

Semiconductor relay, 1-phase 3RF2 Width 45 mm, 20 A 24-230 V / 110-230 V AC screw terminal



|                          |                   |
|--------------------------|-------------------|
| Product brand name       | SIRIUS            |
| Product designation      | solid-state relay |
| Product type designation | 3RF20             |

### General technical data

|  |                      |
|--|----------------------|
| Product function   | zero-point switching |
| Power loss [W] / total / typical   | 28.6 W               |
| Power loss [W] / for rated value of the current / at AC / in hot operating state     | 28.6 W               |
| Insulation voltage   |                      |
| • rated value  | 600 V                |
| Protection class IP  | IP20                 |
| Shock resistance / acc. to IEC 60068-2-27  | 15g / 11 ms          |
| Vibration resistance / acc. to IEC 60068-2-6   | 2g                   |
| Reference code / acc. to DIN 40719 extended according to IEC 204-2 / acc. to IEC 750 | K                    |
| Reference code / acc. to DIN EN 81346-2  | Q                    |
| Reference code / acc. to DIN EN 61346-2  | Q                    |

### Main circuit

|  |   |
|--|---|
| Number of poles / for main current circuit | 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 / minimum</b>   | 100 mA                |
| <b>Operating current</b>   |                       |
| • at AC-1 / at 400 V / rated value   | 20 A                  |
| • at AC-51 / rated value   | 20 A                  |
| <b>Rate of voltage rise / at the thyristor / for main contacts / maximum permissible</b> | 500 V/ $\mu$ s        |
| <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>     | 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          |
| <b>Control current / at AC / rated value</b>               | 15 mA         |

|   |  |
|---|--|
| <b>Switch-on delay time</b>                           | 40 ms; additionally max. one half-wave |
| <b>Off-delay time</b>                                 | 40 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                                      |
| <b>Number of CO contacts / for auxiliary contacts</b> | 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>   | 58 mm        |
| <b>Width</b>  | 45 mm        |
| <b>Depth</b>  | 48 mm        |
| <b>Installation altitude / at height above sea level / maximum</b>        | 1 000 m      |

### Connections/ Terminals

|   |   |
|---|---|
| <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> </ul> </li> </ul>                  | 2x (1.5 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> )                      |
| <ul style="list-style-type: none"> <li>— finely stranded / with core end processing</li> </ul>  | 2x (1 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> ), 1x 10 mm <sup>2</sup> |
| <ul style="list-style-type: none"> <li>• at AWG conductors / for main contacts</li> </ul>   | 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> </ul> </li> </ul> | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )                    |
| <ul style="list-style-type: none"> <li>— finely stranded / with core end processing</li> </ul>  | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )                    |
| <ul style="list-style-type: none"> <li>— finely stranded / without core end processing</li> </ul>   | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )                    |
| <ul style="list-style-type: none"> <li>• at AWG conductors / for auxiliary and control contacts</li> </ul>  | 1x (AWG 20 ... 12)  |
| <b>Tightening torque / for main contacts / with screw-type terminals</b>  | 2 ... 2.5 N·m   |
| <b>Tightening torque / for auxiliary and control contacts / with screw-type terminals</b>   | 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> </ul>   | 7 ... 10.3 lbf·in   |
| <ul style="list-style-type: none"> <li>• for auxiliary and control contacts / with screw-type terminals</li> </ul>                                | 4.5 ... 5.3 lbf·in  |
| <b>Design of the thread / of the connection screw</b>   |   |
| <ul style="list-style-type: none"> <li>• for main contacts</li> </ul>   | M4  |
| <ul style="list-style-type: none"> <li>• of the auxiliary and control contacts</li> </ul>   | M3  |
| <b>Wire stripping length / of the cable</b>   |   |

- for main contacts
- for auxiliary and control contacts

10 mm

7 mm

## Ambient conditions

### Ambient temperature

- during operation
- during storage

-25 ... +60 °C

-55 ... +80 °C

## Electromagnetic compatibility

### Conducted interference

- due to burst / acc. to IEC 61000-4-4
- due to conductor-earth surge / acc. to IEC 61000-4-5
- due to conductor-conductor surge / acc. to IEC 61000-4-5
- due to high-frequency radiation / acc. to IEC 61000-4-6

2 kV / 5 kHz behavior criterion 2

2 kV behavior criterion 2

1 kV behavior criterion 2

140 dBuV in the frequency range 0.15 ... 80 MHz, behavior criterion 1

### Electrostatic discharge / acc. to IEC 61000-4-2

4 kV contact discharging / 8 kV air discharging, behavior criterion 2

### Conducted HF-interference emissions / acc. to CISPR11

Class A for industrial environment

### Field-bound HF-interference emission / acc. to CISPR11

Class B for the domestic, business and commercial environments

## Further information

### Information- and Downloadcenter (Catalogs, Brochures,...)

[www.siemens.com/sirius/catalogs](http://www.siemens.com/sirius/catalogs)

### Industry Mall (Online ordering system)

<https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RF2020-1AA22>

### Cax online generator

<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2020-1AA22>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2020-1AA22>

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

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF2020-1AA22&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2020-1AA22&lang=en)

### Short-circuit protection, design of the fuse link

[https://www.automation.siemens.com/cd-static/material/info/3RF20\\_eng.pdf](https://www.automation.siemens.com/cd-static/material/info/3RF20_eng.pdf)

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