

Siemens  
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semiconductor relay, 1-pole 3RF3 for use with heat sinks width 22.5 mm, 80 A 48-460 V 110-230 V AC ring cable lug connection

|                                                         |                                                                                                                                                                                    |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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>                                                                                                                                                      |
| product designation                                     |                                                                                                                                                                                    |
| • _1 of the accessories that can be ordered             | terminal cover                                                                                                                                                                     |
| • _2 of the accessories that can be ordered             | heat conducting foil                                                                                                                                                               |
| General technical data                                  |                                                                                                                                                                                    |
| product function                                        | zero-point switching                                                                                                                                                               |
| power loss [V·A] maximum                                | 83 VA                                                                                                                                                                              |
| power loss [W] for rated value of the current           |                                                                                                                                                                                    |
| • at AC in hot operating state                          | 83 W                                                                                                                                                                               |
| • at AC in hot operating state per pole                 | 83 W                                                                                                                                                                               |
| • without load current share typical                    | 3.5 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                                     | IP00                                                                                                                                                                               |
| protection class IP on the front according to IEC 60529 | IP00                                                                                                                                                                               |
| 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                                              | 0.063 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"> <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>                                                                                                            | 48 ... 460 V<br>48 ... 460 V           |
| <b>operating frequency rated value</b>                                                                                                                                                                                                                                         | 50 ... 60 Hz                           |
| <b>relative symmetrical tolerance of the operating frequency</b>                                                                                                                                                                                                               | 10 %                                   |
| <b>operating range relative to the operating voltage at AC</b> <ul style="list-style-type: none"> <li>• at 50 Hz</li> <li>• at 60 Hz</li> </ul>                                                                                                                                | 40 ... 506 V<br>40 ... 506 V           |
| <b>operational current rated value maximum</b>                                                                                                                                                                                                                                 | 80 A                                   |
| <b>operational current</b> <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>                                          | 80 A<br>80 A<br>80 A<br>80 A           |
| <b>ampacity maximum</b>                                                                                                                                                                                                                                                        | 90 A                                   |
| <b>operational current minimum</b>                                                                                                                                                                                                                                             | 500 mA                                 |
| <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>                                                                                                                                                                                                                                    | 1 300 A                                |
| <b>I<sup>2</sup>t value maximum</b>                                                                                                                                                                                                                                            | 8 000 A <sup>2</sup> ·s                |
| <b>Control circuit/ Control</b>                                                                                                                                                                                                                                                |                                        |
| <b>type of voltage of the control supply voltage</b>                                                                                                                                                                                                                           | AC                                     |
| <b>control supply voltage at AC</b> <ul style="list-style-type: none"> <li>• at 50 Hz</li> <li>• at 60 Hz</li> </ul>                                                                                                                                                           | 110 ... 230 V<br>110 ... 230 V         |
| <b>control supply voltage 1 at AC</b> <ul style="list-style-type: none"> <li>• at 50 Hz</li> <li>• at 60 Hz</li> </ul>                                                                                                                                                         | 110 ... 230 V<br>110 ... 230 V         |
| <b>control supply voltage at AC</b> <ul style="list-style-type: none"> <li>• at 50 Hz full-scale value for signal&lt;0&gt; recognition</li> <li>• at 60 Hz full-scale value for signal&lt;0&gt; recognition</li> <li>• initial value for signal &lt;1&gt; detection</li> </ul> | 40 V<br>40 V<br>90 V                   |
| <b>control supply voltage frequency</b> <ul style="list-style-type: none"> <li>• 1 rated value</li> <li>• 2 rated value</li> </ul>                                                                                                                                             | 50 Hz<br>60 Hz                         |
| <b>symmetrical line frequency tolerance</b>                                                                                                                                                                                                                                    | 5 Hz                                   |
| <b>operating range factor control supply voltage rated value at AC at 50 Hz</b> <ul style="list-style-type: none"> <li>• initial value</li> </ul>                                                                                                                              | 0.82                                   |
| <b>operating range factor control supply voltage rated value at AC at 60 Hz</b> <ul style="list-style-type: none"> <li>• initial value</li> </ul>                                                                                                                              | 0.82                                   |
| <b>control current at minimum control supply voltage</b> <ul style="list-style-type: none"> <li>• at AC</li> </ul>                                                                                                                                                             | 2 mA                                   |
| control current at AC rated value                                                                                                                                                                                                                                              | 15 mA                                  |
| <b>ON-delay time</b>                                                                                                                                                                                                                                                           | 40 ms; additionally max. one half-wave |
| <b>OFF-delay time</b>                                                                                                                                                                                                                                                          | 40 ms; additionally max. one half-wave |
| <b>Installation/ mounting/ dimensions</b>                                                                                                                                                                                                                                      |                                        |
| fastening method side-by-side mounting                                                                                                                                                                                                                                         | Yes                                    |
| <b>fastening method</b>                                                                                                                                                                                                                                                        | screw fixing                           |
| <b>design of the thread of the screw for securing the equipment</b>                                                                                                                                                                                                            | M4                                     |
| <b>tightening torque of fixing screw maximum</b>                                                                                                                                                                                                                               | 1.5 N·m                                |
| <b>tightening torque [lbf·in] of fixing screw maximum</b>                                                                                                                                                                                                                      | 13 lbf·in                              |
| <b>height</b>                                                                                                                                                                                                                                                                  | 85 mm                                  |
| <b>width</b>                                                                                                                                                                                                                                                                   | 22.5 mm                                |

|                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                  |
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| depth                                                                                                                                                                                                                                                                                                                                                        | 48 mm                                                                                                                                                                                                                            |
| <b>Connections/ Terminals</b>                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                  |
| product component removable terminal for auxiliary and control circuit                                                                                                                                                                                                                                                                                       | Yes                                                                                                                                                                                                                              |
| type of electrical connection <ul style="list-style-type: none"> <li>for main current circuit</li> <li>for auxiliary and control circuit</li> </ul>                                                                                                                                                                                                          | Ring cable lug connection<br>screw-type terminals                                                                                                                                                                                |
| type of connectable conductor cross-sections <ul style="list-style-type: none"> <li>for main contacts for JIS cable lug</li> <li>for AWG cables for main contacts</li> <li>for DIN cable lug for main contacts</li> </ul>                                                                                                                                    | JIS C 2805 R 2-5, 5,5-5, 8-5, 14-5<br>1x (12 ... 4)<br>DIN 46234-5-2,5, -5-6, -5-10, -5-16, -5-25                                                                                                                                |
| type of connectable conductor cross-sections <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) |
| AWG number as coded connectable conductor cross section for main contacts                                                                                                                                                                                                                                                                                    | 12 ... 4                                                                                                                                                                                                                         |
| tightening torque <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                                                                                                                                                                                                 |
| tightening torque [lbf·in] <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                                                                                                                                                                                           |
| design of the thread of the connection screw <ul style="list-style-type: none"> <li>for main contacts</li> <li>of the auxiliary and control contacts</li> </ul>                                                                                                                                                                                              | M5<br>M3                                                                                                                                                                                                                         |
| stripped length of the cable <ul style="list-style-type: none"> <li>for main contacts</li> <li>for auxiliary and control contacts</li> </ul>                                                                                                                                                                                                                 | 7 mm<br>7 mm                                                                                                                                                                                                                     |
| <b>UL/CSA ratings</b>                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                  |
| operational current according to UL 508 rated value                                                                                                                                                                                                                                                                                                          | 80 A                                                                                                                                                                                                                             |
| Electrical Safety                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                  |
| touch protection on the front according to IEC 60529                                                                                                                                                                                                                                                                                                         | finger-safe, for vertical contact from the front with cover                                                                                                                                                                      |
| <b>Ambient conditions</b>                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                  |
| installation altitude at height above sea level maximum                                                                                                                                                                                                                                                                                                      | 1 000 m                                                                                                                                                                                                                          |
| ambient temperature <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>                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                  |
| conducted interference <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                                                          |
| 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                                                                                                                                                                   |
| <b>Short-circuit protection, design of the fuse link</b>                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                  |
| manufacturer's article number <ul style="list-style-type: none"> <li>of full range R fuse link for semiconductor protection at NH design usable</li> <li>of back-up R fuse link for semiconductor protection at NH design usable</li> </ul>                                                                                                                  | <a href="#">3NE1021-2</a><br><a href="#">3NE8021-1</a>                                                                                                                                                                           |

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| <ul style="list-style-type: none"> <li>• of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable</li> </ul>                                                                                                                     | <a href="#">3NC2280: These fuses have a smaller rated current than the semiconductor relays</a>                                                                                                                                                                                                                                                          |
| manufacturer's article number of the gG fuse <ul style="list-style-type: none"> <li>• at NH design usable</li> <li>• at NH design 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> | <a href="#">3NA6812: These fuses have a smaller rated current than the semiconductor relays</a><br>These fuses have a smaller rated current than the semiconductor relays<br><a href="#">3NW6212-1: These fuses have a smaller rated current than the semiconductor relays</a><br>These fuses have a smaller rated current than the semiconductor relays |
| manufacturer's article number <ul style="list-style-type: none"> <li>• of DIAZED fuse usable</li> <li>• of DIAZED fuse usable note</li> </ul>                                                                                                                       | <a href="#">5SB4111: These fuses have a smaller rated current than the semiconductor relays</a><br>These fuses have a smaller rated current than the semiconductor relays                                                                                                                                                                                |

#### Approvals Certificates

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

[Environmental Confirmations](#)



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| EMV | Test Certificates | other |
|-----|-------------------|-------|
|-----|-------------------|-------|



[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=3RF3190-3AA24>

Cax online generator

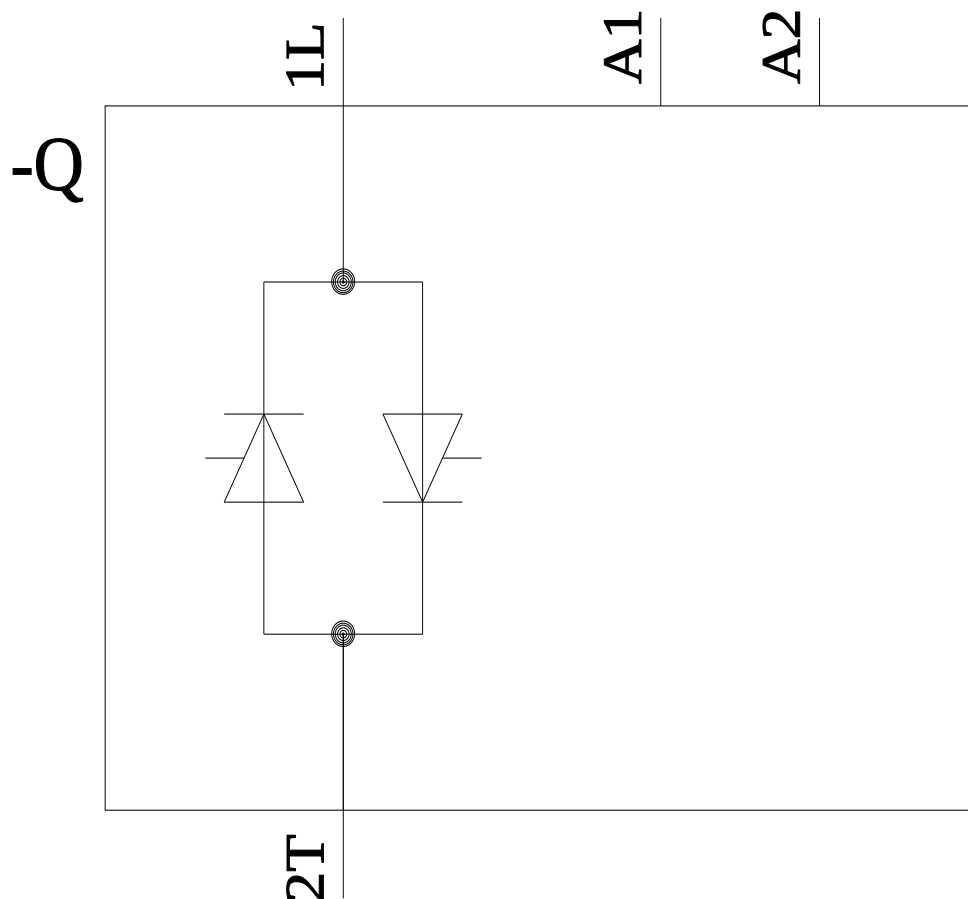
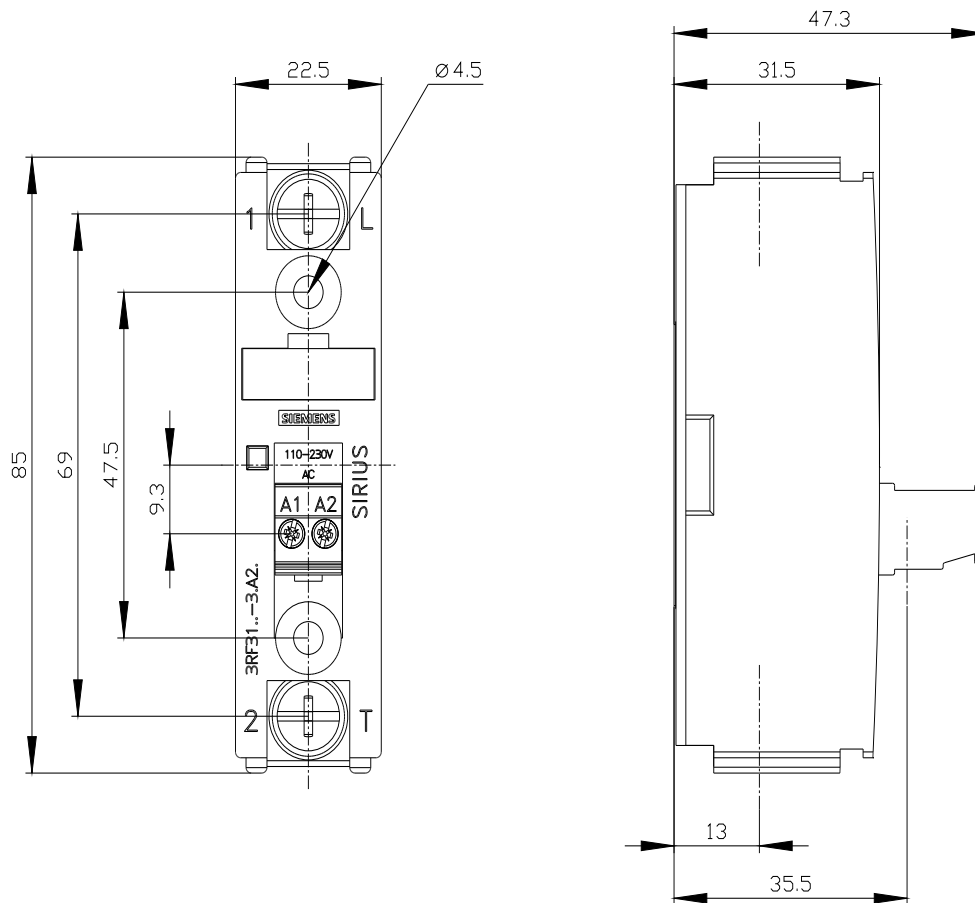
<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF3190-3AA24>

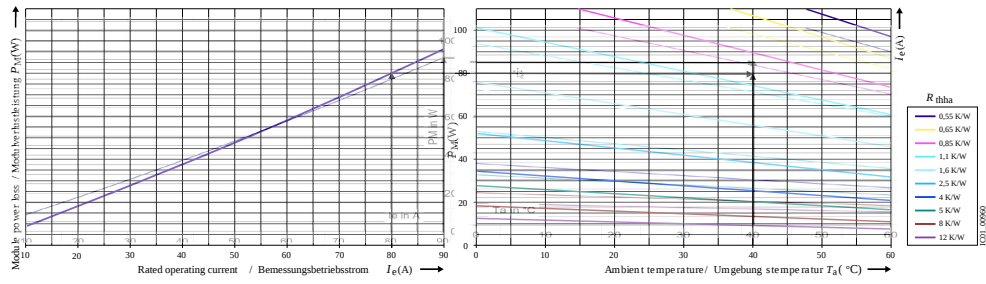
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF3190-3AA24>

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

[https://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF3190-3AA24&lang=en](https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF3190-3AA24&lang=en)





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