Motor starters

EasyPact TVS

Designed for the essential

Designed for the essential

Contents

EasyPact TVS contactors,
6 A to 630 A

EasyPact TVS thermal overload relays
0.1 A to 630 A

EasyPact TVS control relays
4 NO/NC contacts

EasyPact TVS motor protection circuit breaker 0.1A to 32A

Coordination between protection and control components

EasyPact TVS: control & protection,

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

EasyPact TVS starters range is the perfect fit between 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.

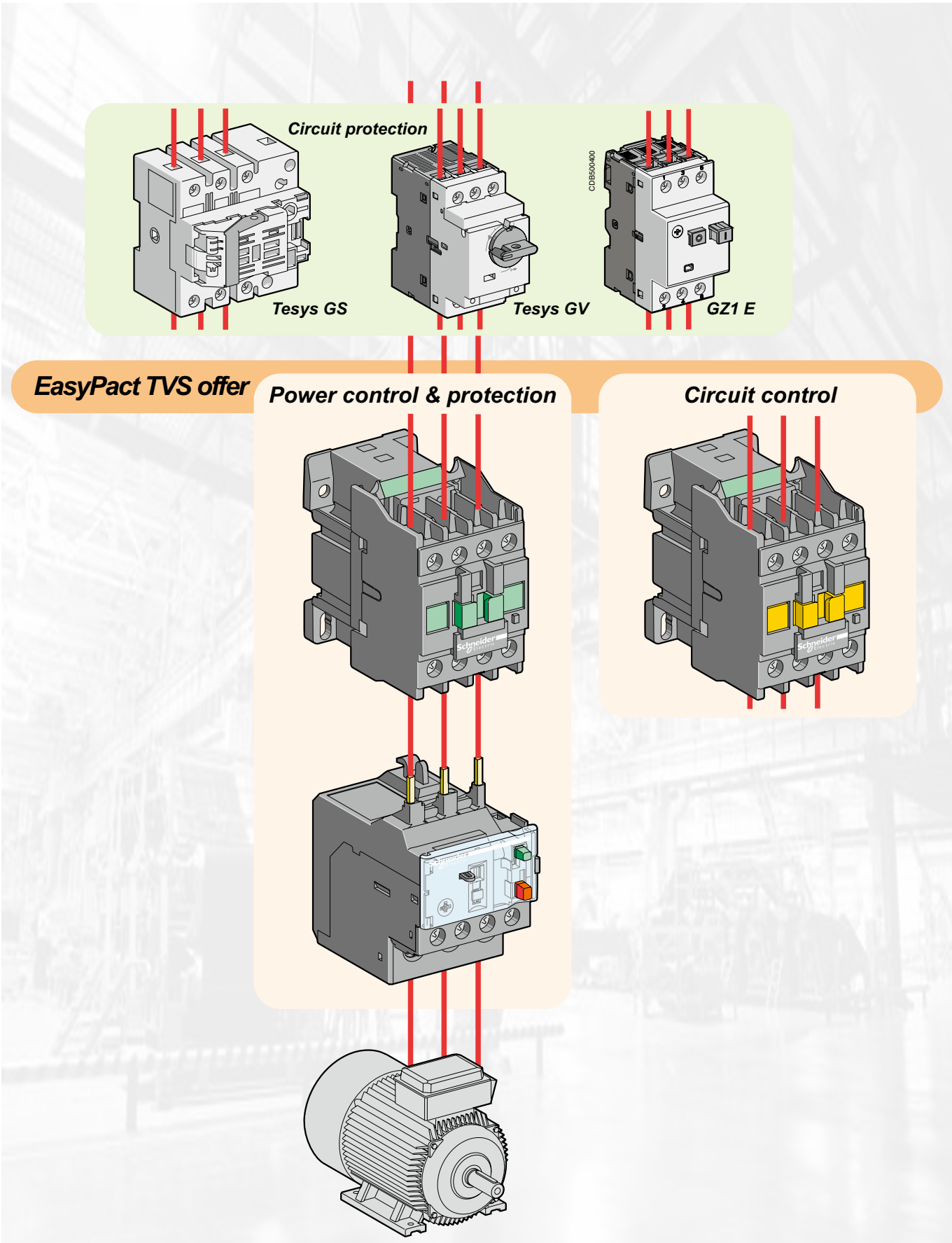
Simple and intuitive

> Easy to install.
> Covering 80 % of applications.
> With the key accessories to easily build lots of Do-It-Yourself solutions.
> With an intuitive commercial references system: easy to order, easy to understand and easy to remember.

Guaranteed availability

> Available in distribution.
> EasyPact TVS 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



EasyPact TVS: contactors

> EasyPact TVS contactors, 6 A to 630 A

> EasyPact TVS thermal overload relays 0.1 A to 630 A

> EasyPact TVS control relays 4 NO/NC contacts

> EasyPact TVS motor protection circuit breaker 0.1A to 32A

> Coordination between protection and control components

> Glossary, definitions, technical information

and relays

Control your motors, Do It Yourself simply your solution: direct-on-line starter, reversing starter, star-delta starter

Characteristics ▶ A-3

Accessories, spare parts ▶ A-10

Dimensions, mounting ▶ A-18

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

Characteristics ▶ B-1

Dimensions, mounting ▶ B-7

Pilot your control circuits

Characteristics ▶ C-1

Dimensions, mounting ▶ C-4

Characteristics ▶ D-1

References ▶ D-3

Dimensions, mounting ▶ D-7

Better continuity of service

What coordination means ▶ E-1

Glossary ▶ E-4

Definitions ▶ E-5

Technical informations ▶ E-6

EasyPact TVS 3 pole contactors

Size		1					2		3		
Rated operational current AC-3	**A**	6	9	12	18	25	32	38	40	50	65
Rated operational current AC-1	**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
660/690 V		3	5.5	7.5	10	15	18.5	18.5	30	33	37
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
LC1E06-300	50 Hz	B5	E5	F5	M5	U5	Q5	N5	R5
	60 Hz	B6	-	F6	M6	-	Q6	-	R6
LC1E400-630	50/60Hz	-	E7	F7	M7	U7	Q7	N7	-

Contactor: 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)	01 1NC 10 1NO N/A 1NO+1NC
				Rated operation current AC3	12 A
				Contactor	EasyPact TVS

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 NC + NO auxiliary contact, 220 V - 50 Hz coil ⇨ **LC1E120M5**

(2) Only up to LC1E38.

from 6 to 630 A

4		5		6		7		8	9
80	95	120	160	200	250	300	400	500	630
110	120	150	200	250	300	320	500	700	1000
22	25	37	45	55	75	90	110	147	185
37	45	55	75	90	132	160	200	250	335
45	45	59	80	100	140	160/185	220/250	280/295	375/400
45	55	75	90	110	160	200	257	355	400
45	45	80	100	110	160	220	280	335	450
85		120		168.5		213	213	233	309
1 NO + 1 NC				-		-			
LC1E80	**LC1E95**	**LC1E120**	**LC1E160**	**LC1E200**	**LC1E250**	**LC1E300**	**LC1E400**	**LC1E500**	**LC1E630**

Common characteristics

> Contactors compatible with:

LAEN● auxiliary contact blocks
(see page 16)

LAETSD time delay auxiliary contact (from 25 A contactor)
(see page 16)

LAERC●● RC switch suppressor (up to 95 A)
(see page 15)

LAEM● mechanical interlock
(see page 15)

LAEP● set of power connections (up to 95 A)
(see page 15)

Utilisation categories

> Class AC-1: AC loads with cos φ 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.

EasyPact TVS contactors
6 to 630 A
Power characteristics

Power circuit connections

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 gG fuse	Type 1	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 33			
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	mm²	1...4		
	2 conductors		1...2.5		
Solid cable without cable end	1 conductor	mm²	1...4		1.5...6
	2 conductors		1...4		1.5...6
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 Ø6mm flat		

	LC1E25	LC1E32	LC1E38	LC1E40	LC1E50	LC1E65	LC1E80	LC1E95	LC1E120	LC1E160	LC1E200	LC1E250	LC1E300	LC1E400	LC1E500	LC1E630
	25	32	38	40	50	65	80	95	–							
									120	160	200	250	300	400	500	630
	36	50		60	70	80	110	120	–							
									150	200	250	300	320	500	700	1000
	36	50		60	70	80	110	120	–							
									150	200	250	300	320	500	700	1000
	200	256	304	320	400	520	640	760	960	1280	1600	2000	2400	3200	4000	5040
	250	320	380	400	500	650	800	950	1200	1600	2000	2500	3000	4000	5000	6300
	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	3600	4200	5050
	40	63		80	100	125	160		250	315			500	630	800	800
									–							
	2.5			1.5		1	0.8		0.6		0.33	0.32	0.3	0.26	0.18	0.12
	1.6	2.0	2.9	2.4	3.8	4.2	5.1	7.2	8.6	15	13	20	27	42	45	48
	3.2	5.0		5.4	7.4	6.4	9.7	12	14	24	21	29	31	65	88	120
		1	0.9						0.8					0.6	0.6	0.6
	0.35								0.25					0.25	0.25	0.2
		0.03	0.025						0.012	0.007	0.006	0.005		0.005	0.005	0.005
		8		5			3		4		5			4	4	4
	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 x 150	2 x 240	–
											2					
											3 x 25	4 x 32	5 x 30	30 x 5	40 x 5	60 x 5
											M8	M10				M12
	1.5	2.1		5			9		12		18	35				58
				Ø8mm flat			Ø8mm flat or Allen key n°4		Allen key n°4		Wrench					

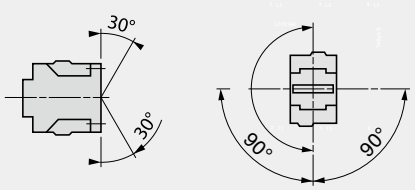
EasyPact TVS contactors
6 to 630 A
Control circuit: coil characteristics
Built in auxiliary contact

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 (θ ≤ 55 °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 ≤ 440 V)			**In millions of operating cycles**	1.2...1.4			
	AC-1 (Ue ≤ 440 V)				–			
Mechanical durability at Uc					10			
Maximum operating rate at ambiant temperature ≤ 60 °C				**In operating cycles per hour**	1800			
Maximum operating rate at ambiant temperature ≤ 55 °C					–			
Control circuit connections								
Connection maximum c.s.a.								
Flexible cable without cable end	1 or 2 conductors			**mm²**	1...4			
Flexible cable with cable end	1 conductor			**mm²**	1...4			
	2 conductors				1...2.5			
Solid cable without cable end	1 or 2 conductors			**mm²**	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 ≤ 60 °C			**A**	10			
Operating current frequency				**Hz**	50/60 Hz			
Minimum switching capacity λ = 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 60947-1			**A**	∿: 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 N/C and N/O contacts			**ms**	1.5 on energisation and on de-energisation			

LC1E25	LC1E32	LC1E38	LC1E40	LC1E50	LC1E65	LC1E80	LC1E95	LC1E120	LC1E160	LC1E200	LC1E250	LC1E300	LC1E400	LC1E500	LC1E630
								24...440 according coil voltage code							
													–		
								–							
95			160			200		300		805		650	1075	1100	1650
								0.8	0.9	0.3		0.9	0.9	0.9	0.9
8.3			15			20		22		55		10	15	18	22
								0.3	0.9	0.3		0.9	0.9	0.9	0.9
95			140			220		300		970		650	1075	1100	1650
								0.8	0.9	0.3		0.9	0.9	0.9	0.9
8.3			13			22		22		66		10	15	18	22
									0.9	0.3		0.9	0.9	0.9	0.9
			6...10					3...8		18...24		8	14	18	20
			20...26			20...35		20...50		20...35		40...65	40…75		40…80
			8...12			6...20		6...20		7...15		100...170	100…170		100…200
	1		0.9					0.8					0.6	0.6	0.6
								0.4					0.25	0.25	0.2
	8		5					3					4	4	4
			1200					–							
								1200					2400		1200
								1...2.5		1...4			1/4	1/4	1/4
								1...2.5					1/4	1/4	1/4
													1/2.5	1/2.5	1/2.5
								1...2.5		1...4			1/4	1/4	1/4
			1.2					1.2					1.2	1.2	1.2

EasyPact TVS contactors
6 to 630 A

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 (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 E-4.
(3) Without change of contact states, in the most unfavorable direction (coil energised at Ue).

Installation recommandations

Avoid fire, product damage or power loss with a safe enclosure

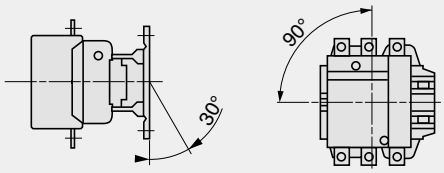
Severe conditions such as dust, humidity, high temperature can result in people or equipments exposed to serious risks if the suitable protection of the electrical components is not taken.

Spacial CRN steel enclosures is one of our solutions
A complete offer with 39 dimensions from 200 x 200 x 150 mm to 1000 x 800 x 300 mm:
- with plain door, without plain mounting plate
- with plain door and plain mounting plate
- with glazed door, without plain mounting plate.

- Degree of protection IP 66.
- Compliance with standard IEC 62208.
- A wide range of accessories to fit to all your applications.

Spacial CRN, suitable for any application
Indoors with harsh and dirty environments like machines, manufacturing plants, and logistic centers.

Specific optional devices re-enforce the protection: fans, filters.

	LC1E40...E65	LC1E80...E95	LC1E120...E160	LC1E200...E300	LC1E400	LC1E500	LC1E630
			8				
				IEC 60947-4-1			
				IP00			
				–			
							
					6gn	9gn	6gn
	7 gn				15gn		
					1.5gn	2gn	
					5gn	4gn	

EasyPact TVS contactors

EasyPact TVS contactors for motor control up to 335 kW at 400 V, in category AC-3

CPB100417

LC1E06

CPB100419

LC1E65

CPB100421

LC1E120

CPB100415

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	380 V								
230 V	400 V	415 V	500 V	690 V				Fixing [1]	
kW	kW	kW	kW	kW	A				kg
Connection by screw clamp terminals									
1.1	2.2	2.2	3	3	**6**	1	0	**LC1E0610●●**	0.300
1.1	2.2	2.2	3	3	**6**	0	1	**LC1E0601●●**	0.300
2.2	4	4	5.5	5.5	**9**	1	0	**LC1E0910●●**	0.300
2.2	4	4	5.5	5.5	**9**	0	1	**LC1E0901●●**	0.300
3	5.5	5.5	7.5	7.5	**12**	1	0	**LC1E1210●●**	0.300
3	5.5	5.5	7.5	7.5	**12**	0	1	**LC1E1201●●**	0.300
4	7.5	9	10	10	**18**	1	0	**LC1E1810●●**	0.300
4	7.5	9	10	10	**18**	0	1	**LC1E1801●●**	0.300
5.5	11	11	15	15	**25**	1	0	**LC1E2510●●**	0.360
5.5	11	11	15	15	**25**	0	1	**LC1E2501●●**	0.360
7.5	15	15	18.5	18.5	**32**	1	0	**LC1E3210●●**	0.450
7.5	15	15	18.5	18.5	**32**	0	1	**LC1E3201●●**	0.450
9	18.5	18.5	18.5	18.5	**38**	1	0	**LC1E3810●●**	0.450
9	18.5	18.5	18.5	18.5	**38**	0	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	59	75	80	**120**	1	1	**LC1E120●●**	2.300
45	75	80	90	100	**160**	1	1	**LC1E160●●**	2.300
Connection by bars									
55	90	100	110	110	**200**	0	0	**LC1E200●●**	4.600
75	132	140	160	160	**250**	0	0	**LC1E250●●**	4.700
90	160	160/185	200	220	**300**	0	0	**LC1E300●●**	8.500
110	200	220/250	257	280	**400**	0	0	**LC1E400●●**	9.1
147	250	280/295	355	335	**500**	0	0	**LC1E500●●**	11.35
185	335	375/400	400	450	**630**	0	0	**LC1E630●●**	18.6

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
LC1E400-630	50/60Hz	-	E7	F7	M7	U7	Q7	N7	-

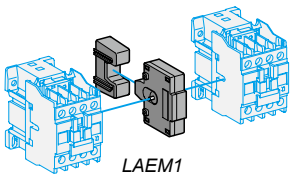
Seperate components

Auxiliary contact blocks, add-on modules and accessories, see pages 15 to 17.

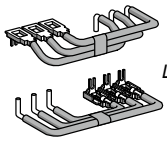
Coil spare parts

For maintenance, each coil can be ordered separatly, see page 18 to 21.

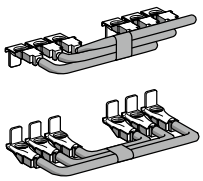
(1) LC1E06 to E65: clip-on mounting on 35 mm ⊐ rail AM1 DP or screw fixing.
LC1E80 to E95: clip-on mounting on 35 mm ⊐ rail AM1DP or 75 mm ⊐ rail AM1 DL or screw fixing.
LC1E120 and E160: clip-on mounting on 2 x 35 mm ⊐ rail AM1 DP or screw fixing.



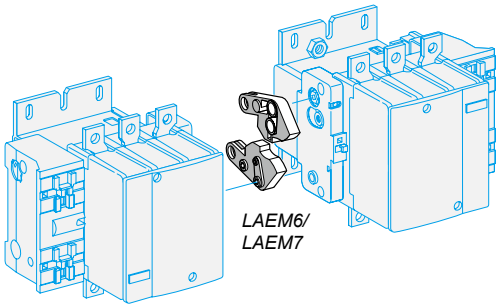
LAEM1



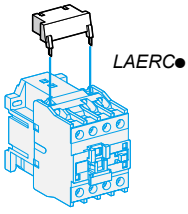
LAEP3



LAEP4



LAEM6/ LAEM7



LAERC●

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	– (*DIY*) (1)		**LAEM5**	0.300
LC1E200/E250	– (*DIY*) (1)		**LAEM6**	0.110
LC1E300	– (*DIY*) (1)		**LAEM7**	0.250
LC1E400	– (*DIY*) (1)		**LAEM8**	0.14
LC1E500	– (*DIY*) (1)		**LAEM9**	0.14
LC1E630	– (*DIY*) (1)		**LAEM10**	0.15

(1) DIY : Do It Yourself.

RC surge suppressor

■ Effective protection for circuits highly sensitive to "high frequency" interference and transcient 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		
		V~		kg
Screw mounting	LC1E06...E95	24...48	**LAERCE**	0.025
		50...127	**LAERCG**	0.025
		110...240	**LAERCU**	0.025
		380...415	**LAERCN**	0.025

EasyPact TVS contactors
Accessories for LC1E contactor

LAEN22

Instantaneous auxiliary contact blocks for connection by screw lamps 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

LAETSD

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 LC1E630.

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		
	Repeat accuracy			–			±2 %		
	Drift up to 0.5 million operating cycles			–			+15 %		
	Drift depending on ambient air temperature			–			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

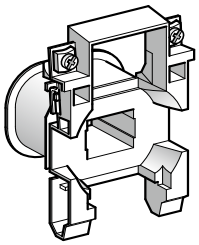
Environment				
Contact block type			**LAEN11, 20, 02, 22**	**LAETSD**
Conforming to standard			IEC 60947-5-1	
Product certifications			GOST	
Protective treatment	Conforming to IEC 60068		"TH"	
Degree of protection	Conforming to IEC 60529		IP20	
Ambiant air temperature	Storage	**°C**	-60...+80	
	Operation		-5...+55	
	Permissible for operation at Uc		-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	**mm²**	Min: 1 x 1 Max: 2 x 2.5	

Accessories compatibility

Contactor	Built in contacts	LAEN●●	LAETSD	LAERC●	LAEM	LAEP●
LC1E06 LC1E09 LC1E12 LC1E18	1 NO or 1NC	1	-	1	1	1
LC1E25 LC1E32 LC1E38	1 NO or 1NC	1 or 1				
LC1E40 LC1E50 LC1E65 LC1E80 LC1E95	1 NO + 1NC	1 or 1				
LC1E120 LC1E160	1 NO + 1NC	1 or 1		-		DIY (1)
LC1E200 LC1E250 LC1E300	-	2 or 0		-		DIY (1)
LC1E400 LC1E500 LC1E630	-	1 or 1		-		DIY (1)

(1) Do It Yourself.

EasyPact TVS contactors
Coil replacement for EasyPact TVS, LC1E06 to E38



LAEX1●●

For 3-pole contactors LC1E06...E18

Specifications

Average consumption at 20 °C:
- inrush (cos φ = 0.75) 50 Hz: 95 VA; 60 Hz: 95 VA
- sealed (cos φ = 0.3) 50 Hz: 8.5 VA; 60 Hz: 8.5 VA

Operating range (θ ≤ 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

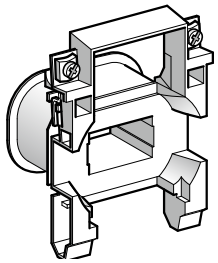
For 3-pole contactors LC1E25

Specifications

Average consumption at 20 °C:
- inrush (cos φ = 0.75) 50 Hz: 70 VA; 60 Hz: 70 VA
- sealed (cos φ = 0.3) 50 Hz: 7 VA; 60 Hz: 7.5 VA

Operating range (θ ≤ 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 φ = 0.75) 50 Hz: 70 VA; 60 Hz: 70 VA
- sealed (cos φ = 0.3) 50 Hz: 7 VA; 60 Hz: 7.5 VA

Operating range (θ ≤ 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 EasyPact TVS, LC1E40 to E160

For 3-pole contactors LC1E40...E65

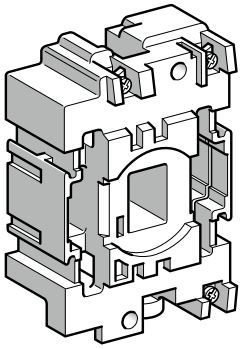
Specifications

Average consumption at 20 °C:
- inrush (cos φ = 0.75): 50 Hz: 160 VA; 60 Hz: 140 VA
- sealed (cos φ = 0.3) 50 Hz: 15 VA; 60 Hz: 13 VA

Operating range (θ ≤ 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

For 3-pole contactors LC1E80/E95



LAEX4●●

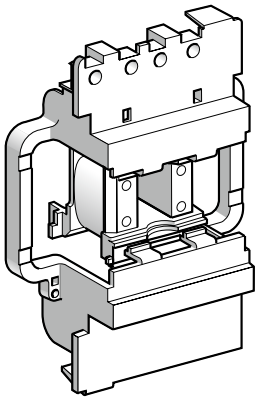
Specifications

Average consumption at 20 °C:
- inrush (cos φ = 0.75) 50 Hz: 200 VA; 60 Hz: 220 VA
- sealed (cos φ = 0.3) 50 Hz: 20 VA; 60 Hz: 22 VA

Operating range (θ ≤ 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

For 3-pole contactors LC1E120/E160



LAEX5●●

Specifications

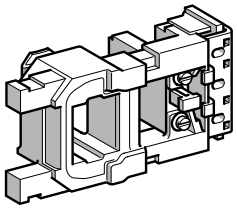
Average consumption at 20 °C:
- inrush (cos φ = 0.8) 50 Hz: 300 VA
- sealed (cos φ = 0.8) 50 Hz: 22 VA

Operating range (θ ≤ 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.

EasyPact TVS contactors
Coil replacement for EasyPact TVS, LC1E200 to E300



LAEX6●●

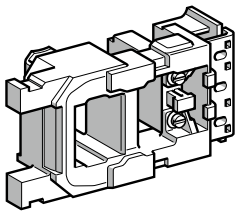
For 3-pole contactors LC1E200...E250

Specifications

Average consumption at 20 °C:
- inrush (cos φ = 0.9) 50 Hz: 805 VA; 60 Hz: 970 VA
- sealed (cos φ = 0.3) 50 Hz: 55 VA; 60 Hz: 66 VA

Heat dissipation: 18...24 W.
Operating time à Uc: closing = 20...35 ms, opening = 7...15 ms.

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	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



LAEX7●●

For 3-pole contactors LC1E300

Specifications

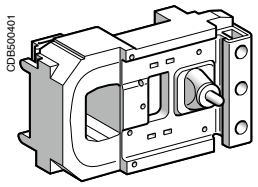
Average consumption at 20 °C:
- inrush (cos φ = 0.9) 50 Hz or 60 Hz: 650 VA
- sealed (cos φ = 0.3) 50 Hz or 60 Hz: 10 VA.

Heat dissipation: 8 W.
Operating time à Uc: closing = 40...65 ms, opening = 100...170 ms.
Operate on networks with harmonic numbers ≤ 7.
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400

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	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.

Coil replacement for EasyPact TVS, LC1E400 to E630



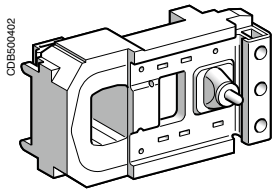
LAEX8●●

For 3-pole contactors LC1E400

Average consumption at 20 °C:
- inrush (cosφ =0.9) 50Hz or 60Hz:1000…1150
- sealed (cos φ = 0.9) 50Hz or 60Hz:12…18VA

Heat dissipation : 14W
Operation time à Uc: closing=40…75ms,opening=100…170ms
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no.	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no.	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
48	29.5	0.18		-	-		1
110	230	1.35		230	1.35		1
220	1030	5.1		1030	5.1		1
240	1320	6.4		-	-		1
380	3310	15.8		3310	15.8		1
415	4070	19.4		-	-		1
440	4070	19.4		4070	19.4		1



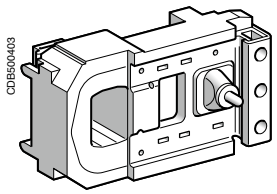
LAEX9●●

For 3-pole contactors LC1E500

Average consumption at 20 °C:
- inrush (cosφ =0.9) 50Hz or 60Hz:1050…1150A
- sealed (cos φ = 0.9) 50Hz or 60Hz:16…20VA

Heat dissipation : 18W
Operation time à Uc: closing=40…75ms,opening=100…170ms
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no.	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no.	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
48	33.5	0.19		-	-		1.15
110	260	1.25		258	1.25		1.15
220	915	4.55		916	4.55		1.15
240	1160	5.75		-	-		1.15
380	2980	14.7		2981	14.7		1.15
415	3730	18.4		-	-		1.15
440	3730	18.4		3733	18.4		1.15



LAEX10●●

For 3-pole contactors LC1E630

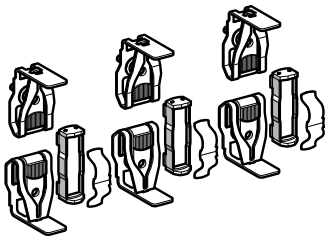
Average consumption at 20 °C:
- inrush (cosφ =0.9) 50Hz or 60Hz:1500…1730VA
- sealed (cos φ = 0.9) 50Hz or 60Hz:20…25VA

Heat dissipation : 20W
Operation time à Uc: closing=40…80ms,opening=100…200ms
Operating cycles/hour (θ ≤ 55 °C): ≤ 1200

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no.	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Cat. no.	Weight
V	Ω	H	50 Hz	Ω	H	60 Hz	kg
48	17.1	0.09		-	-		1.5
110	165	1.85		165	1.85		1.5
220	730	3.35		730	3.35		1.5
240	730	3.35		-	-		1.5
380	2360	10.5		2360	10.5		1.5
415	2960	13		-	-		1.5
440	2960	13		2960	13		1.5

EasyPact TVS contactors

Replacement contacts for EasyPact TVS, LC1E120 to E630



LAEC6

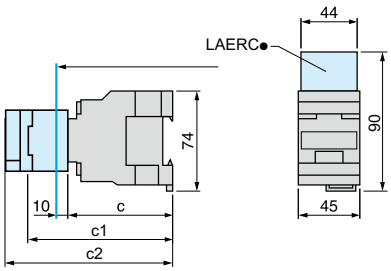
Sets of contacts

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**	0.350
	LC1E160	3 poles	**LAEC51**	0.350
	LC1E200	3 poles	**LAEC6**	0.350
	LC1E250	3 poles	**LAEC61**	0.660
	LC1E300	3 poles	**LAEC7**	2.000
	LC1E400	3 poles	**LAEC71**	2
	LC1E500	3 poles	**LAEC8**	2.95
	LC1E630	3 poles	**LAEC9**	6.1

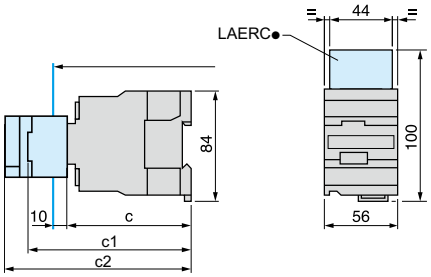
EasyPact TVS contactors
LC1E06 to E95

LC1E06...E25



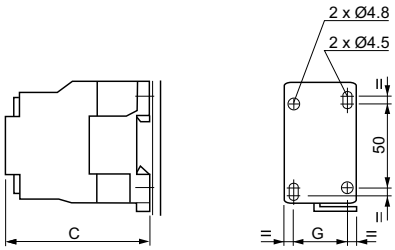
LC1	E06...E18	E25
c	80	85
c1 with LAEN	113	118
c2 with LAETSD	-	136

LC1E32/38



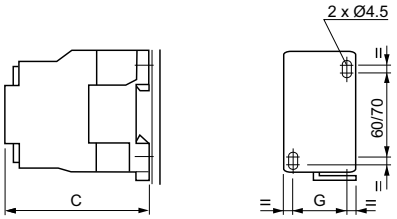
LC1	E32/38
c	86
c1 with LAEN	120
c2 with LAETSD	138

LC1E06...E25



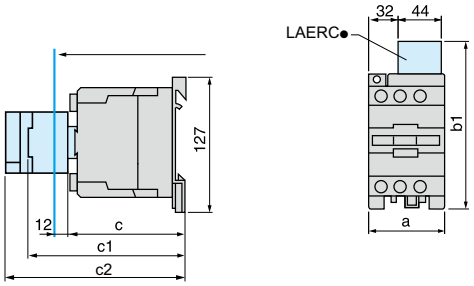
LC1	E06	E09	E12	E18	E25
c	80	80	80	80	85
G	35	35	35	35	35

LC1E32/38



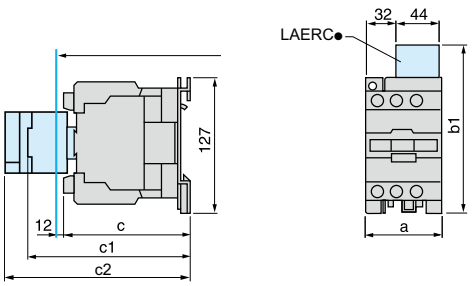
LC1	E32/38
c	86
G	40

LC1E40...E65



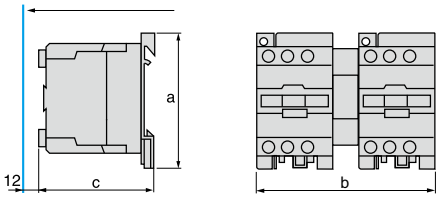
LC1		E40...E65
a		75
b1	with LAERC●	135
c		114
c1	with LAEN●	147
c2	with LAETSD	165

LC1E80/95



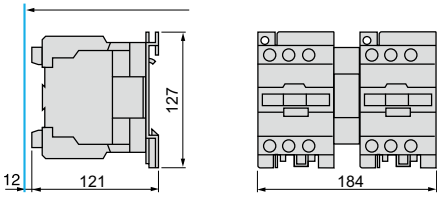
LC1		E80/95
a		85
b1	with LAERC●	135
c		121
c1	with LAEN●	153
c2	with LAETSD	171

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

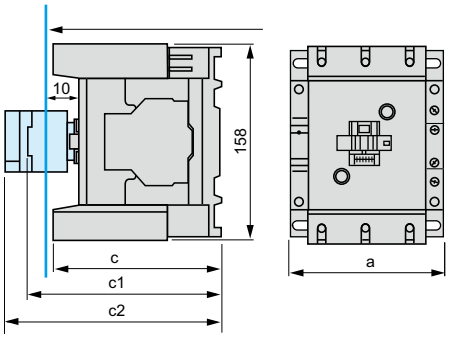
2 x LC1E80/95 with LAEM4



EasyPact TVS contactors
LC1E120 and 160 A

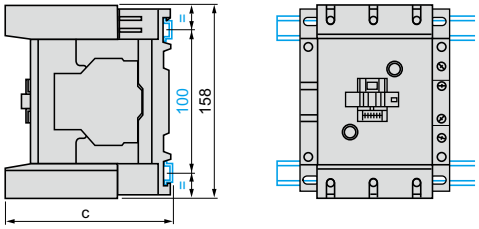
LC1E120/160

On panel with accessories



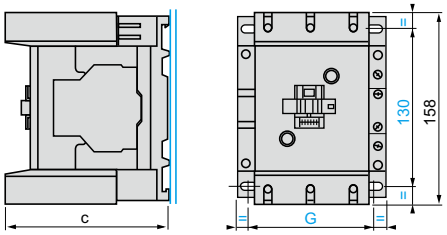
a		120
c	Without add-on blocks	132
c1	With LAEN	150
c2	With LAETSD	168

On 2 mounting rails DZ5 MB on 120 mm centres



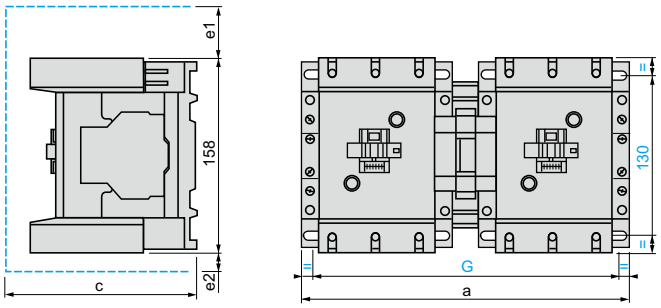
c	(AM1 DP200 or DR200)	134.5
c	(AM1 DE200 or ED●●●)	150

On Panel



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

2 x LC1E120 or LC160 with LAEM5

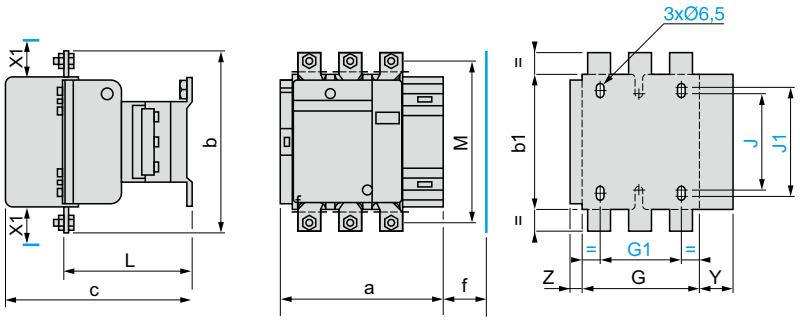


2 x LC1E120 or 160	a	c	e1	e2	G
For 120 and 160	266	148	56	18	242/256

c, e1 and e2: including cabing

EasyPact TVS contactors
LC1E200, E250 and E300 A

LC1E200 - LC1E250 - LC1E300
On panel



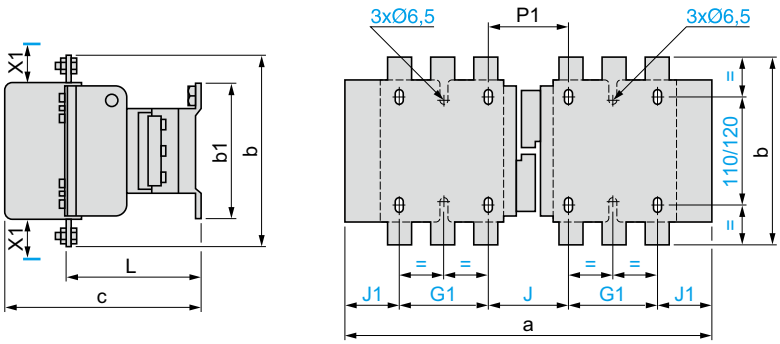
X1 (mm) = minimum electrical clearence according to operating voltage and breaking capacity.

	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



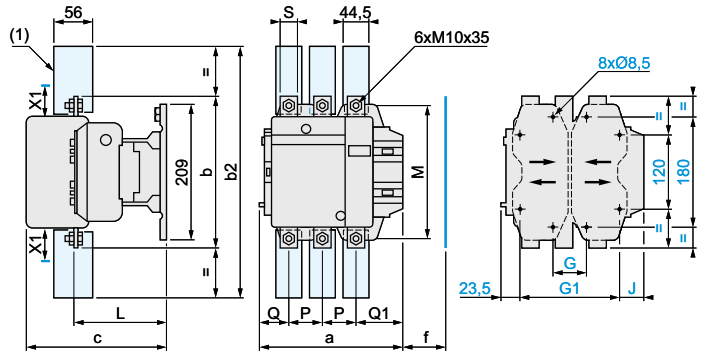
X1 (mm) = minimum electrical clearence according to operating voltage and breaking capacity.

	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

EasyPact TVS contactors
LC1E400, E500 and E630 A

LC1E400 - LC1E500
On panel



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

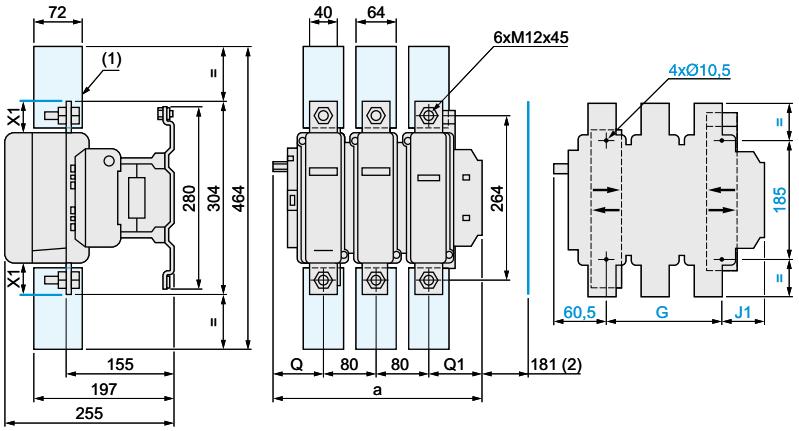
	220...500 V	600...690 V
LC1E400	15	20
LC1E500	15	20

(1) Power terminal protection shroud (see page 5/126).

	a	b	b2	c	f	G*	Gmin.	Gmax.	G1*	G1min.	G1max.	J	L	M	P	Q	Q1	S
LC1E400	213	206	375	219	146	80	66	102	170	156	192	19.5	145	181	48	43	74	25
LC1E500	233	238	400	232	150	80	66	120	170	156	210	39.5	146	208	55	46	77	30

f=minimum distance required for coil removal

LC1E630



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

	220...500 V	600...690 V
LC1E630	20	30

(1) Power terminal protection shroud (see page 5/126).
(2) Minimum distance required for coil removal.

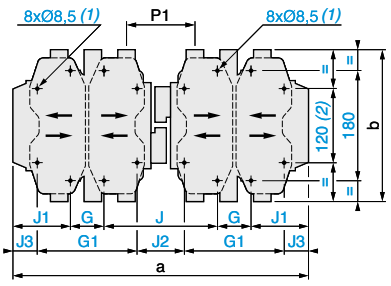
	a	G*	G min	Gmax.	J1	Q	Q1
LC1E630	309	180	100	195	68.5	60	89

2 x LC1E400,LC1E500,LC1E630

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

	220...500 V	600...690 V
LC1E400,500	15	20
LC1E630	20	30

(1) Except LC1 E630 : 4 x Ø 10.5.
(2) Except LC1 E630.

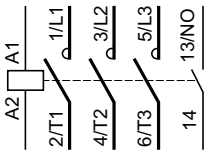


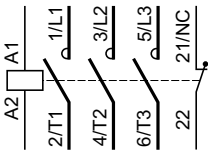
	a	b	b1	c	G	G1	J	J1	J2	J3	L	P1
2 x LC1E400	446	206	209	219	80	170	157	64.5	67	19.5	145	107
3 x LC1E500	485	238	209	232	80	170	156	84.5	66	39.5	146	112
4 x LC1E630	636	304	280	255	180	-	139	68.5	-	-	155	137

EasyPact TVS contactors
LC1E06...630 A

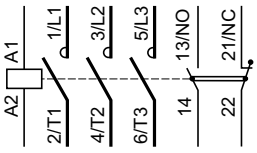
Contactors

LC1E06...38

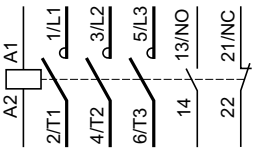




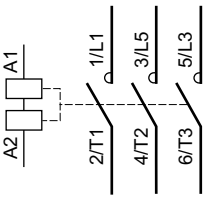
LC1E40...95



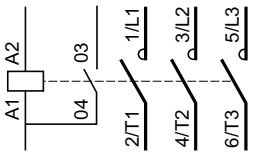
LC1E120/160



LC1E200, 250, 300



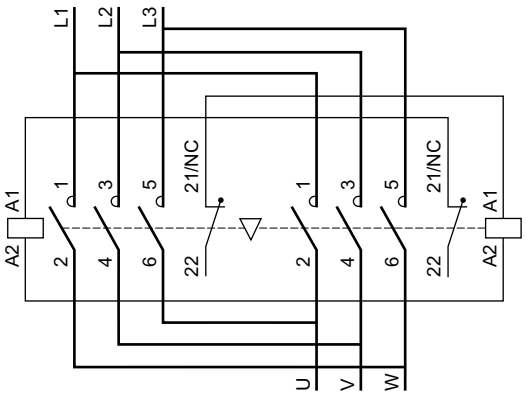
LC1E 400,500,630



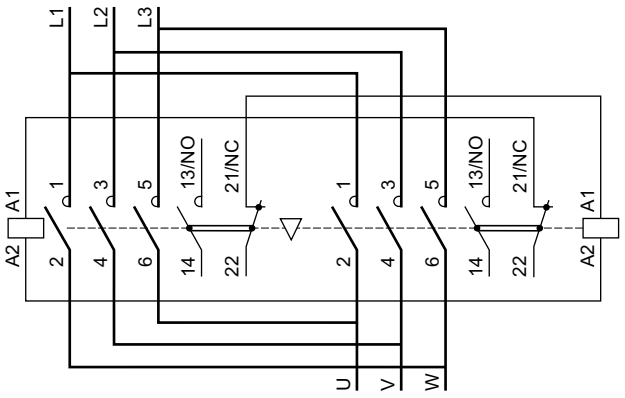
Reversing contactors

2 x LC1E06...38

Horizontaly mounted

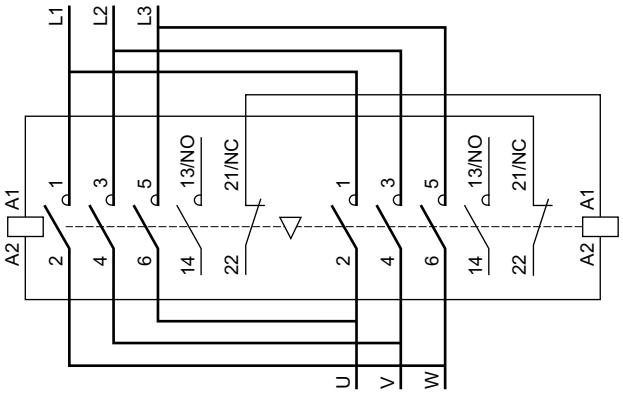


2 x LC1E40...95

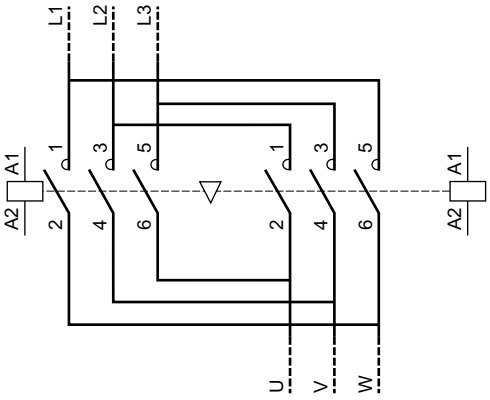


2 x LC1E120, 160

Horizontaly mounted

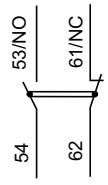


2 x LC1E200, 250, 300

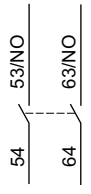


Front mounting add-on contact blocks

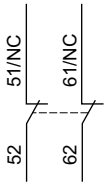
1NO + 1NC (LAEN11)



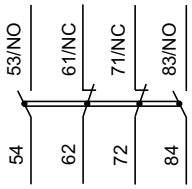
2NO (LAEN20)



2NC (LAEN02)

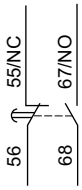


2NO +2NC (LAEN22)



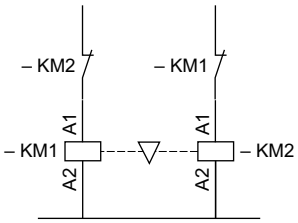
Time delay auxiliary contacts

On delay 1NO + 1NC (LAETSD)



Mechanical interlock

LAEM●



EasyPact TVS thermal

Possible Imax Calibration	TOR Com. Ref	Compatible with Contactor (size 1 & 2) Com. Ref.						
		LC1E06	LC1E09	LC1E12	LC1E18	LC1E25	LC1E32	LC1E38
0.10…0.16 A	LRE01	■	■	■	■	■	■	■
0.16…0.25 A	LRE02	■	■	■	■	■	■	■
0.25…0.40 A	LRE03	■	■	■	■	■	■	■
0.40…0.63 A	LRE04	■	■	■	■	■	■	■
0.63…1 A	LRE05	■	■	■	■	■	■	■
1…1.6 A	LRE06	■	■	■	■	■	■	■
1.6…2.5 A	LRE07	■	■	■	■	■	■	■
2.5…4 A	LRE08	■	■	■	■	■	■	■
4…6 A	LRE10	■	■	■	■	■	■	■
5.5…8 A	LRE12		■	■	■	■	■	■
7…10 A	LRE14		■	■	■	■	■	■
9 …13 A	LRE16			■	■	■	■	■
12…18 A	LRE21				■	■	■	■
16…24 A	LRE22					■	■	■
23…32 A	LRE32					■	■	■
30…38 A	LRE35							■

Common characteristics

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

overload relays

TOR Com. Ref	Possible Imax Calibration	Compatible with Contactor (size 3 & 4) Com. Ref.				
		LC1E40	LC1E50	LC1E65	LC1E80	LC1E95
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					■

TOR Com. Ref	Possible Imax Calibration	Compatible with Contactor (size 5, 6, 7, 8 & 9) Com. Ref.							
		LC1E120	LC1E160	LC1E200	LC1E250	LC1E300	LC1E400	LC1E500	LC1E630
LRE480	51…81A	■	■	□	□	□	□	□	□
LRE481	62…99A	■	■	□	□	□	□	□	□
LRE482	84…135A	■	■	□	□	□	□	□	□
LRE483	124…198A		□	■	□	□	□	□	□
LRE484	146…234A			□	■	■	■	□	□
LRE485	174…279A			□	■	■	■	□	□
LRE486	208…333A				■	■	■	□	□
LRE487	259…414A					■	■	□	□
LRE488	321…513A						□	■	□
LRE489	394…630A							□	■

Note:

■ *means the relay can match with contactor both in electrical and mechanical.*

□ *means the relay can match with contactor only in electrical (can not directly mounting).*

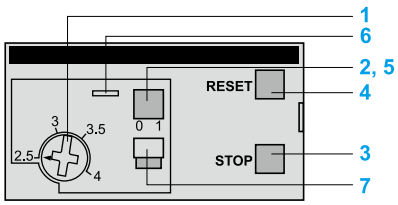
EasyPact TVS thermal overload relays

Presentation

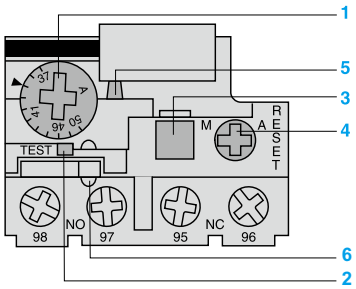
EasyPact TVS thermal overload relays are designed to protect a.c. circuits and motors against:
- overloads
- phase failure
- Long starting time
- prolonged stalled rotor condition.

The thermal relay controls permanently the current driven by the motor. When this current exceeds the setting it's auxiliary contacts will change state, causing the motor to stop.

Description



LRE●●, LRE48●



LRE3●●

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 N/O and N/C contacts).
3 Stop button. Actuates the N/C contact; does not affect the N/O contact.
4 Reset button.
5 Trip indicator.
6 Setting locked by sealing the cover.
7 Selector for manual or automatic reset.

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.

EasyPact TVS thermal overload relays

Power circuit characteristics

Relay type		Ref.	LRE 01...21	LRE 22...35	LRE 322...365	LRE 480...482	LRE 483	LRE 484	LRE 485...487	LRE 488	LRE 489
		Size	1		2	3				4	
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	51...630					

Power circuit connections

Connection by screw clamp terminals			Minimum/maximum c.s.a.								
	Flexible cable without cable end 1 conductor	mm²	1.5...6	2.5...10	4...35	-					
	Flexible cable with cable end 1 conductor		1...4	1.5...6	4...35	-					
	Solid cable without cable end 1 conductor		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	-			34.8	40	48	48	55	80
Bars or cables with lugs	Cross section		-			3X18	3X20	3X25	4X25	5x30	6X40
Screws	Type		-			M8	M8	M10	M10	M10	M12
	Tightening torque	N.m	-			27.5	27.5	35	35	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	110	120	220	240	380	480	500	600
		A	3.27	3	1.63	1.5	0.95	0.75	0.72	0.12
Protection against short-circuits	By gG, maximum rating or by GB2	A	5							
Connection by screw clamp terminals			Minimum/maximum c.s.a.							
	Flexible cable without cable end 1 conductor	mm²	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	IP00
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

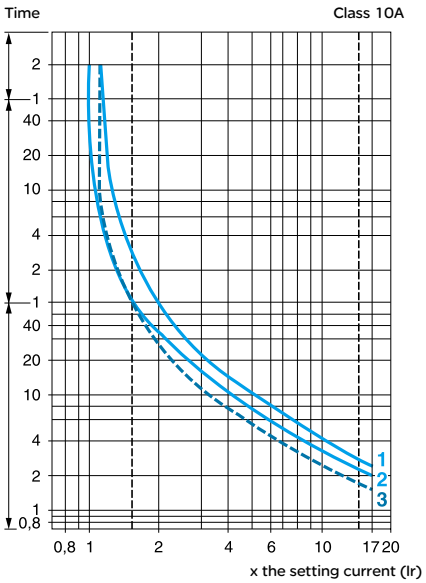
Temperature compensation		°C	-20...+60
Tripping threshold	Conforming to IEC 60947-4-1	A	1.14 ± 0.06 Ir
Sensitivity to phase failure	Conforming to IEC 60947-4-1		Tripping current 130 % of Ir on two phase, the last one at 0

(1) Contact your regional sales.

EasyPact TVS thermal overload relays

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).

EasyPact TVS thermal overload relays

3-pole thermal overload relays

LRE●●

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					
51...81	100	125	E120...E300	**LRE480**	2.2
62...99	125	160	E120...E300	**LRE481**	2.2
84...135	160	200	E120...E300	**LRE482**	2.2
124...198	200	250	E160...E300	**LRE483**	2.1
146...234	250	315	E200...E300	**LRE484**	2.2
174...279	315	315	E250...E300	**LRE485**	2.2
208...333	400	400	E300	**LRE486**	2.2
259…414	400	500	E500	**LRE487**	2.4
321…513	500	800	E630	**LRE488**	3.2
394…630	630	1000	E630	**LRE489**	3.9

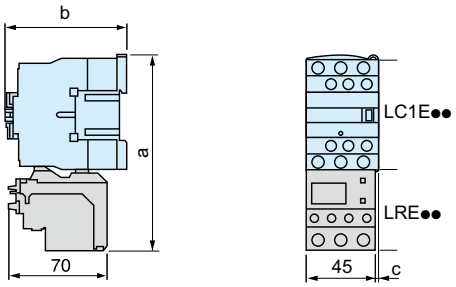
(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R : class 10 A: between 2 and 10 seconds.

EasyPact TVS thermal overload relays

Direct connection to LRE contactors

LRE01...E35

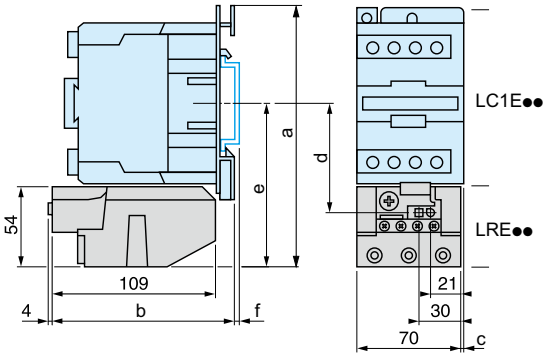
Direct mounting under LC1E06...38 contactors with screw clamp connections



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

LRE3●●

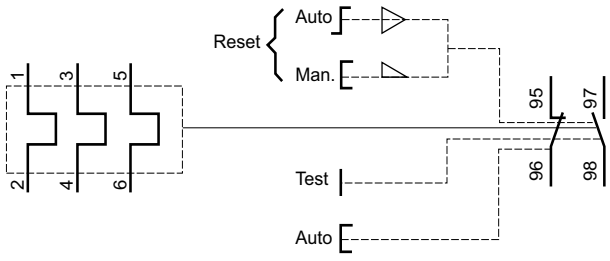
Direct mounting under LC1E06...38 contactors with screw clamp connections



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

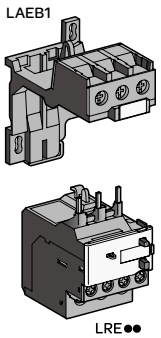
Electrical diagram all relays

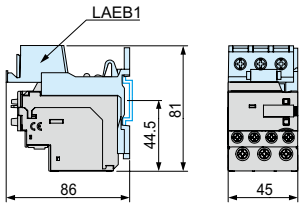


LRE01...E35 connected to LAEB1 terminal block

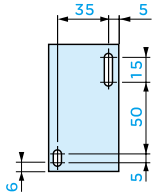
Independent mounting on 50 mm centres; or on rail AM1 DP200 or DE200

Independent mounting on 110 mm centres





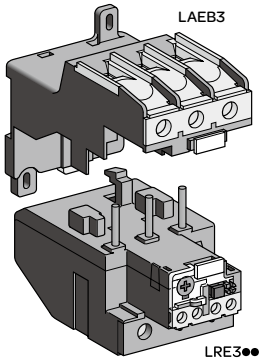
Mounting on DIN rail AM1D●●●

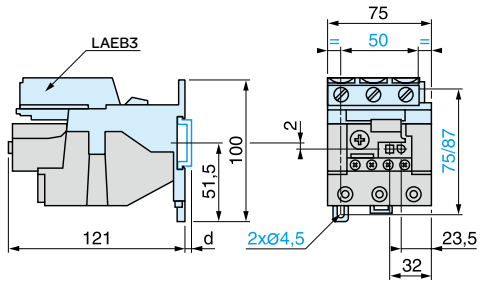


Mounting customer back plate

LRE322...E365, connected to LAEB3 terminal block

Independent mounting on 50 mm centres; or on rail AM1 DP200 or DE200





Mounting on DIN rail AM1D●●●

	AM1-DP200	AM1-DE200
d	2	9.5

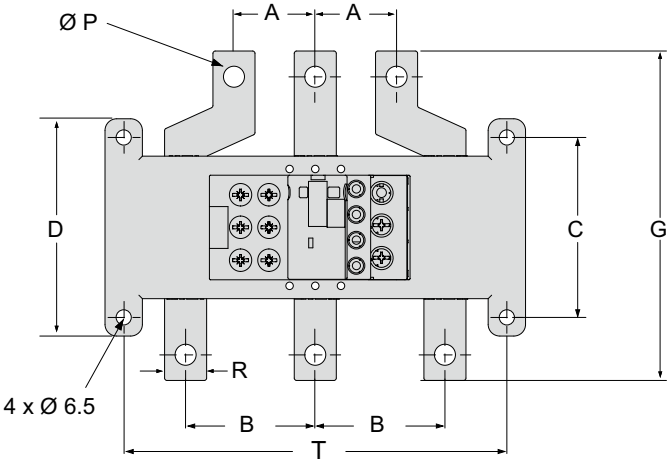
EasyPact TVS thermal overload relays

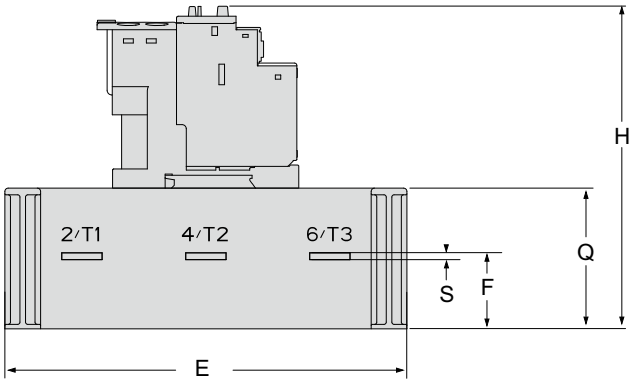
Independant mounting and connection

LRE48●

Independent mounting on mounting plate

LRE48●: with direct mounting under contactors LC1E120...630 or separate mounting (without accessory).





(mm)

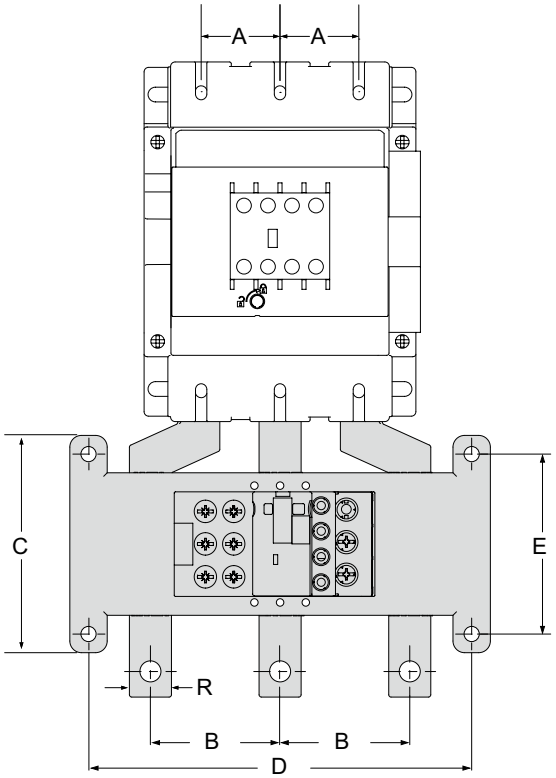
Dimensions and mounting

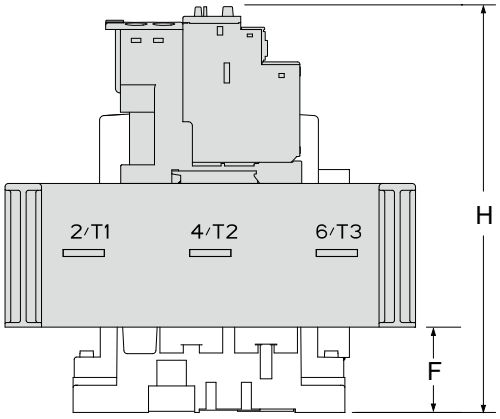
Range (A)		A	B	C	D	E	F	G	H	P	Q	R	S	T
LRE480	51…81	34.8	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE481	62...99													
LRE482	84...135													
LRE483	124...198	40						131		10		20		
LRE484	146...234	48						134		12		25		
LRE485	174...279						32.5					25	4	
LRE486	208...333													
LRE487	259...414													
LRE488	321...513	55	76			242	43	140	148	14	77	30	5	222
LRE489	394...630	80	80				43.5	150				40	6	

LRE48●

Independent mounting on mounting plate

LRE48●: with direct mounting.





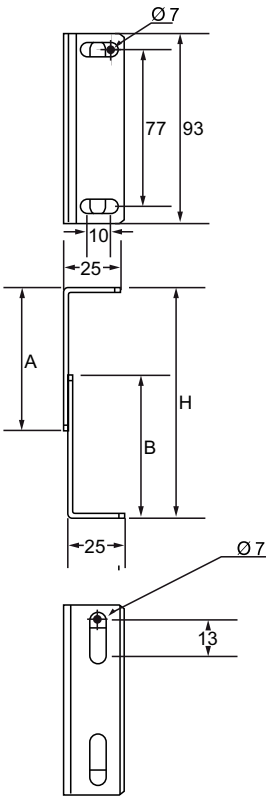
(mm)

Dimensions and mounting

Range (A)		A	B	C	D	E	F	H
LRE480	51…81	34.8	55.5	93	164	77	38	180
LRE481	62...99							
LRE482	84...135							
LRE483	124...198	40					82	223
LRE484	146...234	48					113	255
LRE485	174...279							
LRE486	208...333							
LRE487	259...414							
LRE488	321...513	55	76		222			264
LRE489	394...630	80	80				125	279

EasyPact TVS thermal overload relays

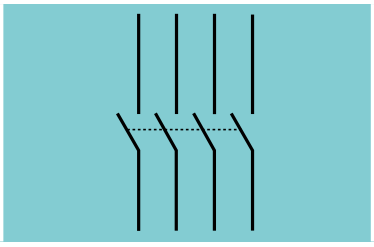
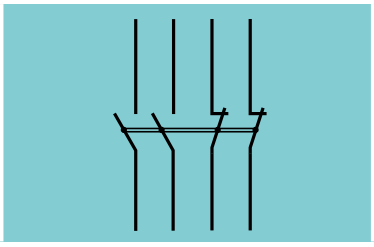
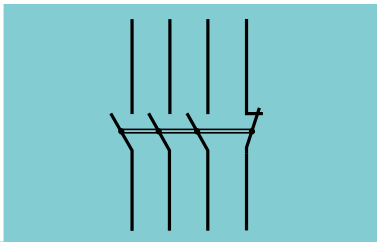
Independant mounting and connection



Accessories for LRE48X Thermal Overload Relay			
Relay mounting with Contactor directly			
Relay	Contactor	Mounting support	
		cat No.	weight (Kg)
LRE480	LC1E120...160	LAES1	0.12
LRE481	LC1E120...160	LAES1	0.12
LRE482	LC1E120...160	LAES1	0.12
LRE483	LC1E200	LAES2	0.2
LRE484	LC1E250...300	LAES2	0.2
LRE485	LC1E250...300	LAES2	0.2
LRE486	LC1E250...300	LAES2	0.2
LRE487	LC1E300...400	LAES2	0.2

Dimension	LAES1	LAES2	
A (mm)	34	70	
B (mm)	30	70	
C (mm)	34-42	75-90	107-122

EasyPact TVS 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	~ 50 Hz		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			3
Mechanical durability In millions of operating cycles	Coil type:	50 Hz		10

Control connection (coil)

Connecting to screw clamp 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

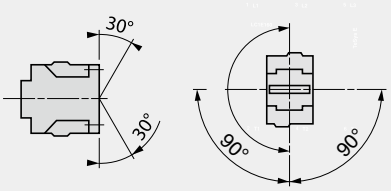
Characteristics of built in instantaneous contacts

Number of contacts				4
Rated operational voltage (Ue)	Up to		V	690
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1			690
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			MΩ	> 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

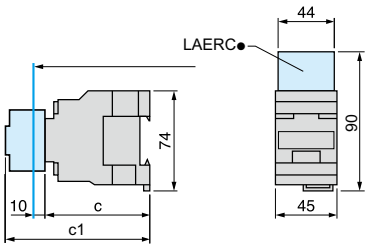
Connecting to screw clamp terminals	Flexible cable without cable end	1 conductor	mm²	1...2.5
		2 conductors		1...2.5
	Flexible cable with cable end	1 conductor		1...2.5
		2 conductors		1...2.5
	Solid cable without cable end	1 conductor		1...2.5
		2 conductors		1...2.5
	Tightening torque		N.m	1.2

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 ware, 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 Ue in worst conditions.

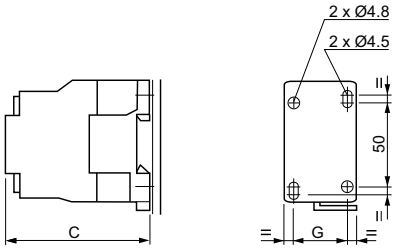
CAE●●



CAE	32	50
c	80	80
c1 with LAEN	113	113

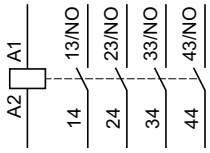
CAE

On mounting plate AM1-P

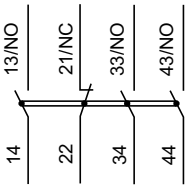


	CAE~
c	80
G	35

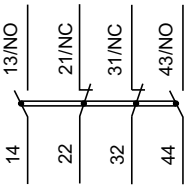
CAE40



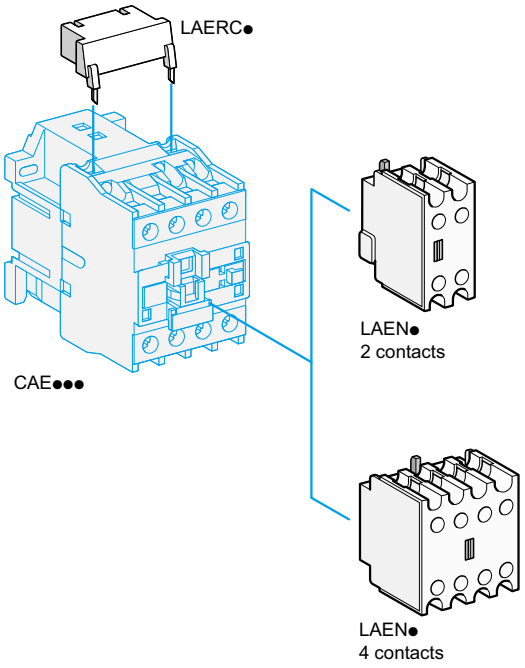
CAE31



CAE22



EasyPact TVS 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	Side 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

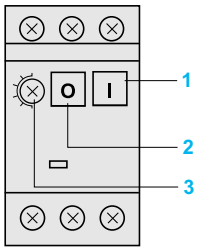
RC suppressor

■ Effective protection for circuits highly sensitive to "high frequency" interference and transcient 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

Protection components
Thermal-magnetic motor circuit-breakers
GZ1 E

Presentation



GZ1 E motor circuit-breakers are 3-pole thermal-magnetic circuit-breakers specifically designed for the control and protection of motors, conforming to standards IEC 60947-2 and IEC 60947-4-1.

Connection
These circuit-breakers are designed for connection by screw clamp terminals. This technique ensures secure, permanent and durable clamping that is resistant to harsh environments, vibration and impact and is even more effective when conductors without cable ends are used. Each connection can take two independent conductors.

Pushbutton control.
Energisation is controlled manually by operating the Start button “I” 1.
De-energisation is controlled manually by operating the Stop button “O” 2, or automatically by the thermal-magnetic protection elements or by a voltage trip attachment.

Protection of motors and personnel
Motor protection is provided by the thermal-magnetic protection elements incorporated in the motor circuit-breaker.
The magnetic elements (short-circuit protection) have a non-adjustable tripping threshold, which is equal to about 13 times the maximum setting current of the thermal trips.
The thermal elements (overload protection) include automatic compensation for ambient temperature variations.
The rated operational current of the motor is displayed by means of a graduated knob 3.
Personnel protection is also provided. All live parts are protected against direct finger contact.
GZ1 E motor circuit-breakers are easily installed in any confi guration thanks to their universal fi xing arrangement: screw fi xing or clip-on mounting on symmetrical, asymmetrical or combination rails.

Environment

Circuit-breaker type			**GZ1 E**	
Conforming to standards			IEC 60947-2, IEC 60947-4	
Protective treatment			“TH”	
Degree of protection			In **GV2 MC01** enclosure: IP 41 In **GV2 MC02** enclosure: IP 55	
Ambient air temperature	Storage	**°C**	- 40…+ 80	
	Operation		- 20…+ 60	
Flame resistance	Conforming to IEC 60695-2-1	**°C**	960	
Maximum operating altitude		**m**	2000	
Cabling Number of conductors and c.s.a.			**Min.**	**Max.**
	Solid cable	**mm²**	2 x 1	2 x 6
	Flexible cable without cable end	**mm²**	2 x 1.5	2 x 6
	Flexible cable with cable end	**mm²**	2 x 1	2 x 4
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6		Yes	
Tightening torque		**N.m**	1,7	
Rated operational voltage (Ue)	Conforming to IEC 60947-2	**V**	690	
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	**V**	690	
Rated operational frequency	Conforming to IEC 60947-2	**Hz**	50/60	
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	**kV**	6	
Total power dissipated per pole		**W**	2.5	
Mechanical durability (C.O.: closing, opening)		**C.O.**	100 000	
Electrical durability	For AC-3 duty	**CF.O.**	100 000	
Duty class (maximum operating rate)		**C.O./h**	25	

Protection components
Thermal-magnetic motor circuit-breakers
GZ1 E

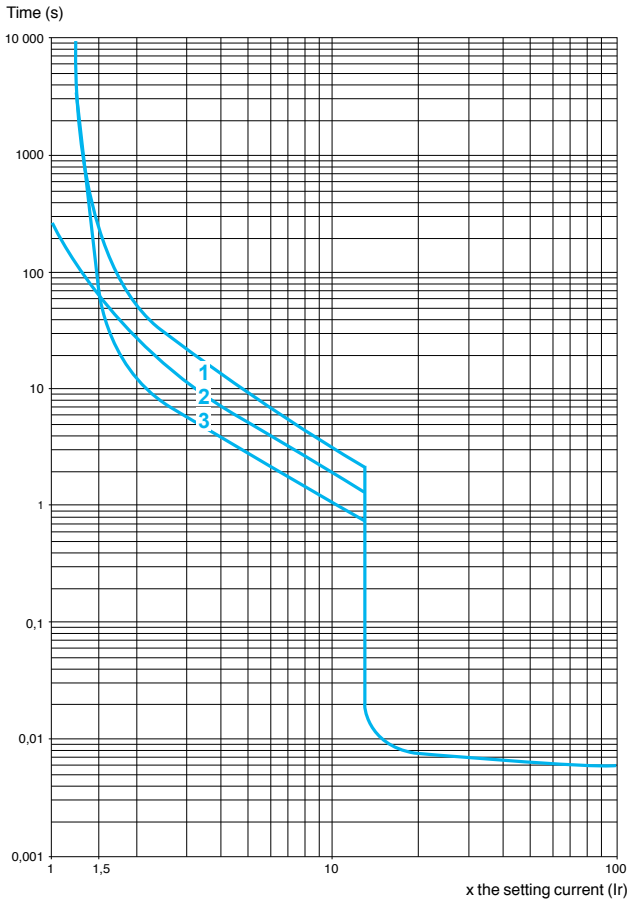
Breaking capacity

Circuit-breaker type				GZ1 E								
				01 to 06	07	08	10	14	16	20	21	22 to 32
Rating			A	0.1 to 1.6	2,5	4	6.3	10	14	18	23	25 to 32
Breaking capacity	230/240 V	Icu	kA	★	★	★	★	★	★	★	30	30
conforming to IEC 60947-2		Ics % (1)		★	★	★	★	★	★	★	100	100
	400/415 V	Icu	kA	★	★	★	★	★	10	10	10	10
		Ics % (1)		★	★	★	★	★	50	50	40	40
	440 V	Icu	kA	★	★	★	30	10	6	6	5	5
		Ics % (1)		★	★	★	100	100	50	50	50	50
	500 V	Icu	kA	★	★	★	30	8	5	5	3	3
		Ics % (1)		★	★	★	100	100	75	75	75	75
	690 V	Icu	kA	★	2	2	2	2	2	2	2	2
		Ics % (1)		★	75	75	75	75	75	75	75	75

★ > 100 kA.
(1) As % of Icu.

Tripping curves

Average operating times at 20 °C related to multiples of the setting current



1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

Protection components
Thermal-magnetic motor circuit-breakers GZ1 E

CPB100407

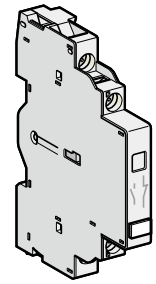
GZ1 E

Motor circuit-breakers

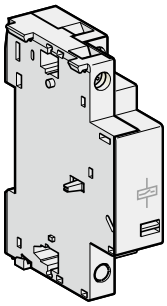
Pushbutton control

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3					Setting range of thermal trips	Magnetic tripping current Id ± 20 %	Reference	Weight
230 V	400 V	440 V	500 V	690 V				
kW	kW	kW	kW	kW	A	A		kg
–	–	–	–	–	0.1…0.16	1.5	**GZ1 E01**	0.260
–	–	–	–	–	0.16…0.25	2.4	**GZ1 E02**	0.260
–	–	–	–	–	0.25…0.40	5	**GZ1 E03**	0.260
–	–	–	–	0.37	0.40…0.63	8	**GZ1 E04**	0.260
–	–	–	0.37	0.55	0.63…10	13	**GZ1 E05**	0.260
–	0.37	0.55	0.75	1.1	1…1.6	22.5	**GZ1 E06**	0.260
0.37	0.75	1.1	1.1	1.5	1.6…2.5	33.5	**GZ1 E07**	0.260
0.75	1.5	1.5	2.2	3	2.5…4	51	**GZ1 E08**	0.260
1.1	2.2	3	3.7	4	4…6.3	78	**GZ1 E10**	0.260
2.2	4	4	5.5	7.5	6…10	138	**GZ1 E14**	0.260
–	5.5	5.5	9	11	9…14	170	**GZ1 E16**	0.260
4	7.5	9	10	15	13…18	223	**GZ1 E20**	0.260
5.5	9	11	11	18.5	17…23	327	**GZ1 E21**	0.260
5.,5	11	11	15	22	20…25	327	**GZ1 E22**	0.260
7.5	15	15	18.5	22	24…32	416	**GZ1 E32**	0.260

Protection components
Thermal-magnetic motor circuit-breakers GZ1 E



GZ1 AN11



GZ1 AS115

Contact blocks

Instantaneous auxiliary contacts

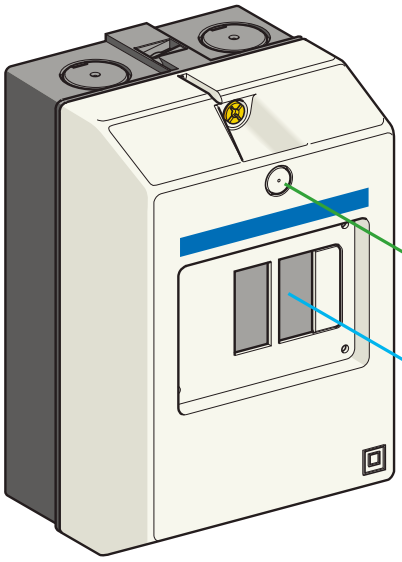
Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference	Weight kg
Side	2	N/O + N/C	1	**GZ1 AN11**	0.050
LH side		N/O + N/O	1	**GZ1 AN20**	0.050

Electric trips

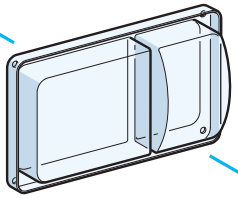
Montage	Type	Tension		Reference	Weight kg
Side (1 block on RH side of circuit-breaker)	Undervoltage trip	110…115 V	50 Hz	**GZ1 AU115**	0.105
		220…240 V	50 Hz	**GZ1 AU225**	0.105
		380…400 V	50 Hz	**GZ1 AU385**	0.105
	Shunt trip	110…115 V	50 Hz	**GZ1 AS115**	0.105
		220…240 V	50 Hz	**GZ1 AS225**	0.105

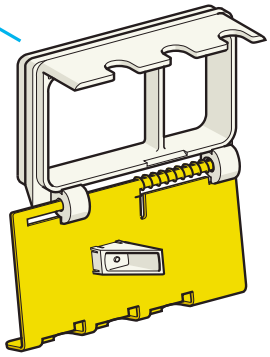
Mounting accessory

Description	Application	Sold in lots of	Unit reference	Weight kg
Adapter plate	For screw fixing of a GZ1 E	10	**GV2 AF02**	0.021

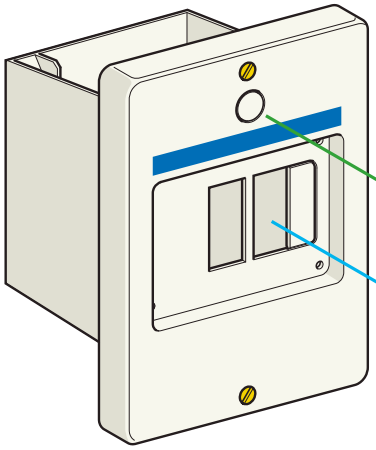


GV2 MC

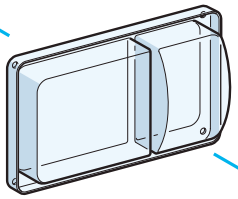


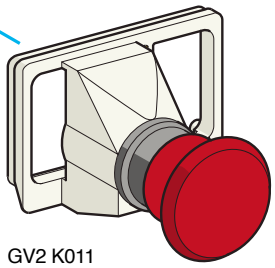


GV2 V01

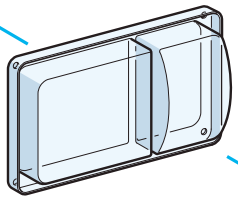


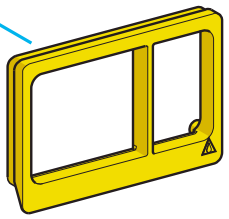
GV2 MP



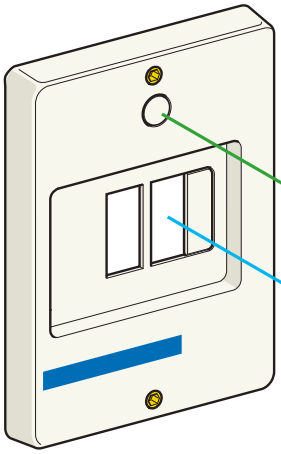


GV2 K011

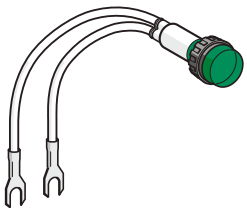




GV2 E01



GV2 CP



GV2 SN

Protection components
Thermal-magnetic motor circuit-breakers GZ1 E

Enclosures for thermal-magnetic circuit-breakers GZ1 E

Type	Degree of protection	Reference	Weight kg
Surface mounting, double insulated, with protective earth Sealable cover	IP 41	**GV2 MC01**	0.290
	IP 55	**GV2 MC02**	0.300
Flush mounting, with protective earth	IP 41 (front face)	**GV2 MP01**	0.115
	IP 55 (front face)	**GV2 MP02**	0.130

Front plate

Description	Degree of protection	Sold in lots of	Unit reference	Weight kg
For direct control, through a panel, of a chassis mounted GZ1 E	IP 55	1	**GV2 CP21**	0.800

Accessories common to all enclosures (to be ordered separately)

Padlocking device [1] **for GZ1 E operator** (padlocking is only possible in the “O” position)	1 to 3 padlocks Ø 4 to 8 mm	1	**GV2 V01**	0.075
Mushroom head “Stop” pushbutton, Ø 40 mm, red	Spring return [1]	1	**GV2 K011**	0.052
Sealing kit	For enclosures and front plate IP 55	10	**GV2 E01**	0.012
Neutral terminal		100	**AB1 VV635UBL**	0.015
Partition		50	**AB1 AC6BL**	0.003

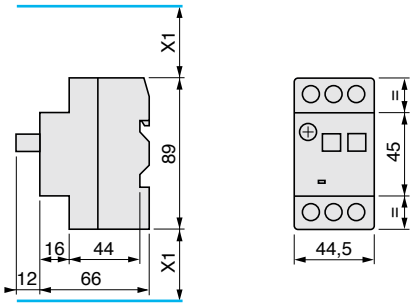
Description	Voltage V	Colour	Sold in lots of	Unit reference	Weight kg
Pilot light with neon bulb	380/440	Green	10	**GV2 SN33**	0.019
		Red	10	**GV2 SN34**	0.019
		Orange	10	**GV2 SN35**	0.019
		Clear	10	**GV2 SN37**	0.019

[1] Supplied with IP 55 sealing kit. To be fitted with enclosures **GV2 M●01**.

Protection components
Thermal-magnetic motor circuit-breakers GZ1E

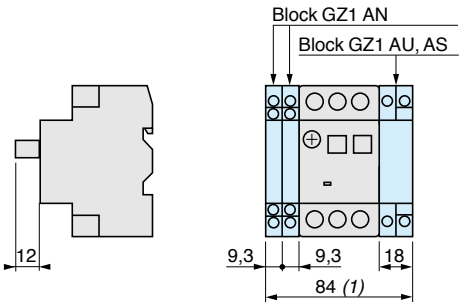
Dimensions

GZ1 E



X1: electrical clearance = 40 mm for Ue y 690 V.

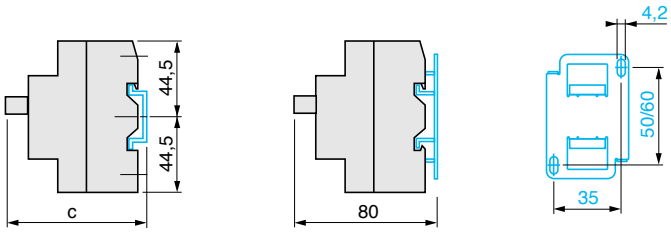
GZ1 AN, GZ1 AU, GZ1 AS



(1) max.

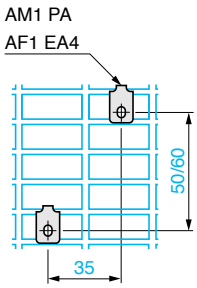
Mounting

GZ1 E on 35 mm ⩽ rail

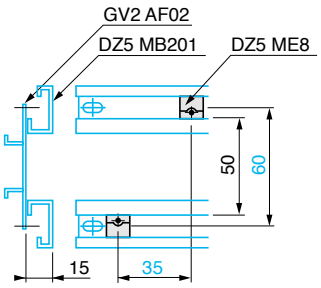


c = 78.5 on AM1 DP200 (35 x 7.5).
c = 86 on AM1 DE200 and AM1 ED200 (35 x 15).

GZ1 E on pre-slotted mounting plate



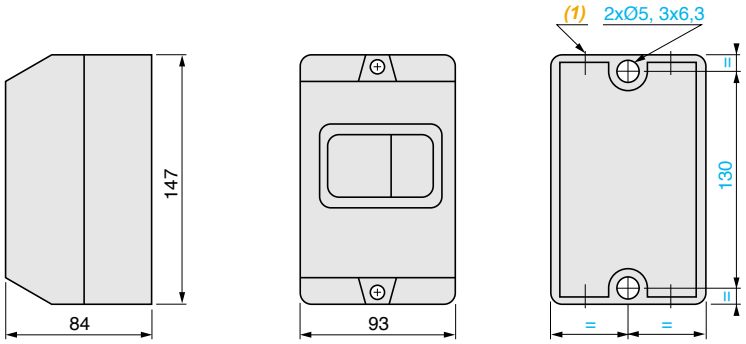
GZ1 E on rails DZ5 MB201, DZ5 ME8 or GV2 AF02



Protection components
Thermal-magnetic motor circuit-breakers GZ1 E, in enclosure

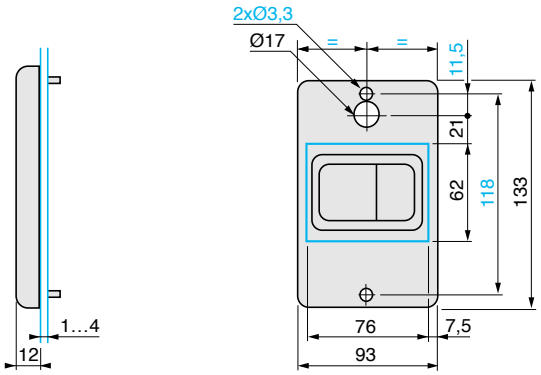
Dimensions

Surface mounting enclosure GV2 MC0●

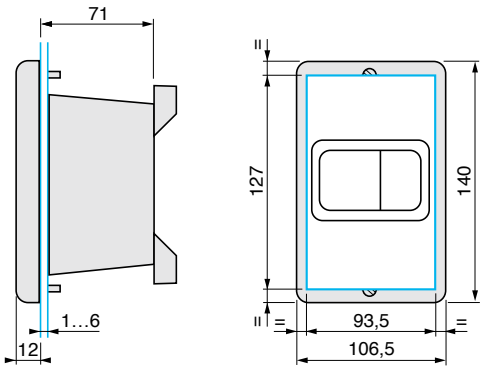


(1) 4 knock-outs for 16 mm plastic cable gland or 16 mm conduit.

Front plate GV2 CP21



Flush mounting enclosures GV2 MP01 and GV2 MP02



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.

EasyPact TVS LC1E06 to 630

Type 1 coordination (IEC 947-4-1)

400 - 440 V

Direct on line starter													
Motors					Switch-fuse (1)	Fuse-link type:	Fuse size	Switch-Fuse	Fuse-link type:	Fuse size	Contactors	Thermal o/l relays:	
	400V		440V										
P(KW)	Ie	P(KW)	Ie	Ie max	Type	gG cal(A)		Type	aM cal(A)		Type	Type	Ith
0,06	0,2	**0,06**	0,19	0,25	GS* G	4	T000	GS* G	2	T000	LC1E06	LRE02	0.16..0.25
0,09	0,3	**0,09**	0,28	0,4	GS* G	4	T000	GS* G	2	T000	LC1E06	LRE03	0.25..0.4
-	-	**0,12**	0,37	0,63	GS* G	4	T000	GS* G	2	T000	LC1E06	LRE04	0.4..0.63
0,12	0,44	**-**	-	1	GS* G	4	T000	GS* G	2	T000	LC1E06	LRE05	0.63..1
0,18	0,6	**0,18**	0,55	1	GS* G	4	T000	GS* G	2	T000	LC1E06	LRE05	0.63..1
0,37	1,1	**0,37**	1	1,6	GS* G	4	T000	GS* G	2	T000	LC1E06	LRE06	1..1,6
0,55	1,5	**0,55**	1,36	1,6	GS* G	6	T000	GS* G	2	T000	LC1E06	LRE06	1..1,6
0,75	1,9	**0,75**	1,68	2,5	GS* G	10	T000	GS* G	4	T000	LC1E06	LRE07	1,6..2,5
-	-	**1,1**	2,37	2,5	GS* G	10	T000	GS* G	4	T000	LC1E06	LRE07	1,6..2,5
1,1	2,7	**-**	-	4	GS* G	10	T000	GS* G	4	T000	LC1E06	LRE08	2,5..4
1,5	3,6	**1,5**	3,06	4	GS* G	16	T000	GS* G	4	T000	LC1E06	LRE08	2,5..4
2,2	4,9	**2,2**	4,42	6	GS* G	16	T000	GS* G	6	T000	LC1E06	LRE10	4..6
3	6,5	**3**	5,77	8	GS* G	20	T000	GS* G	8	T000	LC1E09	LRE12	5,5..8
4	8,5	**4**	7,9	9	GS* G	25	T000	GS* G	12	T000	LC1E09	LRE14	7..10
5,5	11,5	**5,5**	10,4	12	GS* G	32	T000	GS* G	16	T000	LC1E12	LRE16	9..13
7,5	15,5	**7,5**	13,7	18	GS* G	40	T000	GS* G	16	T000	LC1E18	LRE21	12..18
9	18,1	**9**	16,9	24	GS* G	50	T000	GS* G	25	T000	LC1E25	LRE22	16..24
11	22	**11**	20,1	24	GS* G	50	T000	GS* G	25	T000	LC1E25	LRE22	16..24
15	29	**15**	26,5	32	GS* G	80	T000	GS* G	32	T000	LC1E32	LRE32	23..32
18,5	35	**18,5**	32,8	40	GS* G	80	T000	GS* G	40	T000	LC1E40	LRE355	30..40
22	41	**22**	39	50	GS* G	100	T000	GS* G	50	T000	LC1E50	LRE357	37..50
30	55	**30**	51,5	65	GS* KK	125	T00	GS* KK	80	T00	LC1E65	LRE359	48..65
37	66	**37**	64	70	GS* KK	160	T00	GS* KK	100	T00	LC1E80	LRE361	55..70
-	-	**45**	76	80	GSx L	200	T0	GS* KK	100	T00	LC1E80	LRE363	63..80
45	80	**-**	-	95	GSx L	200	T0	GS* KK	100	T00	LC1E95	LRE365	80..104
55	97	**55**	90	120	GSx L	200	T0	GS* L	125	T0	LC1E120	LRE482	84..135
75	132	**75**	125	160	GSx N	250	T1	GS* L	160	T0	LC1E160	LRE483	124..198
90	160	**90**	146	200	GSxQQ	350	T2	GS* N	200	T1	LC1E200	LRE483	124..198
110	195	**110**	178	234	GSxQQ	400	T2	GS* N	250	T1	LC1E250	LRE484	146..234
132	230	**132**	215	234	GS2 S	450	T3	GS* QQ	315	T2	LC1E250	LRE484	146..234
160	280	**160**	256	300	GS2 S	630	T3	GS* QQ	400	T2	LC1E300	LRE486	208..333
200	350	**200**	391	400	GS2 S	500	T3	GS*QQ	400	T3	LC1E400	LRE487	259….414
250	430	**250**	461	500	GS2 S	800	T3	GS*QQ	500	T3	LC1E500	LRE488	321….513
335	574	**335**	627	630	GS2 S	1000	T3	GS*QQ	630	T3	LC1E630	LRE489	394….630

(1) Proposed Switch-Fuse are for Blade fuse type. Other fuse type and according switch-fuse can be used.

EasyPact TVS LC1E06 to 300

Type 1 coordination (IEC 947-4-1)

400 - 440 V

Star-delta starter

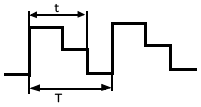
Motors							Switch-fuse (1)	Fuse-link type:	Fuse size	Switch-Fuse	Fuse-link type:	Fuse size	Line contactor	Delta contactor	Star contactor	Thermal o/l relays:	
	400V			440V													
P (KW)	Ie	I rD	P (KW)	Ie	IrD	Ie max	Type	gG cal(A)		Type	aM cal(A)		Type	Type	Type	Type	Ith
1,5	3,6	2,08	**1,5**	3,06	1,8	4	GS* G	10	T000	GS* G	4	T000	LC1E06	LC1E06	LC1E06	LRE07	1,6..2,5
2,2	4,9	2,83	**2,2**	4,42	2,6	6	GS* G	16	T000	GS* G	6	T000	LC1E06	LC1E06	LC1E06	LRE08	2,5..4
3	6,5	3,75	**3**	5,77	3,3	8	GS* G	16	T000	GS* G	8	T000	LC1E06	LC1E06	LC1E06	LRE08	2,5..4
4	8,5	4,9	**4**	7,9	4,6	10	GS* G	20	T000	GS* G	12	T000	LC1E06	LC1E06	LC1E06	LRE10	4..6
-	-	-	**5,5**	10,4	6	12	GS* G	20	T000	GS* G	16	T000	LC1E06	LC1E06	LC1E06	LRE10	4..6
5,5	11,5	6,64	**-**	-	-	16	GS* G	20	T000	GS* G	16	T000	LC1E09	LC1E09	LC1E09	LRE14	7..10
7,5	15,5	8,95	**7,5**	13,7	7,9	16	GS* G	32	T000	GS* G	16	T000	LC1E09	LC1E09	LC1E09	LRE14	7..10
9	18,1	10,5	**9**	16,9	9,8	20	GS* G	32	T000	GS* G	25	T000	LC1E12	LC1E12	LC1E09	LRE16	9..13
11	22	12,7	**11**	20,1	12	24	GS* G	50	T000	GS* G	25	T000	LC1E18	LC1E18	LC1E09	LRE21	12..18
15	29	16,7	**15**	26,5	15	32	GS* G	63	T000	GS* G	32	T000	LC1E18	LC1E18	LC1E09	LRE21	12..18
18,5	35	20,2	**18,5**	32,8	19	40	GS* G	80	T000	GS* G	40	T000	LC1E25	LC1E25	LC1E09	LRE22	16..24
22	41	23,7	**22**	39	23	43	GS* G	80	T000	GS* G	50	T000	LC1E25	LC1E25	LC1E09	LRE32	23..32
30	55	31,8	**30**	51,5	30	55	GS* KK	100	T00	GS* KK	80	T00	LC1E32	LC1E32	LC1E18	LRE35	30..38
37	66	38,1	**37**	64	37	70	GS* KK	125	T00	GS* KK	100	T00	LC1E40	LC1E40	LC1E40	LRE355	30..40
45	80	46,2	**45**	76	44	85	GSx L	160	T0	GS* KK	100	T00	LC1E50	LC1E50	LC1E40	LRE357	37..50
55	97	56	**55**	90	52	110	GSx L	200	T0	GS* L	125	T0	LC1E65	LC1E65	LC1E40	LRE359	48..65
75	132	76,2	**75**	125	72	140	GSx N	250	T1	GS* L	160	T0	LC1E80	LC1E80	LC1E65	LRE365	80..104
90	160	92,4	**90**	146	84	165	GSxQQ	350	T2	GS* N	200	T1	LC1E95	LC1E95	LC1E80	LRE365	80..104
110	195	113	**110**	178	103	210	GSxQQ	400	T2	GS* N	250	T1	LC1E120	LC1E120	LC1E95	LRE482	84..135
132	230	133	**132**	215	124	280	GS2 S	450	T3	GS* QQ	315	T2	LC1E160	LC1E160	LC1E120	LRE483	124..198
160	280	162	**160**	256	148	300	GS2 S	500	T3	GS* QQ	315	T2	LC1E200	LC1E200	LC1E160	LRE483	124..198
220	388	224	**220**	350	202	405	GS2 S	630	T3	GS* QQ	400	T2	LC1E250	LC1E250	LC1E200	LRE484	146..234
260	480	277	**220**	430	248	500	GS2 S	800	T3	GS2 S	500	T3	LC1E300	LC1E300	LC1E250	LRE486	208..333

(1) Proposed Switch-Fuse are for Blade fuse type. Other fuse type and according switch-fuse can be used.

Glossary

Altitude	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. Derating factors to be applied above this for main pole operational voltage and current (a.c.supply) are as follows:

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	The temperature of the air surrounding the device, measured near to the device. The operating characteristics are given: ■ 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, ulilisation 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)	This is the ratio between the time the current flows (t) and the duration of the cycle (T).  m=t/T Cycle duration: duration of current flow + time at zero current.
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 ($X = L\omega$). 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.
Electrical durability	This is the average number of on-load operating cycles which the main pole contacts can perform without maintance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.
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.

(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 symetrical component.

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

Definitions

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.

3-phase 4-pole motors

Current values for power in kW

Rated operational power *(1)*	Indicative rated operational current values at:			
	230 V	400 V	500 V	690 V
kW	A	A	A	A
0.06	0.35	0.2	0.16	0.12
0.09	0.52	0.3	0.24	0.17
0.12	0.7	0.44	0.32	0.23
0.18	1	0.6	0.48	0.35
0.25	1.5	0.85	0.68	0.49
0.37	1.9	1.1	0.88	0.64
0.55	2.6	1.5	1.2	0.87
0.75	3.3	1.9	1.5	1.1
1.1	4.7	2.7	2.2	1.6
1.5	6.3	3.6	2.9	2.1
2.2	8.5	4.9	3.9	2.8
3	11.3	6.5	5.2	3.8
4	15	8.5	6.8	4.9
5.5	20	11.5	9.2	6.7
7.5	27	15.5	12.4	8.9
11	38	22	17.6	12.8
15	51	29	23	17
18.5	61	35	28	21
22	72	41	33	24
30	96	55	44	32
37	115	66	53	39
45	140	80	64	47
55	169	97	78	57
75	230	132	106	77
90	278	160	128	93
110	340	195	156	113
132	400	230	184	134
160	487	280	224	162
200	609	350	280	203
250	748	430	344	250
315	940	540	432	313
355	1061	610	488	354
400	1200	690	552	400
500	1478	850	680	493
560	1652	950	760	551
630	1844	1060	848	615
710	2070	1190	952	690
800	2340	1346	1076	780
900	2640	1518	1214	880
1000	2910	1673	1339	970

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	Gosudarstvenne 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.

Schneider Electric Industries SAS
35, rue Joseph Monier
CS 30323
F - 92506 Rueil Malmaison Cedex

RCS Nanterre 954 503 439
Capital social 896 313 776 €
www.schneider-electric.com

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

This document has been printed on ecological paper.

Design: Schneider Electric
Photos: Schneider Electric
Printed:

ART960595 © 2012 - Schneider Electric - All rights reserved