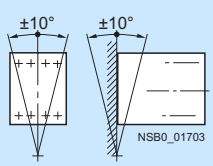
Technical specifications

Order No.		3RF24 ..-1BB..	3RF24 ..-2BB..
General data			
Ambient temperature			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
Installation altitude	m	0 ... 1000; derating over 1000 m upon request	
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 acc. to IEC 60947-4-3			
- conducted interference voltage		Class A for industrial applications[1]	
- emitted, high-frequency interference voltage		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 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**
Connection, main contacts			
• Conductor cross-section			
- solid	mm^2	2 x (1.5 ... 2.5)[2], 2 x (2.5 ... 6)[2]	2x (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	2x (0.5 ... 1.5)
- finely stranded without end sleeve	mm^2	--	2x (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	--
- tightening torque	Nm lb.in	2 ... 2.5 18 ... 22	
Connection, auxiliary/control contacts			
• Conductor cross-section			
- with/without end sleeve	mm AWG	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, (∅ 3.5, PZ 1)	Nm lb.in	0.5 ... 0.6 4.5 ... 5.3	
Permissible mounting positions			

[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.

Solid-State Contactors

3RF24 solid-state contactors, 3-phase

Order No.	Fuseless design with motor starter protector CLASS 10					
	Rated operational current I_{AC-53} [1] acc. to IEC 60947-4-2			Power loss at I_{AC-53}	Short-circuit protection with coordination type "1" at an operational voltage of U_e to 440 V	
	at 40 °C	UL/CSA, at 50 °C	at 60 °C	at 40 °C	Motor starter protector	I_q
	A	A	A	W	Type	kA
Main circuit						
3RF24 05-.BB..	5.2 (4.5)	4.6 (4.0)	4.2 (3.5)	10 (8)	3RV1 021-1GA10	50
3RF24 10-.BB..	9.2	8.4	7.6	16	3RV1 021-1JA10	20
3RF24 12-.BB..	12.5	11.5	10.5	22	3RV1 021-1KA10	5
3RF24 16-.BB..	16	14	12.5	28	3RV1 021-4AA10	5

Order No.	Fused design with directly connected 3RB20 overload relay				Minimum load current	Max. leakage current	Rated impulse withstand capacity I_{tsm}	I^2t value
	Rated operational current I_{AC-53} acc. to IEC 60947-4-2			Power loss at I_{AC-53}				
	at 40 °C	UL/CSA, at 50 °C	at 60 °C	at 40 °C				
	A	A	A	W	A	A	A	A^2s
Main circuit								
3RF24 05-.BB.4	4	3.6	3.2	7	0.5	10	200	200
3RF24 05-.BB.6							600	1800
3RF24 10-.BB..	7.8	7	6.2	13	0.5	10	600	1800
3RF24 12-.BB.4	9.5	8.5	7.6	16	0.5	10	1200	7200
3RF24 12-.BB.6							1150	6600
3RF24 16-.BB..	11	10	9	18	0.5	10	1150	6600

Type		3RF24 ..-.BB.4	3RF24 ..-.BB.6
Main circuit			
Controlled phases		2-phase	2-phase
Rated operational voltage U_e	V	48 ... 460	48 ... 600
• Operating range	V	40 ... 506	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	1600
Rage of voltage rise	V/µs	1000	1000

Type		3RF24 ..-.BB0.	3RF24 ..-.BB2.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24 to EN 61131-2	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%
Control supply voltage, max.	V	30	253
Typical actuating current	mA	20	15
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times			
• ON-delay	ms	1	5
• OFF-delay	ms	1 + max. one half-wave	30 + max. one half-wave

[1] The reduced values in brackets apply for direct mounting of a motor starter protector on the contactor and installation without any clearance.

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

The semiconductor protection for the 3RF24 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 3RF24 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 up to a lower rated current of the load can only be used after the behavior of the existing load alternation has been tested.

Order No.	All-range fuses gR		Semiconductor fuses aR				Cable and line protection fuses				
			LV HRC design	Cylindrical design			LV HRC design	Cylindrical design			
	LV HRC design SITOR 3NE1	Cylindr. design NEOZED 3SE1[2)]	SITOR 3NE8	10 mm x 38 mm SITOR 3NC1	14 mm x 51 mm SITOR 3NC1	22 mm x 58 mm SITOR 3NC2	gG 3NA3	10 mm x 38 mm gG 3NW6	14 mm x 51 mm gG 3NW6	22 mm x 58 mm gG 3NW6	DIAZED quick 5SB1
Operational voltage U_e up to 506 V											
3RF24 05-.BB.4	3NE1 813-0	5SE1 320	3NE8 015-1	3NC1 020	3NC1 415	3NC2 220	3NA3 801-6	3NW6 001-1	3NW6 101-1	--	5SB1 71
3RF24 10-.BB.4	3NE1 802-0	5SE1 335	3NE8 020-1	3NC1 032	3NC1 450	3NC2 263	3NA3 805-6	3NW6 005-1	3NW6 105-1	3NW6 205-1	5SB3 11
3RF24 12-.BB.4	3NE1 818-0	5SE1 363	3NE8 021-1	3NC1 032	3NC1 450	3NC2 280	3NA3 810-6	3NW6 010-1	3NW6 116-1	3NW6 210-1	5SB3 21
3RF24 16-.BB.4	3NE1 818-0	5SE1 363	3NE8 022-1	3NC1 032	3NC1 450	3NC2 280	3NA3 812-6	3NW6 010-1	3NW6 116-1	3NW6 210-1	5SB3 22
Operational voltage U_e up to 660 V											
3RF24 05-.BB.6	3NE1 813-0	--	3NE8 015-1	3NC1 016	3NC1 420	3NC2 220	3NA3 801-6	--	--	--	--
3RF24 10-.BB.6	3NE1 803-0	--	3NE8 018-1	3NC1 032	3NC1 450	3NC2 250	3NA3 805-6	--	--	--	--
3RF24 12-.BB.6	3NE1 817-0	--	3NE8 021-1	3NC1 032	3NC1 450	3NC2 280	3NA3 810-6	--	--	--	--
3RF24 16-.BB.6	3NE1 817-0	--	3NE8 022-1	3NC1 032	3NC1 450	3NC2 280	3NA3 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) For use only with operational voltage U_e up to 400 V.