### TeSys<sup>™</sup> IEC-Style Contactors and Starters

Catalog



File 8502



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#### Environment

Tuno					LC1D12	LC1D18	LC1D25				
Туре				LC1DT20	LC1DT25	LC1DT32	LC1DT40				
	UL/CSA		V	690	690	690	690				
Rated insulation voltage (Vi)	To IEC 60947-4-1, overvo category III, degree of pol	ltage lution: 3	V	1000	1000	1000	1000				
	Conforming to UL, CSA		V	600	600	600	600				
Rated impulse withstand voltage (Vimp)	Conforming to IEC 60947		kV	6 6 6							
Conforming to standards	CE Meets the ess LV & EMC dir	sential requirements of the rectives		IEC 60947-1, 60947-4-1, NFC 63-110, VDE 0660, BS 5424, JEM 1038., EN 60947-1, EN 60947-4-1.							
Approvals	E164862 CCN NLDX	ER43364 Class 3211 04		ASE, UL, CSA, DEMKO, NEMKO, SEMKO, FI, Conforming to SNCF, Sichere Trennung recommendations							
Degree of protection +	Conforming to VDE 0106	Power connections		Protection against direct	ct finger contact IP 2X						
	Control in the Control of Control	Coil connections		Protection against direct	ct finger contact IP 2X						
Protective treatment	Conforming to IEC 60068			"TH"							
Ambient air temperature around	Storage			- 60 to + 80 °C (-76 to -	+176 °F)						
the device	Operation at 80 to 110% r	nominal control voltage		- 5 to + 60 °C (+23 to +	140 °F)						
	Permissible at nominal co	ntrol voltage		- 40 to + 70 °C (-40 to -	+158 °F)						
Maximum operating altitude	Without derating			3000m (8900 ft.)							
Operating positions	Without derating			± 30° possible, in relati	on to normal vertical mo	unting plane	1				
Flame resistance	Conforming to UL 94			V 1	V1	V1	V1				
	Conforming to IEC 60695	-2-1		960°	960°	960°	960°				
Shock resistance ▲	ck resistance A Contactor open			10 g	10 g	10 g	8 g				
	Contactor closed			15 g	15 g	15 g	15 g				
Vibration resistance ▲	Contactor open			2 g	2 g	2 g	2 g				
	Contactor closed			4 g	4 g	4 g	4 g				
Pole characteristics	1		1								
Number of poles				3	3 or 4	3	3 or 4				
Rated operational current (le)	In ac-3, $\theta \le 55^{\circ}$ C (131°F)		A	9	12	18	25				
Retard exerctional values (Va)	In ac-1, θ ≤ 40°C (104°F)		A	25	25	32	40				
Rated operational voltage (ve)	Up to		V	690 25 to 400	690 25 to 400	690 25 to 400	690 25 to 400				
Prequency limits	Of the operational current		ΠZ Λ	25 10 400	25 10 400	25 10 400	25 10 400				
Rated merinal current (itil)	$\theta \le 40 \text{ C} (104 \text{ F})$	1	A A	250	250	32	40				
Kated making capacity (1 mis)		220-280-415-440 V	^	250	250	300	450				
Rated breaking canacity (1 rms)	Conforming to IEC 60947	500 V	<u>م</u>	175	175	250	400				
Nated breaking capacity (1 mis)		690 V	Ŷ	85	85	120	180				
Dermineible obert time reting	For 1 s	000 1	А	210	210	240	380				
from cold state, no current	For 10 s		A	105	105	145	240				
flowing for previous 15 minutos	For 1 min		A	61	61	84	120				
at $\theta \leq 40$ °C (104 °F)	For 10 min		A	30	30	40	50				
	By circuit breaker			Select circuit breaker ir	accordance with NEC a	and local codes	1				
Short-circuit protection	By fuses			Maximum 400% of mot	or full load Amps						
Average impedance per pole	A lth and 50 Hz		mΩ	2.5	2.5	2.5	2				
Power dissipation per pole for the	AC-3		W	0.20	0.36	0.8	1.25				
above operational currents	AC-1		W	1.56	1.56	2.5	3.2				

Protection provided for the cable c.s.a. indicated on page 86 and for cable connections. In the least favorable direction, without change of contact state (coil supplied at Ve). ٠

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#### **Control Circuit Characteristics**

Turne		LC1D09	LC1D12	LC1D18	LC1D25	LC1D32	LC1D38				
туре					LC1DT20	LC1DT25	LC1DT32	LC1DT40			
Rated control circuit voltage (Vc)		50 or 60 Hz		V	21 to 660			21 to 660			
		Operational			0.8 to 1.1 Vac				0.8 to 1.1 Vac		
Control voltage limits	50 01 00 HZ COIIS	Drop-out			0.3 to 0.6 Vac				0.3 to 0.6 Vac		
(θ ≤ 55 °C [131 °F])		Operational			0.85 to 1.1 Vac	c at 60 Hz			0.85 to 1.1 Vac	; at 60 Hz	
	50/00 112 00113	Drop-out			0.3 to 0.6 Vac				0.3 to 0.6 Vac		
			50 Hz coil	VA	-	-	_	_	-	_	
Average consumption		Inrush	Cos φ		0.75	0.75	0.75	0.75	0.75	0.75	
	50 Hz ac		50/60 Hz coil	VA	70	70	70	70	70	70	
		Sealed	50 Hz coil	VA	-	-	-	_	-	-	
			Cos φ		0.3	0.3	0.3	0.3	0.3	0.3	
			50/60 Hz coil	VA	7	7	7	7	7	7	
at 20 °C (68 °F) and at Vc	00.11	Inrush	60 Hz coil	VA	-	-	_	-	-	-	
			Cos φ		0.75	0.75	0.75	0.75	0.75	0.75	
			50/60 Hz coil	VA	70	70	70	100	70	70	
	OU FIZ AC		60 Hz coil	VA	-	-	_	-	-	-	
		Sealed	Cos φ		0.3	0.3	0.3	0.3	0.3	0.3	
			50/60 Hz coil	VA	7.5	7.5	7.5	7.5	7.5	7.5	
Heat dissipation	50/60 Hz			W	2 to 3	2 to 3	2 to 3	2.5 to 3.5	2 to 3	2 to 3	
On another stress	Closing "C" ■			ms	12 to 22	12 to 22	12 to 22	15 to 24	12 to 22	12 to 22	
Operating time	Opening "O" 🔺			ms	4 to 19	4 to 19	4 to 19	5 to 19	4 to 19	4 to 19	
Mechanical durability in millions of	50 or 60 Hz coil				_	-	_	-	-	-	
operating cycles	50/60 Hz coil at 50	) Hz			15	15	15	15	15	15	
Maximum operating rate at ambient temperature $\leq$ 55 °C (131 °F)	In operating cycles	s per hour			3600	3600	3600	3600	3600	3600	

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. ۸

#### **Control Circuit Characteristics**

Туре					LC1D40	LC1D50	LC1D65	LC1D80	LC1D95	LC1D115	LC1D150
Rated control circuit voltage (Vc)		50 or 60 Hz		V	24 to 660					24 to 500	
		Operational			0.85 to 1.1 Va	ас			-		
Control voltage limits	50 or 60 Hz colls	Drop-out			0.3 to 0.6 Va	0				0.3 to 0.5 Vc	-
(θ ≤ 55 °C [131 °F])		Operational			0.85 to 1.1 Va	ac at 60 Hz			0.8 to 1.15 Va	ac at 50/60 Hz	
	50/60 HZ COIIS	Drop-out			0.3 to 0.6 Va	<b>c</b>				0.3 to 0.5 Vac	;
			50 Hz coil	VA	200	200	200	200	200	300	-
		Inrush	Cos φ		0.75	0.75	0.75	0.75	0.75	0.8	0.9
	50 Hz ac		50/60 Hz coil	VA	245	245	245	245	245	280-350	280-350
		Sealed	50 Hz coil	VA	20	20	20	20	20	22	-
			Cos φ		0.3	0.3	0.3	0.3	0.3	0.3	0.9
Average consumption			50/60 Hz coil	VA	26	26	26	26	26	2 to 18	2 to 18
at 20 °C (68 °F) and at Vc	60 Hz ee	Inrush	60 Hz coil	VA	220	220	220	220	220	300	-
			Cos φ		0.75	0.75	0.75	0.75	0.75	0.8	0.9
			50/60 Hz coil	VA	245	245	245	245	245	280-350	280-350
			60 Hz coil	VA	22	22	22	22	22	22	-
		Sealed	Cos φ		0.3	0.3	0.3	0.3	0.3	0.3	0.9
			50/60 Hz coil	VA	26	26	26	26	26	6	6
Heat dissipation	50/60 Hz			W	6 to 10	6 to 10	6 to 10	6 to 10	6 to 10	2 to 18	2 to 18
Operating time	Closing "C" ■			ms	20 to 26	20 to 26	20 to 26	20 to 35	20 to 35	20 to 50	20 to 35
Operating time	Opening "O" 🔺			ms	8 to 12	8 to 12	8 to 12	6 to 20	6 to 20	6 to 20	40 to 75
Mechanical durability in millions of	50 or 60 Hz coil				16	16	16	10	10	8	-
operating cycles	50/60 Hz coil at 5	0 Hz			6	6	6	4	4	8	8
Maximum operating rate at ambient temperature $\leq$ 55 °C (131 °F)	In operating cycle	s per hour			3600	3600	3600	3600	3600	2400	1200

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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#### **DC Control Circuit Characteristics**

Type of contactor				LC1 D09 to D38 DT20 to DT40	LP1 D12 and D25	LC1 or LP1 D40 to D65	LC1 or LP1D80	LC1D115 & LC1D150		
Rated control circuit voltage (Uc)	dc		V	12 to 440	•	12 to 440		24 to 440		
Deted inculation valters	Conforming to IEC 609	V	690							
Rated insulation voltage	Conforming to UL, CS	V	600							
Control voltage limits	Operational	Standard coil		0.7 to 1.25 Uc at 60 °C (140 °F)	0.8 to 1.1 Uc @ 55 °C (131 °F)	0.85 to 1.1 Uc at 55 °C (131 °	0.75 to 1.2 Uc at 55 °C (131 °F)			
	Operational	Wide range coil		- 0.7 to 1.25 Uc @ 55 °C (131 °F)		0.75 to 1.2 Uc at 55 °C (131 °	-			
	Drop-out		0.1 to 0.25 Uc at 60 °C (140 °F)		0.1 to 0.3 Uc a	0.15 to 0.4 Uc at 55 °C (131 °F)				
Average consumption at 20 °C (68 ° F)	4.	Inrush	W	5.4	9/11	22	22	270 to 365		
and at Uc	dc	Sealed	W	5.4	9/11	22	22	2.4 to 5.1		
	Closing	"C"	ms	55	52 - 64	85 to 110	95 to 130	20 to 35		
Average operating time at Uc (1)	Opening	"O"	ms	20	8 - 14	20 to 35	20 to 35	40 to 75		
	Note: The arcing time The load is isolated fro	depends on the circuit om the supply after a tir	switched b ne equal to	y the poles. For nor o the sum of the op	mal three-phase ap ening time and the a	plications, the ar arcing time.	cing time is usua	ally less than 10 ms.		
Time constant (L/R)			ms	28	42	65	75	25		
Mechanical life at Uc	In millions of operating	g cycles		30	30	20	20	8		
Maximum operating rate at ambient temperature ≤ 60 °C (140 °F)	In operating cycles pe	r hour		3600	3600	3600	3600	1200		

#### Low Consumption Control Circuit Characteristics

Deted inculation veltage	Conforming to IEC 60	947-1	V	690
Rated insulation voltage	Conforming to UL, CS	A	V	600
Maximum voltage	Of the control circuit o	n dc		250
Average consumption dc at 20 °C and at Uc	Wide range coil	Inrush	W	2.4
	(0.7 to 1.25 Uc)	Sealed	W	2.4
Operating time (1) at Uc and	Closing	"C"	ms	70
at 20 °C (68 ° F)	Opening	"O"	ms	25
Voltage limits $\theta \le 60$ °C (140 °F)	Operational			0.7 to 1.25 Uc
of the control circuit	Drop-out			0.1 to 0.3 Uc
Time constant (L/R)			ms	40
Mechanical life	In millions of operating	g cycles		30
Maximum operating rate	At ambient temperatur	re ≤ 60 °C (140 °F)	ops/h	3600
Poted inculation voltage	Conforming to UL, CS	A	V	600
Rateu insulation voltage	Conforming to IEC 60	947-1	V	690

(1) 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.

#### **Contactor Integral Auxiliary Contact Characteristics**

Linked contacts conforming to draft standard IEC 60947-4-5	Each contactor has two N.O	Each contactor has two N.O. and N.C. contacts mechanically linked on the same movable contact holder.									
Mirror contact	The N.C. contact on each co	ontactor represents the state of the p	ower contact	is 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 $\leq 6$	60 °C (140 °F)	Α	10							
Operating current frequency			Hz	25 to 400							
Minimum quitching consolity	U min.		v	17							
Minimum switching capacity	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	Α	ac: 140; dc: 250							
		1 s	Α	100							
Short-time rating	Permissible for	500 ms	Α	120							
		100 ms	Α	140							
Insulation resistance			MΩ	> 10							
Non-overlap time	Guaranteed between N.C. a	nd N.O. contacts	ms	1.5 on energizing and on de-energizing							

• Select short circuit protection to meet the National Electrocal Code or other local codes and standards.

#### ac supply categories AC-14 and AC-15

Contact operating power conforming to IEC 60947-5-1 Electrical life (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making power (cos  $\phi$  0.7) = 10 times the power broken (cos  $\phi$  0.4).

#### dc supply category DC-13

Electrical life (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	115	230	400	440	600	۷	24	48	125	250	440
1 million operating cycles	VA	60	120	280	560	960	1050	1440	w	96	76	76	76	44
3 million operating cycles	VA	16	32	80	160	280	300	420	w	48	38	38	32	-
10 million operating cycles	VA	4	8	20	40	70	80	100	w	14	12	12	-	-

DC-13

#### AC-15





#### **Power Circuit Connections**

Туре			LC1 D09, D12 DT20, DT25	LC1D18 LC1DT32	LC1D25 LC1DT40	LC1D32	LC1D38	LC1D40 LP1D40	LC1D50 LP1D50			
		Connector type		Screw clamp	terminals					Box lug terminals		
		1 conductor	AWG	18-10	18-8	18-8	14-6	-	10-3	10-3		
	Stranded cable	2 conductors	AWG	18-10	18-8	18-8	14-6	-	10-4	10-4		
	without cable end	1 conductor	mm <sup>2</sup>	1/4	1.5/6	1.5/10	2.5/10	2.5/10	2.5/25	2.5/25		
		2 conductors	mm <sup>2</sup>	1/4	1.5/6	1.5/6	2.5/10	2.5/10	2.5/16	2.5/16		
		1 conductor	AWG	18-10	18-3	18-3	18-3/0	-	10-4	10-4		
	Stranded cable	2 conductors	AWG	18-10	18-10	18-10	14-2	-	12-2	12-2		
	with cable end	1 conductor	mm <sup>2</sup>	1/4	1/6	1/6	1/10	1/10	2.5/25	2.5/25		
Cabling		2 conductors	mm <sup>2</sup>	1/2.5	1/4	1/4	1.5/6	1.5/6	2.5/10	2.5/10		
(for screw clamp terminals)		1 conductor	AWG	18-8	18-8	18-8	14-8	-	10-3	10-3		
	Solid cable without cable end	2 conductors	AWG	18-8	18-8	18-8	10-8	-	10-6	10-6		
		1 conductor	mm <sup>2</sup>	1/4	1.5/6	1.5/6	1.5/10	1.5/10	2.5/25	2.5/25		
		2 conductors	mm <sup>2</sup>	1/4	1.5/6	1.5/6	2.5/10	2.5/10	2.5/16	2.5/16		
	Phillips head type			N° 2	N° 2	N° 2	N° 2	N° 2	-	-		
	Screwdriver Ø			Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6 to Ø 8	Ø 6 to Ø 8		
	Hexagon spanner			-	-	-	-	-	4 mm	4 mm		
	Tightening torque			15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	23 lbin. 2.5 N∙m	23 lbin. 2.5 N∙m	23 lbin. 2.5 N∙m	45 lbin. 5 N∙m	45 lbin. 5 N∙m		
				Connection by bus bar or ring-tongue terminals								
	Bar c.s.a.			-	-	-	-	-	-	-		
	Lug external Ø		mm	8	8	10	10	10	13	16		
Bus bar connection	Screw Ø		mm	M3.5	M3.5	M4	M4	M4	M5	M6		
<i>"</i> , , ,	Phillips head type			N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 3		
(for bus bar or ring-tongue terminals)	Screwdriver Ø			Ø 6	Ø 6	Ø 6	3/16 in. Ø 6 mm	3/16 in. Ø 6 mm	Ø 8 mm	Ø 8 mm		
	Hexagon spanner			-	-	-	-	-	-	-		
	Tightening torque			15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	20 lbin. 7.5 N∙m	20 lbin. 7.5 N∙m	53 lbin. 6 N∙m	71 lbin. 6 N∙m		
				Spring termin	als		•	•	•			
Flexible cabling		1 conductor	AWG	14	12	12	12	12	-			
	Flexible cable without	2 conductors	AWG	14	12	12	12	12	-	-		
(for spring terminals)	cable end	1 conductor	mm <sup>2</sup>	2.5	4	4	4	4	-	-		
		2 conductors	mm <sup>2</sup>	2.5	4	4	4	4	-	-		

#### **Control Circuit Connections**

Туре	уре			LC1 D09, D12 DT20, DT25	LC1D18 LC1DT32	LC1D25 LC1DT40	LC1D32	LC1D38	LC1D40 LP1D40	LC1D50 LP1D50
Connection by ca	ble			•			÷		·	·
Screw clamp tern	ninals									
	Stranded cable 1	1 conductor	AWG (mm <sup>2</sup> )	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)	1/4	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)
	without cable end	2 conductors	AWG (mm <sup>2</sup> )	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)	1/4	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)
Cabling Stranded cable with cable end	1 conductor	AWG (mm <sup>2</sup> )	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)	1/4	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)	
	with cable end	2 conductors	AWG (mm <sup>2</sup> )	18 - 12 (1/2.5)	18 - 12 (1/2.5)	18 - 12 (1/2.5)	18 - 12 (1/2.5)	18 - 12 (1/2.5)	18 - 12 (1/2.5)	18 - 12 (1/2.5)
Solid cable	1 conductor	AWG (mm <sup>2</sup> )	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)	1/4	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)	
	without cable end	2 conductors	AWG (mm <sup>2</sup> )	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)	1/4	18 - 10 (1/4)	18 - 10 (1/4)	18 - 10 (1/4)
Phillips head type				N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2
Screwdriver Ø			mm	Ø 6	Ø 6	Ø 6	Ø6	Ø 6	Ø 6	Ø 6
Tightening torque	9			15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	17 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m
Connection by bu	is bar or ring-tong	ue terminals		•	•	•		•		
Lug external Ø			mm	8	8	8	8	8	8	8
Screw Ø			mm	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Phillips head type	9			N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2
Screwdriver Ø				3/16 in. Ø 6	3/16 in. Ø 6	3/16 in. Ø 6	3/16 in. Ø 6	3/16 in. Ø 6	3/16 in. Ø 6	3/16 in. Ø 6
Tightening torque			15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	15 lbin. 1.7 N∙m	

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