

Siemens  
EcoTech



semiconductor relay, 1-pole 3RF3 for use with heat sinks width 22.5 mm, 20 A 24-230 V / 4-30 V DC spring-loaded 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="#">3RF3900-0WA88</a>                                                                                                                            |
| • _2 of the accessories that can be ordered             | <a href="#">3RF3900-0EA18</a>                                                                                                                            |
| product designation                                     |                                                                                                                                                          |
| • _1 of the accessories that can be ordered             | heat conducting foil                                                                                                                                     |
| • _2 of the accessories that can be ordered             | converter                                                                                                                                                |
| General technical data                                  |                                                                                                                                                          |
| product function                                        | zero-point switching                                                                                                                                     |
| power loss [V·A] maximum                                | 22 VA                                                                                                                                                    |
| power loss [W] for rated value of the current           |                                                                                                                                                          |
| • at AC in hot operating state                          | 22 W                                                                                                                                                     |
| • at AC in hot operating state per pole                 | 22 W                                                                                                                                                     |
| • without load current share typical                    | 0.5 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                                     | 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 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                                              | 0.08 kg                                                                                                                                                  |
| Main circuit                                            |                                                                                                                                                          |
| number of poles for main current circuit                | 1                                                                                                                                                        |
| number of NO contacts for main contacts                 | 1                                                                                                                                                        |
| number of NC contacts for main contacts                 | 0                                                                                                                                                        |
| type of voltage of the operating voltage                | AC                                                                                                                                                       |
| operating voltage                                       |                                                                                                                                                          |
| • at AC                                                 |                                                                                                                                                          |

|                                                                                    |                                       |
|------------------------------------------------------------------------------------|---------------------------------------|
| — at 50 Hz rated value                                                             | 24 ... 230 V                          |
| — at 60 Hz rated value                                                             | 24 ... 230 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>                     |                                       |
| • at 50 Hz                                                                         | 20 ... 253 V                          |
| • at 60 Hz                                                                         | 20 ... 253 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                                                  | 20 A                                  |
| <b>ampacity maximum</b>                                                            | 25 A                                  |
| <b>operational current minimum</b>                                                 | 100 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>     | 800 V                                 |
| <b>reverse current of the thyristor</b>                                            | 10 mA                                 |
| <b>derating temperature</b>                                                        | 40 °C                                 |
| <b>surge current resistance rated value</b>                                        | 260 A                                 |
| <b>I<sup>2</sup>t value maximum</b>                                                | 360 A <sup>2</sup> ·s                 |
| <b>Control circuit/ Control</b>                                                    |                                       |
| <b>type of voltage of the control supply voltage</b>                               | DC                                    |
| <b>control supply voltage at DC</b>                                                | 4 ... 30 V                            |
| <b>control supply voltage 1 at DC</b>                                              | 4 ... 30 V                            |
| <b>control supply voltage at DC</b>                                                |                                       |
| • initial value for signal <1> detection                                           | 4 V                                   |
| • full-scale value for signal<0> recognition                                       | 1 V                                   |
| <b>operating range factor control supply voltage rated value at DC</b>             |                                       |
| • initial value                                                                    | 0.17                                  |
| • full-scale value                                                                 | 1.25                                  |
| <b>control current at minimum control supply voltage</b>                           |                                       |
| • at DC                                                                            | 13 mA                                 |
| control current at DC rated value                                                  | 15 mA                                 |
| <b>ON-delay time</b>                                                               | 1 ms; additionally max. one half-wave |
| <b>OFF-delay time</b>                                                              | 1 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                               |
| <b>depth</b>                                                                       | 48 mm                                 |
| <b>Connections/ Terminals</b>                                                      |                                       |
| <b>product component removable terminal for auxiliary and control circuit</b>      | Yes                                   |
| <b>type of electrical connection</b>                                               |                                       |
| • for main current circuit                                                         | spring-loaded terminals               |
| • for auxiliary and control circuit                                                | spring-loaded terminals               |
| <b>type of connectable conductor cross-sections</b>                                |                                       |
| • for main contacts                                                                |                                       |
| — solid                                                                            | 2x (0.5 ... 2.5 mm <sup>2</sup> )     |
| — finely stranded with core end processing                                         | 2x (0.5 ... 1.5 mm <sup>2</sup> )     |
| — finely stranded without core end processing                                      | 2x (0.5 ... 2.5 mm <sup>2</sup> )     |

|                                                                                                                                                   |                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• for AWG cables for main contacts</li> </ul>                                                              | 2x (18 ... 14)                                                                                    |
| <b>connectable conductor cross-section for main contacts</b>                                                                                      |                                                                                                   |
| <ul style="list-style-type: none"> <li>• solid or stranded</li> </ul>                                                                             | 0.5 ... 2.5 mm <sup>2</sup>                                                                       |
| <ul style="list-style-type: none"> <li>• finely stranded with core end processing</li> </ul>                                                      | 0.5 ... 1.5 mm <sup>2</sup>                                                                       |
| <ul style="list-style-type: none"> <li>• finely stranded without core end processing</li> </ul>                                                   | 0.5 ... 2.5 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> </ul> </li> </ul> | 0.5 ... 1.5 mm <sup>2</sup>                                                                       |
| <ul style="list-style-type: none"> <li>— finely stranded with core end processing</li> </ul>                                                      | 0.5 ... 2.5 mm <sup>2</sup>                                                                       |
| <ul style="list-style-type: none"> <li>— finely stranded without core end processing</li> </ul>                                                   | 0.5 ... 2.5 mm <sup>2</sup>                                                                       |
| <ul style="list-style-type: none"> <li>• for AWG cables for auxiliary and control contacts</li> </ul>                                             | 1x (20 ... 12)                                                                                    |
| <b>AWG number as coded connectable conductor cross section for main contacts</b>                                                                  | 18 ... 14                                                                                         |
| <b>stripped length of the cable</b>                                                                                                               |                                                                                                   |
| <ul style="list-style-type: none"> <li>• for main contacts</li> </ul>                                                                             | 10 mm                                                                                             |
| <ul style="list-style-type: none"> <li>• for auxiliary and control contacts</li> </ul>                                                            | 10 mm                                                                                             |
| <b>UL/CSA ratings</b>                                                                                                                             |                                                                                                   |
| <b>operational current according to UL 508 rated value</b>                                                                                        | 20 A                                                                                              |
| Electrical Safety                                                                                                                                 |                                                                                                   |
| <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> </ul>                                                                              | -25 ... +60 °C                                                                                    |
| <ul style="list-style-type: none"> <li>• during storage</li> </ul>                                                                                | -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> </ul>                                                       | 2 kV / 5 kHz, behavior criterion 2                                                                |
| <ul style="list-style-type: none"> <li>• due to conductor-earth surge according to IEC 61000-4-5</li> </ul>                                       | 2 kV, behavior criterion 2                                                                        |
| <ul style="list-style-type: none"> <li>• due to conductor-conductor surge according to IEC 61000-4-5</li> </ul>                                   | 1 kV, behavior criterion 2                                                                        |
| <ul style="list-style-type: none"> <li>• due to high-frequency radiation according to IEC 61000-4-6</li> </ul>                                    | 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> </ul>                                   | <a href="#">3NE1815-0</a>                                                                         |
| <ul style="list-style-type: none"> <li>• of full range R fuse link for semiconductor protection at cylindrical design usable</li> </ul>           | <a href="#">5SE1325</a>                                                                           |
| <ul style="list-style-type: none"> <li>• of back-up R fuse link for semiconductor protection at NH design usable</li> </ul>                       | <a href="#">3NE8015-1</a>                                                                         |
| <ul style="list-style-type: none"> <li>• of back-up R fuse link for semiconductor protection at cylindrical design 10 x 38 mm usable</li> </ul>   | <a href="#">3NC1020: These fuses have a smaller rated current than the semiconductor relays</a>   |
| <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> </ul>   | <a href="#">3NC1430</a>                                                                           |
| <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="#">3NC2225</a>                                                                           |
| manufacturer's article number of the gG fuse                                                                                                      |                                                                                                   |
| <ul style="list-style-type: none"> <li>• at NH design usable</li> </ul>                                                                           | <a href="#">3NA6803: These fuses have a smaller rated current than the semiconductor relays</a>   |
| <ul style="list-style-type: none"> <li>• at NH design usable note</li> </ul>                                                                      | These fuses have a smaller rated current than the semiconductor relays                            |
| <ul style="list-style-type: none"> <li>• at cylindrical design 10 x 38 mm usable</li> </ul>                                                       | <a href="#">3NW6001-1: These fuses have a smaller rated current than the semiconductor relays</a> |
| <ul style="list-style-type: none"> <li>• at cylindrical design 10 x 38 mm usable note</li> </ul>                                                  | These fuses have a smaller rated current than the semiconductor relays                            |
| <ul style="list-style-type: none"> <li>• at cylindrical design 14 x 51 mm usable</li> </ul>                                                       | <a href="#">3NW6101-1: These fuses have a smaller rated current than the semiconductor relays</a> |
| <ul style="list-style-type: none"> <li>• at cylindrical design 14 x 51 mm usable note</li> </ul>                                                  | These fuses have a smaller rated current than the semiconductor relays                            |

- at cylindrical design 22 x 58 mm usable

[3NW6208-1: These fuses have a smaller rated current than the semiconductor relays](#)

- at cylindrical design 22 x 58 mm usable note

These fuses have a smaller rated current than the semiconductor relays

manufacturer's article number

- of DIAZED fuse usable

[5SB251: These fuses have a smaller rated current than the semiconductor relays](#)

- of DIAZED fuse usable note

These fuses have a smaller rated current than the semiconductor relays

- of NEOZED fuse usable

[5SE2310: 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=3RF3125-2AA42>

Cax online generator

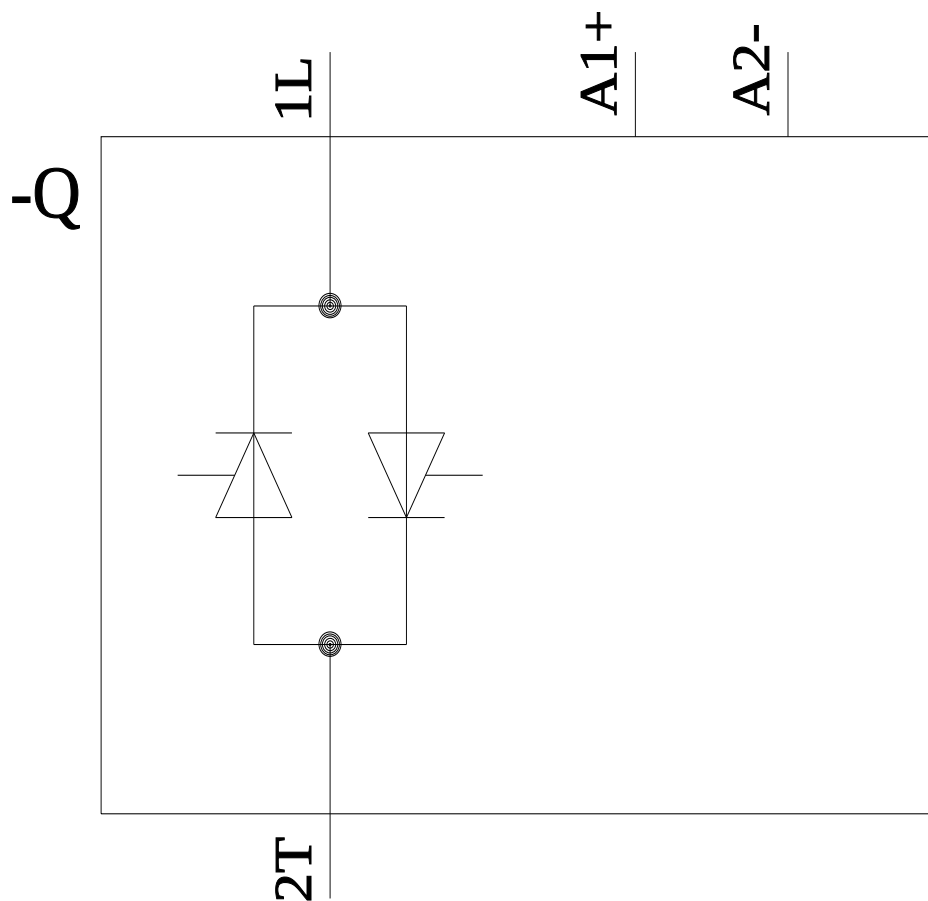
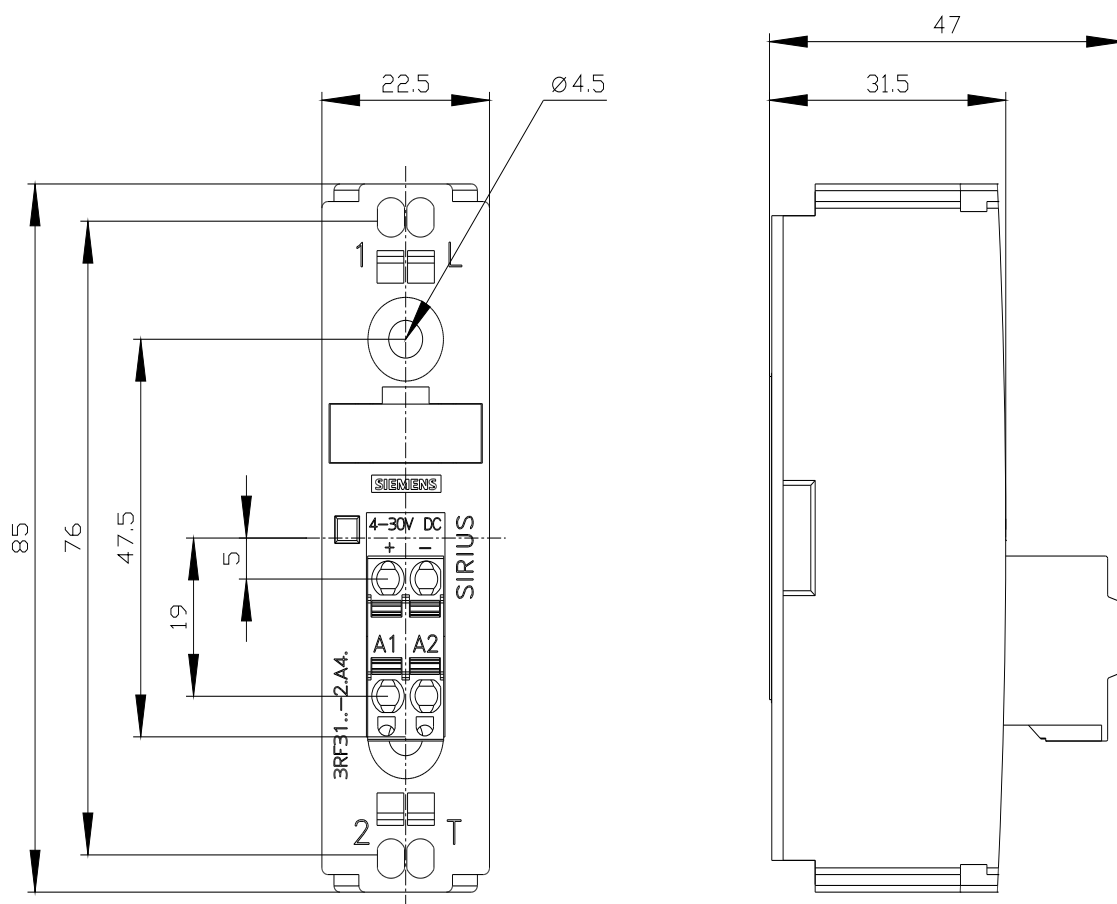
<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF3125-2AA42>

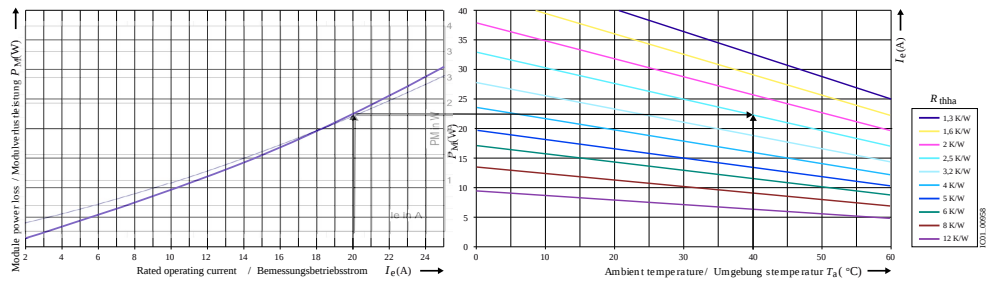
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF3125-2AA42>

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

[https://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF3125-2AA42&lang=en](https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF3125-2AA42&lang=en)





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