

Contactor type	LC1	D09...D18 DT20 and DT25	D25...D38 DT32 and DT40	D40A...D65A DT60A and DT80A	D80...D95	D115 and D150	
Environment							
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 508, CSA C22.2 n°14.				
Product certifications			UL, CSA (1), CCC, GOST GL, DNV, RINA, BV, LROS (pending for contactors LC1 D40A to D65A)				
Degree of protection (2) (front face only)	Conforming to VDE 0106 and IEC 60529						
	Power circuit connections		Protection against direct finger contact IP 2X				
	Coil connection		Protection against direct finger contact IP 2X				
Protective treatment	Conforming to IEC 60068-2-30		"TH"				
Ambient air temperature around the device	Storage	°C	- 60...+ 80				
	Operation	°C	- 5...+ 60				
	Permissible	°C	- 40...+ 70, for operation at Uc				
Maximum operating altitude	Without derating	m	3000				
Operating positions (3)	Without derating in the following positions						
	Positions that are not permissible		For $\overline{\text{---}}$ contactors LC1 D09 to LC1 D65A. 				
Flame resistance	Conforming to UL 94		V1				
	Conforming to IEC 60695-2-1	°C	850				
Shock resistance (4) 1/2 sine wave = 11 ms	Contactor open		10 gn	8 gn	10 gn	8 gn	6 gn
	Contactor closed		15 gn	15 gn	15 gn	10 gn	15 gn
Vibration resistance (4) 5...300 Hz	Contactor open		2 gn				
	Contactor 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.

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

(4) Without modifying the contact states, in the most unfavourable direction (coil energised at Ue).

Contactor type	LC1	D09 and D12 DT20 and DT25	D18 (3P)	D25 (3P)	D32	D38	D18 and D25 (4P) DT32 and DT40	D40A to D65A DT60A and DT80A (1)	D80 and D95	D115 and D150
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Power circuit connections

Screw clamp terminal connections

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	4...25	10...120 + 10...50
Screwdriver	Philips		N° 2	N° 2	N° 2		N° 2	–	–	–
	Flat screwdriver Ø		Ø 6	Ø 6	Ø 6		Ø 6	–	Ø 6...Ø 8	–
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)

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

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		Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	–	Ø 8	–
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)

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		Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7	1.7	1.2	1.2

Spring terminal connections (2)

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

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		Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7	1.7	1.2	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 24511/9).

(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.

Contactor type	LC1	D09 (3P)	DT20 D098	D12 (3P)	DT25 D128	D18 (3P)	DT32 D188	D25 (3P)	DT40 D258	
Pole characteristics										
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 24514/2 and 24514/3, 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

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	50/60 Hz coil	50 Hz coil	VA	70
			Cos φ		0.3
	~ 60 Hz	Inrush	50/60 Hz coil	VA	7
			60 Hz coil	VA	–
	Sealed	60 Hz coil	60 Hz coil	VA	–
			Cos φ		0.3
	50/60 Hz coil	50/60 Hz coil	VA	7.5	
		Cos φ		0.3	
	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	DT80A	D80	D95	D115	D150
32	38	40	–	50	65	–	80	95	115	150
50 (1)	50	60	60	80	80	80	125	125	200	200
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
50	50	60	60	80	80	80	125	125	200	200
550	550	800	800	900	1000	1000	1100	1100	1260	1660
550	550	800	800	900	1000	1000	1100	1100	1100	1400
430	430	720	720	810	900	900	990	1100	1100	1400
260	310	320	320	400	520	520	640	800	950	1200
138	150	165	165	208	260	260	320	400	550	580
60	60	72	72	84	110	110	135	135	250	250
63	63	80	80	100	125	125	200	200	250	315
63	63	80	80	100	125	125	160	160	200	250

See pages 24514/2 and 24514/3 for aM or gG fuse ratings corresponding to the associated thermal overload relay

2	2	1.5	1.6	1.5	1.5	1.6	0.8	0.8	0.6	0.6
2	3	2.4	–	3.7	6.3	–	5.1	7.2	7.9	13.5
5	5	5.4	5.8	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		0.9		
70	160	245			280...350		280...350		
–	–	20			22		–		
0.3	0.3	0.3			0.3		0.9		
7	15	26			2...18		2...18		
–	–	220			300		–		
0.75	0.75	0.75			0.8		0.9		
70	140	245			280...350		280...350		
–	–	22			22		–		
0.3	0.3	0.3			0.3		0.9		
7.5	13	26			2...18		2...18		
2...3	4...5	6...10			3...8		3...4.5		
12...22	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	6...20	6...20	6...20	40...75
–	–	–	–	–	–	10	10	8	–
15	6	6	6	6	6	4	4	8	8
3600	3600	3600	3600	3600	3600	3600	3600	2400	1200

Contactor type			LC1 D09...D38 LC1 DT20...DT40	LC1 D40A...D65A LC1 DT60A and DT80A	LC1 or LP1 D80 LC1 D95	LC1 D115 and LC1 D150	
d.c. control circuit characteristics							
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							
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 (0.7...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 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 (U_e)	Up to	V	690
Rated insulation voltage (U_i)	Conforming to IEC 60947-1	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 λ = 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)

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 φ 0.7) = 10 times the power broken (cos φ 0.4).

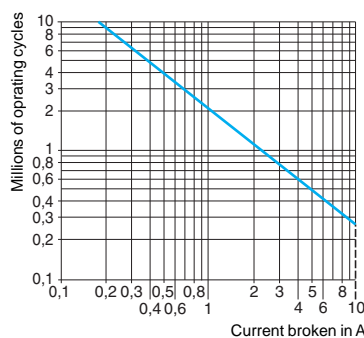
d.c. supply, category DC-13
Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

1 million operating cycles
3 million operating cycles
10 million operating cycles

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

V	24	48	125	250	440
W	96	76	76	76	44
W	48	38	38	32	–
W	14	12	12	–	–

AC-15



DC-13

