



phase-out type semiconductor relay, 1-phase 3RF2 width 22.5 mm, 90 A 48-460 V / 24 V DC 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	3RF21
manufacturer's article number	<ul style="list-style-type: none"> • _1 of the accessories that can be ordered 3RF2900-3PA88 • _2 of the accessories that can be ordered 3RF2990-0HA16 • _3 of the accessories that can be ordered 3RF2900-0EA18 • _4 of the accessories that can be ordered 3RF2990-0GA16 • _5 of the accessories that can be ordered 3RF2920-0FA08
product designation	<ul style="list-style-type: none"> • _1 of the accessories that can be ordered terminal cover • _2 of the accessories that can be ordered power regulator • _3 of the accessories that can be ordered converter • _4 of the accessories that can be ordered load monitoring • _5 of the accessories that can be ordered load monitoring, basis
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 • at AC in hot operating state per pole 118 W • 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	IP20
protection class IP on the front according to IEC 60529	IP20
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	0.07 g
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 <ul style="list-style-type: none"> at 50 Hz rated value at 60 Hz rated value 	48 ... 460 V 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 <ul style="list-style-type: none"> at 50 Hz at 60 Hz 	40 ... 506 V 40 ... 506 V
operational current rated value maximum	88 A
operational current <ul style="list-style-type: none"> at AC-1 at 400 V rated value at AC-51 rated value according to UL 508 rated value 	90 A 50 A 50 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	1 200 V
reverse current of the thyristor	10 mA
derating temperature	40 °C
surge current resistance rated value	1 150 A
I ² t 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 <ul style="list-style-type: none"> initial value for signal <1> detection full-scale value for signal<0> recognition 	15 V 5 V
control current at minimum control supply voltage <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> for main current circuit for auxiliary and control circuit 	screw-type terminals screw-type terminals
type of connectable conductor cross-sections <ul style="list-style-type: none"> for main contacts <ul style="list-style-type: none"> solid finely stranded with core end processing for AWG cables for main contacts 	2x (1.5 ... 2.5 mm ²), 2x (2.5 ... 6 mm ²) 2x (1 ... 2.5 mm ²), 2x (2.5 ... 6 mm ²), 1x 10 mm ² 2x (14 ... 10)

connectable conductor cross-section for main contacts	
<ul style="list-style-type: none"> • solid or stranded • finely stranded with core end processing 	<p>1.5 ... 6 mm²</p> <p>1 ... 10 mm²</p>
type of connectable conductor cross-sections	
<ul style="list-style-type: none"> • for auxiliary and control contacts <ul style="list-style-type: none"> — solid — finely stranded with core end processing — finely stranded without core end processing • for AWG cables for auxiliary and control contacts 	<p>1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1 mm²)</p> <p>1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1 mm²)</p> <p>1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1 mm²)</p> <p>1x (20 ... 12)</p>
AWG number as coded connectable conductor cross section for main contacts	14 ... 10
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>M4</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	50 A
Electrical Safety	
touch protection on the front according to IEC 60529	finger-safe, for vertical contact from the front
Ambient conditions	
installation altitude at height above sea level maximum	1 000 m
ambient temperature	
<ul style="list-style-type: none"> • during operation • during storage 	<p>-25 ... +60 °C</p> <p>-55 ... +80 °C</p>
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>
field-based interference according to IEC 61000-4-3	80 MHz ... 1 GHz 10 V/m, behavior criterion 1
electrostatic discharge according to IEC 61000-4-2	4 kV contact discharging / 8 kV air discharging, behavior criterion 2
conducted HF interference emissions according to CISPR11	Class A for industrial environment
field-bound HF interference emission according to CISPR11	Class B for the domestic, business and commercial environments
Short-circuit protection, design of the fuse link	
<p>manufacturer's article number</p> <ul style="list-style-type: none"> • of full range R fuse link 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>3NE1021-2</p> <p>3NE8021-1</p> <p>3NC2280: These fuses have a smaller rated current than the semiconductor relays</p>
<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 • at cylindrical design 22 x 58 mm usable • at cylindrical design 22 x 58 mm usable note 	<p>3NA6812: 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> <p>3NW6212-1: 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>

manufacturer's article number








- of DIAZED fuse usable
- of DIAZED fuse usable note
- of NEOZED fuse usable

[5SB4111: These fuses have a smaller rated current than the semiconductor relays](#)

These fuses have a smaller rated current than the semiconductor relays

[5SE2335: These fuses have a smaller rated current than the semiconductor relays](#)

Approvals Certificates

Environment		General Product Approval			
Environmental Confirmations					
EMV	Test Certificates	other			
	Type Test Certificates/Test Report	Special Test Certificate	Confirmation	Miscellaneous	Confirmation
other	Railway				
	Special Test Certificate				

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=3RF2190-1AA04>

Cax online generator

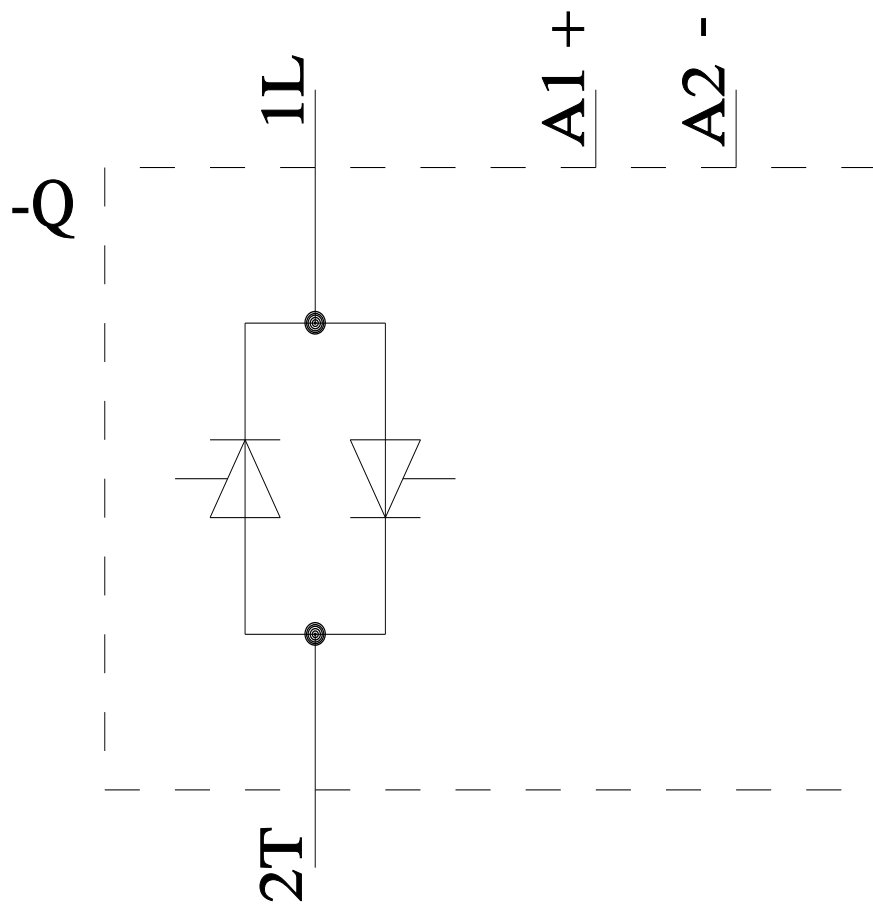
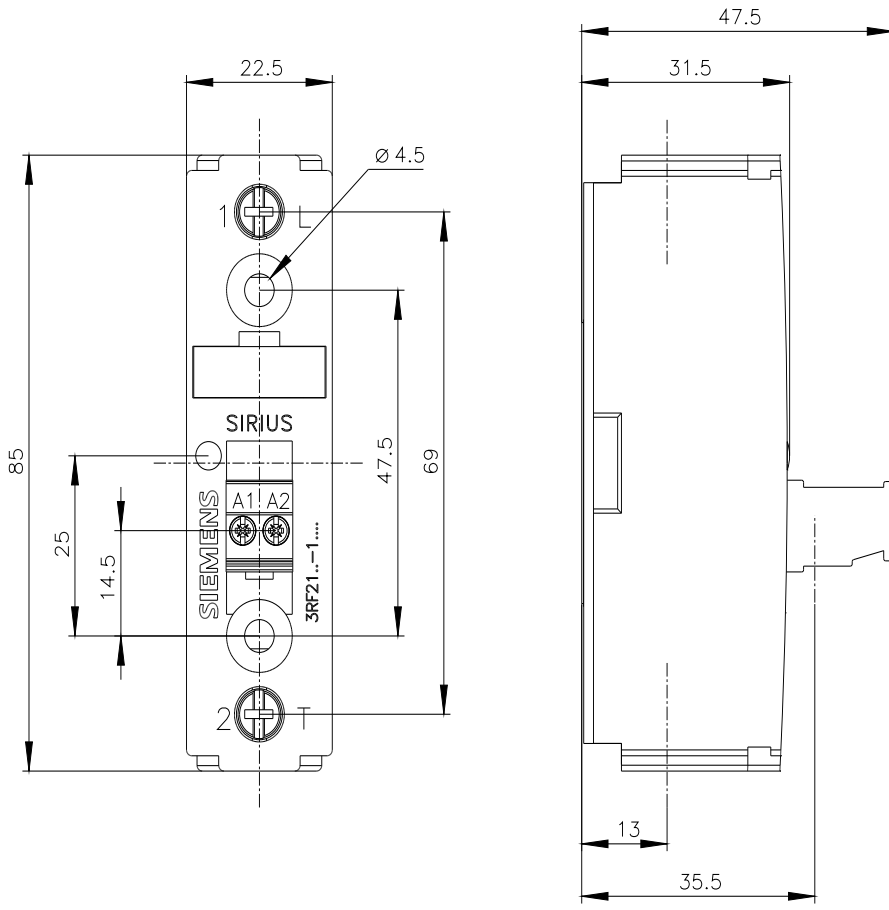
<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2190-1AA04>

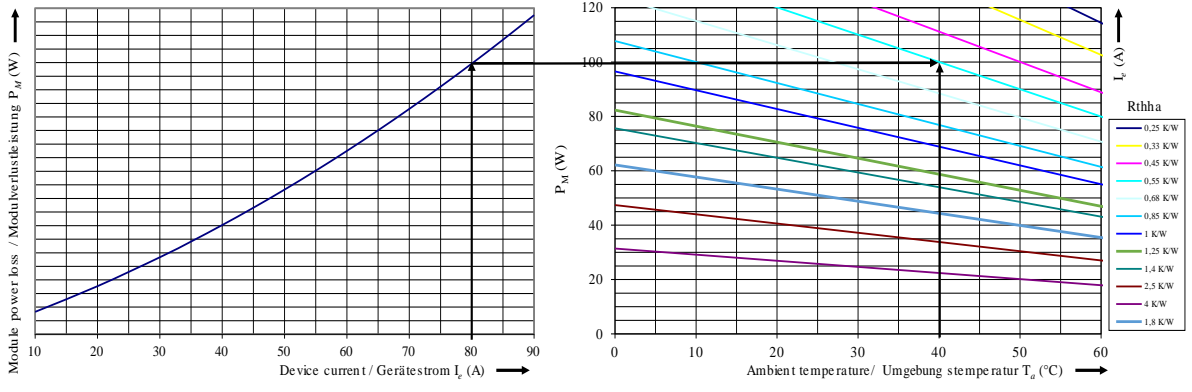
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2190-1AA04>

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

https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2190-1AA04&lang=en





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