



Semiconductor relay, 1-phase 3RF2 Overall width 45 mm, 70 A 24-230 V / 110-230 V AC screw terminal

|                          |                   |
|--------------------------|-------------------|
| product brand name       | SIRIUS            |
| product designation      | solid-state relay |
| design of the product    | single-phase      |
| product type designation | 3RF20             |



### General technical data

|   |                      |
|---|----------------------|
| product function                                | zero-point switching |
| power loss [W] for rated value of the current   |                      |
| • at AC in hot operating state                  | 94 W                 |
| • at AC in hot operating state per pole         | 94 W                 |
| • without load current share typical            | 3.5 W                |
| insulation voltage rated value                  | 600 V                |
| type of voltage of the control supply voltage   | AC                   |
| 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           |

### 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                       |
| operating voltage at AC   |                         |
| • at 50 Hz rated value  | 24 ... 230 V            |
| • at 60 Hz rated value  | 24 ... 230 V            |
| operating frequency rated value   | 50 ... 60 Hz            |
| relative symmetrical tolerance of the operating frequency                   | 10 %                    |
| operating range relative to the operating voltage at AC                     |                         |
| • at 50 Hz  | 20 ... 253 V            |
| • at 60 Hz  | 20 ... 253 V            |
| operational current   |                         |
| • at AC-51 rated value  | 50 A                    |
| • according to UL 508 rated value   | 50 A                    |
| ampacity maximum  | 70 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     | 800 V                   |
| reverse current of the thyristor  | 10 mA                   |
| derating temperature  | 40 °C                   |
| surge current resistance rated value  | 1 200 A                 |
| I <sup>2</sup> t value maximum  | 7 200 A <sup>2</sup> ·s |

| Control circuit/ Control  |   |
|---|---|
| <b>type of voltage of the control supply voltage</b>                      | AC  |
| <b>control supply voltage 1 at AC</b>                                     |   |
| • at 50 Hz  | 110 ... 230 V                                     |
| • at 60 Hz  | 110 ... 230 V                                     |
| <b>control supply voltage frequency</b>                                   |   |
| • 1 rated value   | 50 Hz   |
| • 2 rated value   | 60 Hz   |
| <b>control supply voltage at AC</b>                                       |   |
| • at 50 Hz full-scale value for signal<0> recognition                     | 40 V  |
| • at 60 Hz full-scale value for signal<0> recognition                     | 40 V  |
| <b>control supply voltage</b>   |   |
| • at AC initial value for signal <1> detection                            | 90 V  |
| <b>symmetrical line frequency tolerance</b>                               | 5 Hz  |
| <b>control current at minimum control supply voltage</b>                  |   |
| • at AC   | 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   |
| Auxiliary circuit   |   |
| <b>number of NC contacts for auxiliary contacts</b>                       | 0   |
| <b>number of NO contacts for auxiliary contacts</b>                       | 0   |
| number of CO contacts for auxiliary contacts                              | 0   |
| Installation/ mounting/ dimensions  |   |
| <b>fastening method</b>   | screw fixing                                      |
| • side-by-side mounting   | Yes   |
| <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>   | 58 mm   |
| <b>width</b>  | 45 mm   |
| <b>depth</b>  | 48 mm   |
| Connections/ Terminals  |   |
| <b>type of electrical connection</b>                                      |   |
| • for main current circuit  | screw-type terminals                              |
| • for auxiliary and control circuit                                       | screw-type terminals                              |
| <b>type of connectable conductor cross-sections</b>                       |   |
| • for main contacts   |   |
| — solid   | 2x (1.5 ... 2.5 mm²), 2x (2.5 ... 6 mm²)          |
| — finely stranded with core end processing                                | 2x (1 ... 2.5 mm²), 2x (2.5 ... 6 mm²), 1x 10 mm² |
| • at AWG cables for main contacts   | 2x (14 ... 10)                                    |
| <b>connectable conductor cross-section for main contacts</b>              |   |
| • solid or stranded   | 1.5 ... 6 mm²                                     |
| • finely stranded with core end processing                                | 1 ... 10 mm²                                      |
| <b>type of connectable conductor cross-sections</b>                       |   |
| • for auxiliary and control contacts                                      |   |
| — solid   | 1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1.0 mm²)        |
| — finely stranded with core end processing                                | 1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1.0 mm²)        |
| — finely stranded without core end processing                             | 1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1.0 mm²)        |
| • at AWG cables for auxiliary and control contacts                        | 1x (AWG 20 ... 12)                                |
| AWG number as coded connectable conductor cross section for main contacts | 14 ... 10   |
| <b>tightening torque</b>  |   |
| • for main contacts with screw-type terminals                             | 2 ... 2.5 N·m                                     |
| • for auxiliary and control contacts with screw-type terminals            | 0.5 ... 0.6 N·m                                   |
| <b>tightening torque [lbf·in]</b>   |   |
| • for main contacts with screw-type terminals                             | 7 ... 10.3 lbf·in                                 |
| • for auxiliary and control contacts with screw-type terminals            | 4.5 ... 5.3 lbf·in                                |
| <b>design of the thread of the connection screw</b>                       |   |
| • for main contacts   | M4  |

|   |  |   |   |   |   |
|---|--|---|---|---|---|
| <ul style="list-style-type: none"><li>• of the auxiliary and control contacts</li></ul>   | M3   |   |   |   |   |
| <b>stripped length of the cable</b>   |  |   |   |   |   |
| <ul style="list-style-type: none"><li>• for main contacts</li><li>• for auxiliary and control contacts</li></ul>  | 10 mm<br>7 mm  |   |   |   |   |
| <b>Safety related data</b>  |  |   |   |   |   |
| <b>protection class IP on the front according to IEC 60529</b>  | IP20   |   |   |   |   |
| <b>touch protection on the front according to IEC 60529</b>   | finger-safe, for vertical contact from the front   |   |   |   |   |
| <b>Ambient conditions</b>   |  |   |   |   |   |
| installation altitude at height above sea level maximum   | 1 000 m  |   |   |   |   |
| <b>ambient temperature</b>  |  |   |   |   |   |
| <ul style="list-style-type: none"><li>• during operation</li><li>• during storage</li></ul>   | -25 ... +60 °C<br>-55 ... +80 °C   |   |   |   |   |
| <b>Electromagnetic compatibility</b>  |  |   |   |   |   |
| <b>conducted interference</b>   |  |   |   |   |   |
| <ul style="list-style-type: none"><li>• due to burst according to IEC 61000-4-4</li><li>• due to conductor-earth surge according to IEC 61000-4-5</li><li>• due to conductor-conductor surge according to IEC 61000-4-5</li><li>• due to high-frequency radiation according to IEC 61000-4-6</li></ul>  | 2 kV / 5 kHz behavior criterion 2<br>2 kV behavior criterion 2<br><br>1 kV behavior criterion 2<br><br>140 dBuV in the frequency range 0.15 ... 80 MHz, behavior criterion 1                           |   |   |   |   |
| <b>field-based interference according to IEC 61000-4-3</b>  | 80 MHz ... 1 GHz 10 V/m, behavior criterion 1  |   |   |   |   |
| <b>electrostatic discharge according to IEC 61000-4-2</b>   | 4 kV contact discharging / 8 kV air discharging, behavior criterion 2  |   |   |   |   |
| <b>conducted HF interference emissions according to CISPR11</b>   | Class A for industrial environment   |   |   |   |   |
| <b>field-bound HF interference emission according to CISPR11</b>  | Class B for the domestic, business and commercial environments   |   |   |   |   |
| <b>Short-circuit protection, design of the fuse link</b>  |  |   |   |   |   |
| manufacturer's article number   |  |   |   |   |   |
| <ul style="list-style-type: none"><li>• of gS fuse for semiconductor protection at NH design usable</li><li>• of full range R fuse link for semiconductor protection at cylindrical design usable</li><li>• of back-up R fuse link for semiconductor protection at NH design usable</li><li>• of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable</li></ul> | <a href="#">3NE1820-0</a><br><br><a href="#">5SE1363</a> ; These fuses have a smaller rated current than the semiconductor relays<br><a href="#">3NE8020-1</a><br><br><a href="#">3NC2200</a>          |   |   |   |   |
| manufacturer's article number of the gG fuse  |  |   |   |   |   |
| <ul style="list-style-type: none"><li>• at NH design usable</li><li>• at cylindrical design 22 x 58 mm usable</li></ul>   | <a href="#">3NA6817</a> ; These fuses have a smaller rated current than the semiconductor relays<br><a href="#">3NW6217-1</a> ; 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 NEOZED fuse usable</li></ul>   | <a href="#">5SB4111</a> ; These fuses have a smaller rated current than the semiconductor relays<br><a href="#">5SE2335</a> ; These fuses have a smaller rated current than the semiconductor relays   |   |   |   |   |
| <b>Certificates/ approvals</b>  |  |   |   |   |   |
| <b>General Product Approval</b>   | <b>EMC</b>   | <b>Declaration of Conformity</b>  |   |   |   |
|    | <a href="#">Confirmation</a>   |  |  |  |  |
| <b>Declaration of Conformity</b>  | <b>Test Certificates</b>   | <b>other</b>  |   |   |   |
|    | <a href="#">Type Test Certificates/Test Report</a>   | <a href="#">Confirmation</a>  |   |   |   |

## Further information

### Information on the packaging

<https://support.industry.siemens.com/cs/ww/en/view/109813875>

### 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=3RF2070-1AA22>

### Cax online generator

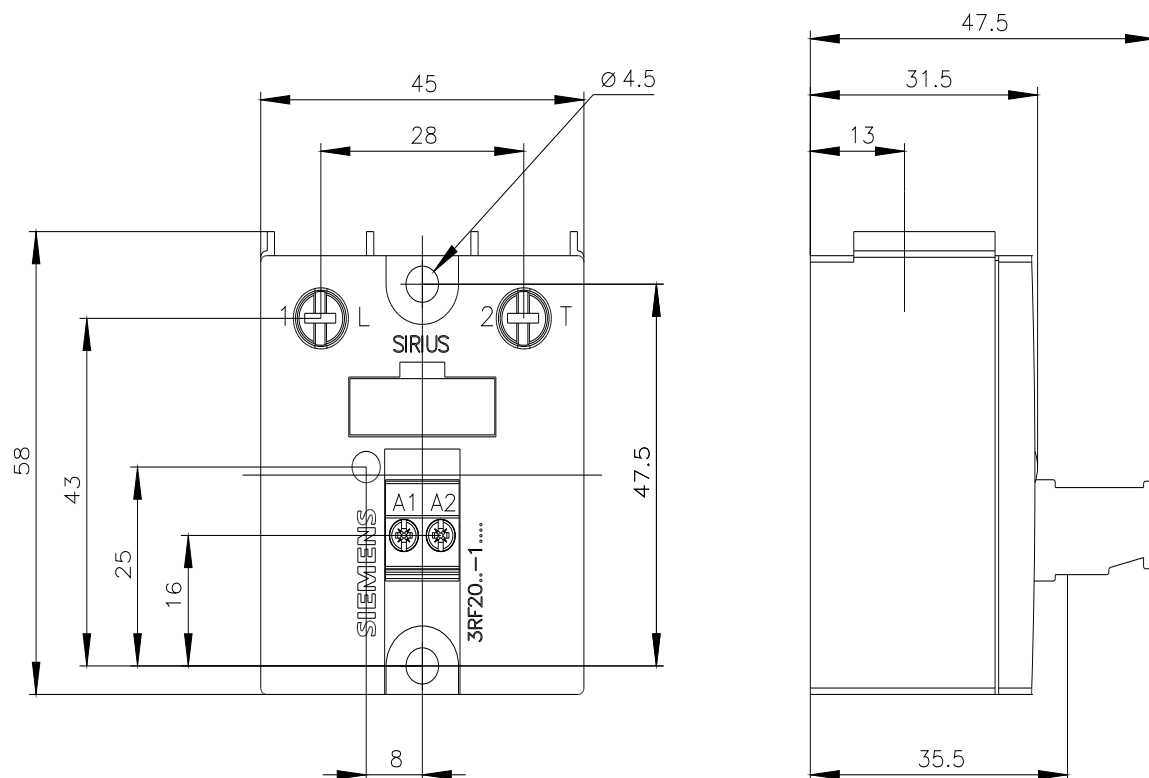
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2070-1AA22>

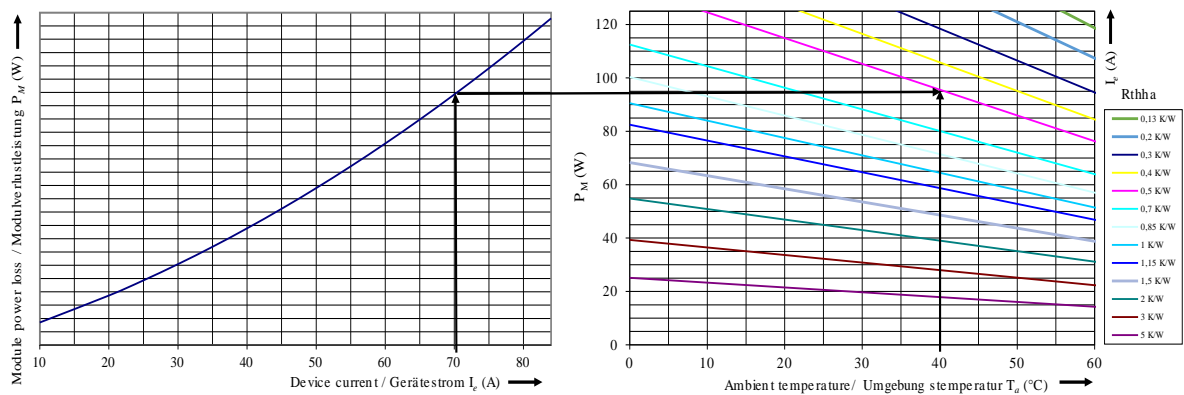
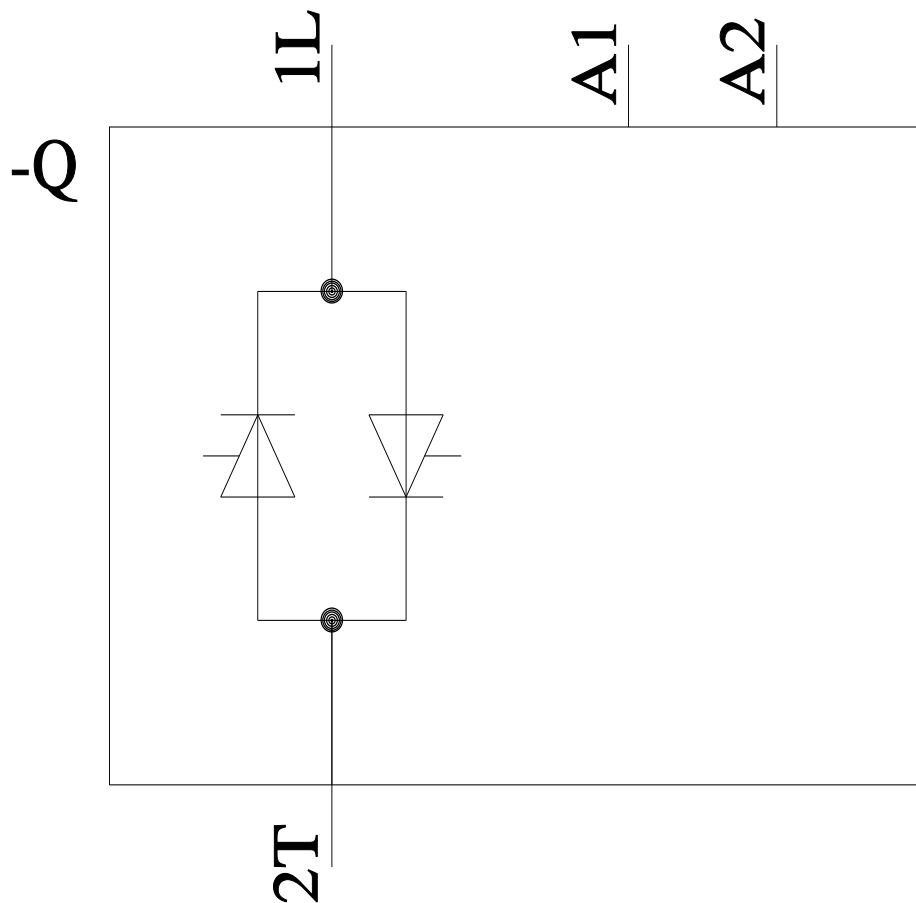
### Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2070-1AA22>

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

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF2070-1AA22&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2070-1AA22&lang=en)





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