



Semiconductor relay, 1-phase 3RF2 Overall width 22.5 mm, 90 A 24-230 V / 110-230 V AC screw terminal

product brand name

SIRIUS

product designation

solid-state relay

design of the product

single-phase

product type designation

3RF21

manufacturer's article number

- _1 of the accessories that can be ordered
- _2 of the accessories that can be ordered
- _4 of the accessories that can be ordered

[3RF2900-3PA88](#)

[3RF2990-0HA33](#)

[3RF2990-0GA33](#)

product designation

- _1 of the accessories that can be ordered
- _2 of the accessories that can be ordered
- _4 of the accessories that can be ordered

terminal cover
power regulator
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

- at AC in hot operating state
- at AC in hot operating state per pole
- without load current share typical

118 W

118 W

3.5 W

insulation voltage rated value

600 V

type of voltage of the control supply voltage

AC

surge voltage resistance of main circuit rated value

6 kV

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

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Substance Prohibitance (Date)

05/28/2009

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

operating voltage at AC

- at 50 Hz rated value
- at 60 Hz rated value

24 ... 230 V

24 ... 230 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

20 ... 253 V

20 ... 253 V

operational current

- at AC-51 rated value
- according to UL 508 rated value

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/μs
blocking voltage at the thyristor for main contacts maximum permissible	800 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	AC
control supply voltage 1 at AC	
• at 50 Hz	110 ... 230 V
• at 60 Hz	110 ... 230 V
control supply voltage frequency	
• 1 rated value	50 Hz
• 2 rated value	60 Hz
control supply voltage at AC	
• at 50 Hz full-scale value for signal<0> recognition	40 V
• at 60 Hz full-scale value for signal<0> recognition	40 V
control supply voltage	
• at AC initial value for signal <1> detection	90 V
symmetrical line frequency tolerance	5 Hz
control current at minimum control supply voltage	
• at AC	2 mA
control current at AC rated value	15 mA
ON-delay time	40 ms; additionally max. one half-wave
OFF-delay time	40 ms; additionally max. one half-wave
Auxiliary circuit	
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	
fastening method	screw fixing
• side-by-side mounting	Yes
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	
type of electrical connection	
• for main current circuit	screw-type terminals
• for auxiliary and control circuit	screw-type terminals
type of connectable conductor cross-sections	
• for main contacts	
— solid	2x (1.5 ... 2.5 mm ²), 2x (2.5 ... 6 mm ²)
— finely stranded with core end processing	2x (1 ... 2.5 mm ²), 2x (2.5 ... 6 mm ²), 1x 10 mm ²
• at AWG cables for main contacts	2x (14 ... 10)
connectable conductor cross-section for main contacts	
• solid or stranded	1.5 ... 6 mm ²
• finely stranded with core end processing	1 ... 10 mm ²
type of connectable conductor cross-sections	
• for auxiliary and control contacts	
— solid	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1.0 mm ²)
— finely stranded with core end processing	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1.0 mm ²)
— finely stranded without core end processing	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1.0 mm ²)
• at AWG cables for auxiliary and control contacts	1x (AWG 20 ... 12)
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 	2 ... 2.5 N·m 0.5 ... 0.6 N·m
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 	7 ... 10.3 lbf·in 4.5 ... 5.3 lbf·in
design of the thread of the connection screw	
<ul style="list-style-type: none"> for main contacts of the auxiliary and control contacts 	M4 M3
stripped length of the cable	
<ul style="list-style-type: none"> for main contacts for auxiliary and control contacts 	7 mm 7 mm
Safety related data	
protection class IP on the front according to IEC 60529	IP20
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 	-25 ... +60 °C -55 ... +80 °C
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 	2 kV / 5 kHz behavior criterion 2 2 kV behavior criterion 2 1 kV behavior criterion 2 140 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	
<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 	3NE1021-2 3NE8021-1 3NC2200
manufacturer's article number of the gG fuse	
<ul style="list-style-type: none"> at NH design usable at cylindrical design 22 x 58 mm usable 	3NA6817 ; These fuses have a smaller rated current than the semiconductor relays 3NW6217-1 ; These fuses have a smaller rated current than the semiconductor relays
manufacturer's article number	
<ul style="list-style-type: none"> of DIAZED fuse usable of NEOZED fuse usable 	5SB4111 ; These fuses have a smaller rated current than the semiconductor relays 5SE2335 ; These fuses have a smaller rated current than the semiconductor relays
Certificates/ approvals	
General Product Approval	EMC
	Declaration of Conformity



[Confirmation](#)



Declaration of Conformity	Test Certificates	other	Railway
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[Type Test Certificates/Test Report](#)

[Special Test Certificate](#)

[Confirmation](#)



[Vibration and Shock](#)

Further information

Information on the packaging

<https://support.industry.siemens.com/cs/ww/en/view/109813875>

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=3RF2190-1AA22>

Cax online generator

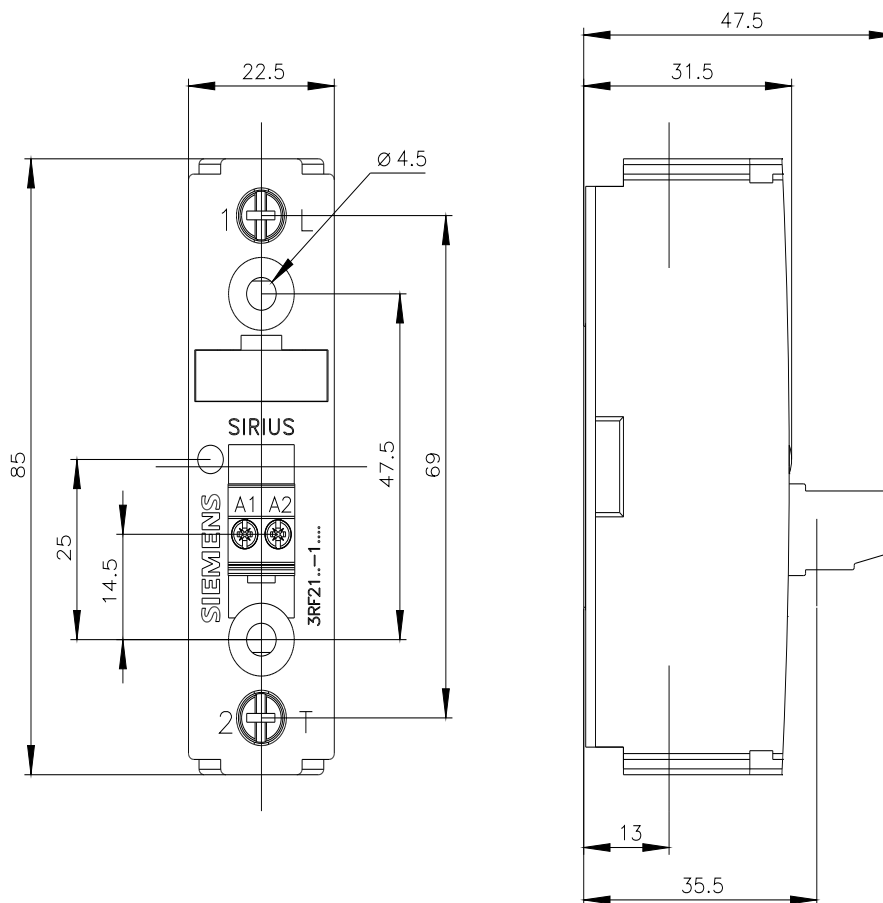
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2190-1AA22>

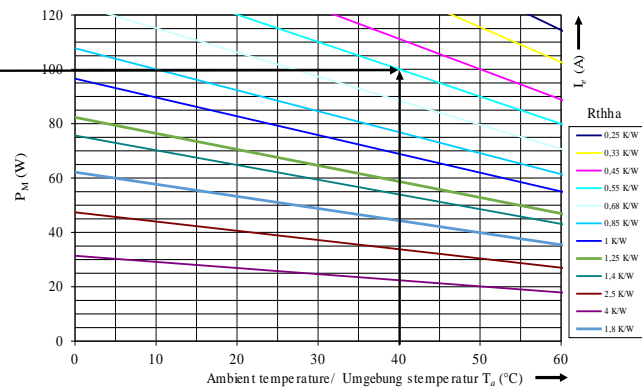
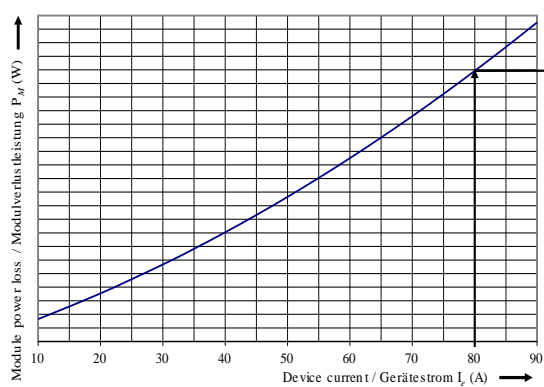
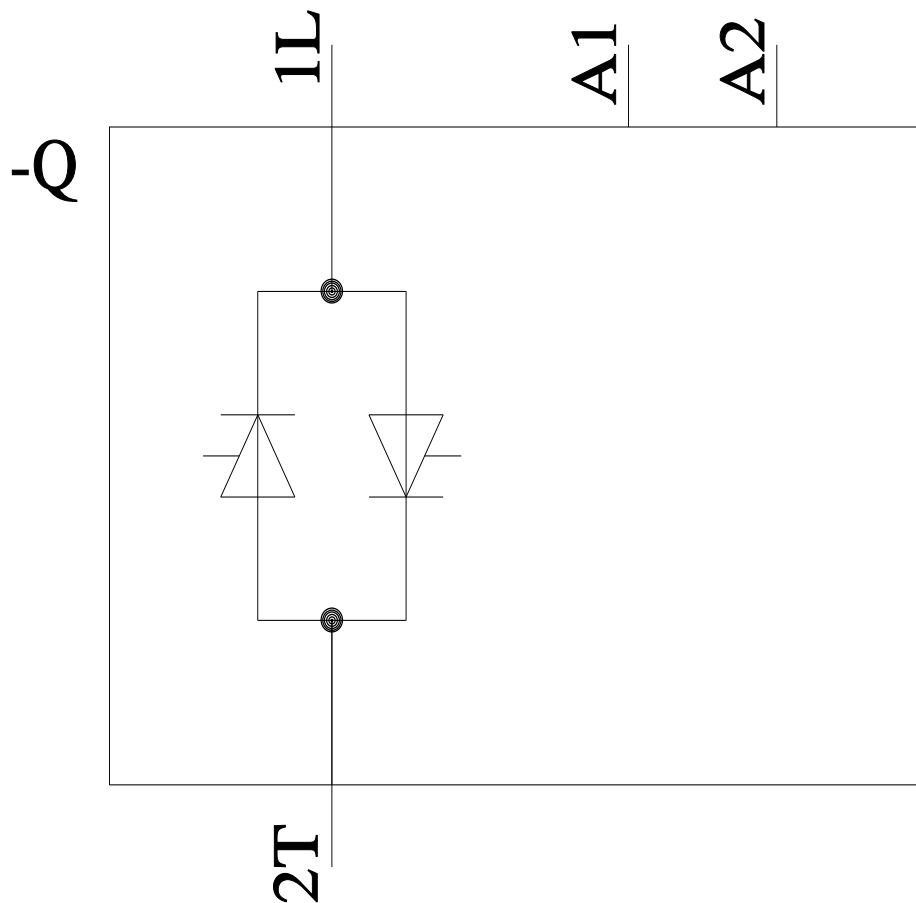
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3RF2190-1AA22>

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

http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RF2190-1AA22&lang=en





last modified:

1/12/2022