

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, ONV, CIS, RINA, PRS				
Mechanical lifespan	Operations	$\times 10^6$		10	20	10	20	
Maximum operating frequency	Ops./h			9000				
Mechanical				See table, Page 32/090				
Electrical				Damp heat, constant, to IEC 68 Part 2-3				
Climatic proofing				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								
Auxiliary contacts	g			8/5.5	20/20	8/5.5	20/20	
Make/break contacts								
<i>Basic unit with auxiliary contact module</i>								
Main contacts	g			7.5	20	7.5	20	
Make contacts								
Auxiliary contacts	g			7.5/4.5	20/20	7.5/4.5	20/20	
Make/break contacts								
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				
	Max.	mm ²		2 x 2.5				
Solid or stranded	Min.	AWG		18				
	Max.	AWG		14				
Terminal screw				M 3.5				
Pozidrive screwdriver				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 _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 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 ⁵		-	-	-	-
			Operations × 10 ⁶		6000	6000	-	-
Maximum operating frequency			Ops./h		≤ 5	≤ 25	-	-
Operating force			N		IEC 11: ≤ 7.3	-	-	-
			N		IEC 20: ≤ 9	-	-	-
			N		IEC 02: ≤ 5.5	-	-	-
			N		-	-	-	-
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					6	4	4 ¹⁾	6
Rated impulse withstand voltage	U _{imp}		kV		500	250	250	630
Rated insulation voltage	U _i		V		3			
Pollution degree					III			
Overvoltage category					PKZM 1-6/ FAZN B10 10	PKZM 1-6/ FAZN B10 10	-	Short-circuit-proof
Max. short-circuit protective device	Fuseless		Type		-	-	-	Short-circuit-proof
	Fuse, gL		A					
Switching capacity					2	-	-	-
Rated operational current I _a AC-15	500 V		A		4	-	-	-
	400 V		A		6	6	-	-
	230 V		A		0.5	0.5	-	-
Rated operational current I _a DC-13	220 V		A		1.1	1.1	-	-
	110 V		A					
Electrical lifespan			Operations × 10 ⁴		0.6	-	-	-
AC-15	230 V	1.2 A	Operations × 10 ³		0.3	-	-	-
		3.6 A	Operations × 10 ⁴		1.2	-	-	-
DC-13	12 V	2.8 A	Operations × 10 ⁴					

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

RMQ 22 Technical Data

RMQ 16

Push-button actuators	Emergency- stop actuators	Double actuators ²⁾	Selector switches	Toggle switches	Key-operated actuators	Key-release mushroom actuators	Illuminated push-button actuators - stay-put ³⁾	Indicator lights
Mushroom actuators			Illuminated selector switches					



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

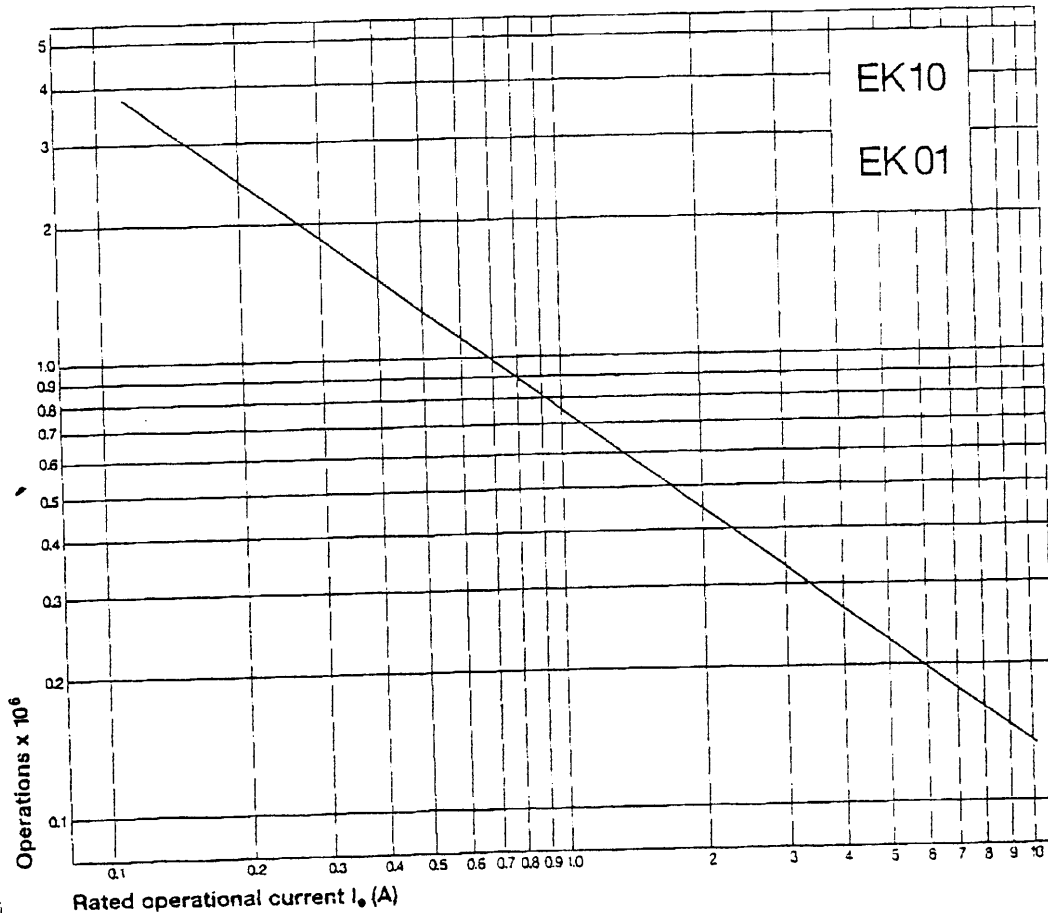
> 30	> 50	> 30	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-



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						 32/022
Short-circuit rating Maximum fuse ¹⁾		A	10						 32/028
Type "2" co-ordination	gL	A	20						
Type "1" co-ordination	gL	A	20						
A.C.									
AC-1 duty									
Conventional free air thermal current I_{th} Δ rated operational current I_n , 50-60 Hz									
3-pole	Open at 40 °C	A	22		(19.8) ²⁾				 32/038
	at 50 °C	A	20		(18) ²⁾				
	at 55 °C	A	19		(17) ²⁾				
	Enclosed ³⁾	A	16						
1-pole	Open ³⁾	A	50		60	50			 32/048
	Three/four main contacts in parallel	A	40		50	40			
AC-3 duty									
Rated operational current I_n , Open ³⁾ , 50-60 Hz									
	220 V	A	6		8.7				 32/056
	230 V	A	6		8.7				
	380 V	A	6.6		8.5				 32/008
	400 V	A	6.6		8.5				
	500 V	A	5		6.4				 32/022
	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				 32/028
	230 V	A	4.5		6				
	380 V	A	5		6.6				 32/058
	400 V	A	5		6.6				
	500 V	A	3.7		5				 32/068
	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		 32/088
	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		 32/088
	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		 32/088
		W	0.3	0.4	0.5	-	0.7		 32/088

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			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										32/038
	220/240 V	A	6							
	380/415 V	A	3							
	500 V	A	1.5							
DC-13 ¹⁾	Contacts in series									
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 ≤ 15 ms	1	24 V~	A	2.5					32/048
Required capacitor C-1 μF	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					
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 ⁻⁴ , < 1 fault operation in 100 million operations							32/056
Conventional free air thermal current I_n		A	10							
Component lifespan										32/008
$U_c = 240$ V AC-15	Operations × 10 ⁶		Page 32/088							
$U_c = 240$ V DC-13 ¹⁾	At $I_n = 0.5$ A, L/R = 50 ms									32/022
	2 contacts in series		Operations × 10 ⁶		0.15					
Short-circuit rating	Without welding									
With direct connection to mains or transformer > 1000 VA	Max. overcurrent protective device	220/240 V PKZM 1	4							32/028
		380/415 V PKZM 1	4							
	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