



semiconductor relay, 1-phase 3RF2 width 22.5 mm, 90 A 48-460 V / 110-230 V AC  
spring-loaded terminal for mounting on available cooling surfaces

|                                                           |                                                            |
|-----------------------------------------------------------|------------------------------------------------------------|
| product brand name                                        | SIRIUS                                                     |
| product designation                                       | solid-state relay                                          |
| design of the product                                     | 1-pole                                                     |
| product type designation                                  | 3RF21                                                      |
| General technical data                                    |                                                            |
| product function                                          | zero-point switching                                       |
| power loss [W] for rated value of the current             |                                                            |
| • at AC in hot operating state                            | 118 W                                                      |
| • at AC in hot operating state per pole                   | 118 W                                                      |
| • without load current share typical                      | 3.5 W                                                      |
| insulation voltage rated value                            | 600 V                                                      |
| surge voltage resistance of main circuit rated value      | 6 kV                                                       |
| protection class IP                                       | IP20                                                       |
| protection class IP on the front according to IEC 60529   | IP20                                                       |
| shock resistance according to IEC 60068-2-27              | 15g / 11 ms                                                |
| vibration resistance according to IEC 60068-2-6           | 2g                                                         |
| reference code according to IEC 81346-2                   | Q                                                          |
| Substance Prohibitance (Date)                             | 05/28/2009                                                 |
| SVHC substance name                                       | Lead - 7439-92-1<br>Lead monoxide (lead oxide) - 1317-36-8 |
| Weight                                                    | 0.06 kg                                                    |
| Main circuit                                              |                                                            |
| number of poles for main current circuit                  | 1                                                          |
| number of NO contacts for main contacts                   | 1                                                          |
| number of NC contacts for main contacts                   | 0                                                          |
| type of voltage of the operating voltage                  | AC                                                         |
| operating voltage                                         |                                                            |
| • at AC                                                   |                                                            |
| — at 50 Hz rated value                                    | 48 ... 460 V                                               |
| — at 60 Hz rated value                                    | 48 ... 460 V                                               |
| operating frequency rated value                           | 50 ... 60 Hz                                               |
| relative symmetrical tolerance of the operating frequency | 10 %                                                       |
| operating range relative to the operating voltage at AC   |                                                            |
| • at 50 Hz                                                | 40 ... 506 V                                               |
| • at 60 Hz                                                | 40 ... 506 V                                               |
| operational current rated value maximum                   | 88 A                                                       |
| operational current                                       |                                                            |
| • at AC-51 rated value                                    | 20 A                                                       |
| • according to UL 508 rated value                         | 20 A                                                       |
| operational current minimum                               | 500 mA                                                     |

|                                                                             |                                        |
|-----------------------------------------------------------------------------|----------------------------------------|
| rate of voltage rise at the thyristor for main contacts maximum permissible | 1 000 V/μs                             |
| blocking voltage at the thyristor for main contacts maximum permissible     | 1 200 V                                |
| reverse current of the thyristor                                            | 10 mA                                  |
| derating temperature                                                        | 40 °C                                  |
| surge current resistance rated value                                        | 1 150 A                                |
| I <sup>2</sup> t value maximum                                              | 6 600 A <sup>2</sup> ·s                |
| <b>Control circuit/ Control</b>                                             |                                        |
| type of voltage of the control supply voltage                               | AC                                     |
| control supply voltage 1 at AC                                              |                                        |
| • at 50 Hz                                                                  | 110 ... 230 V                          |
| • at 60 Hz                                                                  | 110 ... 230 V                          |
| control supply voltage frequency                                            |                                        |
| • 1 rated value                                                             | 50 Hz                                  |
| • 2 rated value                                                             | 60 Hz                                  |
| control supply voltage at AC                                                |                                        |
| • at 50 Hz full-scale value for signal<0> recognition                       | 40 V                                   |
| • at 60 Hz full-scale value for signal<0> recognition                       | 40 V                                   |
| control supply voltage                                                      |                                        |
| • at AC initial value for signal <1> detection                              | 90 V                                   |
| symmetrical line frequency tolerance                                        | 5 Hz                                   |
| control current at minimum control supply voltage                           |                                        |
| • at AC                                                                     | 2 mA                                   |
| control current at AC rated value                                           | 15 mA                                  |
| ON-delay time                                                               | 40 ms; additionally max. one half-wave |
| OFF-delay time                                                              | 40 ms; additionally max. one half-wave |
| <b>Auxiliary circuit</b>                                                    |                                        |
| type of switching contact                                                   | normally open contact (NO)             |
| number of NC contacts for auxiliary contacts                                | 0                                      |
| number of NO contacts for auxiliary contacts                                | 0                                      |
| number of CO contacts for auxiliary contacts                                | 0                                      |
| <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                                               |                                        |
| • for main current circuit                                                  | spring-loaded terminals                |
| • for auxiliary and control circuit                                         | spring-loaded terminals                |
| type of connectable conductor cross-sections                                |                                        |
| • 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> )      |
| • for AWG cables for main contacts                                          | 2x (18 ... 14)                         |
| connectable conductor cross-section for main contacts                       |                                        |
| • solid or stranded                                                         | 0.5 ... 2.5 mm <sup>2</sup>            |
| • finely stranded with core end processing                                  | 0.5 ... 1.5 mm <sup>2</sup>            |
| • finely stranded without core end processing                               | 0.5 ... 2.5 mm <sup>2</sup>            |
| type of connectable conductor cross-sections                                |                                        |
| • for auxiliary and control contacts                                        |                                        |
| — solid                                                                     | 0.5 ... 1.5 mm <sup>2</sup>            |
| — finely stranded with core end processing                                  | 0.5 ... 2.5 mm <sup>2</sup>            |

|                                                                                               |                                                                                                   |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| — finely stranded without core end processing                                                 | 0.5 ... 2.5 mm <sup>2</sup>                                                                       |
| • for AWG cables for auxiliary and control contacts                                           | 1x (20 ... 12)                                                                                    |
| <b>AWG number as coded connectable conductor cross section for main contacts</b>              | 18 ... 14                                                                                         |
| <b>tightening torque</b>                                                                      |                                                                                                   |
| • for main contacts with screw-type terminals                                                 | 2 ... 2.5 N·m                                                                                     |
| <b>stripped length of the cable</b>                                                           |                                                                                                   |
| • for main contacts                                                                           | 10 mm                                                                                             |
| • for auxiliary and control contacts                                                          | 10 mm                                                                                             |
| <b>Electrical Safety</b>                                                                      |                                                                                                   |
| <b>protection class IP on the front according to IEC 60529</b>                                | IP20                                                                                              |
| <b>touch protection on the front according to IEC 60529</b>                                   | finger-safe, for vertical contact from the front                                                  |
| <b>Ambient conditions</b>                                                                     |                                                                                                   |
| installation altitude at height above sea level maximum                                       | 1 000 m                                                                                           |
| <b>ambient temperature</b>                                                                    |                                                                                                   |
| • during operation                                                                            | -25 ... +60 °C                                                                                    |
| • during storage                                                                              | -55 ... +80 °C                                                                                    |
| <b>Electromagnetic compatibility</b>                                                          |                                                                                                   |
| <b>conducted interference</b>                                                                 |                                                                                                   |
| • due to burst according to IEC 61000-4-4                                                     | 2 kV / 5 kHz behavior criterion 2                                                                 |
| • due to conductor-earth surge according to IEC 61000-4-5                                     | 2 kV behavior criterion 2                                                                         |
| • due to conductor-conductor surge according to IEC 61000-4-5                                 | 1 kV behavior criterion 2                                                                         |
| • due to high-frequency radiation according to IEC 61000-4-6                                  | 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                                                                 |                                                                                                   |
| • of full range R fuse link for semiconductor protection at NH design usable                  | <a href="#">3NE1021-2</a>                                                                         |
| • of back-up R fuse link for semiconductor protection at NH design usable                     | <a href="#">3NE8021-1</a>                                                                         |
| • of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable | <a href="#">3NC2280: These fuses have a smaller rated current than the semiconductor relays</a>   |
| manufacturer's article number of the gG fuse                                                  |                                                                                                   |
| • at NH design usable                                                                         | <a href="#">3NA6812: These fuses have a smaller rated current than the semiconductor relays</a>   |
| • at cylindrical design 22 x 58 mm usable                                                     | <a href="#">3NW6212-1: These fuses have a smaller rated current than the semiconductor relays</a> |
| manufacturer's article number                                                                 |                                                                                                   |
| • of DIAZED fuse usable                                                                       | <a href="#">5SB4111: These fuses have a smaller rated current than the semiconductor relays</a>   |
| • of NEOZED fuse usable                                                                       | <a href="#">5SE2335: These fuses have a smaller rated current than the semiconductor relays</a>   |
| <b>Approvals Certificates</b>                                                                 |                                                                                                   |
| <b>General Product Approval</b>                                                               | EMV                                                                                               |



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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=3RF2190-2AA24>

Cax online generator

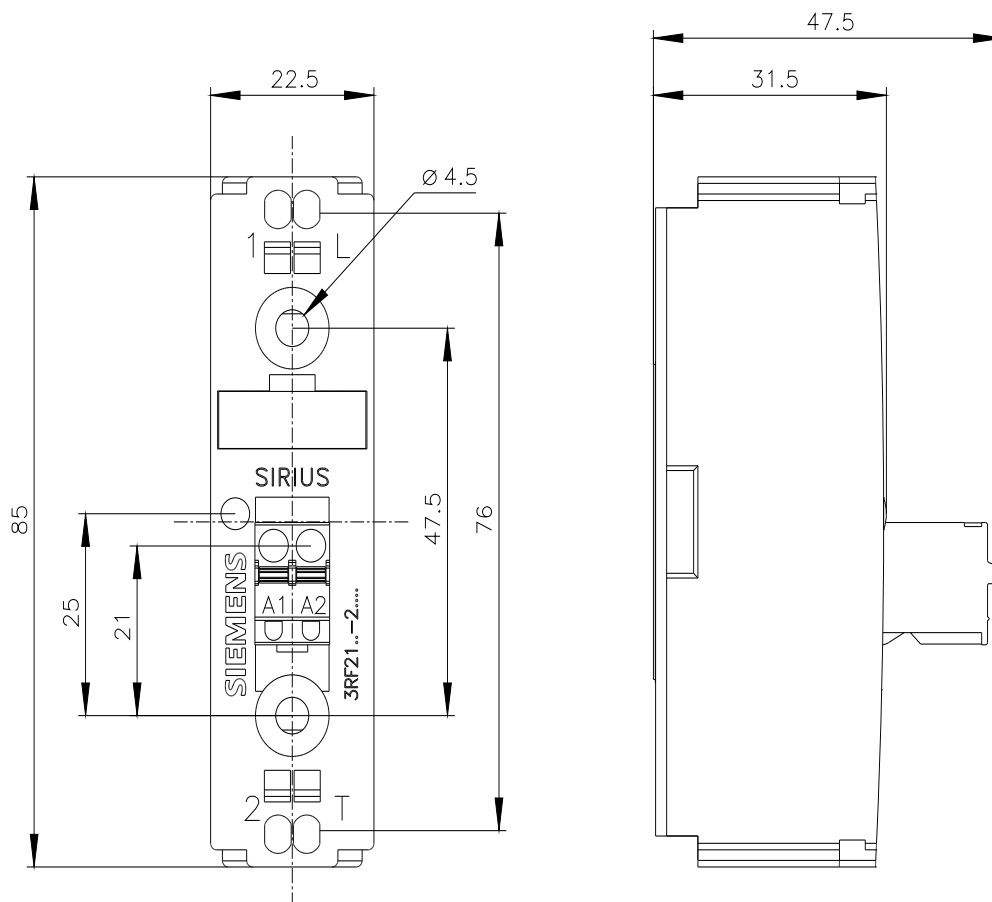
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2190-2AA24>

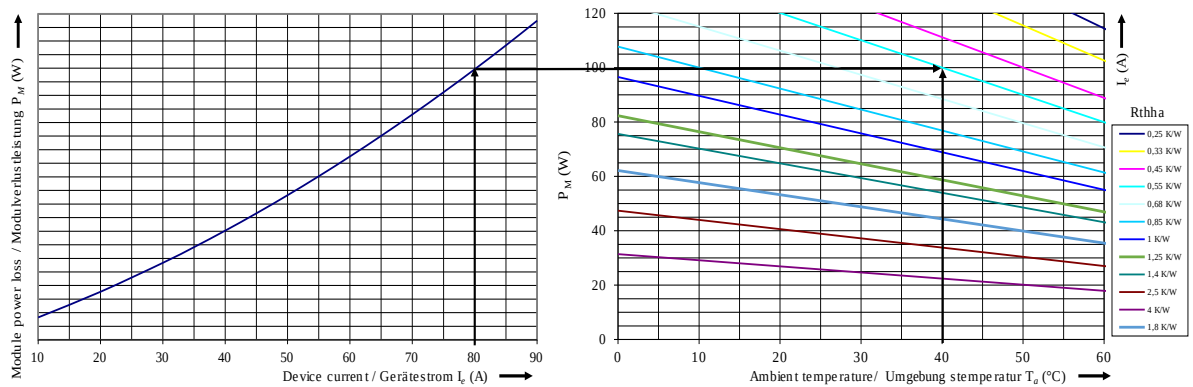
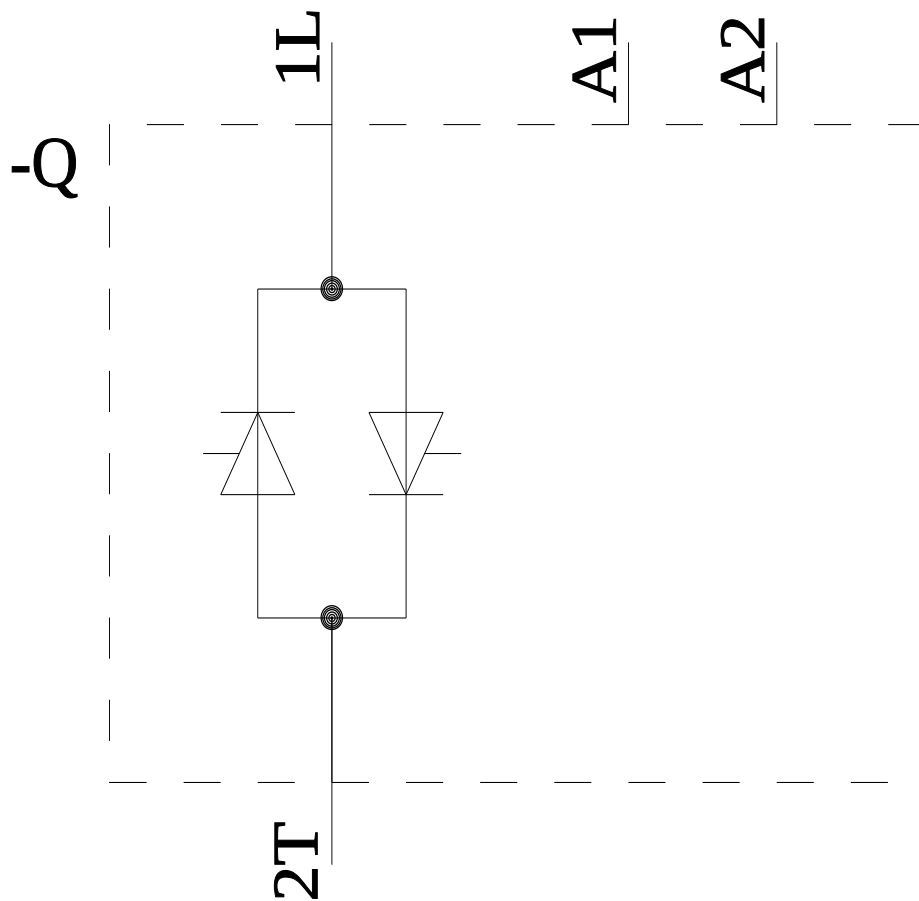
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2190-2AA24>

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

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF2190-2AA24&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2190-2AA24&lang=en)





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