



semiconductor relay, 1-phase 3RF2 width 45 mm, 20 A 48-460 V / 110-230 V AC screw 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	3RF20
<b>General technical data</b>	
product function	zero-point switching
power loss [W] for rated value of the current	
• at AC in hot operating state	28.6 W
• at AC in hot operating state per pole	28.6 W
• without load current share typical	3.5 W
insulation voltage rated value	600 V
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 Lead monoxide (lead oxide) - 1317-36-8
Weight	0.086 kg
<b>Main circuit</b>	
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	20 A
operational current	
• at AC-51 rated value	20 A
• according to UL 508 rated value	20 A
operational current minimum	100 mA
rate of voltage rise at the thyristor for main contacts maximum permissible	500 V/ $\mu$ s

<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
<b>Control circuit/ Control</b>	
<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
<b>Auxiliary circuit</b>	
<b>type of switching contact</b>	normally open contact (NO)
<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
<b>Installation/ mounting/ dimensions</b>	
fastening method side-by-side mounting	Yes
<b>fastening method</b>	screw fixing
<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
<b>Connections/ Terminals</b>	
<b>product component removable terminal for auxiliary and control circuit</b>	Yes
<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 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>
• for AWG cables for main contacts	2x (14 ... 10)
<b>connectable conductor cross-section for main contacts</b>	
• solid or stranded	1.5 ... 6 mm <sup>2</sup>
• finely stranded with core end processing	1 ... 10 mm <sup>2</sup>
<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 mm <sup>2</sup> )
— finely stranded with core end processing	1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1 mm <sup>2</sup> )
— finely stranded without core end processing	1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1 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>	14 ... 10

<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>	<p>2 ... 2.5 N·m</p> <p>0.5 ... 0.6 N·m</p>	
<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>	<p>7 ... 10.3 lbf·in</p> <p>4.5 ... 5.3 lbf·in</p>	
<b>design of the thread of the connection screw</b>		
<ul style="list-style-type: none"> <li>for main contacts</li> <li>of the auxiliary and control contacts</li> </ul>	<p>M4</p> <p>M3</p>	
<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>	<p>10 mm</p> <p>7 mm</p>	
<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>		
<ul style="list-style-type: none"> <li>during operation</li> <li>during storage</li> </ul>	<p>-25 ... +60 °C</p> <p>-55 ... +80 °C</p>	
<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>	<p>2 kV / 5 kHz behavior criterion 2</p> <p>2 kV behavior criterion 2</p> <p>1 kV behavior criterion 2</p> <p>140 dBuV in the frequency range 0.15 ... 80 MHz, behavior criterion 1</p>	
<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>		
<p>manufacturer's article number</p> <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 10 x 38 mm usable</li> <li>of back-up R fuse link for semiconductor protection at cylindrical design 14 x 51 mm usable</li> <li>of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable</li> </ul>	<p><a href="#">3NE1813-0; These fuses have a smaller rated current than the semiconductor relays</a></p> <p><a href="#">5SE1320</a></p> <p><a href="#">3NE8015-1</a></p> <p><a href="#">3NC1016; These fuses have a smaller rated current than the semiconductor relays</a></p> <p><a href="#">3NC1425</a></p> <p><a href="#">3NC2220</a></p>	
<p>manufacturer's article number of the gG fuse</p> <ul style="list-style-type: none"> <li>at NH design usable</li> <li>at cylindrical design 14 x 51 mm usable</li> </ul>	<p><a href="#">3NA6801; These fuses have a smaller rated current than the semiconductor relays</a></p> <p><a href="#">3NW6101-1; These fuses have a smaller rated current than the semiconductor relays</a></p>	
<p>manufacturer's article number</p> <ul style="list-style-type: none"> <li>of NEOZED fuse usable</li> </ul>	<p><a href="#">5SE2306; These fuses have a smaller rated current than the semiconductor relays</a></p>	
<b>Approvals Certificates</b>		
<b>General Product Approval</b>	<b>EMV</b>	<b>Test Certificates</b>



[Type Test Certificates/Test Report](#)


[Confirmation](#)
[Environmental Confirmations](#)

#### 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=3RF2020-1AA24>

Cax online generator

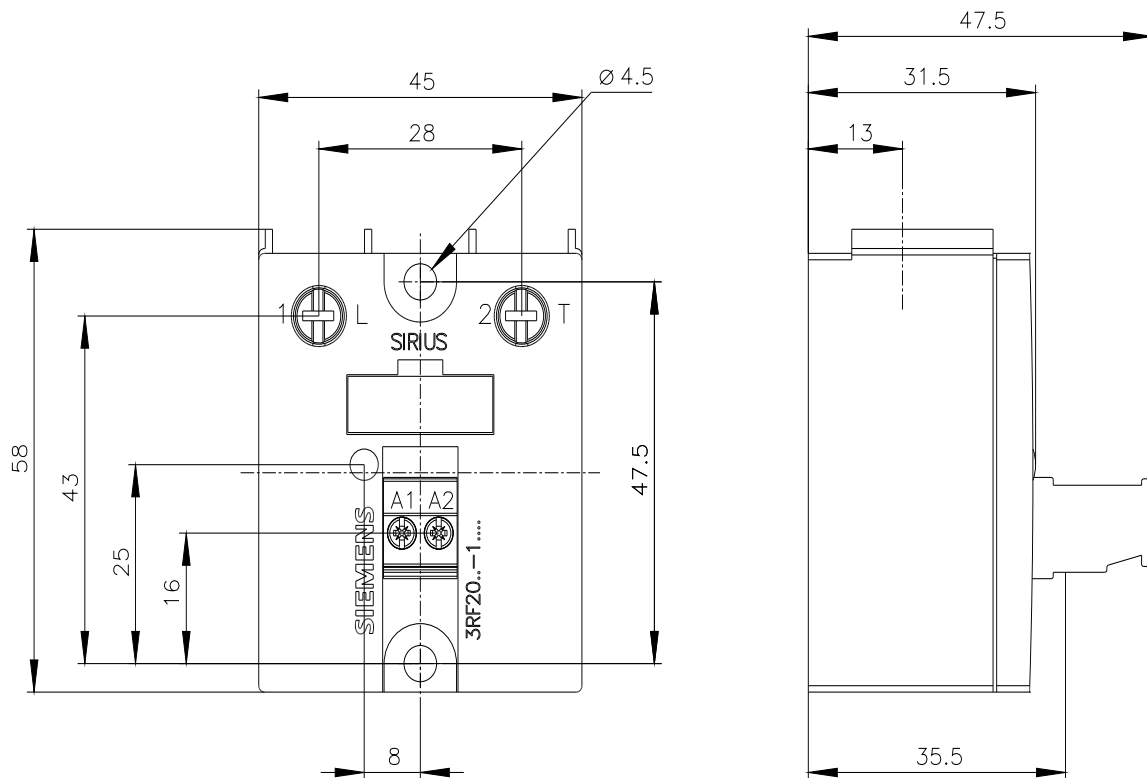
<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2020-1AA24>

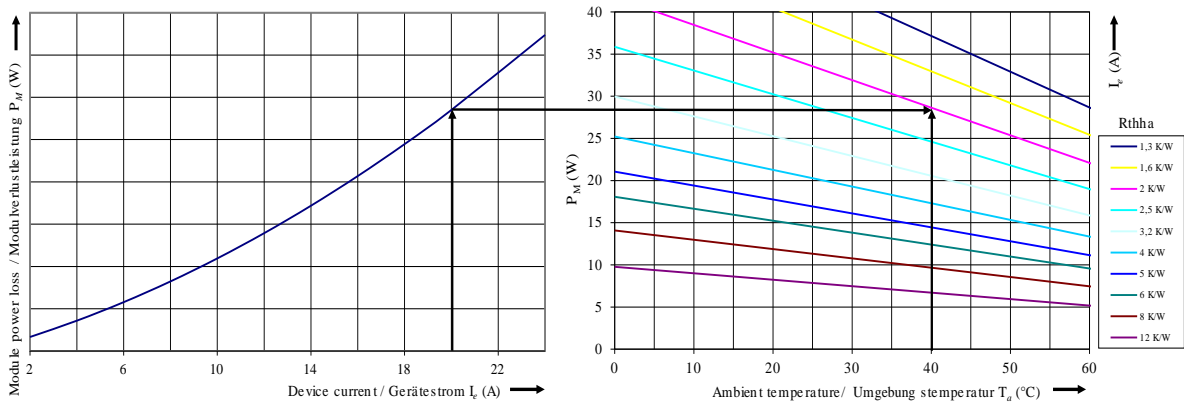
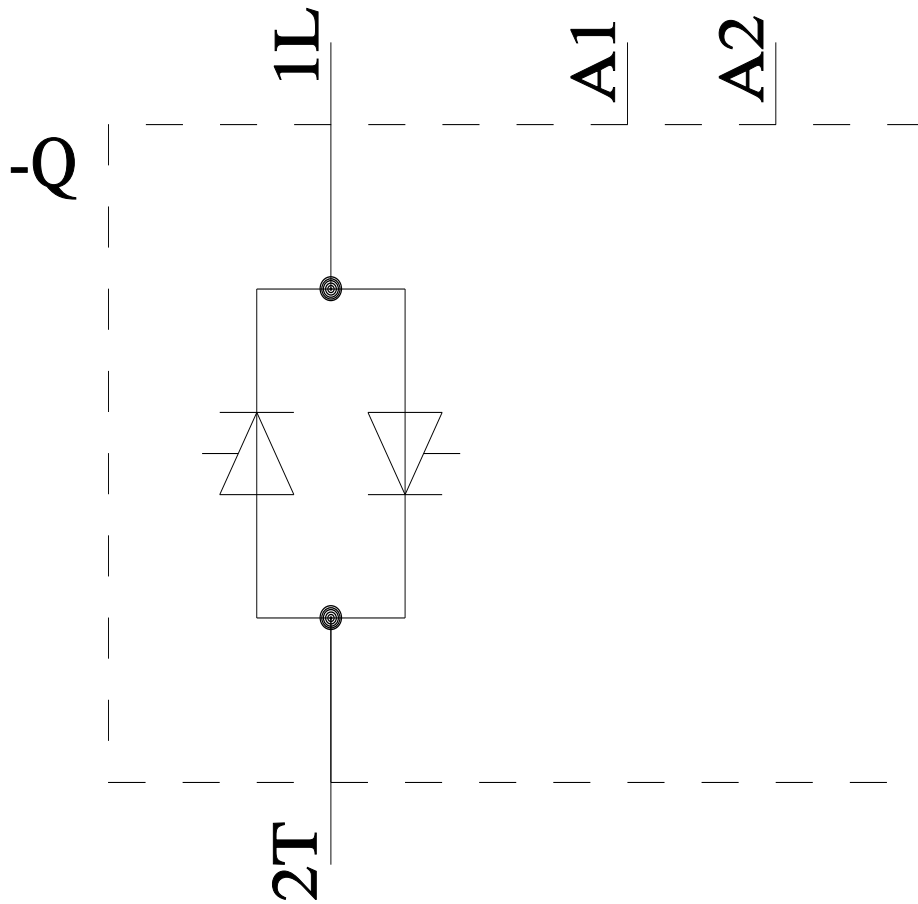
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<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, ...)

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





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