

TeSys™ IEC-Style Contactors and Starters

Catalog

04

File 8502



CONTENTS




Description	Page
TeSys IEC Contactors and Starters Selection Guide	3
TeSys K-line Mini-contactors, Overload Relays, and Accessories	37
TeSys D-line Contactors, Enclosed Starters Overload Relays, and Accessories	77
TeSys F-line Contactors, Overload Relays, and Accessories	179
Catalog Number Index	247



TeSys™ D-Line Contactors and Starters

Characteristics of Type LC•D and LP•D Contactors

Environment

Type			LC1D09	LC1D12	LC1D18	LC1D25	
			LC1DT20	LC1DT25	LC1DT32	LC1DT40	
Rated insulation voltage (Vi)	UL/CSA	V	690	690	690	690	
	To IEC 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 (Vimp)	Conforming to IEC 60947	kV	6	6	6	6	
Conforming to standards	 Meets the essential requirements of the LV & EMC directives		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	 LR43364 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 finger contact IP 2X				
		Coil connections	Protection against direct finger contact IP 2X				
Protective treatment	Conforming to IEC 60068		"TH"				
Ambient air temperature around the device	Storage		- 60 to + 80 °C (-76 to +176 °F)				
	Operation at 80 to 110% nominal control voltage		- 5 to + 60 °C (+23 to +140 °F)				
	Permissible at nominal control voltage		- 40 to + 70 °C (-40 to +158 °F)				
Maximum operating altitude	Without derating		3000m (8900 ft.)				
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 60695-2-1		960°	960°	960°	960°	
Shock resistance ▲ 1/2 sine wave = 11ms	Contact open		10 g	10 g	10 g	8 g	
	Contact closed		15 g	15 g	15 g	15 g	
Vibration resistance ▲ 5 to 300 Hz	Contact open		2 g	2 g	2 g	2 g	
	Contact 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)	In ac-3, θ ≤ 55°C (131°F)	A	9	12	18	25	
	In ac-1, θ ≤ 40°C (104°F)	A	25	25	32	40	
Rated operational voltage (Ve)	Up to	V	690	690	690	690	
Frequency limits	Of the operational current	Hz	25 to 400	25 to 400	25 to 400	25 to 400	
Rated thermal current (Ith)	θ ≤ 40°C (104°F)	A	25	25	32	40	
Rated making capacity (1 rms)	Conforming to IEC 60947-4	A	250	250	300	450	
Rated breaking capacity (1 rms)	Conforming to IEC 60947	220-380-415-440 V	A	250	250	300	450
		500 V	A	175	175	250	400
		690 V	A	85	85	120	180
Permissible short time rating from cold state, no current flowing for previous 15 minutes, at θ ≤ 40 °C (104 °F)	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 circuit breaker		Select circuit breaker in accordance with NEC and local codes				
	By fuses		Maximum 400% of motor full load Amps				
Average impedance per pole	A 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	

♦ 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).

TeSys™ D-Line Contactors and Starters

Characteristics of Type LC•D and LP•D Contactors

Control Circuit Characteristics

Type				LC1D09	LC1D12	LC1D18	LC1D25	LC1D32	LC1D38						
				LC1DT20	LC1DT25	LC1DT32	LC1DT40								
Rated control circuit voltage (Vc)		50 or 60 Hz		V				21 to 660							
Control voltage limits ($\theta \leq 55\text{ °C}$ [131 °F])		50 or 60 Hz coils		Operational		0.8 to 1.1 Vac									
				Drop-out		0.3 to 0.6 Vac									
		50/60 Hz coils		Operational		0.85 to 1.1 Vac at 60 Hz									
				Drop-out		0.3 to 0.6 Vac									
Average consumption at 20 °C (68 °F) and at Vc		50 Hz ac		Inrush		50 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	70	70	70		
						Sealed		50 Hz coil		VA	–	–	–	–	–
				60 Hz ac		Inrush		60 Hz coil		VA	–	–	–	–	–
								Cos φ			0.75	0.75	0.75	0.75	0.75
		50/60 Hz coil		VA		70	70	70	100	70	70				
				Sealed		60 Hz coil		VA	–	–	–	–	–		
		50/60 Hz coil		Cos φ			0.3	0.3	0.3	0.3	0.3				
				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		
		Operating time		Closing "C" ■		ms		12 to 22	12 to 22	12 to 22	15 to 24	12 to 22	12 to 22		
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 operating cycles		50 or 60 Hz coil				–	–	–	–	–	–				
		50/60 Hz coil at 50 Hz				15	15	15	15	15	15				
Maximum operating rate at ambient temperature $\leq 55\text{ °C}$ (131 °F)		In operating cycles 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.

TeSys™ D-Line Contactors and Starters

Characteristics of Type LC•D and LP•D Contactors

Control Circuit Characteristics

Type			LC1D40	LC1D50	LC1D65	LC1D80	LC1D95	LC1D115	LC1D150		
Rated control circuit voltage (Vc)	50 or 60 Hz	V	24 to 660						24 to 500		
Control voltage limits ($\theta \leq 55\text{ °C}$ [131 °F])	50 or 60 Hz coils	Operational	0.85 to 1.1 Vac						-		
		Drop-out	0.3 to 0.6 Vac						0.3 to 0.5 Vc		
	50/60 Hz coils	Operational	0.85 to 1.1 Vac at 60 Hz				0.8 to 1.15 Vac at 50/60 Hz				
		Drop-out	0.3 to 0.6 Vac						0.3 to 0.5 Vac		
Average consumption at 20 °C (68 °F) and at Vc	50 Hz ac	Inrush	50 Hz coil	VA	200	200	200	200	200	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
		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
			50/60 Hz coil	VA	26	26	26	26	26	2 to 18	2 to 18
	60 Hz ac	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
		Sealed	60 Hz coil	VA	22	22	22	22	22	22	-
			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		
	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 operating cycles	50 or 60 Hz coil		16	16	16	10	10	8	-		
	50/60 Hz coil at 50 Hz		6	6	6	4	4	8	8		
Maximum operating rate at ambient temperature $\leq 55\text{ °C}$ (131 °F)	In operating cycles 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.

TeSys™ D-Line Contactors and Starters

Characteristics of Type LC•D and LP•D Contactors

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	
Rated insulation voltage	Conforming to IEC 60947-1	V	690					
	Conforming to UL, CSA	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 °F)		0.75 to 1.2 Uc at 55 °C (131 °F)	
		Wide range coil	–	0.7 to 1.25 Uc @ 55 °C (131 °F)	0.75 to 1.2 Uc at 55 °C (131 °F)		–	
	Drop-out		0.1 to 0.25 Uc at 60 °C (140 °F)		0.1 to 0.3 Uc at 55 °C (131 °F)		0.15 to 0.4 Uc at 55 °C (131 °F)	
Average consumption at 20 °C (68 °F) and at Uc	dc	Inrush	W	5.4	9/11	22	22	270 to 365
		Sealed	W	5.4	9/11	22	22	2.4 to 5.1
Average operating time at Uc (1)	Closing	"C"	ms	55	52 - 64	85 to 110	95 to 130	20 to 35
	Opening	"O"	ms	20	8 - 14	20 to 35	20 to 35	40 to 75
Note: The arcing time depends on the circuit switched by the poles. For normal three-phase applications, the arcing time is usually 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.								
Time constant (L/R)		ms	28	42	65	75	25	
Mechanical life at Uc	In millions of operating cycles		30	30	20	20	8	
Maximum operating rate at ambient temperature ≤ 60 °C (140 °F)	In operating cycles per hour		3600	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 dc		250				
Average consumption dc at 20 °C and at Uc	Wide range coil (0.7 to 1.25 Uc)	Inrush	W	2.4			
		Sealed	W	2.4			
Operating time (1) at Uc and at 20 °C (68 °F)	Closing	"C"	ms	70			
	Opening	"O"	ms	25			
Voltage limits $\theta \leq 60$ °C (140 °F) of the control circuit	Operational		0.7 to 1.25 Uc				
	Drop-out		0.1 to 0.3 Uc				
Time constant (L/R)		ms	40				
Mechanical life	In millions of operating cycles		30				
Maximum operating rate	At ambient temperature ≤ 60 °C (140 °F)	ops/h	3600				
Rated insulation voltage	Conforming to UL, CSA	V	600				
	Conforming to IEC 60947-1	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.

TeSys™ D-Line Contactors and Starters

Characteristics of Type LC•D and LP•D Contactors

Contactor Integral Auxiliary Contact Characteristics

Linked contacts conforming to draft standard IEC 60947-4-5	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 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 (140 °F)	A	10
Operating current frequency		Hz	25 to 400
Minimum switching capacity	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	ac: 140; dc: 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 energizing and on de-energizing

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

ac supply categories AC-14 and AC-15

Contact operating power
conforming to IEC 60947-5-1

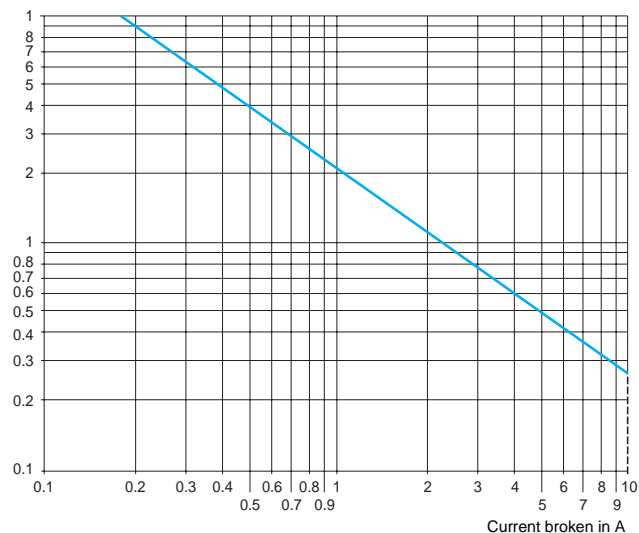
Electrical life (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making power (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

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	V	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	–	–

AC-15



DC-13

