

Semiconductor relay, 1-phase 3RF2 Width 45 mm, 20 A 48-460 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] / 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 |
| Number of NO contacts / for main contacts  | 1 |

|                                                                                          |                       |
|------------------------------------------------------------------------------------------|-----------------------|
| <b>Number of NC contacts / for main contacts</b>                                         | 0                     |
| <b>Operating voltage / at AC</b>                                                         |                       |
| • at 50 Hz / rated value                                                                 | 48 ... 460 V          |
| • at 60 Hz / rated value                                                                 | 48 ... 460 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                                                                               | 40 ... 506 V          |
| • at 60 Hz                                                                               | 40 ... 506 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/μs              |
| <b>Blocking voltage / at the thyristor / for main contacts / maximum permissible</b>     | 1 200 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 |

|                                                |       |
|------------------------------------------------|-------|
| Off-delay time                                 | 40 ms |
| Number of NC contacts / for auxiliary contacts | 0     |
| Number of NO contacts / for auxiliary contacts | 0     |
| Number of CO contacts / for auxiliary contacts | 0     |

#### Installation/ mounting/ dimensions

|                                                                    |              |
|--------------------------------------------------------------------|--------------|
| <b>Mounting type</b>                                               | screw fixing |
| • Side-by-side mounting                                            | 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 connectable conductor cross-sections</b>                                       |                                                                                         |
| • for main contacts                                                                       |                                                                                         |
| — solid                                                                                   | 2x (1.5 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> )                      |
| — finely stranded / with core end processing                                              | 2x (1 ... 2.5 mm <sup>2</sup> ), 2x (2.5 ... 6 mm <sup>2</sup> ), 1x 10 mm <sup>2</sup> |
| • at AWG conductors / for main contacts                                                   | 2x (14 ... 10)                                                                          |
| <b>Type of connectable conductor cross-sections</b>                                       |                                                                                         |
| • for auxiliary and control contacts                                                      |                                                                                         |
| — solid                                                                                   | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )                    |
| — finely stranded / with core end processing                                              | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )                    |
| — finely stranded / without core end processing                                           | 1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )                    |
| • at AWG conductors / for auxiliary and control contacts                                  | 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>                                                         |                                                                                         |
| • 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                                                                                      |
| • of the auxiliary and control contacts                                                   | M3                                                                                      |
| <b>Wire stripping length / of the cable</b>                                               |                                                                                         |
| • for main contacts                                                                       | 10 mm                                                                                   |
| • for auxiliary and control contacts                                                      | 7 mm                                                                                    |

#### Ambient conditions

|                            |  |
|----------------------------|--|
| <b>Ambient temperature</b> |  |
|----------------------------|--|

- during operation
- during storage

-25 ... +60 °C

-55 ... +80 °C

## Electromagnetic compatibility

|                                                               |                                                                       |
|---------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>Conducted interference</b>                                 |                                                                       |
| • due to burst / acc. to IEC 61000-4-4                        | 2 kV / 5 kHz behavior criterion 2                                     |
| • due to conductor-earth surge / acc. to IEC 61000-4-5        | 2 kV behavior criterion 2                                             |
| • due to conductor-conductor surge / acc. to IEC 61000-4-5    | 1 kV behavior criterion 2                                             |
| • due to high-frequency radiation / acc. to IEC 61000-4-6     | 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        |

## 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=3RF2020-1AA24>

### Cax online generator

<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2020-1AA24>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2020-1AA24>

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

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3RF2020-1AA24&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2020-1AA24&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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