

Siemens  
EcoTech



semiconductor relay, 1-pole 3RF3 for use with heat sinks width 22.5 mm, 50 A 24-230 V / 24 V DC screw terminal

|                                                         |                                                                                                                                                                                    |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| product brand name                                      | SIRIUS                                                                                                                                                                             |
| product designation                                     | solid-state relay                                                                                                                                                                  |
| product type designation                                | 3RF31                                                                                                                                                                              |
| manufacturer's article number                           |                                                                                                                                                                                    |
| • _1 of the accessories that can be ordered             | <a href="#">3RF2900-3PA88</a>                                                                                                                                                      |
| • _2 of the accessories that can be ordered             | <a href="#">3RF3900-0WA88</a>                                                                                                                                                      |
| • _3 of the accessories that can be ordered             | <a href="#">3RF3950-0HA13</a>                                                                                                                                                      |
| • _4 of the accessories that can be ordered             | <a href="#">3RF3900-0EA18</a>                                                                                                                                                      |
| • _5 of the accessories that can be ordered             | <a href="#">3RF3950-0GA13</a>                                                                                                                                                      |
| product designation                                     |                                                                                                                                                                                    |
| • _1 of the accessories that can be ordered             | terminal cover                                                                                                                                                                     |
| • _2 of the accessories that can be ordered             | heat conducting foil                                                                                                                                                               |
| • _3 of the accessories that can be ordered             | power regulator                                                                                                                                                                    |
| • _4 of the accessories that can be ordered             | converter                                                                                                                                                                          |
| • _5 of the accessories that can be ordered             | load monitoring                                                                                                                                                                    |
| General technical data                                  |                                                                                                                                                                                    |
| product function                                        | zero-point switching                                                                                                                                                               |
| power loss [V·A] maximum                                | 51 VA                                                                                                                                                                              |
| power loss [W] for rated value of the current           |                                                                                                                                                                                    |
| • at AC in hot operating state                          | 51 W                                                                                                                                                                               |
| • at AC in hot operating state per pole                 | 51 W                                                                                                                                                                               |
| • without load current share typical                    | 0.4 W                                                                                                                                                                              |
| type of calculation of power loss current-dependent     | linear                                                                                                                                                                             |
| 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            | 15 g / 11 ms                                                                                                                                                                       |
| vibration resistance according to IEC 60068-2-6         | 2 g                                                                                                                                                                                |
| reference code according to IEC 81346-2                 | Q                                                                                                                                                                                  |
| Substance Prohibitance (day/month/year)                 | 01/15/2024                                                                                                                                                                         |
| SVHC substance name                                     | Lead CAS-No. 7439-92-1<br>Lead monoxide (lead oxide) CAS-No. 1317-36-8<br>2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one CAS-No. 71868-10-5<br>Melamine CAS-No. 108-78-1 |
| Net Weight                                              | 0.065 kg                                                                                                                                                                           |

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| <b>Main circuit</b>                                                                                                                                                                                                    |                                       |
| 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"> <li>at AC <ul style="list-style-type: none"> <li>at 50 Hz rated value</li> <li>at 60 Hz rated value</li> </ul> </li> </ul>                                        | 24 ... 230 V<br>24 ... 230 V          |
| operating frequency rated value                                                                                                                                                                                        | 50 ... 60 Hz                          |
| relative symmetrical tolerance of the operating frequency                                                                                                                                                              | 10 %                                  |
| operating range relative to the operating voltage at AC <ul style="list-style-type: none"> <li>at 50 Hz</li> <li>at 60 Hz</li> </ul>                                                                                   | 20 ... 253 V<br>20 ... 253 V          |
| operational current rated value maximum                                                                                                                                                                                | 50 A                                  |
| operational current <ul style="list-style-type: none"> <li>at AC-1 at 400 V rated value</li> <li>at AC-51 rated value</li> <li>at AC-51 according to IEC 60947-4-3</li> <li>according to UL 508 rated value</li> </ul> | 50 A<br>50 A<br>50 A<br>50 A          |
| ampacity maximum                                                                                                                                                                                                       | 50 A                                  |
| operational current minimum                                                                                                                                                                                            | 500 mA                                |
| rate of voltage rise at the thyristor for main contacts maximum permissible                                                                                                                                            | 1 000 V/ $\mu$ s                      |
| blocking voltage at the thyristor for main contacts maximum permissible                                                                                                                                                | 800 V                                 |
| reverse current of the thyristor                                                                                                                                                                                       | 10 mA                                 |
| derating temperature                                                                                                                                                                                                   | 40 °C                                 |
| surge current resistance rated value                                                                                                                                                                                   | 600 A                                 |
| I <sup>2</sup> t value maximum                                                                                                                                                                                         | 1 800 A <sup>2</sup> ·s               |
| <b>Control circuit/ Control</b>                                                                                                                                                                                        |                                       |
| type of voltage of the control supply voltage                                                                                                                                                                          | DC                                    |
| control supply voltage at DC                                                                                                                                                                                           | 15 ... 24 V                           |
| control supply voltage 1 at DC rated value                                                                                                                                                                             | 24 V                                  |
| control supply voltage at DC <ul style="list-style-type: none"> <li>initial value for signal &lt;1&gt; detection</li> <li>full-scale value for signal&lt;0&gt; recognition</li> </ul>                                  | 15 V<br>5 V                           |
| operating range factor control supply voltage rated value at DC <ul style="list-style-type: none"> <li>initial value</li> <li>full-scale value</li> </ul>                                                              | 0.63<br>1                             |
| control current at minimum control supply voltage <ul style="list-style-type: none"> <li>at DC</li> </ul>                                                                                                              | 13 mA                                 |
| control current at DC rated value                                                                                                                                                                                      | 15 mA                                 |
| ON-delay time                                                                                                                                                                                                          | 1 ms; additionally max. one half-wave |
| OFF-delay time                                                                                                                                                                                                         | 1 ms; additionally max. one half-wave |
| <b>Installation/ mounting/ dimensions</b>                                                                                                                                                                              |                                       |
| 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                                 |
| <b>Connections/ Terminals</b>                                                                                                                                                                                          |                                       |
| product component removable terminal for auxiliary and control circuit                                                                                                                                                 | Yes                                   |
| type of electrical connection                                                                                                                                                                                          |                                       |

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| <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), 1x 8                                              |
| <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>UL/CSA ratings</b>                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                  |
| <b>operational current according to UL 508 rated value</b>                                                                                                                                                                                                                                                                                                                    | 50 A                                                                                                                                                                                                                             |
| <b>Electrical Safety</b>                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                  |
| <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                                                                                                                                                                                    |
| <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</li> </ul>                                                             | <a href="#">3NE1817-0</a><br><a href="#">5SE1350</a><br><a href="#">3NE8017-1</a>                                                                                                                                                |

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| <p>design usable</p> <ul style="list-style-type: none"> <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>                                                                                                                                                                                                                      | <p><a href="#">3NC1450</a></p> <p><a href="#">3NC2263</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>manufacturer's article number of the gG fuse</p> <ul style="list-style-type: none"> <li>• at NH design usable</li> <li>• at NH design usable note</li> <li>• at cylindrical design 10 x 38 mm usable</li> <li>• at cylindrical design 10 x 38 mm usable note</li> <li>• at cylindrical design 14 x 51 mm usable</li> <li>• at cylindrical design 14 x 51 mm usable note</li> <li>• at cylindrical design 22 x 58 mm usable</li> <li>• at cylindrical design 22 x 58 mm usable note</li> </ul> | <p><a href="#">3NA6810: These fuses have a smaller rated current than the semiconductor relays</a></p> <p>These fuses have a smaller rated current than the semiconductor relays</p> <p><a href="#">3NW6007-1: These fuses have a smaller rated current than the semiconductor relays</a></p> <p>These fuses have a smaller rated current than the semiconductor relays</p> <p><a href="#">3NW6107-1: These fuses have a smaller rated current than the semiconductor relays</a></p> <p>These fuses have a smaller rated current than the semiconductor relays</p> <p><a href="#">3NW6207-1: These fuses have a smaller rated current than the semiconductor relays</a></p> <p>These fuses have a smaller rated current than the semiconductor relays</p> |
| <p>manufacturer's article number</p> <ul style="list-style-type: none"> <li>• of DIAZED fuse usable</li> <li>• of DIAZED fuse usable note</li> <li>• of NEOZED fuse usable</li> </ul>                                                                                                                                                                                                                                                                                                            | <p><a href="#">5SB2711: These fuses have a smaller rated current than the semiconductor relays</a></p> <p>These fuses have a smaller rated current than the semiconductor relays</p> <p><a href="#">5SE2320: These fuses have a smaller rated current than the semiconductor relays</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

#### Approvals Certificates

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

[Environmental Confirmations](#)



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| EMV | Test Certificates | other |
|-----|-------------------|-------|
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[Type Test Certificates/Test Report](#)

[Confirmation](#)



[Confirmation](#)

#### 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=3RF3150-1AA02>

Cax online generator

<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF3150-1AA02>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3RF3150-1AA02>

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

[https://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF3150-1AA02&lang=en](https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF3150-1AA02&lang=en)



