Technical specifications

Type		3RF20 ..-1....	3RF20 ..-4....
General data			
Ambient temperature			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
Installation altitude	m	0 ... 1000; derating from 1000	
Shock resistance According to IEC 60068-2-27	*g*/ms	15 /11	
Vibration resistance According to IEC 60068-2-6	*g*	2	
Degree of protection		IP20	
Electromagnetic compatibility (EMC)			
• Emitted interference			
- Conducted interference voltage according to IEC 60947-4-3		Class A for industrial applications	
- Emitted, high-frequency interference voltage according to IEC 60947-4-3		Class A for industrial applications	
• Interference immunity			
- Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2	
- Induced RF fields according to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1	
- Burst according to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1	
- Surge according to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2	
Connection type		**Screw connections**	**Spring-loaded terminal connections**
Connection, main contacts			
• Conductor cross-section			
- Solid	mm^2	2 x (1.5 ... 2.5)[1], 2 x (2.5 ... 6)[1]	--
- Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], 1 x 10	--
- Solid or stranded, AWG conductors		2x (AWG 14 ... 10)	--
• Terminal screw		M4	--
• Tightening torque	NM lb. in	2 ... 2.5 7 ... 10.3	-- --
Connection, auxiliary/control contacts			
• Conductor cross-section	mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0), AWG 20 ... 12	0.5 ... 2.5, AWG 20 ... 12
• Stripped length	mm	7	10
• Terminal screw		M3	--
• Tightening torque	NM lb. in	0.5 ... 0.6 4.5 ... 5.3	-- --

[1] 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.

3RF20 solid-state relays, single-phase, 45 mm

Type	I_{max} [1] at R_{thha}/T_u = 40 °C		I_e according to IEC 60947-4-3 at R_{thha}/T_u = 40 °C		I_e according to UL/CSA at R_{thha}/T_u = 50 °C		Power loss at I_{max}	Minimum load current	Leakage current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF20 20-1.A..	20	2.0	20	1.7	20	1.3	28.6	0.1	10
3RF20 30-1.A..	30	1.1	30	0.79	30	0.56	44.2	0.5	10
3RF20 50-1.A..	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF20 70-1.A..	70	0.40	50	0.77	50	0.6	94	0.5	10
3RF20 90-1.A..	88	0.33	50	0.94	50	0.85	118	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 rate currents and Imax do not provide information about the full performance of the solid-state relay. The required heat sinks for the corresponding load currents can be determined from the characteristic curves, page 4/10. The minimum thickness values for the mounting surface must be observed.

Type	Rated impulse withstand capacity I_{tsm}	I^2t value
	A	A^2s
Main circuit		
3RF20 20-1.A..	200	200
3RF20 30-1.A.2	300	450
3RF20 30-1.A.4	300	450
3RF20 30-1.A.6	400	800
3RF20 50-1.A..	600	1800
3RF20 70-1.A.2	1200	7200
3RF20 70-1.A.4	1200	7200
3RF20 70-1.A.5	1200	7200
3RF20 70-1.A.6	1150	6600
3RF20 90-1.A..	1150	6600

Type		3RF20 .0-1.A.2	3RF20 .0-1.A.4	3RF20 .0-1.A.5	3RF20 .0-1.A.6
Main circuit					
Rated operational voltage U_e	V	24 ... 230	48 ... 460	48 ... 600	48 ... 600
• Operating range	V	20 ... 253	40 ... 506	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ±10 %			
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1200		1600
Rage of voltage rise	V/µs	1000			

Type		3RF20 .0-1.A0.	3RF20 .0-1.A2.	3RF20 .0-1.A4.
Control circuit				
Method of operation		DC operation	AC operation	DC operation
Rated control supply voltage U_S	V	24 according to EN 61131-2	110 … 230	4 … 30
Rated frequency of the control supply voltage	Hz	--	50/60 ±10 %	--
Rated control voltage U_c	V	30	253	30
Typical actuating current	mA	20	15	20
Response voltage	V	15	90	4
Drop-out voltage	V	5	40	1
Operating times				
• ON-delay	ms	1 + additional max. one half-wave[1]	40 + additional max. one half-wave[1]	1 + additional max. one half-wave[1]
• OFF-delay	ms	1 + additional max. one half-wave	40 + additional max. one half-wave	1 + additional max. one half-wave

[1] Only for zero-point-switching devices.

3RF20 solid-state relays, single-phase, 45 mm

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

The semiconductor protection for the SIRIUS controls can be used with different protective devices. This allows protection by means of LV HRC fuses of gG operational class or miniature circuit breakers. Siemens recommends the use of special SITOR semiconductor fuses. The table below lists the maximum permissible fuses for each SIRIUS 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.

For protective devices with gG operational class and for SITOR full range fuses 3NE1, the minimum cross-sections for the conductor to be connected must be taken into account.

Type	**All-range fuses**	**Semiconductor fuses**				**Cable and line protection fuses**				
		LV HRC design	Cylindrical design			LV HRC design	Cylindrical design			DIAZED
	LV HRC design gR/SITOR 3NE1	aR/SITOR 3NE8	10 x 38 mm aR/SITOR 3NC1 0	14 x 51 mm aR/SITOR 3NC1 4	22 x 58 mm aR/SITOR 3NC2 2	gG 3NA	10 x 38 mm gG 3NW	14 x 51 mm gG 3NW	22 x 58 mm gG 3NW	Quick 5SB
3RF20 20-1.A.2	3NE1 814-0	3NE8 015-1	3NC1 020	3NC1 420	3NC2 220	3NA2 803	3NW6 001-1	3NW6 101-1	--	5SB1 71
3RF20 20-1.A.4	3NE1 813-0	3NE8 015-1	3NC1 016	3NC1 420	3NC2 220	3NA2 801	--	3NW6 101-1	--	5SB1 41
3RF20 30-1.A.2	3NE1 815-0	3NE8 003-1	3NC1 032	3NC1 432	3NC2 232	3NA2 803	--	3NW6 103-1	--	5SB311
3RF20 30-1.A.4	3NE1 815-0	3NE8 003-1	3NC1 025[2)]	3NC1 432	3NC2 232	3NA2 803	--	3NW6 101-1	--	5SB1 71
3RF20 30-1.A.6	3NE1 815-0	3NE8 003-1	3NC1 032	3NC1 432	3NC2 232	3NA2 803-6	--	--	--	--
3RF20 50-1.A.2	3NE1 817-0	3NE8 017-1	--	3NC1 450	3NC2 250	3NA2 810	--	3NW6 107-1	3NW6 207-1	5SB3 21
3RF20 50-1.A.4	3NE1 802-0	3NE8 017-1	--	3NC1 450	3NC2 250	3NA2 807	--	--	3NW6 205-1	5SB3 11
3RF20 50-1.A.6	3NE1 803-0	3NE8 017-1	--	3NC1 450	3NC2 250	3NA2 807-6	--	--	--	--
3RF20 70-1.A.2 [3)]	3NE1 820-0	3NE8 020-1	--	--	3NC2 280	3NA2 817	--	--	3NW6 217-1	5SB3 31
3RF20 70-1.A.4 [3)]	3NE1 020-2	3NE8 020-1	--	--	3NC2 280	3NA2 812	--	--	3NW6 212-1	5SB3 21
3RF20 70-1.A.5 [3)]	3NE1 020-2	3NE8 020-1	--	--	3NC2 280	3NA2 812	--	--	3NW6 212-1	5SB3 21
3RF20 70-1.A.6 [3)]	3NE1 020-2	3NE8 020-1	--	--	3NC2 280	3NA2 812-6	--	--	--	--
3RF20 90-1.A.2 [3)]	3NE1 021-2	3NE8 021-1	--	--	3NC2 200	3NA2 817	--	--	3NW6 217-1	5SB3 31
3RF20 90-1.A.4 [3)]	3NE1 021-2	3NE8 021-1	--	--	3NC2 280[2)]	3NA2 812	--	--	3NW6 212-1	5SB3 21
3RF20 90-1.A.6 [3)]	3NE1 020-2[2)]	3NE8 021-1	--	--	3NC2 280[2)]	3NA2 812-6	--	--	--	--

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

3) These versions can also be protected against short-circuits with miniature circuit breakers as described in the notes on "SIRIUS Solid-State Contactors → Special Version Short-Circuit Resistant".