

3TG10

General data

Mechanical endurance	Operating cycles			3 million	
Electrical endurance at I_e	Operating cycles	AC-1 AC-3		0.1 million 0.4 million	
Rated insulation voltage U_i (pollution degree 3)		V		400	
Rated impulse withstand voltage U_{imp}		kV		4	
Permissible ambient temperature	in operation ¹⁾ when stored	°C °C		-25 to +55 -50 to +80	
Degree of protection acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)				IP 00, coil system IP 20	
Power consumption of the coils (with coil in cold state and $1.0 \times U_s$)					
	AC operation 50 Hz/60 Hz	VA		4.4	
	p.f.			0.9 (hum-free)	
	DC operation	W		4	
Coil voltage tolerance				0.85 to $1.1 \times U_s$	
Operating times (break-time = opening time + arcing time)				AC operation	DC operation
	Closing	closing time opening time	NO NC	ms ms	ms ms
				10 to 50 5 to 45	11 to 50 5 to 45
	Opening	opening time closing time	NO NC	ms ms	ms ms
				20 to 30 20 to 30	19 to 35 21 to 39
	Arcing time			ms	
				10 to 15	
Shock resistance					
Rectangular pulse	AC and DC operation	g/ms		5.1/5 and 3.5/10	
Sine pulse	AC and DC operation	g/ms		7.9/5 and 5.2/10	
Operating frequency z in operating cycles per hour					
Rated operation	No-load op. frequency	1/h		10000	
	for AC-1	1/h		1000	
	for AC-2	1/h		500	
	for AC-3	1/h		1000	

Short-circuit protection

Fuse links					
Utilization category gL/gG	NH DIAZED NEOZED	Type 3NA Type 5SB Type 5SE			
acc. to IEC 60 947-4-1 (DIN VDE 0660Part 102)	Type of coordination "1"		A	25	
	Type of coordination "2"		A	10	
Miniature circuit-breaker	C-characteristic		A	10	

Load ratings with AC

AC-1 utilization category, switching resistive load					
Rated operational current I_e at 55 °C to 400 V ¹⁾					
with screw connection			A	20	
with tab connector			A	16	
Ratings U_e of three-phase loads p.f. = 1			V	400	230/220
with screw connection			kW	13	7.5
with tab connector			kW	10	6.0
Minimum conductor cross-section with I_e load			mm ²	2.5	

1) If the three main conducting paths are loaded with 20 A and $I > 10$ A, the permissible ambient temperature for the fourth conducting paths 40 °C.

3TG10 Contactors

Technical data

3TG10

Load ratings with AC

AC-2 and AC-3 utilization categories

Rated operational currents I_e up to 400 V	A	8.4							
Ratings of motors with slipring or squirrel-cage rotor at 50 Hz and 60 Hz and at 400 V	kW	4							

AC-5a utilization category (permissible supply impedance: $\geq 0.5 \Omega$)

Switching gas discharge lamps

per main conducting path at 50 Hz 230 V

		Uncorrected			Lead-lag		
Rating per lamp	W	18	36	58	18	36	58
Rated operational current per lamp	A	0.37	0.43	0.67	2 x 0.11	2 x 0.21	2 x 0.32
Number of lamps	units	43	37	24	2 x 81	2 x 42	2 x 28

Switching gas discharge lamps with correction, electronic ballast

per main conducting path at 50 Hz 230 V

		Parallel correction			Electr. ballast, 1 lamp			Electr. ballast, 2 lamps		
Rating per lamp	W	18	36	58	18	36	58	18	36	58
Capacitor	μF	4.5	4.5	7	6.8	6.8	10	10	10	22
Rated operational current per lamp	A	0.11	0.21	0.32	0.10	0.18	0.27	0.18	0.35	0.52
Number of lamps	units	15	15	10	39	39	26	2 x 26	2 x 26	2 x 1

AC-5b utilization category, switching incandescent lamps

per main conducting path at 50 Hz 230 V

	kW	1.6							
--	----	-----	--	--	--	--	--	--	--

Load ratings with DC

DC-1 utilization category, switching resistive load ($\frac{L}{R} \leq 1 \text{ ms}$)

Rated operational currents I_e		Conducting paths connected in series			
		1	2	3	4
up to 24 V	A	16	16	18	20
	A	6	16	18	20
	A	2	6	16	20
	A	0.8	1.6	6	20

DC-3 and DC-5 utilization categories, shunt and series motors ($\frac{L}{R} \leq 15 \text{ ms}$)

Rated operational currents I_e		Conducting paths connected in series			
		1	2	3	4
up to 24 V	A	10	16	16	18
	A	0.5	5	16	16
	A	0.15	0.35	10	10
	A	–	–	1.75	2

Conductor cross-sections for designs

with screw connections

Terminal screws		M3
Finely stranded with end sleeve (DIN 46 228, style A/D/C)	mm ²	2 x (0.75 to 2.5)
Solid	mm ²	2 x (1 to 2.5)
	mm ²	1 x 4

with tab connectors

Finely stranded	6.3 to 1	mm ²	0.5 to 1
When using push-on contact acc. to DIN 46 245/46 247	6.3 to 2.5	mm ²	1 to 2.5

Ⓢ and Ⓣ ratings (screw connection)

Rated insulation voltage	AC	V	600
Conventional thermal current	Free air and enclosed	A	20
Maximum horsepower ratings (Ⓢ and Ⓣ-approved values)			Single-phase 3-phase
Ratings of three-phase motors at 60 Hz	at 115 V	hp	1/2 –
	200 V	hp	1 3
	230 V	hp	1 1/2 3
	460 V/575 V	hp	– 5
	600 V	hp	– 5
Overload relay	Type		3UA7
	Setting range	A	6.3 to 10

For short-circuit protection with overload relays, see Part 4.

Technical data

Short-circuit protection of contactors without overload relays

Contactor	Size Type	0		1		2		3		
		3TF40	3TF41	3TF42	3TF43	3TF44	3TF45	3TF46	3TF47	
Main circuit										
Fuse links, utilization category gL/gG or miniature circuit-breaker with C-characteristic	NH DIAZED NEOZED	Type 3NA Type 5SB Type 5SE								
With fuse links										
– acc. to IEC 60 947-4-1 (DIN VDE 0660 Part 102)	Type of coord. "1" 1) Type of coord. "2" 1)	A A	35 25	35 25	63 25	63 25	80 80	80 80	160 125	160 125
– weld-free	$I_k < 100 \times I_e$ $I_k \geq 100 \times I_e$	A A	– 10	– 10	16 16	16 16	25 25	25 25	50 63	63 80
With miniature circuit-breaker		A	16	25	25	35	–	–	–	–
Auxiliary circuit (short-circuit current $I_k \geq 1$ kA)										
Fuse links, utilization category gL/gG or miniature circuit-breaker with C-characteristic	NH DIAZED NEOZED	Type 3NA Type 5SB Type 5ES								
With fuse links		A	16 (6 if the auxiliary contact of the overload relay is connected in the contactor coil circuit).							
With miniature circuit-breaker		A	10 (3 if the auxiliary contact of the overload relay is connected in the contactor coil circuit).							

For short-circuit protection of contactors with overload relays, see Part 4.
For fuseless motor feeders, see Part 5.

General data

Contactor	Size Type	0		1		2		3			
		3TF40/3TF41	3TF42/3TF43	3TF44/3TF45	3TF46/3TF47						
Mechanical endurance	DC operation	Oper. cycles	10 mill.	10 mill.	10 mill.	3 mill.					
Rated insulation voltage U_i (pollution degree 3)		V	690	690	690	1000					
Rated impulse withstand voltage U_{imp}		kV	8	8	8	8					
Permissible ambient temperature	in operation when stored	°C °C	–50 to +70 –55 to +80	(for ambient temperatures > +55 °C or < –25 °C, see description)							
Degree of protection acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)			IP 20	IP 20	IP 00	IP 00 (open), IP 40 (coil)					
Coil voltage tolerance			0.7 to 1.25 x U_s								
Power consumption of the coils (with coil in cold state and 1.0 x U_s) closing = closed ³⁾	DC operation	W	4.6	5.2	10.3	ON	OFF				
Permissible residual current of the electronics (with 0 signal)	DC operation		< 10 mA x $\left(\frac{24 V}{U_s}\right)$				–				
Operating times at 0.7 to 1.25 x U_s											
Break-time = opening time + arcing time	Oper. times Closing	at 0.7 x U_s	clos. time	NO ms	70 to 200	82 to 172	112 to 260	90 to 200			
			opng. time	NC ms	28 to 33	24 to 28	86 to 235	65 to 172			
Arcing time: 10 ms ²⁾		at 1.0 x U_s	clos. time	NO ms	45 to 80	58 to 73	74 to 106	48 to 100			
			opng. time	NC ms	30 to 34	24 to 28	58 to 98	35 to 90			
DC operation, DC solenoid system	Opening	at 0.7 to 1.25 x U_s	clos. time	NO ms	40 to 60	42 to 58	60 to 80	40 to 76			
			opng. time	NC ms	31 to 35	25 to 30	47 to 72	30 to 68			
Operating frequency z	DC operation	No-load operating frequency	1/h		1500	1500	1500	1500	1000	1000	
			Rated operation for	AC-1	1/h	1500	1500	1200	1200	1000	1000
				AC-2	1/h	1000	750	750	600	600	400
				AC-3	1/h	1000	750	750	600	1000	1000
				AC-4	1/h	250	250	250	200	400	300
			Dependence of the operating frequency z' on the operational current I' and the operational voltage U': $z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 V}{U'}\right) 1.5$ 1/h								
Contactors with overload relays (mean value)		1/h	15	15	15	15	15	15			

1) According to excerpt from IEC 60 947-4 -1 (DIN VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

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

2) 3TF46/47: 10 to 15 ms.
3) Valid for 3TF40 to 3TF45.

3TF40 to 3TF47 Contactors

Technical data

Contactor	Size Type			0 3TF40/3TF41	1 3TF42/3TF43	2 3TF44/3TF45	3 3TF46/3TF47
Shock resistance	Rectangular pulse	AC	g/ms	7.7/5 and 4.4/10	5.5/5 and 3.2/10	5.7/5 and 3.3/10	11.2/5 and 6.6/10
		DC	g/ms	9.3/5 and 5.4/10	5.8/5 and 3.4/10	5.7/5 and 3.3/10	14.5 and 7.7/10
	Sine pulse	AC	g/ms	12/5 and 6.8/10	8.7/5 and 5.1/10	9/5 and 5.2/10	17.6/5 and 10.3/10
		DC	g/ms	14.7/5 and 8.5/10	9/5 and 5.3/10	9/5 and 5.2/10	22/5 and 12/10

Conductor cross-sections

Contactor	Size Type			0 3TF40/3TF41	1 3TF42/3TF43
Screw connection (1 or 2 conductor connections possible)	Main conductor: Solid Finely stranded with end sleeve Pin-end connector (DIN 46 231) Solid or stranded Terminal screws	mm ²		2 x (0.5 to 1); 2 x (1 to 2.5); 1 x 4	2 x (2.5 to 6)
		mm ²		2 x (0.5 to 1); 2 x (0.75 to 2.5)	2 x (0.5 to 1); 2 x (1.5 to 4)
		mm ²		1 x (1 to 2.5)	1 x (1 to 6)
		AWG		2 x (18 to 12)	2 x (14 to 10)
Tightening torque of terminal screws	Auxiliary conductor: Solid Finely stranded with end sleeve Pin-end connector (DIN 46 231) Solid or stranded Main conductor Auxiliary conductor	mm ²		2 x (0.5 to 1); 2 x (1 to 2.5)	2 x (0.5 to 1); 2 x (1 to 2.5)
		mm ²		2 x (0.5 to 1); 2 x (0.75 to 2.5)	2 x (0.5 to 1); 2 x (0.75 to 2.5)
		mm ²		2 x (1 to 1.5)	2 x (1 to 1.5)
		AWG		2 x (18 to 12)	2 x (18 to 12)
				M 3.5	M 4
				0.8 to 1.4 Nm (7 to 12 lb.in) 0.8 to 1.4 Nm (7 to 12 lb.in)	1 to 1.5 Nm (8.8 to 13 lb.in) 0.8 to 1.4 Nm (7 to 12 lb.in)

Contactor	Size Type			2 3TF44/3TF45							
	Main conductor: Solid Finely stranded without end sleeve Finely stranded with end sleeve Stranded Solid or stranded Pin-end connector (DIN 46 231) Terminal screw Auxiliary conductor: Solid Finely stranded with end sleeve Pin-end connector (DIN 46 231) Solid or stranded Main conductor Auxiliary conductor			Front terminal connected		Back terminal connected		Both terminals connected			
								Front terminal	Back terminal		
				mm ²	1 to 16	1 to 16	1 to 16	1 to 16	1 to 16	1 to 16	1 to 16
				mm ²	2.5 to 16	1.5 to 16	2.5 to 10	1.5 to 16	2.5 to 10	1.5 to 16	1.5 to 16
				mm ²	1 to 16	1 to 16	1 to 10	1 to 16	1 to 10	1 to 16	1 to 16
				mm ²	2.5 to 25	1.5 to 25	2.5 to 10	1.5 to 25	2.5 to 10	1.5 to 25	1.5 to 25
				AWG	14 to 3	16 to 3	14 to 3	16 to 3	14 to 3	16 to 3	16 to 3
				mm ²	1 to 6	1 to 6	1 to 6	1 to 6	1 to 6	1 to 6	1 to 6
					M 4	M 4	M 4	M 4	M 4	M 4	M 4
				2.5 to 3.0 Nm (22 to 26.5 lb.in) 0.8 to 1.4 Nm (7 to 12 lb.in)							

Contactor	Size Type			3 3TF46/3TF47					
	Main conductor: – With box terminal Solid Finely stranded without end sleeve Finely stranded with end sleeve Stranded Solid or stranded Terminal screw Tightening torque (1 or 2 conductor connections possible) – without box terminal Finely stranded with cable lug Stranded with cable lug Solid or stranded Connecting bar (max. width) Terminal screw Tightening torque Auxiliary conductor: Solid Finely stranded with end sleeve Pin-end connector (DIN 46 231) Solid or stranded Tightening torque			Front terminal connected		Back terminal connected			
				mm ²	6 to 16	2.5 to 16	6 to 16	2.5 to 16	
				mm ²	10 to 35	2.5 to 35	10 to 35	2.5 to 35	
				mm ²	6 to 35	2.5 to 35	6 to 35	2.5 to 35	
				mm ²	16 to 50	16 to 50	16 to 50	16 to 50	
				AWG	10 to 1/0	18 to 1/0	10 to 1/0	18 to 1/0	
					M 6		M 6		
					4 to 6 Nm (36 to 52 lb.in)				
							4 to 6 Nm (36 to 52 lb.in)		
			2 x (0.5 to 1); 2 x (1 to 2.5); 1 x 4						
			2 x (0.5 to 1); 2 x (0.75 to 2.5)						
			2 x (1 to 1.5)						
			2 x (18 to 12)						
			0.8 to 1.4 Nm (7 to 12 lb.in)						

1) If the maximum conductor cross-section is connected, a terminal cover is necessary to comply with the phase clearance.

Load ratings with AC

Contactor	Size Type	0		1		2		3		
		3TF40	3TF41	3TF42	3TF43	3TF44	3TF45	3TF46	3TF47	
Thermal load	10 s current ¹⁾	A	90	96	130	176	400	400	360	500
Power loss per conducting path	at $I_e/AC-3$	W	0.6	1.1	1.0	1.6	2.0	2.5	3.5	6.0
AC-1 utilization category, switching resistive load										
Rated operational currents I_e	at 40 °C up to 690 V	A	21		32		65		90	100
	at 55 °C up to 690 V	A	20		30		55		80	90
Ratings of three-phase loads p.f. = 1 (at 55 °C)	at 230 V	kW	7.5		11.4		20.9		30	34
	400 V	kW	13		19.7		36		52	59
	500 V	kW	17		26		47.5		67	74
	690 V	kW	22		34		62.7		91	102
Minimum conductor cross-section with I_e load	at 40 °C	mm ²	4		6		16		35	35
	at 55 °C	mm ²	2.5		4		16		25	35
AC-2 and AC-3 utilization categories										
Rated operational currents I_e	up to 400 V	A	9	12	16	22	32	38	45	63
	500 V	A	9	12	16	17	32	38	45	63
	690 V	A	6.6	8.8	12.2	12.2	27	27	45	63
Ratings of motors with slipring or squirrel-cage rotor at 50 Hz and 60 Hz	at 230 V	kW	2.54	3.45	4.4	6.1	8.5	11	15	19
	400 V	kW	4.42	6	7.7	11	15	18.5	23.7	33.2
	500 V	kW	5.5	7.5	10	11	21	25	30	41.4
	690 V	kW	5.5	7.5	11	11	23	23	40	57.2
AC-4 utilization category (contact endurance approx. 200 000 operating cycles at $I_a = 6 \times I_e$)										
Rated operational currents I_e	up to 400 V	A	3.3	4.3	7.7	8.5	15.6	18.5	24	28
	690 V	A	3.3	4.3	7.7	8.5	15.6	18.5	24	28
Ratings of motors with squirrel-cage rotor at 50 Hz and 60 Hz Max. permissible rated operational current $I_e/AC-4 \hat{=} I_e/AC-3$ up to 500 V with reduced contact endurance and reduced operating frequency	at 230 V	kW	0.85	1.15	2	2.2	4.3	5.2	7.3	8.5
	400 V	kW	1.48	2	3.5	4	7.5	9	12.6	14.7
	500 V	kW	1.85	2.5	4.6	5.2	9.8	11.8	15.8	18.4
	690 V	kW	2.54	3.45	6	6.6	13	15.5	21.8	25.4

Load ratings with DC

Contactor	Size Type	0			1			2			3		
		3TF40/3TF41			3TF42/3TF43			3TF44/3TF45			3TF46/3TF47		
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)													
Rated operational currents I_e (at 55 °C)													
Number of conducting paths connected in series													
up to 24 V A													
60 V A													
110 V A													
220 V A													
440 V A													
600 V A													
DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)													
Rated operational currents I_e (at 55 °C)													
Number of conducting paths connected in series													
up to 24 V A													
60 V A													
110 V A													
220 V A													
440 V A													
600 V A													

1) Acc. to DIN VDE 0660 Part 102.

3TF40 to 3TF47 Contactors

Technical data

Ⓢ and Ⓢ ratings

Contactor	Size Type		0		1		2		3	
			3TF40	3TF41	3TF42	3TF43	3TF44	3TF45	3TF46	3TF47
Rated insulation voltage		AC V	600		600		600		600	
Conventional thermal current	Free air and enclosed	A	10	20	25	30	42	45	80	
Maximum horsepower ratings (Ⓢ and Ⓢ-approved values)										
Ratings of three-phase motors at 60 Hz										
	at 200 V	hp	3	3	5	7.5	10	10	15	20
	230 V	hp	3	3	5	7.5	10	15	20	25
	460 V	hp	5	7.5	10	15	25	25	40	50
	575 V	hp	7.5	10	15	20	25	25	50	60
NEMA/EEMAC ratings NEMA/EEMAC SIZE										
Conventional thermal current	Free air	A	10	–	20	–	30	–	50	–
	Enclosed	A	9	–	18	–	27	–	45	–
Ratings of three-phase motors at 60 Hz	at 200 V	hp	1.5	–	3	–	7.5	–	10	–
	230 V	hp	1.5	–	3	–	7.5	–	15	–
	460 V	hp	2	–	5	–	10	–	25	–
	575 V	hp	2	–	5	–	10	–	25	–
Overload relay	Type		3UA50		3UA52		3UA55		3UA58	
	Setting range	A	0.1 to 14.5		0.1 to 25		1 to 45		10 to 57 57 to 70	

Short-circuit protection of contactors without overload relays

Contactor	Size Type	6		8		10		12		14		
		3TF50	3TF51	3TF52	3TF53	3TF54	3TF55	3TF56	3TF57	3TF68	3TF69	
Main circuit												
Fuse links, utilization category gL/gG or miniature circuit-breaker with C-characteristic	NH Type 3NA DIAZED Type 5SB NEOZED Type 5SE											
With fuse links												
- acc. to IEC 60 947-4-1 (DIN VDE 0660 Part 102)	Type of coordination *1*1)	A	400	400	400	400	500	500	800	800	1000	1250
	Type of coordination *2*1)	A	240	250	250	250	400	400	500	500	500	630
- weld-free	$I_k < 100 \times I_e$	A	160	160	160	160	200	200	315	315	400 ²⁾	500 ²⁾
	$I_k \geq 100 \times I_e$	A	200	200	315	315	500	500	630	630	-	-

Auxiliary circuit

(short-circuit current $I_k \geq 1$ kA)

Fuse links, utilization category gL/gG or miniature circuit-breaker with C-characteristic

NH Type 3NA
DIAZED Type 5SB
NEOZED Type 5SE

With fuse links

A 16
A 6 if the auxiliary contact of the overload relay is connected in the contactor coil circuit.

With miniature circuit-breaker

A 10
A 3 if the auxiliary contact of the overload relay is connected in the contactor coil circuit.

For short-circuit protection of contactors with overload relays, see Part 4.

For fuseless motor feeders, see Part 5.

General data

Contactor	Size Type	6 3TF50/3TF51			8 3TF52/3TF53				
		Mechanical endurance	AC operation	10 million			10 million		
Operating cycles	DC operation	3 million			3 million				
Rated insulation voltage U_i (pollution degree 3)	V	1000							
Rated impulse withstand voltage U_{imp}	kV	8							
Permissible ambient temperature	in operation °C when stored °C	-25 to +55 -55 to +80							
Degree of protection acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)		IP 00/open type, coil system IP 40			IP 00/open type, coil system IP 30				
Power consumption of the coils (with coil in cold state and $1.0 \times U_s$)		Standard design							
AC operation	closing	Hz	50	60	50/60	50	60	50/60	
	p.f.	VA	550	680	660/575	910	1090	1080/990	
	closed	VA	0.45	0.4	0.45/0.4	0.38	0.31	0.36/0.31	
	p.f.	VA	39	48	56/36	58	70	80/59	
				0.24	0.25	0.24/0.25	0.26	0.28	0.27/0.32
		For USA and Canada							
DC economy circuit	closing ²⁾	Hz	50	60	-	50	60	-	
	p.f.	VA	550	570		1015	1005		
	closed	VA	0.45	0.4		0.38	0.31		
	p.f.	VA	39	35		71	62		
				0.24	0.25		0.26	0.28	
	closing ²⁾	W	500			876 ³⁾			
	closed	W	2.7			11 ³⁾			
Coil voltage tolerance⁴⁾		0.8 to $1.1 \times U_s$							

1) According to excerpt from IEC 60 947-4-1 (DIN VDE 0660 Part 102):
Type of coordination *1*:
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

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

2) At DC 24 V; deviations up to $\pm 10\%$ are possible with other voltages.

3) Reversing contactor supplied.

4) 50/60 Hz coil:
voltage tolerance at 60 Hz: 0.85 to $1.1 \times U_s$.

3TF50 to 3TF69 Contactors

Technical data

Contactor	Size Type	6				8							
		3TF50		3TF51		3TF52		3TF53					
Operating frequency z in operating cycles per hour		Operation		AC	DC	AC	DC	AC	DC	AC	DC		
Contactors without overload relays	No-load operating frequency	1/h	5000	1000	5000	1000	5000	1000	5000	1000	5000	1000	
		AC-1	1/h	800	800	800	800	800	800	750	750	750	750
		AC-2	1/h	400	400	300	300	300	300	250	250	250	250
		AC-3	1/h	1000	1000	750	750	700	700	500	500	500	500
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':		AC-4	1/h	300	300	200	200	200	200	130	130	130	
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400V}{U'}\right)^{1.5}$ 1/h													
Contactors with overload relays (mean value)		1/h	15		15		15		15				
Operating times at 0.8 to 1.1 x U_s Break-time = opening time + arcing time		(The values apply with the coil in the cold state and at operating temperature)											
AC operation ¹⁾	closing time	ms	20 to 50		20 to 50		20 to 50		20 to 50				
	opening time	ms	8 to 30		8 to 30		10 to 30		10 to 30				
DC economy circuit	closing time	ms	25 to 40		25 to 40		25 to 70		25 to 70				
	opening time	ms	170 to 210		170 to 210		10 to 20		10 to 20				
Arcing time		ms	10 to 15		10 to 15		10 to 15		10 to 15				
Operating times at 1.0 x U_s													
AC operation ¹⁾	closing time	ms	22 to 37		22 to 37		25 to 40		25 to 40				
	opening time	ms	8 to 30		8 to 30		10 to 30		10 to 30				
DC economy circuit	closing time	ms	28 to 32		28 to 32		32 to 45		32 to 45				
	opening time	ms	185 to 195		185 to 195		10 to 20		10 to 20				
Shock resistance													
rectangular pulse	AC	g/ms	9.3/5 and 5.2/10		9.3/5 and 5.2/10		10.3/5 and 5.75/10		10.3/5 and 5.75/10				
		g/ms	9/5 and 5/10		9/5 and 5/10		10.05/5 and 5.6/10		10.05/5 and 5.6/10				
	DC	g/ms	14.6/5 and 8.2/10		14.6/5 and 8.2/10		16.1/5 and 9/10		16.1/5 and 9/10				
		g/ms	14/5 and 7.9/10		14/5 and 7.9/10		15.8/5 and 8.8/10		15.8/5 and 8.8/10				
sine pulse	AC	g/ms	14.6/5 and 8.2/10		14.6/5 and 8.2/10		16.1/5 and 9/10		16.1/5 and 9/10				
	DC	g/ms	14/5 and 7.9/10		14/5 and 7.9/10		15.8/5 and 8.8/10		15.8/5 and 8.8/10				

Conductor cross-sections

Contactor	Size Type	6					
		3TF50					
Screw connection (1 or 2 conductor connections possible)	Main conductor: – With box terminal	Front terminal connected	Back terminal connected	Both terminals connected Front terminal Back terminal			
		Solid	mm ²	–	–	–	–
		Finely stranded without end sleeve	mm ²	25 to 50	25 to 50	25 to 50	25 to 50
		Finely stranded with end sleeve	mm ²	25 to 50	25 to 50	25 to 50	25 to 50
		Stranded	mm ²	25 to 70	25 to 70	25 to 70	25 to 70
		Solid or stranded	AWG	3 to 2/0	3 to 2/0	3 to 2/0	3 to 2/0
		Terminal screw		M 10 (hexagon socket, A/F4)			
		Tightening torque		6 to 8 Nm (52 to 70 lb.in)			
		– Without box terminal					
		Finely stranded with cable lug	mm ²	16 to 70			
Stranded with cable lug	mm ²	25 to 70					
Solid or stranded	AWG	3 to 2/0					
Connecting bar (max. width)	mm	15					
Terminal screw		M 6 x 20					
Tightening torque		6 to 8 Nm (52 to 70 lb.in)					
Auxiliary conductor:	Solid	mm ²	2 x (0.5 to 1); 2 x (1 to 2.5); 1 x 4				
	Finely stranded with end sleeve	mm ²	2 x (0.5 to 1); 2 x (0.75 to 2.5)				
	Pin-end connector (DIN 46 231)	mm ²	2 x (1 to 1.5)				
	Solid or stranded	AWG	2 x (18 to 12)				
	Tightening torque		0.8 to 1.4 Nm (7 to 12 lb.in)				

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (varistor +2 ms to 5 ms).

3TF50 to 3TF69 Contactors

Technical data

Contactor	Size Type	6 3TF51	8 3TF52	8 3TF53
Screw connections: (1 or 2 conductor connections poss.)	Main conductor:			
	– without box terminal			
	Finely stranded with cable lug	mm ² 35 to 95	35 to 95	50 to 240 ¹⁾
	Stranded with cable lug	mm ² 50 to 120	50 to 120	70 to 240 ¹⁾
	Solid or stranded	AWG 1/0 to 250 MCM	1/0 to 250 MCM	2/0 to 500 MCM
	Connecting bar (max. width)	mm 20	20	25
	Terminal screw	M 8 x 25	M 8 x 25	M 10 x 30
	Tightening torque	10 to 14 Nm (89 to 124 lb.in)	10 to 14 Nm (89 to 124 lb.in)	14 to 24 Nm (124 to 210 lb.in)
	– with box terminal ⁵⁾			
	Connection for laminated copper bar			
Width	mm 9 to 18	9 to 18	15 to 24	
Max. thickness	mm 1 x 20 or 2 x 8	1 x 20 or 2 x 8	1 x 26 or 2 x 11	
Terminal screw, hexagon socket	mm 5	5	6	
Tightening torque	12 to 14 Nm (106 to 124 lb.in)	12 to 14 Nm (106 to 124 lb.in)	25 to 40 Nm (221 to 354 lb.in)	
Auxiliary conductor:				
Solid	mm ² 2 x (0.5 to 1); 2 x (1 to 2.5)	2 x (0.5 to 1); 2 x (1 to 2.5)	2 x (0.5 to 1); 2 x (1 to 2.5)	
Finely stranded with end sleeve	mm ² 2 x (0.5 to 1); 2 x (0.75 to 2.5)	2 x (0.5 to 1); 2 x (0.75 to 2.5)	2 x (0.5 to 1); 2 x (0.75 to 2.5)	
Pin-end connector (DIN 46 231)	mm ² 2 x (1 to 1.5)	2 x (1 to 1.5)	2 x (1 to 1.5)	
Solid or stranded	AWG 2 x (18 to 12)	2 x (18 to 12)	2 x (18 to 12)	
Tightening torque	0.8 to 1.4 Nm (7 to 12 lb.in)	0.8 to 1.4 Nm (7 to 12 lb.in)	0.8 to 1.4 Nm (7 to 12 lb.in)	

General data

Contactor	Size Type	10 3TF54	3TF55	12 3TF56	12 3TF57
Mechanical endurance	operating cycles	AC operation DC operation	10 mill.; 5 mill. (50/60 Hz coil) 3 million	10 mill.; 5 mill. (50/60 Hz coil) 3 million	10 million 3 million
Rated insulation voltage U_i	(pollution degree 3)	V	1000	1000	1000
Rated impulse withstand voltage U_{imp}		kV	8	8	8
Permissible ambient temperature	in operation when stored	°C °C	–25 to +55 –55 to +80	–25 to +55 –55 to +80	–25 to +55 –55 to +80

Degree of protection acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)

IP 00/open type, coil system IP 30

Power consumption of the coils (with coil in cold state and $1.0 \times U_s$)

AC operation	Hz	Standard design						50/60 Rated value of the control supply voltage:	
		50	60	50/60	50	60	50/60	lower	upper
closing	VA	1430	1710	1780/1500	2450	2960	3050/2600	1136	1900
p.f.		0.34	0.26	0.32/0.25	0.21	0.18	0.23/0.18	1	1
closed	VA	84	105	122/86	115	146	165/119	16	45
p.f.		0.24	0.27	0.23/0.29	0.33	0.33	0.29/0.35	0.34	0.15
For USA and Canada									
	Hz	50	60	–	50	60	–	50	60
closing	VA	1690	1590	–	2450	2760	–	–	–
p.f.		0.34	0.26	–	0.21	0.18	–	–	–
closed	VA	101	94	–	115	132	–	–	–
p.f.		0.24	0.27	–	0.33	0.33	–	–	–
DC economy circuit	closing ²⁾	W	1216 ³⁾			1306 ³⁾		1110 ³⁾	
	closed	W	13.3 ³⁾			14 ³⁾		24 ³⁾	

Coil voltage tolerance⁴⁾

0.8 to $1.1 \times U_s$

Operating frequency z

Operation	AC	DC	AC		DC		AC	DC
			AC	DC	AC	DC		
Contactors without overload relays	No-load operat. freq.	1/h	3000	1000	3000	1000	3000	1000
Dependence of the operating frequency z' on the operational current I' and the operational voltage U' :	for AC-1	1/h	800	800	750	750	700	700
	for AC-2	1/h	300	300	250	250	200	200
	for AC-3	1/h	700	700	500	500	500	500
	for AC-4	1/h	200	200	130	130	150	150
$z' = z \cdot \frac{I_s}{I'} \cdot \left(\frac{400V}{U'} \right)^{1.5}$		1/h.						
Contactors with overload relays (mean value)		1/h	15		15		15	

1) If the maximum conductor cross-section is connected, a terminal cover is necessary to comply with the phase clearance.

2) At DC 24 V; deviations up to $\pm 10\%$ are possible with other voltages.

3) Reversing contactor supplied.

4) 50/60 Hz coil: voltage tolerance at 60 Hz: 0.85 to $1.1 \times U_s$.

5) See accessories on page 3/109.

3TF50 to 3TF69 Contactors

Technical data

Contactor	Size Type			10 3TF54/3TF55	12 3TF56	12 3TF57
Operating times at 0.8 to 1.1 x U_s			(The values apply with the coil in the cold state and at operating temperature)			
Break-time = opening time + arcing time						
AC operation ¹⁾	closing time	ms		20 to 50	17 to 65	40 to 110
	opening time	ms		10 to 30	8 to 20	70 to 110
DC economy circuit	closing time	ms		30 to 65	35 to 75	37 to 100
	opening time	ms		10 to 20	10 to 20	15 to 25
Arcing time				10 to 15	10 to 15	15 to 25
Operating times at 1.0 x U_s						
AC operation ¹⁾	closing time	ms		25 to 40	25 to 40	46 to 70
	opening time	ms		10 to 30	8 to 30	80 to 100
DC economy circuit	closing time	ms		36 to 45	40 to 55	44 to 60
	opening time	ms		10 to 20	10 to 20	12 to 15
Minimum command duration for closing			ms	–	–	110
Minimum interval time between two ON commands			ms	–	–	110
Shock resistance	rectangular pulse	AC	g/ms	9.9/5 and 5.5/10	8.8/5 and 4.9/10	8.8/5 and 4.9/10
		DC	g/ms	9.6/5 and 5.3/10	8.6/5 and 4.8/10	8.4/5 and 4.7/10
		AC	g/ms	15.6/5 and 8.6/10	13.8/5 and 7.7/10	13.8/5 and 7.7/10
	sine pulse	DC	g/ms	15.1/5 and 8.3/10	13.5/5 and 7.6/10	on request

Conductor cross-sections

Screw connection (1 or 2 conductor connections possible)		Main conductor:				
		– Without box terminal				
		Finely stranded with cable lug	mm ²	50 to 240 ²⁾	50 to 240 ²⁾	50 to 240 ²⁾
		Stranded with cable lug	mm ²	70 to 240 ²⁾	70 to 240 ²⁾	70 to 240 ²⁾
		Solid or stranded	AWG	2/0 to 500 MCM	2/0 to 500 MCM	2/0 to 500 MCM
		Connecting bar (max. width)	mm	25	25	30
		Terminal screw		M 10 x 30	M 10 x 30	M 10 x 30
		Tightening torque		14 to 24 Nm (124 to 210 lb.in)	14 to 24 Nm (124 to 210 lb.in)	14 to 24 Nm (124 to 210 lb.in)
		– With box terminal ⁵⁾				
		Connection for laminated copper bars				
		Width	mm	15 to 24	15 to 24	15 to 25
		Max. thickness	mm	1 x 26 or 2 x 11	1 x 26 or 2 x 11	1 x 26 or 2 x 11
		Terminal screw, hexagon socket	mm	6	6	6
		Tightening torque		25 to 40 Nm (221 to 354 lb.in)	25 to 40 Nm (221 to 354 lb.in)	25 to 40 Nm (221 to 354 lb.in)
		Auxiliary conductor:				
		Solid	mm ²	2 x (0.5 to 1); 2 x (1 to 2.5)		
		Finely stranded with end sleeve	mm ²	2 x (0.5 to 1); 2 x (0.75 to 2.5)		
		Pin-end connector (DIN 46 231)	mm ²	2 x (1 to 1.5)		
		Solid or stranded	AWG	2 x (18 to 12)		
		Tightening torque		0.8 to 1.4 Nm (7 to 12 lb.in)		

General data

Contactor	Size Type		14 3TF68	14 3TF69
Mechanical endurance		Operating cycles	5 million	5 million
Rated insulation voltage U_i (pollution degree 3)		V	1000	1000
Rated impulse withstand voltage U_{imp}		kV	8	8
Permissible ambient temperature		in operation °C	–25 to +55	–25 to +55
		when stored °C	–55 to +80	–55 to +80
Degree of protection acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)			IP 00/open type, coil system IP 40	IP 00/open type, coil system IP 40
Power consumption of the coils (with coil in cold state and 1.0 x U _s)				
AC operation		Hz	50/60	50/60
			Rated value of the control supply voltage: lower upper	Rated value of the control supply voltage: lower upper
	closing	VA	1200 1850	600 950
	p.f. closed	VA	1 1 13.5 49	0.98 0.98 12.9 30.6
DC economy circuit	p.f. closed		0.47 0.15	0.43 0.31
	closing ³⁾	W	1010 ⁴⁾	960 ⁴⁾
	closed	W	28 ⁴⁾	20.6 ⁴⁾

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (varistor +2 ms to 5 ms).

2) If the maximum conductor cross-section is connected, a terminal cover is necessary to comply with the phase clearance.

3) At DC 24 V; deviations up to ± 10% are possible with other voltages.

4) Reversing contactor supplied.

5) See accessories on page 3/109.

Contactors	Size Type		14 3TF68	14 3TF69	
Coil voltage tolerance			0.8 to 1.1 x U_s	0.8 to 1.1 x U_s	
Operating frequency z			Operation: AC DC AC DC		
Contactors without overload relays	No-load operating frequency	1/h	2000 1000	1000 1000	
Dependence of the operating frequency z' on the operational current I' and the operational voltage U': $z' = z \cdot \frac{I_g}{I'} \cdot \left(\frac{400V}{U'}\right)^{1.5}$ 1/h.	for AC-1	1/h	700	700	
	for AC-2	1/h	200	200	
	for AC-3	1/h	500	500	
	for AC-4	1/h	150	150	
Contactors with overload relays (mean value)			15	15	
Operating times at 0.8 to 1.1 x U_s			(The values apply with the coil in the cold state and at operating temperature)		
Break-time = opening time + arcing time					
AC operation	closing time	ms	70 to 120 (22 to 65) ¹⁾	80 to 120	
	opening time	ms	70 to 100	70 to 80	
DC economy circuit	closing time	ms	76 to 110	86 to 280	
	opening time	ms	50	19 to 25	
Arcing time		ms	10 to 15	10	
Operating times at 1.0 x U_s					
AC operation	closing time	ms	80 to 100 (30 to 45) ¹⁾	85 to 100	
	opening time	ms	70 to 100	70	
DC economy circuit	closing time	ms	80 to 90	90 to 125	
	opening time	ms	50	19 to 25	
Minimum command duration for closing			standard	ms	
			shortened operat. time	ms	
				ms	
Minimum interval time between two ON commands				ms	
Shock resistance	rectangular pulse	AC	g/ms	8.1/5 and 4.7/10	9.5/5 and 5.7/10
		DC	g/ms	9/5 and 5.7/10	8.6/5 and 5.1/10
	sine pulse	AC	g/ms	12.8/5 and 7.4/10	13.5/5 and 7.8/10
		DC	g/ms	14.4/5 and 9.1/10	13.5/5 and 7.8/10

Conductor cross-sections

Screw connection (1 or 2 conductor connections possible)		Main conductor:			
– without box terminal		Finely stranded with cable lug	mm ²	50 to 240	50 to 240
		Stranded with cable lug	mm ²	70 to 240	50 to 240
– with box terminal ²⁾		Solid or stranded	AWG	2/0 to 500 MCM	2/0 to 500 MCM
		Connecting bar (max. width)	mm	max. 50	max. 60 ($U_e \leq 690$ V) 50 ($U_e > 690$ V)
Terminal screw				M 10 x 30	M 12 x 40
Tightening torque				14 to 24 Nm (124 to 210 lb.in)	20 to 35 Nm (177 to 310 lb.in)
– with box terminal ²⁾ Connection for laminated copper bars		Width	mm	15 to 25	15 to 38
		Max. thickness	mm	1 x 26 or 2 x 11	1 x 46 or 2 x 18
		Terminal screw, hexagon socket	mm	6	8
		Tightening torque		25 to 40 Nm (221 to 354 lb.in)	35 to 50 Nm (266 to 443 lb.in)
Auxiliary conductor:					
Solid		mm ²		2 x (0.5 to 1); 2 x (1 to 2.5)	2 x (0.5 to 1); 2 x (1 to 2.5)
Finely stranded with end sleeve		mm ²		2 x (0.5 to 1); 2 x (0.75 to 2.5)	2 x (0.5 to 1); 2 x (0.75 to 2.5)
Pin-end connector (DIN 46 231)		mm ²		2 x (1 to 1.5)	2 x (1 to 1.5)
Solid or stranded		AWG		2 x (18 to 12)	2 x (18 to 12)
Tightening torque				0.8 to 1.4 Nm (7 to 12 lb.in)	0.8 to 1.4 Nm (7 to 12 lb.in)

1) The values in brackets apply to contactors with shortened operating times. 2) See accessories on page 3/109.

3TF50 to 3TF69 Contactors

Technical data

Load ratings with AC

Contactor	Size Type	6		8				
		3TF50	3TF51	3TF52	3TF53			
AC-1 utilization category, switching resistive load								
Rated operational currents I_e	at 40 °C up to 690 V	A	170	170	230	240		
	at 55 °C up to 690 V	A	160	160	210	220		
	at 55 °C up to 1000 V	A	80	80	100	100		
Ratings of three-phase loads with p.f. = 1 at 55 °C	at 230 V	kW	61	61	76	80		
	400 V	kW	105	105	132	138		
	500 V	kW	138	138	173	181		
	690 V	kW	183	183	228	240		
	1000 V	kW	139	139	173	173		
Minimum conductor cross-sections with I_e load	at 40 °C	mm ²	70	70	120	120		
	at 55 °C	mm ²	70	70	95	120		
AC-2 and AC-3 utilization categories								
Rated operational currents I_e	up to 500 V	A	110	140	170	205		
	690 V	A	110	110	170	170		
	1000 V	A	46	46	68	68		
Ratings of motors with slipring or squirrel-cage rotor at 50 Hz and 60 Hz	at 230 V	kW	37	45	56	66		
	400 V	kW	61	75	95	115		
	500 V	kW	76.3	98	118	145		
	690 V	kW	105	105	163	163		
	1000 V	kW	65	65	90	90		
AC-4 utilization category (contact endurance approx. 200 000 operating cycles at $I_a = 6 \times I_e$)								
Rated operational currents I_e	up to 690 V	A	54	68	75	96		
	1000 V	A	34	34	42	42		
Ratings of motors with squirrel-cage rotor at 50 Hz and 60 Hz	at 230 V	kW	16.3	21	23	30		
	400 V	kW	28.4	36	40	52		
Max. permissible rated operational current $I_e/AC-4 \hat{=} I_e/AC-3$ up to 500 V with reduced contact endurance and reduced operating frequency	500 V	kW	35.5	46	50	65		
	690 V	kW	49	63	69	90		
	1000 V	kW	45	45	55	55		
10 3TF54 3TF55 12 3TF56 3TF57 14 3TF68 3TF69								
AC-1 utilization category, switching resistive load								
Rated operational currents I_e	at 40 °C up to 690 V	A	325	325	425	600	700	910
	at 55 °C up to 690 V	A	300	300	400	550	630	850
	at 55 °C up to 1000 V	A	150	150	200	200	450	800
Ratings of three-phase loads with p.f. = 1 at 55 °C	at 230 V	kW	114	114	152	219	240	323
	400 V	kW	195	195	262	381	415	558
	500 V	kW	260	260	345	476	545	735
	690 V	kW	340	340	457	657	720	970
	1000 V	kW	260	260	346	346	780	1385
Minimum conductor cross-sections with I_e load	at 40 °C	mm ²	185	185	2 x 150	2 x 185	2 x 240	$I_e \geq 800$ A: 2 x 60 x 5 $I_e < 800$ A: 2 x 240
	at 55 °C	mm ²	185	185	240	2 x 185	2 x 185	
AC-2 and AC-3 utilization categories								
Rated operational currents I_e	up to 500 V	A	250	300	400	475	630	820
	690 V	A	250	250	400	400	630	820
	1000 V	A	95	95	180	180	435	580
Ratings of motors with slipring or squirrel-cage rotor at 50 Hz and 60 Hz	at 230 V	kW	82	96	131	151	200	260
	400 V	kW	142	168	227	263	347	450
	500 V	kW	178	210	284	329	434	600
	690 V	kW	245	245	392	392	600	800
	1000 V	kW	132	132	250	250	600	800
AC-4 utilization category (contact endurance approx. 200 000 operating cycles at $I_a = 6 \times I_e$)								
Rated operational currents I_e	up to 690 V	A	110	125	150	150	300	360
	1000 V	A	57	57	80	80	210	250
Ratings of motors with squirrel-cage rotor at 50 Hz and 60 Hz	at 230 V	kW	35	40	49	49	97	110
	400 V	kW	61	69	85	85	168	160
Max. permissible rated operational current $I_e/AC-4 \hat{=} I_e/AC-3$ up to 500 V with reduced contact endurance and reduced operating frequency	500 V	kW	76	86	107	107	210	250
	690 V	kW	105	119	147	147	278	335
	1000 V	kW	75	75	110	110	290	350

Load ratings with AC

Contactor	Size Type	6		8		10		12		14	
		3TF50	3TF51	3TF52	3TF53	3TF54	3TF55	3TF56	3TF57	3TF68	3TF69
AC-6a utilization category, switching three-phase transformers with inrush											
Rated operational currents I_e	up to 400 V	A	30 20	30 20	30 20	30 20	30 20	30 20	30 20	30 20	30 20
Ratings of three-phase transformers with an inrush of $n = 30$ or 20 . The ratings must be recalculated for other inrush factors x :	at 230 V 400 V 500 V 690 V 1000 V	kVA kVA kVA kVA kVA	30.8 41.8 53 73 70 95 92 125 80 80	42.5 64 74 112 97 146 128 193 117 117	68 95 119 165 156 216 205 285 164 164	86 128 148 223 195 291 257 385 311 311	103 154 178 267 233 350 308 457 311 311	130 195 226 338 296 444 390 586 592 752	171 256 297 445 389 584 514 771 778 1003	256 445 584 771 771 1003	256 445 584 771 771 1003
$P_x = P_{n30} \cdot \frac{30}{x}$											
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors											
Rated operational currents I_e	up to 400 V	A	86.6	144.3	216.5	288.7	433				
Ratings of single capacitors at 50 Hz, 60 Hz	at 230 V 400 V 500 V 690 V	kvar kvar kvar kvar	35 60 80 60	58 100 130 100	87 150 190 150	115 200 265 200	175 300 400 300				
Ratings of capacitor banks (minimum inductance between parallel capacitors $6 \mu\text{H}$) at 50 Hz, 60 Hz	at 230 V 400 V 500 V 690 V	kvar kvar kvar kvar	30 50 66 50	40 70 90 70	66 115 145 115	85 150 195 150	145 250 333 250				
Used as stator contactors (up to 690 V) (AC-2 utilization category)											
Stator currents I_{es}											
Relative ON period ¹⁾ with intermittent duty	10 % 20 % 40 % 60 % 80 %	A	260 (290) ³⁾ 246 195 174 160	357 (381) ³⁾ 323 256 229 210	357 (389) ³⁾ 339 268 240 220	525 (544) ³⁾ 462 367 327 300	726 617 490 436 400	726 (998) ³⁾ 800 670 600 550	1144 970 768 690 630	1544 1307 1039 925 850	
Used as rotor contactors											
Rotor currents I_{er} ⁴⁾											
Relative ON period ¹⁾ with intermittent duty	5 % 10 % 20 % 40 % 60 % 80 %	A	450 450 389 309 275 253	625 604 510 405 361 332	625 625 535 425 378 348	930 864 729 579 516 474	1240 1152 972 772 688 632	1705 1578 1336 1061 946 869	1900 1814 1530 1216 1083 995	2500 2440 2065 1640 1462 1343	
Uninterrupted duty		A	253	332	348	474	632	869	995	1343	
Locked rotor voltages U_{er}	Starting Variable speed Plugging	V	2000 1000 1000	2000 1000 1000	2000 1000 1000	2000 1000 1000	2000 1000 1000	2000 1000 1000	2000 1000 1000	2000 1000 1000	
Thermal load	10 s current ²⁾	A	880 1140	1360 1640	2500 2500	3400 4200	5040 7000				
Power loss per conducting path at $I_e/AC-3$		W	10	14 20	16 23	40 40	45 70				

1) Relative ON period in % = $\frac{\text{ON period}}{\text{Cycle time}} \times 100$, cycle times up to 10 min.
Max. operating frequency $z = 50$ 1/h; with higher operating frequencies z the following equation must be used for the calculation: $I_{off} \sim 1/z$.

2) Acc. to DIN VDE 0660, Part 102.
3) The values in brackets apply up to 400 V.
4) Conductor currents in the supply lead to the contactor.

3TF50 to 3TF69 Contactors

Technical data

Load ratings with DC

Contactor	Size Type	6 3TF50/3TF51			8 3TF52/3TF53			10 3TF54/3TF55			12 3TF56/3TF57			14 3TF68/3TF69	
		1	2	3	1	2	3	1	2	3	1	2	3		
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)															
Rated operational currents I_e (at 55 °C)															
Number of conducting paths connected in series		1	2	3	1	2	3	1	2	3	1	2	3		
24 V	A	160	160	160	200	200	200	300	300	300	400	400	400	–	–
60 V	A	160	160	160	200	200	200	300	300	300	330	400	400	–	–
110 V	A	18	160	160	18	200	200	33	300	300	33	400	400	–	–
220 V	A	3.4	20	160	3.4	20	200	3.8	300	300	3.8	400	400	–	–
440 V	A	0.8	3.2	1.4	0.8	3.2	11.5	0.9	4	11	0.9	4	11	–	–
600 V	A	0.5	1.6	0.75	0.5	1.6	4	0.6	2	5.2	0.6	2	5.2	–	–

DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)

Contactor	Size Type	6 3TF50/3TF51			8 3TF52/3TF53			10 3TF54/3TF55			12 3TF56/3TF57			14 3TF68/3TF69	
		1	2	3	1	2	3	1	2	3	1	2	3		
Rated operational currents I_e (at 55 °C)															
Number of conducting paths connected in series		1	2	3	1	2	3	1	2	3	1	2	3		
24 V	A	160	160	160	200	200	200	300	300	300	400	400	400	–	–
60 V	A	7.5	160	160	7.5	200	200	11	300	300	11	400	400	–	–
110 V	A	2.5	160	160	2.5	200	200	3	300	300	3	400	400	–	–
220 V	A	0.6	2.5	160	0.6	2.5	200	0.6	2.5	300	0.6	2.5	400	–	–
440 V	A	0.17	0.65	11.5	0.17	0.65	1.4	0.18	0.65	1.4	0.18	0.65	1.4	–	–
600 V	A	0.12	0.37	4	0.12	0.37	0.75	0.125	0.37	0.75	0.125	0.37	0.75	–	–

Ⓢ and Ⓜ ratings

Contactor	Size Type	6 3TF50 3TF51		8 3TF52 3TF53		10 3TF54 3TF55		12 3TF56 3TF57		14 3TF68 3TF69		
Rated insulation voltage		AC V	600	600	600	600	600	600	600	600	600	600
Conventional thermal current		Free air and enclosed A	150	150	200	210	260	300	400	520	630	820
Maximum horsepower ratings (Ⓢ and Ⓜ-approved values)												
Ratings of three-phase motors at 60 Hz		at 200 V hp	40	50	50	60	75	100	125	150	231	290
		230 V hp	50	60	60	75	100	125	150	200	266	341
		460 V hp	100	100	125	150	200	250	300	400	530	695
		575 V hp	125	150	150	200	250	300	400	500	664	869
NEMA/EEMAC ratings												
Conventional thermal current		Free air A	–	–	150	–	–	–	300	–	600	820
		Enclosed A	–	–	135	–	–	–	270	–	540	810
Ratings of three-phase motors at 60 Hz		at 200 V hp	–	–	40	–	–	–	75	–	150	–
		230 V hp	–	–	50	–	–	–	100	–	200	300
		460 V hp	–	–	100	–	–	–	200	–	400	600
		575 V hp	–	–	100	–	–	–	200	–	400	600
Overload relay		Type	3UA60		3UA62		3UA66	3UA66	3UA66	on request	3UA68	3RB12
		Setting range A	110 up to 135		135 up to 160		160 up to 250	200 up to 320	250 up to 400		400 up to 630	200 up to 820

For short-circuit protection with overload relays, see Part 4.