



General Data					
Contactor	Type	Unit of Measure	3RT104		
Mechanical life	Basic units Basic unit with mounted auxiliary contact block Basic unit with mounted solid state compatible auxiliary contact block	Operating cycles	10 million 10 million 5 million		
Rated insulation voltage U_i (pollution severity 3)		V	1000		
Safe isolation between coil and main contacts (according to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	690		
Positively driven contacts			Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the fitted or mounted auxiliary switch blocks. The solid state compatible auxiliary contact blocks have no positively driven contacts.		
Permissible ambient temperature		operation storage	–25 to + 60°C –13 to + 140°F –55 to + 80°C –67 to + 176°F		
Degree of protection according to IEC 947-1 and DIN 40 050			IP 20 ^① , coil system IP 40		
Shock resistance	Rectangular pulse Sine pulse	AC/DC AC/DC	g/ms g/ms 6.8/5 and 4/10 10.6/5 and 6.2/10		
Contactor cross-sections					
Screw connection (1 or 2 conductor connections possible)	Main conductor: with box terminal (according to EN 50 027) finely stranded with end sleeve finely stranded without end sleeve solid stranded flat strip (number × width × depth) AWG conductor connections max. conductor cross-sections	mm ² mm ² mm ² mm ² mm AWG mm	Front terminal connected	Back terminal connected	Both terminals connected
			2.5 to 50 4 to 50 2.5 to 70 4 to 70 6 × 9 × 0.8 10 to 1/0		2.5 to 50 10 to 50 2.5 to 70 10 to 70 6 × 9 × 0.8 10 to 1/0
Connection of drilled copper bars			18 × 10	If the bars larger than 12 × 10 mm are connected, a 3RT1946-4EA1 terminal cover is necessary for meeting the phase clearance.	
Without box terminal With cable lug (1 or 2 conductor connections possible)	finely stranded with cable lug stranded with cable lug AWG conductor connections, solid or stranded Terminal screws Tightening torque	mm ² mm ² AWG	10 to 50 10 to 70 7 to 1/0	If conductors larger than 25 mm ² are connected, a 3RT1946-4EA1 terminal cover is necessary for meeting the phase clearance.	
	Auxiliary conductor solid	Nm (in lbs.)	M6 u 20 (allen-head size 5/32" or 4 mm) 4 to 6 (36 to 53)		
	finely stranded with end sleeve AWG conductor connections, solid or stranded Terminal screws Tightening torque	mm ² mm ² AWG	2 × (0.5 to 1.5); 2 × (0.75 to 2.5) acc. to IEC 947; max. 2 × (0.75 to 4) 2 × (0.5 to 1.5); 2 × (0.75 to 2.5) 2 × (18 to 14)		
		Nm (in lbs.)	M3 0.8 to 1.2 (7 to 10.3)		
Cage Clamp connection (1 or 2 conductor connections possible)	Auxiliary conductors: solid finely stranded with end sleeve finely stranded without end sleeve AWG conductor connections, solid or stranded	mm ² mm ² mm ² AWG	2 × (0.5 to 2.5) 2 × (0.5 to 1.5) 2 × (0.5 to 2.5) 2 × (18 to 14)		
For conductor cross-sections ≤ 1 mm ² an "insulation stop" has to be used, 3RT1916-4JA02.					
Permissible mounting position	The contactors are designed for operation on vertical mounting surface.	 	DC coil: inclination to the front up to 22.5°; coil volt. tolerance changes to 0.85 to 1.1 • U _s		
Short-circuit protection of the 3RT1034 to 3RT1036 contactors without overload relays for export applications					
Contactor	Type		3RT1044	3RT1045	3RT1046
Main circuit Fuses, utilization category gL/gG	NH DIAZED NEOZED	Type 3NA Type 5SB Type 5SE			
With fuses —according to IEC 947-4/DIN VDE 0660 Part 102		Type of coord. "1" ^② Type of coord. "2" ^② Weld-free	A A A	250 125 63	250 160 100
Auxiliary circuit Fuses, utilization category gL/gG (weld-free protection at I _k ≥ 1kA) or miniature circuit breaker with C-characteristic (short circuit current I _k < 400 A)	DIAZED NEOZED	Type 5SB Type 5SE			
With fuses NEOZED, DIAZED With miniature circuit-breaker	gL/gG		A A	10 10	

①Terminal housing IP 00.

②According to excerpt from IEC 947-4/DIN VDE 0660 Part 102:

Type of coordination "1": Destruction of contactor and overload relay is permissible. Contactor and/or

overload relay must be replaced, if necessary.

Type of coordination "2": No damage can be tolerated on the overload relay, but contact welding on the contactor is permitted if the contacts can easily be separated.



Contactor Control						
Contactor	Type	Unit of Measure	3RT1044	3RT1045	3RT1046	
Coil voltage tolerance		AC/DC operation	0.8 to 1.1 × U _s			
Power consumption of the coils (with cold coil and 1.0 • U _s)						
AC coil		Hz	50	60	50	60
	inrush	VA	218	232	270	300
	p.f.		0.61	0.55	0.68	0.52
	sealed	VA	21	20	22	21
	p.f.		0.20	0.28	0.27	0.29
DC coil	inrush = sealed	W	15		15	
Permissible residual current of the electronics (at 0 signal)		AC coil	$< 25 \text{ mA} \times \left(\frac{230\text{V}}{U_s}\right)$			
		DC coil	$< 8.5 \text{ mA} \times \left(\frac{230\text{V}}{U_s}\right)$			
Operating times [Ⓞ] , coil voltage tolerance 0.8 to 1.1 × U _s Break-time = opening time + arcing time						
AC coil	Closing time	ms	16 to 57	17 to 90	17 to 90	
	Opening time	ms	10 to 19	10 to 25	10 to 25	
DC coil	Closing time	ms	90 to 230	90 to 230	90 to 230	
	Opening time	ms	14 to 20	14 to 20	14 to 20	
Arcing time		ms	10 to 15	10 to 15	10 to 15	
Operating times at nominal coil voltage, 1.0 × U_s [Ⓞ]						
AC coil	Closing time	ms	18 to 34	18 to 30	18 to 30	
	Opening time	ms	11 to 18	11 to 23	11 to 23	
DC coil	Closing time	ms	100 to 120	100 to 120	100 to 120	
	Opening time	ms	16 to 20	16 to 20	16 to 20	
Main circuit—AC Load Ratings for export applications						
AC-1 duty, switching resistive load						
Rated operational currents I _e		A	100	120	120	
	at 40°C up to 690V	A	90	100	100	
	at 60°C up to 690V	kW	34	38	38	
Rated output	at 230V	kW	59	66	66	
of three-phase motors	400V	kW	74	82	82	
p.f. = 0.95 (at 60°C)	500V	kW	102	114	114	
	690V	mm ²	35	50	50	
Minimum conductor cross-section at I _e load	at 40°C	mm ²	35	35	35	
	60°C	mm ²				
AC-2 and AC-3 duty						
Rated operational currents I _e		A	65	80	95	
	up to 400V	A	65	80	95	
	500V	A	58	65	65	
	690V	kW	7.5	11	15	
Rated output of motors	up to 127V	kW	15	18.5	22	
with slipring and squirrel-cage rotor at 50 and 60Hz	200V	kW	18.5	22	22	
	220V	kW	18.5	22	22	
	230V	kW	18.5	22	22	
	240V	kW	18.5	22	30	
	380V	kW	30	37	45	
	400V	kW	30	37	45	
	415V	kW	30	45	45	
	440V	kW	37	45	55	
	460V	kW	37	45	55	
	500V	kW	37	45	55	
	575V	kW	45	55	55	
	660V	kW	45	55	55	
	690V	kW	55	55	55	
Thermal load		acc. to VDE 0660 Part 102 10s current	A	600	760	760
Power loss per current path		at I _e /AC-3	W	4.6	7.7	10.8
AC-4 duty, plugging and jogging						
(contactor endurance approx. 200,000 operating cycles at I _b = 6 × I _e)						
Rated operational currents I _e		A	28	34	42	
	up to 400V	A	28	34	42	
	690V	kW	4.8	5.6	6.7	
Rated outputs of motors with	up to 127V	kW	7.6	8.7	10.5	
squirrel-cage rotor at 50 and 60Hz	200V	kW	8.3	9.6	11.6	
	220V	kW	8.7	10	12.1	
	230V	kW	9.1	10.5	12.6	
	240V	kW	14.4	16.6	20	
	380V	kW	15.1	17.5	22	
	400V	kW	15.7	18.2	21.8	
	415V	kW	16.6	19.3	23.2	
	440V	kW	17.4	20.1	24.2	
	460V	kW	18.4	22.4	27	
	500V	kW	18.4	22.4	27	
	575V	kW	24.3	29.5	36	
	660V	kW	25.4	30.9	38	
	690V	kW				

[Ⓞ]The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils

are protected against voltage peaks (varistor +2 ms to 5 ms, diode assemblies 2 to 6 times).



Main circuit—AC Load Ratings for export applications										
Contactor	Type	Unit of Measure	3RT1044			3RT1045		3RT1046		
AC-5a duty, switching gas discharge lamps per main current path at 230V										
	Rating per lamp Uncorrected	Rated operational current per lamp (A)								
	L 18 W	0.37	Number	243		270		270		
	L 36 W	0.43	Number	209		232		232		
	L 58 W	0.67	Number	134		149		149		
	Lead-lag									
	L 18 W	0.11	Number	818		909		909		
	L 36 W	0.21	Number	428		476		476		
	L 58 W	0.32	Number	281		312		312		
Switching gas discharge lamps with p.f. correction, electronic ballast per main current path at 230V										
	Rating per lamp Capacitor (µF)	Rated operational current per lamp (A)								
Parallel correction										
	L 18 W	0.11	Number	160		197		234		
	L 36 W	0.21	Number	160		197		234		
	L 58 W	0.32	Number	103		127		150		
With electronic ballast, single lamp										
	L 18 W	0.10	Number	455		560		665		
	L 36 W	0.18	Number	253		311		369		
	L 58 W	0.27	Number	168		207		246		
With electronic ballast, twin lamp										
	L 18 W	0.18	Number	253		311		369		
	L 36 W	0.35	Number	130		160		190		
	L 58 W	0.52	Number	88		108		128		
AC-5b duty, switching incandescent lamps per main current path at 230/220V										
			kW	9		14.6		17.3		
AC-6a duty, switching three-phase transformers for inrush factor										
	Rated operational current I_e		n	30	20	30	20	30	20	
		at 400V	A	42.3	63.5	56.3	80	56.3	84.4	
		at 690V	A	42.3	47	56.3	58	56.3	58	
	Rated output of three-phase transformers at an inrush of $n = 30$ or 20 . For deviating switching inrush factors x , the power must be recalculated as follows:		kVA	16.8	25.3	22.4	31.9	22.4	33.6	
		230V	kVA	29.3	43.9	39	55.4	39	58	
		400V	kVA	36.6	54.9	48.7	69.3	48.7	73.1	
		500V	kVA	50.5	56.2	67.3	69.3	67.3	69.3	
		690V	kVA							
				$P_x = P_{n30} \cdot \frac{30}{x}$						
Main current—DC Load Ratings										
DC-1 duty, switching resistive load ($L/R \leq 1$ ms)										
	Rated operational current I_e (at 60°C/140°F)	Number of conducting paths in series		1	2	3	1	2	3	
		up to 24V	A	90	90	90	80	80	80	
		60V	A	23	90	90	60	80	80	
		110V	A	4.5	90	90	9	80	80	
		220V	A	1	5	70	2	10	80	
		440V	A	0.4	1	2.9	0.6	1.8	4.5	
		600V	A	0.26	0.8	1.4	0.4	1	2.6	
DC-3 and DC-5 duty, shunt and series motors ($L/R \leq 15$ ms)										
	Rated operational current I_e (at 60°C/140°F)	Number of conducting paths in series		1	2	3	1	2	3	
		up to 24V	A	40	90	90	40	100	100	
		60V	A	6	90	90	6.5	100	100	
		110V	A	2.5	90	90	2.5	100	100	
		220V	A	1	7	35	1	7	35	
		440V	A	0.15	0.42	0.8	0.15	0.42	0.8	
		600V	A	0.06	0.16	0.35	0.06	0.16	0.35	
Switching frequency										
Switching frequency z in operating cycles per hour (1/h)										
	Contactors without overload relay	No-load switching frequency	coil	1/h	AC	DC	AC	DC	AC	DC
					5000	1000	5000	1000	5000	1000
	Interdependence of switching frequency z' of rated operational current and the rated operational voltage:	at AC-1 at AC-2 at AC-3 at AC-4	coil	1/h	AC/DC		AC/DC		AC/DC	
					1000		900		900	
					1/h		400		350	
					1/h		1000		850	
					1/h		300		250	
	$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400V}{U'}\right)^{1.5}$ 1/h									
	Contactors with overload relay (average value)			1/h	15		15		15	
Weight										
		AC coil	kg	1.78			1.78		1.78	
		DC coil	kg	2.68			2.68		2.68	