



solid-state contactor 1-pole 3RF3 AC-1 / 20 A / 40 °C 48-460 V / 24 V AC/DC  
screw terminal

|                                                         |                                                                                                                    |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| product brand name                                      | SIRIUS                                                                                                             |
| product designation                                     | solid-state contactor                                                                                              |
| product type designation                                | 3RF33                                                                                                              |
| manufacturer's article number                           |                                                                                                                    |
| • _1 of the accessories that can be ordered             | <a href="#">3RF2900-3PA88</a>                                                                                      |
| • _3 of the accessories that can be ordered             | <a href="#">3RF3900-0EA18</a>                                                                                      |
| • _4 of the accessories that can be ordered             | <a href="#">3RF3920-0GA16</a>                                                                                      |
| product designation                                     |                                                                                                                    |
| • _1 of the accessories that can be ordered             | terminal cover                                                                                                     |
| • _3 of the accessories that can be ordered             | converter                                                                                                          |
| • _4 of the accessories that can be ordered             | load monitoring                                                                                                    |
| General technical data                                  |                                                                                                                    |
| product function                                        | zero-point switching                                                                                               |
| power loss [W] for rated value of the current           |                                                                                                                    |
| • at AC in hot operating state                          | 18.5 W                                                                                                             |
| • at AC in hot operating state per pole                 | 18.5 W                                                                                                             |
| • without load current share typical                    | 0.5 W                                                                                                              |
| insulation voltage rated value                          | 600 V                                                                                                              |
| degree of pollution                                     | 3                                                                                                                  |
| 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<br>Lead monoxide (lead oxide) - 1317-36-8<br>Dibutylbis(pentane-2,4-dionato-O,O')tin - 22673-19-4 |
| Net Weight                                              | 0.186 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                                       |                                                                                                                    |
| • at AC                                                 |                                                                                                                    |
| — at 50 Hz rated value                                  | 48 ... 460 V                                                                                                       |
| — at 60 Hz rated value                                  | 48 ... 460 V                                                                                                       |
| operating frequency rated value                         | 50 ... 60 Hz                                                                                                       |

|                                                                                    |                                        |
|------------------------------------------------------------------------------------|----------------------------------------|
| <b>relative symmetrical tolerance of the operating frequency</b>                   | 10 %                                   |
| <b>operating range relative to the operating voltage at AC</b>                     |                                        |
| • at 50 Hz                                                                         | 40 ... 506 V                           |
| • at 60 Hz                                                                         | 40 ... 506 V                           |
| <b>operational current rated value maximum</b>                                     | 20 A                                   |
| <b>operational current</b>                                                         |                                        |
| • at AC-1 at 400 V rated value                                                     | 20 A                                   |
| • at AC-51 rated value                                                             | 20 A                                   |
| • at AC-51 according to IEC 60947-4-3                                              | 20 A                                   |
| • according to UL 508 rated value                                                  | 16 A                                   |
| <b>rate of voltage rise at the thyristor for main contacts maximum permissible</b> | 1 000 V/μs                             |
| <b>blocking voltage at the thyristor for main contacts maximum permissible</b>     | 1 200 V                                |
| <b>reverse current of the thyristor</b>                                            | 10 mA                                  |
| <b>derating temperature</b>                                                        | 40 °C                                  |
| <b>surge current resistance rated value</b>                                        | 600 A                                  |
| <b>I<sup>2</sup>t value maximum</b>                                                | 1 800 A <sup>2</sup> ·s                |
| <b>Control circuit/ Control</b>                                                    |                                        |
| <b>type of voltage of the control supply voltage</b>                               | AC/DC                                  |
| <b>control supply voltage at AC</b>                                                |                                        |
| • at 50 Hz                                                                         | 14 ... 27 V                            |
| • at 60 Hz                                                                         | 14 ... 27 V                            |
| <b>control supply voltage 1 at AC</b>                                              |                                        |
| • at 50 Hz rated value                                                             | 24 V                                   |
| • at 60 Hz rated value                                                             | 24 V                                   |
| <b>control supply voltage frequency</b>                                            |                                        |
| • 1 rated value                                                                    | 50 Hz                                  |
| • 2 rated value                                                                    | 60 Hz                                  |
| <b>control supply voltage at DC</b>                                                | 15 ... 24 V                            |
| <b>control supply voltage 1 at DC rated value</b>                                  | 24 V                                   |
| <b>control supply voltage at AC</b>                                                |                                        |
| • at 50 Hz full-scale value for signal<0> recognition                              | 5 V                                    |
| • at 60 Hz full-scale value for signal<0> recognition                              | 5 V                                    |
| <b>control supply voltage</b>                                                      |                                        |
| • at AC initial value for signal <1> detection                                     | 14 V                                   |
| • at DC initial value for signal <1> detection                                     | 15 V                                   |
| • at DC full-scale value for signal<0> recognition                                 | 5 V                                    |
| <b>symmetrical line frequency tolerance</b>                                        | 5 Hz                                   |
| <b>operating range factor control supply voltage rated value at DC</b>             |                                        |
| • initial value                                                                    | 0.63                                   |
| • full-scale value                                                                 | 1.25                                   |
| <b>operating range factor control supply voltage rated value at AC at 50 Hz</b>    |                                        |
| • initial value                                                                    | 0.58                                   |
| • full-scale value                                                                 | 1.13                                   |
| <b>operating range factor control supply voltage rated value at AC at 60 Hz</b>    |                                        |
| • initial value                                                                    | 0.58                                   |
| • full-scale value                                                                 | 1.13                                   |
| <b>control current at minimum control supply voltage</b>                           |                                        |
| • at AC                                                                            | 2 mA                                   |
| control current at AC rated value                                                  | 15 mA                                  |
| control current at DC rated value                                                  | 20 mA                                  |
| <b>ON-delay time</b>                                                               | 1 ms; additionally max. one half-wave  |
| <b>OFF-delay time</b>                                                              | 15 ms; additionally max. one half-wave |
| <b>Auxiliary circuit</b>                                                           |                                        |
| number of CO contacts for auxiliary contacts                                       | 0                                      |
| <b>Installation/ mounting/ dimensions</b>                                          |                                        |

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| fastening method side-by-side mounting                                                                                                                                                                                                                                                                                                                               | Yes                                                                                                                                                                                                                              |
| <b>fastening method</b>                                                                                                                                                                                                                                                                                                                                              | screw fixing and snap-on mounting on standard mounting rail 35 mm according to IEC 60715                                                                                                                                         |
| <b>design of the thread of the screw for securing the equipment</b>                                                                                                                                                                                                                                                                                                  | M4                                                                                                                                                                                                                               |
| <b>height</b>                                                                                                                                                                                                                                                                                                                                                        | 95 mm                                                                                                                                                                                                                            |
| <b>width</b>                                                                                                                                                                                                                                                                                                                                                         | 22.5 mm                                                                                                                                                                                                                          |
| <b>depth</b>                                                                                                                                                                                                                                                                                                                                                         | 121 mm                                                                                                                                                                                                                           |
| <b>Connections/ Terminals</b>                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                  |
| <b>product component removable terminal for auxiliary and control circuit</b>                                                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                                              |
| <b>type of electrical connection</b> <ul style="list-style-type: none"><li>• for main current circuit</li><li>• for auxiliary and control circuit</li></ul>                                                                                                                                                                                                          | screw-type terminals<br>screw-type terminals                                                                                                                                                                                     |
| <b>type of connectable conductor cross-sections</b> <ul style="list-style-type: none"><li>• for main contacts<ul style="list-style-type: none"><li>— solid</li><li>— finely stranded with core end processing</li></ul></li><li>• for AWG cables for main contacts</li></ul>                                                                                         | 2x (1 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> )<br>2x (1 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> ), 1x 10 mm <sup>2</sup><br>2x (14 ... 10)                                                    |
| <b>connectable conductor cross-section for main contacts</b> <ul style="list-style-type: none"><li>• solid or stranded</li><li>• finely stranded with core end processing</li></ul>                                                                                                                                                                                  | 1.5 ... 6 mm <sup>2</sup><br>1 ... 10 mm <sup>2</sup>                                                                                                                                                                            |
| <b>type of connectable conductor cross-sections</b> <ul style="list-style-type: none"><li>• for auxiliary and control contacts<ul style="list-style-type: none"><li>— solid</li><li>— finely stranded with core end processing</li><li>— finely stranded without core end processing</li></ul></li><li>• for AWG cables for auxiliary and control contacts</li></ul> | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1 mm <sup>2</sup> )<br>1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1 mm <sup>2</sup> )<br>1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1 mm <sup>2</sup> )<br>1x (20 ... 12) |
| <b>AWG number as coded connectable conductor cross section for main contacts</b>                                                                                                                                                                                                                                                                                     | 14 ... 8                                                                                                                                                                                                                         |
| <b>tightening torque</b> <ul style="list-style-type: none"><li>• for main contacts with screw-type terminals</li><li>• for auxiliary and control contacts with screw-type terminals</li></ul>                                                                                                                                                                        | 2 ... 2.5 N·m<br>0.5 ... 0.6 N·m                                                                                                                                                                                                 |
| <b>tightening torque [lbf·in]</b> <ul style="list-style-type: none"><li>• for main contacts with screw-type terminals</li><li>• for auxiliary and control contacts with screw-type terminals</li></ul>                                                                                                                                                               | 18 ... 22 lbf·in<br>4.5 ... 5.3 lbf·in                                                                                                                                                                                           |
| <b>design of the thread of the connection screw</b> <ul style="list-style-type: none"><li>• for main contacts</li><li>• of the auxiliary and control contacts</li></ul>                                                                                                                                                                                              | M4<br>M3                                                                                                                                                                                                                         |
| <b>stripped length of the cable</b> <ul style="list-style-type: none"><li>• for main contacts</li><li>• for auxiliary and control contacts</li></ul>                                                                                                                                                                                                                 | 10 mm<br>7 mm                                                                                                                                                                                                                    |
| <b>Electrical Safety</b>                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                  |
| <b>protection class IP on the front according to IEC 60529</b>                                                                                                                                                                                                                                                                                                       | IP20                                                                                                                                                                                                                             |
| <b>touch protection on the front according to IEC 60529</b>                                                                                                                                                                                                                                                                                                          | finger-safe, for vertical contact from the front                                                                                                                                                                                 |
| <b>Ambient conditions</b>                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                  |
| installation altitude at height above sea level maximum                                                                                                                                                                                                                                                                                                              | 1 000 m                                                                                                                                                                                                                          |
| <b>ambient temperature</b> <ul style="list-style-type: none"><li>• during operation</li><li>• during storage</li></ul>                                                                                                                                                                                                                                               | -25 ... +60 °C<br>-55 ... +80 °C                                                                                                                                                                                                 |
| <b>Electromagnetic compatibility</b>                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                  |
| <b>conducted interference</b> <ul style="list-style-type: none"><li>• due to burst according to IEC 61000-4-4</li><li>• due to conductor-earth surge according to IEC 61000-4-5</li><li>• due to conductor-conductor surge according to IEC 61000-4-5</li><li>• due to high-frequency radiation according to IEC 61000-4-6</li></ul>                                 | 2 kV / 5 kHz behavior criterion 2<br>2 kV behavior criterion 2<br>1 kV behavior criterion 2<br>140 dBuV in the frequency range 0.15 ... 80 MHz, behavior criterion 1                                                             |
| <b>field-based interference according to IEC 61000-4-3</b>                                                                                                                                                                                                                                                                                                           | 80 MHz ... 1 GHz 10 V/m, behavior criterion 1                                                                                                                                                                                    |

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| <b>electrostatic discharge according to IEC 61000-4-2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4 kV contact discharging / 8 kV air discharging, behavior criterion 2                                                                                                                                                                                          |
| <b>conducted HF interference emissions according to CISPR11</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Class A for industrial environment                                                                                                                                                                                                                             |
| <b>field-bound HF interference emission according to CISPR11</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Class B for the domestic, business and commercial environments                                                                                                                                                                                                 |
| <b>Short-circuit protection, design of the fuse link</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                |
| manufacturer's article number <ul style="list-style-type: none"> <li>• of gS fuse for semiconductor protection at NH design usable</li> <li>• of full range R fuse link for semiconductor protection at cylindrical design usable</li> <li>• of back-up R fuse link for semiconductor protection at NH design usable</li> <li>• of back-up R fuse link for semiconductor protection at cylindrical design 10 x 38 mm usable</li> <li>• of back-up R fuse link for semiconductor protection at cylindrical design 14 x 51 mm usable</li> <li>• of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable</li> </ul> | <a href="#">3NE1814-0</a><br><a href="#">5SE1325</a><br><a href="#">3NE8814-0MK</a><br><a href="#">3NC1032</a><br><a href="#">3NC1450</a><br><a href="#">3NC2263</a>                                                                                           |
| manufacturer's article number of the gG fuse <ul style="list-style-type: none"> <li>• at NH design usable</li> <li>• at cylindrical design 10 x 38 mm usable</li> <li>• at cylindrical design 14 x 51 mm usable</li> <li>• at cylindrical design 22 x 58 mm usable</li> </ul>                                                                                                                                                                                                                                                                                                                                                                        | <a href="#">3NA6807</a><br><a href="#">3NW6007-1</a><br><a href="#">3NW6105-1: These fuses have a smaller rated current than the semiconductor relays</a><br><a href="#">3NW6205-1: These fuses have a smaller rated current than the semiconductor relays</a> |
| manufacturer's article number <ul style="list-style-type: none"> <li>• of DIAZED fuse usable</li> <li>• of NEOZED fuse usable</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <a href="#">5SB2711</a><br><a href="#">5SE2320</a>                                                                                                                                                                                                             |

**last modified:**

10/8/2025 