

# 3RT, 3TB, 3TF Contactors for Switching Motors

3RT10 contactors, 3-pole, 3 ... 250 kW

## Technical specifications

*SIRIUS controls are climate-proof and are suitable and tested for use worldwide.*

*If the devices are used in ambient conditions which deviate from common industrial conditions (EN 60721-3-3 "Stationary Use,*

*Weather-Protected"), the manufacturer must be consulted about possible restrictions with regard to the reliability and endurance of the device and possible protective measures.*

Contactor	Type Size	3RT1 S00 to S12
<b>Rated data of the auxiliary contacts</b>		
<b>According to IEC 60947-5-1/EN 60947-5-1 (VDE 0660 Part 200)</b>		
The data apply to integrated auxiliary contacts and contacts in the auxiliary switch blocks for contactor sizes S00 to S12 <sup>1)</sup>		
<b>Rated insulation voltage <math>U_i</math></b> (degree of pollution 3)	V	690
For 3RH19 21-. laterally mountable auxiliary switch blocks	V	Max. 500
<b>Continuous thermal current <math>I_{th}</math> = Rated operational current <math>I_e</math>/AC-12</b>	A	10
<b>AC load</b>		
<b>Rated operational current <math>I_e</math>/AC-15/AC-14</b>		
for rated operational voltage $U_e$		
	24 V A	6
	110 V A	6
	125 V A	6
	220 V A	6
	230 V A	6
	380 V A	3
	400 V A	3
	500 V A	2
	660 V <sup>2)</sup> A	1
	690 V <sup>2)</sup> A	1
<b>DC load</b>		
<b>Rated operational current <math>I_e</math>/DC-12</b>		
for rated operational voltage $U_e$		
	24 V A	10
	60 V A	6
	110 V A	3
	125 V A	2
	220 V A	1
	440 V A	0.3
	600 V <sup>2)</sup> A	0.15
<b>Rated operational current <math>I_e</math>/DC-13</b>		
for rated operational voltage $U_e$		
	24 V A	10 <sup>1)</sup>
	60 V A	2
	110 V A	1
	125 V A	0.9
	220 V A	0.3
	440 V A	0.14
	600 V <sup>2)</sup> A	0.1
• <b>Contact reliability at 17 V, 1 mA</b> according to EN 60947-5-4		Frequency of contact faults $<10^{-8}$ i.e. $<1$ fault per 100 million operating cycles

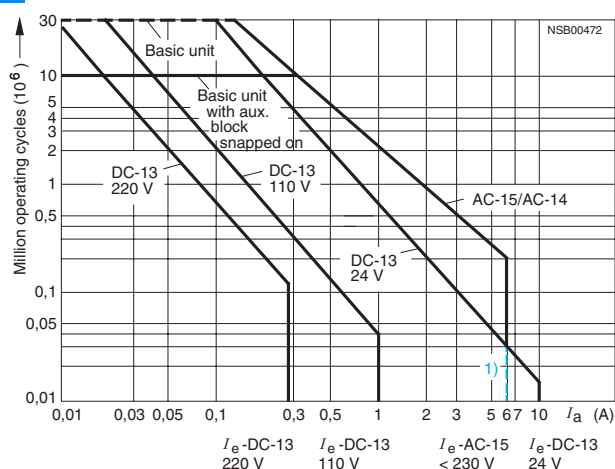
## Endurance of the auxiliary contacts

It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

The contact endurance is mainly dependent on the breaking current.

The characteristic curves apply to

- Integrated auxiliary contacts for 3RT10
- 3RH19 11, 3RH19 21 auxiliary switch blocks for contactor sizes S00 to S12.



<sup>1)</sup> Attachable auxiliary switch blocks for size S00 and laterally mountable auxiliary switch blocks for S0 to S12: 6 A.

<sup>2)</sup> Up to 500 V switching capacity for laterally mountable auxiliary switch blocks.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

### Endurance of the main contacts

The characteristic curves show the contact endurance of the contactors when switching resistive and inductive AC loads (AC-1/AC-3) depending on the breaking current and rated operational voltage. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

The rated operational current  $I_e$  complies with utilization category AC-4 (breaking six times the rated operational current) and is intended for a contact endurance of at least 200 000 operating cycles.

If a shorter endurance is sufficient, the rated operational current  $I_e$ /AC-4 can be increased.

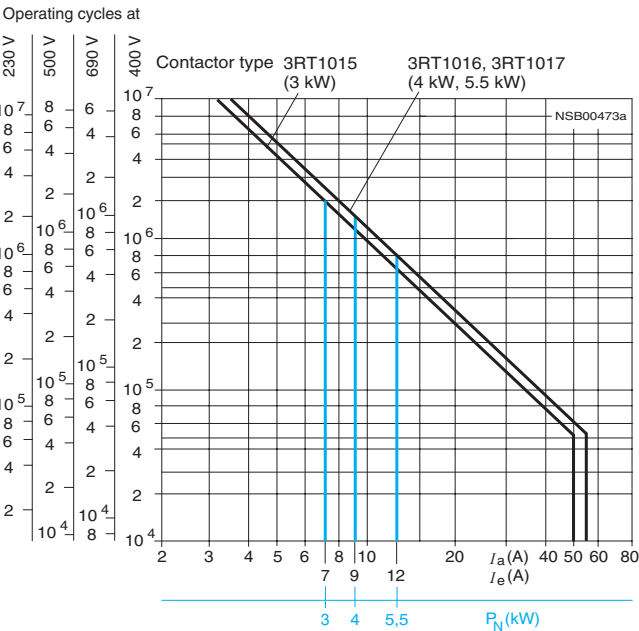
If the contacts are used for **mixed operation**, i.e. if normal switching (breaking the rated operational current according to utilization category AC-3) in combination with intermittent inching (breaking several times the rated operational current according to utilization category AC-4), the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100} \left( \frac{A}{B} - 1 \right)}$$

Characters in the equation:

- X Contact endurance for mixed operation in operating cycles
- A Contact endurance for normal operation ( $I_a = I_e$ ) in operating cycles
- B Contact endurance for inching ( $I_a = \text{multiple of } I_e$ ) in operating cycles
- C Inching operations as a percentage of total switching operations

### Size S00



### Size S0

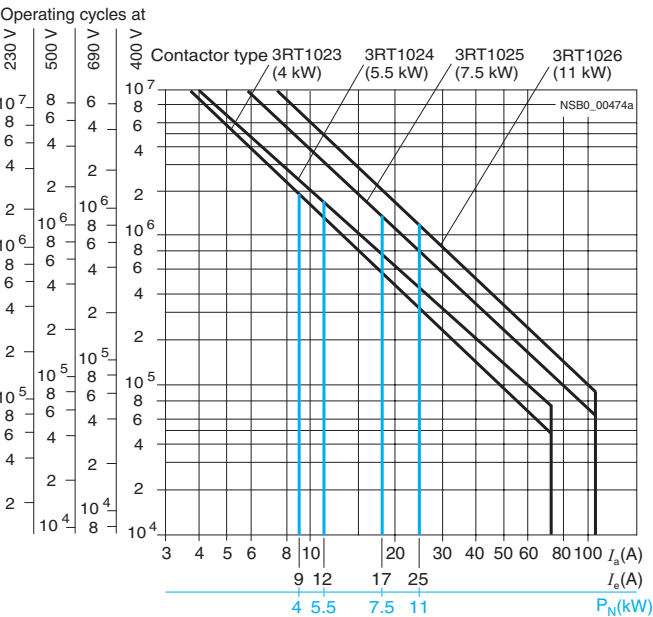


Diagram legend:

$P_N$ = Rated power for squirrel-cage motors at 400 V

$I_a$ = Breaking current

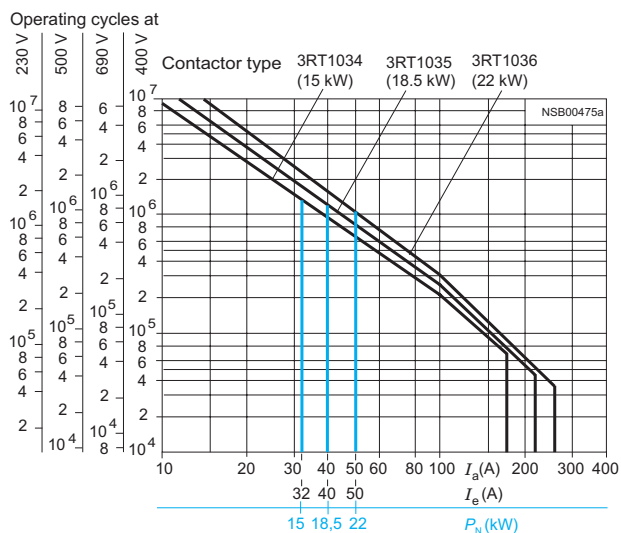
$I_e$ = Rated operational current

# 3RT, 3TB, 3TF Contactors for Switching Motors

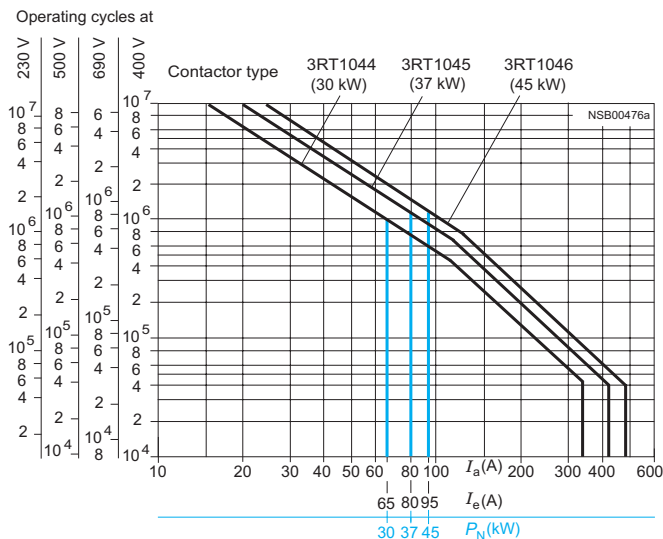
3RT10 contactors, 3-pole, 3 ... 250 kW

## Endurance of the main contacts

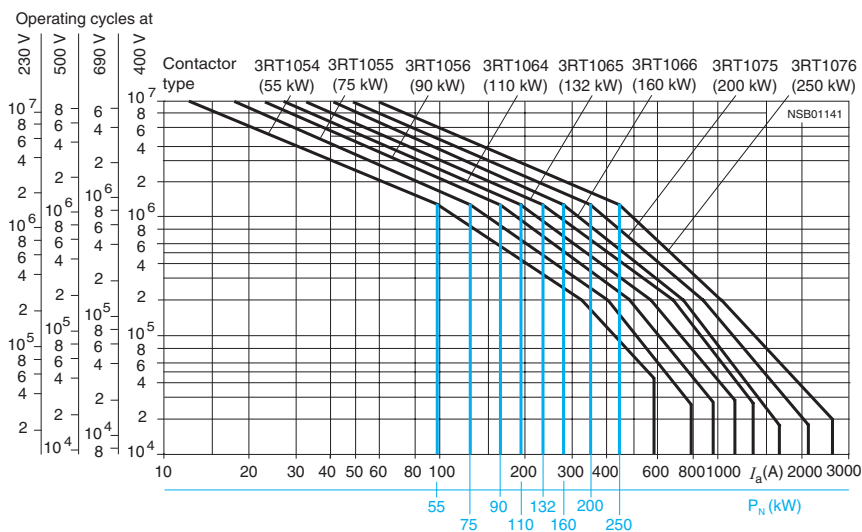
### Size S2



### Size S3



### Sizes S6 to S12



### 3RT12 vacuum contactors

#### Sizes S10 and S12

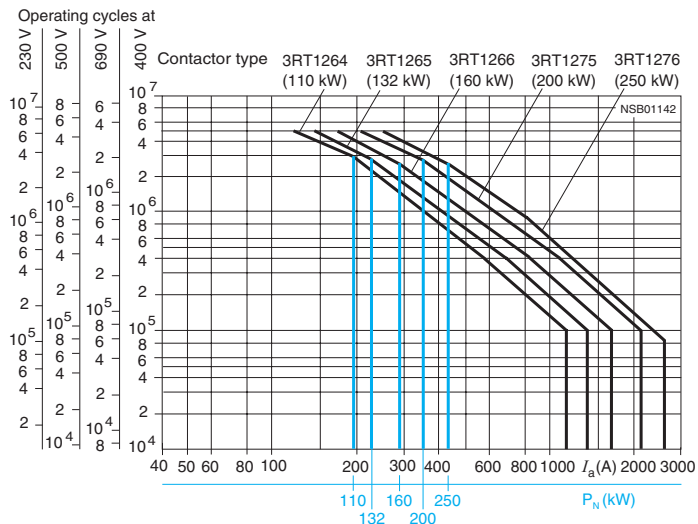


Diagram legend:

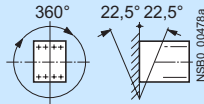

$P_N$  = Rated power for squirrel-cage motors at 400 V

$I_a$  = Breaking current

$I_e$  = Rated operational current

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 1. S00
<b>General data</b>			
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.	AC and DC operation		
Upright mounting position:	AC operation		
	DC operation		Special version required. Standard version
<b>Mechanical endurance</b>	Basic unit	Operating cycles	30 million
	Basic unit with snap-on auxiliary switch block		10 million
	Solid-state compatible auxiliary switch block		5 million
<b>Electrical endurance</b>			1)
<b>Rated insulation voltage</b> $U_i$ (degree of pollution 3)		V	690
<b>Rated impulse withstand voltage</b> $U_{imp}$		kV	6
<b>Safe isolation</b> between the coil and the main contacts according to EN 60947-1, Appendix N		V	400
<b>Mirror contacts</b> • A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.	3RT10 1., 3RT13 1. (removable auxiliary switch block)		Yes, this applies to both the basic unit as well as to between the basic unit and the mounted auxiliary switch block according to EN 60947-4-1, Appendix F.
	3RT10 1., 3RT13 1. (permanent auxiliary switch block)		Yes, according to EN 60947-4-1, Appendix F, SUVA
• No mirror contacts for the solid-state compatible auxiliary switch blocks	3RH19 11-.NF..		
<b>Ambient temperature</b>	During operation	°C	-25 ... +60
	During storage	°C	-55 ... +80
<b>Degree of protection</b> according to EN 60947-1, Appendix C			IP20, coil assembly IP40
<b>Touch protection</b> according to EN 50274			Finger-safe
<b>Shock resistance</b> rectangular pulse	AC operation	g/ms	7/5 and 4.2/10
	DC operation	g/ms	7/5 and 4.2/10
<b>Shock resistance</b> sine pulse	AC operation	g/ms	9.8/5 and 5.9/10
	DC operation	g/ms	9.8/5 and 5.9/10
<b>Conductor cross-sections</b>			2)
<b>Short-circuit protection for contactors without overload relays</b>			
For short-circuit protection for contactors with overload relays see Protection Equipment: Overload Relays For short-circuit protection for fuseless load feeders see Load Feeders, Motor Starters and Soft Starters: -> 3RA Fuseless Load Feeders.			
<b>Main circuit</b>			
• Fuse links gL/gG LV HRC 3NA, DIAZED 5SB, NEOZED 5SE - Acc. to IEC 60947-4-1/ EN 60947-4-1	Type of coordination "1"	A	35
	Type of coordination "2"	A	20
	Weld-free <sup>3)</sup>	A	10
		A	10
• Miniature circuit breakers (up to 230 V) with C characteristic Short-circuit current 1 kA, type of coordination "1"		A	10
<b>Auxiliary circuit</b>			
• Fuse links gL/gG DIAZED 5SB, NEOZED 5SE (weld-free protection $I_k \geq 1$ kA)		A	10
		A	6
• Miniature circuit breakers up to 230 V with C characteristic Short-circuit current $I_k < 400$ A		A	6

1) See endurance of the main contacts on page 3/18.

2) For conductor cross-sections see page 3/23.

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

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor		Type Size	3RT10 1. S00	
Control				
Magnetic coil operating range				
• AC operation	50 Hz 60 Hz		0.8 ... 1.1 x $U_s$ 0.85 ... 1.1 x $U_s$	
• DC operation	up to 50 °C up to 60 °C		0.8 ... 1.1 x $U_s$ 0.85 ... 1.1 x $U_s$	
Power consumption of the magnetic coils (when coil is cold and 1.0 x $U_s$ )				
AC operation, 50/60 Hz				
Standard version	• Closing	VA	27/24.3	
	• P.f.		0.8/0.75	
	• Closed	VA	4.4/3.4	
	• P.f.		0.27/0.27	
AC operation, 50 Hz, USA/Canada	• Closing	VA	26.4	
	• P.f. for closing		0.81	
	• Closed	VA	4.7	
	• P.f. for closed		0.26	
AC operation, 60 Hz, USA/Canada	• Closing	VA	31.7	
	• P.f. for closing		0.77	
	• Closed	VA	5.1	
	• P.f. for closed		0.27	
DC operation	Closing = Closed	W	3.3	
Permissible residual current of the electronics (with 0 signal)				
• AC operation			< 3 mA x (230 V/ $U_s$ ), the 3RT19 16-1GA00 additional load module is recommended for a higher residual current	
• DC operation			< 10 mA x (24 V/ $U_s$ ), the 3RT19 16-1GA00 additional load module is recommended for a higher residual current	
Operating times <sup>1)</sup>				
Total break time = Opening delay + Arcing time				
• AC operation at 0.8 ... 1.1 x $U_s$	Closing delay	ms	8 ... 35	
	Opening delay	ms	4 ... 30	
• DC operation at 0.85 ... 1.1 x $U_s$	Closing delay	ms	25 ... 100	
	Opening delay	ms	7 ... 10	
• Arcing time		ms	10 ... 15	
Operating times for 1.0 x $U_s$ <sup>1)</sup>				
• AC operation	Closing delay	ms	10 ... 25	
	Opening delay	ms	5 ... 30	
• DC operation	Closing delay	ms	30 ... 50	
	Opening delay	ms	7 ... 9	

<sup>1)</sup> 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 (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 ms to 5 ms).

Contactor	Type Size	3RT10 15 S00	3RT10 16 S00	3RT10 17 S00
<b>Main circuit</b>				
<b>AC capacity</b>				
<b>Utilization category AC-1 Switching resistive loads</b>				
Rated operational current $I_e$	at 40 °C up to 690 V	A	18	22
	at 60 °C up to 690 V	A	16	20
Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	230 V	kW	6.3	7.5
	400 V	kW	11	13
	500 V	kW	13.8	17
	690 V	kW	19	22
Minimum conductor cross-section for loads with $I_e$	at 40 °C	mm <sup>2</sup>	2.5	2.5
	at 60 °C	mm <sup>2</sup>	2.5	2.5
<b>Utilization category AC-2 and AC-3</b>				
Rated operational currents $I_e$	up to 400 V	A	7	9
	440 V	A	7	9
	500 V	A	5	6.5
	690 V	A	4	5.2
Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	at 230 V	kW	2.2	3
	400 V	kW	3	4
	500 V	kW	3.5	4.5
	690 V	kW	4	5.5
<b>Thermal load capacity</b>	10 s current <sup>2)</sup>	A	56	72

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

<sup>2)</sup> According to IEC 60947-4-1. For rated values for various start-up conditions see Protection Equipment: Overload Relays.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 15 S00	3RT10 16 S00	3RT10 17 S00
Main circuit					
AC capacity					
Power loss per conducting path	at $I_e$ /AC-3	W	0.42	0.7	1.24
Utilization category AC-4 (for $I_a = 6 \times I_e$ ) <sup>1)</sup>					
Rated operational current $I_e$	up to 400 V	A	6.5	8.5	8.5
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	up to 400 V	kW	3	4	4
• The following applies to a contact endurance of about 200000 operating cycles:					
- Rated operational currents $I_e$	up to 400 V	A	2.6	4.1	4.1
	690 V	A	1.8	3.3	3.3
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 230 V	kW	0.67	1.1	1.1
	400 V	kW	1.15	2	2
	500 V	kW	1.45	2	2
	690 V	kW	1.15	2.5	2.5
Utilization category AC-5a					
Switching gas discharge lamps, inductive ballast					
Per main current path at 230 V					
• Uncorrected, rated power per lamp/rated operational current per lamp					
	L 18 W/0.37 A	Units	30	43	43
	L 36 W/0.43 A	Units	26	37	37
	L 58 W/0.67 A	Units	16	23	23
• Lead-lag circuit, rated power per lamp/rated operational current per lamp					
	L 18 W/0.11 A	Units	100	144	144
	L 36 W/0.21 A	Units	54	76	76
	L 58 W/0.32 A	Units	35	50	50
Switching gas discharge lamps with correction					
Per main current path at 230 V					
• Shunt compensation with inductive ballast, rated power per lamp/capacitance/ rated operational current per lamp					
	L 18 W/4.5 µF/0.11 A	Units	16	22	22
	L 36 W/4.5 µF/0.21 A	Units	16	22	22
	L 58 W/7.0 µF/0.32 A	Units	10	14	14
• With solid-state ballast (single lamp)					
	L 18 W/6.8 µF/0.10 A	Units	44	63	63
	L 36 W/6.8 µF/0.18 A	Units	25	35	35
	L 58 W/10 µF/0.27 A	Units	16	23	23
• With solid-state ballast (two lamps)					
	L 18 W/10 µF/0.18 A	Units	25	35	35
	L 36 W/10 µF/0.35 A	Units	13	18	18
	L 58 W/22 µF/0.52 A	Units	8	12	12
Utilization category AC-5b, switching incandescent lamps					
Per main current path at 230/220 V					
Utilization category AC-6a					
Switching AC transformers					
Rated operational current $I_e$					
• For inrush current n = 20	up to 400 V	A	3.6	5.1	7.2
	up to 400 V	A	2.4	3.3	5.1
Rated power P					
• For inrush current n = 20	at 230 V	kVA	1.4	2	2.9
	400 V	kVA	2.5	3.5	5
	500 V	kVA	3.3	4.6	6.2
	690 V	kVA	4.3	6	8.6
• For inrush current n = 30	at 230 V	kVA	1	1.3	2
	400 V	kVA	1.6	2.3	3.5
	500 V	kVA	2.2	3.1	4.6
	690 V	kVA	2.9	4	6
For deviating inrush current factors x, the power must be recalculated as follows:					
$P_x = P_{n\ 30} \cdot 30/x$					

<sup>1)</sup> The data only apply to 3RT15 16 and 3RT15 17 (2 NO + 2 NC) up to a rated operational voltage of 400 V.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 15 S00	3RT10 16 S00	3RT10 17 S00
<b>Main circuit</b>				
<b>Load rating with DC</b>				
<b>Utilization category DC-1</b>				
<b>Switching resistive loads (<math>L/R \leq 1\text{ ms}</math>)</b>				
Rated operational current $I_e$ (at 60 °C)				
• 1 conducting path	up to 24 V A	15	20	
	60 V A	15	20	
	110 V A	1.5	2.1	
	220 V A	0.6	0.8	
	440 V A	0.42	0.6	
	600 V A	0.42	0.6	
• 2 conducting paths in series	up to 24 V A	15	20	
	60 V A	15	20	
	110 V A	8.4	12	
	220 V A	1.2	1.6	
	440 V A	1.6	0.8	
	600 V A	0.5	0.7	
• 3 conducting paths in series	up to 24 V A	15	20	
	60 V A	15	20	
	110 V A	15	20	
	220 V A	15	20	
	440 V A	0.9	1.3	
	600 V A	0.7	1	
<b>Utilization category DC-3 and DC-5</b>				
<b>Shunt-wound and series-wound motors (<math>L/R \leq 15\text{ ms}</math>)</b>				
Rated operational current $I_e$ (at 60 °C)				
• 1 conducting path	up to 24 V A	15	20	
	60 V A	0.35	0.5	
	110 V A	0.1	0.15	
	220 V A	--	--	
	440 V A	--	--	
	600 V A	--	--	
• 2 conducting paths in series	up to 24 V A	15	20	
	60 V A	3.5	5	
	110 V A	0.25	0.35	
	220 V A	--	--	
	440 V A	--	--	
	600 V A	--	--	
• 3 conducting paths in series	up to 24 V A	15	20	
	60 V A	15	20	
	110 V A	15	20	
	220 V A	1.2	1.5	
	440 V A	0.14	0.2	
	600 V A	0.14	0.2	
<b>Switching frequency</b>				
<b>Switching frequency z</b> in operating cycles/hour				
• Contactors without overload relay	No-load switching frequency AC	$\text{h}^{-1}$	10000	
	No-load switching frequency DC	$\text{h}^{-1}$	10000	
	Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400\text{ V}/U')^{1.5} \cdot 1/\text{h}$	Rated operation		
		AC-1 (AC/DC)	$\text{h}^{-1}$	1000
		AC-2 (AC/DC)	$\text{h}^{-1}$	750
		AC-3 (AC/DC)	$\text{h}^{-1}$	750
• Contactors with overload relays (mean value)		AC-4 (AC/DC)	$\text{h}^{-1}$	250
			$\text{h}^{-1}$	15
<b>Conductor cross-sections</b>				
• <b>Screw terminals</b> (1 or 2 conductors can be connected) For standard screwdriver size 2 and Pozidriv 2	<b>Main and auxiliary conductors:</b>			
	• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup> according to IEC 60947; max. 2 x (1 ... 4)	
	• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup>	
	• Solid or stranded, AWG conductors	AWG	2 x (20 ... 16) <sup>1)</sup> ; 2 x (18 ... 14) <sup>1)</sup> ; 1 x 12	
• <b>Cage Clamp terminals</b> (1 or 2 conductors can be connected)	• Terminal screw		M3	
	- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)	
	<b>Main and auxiliary conductors; coil connections:</b>			
	• Solid	mm <sup>2</sup>	2 x (0.25 ... 2.5)	
	• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 ... 1.5)	
	• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.25 ... 2.5)	
	• AWG conductors, solid or stranded	AWG	2 x (24 ... 14)	

For tools for opening Cage Clamp terminals see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

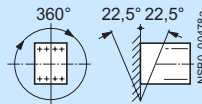

Maximum outer diameter of the conductor insulation: 3.6 mm.

With conductor cross-sections  $\leq 1\text{ mm}^2$  an "insulation stop" must be used, see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

<sup>1)</sup> If two different conductor cross-sections are connected at one clamping point, then the two cross-sections must lie within the range quoted. If identical cross-sections are used, this restriction does not apply.

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## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 23 S0	3RT10 24 S0	3RT10 25 S0	3RT10 26 S0
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.	AC and DC operation					
Upright mounting position:	AC operation		 Standard version			
	DC operation		Special version required, also applies to 3RT10 2.-.K.40. coupling relays.			
Mechanical endurance	Basic unit	Operating cycles	10 million			
	Basic unit with snap-on auxiliary switch block		10 million			
	Solid-state compatible auxiliary switch block		5 million			
Electrical endurance			1)			
Rated insulation voltage $U_i$ (degree of pollution 3)		V	690			
Rated impulse withstand voltage $U_{imp}$		kV	6			
Safe isolation between the coil and the main contacts (according 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.	3RT10 2., 3RT13 2. (removable auxiliary switch block)		Yes, according to EN 60947-4-1, Appendix F			
• Mirror contacts with solid-state compatible auxiliary switch blocks according to SUVA requirements on request.	3RT10 2., 3RT13 2. (permanent auxiliary switch block)		Yes, according to EN 60947-4-1, Appendix F, SUVA			
Permissible ambient temperature	During operation	°C	-25 ... +60			
	During storage	°C	-55 ... +80			
Degree of protection according to EN 60947-1, Appendix C			IP20, coil assembly IP20			
Touch protection according to EN 50274			Finger-safe			
Shock resistance rectangular pulse	AC operation	g/ms	8.2/5 and 4.9/10			
	DC operation	g/ms	10/5 and 7.5/10			
Shock resistance sine pulse	AC operation	g/ms	12.5/5 and 7.8/10			
	DC operation	g/ms	15/5 and 10/10			
Conductor cross-sections			2)			
Short-circuit protection for contactors without overload relays						
Main circuit						
• Fuse links gL/gG LV HRC 3NA, DIAZED 5SB, NEOZED 5SE			For short-circuit protection for contactors with overload relays see Protection Equipment: Overload Relays For short-circuit protection for fuseless load feeders see Load Feeders, Motor Starters and Soft Starters: -> 3RA Fuseless Load Feeders.			
- Acc. to IEC 60947-4-1/ EN 60947-4-1	Type of coordination "1"	A	63	100		
	Type of coordination "2"	A	25	35		
	Weld-free <sup>3)</sup>	A	10	16		
• Miniature circuit breakers with C characteristic (short-circuit current 3 kA, type of coordination "1")		A	25	32		
Auxiliary circuit						
• Fuse links gL/gG DIAZED 5SB, NEOZED 5SE (weld-free protection at $I_k \geq 1$ kA)		A	10			
• Miniature circuit breaker with C characteristic (short-circuit current $I_k < 400$ A)		A	10			

1) See endurance of the main contacts on page 3/18.

2) See conductor cross-sections on page 3/28.

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



# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 2. S0
<b>Control</b>			
<b>Magnetic coil operating range</b>	AC/DC		$0.8 \dots 1.1 \times U_s$
<b>Power consumption of the magnetic coils</b> (when coil is cold and $1.0 \times U_s$ )			
AC operation, 50 Hz, standard version	• Closing	VA	61
	• P.f.		0.82
	• Closed	VA	7.8
	• P.f.		0.24
AC operation, 50/60 Hz, standard version	• Closing	VA	64/63
	• P.f.		0.72/0.74
	• Closed	VA	8.4/6.8
	• P.f.		0.24/0.28
AC operation, 50 Hz, USA/Canada	• Closing	VA	61
	• P.f.		0.82
	• Closed	VA	7.8
	• P.f.		0.24
AC operation, 60 Hz, USA/Canada	• Closing	VA	69
	• P.f.		0.76
	• Closed	VA	7.5
	• P.f.		0.28
DC operation	Closing = Closed	W	5.4
<b>Permissible residual current of the electronics</b> (with 0 signal)			
	• AC operation	mA	$< 6 \text{ mA} \times (230 \text{ V}/U_s)$
	• DC operation	mA	$< 16 \text{ mA} \times (24 \text{ V}/U_s)$
<b>Operating times for <math>0.8 \dots 1.1 \times U_s</math><sup>1)</sup></b>			
Total break time = Opening delay + Arcing time			
• AC operation	Closing delay	ms	8 ... 44
	Opening delay	ms	4 ... 20
• DC operation	Closing delay	ms	50 ... 170
	Opening delay	ms	13.5 ... 15.5
• Arcing time		ms	10
<b>Operating times for <math>1.0 \times U_s</math><sup>1)</sup></b>			
• AC operation	Closing delay	ms	10 ... 17
	Opening delay	ms	4 ... 20
• DC operation	Closing delay	ms	55 ... 85
	Opening delay	ms	14 ... 15.5

<sup>1)</sup> 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).

Contactor	Type Size		3RT10 23 S0	3RT10 24 S0	3RT10 25 S0	3RT10 26 S0
<b>Main circuit</b>						
<b>AC capacity</b>						
<b>Utilization category AC-1</b>						
<b>Switching resistive loads</b>						
Rated operational current $I_e$	at 40 °C up to 690 V	A	40			
	at 60 °C up to 690 V	A	35			
Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	230 V	kW	13.3			
	400 V	kW	23			
	500 V	kW	29			
	690 V	kW	40			
Minimum conductor cross-section for loads with $I_e$	at 40 °C	mm <sup>2</sup>	10			
	at 60 °C	mm <sup>2</sup>	10			
<b>Utilization category AC-2 and AC-3</b>						
Rated operational currents $I_e$	up to 400 V	A	9	12	17	25
	440 V	A	9	12	17	22
	500 V	A	6.5	12	17	18
	690 V	A	5.2	9	13	13
Rated power for slipring or squirrel- cage motors at 50 and 60 Hz	at 110 V	kW	1.1	1.5	2.2	3
	230 V	kW	3	3	4	5.5
	400 V	kW	4	5.5	7.5	11
	500 V	kW	4.5	7.5	10	11
	660 V / 690 V	kW	5.5	7.5	11	11
<b>Thermal load capacity</b>	10 s current <sup>2)</sup>	A	80	110	150	200
<b>Power loss per conducting path</b>	at $I_e$ /AC-3	W	0.4	0.5	0.9	1.6

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

<sup>2)</sup> According to IEC 60947-4-1.  
For rated values for various start-up conditions see Protection Equipment: Overload Relays.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type		3RT10 23	3RT10 24	3RT10 25	3RT10 26
	Size		S0	S0	S0	S0
Main circuit						
AC capacity						
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
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 400 V	kW	4	5.5	7.5	7.5
• 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
	690 V	A	3.3	5.5	7.7	9
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 110 V	kW	0.5	0.73	1	1.2
	230 V	kW	1.1	1.5	2	2.5
	400 V	kW	2	2.6	3.5	4.4
	500 V	kW	2	3.3	4.6	5.6
	690 V	kW	2.5	4.6	6	7.7
Utilization category AC-5a						
Switching gas discharge lamps, inductive ballast						
Per main current path at 230 V <sup>1)</sup>						
Rated power per lamp/rated operational current per lamp						
Uncorrected	L 18 W/0.37 A	Units	95			
	L 36 W/0.43 A	Units	81			
	L 58 W/0.67 A	Units	52			
Lead-lag circuit	L 18 W/0.11 A	Units	318			
	L 36 W/0.21 A	Units	166			
	L 58 W/0.32 A	Units	109			
Switching gas discharge lamps with correction						
Per main current path at 230 V						
Rated power per lamp/capacitance/rated operational current per lamp						
• Shunt compensation with inductive ballast	L 18 W/4.5 µF/0.11 A	Units	37			61
	L 36 W/4.5 µF/0.21 A	Units	37			61
	L 58 W/7.0 µF/0.32 A	Units	23			39
• With solid-state ballast (single lamp)	L 18 W/6.8 µF/0.10 A	Units	105			175
	L 36 W/6.8 µF/0.18 A	Units	58			97
	L 58 W/10 µF/0.27 A	Units	38			64
• With solid-state ballast (two lamps)	L 18 W/10 µF/0.18 A	Units	58			97
	L 36 W/10 µF/0.35 A	Units	30			50
	L 58 W/22 µF/0.52 A	Units	20			33
Utilization category AC-5b, switching incandescent lamps						
Per main current path at 230/220 V						
		kW	3			4
Utilization category AC-6a, switching AC transformers						
Rated operational current $I_e$						
• For inrush current n = 20	up to 400 V	A	11.4			20.2
	up to 400 V	A	7.6			13.5
Rating P						
• For inrush current n = 20	at 230 V	kVA	4.5			8
	400 V	kVA	7.9			13.9
	500 V	kVA	9.9			15.5
	690 V	kVA	13.6			15.5
• For inrush current n = 30	at 230 V	kVA	3			5.4
	400 V	kVA	5.2			9.3
	500 V	kVA	6.6			11.7
	690 V	kVA	9.1			15.5
For deviating inrush current factors x, the power must be recalculated as follows: $P_x = P_{n30} \cdot 30/x$						
Utilization category AC-6b , switching low-inductance (low-loss, metallized dielectric) AC capacitors						
Rated operational currents $I_e$	up to 400 V	A	5.8			10.8
Rated power for single capacitors or banks of capacitors (minimum inductance of 6 µH between capacitors connected in parallel) at 50 Hz, 60 Hz and	at 230 V	kvar	2.5			4
	400 V	kvar	4			7.5
	500 V	kvar	4			7.5
	690 V	kvar	4			7.5

<sup>1)</sup> For  $I_e/AC-1 = 35$  A (60 °C) and the corresponding minimum conductor cross-section 10 mm<sup>2</sup>.

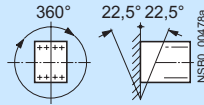

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 23 S0	3RT10 24 S0	3RT10 25 S0	3RT10 26 S0	
Main circuit							
Load rating with DC							
Utilization category DC-1, switching of resistive loads ( $L/R \leq 1$ ms)							
Rated operational current $I_e$ (for 60 °C)							
• 1 conducting path	up to 24 V	A	35				
	60 V	A	20				
	110 V	A	4.5				
	220 V	A	1				
	440 V	A	0.4				
	600 V	A	0.25				
	• 2 conducting paths in series	up to 24 V	A	35			
		60 V	A	35			
		110 V	A	35			
		220 V	A	5			
		440 V	A	1			
		600 V	A	0.8			
	• 3 conducting paths in series	up to 24 V	A	35			
		60 V	A	35			
		110 V	A	35			
		220 V	A	35			
		440 V	A	2.9			
		600 V	A	1.4			
Utilization category DC-3 and DC-5 Shunt-wound and series-wound motors ( $L/R \leq 15$ ms)							
Rated operational current $I_e$ (at 60 °C)							
• 1 conducting path	up to 24 V	A	20				
	60 V	A	5				
	110 V	A	2.5				
	220 V	A	1				
	440 V	A	0.09				
	600 V	A	0.06				
	• 2 conducting paths in series	up to 24 V	A	35			
		60 V	A	35			
		110 V	A	15			
		220 V	A	3			
		440 V	A	0.27			
		600 V	A	0.16			
	• 3 conducting paths in series	up to 24 V	A	35			
		60 V	A	35			
		110 V	A	35			
		220 V	A	10			
		440 V	A	0.6			
		600 V	A	0.6			
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				
	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	
	Dependence of the switching frequency $z'$ on the operational current $I'$ and operational voltage $U'$ : $z' = z \cdot (I_e/I') \cdot (400\text{ V}/U')^{1.5} \cdot 1/h$						
• Contactors with overload relays (mean value)		$h^{-1}$	15				

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 23 S0	3RT10 24 S0	3RT10 25 S0	3RT10 26 S0
Conductor cross-sections						
Screw terminals (1 or 2 conductors can be connected)	Main conductors					
	Conductor cross-section					
	• Solid	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>1)</sup> ; 2 x (2.5 ... 6) <sup>1)</sup> according to IEC 60947; max. 1 x 10			
	• Finely stranded with end sleeve	mm <sup>2</sup>				
	• AWG conductors, solid	AWG				
	• AWG conductors, solid or stranded	AWG				
	• AWG conductors, stranded	AWG				
	• Terminal screws		M4 (Pozidriv size 2)			
	- Tightening torque	Nm				
	Auxiliary conductors					
Conductor cross-section						
• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup> according to IEC 60947; max. 2 x (0.75 ... 4)				
• Finely stranded with end sleeve	mm <sup>2</sup>					
• Solid or stranded AWG (2 x)	AWG					
• Terminal screws						
- Tightening torque	NM					
Cage Clamp terminals (1 or 2 conductors can be connected)	Auxiliary conductors					
	• Solid	mm <sup>2</sup>	2 x (0.25 ... 2.5)			
	• Finely stranded with end sleeve	mm <sup>2</sup>				
	• Finely stranded without end sleeve	mm <sup>2</sup>				
	• AWG conductors, solid or stranded	AWG				
	• AWG conductors, solid or stranded	AWG				
			2 x (0.25 ... 1.5) 2 x (0.25 ... 2.5) 2 x (24 ... 14)			
<sup>1)</sup> If two different conductor cross-sections are connected at one clamping point, then the two cross-sections must lie within the range quoted. If identical cross-sections are used, this restriction does not apply.						
Contactor	Type Size		3RT10 34 S2	3RT10 35 S2	3RT10 36 S2	
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.	AC and DC operation		 For DC operation and 22.5° inclination towards the front, operating range 0.85 ... 1.1 x U <sub>s</sub>			
Upright mounting position:	AC operation		 Special version required.			
	DC operation					
Mechanical endurance	Basic units	Operating cycles	10 million			
	Basic unit with snap-on auxiliary switch block		10 million			
	Solid-state compatible auxiliary switch block		5 million			
Electrical endurance			<sup>1)</sup>			
Rated insulation voltage U <sub>i</sub> (degree of pollution 3)		V	690			
Rated impulse withstand voltage U <sub>imp</sub>		kV	6			
Safe isolation between the coil and the main contacts according 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.	3RT10 3., 3RT13 3. (removable auxiliary switch block)		Yes, according to EN 60947-4-1, Appendix F			
	3RT10 3., 3RT13 3. (permanent auxiliary switch block)		According to SUVA requirements on request.			
Permissible ambient temperature	During operation	°C	-25 ... +60			
	During storage	°C	-55 ... +80			
Degree of protection according to EN 60947-1, Appendix C			IP20 (terminal compartment IP00), AC coil assembly IP40, DC coil assembly IP30 finger-safe			
Touch protection according to EN 50274						
Shock resistance						
• Rectangular pulse • Sine pulse	AC and DC operation	g/ms	10/5 and 5/10			
	AC and DC operation	g/ms	15/5 and 8/10			
Conductor cross-sections			<sup>2)</sup>			

<sup>1)</sup> See endurance of the main contacts on page 3/19.

<sup>2)</sup> See conductor cross-sections on page 3/32.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 34 S2	3RT10 35 S2	3RT10 36 S2
Short-circuit protection for contactors without overload relays					
			For short-circuit protection for contactors with overload relays see Protection Equipment: Overload Relays For short-circuit protection for fuseless load feeders see Load Feeders, Motor Starters and Soft Starters: -> 3RA Fuseless Load Feeders.		
Main circuit					
Fuse links, gL/gG					
LV HRC 3NA, DIAZED 5SB, NEOZED 5SE					
According to IEC 60947-4-1/	Type of coordination "1"	A	125	125	160
EN 60947-4-1	Type of coordination "2"	A	63	63	80
	Weld-free <sup>1)</sup>	A	16	16	50
Auxiliary circuit					
• Fuse links gL/gG	A	10			
DIAZED 5SB, NEOZED 5SE (weld-free protection at I <sub>k</sub> ≥ 1 kA)					
• Miniature circuit breakers with C characteristic (short-circuit current I <sub>k</sub> ≤ 400 A)	A	10			
Control					
Magnetic coil operating range	AC/DC		0.8 ... 1.1 x U <sub>s</sub>		
Power consumption of the magnetic coils (when coil is cold and 1.0 x U <sub>s</sub> )					
AC operation, 50 Hz, standard version	• Closing	VA	104	145	
	• P.f.		0.78	0.79	
	• Closed	VA	9.7	12.5	
	• P.f.		0.42	0.36	
AC operation, 50/60 Hz, standard version	• Closing	VA	127/113	170/155	
	• P.f.		0.73/0.69	0.76/0.72	
	• Closed	VA	11.3/9.5	15/11.8	
	• P.f.		0.41/0.42	0.35/0.38	
AC operation, 50 Hz, USA/Canada	• Closing	VA	108	150	
	• P.f.		0.76	0.77	
	• Closed	VA	9.6	12.5	
	• P.f.		0.42	0.35	
AC operation, 60 Hz, USA/Canada	• Closing	VA	120	166	
	• P.f.		0.7	0.71	
	• Closed	VA	10.1	12.6	
	• P.f.		0.42	0.37	
DC operation	Closing = Closed	W	13.3	13.3	
Permissible residual current of the electronics (with 0 signal)					
	• AC operation	mA	<12 mA x (230 V/U <sub>s</sub> )	<18 mA x (230 V/U <sub>s</sub> )	
	• DC operation	mA	<38 mA x (24 V/U <sub>s</sub> )	<38 mA x (24 V/U <sub>s</sub> )	
Operating times for 0.8 ... 1.1 x U <sub>s</sub> <sup>2)</sup>					
(Total break time = OFF-delay + Arcing time)					
AC operation	• Closing delay	ms	11 ... 30	10 ... 24	
	• Opening delay	ms	7 ... 10	7 ... 10	
DC operation	• Closing delay	ms	50 ... 95	60 ... 100	
	• Opening delay	ms	20 ... 30	20 ... 25	
Arcing time		ms	10	10	
Operating times for 1.0 x U <sub>s</sub> <sup>2)</sup>					
AC operation	• Closing delay	ms	13 ... 22	12 ... 20	
	• Opening delay	ms	7 ... 10	7 ... 10	
DC operation	• Closing delay	ms	60 ... 75	70 ... 85	
	• Opening delay	ms	20 ... 30	20 ... 25	

<sup>1)</sup> Test conditions according to IEC 60947-4-1.

<sup>2)</sup> 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).

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 34 S2	3RT10 35 S2	3RT10 36 S2
Main circuit					
AC capacity					
Utilization category AC-1 Switching resistive loads					
Rated operational currents $I_e$	at 40 °C up to 690 V	A	50	60	60
	at 60 °C up to 690 V	A	45	55	55
Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	230 V	kW	18	22	22
	400 V	kW	31	38	38
	500 V	kW	39	46	46
	690 V	kW	54	66	66
Minimum conductor cross-section for loads with $I_e$	at 40 °C	mm <sup>2</sup>	16	16	16
	at 60 °C	mm <sup>2</sup>	10	16	16
Utilization category AC-2 and AC-3					
Rated operational currents $I_e$	up to 500 V	A	32	40	50
	690 V	A	20	24	24
Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	230 V	kW	7.5	11	15
	400 V	kW	15	18.5	22
	500 V	kW	18.5	22	30
	690 V	kW	18.5	22	22
Thermal load capacity	10 s current <sup>2)</sup>	A	320	400	400
Power loss per conducting path	at $I_e$ /AC-3	W	1.8	2.6	5
Utilization category AC-4 (for $I_a = 6 \times I_e$ )					
Rated operational current $I_e$	up to 400 V	A	29	35	41
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 400 V	kW	15	18.5	22
• The following applies to a contact endurance of about 200000 operating cycles:					
Rated operational currents $I_e$	up to 400 V	A	15.6	18.5	24
	690 V	A	15.6	18.5	24
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	230 V	kW	4.7	5.4	7.3
	400 V	kW	8.2	9.5	12.6
	500 V	kW	9.8	11.8	15.8
	690 V	kW	13	15.5	21.8
Utilization category AC-5a Switching gas discharge lamps, inductive ballast					
Per main current path at 230 V					
• Uncorrected, rated power per lamp/rated operational current per lamp					
	L 18 W/0.37 A	Units	122	149	135
	L 36 W/0.43 A	Units	105	128	116
	L 58 W/0.67 A	Units	67	82	75
• Lead-lag circuit, rated power per lamp/rated operational current per lamp					
	L 18 W/0.11 A	Units	409	500	454
	L 36 W/0.21 A	Units	214	262	238
	L 58 W/0.32 A	Units	141	172	156
Switching gas discharge lamps with correction					
Per main current path at 230 V					
• Shunt compensation with inductive ballast, rated power per lamp/capacitance/ rated operational current per lamp					
	L 18 W/4.5 µF/0.11 A	Units	78	98	123
	L 36 W/4.5 µF/0.21 A	Units	78	98	123
	L 58 W/7 µF/0.32 A	Units	50	63	79
• With solid-state ballast (single lamp)					
	L 18 W/6.8 µF/0.10 A	Units	224	280	350
	L 36 W/6.8 µF/0.18 A	Units	124	155	194
	L 58 W/10 µF/0.27 A	Units	83	104	129
• With solid-state ballast (two lamps)					
	L 18 W/10 µF/0.18 A	Units	124	155	194
	L 36 W/10 µF/0.35 A	Units	64	80	100
	L 58 W/22 µF/0.52 A	Units	43	54	67

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 Protection Equipment:  
Overload Relays.

# 3RT, 3TB, 3TF Contactors for Switching Motors






## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 34 S2	3RT10 35 S2	3RT10 36 S2
<b>Main circuit</b>					
<b>AC capacity</b>					
<b>Utilization category AC-5b</b> <b>Switching incandescent lamps</b> Per main current path at 230/220 V		kW	5.8	7.3	9.1
<b>Utilization category AC-6a</b> <b>Switching AC transformers</b> Rated operational current $I_e$					
• For inrush current $n = 20$	up to 400 V	A	31	36.5	43.2
• For inrush current $n = 30$	up to 400 V	A	20.7	24.3	28.8
Rated power $P$					
For inrush current $n = 20$	at 230 V	kVA	12.3	14.5	17.2
	400 V	kVA	21.5	25.3	29.9
	500 V	kVA	26.8	31.6	37.4
	690 V	kVA	23.9	28.7	28.7
For inrush current $n = 30$	230 V	kVA	8.2	9.7	11.5
	400 V	kVA	14.3	16.8	20
	500 V	kVA	17.9	21	24.9
	690 V	kVA	23.9	28.7	28.7
For deviating inrush current factors $x$ , the power must be recalculated as follows: $P_x = P_{n30} \cdot 30/x$					
<b>Utilization category AC-6b</b> <b>Switching low-inductance (low-loss, metallized dielectric) AC capacitors</b> Ambient temperature 40 °C					
Rated operational currents $I_e$	up to 400 V	A	29	36	36
Rated power for single capacitors or banks of capacitors (minimum inductance of 20 µH between capacitors connected in parallel) at 50 Hz, 60 Hz and	at 230 V	kvar	12	15	15
	400 V	kvar	20	25	25
	525 V	kvar	25	33	33
	690 V	kvar	20	25	25
<b>Load rating with DC</b>					
<b>Utilization category DC-1</b> <b>Switching resistive loads (<math>L/R &lt; 1\text{ ms}</math>)</b> Rated operational current $I_e$ (at 60 °C)					
• 1 conducting path	up to 24 V	A	45	55	55
	60 V	A	20	23	23
	110 V	A	4.5	4.5	4.5
	220 V	A	1	1	1
	440 V	A	0.4	0.4	0.4
	600 V	A	0.25	0.25	0.25
• 2 conducting paths in series	up to 24 V	A	45	55	55
	60 V	A	45	45	45
	110 V	A	25	25	25
	220 V	A	5	5	5
	440 V	A	1	1	1
	600 V	A	0.8	0.8	0.8
• 3 conducting paths in series	up to 24 V	A	45	55	55
	60 V	A	45	55	55
	110 V	A	45	55	55
	220 V	A	45	45	45
	440 V	A	2.9	2.9	2.9
	600 V	A	1.4	1.4	1.4
<b>Utilization category DC-3 and DC-5</b> <b>Shunt-wound and series-wound motors (<math>L/R \leq 15\text{ ms}</math>)</b> Rated operational current $I_e$ (at 60 °C)					
• 1 conducting path	up to 24 V	A	35	35	35
	60 V	A	6	6	6
	110 V	A	2.5	2.5	2.5
	220 V	A	1	1	1
	440 V	A	0.1	0.1	0.1
	600 V	A	0.06	0.06	0.06
• 2 conducting paths in series	up to 24 V	A	45	55	55
	60 V	A	45	45	45
	110 V	A	25	25	25
	220 V	A	5	5	5
	440 V	A	0.27	0.27	0.27
	600 V	A	0.16	0.16	0.16
• 3 conducting paths in series	up to 24 V	A	45	55	55
	60 V	A	45	55	55
	110 V	A	45	55	55
	220 V	A	25	25	25
	440 V	A	0.6	0.6	0.6
	600 V	A	0.35	0.35	0.35

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 34 S2	3RT10 35 S2	3RT10 36 S2
<b>Switching frequency</b>				
<b>Switching frequency z</b> in operating cycles/hour				
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400 \text{ V}/U')^{1.5} \cdot 1/h$	• Contactors without overload relays	No-load switching frequency AC	h <sup>-1</sup>	5000
		No-load switching frequency DC	h <sup>-1</sup>	1500
		AC-1 (AC/DC)	h <sup>-1</sup>	1200
		AC-2 (AC/DC)	h <sup>-1</sup>	750
		AC-3 (AC/DC)	h <sup>-1</sup>	1000
• Contactors with overload relays (mean value)		AC-4 (AC/DC)	h <sup>-1</sup>	250
			h <sup>-1</sup>	15

Contactor	Type Size	3RT10 3. S2
<b>Conductor cross-sections</b>		
<b>Screw terminals</b> (1 or 2 conductors can be connected)		
<b>Front clamping point connected</b>		
	<b>Main conductors:</b> with box terminal	
	• Finely stranded with end sleeve	mm <sup>2</sup> 0.75 ... 25
	• Finely stranded without end sleeve	mm <sup>2</sup> 0.75 ... 25
	• Stranded	mm <sup>2</sup> 0.75 ... 35
	• Solid	mm <sup>2</sup> 0.75 ... 16
	• Ribbon cable conductors (number x width x circumference)	mm 6 x 9 x 0.8
	• AWG conductors, solid or stranded	AWG 18 ... 2
	• Finely stranded with end sleeve	mm <sup>2</sup> 0.75 ... 25
	• Finely stranded without end sleeve	mm <sup>2</sup> 0.75 ... 25
	• Stranded	mm <sup>2</sup> 0.75 ... 35
	• Solid	mm <sup>2</sup> 0.75 ... 16
	• Ribbon cable conductors (number x width x circumference)	mm 6 x 9 x 0.8
	• AWG conductors, solid or stranded	AWG 18 ... 2
	• Terminal screw - Tightening torque	Nm M6 (Pozidriv size 2) 3 ... 4.5 (27 ... 40 lb.in)
	<b>Auxiliary conductors:</b>	
	• Solid	mm <sup>2</sup> 2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup> according to IEC 60947; max. 2 x (0.75 ... 4)
	• Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup>
	• AWG conductors, solid or stranded	AWG 2 x (20 ... 16) <sup>1)</sup> ; 2 x (18 ... 14) <sup>1)</sup> ; 1 x 12
	• Terminal screw - Tightening torque	NM M3 0.8 ... 1.2 (7 ... 10.3 lb.in)
	<b>Auxiliary conductors:</b>	
	• Solid	mm <sup>2</sup> 2 x (0.25 ... 2.5)
	• Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.25 ... 1.5)
	• Finely stranded without end sleeve	mm <sup>2</sup> 2 x (0.25 ... 2.5)
	• AWG conductors, solid or stranded	mm <sup>2</sup> 2 x (24 ... 14)

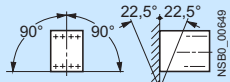

For tools for opening Cage Clamp terminals see Catalog LV 1, Chapter 3, Accessories and Spare Parts.  
Maximum outer diameter of the conductor insulation: 3.6 mm.  
With conductor cross-sections ≤ 1 mm<sup>2</sup> an "insulation stop" must be used, see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

<sup>1)</sup> If two different conductor cross-sections are connected at one clamping point, then the two cross-sections must lie within the range quoted.  
If identical cross-sections are used, this restriction does not apply.



# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 44 S3	3RT10 45 S3	3RT10 46 S3
General data					
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.	AC and DC operation		 For DC operation and 22.5° inclination towards the front, operating range 0.85 ... 1.1 x U <sub>s</sub>  NSB0_00477a Special version required. --		
Upright mounting position:	AC operation				
	DC operation				
<b>Mechanical endurance</b>	Basic units	Operating cycles	10 million		
	Basic unit with snap-on auxiliary switch block		10 million		
	Solid-state compatible auxiliary switch block		5 million		
<b>Electrical endurance</b>			1)		
<b>Rated insulation voltage U<sub>i</sub></b> (degree of pollution 3)		V	1000		
<b>Rated impulse withstand voltage U<sub>imp</sub></b>		kV	6		
<b>Safe isolation</b> between the coil and the main contacts according to EN 60947-1, Appendix N		V	690		
<b>Mirror contacts</b> A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.	3RT10 4., 3RT13 4., 3RT14 4. (removable auxiliary switch block)		Yes, according to EN 60947-4-1, Appendix F		
	3RT10 4., 3RT13 4., 3RT14 4. (permanent auxiliary switch block)		According to SUVA requirements on request.		
<b>Permissible ambient temperature</b>	During operation	°C	-25 ... +60		
	During storage	°C	-55 ... +80		
<b>Degree of protection</b> according to EN 60947-1, Appendix C			IP20 (terminal compartment IP00), AC coil assembly IP40, DC coil assembly IP30 finger-safe		
<b>Touch protection</b> according to EN 50274					
<b>Shock resistance</b>					
• Rectangular pulse	AC and DC operation	g/ms	6.8/5 and 4/10		
• Sine pulse	AC and DC operation	g/ms	10.6/5 and 6.2/10		
<b>Conductor cross-sections</b>			2)		
Short-circuit protection for contactors without overload relays					
<b>Main circuit</b>			For short-circuit protection for contactors with overload relays see Protection Equipment: Overload Relays For short-circuit protection for fuseless load feeders see Load Feeders, Motor Starters and Soft Starters: -> 3RA Fuseless Load Feeders.		
• Fuse links gL/gG LV HRC 3NA, DIAZED 5SB, NEOZED 5SE					
- According to IEC 60947-4-1/ EN 60947-4-1	Type of coordination "1"	A	250	250	
	Type of coordination "2"	A	125	160	
	Weld-free <sup>3)</sup>	A	63	100	
<b>Auxiliary circuit</b>					
• Fuse links gL/gG DIAZED 5SB, NEOZED 5SE (weld-free protection at I <sub>k</sub> ≥ 1 kA)		A	10		
• Miniature circuit breakers with C characteristic (short-circuit current I <sub>k</sub> < 400 A)		A	10		

1) See endurance of the main contacts on page 3/19.

2) See conductor cross-sections on page 3/37.

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

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 44 S3	3RT10 45 S3	3RT10 46 S3
Control					
Magnetic coil operating range	AC/DC		0.8 ... 1.1 x U <sub>s</sub>		
Power consumption of the magnetic coils (when coil is cold and 1.0 x U <sub>s</sub> )					
AC operation, 50 Hz, standard version	• Closing	VA	218	270	
	• P.f.		0.61	0.68	
	• Closed	VA	21	22	
	• P.f.		0.26	0.27	
AC operation, 50/60 Hz, standard version	• Closing	VA	247/211	298/274	
	• P.f.		0.62/0.57	0.7/0.62	
	• Closed	VA	25/18	27/20	
	• P.f.		0.27/0.3	0.29/0.31	
AC operation, 50 Hz, USA/Canada	• Closing	VA	218	270	
	• P.f.		0.61	0.68	
	• Closed	VA	21	22	
	• P.f.		0.26	0.27	
AC operation, 60 Hz, USA/Canada	• Closing	VA	232	300	
	• P.f.		0.55	0.52	
	• Closed	VA	20	21	
	• P.f.		0.28	0.29	
DC operation	Closing = Closed	W	15	15	
Permissible residual current of the electronics (with 0 signal)					
• AC operation			< 25 mA x (230 V/U <sub>s</sub> )		
• DC operation			< 43 mA x (24 V/U <sub>s</sub> )		
Operating times for 0.8 ... 1.1 x U <sub>s</sub> <sup>1)</sup>					
Total break time = Opening delay + Arcing time					
• AC operation	Closing delay	ms	16 ... 57	17 ... 90	
	Opening delay	ms	10 ... 19	10 ... 25	
• DC operation	Closing delay	ms	90 ... 230	90 ... 230	
	Opening delay	ms	14 ... 20	14 ... 20	
• Arcing time		ms	10 ... 15	10 ... 15	
Operating times for 1.0 x U <sub>s</sub> <sup>1)</sup>					
• AC operation	Closing delay	ms	18 ... 34	18 ... 30	
	Opening delay	ms	11 ... 18	11 ... 23	
• DC operation	Closing delay	ms	100 ... 120	100 ... 120	
	Opening delay	ms	16 ... 20	16 ... 20	

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).

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 44 S3	3RT10 45 S3	3RT10 46 S3
<b>Main circuit</b>					
<b>AC capacity</b>					
<b>Utilization category AC-1</b>					
<b>Switching resistive loads</b>					
Rated operational currents $I_e$	at 40 °C up to 690 V	A	100	120	120
	1000 V	A	50	60	70
	at 60 °C up to 690 V	A	90	100	100
	1000 V	A	40	50	60
Rated output of AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	at 230 V	kW	34	38	38
	400 V	kW	59	66	66
	500 V	kW	74	82	82
	690 V	kW	102	114	114
	1000 V	kW	66	82	98
Minimum conductor cross-section for loads with $I_e$	at 40 °C	mm <sup>2</sup>	35	50	50
	at 60 °C	mm <sup>2</sup>	35	35	35
<b>Utilization categories AC-2 and AC-3</b>					
Rated operational currents $I_e$	up to 500 V	A	65	80	95
	690 V	A	47	58	58
	1000 V	A	25	30	30
Rated power for slipping or squirrel-cage motors at 50 and 60 Hz	at 230 V	kW	18.5	22	22
	400 V	kW	30	37	45
	500 V	kW	37	45	55
	690 V	kW	45	55	55
	1000 V	kW	30	37	37
<b>Thermal load capacity</b>	10 s current <sup>2)</sup>	A	600	760	760
<b>Power loss per conducting path</b>	at $I_e$ /AC-3	W	4.6	7.7	10.8
<b>Utilization category AC-4 (for <math>I_a = 6 \times I_e</math>)</b>					
Rated operational current $I_e$	up to 400 V	A	55	66	80
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 400 V	kW	30	37	45
• The following applies to a contact endurance of about 200000 operating cycles:					
- Rated operational currents $I_e$	up to 400 V	A	28	34	42
	690 V	A	28	34	42
	1000 V	A	20	23	23
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 230 V	kW	8.7	10.4	12
	400 V	kW	15.1	17.9	22
	500 V	kW	18.4	22.4	27
	690 V	kW	25.4	30.9	38
	1000 V	A	22	30	30
<b>Utilization category AC-5a</b>					
<b>Switching gas discharge lamps, inductive ballast</b>					
Per main current path at 230 V					
• Uncorrected, rated power per lamp/rated operational current per lamp					
	L18 W/0.37 A	Units	243	270	
	L36 W/0.43 A	Units	209	232	
	L58 W/0.67 A	Units	134	149	
• Lead-lag circuit, rated power per lamp/rated operational current per lamp					
	L18 W/0.11 A	Units	818	909	
	L36 W/0.21 A	Units	428	476	
	L58 W/0.32 A	Units	281	312	
<b>Switching gas discharge lamps with correction</b>					
Per main current path at 230 V					
• Shunt compensation with inductive ballast, rated power per lamp/capacitance/rated operational current per lamp					
	L18 W/4.5 µF/0.11 A	Units	160	197	234
	L36 W/4.5 µF/0.21 A	Units	160	197	234
	L58 W/7 µF/0.32 A	Units	103	127	150
• With solid-state ballast (single lamp)					
	L18 W/6.8 µF/0.10 A	Units	455	560	665
	L36 W/6.8 µF/0.18 A	Units	253	311	369
	L58 W/10 µF/0.27 A	Units	168	207	246
• With solid-state ballast (two lamps)					
	L18 W/10 µF/0.18 A	Units	253	311	369
	L36 W/10 µF/0.35 A	Units	130	160	190
	L58 W/22 µF/0.52 A	Units	88	108	128
<b>Utilization category AC-5b</b>					
<b>Switching incandescent lamps</b>					
Per main current path at 230/220 V					
		kW	9	14.6	17.3

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

<sup>2)</sup> According to IEC 60947-4-1.  
For rated values for various start-up conditions see Protection Equipment:  
Overload Relays.

# 3RT, 3TB, 3TF Contactors for Switching Motors




## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size			3RT10 44 S3	3RT10 45 S3	3RT10 46 S3
Main circuit						
AC capacity						
Utilization category AC-6a Switching AC transformers						
Rated operational current $I_g$ (60 °C)						
• For inrush current n = 20	up to 400 V	A		63.5	80	84.4
	up to 690 V	A		47	58	58
• For inrush current n = 30	up to 400 V	A		42.3	56.3	56.3
	up to 690 V	A		42.3	56.3	56.3
Rated power $P$						
• For inrush current n = 20	230 V	kVA		25.3	31.9	33.6
	400 V	kVA		43.9	55.4	58
	500 V	kVA		54.9	69.3	73.1
	690 V	kVA		56.2	69.3	69.3
• For inrush current n = 30	230 V	kVA		16.8	22.4	22.4
	400 V	kVA		29.3	39	39
	500 V	kVA		36.6	48.7	48.7
	690 V	kVA		50.3	67.3	67.3
For deviating inrush current factors x, the power must be recalculated as follows: $P_x = P_{n30} \cdot 30/x$						
Utilization category AC-6b Switching low-inductance (low-loss, metallized dielectric) AC capacitors						
Rated operational currents $I_g$ (60 °C)						
	up to 400 V	A		57	72	
Rated power for single capacitors or banks of capacitors (minimum inductance of 6 µH between capacitors connected in parallel) at 50 Hz, 60 Hz and						
	at 230 V	kvar		24	29	
	400 V	kvar		40	50	
	525 V	kvar		50	65	
	690 V	kvar		40	50	
Load rating with DC						
Utilization category DC-1 Switching resistive load ( $L/R \leq 1$ ms)						
Rated operational current $I_g$ (60 °C)						
• 1 conducting path	up to 24 V	A		90	100	100
	60 V	A		23	60	60
	110 V	A		4.5	9	9
	220 V	A		1	2	2
	440 V	A		0.4	0.6	0.6
	600 V	A		0.26	0.4	0.4
• 2 conducting paths in series	up to 24 V	A		90	100	100
	60 V	A		90	100	100
	110 V	A		90	100	100
	220 V	A		5	10	10
	440 V	A		1	1.8	1.8
	600 V	A		0.8	1	1
• 3 conducting paths in series	up to 24 V	A		90	100	100
	60 V	A		90	100	100
	110 V	A		90	100	100
	220 V	A		70	80	80
	440 V	A		2.9	1.8	4.5
	600 V	A		1.4	1	2.6
Utilization category DC-3 and DC-5 Shunt-wound and series-wound motors ( $L/R \leq 15$ ms)						
Rated operational current $I_g$ (60 °C)						
• 1 conducting path	up to 24 V	A		40	40	40
	60 V	A		6	6.5	6.5
	110 V	A		2.5	2.5	2.5
	220 V	A		1	1	1
	440 V	A		0.15	0.15	0.15
	600 V	A		0.06	0.06	0.06
• 2 conducting paths in series	up to 24 V	A		90	100	100
	60 V	A		90	100	100
	110 V	A		90	100	100
	220 V	A		7	7	7
	440 V	A		0.42	0.42	0.42
	600 V	A		0.16	0.16	0.16
• 3 conducting paths in series	up to 24 V	A		90	100	100
	60 V	A		90	100	100
	110 V	A		90	100	100
	220 V	A		35	35	35
	440 V	A		0.8	0.8	0.8
	600 V	A		0.35	0.35	0.35

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 44 S3	3RT10 45 S3	3RT10 46 S3	
Main circuit					
Switching frequency					
Switching frequency z in operating cycles/hour					
• Contactors without overload relays	No-load switching frequency AC	h <sup>-1</sup>	5000	5000	5000
	No-load switching frequency DC	h <sup>-1</sup>	1000	1000	1000
	Dependence of the switching frequency z' on the operational current I' and operational voltage U': z' = z · (I <sub>e</sub> /I') · (400 V/U') <sup>1.5</sup> · 1/h	AC-1 (AC/DC)	h <sup>-1</sup>	1000	900
		AC-2 (AC/DC)	h <sup>-1</sup>	400	350
		AC-3 (AC/DC)	h <sup>-1</sup>	1000	850
• Contactors with overload relays (mean value)		AC-4 (AC/DC)	h <sup>-1</sup>	300	250
			h <sup>-1</sup>	15	15

Contactor	Type Size	3RT10 4. S3
<b>Conductor cross-sections</b>		
<b>Screw terminals</b> (1 or 2 conductors can be connected)		
<b>Front clamping point connected</b> 		
<b>Main conductors:</b> with box terminal		
• Finely stranded with end sleeve	mm <sup>2</sup>	2.5 ... 35
• Finely stranded without end sleeve	mm <sup>2</sup>	4 ... 50
• Solid	mm <sup>2</sup>	2.5 ... 16
• Stranded	mm <sup>2</sup>	4 ... 70
• Ribbon cable conductors (number x width x circumference)	mm	6 x 9 x 0.8
• AWG conductors, solid or stranded	AWG	10 ... 2/0
<b>Rear clamping point connected</b> 		
• Finely stranded with end sleeve	mm <sup>2</sup>	2.5 ... 50
• Finely stranded without end sleeve	mm <sup>2</sup>	10 ... 50
• Solid	mm <sup>2</sup>	2.5 ... 16
• Stranded	mm <sup>2</sup>	10 ... 70
• Ribbon cable conductors (number x width x circumference)	mm	6 x 9 x 0.8
• AWG conductors, solid or stranded	AWG	10 ... 2/0
<b>Both clamping points connected</b> 		
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (2.5 ... 35)
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (4 ... 35)
• Solid	mm <sup>2</sup>	2 x (2.5 ... 16)
• Stranded	mm <sup>2</sup>	2 x (4 ... 50)
• Ribbon cable conductors (number x width x circumference)	mm	2 x (6 x 9 x 0.8)
• AWG conductors, solid or stranded	AWG	2 x (10 ... 1/0)
• Terminal screw - Tightening torque	Nm	M6 (hexagon socket, A/F 4) 4 ... 6 (36 ... 53 lb.in)
Connection for drilled copper bars <sup>1)</sup>	max. width	mm 10
Without box terminal with cable lugs <sup>2)</sup> (1 or 2 conductors can be connected)	<ul style="list-style-type: none"> <li>• Finely stranded with cable lug</li> <li>• Stranded with cable lug</li> <li>• AWG conductors, solid or stranded</li> </ul>	mm <sup>2</sup> 10 ... 50 <sup>3)</sup> mm <sup>2</sup> 10 ... 70 <sup>3)</sup> AWG 7 ... 1/0
<b>Auxiliary conductors:</b>		
• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>4)</sup> ; 2 x (0.75 ... 2.5) <sup>4)</sup> according to IEC 60947; max. 2 x (0.75 ... 4)
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>4)</sup> ; 2 x (0.75 ... 2.5) <sup>4)</sup>
• AWG conductors, solid or stranded	AWG	2 x (20 ... 16) <sup>4)</sup> ; 2 x (18 ... 14) <sup>4)</sup> ; 1 x 12
• Terminal screw - Tightening torque	Nm	M3 0.8 ... 1.2 (7 ... 10.3 lb.in)
<b>Cage Clamp terminals</b> (1 or 2 conductors can be connected)		
<b>Auxiliary conductors:</b>		
• Solid	mm <sup>2</sup>	2 x (0.25 ... 2.5)
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 ... 1.5)
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.25 ... 2.5)
• AWG conductors, solid or stranded	AWG	2 x (24 ... 14)

For tools for opening Cage Clamp terminals see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

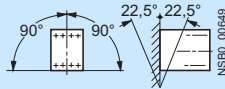
Maximum outer diameter of the conductor insulation: 3.6 mm.

For conductor cross-sections  $\leq 1 \text{ mm}^2$  an "insulation stop" must be used, see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

- 1) If bars larger than 12 x 10 mm are connected, a 3RT19 46-4EA1 terminal cover is needed to comply with the phase clearance.
- 2) If bars larger than 25 mm<sup>2</sup> are connected, a 3RT19 46-4EA1 terminal cover is needed to comply with the phase clearance.
- 3) Only with crimped cable lugs according to DIN 46234.  
Cable lug max. 20 mm wide.
- 4) If two different conductor cross-sections are connected at one clamping point, then the two cross-sections must lie within the range quoted. If identical cross-sections are used, this restriction does not apply.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 54 S6	3RT10 55 S6	3RT10 56 S6
General data					
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance		Operating cycles	10 million		
Electrical endurance			1)		
Rated insulation voltage $U_i$ (degree of pollution 3)		V	1000		
Rated impulse withstand voltage $U_{imp}$		kV	8		
Safe isolation between the coil and the main contacts according to EN 60947-1, Appendix N		V	690		
Mirror contacts A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.			Yes, according to EN 60947-4-1, Appendix F		
Permissible ambient temperature		During operation During storage	°C °C		
			-25 ... +60/+55 with AS-Interface -55 ... +80		
Degree of protection according to EN 60947-1, Appendix C			IP00/open, coil assembly IP20		
Touch protection according to EN 50274			Finger-safe with cover		
Shock resistance		Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections			2)		
Electromagnetic compatibility (EMC)			3)		
Short-circuit protection					
Main circuit Fuse links, gL/gG LV HRC 3NA, DIAZED 5SB, NEOZED 5SE			For short-circuit protection for contactors with overload relays see Protection Equipment: Overload Relays		
- According to IEC 60947-4-1/ EN 60947-4-1		• Type of coordination "1" • Type of coordination "2" • Weld-free <sup>4)</sup>	A A A	355 315 80	355 315 160
Auxiliary circuit					
• Fuse links gL/gG DIAZED 5SB, NEOZED 5SE (weld-free protection at $I_k \geq 1$ kA)			A	10	
• Or miniature circuit breakers with C characteristic ( $I_k < 400$ A)					

1) See endurance of the main contacts on page 3/19.  
2) See conductor cross-sections on page 3/42.  
3) See electromagnetic compatibility (EMC) on page 3/12.  
4) Test conditions according to IEC 60947-4-1.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 5. S6		
<b>Control</b>				
<b>Operating range of the solenoid AC/DC (UC)</b>		$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$		
<b>Power consumption of the solenoid</b> (when coil is cool and rated range $U_{s \min} \dots U_{s \max}$ )				
• Conventional operating mechanism				
- AC operation	Closing at $U_{s \min}$	VA/p.f.	250/0.9	
	Closing at $U_{s \max}$	VA/p.f.	300/0.9	
	Closed at $U_{s \min}$	VA/p.f.	4.8/0.8	
	Closed at $U_{s \max}$	VA/p.f.	5.8/0.8	
- DC operation	Closing at $U_{s \min}$	W	300	
	Closing at $U_{s \max}$	W	360	
	Closed at $U_{s \min}$	W	4.3	
	Closed at $U_{s \max}$	W	5.2	
• Solid-state operating mechanism				
- AC operation	Closing at $U_{s \min}$	VA/p.f.	190/0.8	
	Closing at $U_{s \max}$	VA/p.f.	280/0.8	
	Closed at $U_{s \min}$	VA/p.f.	3.5/0.5	
	Closed at $U_{s \max}$	VA/p.f.	4.4/0.4	
- DC operation	Closing at $U_{s \min}$	W	250	
	Closing at $U_{s \max}$	W	320	
	Closed at $U_{s \min}$	W	2.3	
	Closed at $U_{s \max}$	W	2.8	
<b>PLC control input</b> (EN 61131-2/type 2)		24 V DC/ $\leq 30$ mA power consumption, (operating range 17 ... 30 V DC)		
<b>Operating times</b> (Total break time = Opening delay + Arcing time)				
• Conventional operating mechanism				
- With $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	Closing delay	ms	20 ... 95	
	Opening delay	ms	40 ... 60	
- With $U_{s \min} \dots U_{s \max}$	Closing delay	ms	25 ... 50	
	Opening delay	ms	40 ... 60	
• Solid-state operating mechanism, actuated via PLC input				
- With $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	Closing delay	ms	35 ... 75	
	Opening delay	ms	80 ... 90	
- With $U_{s \min} \dots U_{s \max}$	Closing delay	ms	40 ... 60	
	Opening delay	ms	80 ... 90	
• Solid-state operating mechanism, actuated via A1/A2				
- With $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	Closing delay	ms	95 ... 135	
	Opening delay	ms	80 ... 90	
- With $U_{s \min} \dots U_{s \max}$	Closing delay	ms	100 ... 120	
	Opening delay	ms	80 ... 90	
Arcing time		ms	10 ... 15	

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 54 S6	3RT10 55 S6	3RT10 56 S6
Main circuit					
AC capacity					
Utilization category AC-1 Switching resistive loads					
Rated operational currents $I_e$	at 40 °C up to 690 V	A	160	185	215
	at 60 °C up to 690 V	A	140	160	185
	at 60 °C up to 1000 V	A	80	90	100
Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	at 230 V	kW	53	60	70
	400 V	kW	92	105	121
	500 V	kW	115	131	152
	690 V	kW	159	181	210
	1000 V	kW	131	148	165
Minimum conductor cross-section for loads with $I_e$	at 40 °C	mm <sup>2</sup>	70	95	95
	at 60 °C	mm <sup>2</sup>	50	70	95
Utilization category AC-2 and AC-3					
Rated operational currents $I_e$	up to 500 V	A	115	150	185
	690 V	A	115	150	170
	1000 V	A	53	65	65
Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	at 230 V	kW	37	50	61
	400 V	kW	64	84	104
	500 V	kW	81	105	132
	690 V	kW	113	146	167
	1000 V	kW	75	90	90
Thermal load capacity	10 s current <sup>2)</sup>	A	1100	1300	1480
Power loss per main current path	for $I_e$ /AC-3/500 V	W	7	9	13
Utilization category AC-4 (for $I_a = 6 \times I_e$ )					
Rated operational current $I_e$	up to 400 V	A	97	132	160
	at 400 V	kW	55	75	90
Rated power for squirrel-cage motors with 50 Hz and 60 Hz					
• The following applies to a contact endurance of about 200000 operating cycles:					
- Rated operational current $I_e$	up to 500 V	A	54	68	81
	690 V	A	48	57	65
	1000 V	A	34	38	42
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 230 V	kW	16	20	25
	400 V	kW	29	38	45
	500 V	kW	37	47	57
	690 V	kW	48	55	65
	1000 V	kW	49	55	60
Utilization category AC-6a Switching AC transformers					
Rated operational currents $I_e$					
• For inrush current n = 20	up to 690 V	A	115	148	148
	up to 690 V	A	90	99	99
Rated power $P$					
• For inrush current n = 20	at 230 V	kVA	45	58	58
	400 V	kVA	79	102	102
	500 V	kVA	99	128	128
	690 V	kVA	137	176	176
	1000 V	kVA	80	98	117
• For inrush current n = 30	at 230 V	kVA	35	39	39
	400 V	kVA	62	68	68
	500 V	kVA	77	85	85
	690 V	kVA	107	118	118
	1000 V	kVA	80	98	117
For deviating inrush current factors x, the power must be recalculated as follows: $P_x = P_{n,30} \cdot 30/x$					
Utilization category AC-6b Switching low-inductance (low-loss, metallized dielectric) AC capacitors					
Ambient temperature 40 °C					
Rated operational current $I_e$	up to 500 V	A	105	125	145
Rated power for single capacitors or banks of capacitors (minimum inductance of 6 µH between capacitors connected in parallel) at 50 Hz, 60 Hz	at 230 V	kvar	42	50	58
	400 V	kvar	72	86	100
	500 V	kvar	90	108	125
	690 V	kvar	72	86	100

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 Protection Equipment:  
Overload Relays.




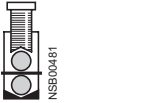
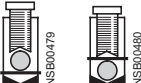
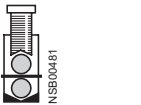
# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 54 S6	3RT10 55 S6	3RT10 56 S6
Main circuit				
Load rating with DC				
Utilization category DC-1				
Switching resistive load ( $L/R \leq 1 \text{ ms}$ )				
Rated operational current $I_e$ (at 60 °C)				
• 1 conducting path	up to 24 V	A	160	
	60 V	A	160	
	110 V	A	18	
	220 V	A	3.4	
	440 V	A	0.8	
	600 V	A	0.5	
• 2 conducting paths in series	up to 24 V	A	160	
	60 V	A	160	
	110 V	A	160	
	220 V	A	20	
	440 V	A	3.2	
	600 V	A	1.6	
• 3 conducting paths in series	up to 24 V	A	160	
	60 V	A	160	
	110 V	A	160	
	220 V	A	160	
	440 V	A	11.5	
	600 V	A	4	
Utilization category DC-3 and DC-5				
Shunt-wound and series-wound motors ( $L/R \leq 15 \text{ ms}$ )				
Rated operational current $I_e$ (at 60 °C)				
• 1 conducting path	up to 24 V	A	160	
	60 V	A	7.5	
	110 V	A	2.5	
	220 V	A	0.6	
	440 V	A	0.17	
	600 V	A	0.12	
• 2 conducting paths in series	up to 24 V	A	160	
	60 V	A	160	
	110 V	A	160	
	220 V	A	2.5	
	440 V	A	0.65	
	600 V	A	0.37	
• 3 conducting paths in series	up to 24 V	A	160	
	60 V	A	160	
	110 V	A	160	
	220 V	A	160	
	440 V	A	1.4	
	600 V	A	0.75	
Switching frequency				
Switching frequency $z$ in operating cycles/hour				
• Contactors without overload relays	No-load switching frequency	$\text{h}^{-1}$	2000	2000
Dependence of the switching frequency $z'$ on the operational current $I'$ and operational voltage $U'$ : $z' = z \cdot (I_e/I') \cdot (400 \text{ V}/U')^{1.5} \cdot 1/\text{h}$	AC-1	$\text{h}^{-1}$	800	800
	AC-2	$\text{h}^{-1}$	400	300
	AC-3	$\text{h}^{-1}$	1000	750
	AC-4	$\text{h}^{-1}$	130	130
• Contactors with overload relays (mean value)		$\text{h}^{-1}$	60	60

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 5. S6
<b>Conductor cross-sections of main conductors with box terminal</b>		
<b>Screw terminals</b> (1 or 2 conductors can be connected)	<b>Main conductors:</b> <u>with 3RT19 55-4G box terminal (55 kW)</u>	
<b>Front or rear clamping point connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup> 16 ... 70
	• Finely stranded without end sleeve	mm <sup>2</sup> 16 ... 70
	• Stranded	mm <sup>2</sup> 16 ... 70
	• Ribbon cable conductors (number x width x circumference)	mm Min. 3 x 9 x 0.8, max. 6 x 15.5 x 0.8
	• AWG conductors, solid or stranded	AWG 6 ... 2/0
<b>Both clamping points connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup> Max. 1 x 50, 1 x 70
	• Finely stranded without end sleeve	mm <sup>2</sup> Max. 1 x 50, 1 x 70
	• Stranded	mm <sup>2</sup> Max. 2 x 70
	• Ribbon cable conductors (number x width x circumference)	mm Max. 2 x (6 x 15.5 x 0.8)
	• AWG conductors, solid or stranded	AWG Max. 2 x 1/0
	• Terminal screw - Tightening torque	Nm M10 (hexagon socket, A/F 4) 10 ... 12 (90 ... 110 lb.in)
<b>Screw terminals</b> (1 or 2 conductors can be connected)	<b>Main conductors:</b> <u>with 3RT19 56-4G box terminal</u>	
<b>Front or rear clamping point connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup> 16 ... 120
	• Finely stranded without end sleeve	mm <sup>2</sup> 16 ... 120
	• Stranded	mm <sup>2</sup> 16 ... 120
	• Ribbon cable conductors (number x width x circumference)	mm Min. 3 x 9 x 0.8, max. 10 x 15.5 x 0.8
	• AWG conductors, solid or stranded	AWG 6 ... 250 kcmil
<b>Both clamping points connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup> Max. 1 x 95, 1 x 120
	• Finely stranded without end sleeve	mm <sup>2</sup> Max. 1 x 95, 1 x 120
	• Stranded	mm <sup>2</sup> Max. 2 x 120
	• Ribbon cable conductors (number x width x circumference)	mm Max. 2 x (10 x 15.5 x 0.8)
	• AWG conductors, solid or stranded	AWG Max. 2 x 3/0
	• Terminal screw - Tightening torque	Nm M10 (hexagon socket, A/F 4) 10 ... 12 (90 ... 110 lb.in)
<b>Screw terminals</b>	<b>Main conductors:</b> <u>without box terminal/rail connection</u>	
	• Finely stranded with cable lug <sup>1)</sup>	mm <sup>2</sup> 16 ... 95
	• Stranded with cable lug <sup>1)</sup>	mm <sup>2</sup> 25 ... 120
	• AWG conductors, solid or stranded	AWG 4 ... 250 kcmil
	• Connecting bar (max. width)	mm 17
	• Terminal screw - Tightening torque	Nm M8 x 25 (A/F 13) 10 ... 14 (89 ... 124 lb.in)
	<b>Auxiliary conductors:</b>	
	• Solid	mm <sup>2</sup> 2 x (0.5 ... 1.5) <sup>2)</sup> ; 2 x (0.75 ... 2.5) <sup>2)</sup> according to IEC 60947; max. 2 x (0.75 ... 4)
	• Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.5 ... 1.5) <sup>2)</sup> ; 2 x (0.75 ... 2.5) <sup>2)</sup>
	• AWG conductors, solid or stranded	AWG 2 x (18 ... 14)
	• Terminal screw - Tightening torque	Nm M3 (PZ 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)
<b>Cage Clamp terminals</b>	<b>Auxiliary conductors:</b>	
	• Solid	mm <sup>2</sup> 2 x (0.25 ... 2.5)
	• Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.25 ... 1.5)
	• Finely stranded without end sleeve	mm <sup>2</sup> 2 x (0.25 ... 2.5)
	• AWG conductors, solid or stranded	AWG 2 x (24 ... 14)

For tools for opening Cage Clamp terminals see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

Maximum outer diameter of the conductor insulation: 3.6 mm.

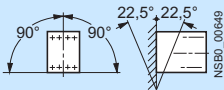
With conductor cross-sections ≤ 1 mm<sup>2</sup> an "insulation stop" must be used, see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

<sup>1)</sup> When connecting cable lugs to DIN 46235 use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm<sup>2</sup> to ensure phase spacing.

<sup>2)</sup> If two different conductor cross-sections are connected at one clamping point, then the two cross-sections must lie within the range quoted. If identical cross-sections are used, this restriction does not apply.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor		Type Size	3RT10 64 S10	3RT10 65 S10	3RT10 66 S10
General data					
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.					
<b>Mechanical endurance</b>		Operating cycles	10 million		
<b>Electrical endurance</b>			1)		
<b>Rated insulation voltage <math>U_i</math></b> (degree of pollution 3)		V	1000		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		kV	8		
<b>Safe isolation</b> between the coil and the main contacts according to EN 60947-1, Appendix N		V	690		
<b>Mirror contacts</b> A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.			Yes, accotding to EN 60947-4-1, Appendix F		
<b>Permissible ambient temperature</b>		During operation During storage	°C °C	-25 ... +60/+55 with AS-Interface -55 ... +80	
<b>Degree of protection</b> according to EN 60947-1, Appendix C				IP00/open, coil assembly IP20	
<b>Touch protection</b> according to EN 50274				Finger-safe with cover	
<b>Shock resistance</b>		Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
<b>Conductor cross-sections</b>				2)	
<b>Electromagnetic compatibility (EMC)</b>				3)	
Short-circuit protection					
<b>Main circuit</b> Fuse links, gL/gG LV HRC 3NA, DIAZED 5SB, NEOZED 5SE					
- Acc. to IEC 60947-4-1/ EN 60947-4-1		• Type of coordination "1" • Type of coordination "2" • Weld-free <sup>4)</sup>	A A A	500 400 250	
<b>Auxiliary circuit</b>					
• Fuse links gL/gG DIAZED 5SB, NEOZED 5SE (weld-free protection at $I_k \geq 1$ kA) or miniature circuit breakers with C characteristic (short-circuit current $I_k < 400$ A)			A	10	

1) See endurance of the main contacts on page 3/19.

2) See conductor cross-sections on page 3/47.

3) See Electromagnetic Compatibility (EMC) on page 3/12.

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

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 64 S10	3RT10 65 S10	3RT10 66 S10
Control					
Operating range of the solenoid AC/DC (UC)			0.8 x $U_{s\ min}$ ... 1.1 x $U_{s\ max}$		
Power consumption of the solenoid (when coil is cool and rated range $U_{s\ min}$ ... $U_{s\ max}$ )					
• Conventional operating mechanism					
- AC operation	Closing at $U_{s\ min}$	VA/p.f.	490/0.9		
	Closing at $U_{s\ max}$	VA/p.f.	590/0.9		
	Closed at $U_{s\ min}$	VA/p.f.	5.6/0.9		
	Closed at $U_{s\ max}$	VA/p.f.	6.7/0.9		
- DC operation	Closing at $U_{s\ min}$	W	540		
	Closing at $U_{s\ max}$	W	650		
	Closed at $U_{s\ min}$	W	6.1		
	Closed at $U_{s\ max}$	W	7.4		
• Solid-state operating mechanism					
- AC operation	Closing at $U_{s\ min}$	VA/p.f.	400/0.8		
	Closing at $U_{s\ max}$	VA/p.f.	530/0.8		
	Closed at $U_{s\ min}$	VA/p.f.	4/0.5		
	Closed at $U_{s\ max}$	VA/p.f.	5/0.4		
- DC operation	Closing at $U_{s\ min}$	W	440		
	Closing at $U_{s\ max}$	W	580		
	Closed at $U_{s\ min}$	W	3.2		
	Closed at $U_{s\ max}$	W	3.8		
PLC control input (EN 61131-2/type 2)			24 V DC/ ≤ 30 mA power consumption, (operating range 17 ... 30 V DC)		
Operating times (Total break time = Opening delay + Arcing time)					
• Conventional operating mechanism					
- With 0.8 x $U_{s\ min}$ ... 1.1 x $U_{s\ max}$	Closing delay	ms	30 ... 95		
	Opening delay	ms	40 ... 80		
- For $U_{s\ min}$ ... $U_{s\ max}$	Closing delay	ms	35 ... 50		
	Opening delay	ms	50 ... 80		
• Solid-state operating mechanism, actuated via A1/A2					
- With 0.8 x $U_{s\ min}$ ... 1.1 x $U_{s\ max}$	Closing delay	ms	105 ... 145		
	Opening delay	ms	80 ... 100		
- For $U_{s\ min}$ ... $U_{s\ max}$	Closing delay	ms	110 ... 130		
	Opening delay	ms	80 ... 100		
• Solid-state operating mechanism, actuated via PLC input					
- With 0.8 x $U_{s\ min}$ ... 1.1 x $U_{s\ max}$	Closing delay	ms	45 ... 80		
	Opening delay	ms	80 ... 100		
- For $U_{s\ min}$ ... $U_{s\ max}$	Closing delay	ms	50 ... 65		
	Opening delay	ms	80 ... 100		
• Arcing time			10 ... 15		

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 64 S10	3RT10 65 S10	3RT10 66 S10
<b>Main circuit</b>					
<b>AC capacity</b>					
<b>Utilization category AC-1</b>					
<b>Switching resistive loads</b>					
Rated operational currents $I_e$	at 40 °C up to 690 V	A	275	330	
	at 60 °C up to 690 V	A	250	300	
	at 60 °C up to 1000 V	A	100	150	
Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (for 60 °C)	at 230 V	kW	94	113	
	400 V	kW	164	197	
	500 V	kW	205	246	
	690 V	kW	283	340	
	1000 V	kW	164	246	
Minimum conductor cross-section for loads with $I_e$	at 40 °C	mm <sup>2</sup>	150	185	
	at 60 °C	mm <sup>2</sup>	120	185	
<b>Utilization category AC-2 and AC-3</b>					
Rated operational currents $I_e$	up to 500 V	A	225	265	300
	690 V	A	225	265	280
	1000 V	A	68	95	95
Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	at 230 V	kW	73	85	97
	400 V	kW	128	151	171
	500 V	kW	160	189	215
	690 V	kW	223	265	280
	1000 V	kW	90	132	132
<b>Thermal load capacity</b>	10 s current <sup>2)</sup>	A	1800	2400	2400
<b>Power loss per main current path</b>	for $I_e/AC-3/500$ V	W	17	18	22
<b>Utilization category AC-4 (for <math>I_a = 6 \times I_e</math>)</b>					
Rated operational current $I_e$	up to 400 V	A	195	230	280
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 400 V	kW	110	132	160
• The following applies to a contact endurance of about 200000 operating cycles:					
- Rated operational currents $I_e$	up to 500 V	A	96	117	125
	690 V	A	85	105	115
	1000 V	A	42	57	57
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 230 V	kW	30	37	40
	400 V	kW	54	66	71
	500 V	kW	67	82	87
	690 V	kW	82	102	112
	1000 V	kW	59	80	80
<b>Utilization category AC-6a</b>					
<b>Switching AC transformers</b>					
Rated operational current $I_e$					
• For inrush current n = 20	up to 690 V	A	227	265	273
	up to 690 V	A	151	182	182
Rated power $P$					
• For inrush current n = 20	at 230 V	kVA	90	105	109
	400 V	kVA	157	183	189
	500 V	kVA	196	229	236
	690 V	kVA	271	317	326
	1000 V	kVA	117	164	164
	at 230 V	kVA	60	72	72
• For inrush current n = 30	400 V	kVA	105	126	126
	500 V	kVA	130	158	158
	690 V	kVA	180	217	217
	1000 V	kVA	117	164	164
For deviating inrush current factors x, the power must be recalculated as follows: $P_x = P_{n\ 30} \cdot 30/x$					
<b>Utilization category AC-6b</b>					
<b>Switching low-inductance (low-loss, metallized dielectric) AC capacitors</b>					
Ambient temperature 40 °C					
Rated operational current $I_e$	up to 500 V	A	183	220	
Rated power for single capacitors or banks of capacitors (minimum inductance of 6 µH between capacitors connected in parallel) at 50 Hz, 60 Hz and	at 230 V	kvar	73	88	
	400 V	kvar	127	152	
	500 V	kvar	159	191	
	690 V	kvar	127	152	

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

<sup>2)</sup> According to IEC 60947-4-1.  
For rated values for various start-up conditions see Protection Equipment:  
Overload Relays.




# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 64 S10	3RT10 65 S10	3RT10 66 S10
Main circuit				
Load rating with DC				
Utilization category DC-1				
Switching resistive load ( $L/R \leq 1$ ms)				
Rated operational current $I_e$ (at 60 °C)				
• 1 conducting path	up to 24 V	A	200	300
	60 V	A	200	300
	110 V	A	18	33
	220 V	A	3.4	3.8
	440 V	A	0.8	0.9
	600 V	A	0.5	0.6
• 2 conducting paths in series	up to 24 V	A	200	300
	60 V	A	200	300
	110 V	A	200	300
	220 V	A	20	300
	440 V	A	3.2	4
	600 V	A	1.6	2
• 3 conducting paths in series	up to 24 V	A	200	300
	60 V	A	200	300
	110 V	A	200	300
	220 V	A	200	300
	440 V	A	11.5	11
	600 V	A	4	5.2
Utilization category DC-3 and DC-5				
Shunt-wound and series-wound motors ( $L/R \leq 15$ ms)				
Rated operational current $I_e$ (at 60 °C)				
• 1 conducting path	up to 24 V	A	200	300
	60 V	A	7.5	11
	110 V	A	2.5	3
	220 V	A	0.6	0.6
	440 V	A	0.17	0.18
	600 V	A	0.12	0.125
• 2 conducting paths in series	up to 24 V	A	200	300
	60 V	A	200	300
	110 V	A	200	300
	220 V	A	2.5	2.5
	440 V	A	0.65	0.65
	600 V	A	0.37	0.37
• 3 conducting paths in series	up to 24 V	A	200	300
	60 V	A	200	300
	110 V	A	200	300
	220 V	A	200	300
	440 V	A	1.4	1.4
	600 V	A	0.75	0.75
Switching frequency				
Switching frequency $z$ in operating cycles/hour				
• Contactors without overload relays	No-load switching frequency	$h^{-1}$	2000	2000
	Dependence of the switching	$h^{-1}$	750	800
	frequency $z'$ on the operational	$h^{-1}$	250	300
	current $I'$ and operational voltage $U'$ :	$h^{-1}$	500	700
	$z' = z \cdot (I_e/I') \cdot (400\text{ V}/U')^{1.5} \cdot 1/h$	$h^{-1}$	130	130
• Contactors with overload relays (mean value)		$h^{-1}$	60	60

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 6. S10	
Conductor cross-sections			
<b>Screw terminals</b>	<b>Main conductors:</b> <u>with 3RT19 66-4G box terminal</u>		
<b>Front clamping point connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup>	70 ... 240
	• Finely stranded without end sleeve	mm <sup>2</sup>	70 ... 240
	• Stranded	mm <sup>2</sup>	95 ... 300
	• AWG conductors, solid or stranded	AWG	3/0 ... 600 kcmil
	• Ribbon cable conductors (number x width x circumference)	mm	Min. 6 x 9 x 0.8, max. 20 x 24 x 0.5
<b>Rear clamping point connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup>	120 ... 185
	• Finely stranded without end sleeve	mm <sup>2</sup>	120 ... 185
	• Stranded	mm <sup>2</sup>	120 ... 240
	• AWG conductors, solid or stranded	AWG	250 ... 500 kcmil
	• Ribbon cable conductors (number x width x circumference)	mm	Min. 6 x 9 x 0.8, max. 20 x 24 x 0.5
<b>Both clamping points connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup>	Min. 2 x 50, max. 2 x 185
	• Finely stranded without end sleeve	mm <sup>2</sup>	Min. 2 x 50, max. 2 x 185
	• Stranded	mm <sup>2</sup>	Min. 2 x 70, max. 2 x 240
	• AWG conductors, solid or stranded	AWG	Min. 2 x 2/0, max. 2 x 500 kcmil
	• Ribbon cable conductors (number x width x circumference)	mm	Max. 2 x (20 x 24 x 0.5)
	• Terminal screws - Tightening torque	Nm	M12 (hexagon socket, A/F 5) 20 ... 22 (180 ... 195 lb.in)
<b>Screw terminals</b>	<b>Main conductors:</b> <u>without box terminal/rail connection</u>		
	• Finely stranded with cable lug <sup>1)</sup>	mm <sup>2</sup>	50 ... 240
	• Stranded with cable lug <sup>1)</sup>	mm <sup>2</sup>	70 ... 240
	• AWG conductors, solid or stranded	AWG	2/0 ... 500 kcmil
	• Connecting bar (max. width)	mm	25
	• Terminal screws - Tightening torque	Nm	M10 x 30 (A/F 17) 14 ... 24 (124 ... 210 lb.in)
	<b>Auxiliary conductors:</b>		
	• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>2)</sup> ; 2 x (0.75 ... 2.5) <sup>2)</sup> according to IEC 60947; max. 2 x (0.75 ... 4)
	• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>2)</sup> ; 2 x (0.75 ... 2.5) <sup>2)</sup>
	• AWG conductors, solid or stranded	AWG	2 x (18 ... 14)
	• Terminal screws - Tightening torque	Nm	M3 (PZ 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)
<b>Cage Clamp terminals</b>	<b>Auxiliary conductors:</b>		
	• Solid	mm <sup>2</sup>	2 x (0.25 ... 2.5)
	• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 ... 1.5)
	• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.25 ... 2.5)
	• AWG conductors, solid or stranded	AWG	2 x (24 ... 14)

For tools for opening Cage Clamp terminals see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

Maximum outer diameter of the conductor insulation: 3.6 mm.

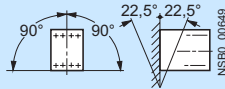
With conductor cross-sections ≤ 1 mm<sup>2</sup> an "insulation stop" must be used, see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

<sup>1)</sup> When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm<sup>2</sup> and more as well as DIN 46235 for conductor cross-sections of 185 mm<sup>2</sup> and more to keep the phase clearance.

<sup>2)</sup> If two different conductor cross-sections are connected at one clamping point, then the two cross-sections must lie within the range quoted. If identical cross-sections are used, this restriction does not apply.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor		Type Size	3RT10 75 S12	3RT10 76 S12	
General data					
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance		Oper- ating cycles	10 million		
Electrical endurance			1)		
Rated insulation voltage $U_i$ (degree of pollution 3)		V	1000		
Rated impulse withstand voltage $U_{imp}$		kV	8		
Safe isolation between the coil and the main contacts according to EN 60947-1, Appendix N		V	690		
Mirror contacts A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.			Yes, according to EN 60947-4-1, Appendix F		
Permissible ambient temperature		During operation During storage	°C °C	-25 ... +60/+55 with AS-Interface -55 ... +80	
Degree of protection according to EN 60947-1, Appendix C			IP00/open, coil assembly IP20		
Touch protection according to EN 50274			Finger-safe with cover		
Shock resistance		Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections			2)		
Electromagnetic compatibility (EMC)			3)		
Short-circuit protection					
Main circuit Fuse links, gL/gG LV HRC 3NA, DIAZED 5SB, NEOZED 5SE					
- According to IEC 60947-4-1/ EN 60947-4-1		• Type of coordination "1"	A	630	630
		• Type of coordination "2"	A	500	500
		• Weld-free <sup>4)</sup>	A	250	315
Auxiliary circuit					
• Fuse links gL/gG DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA) or miniature circuit breakers with C characteristic (short-circuit current $I_k < 400$ A)		A	10		

1) See endurance of the main contacts on page 3/19.  
2) See conductor cross-sections on page 3/52.  
3) See Electromagnetic Compatibility (EMC) on page 3/12.  
4) Test conditions according to IEC 60947-4-1.



# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 75 S12	3RT10 76 S12
<b>Control</b>				
<b>Operating range of the solenoid AC/DC (UC)</b>			$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	
<b>Power consumption of the solenoid</b> (when coil is cool and rated range $U_{s \min} \dots U_{s \max}$ )				
• Conventional operating mechanism				
- AC operation	Closing at $U_{s \min}$	VA/p.f.	700/0.9	
	Closing at $U_{s \max}$	VA/p.f.	830/0.9	
	Closed at $U_{s \min}$	VA/p.f.	7.6/0.9	
	Closed at $U_{s \max}$	VA/p.f.	9.2/0.9	
- DC operation	Closing at $U_{s \min}$	W	770	
	Closing at $U_{s \max}$	W	920	
	Closed at $U_{s \min}$	W	8.5	
	Closed at $U_{s \max}$	W	10	
• Solid-state operating mechanism				
- AC operation	Closing at $U_{s \min}$	VA/p.f.	560/0.8	
	Closing at $U_{s \max}$	VA/p.f.	750/0.8	
	Closed at $U_{s \min}$	VA/p.f.	5.4/0.8	
	Closed at $U_{s \max}$	VA/p.f.	7/0.8	
- DC operation	Closing at $U_{s \min}$	W	600	
	Closing at $U_{s \max}$	W	800	
	Closed at $U_{s \min}$	W	4	
	Closed at $U_{s \max}$	W	5	
<b>PLC control input</b> (EN 61131-2/type 2)			24 V DC/≤ 30 mA power consumption, (operating range 17 ... 30 V DC)	
<b>Operating times</b> (Total break time = Opening delay + Arcing time)				
• Conventional operating mechanism				
- With $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	Closing delay	ms	45 ... 100	
	Opening delay	ms	60 ... 100	
- For $U_{s \min} \dots U_{s \max}$	Closing delay	ms	50 ... 70	
	Opening delay	ms	70 ... 100	
• Solid-state operating mechanism, actuated via A1/A2				
- With $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	Closing delay	ms	120 ... 150	
	Opening delay	ms	80 ... 100	
- For $U_{s \min} \dots U_{s \max}$	Closing delay	ms	125 ... 150	
	Opening delay	ms	80 ... 100	
• Solid-state operating mechanism, actuated via PLC input				
- With $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	Closing delay	ms	60 ... 90	
	Opening delay	ms	80 ... 100	
- For $U_{s \min} \dots U_{s \max}$	Closing delay	ms	65 ... 80	
	Opening delay	ms	80 ... 100	
• Arcing time			10 ... 15	

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 75 S12	3RT10 76 S12
Main circuit			
AC capacity			
Utilization category AC-1 Switching resistive loads			
Rated operational currents $I_e$	at 40 °C up to 690 V A at 60 °C up to 690 V A at 60 °C up to 1000 V A	430 400 200	610 550 200
Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	at 230 V kW 400 V kW 500 V kW 690 V kW 1000 V kW	151 263 329 454 329	208 362 452 624 329
Minimum conductor cross-section for loads with $I_e$	at 40 °C mm <sup>2</sup> at 60 °C mm <sup>2</sup>	2 x 150 240	2 x 185 2 x 185
Utilization category AC-2 and AC-3			
Rated operational currents $I_e$	up to 500 V A 690 V A 1000 V A	400 400 180	500 450 180
Rated power of slipring or squirrel-cage motors at 50 and 60 Hz	at 230 V kW 400 V kW 500 V kW 690 V kW 1000 V kW	132 231 291 400 250	164 291 363 453 250
Thermal load capacity	10 s current <sup>2)</sup> A	3200	4000
Power loss per main current path	at $I_e$ /AC-3/500 V W	35	55
Utilization category AC-4 (for $I_a = 6 \times I_e$ )			
Rated operational current $I_e$	up to 400 V A	350	430
Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 400 V kW	200	250
• The following applies to a contact endurance of about 200000 operating cycles:			
- Rated operational current $I_e$	up to 500 V A 690 V A 1000 V A	150 135 80	175 150 80
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	at 230 V kW 400 V kW 500 V kW 690 V kW 1000 V kW	48 85 105 133 113	56 98 123 148 113
Utilization category AC-6a Switching AC transformers			
Rated operational current $I_e$			
• For inrush current n = 20 • For inrush current n = 30	up to 690 V A up to 690 V A	377 251	404 270
Rated power P			
• For inrush current n = 20	at 230 V kVA 400 V kVA 500 V kVA 690 V kVA 1000 V kVA	150 261 326 450 311	161 280 350 483 311
• For inrush current n = 30	at 230 V kVA 400 V kVA 500 V kVA 690 V kVA 1000 V kVA	100 173 217 300 311	107 187 234 323 311
For deviating inrush current factors x, the power must be recalculated as follows: $P_x = P_{n\ 30} \cdot 30/x$			
Utilization category AC-6b Switching low-inductance (low-loss, metallized dielectric) AC capacitors			
Ambient temperature 40 °C			
Rated operational current $I_e$	up to 500 V A	287	407
Rated power for single capacitors or banks of capacitors (minimum inductance of 6 µH between capacitors connected in parallel) at 50 Hz, 60 Hz and	at 230 V kvar 400 V kvar 500 V kvar 690 V kvar	114 199 248 199	162 282 352 282

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

2) According to IEC 60947-4-1.  
For rated values for various start-up conditions see Protection Equipment:  
Overload Relays.




# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 75 S12	3RT10 76 S12
Main circuit			
Load rating with DC			
Utilization category DC-1 Switching resistive load ( $L/R \leq 1\text{ ms}$ )			
Rated operational current $I_e$ (at 60 °C)			
• 1 conducting path	up to 24 V	A	400
	60 V	A	330
	110 V	A	33
	220 V	A	3.8
	440 V	A	0.9
	600 V	A	0.6
• 2 conducting paths in series	up to 24 V	A	400
	60 V	A	400
	110 V	A	400
	220 V	A	400
	440 V	A	4
	600 V	A	2
• 3 conducting paths in series	up to 24 V	A	400
	60 V	A	400
	110 V	A	400
	220 V	A	400
	440 V	A	11
	600 V	A	5.2
Utilization category DC-3 and DC-5 Shunt-wound and series-wound motors ( $L/R \leq 15\text{ ms}$ )			
Rated operational current $I_e$ (at 60 °C)			
• 1 conducting path	up to 24 V	A	400
	60 V	A	11
	110 V	A	3
	220 V	A	0.6
	440 V	A	0.18
	600 V	A	0.125
• 2 conducting paths in series	up to 24 V	A	400
	60 V	A	400
	110 V	A	400
	220 V	A	2.5
	440 V	A	0.65
	600 V	A	0.37
• 3 conducting paths in series	up to 24 V	A	400
	60 V	A	400
	110 V	A	400
	220 V	A	400
	440 V	A	1.4
	600 V	A	0.75
Switching frequency			
Switching frequency $z$ in operating cycles/hour			
• Contactors without overload relays	No-load switching frequency	$\text{h}^{-1}$	2000
	Dependence of the switching frequency $z'$ on the operational current $I'$ and operational voltage $U'$ :	$\text{h}^{-1}$	700
		$\text{h}^{-1}$	500
		$\text{h}^{-1}$	200
		$\text{h}^{-1}$	170
• Contactors with overload relays (mean value)		$\text{h}^{-1}$	420
		$\text{h}^{-1}$	130
		$\text{h}^{-1}$	60

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size	3RT10 7. S12
<b>Conductor cross-sections</b>		
<b>Screw terminals</b>	<b>Main conductors:</b> with 3RT19 66-4G box terminal	
<b>Front clamping point connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup> 70 ... 240
	• Finely stranded without end sleeve	mm <sup>2</sup> 70 ... 240
	• Stranded	mm <sup>2</sup> 95 ... 300
	• AWG conductors, solid or stranded	AWG 3/0 ... 600 kcmil
	• Ribbon cable conductors (number x width x circumference)	mm <sup>2</sup> Min. 6 x 9 x 0.8, max. 20 x 24 x 0.5
<b>Rear clamping point connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup> 120 ... 185
	• Finely stranded without end sleeve	mm <sup>2</sup> 120 ... 185
	• Stranded	mm <sup>2</sup> 120 ... 240
	• AWG conductors, solid or stranded	AWG 250 ... 500 kcmil
	• Ribbon cable conductors (number x width x circumference)	mm <sup>2</sup> Min. 6 x 9 x 0.8, max. 20 x 24 x 0.5
<b>Both clamping points connected</b> 	• Finely stranded with end sleeve	mm <sup>2</sup> Min. 2 x 50, max. 2 x 185
	• Finely stranded without end sleeve	mm <sup>2</sup> Min. 2 x 50, max. 2 x 185
	• Stranded	mm <sup>2</sup> Min. 2 x 70, max. 2 x 240
	• AWG conductors, solid or stranded	AWG Min. 2 x 2/0, max. 2 x 500 kcmil
	• Ribbon cable conductors (number x width x circumference)	mm <sup>2</sup> Max. 2 x (20 x 24 x 0.5)
<b>Screw terminals</b>	• Terminal screws - Tightening torque	Nm M12 (hexagon socket, A/F 5) 20 ... 22 (180 ... 195 lb.in)
	<b>Main conductors:</b> without box terminal/rail connection	
	• Finely stranded with cable lug <sup>1)</sup>	mm <sup>2</sup> 50 ... 240
	• Stranded with cable lug <sup>1)</sup>	mm <sup>2</sup> 70 ... 240
	• AWG conductors, solid or stranded	AWG 2/0 ... 500 kcmil
<b>Cage Clamp terminals</b>	• Connecting bar (max. width)	mm 25
	• Terminal screws - Tightening torque	NM M10 x 30 (A/F 17) 14 ... 24 (124 ... 210 lb.in)
	<b>Auxiliary conductors:</b>	
	• Solid	mm <sup>2</sup> 2 x (0.5 ... 1.5) <sup>2)</sup> ; 2 x (0.75 ... 2.5) <sup>2)</sup> according to IEC 60947; max. 2 x (0.75 ... 4)
	• Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.5 ... 1.5) <sup>2)</sup> ; 2 x (0.75 ... 2.5) <sup>2)</sup>
<b>Screw terminals</b>	• AWG conductors, solid or stranded	AWG 2 x (18 ... 14)
	• Terminal screws - Tightening torque	NM M3 (PZ 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)
	<b>Auxiliary conductors:</b>	
	• Solid	mm <sup>2</sup> 2 x (0.25 ... 2.5)
	• Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.25 ... 1.5)
<b>Cage Clamp terminals</b>	• Finely stranded without end sleeve	mm <sup>2</sup> 2 x (0.25 ... 2.5)
	• AWG conductors, solid or stranded	mm <sup>2</sup> 2 x (24 ... 14)

For tools for opening Cage Clamp terminals see Catalog LV 1, Chapter 3, Accessories and Spare Parts.  
Maximum outer diameter of the conductor insulation: 3.6 mm.  
With conductor cross-sections ≤ 1 mm<sup>2</sup> an "insulation stop" must be used, see Catalog LV 1, Chapter 3, Accessories and Spare Parts.

<sup>1)</sup> When connecting cable lugs according to DIN 46234 for conductor cross-sections of 185 mm<sup>2</sup> and more and according to DIN 46235 for conductor cross-sections of 240 mm<sup>2</sup> and more, the 3RT19 66-4EA1 terminal cover must be used more to keep the phase clearance.

<sup>2)</sup> If two different conductor cross-sections are connected at one clamping point, then the two cross-sections must lie within the range quoted. If identical cross-sections are used, this restriction does not apply.

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Type Size		3RT10 15 S00	3RT10 16 S00	3RT10 17 S00	3RT10 23 S0	3RT10 24 S0	3RT10 25 S0	3RT10 26 S0
CSA and UL rated data									
Rated insulation voltage		V AC	600			600			
Uninterrupted current, at 40 °C		Open and enclosed	A			20			
Maximum horsepower ratings (CSA and UL approved values)									
Rated power for induction motors with 60 Hz		at 200 V hp	1.5	2	3	2	3	5	7.5
		230 V hp	2	3	3	3	3	5	7.5
		460 V hp	3	5	7.5	5	7.5	10	15
		575 V hp	5	7.5	10	7.5	10	15	20
Short-circuit protection (contactor or overload relay)		at 600 V kA	5	5	5	5	5	5	5
		CLASS RK5 fuse	60	60	60	70	70	70	100
		Circuit breakers with overload protection according to UL 489	50	50	50	70	70	70	100
Combination motor controllers type E according to UL 508									
at 480 V		Type	--	--	--	3RV10 2			
		A	--	--	--	8	10	16	22
		kA	--	--	--	65	65	65	65
at 600 V		Type	--	--	--	3RV10 2			
		A	--	--	--	8	10	12.5	12.5
		kA	--	--	--	25	25	25	25
NEMA/EEMAC ratings									
NEMA/EEMAC size		hp	--		0	--			1
Uninterrupted current		Open	A	--	18	--			27
		Enclosed	A	--	18	--			27
Rated power for induction motors with 60 Hz		at 200 V hp	--		3	--			7.5
		230 V hp	--		3	--			7.5
		460 V hp	--		5	--			10
		575 V hp	--		5	--			10
Overload relays		Type	3RU11 16			3RU11 2			
		Setting range	A			0.11 ... 12			

Contactor	Type Size		3RT10 34 S2	3RT10 35 S2	3RT10 36 S2	3RT10 44 S3	3RT10 45 S3	3RT10 46 S3
CSA and UL rated data								
Rated insulation voltage		V AC	600			600		
Uninterrupted current, at 40 °C		Open and enclosed	45	55	50	90	105	105
Maximum horsepower ratings (CSA and UL approved values)								
Rated power for induction motors with 60 Hz		at 200 V hp	10	10	15	20	25	30
		230 V hp	10	15	15	25	30	30
		460 V hp	25	30	40	50	60	75
		575 V hp	30	40	50	60	75	100
Short-circuit protection (contactor or overload relay)		at 600 V kA	5	5	5	10	10	10
		CLASS RK5 fuse	125	150	200	250	300	350
		Circuit breakers with overload protection according to UL 489	125	150	200	250	300	400
Combination motor controllers type E according to UL 508								
at 480 V		Type	3RV10 3			3RV10 4		
		A	32	40	50	63	75	100
		kA	65	65	65	65	65	65
at 600 V		Type	3RV10 4			3RV10 4		
		A	32	40	50	63	75	75
		kA	25	25	25	30	30	30
NEMA/EEMAC ratings								
NEMA/EEMAC size		hp	--		2	--		3
Uninterrupted current		Open	A	--	45	--		90
		Enclosed	A	--	45	--		90
Rated power for induction motors with 60 Hz		at 200 V hp	--		10	--		25
		230 V hp	--		15	--		30
		460 V hp	--		25	--		50
		575 V hp	--		25	--		50
Overload relays		Type	3RU11 3			3RU11 4		
		Setting range	A			5.5 ... 50		

# 3RT, 3TB, 3TF Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 3 ... 250 kW

Contactor	Size		<b>S00</b> <b>Screw terminals and</b> <b>Cage Clamp terminals</b>  Integrated or snap-on auxiliary switch block	<b>S0 to S12</b> <b>Screw terminals and</b> <b>Cage Clamp terminals</b>  1 and 4-pole snap-on auxiliary switch block	<b>Screw terminals and</b> <b>Cage Clamp terminals</b>  Laterally mountable auxiliary switch block
<b>CSA and UL rated data for the auxiliary contacts</b>					
Rated voltage		V AC	600	600	600
Switching capacity	Uninterrupted current at 240 V AC	A	A 600, Q 600 10	A 600, Q 600 10	A 300, Q 300 10

Contactor	Type	Size		<b>3RT10 54</b> <b>S6</b>	<b>3RT10 55</b> <b>S6</b>	<b>3RT10 56</b> <b>S6</b>	<b>3RT10 64</b> <b>S10</b>	<b>3RT10 65</b> <b>S10</b>	<b>3RT10 66</b> <b>S10</b>
<b>CSA and UL rated data</b>									
Rated insulation voltage		V AC		600			600		
Uninterrupted current, at 40 °C	Open and enclosed	A	140	195	195	250	330	330	
<b>Maximum horsepower ratings</b> (CSA and UL approved values)									
Rated power for induction motors with 60 Hz		at 200 V hp	40	50	60	60	75	100	
		230 V hp	50	60	75	75	100	125	
		460 V hp	100	125	150	150	200	250	
		575 V hp	125	150	200	200	250	300	
<b>Short-circuit protection</b>									
		at 600 V kA	10	10	10	10	18	18	
	CLASS RK5/L fuse	A	450	500	500	700	800	800	
	Circuit breakers with overload protection according to UL 489	A	350	450	500	500	700	800	
<b>NEMA/EEMAC ratings</b>									
NEMA/EEMAC size		hp	--	4	--	--	--	--	5
Uninterrupted current	Open	A	--	150	--	--	--	--	300
	Enclosed	A	--	135	--	--	--	--	270
Rated power for induction motors with 60 Hz		at 200 V hp	--	40	--	--	--	--	75
		230 V hp	--	50	--	--	--	--	100
		460 V hp	--	100	--	--	--	--	200
		575 V hp	--	100	--	--	--	--	200
<b>Overload relays</b>	Type		3RB20 56				3RB20 66		

Contactor	Type	Size		<b>3RT10 75</b> <b>S12</b>	<b>3RT10 76</b> <b>S12</b>
<b>CSA and UL rated data</b>					
Rated insulation voltage		V AC		600	
Uninterrupted current, at 40 °C	Open and enclosed	A		400	540
<b>Maximum horsepower ratings</b> (CSA and UL approved values)					
Rated power for induction motors with 60 Hz		at 200 V hp		125	150
		230 V hp		150	200
		460 V hp		300	400
		575 V hp		400	500
<b>Short-circuit protection</b>					
		at 600 V kA		18	30
	CLASS L fuse	A		1000	1200
	Circuit breakers with overload protection according to UL 489	A		900	900
<b>NEMA/EEMAC ratings</b>					
NEMA/EEMAC size		hp		--	6
Uninterrupted current	Open	A		--	600
	Enclosed	A		--	540
Rated power for induction motors with 60 Hz		at 200 V hp		--	150
		230 V hp		--	200
		460 V hp		--	400
		575 V hp		--	400
<b>Overload relays</b>	Type			3RB20 66	