

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	× 10 ⁶		10	20	10	20	
Maximum operating frequency	Mechanical	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	Make contacts	g		8	20	8	20	
Auxiliary contacts	Make/break contacts	g		8/5.5	20/20	8/5.5	20/20	
<i>Basic unit with auxiliary contact module</i>								
Main contacts	Make contacts	g		7.5	20	7.5	20	
Auxiliary contacts	Make/break 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 × 0.75				
		Max.	mm ²	2 × 2.5				
Flexible	With ferrule to DIN 46 228	Max.	mm ²	2 × 1.5				
		Max.	mm ²	2 × 2.5				
Solid or stranded		Min.	AWG	18				
		Max.	AWG	14				
Terminal screw	Pozidrive screwdriver	Standard screwdriver	Size	M 3.5				
			mm	2				
			mm	0.8 × 5.5				
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 _e	V~		690				
"Safe isolation" to DIN VDE 0106 Part 101 and Part 101 A								
between coil and contacts, and between contacts				V~	300			

¹⁾ For suitable enclosure, see Pages 32/086, 087
²⁾ DIL EM-...F: only finger-proof when 6.3 × 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			
Overtoltage 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 _a , AC-15	500 V		A	2	-	-	-
	400 V		A	4	-	-	-
	230 V		A	6	6	-	-
Rated operational current I _a , 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 ⁶	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	-	-	-



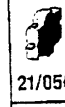
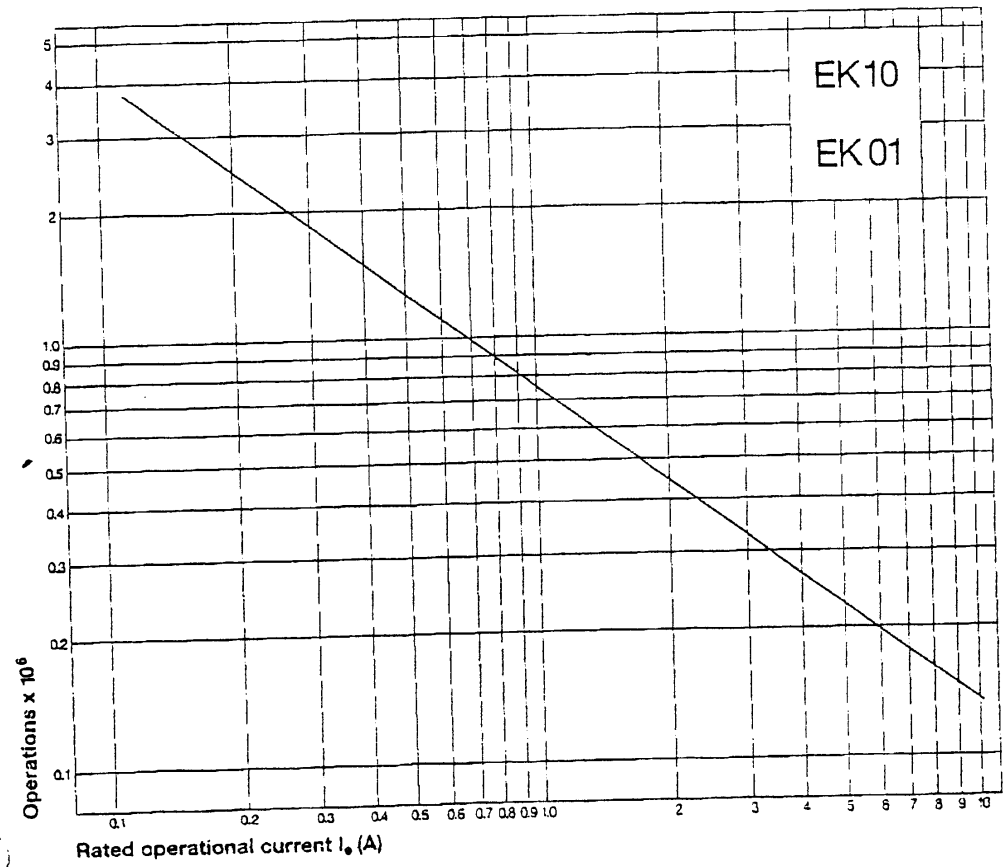
IP 65								
Damp heat, constant, to IEC 68 Part 2-3								
Damp heat, cyclic, to IEC 68 Part 2-30								
+60/-25	-							
+40/-25	-							
As required	-							
> 30	> 50	> 30	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-



21/090, 091
21/092-095

RMQ 22

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



²⁾ Only for \otimes up to 2 W ³⁾ Only for \otimes 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					
	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					32/022
Short-circuit rating Maximum fuse 1)	Type "2" co-ordination	gL	A	10				
	Type "1" co-ordination	gL	A	20				
A.C.								
AC-1 duty								
Conventional free air thermal current I _{th} Δ rated operational current I _o , 50 - 60 Hz								
3-pole	Open at 40 °C	A	22		(19.8) ²⁾			
	at 50 °C	A	20		(18) ²⁾			
	at 55 °C	A	19		(17) ²⁾			
	Enclosed ³⁾	A	16					
1-pole Three/four main contacts in parallel	Open ³⁾	A	50		60	50		
	Enclosed ³⁾	A	40		50	40		
AC-3 duty								
Rated operational current I _o , Open ³⁾ , 50 - 60 Hz								
	220 V	A	6		8.7			
	230 V	A	6		8.7			
	380 V	A	6.6		8.5			
	400 V	A	6.6		8.5			
	500 V	A	5		6.4			
	660 V	A	3.5		4.9			
690 V	A	3.5		4.8				
AC-4 duty								
Rated operational current I _o , Open ³⁾ , 50 - 60 Hz								
	220 V	A	4.5		6			
	230 V	A	4.5		6			
	380 V	A	5		6.5			
	400 V	A	5		6.6			
	500 V	A	3.7		5			
	660 V	A	2.9		3.5			
690 V	A	2.9		3.4				
D.C.								
Circuitry								
Rated operational current I _o , Open ³⁾								
DC-1 duty	12 V-	A	20				20	
	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	
	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	
	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 _o , AC-3/400 V								
		W	2	3.5	2	2.7	3.5	32/088
		W	0.3	0.4	0.5	-	0.7	














1) See overlay "Fusas" 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			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 AC-15		220/240 V A	6	.....	.....	.....
		380/415 V A	3	.....	.....	.....
		500 V A	1.5	.....	.....	.....
DC-13 ¹⁾ Above 110 V and at L/R > 15 ms it is essential that means of arc suppression be used in parallel with the contacts: Required capacitor C-1 μ F R-0.5 Ω in series	Contacts in series							
	L/R \leq 15 ms	1	24 V-	A	2.5	.....	
	e. g. contactor coils	2	60 V-	A	2.5	.....	
	solenoid valves	3	110 V-	A	1.5	.....	
d.c. motors	3	220 V-	A	0.5	.....	0.5	.....
Control circuit reliability at $U_o = 24$ V DC Voltage, current and tolerances to DIN 19 240, 17 V, 5.4 mA	Error rate	H_f	< 10^{-8} , < 1 fault operation in 100 million operations					
Conventional free air thermal current I_{th}		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		Operations $\times 10^6$	0.15	.....	.....	32/022
Short-circuit rating With direct connection to mains or transformer > 1000 VA	Without welding Max. overcurrent protective device	220/240 V PKZM 1	4	.....	.....	.....
		380/415 V PKZM 1	4	.....	.....	.....
	Without welding Maximum fuse ²⁾	500 V A gL	6	.....	.....	.....
		500 V A fast	10	.....	.....	.....
Current heat loss at conventional free air thermal current I_{th}	Per contact	Max.	W	0.2	0.3	0.2	0.3	
								
								

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