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 Iq = 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 deration 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.

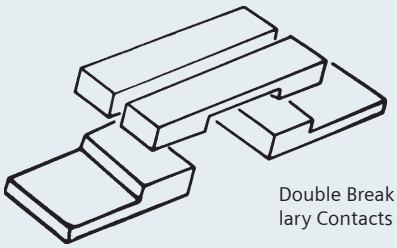
- **Long Life**
  Superior design of current carrying parts, contact system and the magnet system increases the reliability results into **higher electrical and mechanical endurance**.

- **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)



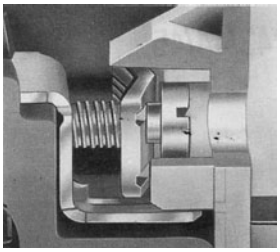
Double Break Parallel Bridge Auxiliary Contacts

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**



  – **Finger 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) Ie 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..**	
	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 [$]	**3TF47 72-0A..**	**3TF47 72-0D..**	**1**
4	**75**	**42**	2NO + 2NC [$]	**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 & 3TH30	1NO	**3TX4010-2A**	**10**
	1NC	**3TX4001-2A**	**10**
	1NO (Extd)	**3TX4010-4A**	**10**
	1NC (Extd)	**3TX4001-4A**	**10**
3TF46 to 3TF57, 3TK5	Second 1NO+1NC Left	**3TY7561-1KA008K**	**1**
	Second 1NO+1NC Right		

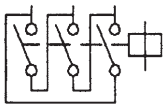
2 Pole AC contactors - 3TF

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**	
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**	**1**
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**	°C		-55 to +80					
	Service	°C		-25 to +55					
Maximum operating voltage		V		690					
Rated insulation voltage *Ui* (At Pollution Degree 3)[1]		V		690					
Rated impulse strength *Uimp*		kV		8					
Mechanical endurance	AC	Cycles		15×10^6				10×10^6	
(make/break operations)	DC	Cycles		15×10^6				10×10^6	
Rating of contactors for AC loads									
AC-1 duty, switching resistive load									
Rated operational current ***Ie***	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 ***Ie***[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 slipring or squirrel-cage motors at	**at 415V**	**kW**		**4**	**5.5**	**7.5**	**11**	**15**	**18.5**
50/60 Hz.	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. 2×10^5 make-break operations at Ia=6Ie)									
Rated operational current ***Ie***	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 Ie/AC-4 = Ie/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 ***Ies***	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 ***Ier***	20%	A		31		73		125	
On-load factor (ED)[3]	40%	A		31		58		106	
with intermittent duty	60%	A		31		52		95	
	80%	A		31		47		87	
Locked rotor voltage Uer	Starting	V		1320		1320		1320	
	Plugging / Control	V		660		660		660	
AC-6b duty, switching low-inductance individual three-phase capacitors at 50/60Hz[4] (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 Ie/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 < 1mS)									
Rated operational current ***Ie*** (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 < 15mS)									
Rated operational current ***Ie*** (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 IS/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	28	31	34	42	54	68	75	96	110	125	150	150
	13.1 15.8	15.3 18.4	16.9 20.4	18.6 22.4	23 27	29.5 35.5	38 46	42 50	54 65	63 76	72 86	88 107	88 107
	21.8	25.4	28.2	30.9	38	49	63	69	90	105	119	147	147
	123	138	138	154		246		323	339	462		617	800
	98	110	110	122		195		256	268	367		490	670
	87	98	98	109		174		229	240	327		436	600
	80	90	90	100		160		210	220	300		400	550
	150	219	219	243		389		510	535	729		972	1336
	150	174	174	193		309		405	425	579		772	1061
	138	155	155	172		275		361	378	516		688	946
	126	142	142	158		253		332	348	474		632	869
	1500	1500	1500	2000		2000		2000	2000	2000		2000	2000
	750	750	750	1000		1000		1000	1000	1000		1000	1000
	30 35 30			50 62.5 50		60 80 60		100 130 100		150 190 150		200 265 200	
	360	500	500	800	800	880	1140	1360	1640	2500	2500	3400	4200
	3.5	6	6	7.5	10	10	14	14	20	16	23	40	40
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
	80 6 1.2 0.48	80 80 7 1.2	80 80 80 3	100 12 2.5 0.8	100 100 13 2.4	100 100 100 6	160 18 3.4 0.8	160 160 20 3.2	160 160 160 11.5	200 18 3.4 0.8	200 200 20 3.2	200 200 200 11.5	300 33 3.8 0.9	300 300 300 4	300 300 300 11	400 33 3.8 0.9	400 400 400 4	400 400 400 11
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
	5 0.75 0.2 0.1	80 12.5 1.1 0.27	80 80 3.5 0.6	6 1.25 0.35 0.15	100 100 1.75 0.42	100 100 4 0.8	160 2.5 0.6 0.17	160 160 2.5 0.65	160 160 160 1.4	200 2.5 0.6 0.17	200 200 2.5 0.65	200 200 200 1.4	300 3 0.6 0.18	300 300 2.5 0.65	300 300 300 1.4	400 3 0.6 0.18	400 400 2.5 0.65	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)			Operation									
	No load	AC	Cycles/hr	10,000	10,000	5000	5000	5000	5000	5000	5000	5000
		DC	Cycles/hr	1,500	1,500	1,500	1,500	1,500	1,500	1,000	1,000	1,000
	at AC-1		Cycles/hr	2,000	2,000	1,500	1,500	1,200	1,200	1,000	1,000	1,000
	at AC-2		Cycles/hr	1,000	1,000	750	750	750	600	600	400	400
	at AC-3		Cycles/hr	1,000	1,000	750	750	750	600	1200[5]	1000	1000
	at AC-4		Cycles/hr	250	250	250	250	250	200	400	300	300
Coil ratings (cold coil 1.0 x Us)		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		
		p.f.		0.29		0.29		0.28		0.29		
DC operation		Closing	W	6.2		6.2		11.7		400		
		Closed	W	6.2		6.2		11.7		2.1		
Coil voltage tolerance		Operation AC/DC		0.8 to 1.1 x Us		0.8 to 1.1 x Us						
		at 24V DC		0.8 to 1.2 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 *Ie* / AC-12			A	Inbuilt Aux Contact 10		Contact Block 3TX4 10				Contact Block 3TY7 10		
Rated operational current ***Ie / AC-15/AC-14***												
at rated operational voltage *Ue*		upto 125V	A	10		6				10		
		220V	A	10		6				6		
		415V	A	5.5		3.6				3.6		
		500V	A	4		2.5				2.5		
Rated operational current ***Ie / DC12***												
at rated operational voltage *Ue*		upto 48V	A	10		10				10		
		110V	A	2.1		5.5				3.2		
		220V	A	0.8		1.2				0.9		
		440V	A	0.6		0.28				0.33		
Rated operational current ***Ie / DC13***												
at rated operational voltage *Ue*		upto 24V	A	10		10				10		
		48V	A	5		4.6				5		
		110V	A	0.9		0.80				1.14		
		220V	A	0.45		0.30				0.48		
		440V	A	0.25		0.11				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				Inbuilt Aux Contact		Contact Block 3TX4				Contact Block 3TY7		
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),				2 x (0.5 to 1, 1 to 2.5), 1 x 4		
Finely stranded with end sleeve			mm^2	2 x (0.75 to 2.5)		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)		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			Nm	0.8 to 1.4		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		22 - 37		25 - 50		25 - 40		25 - 40	48 - 70
	5 - 30		8 - 30		10 - 30		10 - 30		8 - 30	80 - 100
	32 - 40		28 - 32		32 - 45		36 - 45		40 - 55	44 - 60
	95-105		185 - 195		10 - 20		10 - 20		10 - 20	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	35 to 95	35 to 95	50 to 240	50 to 240	50 to 240	50 to 240	50 to 240
			15	20	20	25	25	25	25	30
			3 to 2/0							
			6 to 8	10 to 14	10 to 14	14 to 24	14 to 24	14 to 24	14 to 24	14 to 24
	2 x (0.5 to 1, 1 to 2.5), 1 x 4				2 x (0.5 to 1, 1 to 2.5)				2 x (0.5 to 1, 1 to 2.5)	
	2 x (0.75 to 2.5)				2 x (0.75 to 2.5)				2 x (0.75 to 2.5)	
	1 x (1 to 2.5)				1 x (1 to 2.5)				1 x (1 to 2.5)	
	2 x (18 to 12)				2 x (18 to 12)				2 x (18 to 12)	
	0.8 to 1.4				0.8 to 1.4				0.8 to 1.4	
	250	250	400	400	400	400	500	500	630	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)