



phase-out type semiconductor relay, 1-phase 3RF2 width 22.5 mm, 90 A 48-600 V / 24 V DC ring cable 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	3RF21
manufacturer's article number	
<ul style="list-style-type: none"> • _1 of the accessories that can be ordered 	3RF2900-3PA88
<ul style="list-style-type: none"> • _3 of the accessories that can be ordered 	3RF2900-0EA18
<ul style="list-style-type: none"> • _4 of the accessories that can be ordered 	3RF2990-0GA16
product designation	
<ul style="list-style-type: none"> • _1 of the accessories that can be ordered 	terminal cover
<ul style="list-style-type: none"> • _3 of the accessories that can be ordered 	converter
<ul style="list-style-type: none"> • _4 of the accessories that can be ordered 	load monitoring
General technical data	
product function	zero-point switching
power loss [V·A] maximum	118 VA
power loss [W] for rated value of the current	
<ul style="list-style-type: none"> • at AC in hot operating state 	118 W
<ul style="list-style-type: none"> • at AC in hot operating state per pole 	118 W
<ul style="list-style-type: none"> • without load current share typical 	0.4 W
insulation voltage rated value	600 V
surge voltage resistance of main circuit rated value	6 kV
protection class IP	IP00
protection class IP on the front according to IEC 60529	IP00
shock resistance according to IEC 60068-2-27	15 g / 11 ms
vibration resistance according to IEC 60068-2-6	2 g
reference code according to IEC 81346-2	Q
Substance Prohibitance (day/month/year)	05/28/2009
SVHC substance name	Lead CAS-No. 7439-92-1 Lead monoxide (lead oxide) CAS-No. 1317-36-8 2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one CAS-No. 71868-10-5 Melamine CAS-No. 108-78-1
Net Weight	0.072 kg
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
type of voltage of the operating voltage	AC
operating voltage	
<ul style="list-style-type: none"> • at AC 	

— at 50 Hz rated value	48 ... 600 V
— at 60 Hz rated value	48 ... 600 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 ... 660 V
• at 60 Hz	40 ... 660 V
operational current rated value maximum	88 A
operational current	
• at AC-1 at 400 V rated value	90 A
• at AC-51 rated value	88 A
• according to UL 508 rated value	80 A
ampacity maximum	90 A
operational current minimum	500 mA
rate of voltage rise at the thyristor for main contacts maximum permissible	1 000 V/ μ s
blocking voltage at the thyristor for main contacts maximum permissible	1 600 V
reverse current of the thyristor	10 mA
derating temperature	40 °C
surge current resistance rated value	1 150 A
I²t value maximum	6 600 A ² ·s
Control circuit/ Control	
type of voltage of the control supply voltage	DC
control supply voltage 1 at DC rated value maximum permissible	30 V
control supply voltage 1 at DC	15 ... 24 V
control supply voltage at DC	
• initial value for signal <1> detection	15 V
• full-scale value for signal<0> recognition	5 V
control current at minimum control supply voltage	
• at DC	13 mA
control current at DC rated value	15 mA
ON-delay time	1 ms; additionally max. one half-wave
OFF-delay time	1 ms; additionally max. one half-wave
Installation/ mounting/ dimensions	
fastening method side-by-side mounting	Yes
fastening method	screw fixing
design of the thread of the screw for securing the equipment	M4
tightening torque of fixing screw maximum	1.5 N·m
tightening torque [lbf·in] of fixing screw maximum	13 lbf·in
height	85 mm
width	22.5 mm
depth	48 mm
Connections/ Terminals	
product component removable terminal for auxiliary and control circuit	Yes
type of electrical connection	
• for main current circuit	Ring cable lug connection
• for auxiliary and control circuit	ring terminal lug connection
type of connectable conductor cross-sections	
• for main contacts for JIS cable lug	JIS C 2805 R 2-5, 5,5-5, 8-5, 14-5
• for DIN cable lug for main contacts	DIN 46234-5-2,5, -5-6, -5-10, -5-16, -5-25
type of connectable conductor cross-sections	
• for auxiliary and control contacts	
— solid	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²)
— finely stranded with core end processing	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²)
— finely stranded without core end processing	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²)
• for AWG cables for auxiliary and control contacts	1x (20 ... 12)

tightening torque	
<ul style="list-style-type: none"> for main contacts with screw-type terminals for auxiliary and control contacts with screw-type terminals 	<p>2 ... 2.5 N·m</p> <p>0.5 ... 0.6 N·m</p>
tightening torque [lbf·in]	
<ul style="list-style-type: none"> for main contacts with screw-type terminals for auxiliary and control contacts with screw-type terminals 	<p>7 ... 10.3 lbf·in</p> <p>4.5 ... 5.3 lbf·in</p>
design of the thread of the connection screw	
<ul style="list-style-type: none"> for main contacts of the auxiliary and control contacts 	<p>M5</p> <p>M3</p>
stripped length of the cable	
<ul style="list-style-type: none"> for main contacts for auxiliary and control contacts 	<p>10 mm</p> <p>7 mm</p>

UL/CSA ratings

operational current according to UL 508 rated value	80 A
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Electrical Safety

touch protection on the front according to IEC 60529	finger-safe, for vertical contact from the front with cover
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Ambient conditions

installation altitude at height above sea level maximum	1 000 m
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ambient temperature

<ul style="list-style-type: none"> during operation during storage 	<p>-25 ... +60 °C</p> <p>-55 ... +80 °C</p>
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Electromagnetic compatibility

conducted interference

<ul style="list-style-type: none"> due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 due to high-frequency radiation according to IEC 61000-4-6 	<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>
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field-based interference according to IEC 61000-4-3	80 MHz ... 1 GHz 10 V/m, behavior criterion 1
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electrostatic discharge according to IEC 61000-4-2	4 kV contact discharging / 8 kV air discharging, behavior criterion 2
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conducted HF interference emissions according to CISPR11	Class A for industrial environment
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field-bound HF interference emission according to CISPR11	Class B for the domestic, business and commercial environments
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Short-circuit protection, design of the fuse link

<p>manufacturer's article number</p> <ul style="list-style-type: none"> of gS fuse for semiconductor protection at NH design usable of back-up R fuse link for semiconductor protection at NH design usable of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable 	<p>3NE1817-0</p> <p>3NE8021-1</p> <p>3NC2280: These fuses have a smaller rated current than the semiconductor relays</p>
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<p>manufacturer's article number of the gG fuse</p> <ul style="list-style-type: none"> at NH design usable at NH design usable note 	<p>3NA6812-6: These fuses have a smaller rated current than the semiconductor relays</p> <p>These fuses have a smaller rated current than the semiconductor relays</p>
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Approvals Certificates

Environment	General Product Approval
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[Environmental Confirmations](#)



EMV	Test Certificates	other
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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=3RF2190-3AA06>

Cax online generator

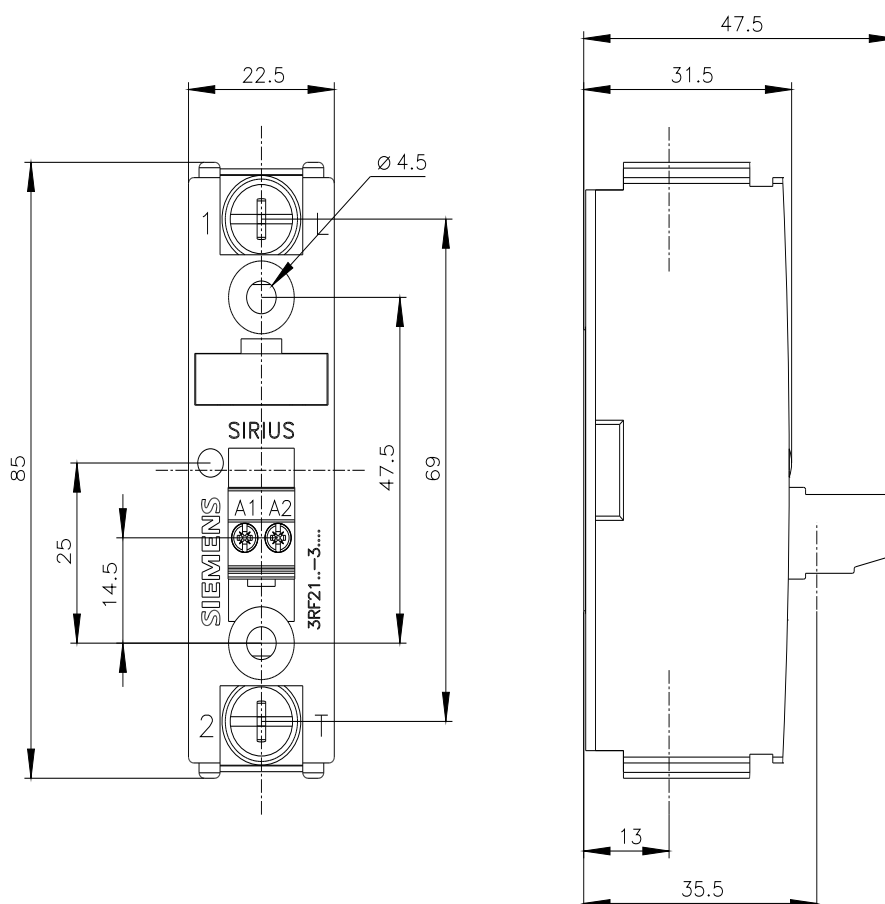
<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2190-3AA06>

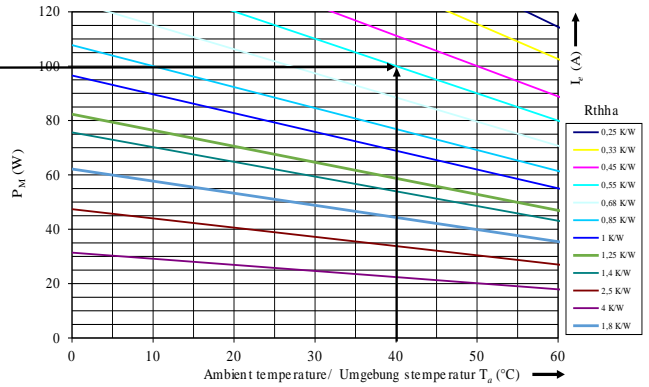
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2190-3AA06>

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

https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2190-3AA06&lang=en





last modified:

4/4/2026