

Switching Devices – Contactors and Contactor Assemblies

Power Contactors for Switching Motors

Introduction



Size	S6			S10			S12			
Type	3RT105			3RT1.6			3RT1.7			
3RT10 contactors · 3RT12 vacuum contactors										
Type	3RT1054	3RT1055	3RT1056	3RT1064	3RT1065	3RT1066	3RT1075	3RT1076		
AC, DC operation	(p. 3/71 ... 3/73)			(p. 3/71 ... 3/73)			(p. 3/71 ... 3/73)			
Type	--	--	--	3RT1264	3RT1265	3RT1266	3RT1275	3RT1276		
				(p. 3/135)			(p. 3/135)			
AC-3										
I_e /AC-3/400 V	A	115	150	185	225	265	300	400	500	
400 V	kW	55	75	90	110	132	160	200	250	
230 V	kW	37	45	55	55	75	90	132	160	
690 V	3RT10/3RT12 kW	110	132	160	200	250	250	400	400/500	
1 000 V	3RT10/3RT12 kW	75	90	90	90/315	132/355	132/400	250/560	250/710	
AC-4 (at $I_a = 6 \times I_e$)										
400 V	kW	55	75	90	110	132	160	200	250	
400 V	3RT10/3RT12 kW	29	38	45	54/78	66/93	71/112	84/140	98/161	
(200 000 operating cycles)										
AC-1 (40 °C, ≤ 690 V)										
I_e	3RT10/3RT12 A	160	185	215	275/330	330	330	430/610	610	
3RT14 AC-1 contactors										
Type	3RT1456	(p. 4/15, 4/16)			3RT1466	(p. 4/15, 4/16)		3RT1476	(p. 4/15, 4/16)	
I_e /AC-1/40 °C/≤ 690 V	A	275				400			690	
Accessories for contactors										
Auxiliary switch blocks	• On front • Lateral	3RH19, 3RT1926						3RH19		(p. 3/97, 3/102) (p. 3/99, 3/100)
Surge suppressors		3RT1956-1C (RC element)								(p. 3/104)
Terminal covers		3RT1956-4EA.			(p. 3/118)		3RT1966-4EA.		(p. 3/118)	
Box terminal blocks		3RT1955-4G, 3RT1956-4G			(p. 3/116)		3RT1966-4G		(p. 3/116)	
3RB2 overload relays										
3RB electronic overload relays										
• For standard applications		3RB2056	50 ... 200 A	(p. 7/117, 7/118)	3RB2066	55 ... 250 A or 160 ... 630 A	(p. 7/117, 7/118)			
		3RB2153	50 ... 200 A	(p. 7/119)	3RB2163	55 ... 250 A or 160 ... 630 A	(p. 7/119)			
• For High-Feature applications		3RB22, 3RB23 and 3RB24	(p. 7/128)		3RB22, 3RB23 and 3RB24	(p. 7/128)				
		with current measuring module 3RB2956-2TH2	(p. 7/136)		with current measuring module 3RB2966-2WH2	(p. 7/136)				
		20 ... 200 A	(p. 7/140)		63 ... 630 A	(p. 7/140)				
3RV10 molded case motor starter protectors										
Molded case motor starter protectors		3RV1063	40 ... 200 A	(p. 7/75)	3RV1073	160 ... 400 A	(p. 7/75)	3RV1083	252 ... 630 A (p. 7/75)	
Reversing contactor assemblies¹⁾										
Complete units	Type	--								
400 V	kW	55	75	90	110	132	160	200	250	
Assembly kits/wiring modules		3RA1953-2A			(p. 3/110)		3RA1963-2A		(p. 3/110)	
Mechanical interlocks		3RA1954-2A			(p. 3/114)		3RA1973-2A		(p. 3/110)	
Contactor assemblies for star-delta (wye-delta) starting¹⁾										
Complete units	Type	--								
400 V	kW	--								
Assembly kits/wiring modules		3RA1953-2B			(p. 3/112)		3RA1963-2B		(p. 3/112)	
		3RA1973-2B			(p. 3/112)				(p. 3/112)	

¹⁾ Contactor assemblies for customer assembly:
 - Reversing contactor assemblies, see pages 3/168 to 3/170,
 - Contactor assemblies for star-delta (wye-delta) starting,
 see pages 3/185 to 3/190.

Note:

Safety characteristics for contactors, see "Standards and approvals", page 16/6.

Rated control supply voltages for 3RT10 contactors, possible on request (change of the 10th and 11th digits of the Article No.)

Delivery time on request

Rated control supply voltage	Contactor type	3RT105.-A, 3RT106.-A, 3RT107.-A	Rated control supply voltage	Contactor type	3RT105.-N, 3RT106.-N, 3RT107.-N	3RT105.-P, 3RT105.-S, 3RT106.-P, 3RT106.-S, 3RT107.-P, 3RT107.-S
$U_{s \min} \dots U_{s \max}$	Sizes	S6 to S12	$U_{s \min} \dots U_{s \max}$	Sizes	S6 to S12	

Sizes S6 to S12**AC/DC operation (50/60 Hz AC or DC) and operating range $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$** **Standard operating mechanism**

23 ... 26 V AC/DC	B3
42 ... 48 V AC/DC	D3
110 ... 127 V AC/DC	F3
200 ... 220 V AC/DC	M3
220 ... 240 V AC/DC	P3
240 ... 277 V AC/DC	U3
380 ... 420 V AC/DC	V3
440 ... 480 V AC/DC	R3
500 ... 550 V AC/DC	S3
575 ... 600 V AC/DC	T3

Solid-state operating mechanism

21 ... 27,3 V AC/DC	B3	--
96 ... 127 V AC/DC	F3	F3
200 ... 277 V AC/DC	P3	P3

Power Contactors for Switching Motors

SIRIUS 3RT12 and 3TF6 vacuum contactors

Overview

Vacuum contactors

Standards

IEC/EN 60947-1,
IEC/EN 60947-4-1,
IEC/EN 60947-5-1 (auxiliary switches)

The SIRIUS 3RT12 and 3TF68/3TF69 vacuum contactors are suitable for use in any climate. They are finger-safe according to IEC 60529. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices (see pages 3/118 and 3/139).

Connection methods

The vacuum contactors are available with screw terminals (box terminals).

Contact reliability

If voltages ≤ 110 V and currents ≤ 100 mA are to be switched, the auxiliary contacts of the vacuum contactors or 3RH contactor relays should be used as they guarantee a high level of contact reliability.

These auxiliary contacts are particularly suitable for solid-state circuits with currents ≥ 1 mA at a voltage ≥ 17 V.

Short-circuit protection

For short-circuit protection of the vacuum contactors with or without overload relays, refer to the Manuals and Configuration Manuals, see "More information" on page 3/127.

Electromagnetic compatibility (EMC)

The contactors with solid-state operating mechanism comply with the international standards IEC/EN 60947-1 and IEC/EN 60947-4-1.

These contactors have been developed for environment A.

Note:

Environment A refers to private low-voltage or industrial networks/locations/plants, including high-grade sources of interference.

Environment A corresponds to devices of Class A with CISPR 11, EN 55011.

Note:

In connection with converters, the control cables must be routed separately from the load cables to the converter.

Motor protection

For protection against overload, 3RB2 electronic overload relays (see page 7/117 onwards) can be mounted on the vacuum contactors. These must be ordered separately.

Ratings of three-phase motors

The quoted rating (in kW) refers to the output power on the motor shaft (according to the nameplate).

The power rating specifications of the vacuum contactors in kW are guide values for 4-pole standard motors at 50 Hz AC and specified voltage (e.g. 400 V). The specific starting and rated data of the motor to be switched are decisive when it comes to selecting the right devices, and the motor current, motor protection device and the permissible contactor current according to the utilization category must be aligned with each other when doing so.

Surge suppression

The vacuum contactors can be retrofitted with varistors for damping opening overvoltages in the coil.

Note:

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 to 5 ms)

Vacuum contactors are basically unsuitable for switching DC voltage.

SIRIUS 3RT12 vacuum contactors, 3-pole, 110 to 250 kW

AC/DC operation

The contactors can be operated with AC (50 to 60 Hz) as well as with DC.

Two types of solenoid operation are available:

- Standard operating mechanism with economy circuit for AC and DC operation (switchover from closing coil to holding coil), version 3RT12...-A
- Solid-state operating mechanism, version 3RT12...-N

Withdrawable coils

For simple coil replacement, e.g. if the application is replaced, the solenoid coil can be pulled out upwards after the release mechanism has been actuated and can be replaced by any other coil of the same size.

Vacuum interrupters

In contrast to the 3RT10 contactors – the main contacts operate in air under atmospheric conditions – the contact gaps of the 3RT12 vacuum contactors are contained in hermetically enclosed vacuum interrupters. Neither arcs nor arcing gases are produced. The particular benefit of 3RT12 vacuum contactors, however, is that their electrical endurance is at least twice as long as that of 3RT10 contactors. They are therefore particularly well suited to frequent switching in inching/mixed operation, e.g. in crane control systems.

Auxiliary contact complement

The 3RT12 vacuum contactors of sizes S10 to S12 are supplied with laterally mounted auxiliary switch blocks. These can be fitted with up to eight lateral auxiliary contacts (identical auxiliary switch blocks for S10 and S12). Of these, no more than four are permitted to be NC contacts.

3TF6 vacuum contactors, 3-pole, 335 to 450 kW

Main contacts

Contact erosion indication with 3TF68/3TF69 vacuum contactors: The contact erosion of the vacuum interrupters can be checked during operation with the help of three white double slides on the contactor base. If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all three vacuum interrupters simultaneously.

Power Contactors for Switching Motors

SIRIUS 3RT12 and 3TF6 vacuum contactors

Type Size	SIRIUS vacuum contactors		Vacuum contactors	
	3RT126 S10	3RT127 S12	3TF68 14	3TF69
General data (continued)				
Permissible ambient temperature				
• During operation	°C	-25 ... +60	-25 ... +55 ¹⁾	
• During storage	°C	-55 ... +80	-55 ... +80	
Degree of protection acc. to IEC 60529				
• On front		IP00 (IP20 with box terminal/cover)	2)3)	
• Connecting terminal		IP00 (for higher degree of protection, use additional terminal covers)		
Touch protection acc. to IEC 60529				
Finger-safe for vertical touching from the front with cover				
Shock resistance				
• Rectangular pulse				
- AC operation	g/ms	8.5/5 and 4.2/10	8.1/5 and 4.7/10	9.5/5 and 5.7/10
- DC operation	g/ms	8.5/5 and 4.2/10	9/5 and 5.7/10	8.6/5 and 5.1/10
• Sine pulse				
- AC operation	g/ms	13.4/5 and 6.5/10	12.8/5 and 7.4/10	13.5/5 and 7.8/10
- DC operation	g/ms	13.4/5 and 6.5/10	14.4/5 and 9.1/10	13.5/5 and 7.8/10
Electromagnetic compatibility (EMC)				
See page 3/126				
Short-circuit protection				
Main circuit				
Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE acc. to IEC/EN 60947-4-1				
• Type of coordination "1"	A	500	800	1 000
• Type of coordination "2"	A	500	800	630
• Weld-free (test conditions acc. to IEC 60947-4-1)	A	400	500	400
Auxiliary circuit				
Short-circuit test				
• Fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE (weld-free protection at $I_k \leq 1$ kA)	A	10		
• Miniature circuit breaker with C characteristic (short-circuit current $I_k \leq 400$ A)	A	10		
Short-circuit protection for contactors with overload relays				
See Configuration Manual for load feeders				

¹⁾ For ambient temperatures > 55 °C, only 3TF6.33-.Q..-Z A02 contactors (= without connection of the main current path circuits) can be used. Then, derating is also possible with these contactors:
- AC-1: $I_e = 782$ A, 644 operating cycles/h;
- AC-3: Operating range 0.85 to 1.05 x U_s , 460 operating cycles/h, mech. endurance 5 million operating cycles, lateral clearance 10 mm.

²⁾ The following applies for 3TF6.-.C.:
- IP00 without cover (the connecting bar is reached directly from the front)
- IP00 with cover for conductor entry
- IP20 on the front plate with cover.
³⁾ The following applies for 3TF6.-.Q../-.D.:
- IP00 without box terminal (the connecting bar, series resistor and the 3TC44 reversing contactor are reached directly from the front)
- IP00 with box terminal (the series resistor and the 3TC44 reversing contactor are reached directly).

Type Size	SIRIUS vacuum contactors		Vacuum contactors		
	3RT126 S10	3RT127 S12	3TF68 14	3TF69	
Control					
Solenoid coil operating range	AC/DC	0.8 x $U_{s \text{ min}}$... 1.1 x $U_{s \text{ max}}$			
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)					
<u>Standard operating mechanism</u>					
• AC operation	- Closing at $U_{s \text{ min}}/U_{s \text{ max}}$ - P.f.	VA	530/630	700/830	--
			0.9		
- Closed at $U_{s \text{ min}}/U_{s \text{ max}}$ - P.f.	VA	6.1/7.4	7.6/9.2	--	
		0.9		--	
• DC operation	- Closing at $U_{s \text{ min}}/U_{s \text{ max}}$ - Closed at $U_{s \text{ min}}/U_{s \text{ max}}$	W	580/780	770/920	--
		W	6.8/8.2	8.5/10	--
<u>Solid-state operating mechanism</u>					
• AC operation	- Closing at $U_{s \text{ min}}/U_{s \text{ max}}$ - P.f.	VA	420/570	560/750	1 200/1 850
			0.8		1
- Closed at $U_{s \text{ min}}/U_{s \text{ max}}$ - P.f.	VA	5.5/8.5	5.6/9	13.5/49	12.9/30.6
		0.5/0.4		0.15	0.31
• AC operation for 3TF68/3TF69...Q	- Closing at $U_{s \text{ min}}$ - P.f.	VA	--	--	1 000
			--	--	0.99
- Closed at $U_{s \text{ min}}$ - P.f.	VA	--	--	11	1 150
		--	--	1	
• DC operation	- Closing at $U_{s \text{ min}}/U_{s \text{ max}}$ - Closed at $U_{s \text{ min}}/U_{s \text{ max}}$	W	460/630	600/800	--
		W	2.8/3.4	3/3.6	--
• DC economy circuit ¹⁾	- Closing at $U_{s \text{ min}}$ - Closed at $U_{s \text{ min}}$	W	--	--	1 010
		W	--	--	28
PLC control input acc. to IEC 61131-2		Type 2			--
• Rated voltage	V DC	24			--
• Operating range	V DC	17 ... 30			--
• Power consumption	mA	≤ 30			--
Operating times (Total break time = Opening delay + Arcing time)					
(Values apply to cold and warm coil)					
<u>Standard operating mechanism</u>					
• For 0.8 x $U_{s \text{ min}}$... 1.1 x $U_{s \text{ max}}$	- Closing delay	ms	30 ... 95	45 ... 100	--
		- Opening delay	ms	40 ... 80	60 ... 100
• For $U_{s \text{ min}}$... $U_{s \text{ max}}$	- Closing delay	ms	35 ... 50	50 ... 70	--
		- Opening delay	ms	50 ... 80	70 ... 100
<u>Solid-state operating mechanism, actuated via A1/A2</u>					
• AC operation at 0.8 x $U_{s \text{ min}}$... 1.1 x $U_{s \text{ max}}$	- Closing delay	ms	105 ... 145	120 ... 150	70 ... 120 (22 ... 65)
		- Opening delay	ms	80 ... 100	
• AC operation for 3TF68/3TF69...Q at $U_{s \text{ min}}$ (including reversing contactor)	- Closing delay	ms	--	--	35 ... 90
		- Opening delay	ms	--	--
• AC operation at $U_{s \text{ min}}$... $U_{s \text{ max}}$	- Closing delay	ms	110 ... 130	125 ... 150	80 ... 100 (30 ... 45)
		- Opening delay	ms	80 ... 100	
<u>Solid-state operating mechanism, actuated via PLC input</u>					
• For 0.8 x $U_{s \text{ min}}$... 1.1 x $U_{s \text{ max}}$	- Closing delay	ms	45 ... 80	60 ... 90	--
		- Opening delay	ms	80 ... 100	
• DC economy circuit for 0.8 x $U_{s \text{ min}}$... 1.1 x $U_{s \text{ max}}$	- Closing delay	ms	--	--	76 ... 110
		- Opening delay	ms	--	--
• For $U_{s \text{ min}}$... $U_{s \text{ max}}$	- Closing delay	ms	50 ... 65	65 ... 80	--
		- Opening delay	ms	80 ... 100	
• DC economy circuit for $U_{s \text{ min}}$... $U_{s \text{ max}}$	- Closing delay	ms	--	--	80 ... 90
		- Opening delay	ms	--	--
Arcing time		ms	10 ... 15		10 ... 15
Minimum command duration		ms	--		120
For closing		ms	--		90
Minimum interval time between two ON commands		ms	--		100
					300

1) At 24 V DC; for further voltages, deviations of up to ± 10 % are possible.

Power Contactors for Switching Motors




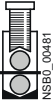
SIRIUS 3RT12 and 3TF6 vacuum contactors

Type Size	SIRIUS vacuum contactors					Vacuum contactors			
	3RT1264	3RT1265	3RT1266	3RT1275	3RT1276	3TF68	3TF69		
	S10			S12		14			
Rated data of the main contacts									
Load rating with AC									
Utilization category AC-1									
Switching resistive loads									
• Rated operational currents I_e	- At 40 °C up to 690 V	A	330		610		700	910	
	- At 40 °C up to 1 000 V	A	330		610		--	--	
	- At 55 °C up to 690 V	A	--		--		630	850	
	- At 55 °C up to 1 000 V	A	--		--		450	800	
	- At 60 °C up to 1 000 V	A	300		550		--	--	
• Rated power for AC loads ¹⁾ with p.f. = 0.95	- At 230 V	kW	113		208		240	323	
	- At 400 V	kW	197		362		415	558	
	- At 500 V	kW	246		452		545	735	
	- At 690 V	kW	340		624		720	970	
	- At 1 000 V	kW	492		905		780	1 385	
• Minimum conductor cross-section for loads with I_e	- At 40 °C	mm ²	185		2 x 185		2 x 240	$I_e \geq 800$ A: 2 x 60 x 5 (copper busbars)	
	- At 55 °C	mm ²	--		--		2 x 185	$I_e < 800$ A: 2 x 240	
	- At 60 °C	mm ²	185		2 x 185		--	--	
Utilization categories AC-2 and AC-3									
• Rated operational currents I_e	- Up to 690 V	A	--		--		630	820	
	- Up to 1 000 V	A	225	265	300	400	500	435	580
• Rated power for slipring or squirrel-cage motors at 50 Hz and 60 Hz	- At 230 V	kW	73	85	97	132	164	200	260
	- At 400 V	kW	128	151	171	231	291	347	450
	- At 500 V	kW	160	189	215	291	363	434	600
	- At 690 V	kW	223	265	288	400	507	600	800
	- At 1 000 V	kW	320	378	428	578	728	600	800
Thermal load capacity, 10 s current		A	1 800	2 120	2 400	3 200	4 000	5 040	7 000
Power loss per conducting path at $I_e/AC-3$		W	9	12	14	21	32	45	70
Utilization category AC-4 (for $I_a = 6 \times I_e$)									
Maximum values:									
• Rated operational current I_e	- Up to 690 V	A	195	230	280	350	430	610	690
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	- At 400 V	kW	110	132	160	200	250	355	400
The following applies to a contact endurance of about 200 000 operating cycles:									
• Rated operational currents I_e	- Up to 690 V	A	97	115	140	175	215	300	360
	- Up to 1 000 V	A	68	81	98	123	151	210	250
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	- At 230 V	kW	30	37	45	56	70	97	110
	- At 400 V	kW	55	65	79	98	122	168	191
	- At 500 V	kW	68	81	98	124	153	210 ²⁾	250 ²⁾
	- At 690 V	kW	94	112	138	172	212	278 ²⁾	335 ²⁾
	- At 1 000 V	kW	95	114	140	183	217	290 ²⁾	350 ²⁾
Switching frequency									
Switching frequency z in operating cycles/hour									
Contactors without overload relays									
• No-load switching frequency	- AC/DC	1/h	Standard operating mechanism: 2 000, Solid-state operating mechanism: 1 000				--	--	
	- AC	1/h	--		--	2 000	1 000		
	- DC	1/h	--		--	--	--		
• Switching frequency z during rated operation ³⁾	- $I_e/AC-1$ at 400 V	1/h	800	750			700		
	- $I_e/AC-2$ at 400 V	1/h	300	250			200		
	- $I_e/AC-3$ at 400 V	1/h	750				500		
	- $I_e/AC-4$ at 400 V	1/h	250				150		
Contactors with overload relays									
• Mean value		1/h	60				15		

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

²⁾ Max. permissible rated operational current $I_e/AC-4 = I_e/AC-3$ up to 500 V, for reduced contact endurance and reduced switching frequency.

³⁾ Dependence of the switching frequency z' on the operational current I' and operational voltage U':
 $z' = z \cdot (I_e/I') \cdot (U_e/U)^{1.5} \cdot 1/h$.

Type Size	SIRIUS vacuum contactors		Vacuum contactors	
	3RT126. S10	3RT127. S12	3TF68 14	3TF69
Conductor cross-sections				
Main conductors (1 or 2 conductors can be connected)				
 Screw terminals				
With mounted box terminals	Type	3RT1966-4G		--
• Terminal screws - Tightening torque	Nm	M12 (hexagon socket, A/F 5) 20 ... 22 (180 ... 195 lb.in)		--
Front clamping point connected				
	• Finely stranded with end sleeve (DIN 46228-1)	mm ²	70 ... 240	--
	• Finely stranded without end sleeve	mm ²	70 ... 240	--
	• Stranded	mm ²	95 ... 300	--
	• AWG cables, solid or stranded	AWG	3/0 ... 600 kcmil	--
• Ribbon cable conductors (number x width x thickness)	mm	Min. 6 x 9 x 0.8; max. 20 x 24 x 0.5		--
Rear clamping point connected				
	• Finely stranded with end sleeve (DIN 46228-1)	mm ²	120 ... 185	--
	• Finely stranded without end sleeve	mm ²	120 ... 185	--
	• Stranded	mm ²	120 ... 240	--
	• AWG cables, solid or stranded	AWG	250 ... 500 kcmil	--
• Ribbon cable conductors (number x width x thickness)	mm	Min. 6 x 9 x 0.8; max. 20 x 24 x 0.5		--
Both clamping points connected				
	• Finely stranded with end sleeve (DIN 46228-1)	mm ²	Min. 2 x 50, max. 2 x 185	--
	• Finely stranded without end sleeve	mm ²	Min. 2 x 50, max. 2 x 185	--
	• Stranded	mm ²	Min. 2 x 70, max. 2 x 240	--
	• AWG cables, solid or stranded	AWG	Min. 2 x 2/0, max. 1 x 500 kcmil	--
• Ribbon cable conductors (number x width x thickness)	mm	Max. 2 x (20 x 24 x 0.5)		--
Cable lug connection				
• Finely stranded with cable lug ¹⁾	mm ²	50 ... 240	--	--
• Stranded with cable lug ¹⁾	mm ²	70 ... 240	--	--
• AWG cables, solid or stranded	AWG	2/0 ... 500 kcmil	--	--
• Terminal screws - Tightening torque	Nm	M10 x 30 (A/F 17) 14 ... 24 (124 ... 210 lb.in)	--	--
Busbar connections				
• Finely stranded with cable lug	mm ²	--	50 ... 240	--
• Stranded with cable lug	mm ²	--	70 ... 240	50 ... 240
• Solid or stranded	AWG	--	2/0 ... 500 MCM	2/0 ... 500 MCM
• Connecting bar (max. width)	mm	25	50	60 (U _b ≤ 690 V), 50 (U _b > 690 V)
• Terminal screws - Tightening torque	Nm lb.in	-- --	M10 x 30 14 ... 24 124 ... 210	M12 x 40 20 ... 35 177 ... 310
With box terminal (see page 3/139)				
• Connectable laminated copper bars	--	--	Yes	--
• Width	mm	--	15 ... 25	15 ... 38
• Max. thickness	mm	--	1 x 26 or 2 x 11	1 x 46 or 2 x 18
• Terminal screw	--	--	A/F 6 (hexagon socket)	A/F 8 (hexagon socket)
• Tightening torque	Nm	--	25 ... 40 (221 ... 354 lb.in)	35 ... 50 (266 ... 443 lb.in)
Auxiliary conductors (1 or 2 conductors connectable)				
• Solid	mm ²	2 x (0.5 ... 1.5) ²⁾ ; 2 x (0.75 ... 2.5) ²⁾ acc. to IEC 60947; max. 2 x (0.75 ... 4)	2 x (0.5 ... 1) ²⁾ /2 x (1 ... 2.5) ²⁾	--
• Finely stranded with end sleeve (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5) ²⁾ ; 2 x (0.75 ... 2.5) ²⁾	2 x (0.5 ... 1) ²⁾ ; 2 x (0.75 ... 2.5) ²⁾	--
• Pin-end connector to DIN 46231	mm ²	--	2 x (1 ... 1.5)	--
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)	2 x (18 ... 12)	--
• Terminal screws - Tightening torque	Nm	M3 (Poqidriv size 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)	-- 0.8 ... 1.4 (7 ... 12 lb.in)	--

¹⁾ When connecting cable lugs according to DIN 46234 for conductor cross-sections larger than 240 mm² and according to DIN 46235 for conductor cross-sections larger than 185 mm², the 3RT1966-4EA1 terminal cover is required to maintain phase separation, see page 3/118.

²⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Power Contactors for Switching Motors

SIRIUS 3RT12 and 3TF6 vacuum contactors

Type Size	SIRIUS vacuum contactors					Vacuum contactors		
	3RT1264 S10	3RT1265	3RT1266	3RT1275 S12	3RT1276	3TF68 14	3TF69	
Ⓢ and Ⓜ rated data								
Rated insulation voltage	V AC	600					600	
Uninterrupted current at 40 °C, open and enclosed	A	330			540		630	820
Maximum horsepower ratings (from Ⓢ and Ⓜ approved values)								
• Rated power for three-phase motors at 60 Hz								
- At 200 V	hp	60	75	100	125	150	231	290
- At 230 V	hp	75	100	125	150	200	266	350
- At 460 V	hp	150	200	250	300	400	530	700
- At 575 V	hp	200	250	300	400	500	664	860
NEMA/EEMAC ratings								
SIZE	hp	--					6	7
• Uninterrupted current								
- Open	A	--					600	820
- Enclosed	A	--					540	810
• Rated power for three-phase motors at 60 Hz								
- At 200 V	hp	--					150	--
- At 230 V	hp	--					200	300
- At 460 V	hp	--					400	600
- At 575 V	hp	--					400	600
Short-circuit protection¹⁾								
	kA	10	18			30	100	
• CLASS L fuse	A	600	700	800	1 000	1 200	1 600	
• Circuit breakers acc. to UL 489	A	500	700	800	1 000	1 200	On request ¹⁾	

¹⁾ For more information about short-circuit values, e.g. for protection against short-circuit currents, see [Certificate of Compliance for the individual devices](#).

For the selection and dimensioning of load feeders, see [UL Configuration Manual](#) and the [UL guide "Industrial Control Panels and Electrical Equipment of Industrial Machinery for North America"](#).