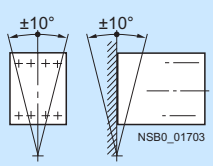
Technical specifications

Order No.		3RF24 ..-1BD..
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[2)]	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2
Connection type		**Screw terminals**
Connection, main contacts		
• Conductor cross-section		
- solid	mm^2	2 x (1.5 ... 2.5)[3)], 2 x (2.5 ... 6)[3)]
- finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[3)], 2 x (2.5 ... 6)[3)], 1 x 10
- finely stranded without end sleeve	mm^2	--
- solid or stranded, AWG cables		2 x (AWG 14 ... 10)
• Stripped length	mm	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
• Stripped length	mm	7
• Terminal screw		M3
- tightening torque, (Ø 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) To maintain the values, a 3TX7 462-3L surge suppressor (see catalog LV 1, Chapter 3, page 3/119) should be used between the connections L1 and L3.

3) 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 reversing contactors, 3-phase

Order No.	Fuseless design with motor starer 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 03-.BD.4	3.8 (3,4)	3.5 (3,1)	3.2 (2,8)	7 (6)	3RV1 021-1FA10	50
3RF24 05-.BD.4	5.4 (4,8)	5 (4,3)	4.6 (3,8)	9 (8)	3RV1 021-1GA10	50
3RF24 10-.BD.4	7.4	6.8	6.2	13	3RV1 021-1JA10	10

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	mA	A	A^2s
Main circuit								
3RF24 03-.BD.4	3.8	3.5	3.2	6	0.5	10	200	200
3RF24 05-.BD.4	5.4	5	4.6	8	0.5	10	600	1800
3RF24 10-.BD.4	7.4	6.8	6.2	16	0.5	10	600	1800

Type		3RF24 ..-.BD.4
Main circuit		
Controlled phases		2-phase
Rated operational voltage U_e [2]	V	48 ... 460
• Operating range	V	40 ... 506
• Rated frequency	Hz	50/60 ± 10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Blocking voltage	V	1200
Rage of voltage rise	V/µs	1000

Type		3RF24 ..-.BD0.	3RF24 ..-.BD2.
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	15	10
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times			
• ON-delay	ms	5	20
• OFF-delay	ms	5 + max. one half-wave	10 + max. one half-wave
• Interlocking time	ms	60 ... 100	50 ... 100

1) The reduced values in brackets apply for direct mounting of a circuit breaker on the contactor and installation without any clearance.

2) To reduce the risk of a phase short circuit due to overvoltage, we recommend connecting a varistor type 3TX7 462-3L between L1 and L3. We recommend a design with semiconductor protection as short-circuit protection.

3RF24 solid-state reversing contactors, 3-phase

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	DIAZED quick 5SB1
Operational voltage U_e up to 506 V										
3RF24 03-.BD..	3NE1 813-0	5SE1 335	3NE8 015-1	3NC1 020	3NC1 415	3NC2 220	3NA3 801-6	3NW6 001-1	3NW6 101-1	5SB1 71
3RF24 05-.BD..	3NE1 802-0	5SE1 335	3NE8 020-1	3NC1 032	3NC1 450	3NC2 263	3NA3 805-6	--	--	5SB3 11
3RF24 10-.BD..	3NE1 802-0	5SE1 335	3NE8 020-1	3NC1 032	3NC1 450	3NC2 263	3NA3 805-6	--	--	5SB3 11

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.