value | 1 A |
| — at 440 V rated value | 0.09 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 | 35 A |
| — at 60 V rated value | 35 A |
| — at 110 V rated value | 15 A |
| — at 220 V rated value | 3 A |
| — at 440 V rated value | 0.27 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 | 35 A |
| — at 60 V rated value | 35 A |
| — at 110 V rated value | 35 A |
| — at 220 V rated value | 10 A |
| — at 440 V rated value | 0.6 A |
| — at 600 V rated value | 0.6 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 | 7.5 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 | 7.5 kW |
| **operating power for approx. 200000 operating cycles at AC-4** | |
| ● at 400 V rated value | 2 kW |
| ● at 690 V rated value | 2.5 kW |
| **operating apparent power at AC-6a** | |
| ● up to 230 V for current peak value n=20 rated value | 4.5 kVA |
| ● up to 400 V for current peak value n=20 rated value | 7.8 kVA |
| ● up to 500 V for current peak value n=20 rated value | 7.8 kVA |
| ● up to 690 V for current peak value n=20 rated value | 10.7 kVA |
| **operating apparent power at AC-6a** | |
| ● up to 230 V for current peak value n=30 rated value | 3 kVA |
| ● up to 400 V for current peak value n=30 rated value | 5.2 kVA |
| ● up to 500 V for current peak value n=30 rated value | 5.2 kVA |
| ● up to 690 V for current peak value n=30 rated value | 7.2 kVA |
| **short-time withstand current in cold operating state up to 40 °C** | |
| ● limited to 1 s switching at zero current maximum | 170 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 5 s switching at zero current maximum | 170 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 10 s switching at zero current maximum | 140 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 30 s switching at zero current maximum | 104 A; Use minimum cross-section acc. to AC-1 rated value |
| ● limited to 60 s switching at zero current maximum | 88 A; Use minimum cross-section acc. to AC-1 rated value |
| **no-load switching frequency** | |
| ● at AC | 5 000 1/h |


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| **operating frequency** | |
| ● at AC-1 maximum | 1 000 1/h |
| ● at AC-2 maximum | 1 000 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 | 110 V |
| ● at 60 Hz rated value | 110 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 | 68 V·A |
| ● at 60 Hz | 67 V·A |
| **inductive power factor with closing power of the coil** | |
| ● at 50 Hz | 0.72 |
| ● at 60 Hz | 0.74 |
| **apparent holding power of magnet coil at AC** | |
| ● at 50 Hz | 7.9 V·A |
| ● at 60 Hz | 6.5 V·A |
| **inductive power factor with the holding power of the coil** | |
| ● at 50 Hz | 0.25 |
| ● at 60 Hz | 0.28 |
| **closing delay** | |
| ● at AC | 8 ... 40 ms |
| **opening delay** | |
| ● at AC | 4 ... 16 ms |
| **arcing time** | 10 ms |
| **control version of the switch operating mechanism** | Standard A1 - A2 |
| **Auxiliary circuit** | |
| number of NC contacts for auxiliary contacts instantaneous contact | 1 |
| 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 | 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** | |
| ● 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 |


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| ● 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 | 1 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 / P600 |
| **UL File Number (CCN)** | E31519 (NLDX, NLDX7) |
| **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: 63 A (690 V, 100 kA), aM: 32 A (690 V, 100 kA), BS88: 63 A (415 V, 80 kA) |
| — with type of coordination 2 required | gG: 25 A (690 V, 100 kA), aM: 20 A (690 V, 100 kA), BS88: 25 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** | 85 mm |
| **width** | 45 mm |
| **depth** | 97 mm |
| **required spacing** | |
| ● with side-by-side mounting | |
| — forwards | 10 mm |
| — upwards | 10 mm |
| — downwards | 10 mm |
| — at the side | 0 mm |
| ● for grounded parts | |
| — forwards | 10 mm |
| — 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 terminal |
| **type of connectable conductor cross-sections** | |
| ● for main contacts | |
| — solid | 2x (1 ... 2.5 mm²), 2x (2.5 ... 10 mm²) |
| — solid or stranded | 2x (1 ... 2.5 mm²), 2x (2.5 ... 10 mm²) |


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| — finely stranded with core end processing | 2x (1 ... 2.5 mm²), 2x (2.5 ... 6 mm²), 1x 10 mm² |
| ● for AWG cables for main contacts | 2x (16 ... 12), 2x (14 ... 8) |
| **connectable conductor cross-section for main contacts** | |
| ● solid | 1 ... 10 mm² |
| ● stranded | 1 ... 10 mm² |
| ● finely stranded with core end processing | 1 ... 10 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 as coded connectable conductor cross section for main contacts** | 16 ... 8 |
| **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** | |
| Environmental Product Declaration | |
| ● global warming potential [CO2 eq] / during manufacturing | 1.9 kg |
| ● global warming potential [CO2 eq] / during operation | 72.4 kg |
| ● global warming potential [CO2 eq] / after end of life | -0.117 kg |
| ● global warming potential [CO2 eq] / total | 74.2 kg |

| **Environment** | **General Product Approval** |
|---|---|

Environmental Confirmations

**General Product Approval** **EMV**


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| Test Certificates | | Maritime application | | | |
|---|---|---|---|---|---|
| Special Test Certific-ate | Type Test Certific-ates/Test Report | ABS | BUREAU VERITAS | DNV | LRS |

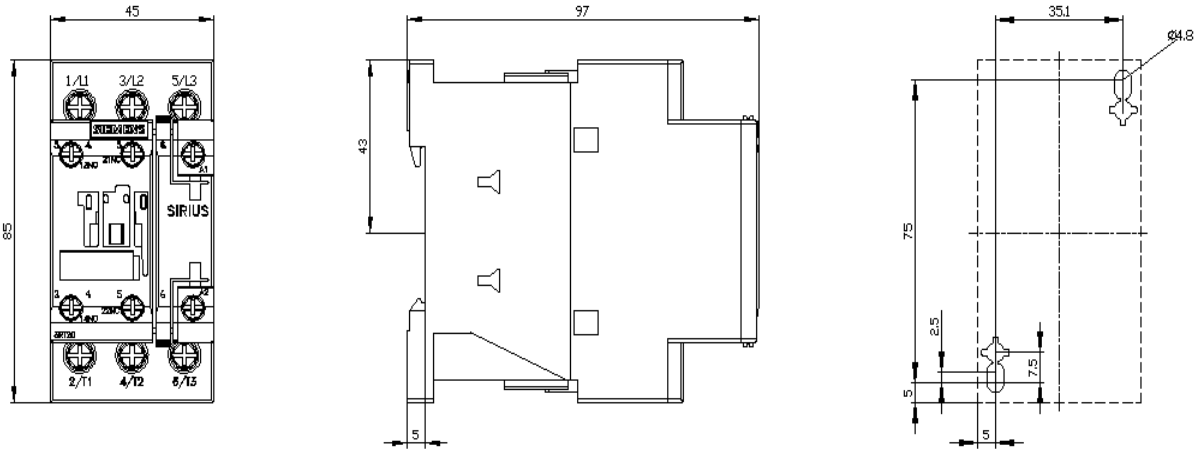
| Maritime application | other | | | | |
|---|---|---|---|---|---|
| RINA | Miscellaneous | Confirmation | Confirmation | 产品合格 QC PASS | Miscellaneous |

| Railway |
|---|
| Special Test Certific-ate |

## Further information

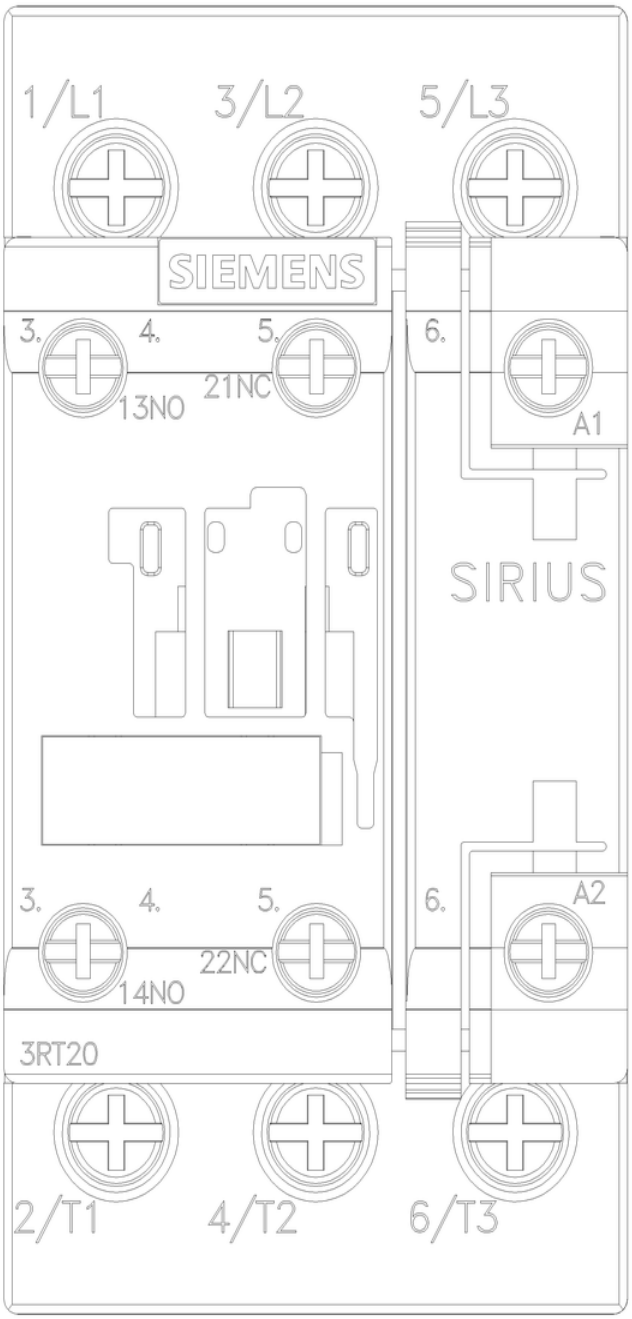
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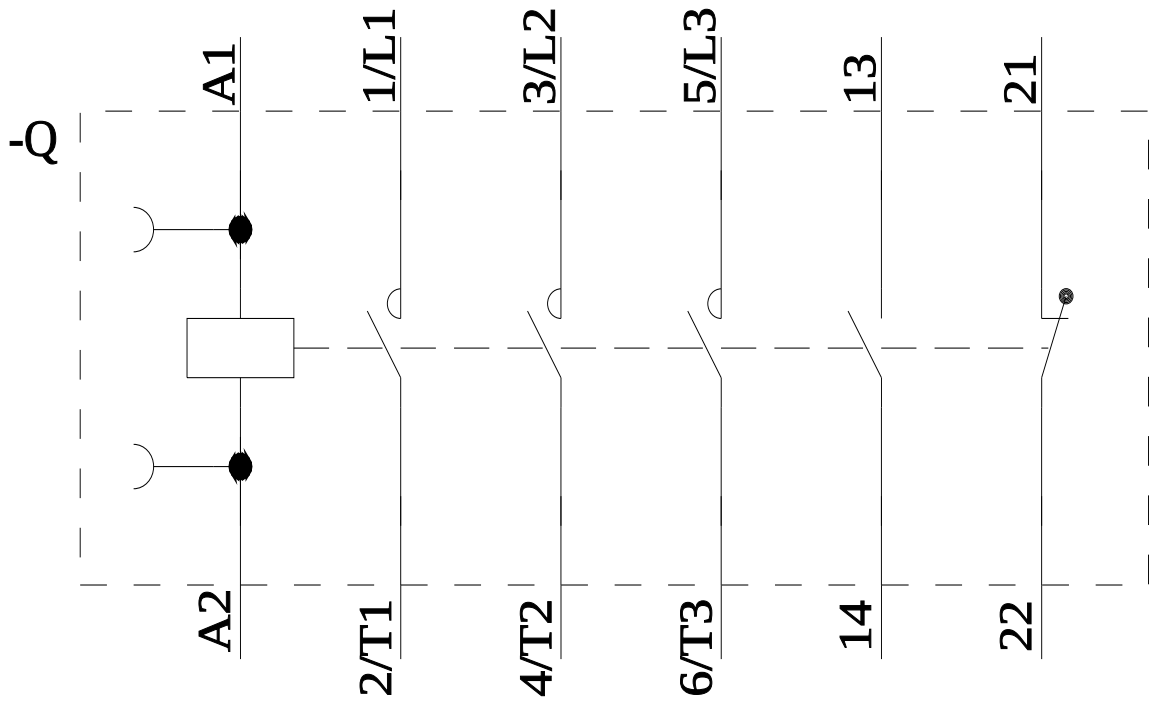


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**last modified:** 7/22/2026


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