

Semiconductor relay, 1-phase 3RF2 Width 22.5 mm, 20 A 24-230 V / 4-30 V DC screw terminal



|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| product brand name            | SIRIUS                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| product designation           | solid-state relay                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| product type designation      | 3RF21                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| manufacturer's article number | <div><ul style="list-style-type: none"><li>_1 / of the accessories that can be ordered <a href="#">3RF2900-3PA88</a></li><li>_2 / of the accessories that can be ordered <a href="#">3RF2920-0HA13</a></li><li>_3 / of the accessories that can be ordered <a href="#">3RF2900-0EA18</a></li><li>_4 / of the accessories that can be ordered <a href="#">3RF2920-0GA13</a></li><li>_5 / of the accessories that can be ordered <a href="#">3RF2920-0FA08</a></li></ul></div> |
| product designation           | <div><ul style="list-style-type: none"><li>_1 / of the accessories that can be ordered terminal cover</li><li>_2 / of the accessories that can be ordered power regulator</li><li>_3 / of the accessories that can be ordered converter</li><li>_4 / of the accessories that can be ordered load monitoring</li><li>_5 / of the accessories that can be ordered load monitoring, basis</li></ul></div>                                                                       |
| General technical data        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| product function              | zero-point switching                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| power loss [V·A] / maximum    | 28.6 V·A                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|                                                                                  |             |
|----------------------------------------------------------------------------------|-------------|
| power loss [W] / for rated value of the current / at AC / in hot operating state | 28.6 W      |
| <b>insulation voltage</b>                                                        |             |
| • rated value                                                                    | 600 V       |
| <b>protection class IP</b>                                                       | IP20        |
| shock resistance / acc. to IEC 60068-2-27                                        | 15g / 11 ms |
| vibration resistance / acc. to IEC 60068-2-6                                     | 2g          |
| <b>reference code / acc. to DIN EN 81346-2</b>                                   | Q           |

#### Main circuit

|                                                                                          |                       |
|------------------------------------------------------------------------------------------|-----------------------|
| <b>number of poles / for main current circuit</b>                                        | 1                     |
| <b>number of NO contacts / for main contacts</b>                                         | 1                     |
| <b>number of NC contacts / for main contacts</b>                                         | 0                     |
| <b>operating voltage / at AC</b>                                                         |                       |
| • 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>operating current</b>                                                                 |                       |
| • at AC-51 / rated value                                                                 | 20 A                  |
| • acc. to UL 508 / rated value                                                           | 20 A                  |
| <b>ampacity / maximum</b>                                                                | 20 A                  |
| <b>operating current / minimum</b>                                                       | 100 mA                |
| <b>rate of voltage rise / at the thyristor / for main contacts / maximum permissible</b> | 500 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>                                            | 200 A                 |
| <b>I<sup>2</sup>t value / maximum</b>                                                    | 200 A <sup>2</sup> ·s |

#### Control circuit/ Control

|                                                        |            |
|--------------------------------------------------------|------------|
| <b>type of voltage / of the control supply voltage</b> | DC         |
| <b>control supply voltage / 1</b>                      |            |
| • at DC / rated value                                  | 30 V       |
| • at DC                                                | 4 ... 30 V |
| <b>control supply voltage</b>                          |            |
| • at DC / initial value for signal <1> detection       | 4 V        |

|                                                                                                              |                                       |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <ul style="list-style-type: none"> <li>• at DC / full-scale value for signal&lt;0&gt; recognition</li> </ul> | 1 V                                   |
| <b>control current / at minimum control supply voltage</b>                                                   |                                       |
| <ul style="list-style-type: none"> <li>• at DC</li> </ul>                                                    | 13 mA                                 |
| control current / at DC / rated value                                                                        | 15 mA                                 |
| <b>switch-on delay time</b>                                                                                  | 1 ms; additionally max. one half-wave |
| <b>Off-delay time</b>                                                                                        | 1 ms; additionally max. one half-wave |
| <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>mounting type</b>                                                      | screw fixing |
| <ul style="list-style-type: none"> <li>• side-by-side mounting</li> </ul> | Yes          |
| <b>height</b>                                                             | 85 mm        |
| <b>width</b>                                                              | 22.5 mm      |
| <b>depth</b>                                                              | 48 mm        |

#### Connections/ Terminals

|                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                            |
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| <b>type of electrical connection</b>                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• for main current circuit</li> </ul>                                                                                                                                                                                                                                                       | screw-type terminals                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>• for auxiliary and control current circuit</li> </ul>                                                                                                                                                                                                                                      | screw-type terminals                                                                                                                                                                                                                       |
| <b>type of connectable conductor cross-sections</b>                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• for main contacts <ul style="list-style-type: none"> <li>— solid</li> <li>— finely stranded / with core end processing</li> </ul> </li> <li>• at AWG conductors / for main contacts</li> </ul>                                                                                            | 2x (1.5 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> )<br>2x (1 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> ), 1x 10 mm <sup>2</sup><br>2x (14 ... 10)                                                            |
| <b>type of connectable conductor cross-sections</b>                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• for auxiliary and control contacts <ul style="list-style-type: none"> <li>— solid</li> <li>— finely stranded / with core end processing</li> <li>— finely stranded / without core end processing</li> </ul> </li> <li>• at AWG conductors / for auxiliary and control contacts</li> </ul> | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )<br>1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )<br>1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )<br>1x (AWG 20 ... 12) |
| <b>tightening torque</b>                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• for main contacts / with screw-type terminals</li> <li>• for auxiliary and control contacts / with screw-type terminals</li> </ul>                                                                                                                                                        | 2 ... 2.5 N·m<br>0.5 ... 0.6 N·m                                                                                                                                                                                                           |
| <b>tightening torque [lbf·in]</b>                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• for main contacts / with screw-type terminals</li> <li>• for auxiliary and control contacts / with screw-type terminals</li> </ul>                                                                                                                                                        | 7 ... 10.3 lbf·in<br>4.5 ... 5.3 lbf·in                                                                                                                                                                                                    |
| <b>design of the thread / of the connection screw</b>                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                            |

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| <ul style="list-style-type: none"> <li>• for main contacts</li> <li>• of the auxiliary and control contacts</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | M4<br>M3                                                                                                                                                             |
| <b>wire stripping length / of the cable</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                      |
| <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>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 / acc. to IEC 61000-4-4</li> <li>• due to conductor-earth surge / acc. to IEC 61000-4-5</li> <li>• due to conductor-conductor surge / acc. to IEC 61000-4-5</li> <li>• due to high-frequency radiation / acc. to IEC 61000-4-6</li> </ul>                                                                                                                                                                                                                                                                                          | 2 kV / 5 kHz behavior criterion 2<br>2 kV behavior criterion 2<br>1 kV behavior criterion 2<br>140 dBuV in the frequency range 0.15 ... 80 MHz, behavior criterion 1 |
| <b>electrostatic discharge / acc. to IEC 61000-4-2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4 kV contact discharging / 8 kV air discharging, behavior criterion 2                                                                                                |
| <b>conducted HF-interference emissions / acc. to CISPR11</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Class A for industrial environment                                                                                                                                   |
| <b>field-bound HF-interference emission / acc. 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</li> <li>• of full range R fuse link for semiconductor protection / at cylindrical design</li> <li>• of back-up R fuse link for semiconductor protection / at NH design</li> <li>• of back-up R fuse link for semiconductor protection / at cylindrical design 10 x 38 mm</li> <li>• of back-up R fuse link for semiconductor protection / at cylindrical design 14 x 51 mm</li> <li>• of back-up R fuse link for semiconductor protection / at cylindrical design 22 x 58 mm</li> </ul> | <a href="#">3NE1814-0</a><br><a href="#">5SE1325</a><br><a href="#">3NE8015-1</a><br><a href="#">3NC1032</a><br><a href="#">3NC1430</a><br><a href="#">3NC2225</a>   |
| manufacturer's article number / of the gG fuse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>• at NH design</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <a href="#">3NA6803; These fuses have a smaller rated current than the semiconductor relays</a>                                                                      |

- at cylindrical design 10 x 38 mm
- at cylindrical design 14 x 51 mm

[3NW6001-1; These fuses have a smaller rated current than the semiconductor relays](#)

[3NW6101-1; These fuses have a smaller rated current than the semiconductor relays](#)

manufacturer's article number

- of DIAZED fuse
- of NEOZED fuse

[5SB141; These fuses have a smaller rated current than the semiconductor relays](#)

[5SE2306; These fuses have a smaller rated current than the semiconductor relays](#)

## Certificates/ approvals

### General Product Approval



[Miscellaneous](#)

### Test Certificates

[Type Test Certificates/Test Report](#)

[Special Test Certificate](#)

[Confirmation](#)



[Vibration and Shock](#)

### other

### Railway

## Further information

**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=3RF2120-1AA42>

**Cax online generator**

<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2120-1AA42>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2120-1AA42>

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

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF2120-1AA42&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2120-1AA42&lang=en)





