

Technical Data for Designers

Contents

TeSys D, TeSys D Green:

- > characteristics.....B8/61 to B8/73
- > dimensions.....B8/74 to B8/87

TeSys SK:

- > characteristics.....B8/88 to B8/91
- > dimensions.....B8/92

TeSys K:

- > characteristics.....B8/93 to B8/96
- > dimensions.....B8/97 to B8/100

TeSys SKGC:

- > characteristics.....B8/101 to B8/104
- > dimensions.....B8/105

TeSys GC:

- > characteristics.....B8/106 to B8/113
- > dimensions.....B8/114 and B8/115

TeSys GY:

- > characteristics.....B8/116 to B8/119
- > dimensions.....B8/120 and B8/78

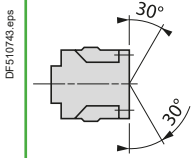
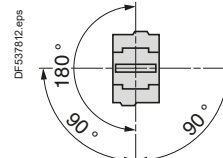
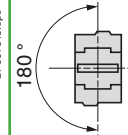
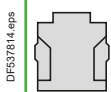
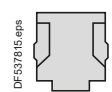
TeSys GF:

- > characteristics.....B8/122 to B8/125
- > dimensions.....B8/126

Standard IEC tests - Contactors
conforming to UL/CSA.....B8/127

TeSys contactors

TeSys D, TeSys D Green contactors

Environment			D09...D18 DT20 and DT25	D25...D38 DT32 and DT40	D40A...D80A DT60A and DT80A	D80...D95	D115 and D150	
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1, overvoltage category III, degree of pollution: 3	V	690				1000	
	Conforming to UL, CSA	V	600					
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947	kV	6				8	
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4					
Product certifications ⁽¹⁾			UL, CSA, CCC, EAC, CB certification, EU-MR-RO by DNV-GL			UL, CSA, CCC, EAC, CB certification, DNV-GL, RINA, BV, LRoS		
Degree of protection ⁽²⁾ (front face)	Conforming to IEC 60529							
	Power circuit connections		Protection against direct finger contact IP20					
	Coil connection		Protection against direct finger contact IP20					
Climatic withstand			According to IACS E10 and IEC 60947-1 Annex Q category D			According to IACS E10		
Ambient air temperature around the device	Storage	°C	-60...+80					
	Operation ⁽³⁾	°C	-40...+60					
	Allowed with derating ^{(3) (4)}	°C	+60...+70 at U _c to 1.●● x U _c					
Maximum operating altitude	Without derating	m	3000					
Operating positions ⁽⁵⁾	Without derating in the following positions		AC and DC coils AC/DC and "BBE" coils 		AC coils AC/DC and "BBE" coils 		DC coils 	
	Positions that are not allowed		For --- contactors LC1 D09 to LC1 D150.  					
Flame resistance	Conforming to IEC 60695-2-11	°C	850					
Shock resistance ⁽⁶⁾ 1/2 sine wave = 11 ms	Contacteur open		10 gn	8 gn	10 gn	8 gn	6 gn	
	Contacteur closed		15 gn	15 gn	15 gn	10 gn	15 gn	
Vibration resistance ⁽⁶⁾ 5...300 Hz	Contacteur open		2 gn					
	Contacteur closed		4 gn	4 gn	4 gn	3 gn	4 gn	

(1) Contactor LC1 D95 with d.c. coil is not UL/CSA certified.

(2) Protection provided for the cabling c.s.a.'s indicated on the next page and for connection by cable. For lug type: add a protective cover.

(3) As per IEC60947-4-1, operating time and drop out voltage given and tested for -5...+40 °C.

(4) Refer to operational current in AC1 (page A6/30).

(5) When mounting on a vertical rail, use a stop.

(6) Without modifying the power contact states, in the most unfavourable direction (coil energised at U_e).

In case of vibration, it is recommended to mount the devices separately by screws on metal plate.

TeSys contactors

TeSys D, TeSys D Green contactors

Pole characteristics TeSys D, TeSys D Green										
Contactor type		LC1	D09 (3P)	DT20 D098	D12 (3P)	DT25 D128	D18 (3P)	DT32 D188	D25 (3P)	DT40 D258
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 60 °C	A	9		12		18		25	
	In AC-1, θ ≤ 60 °C	A	25 ⁽¹⁾	20	25 ⁽¹⁾	25	32 ⁽¹⁾	32	40 ⁽¹⁾	40
Rated operational voltage (Ue)	Up to	V	690		690		690		690	
Frequency limits	Of the operational current	Hz	25...400		25...400		25...400		25...400	
Conventional thermal current (Ith)	θ ≤ 60 °C	A	25 ⁽¹⁾	20	25 ⁽¹⁾	25	32 ⁽¹⁾	32	40 ⁽¹⁾	40
Rated making capacity (440 V)	Conforming to IEC 60947	A	250		250		300		450	
Rated breaking capacity (440 V)	Conforming to IEC 60947	A	250		250		300		450	
Permissible short time rating No current flowing for preceding 15 minutes with θ ≤ 40 °C	For 1 s	A	210		210		240		380	
	For 10 s	A	105		105		145		240	
	For 1 min	A	61		61		84		120	
	For 10 min	A	30		30		40		50	
Fuse protection against short-circuits (U ≤ 690 V)	Without thermal overload relay, gG fuse	type 1	A	25		40		50		63
		type 2	A	20		25		35		40
	With thermal overload relay	A	See pages B11/4 and B11/5, for aM or gG fuse ratings corresponding to the associated thermal overload relay							
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5		2.5		2.5		2	
Power dissipation per pole for the above operational currents	AC-3	W	0.20		0.36		0.8		1.25	
	AC-1	W	1.56		1.56		2.5		3.2	

Control circuit characteristics, a.c. supply TeSys D						
Rated control circuit voltage (Uc)	50/60 Hz	V	12...690			
Control voltage limits	50 or 60 Hz coils	Operation	-			
		Drop-out	-			
	50/60 Hz coils	Operation	0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C			
		Drop-out	0.3...0.6 Uc at 60 °C			
Average consumption at 20 °C and at Uc	~ 50 Hz	Inrush	50 Hz coil	VA	-	
			Cos φ		0.75	
		Sealed	50 Hz coil	VA	70	
			Cos φ		0.3	
		~ 60 Hz	Inrush	60 Hz coil	VA	7
				Cos φ		0.75
	Sealed		60 Hz coil	VA	70	
			Cos φ		0.3	
	50/60 Hz coil		VA	7.5		
	Heat dissipation		50/60 Hz	W	2...3	
	Operating time ⁽²⁾	Closing "C"	ms	12...22		
		Opening "O"	ms	4...19		
Mechanical durability in millions of operating cycles	50 or 60 Hz coil		-			
	50/60 Hz coil on 50 Hz		15			
Maximum operating rate at ambient temperature ≤ 60 °C	In operating cycles per hour		3600			

(1) Versions with spring terminal connections:

16 A for LC1 D093 and LC1 D123 (20 A possible with 2 x 2.5 mm² in parallel),

25 A for LC1 D183 to LC1 D323 (32 A possible for LC1 D183 connected with 2 x 4 mm² cables in parallel; 40 A possible for LC1 D253 and LC1 D323 connected with 2 x 4 mm² in parallel).

(2) The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

D32	D38	D40A	DT60A	D50A	D65A	D80A	DT80A	D80	D95	D115	D150
32	38	40	–	50	65	80	–	80	95	115	150
50 ⁽¹⁾	50	60	60	80	80	80	80	125	125	200	200
690	690	690	690	690	690	690	690	1000	1000	1000	1000
25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400
50	50	60	60	80	80	80	80	125	125	200	200
550	550	800	800	900	1000	1000	1000	1100	1100	1260	1660
550	550	800	800	900	1000	1000	1000	1100	1100	1100	1400
430	430	720	720	810	900	900	900	990	1100	1100	1400
260	310	320	320	400	640	640	640	640	800	950	1200
138	150	165	165	208	260	260	260	320	400	550	580
60	60	72	72	84	110	110	110	135	135	250	250
63	63	80	80	100	125	125	125	200	200	250	315
63	63	80	80	100	125	125	125	160	160	200	250

See pages B11/4 and B11/5 for aM or gG fuse ratings corresponding to the associated thermal overload relay

2	2	1.5	1.6	1.5	1.5	1.5	1.6	0.8	0.8	0.6	0.6
2	3	2.4	–	3.7	6.3	6.3	–	5.1	7.2	7.9	13.5
5	5	5.4	5.8	9.6	9.6	9.6	10.2	12.5	12.5	24	24

12...690	12...690							24...500			
–	–							0.85...1.1 Uc at 55 °C			
–	–							0.3...0.6 Uc at 55 °C		0.3...0.5 Uc at 55 °C	
0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C	0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C							0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 55 °C		0.8...1.15 Uc on 50/60 Hz at 55 °C	
0.3...0.6 Uc at 60 °C	0.3...0.6 Uc at 60 °C							0.3...0.6 Uc at 55 °C		0.3...0.5 Uc at 55 °C	
–	–							200		300	
0.75	0.75							0.75		0.8	
70	160							245		280...350	
–	–							20		22	
0.3	0.3							0.3		0.3	
7	15							26		2...18	
–	–							220		300	
0.75	0.75							0.75		0.8	
70	140							245		280...350	
–	–							22		22	
0.3	0.3							0.3		0.3	
7.5	13							26		2...18	
2...3	4...5							6...10		3...8	
12...22	12...26	12...26	12...26	12...26	12...26	12...26	12...26	20...35	20...35	20...50	20...35
4...19	4...19	4...19	4...19	4...19	4...19	4...19	4...19	6...20	6...20	6...20	40...75
–	–							10		8	
15	6	6	6	6	6	6	6	4	4	8	8
3600	3600		3600	3600	3600	3600	3600	3600	3600	2400	1200

d.c. control circuit characteristics TeSys D				LC1 D09...D38 LC1 DT20...DT40	LC1 D40A...D80A LC1 DT60A and DT80A	LC1 or LP1 D80 LC1 D95	LC1 D115 and LC1 D150
Rated control circuit voltage (Uc) ---			V	12...440	12...440		24...440
Rated insulation voltage	Conforming to IEC 60947-1		V	690			
	Conforming to UL, CSA		V	600			
Control voltage limits	Operation	Standard coil		0.7...1.25 Uc at 60 °C	0.75...1.25 Uc at 60 °C	0.85...1.1 Uc at 55 °C	0.75...1.2 Uc at 55 °C
		Wide range coil		–	–	0.75...1.2 Uc at 55 °C	–
	Drop-out			0.1...0.25 Uc at 60 °C	0.1...0.3 Uc at 60 °C	0.1...0.3 Uc at 55 °C	0.15...0.4 Uc at 55 °C
Average consumption at 20 °C and at Uc	---	Inrush	W	5.4	19	22	270...365
		Sealed	W	5.4	7.4	22	2.4...5.1
Operating time ⁽¹⁾ average at Uc	Closing	"C"	ms	63 ±15 %	50 ±15%	95...130	20...35
	Opening	"O"	ms	20 ±20 %	20 ±20%	20...35	40...75
				<i>Note: The arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.</i>			
Time constant (L/R)			ms	28	34	75	25
Mechanical durability at Uc	In millions of operating cycles			30	10	10	8
Maximum operating rate at ambient temperature ≤ 60 °C	In operating cycles per hour			3600	3600	3600	1200

Low consumption control circuit characteristics TeSys D				LC1 D09...D38 LC1 DT20...DT40	LC1 D40A...D80A LC1 DT60A and DT80A
Rated insulation voltage	Conforming to IEC 60947-1		V	690	–
	Conforming to UL, CSA		V	600	–
Maximum voltage	Of the control circuit on ---		V	250	–
Average consumption d.c. at 20 °C and at Uc	Wide range coil (0.8...1.25 Uc)	Inrush	W	2.4	–
		Sealed	W	2.4	–
Operating time ⁽¹⁾ at Uc and at 20 °C	Closing	"C"	ms	77 ±15 %	–
	Opening	"O"	ms	25 ±20 %	–
Voltage limits (θ ≤ 60 °C) of the control circuit	Operation			0.8 to 1.25 Uc	–
	Drop-out			0.1...0.3 Uc	–
Time constant (L/R)			ms	40	–
Mechanical durability	In millions of operating cycles			30	–
Maximum operating rate at ambient temperature ≤ 60 °C	In operating cycles per hour			3600	–

(1) The operating times depend on the type of contactor electromagnet and its control mode.
The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Characteristics

TeSys D Green

Contactors with AC/DC coil

Wide band TeSys D Green AC/DC coil circuit characteristics									
Rated control circuit voltage (Uc)		V	AC/DC 24...250						
Operation		V	0.85 Uc mini...1.1 Uc maxi at 60 °C in AC or DC (BNE coil: 0.8 Uc mini at 24 VDC, 0.85 Uc mini in AC).						
Drop-out		V	0.1 Uc maxi (e.g. 100 to 250 V = 25 V at 60 °C)						
Contactor type		LC1 D09...D38			LC1 D40A...D80A, LC1 DT60A, LC1 DT80A				
Coil code		BNE	EHE	KUE	BBE	BNE	EHE	KUE	
Rated control circuit voltage (Uc)		24-60	48-130	100-250	24 DC	24-60	48-130	100-250	
AC supply at 20°C	Consumption inrush	VA	15	25	25	-	15	23	18
	Consumption sealed	VA	0.9	1.3	1.6	-	1	1.4	1.8
	Consumption sealed	mA	28	15	9	-	35	17	9.5
	Heat dissipation	W	0.6	0.8	1.1	-	0.8	0.9	1.3
DC supply at 20°C	Consumption inrush	W	14	24	18	11	16	19	14
	Consumption sealed	mA	23	13	7	20	30	15	7.7
	Heat dissipation	W	0.6	0.8	1.1	0.5	0.7	0.9	1.2
Max operating time ⁽²⁾	Closing "C"	ms	50 ±5 ms			60 ±5 ms			
	Opening "O"	ms	20...90 ms			20...80 ms			
EMC immunity			Meets IEC 60947-4-1 standard, table 14						
EMC emission		IEC 60947-4-1 §9.4.3	Environment A ⁽¹⁾						
Maximum operating rate at ambient temperature ≤ 60°C		cycle/h	3600						
Mechanical durability at Uc In millions of operating cycles			15			6			

⁽¹⁾ Use of this product in EMC environment B may require mitigation measures to avoid unwanted disturbance.

⁽²⁾ The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separates.

TeSys contactors

TeSys D, TeSys D Green contactors

Power circuit connections

Screw clamp terminal connections TeSys D, TeSys D Green

Contactor type		LC1	D09 and D12 DT20 and DT25	D18 (3P)	D25 (3P)	D32	D38	D18 and D25 (4P) DT32 and DT40	D40A to D80A DT60A and DT80A ⁽¹⁾	D80 and D95	D115 and D150
Tightening			Screw clamp terminals				Connector 2 inputs	Screw clamp terminals	Connector 1 input	Connector 2 inputs	
Flexible cable without cable end	1 conductor	mm ²	1...4	1.5...6	2.5...10			2.5...10	1...35	4...50	10...120
	2 conductors	mm ²	1...4	1.5...6	2.5...10			2.5...10	1...25 and 1...35	4...25	10...120 + 10...50
Flexible cable with cable end	1 conductor	mm ²	1...4	1...6	1...10			2.5...10	1...35	4...50	10...120
	2 conductors	mm ²	1...2.5	1...4	1.5...6			2.5...10	1...25 and 1...35	4...16	10...120 + 10...50
Solid cable without cable end	1 conductor	mm ²	1...4	1.5...6	1.5...10			2.5...16	1...35	4...50	10...120
	2 conductors	mm ²	1...4	1.5...6	2.5...10			2.5...16	1...25 and 1...35	6...25	10...120 + 10...50
Screwdriver	Philips		N° 2	N° 2	N° 2			N° 2	–	–	–
	Flat screwdriver Ø		Ø6	Ø6	Ø6			Ø6	–	Ø6...Ø8	–
Hexagonal key			–	–	–			–	4	4	4
Tightening torque		N.m	1.7	1.7	2.5			1.8	5: ≤ 25 mm ² 8: 35 mm ²	9	12

Spring terminal connections ⁽²⁾ TeSys D

Flexible cable without cable end	1 conductor	mm ²	2.5 (4: DT25)	4	4	4	–	10	–	–
	2 conductors	mm ²	2.5 (except DT25)	4	4	4	–	–	–	–

Connection by bars or lugs TeSys D

Bar c.s.a.			–	–	–	–	–	–	3 x 16	5 x 25
Lug external Ø		mm	8	8	10	10	8	16.5	17	25
Ø of screw		mm	M3.5	M3.5	M4	M4	M3.5	M6	M6	M8
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2	N° 2	–	–	–
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6	Ø6	–	Ø8	–
Key for hexagonal headed screw			–	–	–	–	–	10	10	13
Tightening torque		N.m	1.7	1.7	2.5	2.5	1.8	6	9	12

Control circuit connections

Connection by cable (tightening via screw clamps) TeSys D, TeSys D Green

Flexible cable without cable end	1 conductor	mm ²	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
	2 conductors	mm ²	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
Flexible cable with cable end	1 conductor	mm ²	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5	1...2.5
	2 conductors	mm ²	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5
Solid cable without cable end	1 conductor	mm ²	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
	2 conductors	mm ²	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.2

Spring terminal connections ⁽²⁾ TeSys D

Flexible cable without cable end	1 conductor	mm ²	2.5	2.5	2.5	2.5	–	2.5	0.75...2.5	–	–
	2 conductors	mm ²	2.5	2.5	2.5	2.5	–	2.5	0.75...2.5	–	–

Connection by bars or lugs TeSys D

Lug external Ø		mm	8	8	8	8	8	8	8	8
Ø of screw		mm	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.2

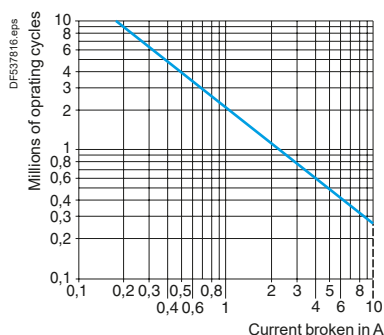
⁽¹⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LAD ALLEN4**, see page B8/29).

⁽²⁾ If cable ends are used, choose the next size down (example: for 2.5 mm², use 1.5 mm²) and square crimp the cable ends using a special tool.

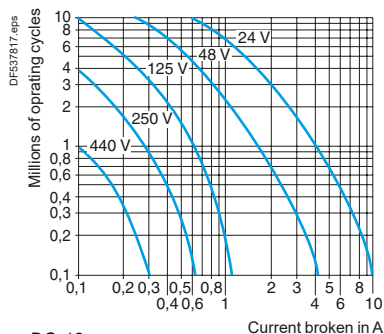
TeSys contactors

TeSys D, TeSys D Green contactors

Characteristics of auxiliary contacts incorporated in the contactor			
Mechanically linked contacts	Conforming to IEC 60947-5-1		Each contactor has 2 N/O and N/C contacts mechanically linked on the same movable contact holder
Mirror contact	Conforming to IEC 60947-4-1		The N/C contact on each contactor represents the state of the power contacts and can be connected to a PREVENTA safety module
Rated operational voltage (Ue)	Up to	V	690
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690
	Conforming to UL, CSA	V	600
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C	A	10
Frequency of the operational current		Hz	25...400
Minimum switching capacity $\lambda = 10^{-8}$	U min	V	17
	I min	mA	5
Short-circuit protection	Conforming to IEC 60947-5-1		gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1, I rms	A	~: 140, ---: 250
Short-time rating	Permissible for	1 s	A 100
		500 ms	A 120
		100 ms	A 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)
Tightening torque	Philips head n° 2 and Ø6	N.m	1.7



AC-15



DC-13

Operational power of contacts conforming to IEC 60947-5-1

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$).

Operating cycles	V	24	48	115	230	400	440	600
1 million	VA	60	120	280	560	960	1050	1440
3 million	VA	16	32	80	160	280	300	420
10 million	VA	4	8	20	40	70	80	100

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	125	250	440
1 million	W	96	76	76	76	44
3 million	W	48	38	38	32	—
10 million	W	14	12	12	—	—

Characteristics - TeSys D, TeSys D Green

TeSys contactors

Auxiliary contact blocks without dust and damp protected contacts for TeSys D, TeSys D Green contactors

Environment					
Contact block type		LAD N or LAD C	LAD T and LAD S	LAD R	LAD 8
Conforming to standards		IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5			
Product certifications		UL, CSA, CCC, EAC, CB certification			
Degree of protection	Conforming to IEC 60529	Protection against direct finger contact IP 2X			
Ambient air temperature around the device	Storage	°C	-60...+80		
	Operation	°C	-5...+60		
Maximum operating altitude	Without derating	m	3000		
Connection by cable	Phillips n° 2 and Ø6 mm Flexible or solid cable with or without cable end	mm ²	Min: 1 x 1; max: 2 x 2.5		
Tightening torque		N.m	1.7		
Spring terminal connections	Flexible or solid cable without cable end	mm ²	Max: 2 x 2.5		

Instantaneous and time delay contact characteristics						
Number of contacts			1, 2 or 4	2	2	2
Rated operational voltage (U _e)	Up to	V	690			
Rated insulation voltage (U _i)	Conforming to IEC 60947-5-1	V	690			
	Conforming to UL, CSA	V	600			
Conventional thermal current (I _{th})	For ambient temperature ≤ 60 °C	A	10			
Frequency of the operational current		Hz	25...400			
Minimum switching capacity	U min	V	17			
	I min	mA	5			
Short-circuit protection	Conforming to IEC 60947-5-1 gG fuse	A	10			
Rated making capacity	Conforming to IEC 60947-5-1 I rms	A	~: 140; ∴: 250			
Short-time rating	Permissible for	1 s	A	100		
		500 ms	A	120		
		100 ms	A	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)			
Overlap time	Guaranteed between N/C and N/O contacts on LAD C22	ms	1.5	–	–	–
Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face	Ambient air temperature for operation	°C	–	-40...+70	-40...+70	–
	Repeat accuracy		–	±2 %	±2 %	–
	Drift up to 0.5 million operating cycles		–	+15 %	+15 %	–
	Drift depending on ambient air temperature		–	0.25 % per °C	0.25 % per °C	–
Mechanical durability	In millions of operating cycles		30	5	5	30
Operational power of contacts			See page B8/70			

Characteristics - TeSys D, TeSys D Green

TeSys contactors

Auxiliary contact blocks with dust and damp protected contacts for TeSys D, TeSys D Green contactors

Environment							
Contact block type			LA1 DX	LA1 DZ		LA1 DY	
			Protected	Protected	Non protected	Protected	
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5				
Product certifications			UL, CSA, CCC, EAC, CB certification				
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X				
Ambient air temperature	Storage and operation		°C	-25...+70			
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end		mm ²	Min: 1 x 1; max: 2 x 2.5			
Tightening torque			N.m	1.7			
Number of contacts			2	2	2	2	
Contact characteristics							
Rated operational voltage (Ue)	Up to		Vac	125	125	690	125
			Vdc	30	30		30
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1		V	250	250	690	250
	Conforming to UL, CSA		V	–	–	600	–
Conventional thermal current (Ith)	For ambient temperature ≤ 40 °C		A	–	–	10	–
Maximum operational current (Ie)			mA	100	100	–	100
Frequency of the operational current			Hz	–	–	25...400	–
Minimum switching capacity	U min		V	5	5	17	5
	I min		mA	1	1	5	1
Short-circuit protection	Conforming to IEC 60947-5-1 gG fuse		A	–	–	10	–
Rated making capacity	Conforming to IEC 60947-5-1		I rms	A	–	~:140; ---: 250	–
Short-time rating	Permissible for		1 s	A	–	–	100
			500 ms	A	–	–	120
			100 ms	A	–	–	140
Insulation resistance			MΩ	> 10	> 10	> 10	> 10
Mechanical durability			In millions of operating cycles	5	5	30	5
Materials and technology used for dust and damp protected contacts				Gold alloy - Single break	Gold alloy - Single break	–	Gold alloy - Single break with crossed bars

TeSys contactors

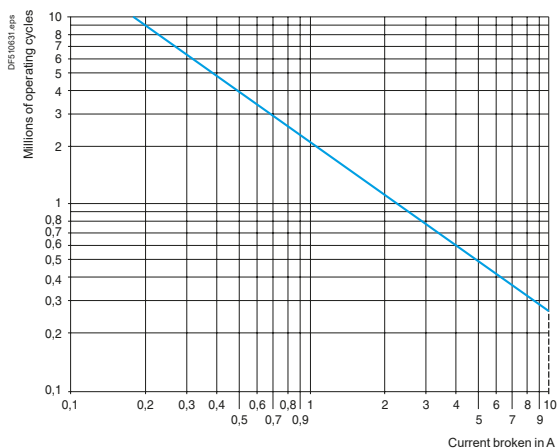
Auxiliary contact blocks without dust and damp protected contacts for TeSys D, TeSys D Green contactors

Rated operational power of contacts (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$).

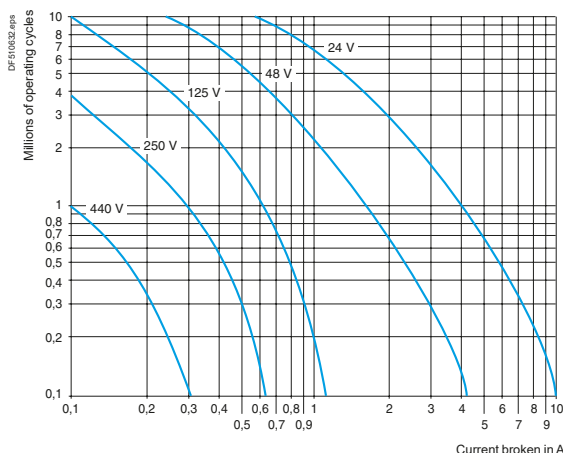
Operating cycles	V	24	48	115	230	400	440	600
1 million	VA	60	120	280	560	960	1050	1440
3 million	VA	16	32	80	160	280	300	420
10 million	VA	4	8	20	40	70	80	100



d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	125	250	440
1 million	W	96	76	76	76	44
3 million	W	48	38	38	32	–
10 million	W	14	12	12	–	–



Characteristics - TeSys D, TeSys D Green

TeSys contactors

Control modules, coil suppressor modules and mechanical latch blocks for TeSys D, TeSys D Green contactors

Environment			
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5
Product certifications			UL, CSA
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	-40...+80
	Operation	°C	-25...+55
	Permissible for operation at Uc	°C	-25...+70

Suppressor modules TeSys D						
Module type			LA4 DA, LAD 4RC, LAD 4RC3	LA4 DB, LAD 4T, LAD 4T3	LA4 DC, LAD 4D3	LA4 DE, LAD 4V, LAD 4V3
Type of protection			RC circuit	Bidirectional peak limiting diode	Diode	Varistor
Rated control circuit voltage (Uc)		V	~ 24...415	~ or --- 24...440	--- 12...250	~ or --- 24...250
Maximum peak voltage			3 Uc	2 Uc	Uc	2 Uc
Natural RC frequency	24/48 V	Hz	400	–	–	–
	50/127 V	Hz	200	–	–	–
	110/240 V	Hz	100	–	–	–
	380/415 V	Hz	150	–	–	–

Mechanical latch blocks ⁽¹⁾ TeSys D, TeSys D Green					
Mechanical latch block type			LAD 6K10	LA6 DK20	
For use on contactor			LC1 D09...D80A DT20...DT80A	LC1 D80...D150 LP1 D80 and LC1 D115	
Product certifications			UL, CSA	UL, CSA	
Rated insulation voltage	Conforming to IEC 60947-5-1	V	690	690	
Rated control circuit voltage	~ 50/60 Hz and ---	V	24...415	24...415	
Power required	For unlatching	~	VA	25	
		---	W	30	
Maximum operating rate	In operating cycles/hour		1200	1200	
On-load factor			10 %	10 %	
Mechanical durability at Uc	In millions of operating cycles		0.5	0.5	

⁽¹⁾ Unlatching can be manually operated or electrically controlled (pulsed).

The LA6 DK or LAD 6K latch coil and the LC1 D operating coil must not be energised simultaneously.

The duration of the LA6 DK or LAD 6K and LC1 D control signals must be ≥ 100 ms.

TeSys contactors

Electronic serial timer module for TeSys D, TeSys D Green contactors

Environment TeSys D, TeSys D Green			
Module type		LA4 DT (On-delay)	
Conforming to standards			IEC 60255-5
Product certifications			UL, CSA
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	-40...+80
	Operation	°C	-25...+55
	For operation at U _c	°C	-25...+70
Rated insulation voltage (U _i)	Conforming to IEC 60947-1	V	250
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end	mm ²	Min: 1 x 1; max: 2 x 2.5
Tightening torque		N.m	1.7

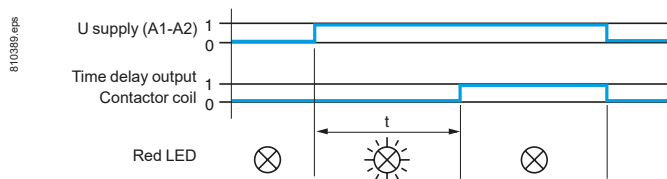
Control circuit characteristics			
Built-in protection	Of the input		By varistor
	Contactors coil suppression		By varistor
Rated control circuit voltage (U _c)		V	~ or ≡: 24...250
Permissible variation			0.8...1.1 U _c
Type of control			By mechanical contact only

Timing characteristics			
Timing ranges		s	0.1...2; 1.5...30; 25...500
Repeat accuracy	0...40 °C		±3 % (10 ms minimum)
Reset time	During time delay period	ms	150
	After time delay period	ms	50
Immunity to microbreaks	During time delay period	ms	10
	After time delay period	ms	2
Minimum control pulse duration		ms	–
Time delay signalling	By LED		Illuminates during time delay period

Switching characteristics (solid state type)			
Maximum power dissipated		W	2
Leakage current		mA	< 5
Residual voltage		V	3.3
Overvoltage protection			3 kV; 0.5 joule
Electrical durability	In millions of operating cycles		30

Function diagram

Electronic on-delay timer LA4 DT



TeSys contactors

Interface modules for TeSys D, TeSys D Green contactors

Environment TeSys D, TeSys D Green						
Conforming to standards			IEC 60255-5			
Product certifications			UL, CSA			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X			
Ambient air temperature around the device	Storage	°C	-40...+80			
	Operation	°C	-25...+55			
	Permissible for operation at Uc	°C	-25...+70			
Other characteristics						
Module type			LA4 DFB for TeSys D With relay	LA4 DWB for TeSys D, TeSys D Green Solid state		
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C	A	8			
Rated insulation voltage	Conforming to IEC 60947-5-1	V	250			
Rated operational voltage	Conforming to IEC 60947-5-1	V	250			
Indication of input state			By integral LED which illuminates when the contactor coil is energised			
Input signals	Control voltage (E1-E2)	V	~ 24	~ 24		
	Permissible variation	V	17...30	5...30		
	Current consumption at 20 °C	mA	25	8.5 for 5 V 15 for 24 V		
	State "0" guaranteed for U	V	< 2.4	< 2.4		
	I	mA	< 2	< 2		
	State "1" guaranteed for U	V	17	5		
Built-in protection	Against reversed polarity		By diode	By diode		
	Of the input		By diode	By diode		
Electrical durability at 220 A/240 V	In millions of operating cycles		10	20		
Maximum immunity to microbreaks		ms	4	1		
Power dissipated	At 20 °C	W	0.6	0.4		
Direct mounting on contactor	With coil	~ 24...250 V	LC1 D80...D150	–		
		~ 100...250 V	–	LC1 D80...D115		
		~ 380...415 V	–	–		
Mounting with cabling adapter LAD 4BB	With coil	~ 24...250 V	LC1 D09...D38, LC1 DT20...DT40	LC1 D09...D38, LC1 DT20...DT40		
		~ 380...415 V	–	–		
Mounting with cabling adapter LAD 4BB3	With coil	~ 24...250 V	LC1 D40A...D80A	LC1 D40A...D80A		
		~ 380...415 V	LC1 D40A...D80A	LC1 D40A...D80A		
Total operating time at Uc (of the contactor)	The operating times depend on the type of contactor electromagnet and its control mode. The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.					
			LC1 D09...D38, LC1 DT20...DT40	LC1 D40A...D80A	LC1 D80 and D95	
	With LA4 DFB	"C"	ms	20...30	28...34	28...43
		"O"	ms	16...24	20...24	18...32
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid cable with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5			
Tightening torque		N.m	1.7			

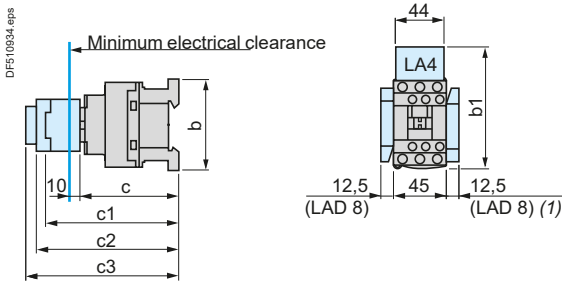
Dimensions - TeSys D

TeSys contactors

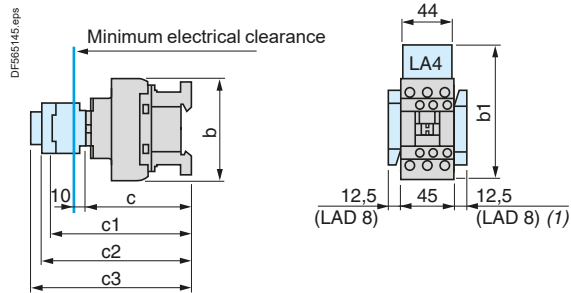
TeSys D contactors

Control circuit: a.c.

LC1 D09...D18 (3-pole)



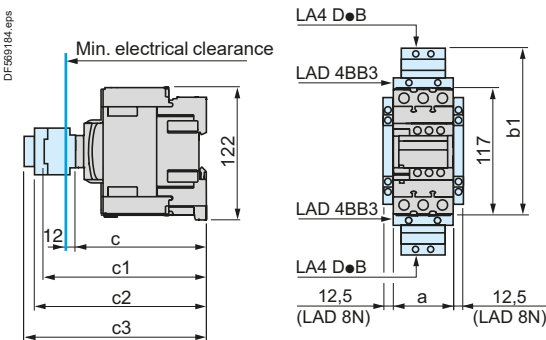
LC1 D25...D38 (3-pole), LC1 DT20...DT40 (4-pole)



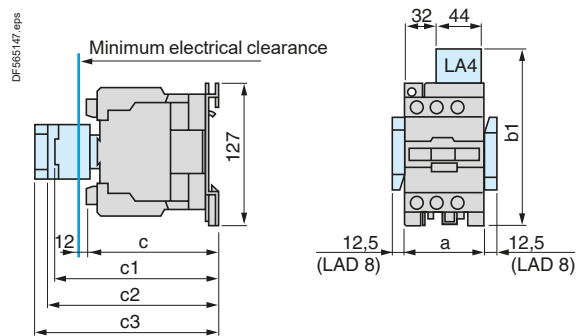
LC1	D09...D18	D093... D123	D099... D129	D25... D38	D183... D323	D098, D128, DT20 and DT25	DT203 and DT253	DT32 and DT40	D188, D258, DT323 and DT403
b without add-on blocks	77	99	80	85	99	85	99	91	105
b1 with LAD 4BB	94	107	95,5	98	107	98	-	-	-
with LA4 D●2	110 ⁽¹⁾	123 ⁽¹⁾	111,5 ⁽¹⁾	114 ⁽¹⁾	123 ⁽¹⁾	114	-	-	-
with LA4 DF, DT	119 ⁽¹⁾	132 ⁽¹⁾	120,5 ⁽¹⁾	123 ⁽¹⁾	132 ⁽¹⁾	129	-	-	-
with LA4 DW, DL	126 ⁽¹⁾	139 ⁽¹⁾	127,5 ⁽¹⁾	130 ⁽¹⁾	139 ⁽¹⁾	190	-	-	-
c without cover or add-on blocks	84	84	84	90	90	90	90	97	97
with cover, without add-on blocks	86	86	86	92	92	92	92	99	99
c1 with LAD N or C (2 or 4 contacts)	117	117	117	123	123	123	123	131	131
c2 with LA6 DK10, LAD 6K10	129	129	129	135	135	135	135	143	143
c3 with LAD T, R, S	137	137	137	143	143	143	143	151	151
with LAD T, R, S and sealing cover	141	141	141	147	147	147	147	155	155

⁽¹⁾ Including LAD 4BB.

LC1 D40A...D80A (3-pole), LC1 DT60A...DT80A (4-pole)



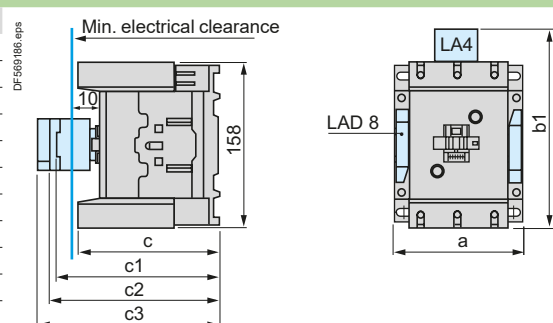
LC1 D80 and D95 (3-pole), LC1 D80004 and D80008 (4-pole), D40008 and D65008 (4-pole)



LC1	D40A...D80A	DT60A...DT80A	D40008	D80	D95, D65008	D80004	D80008
a	55	70	85	85	85	96	96
b1 with LA4 D●2	-	-	135	135	135	135	135
with LA4 DB3 or LAD 4BB3	136	-	-	135	-	-	-
with LA4 DF, DT	157	-	142	142	142	142	142
with LA4 DM, DW, DL	166	-	150	150	150	150	150
c without cover or add-on blocks	118	118	125	125	125	125	140
with cover, without add-on blocks	120	120	-	130	130	-	-
c1 with LAD N (1 contact)	-	-	139	150	150	150	150
with LAD N or C (2 or 4 contacts)	150	150	147	158	158	158	158
c2 with LAD 6K10 or LA6 DK	163	163	159	170	170	170	170
c3 with LAD T, R, S	171	171	167	178	178	178	178
with LAD T, R, S and sealing cover	175	175	171	182	182	182	182

LC1 D115 and D150 (3-pole), LC1 D115004 (4-pole)

LC1	D115, D150	D115004	D1150046
a	120	150	155
b1 with LA4 DA2	174	174	174
with LA4 DF, DT	185	185	185
with LA4 DM, DL	188	188	188
with LA4 DW	188	188	188
c without cover or add-on blocks	132	132	115
with cover, without add-on blocks	136	-	-
c1 with LAD N or C (2 or 4 contacts)	150	150	150
c2 with LA6 DK20	155	155	155
c3 with LAD T, R, S	168	168	168
with LAD T, R, S and sealing cover	172	172	172



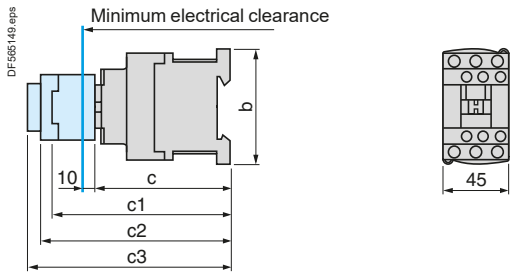
Dimensions - TeSys D

TeSys contactors

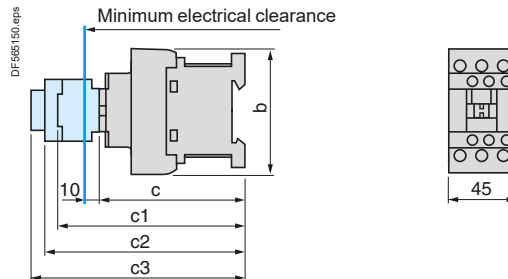
TeSys D contactors

Control circuit: d.c. or low consumption

LC1 D09...D18 (3-pole)

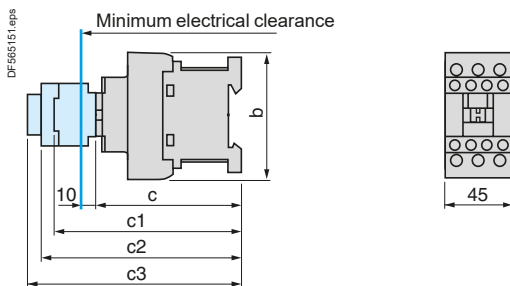


LC1 D25...D38 (3-pole)



LC1	D09...D18	D093...D123	D099...D129	D25...D38	D183...D323
b	77	99	80	85	99
c without cover or add-on blocks	93	93	93	99	99
with cover, without add-on blocks	95	95	95	101	101
c1 with LAD N or C (2 or 4 contacts)	126	126	126	132	132
c2 with LA6 DK10	138	138	138	144	144
c3 with LAD T, R, S	146	146	146	152	152
with LAD T, R, S and sealing cover	150	150	150	156	156

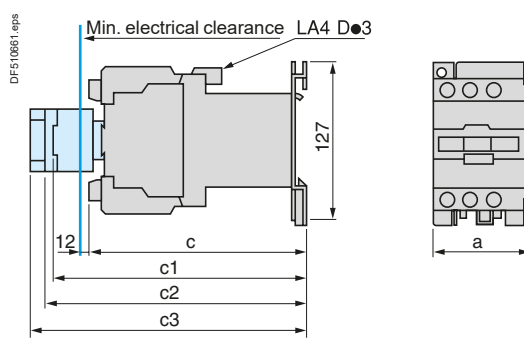
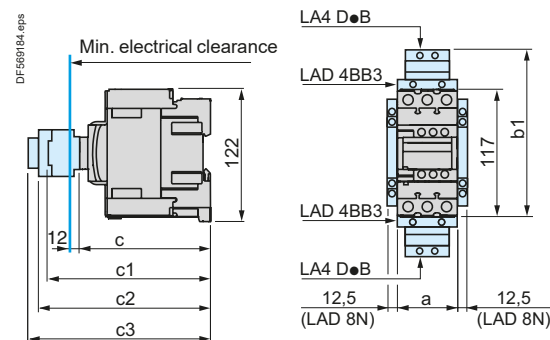
LC1 DT20...DT40 (4-pole)



LC1	DT20 and DT25 D098 and D128	DT203 and DT253 D0983 and D1283	DT32 and DT40 D188...D258	DT323 and DT403 D1883 and D2583
b	85	99	91	105
c with cover	102	102	107	107
c1 with LAD N or C (2 or 4 contacts)	123	123	131	131
c2 with LA6 DK10	135	135	143	143
c3 with LAD T, R, S	143	143	151	151
with LAD T, R, S and sealing cover	147	147	155	155

LC1 D40A...D80A (3-pole), LC1 DT60A...DT80A (4-pole)

LC1 D80 and D95 (3-pole), LP1 D80004, LP1 D80008 (4-pole), LP1 D40008 and D65008 (4-pole)



	LC1 D40A ... D80A	LC1 DT60A...DT80A	LP1 D40008 and D65008	LC1 D80 and D95	LP1 D80004	LP1 D80008
a	55	72	85	85	96	96
b1 with LAD 4BB3	136	136	-	-	-	-
with LA4 DF, DT	157	157	-	-	-	-
c without cover or add-on blocks	118	118	182	181	181	196
with cover, without add-on blocks	120	120	-	186	-	-
c1 with LAD N (1 contact)	-	-	196	204	204	204
with LAD N or C (2 or 4 contacts)	150	150	202	210	210	210
c2 with LA6 DK10	163	163	213	221	221	221
c3 with LAD T, R, S	171	171	221	229	229	229
with LAD T, R, S and sealing cover	175	175	225	233	233	233

LC1 D115●●● and LC1 D150●●● with ∴ coil: see page B8/74.

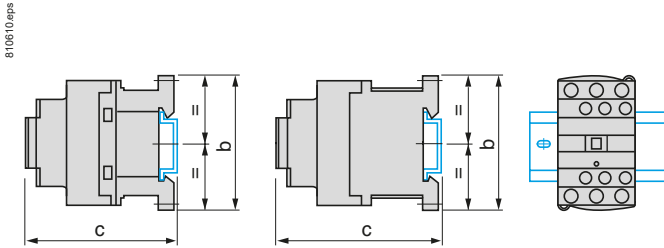
Mounting - TeSys D

TeSys contactors

TeSys D contactors

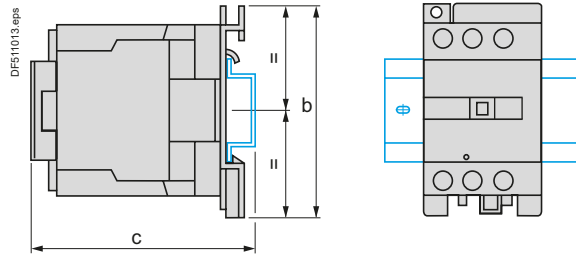
LC1 D09...D38, DT20...DT40

On mounting rail AM1 DP200, DR200 or AM1 DE200 (width 35 mm)



LC1 D40A...D80A, LC1 DT60A and DT80A, LC1 D80 and D95, LC1 D40008 and D65008

On mounting rail AM1 DL200 or DL201 (width 75 mm) ⁽²⁾
On mounting rail AM1 ED●●● or AM1 DE200 (width 35 mm)



Control circuit: a.c.

LC1	D09... D18	D25... D38	DT20 and DT25	DT32 and DT40
b	77	85	85	100
c (AM1 DP200 or DR200) ⁽¹⁾	88	94	94	109
c (AM1 DE200) ⁽¹⁾	96	102	102	117

Control circuit: a.c.

LC1	D40A...D80A DT60A...DT80A	D80 and D95	D40008 and D65008
b	122	127	127
c (AM1 DL200) ⁽¹⁾	–	147	143
c (AM1 DL201) ⁽¹⁾	–	137	133
c (AM1 ED●●● or DE200) ⁽¹⁾	128	137	133

Control circuit: d.c.

LC1	D09... D18	D25... D38	DT20 and DT25	DT32 and DT40
b	77	85	94	109
c (AM1 DP200 or DR200) ⁽¹⁾	97	103	103	118
c (AM1 DE200) ⁽¹⁾	105	110	111	126

Control circuit: d.c.

LC1	D40A...D80A DT60A...DT80A	D80 and D95	D40008 and D65008
c (AM1 DL200) ⁽¹⁾	–	205	200
c (AM1 DL201) ⁽¹⁾	–	195	190
c (AM1 ED●●● or DE200) ⁽¹⁾	128	–	190

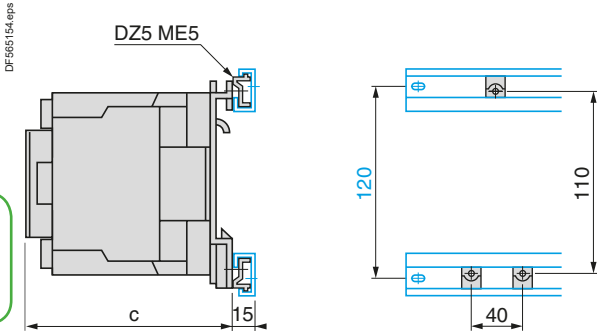
⁽¹⁾ With safety cover.

⁽¹⁾ With safety cover.

⁽²⁾ Except for LC1 D40A...D80A, LC1 DT60A and DT80A.

LC1 D80 and D95, LP1 D80

On 2 mounting rails DZ5 MB on 120 mm centres



Control circuit: a.c.

LC1	D80 and D95
c with cover	130

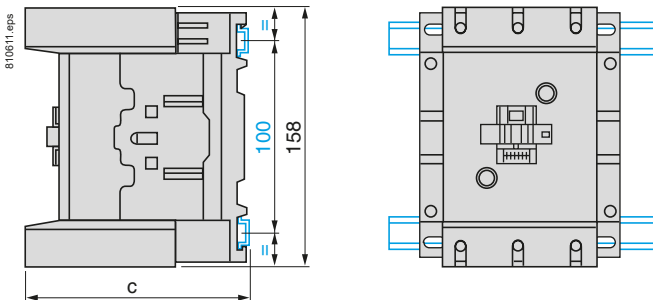
Control circuit: d.c.

LC1	D80 and D95
c with cover	186

LP1	D80
c	181

LC1 D115, D150

On 2 mounting rails DZ5 MB on 120 mm centres



Control circuit: a.c. or d.c.

LC1	D115 and D150	D1156 and D1506
c (AM1 DP200 or DR200)	134.5	117.5
c (AM1 DE200 or ED●●●)	142.5	125.5

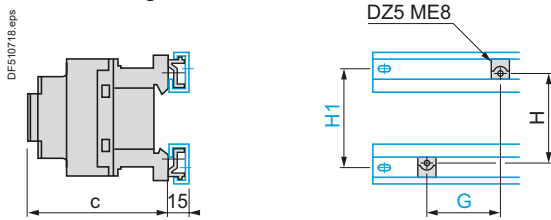
Mounting - TeSys D

TeSys contactors

TeSys D contactors

LC1 D09...D38 and LC1 DT20...DT40

On 2 mounting rails DZ5 MB



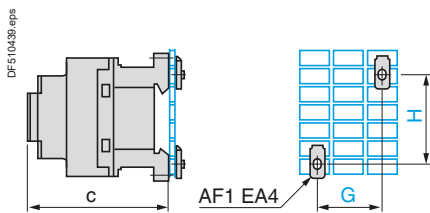
Control circuit:	a.c.		d.c.	
	D09...D18	D25...D38	D09...D18	D25...D38
LC1				
c with cover	86	92	95	101
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70

4-pole contactors

LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
	c with cover	92	100	101
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70

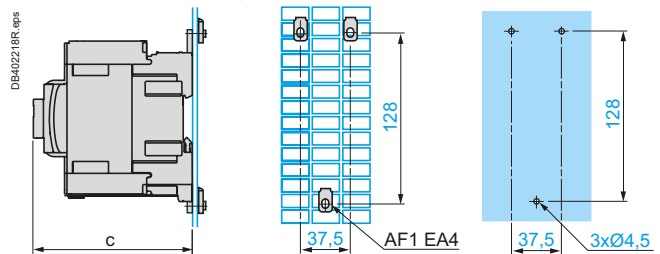
LC1 D09...D38 and LC1 DT20...DT40

On pre-slotted mounting plate AM1 PA, PB, PC



LC1 D40A...D80A, LC1 DT60A...DT80A

On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted

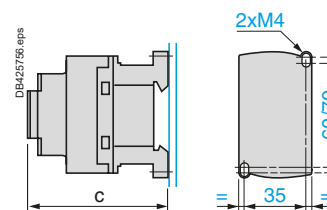


Control circuit:	a.c.		d.c.	
	D09...D18	D25...D38	D09...D18	D25...D38
LC1				
c with cover	86	92	95	101
G	35	35	35	35
H	60/70	60/70	70	70
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	80	93	118	132
G	35	35	35	35
H	60	60	70	70

Control circuit:	a.c.		d.c.	
	D40A...D80A, DT60A...DT80A	D40A...D80A, DT60A...DT80A	D40A...D80A, DT60A...DT80A	D40A...D80A, DT60A...DT80A
LC1				
c with cover	120	120	120	120

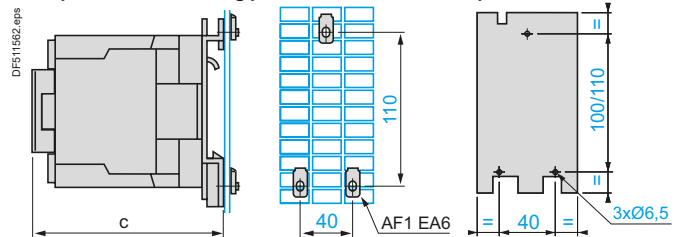
LC1 D09...D38, LC1 DT20...DT40

Panel mounted



LC1 D80 and D95, LC1 D40008 and D65008, LP1 D80

On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted

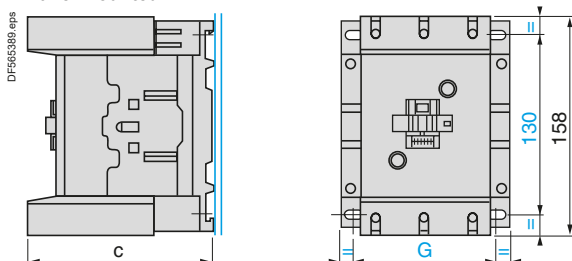


Control circuit:	a.c.		d.c.	
	D09...D18	D25...D38	D09...D18	D25...D38
LC1				
c with cover	86	92	95	101
4-pole contactors				
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	90	98	90	98

Control circuit:	a.c.		d.c.	
	D80 and D95, D40008 and D65008	D80 and D95, D40008 and D65008	D80 and D95, D40008 and D65008	D80 and D95, D40008 and D65008
LC1				
c with cover	130	130	186	186
LP1	-	-	D80	D80
c without cover	-	-	181	181

LC1 D115, D150

Panel mounted



LC1	D115	D1156	D150	D1506
c	132	115	132	115
G (3-pole)	96/110	96/110	96/110	96/110
G (4-pole)	130/144	130/144	-	-

Selection: pages A6/25 to A6/49

Characteristics: pages B8/61 to B8/73

References: pages B8/2 to B8/5

Schemes: pages B8/81 to B8/82

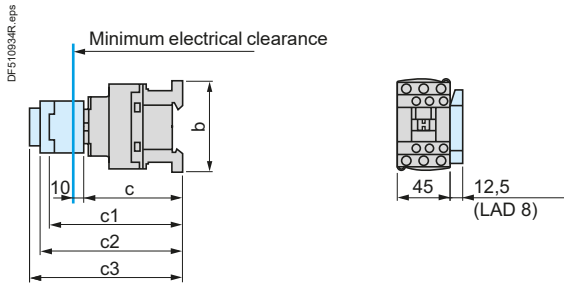
Contactors

Dimensions

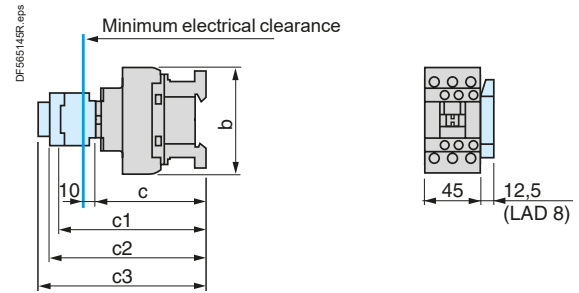
TeSys D Green

Contactors with AC/DC coil

LC1 D09...D18 (3-pole), with AC/DC compatible coil

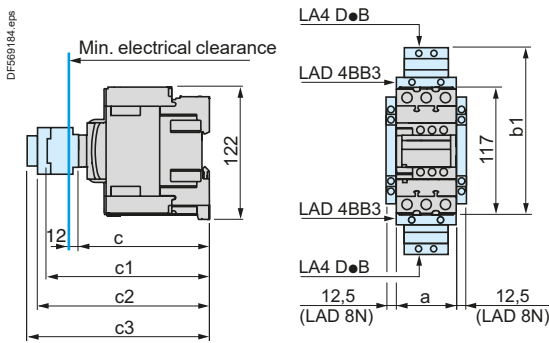


LC1 D25...D38 (3-pole), with AC/DC compatible coil



LC1	D09...D18	D25...D38
b without add-on blocks	77	85
c without cover or add-on blocks	84	90
with cover, without add-on blocks	86	92
c1 with LAD N or C (2 or 4 contacts)	117	123
c2 with LA6 DK10	129	135
c3 with LAD T, R, S	137	143
with LAD T, R, S and sealing cover	141	147

LC1 D40A...D80A (3-pole), LC1 DT60A...DT80A (4-pole), with AC/DC compatible coil



LC1	D40A...D80A	DT60A...DT80A
a	55	70
b1 LAD 4BB3	136	-
with LAD4DWB	166	-
c without cover or add-on blocks	118	118
with cover, without add-on blocks	120	120
c1 with LAD N (1 contact)	-	-
with LAD N or C (2 or 4 contacts)	150	150
c2 with LAD 6K10	163	163
c3 with LAD T, R, S	171	171
with LAD T, R, S and sealing cover	175	175

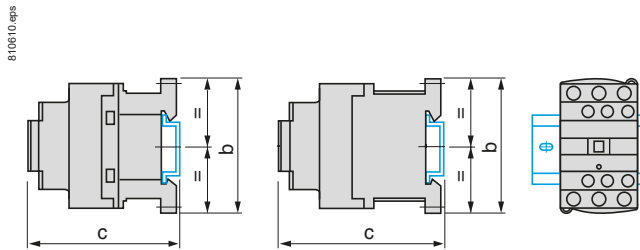
Mounting

TeSys D Green

Contactors with AC/DC coil

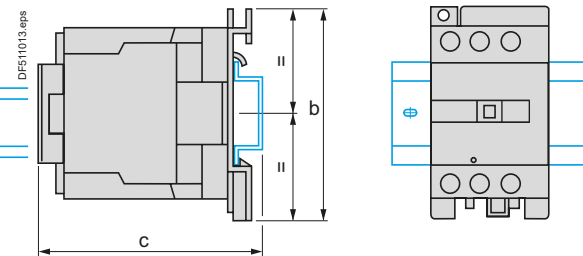
**LC1 D09...D38 (3-pole),
with AC/DC compatible coil**

On mounting rail **AM1 DP200, DR200 or AM1 DE200** (width 35 mm)



**LC1 D40A...D80A (3-pole), LC1 DT60A and DT80A (4-pole),
with AC/DC compatible coil**

On mounting rail **AM1 DL200 or DL201** (width 75 mm) ⁽²⁾
On mounting rail **AM1 ED●●● or AM1 DE200** (width 35 mm)



LC1	D09...D18	D25...D38
b	77	85
c (AM1 DP200 or DR200)	88	94
c (AM1 DE200)	96	102

LC1	D40A...D80A DT60A...DT80A
b	122
c (AM1 DL200)	—
c (AM1 DL201)	—
c (AM1 ED●●● or DE200)	128

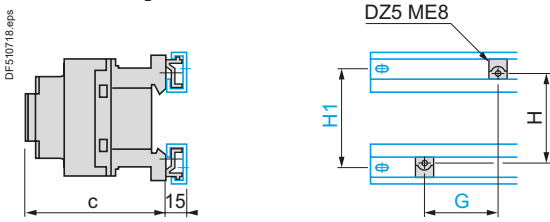
Mounting

TeSys D Green

Contactors with AC/DC coil

LC1 D09...D38 (3-pole), with AC/DC compatible coil

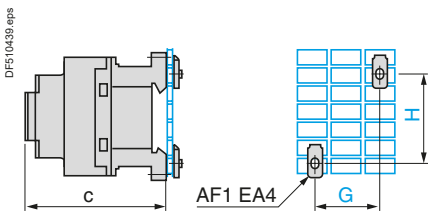
On 2 mounting rails DZ5 MB



LC1	D09...D18	D25...D38
c with cover	86	92
G	35	35
H	60	60
H1	70	70

LC1 D09...D38 (3-pole), with AC/DC compatible coil

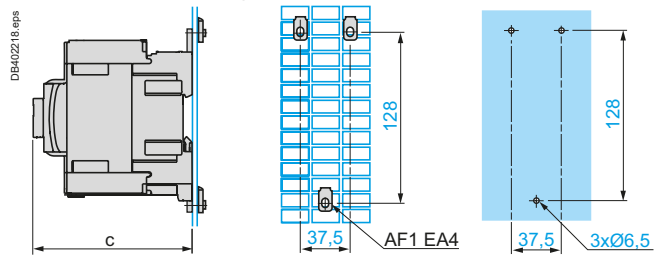
On pre-slotted mounting plate AM1 PA, PB, PC



LC1	D09...D18	D25...D38
c with cover	86	92
G	35	35
H	60/70	60/70

LC1 D40A...D80A (3-pole), LC1 DT60A...DT80A (4-pole), with AC/DC compatible coil

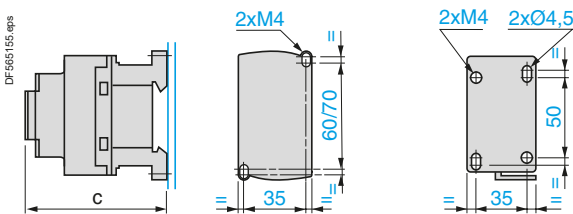
On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



LC1	D40A...D80A, DT60A...DT80A
c with cover	120

LC1 D09...D38 (3-pole), with AC/DC compatible coil

Panel mounted

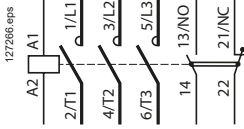


LC1	D09...D18	D25...D38
c with cover	86	92

Contactors

TeSys D, TeSys D Green 3-pole contactors (References: pages B8/2 to B8/5)

LC1 D09 to D150



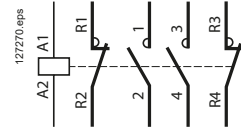
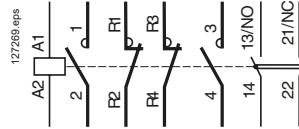
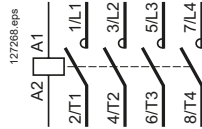
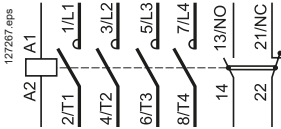
TeSys D 4-pole contactors (References: pages B8/6 and B8/7)

LC1 DT20 to DT80A

LC1 D115004

LC1 D098 to D258

LC1 and LP1 D4008 to D80008



Front mounting add-on contact blocks

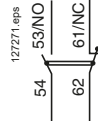
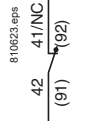
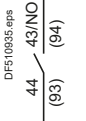
Instantaneous auxiliary contacts for TeSys D, TeSys D Green (References: page B8/23)

1 N/O LAD N10 ⁽¹⁾

1 N/C LAD N01 ⁽¹⁾

1 N/O + 1 N/C LAD N11

2 N/O LAD N20

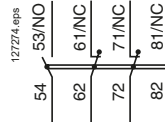
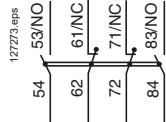


2 N/C LAD N02

2 N/O + 2 N/C LAD N22

1 N/O + 3 N/C LAD N13

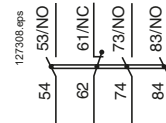
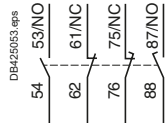
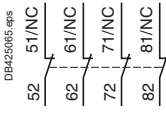
4 N/O LAD N40



4 N/C LAD N04

2 N/O + 2 N/C including 1 N/O + 1 N/C make before break LAD C22

3 N/O + 1 N/C LAD N31



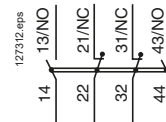
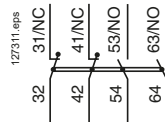
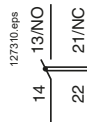
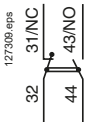
Instantaneous auxiliary contacts conforming to standard EN 50012 for TeSys D, TeSys D Green (References: page B8/23)

1 N/O + 1 N/C LAD N11G

1 N/O + 1 N/C LAD N11P

2 N/O + 2 N/C LAD N22G

2 N/O + 2 N/C LAD N22P

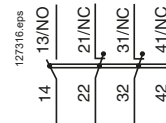
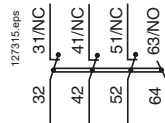
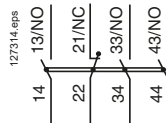
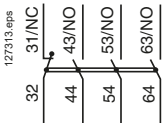


3 N/O + 1 N/C LAD N31G

3 N/O + 1 N/C LAD N31P

1 N/O + 3 N/C LAD N13G

1 N/O + 3 N/C LAD N13P



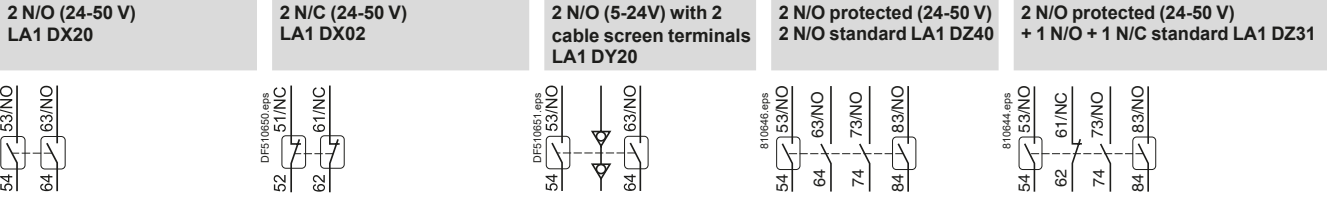
(1) Items in brackets refer to blocks mounted on right-hand side of contactor.

TeSys contactors

TeSys D, TeSys D Green contactors

Front mounting add-on contact blocks for TeSys D, TeSys D Green

Dust and damp protected instantaneous auxiliary contacts (References: page B8/23)

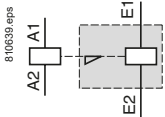


Time delay auxiliary contacts (References: page B8/24)



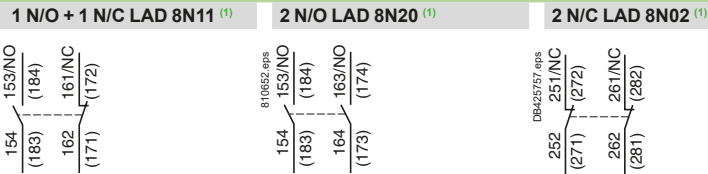
Mechanical latch blocks for TeSys D, TeSys D Green (References: page B8/24)

LAD 6K10 and LA6 DK20



Side mounting add-on contact blocks for TeSys D, TeSys D Green

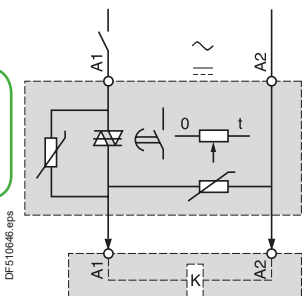
Instantaneous auxiliary contacts (References: page B8/23)



⁽¹⁾ Items in brackets refer to blocks mounted on right-hand side of contactor.

Electronic serial timer modules for TeSys D, TeSys D Green

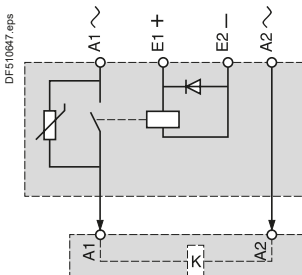
On-delay LA4 DT●U



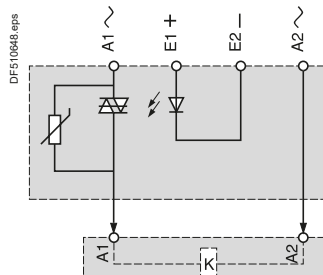
Contactor

Interface modules

Relay output for TeSys D
LA4 DFB



Solid state for TeSys D, TeSys D Green
LA4 DWB



References: page B8/85.

Selection:
pages A6/25 to A6/49

Characteristics:
pages B8/61 to B8/73

References:
pages B8/2 to B8/27

Dimensions:
pages B8/74 and B8/75

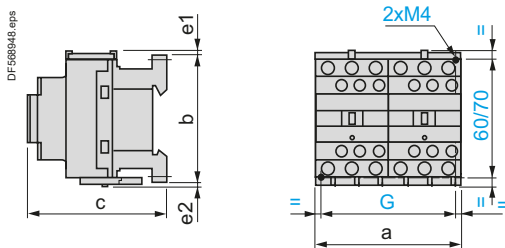
Dimensions - TeSys D, TeSys D Green

TeSys contactors

TeSys D, TeSys D Green reversing and changeover contactors

LC2 D09 to D38 TeSys D, TeSys D Green

2 x LC1 D09 to D38



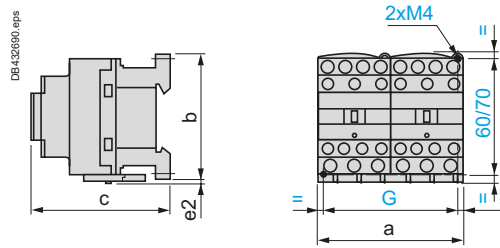
LC2 or 2 x LC1	a	b	c ⁽¹⁾	e1	e2	G
D09 to D18 AC, AC/DC	90	77	86	4	1.5	80
D093 to D123 AC	90	99	86	–	–	80
D09 to D18 DC	90	77	95	4	1.5	80
D093 to D123 DC	90	99	95	–	–	80
D25 to D38 AC, AC/DC	90	85	92	9	5	80
D183 to D383 AC	90	99	92	–	–	80
D25 to D32 DC	90	85	101	9	5	80
D183 to D383 DC	90	99	101	–	–	80

e1 and e2: including cabling.

(1) With safety cover, without add-on block.

LC2 DT20 to DT40 TeSys D

2 x LC1 DT20 to DT40

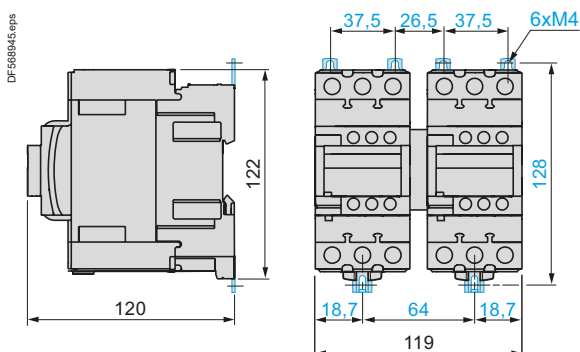


LC2 or 2 x LC1	a	b	c	G	e2
DT20 and DT25 AC	90	85	92	80	20
DT32 and DT40 AC	90	91	99	80	22
DT20 and DT25 DC	90	85	102	80	20
DT32 and DT40 DC	90	91	109	80	22

c, e: including cabling.

LC2 D40A to D80A for TeSys D, TeSys D Green

2 x LC1 D40A to D80A



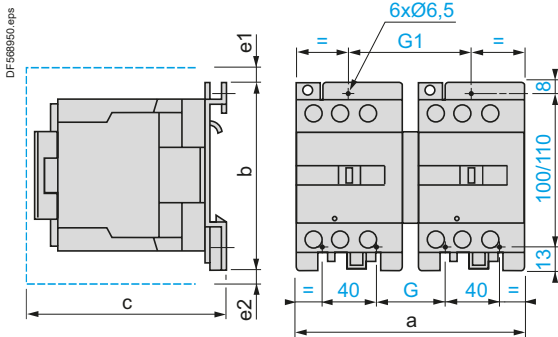
Dimensions - TeSys D

TeSys contactors

TeSys D reversing and changeover contactors

LC2 D80 and D95

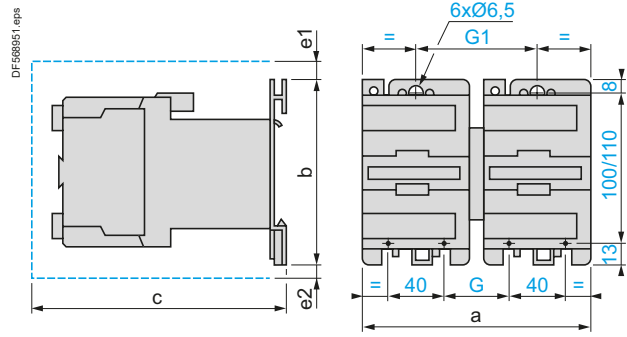
2 x LC1 D80 and D95 ~



LC2 or 2 x LC1	a	b	c	e1	e2	G	G1
D80 and D95 ~	182	127	158	13	-	57	96
D80004 ~	207	127	158	-	20	71	111

c, e1 and e2: including cabling.

2 x LC1 D80 and D95 ---

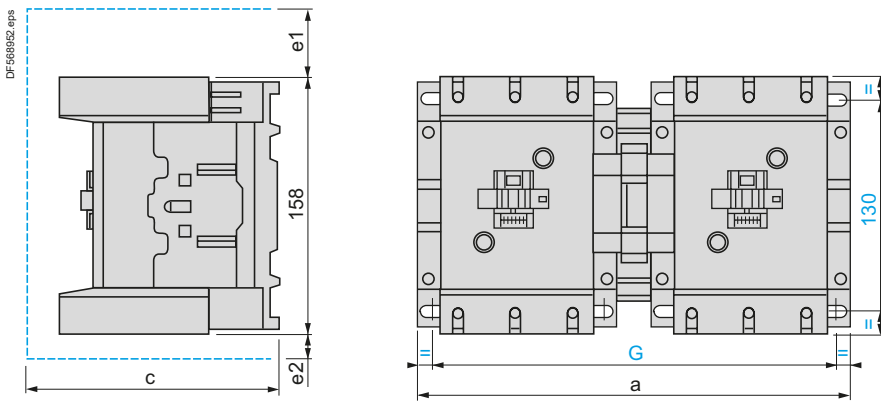


2 x LC1	a	b	c	e1	e2	G	G1
D80 and D95	207	127	215	13	20	96	111

c, e1 and e2: including cabling.

LC2 D115 and D150

2 x LC1 D115 and D150



LC2 or 2 x LC1	a	c	e1	e2	G
D115 and D150	266	148	56	18	242/256
D115004	334	148	-	60	310/324

c, e1 and e2: including cabling.

Contactors

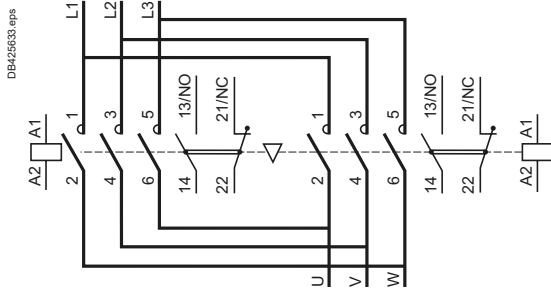
TeSys contactors

TeSys D, TeSys D Green reversing and changeover contactors

Reversing contactors for motor control

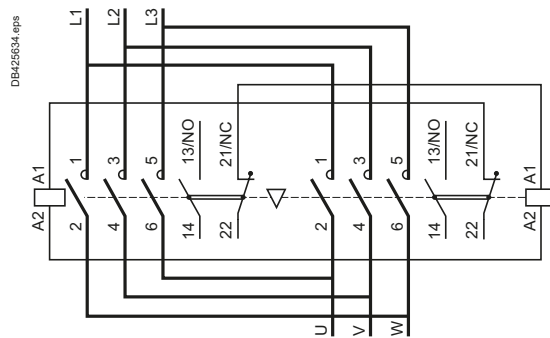
LC2 D09...D80A TeSys D , TeSys D Green LC2D80...D150 TeSys D

Horizontally mounted



LAD 9R1V TeSys D, TeSys D Green

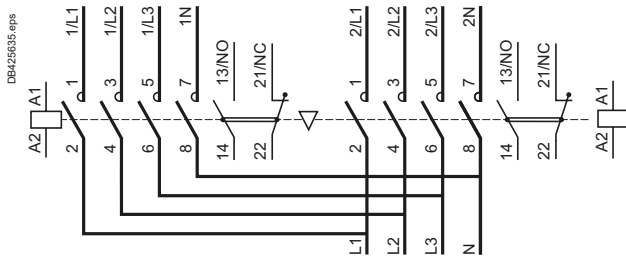
With integral electrical interlocking



Changeover contactor pairs TeSys D

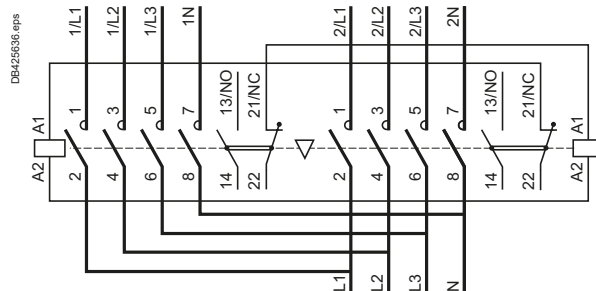
LC2 DT20...DT40

Horizontally mounted



LAD T9R1V

With integral electrical interlocking



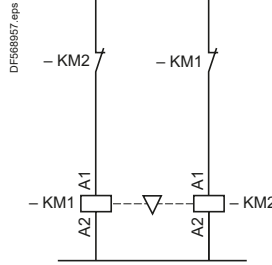
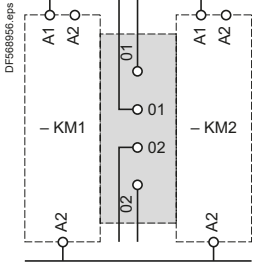
TeSys contactors

TeSys D, TeSys D Green reversing and changeover contactors

Electrical interlocking of TeSys D, TeSys D Green reversing contactors fitted with:

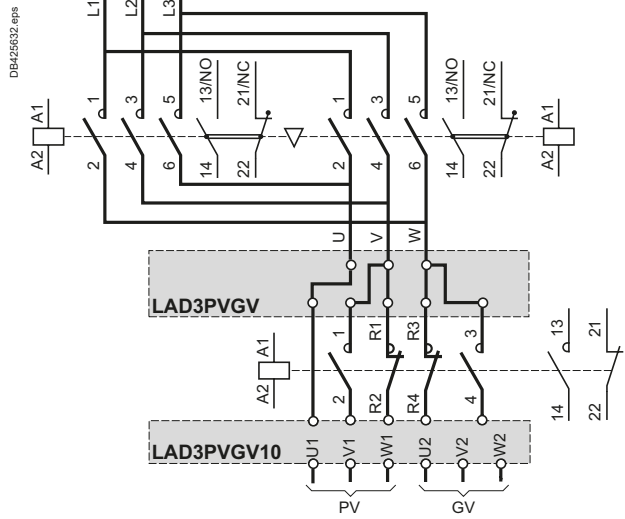
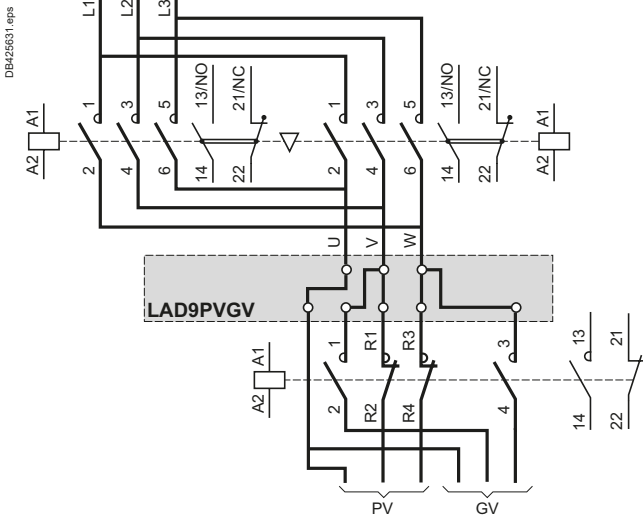
Mechanical interlock with integral electrical contacts
 LA9 D4002, LA9 D8002 and LA9 D11502

Mechanical interlock without integral electrical contacts
 LAD 9V2, LAD 4CM, LA9 D50978 and LA9 D80978



Low speed - High speed cabling kit, screw clamp terminals for LC1D09... D38 contactors (TeSys D, TeSys D Green)

Low speed - High speed cabling kit, spring terminals for LC1D09... D38 contactors (TeSys D)

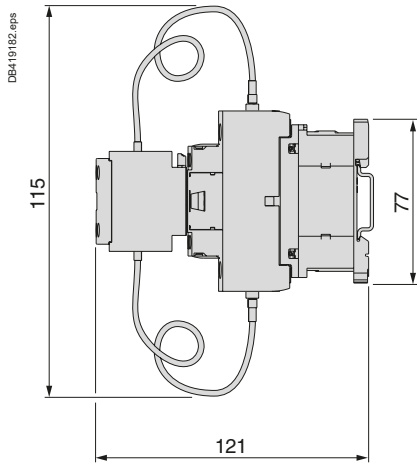


TeSys contactors

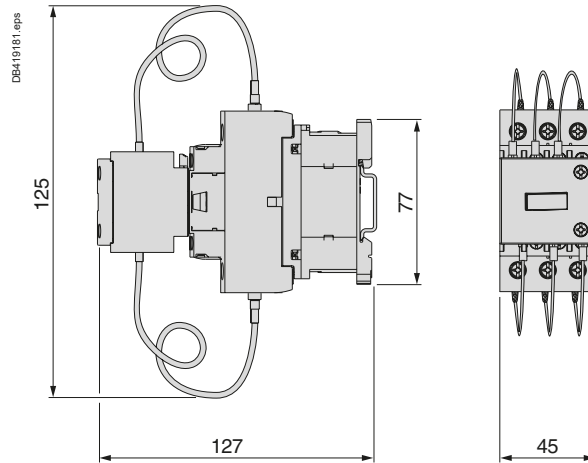
For switching 3-phase capacitor banks, used for power factor correction

Dimensions

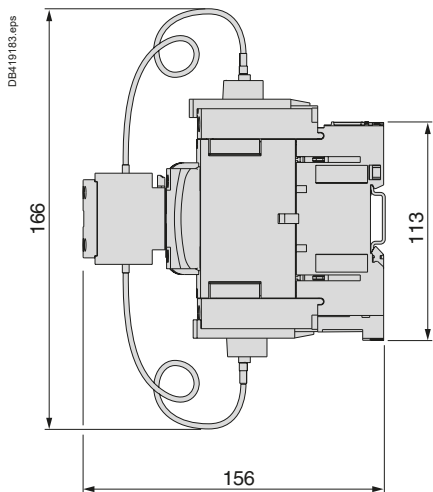
LC1 DFK



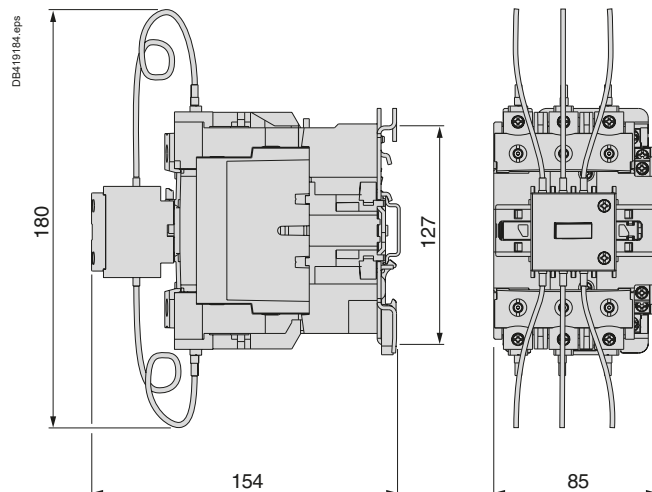
LC1 DGK, DLK, DMK



LC1 DPK, DTK

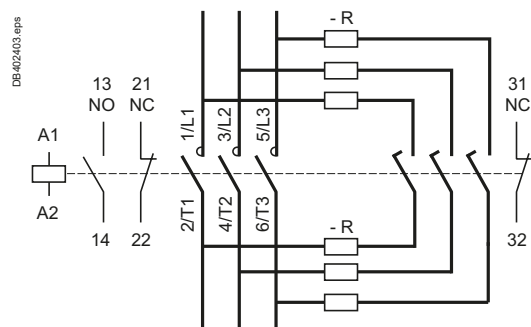


LC1 DWK



Schemes

LC1 D•K



R = Pre-wired resistor connections.

TeSys contactors

Mini-contactors TeSys LC1 SK and LP1 SK

Environment				
Rated insulation voltage (Ui)	Conforming to 60947	V	690	
Conforming to standards			IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1	
Approvals			cULus, CCC, EAC, CB certification	
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2x	
Ambient air temperature around the device	Storage	°C	-50...+70	
	Operation	°C	-20...+50	
Maximum operating altitude	Without derating	m	2000	
Operating position			<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Vertical axis</p> <p>Without derating</p> </div> <div style="text-align: center;"> <p>Horizontal axis</p> <p>Without derating</p> </div> </div>	
Cabling, screw clamp terminals		Min	Max	
	Solid conductor	mm²	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4
	Flexible cable without cable end	mm²	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5
	Flexible cable with cable end	mm²	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
Tightening torque	Pozidriv n° 1 head	N.m	0.8	
Terminal referencing			Conforming to standards En 50005	

TeSys contactors

Mini-contactors TeSys LC1 SK and LP1 SK

Pole characteristics			
Conventional thermal current (I _{th})	For ambient temperature ≤ 55 °C	A	12
Rated operational frequency		Hz	50/60
Frequency limits of the operational current		Hz	Up to 400
Rated operational voltage (U _e)		V	690
Rated making capacity	I _{rms} conforming to IEC 60947-1	A	66
Rated breaking capacity (for U _e ≤ 400 V)	Conforming to IEC 60947-1	A	52
Short time rating	In free air for a time "t" from cold state (θ ≤ 55 °C)	A	50
Short-circuit protection	gl fuse U ≤ 440 V	A	16
Average impedance per pole	At I _{th} and 50 Hz	mΩ	4
Maximum rated operational current			
For a temperature ≤ 55 °C	AC-3 ⁽¹⁾ (U _e ≤ 400 V)	A	6
	AC-1	A	12
Utilisation in category AC-1 resistive circuits, heating, lighting (U _e ≤ 440 V)	Increase in operational current by paralleling of poles	A	20

Auxiliary contact characteristics of add-on blocks			
Rated operational voltage (U _e)	Up to	V	690
Rated insulation voltage (U _i)	Conforming to IEC 60947, IEC 60947-1	V	690
Conventional thermal current (I _{th})	For ambient temperature ≤ 55 °C	A	10
Frequency of operational current		Hz	Up to 400
Short-circuit protection	Conforming to IEC 60947 and IEC 60947-1, gl fuse	A	10

Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid up to 3600 operating cycles per hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the breaking current (cos φ 0.4).

	V	24	48	110/127	220/230	380/400	440
1 million operating cycles	VA	48	96	240	440	800	880
3 million operating cycles	VA	17	34	86	158	288	317
10 million operating cycles	VA	7	14	36	66	120	132
Occasional making capacity	VA	1000	2050	5000	10000	14000	13000

d.c. supply, category DC-13

Electrical durability (valid up to 1200 operating cycles per hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110	220	440	440
1 million operating cycles	W	120	80	60	52	51	880
3 million operating cycles	W	55	38	30	28	26	317
10 million operating cycles	W	15	11	9	8	7	132
Occasional making capacity	W	720	600	400	300	230	13000

⁽¹⁾ For LC1 contactors.

TeSys contactors

Mini-contactors TeSys LC1 SK and LP1 SK

Control circuit characteristics				
Type			LC1 SK06	LP1 SK06
Rated control circuit voltage (Uc)		V	~ 24...400	~ 12...72
Control voltage limits (q ≤ 50 °C)	For operation		0.85...1.1 Uc	0.85...1.1 Uc
	For drop-out		≥ 0.20 Uc	≥ 0.10 Uc
Average coil consumption at 20 °C and at Uc	Inrush		16 VA	2.2 W
	Sealed		4.2 VA	2.2 W
Heat dissipation		W	1.4	2.2
Operating time at 20 °C and at Uc	Between coil energisation and	opening of the N/C contacts	ms	8...16
		closing of the N/O contacts	ms	7...14
	Between coil de-energisation and	opening of the N/O contacts	ms	6...8
		closing of the N/C contacts	ms	8...10
Maximum operating rate	In operating cycles per hour		1200	1200
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil		10	–
	~ coil		–	10

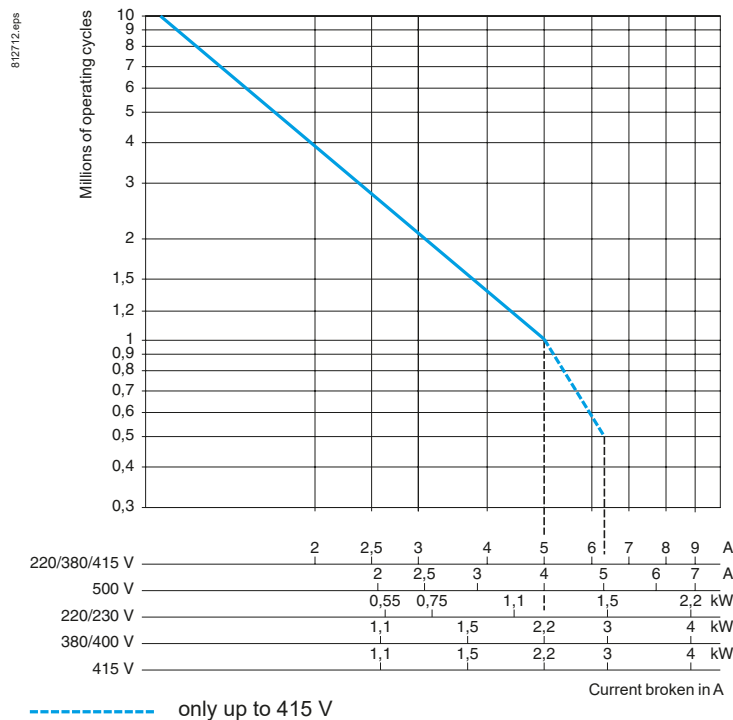
TeSys contactors

Mini-contactors TeSys LC1 SK and LP1 SK

Use in category AC-3 ($U_e \leq 440\text{ V}$)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

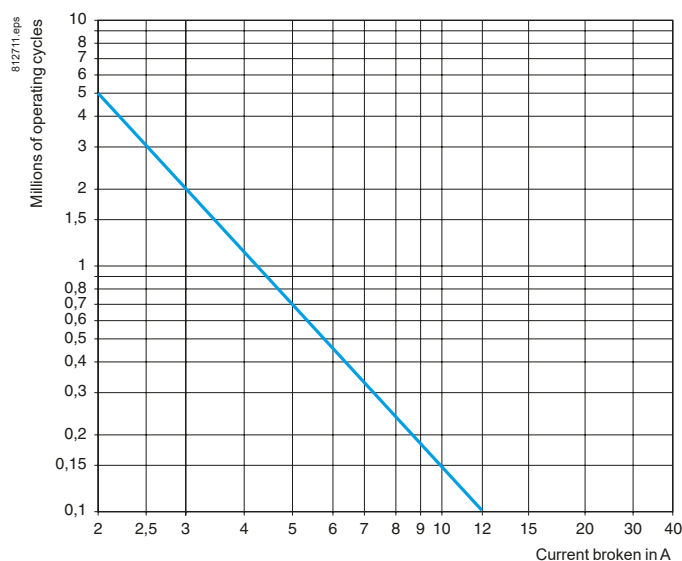
The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



Use in category AC-1 ($U_e \leq 440\text{ V}$)

Control of resistive circuits ($\cos \varphi \geq 0.95$).

The current broken (I_c) in category AC-1 is equal to the current (I_e) normally drawn by the load.



Contactors

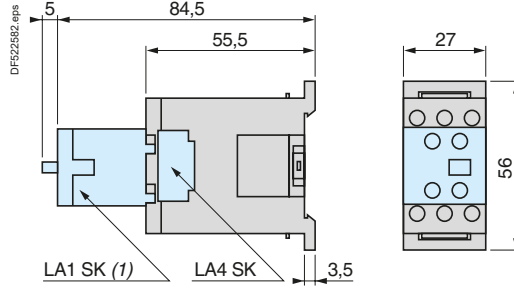
TeSys contactors

Mini-contactors TeSys LC1 SK and LP1 SK

Dimensions

Mini-contactors

LC1 and LP1 SK06



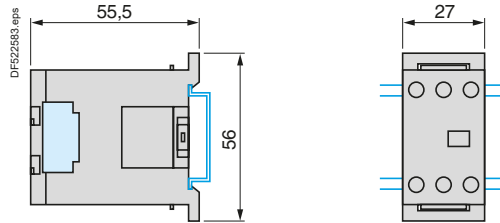
(1) Only on LC1 SK06.

Mounting

Mini-contactors

LC1 and LP1 SK06

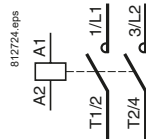
On mounting rail AM1 DP200 or AM1 DE200 (≈ 35 mm)



Schemes

2-pole mini-contactors

LC1 and LP1 SK06



Add-on power pole block

1 pole + 1 "N/O" aux.

1 pole + 1 "N/C" aux.

LA1 SK10

LA1 SK01



Instantaneous auxiliary contacts

2 "N/O"

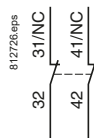
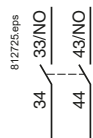
2 "N/C"

1 "N/O" + 1 "N/C"

LA1 SK20

LA1 SK02

LA1 SK11



TeSys contactors

TeSys K contactors and reversing contactors

Environment characteristics						
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4				
Product certifications	LC● and LP● K06 to K12	UL, CSA, CCC, EAC, CB certification				
Operating positions						
Connection	Screw clamp terminals	Solid conductor	mm²	Min. 1 x 1.5	Max. 2 x 4	Max. to IEC 60947 1 x 4 + 1 x 2.5
		Flexible conductor without cable end	mm²	1 x 0.75	2 x 4	2 x 2.5
		Flexible conductor with cable end	mm²	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5
	Spring terminals	Solid conductor	mm²	1 x 0.75	1 x 1.5	2 x 1.5
		Flexible conductor without cable end	mm²	1 x 0.75	1 x 1.5	2 x 1.5
	Faston connectors	Clip	mm	2 x 2.8 or 1 x 6.35		
	Solder pins for printed circuit board			With locating device between power and control circuits pins length 5 mm Recommended minimum width and thickness layer for power printed circuit board track : 4mm x 35 microns		
Tightening torque	of screw-clamp terminals only Philips head n° 2 and Ø6	N.m	0.8			
Terminal referencing	Conforming to standards EN 50005 and EN 50012		Up to 5 contacts, depending on model			
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	690			
	Conforming to CSA 22-2 n° 60947-4-1, UL 60947-4-1	V	600			
Rated impulse withstand voltage (Uimp)		kV	8			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2x			
Ambient air temperature around the device	Storage	°C	-50...+80			
	Operation	°C	-25...+50 in AC3, -25...+60 in AC1			
Maximum operating altitude	Without derating	m	2000			
Vibration resistance 5 ... 300 Hz	Contacteur open		2 gn			
	Contacteur closed		4 gn			
Flame resistance	according to IEC 60695-2-10	°C	850			
Shock resistance (1/2 sine wave, 11 ms)	Contacteur open		On X axis: 6 gn On Y and Z axes: 10 gn			
	Contacteur closed		On X axis: 10 gn On Y and Z axes: 15 gn			

TeSys contactors

TeSys K contactors and reversing contactors

Pole characteristics								
Type	LC● or LP●			K06	K09	K12	K16	
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		A	20 ⁽¹⁾				
Rated operational frequency			Hz	50/60				
Frequency limits of the operational current			Hz	Up to 400				
Rated operational voltage (Ue)			V	690				
Rated making capacity	I rms conforming to IEC 60947		A	110	110	144	160	
Rated breaking capacity	I rms conforming to IEC 60947	220/230 V	A	110	110	–	–	
		380/400 V	A	110	110	–	–	
		415 V	A	110	110	–	–	
		440 V	A	110	110	110	110	
		500 V	A	80	80	80	80	
		660/690 V	A	70	70	70	70	
Permissible short time rating	In free air for a time "t" from cold state (θ ≤ 50 °C)	1 s	A	90	90	115	115	
		5 s	A	85	85	105	105	
		10 s	A	80	80	100	100	
		30 s	A	60	60	75	75	
		1 min	A	45	45	55	55	
		3 min	A	40	40	50	50	
		≥ 15 min	A	20	20	25	25	
Short-circuit protection	gG fuse U ≤ 440 V (aM fuse, see page 22009/2)		A	25				
Average impedance per pole	At Ith and 50 Hz		mΩ	3				
Use in category AC-1 resistive circuits, heating, lighting (Ue ≤ 440 V)	Maximum rated operational current for a temperature ≤ 50 °C		A	20				
	Maximum rated operational current for a temperature ≤ 70 °C		A	16 for Ue only				
	Rated operational current limits in relation to the on-load factor and operating frequency			On-load factor		90 %	60 %	30 %
			A	300 operating cycles/hour		13	15	18
			A	120 operating cycles/hour		15	18	19
			A	30 operating cycles/hour		19	20	20
	Increase in rated operational current by paralleling of poles			Apply the following coefficients to the above currents; these coefficients take into account an often unbalanced distribution of current between the poles				
			2 poles in parallel: K = 1.60					
			3 poles in parallel: K = 2.25					
			4 poles in parallel: K = 2.80					
Use in category AC-3 squirrel cage motors	Operational power according to the voltage. Voltage 50 or 60 Hz	115 V single-ph.	kW	0.37	0.55	–	–	
		220 V single-ph.	kW	0.75	1.1	–	–	
		220/230 V 3-ph.	kW	1.5	2.2	3	4	
		380/415 V 3-ph.	kW	2.2	4	5.5	7.5	
		440/480 V 3-ph.	kW	3	4	5.5/4 (480)	5.5/4 (480)	
		500/600 V 3-ph.	kW	3	4	4	4	
		660/690 V 3-ph.	kW	3	4	4	4	
		Maximum operating rate (in operating cycles/hour in relation to % of rated power)			Op. cycles/h		600	900
				Power		100 %	75 %	50 %

(1) For LC●K●●●●●3 / LP●K●●●●●3 with spring terminal, Ith max = 10 A.

TeSys contactors

TeSys K contactors and reversing contactors

Control circuit characteristics									
Type		LC1	LC2	LC7	LC8	LP1	LP2	LP4	LP5
Rated control circuit voltage (Uc)	V	~ 12...690 ⁽¹⁾		~ 24...240 ⁽¹⁾		~ 12...250 ⁽¹⁾		~ 12...120	
Control voltage limits (≤ 50 °C) single voltage coil	Operation	0.8...1.15 Uc ⁽²⁾		0.85...1.1 Uc		0.8...1.15 Uc		0.7...1.30 Uc	
	Drop-out	≥ 0.20 Uc		≥ 0.10 Uc		≥ 0.10 Uc		≥ 0.10 Uc	
Average consumption at 20 °C and at Uc	Inrush	30 VA		3 VA		3 W		1.8 W	
	Sealed	4.5 VA		3 VA		3 W		1.8 W	
Heat dissipation	W	1.3		3		3		1.8	
Operating time at 20 °C and at Uc									
Between coil energisation and:	- opening of the N/C contacts	ms	5...15		25...35		25...35		25...35
	- closing of the N/O contacts	ms	10...20		30...40		30...40		30...40
Between coil de-energisation and:	- opening of the N/O contacts	ms	10...20		30		10		10...20
	- closing of the N/C contacts	ms	15...25		40		15		15...25
Maximum immunity to microbreaks		ms	2		2		2		2
Maximum operating rate	In operating cycles per hour		3600		3600		3600		3600
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil		10	5	10	5	-	-	-
	--- coil		-	-	-	-	10	5	-
	Wide range coil, Low consumption		-	-	-	-	-	-	30 5

(1) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4 KE1FC** (50...129 V) or **LA4 KE1UG** (130...250 V), see page B8/50.

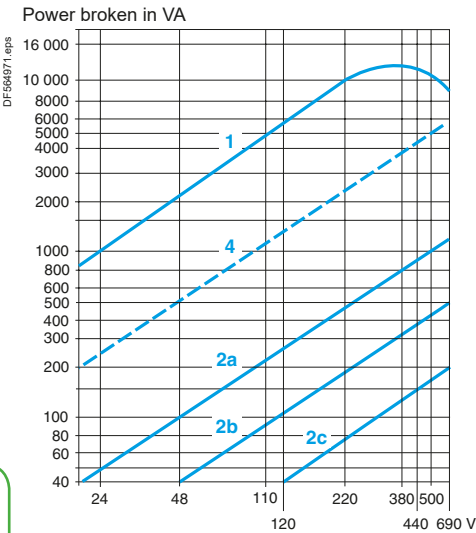
(2) **LC1K12, LC1K16...** : 0.85...1.15 Uc.

TeSys contactors

TeSys K contactors and reversing contactors

Auxiliary contact characteristics of contactors and instantaneous contact blocks

Number of auxiliary contacts	On LC● K or LP● K 3-pole On LA1 K		1 2 or 4
Rated operational voltage (Ue)	Up to	V	690
Rated insulation voltage (Ui)	Conforming to IEC 60947	V	690
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	V	600
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C	A	10
Frequency of the operational current		Hz	Up to 400
Minimum switching capacity	U min	V	17
	I min	mA	5
Short-circuit protection	Conforming to IEC 60947, gG fuse	A	10
Rated making capacity	Conforming to IEC 60947	I rms	A 110
Short-time rating	Permissible for	1 s	A 80
		500 ms	A 90
		100 ms	A 110
Insulation resistance		MΩ	> 10
Non-overlap distance	LA1 K: linked contacts conforming to INRS, BIA and CNA specifications	mm	0.5 (see schemes pages B8/98 and B8/100)



Operational power of contacts conforming to IEC 60947 a.c. supply, category AC-15

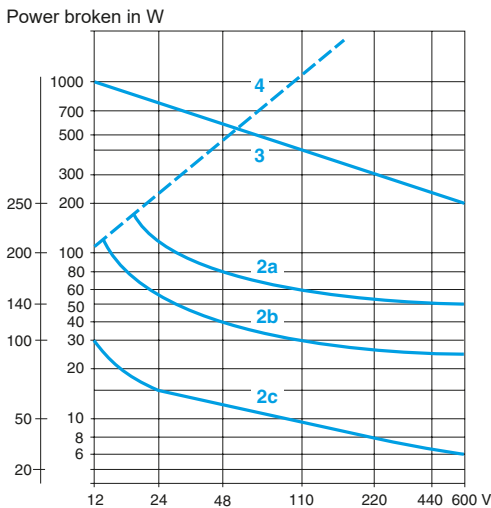
Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

Operating cycles	V	24	48	110/127	220/230	380/400	440	600/690
1 million operating cycles	VA	48	96	240	440	800	880	1200
3 million operating cycles	VA	17	34	86	158	288	317	500
10 million operating cycles	VA	7	14	36	66	120	132	200
Occasional making capacity	VA	1000	2050	5000	10000	14000	13000	9000

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	110	220	440	600
1 million operating cycles	W	120	80	60	52	51	50
3 million operating cycles	W	55	38	30	28	26	25
10 million operating cycles	W	15	11	9	8	7	6
Occasional making capacity	W	720	600	400	300	230	200



1. Breaking limit of contacts valid for:
 - maximum of 50 operating cycles at 10 s intervals (power broken = making current x cos φ 0.7).
2. Electrical durability of contacts for:
 - 1 million operating cycles (2a)
 - 3 million operating cycles (2b)
 - 10 million operating cycles (2c).
3. Breaking limit of contacts valid for:
 - maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.
4. Thermal limit.

Dimensions, mounting - TeSys K

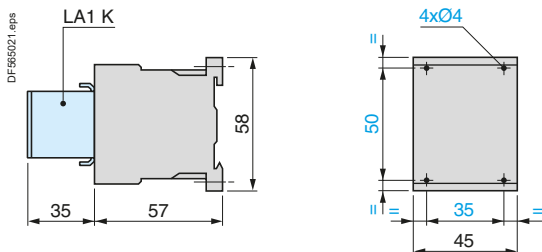
TeSys contactors

TeSys K contactors

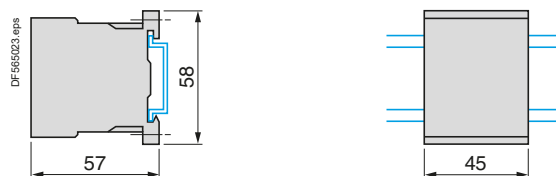
Contactors

LC1 K, LC7 K, LP1 K, LP4 K

On panel

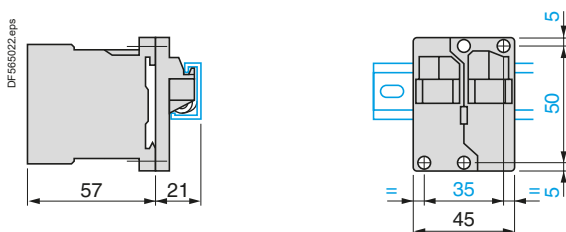


On mounting rail AM1 DP200 or AM1 DE200 (L 35 mm)

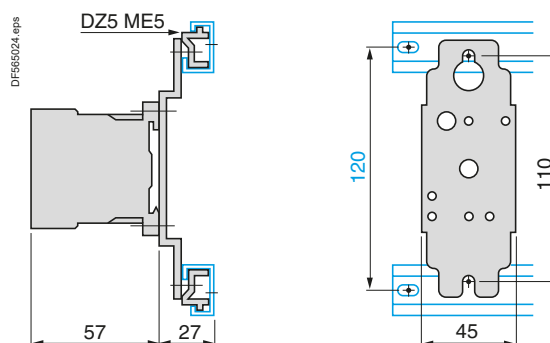


LA9 D973

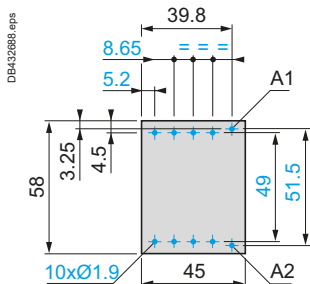
On one asymmetrical rail DZ5 MB with clip-on mounting plates



DX1 AP25



On printed circuit board

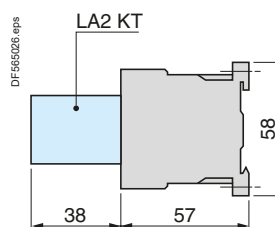


Electronic time delay contact blocks

LA2 KT



On contactor

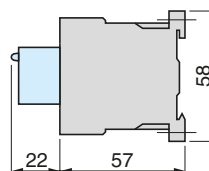


Suppressor modules

LA4 K●



On contactor LC1 K or LP1 K



Characteristics:
pages B8/93 to B8/96

References:
pages B8/40 to B8/43

Schemes:
page B8/98

Life Is On

Schneider
Electric

B8/97

igi
Parts

Ihr Schweizer Industriepartner

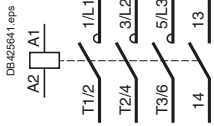
info@digiparts.ch

www.digiparts.ch

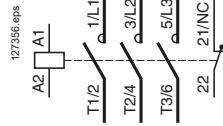
Contactors

3-pole contactors

3 P + N/O

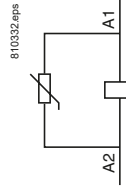


3 P + N/C

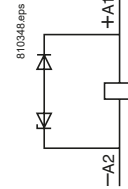


With integral suppression device

LC7 K

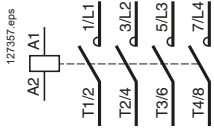


LP4 K

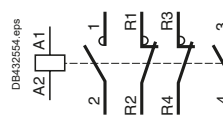


4-pole contactors

4 P

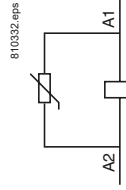


2 P N/O + 2 P N/C

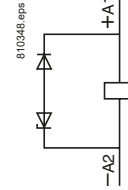


With integral suppression device

LC7 K



LP4 K



Instantaneous auxiliary contacts LA1 K

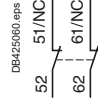
LA1 KN20, KN207, KN203

2 N/O



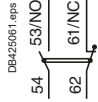
LA1 KN02, KN027, KN023

2 N/C



LA1 KN11, KN117, KN113

1 N/O + 1 N/C



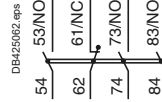
LA1 KN40, KN407, KN403

4 N/O



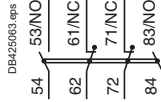
LA1 KN31, KN317, KN313

3 N/O + 1 N/C



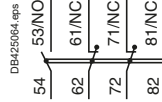
LA1 KN22, KN227, KN223

2 N/O + 2 N/C



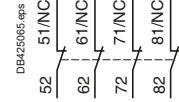
LA1 KN13, KN137, KN133

1 N/O + 3 N/C



LA1 KN04, KN047, KN043

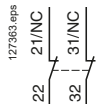
4 N/C



Terminal referencing conforming to standard EN 50012

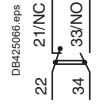
LA1 KN02M

2 N/C



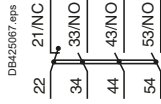
LA1 KN11M

1 N/O + 1 N/C



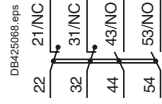
LA1 KN31M

3 N/O + 1 N/C



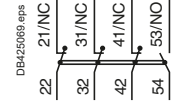
LA1 KN22M

2 N/O + 2 N/C



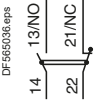
LA1 KN13M

1 N/O + 3 N/C



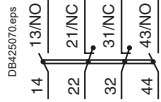
LA1 KN11P

1 N/O + 1 N/C



LA1 KN22P

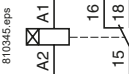
2 N/O + 2 N/C



Electronic time delay contact blocks

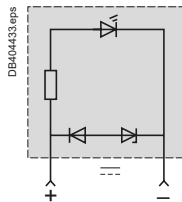
LA2 KT

1 C/O

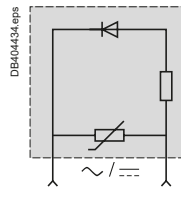


Suppressor modules

LA4 KC



LA4 KE



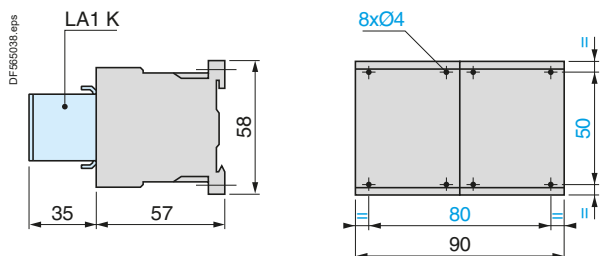
TeSys contactors

TeSys K reversing contactors

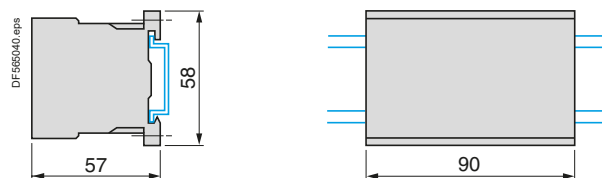
Reversing contactors

LC2 K, LC8 K, LP2 K, LP5 K

On panel



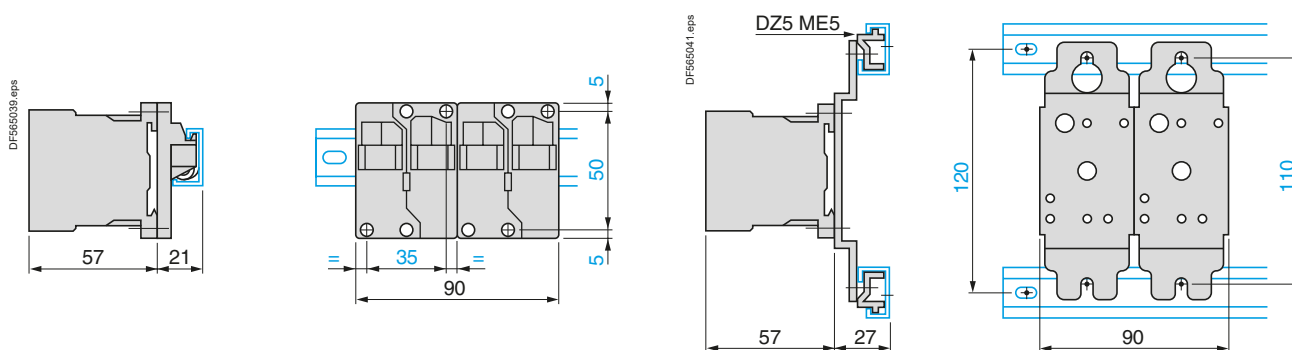
On mounting rail AM1 DP200 or AM1 DE200 (L 35 mm)



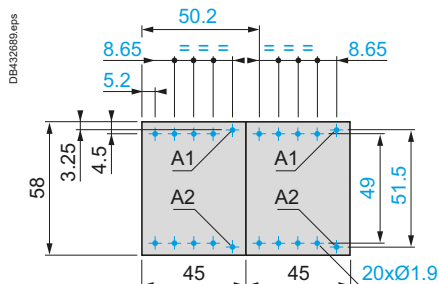
2 x LA9 D973

2 x DX1 AP25

On one asymmetrical mounting rail DZ5 MB with 2 clip-on mounting plates LA9 D973 or on 2 mounting plates DX1 AP25.



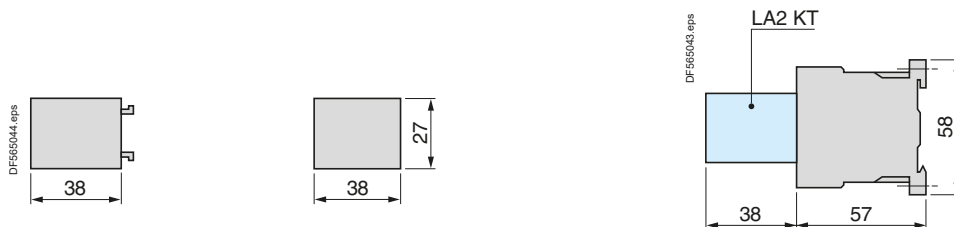
On printed circuit board for reversing contactors or 2 contactors mounted side by side.



Electronic time delay contact blocks

LA2 KT

On reversing contactors



Suppressor modules

LA4 K

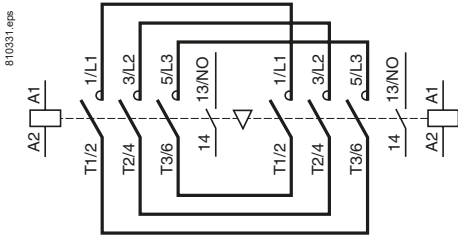
On reversing contactors LC2 K or LP2 K



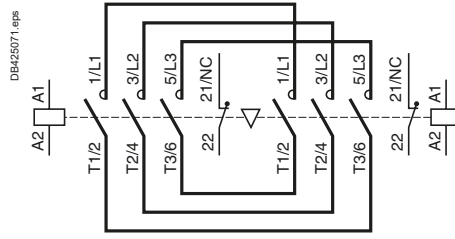
3-pole reversing contactors

With screw clamp connections

3 P + N/O



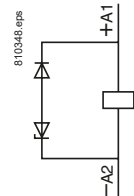
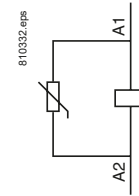
3 P + N/C



With integral suppression device

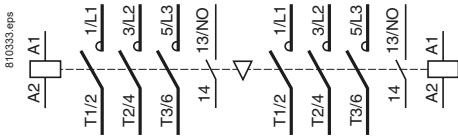
LC8 K

LP5 K

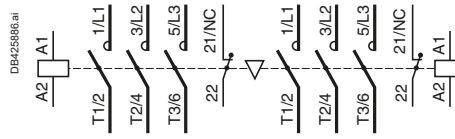


With Faston connectors or solder pins (printed circuit board)

3 P + N/O



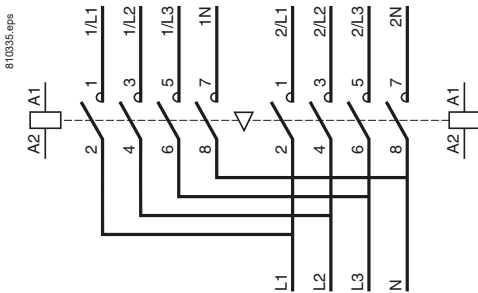
3 P + N/C



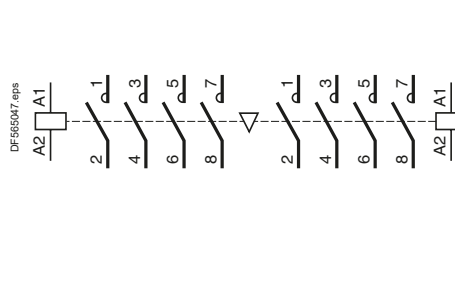
4-pole reversing contactors

With screw clamp connections

4 P



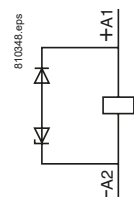
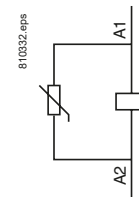
4 P



Integral suppression device

LC8 K

LP5 K



Instantaneous auxiliary contacts LA1 K

Terminal referencing conforming to standard EN 50012

LA1 KN20, KN207, KN203

LA1 KN02, KN027, KN023

LA1 KN11, KN117, KN113

LA1 KN02M

LA1 KN11M

LA1 KN11P

2 N/O

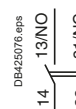
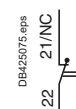
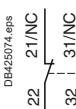
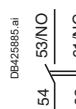
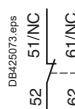
2 N/C

1 N/O + 1 N/C

2 N/C

1 N/O + 1 N/C

1 N/O + 1 N/C



LA1 KN40, KN407, KN403

LA1 KN31, KN317, KN313

LA1 KN22, KN227, KN223

LA1 KN13, KN137, KN133

LA1 KN04, KN047, KN043

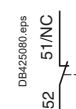
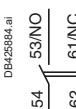
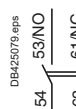
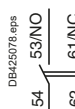
4 N/O

3 N/O + 1 N/C

2 N/O + 2 N/C

1 N/O + 3 N/C

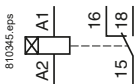
4 N/C



Electronic time delay contact blocks

LA2 KT

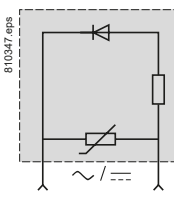
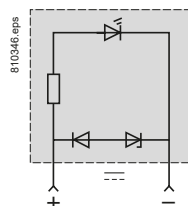
1 C/O



Suppressor modules

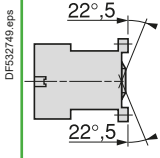
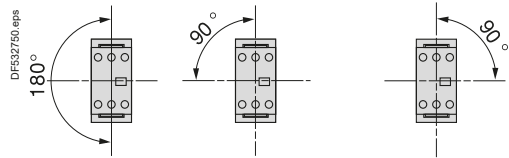
LA4 KC

LA4 KE



TeSys contactors

Mini-contactors TeSys LC1SKGC, for use in modular panels

Environment															
Rated insulation voltage (Ui)	Conforming to IEC 60947	V	690												
Conforming to standards			IEC 60947, UL 60947-4-1, CSA C22.2 n° 60947-4-1												
Approvals			cULus												
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact												
Ambient air temperature around the device															
	Storage	°C	-50...+70												
	Operation	°C	-20...+50												
Maximum operating altitude	Without derating	m	2000												
Operating position			<p>Vertical axis</p>  <p>Horizontal axis</p> 												
Cabling, connectors			<table border="1"> <thead> <tr> <th></th> <th>Min.</th> <th>Max.</th> </tr> </thead> <tbody> <tr> <td>Solid conductor</td> <td>mm² 1 x 1.5 or 2 x 1.5</td> <td>1 x 6 or 2 x 4</td> </tr> <tr> <td>Flexible cable without cable end</td> <td>mm² 1 x 0.5 or 2 x 0.35</td> <td>1 x 6 or 2 x 2.5</td> </tr> <tr> <td>Flexible cable with cable end</td> <td>mm² 1 x 0.35 or 2 x 0.35</td> <td>1 x 6 or 2 x 1.5</td> </tr> </tbody> </table>		Min.	Max.	Solid conductor	mm² 1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4	Flexible cable without cable end	mm² 1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5	Flexible cable with cable end	mm² 1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
	Min.	Max.													
Solid conductor	mm² 1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4													
Flexible cable without cable end	mm² 1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5													
Flexible cable with cable end	mm² 1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5													
Tightening torque	Pozidriv n° 1 head	N.m	0.8												
Terminal referencing			Conforming to standards EN 50005												

TeSys contactors

Mini-contactors TeSys LC1SKGC, for use in modular panels

Pole characteristics					
Mini-contactor type		LC1 SKGC2	LC1 SKGC3 and LC1 SKGC4		
Conventional thermal current (I _{th})	For ambient temperature ≤ 55 °C	A	20	20	
Rated operational frequency		Hz	50/60		
Frequency limit of the operational current		Hz	up to 400		
Rated operational voltage (U _e)		V	690		
Rated making capacity	I rms conforming to IEC 60947	A	50	85	
Rated breaking capacity (for U _e ≤ 400 V)	Conforming to IEC 60947 (I rms)	A	40	68	
Permissible short time rating	In free air for a time "t" from cold state (θ ≤ 55 °C)	A	40	60	
Short-circuit protection	gl fuse U ≤ 440 V	A	20	20	
Average impedance per pole	At I _{th} and 50 Hz	mΩ	4	4	
Maximum rated operational current	For temperature ≤ 55 °C	AC-3 (U _e ≤ 400 V)	A	5	9
		AC-1	A	20	20
Use in category AC-1 resistive circuits, heating, lighting (U _e ≤ 440 V)	Increase in rated operational current by paralleling of 2 poles	A	32	32	

Auxiliary contact characteristics of mini-contactors			
Rated operational voltage (U _e)	Up to	V	690
Rated insulation voltage (U _i)	Conforming to IEC 60947	V	690
Conventional thermal current (I _{th})	For ambient temperature ≤ 55 °C	A	10
Frequency of the operational current		Hz	Up to 400
Short-circuit protection	Conforming to IEC 60947, gl fuse	A	10

Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

	V	24	48	110/127	220/230	380/400	440
1 million operating cycles	VA	48	96	240	440	800	880
3 million operating cycles	VA	17	34	86	158	288	317
10 million operating cycles	VA	7	14	36	66	120	132
Occasional making capacity	VA	1000	2050	5000	10000	14000	13000

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110	220	440	440
1 million operating cycles	W	120	80	60	52	51	880
3 million operating cycles	W	55	38	30	28	26	317
10 million operating cycles	W	15	11	9	8	7	132
Occasional making capacity	W	720	600	400	300	230	13000

TeSys contactors

Mini-contactors TeSys LC1SKGC, for use in modular panels

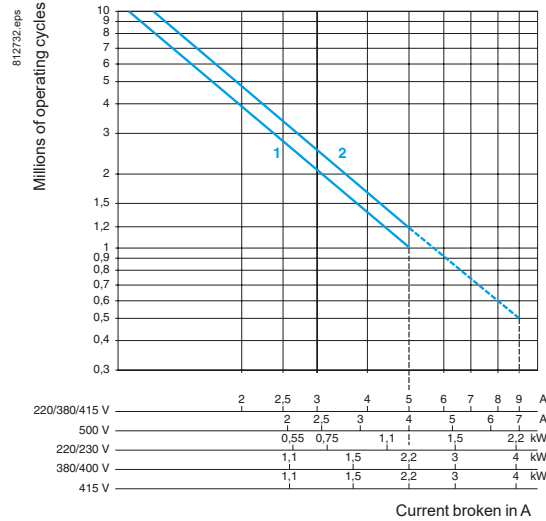
Control circuit characteristics			
Mini-contactor type		LC1 SKGC2	LC1 SKGC3 and LC1 SKGC4
Rated control circuit voltage (Uc)	V	~ 24...400	
Control voltage limits ($\theta \leq 55^\circ\text{C}$)	Operation	0.85...1.1 Uc	
	For drop-out	≥ 0.20 Uc	
Average coil consumption at 20 °C and at Uc	Inrush	VA 16	23
	Sealed	VA 4.2	4.9
Heat dissipation	W	1.4	1.5
Operating time at 20 °C and at Uc	Between coil energisation and	opening of the N/C contacts	ms 8...16
		closing of the N/O contacts	ms 7...14
	Between coil de-energisation and	opening of the N/O contacts	ms 6...8
		closing of the N/C contacts	ms 8...10
Maximum operating rate	In operating cycles per hour	1200	
Mechanical durability at Uc	50/60 Hz coil in millions of operating cycles	10	

TeSys contactors

Mini-contactors TeSys LC1SKGC, for use in modular panels

Use in category AC-3 ($U_e \leq 440\text{ V}$)

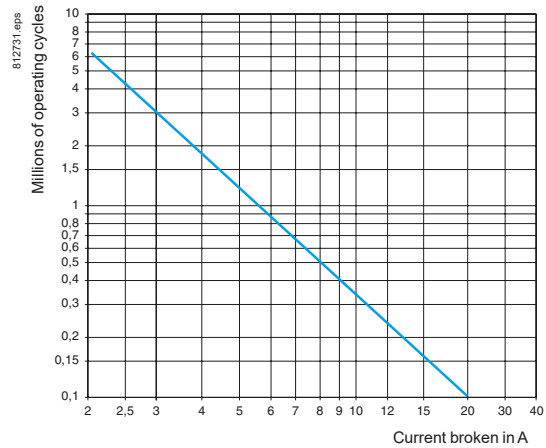
Control of 3-phase asynchronous squirrel cage motors with breaking whilst running. The current broken (I_c) in category AC-3 is equal to the rated operational current of the motor.



1. LC1 SKGC2
 2. LC1 SKGC3 and SKGC4
- only up to 415 V

Use in category AC-1 ($U_e \leq 440\text{ V}$)

Control of resistive circuits ($\cos \varphi \geq 0.95$). The current broken (I_c) in category AC-1 is equal to the current (I_e) normally drawn by the load.

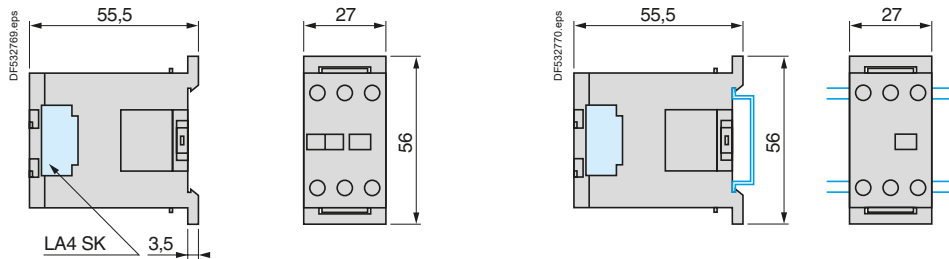


Dimensions, mounting, schemes - TeSys SKGC

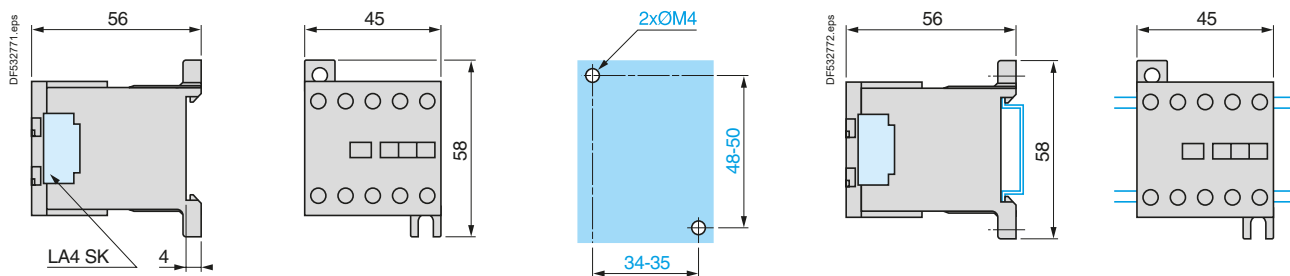
TeSys contactors

Mini-contactors TeSys LC1SKGC, for use in modular panels

Dimensions	Mounting
Mini-contactors LC1 SKGC2	On mounting rail AM1 DP200 or AM1 DE200 (└ 35 mm)

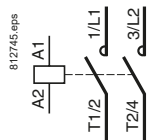


Dimensions	Mounting
Mini-contactors LC1 SKGC3 and SKGC4	On panel On mounting rail AM1 DP200 or AM1 DE200 (└ 35 mm)



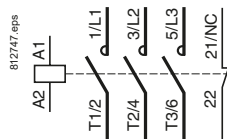
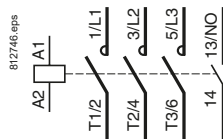
2-pole mini-contactors

LC1 SKGC2



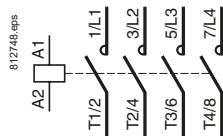
3-pole mini-contactors

LC1 SKGC310	LC1 SKGC301
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4-pole mini-contactors

LC1 SKGC400



Modular equipment

Standard contactors TeSys GC



GC 25

Presentation

TeSys GC contactors are designed for use in modular panels and enclosures. These contactors feature:

■ Easy installation:

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten, captive, pozidrive screw terminals.

■ Compact size:

All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).

■ User safety:

- use of materials conforming to strictest fire safety standards
- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.

This standard is specific to "Electromagnetic contactors for domestic and similar use".

It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in "premises and areas accessible to the public". Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

Applications

TeSys GC modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 100 A.

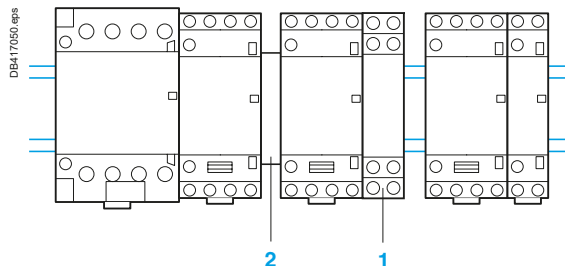
Power switching

These contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:

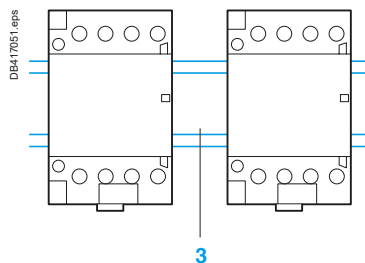
- lighting
- heating
- ventilation
- motorised shutters or gates.

Setting-up precautions

The contactor controls must be bounce free. If not, connect a coil suppression block **1** (GAP 21 or 23) across the coil terminals y 250 V.
When several contactors which operate at the same time are mounted side by side, a GAC 5 ventilation 1/2 module **2** must be fitted every 2 contactors.



It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space **3** equal to one module, or by 2 ventilation 1/2 modules (GAC 5).



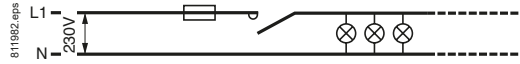
Derating of contactors mounted in a modular enclosure if the temperature within the enclosure is > 40 °C.

Contactor rating	40 °C	50 °C	60 °C ⁽¹⁾
16 A	16 A	14 A	13 A
25 A	25 A	22 A	20 A
40 A	40 A	36 A	32 A
63 A	63 A	57 A	50 A
100 A	100 A	87 A	80 A

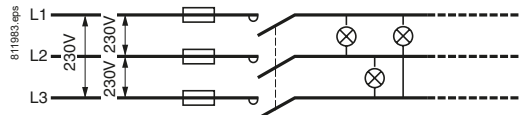
⁽¹⁾ Ventilation 1/2 module must be fitted.

Lighting (Maximum number of lamps depending on the power of each unit) Presentation of installations according to type of supply

■ Single-phase circuit, 230 V

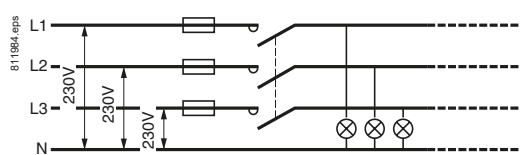


■ 3-phase circuit, 230 V



The maximum number of lamps which can be operated per phase is equal to the number of lamps in the "single phase 230 V" table divided by $\sqrt{3}$.

■ 3-phase circuit, 400 V (with neutral)



The maximum number of lamps which can be operated per phase is equal to the total number of lamps in the "single-phase 230 V" table.

Contactor rating for a single-phase 230 V circuit (single-pole)

Fluorescent lamps with starter

Single fitting	Non corrected					With parallel correction					Contactor rating
	P (W)	I_B (A)	C (μ F)	Maximum number of lamps		P (W)	I_B (A)	C (μ F)	Maximum number of lamps		
Twin fitting	20	0.39	-	22	30	20	0.19	5	15	20	16 A
	40	0.43	-	20	28	40	0.29	5	15	15	25 A
	50	0.70	-	13	17	40	0.46	7	10	15	40 A
	80	0.80	-	10	15	40	0.57	7	10	10	63 A
Twin fitting	110	1.2	-	7	10	110	0.79	16	5	7	63 A
	100	0.90	-	20	60	60	0.60	43	20	30	16 A
	56	0.48	-	4	8	60	0.43	9	6	6	25 A
	32	0.32	-	10	10	60	0.32	18	10	10	40 A
Twin fitting	2 x 18	0.44	-	20	11	2 x 18	0.26	3.5	10	17	16 A
	2 x 36	0.82	-	7	7	2 x 36	0.48	4.5	10	9	25 A
	2 x 58	1.34	-	5	5	2 x 58	0.78	7	9	6	40 A
	2 x 80	1.64	-	4	6	2 x 80	0.96	9	6	6	63 A
Twin fitting	2 x 140	2.2	-	16	16	2 x 140	1.3	18	10	10	63 A

High pressure mercury vapour lamps

	Non corrected						With parallel correction						Contactor rating
	P (W)	I_B (A)	C (μ F)	Maximum number of lamps			P (W)	I_B (A)	C (μ F)	Maximum number of lamps			
	50	0.6	-	15	20	50	0.35	7	10	15	10	16 A	
	80	0.8	-	10	15	80	0.50	8	10	10	10	25 A	
	125	1.15	-	8	10	125	0.7	10	18	6	4	40 A	
	250	2.15	-	4	6	250	1.5	18	25	4	2	63 A	
	400	3.25	-	2	2	400	2.4	40	40	2	1	63 A	
	700	5.4	-	1	1	700	4	60	60	1	1	63 A	
	1000	-	-	-	-	1000	5.7	-	-	-	-	63 A	
	53	0.43	-	15	20	53	0.38	30	17	12	7	63 A	

I_B : value of current drawn by each lamp at its rated voltage.

C: unit capacitance for each lamp.

I_B and C correspond to values normally quoted by lamp manufacturers

Contactor rating for a single-phase 230 V circuit (single-pole) (continued)

Low pressure sodium vapour lamps

	Non corrected						With parallel correction						Contactor rating
P (W)	18	35	55	90	135	180	18	35	55	90	135	180	–
I_B (A)	0.35	1.4	1.4	2.1	3.1	3.1	0.35	0.6	0.6	0.9	0.9	0.9	–
C (µF)	–	–	–	–	–	–	5	20	20	26	45	40	–
Maximum number of lamps	18	4	5	3	2	2	14	3	3	2	1	1	16 A
	34	9	9	6	4	4	21	5	5	4	2	2	25 A
	57	14	14	9	6	6	40	10	10	8	4	5	40 A
	91	24	24	19	10	10	60	15	15	11	6	7	63 A

High pressure sodium vapour lamps

	Non corrected					With parallel correction					Contactor rating
P (W)	70	150	250	400	1000	70	150	250	400	1000	–
I_B (A)	1	1.8	3	4.4	10.3	0.6	0.7	1.5	2.5	6	–
C (µF)	–	–	–	–	–	12	20	32	45	100	–
Maximum number of lamps	8	4	2	1	–	6	6	2	2	1	16 A
	12	7	4	3	1	9	9	3	4	2	25 A
	20	13	8	5	2	18	18	6	8	4	40 A
	32	18	11	8	3	25	25	9	12	6	63 A

Metal iodine or halogen vapour lamps

	Non corrected						With parallel correction						Contactor rating	
P (W)	35	70	150	250	400	1000	39	70	150	250	400	1000	2000	–
I_B (A)	0.3	0.5	1	1.5	2.5	6	0.3	0.5	1	1.5	2.5	6	5.5	–
C (µF)	–	–	–	–	–	–	6	12	20	32	45	85	60	–

Maximum number of lamps	27	16	8	5	3	1	12	6	4	3	2	–	1	16 A
	40	24	12	8	5	2	18	9	6	4	3	1	2	25 A
	68	42	20	14	8	4	31	16	10	7	5	3	3	40 A
	106	64	32	21	13	5	50	25	15	10	7	4	5	63 A

Incandescent and halogen lamps

										Contactor rating
P (W)	60	75	100	150	200	300	500	1000	–	
I_B (A)	0.26	0.32	0.44	0.65	0.87	1.3	2.17	4.4	–	
Maximum number of lamps	30	25	19	12	10	7	4	2	16 A	
	45	38	28	18	14	10	6	3	25 A	
	85	70	50	35	26	18	10	6	40 A	
	125	100	73	50	37	25	15	8	63 A	

Halogen lamps used with transformer

					Contactor rating
P (W)	60	80	105	150	–
I_B (A)	0.26	0.35	0.45	0.65	–
Maximum number of lamps	9	8	6	4	16 A
	14	12	9	6	25 A
	27	23	18	13	40 A
	40	35	27	19	63 A

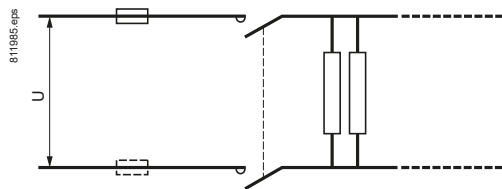
I_B value of current drawn by each lamp at its rated voltage.

C: unit capacitance for each lamp.

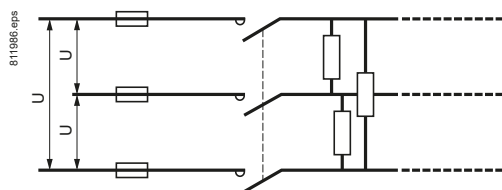
I_B and C correspond to values normally quoted by lamp manufacturers

Heating (AC-7a)

Single-phase, 2-pole switching



3-phase switching



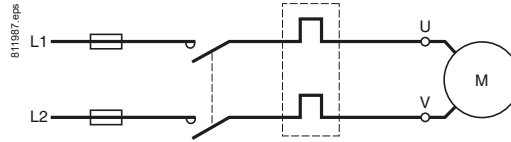
Heating by resistive elements or by infra-red radiators, convectors or radiators, heating ducts, industrial furnaces. The current peak between the hot and cold states must not exceed 2 to 3 I_n at the moment of switch-on.

Contactor selection according to power and required electrical life

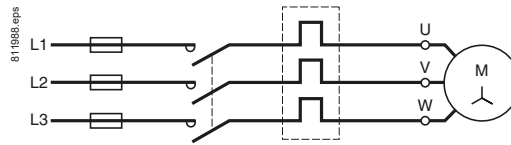
Electrical durability (in operating cycles)	Maximum power (kW)					Contactor rating
	100 x 10 ³	150 x 10 ³	200 x 10 ³	500 x 10 ³	10 ⁶	
Single-phase switching 230 V (2-pole)	3.5	3	2.2	1	0.8	16 A
	5.4	4.6	3.5	1.6	1.2	25 A
	8.6	7.4	5.6	2.6	1.9	40 A
	13.6	11.6	8.8	4	3	63 A
	21.6	18.4	14	6.4	4.8	100 A
3-phase switching 400 V (3-pole)	10	9	6.5	3.2	2.2	16 A
	16	14	10	5	3.5	25 A
	26	22	17	7.5	6	40 A
	41	35	26.5	12	9	63 A
	64.8	55.2	42	19.2	14.4	100 A

Motor control (AC-7b)

Single-phase circuit, 230 V



3-phase circuit, 400 V



Contactor selection according to maximum power in kW

230 V single-phase capacitor motor (2-pole)	400 V 3-phase motor	Contactor rating (Ith)
0.55	2.2	16 A
1.1	4	25 A
2.2	7.5	40 A
4	11	63 A

Environment								
Contactor type			GC16	GC25	GC40	GC63	GC100	
Rated insulation voltage (Ui)	Conforming to IEC 61095	V	500					
	Conforming to VDE 0110	V	500					
Rated impulse withstand voltage (Uimp)		kV	4 in enclosure					
Conforming to standards			IEC 61095 and IEC 60947-5-1 for auxiliary contacts					
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact (IP 20 open, IP 40 in enclosure)					
Ambient air temperature around the device	Storage	°C	-40...+70					
	Operation	°C	-5...+50 (0.85...1.1 Uc)					
Maximum operating altitude	Without derating	m	3000					
Operating positions	Without derating		±30° in relation to normal vertical mounting plane					
Shock resistance 1/2 sine wave = 10 ms	Contact open		10 gn					
	Contact closed		15 gn					
Vibration resistance 5...300 Hz	Contact open		2 gn					
	Contact closed		3 gn					
Flame resistance			Conforming to IEC 61095					
Pole characteristics								
Number of poles			2, 3 or 4					
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-7a (heating)	A	16	25	40	63	100	
	In AC-7b (motor control)	A	5	8.5	15	25	–	
Rated operational voltage (Ue)	Up to	V	250 two-pole contactors, 415 three and four-pole contactors					
Frequency limits	Of the operating current	Hz	400					
Conventional thermal current (Ith)	θ ≤ 50 °C	A	16	25	40	63	100	
Rated breaking and making capacity	Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase	A	40	68	120	200	–	
Permissible short time rating no current flowing for preceding 15 minutes with q ≤ 40 °C	For 10 s	A	128	200	320	504	800	
	For 30 s	A	40	62	100	157	250	
Short-circuit protection by fuse or circuit breaker U ≤ 440 V	gl fuse	A	16	25	40	63	100	
	Circuit breaker I ² t 230 V (at 3 kA rms prospective)	A ² s	5000	10000	16000	18000	–	
	400 V	A ² s	9000	14000	17500	20000	–	
Electrical durability in operating cycles	AC-7a, AC-7b		100000	100000	100000	100000	30000	
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5	2.5	2	2	1	
Power dissipated per pole	For the above operational currents	W	0.65	1.6	3.2	8	10	
Maximum cabling c.s.a.	Flexible cable without cable end	1 conductor	mm ²	6	6	25	25	35
		2 conductors	mm ²	4	4	16	16	–
	Flexible cable with cable end	1 conductor	mm ²	6	6	16	16	35
		2 conductors	mm ²	1.5	1.5	4	4	–
	Solid cable without cable end	1 conductor	mm ²	6	6	25	25	35
		2 conductors	mm ²	4	4	6	6	10
Tightening torque	Power circuit connections	N.m	0.8	0.8	3.5	3.5	3.5	

Control circuit characteristics				GC16, GC25 single or 2-pole	GC16, GC25 3 or 4-pole GC40, GC63 2-pole	GC40, GC63 3 or 4-pole GC100 2-pole	GC100 4-pole
Rated control circuit voltage (Uc)		50 or 60 Hz	V	12...240 V, for other voltages, please consult your Regional Sales Office			
Control voltage limits ($\theta \leq 50^\circ\text{C}$)	50 Hz coils	Operational		0.85...1.1 Uc			
		Drop-out		0.2...0.75 Uc			
Average coil consumption at 20 °C and at Uc	~ 50 Hz	Inrush	VA	15	34	53	106
		Sealed	VA	3.8	4.6	6.5	13
Maximum heat dissipation	50/60 Hz		W	1.3	1.6	2.1	4.2
Operating time	Closing "C"		ms	10...30			
	Opening "O"		ms	10...25			
Mechanical durability	In operating cycles			10 ⁶			
Maximum operating rate at ambient temperature $\leq 50^\circ\text{C}$	In operating cycles per hour			300			
Maximum cabling c.s.a.	Flexible cable without cable end	1 or 2 conductors	mm²	2.5			
		Flexible cable with cable end		mm²	2.5		
	Solid cable without cable end	1 or 2 conductors	mm²	1.5			
Tightening torque			N.m	0.8			

Instantaneous auxiliary contact characteristics			
Rated operational voltage (Ue)	Up to	V	250
Rated insulation voltage (Ui)	Conforming to IEC 60947-5	V	500
	Conforming to VDE 0110	V	500
Conventional thermal current (Ith)	For ambient $\theta \leq 50^\circ\text{C}$	A	5
Mechanical durability	Operating cycles		10 ⁶
Maximum cabling c.s.a.	Flexible or solid conductor	mm²	2.5
Tightening torque		N.m	0.8

Dimensions

Contactors

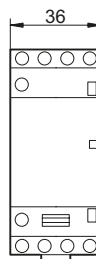
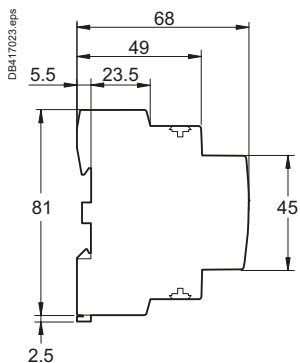
Common side view

GC 1610, 1611, 1620
GC 2502, 2510, 2511, 2520

1 module

GC 1622, 1640
GC 2504, 2522, 2530, 2540

2 modules



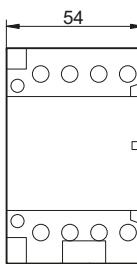
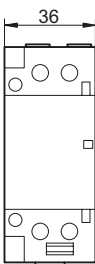
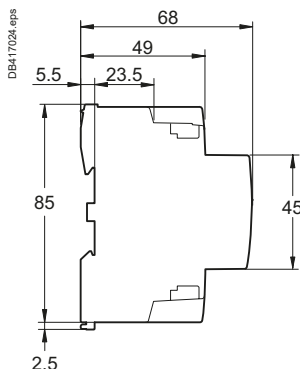
Common side view

GC 4002, 4011, 4020
GC 6302, 6311, 6320

2 modules

GC 4004, 4022, 4030, 4040
GC 6304, 6322, 6330, 6340

3 modules



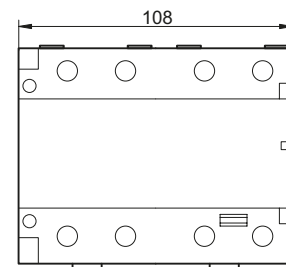
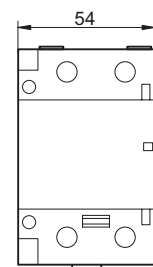
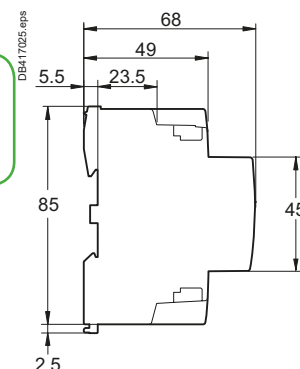
Common side view

GC 10020

3 modules

GC 10040

6 modules

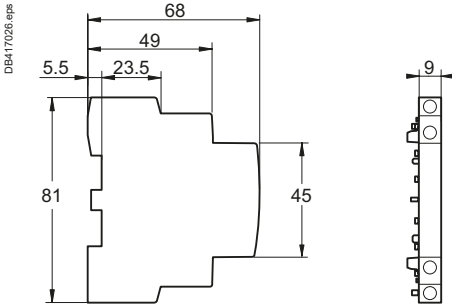


Contactors

Dimensions

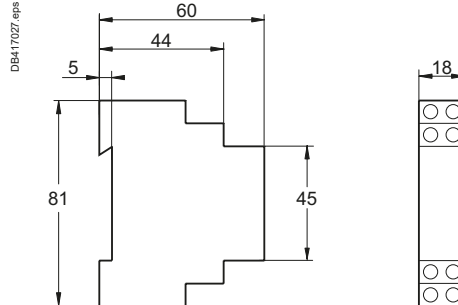
Auxiliary contacts

GAC 0511, 0531 and 0521



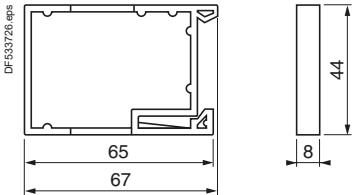
Coil suppression blocks

GAP 21 and 23



Clip-on ventilation 1/2 module

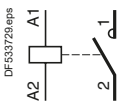
GAC 5



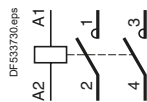
Schemes

Contactors

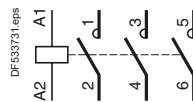
GC ●●10



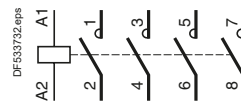
GC ●●20



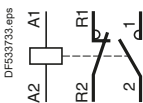
GC ●●30



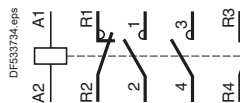
GC ●●40



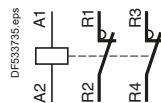
GC ●●11



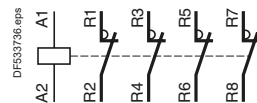
GC ●●22



GC ●●02

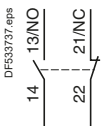


GC ●●04



Auxiliary contacts

GAC 0521



GAC 0531



GAC 0511



Modular equipment

TeSys GY "dual tariff" contactors



GY 25

Presentation

TeSys GY "dual tariff" contactors are designed for use in modular panels and enclosures.

These contactors feature:

■ **Easy installation:**

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten captive, pozidrive screw terminals.

■ **Compact size**

All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).

■ **User safety:**

- use of materials conforming to strictest fire safety standards
- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

"Dual tariff" contactors are designed for use with Electricity Supply Authority dual tariffs.

They have a 4-position selector switch on the front panel:

"Stop" (O)	For switching off the load, e.g. for prolonged periods of absence.
"Off peak" Automatic start (A)	The contactor switches automatically during "off peak" hours as set by the Supply Authority remote control and thus supplies the load, (washing machine, dishwasher, convector heater, water heater) during this period, at an economy rate to the user.
"Peak time" Manual start (I)	In this position, the contactor supplies the load to cater for additional requirements for hot water, heating, etc., but at the standard rate. The contactor returns automatically to the "off-peak" position at the start of the "off-peak" period.
"Peak time" Manual override with lock	Facility for setting the contactor to continuous manual operation, ignoring the automation system and the Supply Authority control; setting and locking is achieved by means of a tool, with manual return to the "AUTO" position.

Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.

This standard is specific to "Electromagnetic contactors for domestic and similar use".

It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in "premises and areas accessible to the public".

Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

"Dual tariff" modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 63 A.

TeSys GY contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:

- lighting,
- heating, ventilation,
- motorised shutters or gates.

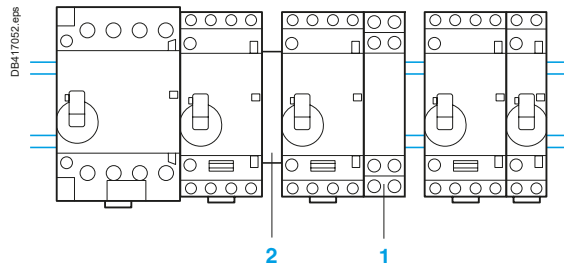
Modular equipment

TeSys GY "dual tariff" contactors

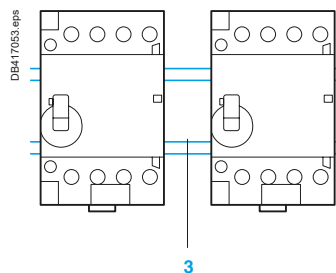
Setting-up precautions

The contactor controls must be bounce free. If not, connect a coil suppression block **1** (GAP 21 or 23) across the coil terminals ≤ 250 V.

When several contactors which operate at the same time are mounted side by side, a GAC 5 ventilation 1/2 module **2** must be fitted every 2 contactors.



It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space equal to one module **3** or by 2 ventilation 1/2 modules GAC 5.



Derating of contactors mounted in a modular enclosure if the temperature within the enclosure is > 40 °C.

Contactor rating	40 °C	50 °C	60 °C ⁽¹⁾
16 A	16 A	14 A	13 A
25 A	25 A	22 A	20 A
40 A	40 A	36 A	32 A
63 A	63 A	57 A	50 A

⁽¹⁾ Ventilation 1/2 module must be fitted.

Modular equipment

TeSys GY "dual tariff" contactors

Environment			GY 16	GY 25	GY 40	GY 63
Rated insulation voltage (Ui)	Conforming to IEC 61095	V	500			
	Conforming to VDE 0110	V	500			
Rated impulse withstand voltage (Uimp)		kV	4 in enclosure			
Conforming to standards			IEC 61095 and IEC 60947-5-1 for auxiliary contacts			
Product certifications			NF-USE, VDE, CEBEC, ÖVE			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 20 open, IP 40 in enclosure			
Ambient air temperature around the device	Storage	°C	-40...+70			
	Operation	°C	-5...+50 (0.85...1.1 Uc)			
Maximum operating altitude	Without derating	m	3000			
Operating positions	Without derating		±30° in relation to normal vertical mounting plane			
Shock resistance 1/2 sine wave = 11 ms	Contacteur open		10 gn			
	Contacteur closed		15 gn			
Vibration resistance 5...300 Hz	Contacteur open		2 gn			
	Contacteur closed		3 gn			
Flame resistance			Conforming to IEC 61095			

Pole characteristics

Number of poles			2, 3 or 4				
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-7a (heating)	A	16	25	40	63	
	In AC-7b (motor control)	A	5	8.5	15	25	
Rated operational voltage (Ue)	Up to	V	250 - 2-pole contactors, 415 - 3 and 4-pole contactors				
Frequency limits	Of the operating current	Hz	400				
Conventional thermal current (Ith)	θ ≤ 50 °C	A	16	25	40	63	
Rated breaking and making capacity	Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase	A	40	68	120	200	
Short time rating with no current flow for the previous 15 minutes with θ ≤ 40 °C	For 10 s	A	128	200	320	504	
	For 30 s	A	40	62	100	157	
Short-circuit protection by fuse or circuit breaker U ≤ 440 V	gl fuse	A	16	25	40	63	
	Circuit breaker I ² t 230V	A ² s	5000	10000	16000	18000	
	(at 3 kA rms prospective) 400V	A ² s	9000	14000	17500	20000	
Electrical durability in operating cycles	AC-7a, AC-7b		100000	100000	100000	100000	
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5	2.5	2	2	
Power dissipated per pole	For the above operational currents	W	0.65	1.6	3.2	8	
Maximum cabling c.s.a.	Flexible cable without cable end	1 conductor	mm ²	6	6	25	25
		2 conductors	mm ²	4	4	16	16
	Flexible cable with cable end	1 conductor	mm ²	6	6	16	16
		2 conductors	mm ²	1.5	1.5	4	4
	Solid cable without cable end	1 conductor	mm ²	6	6	25	25
		2 conductors	mm ²	4	4	6	6
Tightening torque	Power circuit connections	N.m	0.8	0.8	3.5	3.5	

Modular equipment

TeSys GY "dual tariff" contactors

Control circuit characteristics					
Type			GY 16, GY 25 single or 2-pole	GY 16, GY 25 3 or 4-pole GY 40, GY 63 2-pole	GY 40, GY 63 3 or 4-pole
Rated control circuit voltage (Uc)	50 or 60 Hz	V	12...240 V, for other voltages, please consult your Regional Sales Office		
Control voltage limits ($\theta \leq 50$ °C)	50 Hz coils	Operational	0.85...1.1 Uc		
		Drop-out	0.2...0.75 Uc		
Average consumption at 20 °C and at Uc ~ 50 Hz	Inrush	VA	15	34	53
		Sealed	VA	3.8	4.6
Heat dissipation	50/60 Hz	W	1.3	1.6	2.1
Operating time	Closing "C"	ms	10 ... 30		
	Opening "O"	ms	10 ... 25		
Mechanical durability	In operating cycles		10 ⁶		
Maximum operating rate at ambient temperature ≤ 50 °C	In operating cycles per hour		300		
Maximum cabling c.s.a.	Flexible cable without cable end	1 or 2 conductors	mm ²	2.5	
		1 conductor	mm ²	2.5	
	Flexible cable with cable end	2 conductors	mm ²	1.5	
		1 or 2 conductors	mm ²	1.5	
Solid cable without cable end	1 or 2 conductors	mm ²	1.5		
	1 conductor	mm ²	1.5		
Tightening torque		N.m	0.8		
Instantaneous auxiliary contact characteristics					
Rated operational voltage (Ue)	Up to	V	250		
Rated insulation voltage (Ui)	Conforming to IEC 60947-5	V	500		
	Conforming to VDE 0110	V	500		
Conventional thermal current (Ith)	For ambient $\theta \leq 50$ °C	A	5		
Mechanical durability	In operating cycles		10 ⁶		
Maximum cabling c.s.a.	Flexible or solid conductor	mm ²	2.5		
Tightening torque		N.m	0.8		

Modular equipment

TeSys GY "dual tariff" contactors

Dimensions

"Dual tariff" contactors

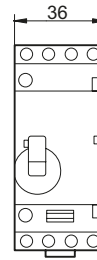
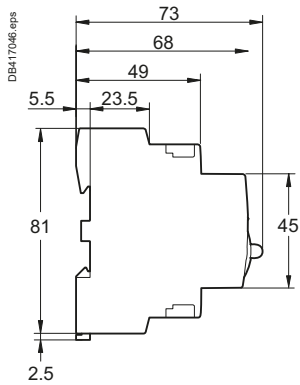
Common side view

GY 1620
GY 2520

1 module

GY 2530, 2540

2 modules



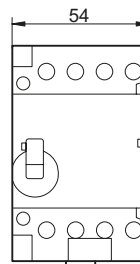
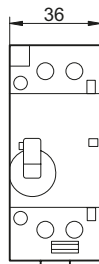
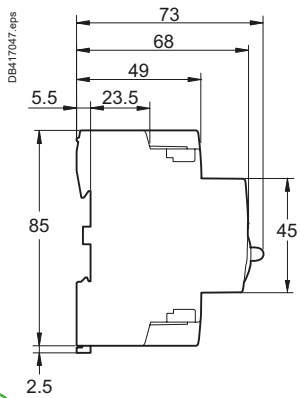
Common side view

GY 4020
GY 6320

2 modules

GY 4030, 4040
GY 6330, 6340

3 modules



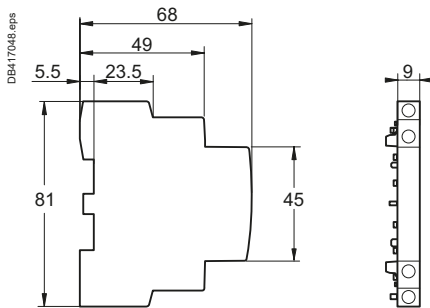
Modular equipment

TeSys GY "dual tariff" contactors

Dimensions

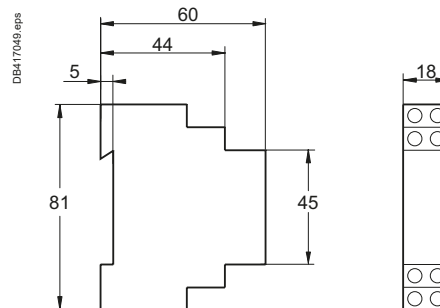
Auxiliary contacts

GAC 0511, 0531 and 0521



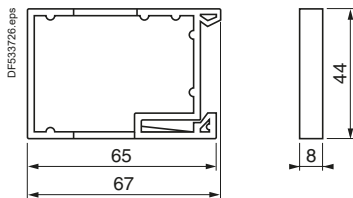
Coil suppression block

GAP 21 and 23



Clip-on ventilation 1/2 module

GAC 5



Schemes

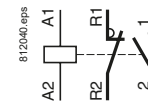
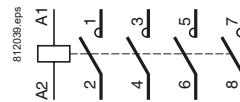
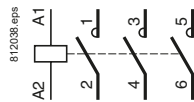
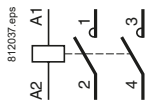
Contactors

GY ●●20

GY ●●30

GY ●●40

GY ●●11

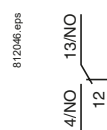
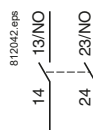
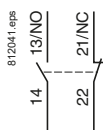


Auxiliary contacts

GAC 0521

GAC 0531

GAC 0511





GF 1611M7

Presentation

TeSys GF impulse relays are designed for use in modular enclosures.

They feature:

■ Easy installation:

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten captive, pozidrive screw terminals.

■ Compact size

Units have a common depth of 60 mm and width of 18 mm.

■ User safety:

- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

Standards

This range of modular impulse relays has been designed taking into account the requirements of international standard IEC 60669-2.

This standard is specific to "Impulse relays".

Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

Functions

Modular impulse relays are designed for opening and closing of circuits which are remotely controlled by impulses. The position is mechanically maintained.

These impulse relays are used in lighting circuits when there are more than two switching points.

Power switching

TeSys GF impulse relays have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific lighting supply is required.

Modular equipment

TeSys GF impulse relays

Lighting circuits

Fluorescent lamps with starter

Single fitting	Non corrected			With parallel correction		
	Power in W	18	36	58	18	36
Number of lamps	70	35	21	50	25	16

Twin fitting	With series correction		
	Power in W	2 x 18	2 x 36
Number of lamps	56	28	17

Incandescent lamps: filament lamps

Power in W	40	60	75	100	200
Number of lamps	40	25	20	16	8

Incandescent lamps: halogen lamps

Power in W	300	500	1000	1500
Number of lamps	5	3	1	1

Incandescent lamps: very low voltage halogen lamps

Power in W	20	50	75	100
Number of lamps	70	28	19	4

Low pressure sodium vapour lamps

	Non corrected			
	Power in W	55	90	135
Number of lamps	24	15	10	7

High pressure sodium vapour lamps

	Non corrected		
	Power in W	250	400
Number of lamps	5	3	1

Heating circuits

Single-phase 230 V, 2-pole

Power in kW	3.6
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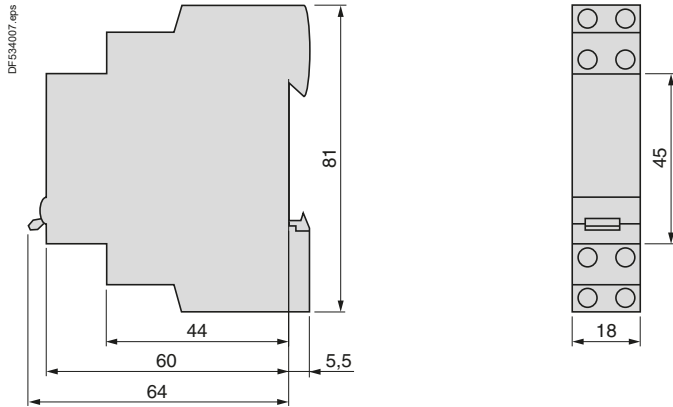
Environment			
Rated insulation voltage (Ui)	Conforming to IEC 60947-1-5	V	400
	Conforming to VDE 0110	V	400
Rated impulse withstand voltage (Uimp)		kV	4 in enclosure
Conforming to standards			IEC 60669-1 and 60669-2
Product certifications			NF-USE, CEBC, ASE, KEMA, N, S, D, FI, VDE
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 20 open, IP 40 in enclosure
Ambient air temperature around the device	Storage	°C	-40...+80
	Operation	°C	-20...+50
Maximum operating altitude	Without derating	m	2000
Operating positions	Without derating		±90° in relation to normal vertical mounting plane
Shock resistance 1/2 sine wave = 10 ms	Impulse relay open		Please consult your Regional Sales Office
	Impulse relay closed		Please consult your Regional Sales Office
Vibration resistance 5...300 Hz	Impulse relay open		4 gn
	Impulse relay closed		4 gn

Pole characteristics							
Number of poles			1 or 2				
Rated operational current (Ie) (Ue ≤ 250 V)	In AC-7a (heating)	A	16				
Rated operational voltage		V	250				
Conventional thermal current (Ith)	θ ≤ 50 °C	A	16				
Permissible short time rating no current flowing for preceding 15 minutes with θ ≤ 40 °C	For 1 s	A	320				
	For 10 s	A	96				
	For 30 s	A	48				
Short-circuit protection by fuse or circuit breaker	gl fuse	A	16				
	Circuit breaker I ² t (at 3 kA rms prospective)	A ² s	5000				
Average impedance per pole	At Ith and 50 Hz	mΩ	4				
Power dissipated per pole		W	1				
Maximum cabling c.s.a.	Flexible cable without cable end	1 conductor	mm ²	Min.	0.5	Max.	6
		2 conductors	mm ²	0.5	4		
	Flexible cable with cable end	1 conductor	mm ²	0.5	6		
		2 conductors	mm ²	0.5	4		
	Solid cable without cable end	1 conductor	mm ²	0.5	6		
		2 conductors	mm ²	0.5	4		
Tightening torque	Power circuit connections	N.m	0.8				

Control circuit characteristics			
Rated control circuit voltage (Uc)		V	12...240 V, for other voltages, please consult your Regional Sales Office
Control voltage limits ($\theta < 50\text{ }^{\circ}\text{C}$)	Operating threshold, dual frequency 50/60 Hz	V	0.85...1.1 Uc
Average consumption at 20 °C and at Uc	Inrush at 50 Hz	VA	19
Operating time	Closing "C"	ms	70
	Opening "O"	ms	70
Minimum impulse time		ms	70
Mechanical durability			10 ⁶ operating cycles
Electrical durability	AC-21		200000 operating cycles
	AC-22		100000 operating cycles
Maximum operating rate	Operating cycles per hour		900
Maximum cabling c.s.a.	Flexible cable without cable end	1 or 2 conductors	mm² 2.5
	Flexible cable with cable end	1 conductor	mm² 2.5
		2 conductors	mm² 1.5
	Solid cable without cable end	1 or 2 conductors	mm² 1.5
Tightening torque		N.m	0.8

Dimensions

GF 1610, GF 1611, GF 1620

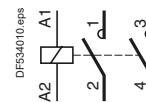
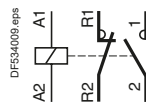
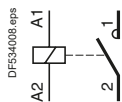


Schemes

GF 1610

GF 1611

GF 1620



Technical information

Tests according to standard utilisation categories conforming to IEC 60947-4-1 and 5-1

Contactors													
Electrical durability: making and breaking conditions											Occasional duty: making and breaking conditions		
a.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	cos φ	I	U	cos φ	I	U	cos φ	I	U	cos φ
Resistors, non inductive or slightly inductive loads	AC-1	1e	Ue	0.95	1e	Ue	0.95	1.5 1e	1.05 Ue	0.8	1.5 1e	1.05 Ue	0.8
Motors													
Slip ring motors: starting, breaking.	AC-2	2.5 1e	Ue	0.65	2.5 1e	Ue	0.65	4 1e	1.05 Ue	0.65	4 1e	1.05 Ue	0.65
Squirrel cage motors: starting, breaking whilst motor running.	AC-3	1e ≤ ⁽¹⁾	Ue	0.65	1 1e	0.17 Ue	0.65	10 1e	1.05 Ue	0.45	8 1e	1.05 Ue	0.45
		1e > ⁽²⁾	Ue	0.35	1 1e	0.17 Ue	0.35	10 1e	1.05 Ue	0.35	8 1e	1.05 Ue	0.35
Squirrel cage motors: starting, reversing, inching	AC-4	1e ≤ ⁽¹⁾	Ue	0.65	6 1e	Ue	0.65	12 1e	1.05 Ue	0.45	10 1e	1.05 Ue	0.45
		1e > ⁽²⁾	Ue	0.35	6 1e	Ue	0.35	12 1e	1.05 Ue	0.35	10 1e	1.05 Ue	0.35
d.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)
Resistors, non inductive or slightly inductive loads	DC-1	1e	Ue	1	1e	Ue	1	1.5 1e	1.05 Ue	1	1.5 1e	1.05 Ue	1
Shunt wound motors: starting, reversing, inching	DC-3	2.5 1e	Ue	2	2.5 1e	Ue	2	4 1e	1.05 Ue	2.5	4 1e	1.05 Ue	2.5
Series wound motors: starting, reversing, inching	DC-5	2.5 1e	Ue	7.5	2.5 1e	Ue	7.5	4 1e	1.05 Ue	15	4 1e	1.05 Ue	15
Control relays and auxiliary contacts													
Electrical durability: making and breaking conditions											Occasional duty: making and breaking conditions		
a.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	cos φ	I	U	cos φ	I	U	cos φ	I	U	cos φ
Electromagnets													
≤ 72 VA	AC-14	-	-	-	-	-	-	6 1e	1.1 Ue	0.7	6 1e	1.1 Ue	0.7
> 72 VA	AC-15	10 1e	Ue	0.7	1e	Ue	0.4	10 1e	1.1 Ue	0.3	10 1e	1.1 Ue	0.3
d.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)
Electromagnets	DC-13	1e	Ue	6 P ⁽³⁾	1e	Ue	6 P ⁽³⁾	1.1 1e	1.1 Ue	6 P ⁽³⁾	1.1 1e	1.1 Ue	6 P ⁽³⁾

(1) $1e \leq 17 A$ for electrical durability, $1e \leq 100 A$ for occasional duty.

(2) $1e > 17 A$ for electrical durability, $1e > 100 A$ for occasional duty.

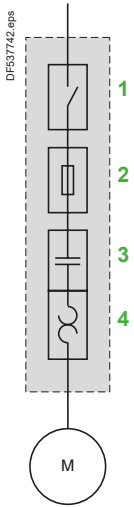
(3) The value 6 P (in watts) is based on practical observations and is considered to represent the majority of d.c. magnetic loads up to the maximum limit of $P = 50 W$ i.e. $6 P = 300 ms = L/R$.

Above this, the loads are made up of smaller loads in parallel. The value 300 ms is therefore a maximum limit whatever the value of current drawn.

TeSys contactors

For the North American market

Conforming to UL and CSA



- 1 Motor Disconnect (Disconnect switch)
- 2 Motor Branch Circuit Protection (Short-circuit protection)
- 3 Motor Controller (Contactor)
- 4 Motor Overload Protection (Thermal overload relay)

Starters for the North American market

In recent years, the North American market has started to harmonise UL, CSA and ANCE standards, as well as the industrial installation codes provided by national regulations (NEC for the United States, CEC for Canada and MEC for Mexico). ⁽¹⁾ Major improvements, carried out by the Canena ⁽²⁾ are aimed at harmonising product requirements based on IEC ⁽³⁾ standards. However, the North American codes use specific terminology for defining the functions of a starter. These functions can be fulfilled by standard IEC products, accompanied by appropriate certifications.

Combination Starters

Combination Starters are the most common type of packaged motor starter. They are called "Combination" because of their structure and their combined functions. The figure opposite shows the four combined functions that constitute a complete motor starter circuit, defined as a "Motor branch circuit" by the NEC (US National Electric Code) in article 430. Standard UL508 currently gives different types of combination starter that meet the requirements of a "Motor branch circuit".

Type E, called "self-protected combination starter", covers all these functions and can be controlled manually (thermal-magnetic circuit breaker) or remotely (starter-controller). Type E starters withstand faults within their declared nominal rating without sustaining damage, after which they can be put back into service. In addition, they can withstand more severe short-circuit and durability performance tests without welding or excessive wear of the contact tips.

Type F, called "Combination motor starter", consists of a type E manual starter (thermal-magnetic circuit breaker) combined with a contactor. These starters are evaluated by means of basic short-circuit tests, but are not considered as "self-protected".

For this combination, the type E starter must be marked "Combination Motor Controller when used with ...", followed by the reference of the load side contactor.

⁽¹⁾ **UL**: Underwriters Laboratories, **CSA**: Canadian Standards Association, **ACNE**: Association of Standardization and Certification, **NEC**: National Electric Code, **CEC**: Canadian Electrical Code, **MEC**: Mexican Electrical Code.
⁽²⁾ **Canena**: Council for Harmonization of Electrotechnical Standardization of North America.
⁽³⁾ **IEC**: International Electrotechnical Commission.

TeSys contactors

For the North American market

Conforming to UL and CSA

Control panels

To help users properly coordinate their motor control equipment with their distribution system in the event of a fault, article 409 of the 2005 NEC requires panel builders to list the short-circuit withstand rating of their motor control panels. According to standard UL508A, manufacturers must use the short-circuit withstand value of the lowest rated device as the nominal withstand rating of the panel, unless the devices have been tested together for a higher coordinated rating. The minimum “**short-circuit current rating**” (SCCR), on motor control components for horsepower ratings of 50 hp or below is 5000 A.

Using a **type E** or **type F** combination starter eliminates the coordination problems of using individual components for the “motor branch circuit protection”, “motor controller” and “motor overload protection” functions. The panel builder uses the declared short-circuit current rating for the combination starter. This value is generally higher than 5000 A. This makes it easier to list the short-circuit current ratings and to check the compatibility of a UL508A motor control panel within a given distribution system.

Group protection

Article 430.53 of the NEC allows a single short-circuit protection device to be used for more than one motor circuit if the components used are marked and listed for such use.

Components suitable for use in group protection, known as “**motor group installations**”, can be marked in one of the following two ways:

Case n° 1

The contactor and the motor overload relay are both listed as suitable for group installation.

An inverse time circuit breaker can be used as the short-circuit protection device if it is also listed as suitable for group installation.

The panel builder must therefore make sure that the short-circuit protection device selected (fuses or inverse time circuit breaker) does not exceed the value allowed by article 430.40 for the smallest overload relay used in the circuit.

Once these conditions have been met, the panel builder can reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one third of the size of the upstream circuit conductor supplying the protection device.

The panel builder must limit the length of the motor starter conductor (connecting the short-circuit protection device to the motor contactor/overload relay) to a maximum of 7.6 m (25 feet).

Case n° 2

The motor contactor and overload relay are listed as suitable for “**tap conductor protection**” in group installations.

This category allows the panel designer to reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one tenth of the size of the upstream circuit conductor supplying the protection device.

The designer must limit the length of this conductor to a maximum of 3.05 m (10 feet).

In both cases, the supply circuits must not be less than 125 % of the connected motor FLA (Full Load Amps) rating.

For panel builders, using **type F** combination starters in group installations simplifies group motor considerations.

Each starter is a fully coordinated motor branch circuit.

The panel builder follows the same NEC requirements for sizing the supply conductors as those required for single motor branch circuits.

The size of the supply conductors can be reduced in accordance with the specifications of article 430.28.

This allows the same flexibility in conductor sizing as that offered in article 430.53 (D), without a requirement to check the short-circuit protection rating marked on the components and the overload relay limit.

A UL508A panel does not need a short-circuit protection device when each motor starter installed is a **type F**.

The upstream short-circuit protection device supplying the starter protects the panel. The panel builder only has to consider the panel/enclosure disconnect requirements specified by the NEC or local codes.

