

Contactors and Contactor Assemblies

Contactors for special application

contents

Contactors for special applications



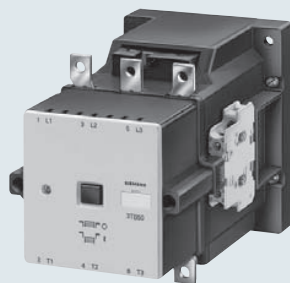
3TF68 and 3TF69 vacuum contactors, 500 to 700 HP; contactor assemblies

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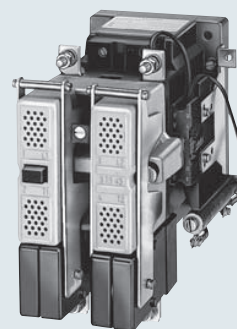


3TB50 to 3TB56 contactors with DC solenoid system, 100 to 300 HP

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3TC Contactors

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3RT1 SIRIUS Nomenclature

3RT1	0	3	5	1	A	B0	1
SIRIUS Contactor	Application 0 = 3 pole Standard 2 = 3 pole Vacuum 3 = 4 pole NO 4 = 3 pole resistive load 5 = 4 pole 2 NO + 2 NC 6 = 3 pole Capacitive	Frame 5 = S6 6 = S10 7 = S12	Current Designation Choices = 4,5,6	Terminal 2 = Spring Loaded Coil only 6 = Busbar Terminal	Coil Type A = AC/DC (S6-S12) N = UC Solid state (S6-S12) P = UC Solid state with RLT (S6-S12)	Coil Voltage See Coil Selection Chart page 2/49	Aux Contacts A) 0 = None 4 = 2NO + 2NC (S6-S12) 5 = 1NO + 1 NC (S6-S12) 6 = 2 NO + 2 NC (S6-S12) A) per EN50012

3RT2 SIRIUS Innovations Nomenclature

3RT2	0	1	5	1	A	B0	1
SIRIUS Innovations Contactor	Application 0 = 3 pole Standard 3 = 4 pole NO 5 = 4 pole 2 NO + 2 NC 6 = 3-pole Capacitive	Frame 1 = S00 2 = S0 3 = S2 4 = S3	Current 3,4,5,6,7,8	Terminal 1 = Screw 2 = Spring Loaded 3 = Spring Loaded Coil only 4 = Ring Lug	Coil Type A = AC (S0-S3) B = DC N = UC Electronic	Coil Voltage See Coil Selection Chart page 2/49	Aux Contacts A) 0 = 1NO + 1NC (S0-S3) 1 = 1 NO (S00) 2 = 1 NC (S00) 4 = 2NO + 2NC (S00-S3) A) per EN50012

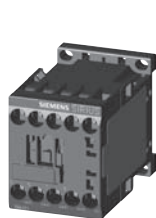
Note: MSPs and Contactors of the same frame size are made to easily fit together with the use of a link module or can be purchased pre-assembled as 3RA starter assemblies. See section 4.

Note: Contactors and Overloads of the frame size S00 - S3 are made to easily fit together without the use of accessories.

Note: This is only a guide to decode the model number. All possible combinations of these are not available.

Contactors and Contactor Assemblies

Overview



Type		S00 3RT20 1				S0 3RT20 2						S2 3RT20 3			
3RT20 contactors															
Type AC/DC operation		3RT2015 (p. 2/8)	3RT2016	3RT2017	3RT2018	3RT2023 (p. 2/8)	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028	3RT2035 (p. 2/8)	3RT2036	3RT2037	3RT2038
Type AC/DC operation															
Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)															
200 V	HP	1.5	2	3	3	2	3	5	7.5	10	10	10	15	20	20
230 V	HP	2	3	3	5	3	3	5	7.5	10	10	15	15	20	25
460 V	HP	3	5	7.5	10	5	7.5	10	15	20	25	30	40	50	50
575 V	HP	5	7.5	10	10	7.5	10	15	20	25	25	40	50	50	60
AC-3															
I_e /AC-3/400V	A	6	9	12	16	9	12	17	25	32	38	40	50	65	80
230 V	kW	1.5	2.2	3	4	2.2	3	4	5.5	7.5	11	11	15	18.5	22
400 V	kW	3	4	5.5	7.5	4	5.5	7.5	11	15	18.5	18.5	22	30	37
500 V	kW	3.5	4.5	5.5	7.5	4.5	7.5	10	11	18.5	18.5	22	30	37	37
690 V	kW	4	5.5	5.5	7.5	7.5	7.5	11	11	18.5	18.5	22	22	37	45
1000 V	kW	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AC-4 (at $I_a = 6 \times I_e$)															
400 V	kW	3	4	4	5.5	4	5.5	7.5	7.5	11	11	18.5	22	30	37
400 V (200,000 operating cycles)	kW	1.15	2	2	2.5	2	2.6	3.5	4.4	6	6	11.6	12.6	14.7	15.8
AC-1 (40°C, ≤ 690V)															
I_e	A	18	22	22	22	40	40	40	40	50	50	60	70	80	90

Accessories for contactors

Auxiliary switch blocks	front	3RH29 11	(p. 2/66)	3RH29 11	(p. 2/66)		
	lateral	3RH29 11	(p. 2/68)	3RH29 21	(p. 2/68)		
Terminal covers		—		—		3RT29 36	(p. 2/77)
Box terminals		—		—		—	
Surge suppressor		3RT29 16	(p. 2/73)	3RT29 26	(p. 2/73)	3RT29 36	(p. 2/73)

3RU21 and 3RB3 overload relays (Section 3)

3RU21, thermal, CLASS 10	3RU21 16	0.1-16A	(p. 3/10)	3RU21 26	0.18-40A	(p. 3/10)	3RU21 36	11-80A	(p. 3/10)
3RB30/31, solid-state, CLASS 5, 10, 20 and 30	3RB30 16	0.1-16A	(p. 3/22)	3RB30 26	0.1-40A	(p. 3/22)	3RB30 36	12-80A	(p. 3/22)
	3RB31 13		(p. 3/23)	3RB31 23		(p. 3/23)	3RB31 33		(p. 3/23)
3RB22/23, solid-state, CLASS 5, 10, 20 and 30	3RB2.83+ 3RB29 06	0.3-25A	(p. 3/34)				3RB22, 10-100A	(p. 3/34)	
							3RB22, 3RB23 and 3RB24 with current measuring module		

3RV20 circuit-breakers (Section 1)

Type	3RV20 11	0.18-16A	(p. 1/4)	3RV20 21	11-40A	(p. 1/4)	3RV20 31	9.5-80A	(p. 1/5)
Link modules	3RA29 11		(p. 1/10)	3RA29 21		(p. 1/10)	3RA29 31		(p. 1/10)

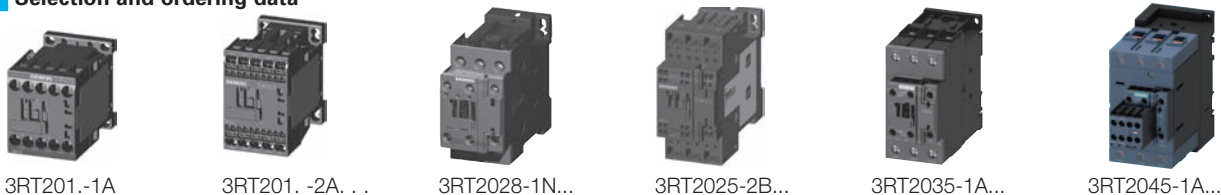
3RA23 Reversing contractor assemblies

Complete units	Type	3RA2315	3RA2316	3RA2317	3RA2318	3RA2324	3RA2325	3RA2326	3RA2327	3RA2328	3RA2335	3RA2336	3RA2337	3RA2338
460 V	HP	3	5	7.5	10	7.5	10	15	20	25	30	40	50	50
Installation kits / wiring connectors		3RA2913-2AA1 (p. 2/81)				3RA2923-2AA1 (p. 2/81)				3RA2933-2AA1 (p. 2/81)				
Mechanical interlocks		3RA2912-2H (p. 2/82)				3RA2922-2H (p. 2/82)				3RA2934-2B (p. 2/80)				

Contactor for Switching Motors

3RT contactors, 3-pole – Size S00 to S3

Selection and ordering data



Frame Size	Amp Ratings		Single-phase HP ratings			Three-phase HP ratings				Auxiliary contacts		Screw Terminals		Spring-Loaded Terminals ¹⁾		Weight approx. kg
	AC3	AC1	115V	208V	230V	208V	230V	460V	575V	NO	NC	Order No.	Order No.			
3RT 3-pole contactors																
S00	6	18	0.25	0.5	0.75	1.5	2	3	5	1	0	3RT2015-1□●●1	3RT2015-2□●●1	0.24/0.29		
										0	1	3RT2015-1□●●2	3RT2015-2□●●2			
	9	22	0.33	1	1	2	3	5	7.5	1	0	3RT2016-1□●●1	3RT2016-2□●●1			
										0	1	3RT2016-1□●●2	3RT2016-2□●●2			
	12	22	0.5	1.5	2	3	3	7.5	10	1	0	3RT2017-1□●●1	3RT2017-2□●●1			
										0	1	3RT2017-1□●●2	3RT2017-2□●●2			
	16	22	1	2	2	3	5	10	10	1	0	3RT2018-1□●●1	3RT2018-2□●●1			
										0	1	3RT2018-1□●●2	3RT2018-2□●●2			
S0	9	40	1	1	1	2	3	5	7.5	1	1	3RT2023-1□●●0	3RT2023-2□●●0	0.42/0.60		
	12	40	1	2	2	3	3	7.5	10	1	1	3RT2024-1□●●0	3RT2024-2□●●0			
	17	40	1	2	3	5	5	10	15	1	1	3RT2025-1□●●0	3RT2025-2□●●0			
	25	40	2	3	3	7.5	7.5	15	20	1	1	3RT2026-1□●●0	3RT2026-2□●●0			
	32	50	2	5	5	10	10	20	25	1	1	3RT2027-1□●●0	3RT2027-2□●●0			
	38	50	3	5	5	10	10	25	25	1	1	3RT2028-1□●●0	3RT2028-2□●●0			
S2	40	60	3	5	7.5	10	15	30	40	1	1	3RT2035-1□●●0	3RT2035-3□●●0	0.99/1.121		
	50	70	3	7.5	10	15	15	40	50	1	1	3RT2036-1□●●0	3RT2036-3□●●0			
	65	80	5	10	10	20	20	50	50	1	1	3RT2037-1□●●0	3RT2037-3□●●0			
	80 ²⁾	90	5	10	15	20	25	50	60	1	1	3RT2038-1□●●0	3RT2038-3□●●0			
S3	80	125	7.5	10	15	25	30	60	60	1	1	3RT2045-1□●●0	3RT2045-3□●●0	1.8/2.8		
	95	130	10	10	20	30	30	75	75	1	1	3RT2046-1□●●0	3RT2046-3□●●0			
	110	130	10	10	20	30	40	75	100	1	1	3RT2047-1□●●0	3RT2047-3□●●0			
												□	□			
Size S2 only: Replace “B” with “K” for 24VDC coil only												AC Coil = A	A			
Size S0 and S2 only: UC Electronic with integrated varistor												DC Coil = B	B			
												UC Coil = N	N			

NEMA Size	Amp Ratings	Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts		Screw Terminals with AC coil	Screw Terminals with 24 VDC coil	Weight approx. kg
		115V	230V	208V	230V	460V	575V	NO	NC			
NEMA Labeled Contactors										Order No.	Order No.	
0	18	1	2	3	3	5	5	1	0	3RT2018-1A●●1-0UA0	3RT2018-1BB41-0UA0	0.28
1	27	2	3	7.5	7.5	10	10	1	1	3RT2027-1A●●0-0UA0	3RT2027-1BB40-0UA0	0.42
2	45	3	7.5	10	15	25	25	1	1	3RT2036-1A●●0-0UA0	3RT2036-1NB30-0UA0	0.986/1.121
3	90	7.5	15	25	30	50	50	1	1	3RT2046-1A●●0-0UA0	3RT2046-1NB40-0UA0	1.8 / 2.8

1) All terminals are spring loaded on frame sizes S00 & S0.
Only the coil terminals are spring loaded on frame sizes S2 & S3.

2) Max UL FLA = 65A at 460V

Note: Ring lug terminals are also available in size S00 & S0 contactors, except contactors with communication interface or UC coil. Change the 8th digit of the order number to a "4", e. g. 3RT2015-4AK61.

For further coil voltages, see page 2/49.
For auxiliaries and accessories, see page 2/66-2/83.
For spare parts, see page 2/94-2/99.
For technical data, see page 2/121-2/142.
For description, see page 2/104-2/105.
For int. circuit diagrams, see page 2/190-2/197.
For dimension drawings, see page 2/209-2/212.

AC Coil Selection for 3RT201 through 3RT204

●●Coil Code	C2 ²⁾	H2 ³⁾	K6	P6	U6	V6	T6
60 Hz	24 V	48 V	120 V	240 V	277 V	480 V	600 V
50 Hz	24 V	48 V	110 V	220 V	—	—	—

²⁾ Use Code B0 for 3RT201, S00

³⁾ Use Code H0 for 3RT201, S00

DC Coil Selection for 3RT201 & 3RT202 (for 3RT203 & 3RT204 see UC)

●●Coil Code	A4 ⁴⁾	B4	W4	E4	F4	G4	M4
DC	12 V	24 V	48 V	60 V	110 V	125 V	220 V

⁴⁾ 3RT201 and 3RT202 only

UC Coil Selection for 3RT202

●●Coil Code	B3	F3	P3 ⁴⁾
UC	21-28V	95-130V	200-280V

UC Coil Selection for 3RT203 & 3RT204

●●	B3	F3	P3 ⁵⁾
UC	20-33V	83-155V	175-280V

⁵⁾ at upper limit = 1.1 x U_S

Rated control supply voltages

Selection and ordering data

Contactor type	3RT201 3RA211	3RT231 3RT251	3RT202 3RA212	3RT232 3RT252	3RT2617 3RT2627 3RT2637	3RT203 3RA213	3RT233 3RT253	3RT104 3RT134 3RT144 3RA114
Rated control supply voltage U_s	S00	S00	S0	S0	S00-S2	S2	S2	S3

Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

AC Operation¹⁾

Coils for 50 Hz (exception: size S00: 50 and 60 Hz ²⁾)	24 V AC	B0	B0	B0	B0	B0	B0	B0
	42 V AC	D0	D0	D0	--	D0	--	D0
	48 V AC	H0	H0	H0	--	H0	--	H0
	110 V AC	F0	F0	F0	F0	F0	F0	F0
	230 V AC	P0	P0	P0	P0	P0	P0	P0
	400 V AC	V0	V0	V0	V0	V0	V0	V0
Coils for 50 and 60 Hz ²⁾	24 V AC	B0	B0	C2	C2	C2	C2	C2
	42 V AC	D0	D0	D2	D2	--	D2	D2
	48 V AC	H0	H0	H2	H2	--	H2	H2
	110 V AC	F0	F0	G2	G2	G2	G2	G2
	208 V AC	M2	M2	M2	M2	M2	M2	M2
	220 V AC	N2	N2	N2	N2	N2	N2	N2
	230 V AC	P0	P0	L2	L2	L2	L2	L2
	240 V AC	P2	P2	P2	P2	P2	P2	P2
For USA and Canada ³⁾	50 Hz:	60 Hz:						
	110 V AC	120 V AC	K6	K6	K6	K6	K6	K6
	220 V AC	240 V AC	P6	P6	P6	P6	P6	P6
		277 V AC	—	—	U6	—	U6	U6
		480 V AC	V6	—	—	V6	V6	V6
		600 V AC	—	—	T6	—	T6	T6
For Japan	50/60 Hz ⁴⁾ :	60 Hz ⁵⁾ :						
	100 V AC	110 V AC	G6	G6	G6	G6	G6	G6
	200 V AC	220 V AC	N6	N6	N6	N6	N6	N6
	400 V AC	440 V AC	R6	R6	R6	R6	R6	R6

DC Operation¹⁾

12 V DC	A4	A4	—	—	—	—	—	—
24 V DC	B4	B4	B4	B4	—	—	—	—
42 V DC	D4	D4	D4	D4	—	—	—	—
48 V DC	W4	W4	W4	W4	—	—	—	—
60 V DC	E4	E4	E4	E4	—	—	—	—
72 V DC	J8	J8	J8	J8	—	—	—	—
80 V DC	—	—	—	—	—	—	—	—
110 V DC	F4	F4	F4	F4	—	—	—	—
125 V DC	G4	G4	G4	G4	—	—	—	—
220 V DC	M4	M4	M4	M4	—	—	—	—
230 V DC	P4	P4	P4	—	—	—	—	—

Coil codes for frame sizes S6-S12 can be found on page 2/9. Further voltages on request

Rated control supply voltage	Contactor type	3RT2. 2.-N	Rated control supply voltage	Contactor type	3RT2. 3.-N	3RT2. 2.-N
$U_{s \min} \dots U_{s \max}^{6)}$	Size	S00	$U_{s \min} \dots U_{s \max}^{6)}$	Size	S2	S3

Sizes S00 to S3

AC/DC operation (50/60 Hz AC, DC)

21 ... 28 V AC/DC	--	B3	20 ... 33 V AC/DC	B3	B3
95 ... 130 V AC/DC	--	F3	83 ... 155 V AC/DC	F3	F3
200 ... 280 V AC/DC ⁷⁾	--	P3	175 ... 280 V AC/DC	P3	P3

¹⁾ For deviating coil voltages and coil operating ranges of sizes S00 and S0, the SITOP power 24 V DC power supply unit with wide range input (93 to 264 V AC; 30 to 264 V DC) can be used for coil excitation (For more SITOP information see section 15).

²⁾ Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s

³⁾ Coil operating range
Size S00: at 50 Hz: 0.85 ... 1.1 x U_s
at 60 Hz: 0.8 ... 1.1 x U_s
Size S0 to S3: at 50 Hz and 60 Hz: 0.8 ... 1.1 x U_s

⁴⁾ Coil operating range
Size S00: at 50/60 Hz: 0.85 ... 1.1 x U_s
Size S0: at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s

⁵⁾ Coil operating range
at 60 Hz: 0.8 ... 1.1 x U_s

⁶⁾ Coil operating range for S0: 0.7 x $U_{s \min}$... 1.3 x $U_{s \max}$
Coil operating range for S2: 0.8 x $U_{s \min}$... 1.1 x $U_{s \max}$

⁷⁾ The following applies to S0 and $U_{s \max} = 280$ V: Upper limit = 1.1 x $U_{s \max}$

Contactors for Switching Motors

3RT2 contactors

Contactors	Type		3RT20 15	3RT20 16	3RT20 17	3RT20 18
	Size		S00	S00	S00	S00
	Width	mm	45	45	45	45
Ⓢ and Ⓛ rated data						
Rated insulation voltage		V AC	600			
Uninterrupted current, at 40 °C		• Open and enclosed	A			
Maximum horsepower ratings (Ⓢ and Ⓛ approved values)						
• Rated power for induction motors at 60 Hz		At 200 V hp	1.5	2	3	3
		230 V hp	2	3	3	5
		460 V hp	3	5	7.5	10
		575 V hp	5	7.5	10	10
Short-circuit protection¹⁾ (contactor or overload relay)		At 600 V kA	5	5	5	5
		• Fuse CLASS J ²⁾	A	40	40	40
		• Circuit breakers with overload protection according to UL 489	A	50	50	50
• Combination motor controllers type E according to UL 508			...3)	...3)	...3)	...3)
NEMA/EEMAC ratings						
NEMA/EEMAC size						
• Uninterrupted current						
		- Open	A			
		- Enclosed	A			
• Rated power for induction motors at 60 Hz						
		At 200 V hp				
		230 V hp				
		460 V hp				
		575 V hp				
Overload relays						
• Type			3RU21 1 / 3RB30 1			
• Setting range			A 0.11 ... 16 / 0.1 ... 16			

Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size		S0	S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45	45
☞ and ☞ rated data								
Rated insulation voltage		V AC	600				600	
Uninterrupted current, at 40 °C		• Open and enclosed	A				42	
Maximum horsepower ratings (☞ and ☞ approved values)								
• Rated power for induction motors at 60 Hz		At 200 V hp	2	3	5	7.5	10	10
		230 V hp	3	3	5	7.5	10	10
		460 V hp	5	7.5	10	15	20	25
		575 V hp	7.5	10	15	20	25	25
Short-circuit protection ¹⁾ (contactor or overload relay)		At 600 V kA	5	5	5	5	5	5
		• Fuse CLASS J ²⁾	A	45	45	70	110	110
		• Circuit breakers with overload protection according to UL 489	A	70	70	70	100	100
• Combination motor controllers type E according to UL 508								
		- At 480 V	Type	3RV20 2				
			A	--				
			kA	-- ³⁾				
		- At 600 V	Type	3RV20 2				
			A	--				
			kA	-- ³⁾				
NEMA/EEMAC ratings								
NEMA/EEMAC size			--				1	
• Uninterrupted current		- Open	A				27	
		- Enclosed	A				27	
• Rated power for induction motors at 60 Hz		At 200 V hp	--				7.5	
		230 V hp	--				7.5	
		460 V hp	--				10	
		575 V hp	--				10	
Overload relays								
• Type			3RU21 2 / 3RB30 2					
• Setting range		A	1.8 ... 40 / 0.1 ... 40					

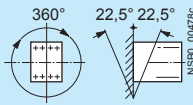
¹⁾ For more information about short-circuit values, e. g. for protection against short-circuit currents, see UL reports (<http://support.automation.siemens.com>) for the individual devices.

²⁾ Values for RK5 fuses on request.

³⁾ Values on request.

Contactors for Switching Motors

3RT2. 2. contactors

Type			3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
Size			S0	S0	S0	S0	S0	S0
Dimensions (W x H x D) for AC operation ¹⁾			45 x 85 x 97 / 45 x 101.5 x 97					
• With mounted auxiliary switch block			45 x 85 x 141 / 45 x 101.5 x 144					
• With mounted function block			45 x 85 x 166 / 45 x 101.5 x 166					
Dimensions (W x H x D) for DC operation ¹⁾			45 x 85 x 107 / 45 x 101.5 x 107					
• With mounted auxiliary switch block			45 x 85 x 151 / 45 x 101.5 x 154					
• With mounted function block			45 x 85 x 176 / 45 x 101.5 x 176					
General data								
Permissible mounting positions								
The contactors are designed for operation on a vertical mounting surface.								
Upright mounting position								
AC and D operation			Special version required, also applies to 3RT20 2.-K.40. coupling relays.					
Mechanical endurance			2)					
• Basic unit	Operating cycles		10 million					
• Basic unit with snap-on auxiliary switch block	Operating cycles		10 million					
• Solid-state compatible auxiliary switch block	Operat. cycles		5 million					
Electrical endurance			2)					
Rated insulation voltage U_i (pollution degree 3)	V		690					
Rated impulse withstand voltage U_{imp}	kV		6					
Protective separation between the coil and the main contacts (acc. to EN 60947-1, Appendix N)	V		400					
Mirror contacts								
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.								
• 3RT20 2., 3RT23 2. (removable auxiliary switch block)			Yes, acc. to EN 60947-4-1, Appendix F					
• 3RT20 2., 3RT23 2. (permanently mounted auxiliary switch block)			Yes, acc. to EN 60947-4-1, Appendix F					
Permissible ambient temperature								
• During operation	°C		-25 ... +60					
• During storage	°C		-55 ... +80					
Degree of protection acc. to EN 60947-1, Appendix C			IP20, coil assembly IP20					
Touch protection acc. to EN 50274			Finger-safe					
Shock resistance rectangular pulse								
• AC operation	g/ms		7.5/5 and 4.7/10			8.3/5 and 5.310		
• DC operation	g/ms		>10/5 and 7.5/10			>10/5 and 7.5/10		
Shock resistance sine pulse								
• AC operation	g/ms		11.8/5 and 7.4/10			13.5/5 and 8.3/10		
• DC operation	g/ms		>15/5 and >10/10			>15/5 and >10/10		
Conductor cross-sections			3)					
Short-circuit protection for contactors without overload relays								
Main circuit			For short-circuit protection for contactors with overload relays see "Protection Equipment --> Overload Relays". For short-circuit protection for fuseless load feeders see "Motor Starters".					
• Fuse links, operational class gG : Type NH 3NA, DIAZED 5SB, NEOZED 5SE acc. to IEC 60947-4-1/ EN 60947-4-1								
- Type of coordination "1"			A	63		100	125	
- Type of coordination "2"			A	25		35	50	
- Weld-free ⁴⁾			A	10		16	16	
• Miniature circuit breakers with C characteristic (short-circuit current 3 kA, type of coordination "1")			A	25		32	40	
Auxiliary circuit								
• Fuse links, operational class gG : DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA)			A	10				
• Miniature circuit breaker with C characteristic (short-circuit current $I_k < 400$ A)			A	10				

¹⁾ Dimensions for devices with screw terminals / spring-type terminals.

²⁾ For endurance of the main contacts see page 2/122.

³⁾ For conductor cross-sections page 2/134.

⁴⁾ Test conditions according to IEC 60947-4-1.

Contactors for Switching Motors

3RT20.2. contactors

Contactors	Type		3RT20 23 ... 3RT20 25	3RT20 26 ... 3RT20 28	3RT20 2. -.NB3	3RT20 2. -.NF3..	3RT20 2. -.NP3
	Size		S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45
Control							
Solenoid coil operating range	AC/DC		0.8 ... 1.1 x U _s		0.7 ... 1.3 x U _s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U _s)							
• AC operation, 50 Hz, standard version	- Closing	VA	65	77	6.5	13.6	16.1
	- P.f.		0.82	0.82	0.98	0.98	0.98
	- Closed	VA	7.6	9.8	1.26	1.91	3.41
	- P.f.		0.25	0.25	0.25	0.25	0.25
• AC operation, 50/60 Hz, standard version	- Closing	VA	68/67	81/79	6.5/5.7	13.6/13.2	16.1/15.9
	- P.f.		0.72/0.74	0.72/0.74	0.98/0.96	0.98/0.99	0.99/0.99
	- Closed	VA	7.9/6.5	10.5/8.5	1.26/1.30	1.91/1.90	3.41/3.58
	- P.f.		0.25/0.28	0.25/0.28	0.78/0.8	0.61/0.61	0.36/0.45
• AC operation, 50 Hz, USA/Canada	- Closing	VA	65	77	--	--	--
	- P.f.		0.82	0.82	--	--	--
	- Closed	VA	7.6	9.8	--	--	--
	- P.f.		0.25	0.28	--	--	--
• AC operation, 60 Hz, USA/Canada	- Closing	VA	73	87	--	--	--
	- P.f.		0.76	0.76	--	--	--
	- Closed	VA	7.2	9.4	--	--	--
	- P.f.		0.28	0.28	--	--	--
• DC operation	Closing/closed	W	5.9/5.9	5.9/5.9	6.7/0.8	13.2/1.56	15/1.83
Permissible residual current of the electronics (with 0 signal)							
	• AC operation	mA	< 6 mA x (230 V/U _s)		< 7 mA x (230 V/U _s)		
	• DC operation	mA	< 16 mA x (24 V/U _s)				
Operating times for 0.8 ... 1.1 x U _s ¹⁾							
Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay	ms	9 ... 38	8 ... 40	60 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	35 ... 45
• DC operation	- Closing delay	ms	50 ... 170	50 ... 170	60 ... 75	50 ... 70	50 ... 75
	- Opening delay	ms	15 ... 17.5	15 ... 17.5	30 ... 45	35 ... 45	40 ... 50
• Arcing time		ms	10	10	10	10	10
Operating times for 1.0 x U _s ¹⁾							
• AC operation	- Closing delay	ms	10 ... 18	10 ... 17	65 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	30 ... 50
• DC operation	- Closing delay	ms	55 ... 80	55 ... 80	60 ... 80	56 ... 70	60 ... 80
	- Opening delay	ms	16 ... 17	16 ... 17	30 ... 45	35 ... 45	30 ... 50

¹⁾ The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

Contactors for Switching Motors

3RT20 2. contactors

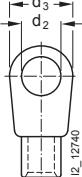
Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size		S0	S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45	45
Main circuit								
AC capacity								
Utilization category AC-1, switching resistive loads								
• Rated operational current I_e	At 40 °C up to 690 V	A	40			50		
	At 60 °C up to 690 V	A	35			42		
• Rated power for AC loads ¹⁾ P.f. = 0.95 (at 60 °C)	230 V	kW	13.3			15.5		
	400 V	kW	23			27.5		
	500 V	kW	29			35		
	690 V	kW	40			47.5		
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm ²	10			10		
	At 60 °C	mm ²	10			10		
Utilization category AC-3								
• Rated operational currents I_e	Up to 400 V	A	9	12	17	25	32	38
	440 V	A	9	12	17	22	32	35
	500 V	A	9	12	17	18	32	32
	690 V	A	9	9	13	13	21	21
• Rated power for slipping or squirrel-cage motors at 50 and 60 Hz	At 230 V	HP	3	3	5	7.5	10	10
	460 V	HP	5	7.5	10	15	20	25
	575 V	HP	7.5	10	15	20	25	25
Thermal load capacity	10 s current ²⁾	A	80	110	150	200	260	300
Power loss per conducting path	at I_e /AC-3	W	0.4	0.5	0.9	1.6	2.7	3.8
Utilization category AC-4 (for $I_a = 6 \times I_e$)								
• Rated operational current I_e	Up to 400 V	A	8.5	12.5	15.5	15.5	22	
• Rated power for squirrel-cage motors with 50 and 60 Hz	At 400 V	kW	4	5.5	7.5	7.5	11	
• The following applies to a contact endurance of about 200000 operating cycles:								
- Rated operational currents I_e	Up to 400 V	A	4.1	5.5	7.7	9	12	
	690 V	A	3.3	5.5	7.7	9	12	
- Rated power for squirrel-cage motors with 50 and 60 Hz	At 110 V	kW	0.5	0.73	1	1.2	1.6	
	At 230 V	kW	1.1	1.5	2	2.5	3.4	
	400 V	kW	2	2.6	3.5	4.4	6	
	500 V	kW	2	3.3	4.6	5.6	7.5	
	690 V	kW	2.5	4.6	6	7.7	10.3	
Switching frequency								
Switching frequency z in operating cycles/hour								
• Contactors without overload relays	No-load switching frequency AC	h ⁻¹	5000					
	No-load switching frequency DC	h ⁻¹	1500					
Dependence of the switching frequency z' on the operational current I' and operational voltage U' : $z' = z \cdot (I_e/I') \cdot (400 V/U')^{1.5} \cdot 1/h$								
	AC-1 (AC/DC)	h ⁻¹	1000					
	AC-2 (AC/DC)	h ⁻¹	1000			750		
	AC-3 (AC/DC)	h ⁻¹	1000			750		
	AC-4 (AC/DC)	h ⁻¹	300			250		
• Contactors with overload relays (mean value)		h ⁻¹	15					

¹⁾ Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

²⁾ According to IEC 60947-4-1.
For rated values for various start-up conditions see Section 3 --> "Overload Relays"

Contactors for Switching Motors

3RT20 2. contactors

Contactors	Type	3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size	S0	S0	S0	S0	S0	S0
	Width mm	45	45	45	45	45	45
Conductor cross-sections (1 or 2 conductors connectable)							
Main conductors		 Screw terminals					
Conductor cross-section							
• Solid	mm ²	2 x (1 ... 2.5) ¹⁾ ; 2 x (2.5 ... 10) ¹⁾ according to IEC 60947					
• Finely stranded with end sleeve	mm ²	2 x (1 ... 2.5) ¹⁾ ; 2 x (2.5 ... 6) ¹⁾ ; 1 x 10					
• AWG cables, solid or stranded	AWG	2 x (16 ... 12); 2 x (14 ... 8)					
• Terminal screws		M4 (Pozidriv size 2)					
- Tightening torque	Nm	2 ... 2.5 (18 ... 22 lb.in)					
Auxiliary conductors							
• Solid	mm ²	2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾ according to IEC 60947					
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾					
• Solid or stranded AWG (2 x)	AWG	2 x (20 ... 16) ¹⁾ ; 2 x (18 ... 14) ¹⁾ ; 1 x 12					
• Terminal screws		M3					
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)					
Main conductors		 Spring-type terminals					
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5					
• Solid	mm ²	2 x (1 ... 10)					
• Finely stranded with end sleeve	mm ²	2 x (1 ... 6)					
• Finely stranded without end sleeve	mm ²	2 x (1 ... 6)					
• AWG cables, solid or stranded	AWG	2 x (18 ... 8)					
Auxiliary conductors							
• Operating devices		3.0 x 0.5; 3.5 x 0.5					
• Solid	mm ²	2 x (0.5 ... 2.5)					
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)					
• Finely stranded without end sleeve	mm ²	2 x (0.5 ... 1.5)					
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)					
Main conductors		 Ring lug terminal connection					
• Terminal screw	mm	M4, Pozidriv size 2					
• Operating devices	mm	Ø 5 ... 6					
• Tightening torque	Nm	2 ... 2.5					
	• Usable ring lug terminals	mm					
	- DIN 46234 without insulation sleeve	mm					
	- DIN 46225 without insulation sleeve	mm					
	- DIN 46237 with insulation sleeve	mm					
	- JIS C2805 Type R without insulation sleeve	mm					
	- JIS C2805 Type RAV with insulation sleeve	mm					
	- JIS C2805 Type RAP with insulation sleeve	mm					
Auxiliary conductors							
• Terminal screw		M3, Pozidriv size 2					
• Operating devices	mm	Ø 5 ... 6					
• Tightening torque	Nm	0.8 ... 1.2					
• Usable ring terminal lugs	mm	d ₂ = min. 3.2					
	mm	d ₃ = max. 7.5					

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Contactors	Size	S00	S0	S0
		Screw or spring-type terminals	Screw or spring-type terminals	Screw or spring-type terminals
		Integrated or snap-on auxiliary switch block	1- and 4-pole snap-on auxiliary switch block	Laterally mountable auxiliary switch block
Ⓢ and Ⓢ rated data of the auxiliary contacts				
Rated voltage	V AC	600	600	600
Switching capacity		A 600, Q 600	A 600, Q 600	A 300, Q 300
Uninterrupted current	• At 240 V AC	A 10	10	10