

Contactors and protection relays

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Contactors, types LC1-D and LP1-D
Control circuit: a.c. or d.c.

Characteristics

Type			LC1-D09 LP1-D09	LC1-D12 LP1-D12	LC1-D18 LP1-D18	LC1-D25 LP1-D25
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Environment

Rated insulation voltage (Ui)	To IEC/EN 60947-4-1, overvoltage category III, degree of pollution: 3	V	1000	1000	1000	1000
	Conforming to UL, CSA	V	600	600	600	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-4-1	kV	8	8	8	8
Conforming to standards			IEC/EN 60947-1, 60947-4-1, NFC 63-110, VDE 0660, JEM 1038.			
Approvals			ASE, UL, CSA, DEMKO, NEMKO, SEMKO, FI, Conforming to SNCF, Sichere Trennung recommendations			
Degree of protection (1)	Conforming to VDE 0106 Power connections Coil connections		Protection against direct finger contact IP 2X Protection against direct finger contact IP 2X			
Protective treatment	Conforming to IEC/EN 60068		"TH"			
Ambient air temperature around the device	Storage	°C	- 60...+ 80			
	Operation	°C	- 5...+ 55			
	Permissible	°C	- 40...+ 70, for operation at U _c			
Maximum operating altitude	Without derating	m	3000			
Operating positions	Without derating		± 30° possible, in relation to normal vertical mounting plane			
Flame resistance	Conforming to UL 94		V 1	V1	V1	V1
	Conforming to IEC 695-2-1		960°	960°	960°	960°
Shock resistance (2) 1/2 sine wave = 11ms	Contacteur open		10 g	10 g	10 g	8 g
	Contacteur closed		15 g	15 g	15 g	15 g
Vibration resistance (2) 5...300 Hz	Contacteur open		2 g	2 g	2 g	2 g
	Contacteur closed		4 g	4 g	4 g	4 g

Pole characteristics

Number of poles			3	3 or 4	3	3 or 4	
Rated operational current (Ie) (U _e ≤ 440 V)	In AC-3, θ ≤ 55 °C	A	9	12	18	25	
	In AC-1, θ ≤ 55 °C	A	25	25	32	40	
Rated operational voltage (U _e)	Up to	V	690	690	690	690	
Frequency limits	Of the operational current	Hz	25...400	25...400	25...400	25...400	
Rated thermal current (I _{th})	θ ≤ 55 °C	A	25	25	32	40	
Rated making capacity	Conforming to IEC/EN 60947-4-1						
Rated breaking capacity	Conforming to IEC/EN 60947-4-1						
Permissible short time rating from cold state, no current flowing for previous 15 minutes, at 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	
Short-circuit protection by fuses U ≤ 440 V	Without thermal overload relay, gG fuse	type 1	A	20	25	32	50
		type 2	A	10	20	25	40
	With thermal overload relay	A	See pages 1/128 and 1/129, for ratings of aM or gG fuses corresponding to the associated thermal overload relay				
Average impedance per pole	At I _{th} 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	

(1) Protection provided for the cable c.s.a. indicated on pages 2/62 and 2/63 and for cable connections.

(2) In the least favourable direction, without change of contact state (coil supplied at U_e).

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LC1-D32 LP1-D32	LC1-D40 LP1-D40	LC1-D50 LP1-D50	LC1-D65 LP1-D65	LC1-D80 LP1-D80	LC1-D95	LC1-D115	LC1-D150
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1000	1000	1000	1000	1000	1000	1000	1000
600	600	600	600	600	600	600	600
8	8	8	8	8	8	8	8

IEC/EN 60947-1, 60947-4-1, NFC 63-110, VDE 0660, JEM 1038.

ASE, DEMKO.
NEMKO, SEMKO, UL, CSA
FI, UL, CSA.

Conforming to SNCF, Sichere Trennung recommendations

Protection against direct finger contact IP 2X

Protection against direct finger contact IP 2X except LP1-D40...D80

"TH"

- 60...+ 80

- 5...+ 55

- 40...+ 70, for operation at U_c

3000

± 30° possible, in relation to normal vertical mounting plane.

V 1	V 1	V 1	V 1	V 1	V 1	V 1	V 1
960°	960°	960°	960°	960°	960°	960°	960°
8 g	8 g	8 g	8 g	8 g	8 g	6 g	6 g
15 g	10 g	10 g	10 g	10 g	10 g	15 g	15 g
2 g	2 g	2 g	2 g	2 g	2 g	2 g	2 g
4 g	4 g	3 g	3 g	3 g	3 g	4 g	4 g

3	3 or 4	3	3 or 4	3 or 4	3	3 or 4	3
32	40	50	65	80	95	115	150
50	60	80	80	125	125	200	200
690	1000	1000	1000	1000	1000	1000	1000
25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400
50	60	80	80	125	125	200	200

Conforming to IEC/EN 60947-4-1

Conforming to IEC/EN 60947-4-1

430	720	810	900	990	1100	1100	1400
260	320	400	520	640	800	950	1200
138	165	208	260	320	400	550	580
60	72	84	110	135	135	250	250
50	63	80	125	125	160	200	250
50	50	63	80	100	100	125	160

See pages 27012/2 and 27012/3, for ratings of aM or gG fuses corresponding to the associated thermal overload relay.

2	1.5	1.5	1	0.8	0.8	0.6	0.6
2	2.4	3.7	4.2	5.1	7.2	7.9	13.5
5	5.4	9.6	6.4	12.5	12.5	24	24

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Contactors, type LC1-D
Control circuit: a.c.

Characteristics (continued)

Type			LC1-D09	LC1-D12	LC1-D18	LC1-D25
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Control circuit characteristics

Rated control circuit voltage (Uc) Control voltage limits ($\theta \leq 55^\circ\text{C}$) 50 or 60 Hz coils	50 or 60 Hz		V	21...660				
	Operational			0.8...1.1 Uc				
	Drop-out			0.3...0.6 Uc				
	50/60 Hz coils			0.85...1.1 Uc at 60 Hz				
Average consumption at 20 °C and at Uc ~ 50 Hz	Inrush	50 Hz coil	VA	60	60	60	90	
		Cos φ		0.75	0.75	0.75	0.75	
		50/60 Hz coil	VA	70	70	70	100	
	Sealed	50 Hz coil	VA	7	7	7	7.5	
		Cos φ		0.3	0.3	0.3	0.3	
		50/60 Hz coil	VA	8	8	8	8.5	
	~ 60 Hz	Inrush	60 Hz coil	VA	70	70	70	100
			Cos φ		0.75	0.75	0.75	0.75
			50/60 Hz coil	VA	70	70	70	100
		Sealed	60 Hz coil	VA	7.5	7.5	7.5	8.5
			Cos φ		0.3	0.3	0.3	0.3
			50/60 Hz coil	VA	8	8	8	8.5
Heat dissipation	50/60 Hz		W	2...3	2...3	2...3	2.5...3.5	
Operating time (1)	Closing "C"		ms	12...22	12...22	12...22	15...24	
	Opening "O"		ms	4...19	4...19	4...19	5...19	
Mechanical durability in millions of operating cycles	50 or 60 Hz coil			20	20	16	16	
	50/60 Hz coil at 50 Hz			15	15	15	12	
Maximum operating rate at ambient temperature $\leq 55^\circ\text{C}$	In operating cycles per hour			3600	3600	3600	3600	

(1) 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 mains poles separate.

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LC1-D32	LC1-D40	LC1-D50	LC1-D65	LC1-D80	LC1-D95	LC1-D115	LC1-D150
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21...660	24...660					24...500	
0.8...1.1 Uc	0.85...1.1 Uc					0.85...1.1 Uc	–
0.3...0.6 Uc					0.3...0.5 Uc		–
0.85...1.1 Uc at 60 Hz					0.8...1.15 Uc at 50/60 Hz		
0.3...0.6 Uc					0.3...0.5 Uc		
90	200	200	200	200	200	300	–
0.75	0.75	0.75	0.75	0.75	0.75	0.8	0.9
100	245	245	245	245	245	450	450
7.5	20	20	20	20	20	22	–
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.9
8.5	26	26	26	26	26	6	6
100	220	220	220	220	220	300	–
0.75	0.75	0.75	0.75	0.75	0.75	0.8	0.9
100	245	245	245	245	245	450	450
8.5	22	22	22	22	22	22	–
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.9
8.5	26	26	26	26	26	6	6
2.5...3.5	6...10	6...10	6...10	6...10	6...10	7...8	6...7
15...24	20...26	20...26	20...26	20...35	20...35	20...50	25...35
5...19	8...12	8...12	8...12	6...20	6...20	6...20	20...55
16	16	16	16	10	10	8	–
12	6	6	6	4	4	8	8
3600	3600	3600	3600	3600	3600	2400	1200

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Contactors, type LP1-D
Control circuit: d.c.

Characteristics (continued)

Type			LP1-D09, D12, D18	LP1- D25, D32	LP1-D40, D50, D65	LP1- D80	LC1-D115 LC1-D150
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Control circuit characteristics

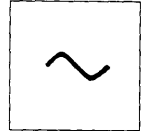
2	Rated control circuit voltage (Uc)	---	V	12...440		12...440		24...440	
	Control voltage limits ($\theta \leq 55^\circ\text{C}$)	Operational	Standard coil	0.8...1.1 Uc		0.85...1.1 Uc		0.7...1.2 Uc	
				Wide range coil		0.75...1.2 Uc		—	
	Drop-out		0.1...0.25 Uc		0.1...0.3 Uc		0.2...0.4 Uc		
2.3	Average consumption at 20 °C and at Uc		Inrush	W	9	11	22	22	450
			Sealed	W	9	11	22	22	6
2.3	Operating time (1) average at Uc		Closing "C"	ms	40...48	52...64	85...110	95...130	25...35
			Opening "O"	ms	6...14	8...14	20...35	20...35	20...35
		Note : the arcing time depends on the circuit switched by the poles. For normal three-phase applications, arcing time is normally 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.							
	Mechanical durability at Uc		In millions of operating cycles		30	25	20	20	8
	Maximum operating rate at ambient temperature $\leq 55^\circ\text{C}$		In operating cycles per hour		3600	3600	3600	3600	1200

(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 mains poles separate.

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Contactors for motor control, 9 to 150 A, in category AC-3
Control circuit: a.c.



References

3-pole contactors for connection by cables with or without cable ends

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3								Rated operat. current in AC-3 440V up to	Instantan. auxiliary contacts	Ordering reference. Complete with code indicating control circuit voltage (2) Fixing (1)	Weight kg
220V kW	380V kW	415V kW	440V kW	500V kW	660V 690V kW	1000V kW	A				
2.2	4	4	4	5.5	5.5	-	9	-	-	LC1-D0900	0.340
								1	-	LC1-D0910	0.340
								-	1	LC1-D0901	0.340
3	5.5	5.5	5.5	7.5	7.5	-	12	-	-	LC1-D1200	0.345
								1	-	LC1-D1210	0.345
								-	1	LC1-D1201	0.345
4	7.5	9	9	10	10	-	18	-	-	LC1-D1800	0.355
								1	-	LC1-D1810	0.365
								-	1	LC1-D1801	0.365
5.5	11	11	11	15	15	-	25	-	-	LC1-D2500	0.400
								1	-	LC1-D2510	0.530
								-	1	LC1-D2501	0.530
7.5	15	15	15	18.5	18.5	-	32	-	-	LC1-D3200	0.545
								1	-	LC1-D3210	0.555
								-	1	LC1-D3201	0.555
11	18.5	22	22	22	30	22	40	1	1	LC1-D4011	1.400
15	22	25	30	30	33	30	50	1	1	LC1-D5011	1.400
18.5	30	37	37	37	37	37	65	1	1	LC1-D6511	1.400
22	37	45	45	55	45	45	80	1	1	LC1-D8011	1.590
25	45	45	45	55	45	45	95	1	1	LC1-D9511	1.610
30	55	59	59	75	80	75	115	-	-	LC1-D11500	2.420
40	75	80	80	90	100	90	150	-	-	LC1-D15000	2.440

Note: 3-pole contactors without auxiliary contacts conform to standard EN 50012.

Auxiliary contact blocks and modules: see pages 2/78 to 2/85.

(1) For LC1-D09 to D38: clip-on mounting on 35 mm rail AM1-DP or screw fixing.

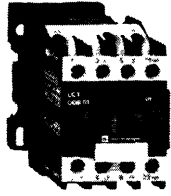
For LC1-D40 to D95: clip-on mounting on 35 mm rail AM1-DE or 75 mm rail AM1-DL or screw fixing.

LC1-D115 and D150: clip-on mounting on 2 x 35 mm rails AM1-DP or screw fixing.

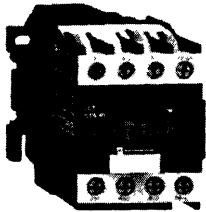
(2) Standard control circuit voltages.

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500	660
LC1-D09...D115														
50 Hz	B5	D5	E5	F5	-	M5	P5	U5	Q5	V5	N5	R5	S5	Y5
60 Hz	B6	D6	E6	F6	-	M6	-	U6	Q6	-	-	R6	-	-
LC1-D09...D150 (coils D115 and D150 with integral suppression device fitted as standard)														
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	-	-

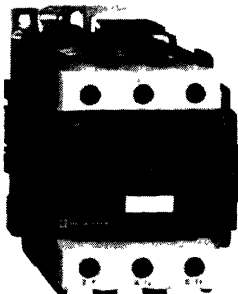
Other voltages from 24 to 660 V, see pages 2/104 to 2/107.



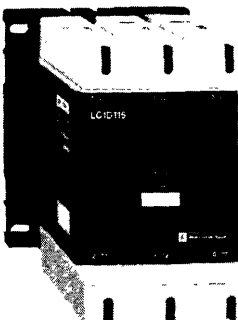
LC1-D0901



LC1-D2510



LC1-D9511



LC1-D11500