



semiconductor relay, 1-pole 3RF3 width 22.5 mm, 50 A 48-460 V / 110-230 V AC screw terminal

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| product brand name | SIRIUS |
| product designation | solid-state relay |
| product type designation | 3RF31 |
| manufacturer's article number | |
| <ul style="list-style-type: none"> • _1 of the accessories that can be ordered • _2 of the accessories that can be ordered • _3 of the accessories that can be ordered • _4 of the accessories that can be ordered | 3RF2900-3PA88 3RF3900-0WA88 3RF3950-0HA36 3RF3950-0GA36 |
| product designation | |
| <ul style="list-style-type: none"> • _1 of the accessories that can be ordered • _2 of the accessories that can be ordered • _3 of the accessories that can be ordered • _4 of the accessories that can be ordered | terminal cover heat conducting foil power regulator load monitoring |
| General technical data | |
| product function | zero-point switching |
| power loss [W] for rated value of the current | |
| <ul style="list-style-type: none"> • at AC in hot operating state • at AC in hot operating state per pole • without load current share typical | 51 W 51 W 3.5 W |
| insulation voltage rated value | 600 V |
| surge voltage resistance of main circuit rated value | 6 kV |
| protection class IP | IP20 |
| protection class IP on the front according to IEC 60529 | IP20 |
| shock resistance according to IEC 60068-2-27 | 15g / 11 ms |
| vibration resistance according to IEC 60068-2-6 | 2g |
| reference code according to IEC 81346-2 | Q |
| Substance Prohibitance (Date) | 01/15/2024 |
| SVHC substance name | Lead - 7439-92-1 Lead monoxide (lead oxide) - 1317-36-8 |
| Net Weight | 0.08 kg |
| Main circuit | |
| number of poles for main current circuit | 1 |
| number of NO contacts for main contacts | 1 |
| number of NC contacts for main contacts | 0 |
| type of voltage of the operating voltage | AC |
| operating voltage | |
| <ul style="list-style-type: none"> • at AC <ul style="list-style-type: none"> — at 50 Hz rated value — at 60 Hz rated value | 48 ... 460 V 48 ... 460 V |

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| operating frequency rated value | 50 ... 60 Hz |
| relative symmetrical tolerance of the operating frequency | 10 % |
| operating range relative to the operating voltage at AC | |
| • at 50 Hz | 40 ... 506 V |
| • at 60 Hz | 40 ... 506 V |
| operational current rated value maximum | 50 A |
| operational current | |
| • at AC-1 at 400 V rated value | 50 A |
| • at AC-51 rated value | 50 A |
| • at AC-51 according to IEC 60947-4-3 | 50 A |
| • according to UL 508 rated value | 50 A |
| rate of voltage rise at the thyristor for main contacts maximum permissible | 1 000 V/ μ s |
| blocking voltage at the thyristor for main contacts maximum permissible | 1 200 V |
| reverse current of the thyristor | 10 mA |
| derating temperature | 40 °C |
| surge current resistance rated value | 600 A |
| I²t value maximum | 1 800 A ² ·s |
| Control circuit/ Control | |
| type of voltage of the control supply voltage | AC |
| control supply voltage at AC | |
| • at 50 Hz | 110 ... 230 V |
| • at 60 Hz | 110 ... 230 V |
| control supply voltage 1 at AC | |
| • at 50 Hz | 110 ... 230 V |
| • at 60 Hz | 110 ... 230 V |
| control supply voltage frequency | |
| • 1 rated value | 50 Hz |
| • 2 rated value | 60 Hz |
| control supply voltage at AC | |
| • at 50 Hz full-scale value for signal<0> recognition | 40 V |
| • at 60 Hz full-scale value for signal<0> recognition | 40 V |
| control supply voltage | |
| • at AC initial value for signal <1> detection | 90 V |
| symmetrical line frequency tolerance | 5 Hz |
| operating range factor control supply voltage rated value at AC at 50 Hz | |
| • initial value | 0.82 |
| operating range factor control supply voltage rated value at AC at 60 Hz | |
| • initial value | 0.82 |
| control current at minimum control supply voltage | |
| • at AC | 2 mA |
| control current at AC rated value | 15 mA |
| ON-delay time | 40 ms; additionally max. one half-wave |
| OFF-delay time | 40 ms; additionally max. one half-wave |
| Auxiliary circuit | |
| number of CO contacts for auxiliary contacts | 0 |
| Installation/ mounting/ dimensions | |
| fastening method side-by-side mounting | Yes |
| fastening method | screw fixing |
| design of the thread of the screw for securing the equipment | M4 |
| tightening torque of fixing screw maximum | 1.5 N·m |
| tightening torque [lbf·in] of fixing screw maximum | 13 lbf·in |
| height | 85 mm |
| width | 22.5 mm |
| depth | 48 mm |
| Connections/ Terminals | |

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| product component removable terminal for auxiliary and control circuit | Yes |
| type of electrical connection <ul style="list-style-type: none"> • for main current circuit • for auxiliary and control circuit | screw-type terminals screw-type terminals |
| type of connectable conductor cross-sections <ul style="list-style-type: none"> • for main contacts <ul style="list-style-type: none"> — solid — finely stranded with core end processing • for AWG cables for main contacts | 2x (1 ... 2.5 mm ²), 2x (2.5 ... 6 mm ²) 2x (1 ... 2.5 mm ²), 2x (2.5 ... 6 mm ²), 1x 10 mm ² 2x (14 ... 10) |
| connectable conductor cross-section for main contacts <ul style="list-style-type: none"> • solid or stranded • finely stranded with core end processing | 1.5 ... 6 mm ² 1 ... 10 mm ² |
| type of connectable conductor cross-sections <ul style="list-style-type: none"> • for auxiliary and control contacts <ul style="list-style-type: none"> — solid — finely stranded with core end processing — finely stranded without core end processing • for AWG cables for auxiliary and control contacts | 1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²) 1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²) 1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²) 1x (20 ... 12) |
| AWG number as coded connectable conductor cross section for main contacts | 14 ... 8 |
| tightening torque <ul style="list-style-type: none"> • for main contacts with screw-type terminals • for auxiliary and control contacts with screw-type terminals | 2 ... 2.5 N·m 0.5 ... 0.6 N·m |
| tightening torque [lbf·in] <ul style="list-style-type: none"> • for main contacts with screw-type terminals • for auxiliary and control contacts with screw-type terminals | 18 ... 22 lbf·in 4.5 ... 5.3 lbf·in |
| design of the thread of the connection screw <ul style="list-style-type: none"> • for main contacts • of the auxiliary and control contacts | M4 M3 |
| stripped length of the cable <ul style="list-style-type: none"> • for main contacts • for auxiliary and control contacts | 10 mm 7 mm |
| 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 |
| Ambient conditions | |
| installation altitude at height above sea level maximum | 1 000 m |
| ambient temperature <ul style="list-style-type: none"> • during operation • during storage | -25 ... +60 °C -55 ... +80 °C |
| Electromagnetic compatibility | |
| conducted interference <ul style="list-style-type: none"> • due to burst according to IEC 61000-4-4 • due to conductor-earth surge according to IEC 61000-4-5 • due to conductor-conductor surge according to IEC 61000-4-5 • due to high-frequency radiation according to IEC 61000-4-6 | 2 kV / 5 kHz behavior criterion 2 2 kV behavior criterion 2 1 kV behavior criterion 2 140 dBuV in the frequency range 0.15 ... 80 MHz, behavior criterion 1 |
| field-based interference according to IEC 61000-4-3 | 80 MHz ... 1 GHz 10 V/m, behavior criterion 1 |
| electrostatic discharge according to IEC 61000-4-2 | 4 kV contact discharging / 8 kV air discharging, behavior criterion 2 |
| conducted HF interference emissions according to CISPR11 | Class A for industrial environment |
| field-bound HF interference emission according to CISPR11 | Class B for the domestic, business and commercial environments |
| Short-circuit protection, design of the fuse link | |
| manufacturer's article number <ul style="list-style-type: none"> • of gS fuse for semiconductor protection at NH design usable • of back-up R fuse link for semiconductor protection at NH | 3NE1802-0: These fuses have a smaller rated current than the semiconductor relays 3NE8017-1 |

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| <p>design usable</p> <ul style="list-style-type: none"> ● of back-up R fuse link for semiconductor protection at cylindrical design 14 x 51 mm usable ● of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable | <p>3NC1450</p> <p>3NC2250</p> |
| <p>manufacturer's article number of the gG fuse</p> <ul style="list-style-type: none"> ● at NH design usable ● at cylindrical design 10 x 38 mm usable ● at cylindrical design 14 x 51 mm usable ● at cylindrical design 22 x 58 mm usable | <p>3NA6807; These fuses have a smaller rated current than the semiconductor relays</p> <p>3NW6007-1; These fuses have a smaller rated current than the semiconductor relays</p> <p>3NW6107-1; These fuses have a smaller rated current than the semiconductor relays</p> <p>3NW6207-1; These fuses have a smaller rated current than the semiconductor relays</p> |
| <p>manufacturer's article number</p> <ul style="list-style-type: none"> ● of DIAZED fuse usable | <p>5SB2711; These fuses have a smaller rated current than the semiconductor relays</p> |

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