



semiconductor relay, 1-pole 3RF3 width 22.5 mm, 25 A 48-460 V 110-230 V AC spring-loaded terminal

product brand name	SIRIUS
product designation	solid-state relay
product type designation	3RF31
manufacturer's article number	
<ul style="list-style-type: none"> _1 of the accessories that can be ordered 	3RF3900-0WA88
product designation	
<ul style="list-style-type: none"> _1 of the accessories that can be ordered 	heat conducting foil
General technical data	
product function	zero-point switching
power loss [W] for rated value of the current	
<ul style="list-style-type: none"> at AC in hot operating state 	19 W
<ul style="list-style-type: none"> at AC in hot operating state per pole 	19 W
<ul style="list-style-type: none"> without load current share typical 	3.5 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	15g / 11 ms
vibration resistance according to IEC 60068-2-6	2g
reference code according to IEC 81346-2	Q
Substance Prohibitance (Date)	01/15/2024
SVHC substance name	Lead - 7439-92-1 Lead monoxide (lead oxide) - 1317-36-8
Net Weight	0.063 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 <ul style="list-style-type: none"> at 50 Hz rated value 	48 ... 460 V
<ul style="list-style-type: none"> at AC <ul style="list-style-type: none"> at 60 Hz rated value 	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 	40 ... 506 V
<ul style="list-style-type: none"> at 60 Hz 	40 ... 506 V
operational current rated value maximum	20 A

operational current	
<ul style="list-style-type: none"> • 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 	<p>20 A</p> <p>20 A</p> <p>20 A</p> <p>20 A</p>
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	1 200 V
reverse current of the thyristor	10 mA
derating temperature	40 °C
surge current resistance rated value	260 A
I²t value maximum	360 A ² ·s
Control circuit/ Control	
type of voltage of the control supply voltage	AC
control supply voltage at AC	
<ul style="list-style-type: none"> • at 50 Hz • at 60 Hz 	<p>110 ... 230 V</p> <p>110 ... 230 V</p>
control supply voltage 1 at AC	
<ul style="list-style-type: none"> • at 50 Hz • at 60 Hz 	<p>110 ... 230 V</p> <p>110 ... 230 V</p>
control supply voltage frequency	
<ul style="list-style-type: none"> • 1 rated value • 2 rated value 	<p>50 Hz</p> <p>60 Hz</p>
control supply voltage at AC	
<ul style="list-style-type: none"> • at 50 Hz full-scale value for signal<0> recognition • at 60 Hz full-scale value for signal<0> recognition 	<p>40 V</p> <p>40 V</p>
control supply voltage	
<ul style="list-style-type: none"> • at AC initial value for signal <1> detection 	90 V
symmetrical line frequency tolerance	5 Hz
operating range factor control supply voltage rated value at AC at 50 Hz	
<ul style="list-style-type: none"> • initial value 	0.82
operating range factor control supply voltage rated value at AC at 60 Hz	
<ul style="list-style-type: none"> • initial value 	0.82
control current at minimum control supply voltage	
<ul style="list-style-type: none"> • 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 CO contacts for auxiliary contacts	0
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 	<p>spring-loaded terminals</p> <p>spring-loaded terminals</p>
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 — finely stranded without core end processing • for AWG cables for main contacts 	<p>2x (0.5 ... 2.5 mm²)</p> <p>2x (0.5 ... 1.5 mm²)</p> <p>2x (0.5 ... 2.5 mm²)</p> <p>2x (18 ... 14)</p>
connectable conductor cross-section for main contacts <ul style="list-style-type: none"> • solid or stranded • finely stranded with core end processing • finely stranded without core end processing 	<p>0.5 ... 2.5 mm²</p> <p>0.5 ... 1.5 mm²</p> <p>0.5 ... 2.5 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>0.5 ... 1.5 mm²</p> <p>0.5 ... 2.5 mm²</p> <p>0.5 ... 2.5 mm²</p> <p>1x (20 ... 12)</p>
AWG number as coded connectable conductor cross section for main contacts	<p>18 ... 14</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>10 mm</p>
Electrical Safety	
protection class IP on the front according to IEC 60529	<p>IP20</p>
touch protection on the front according to IEC 60529	<p>finger-safe, for vertical contact from the front</p>
Ambient conditions	
installation altitude at height above sea level maximum	<p>1 000 m</p>
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	<p>80 MHz ... 1 GHz 10 V/m, behavior criterion 1</p>
electrostatic discharge according to IEC 61000-4-2	<p>4 kV contact discharging / 8 kV air discharging, behavior criterion 2</p>
conducted HF interference emissions according to CISPR11	<p>Class A for industrial environment</p>
field-bound HF interference emission according to CISPR11	<p>Class B for the domestic, business and commercial environments</p>
Short-circuit protection, design of the fuse link	
manufacturer's article number <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 10 x 38 mm usable • of back-up R fuse link for semiconductor protection at cylindrical design 14 x 51 mm usable • of back-up R fuse link for semiconductor protection at cylindrical design 22 x 58 mm usable 	<p>3NE1814-0: These fuses have a smaller rated current than the semiconductor relays</p> <p>3NE8015-1</p> <p>3NC1020: These fuses have a smaller rated current than the semiconductor relays</p> <p>3NC1430</p> <p>3NC2225</p>
manufacturer's article number of the gG fuse <ul style="list-style-type: none"> • at NH design usable • at cylindrical design 10 x 38 mm usable • at cylindrical design 14 x 51 mm usable • at cylindrical design 22 x 58 mm usable 	<p>3NA6803: These fuses have a smaller rated current than the semiconductor relays</p> <p>3NW6008-1: These fuses have a smaller rated current than the semiconductor relays</p> <p>3NW6101-1: These fuses have a smaller rated current than the semiconductor relays</p> <p>3NW6208-1: These fuses have a smaller rated current than the semiconductor relays</p>
manufacturer's article number	

• of DIAZED fuse usable

[5SB251: These fuses have a smaller rated current than the semiconductor relays](#)

last modified:

12/7/2025 