

Motor starters

TeSys E

Designed for the essential





Schneider Electric Worldwide

15.8

billion sales in 2008 (in €)



32

% of sales in new economies



100000+

people in 100+ countries



330

Rank in Fortune 500 ranking



5%

Revenue devoted to R&D



Schneider Electric in india*

8400+

Employees



12

Global Manufacturing Plants



6

Distribution Centres



500+

Authorised Partners: Distributors,
System Integrators, Panel Builders



6

R&D Centres



1

Regional Project &
Engineering Centre

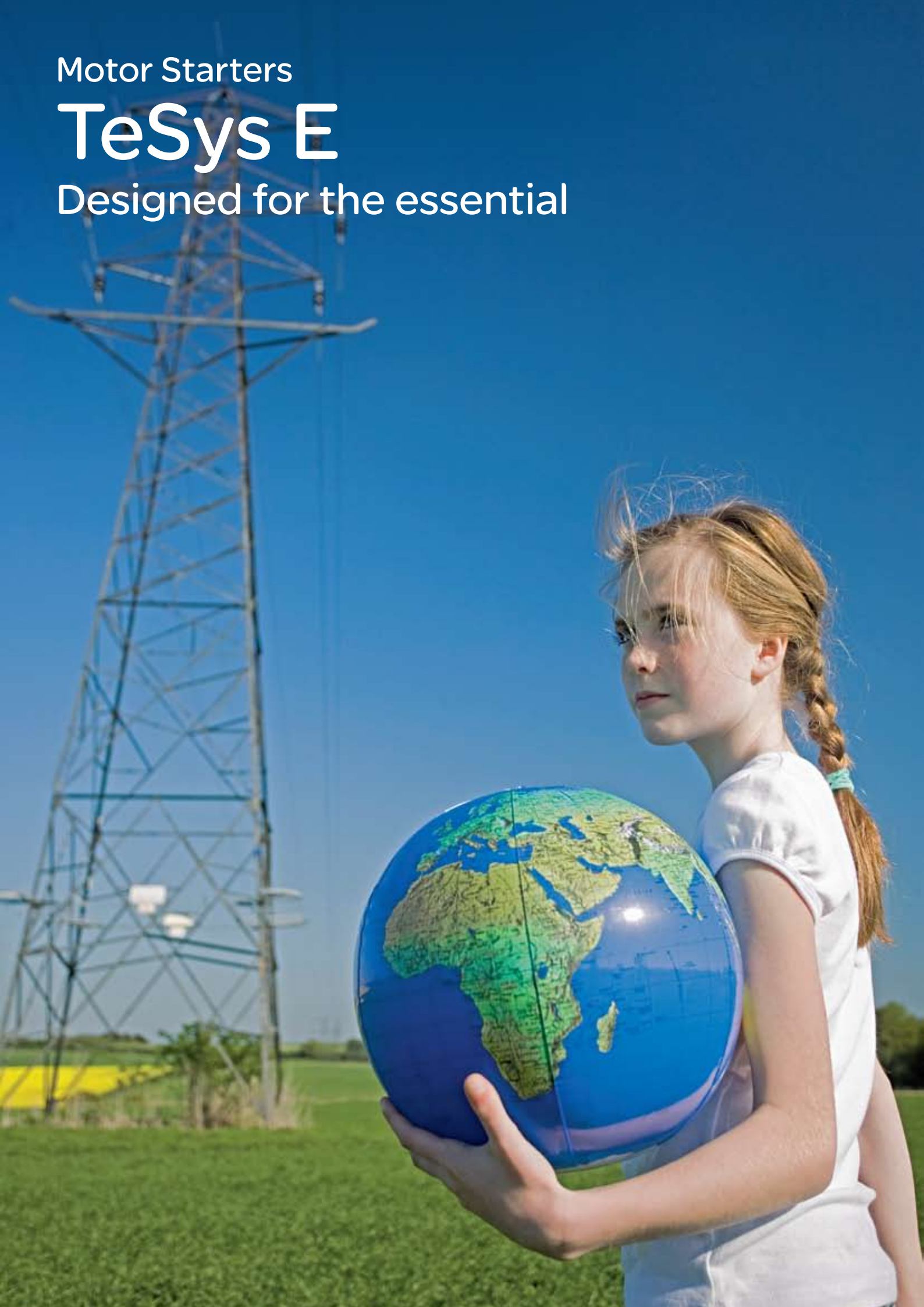


*Figures as on November 1,2009

Motor Starters

TeSys E

Designed for the essential



TeSys E: control & protection,



Leader in the motor starter market for more than 80 years, Schneider Electric has designed TeSys E range to provide you with the competitive solutions you were expecting.

TeSys E starters range is the perfect combination of quality, features and price.



A cost-effective offer

- > The best price for the performance and quality level you need.
- > A maximum of solutions with an optimal number of products.
- > Designed to perform the essential starter's functions: control and overload protection.



Simple and intuitive

- > Easy to install.
- > Covering 80 % of applications.
- > With the key accessories to easily build systems Do-It-Yourself solutions.
- > Easy to order, easy to understand and easy to remember.



Guaranteed availability

- > Available in stock.
- > TeSys E fully benefits from Schneider Electric world wide policies: in terms of standards of production, distribution, quality, availability, services and after-sales support.



in a simple way



Energy &
Infrastructure



Industry



Buildings

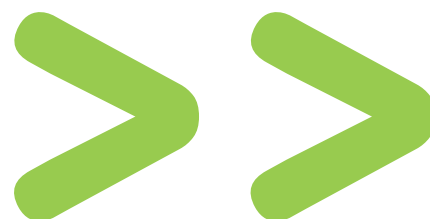
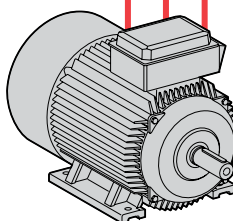
Circuit protection



Tesys E offer

Power control & protection

Circuit control



TeSys E: contactors



- > TeSys E contactors,
6 A to 300 A



- > TeSys E thermal overload relays
0.1 A to 333 A



- > TeSys E control relays
4 NO/NC contacts



- > Coordination between protection
and control components
- > Glossary, definitions, technical
information

and relays

Control your motors, simplyfy your solution:
direct-on-line starter, reversing starter, star-delta combination



Characteristics

Accessories, spare parts

Dimensions, mounting

Footprint for complete compatibility with contactors
(direct mounting under contactors)



Characteristics

Dimensions, mounting

Pilot your control circuits



Characteristics

Dimensions, mounting

Better continuity of service



What coordination means

Glossary

Definitions

Technical informations



Solution to meet Customer needs

>> Global offer, Conformity to IEC 60947-4-1 & CE marking



>> High operational ambient temperature: upto 60°C



>> Reliability with tested Fuse less / Fuse Type 2 co-ordination



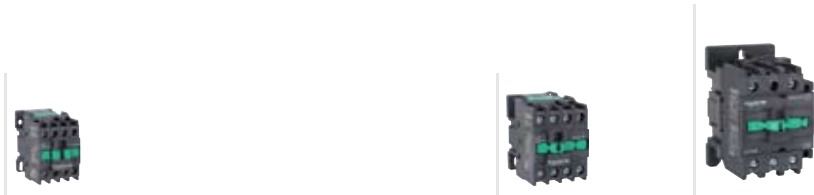
>> High electrical and mechanical life



>> Wide variety of accessories for simple adaptation



TeSys E 3 pole contactors

												
Rated operational current AC3	A	6	9	12	18	25	32	38	40	50	65	
Rated operational current AC1	A	20	25		32	36	50		60	70	80	
Rated operational power in AC-3	220/230 V	kW	1.1	2.2	3	4	5.5	7.5	9	11	15	18.5
	380/400 V		2.2	4	5.5	7.5	11	15	18.5	18.5	22	30
	415/440 V		2.2	4	5.5	9	11	15	18.5	22	25/30	37
	500 V		3	5.5	7.5	10	15	18.5	18.5	22	30	37
	690 V		3	5.5	7.5	10	15	18.5	18.5	30	33	37
Size		1					2		3			
Width	mm	45					56		75			
Coil rated operating voltage		24...440 V AC according to the coil voltage code (see below)										
Auxiliary built in contact		1 NO or 1 NC							1 NO + 1 NC			
References ⁽¹⁾		LC1E06	LC1E09	LC1E12	LC1E18	LC1E25	LC1E32	LC1E38	LC1E40	LC1E50	LC1E65	

(1) Partial, see below.

Coil voltage code

	24	48	110	220	240	380	415	440
50 Hz	B5	E5	F5	M5	U5	Q5	N5	R5
60 Hz	B6	-	F6	M6	-	Q6	-	R6

Contactors: how to determine the full commercial reference ?

Example:

LC1E	12	10	U	5		ref. LC1E1210U5
					5	50 Hz
					Coil voltage code	240 V
					Auxiliary contact configuration (2)	1 Normally Open (NO) 0 Normally Closed (NC)
					Rated operational current AC3	12 A
					Contactors	TeSys E

Example 1: you need a 32 A contactor, 1 NC auxiliary contact, 24 V -

50 Hz coil ⇒ **LC1E3201B5**

Example 2: you need a 120 A contactor, 1 NO + 1 NC auxiliary contact, 220 V -

50 Hz coil ⇒ **LC1E120M5**

(2) Only up to LC1E38.

from 6 to 300 A

						
80	95	120	160	200	250	300
110	120	150	200	250	300	320
22	25	37	45	55	75	90
37	45	55	90	110	132	160
45	45	55	90	110	132	160
45	55	75	90	110	132	160
45	45	75	90	110	132	160
4		5		6		7
85		120		168.5		213
1 NO + 1 NC				-		
LC1E80	LC1E95	LC1E120	LC1E160	LC1E200	LC1E250	LC1E300

Common accessories

> Contactors compatible with:



LAEN ● auxiliary contact blocks



LAETSD time delay auxiliary contact (from 25 A contactor)



LAERC ●● RC switch suppressor (up to 95 A)



LAEM ● mechanical interlock

LAEP ● set of power connections (up to 95 A)

Utilisation categories

- > Class AC-1: AC loads with $\cos \varphi$ at least equal to 0.95 (resistive load, heating, distribution, etc.).
- > Class AC-3: squirrel-cage motors with breaking taking place with the motor running.

Power circuit characteristics

Contactor type			LC1E06	LC1E09	LC1E12	LC1E18
Number of poles			3			
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3 (θ ≤ 60 °C)	A	6	9	12	18
	In AC-3 (θ ≤ 55 °C)		–			
	In AC-1 (θ ≤ 60 °C)		20	25		32
	In AC-1 (θ ≤ 40 °C)		–			
Rated operational voltage (Ue)	Up to	V	690			
Frequency limits	Of the operational current	Hz	50/60			
Conventional thermal current (Ith)	θ ≤ 60 °C	A	20	25		32
	θ ≤ 40 °C		–			
Rated breaking capacity at 440 V	Conforming to IEC 60947	A	48	72	96	144
Rated making capacity at 440 V	Conforming to IEC 60947-4-1	A	60	90	120	180
Permissible short time rating No current flowing for preceding 15 minutes with θ ≤ 40 °C	10 s	A	80	105		145
	1 min		45	61		84
	10 min		20	30		40
Maximum permissive current No current flowing for previous 60 minutes, at θ ≤ 40 °C	For 10 s	A	–			
Protection by fuses against short-circuits (U ≤ 690 V)	Without thermal overload relay Type 1 gG fuse	A	12	20	25	35
	With thermal overload relay		For corresponding aM or gG fuse ratings corresponding to the associated LRE thermal overload relay, please see page 35			
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5			
Power dissipation per pole for the above operational currents	AC-3	W	0.09	0.20	0.36	0.81
	AC-1		1.0	1.6		2.6
Electrical durability	AC-3 (Ue ≤ 440 V)	Million cycles	1.4			1.2
	AC-1 (Ue ≤ 440 V)		0.15		0.3	
	AC-4 (Ue ≤ 440 V)		0.04			0.035
Mechanical durability			10			

Power circuit connections

Connection maximum c.s.a.				
Flexible cable with cable end	1 conductor	mm ²	1...4	
	2 conductors		1...2.5	
Solid cable without cable end	1 conductor	mm ²	1...4	
	2 conductors		1...4	
Cable with lug		mm	–	
Bar	Number of bars		–	
	Bar	mm x mm	–	
Bolt diameter	1 conductor	mm	–	
Tightening torque	Power circuit connection	N.m	1.2	
Tool			Philips N° 2 or Ø6 mm flat	

	LC1E25	LC1E32	LC1E38	LC1E40	LC1E50	LC1E65	LC1E80	LC1E95	LC1E120	LC1E160	LC1E200	LC1E250	LC1E300
	25	32	38	40	50	65	80	95	-				
									120	160	200	250	300
	36	50		60	70	80	110	120	-				
									150	200	250	300	320
	36	50		60	70	80	110	120	-				
									150	200	250	300	320
	200	256	304	320	400	520	640	760	960	1280	1600	2000	2400
	250	320	380	400	500	650	800	950	1200	1600	2000	2500	3000
	240	260	310	320	400	520	640	800	-				
	120	138	150	165	208	260	320	400	-				
	50	60		72	84	110	135		-				
									1100	1400	1500	1800	2200
	40	63		80	100	125	160		250	315			500
									-				
	2.5			1.5		1	0.8		0.6		0.33	0.32	0.3
	1.6	2.0	2.9	2.4	3.8	4.2	5.1	7.2	8.6	15	13	20	27
	3.2	5.0		5.4	7.4	6.4	9.7	12	14	24	21	29	31
		1	0.9						0.8				
	0.35								0.25				
		0.03	0.025						0.012	0.007	0.006	0.005	
		8		5			3		4		5		
	1...6			2.5...25			4...50		10...120		-		
	1...4			2.5...10			4...16		10...120 + 10...50		-		
				2.5...25			4...50		10...120		-		
				2.5...16			4...50		10...120 + 10...50		-		
											150	185	240
											2		
											3 x 25	4 x 32	5 x 30
											M8	M10	
	1.5	2.1		5			9	12			18	35	
				Ø8 mm flat			Ø8 mm flat or Allen key n°4	Allen key n°4			Wrench		

TeSys E contactors

6 to 300 A

Control circuit: coil characteristics

Built in auxiliary contact

Control circuit: coil characteristics with a.c. supply

Contactor type		LC1E06	LC1E09	LC1E12	LC1E18
Rated control circuit voltage (Uc) 50/60 Hz	V	24...440 according coil voltage code			
Control voltage limits ($\theta \leq 55^\circ\text{C}$)					
50 Hz or 60 Hz coils Operational		0.85...1.1 Uc			
Drop-out		0.3...0.6 Uc			
Average consumption at 20°C and at Uc					
~ 50 Hz coils Inrush	coil	VA	95		
	cos ϕ		0.75		
Sealed	coil	VA	8.5		
	cos ϕ		0.3		
~ 60 Hz coils Inrush	coil	VA	95		
	cos ϕ		0.75		
Sealed	coil	VA	8.5		
	cos ϕ		0.3		
Heat dissipation	W	2.3			
Operating time Closing "C"	ms	12...22			
Opening "O"		4...19			
Electrical durability (AC-3)	AC-3 (Ue \leq 440 V)	In millions of operating cycles	1.2...1.4		
	AC-1 (Ue \leq 440 V)		–		
Mechanical durability at Uc			10		
Maximum operating rate at ambient temperature $\leq 60^\circ\text{C}$		In operating cycles per hour	1800		
Maximum operating rate at ambient temperature $\leq 55^\circ\text{C}$			–		

Control circuit connections

Connection maximum c.s.a.

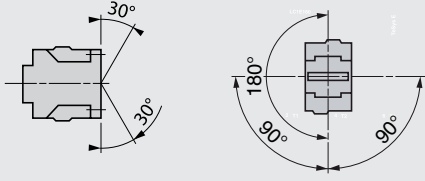
	Flexible cable without cable end	1 or 2 conductors	mm ²	1..4
	Flexible cable with cable end	1 conductor	mm ²	1..4
		2 conductors		1..2.5
	Solid cable without cable end	1 or 2 conductors	mm ²	1..4
Tightening torque			N.m	1.7
Screwdriver				Philips N° 2 - Ø6 mm flat

Built in auxiliary contact

Contacts conforming to	IEC 60947-5-1		LC1E06...E38: contactor's own 1NO or 1NC LC1E40...E160: contactor's own 1NO and 1NC
Rated operational voltage (Ue)	Up to	V	690
Rated insulation voltage (Ui)	Conforming to IEC 60947-1		690
Conventional thermal current (Ith)	Ambient air temperature $\gamma 60^\circ\text{C}$	A	10
Operating current frequency		Hz	50/60 Hz
Minimum switching capacity $\lambda = 10^{-8}$	U min	V	17
	I min	mA	5
Short-circuit protection	Conforming to IEC 60947-5-1		gG fuse: 10 A
Raked making capacity	Conforming to IEC 60947-5-1	A	~: 140
Short-time rating	Permissible for 1 s	A	100
	500 ms		120
	100 ms		140
Insulation resistance		MW	>10
Non-overlap time	Guaranteed between N/C and N/O contacts	ms	1.5 on energisation and on de-energisation



Environment

Contactor type			LC1E06...E18	LC1E25...E38
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1, overvoltage category III, degree of pollution: 3	V	690	
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947	kV	6	
Conforming to standards			IEC 60947-4-1, IEC 60947-5-1	
Product certifications			GOST	
Degree of protection	Conforming to IEC 60529		IP20	
Protective treatment	Conforming to IEC 60068		"TH"	
Ambiant air temperature around the device	Storage	°C	-60...+80	
	Operation		-5...+55	
	Permissible at UC ⁽¹⁾ ⁽²⁾		-20...+70	
Maximum operating altitude	Without derating	m	3000	
Operating positions	Without derating		±30° in relation to normal vertical mounting plane 	
Flame resistance	Conforming to IEC 60695-2-1	°C	850 °C	
Shock resistance ⁽³⁾	Contactor open		7 gn	6 gn
1/2 sinewave = 11 ms	Contactor closed		10 gn	
Vibration resistance ⁽³⁾	Contactor open		1.5 gn	
5...300 Hz	Contactor closed		3 gn	

⁽¹⁾ Derating, please call your regional sales.

⁽²⁾ Derating see page 46.

⁽³⁾ Without change of contact states, in the most unfavorable direction (coil energised at Ue).

LC1E40...E65	LC1E80...E95	LC1E120...E160	LC1E200...E300
8			IEC 60947-4-1
			IP00
			-
7 gn			

TeSys E contactors

TeSys E contactors for motor control up to 160 kW at 400 V, in category AC-3



LC1E06



LC1E65



LC1E120



LC1E300

3-pole contactors

Standard power ratings of 3-phase motors
50/60 Hz in category AC-3

Rated
operational
current in
AC-3 440 V
up to

Instantaneous
auxiliary contacts

Basic reference,
to be completed by
adding the control
voltage code

Weight

220 V 230 V	380 V 400 V	415 V	500 V	690 V	A			Fixing ⁽¹⁾	kg
Connection by screw clamp terminals									
1.1	2.2	2.2	3	3	6	1	-	LC1E0610●●	0.300
1.1	2.2	2.2	3	3	6	-	1	LC1E0601●●	0.300
2.2	4	4	5.5	5.5	9	1	-	LC1E0910●●	0.300
2.2	4	4	5.5	5.5	9	-	1	LC1E0901●●	0.300
3	5.5	5.5	7.5	7.5	12	1	-	LC1E1210●●	0.300
3	5.5	5.5	7.5	7.5	12	-	1	LC1E1201●●	0.300
4	7.5	9	10	10	18	1	-	LC1E1810●●	0.300
4	7.5	9	10	10	18	-	1	LC1E1801●●	0.300
5.5	11	11	15	15	25	1	-	LC1E2510●●	0.360
5.5	11	11	15	15	25	-	1	LC1E2501●●	0.360
7.5	15	15	18.5	18.5	32	1	-	LC1E3210●●	0.450
7.5	15	15	18.5	18.5	32	-	1	LC1E3201●●	0.450
9	18.5	18.5	18.5	18.5	38	1	-	LC1E3810●●	0.450
9	18.5	18.5	18.5	18.5	38	-	1	LC1E3801●●	0.450
11	18.5	22	22	30	40	1	1	LC1E40●●	0.980
15	22	25/30	30	33	50	1	1	LC1E50●●	0.980
18.5	30	37	37	37	65	1	1	LC1E65●●	0.980
22	37	45	45	45	80	1	1	LC1E80●●	1.520
25	45	45	55	45	95	1	1	LC1E95●●	1.520
37	55	55	75	75	120	1	1	LC1E120●●	2.300
45	90	90	90	90	160	1	1	LC1E160●●	2.300
Connection by bars									
55	110	110	110	110	200	-	-	LC1E200●●	4.600
75	132	132	132	132	250	-	-	LC1E250●●	4.700
90	160	160	160	160	300	-	-	LC1E300●●	8.500

Control voltage code

Volts	24	48	110	220	240	380	415	440
LC1E06...300								
50 Hz	B5	E5	F5	M5	U5	Q5	N5	R5
60 Hz	B6	-	F6	M6	-	Q6	-	R6

Seperate components

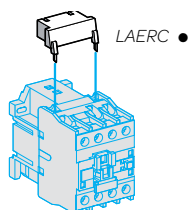
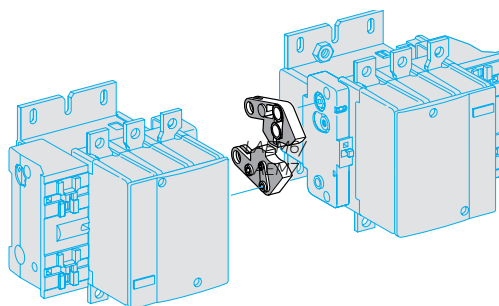
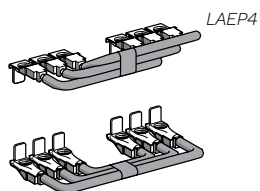
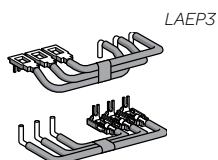
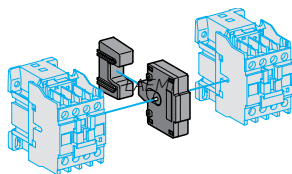
Auxiliary contact blocks, add-on modules and accessories, see pages 19 to 20.

Coil spare parts

For maintenance, each coil can be ordered separately, see page 22 to 24.

⁽¹⁾ LC1E06 to E65: clip-on mounting on 35 mm rail AM1 DP or screw fixing.
LC1E80 to E95: clip-on mounting on 35 mm rail AM1DP or 75 mm rail AM1 DL or screw fixing.
LC1E120 and E160: clip-on mounting on 2 x 35 mm rail AM1 DP or screw fixing.

Accessories for LC1E contactor



LC1E ●●

Accessories for motor reverse assembly

Contactors with screw clamp terminals				
Using 2 identical contactors	Set of power connections		Mechanical interlock	
	Cat. no.	Weight kg	Cat. no.	Weight kg
Mechanical interlock				
LC1E06...E12	LAEP1	0.020	LAEM1	0.030
LC1E18/E25	LAEP12	0.026	LAEM1	0.030
LC1E32/E38	LAEP2	0.040	LAEM1	0.030
LC1E40...E65	LAEP3	0.230	LAEM1	0.030
LC1E80/E95	LAEP4	0.465	LAEM4	0.095
LC1E120/E160	–		LAEM5	0.300
LC1E200/E250	–		LAEM6	0.110
LC1E300	–		LAEM7	0.250

RC surge suppressor

- Effective protection for circuits highly sensitive to "high frequency" interference and transient generated when the contactor coil is switched off. For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5 % total harmonic distortion.
- Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max.
- Slight increase in drop-out time (1.2 to 2 times the normal time).

Mounting	For use with contactor		Cat. no.	Weight
	Rating	Type		
Screw mounting	LC1E06...E95	V~		kg
		24...48	LAERCE	0.025
		50...127	LAERCG	0.025
		110...240	LAERCU	0.025
		380...415	LAERCN	0.025

TeSys E contactors

Accessories for LC1E contactor



LAEN22



LAETSD

Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environment

Clip-on mounting	Number of contacts per block	Cat. no.	Weight kg
Front	1 NO + 1 NC	LAEN11	0.035
	2 NO	LAEN20	0.035
	2 NC	LAEN02	0.035
	2 NO + 2 NC	LAEN22	0.060

Time delay auxiliary contact blocks for connection by screw clamp terminals 8 A - 690 V

Clip-on mounting	Number of contacts per block	Time delay Type	Setting range	Cat. no. ⁽¹⁾	Weight kg
Front	1 NO + 1 NC	On-delay	1...30 s	LAETSD	0.060

⁽¹⁾ For use only LC1E25 to LC1E300.

Instantaneous and time delay contact characteristics

Contact block type			LAEN11, 20, 02, 22			LAETSD			
Number of contacts				2 or 4			2		
Rated operational voltage (Ue)		Up to	V	690					
Rated insulation voltage (Ui)		Conforming to IEC 60947-5-1		690					
Conventional thermal current (Ith)		For ambient temperature θ≤60 °C	A	8					
Frequency of the operational current			Hz	50/60					
Minimum switching capacity		U min	V	17					
		I min	mA	5					
Short-circuit protection		Conforming to IEC 60947-5-1	A	10					
Rated making capacity		Conforming to IEC 60947-5-1	Irms	~ 140					
Short-time rating		Permissible for 1 s	A	100					
		500 ms		120					
		100 ms		140					
Insulation resistance			mΩ	> 10					
Non-overlap time		Guaranteed between NC and NO contacts	ms	1.5 (on energisation and on de-energisation)					
Overlap time		Guaranteed between LAE N22 N/C and N/O contacts	ms	–					
Time delay		Ambient air temperature for operation	°C	–			-20...+70		
		–			12 %				
		–			+15 %				
		–			0.25 % per °C				
Mechanical durability			In millions of operating cycles	10			4		
Rated operational power of contacts (Conforming to IEC 60947-5-1)		a.c. supply categories AC14/15	V	24	48	115	230	400	440
		1 million operating cycles	VA	60	120	280	560	960	1050
		3 million operating cycles		16	32	80	160	280	300
		10 million operating cycles		4	8	20	4	70	80

Accessories for LC1E

Environment			
Contact block type		LAEN11, 20, 02, 22	LAETSD
Conforming to standard		IEC 60947-5-1	
Product certifications		GOST	
Protective treatment	Conforming to IEC 60068	"TH"	
Degree of protection	Conforming to IEC 60529	IP20	
Ambiant air temperature	Storage	°C	-60...+80
	Operation		-5...+55
	Permissible for operation at U _c		-20...+70
Maximum operating altitude	Without derating	m	3000
Connection by cable	Philips N° 2 and Ø 6 mm. Flexible or solid cable with or without cable end	mm ²	Min: 1 x 1 Max: 2 x 2.5

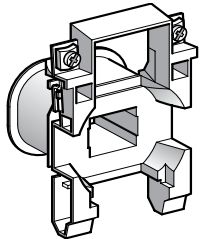
Accessories compatibility

Contactor	Built in contacts	LAEN●●	LAETSD	LAERC●	LAEM	LAEP●
LC1E06	1 NO or 1NC	1	-	1	1	1
LC1E09						
LC1E12						
LC1E18						
LC1E25						
LC1E32	1 NO + 1NC	1 or 1	1	1	1	1
LC1E38						
LC1E40						
LC1E50						
LC1E65						
LC1E80						
LC1E95						
LC1E120	-	2 or 1	0 or 1	-	-	DIY ⁽¹⁾
LC1E160						
LC1E200						
LC1E250						
LC1E300						

⁽¹⁾ Do It Yourself.

TeSys E contactors

Coil replacement for TeSys E, LC1E06 to E38



LAEX1 ●●

For 3-pole contactors LC1E06...E18

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \varphi = 0.75$) 50 Hz: 95 VA; 60 Hz: 95 VA

■ sealed ($\cos \varphi = 0.3$) 50 Hz: 8.5 VA; 60 Hz: 8.5 VA

Operating range ($\theta \leq 55$ °C): 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	8.70	0.24	LAEX1B5	7.80	0.15	LAEX1B6	0.056
48	37.0	1.00	LAEX1E5	-	-	-	0.056
110	190	4.64	LAEX1F5	170	3.07	LAEX1F6	0.056
220	750	19.7	LAEX1M5	690	11.6	LAEX1M6	0.056
240	890	23.4	LAEX1U5	-	-	-	0.056
380	2250	58.3	LAEX1Q5	2110	35.4	LAEX1Q6	0.056
415	2610	69.0	LAEX1N5	-	-	-	0.056
440	2690	78.2	LAEX1R5	2760	50.7	LAEX1R6	0.056

For 3-pole contactors LC1E25

Specifications

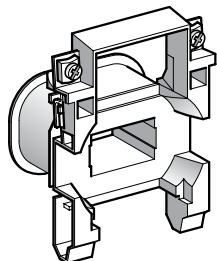
Average consumption at 20 °C:

■ inrush ($\cos \varphi = 0.75$) 50 Hz: 70 VA; 60 Hz: 70 VA

■ sealed ($\cos \varphi = 0.3$) 50 Hz: 7 VA; 60 Hz: 7.5 VA

Operating range ($\theta \leq 55$ °C): 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	5.37	0.21	LAEX12B5	5.37	0.18	LAEX12B6	0.067
48	21.7	0.84	LAEX12E5	-	-	-	0.067
110	124	4.41	LAEX12F5	124	3.68	LAEX12F6	0.067
220	515	17.6	LAEX12M5	516	14.7	LAEX12M6	0.067
240	562	21.0	LAEX12U5	-	-	-	0.067
380	1550	52.6	LAEX12Q5	1550	43.8	LAEX12Q6	0.067
415	1690	62.8	LAEX12N5	-	-	-	0.067
440	1990	70.6	LAEX12R5	1990	58.9	LAEX12R6	0.067



LAEX2 ●●

For 3-pole contactors LC1E32/E38

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \varphi = 0.75$) 50 Hz: 70 VA; 60 Hz: 70 VA

■ sealed ($\cos \varphi = 0.3$) 50 Hz: 7 VA; 60 Hz: 7.5 VA

Operating range ($\theta \leq 55$ °C): 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	5.37	0.21	LAEX2B5	5.37	0.18	LAEX2B6	0.073
48	21.7	0.84	LAEX2E5	-	-	-	0.073
110	124	4.41	LAEX2F5	124	3.68	LAEX2F6	0.073
220	515	17.6	LAEX2M5	516	14.7	LAEX2M6	0.073
240	562	21.0	LAEX2U5	-	-	-	0.073
380	1550	52.6	LAEX2Q5	1550	43.8	LAEX2Q6	0.073
415	1690	62.8	LAEX2N5	-	-	-	0.073
440	1990	70.6	LAEX2R5	1990	58.9	LAEX2R6	0.073

⁽¹⁾ The last two digits in the reference represent the voltage code.

Coil replacement for TeSys E, LC1E40 to E160

For 3-pole contactors LC1E40...E65

Specifications

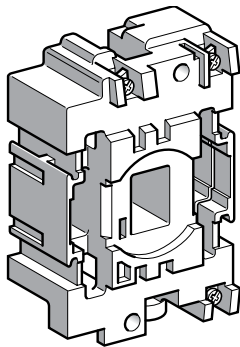
Average consumption at 20 °C:

■ inrush ($\cos \varphi = 0.75$): 50 Hz: 160 VA; 60 Hz: 140 VA

■ sealed ($\cos \varphi = 0.3$) 50 Hz: 15 VA; 60 Hz: 13 VA

Operating range ($\theta \leq 60$ °C): 0.85...1.1 Uc

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	1.98	0.12	LAEX3B5	1.98	0.10	LAEX3B6	0.110
48	7.97	0.48	LAEX3E5	-	-	-	0.110
110	42.3	2.51	LAEX3F5	42.3	2.09	LAEX3F6	0.110
220	182	10.0	LAEX3M5	182	8.36	LAEX3M6	0.110
240	202	12.0	LAEX3U5	-	-	-	0.110
380	512	30.3	LAEX3Q5	512	25.3	LAEX3Q6	0.110
415	635	35.8	LAEX3N5	-	-	-	0.110
440	682	40.1	LAEX3R5	682	33.4	LAEX3R6	0.110



LAEX4 ●●

For 3-pole contactors LC1E80/E95

Specifications

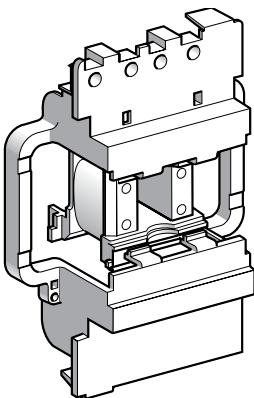
Average consumption at 20 °C:

■ inrush ($\cos \varphi = 0.75$) 50 Hz: 200 VA; 60 Hz: 220 VA

■ sealed ($\cos \varphi = 0.3$) 50 Hz: 20 VA; 60 Hz: 22 VA

Operating range ($\theta \leq 55$ °C): 0.85...1.1 Uc

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	1.4	0.09	LAEX4B5	1.05	0.06	LAEX4B6	0.145
48	5.5	0.35	LAEX4E5	-	-	-	0.145
110	31.0	1.90	LAEX4F5	22.0	1.20	LAEX4F6	0.145
220	127	7.50	LAEX4M5	98	4.80	LAEX4M6	0.145
240	152	8.70	LAEX4U5	-	-	-	0.145
380	381	22.0	LAEX4Q5	300	14.0	LAEX4Q6	0.145
415	463	26.0	LAEX4N5	-	-	-	0.145
440	513	30.0	LAEX4R5	392	19.0	LAEX4R6	0.145



LAEX5 ●●

For 3-pole contactors LC1E120/E160

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \varphi = 0.8$) 50 Hz: 300 VA

■ sealed ($\cos \varphi = 0.8$) 50 Hz: 22 VA

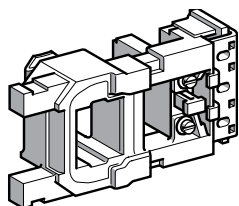
Operating range ($\theta \leq 55$ °C): 0.85...1.1 Uc

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	1.24	0.09	LAEX5B5	0.87	0.07	LAEX5B6	0.210
48	4.51	0.36	LAEX5E5	-	-	-	0.210
110	26.5	2.00	LAEX5F5	20.0	1.45	LAEX5F6	0.210
220	105	7.65	LAEX5M5	79.6	5.69	LAEX5M6	0.210
240	125	8.89	LAEX5U5	-	-	-	0.210
380	339	22.3	LAEX5Q5	243	17.0	LAEX5Q6	0.210
415	368	27.7	LAEX5N5	-	-	-	0.210
440	442	30.3	LAEX5R5	339	22.3	LAEX5R6	0.210

⁽¹⁾ The last two digits in the reference represent the voltage code.

TeSys E contactors

Coil replacement for TeSys E, LC1E200 to E300



LAEX6●●

For 3-pole contactors LC1E200...E250

Specifications

Average consumption at 20 °C:

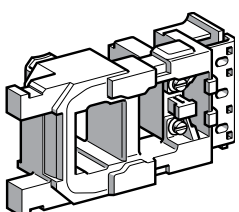
■ inrush ($\cos \varphi = 0.9$) 50 Hz: 805 VA; 60 Hz: 970 VA

■ sealed ($\cos \varphi = 0.3$) 50 Hz: 55 VA; 60 Hz: 66 VA

Heat dissipation: 18...24 W.

Operating time à U_c : closing = 20...35 ms, opening = 7...15 ms.

Control circuit voltage U_c	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	0.18	0.03	LAEX6B5	0.13	0.02	LAEX6B6	0.510
48	0.71	0.12	LAEX6E5	-	-	-	0.510
110	4.2	0.65	LAEX6F5	2.7	0.44	LAEX6F6	0.510
220	17	2.59	LAEX6M5	11.1	1.80	LAEX6M6	0.510
240	20	3.09	LAEX6U5	-	-	-	0.510
380	51.3	7.8	LAEX6Q5	34	5.3	LAEX6Q6	0.510
415	62.3	9.1	LAEX6N5	-	-	-	0.510
440	62.3	9.1	LAEX6R5	43.5	6.9	LAEX6R6	0.510



LAEX ●●

For 3-pole contactors LC1E300

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \varphi = 0.9$) 50 Hz or 60 Hz: 650 VA

■ sealed ($\cos \varphi = 0.3$) 50 Hz or 60 Hz: 10 VA.

Heat dissipation: 8 W.

Operating time à U_c : closing = 40...65 ms, opening = 100...170 ms.

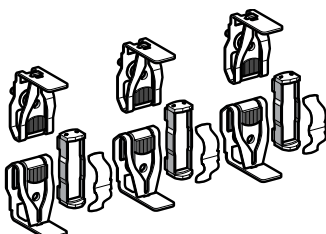
Operate on networks with harmonic numbers ≤ 7 .

Operating cycles/hour ($\theta \leq 55$ °C): ≤ 2400

Control circuit voltage U_c	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no. ⁽¹⁾	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
24	20	⁽²⁾	LAEX7B5	20	⁽²⁾	LAEX7B6	0.770
48	67	⁽²⁾	LAEX7E5	-	-	-	0.770
110	440	⁽²⁾	LAEX7F5	440	⁽²⁾	LAEX7F6	0.770
220	1578	⁽²⁾	LAEX7M5	1578	⁽²⁾	LAEX7M6	0.770
240	1968	⁽²⁾	LAEX7U5	-	-	-	0.770
380	4631	⁽²⁾	LAEX7Q5	4631	⁽²⁾	LAEX7Q6	0.770
415	4631	⁽²⁾	LAEX7N5	-	-	-	0.770
440	6731	⁽²⁾	LAEX7R5	6731	⁽²⁾	LAEX7R6	0.770

⁽¹⁾ The last two digits in the reference represent the voltage code.

⁽²⁾ Please consult your Regional Sales Office.



LAEC6

Sets of contacts

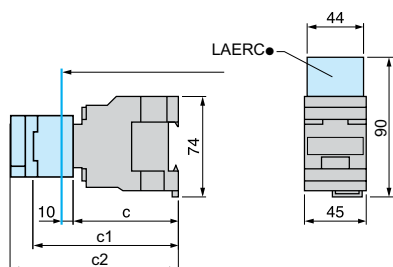
Per pole: 2 fixed contacts, 1 moving contact, 2 deflectors, 1 back-plate, clamping screws and washers.

For contactor	Type	Replacement for	Cat. no. 50 Hz	Weight kg
3-pole	LC1E120	3 poles	LAEC5 ⁽¹⁾	0.350
	LC1E160	3 poles	LAEC51 ⁽¹⁾	0.350
	LC1E200	3 poles	LAEC6 ⁽¹⁾	0.350
	LC1E250	3 poles	LAEC61 ⁽¹⁾	0.660
	LC1E300	3 poles	LAEC7 ⁽¹⁾	2.000

⁽¹⁾ Available H1 2012.

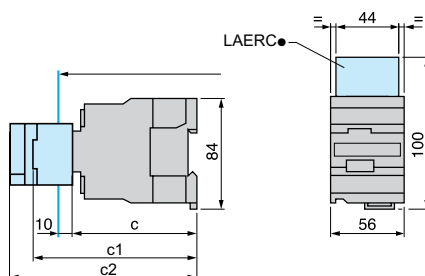
TeSys E contactors LC1E06 to E95

LC1E06...E25



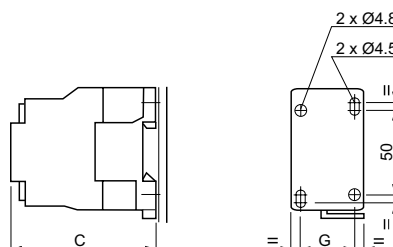
LC1	E06...E18	E25
c	80	85
c1 with LAEN	113	118
c2 with LAETSD	-	136

LC1E32/38



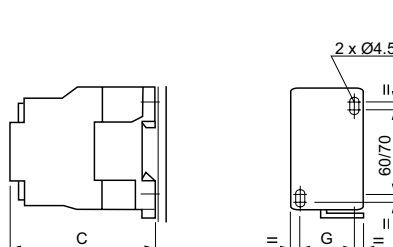
LC1	E32/38
c	86
c1 with LAEN	120
c2 with LAETSD	138

LC1E06...E25



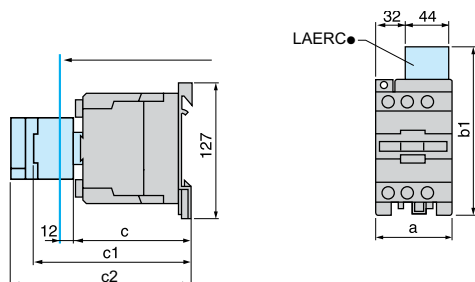
LC1	E06	E09	E12	E18	E25
c	80	80	80	80	85
G	35	35	35	35	35

LC1E32/38



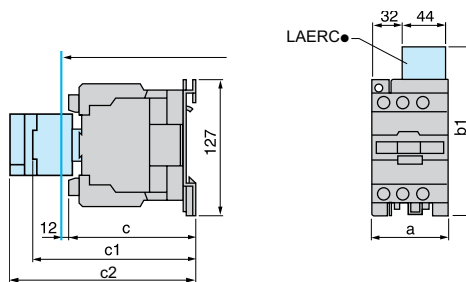
LC1	E32/38
c	86
G	40

LC1E40...E65



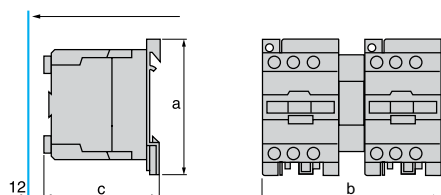
LC1	E40...E65
a	75
b1 with LAERC	135
c	114
c1 with LAEN	147
c2 with LAETSD	165

LC1E80/95



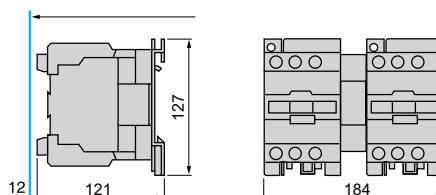
LC1	E80/95
a	85
b1 with LAERC	135
c	121
c1 with LAEN	153
c2 with LAETSD	171

2 x LC1E06...E65 with LAEM1



LC1	E06...25	E32...38	E40...65
a	74	84	127
b	104	126	164
c	80	86	114

2 x LC1E80/95 with LAEM4

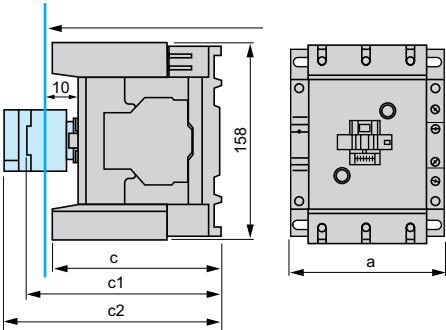


LC1	E06...25	E32...38	E40...65
a	74	84	127
b	104	126	164
c	80	86	114

LC1E120 and 160 A

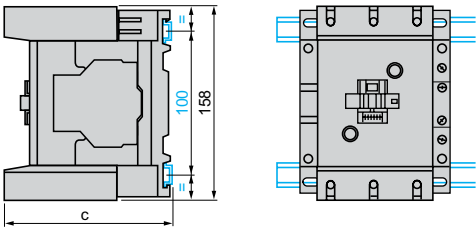
LC1E120/160

On panel with accessories



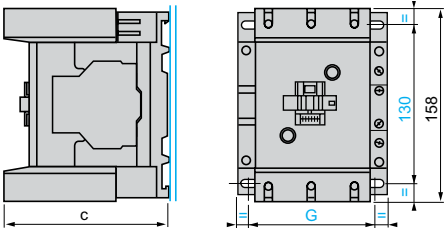
a		120
c	Without add-on blocks	132
c1	With LAEN	150
c2	With LAETSD	168

On 2 mounting rails DZ5 MB on 120 mm centres



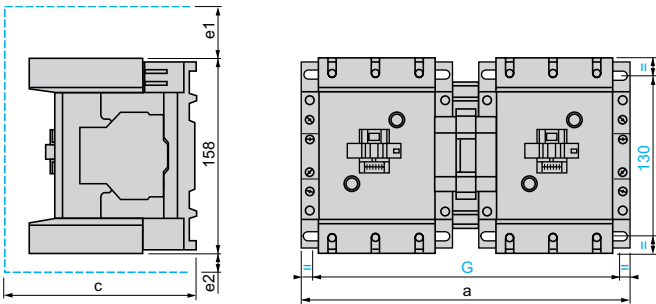
c	(AM1 DP200 or DR200)	134.5
c	(AM1 DE200 or ED ●●●)	150

On Panel



		LC1E120	LC1E160
c	(AM1 DP200 or DR200)	132	132
G		91/110	96/110

2 x LC1E120 or LC160 with LAEM5

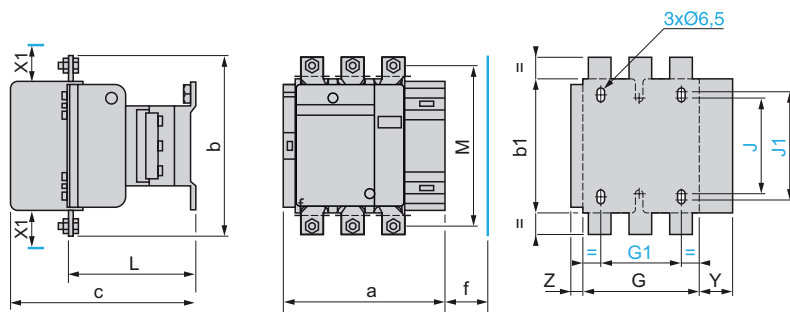


2 x LC1E120 or 160	a	c	e1	e2	G
For 120 and 160	266	148	56	18	242/256

c, e1 and e2: including cabling

LC1E200 - LC1E250 - LC1E300

On panel



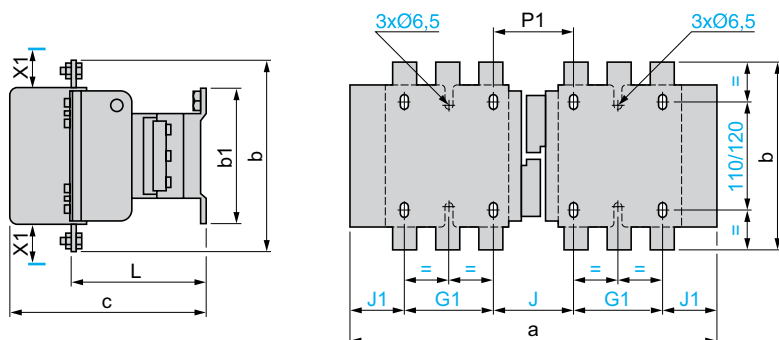
$X1$ (mm) = minimum electrical clearence according to operating voltage and breaking capacity.

	220...500 V	600...690 V
LC1E200	10	15
LC1E250, 300	10	15

	a	b	b1	c	f	G	G1	J	J1	L	M	P	Q	Q1	S	Y	Z
LC1E200	168.5	174	137	181	130	111	80	106	120	113.5	154	40	29	59.5	20	44	13.5
LC1E250	168.5	197	137	181	130	111	80	106	120	113.5	172	48	21	51.5	25	44	13.5
LC1E300	213	206	145	219	147	154.5	96	106	120	145	181	48	43	74	25	38	20.5

f = minimum distance required for coil removal.

2 x LC1E200 or LC1E250 with LAEM6 - 2 x LC1E300 with LAEM7



$X1$ (mm) = minimum electrical clearence according to operating voltage and breaking capacity.

	220...500 V	600...690 V
LC1E200	10	15
LC1E250, 300	10	15

	a	b	b1	c	G1	J	J1	L	P1
2 x LC1E200	357	174	137	181	80	78	59.5	113.5	78
2 x LC1E250	357	197	137	181	80	78	59.5	113.5	62
2 x LC1E300	447	206	145	219	96	124	65.5	145	107

TeSys E contactors

LC1E06...300 A

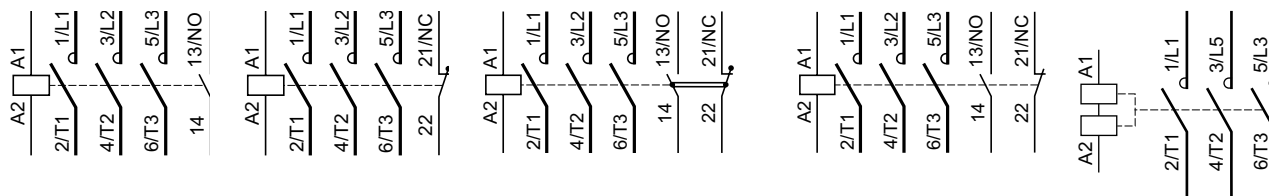
Contactors

LC1E06...38

LC1E40...95

LC1E120/160

LC1E200, 250, 300

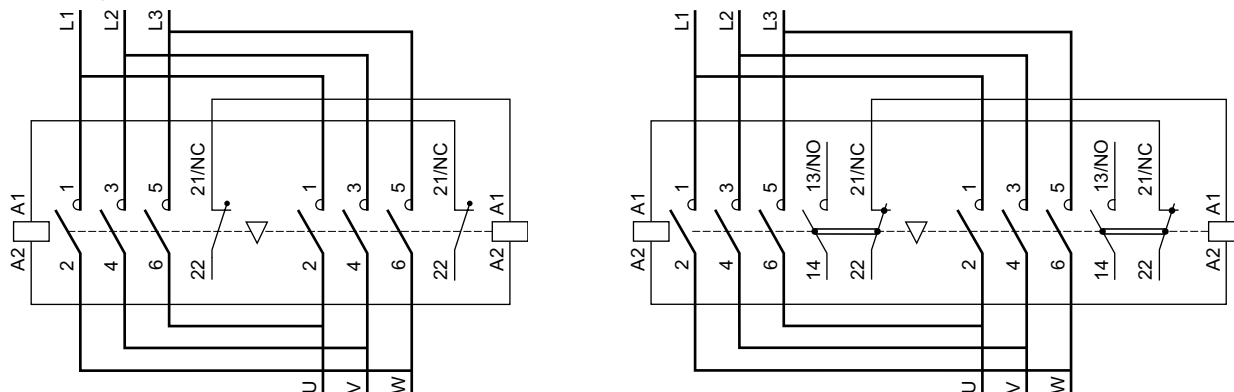


Reversing contactors

2 x LC1E06...38

2 x LC1E40...95

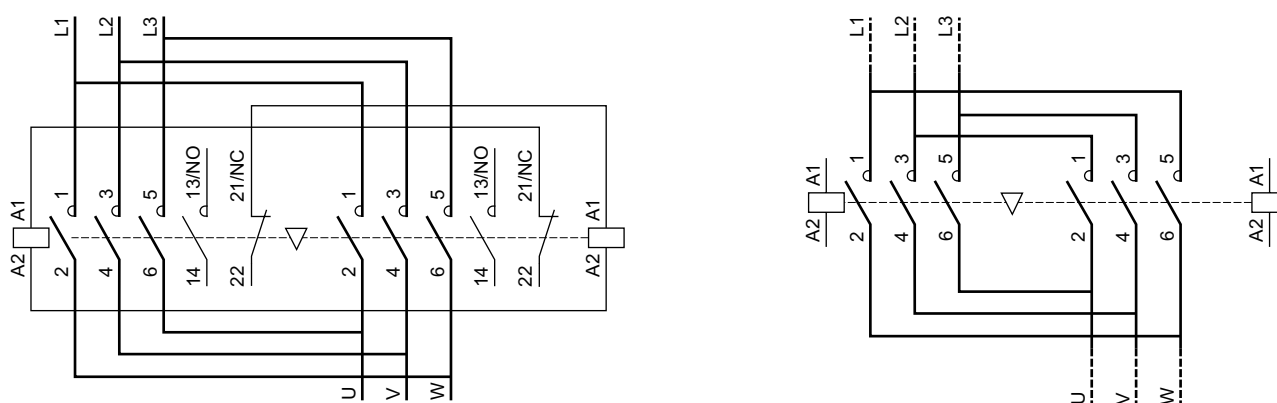
Horizontally mounted



2 x LC1E120, 160

2 x LC1E200, 250, 300

Horizontally mounted



Front mounting add-on contact blocks

1NO + 1NC (LAEN11) 2NO (LAEN20)

2NC (LAEN02)

2NO + 2NC (LAEN22)

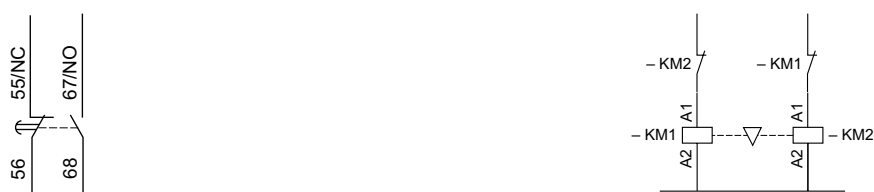


Time delay auxiliary contacts

On delay 1NO + 1NC (LAETSD)

Mechanical interlock

LAEM●





TeSys E thermal



Thermal overload relay Reference	Relay setting range (A)
LRE01	0.10 ... 0.16 A
LRE02	0.16 ... 0.25 A
LRE03	0.25... 0.40 A
LRE04	0.40...0.63 A
LRE05	0.63...1 A
LRE06	1...1.6 A
LRE07	1.6 ... 2.5 A
LRE08	2.5... 4 A
LRE10	4...6 A
LRE12	5.5... 8 A
LRE14	7... 10 A
LRE16	9...13 A
LRE21	12...18 A
LRE22	16... 24 A
LRE32	23... 32 A
LRE35	30...38 A

For use with contactor Reference						
LC1E06	LC1E09	LC1E12	LC1E18	LC1E25	LC1E32	LC1E38
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
	■	■	■	■	■	■
	■	■	■	■	■	■
		■	■	■	■	■
			■	■	■	■
				■	■	■
				■	■	■
						■

Common characteristics

- > Class: 10 A.
- > Operating voltage: max. 690 V AC.

overload relays



Thermal overload relay Reference	Relay setting range (A)
LRE322	17...25 A
LRE353	23...32 A
LRE355	30... 40 A
LRE357	37... 50 A
LRE359	48... 65 A
LRE361	55... 70 A
LRE363	63... 80 A
LRE365	80... 104 A

For use with contactor (size 3 & 4) Reference				
LC1E40	LC1E50	LC1E65	LC1E80	LC1E95
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
	■	■	■	■
		■	■	■
			■	■
			■	■
				■



Thermal overload relay Reference	Relay setting range (A)
LRE480	58...81 A
LRE481	62...99 A
LRE482	84...135 A
LRE483	124...198 A
LRE484	146...234 A
LRE485	174...279 A
LRE486	208...333 A

For use with contactor (size 5, 6 & 7) Reference				
LC1E120	LC1E160	LC1E200	LC1E250	LC1E300
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
	■	■	■	■
		■	■	■
			■	■
				■

Presentation

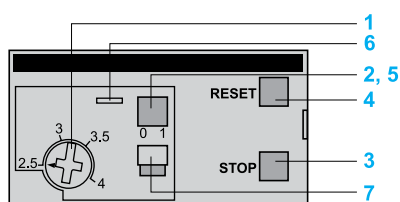


TeSys E thermal overload relays are designed to protect a.c. circuits and motors against:

- overloads
- phase failure
- Long starting time
- prolonged stalled rotor condition.

The thermal relay function on the bases of current driven by the motor this current exceeds the setting it's auxiliary contacts will change state, causing the motor to stop, based on the tripping.

Description



LRE48

1 Adjustment dial Ir.

2 Test button.

Operation of the Test button allows:

- checking of control circuit wiring,
- simulation of relay tripping (actuates both the NO and NC contacts).

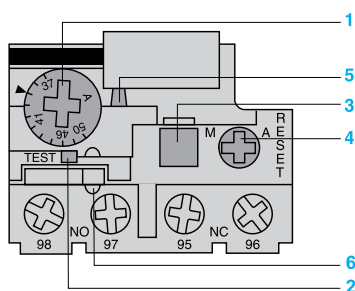
3 Stop button. Actuates the NC contact; does not affect the NO contact.

4 Reset button.

5 Trip indicator.

6 Setting locked by sealing the cover.

7 Selector for manual or automatic reset.



LRE3

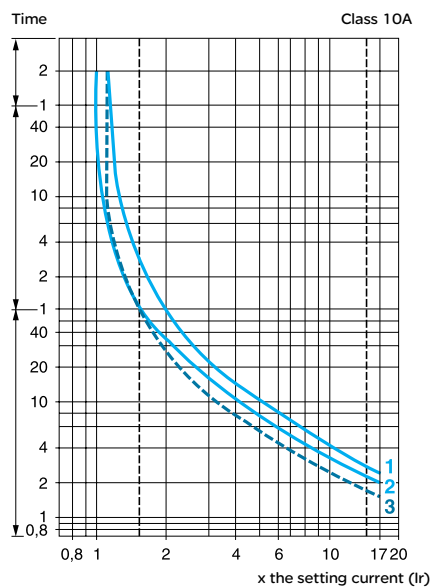
LRE relays are supplied with the selector in the manual position, protected by a cover. Deliberate action is required to move it to the automatic position.

Power circuit characteristics																								
Relay type		Ref.	LRE01...21		LRE22...35		LRE322...365		LRE480...484		LRE485/LRE486													
Tripping class		Conforming to IEC 60947-4-1			10 A																			
Rated insulation voltage		Conforming to IEC 60947-4-1	V		690																			
Rated impulse withstand voltage (Uimp)			kV		6																			
Frequency limits		Of the operating current	Hz		50...60																			
Setting range		Depending on model	A		0.1...18		16...38		17...104		58...333													
Power circuit connections																								
Connection by screw clamp terminals			Minimum/maximum c.s.a.																					
Flexible cable without cable end 1 conductor Flexible cable with cable end 1 conductor Solid cable without cable end 1 conductor		mm ²	1.5...6		2.5...10		4...35		-															
			1...4		1.5...6		4...35		-															
			1...6		2.5...10		4...35		-															
Tightening torque		N.m	1.7		2.5		9		-															
Connection by bars or lugs																								
Pitch		Without spreaders	mm		-				50		58													
Bars or cables with lugs		Cross section			-				≤ 6 x 25		6 x 30													
Screws		Type			-				M10		M12													
		Tightening torque	N.m		-				35		58													
Auxiliary contact characteristics																								
Conventional thermal current			A		5																			
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)		a.c. supply	V		24		48		110		220		380		600		120		240		380		480	
			A		-		-		-		-		-		3		1.5		0.95		0.75			
			VA		100		200		400		600		600		600		-		-		-		-	
Protection against short-circuits By gG, maximum rating or by GB2			A		5																			
Connection by screw clamp terminals			mm ²		Minimum/maximum c.s.a.																			
Flexible cable without cable end 1 conductor		2 x 1...2.5																						
Flexible cable with cable end 1 conductor		2 x 1...2.5																						
Solid cable without cable end 1 conductor				2 x 1...2.5																				
Tightening torque		N.m	1.7																					
Environment																								
Conforming to standard					IEC 60947-4-1, IEC 60947-5-1																			
Product certifications					GOST																			
Degree of protection		Conforming to IEC 60529			IP20							IPO0												
Protective treatment		Conforming to IEC 60068			"TH"																			
Ambiant air temperature		Storage	°C		-60...+80																			
		Normal operation without derating (IEC 60947-4-1)			-20...+60																			
		Minimum/maximum operating temperature (with derating) ⁽¹⁾			-20...+70																			
Operating positions without derating		In relation to normal vertical mounting plane			Any position																			
Flame resistance		Conforming to IEC 60068-2-1	°C		850																			
Shock resistance		Permissive acceleration conforming to IEC 60068-2-7			6 gn - 11 ms																			
Vibration resistance		Permissive acceleration conforming to IEC 60068-2-6			3 gn																			
Dielectric strenght at 50 Hz		Conforming to IEC 60255-5	kV		6																			
Surge withstand		Conforming to IEC 60801-5			6																			
Operating characteristics																								
Temperature compensation			°C		-20...+60																			
Tripping threshold		Conforming to IEC 60947-4-1	A		1.14 ± 0.06 Ir																			
Sensitivity to phase failure		Conforming to IEC 60947-4-1			Tripping current 130% of Ir on two phase, the last one at zero.																			

⁽¹⁾ Contact your regional sales.

Tripping curves

Average operating time related to multiples of the setting current



1. Balanced operation, 3-phase, without prior current flow (cold state).
2. 2-phase operation, without prior current flow (cold state).
3. Balanced operation, 3-phase, after a long period at the set current (hot state).

TeSys E thermal overload relays

3-pole thermal overload relays



LRE01



LRE3



LRE48

Differential thermal overload relays

for use with fuses or magnetic circuit-breakers GV2 L and GV3 L

- Compensated relays with manual or automatic reset,
- with relay trip indicator,
- for a.c.

Relay setting range (A)	Fuses to be used with selected relay		For use with contactor LC1	Reference	Weight kg
	aM (A)	gG (A)			
Class 10 A⁽¹⁾ for connection by screw clamp terminals					
0.10...0.16	0.25	2	E06...E38	LRE01	0.130
0.16...0.25	0.5	2	E06...E38	LRE02	0.130
0.25...0.40	1	2	E06...E38	LRE03	0.130
0.40...0.63	1	2	E06...E38	LRE04	0.130
0.63...1	2	4	E06...E38	LRE05	0.130
1...1.6	2	4	E06...E38	LRE06	0.130
1.6...2.5	4	6	E06...E38	LRE07	0.130
2.5...4	6	10	E06...E38	LRE08	0.130
4...6	8	16	E06...E38	LRE10	0.130
5.5...8	12	20	E09...E38	LRE12	0.130
7...10	12	20	E09...E38	LRE14	0.130
9...13	16	25	E12...E38	LRE16	0.130
12...18	20	35	E18...E38	LRE21	0.130
16...24	25	50	E25...E38	LRE22	0.130
23...32	40	63	E25...E38	LRE32	0.130
30...38	40	80	E38	LRE35	0.130
17...25	25	50	E40...E95	LRE322	0.470
23...32	40	63	E40...E95	LRE353	0.470
30...40	40	100	E40...E95	LRE355	0.470
37...50	63	100	E50...E95	LRE357	0.460
48...65	63	100	E65...E95	LRE359	0.460
55...70	80	125	E80...E95	LRE361	0.480
63...80	80	125	E80...E95	LRE363	0.480
80...104	80	160	E95	LRE365	0.520
Class 10 A⁽¹⁾ for connection by connectors⁽²⁾					
51...81	100	125	E120...E300	LRE480	1.670
62...99	125	160	E120...E300	LRE481	1.670
84...135	160	200	E120...E300	LRE482	1.670
124...198	200	250	E160...E300	LRE483	1.670
146...234	250	315	E200...E300	LRE484	1.670
174...279	315	315	E250...E300	LRE485	1.760
208...333	400	400	E300	LRE486	1.760

⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_n : class 10 A: between 2 and 10 seconds.

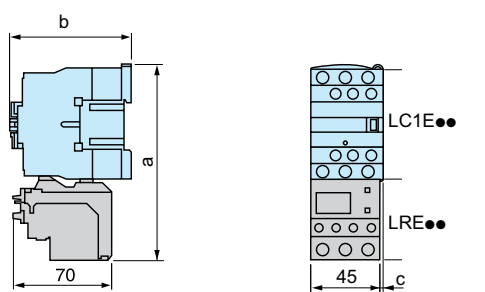
⁽²⁾ Independent mounting of the contactor up to end of 2011; version 2012: direct mounting under contactor.

- **LRE01...E35** : Independent mounting use ref. LAEB1 terminal block.
- **LRE322...E305** : Independent mounting use ref. LAEB3 terminal block.

TeSys E thermal overload relays

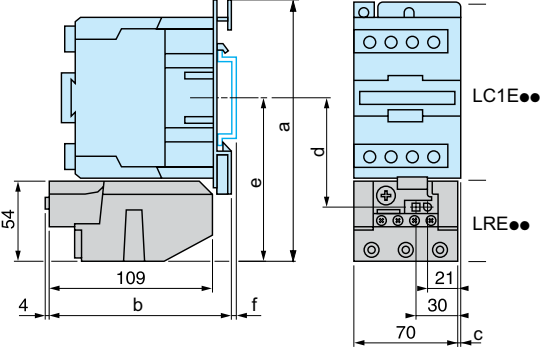
Direct connection to LRE contactors

LRE01...E35
Direct mounting under LC1E06...38 contactors with screw clamp connections



With contactor	LC1E06...E18	LC1E25	LC1E32/E38
a	123	137	137
b	84	92	92
c	0	0	11

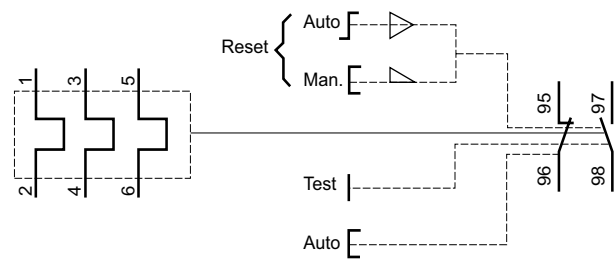
LRE3...
Direct mounting under LC1E06...38 contactors with screw clamp connections



With contactor on DIN rail	AM1-DL201	AM1-DL200
f	7	17

With contactor	LC1E40	LC1E50	LC1E65	LC1E80	LC1E95
a	175	175	175	180	180
b	119	119	119	124	124
c	4.5	4.5	4.5	9.5	9.5
d	72.4	72.4	72.4	76.9	76.9
e	111	111	111	115.5	115.5

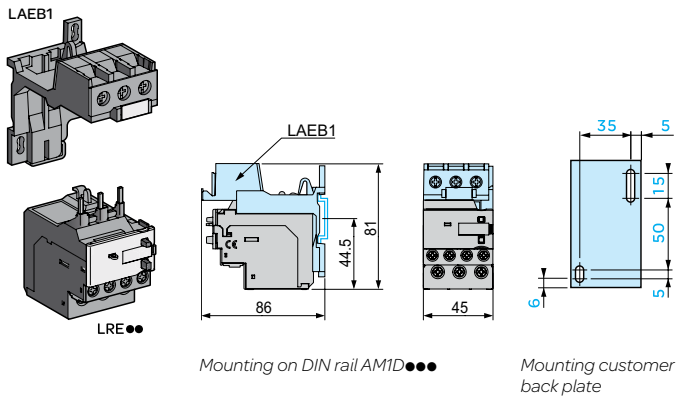
Electrical diagram all relays



Connection to a terminal block

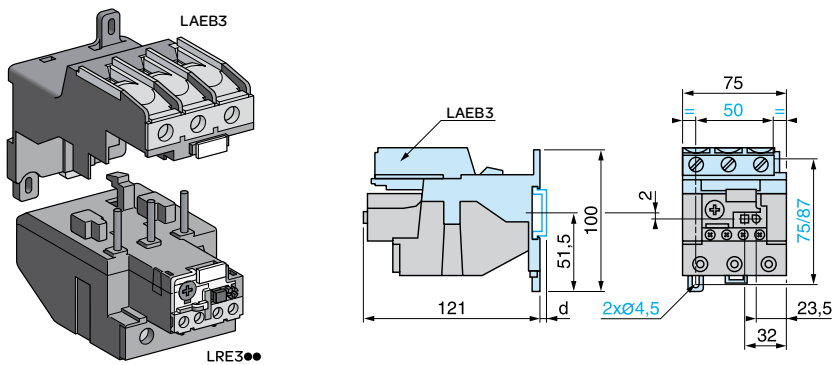
LRE01...E35 connected to LAEB1 terminal block

Independent mounting on 50 mm centres; or on rail



LRE322...E365, connected to LAEB3 terminal block

Independent mounting on 50 mm centres;



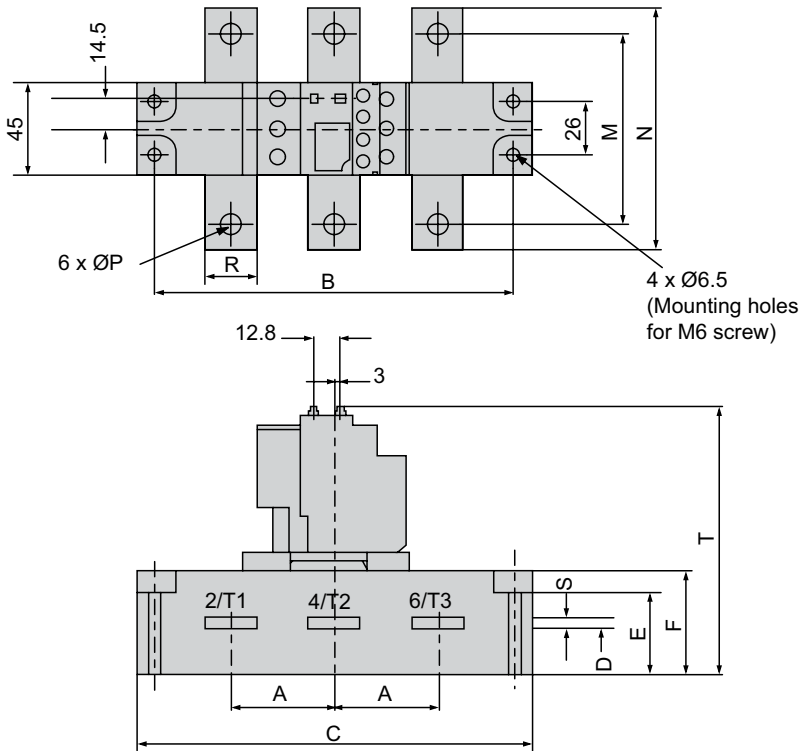
TeSys E thermal overload relays

Independant mounting and connection

LRE48●

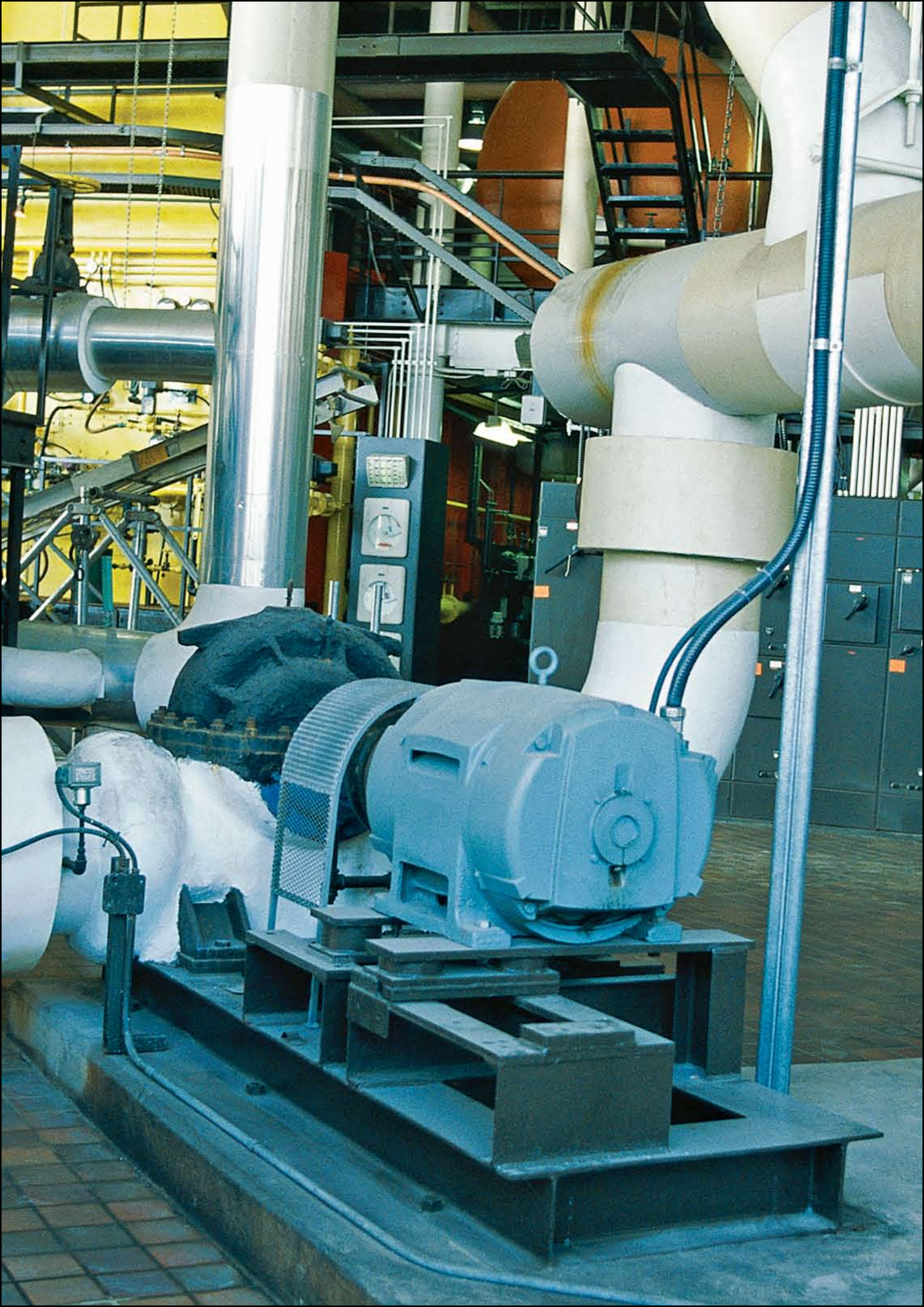
Independent mounting on mounting plate

With separate mounting only.



Dimensions and mounting												
Range (A)	A	B	C	D	E	F	M	N	P	R	S	T
51...81	50	174	192	28	40	50	93	117	11	25	5	130
62...99												
84...135												
124...198												
146...234												
174...279	58	200	218	29	40	50	103	133	12.5	30	6	130
208...333												

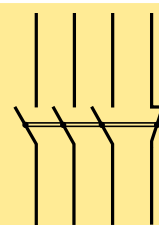
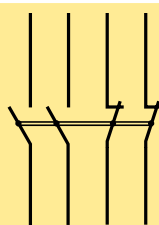
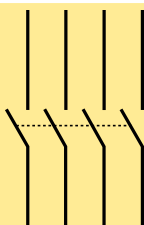
The LRE48● is mounted separately from the contactor (LCE120...300) on a mounting plate with 4 x M6 screws (torque = 6 N.m).
The connections with the contactor are done with bars and cables with lugs.



TeSys E control relays



Contact configuration

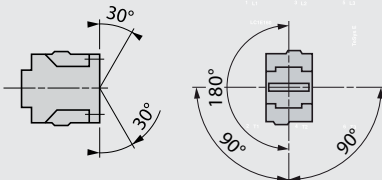


Coil V AC/Hz	50 Hz	50 Hz	50 Hz
24	CAE40B5	CAE22B5	CAE31B5
48	CAE40E5	CAE22E5	CAE31E5
110	CAE40F5	CAE22F5	CAE31F5
220	CAE40M5	CAE22M5	CAE31M5
240	CAE40U5	CAE22U5	CAE31U5
380	CAE40Q5	CAE22Q5	CAE31Q5
415	CAE40N5	CAE22N5	CAE31N5
440	CAE40R5	CAE22R5	CAE31R5

Characteristics

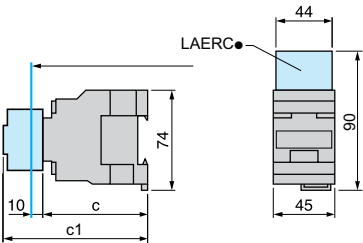
- > 4 NO/NC contacts.
- > Weight: 0.280 kg.

Control circuit characteristics				
Type			CAE~	
Rated control circuit voltage (Uc)			V	24...440
Control voltage limits	Operation	Coil type: 50 Hz		0.85...1.1 Uc
	Drop-out			0.3...0.6 Uc
Average consumption at 20 °C and at Uc			VA	Sealed and closed: 70 Maintain: 8
Operating time (rated control circuit voltage, ambient temperature 20 °C)	Between coil energisation and	opening of the N/C contact	ms	4...19
		closing of the N/O contact		12...22
	Between coil de-energisation and	opening of the N/C contact		4...12
		closing of the N/O contact		6...17
Momentary supply failure	Maximum power-off time without influencing sealed state			2
Maximum operating rate	Operating cycles per second			1800
Mechanical durability In millions of operating cycles	Coil type:	50 Hz		10
Control connection (coil)				
Connecting to screw terminals	Flexible cable without cable end	1 conductor	mm²	1...2.5
		2 conductors		1...2.5
	Flexible cable with cable end	1 conductor		1...2.5
		2 conductors		1...2.5
	Solid cable without cable end	1 conductor		1...2.5
		2 conductors		1...2.5
Tightening torque		N.m	1.2	
Characteristics of built in instantaneous contacts				
Number of contacts				4
Rated operational voltage (Ue)	Up to		V	690
	Conforming to IEC 60947-5-1			690
Rated insulation voltage (Ui)				
Conventional thermal current (Ith)	Operational environment temperature ≤ 40 °C		A	10
Operating current frequency			Hz	50
Minimum switching capacity	U min		V	17
	I min		mA	5
Short-circuit protection	Conforming to IEC 60947-5-1		A	gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1		A	~: 140
Short-time rating	Permissible for	500 ms	A	120
		100 ms		140
Insulation resistance			m Ω	> 10
Non-overlap time	Guaranteed non-overlap between N/C and N/O contacts		ms	1.5 on energisation and on de-energisation
Tightening torque	Philips n°2		N.m	1.2
Non-overlap distance				Contact LAEN●● connecting with auxiliary contacts
Instantaneous contacts connection				
Connecting to screw terminals	Flexible cable without cable end	1 conductor	mm²	1...2.5
		2 conductors		1...2.5
	Flexible cable with cable end	1 conductor		1...2.5
		2 conductors		1...2.5
	Solid cable without cable end	1 conductor		1...2.5
		2 conductors		1...2.5
Tightening torque		N.m	1.2	

Environment			
Type			CAE~
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	V	690
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947	kV	6
Electrical insulation	IEC 60536		Up to 400 V reinforced insulation
Conforming to standards			IEC 60947-5-1
Certifications			GOST
Protective treatment	Conforming to IEC 60068		"TH"
Degree of protection	Conforming to IEC 60529		IP20
Ambient air temperature around the device	Storage	°C	-60...+80
	0.85...1.1 UC		-5...+55
	For operation at Uc		-20...+70
Maximum operating altitude	Without derating	m	3000
Operating position	Without derating in the following positions		
Shock resistance ⁽¹⁾ 1/2 sine wave, 11 ms	Control relay open		7 gn
	Control relay closed		10 gn
Vibration resistance ⁽¹⁾ 5...300 Hz	Control relay open		1.5 gn
	Control relay closed		3 gn

⁽¹⁾ No change of contact state at coil voltage U_e in worst conditions.

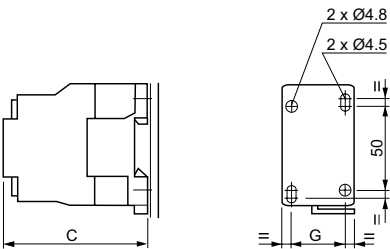
CAE●●



CAE	32	50
c	80	80
c1 with LAEN	113	113

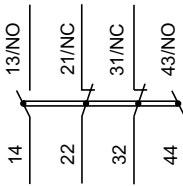
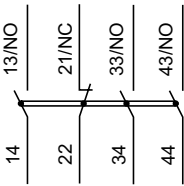
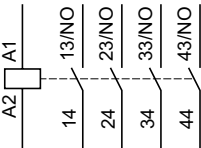
CAE

On mounting plate AM1-P



CAE~	
c	80

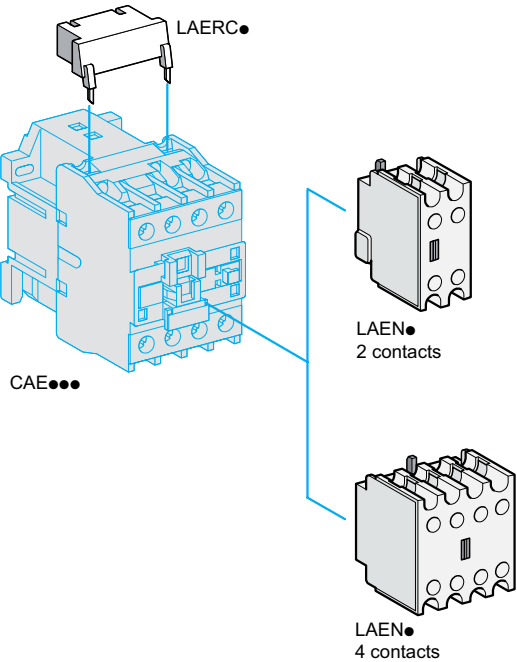
CAE40CAE31CAE22



TeSys E control relays

Auxiliary contact blocks

RC suppressor



Instantaneous auxiliary contact blocks

For use in normal operating environments					
Number of contacts	Maximum number of relays that can be mounted	Composition		Cat. no.	Weight
	Front mounted	NO	NC		kg
2	1	1	1	LAEN11	0.030
	1	2	-	LAEN20	0.030
	1	-	2	LAEN02	0.030
4	1	2	2	LAEN22	0.050

Coil suppressor modules

RC suppressor

- Effective protection for circuits highly sensitive to "high frequency" interference and transient generates when the contactor coil is switched off. For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5 % total harmonic distortion.
- Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max.
- Slight increase in drop-out time (1.2 to 2 times the normal time).

Mounted on	Operational voltage	Cat. no.	Weight kg
CAE40...	~24...48 V	LAERCE	0.012
	~110...240 V	LAERCU	0.012
	~50...120 V	LAERCG	0.012
	~380...415 V	LAERCN	0.012

Coordination between protection & control components

Coordination: safety and faster restart after a short circuit

This benefit is obtained by choosing contactors with Schneider Electric guaranteed coordination.

What exactly is coordination?

A contactor is said to be "coordinated" with the upstream protection device when its behaviour is controlled in the event of a short circuit.

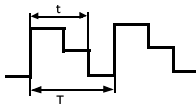
This behaviour can be:

- > type 1: guaranteed not to pose a danger to the workforce and not to damage the installation. It is accepted that the contactor should be destroyed or repaired.
- > type 2: type 1 + put back into service possible after any maintenance operation (contact separation, for example).

Compliance tests

Only the very stringent certified tests performed by Schneider Electric can guarantee the behaviour described by IEC 60947-4-1.

Glossary

Altitude	<p>The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the contactor. It also reduces the cooling effect of the air and hence the rated operational current of the contactor (unless the temperature drops at the same time). No derating is necessary up to 3000 m.</p> <p>Derating factors to be applied above this for main pole operational voltage and current (a.c.supply) are as follows:</p> <table><tr><th>Altitude</th><th>3500m</th><th>4000m</th><th>4500m</th><th>5000m</th></tr><tr><td>Rated operational voltage</td><td>0.90</td><td>0.80</td><td>0.70</td><td>0.60</td></tr><tr><td>Rated operational current</td><td>0.92</td><td>0.90</td><td>0.88</td><td>0.86</td></tr></table>	Altitude	3500m	4000m	4500m	5000m	Rated operational voltage	0.90	0.80	0.70	0.60	Rated operational current	0.92	0.90	0.88	0.86
Altitude	3500m	4000m	4500m	5000m												
Rated operational voltage	0.90	0.80	0.70	0.60												
Rated operational current	0.92	0.90	0.88	0.86												
Ambient air temperature	<p>The temperature of the air surrounding the device, measured near to the device. The operating characteristics are given:</p> <ul style="list-style-type: none">■ with no restriction for temperatures between -5 and +55 °C■ with restrictions, if necessary, for temperatures between -40 and +70 °C.															
Rated operational current (Ie)	This is defined taking into account the rated operational voltage, operating rate, utilisation category and ambient temperature around the device.															
Conventional thermal current (Ith) ⁽¹⁾	The current which a closed contactor can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.															
Permissible short-time rating	The current which a closed contactor can for a short time after a period of no load, without dangerous overheating.															
Rated operational voltage (Ue)	This is the voltage value which, in conjunction with the rated operational current, determines the use of the contactor or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits, it is expressed as the voltage between phases.															
Rated control circuit voltage (Uc)	The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a sinusoidal wave form (less than 5% total harmonic distortion).															
Rated insulation voltage (Ui)	This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths. As the specifications are not identical for all standards, the rated value given for each of them is not necessarily the same.															
Rated impulse withstand voltage (Uimp)	The peak value of a voltage surge which the device is able to withstand without breaking down.															
Rated operational power (expressed in kW)	The rated power of the standard motor which can be switched by the contactor, at the rated operational voltage.															
Rated breaking capacity ⁽²⁾	This is the current value which the contactor can break in accordance with the breaking conditions specified in the IEC standard.															
Rated making capacity ⁽²⁾	This is the current value which the contactor can make in accordance with the making conditions specified in the IEC standard.															
On-load factor (m)	<p>This is the ratio between the time the current flows (t) and the duration of the cycle (T).</p>  <p>$m=t/T$</p> <p>Cycle duration: duration of current flow + time at zero current.</p>															
Pole impedance	The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal. The impedance comprises a resistive component (R) and an inductive component ($X = L \cdot \omega$). The total impedance therefore depends on the frequency and is normally given for 50 Hz. This average value is given for the pole at its rated operational current.															
Mechanical durability	This is the average number of no-load operating cycles (i.e. with zero current flow through the main pole) which the contactor can perform without mechanical failure.															
Electrical durability	This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.															

⁽¹⁾ Conventional thermal current, in free air, conforming to IEC standards.

⁽²⁾ For a.c. applications, the breaking and making capacities are expressed by rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.

Note: these definitions are extracted from standard IEC 60947-1.

Contactor utilisation categories conforming to IEC 60947-4

The standard utilisation categories define the current values which the contactor must be able to make or break.

These values depend on:

- the type of load being switched: squirrel cage or slip ring motor, resistors
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

a.c. applications

■ Category AC-1:

This category applies to all types of a.c. load with a power factor equal to or greater than 0.95.

Examples: heating, lighting, distribution.

■ Category AC-3:

This category applies to squirrel cage motors with breaking during normal running of the motor. On closing, the contactor makes the starting current, which is about 7 times the rated current of the motor.

On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the contactor terminals is about 20 % of the mains supply voltage. Breaking is light. For example: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air condition units, etc...

■ Category AC-4:

The contactor closes at a current peak which may be as high as 5 or 7 times the rated motor current. On opening it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.

This category covers applications with plugging and inching of squirrel cage and slip ring motors.

For example: printing machines, wire drawing machines, cranes and hoists, metallurgy industry.

Technical information

Product standards and certifications

Standardisation

Conformity to standards

Schneider Electric products satisfy, in the majority of cases, European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 for low voltage equipment).

When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines). Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system. On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity
- a certificate of conformity (ASEFA/LOVAG)
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Code	Certification authority		Country
	Name	Abbreviation	
GOST	Gosudarstvennoe Komitet Standartov	GOST	Russia
IEC	International Electrotechnical Commission	IEC	Worldwide

Regulations

European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.

The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".

The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.

As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the **CE** mark.

The **CE** mark is affixed to Schneider Electric brand products concerned, in order to comply with French and European regulations.

Significance of the **CE** mark

- The **CE** mark affixed to a product signifies that the manufacturer certifies that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The **CE** mark is intended solely for national market control authorities.
- The **CE** mark must not be confused with a conformity marking.

European Directives (continued)

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.

For Schneider Electric brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 2006/95/EC: the **CE** mark relating to this Directive has been compulsory since 16th January 2007.
- the Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: the **CE** mark on products covered by this Directive has been compulsory since 1st January 1996.

ASEFA-LOVAG certification

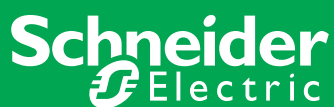
The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - Association of French Testing Stations for Low Voltage Industrial Electrical Equipment) is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC).

ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

Note

For further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Regional Sales Office.

Make the most of your energy



For more information visit our website at www.schneider-electric.co.in

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