3RF22 solid-state relays, 3-phase, 45 mm

Technical specifications

Type		3RF22 ..-1....	3RF22 ..-2....	3RF22 ..-3....
General data				
Ambient temperature				
• During operation, derating from 40 °C	°C	-25 ... + 60		
• During storage	°C	-55 ... + 80		
Installation altitude	m	0 ... 1000; > 1000 ask Technical Assistance		
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6	*g*	2		
Degree of protection		IP20		
Insulation strength at 50/60 Hz (main/control circuit to floor)	V rms	4000		
Electromagnetic compatibility (EMC)				
• Emitted interference				
- conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications[1]		
- emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class A for industrial applications		
• Interference immunity				
- electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2		
- induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
- burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1		
- surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2		
Connection type		**Screw terminals**	**Spring-loaded terminals**	**Ring terminal lug connection**
Connection, main contacts				
• Conductor cross-section				
- solid	mm^2	2 x (1.5 ... 2.5)[2], 2 x (2.5 ... 6)[2]	2 x (0.5 ... 2.5)	--
- finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[2], 2 x (2.5 ... 6)[2], 1 x 10	2 x (0.5 ... 1.5)	--
- finely stranded without end sleeve	mm^2	--	2 x (0.5 ... 2.5)	--
- solid or stranded, AWG cables		2 x (AWG 14 ... 10)	2 x (AWG 18 ... 14)	--
• Stripped length	mm	10	10	
• Terminal screw		M4	--	M5
- tightening torque, ∅ 5 ... 6 mm, PZ 2	Nm lb.in	2 ... 2.5 18 ... 22		2.5 ... 2 18 ... 22
• Cable lug		--	--	
- acc. to DIN 46234				5-2.5 ... 5-25
- acc. to JIS C 2805				R 2-5 ... 14-5
Connection, auxiliary/control contacts				
• Conductor cross-section, with or without end sleeve	mm AWG	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12	0.5 ... 2.5 20 ... 12	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12
• Stripped length	mm	7	10	7
• Terminal screw		M3	--	M3
- tightening torque, ∅ 3.5, PZ 1	Nm lb.in	0.5 ... 0.6 4.5 ... 5.3		0.5 ... 0.6 4.5 ... 5.3

[1] These products were built as Class A devices. The use of these devices in residential areas could result in lead in radio interference. In this case these may be required to introduce additional interference suppression measures.

[2] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

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Order No.	I_{max} [1] at R_{thha}/T_u = 40 °C		I_e acc. to IEC 60947-4-3 at R_{thha}/T_u = 40 °C		I_e acc. to UL/CSA at R_{thha}/T_u = 50 °C		Power loss at I_{max}	Minimum load current	Max. leakage current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF22 30-. AB..	30	0.57	30	0.57	30	0.44	81	0.5	10
3RF22 55-1AB.. **3RF22 55-2AB..** **3RF22 55-3AB..**	55	0.18	50 20 50	0.27 1.83 0.27	50 20 50	0.19 1.58 0.19	151	0.5	10
3RF22 30-. AC..	30	0.33	30	0.33	30	0.25	122	0.5	10
3RF22 55-1AC.. **3RF22 55-2AC..** **3RF22 55-3AC..**	55	0.09	50 20 50	0.15 1.19 0.15	50 20 50	0.1 1.02 0.1	226	0.5	10

[1] I_{max} provides information about the performance of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Note: The required heat sinks for the corresponding load currents can be determined from the characteristic curves, page 4/20. The minimum thickness values for the mounting surface must be observed.

Order No.	Rated impulse withstand capacity I_{tsm}	I^2t value
	A	A^2s
Main circuit		
3RF22 30-....5	300	450
3RF22 55-....5	600	1800

Type		3RF22 ..-.AB.5	3RF22 ..-.AC.5
Main circuit			
Controlled phases		2-phase	3-phase
Rated operational voltage U_e	V	48 ... 600	48 ... 600
• Operating range	V	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1200
Rage of voltage rise	V/µs	1000	1000

Type		3RF22 ..-.A.3.	3RF22 ..-.A.4.
Control circuit			
Method of operation		AC operation	DC operation
Rated control supply voltage U_s	V	110	4 ... 30
Rated frequency of the control supply voltage		50/60 ± 10 %	--
Control supply voltage, max.	V	121	30
Typical actuating current	mA	15	30
Response voltage	V	90	4
Drop-out voltage	V	< 40	1
Operating times			
• ON-delay	ms	40 + max. one half-wave	1 + max. one half-wave
• OFF-delay	ms	40 + max. one half-wave	1 + max. one half-wave

Fused version with semiconductor protection (similar to type of coordination "2")[1)]

The semiconductor protection for the 3RF22 controls can be used with different protective devices. Siemens recommends the use of special SITOR semiconductor fuses. The table below lists the maximum permissible fuses for each 3RF22 control.

If a fuse is used with a higher rated current than specified, semiconductor protection is no longer guaranteed. However, smaller fuses with a lower rated current for the load can be used without problems.

Order No.	All-range fuses		Semiconductor fuses / back-up fuses			
	LV HRC design	Cylindrical design	LV HRC design	Cylindrical design		
	gR/SITOR	gR/NEOZED[2)]	aR/SITOR	aR/SITOR	aR/SITOR	aR/SITOR
	SILIZED			10 mm x 38 mm	14 mm x 51 mm	22 mm x 58 mm
	3NE1	5SE1	3NE8	3NC1 0	3NC1 4	3NC2 2
Operational voltage U_e up to 460 V (+10%)						
3RF22 30-.....	3NE1 814-0[3)]	5SE1 325[3)]	3NE8 003-1	3NC1 032	3NC1 430	3NC2 232
3RF22 55-.....	3NE1 802-0[3)]	5SE1 350[3)]	3NE8 018-1	--	3NC1 450	3NC2 263
Operational voltage U_e up to 600 V (+10%)						
3RF22 30-.....	3NE1 814-0[3)]	--	3NE8 003-1	3NC1 025[3)]	3NC1 430	3NC2 232
3RF22 55-.....	3NE1 803-0[3)]	--	3NE8 018-1	--	3NC1 450[3)]	3NC2 250[3)]

Order No.	Cable and line protection fuses				
	LV HRC design[3)]	Cylindrical design[3)]			DIAZED[3)]
	gG	gG	gG	gG	Quick
		10 mm x 38 mm	14 mm x 51 mm	22 mm x 58 mm	
	3NA3	3NW6 0	3NW6 1	3NW6 2	5SB
Operational voltage U_e up to 460 V (+10%)					
3RF22 30-.....	3NA3 803-6	--	3NW6 101-1	3NW6 205-1	5SB1 71
3RF22 55-.....	3NA3 807-6	--	--	--	5SB3 11
Operational voltage U_e up to 600 V (+10%)					
3RF22 30-.....	3NA3 803-6	--	--	--	--
3RF22 55-.....	3NA3 805-6	--	--	--	--

Suitable fuse holders, fuse bases and controls can be found in Catalog LV 1, Chapter 19.

1) Type of coordination "2" according to EN 60947-4-1:
In the event of a short-circuit, the controls in the load feeder must not endanger persons or the installation. They must be suitable for further operation. For fused configurations, the protective device must be replaced.

2) For use only with operational voltage U_e up to 400 V.

3) These fuses have a smaller rated current than the solid-state relays.