

# Solid State Relays, 2-phase controlled

## Zero-point switching, without heatsink



### Main Characteristics:

- 2-phase control
- Space-saving, width of only 45 mm
- LED display
- Various connection technologies
- Plug-in control terminal
- Degree of protection IP 20

### Standards / Approvals:

- DIN EN 60947-4-3
- UL 508 / CSA<sup>1</sup>
- CE / C-Tick

### Ordering Key:

<b>3RF22</b>	<b>30</b>	<b>- 1</b>	<b>A</b>	<b>B</b>	<b>4</b>	<b>5</b>
Solid state relay without heat sink	Max. load current 30 = 30 A 55 = 55 A	Connection technology 1 = Screw connection 2 = Spring-loaded 3 = Ring cable connection M5	Switching function A = Zero-point switching	Controlled phases B = 2-phase	Control voltage 4 = 4 - 30 VDC	Operating voltage 5 = 48 - 600 V

Not all possible versions are available ex stock.

### Main Circuit<sup>2</sup>:

Type	I <sub>max</sub>		I <sub>e</sub> IEC 947-4-3		I <sub>e</sub> UL/CSA		Power loss With I <sub>max</sub> W	Min. load current A	Max. leakage current mA
	A	With R <sub>thha</sub> / 40 °C	A	With R <sub>thha</sub> / 40 °C	A	With R <sub>thha</sub> / 50 °C			
3RF2230-. .	30	0,57 K/W	30	0,57 K/W	30	0,44 K/W	81	0,5	10
3RF2230-2. .			20	1,36 K/W	20	1,15 K/W			
3RF2255-. .	55	0,18 K/W	55	0,18 K/W	55	0,12 K/W	151		
3RF2255-2. .			20	1,83 K/W	20	1,58 K/W			

Type		3RF22...AB.5
Rated operating voltage U <sub>e</sub>	V	48 ... 600
	V	40 ... 660
	Hz	50/60 ± 10 %
Rated insulation voltage U <sub>i</sub>	V	600
Rated impulse withstand voltage U <sub>imp</sub>	kV	6
Blocking voltage	V	1200
Slew rate	V/µs	1000

Type	Rated impulse withstand strength I <sub>tsm</sub>	I <sup>2</sup> t value
A		A <sup>2</sup> s
3RF2230-. .	300	450
3RF2255-. .	600	1800

### Control Circuit A1-A2:

Type		3RF22...AB.4.	
Control voltage U <sub>s</sub>	V	DC 4 ... 30	
Max. control voltage U <sub>s</sub>	V	30	
Typical operating current	mA	30	
Response voltage	V	4	
Drop-out voltage	V	1	
Switching times	ON delay	ms	1 + max. one half-wave
	OFF delay	ms	1 + max. one half-wave

<sup>1</sup> Use overvoltage protection device; max cut-off-voltage 6.000 V; min energy handling capability 100 J

<sup>2</sup> The current I<sub>max</sub> provides information about the performance of the solid-state relays. The actual permitted rated operating current I<sub>e</sub> can be smaller depending on the connection method and cooling conditions. The spring-loaded terminals version can be used for a rated current of up to approx. 20 A with one conductor and up to approx. 40 A with two conductor on each terminal.

General Data:		
<b>Ambient temperature</b>		
During operation, derating as of 40 °C	°C	-25 ... 60
During storage	°C	-55 ... 80
<b>Mounting altitude</b>	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
<b>Impact resistance</b> acc. to DIN IEC 68	g/ms	15/11
<b>Vibration resistance</b>	g	2
<b>Degree of protection</b>		IP20
<b>Electromagnetic compatibility</b>		
Interference emission		
○ Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications <sup>3</sup>
○ Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
○ Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
○ Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dBµV; performance criterion 1
○ Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
○ Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2
<b>Dielectric Strength</b> 50/60 Hz (Input, Output / Base)	V rms	4000

Type		3RF22...-1.	3RF22...-2.	3RF22...-3.
Connection, main contacts		Screw connection	Spring-loaded connection	Ring cable connection
Conductor cross-section				
○ Solid	mm <sup>2</sup>	2 x (1,5 ... 2,5), 2 x (2,5 ... 6)	2x (0,5 ... 2,5)	
○ Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1,5 ... 2,5), 2 x (2,5 ... 6), 1 x 10	2x (0,5 ... 1,5)	
○ Finely stranded w/o end sleeve	mm <sup>2</sup>		2x (0,5 ... 2,5)	
○ Solid or stranded	AWG	2 x (14 ... 10)	2 x (18 ... 14)	
Stripping length	mm	10	10	
Terminal screw		M 4	-	M 5
○ Tightening torque	Nm	2 ... 2,5	-	2 ... 2,5
D 5...6 mm / PZ 2	lb.in	18 ... 22	-	18 ... 22
Cable lug		-	-	DIN 46234 5-2,5 ... 5-25
DIN		-	-	JIS C 2805 R 2-5 ... 14-5
JIS		-	-	
<b>Connection, auxiliary/control contacts</b>				
Conductor cross-section with or without end sleeve	mm <sup>2</sup>	1 x (0,5 ... 2,5)	0,5 ... 2,5	1 x (0,5 ... 2,5)
	mm <sup>2</sup>	2 x (0,5 ... 1,0)		2 x (0,5 ... 1,0)
	AWG	20 ... 12	20 ... 12	20 ... 12
Stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
○ Tightening torque	Nm	0,5 ... 0,6	-	0,5 ... 0,6
D 3.5 / PZ 1	lb.in	4,5 ... 5,3	-	4,5 ... 5,3

### <sup>3</sup> Attention!

This product was constructed as an EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

### Fused Design with Semiconductor Protection:

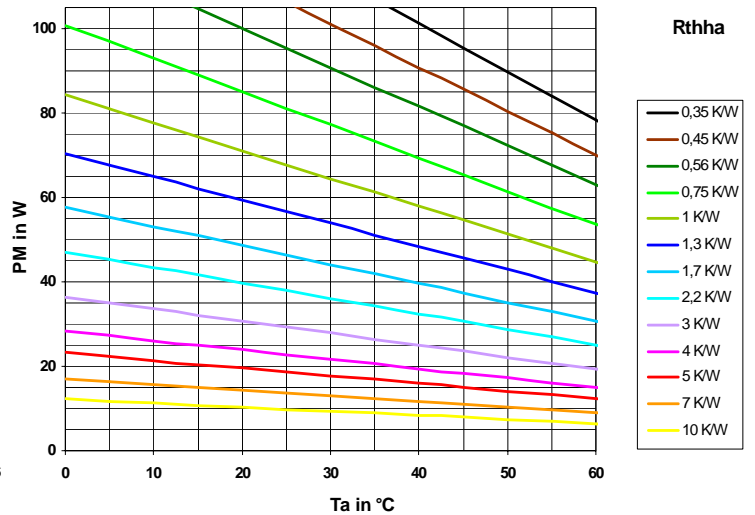
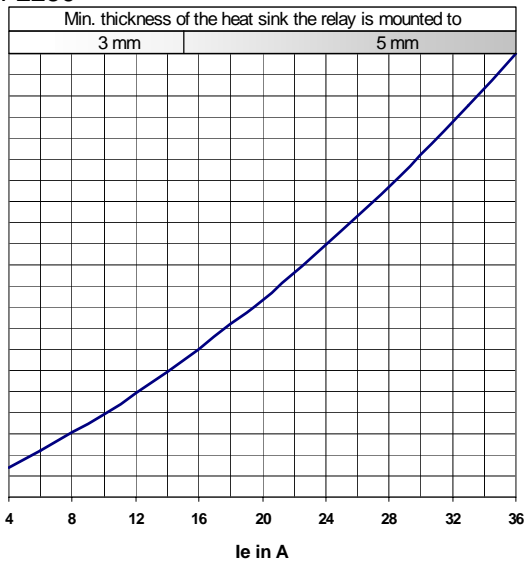
Type	Full-range fuse LV HBC design gR/SITOR	Semiconductor protection fuse, cylindrical design		
		10 x 38 mm aR / SITOR	14 x 51 mm aR / SITOR	22 x 58 mm aR / SITOR
3RF2230- .... up to 506 V	3NE1814-0	3NC1032	3NC1430	3NC2232
3RF2230- .... up to 660 V		3NC1025		
3RF2255- .... up to 506 V	3NE1802-0	-	3NC1450	3NC2263
3RF2255- .... up to 660 V	3NE1803-0	-		3NC2250

### Accessories:

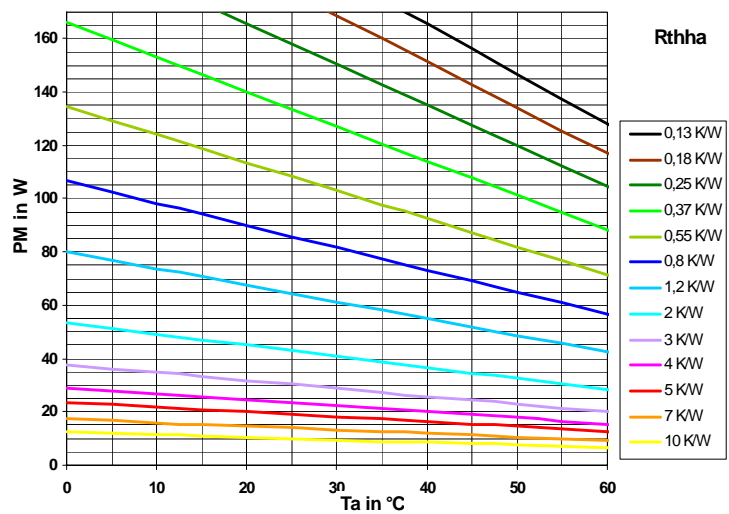
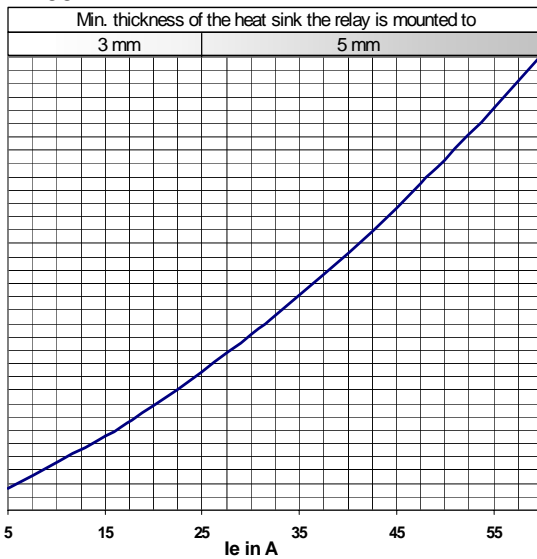
Function module	Order No.	Applicable for the following types	Versions
Converter	3RF2900-0EA18	3RF22...A B 4.	Us = AC/DC 24 V

### Characteristic Curves:

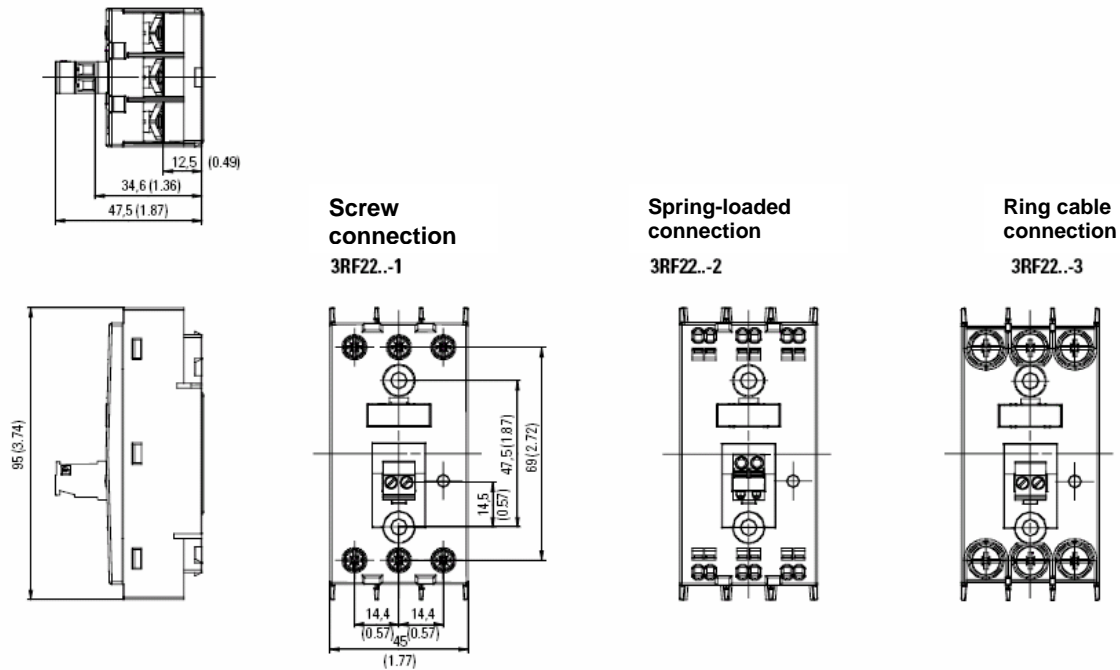
#### 3RF2230-



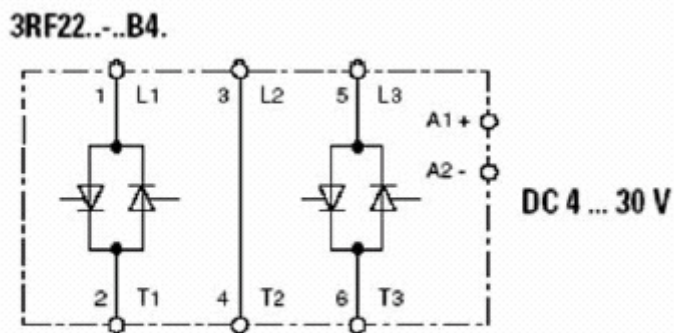
#### 3RF2255-



**Dimension Drawings<sup>4</sup>:**



**Device / Example Circuit Diagram:**



<sup>4</sup> Dimensions in mm (in)