

**Energy Control
DIL Contactors**

239460 585-970
239471
221-326 / 221-338

				DIL EEM	DIL EEM-G	DIL EM	DIL EM-G	DIL EM-GI	
General				585-932					
Standards				IEC 947, (BS) EN 60 947, DIN VDE 0660, CSA, UL, SEV, LRS, GL, BV, DNV, CIS, RINA, PRS					
Mechanical lifespan	Operations	x 10 ⁶		10	20	10	20		
Maximum operating frequency	Maximum	Ops./h		9000					
Electrical				See table, Page 32/090					
Climatic proofing	Damp heat, constant, to IEC 68 Part 2-3								
	Damp heat, cyclic, to IEC 68 Teil 2-30								
Ambient temperature	Open	Max./min.	°C	+50/-25	+50/-20	+50/-25	+50/-20		
	Enclosed ¹⁾	Max./min.	°C	+40/-25	+40/-20	+40/-25	+40/-20		
Mounting position				As required, except vertical with terminal A1/A2 at the bottom					
Mechanical shock resistance (sinusoidal shock 20 ms)									
<i>Basic unit</i>									
Main contacts		g		8	20	8	20		
Make contacts		g		8/5.5	20/20	8/5.5	20/20		
<i>Basic unit with auxiliary contact module</i>									
Main contacts		g		7.5	20	7.5	20		
Make contacts		g		7.5/4.5	20/20	7.5/4.5	20/20		
Degree of protection				IP 20					
Protection against direct contact when actuated from the front by a perpendicular test finger (DIN VDE 0106, Part 100)				Finger- and back-of-hand proof ²⁾					
Dimensions				Page 32/114					
Weights				kg	0.17	0.2	0.17	0.2	
Terminal capacities									
Auxiliary and main contacts	Solid	Min.	mm ²	2 x 0.75					
		Max.	mm ²	2 x 2.5					
Flexible									
With ferrule to DIN 46 228	Max.		mm ²	2 x 1.5					
			mm ²	2 x 2.5					
With Klockner-Mosler ferrule	Max.		mm ²	2 x 1.5					
			mm ²	2 x 2.5					
Solid or stranded	Min.		AWG	18					
		Max.	AWG	14					
Terminal screw				M 3.5					
Pozidrive screwdriver			Size	2					
Standard screwdriver			mm	0.8 x 5.5					
			mm	1 x 6					
Tightening torque				Max.	Nm				1.2
Main contacts									
Rated impulse withstand voltage				U _{imp}	V				6000
Overvoltage category/pollution degree				III/3					
Rated insulation voltage				U _i	V~				690
Rated operational voltage				U _s	V~				690
"Safe isolation" to DIN VDE 0106 Part 101 and Part 101 A									
between coil and contacts, and between contacts					V~				300

DIL EEM

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¹⁾ For suitable enclosure, see Pages 32/086, 087
²⁾ DIL EM-...F: only finger-proof when 6.3 x 0.8 mm blade terminals with ferrules are used

Command System Control Circuit Devices

				Contact elements	Foot and palm switches	Lamp socket elements	Lamp transformers	
					Emergency-stop switches	Front fixing		
General				IEC 947, EN 60 947, DIN VDE 0660				
Standards				10	0.5	-	-	
Mechanical lifespan	Operations × 10 ³ Operations × 10 ⁶			-	-	-	-	
Maximum operating frequency	Ops./h			6000	6000	-	-	
Operating force	N			≤ 5	≤ 25	-	-	
	N			IEC 11: ≤ 7.3	-	-	-	
	N			IEC 20: ≤ 9	-	-	-	
	N			IEC 02: ≤ 5.5	-	-	-	
Operating torque	Nm			-	-	-	-	
Degree of protection to IEC 529				IP 20	IP 65	IP 20	-	
Climatic proofing				Damp heat, constant, to IEC 68 Part 2-3				
				Damp heat, cyclic, to IEC 68 Part 2-30				
Ambient temperature	Open	Max./min. °C		+60/-25				
	Enclosed	Max./min. °C		+40/-25				
Mounting position				As required				
Mechanical shock resistance (shock duration 20 ms)	g			> 30				
Terminal capacity	Solid	Max./min. mm ²		2.5/0.75				
	Stranded	Max./min. mm ²		1.5/0.5				
Dimensions	Page			21/092-095				
Contacts								
Rated impulse withstand voltage	U _{imp}	kV		6	4	4 ¹⁾	6	
Rated insulation voltage	U _i	V		500	250	250	630	
Pollution degree				3				
Overvoltage category				III				
Max. short-circuit protective device	Fuseless	Type		PKZM 1-6/ FAZN B10	PKZM 1-6/ FAZN B10	-	Short-circuit-proof	
	Fuse, gL	A		10	10	-	Short-circuit-proof	
Switching capacity								
Rated operational current I _n , AC-15	500 V		A	2	-	-	-	
	400 V		A	4	-	-	-	
	230 V		A	6	6	-	-	
Rated operational current I _n , DC-13	220 V		A	0.5	0.5	-	-	
	110 V		A	1.1	1.1	-	-	
Electrical lifespan	230 V	1.2 A	Operations × 10 ⁴	0.6	-	-	-	
		3.6 A	Operations × 10 ³	0.3	-	-	-	
		2.8 A	Operations × 10 ⁶	1.2	-	-	-	
DC-13	12 V							

¹⁾ EF 1 (C) : 2.5 kV, EF 0 (C) : 0.8 kV

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Push-button actuators Mushroom actuators	Emergency-stop actuators	Double actuators ²⁾	Selector switches Illuminated selector switches	Toggle switches	Key-operated actuators	Key-release mushroom actuators	Illuminated push-button actuators - stay-put ³⁾	Indicator lights
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IEC 947, EN 60 947, DIN VDE 0660

5	0.1	0.2	0.1	0.1	0.1	0.1	3 R(M)LTR: 0.3	-
6000	10	6000	2000	2500	100	100	6000	-
≤ 5	≤ 30	≤ 5	-	≤ 2	-	≤ 7	≤ 5	-
-	-	-	-	-	-	-	-	-
-	-	-	≤ 0.2	-	≤ 0.4	-	-	-



IP 65

Damp heat, constant, to IEC 68 Part 2-3
Damp heat, cyclic, to IEC 68 Part 2-30

+60/-25
+40/-25

As required

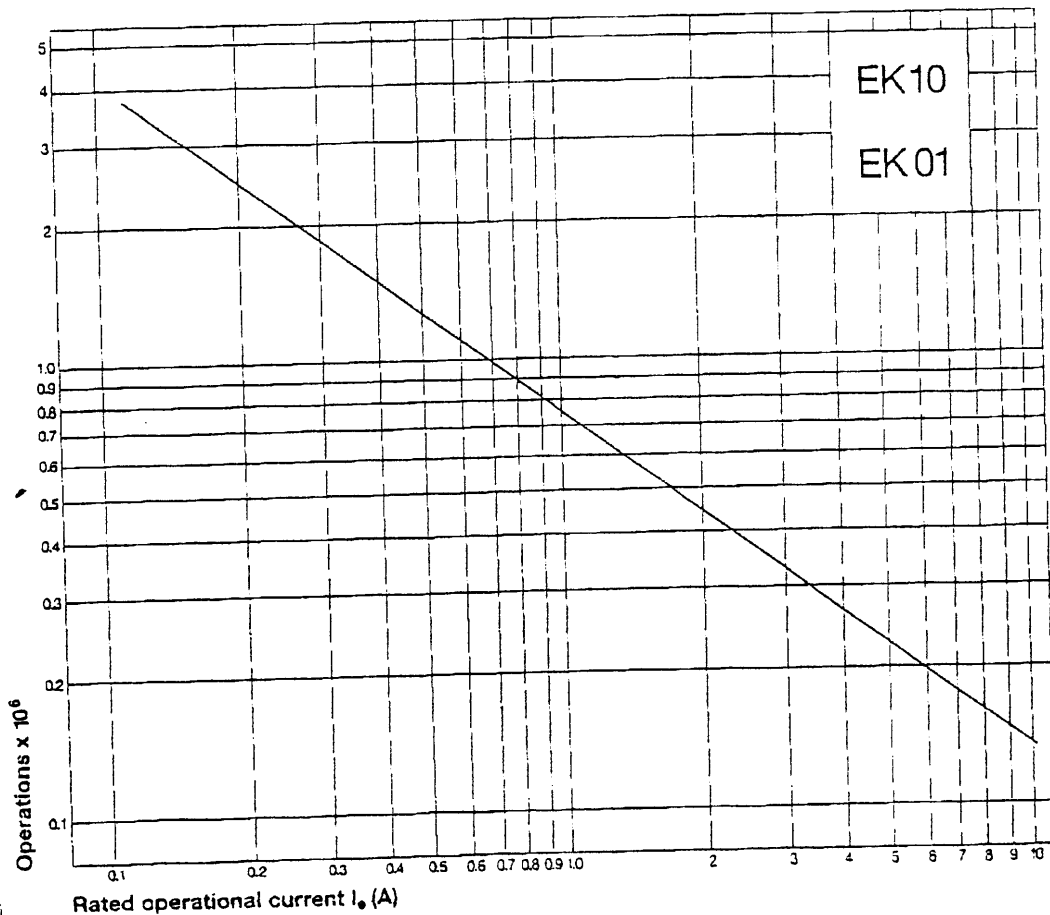
> 30	> 50	> 30	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-



21/090, 091
21/092-095


















RMQ 22

Electrical lifespan AC-15 to EN 60 947-5-1



²⁾ Only for ⊗ up to 2 W ³⁾ Only for ⊗ up to 1.2 W

DIL EM Mini Contactors Technical Data

		DIL EEM	DIL EEM-G	DIL EM	DIL EM4	DIL EM-G	DIL EM-GI	
Making capacity cos φ to IEC 947		A	110	90	200	110	110	 32/006
Breaking capacity cos φ to IEC 947	220/230 V	A	70					 32/022
	380/400 V	A	70					
	500 V	A	52					
	660/690 V	A	40					
Component lifespan AC-1, AC-3, AC-4	Operations		Pages 32/088, 089					 32/028
Short-circuit rating Maximum fuse ¹⁾ Type "2" co-ordination	gL	A	10					 32/038
	Type "1" co-ordination	A	20					
A.C.								
AC-1 duty Conventional free air thermal current I_{th} rated operational current I_n , 50 - 60 Hz								
3-pole	Open at 40 °C	A	22		(19.8) ²⁾			 32/048
	at 50 °C	A	20		(18) ²⁾			
	at 55 °C	A	19		(17) ²⁾			 32/056
	Enclosed ³⁾	A	16					
1-pole Three/four main contacts in parallel	Open ³⁾	A	50		60	50		 32/008
	Enclosed ³⁾	A	40		50	40		
AC-3 duty Rated operational current I_n Open ³⁾ 50 - 60 Hz								
	220 V	A	6		8.7			 32/022
	230 V	A	6		8.7			
	380 V	A	6.6		8.5			 32/028
	400 V	A	6.6		8.5			
	500 V	A	5		6.4			 32/006
	660 V	A	3.5		4.9			
	690 V	A	3.5		4.8			
AC-4 duty Rated operational current I_n Open ³⁾ 50 - 60 Hz								
	220 V	A	4.5		6			 32/022
	230 V	A	4.5		6			
	380 V	A	5		6.6			 32/008
	400 V	A	5		6.6			
	500 V	A	3.7		5			 32/022
	660 V	A	2.9		3.5			
	690 V	A	2.9		3.4			
D.C.								
Circuitry Rated operational current I_n Open ³⁾								
DC-1 duty	12 V-	A	20		-	20		 32/058
	24 V-	A	20		-	20		
	60 V-	A	20		-	20		
	110 V-	A	20		-	20		
	220 V-	A	20		-	20		
DC-3 duty	12 V-	A	6		8	-	8	 32/068
	24 V-	A	6		8	-	8	
	60 V-	A	3		4	-	4	
	110 V-	A	2		3	-	3	
	220 V-	A	-		-	1	-	
DC-5 duty	12 V-	A	1.8		2.5	-	2.5	 32/088
	24 V-	A	1.8		2.5	-	2.5	
	60 V-	A	1.8		2.5	-	2.5	
	110 V-	A	1.1		1.5	2.5	1.5	
	220 V-	A	0.2		0.3	1	0.3	
Current heat loss (3- or 4-pole) at conventional free air thermal current I_{th} at I_n AC-3/400 V		W	2	3.5	2	2.7	3.5	 32/114
		W	0.3	0.4	0.5	-	0.7	














¹⁾ See overlay "Fuses" for time/current characteristics
²⁾ At maximum permissible ambient temperature

³⁾ DIL EM-...F

Energy Control DIL Contactors

				DIL EEM	DIL EEM-G	DIL EM	DIL EM-G	DIL EM-GI
Magnet system								
Pick-up and drop-out values	A.C. operated							
	Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	$\times U_c$	0.8-1.1	-	0.8-1.1	-	-
	Dual-frequency coil ... V, 50/60 Hz	Pick-up	$\times U_c$	0.85-1.1	-	0.85-1.1	-	-
	D.C. operated		Pick-up	$\times U_c$	-	0.85-1.1	-	0.85-1.1 0.7-1.3
Power consumption of the coil	A.C. operated							
	Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	VA/W	25/22	-	25/22	-	-
		Sealing	VA/W	4.6/1.3	-	4.6/1.3	-	-
	Dual-frequency coil ... V, 50/60 Hz at 50 Hz	Pick-up	VA/W	30/26	-	30/26	-	-
		Sealing	VA/W	5.4/1.6	-	5.4/1.6	-	-
... V, 50/60 Hz at 60 Hz	Pick-up	VA/W	29/24	-	29/24	-	-	
	Sealing	VA/W	3.9/1.1	-	3.9/1.1	-	-	
	D.C. operated		Pick-up = W	-	2.6	-	2.6	1.5
			Sealing					
Duty factor			% DF	100				
Switching times at 100 % U_c (approximate values)	Make contacts	Closing delay	ms	14-21	26-35	14-21	26-35
		Opening delay	ms	8-18	15-17	8-18	15-17	14-20
Reversing contactors								
Changeover time at 110 % U_c			ms	16-21	30-40	16-21	30-40
Arcing time when a.c. operated 690 V			ms	12				
Coil 50/60 Hz				Mechanical lifespan at 50 Hz approximately 30 % less than listed under "General", (Page 32/092)				

DIL EM Mini Contactors Technical Data

				DIL EEM	DIL EEM-G	DIL EM	DIL EM-G	DIL EM-GI	
Contacts									
Interlocked opposing contacts to German specification ZH 1/457, including auxiliary contact modules				+	+	+	+	+	32/006
Rated impulse withstand voltage		U_{imp}	V	6000					
Overvoltage category/pollution degree		U_c	V~	III/3					32/022
Rated insulation voltage		U_i	V~	690					
Rated operational voltage		U_o	V~	600					
"Safe isolation" to DIN VDE 0106 Part 101 and Part 101 A1 between coil and auxiliary contacts, and between auxiliary contacts									
			V~	300					32/028
Rated operational current I_n				6					
AC-15		220/240 V	A	3					
		380/415 V	A	1.5					32/038
		500 V	A						
DC-13 ¹⁾	Contacts in series			2.5					
Above 110 V and at L/R > 15 ms it is essential that means of arc suppression be used in parallel with the contacts:	$L/R \leq 15$ ms	1	24 V-	A	2.5				
Required capacitor C-1 μ F	e. g. contactor coils	2	60 V-	A	2.5				
R-0.5 Ω in series	solenoid valves	3	110 V-	A	1.5				
	d.c. motors	3	220 V-	A	0.5				32/048
Control circuit reliability at $U_c = 24$ V DC									
Voltage, current and tolerances to DIN 19 240, 17 V, 5.4 mA	Error rate	H_f		< 10^{-6} , < 1 fault operation in 100 million operations					32/056
Conventional free air thermal current I_n			A	10					
Component lifespan									
$U_o = 240$ V AC-15	Operations $\times 10^6$			Page 32/088					
$U_o = 240$ V DC-13 ¹⁾	At $I_n = 0.5$ A, L/R = 50 ms								
	2 contacts in series			0.15					32/022
Short-circuit rating	Without welding								
With direct connection to mains or transformer > 1000 VA	Max. overcurrent protective device	220/240 V	PKZM 1	4					
		380/415 V	PKZM 1	4					32/028
	Without welding	500 V	A gL	6					
	Maximum fuse ²⁾	500 V	A fast	10					32/058
Current heat loss at conventional free air thermal current I_n	Per contact	Max.	W	0.2	0.3	0.2	0.3		
									32/068
									
									32/088
									
									32/114

1) Making and breaking currents to DC-13, time constant as stated
 2) See overlay "Fuses" for time/current characteristics