

Power Contactors 3TF

For more than 110 years, Siemens has been developing and manufacturing industrial control products. We offer a wide product range which fulfills the demands of our customers regarding performance and reliability. Our aim is to make industrial operation easier ensuring flexible mounting, modular construction and high functionality. With 3TF contactors Siemens has been offering a tried tested trusted solution to control, switch and protect your motors upto 250kW.

Applications

3TF power contactors are suitable for switching and controlling squirrel cage and slip-ring motors as well as other AC loads, such as solenoids, capacitors, lighting loads, heating loads and transformer loads.

Standards

Contactors conform to IS/IEC 60947-4-1. They also carry the CE mark.

Coordinated feeder

Contactors and bi-relays have been tested for type-2 coordination at $I_q = 50kA$, 415V AC, 50Hz as per IS/IEC 60947-4-1, for both fuse protected as well as fuseless motor feeders.

Range

Air break contactors are available from 9 A to 475A in 3 pole version.

Also available in 2 pole AC version from 45A to 400A.

Benefits and features

Flexibility

- Choice of Auxiliary contacts

Contactor	Aux. contacts on basic unit	Permissible add-on contact blocks
9A / 12A	1 NO	Upto 4NO or 4NC
9A / 12A	1 NC	Upto 4NO or 2NC
16A/22A	-	Upto 4NO or 4NC
32A/38A	-	Upto 4NO or 4NC
45A to 475A	2NO+2NC	2 x (1NO+1NC)

The customer can order desired number of contacts thereby reducing the cost.

- Choice of mounting

Contactor can be mounted on 35mm DIN and they are also suitable for screw mounting (9-38A – DIN / Screw mounting and 45-475A – Screw mounting).



- Choice of coil voltages

AC 50Hz coil code: 3TF30 to 3TF56

Coil voltage (V)	24	42	110	230	415
Code	B0	D0	F0	P0	R0

Wide band AC 50 Hz coil code: 3TF30 to 3TF35

Coil voltage (V)	70-140	150-280	260-460
Code	W110	W220	W415

AC 50/60 Hz coil code: 3TF57

Coil voltage (V)	110-132	220-240	380-460
Code	F7	M7	Q7

DC coil code: 3TF30 to 3TF57

Coil voltage (V)	24	42	48	110	220	250 ⁺
Code	B4	D4	W4	F4	M4	N4

⁺ For 3TF3 only

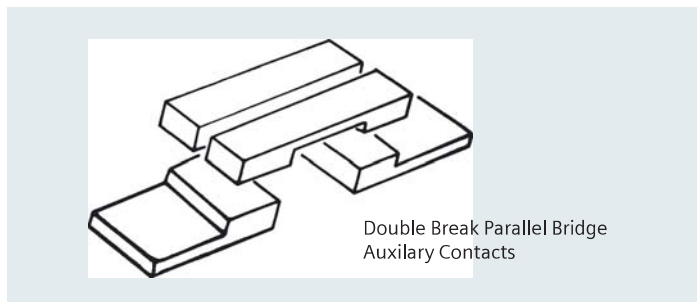
(Other coil voltages are also available.)

High performance

- **No duration upto 55°C**
Contactors are suitable for operation in service temperature upto 55°C without derating. This avoids selection of higher rated contactor, thereby reducing cost.
- **Long Life**
Superior design of current carrying parts, contact system and the magnet system increases the reliability results into **higher electrical and mechanical endurance**.
- **High short-time rating**
Contactors have a high short-time rating, which makes them suitable for applications having high starting currents and long run-up times.

High reliability

- High insulation voltage and impulse withstand voltage capacity ensures reliable performance during occasional abnormal increase in supply voltage.
- **Double break parallel bridge contact mechanism**
This mechanism is available for auxiliary contacts. Such contact mechanism ensures reliable contact at low voltage and low currents (5mA at 17VDC). It also offers unmatched reliability. (Chances of 2 mal-operations in 100 mill. operations as against 4460 for single bridge contacts)



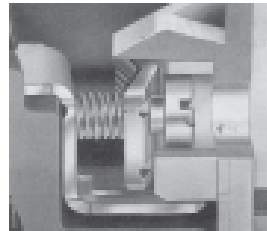
User friendliness and safety

- **Arc Chamber Interlock (45A and above)**
It prevents the contactor from switching ON, if the arc chamber is not fitted properly. Thus avoids accidents to plant and personnel.



- **Positively driven contacts**
3TF contactors satisfy the conditions for **positively driven operation** between the main power contacts and the NC contacts. NC contacts positively open before the main contact closes. This is extremely important when power contactors are used in safety circuits of critical applications.

SIGUT Termination



- **Figure touch proof terminals***
It protects against accidental contact with live parts which ensures operator safety.
- **Funnel shaped cable entries**
Reduce wiring time by facilitating quick location of the connecting wire.
- **Cable end-stop**
It decides the insertion depth of the connecting wires. Since the insertion depth is predetermined, insulation of the cable can be cut accordingly and the possibility of insulation getting inadvertently caught under the terminal, is avoided.
- **Captive Screws**
This feature prevents the screws from falling down thereby facilitates the wiring. Hence, the contactors are delivered with untightened terminals. This eliminates the operation of untightening terminals before wiring.
- **Lug less termination**
This feature helps in reducing the termination time.

* Finger touch proof terminals are available upto 85 A

Selection and ordering data

Contactor size	Rated current (A) le AC3 at 415V, 50Hz, 3ph	Motor kW at 415V 50Hz, 3ph	Auxiliary contacts	AC 50 Hz coil Type Pl. fill in coil voltage code	DC coil Type Pl. fill in coil voltage code	Std. pkg. (nos.)
0	9	4	1NO ^{\$} 1NC ^{\$}	3TF30 10-0A.. 3TF30 01-0A..	3TF30 10-0B.. 3TF30 01-0B..	1
	12	5.5	1NO ^{\$} 1NC ^{\$}	3TF31 10-0A.. 3TF31 01-0A..	3TF31 10-0B.. 3TF31 01-0B..	
1	16	7.5	— ^{\$}	3TF32 00-0A..	3TF32 00-0B..	
	22	11	— ^{\$}	3TF33 00-0A..	3TF33 00-0B..	
2	32	15	— ^{\$}	3TF34 00-0A..	3TF34 00-0B..	
	38	18.5	— ^{\$}	3TF35 00-0A..	3TF35 00-0B..	
3	45	22	2NO + 2NC ^{\$}	3TF46 02-0A..ZA01 [®]	3TF46 02-0D..ZA01 [®]	
	63	30	2NO + 2NC ^{\$}	3TF47 02-0A..ZA01 [®]	3TF47 02-0D..ZA01 [®]	
	70	37	2NO + 2NC ^{\$}	3TF47 72-0A..	3TF47 72-0D..	
4	75	42	2NO + 2NC ^{\$}	3TF48 22-0A..ZA01 [®]	3TF48 22-0D..ZA01 [®]	
	85	45	2NO + 2NC ^{\$}	3TF49 22-0A..ZA01 [®]	3TF49 22-0D..ZA01 [®]	
6	110	55	2NO + 2NC ^{\$}	3TF50 02-0A..	3TF50 02-0D..	
	140	75	2NO + 2NC ^{\$}	3TF51 02-0A..	3TF51 02-0D..	
8	170	90	2NO + 2NC ^{\$}	3TF52 02-0A..	3TF52 02-0D..	
	205	110	2NO + 2NC ^{\$}	3TF53 02-0A..	3TF53 02-0D..	
10	250	132	2NO + 2NC ^{\$}	3TF54 02-0A..	3TF54 02-0D.. ¹⁾	
	300	160	2NO + 2NC ^{\$}	3TF55 02-0A..	3TF55 02-0D.. ¹⁾	
12	400	200	2NO + 2NC ^{\$}	3TF56 02-0A..	3TF56 02-0D.. ¹⁾	
	475	250	2NO + 2NC ^{\$}	3TF57 02-0C..	3TF57 02-0D.. ¹⁾	

¹⁾ Please connect DC coil circuit as recommended on page 16

^{\$} For more auxiliary contacts please refer table below - "auxiliary contact blocks"

[®] For box type (SIGUT) terminal, order 2 nos. 3TX7 460-0E

Coil voltage code AC 50Hz: 3TF30 to 3TF56

Coil voltage	24	42	110	230	415
Code	B0	D0	F0	P0	R0

Coil voltage code AC 50/60 Hz: 3TF57

Coil voltage (V)	110-132	220-240	380-460
Code	F7	M7	Q7

Coil voltage code DC: 3TF30 to 3TF57

Coil voltage (V)	24	42	48	110	220	250 ⁺
Code	B4	D4	W4	F4	M4	N4

⁺ For 3TF3 only

²⁾ Coil voltage code AC 50Hz: 3TF (2 Pole AC Contactor)

Coil voltage	110	230	415
Code	F0	P0	R0

(Other coil voltages are also available)

Auxiliary contact blocks

For Contactor	Description	Type	Std. pkg. (nos.)
3TF30 to 35	1NO 1NC 1NO ext 1NC ext	3TX4 010-2A 3TX4 001-2A 3TX4 010-4A 3TX4 001-4A	10
3TF46 to 57	Second 1NO+1NC Left Second 1NO+1NC Right	3TY7 561-1K 3TY7 561-1L	1

2 Pole AC contactors - 3TF

For single phase and 2 phase applications with AC coils

Contactor Size	Rated current Ie (A) AC3, 415V	Type ²⁾	Std. pkg. (nos.)
3	45	3TF46 02-0A..ZB01	1
3	63	3TF47 02-0A..ZB01	
3	70	3TF47 72-0A..ZB01	
6	110	3TF50 02-0A..ZB01	
6	140	3TF51 02-0A..ZB01	
8	170	3TF52 02-0A..ZB01	
8	205	3TF53 02-0A..ZB01	
10	250	3TF54 02-0A..ZB01	
10	300	3TF55 02-0A..ZB01	
12	400	3TF56 02-0A..ZB01	

Technical data

Contactor	Size	0			1			2			
		Type	3TF30	3TF31	3TF32	3TF33	3TF34	3TF35			
Permissible ambient temperature	Storage Service	°C	-55 to +80								
		°C	-25 to +55								
Maximum operating voltage		V	690								
Rated insulation voltage U_i (At Pollution Degree 3) ¹⁾		V	690								
Rated impulse strength U_{imp}		kV	8								
Mechanical endurance (make/break operations)	AC	Cycles	15 x 10 ⁶						10 x 10 ⁶		
	DC	Cycles	15 x 10 ⁶						10 x 10 ⁶		
Rating of contactors for AC loads											
AC-1 duty, switching resistive load											
Rated operational current I_e	at 40°C upto 690V	A	21			32			65		
	at 55°C upto 690V	A	20			30			55		
Ratings of three-phase loads	p.f.=1 at 55°C										
	at 415V	kW	13			19.7			36		
	500V	kW	17			26			47.5		
	690V	kW	22			34.			62.7		
AC-2 and AC-3 duty											
Rated operational current $I_e^{2)}$	upto 415V	A	9	12	16	22	32	38			
	500V	A	9	12	16	17	32	38			
	690V	A	6.6	8.8	12.2	12.2	27	27.			
Nominal rating of slipping or squirrel-cage motors at 50/60 Hz.	at 415V	kW	4	5.5	7.5	11	15	18.5			
	500V	kW	5.5	7.5	10	11	21	25			
	690V	kW	5.5	7.5	11	11	23	23.			
AC-4 duty (contact endurance approx. 2x10 ⁵ make-break operations at $I_a=6I_e$)											
Rated operational current I_e	upto 690V	A	3.3	4.3	7.7	8.5	15.6	18.5			
Rating of squirrel-cage motors at 50/60Hz.	at 415V	kW	1.54	2.1	3.5	4	8.2	9.8			
	500V	kW	1.7	2.5	4.6	5.2	9.8	11.8			
Max. permitted rated operational current $I_e/AC-4 = I_e/AC-3$ upto 500V. Ref. life curve for the life.	690V	kW	2.54	3.45	6	6.6	13	15.5			
Used as stator contactor (upto 690V) (AC-2 duty)											
Stator currents I_{es}	20%	A	20	20	25(46*)		85				
On-load factor (ED) ³⁾ with intermittent duty	40%	A	20	20	25(37*)		67				
	60%	A	20	20	25(33*)		60				
* Applicable up to 500V	80%	A	20	20	25(30*)		55				
Used as rotor contactor (upto 690V) (AC-2 duty)											
Rotor current I_{er}	20%	A	31			73			125		
On-load factor (ED) ³⁾ with intermittent duty	40%	A	31			58			106		
	60%	A	31			52			95		
	80%	A	31			47			87		
Locked rotor voltage U_{er}	Starting	V	1320			1320			1320		
	Plugging / Control	V	660			660			660		
AC-6b duty, switching low-inductance individual three-phase capacitors at 50/60Hz⁴⁾ (we also offer special capacitor duty contactors)											
	415V	kVAR	4			7.5			16.7		
	500V	kVAR	4			7.5			16.7		
	690V	kVAR	4			7.5			16.7		
Thermal loading	10 s current	A	90	96	130	176	400	400			
Power loss per current path at $I_e/AC-3$		W	0.6	1.1	1	1.6	2	2.5			
Rating of contactors for DC loads											
DC-1 duty, switching resistive load ($L/R < 1\text{ms}$)											
Rated operational current I_e (at 55°C)											
Number of current paths in series connection			1	2	3	1	2	3	1	2	3
	at 24V	A	20	20	20	30	30	30	55	55	55
	110V	A	2.1	12	20	4.5	30	30	6	55	55
	220V	A	0.8	1.6	20	1	5	30	1	6	45
	440V	A	0.6	0.8	1.3	0.4	1	2.9	0.4	1.1	2.9
DC-3 and DC-5 duty, shunt & series motors ($L/R < 15\text{ms}$)											
Rated operational current I_e (at 55°C)											
Number of current paths in series connection			1	2	3	1	2	3	1	2	3
	at 24V	A	20	20	20	20	30	30	20	55	55
	110V	A	0.15	0.35	20	0.75	7	30	0.75	7	55
	220V	A	-	-	1.75	0.2	1	3.5	0.2	1	3.5
	440V	A	-	-	0.2	0.09	0.27	0.6	0.1	0.27	0.6

1) As per I/IEC 60947-1

2) Ratings at 1000V AC - upon enquiry.

3) On-load factor (ED) in % = $\frac{\text{ontime} \times 100}{\text{cycle time}}$

Max. switching freq. z = 50 per hour. Ratings at higher frequency upon enquiry.

3			4			6			8			10			12		
3TF46	3TF47	3TF47 7	3TF48	3TF49	3TF50	3TF51	3TF52	3TF53	3TF54	3TF55	3TF56	3TF57					
			-55 to +80 -25 to +55														
1000			1000														
1000			1000														
8			8														
10 x 10 ⁶ 3 x 10 ⁶			10 x 10 ⁶ 3 x 10 ⁶														
90 80	100 90	100 90	120 100	120 100	170 160		230 210	240 220	325 300	325 300	425 400	600 550					
52 67 91	52 67 91	52 67 91	66 86 114	66 86 114	105 138 183		132 173 228	138 181 240	195 260 340	195 260 340	262 345 457	381 476 657					
45 45 45	63 63 63	70 70 70	75 75 75	85 85 75	110 110 110	140 140 110	170 170 170	205 205 170	250 250 250	300 300 250	400 400 400	475 475 400					
22 30 40	30 41.4 57.2	37 46 60.1	42 50.7 70	45 59 70	55 76.3 105	75 98 105	90 118 163	110 145 163	132 178 245	160 210 245	200 284 392	250 329 392					
24 13.1 15.8	28 15.3 18.4	31 16.9 20.4	34 18.6 22.4	42 23 27	54 29.5 35.5	68 38 46	75 42 50	96 54 65	110 63 76	125 72 86	150 88 107	150 88 107					
21.8	25.4	28.2	30.9	38	49	63	69	90	105	119	147	147					
123 98 87 80	138 110 98 90	138 110 98 90	154 122 109 100		246 195 174 160		323 256 229 210	339 268 240 220	462 367 327 300		617 490 436 400	800 670 600 550					
150 150 138 126 1500 750	219 174 155 142 1500 750	219 174 155 142 1500 750	243 193 172 158 2000 1000		389 309 275 253 2000 1000		510 405 361 332 2000 1000	535 425 378 348 2000 1000	729 579 516 474 2000 1000		972 772 688 632 2000 1000	1336 1061 946 869 2000 1000					
30 35 30			50 62.5 50		60 80 60		100 130 100		150 190 150		200 265 200						
360 3.5	500 6	500 6	800 7.5	800 10	880 10	1140 14	1360 14	1640 20	2500 16	2500 23	3400 40	4200 40					
1 80 6 1.2 0.48	2 80 80 7 1.2	3 80 80 80 3	1 100 12 2.5 0.8	2 100 100 13 2.4	3 100 100 100 6	1 160 18 3.4 0.8	2 160 160 20 3.2	3 160 160 160 11.5	1 200 18 3.4 0.8	2 200 200 20 3.2	3 200 200 200 11.5	1 300 33 3.8 0.9	2 300 300 300 4	3 300 300 300 11	1 400 33 3.8 0.9	2 400 400 400 4	3 400 400 400 11
1 0.75 0.2 0.1	2 80 12.5 1.1 0.27	3 80 80 3.5 0.6	1 6 1.25 0.35 0.15	2 100 100 1.75 0.42	3 100 100 4 0.8	1 160 2.5 0.6 0.17	2 160 160 2.5 0.65	3 160 160 160 1.4	1 200 2.5 0.6 0.17	2 200 200 2.5 0.65	3 200 200 200 1.4	1 300 3 0.6 0.18	2 300 300 2.5 0.65	3 300 300 300 1.4	1 400 3 0.6 0.18	2 400 400 2.5 0.65	3 400 400 400 1.4

4) Ratings for capacitor - banks in parallel - upon enquiry. Minimum inductance of 6µH required between parallel connected capacitors.

Power Contactors Technical Data

Contactor	Size	0		1		2		3				
		Type	3TF30	3TF31	3TF32	3TF33	3TF34	3TF35	3TF46	3TF47	3TF47 7	
Switching frequency z (Contactors without overload relay)												
No load	AC	Operation										
		Cycles/hr	10,000	10,000	5000	5000	5000	5000	5000	5000	5000	
		Cycles/hr	1,500	1,500	1,500	1,500	1,500	1,500	1,000	1,000	1,000	
		at AC-1	2,000	2,000	1,500	1,500	1,200	1,200	1,000	1,000	1,000	
		at AC-2	1,000	1,000	750	750	750	600	600	400	400	
at AC-3	DC	Cycles/hr	1,000	1,000	750	750	750	600	1200 ⁵⁾	1000	1000	
		Cycles/hr	250	250	250	250	250	200	400	300	300	
Coil ratings												
Supply frequency		Hz	50		50		50		50			
AC operation 50Hz	Closing	VA	68		68		101		183			
		p.f.	0.79		0.82		0.83		0.6			
	Closed	VA	10		10		12.1		17			
DC operation	Closing	p.f.	0.29		0.29		0.28		0.29			
		W	6.2		6.2		11.7		400			
	Closed	W	6.2		6.2		11.7		2.1			
Coil voltage tolerance		Operation										
		AC/DC										
		at 24V DC	0.8 to 1.1 x Us 0.8 to 1.2 x Us		0.8 to 1.1 x Us							
Operating times at 1 x Us ⁸⁾												
AC operation	Closing	ms	10-25		10 - 25		13 - 32		17 - 30			
	Opening	ms	4-18		5 - 20		5 - 10		5 - 25			
DC operation	Closing	ms	30-70		40 - 80		58-107		22 - 40			
	Opening	ms	12-20		10 - 20		13 - 17		105 - 115			
Auxiliary contacts												
Rated thermal current I_{th} =												
rated operational current I_e / AC-12		A	10				10					
Rated operational current I_e / AC-15/AC-14												
at rated operational voltage U_e	upto 125V	A	10				10					
	220V	A	10				6					
	415V	A	5.5				3.6					
	500V	A	4				2.5					
Rated operational current I_e / DC12												
at rated operational voltage U_e	upto 48V	A	10				10					
	110V	A	2.1				3.2					
	220V	A	0.8				0.9					
	440V	A	0.6				0.33					
Rated operational current I_e / DC13												
at rated operational voltage U_e	upto 24V	A	10				10					
	48V	A	5				5					
	110V	A	0.9				1.14					
	220V	A	0.45				0.48					
	440V	A	0.25				0.13					
Conductor cross-sections												
Main conductor												
Solid	mm ²	2 x (0.5 to 1, 1 to 2.5), 1x4			2 x (2.5 to 6)		1 to 16		2 x (6 to 16)			
Finely stranded with end sleeve	mm ²	2 x (0.75 to 2.5)			2 x (1.5 to 4)		1 x (5 to 16, 2.5 to 10)		1 x (10 to 35), 2 x (10 to 25)			
Pin end connector	mm ²	1 x (1 to 2.5)			1 x (1 to 6)		2 x (1 to 6)		-			
Solid or stranded	AWG	2 x (18 to 12)			2 x (14 to 10)		2 x (14 to 6)		2 x (10 to 1/10)			
Tightening torque	Nm	0.8 to 1.4			1 to 1.5		2.5 to 3.0		4 to 6			
Finely stranded with cable lug	mm ²								10 to 35			
Terminal bar (max. width)	mm								12			
Solid or stranded	AWG								7 to 1/0			
Tightening torque	Nm								4 to 6			
Auxiliary conductor												
Solid	mm ²	2 x (0.5 to 1, 1 to 2.5), 1 x 4					2 x (0.5 to 1, 1 to 2.5), 1					
Finely stranded with end sleeve	mm ²	2 x (0.75 to 2.5)					2 x (0.75 to 2.5)					
Pin end connector	mm ²	1 x (1 to 2.5)					1 x (1 to 2.5)					
Solid or stranded	AWG	2 x (18 to 12)					2 x (18 to 12)					
Tightening torque	Nm	0.8 to 1.4					0.8 to 1.4					
Short-circuit protection												
Main circuit (Fuse type 3NA3)	Co-ordination	Type - 1	A	35	35	63	63	80	80	160	160	160
		Type - 2	A	25	25	32	32	80	80	125	125	160
Auxiliary circuits		A	16									
		A	6, if overload relay auxiliary contacts are in the contactor coil circuit									

5) With AC coil. With DC coil: 1000 oprs/hr.

6) Including switching contactor.

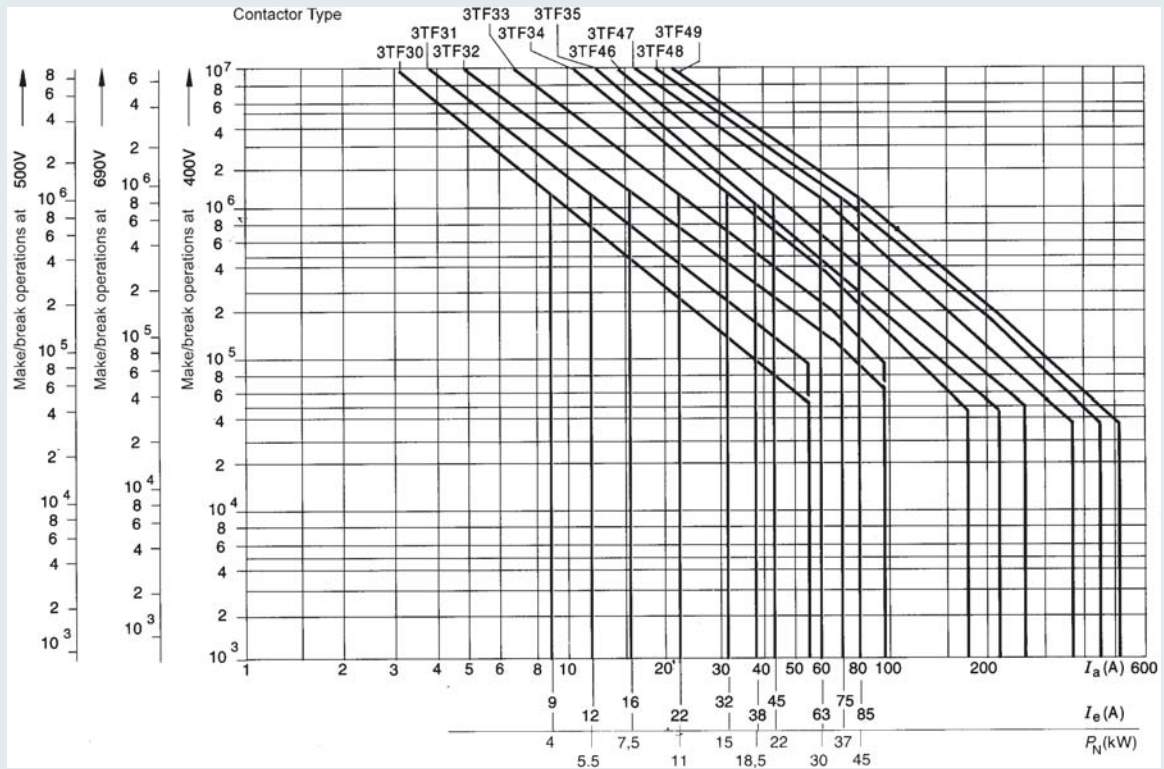
7) Rated value of the control voltage.

4		6		8		10		12	
3TF48	3TF49	3TF50	3TF51	3TF52	3TF53	3TF54	3TF55	3TF56	3TF57
5000	5000	5000	5000	5000	5000	3000	3000	3000	2000
1,000	1,000	1000	1000	1000	1000	1000	1000	1000	1000
900	900	800	800	800	750	800	750	700	500
400	350	400	300	300	250	300	250	200	170
1000	850	1000	750	700	500	700	500	500	420
300	300	300	200	200	130	200	130	150	150
50		50		50		50		50	50/60 Lower ⁷⁾ Upper ⁷⁾
330		550		910		1430		2450	1136 1900
0.5		0.45		0.38		0.34		0.21	1 1
32		39		58		84		115	16 45
0.23		0.24		0.26		0.24		0.33	0.34 0.16
420		500		876 ⁶⁾		1216 ⁶⁾		1306 ⁶⁾	1110 ⁶⁾
2.7		2.7		11 ⁶⁾		13.3 ⁶⁾		14 ⁶⁾	24 ⁶⁾
0.8 to 1.1 x Us									
22 - 35 5 - 30		22 - 37 8 - 30		25 - 50 10 - 30		25 - 40 10 - 30		25 - 40 8 - 30	
32 - 40 95 - 105		28 - 32 185 - 195		32 - 45 10 - 20		36 - 45 10 - 20		40 - 55 10 - 20	
48 - 70 80 - 100		44 - 60 12 - 15							
10				10				10	
10				10				10	
6				6				6	
3.6				3.6				3.6	
2.5				2.5				2.5	
10				10				10	
3.2				3.2				3.2	
0.9				0.9				0.9	
0.33				0.33				0.33	
10				10				10	
5				5				5	
1.14				1.14				1.14	
0.48				0.48				0.48	
0.13				0.13				0.13	
		16 to 70 15 3 to 2/0 6 to 8		35 to 95 20 10 to 14		35 to 95 20 10 to 14		50 to 240 25 14 to 24	
		10 to 14		14 to 24		14 to 24		14 to 24	
2 x (0.5 to 1, 1 to 2.5), 1 x 4 2 x (0.75 to 2.5) 1 x (1 to 2.5) 2 x (18 to 12) 0.8 to 1.4				2 x (0.5 to 1, 1 to 2.5) 2 x (0.75 to 2.5) 1 x (1 to 2.5) 2 x (18 to 12) 0.8 to 1.4				2 x (0.5 to 1, 1 to 2.5) 2 x (0.75 to 2.5) 1 x (1 to 2.5) 2 x (18 to 12) 0.8 to 1.4	
250	250	400	400	400	400	500	500	800	800
160	160	200	250	250	250	400	400	500	500

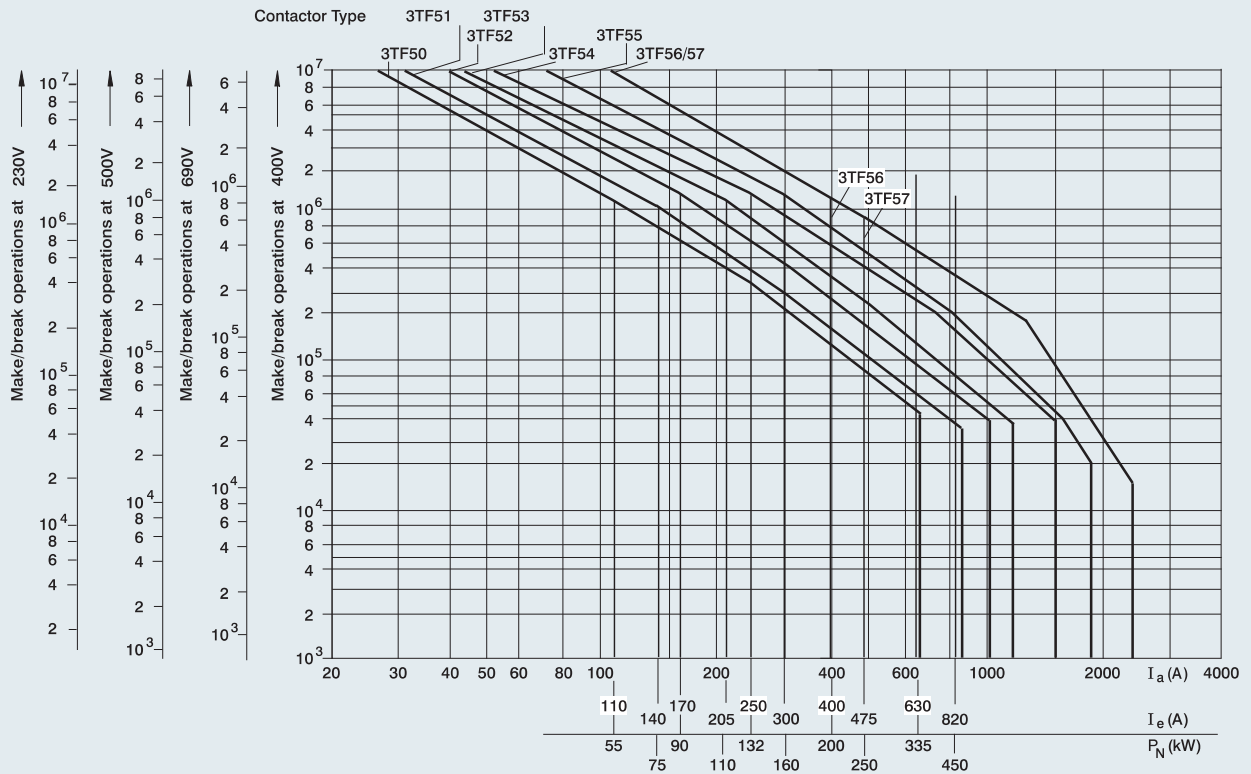
8) The opening time delay increases when the contactor coil is protected against voltage peaks. (e.g. Varistor: +2 to +5ms)

Electrical Life Curves

3TF30 to 3TF49 contactors

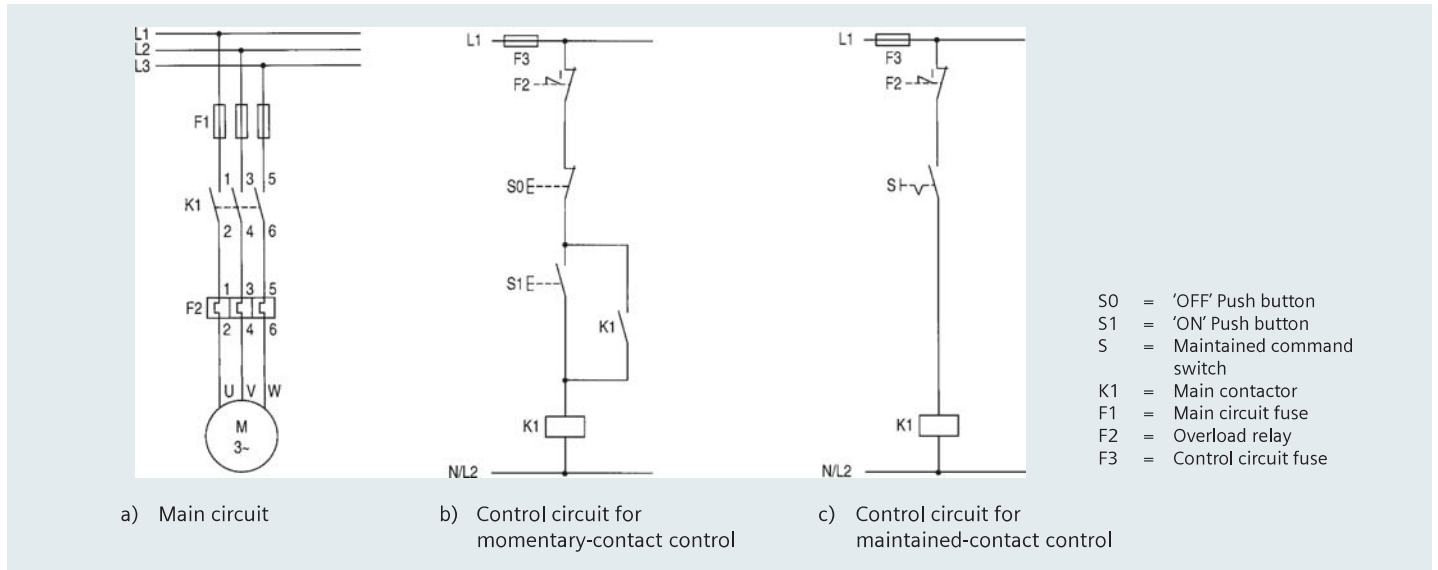


3TF50 to 3TF57 contactors

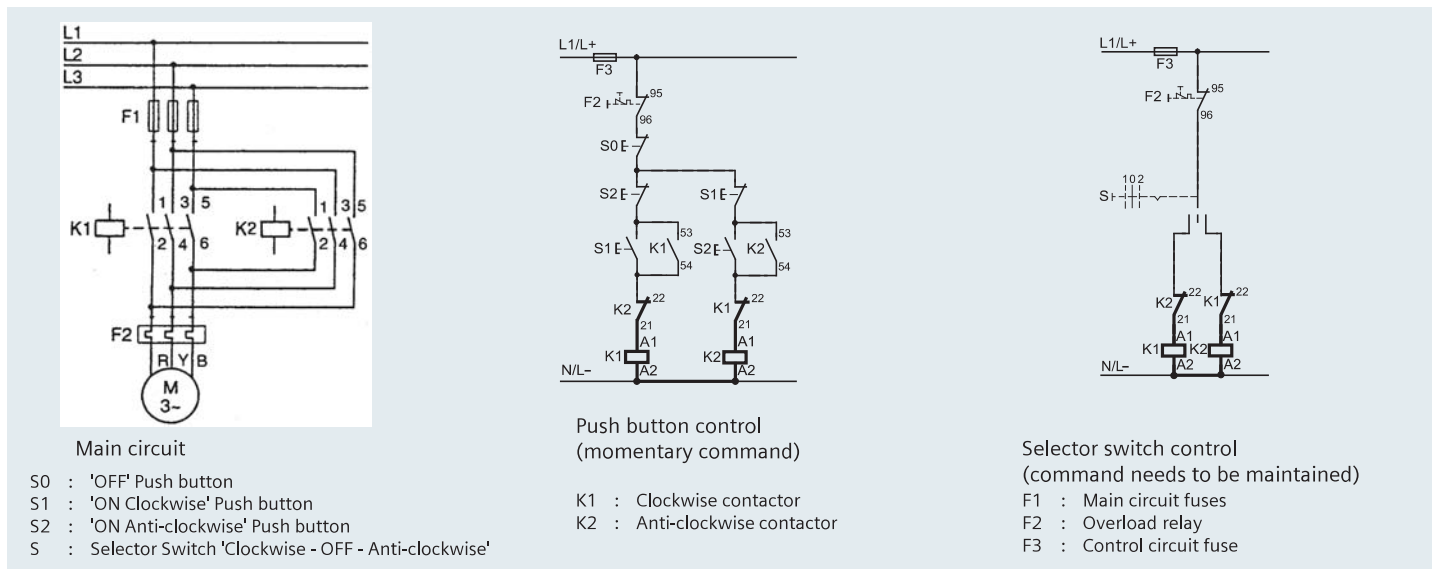


Typical Circuit Diagrams

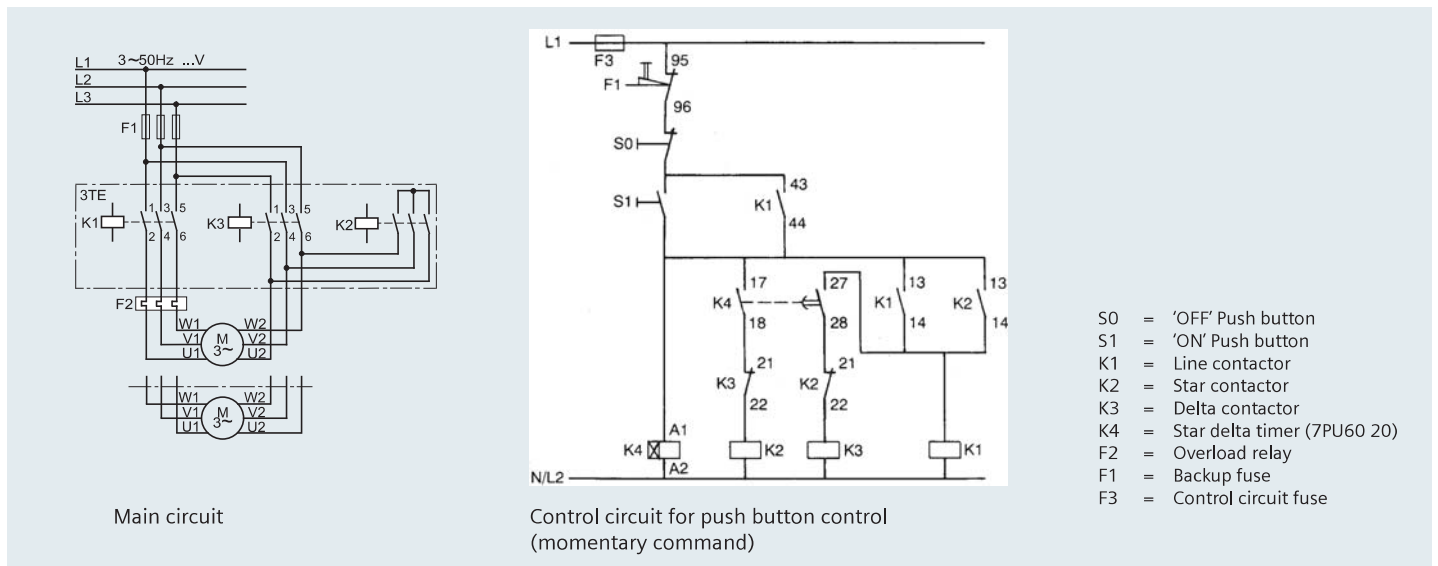
Direct On Line starter



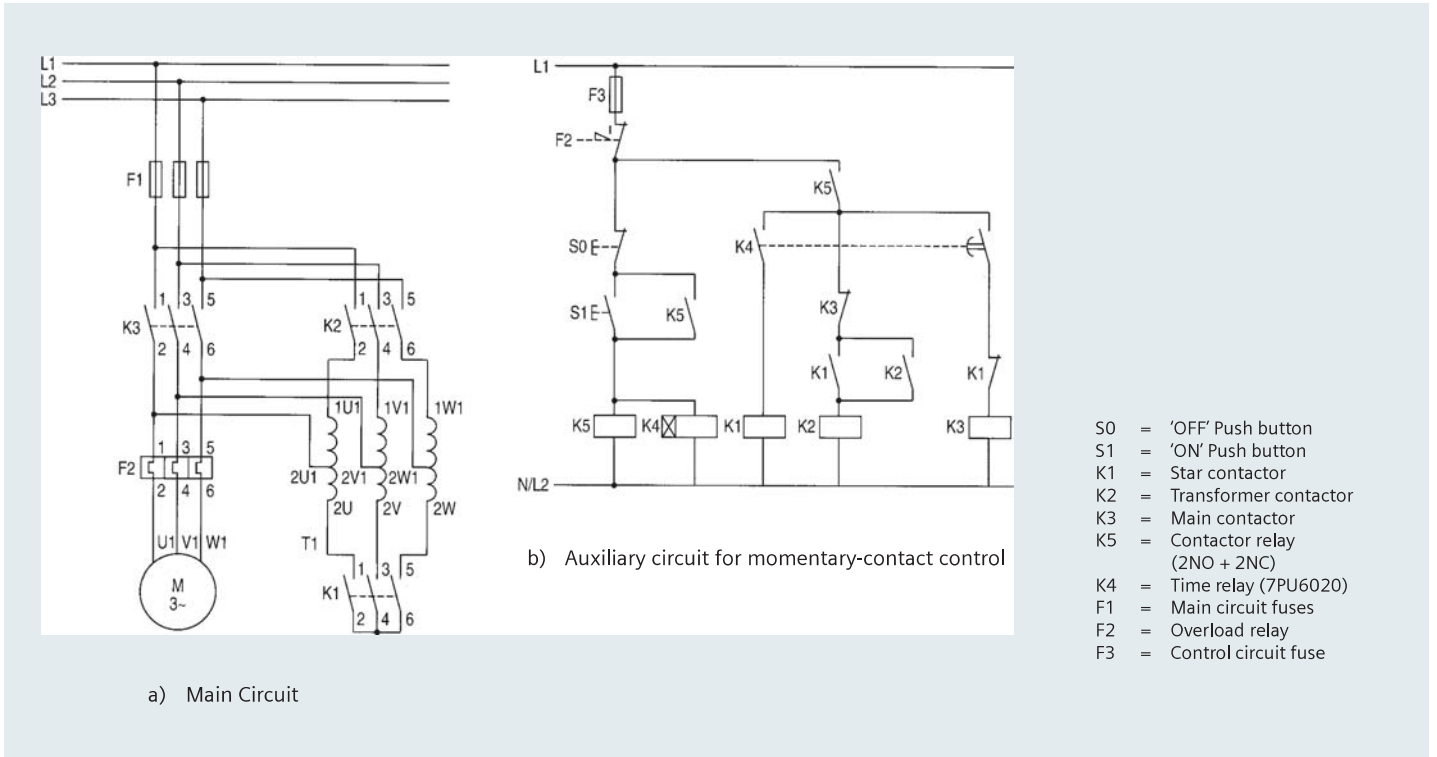
Forward / Reverse starter (Electrical Interlocking)



Star Delta starter

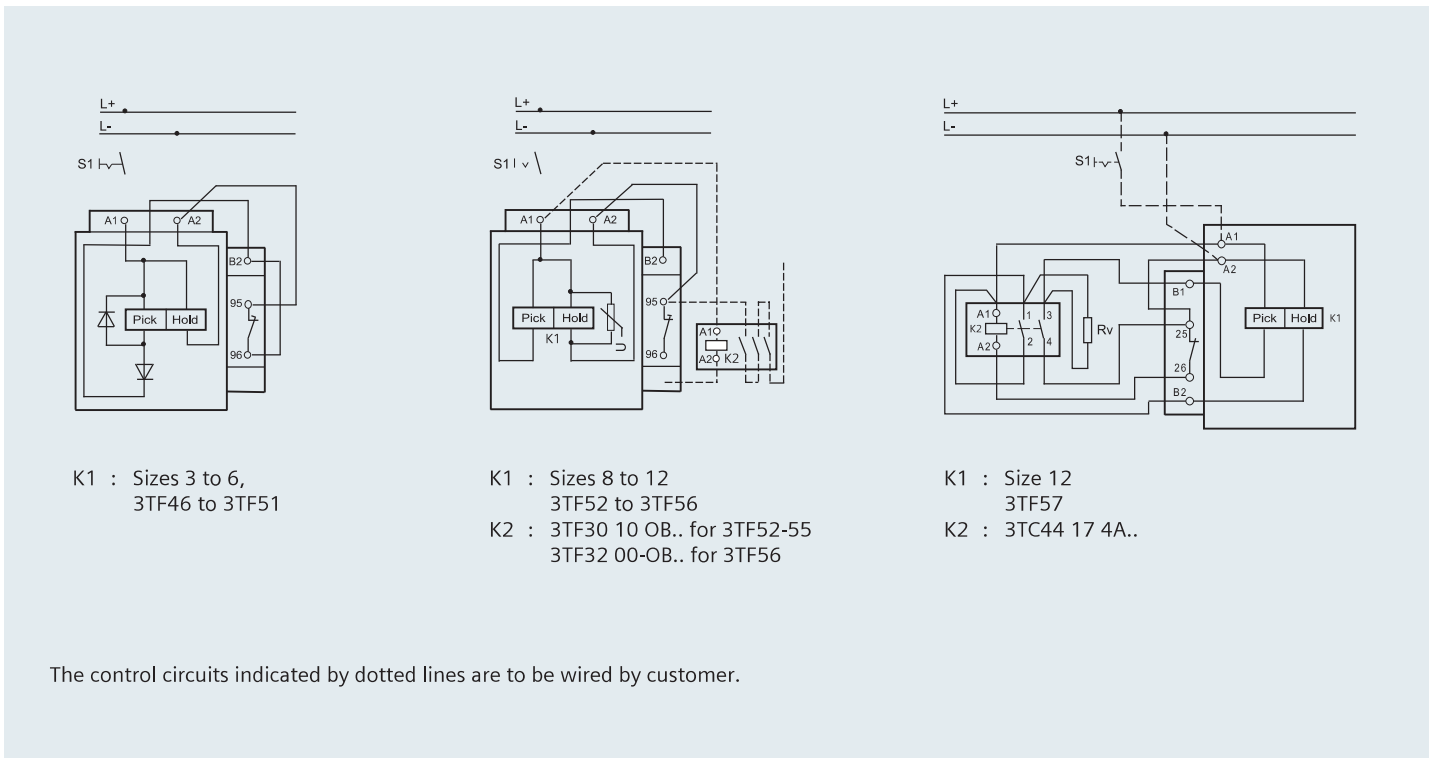


Auto Transformer starter

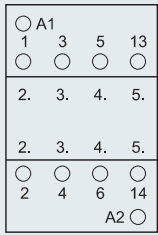


Please refer page no. 70 for selection of switchgear for autotransformer starting method

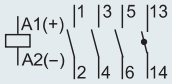
Internal connection diagram for DC coil circuits



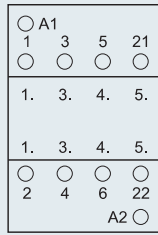
Terminal Designation



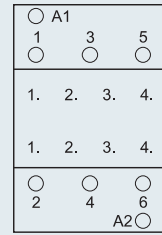
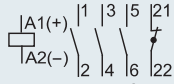
1 NO



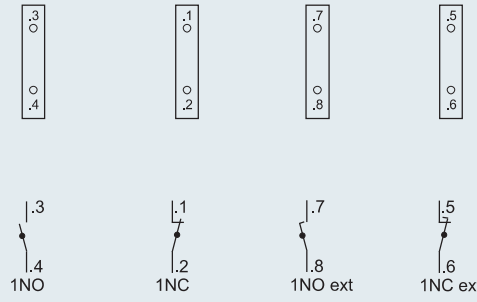
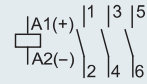
Size 0, 3TF30/31
AC and DC Coil



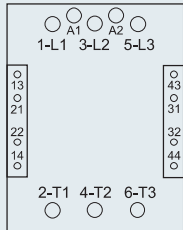
1 NC



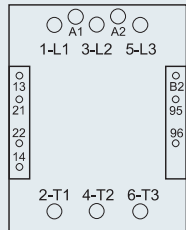
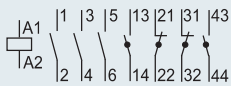
Size 2, 3TF32/33/34/35
AC and DC Coil



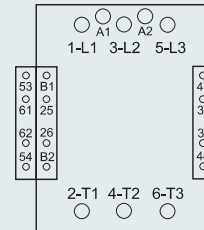
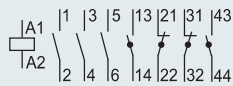
Add-on contact block for 3TF30/31/32/33



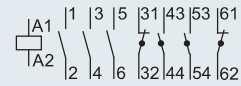
Size 3 to 12, 3TF46 to 3TF57
AC Coil



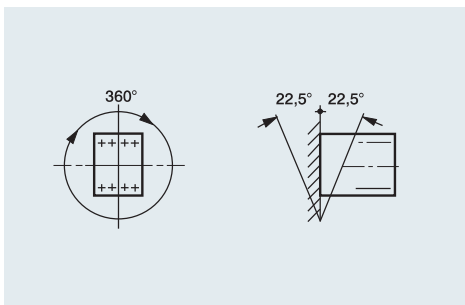
Size 3 to 12, 3TF46 to 3TF56
DC Coil



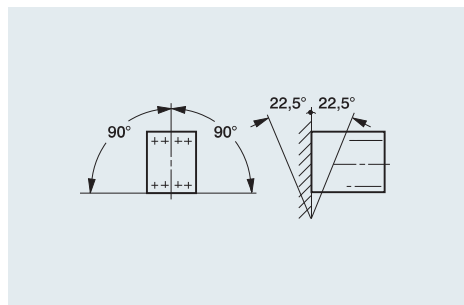
Size 12, 3TF57
DC Coil



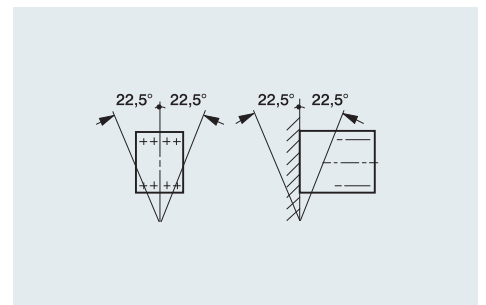
Permissible Mounting Position



3TF30 to 3TF33 - AC operation



3TF30 to 3TF33 - DC operation
3TF34 to 3TF57 - AC operation
3TF46 to 3TF57 - DC operation



3TF34/35 - DC operation

Accessories and ordering data

1. Mechanical interlocking kit

Mechanical interlock is required when the supply from two different sources is available. Also the same is required for the application involving reversing of motor. Here two contactors are mechanically interlocked with the help of mechanical interlock kit. This ensures closing of only one contactor at a time. Thus prevents a short circuit upon load changeover from one contactor to another.

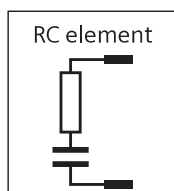
For Contactor		MLFB	Std. pkg. (nos.)
AC3 Rating	Contactor		
9 to 38A	3TF30 to 35	3TX4 091-1A #	10
45/63/70A	3TF46/47/47-7	3TX7 466-1YA0	2
75/85A	3TF48/49	3TX7 486-1YA0	2
110/140A	3TF50/51	3TX7 506-1YA0	2
170/205A	3TF52/53	3TX7 526-1YA0	2
250/300A	3TF54/55	3TX7 546-1YA0	2
400 A	3TF56	3TX7 566-1YA0	2
110/170 A	3TF50/52	3TX7 526-1YA09	1
170/250 A	3TF52/54	3TX7 546-1YA09	1

#: W/O base plate (not required)

2. Surge suppressor

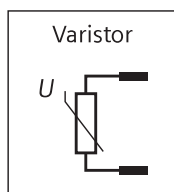
It is used to reduce the effect of switching overvoltages created during the opening of inductive circuits. Typically they are mounted outside the body of the contactor, and are connected in parallel with the coil terminals. Various techniques for the suppression of switching overvoltages can be employed. For example: RC element, Varistor etc.

RC Element:



The effective increase in the capacitance of the coil circuit reduces the amplitude and rate of rise of switch off overvoltage spikes to such an extent that no rapid restriking occurs.

Varistor:



Varistor limits the maximum value of the overvoltage because they become highly conductive above a threshold value. Until this threshold value is reached, no discharge occurs for a small duration.

Selection table:

Surge suppressor (Varistor) for 3TF30-3TF35

Coil Voltage		Type	Std. pkg. (nos.)
AC	DC		
24 - 48 V	24 - 70V	3TX7 402-3GY1	10
48 - 127V	70 - 150V	3TX7 402-3HY1	
127 - 240V	150 - 250V	3TX7 402-3JY1	
240 - 400V	–	3TX7 402-3KY1	
400 - 600V	–	3TX7 402-3LY1	

Surge suppressor (Varistor) for 3TF46-56

Coil Voltage		Type	Std. pkg. (nos.)
AC	DC		
Less than 48V	24 - 70V	3TX7 462-3GY1	10
48 - 127V	70 - 150V	3TX7 462-3HY1	
127 - 240V	150 - 250V	3TX7 462-3JY1	
240 - 400V	–	3TX7 462-3KY1	
400 - 600V	–	3TX7 462-3LY1	

Surge suppressor (RC Element) for 3TF30-3TF35

Coil Voltage		Type	Std. pkg. (nos.)
AC	DC		
24 - 48V	24 - 70V	3TX7 402-3RY2	10
48 - 127V	70 - 150V	3TX7 402-3SY2	
127 - 240V	150 - 250 V	3TX7 402-3TY2	
240 - 400V	–	3TX7 402-3UY2	
400 - 460V	–	3TX7 402-3VY2	

3. Connector

The 3TS90 connector is used to mount the motor protection circuit breaker 3VU on the contactor 3TF with screw terminals. It enables mechanical and electrical connection between contactor and motor protection circuit breaker.



Range:

Size of connector	MPCB		Contactor		MLFB of Connector	Std. pkg. (nos.)
	MLFB	Current Rating	MLFB	AC3 Current Rating		
I	3VU13	0.16 to 20A	3TF30 / 31	9 / 12 A	3TS90 01-8K	1
II	3VU13	6 to 25A	3TF32 / 33	16 / 22A	3TS90 02-8K	1

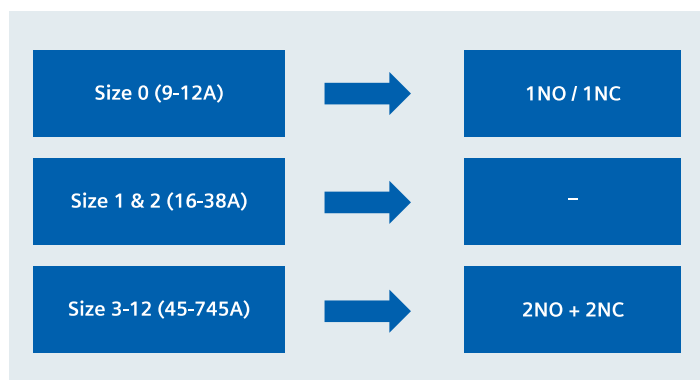
Benefits:

Direct mounting of 3VU MPCB on 3TF contactor eliminates the need of power wiring and ensures secure connection. In addition, the assembly time and size of the feeder is reduced which results in cost saving. The overall assembly also looks contemporary.

Spares and ordering data

1. Auxiliary Contact Blocks

In-built contact configuration



Add – on Contact Blocks:

For Contactor	Add on contact blocks	Type	Std. pkg. (nos.)
3TF30-35	1NO 1NC 1NO ext 1NC ext	3TX40 10-2A 3TX40 01-2A 3TX40 10-4A 3TX40 01-4A	10
3TF46-57	1NO+1NC Left 1NO+1NC Right 1NO + 1NC (Extd) Right	3TY7 561-1A 3TY7 561-1B 3TY7 561-1E	1
3TF46-57	Second 1NO+1NC Left Second 1NO+1NC Right	3TY7 561-1K 3TY7 561-1L	1
3TF46/47/477	Special block for DC Coil Circuit	3TY7 461-1F	1
3TF48 to 57	Special block for DC Coil Circuit	3TY7 481-1F	1

2. Main contact kits / arc chambers / AC-DC coils

For contactor type (AC3 rating)	Main contact kits (6 fixed & 3 moving contacts)	Arc chambers	AC coils ¹⁾	DC coils ¹⁾	Std. pkg. (nos.)
3TF30 (9A)	-	-	3TY7 403-0A..	3TY4 803-0B..	1
3TF31 (12A)	-	-			
3TF32 (16A)	3TY7 420-0A	-			
3TF33 (22A)	3TY7 430-0A	-			
3TF34 (32A)	3TY7 340-0C	3TY7 342-0C	3TY7 443-0A..	3TY7 443-0B..	
3TF35 (38A)	3TY7 350-0C	3TY7 352-0C			
3TF46 (45A)	3TY7 460-0YA	3TY7 462-0YA	3TY7 463-0A..	3TY7 463-0D..	
3TF47 (63A)	3TY7 470-0YA	3TY7 472-0YA			
3TF477 (70A)	3TY7 477-0YA	3TY7 477-0YD			
3TF48 (75A)	3TY7 480-0A	3TY7 482-0A	3TY7 483-0A..	3TY7 483-0D..	
3TF49 (85A)	3TY7 490-0A	3TY7 492-0A			
3TF50 (110A)	3TY7 500-0YA	3TY7 502-0YA	3TY7 503-0A..	3TY7 503-0D..	
3TF51 (140A)	3TY7 510-0YA	3TY7 512-0YA			
3TF52 (170A)	3TY7 520-0YA	3TY7 522-0YA	3TY7 523-0A..	3TY7 523-0D..	
3TF53 (205A)	3TY7 530-0YA	3TY7 532-0YA			
3TF54 (250A)	3TY7 540-0YA	3TY7 542-0YA	3TY7 543-0A..	3TY7 543-0D..	
3TF55 (300A)	3TY7 550-0YA	3TY7 552-0YA			
3TF56 (400A)	3TY7 560-0YA	3TY7 562-0YA			
3TF57 (475A)	3TY7 570-0YA	3TY7 572-0YA	3TY7 573-0C	3TY7 573-0D..	

¹⁾ Please fill in coil voltage code from table below

Coil voltage code AC 50Hz: 3TF30 to 3TF56

Coil voltage	24	42	110	230	415
Code	B0	D0	F0	P0	R0

Coil voltage code DC: 3TF30 to 3TF57

Coil voltage (V)	24	42	48	110	220	250 ⁺
Code	B4	D4	W4	F4	M4	N4

⁺ For 3TF3 only

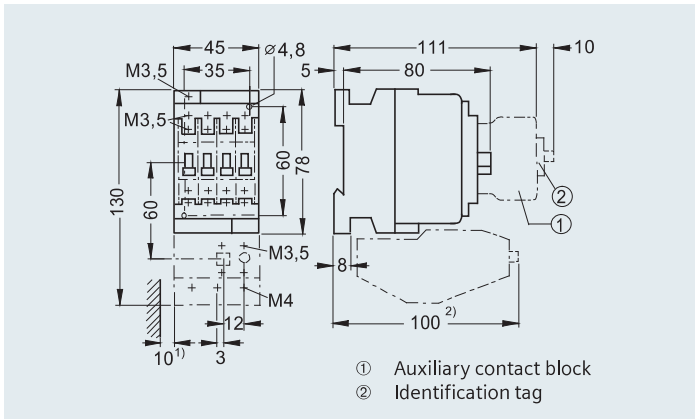
Coil voltage code AC 50/60 Hz: 3TF57

Coil voltage (V)	110-132	220-240	380-460
Code	F7	M7	Q7

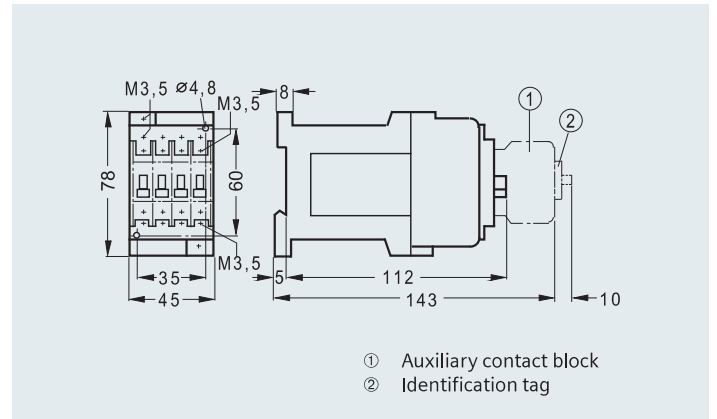
(Other coil voltages are also available)

Dimensional drawing

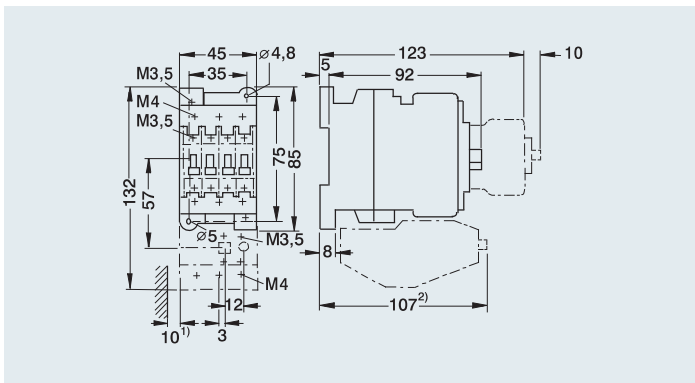
3TF30/31 AC Coil



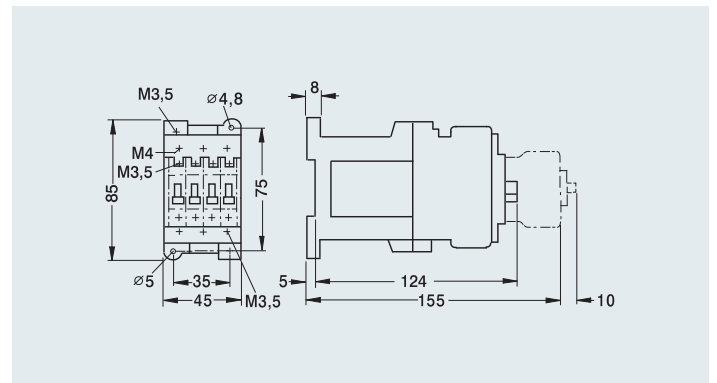
3TF30/31 DC Coil



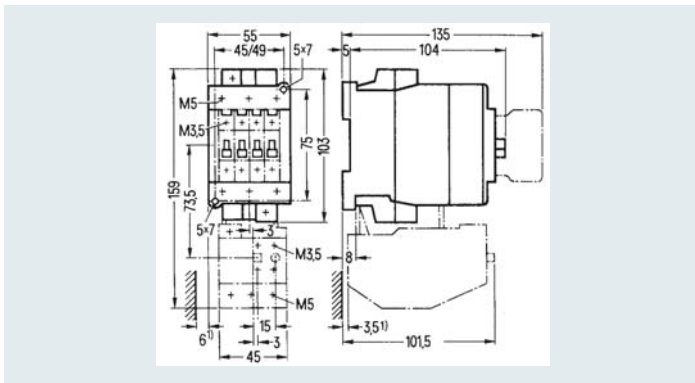
3TF32/33 AC Coil



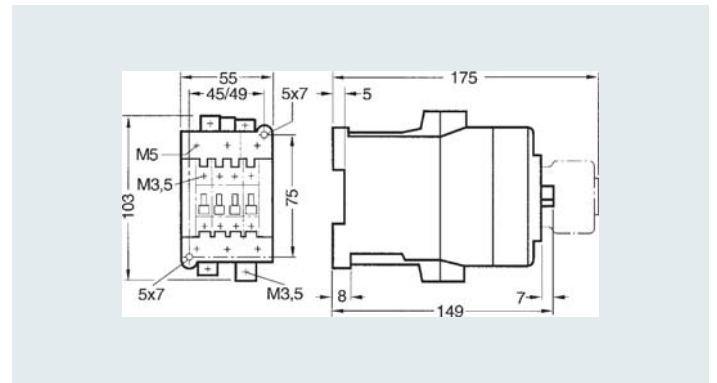
3TF32/33 DC Coil



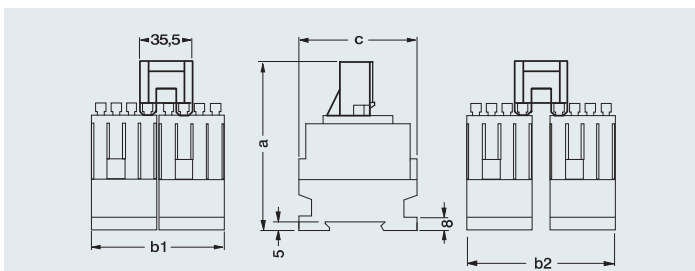
3TF34/35 AC Coil



3TF34/35 DC Coil



3TF30 to 3TF32, with mechanical interlock kit

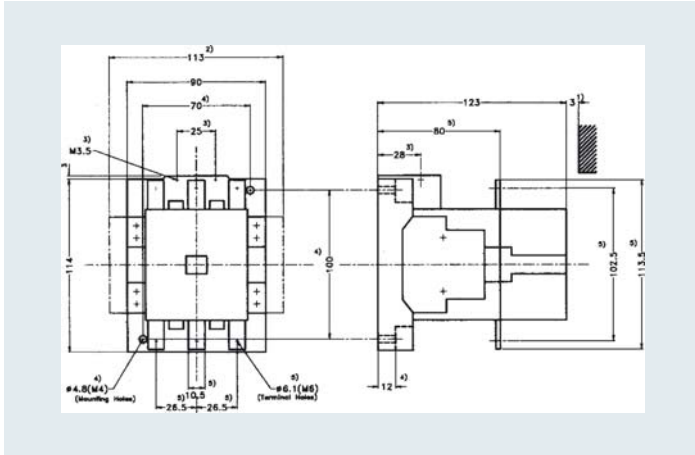


Type	a (AC coil)	a (DC coil)	b1	b2	c
3TF30/31	116	148	90	100	78
3TF32/33	127	159	91	101	85

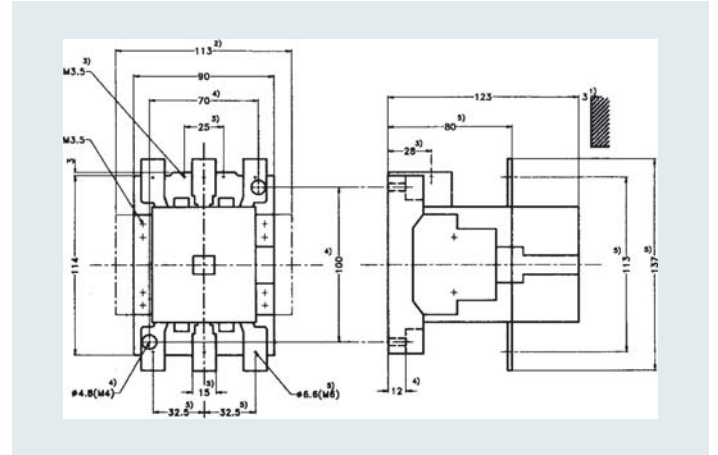
Notes

- Dimensions for coil terminals
- Dimensions for mounting terminals
Minimum clearance from insulated components = 5mm
Minimum clearance from earthed components = 10mm
- size of power terminals
- Size of auxiliary terminals

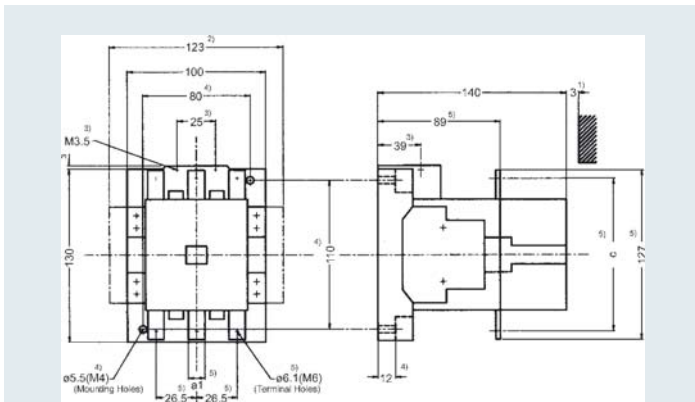
3TF46 and 3TF47



3TF47 7

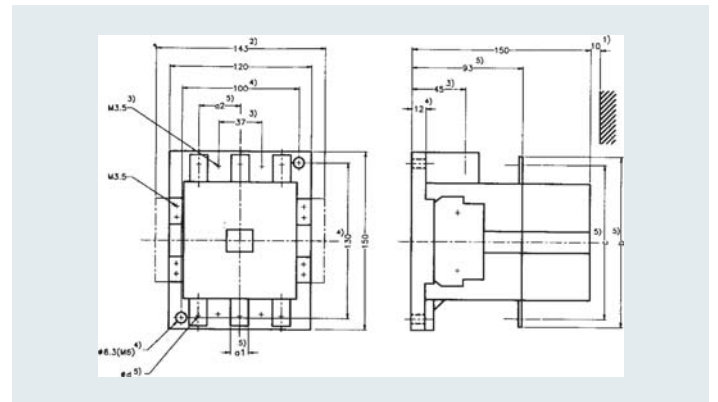


3TF48 and 3TF49



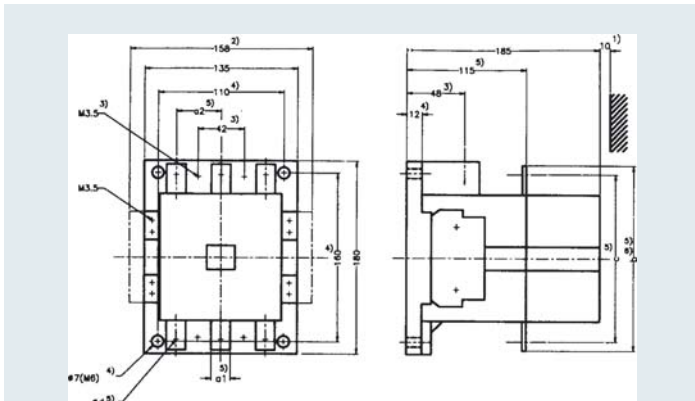
Type	a1	c
3TF48	8	107
3TF49	10.5	116

3TF50 and 3TF51



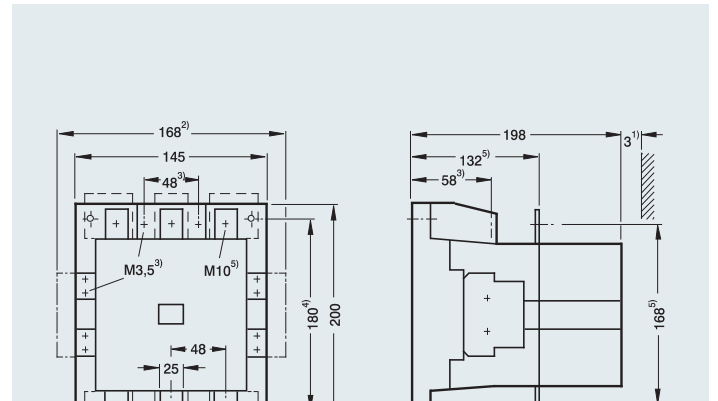
Type	a1	a2	b	c	φd
3TF50	15	37	149	134	6.6(M6)
3TF51	20	42	159	139	9(M8)

3TF52 and 3TF53



Type	a1	a2	b	c	φd
3TF52	20	42	174	154	6.6(M6)
3TF53	25	48	184	159	9(M8)

3TF54/55

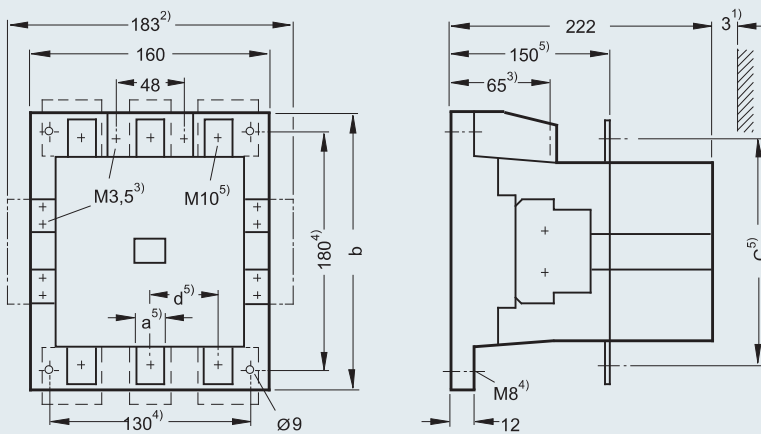


Notes

- 1) Minimum clearance from insulated components = 3mm
Minimum clearance from earthed components = 10mm
- 2) Dimension with second auxiliary contact block on both sides
- 3) Dimension for coil terminal.

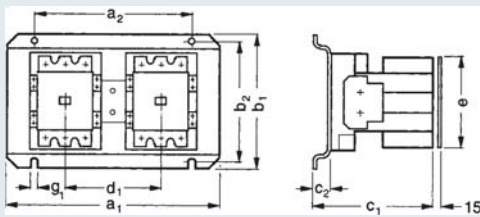
- 4) Dimension for mounting.
- 5) Dimension for power terminal.
- 6) 3TF53 The conductor bars protrude over the contactor edges on top and bottom by 2mm each.

3TF56/57



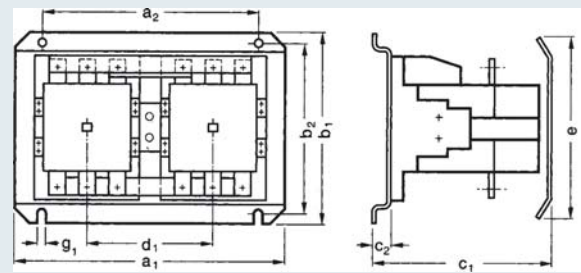
Type	a	b	c	d
3TF56	25	200	178	48
3TF57	30	209.5	182	52

3TF46/47/477/48/49 with Mechanical Interlock Kit



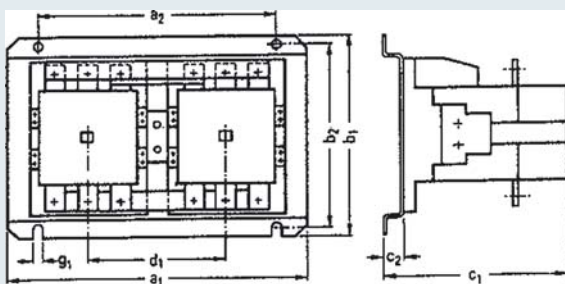
For Contactor	a ₁	a ₂	b ₁	b ₂	c ₁	c ₂	d ₁	e	g ₁
3TF46/47/477	240	180	165	145	141	18	117	150	7 (M6)
3TF48/49	260	200	175	155	158	18	127	160	7 (M6)

3TF50 to 3TF57 with Mechanical Interlock Kit



For Contactor	a ₁	a ₂	b ₁	b ₂	c ₁	c ₂	d ₁	e	g ₁
3TF50/51	300	240	210	185	160	18	147	260	9 (M8)
3TF52/53	330	270	240	215	203	18	162	315	9 (M8)
3TF54/55	350	290	265	240	219	21	172	375	11 (M10)
3TF56/57	380	310	265	240	243	21	187	385	11 (M10)

3TF50 and 3TF52 with Mechanical Interlock Kit 3TF52 and 3TF54 with Mechanical Interlock Kit



Type	a ₁	a ₂	b ₁	b ₂	c ₁	c ₂	d ₁	g ₁
3TF52 & 50	330	270	240	215	203	18	154.5	11
3TF54 & 52	350	290	265	240	219	21	167	11

Notes

- 1) Minimum clearance from insulated components = 3mm
Minimum clearance from earthed components = 10mm
- 2) Dimension with second auxiliary contact block on both sides
- 3) Dimension for coil terminal.
- 4) Dimension for mounting.
- 5) Dimension for power terminal.