

Siemens
EcoTech



semiconductor relay, 1-pole 3RF3 for use with heat sinks width 22.5 mm, 20 A 48-600 V / 24 V DC spring-loaded terminal

product brand name	SIRIUS
product designation	solid-state relay
product type designation	3RF31
manufacturer's article number	
• _1 of the accessories that can be ordered	3RF3900-0WA88
• _2 of the accessories that can be ordered	3RF3900-0EA18
product designation	
• _1 of the accessories that can be ordered	heat conducting foil
• _2 of the accessories that can be ordered	converter
General technical data	
product function	zero-point switching
product feature	high blocking voltage
power loss [V·A] maximum	19 VA
power loss [W] for rated value of the current	
• at AC in hot operating state	19 W
• at AC in hot operating state per pole	19 W
• without load current share typical	0.4 W
type of calculation of power loss current-dependent	linear
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)	01/15/2024
SVHC substance name	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	0.08 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	

• at AC — at 50 Hz rated value — at 60 Hz rated value	48 ... 600 V 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 • at 60 Hz	40 ... 660 V 40 ... 660 V
operational current rated value maximum	20 A
operational current • at AC-1 at 400 V rated value • at AC-51 rated value • at AC-51 according to IEC 60947-4-3 • according to UL 508 rated value	20 A 20 A 20 A 20 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/μs
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	1 300 A
I²t value maximum	8 000 A ² ·s
Control circuit/ Control	
type of voltage of the control supply voltage	DC
control supply voltage at DC	15 ... 24 V
control supply voltage 1 at DC rated value	24 V
control supply voltage at DC • initial value for signal <1> detection • full-scale value for signal<0> recognition	15 V 5 V
operating range factor control supply voltage rated value at DC • initial value • full-scale value	0.63 1
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 • for auxiliary and control circuit	spring-loaded terminals spring-loaded terminals
type of connectable conductor cross-sections • for main contacts — solid — finely stranded with core end processing	2x (0.5 ... 2.5 mm ²) 2x (0.5 ... 1.5 mm ²)

— finely stranded without core end processing	2x (0.5 ... 2.5 mm ²)
• for AWG cables for main contacts	2x (18 ... 14)
connectable conductor cross-section for main contacts	
• solid or stranded	0.5 ... 2.5 mm ²
• finely stranded with core end processing	0.5 ... 1.5 mm ²
• finely stranded without core end processing	0.5 ... 2.5 mm ²
type of connectable conductor cross-sections	
• for auxiliary and control contacts	
— solid	0.5 ... 1.5 mm ²
— finely stranded with core end processing	0.5 ... 2.5 mm ²
— finely stranded without core end processing	0.5 ... 2.5 mm ²
• for AWG cables for auxiliary and control contacts	1x (20 ... 12)
AWG number as coded connectable conductor cross section for main contacts	18 ... 14
stripped length of the cable	
• for main contacts	10 mm
• for auxiliary and control contacts	10 mm

UL/CSA ratings

operational current according to UL 508 rated value	20 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	
• during operation	-25 ... +60 °C
• during storage	-55 ... +80 °C

Electromagnetic compatibility

conducted interference	
• due to burst according to IEC 61000-4-4	2 kV / 5 kHz, behavior criterion 2
• due to conductor-earth surge according to IEC 61000-4-5	2 kV, behavior criterion 2
• due to conductor-conductor surge according to IEC 61000-4-5	1 kV, behavior criterion 2
• due to high-frequency radiation according to IEC 61000-4-6	140 dBuV in the frequency range 0.15 ... 80 MHz, behavior criterion 1
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

manufacturer's article number	
• of gS fuse for semiconductor protection at NH design usable	3NE1818-0: These fuses have a smaller rated current than the semiconductor relays
• of back-up R fuse link for semiconductor protection at NH design usable	3NE8021-1
• of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable	3NC2280: These fuses have a smaller rated current than the semiconductor relays
manufacturer's article number of the gG fuse	
• at NH design usable	3NA6812-6: These fuses have a smaller rated current than the semiconductor relays
• at NH design usable note	These fuses have a smaller rated current than the semiconductor relays

Approvals Certificates

Environment	General Product Approval
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[Environmental Conformations](#)



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EMV	Test Certificates	other
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[Type Test Certificates/Test Report](#)

[Confirmation](#)



[Confirmation](#)

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=3RF3190-2AA06>

Cax online generator

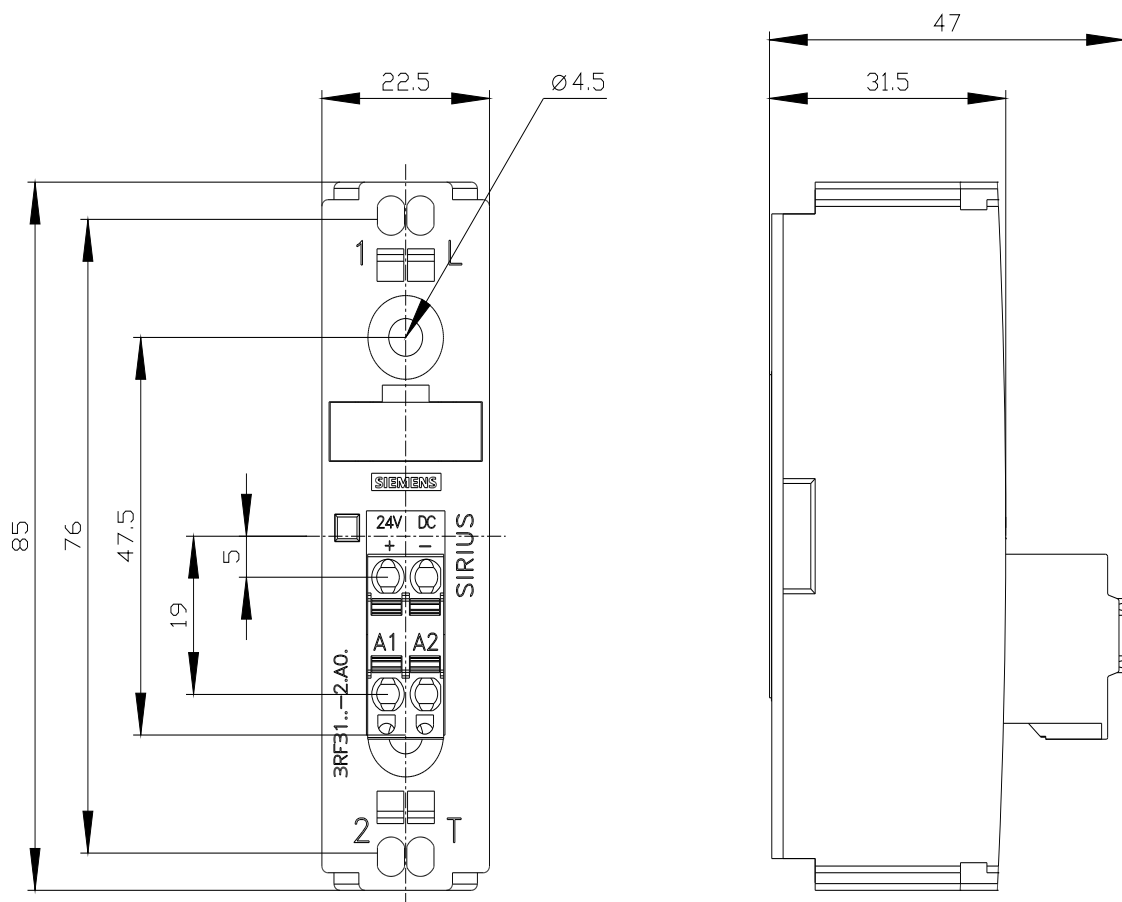
<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF3190-2AA06>

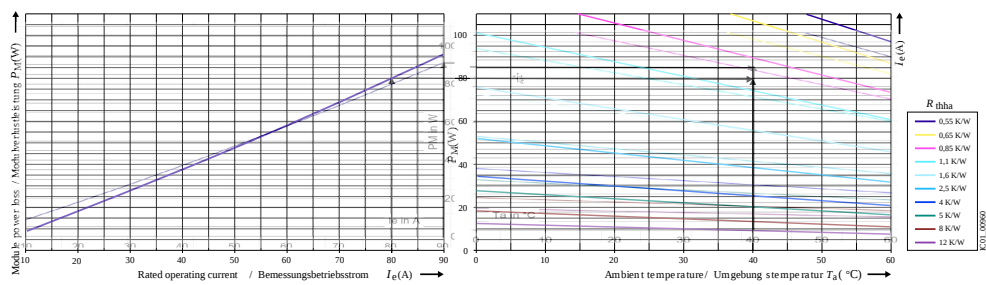
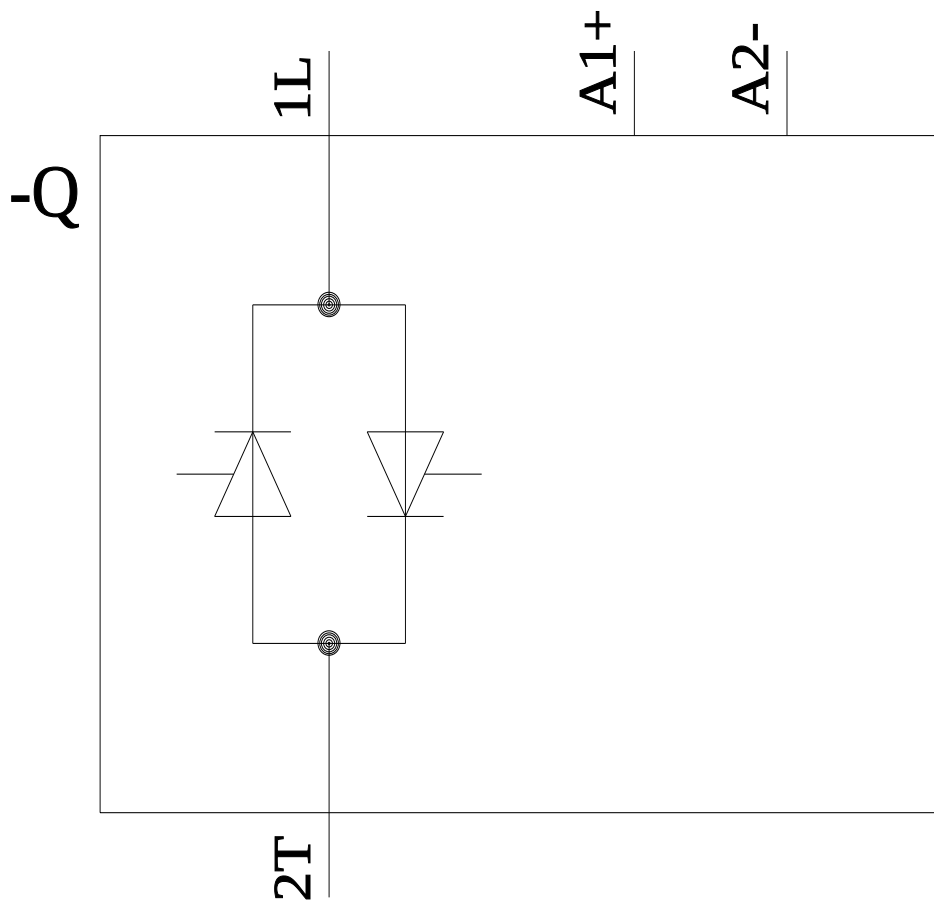
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF3190-2AA06>

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

https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF3190-2AA06&lang=en





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