



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

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	3RF2900-3PA88
• _4 of the accessories that can be ordered	3RF2990-0GA33
product designation	
• _1 of the accessories that can be ordered	terminal cover
• _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	
• at AC in hot operating state	118 W
• at AC in hot operating state per pole	118 W
• without load current share typical	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	Q
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	24 ... 230 V
• at 60 Hz rated value	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	20 ... 253 V
• at 60 Hz	20 ... 253 V
operational current	
• 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/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	Ring cable lug connection ring terminal lug connection
• for main current circuit	
• for auxiliary and control circuit	
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 ... 1.0 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)
tightening torque	
• for main contacts with screw-type terminals	2 ... 2.5 N·m
• for auxiliary and control contacts with screw-type terminals	0.5 ... 0.6 N·m
tightening torque [lbf·in]	
• for main contacts with screw-type terminals	7 ... 10.3 lbf·in
• for auxiliary and control contacts with screw-type terminals	4.5 ... 5.3 lbf·in
design of the thread of the connection screw	
• for main contacts	M5

<ul style="list-style-type: none">• of the auxiliary and control contacts stripped length of the cable <ul style="list-style-type: none">• for main contacts• for auxiliary and control contacts	M3 7 mm 7 mm						
Safety related data							
protection class IP on the front according to IEC 60529	IP00; IP20 with cover						
touch protection on the front according to IEC 60529	finger-safe, for vertical contact from the front with cover						
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 field-based interference according to IEC 61000-4-3 electrostatic discharge according to IEC 61000-4-2 conducted HF interference emissions according to CISPR11 field-bound HF interference emission according to CISPR11	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 80 MHz ... 1 GHz 10 V/m, behavior criterion 1 4 kV contact discharging / 8 kV air discharging, behavior criterion 2 Class A for industrial environment 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 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 manufacturer's article number <ul style="list-style-type: none">• of DIAZED fuse usable• of NEOZED fuse usable	3NE1021-2 3NE8021-1 3NC2200 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 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							
<table><tr><td>General Product Approval</td><td>EMC</td><td>Declaration of Conformity</td></tr><tr><td> Confirmation</td><td>   </td><td></td></tr></table>		General Product Approval	EMC	Declaration of Conformity	 Confirmation	   	
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<table><tr><td>Declaration of Conformity</td><td>Test Certificates</td><td>other</td></tr><tr><td> EG-Konf.</td><td>Type Test Certificates/Test Report</td><td>Confirmation  VDE</td></tr></table>		Declaration of Conformity	Test Certificates	other	 EG-Konf.	Type Test Certificates/Test Report	Confirmation  VDE
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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=3RF2190-3AA22>

Cax online generator

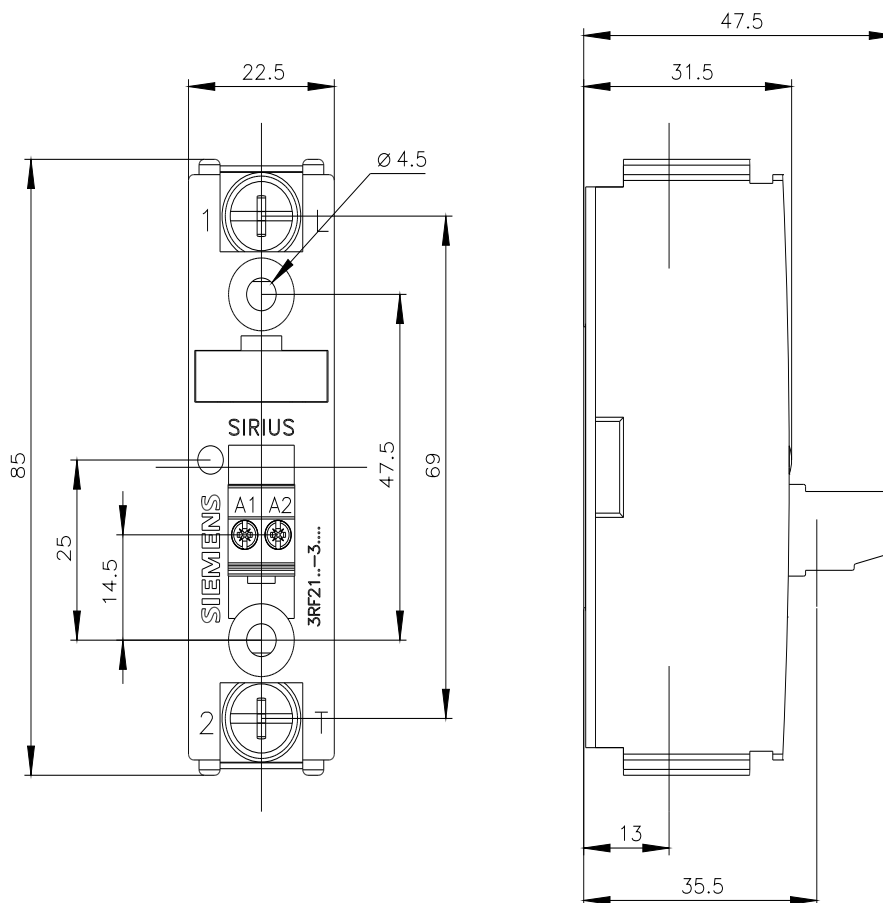
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RF2190-3AA22>

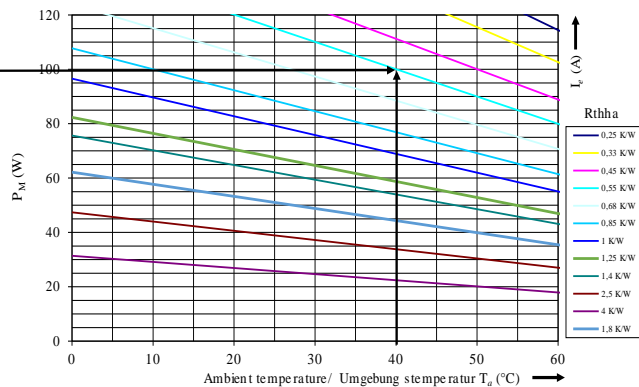
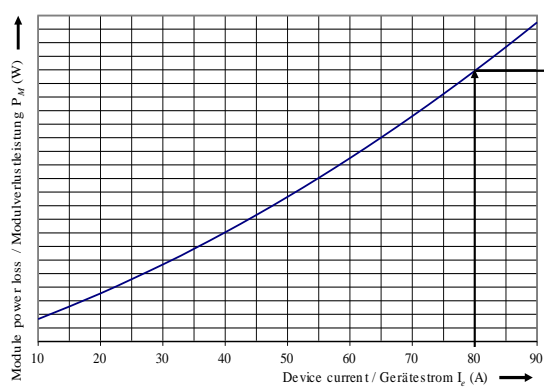
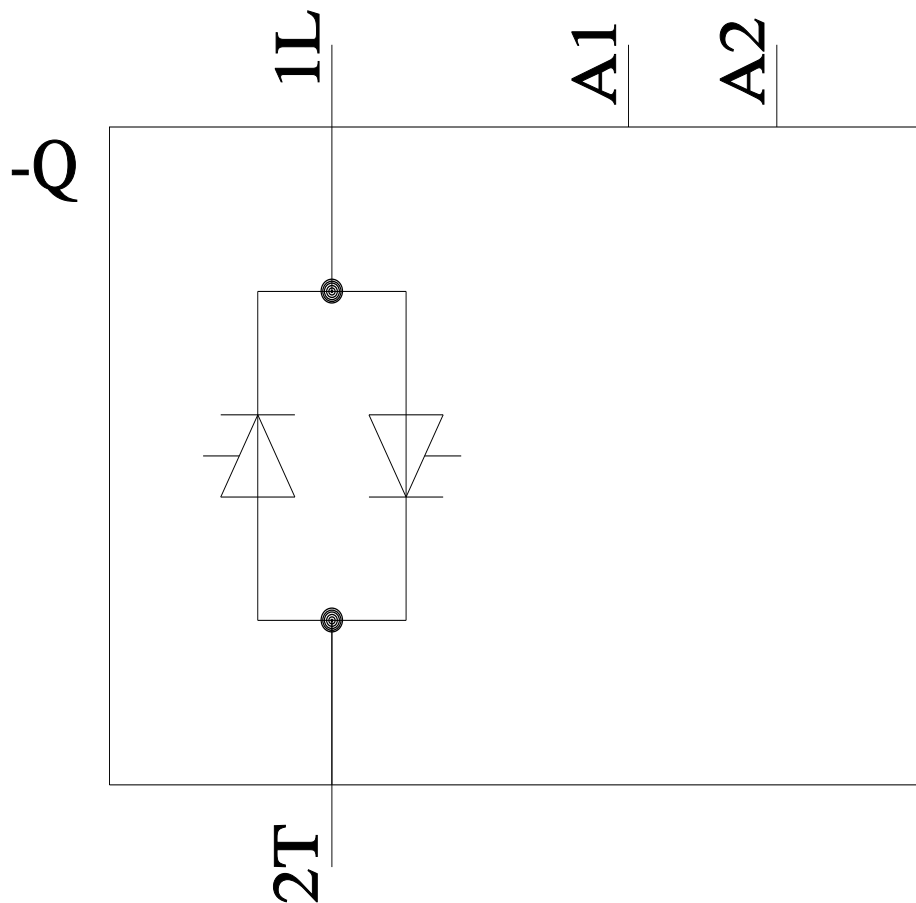
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

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

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

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





last modified:

1/27/2022