

PCB relay for DC voltage, neutral, monostable

Features

- Used as a switching element for electrical separation between low-power control circuits and power load circuits
- Clearance/creepage distances between winding and contact ≥ 4 mm (A/B version, make contact or changeover contact) or ≥ 8 mm (C/D version, make contact or break contact)
- Mechanical and electrical characteristics comply with the "Rules for electrical relays in power installations" (VDE 0435/9.72)
- Used for safe electrical insulation in the following applications
 - open and closed-loop control equipment for domestic use (VDE 0631)
 - electronic equipment for domestic use (VDE 0860)
- Suitable for fully automated processing

Typical applications

- Machine tool control
- Interface modules
- Timer relays
- Elevator controls

Design

- Flat or upright versions with 1 changeover contact or 1 make contact or 1 break contact
- Changeover contact assembly with single or double contacts
- For printed circuit assembling
- Immersion cleanable

Approvals



VDE

Mark of conformity



SEV

91.1 12262.04



CSA

File LR 89731



UL

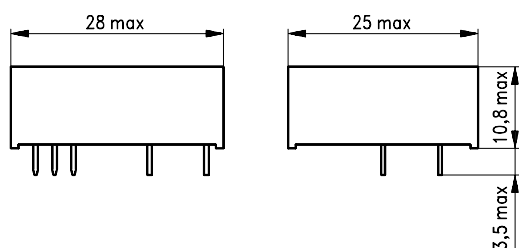
File E 48393

Card Relay E (KRE)

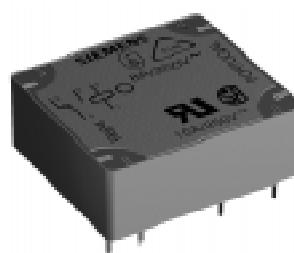
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Dimensional drawing (in mm)

Flat version



ECR0791-E

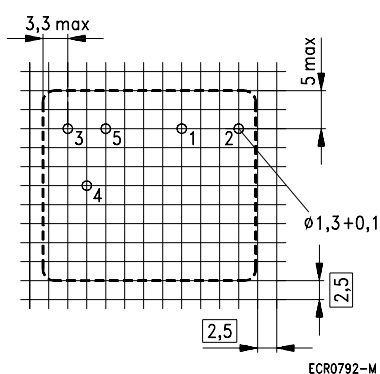


ECR0975-B

Approx. 1:1 scale

Mounting hole layout

View on the terminals



ECR0792-M

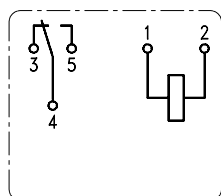
Terminals in a 2.5 mm and 2.54 mm basic grid to EN 60097 and DIN 40803, fine

Terminal assignment

View on the terminals

Changeover contact

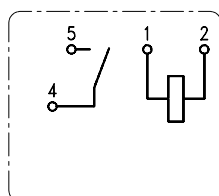
Clearance/creepage dist. $\tilde{S} \geq 4$ mm



ECR0679-P

Make contact

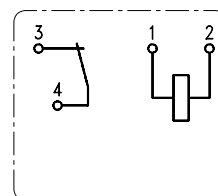
Clearance/creepage dist. $\tilde{S} \geq 4$ mm



ECR0793-V

Break contact

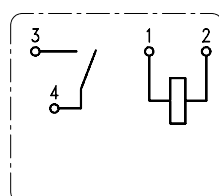
Clearance/creepage dist. $\tilde{S} \geq 8$ mm



ECR0795-C

Make contact

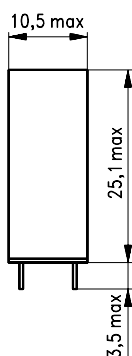
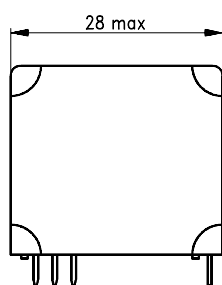
Clearances/creepage dist. $\tilde{S} \geq 8$ mm



ECR0794-4

Dimensional drawing (in mm)

Upright version



ECR0789-3

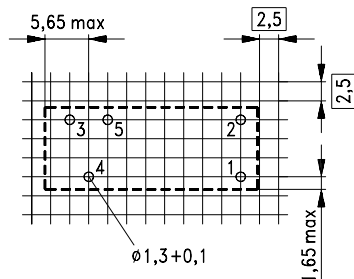


ECR0975-A

Approx. 1:1 scale

Mounting hole layout

View on the terminals



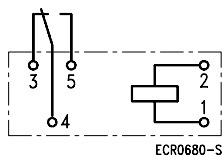
ECR0790-6

Terminals in 2.5 mm and 2.54 mm basic grid to EN 60097 and DIN 40803, fine

Terminal assignment

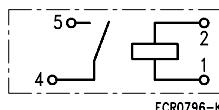
View on the terminals

Changeover contact
 Clearance/creepage dist. $\checkmark \geq 4$ mm



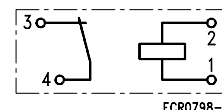
ECR0680-S

Make contact
 Clearance/creepage dist. $\checkmark \geq 4$ mm



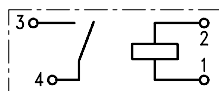
ECR0796-K

Break contact
 Clearance/creepage dist. $\checkmark \geq 8$ mm



ECR0798-2

Make contact
 Clearance/creepage dist. $\checkmark \geq 8$ mm



ECR0797-T

Card Relay E (KRE)

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Contact data

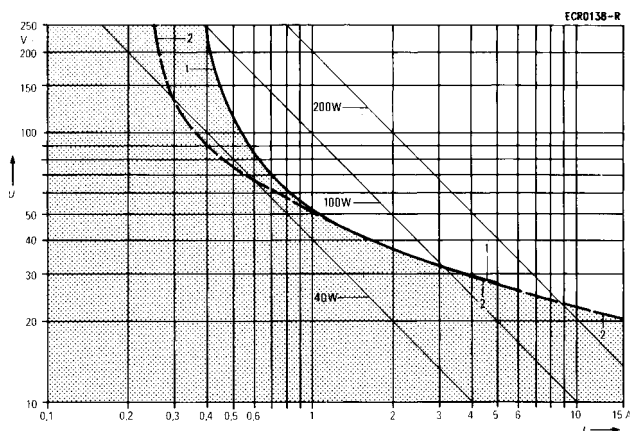
Contact category III according to VDE 0435 Part 120/10.81 B

Ordering code, block 3/ No. of contacts and type/ contact assembly	A101	A102	A103	A201	A202	A203	A401	A402	A403
	1 change.	1 make	1 break	1 change.	1 make	1 break	1 change.	1 make	1 break
	Single contacts								
Ordering code, block 3/ No. of contacts and type/ contact assembly	B101	—	—	B201	—	—	B401	—	—
	1 change.	—	—	1 change.	—	—	1 change.	—	—
	Double contacts								
Contact material	AgNi0,15 gold-flashed			AgNi20			AgCdO		
Max. continuous current at max. ambient temperature	8 A								
Inrush current (max. 4 s for 10% duty cycle)	15 A								
Maximum switching voltage	440 V~ 300 V–								
Maximum switching capacity AC voltage DC voltage	2000 VA See load limit curve								
Recommended for loads >	1 mA, 6 V–			100 mA, 12 V~/V–			500 mA, 12 V~		
Contact resistance (initial value)/measuring current/driver voltage	≤ 100 mΩ/100 mA/6 V			≤ 100 mΩ/100 mA/12 V			≤ 100 mΩ/1A/24 V		

Note: Other contact materials and hard gold-plated contacts available on request

Load limit curve

for relays with single contacts



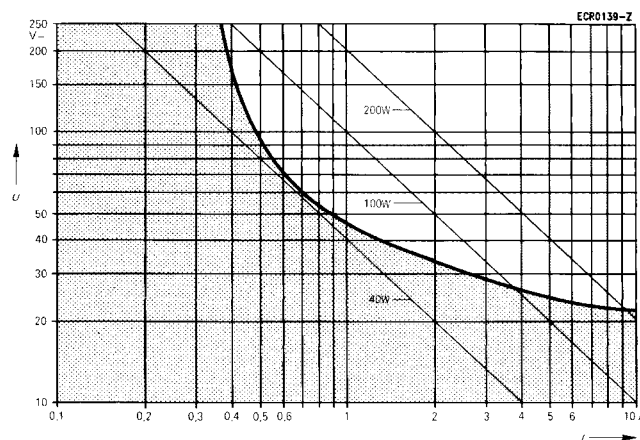
I = switching current

U = switching voltage

Curves: Safe shutdown, no stationary
arc > 10 ms.
Max. 12.5 operations/s.

Load limit curve

for relays with double contacts



Curve 1 ——— Contact material silver,
gold-flashed

Curve 2 - - - - - Contact material
silver cadmium oxide

Coil data	
Nominal voltages	From 6 V– to 60 V– Special voltages on request
Nominal power consumption, typ.	450 ... 500 mW
Maximum pull-in power	240 mW
Minimum release voltage	10 % of nominal voltage

Coil versions				
Nominal voltage U_{nom} V–	Operating voltage range at 20 °C		Resistance at 20 °C Ω	Number of coil Ordering code, block 2
	Operate voltage U_I V–	Max. voltage U_{II} V–		
6	4.2	10.6	80 ± 8	001
12	8.3	21.5	330 ± 33	002
24	16.8	40.0	1200 ± 180	006
48	33.6	79.0	4700 ± 700	013
60	42.0	98.0	7200 ± 1080	023

Other coil versions available on request
Data for operating range and class of operative range according to DIN IEC 255 Part 1-00/VDE 435 Part 205 available on request

U_I = Operate voltage at 20 °C after pre-energizing with U_I without contact current

U_{II} = Maximum continuous voltage at 20 °C for $T_{\text{c max}} = 115$ °C without contact loading

Operating voltage limits U_I and U_{II} depend on temperature and can be calculated by:

$U_{I \text{ t amb}} = k_I \cdot U_{I \text{ 20 °C}}$ and $U_{II \text{ t amb}} = k_{II} \cdot U_{II \text{ 20 °C}}$

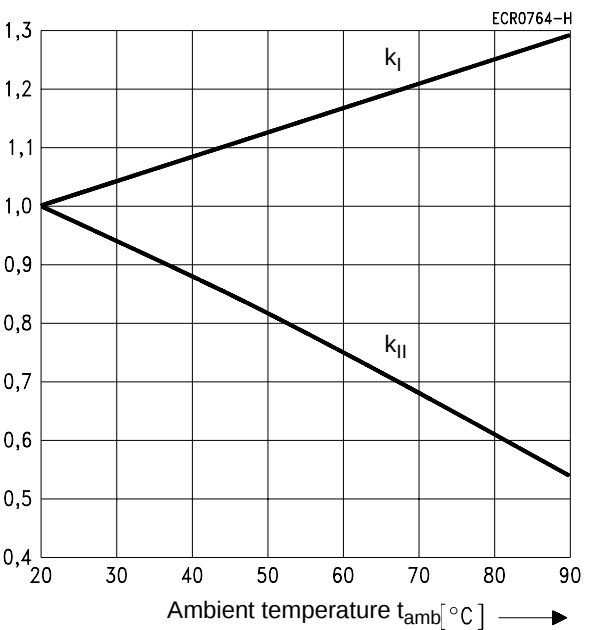
t_{amb} = Ambient temperature

$U_{I \text{ t amb}}$ = Minimum voltage at ambient temperature t_{amb}

$U_{II \text{ t amb}}$ = Maximum voltage at ambient temperature t_{amb}

k_I a. k_{II} = Factors (dependent on temperature), see diagram

$T_{\text{c max}}$ = Maximum coil temperature



Card Relay E (KRE)

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General data

Operate time at U_{nom} and 20 °C, typ.	7 ms
Release time without/with diode in parallel, typ.	3 ms / 10 ms
Bounce time, make/break contact, typ.	0.5 ms / 3 ms
Maximum switching rate without load	1200 min ⁻¹
Maximum switching rate with rated load	30 min ⁻¹
Ambient temperature range according to DIN IEC 255 Part 1-00 or VDE 0435 Part 201	-40 °C ... +70 °C
Thermal resistance	75 K/W
Coil temperature rise due to rated contact current	Approx. 10 K
Maximum permissible coil temperature	115 °C
Protection class according to DIN 40050/IEC 529	Immersion cleanable IP 67
Electrical endurance at rated load	1 x 10 ⁵ operations
Mechanical endurance	Approx. 2 x 10 ⁷ operations
Flammability according to UL 94	V-0
Solder bath temperature/max. duration	260 °C / 5 s
Mounting position	Any
Processing information	Wherever possible, ultrasonic cleaning should not be used; if absolutely necessary, then only after consultation with the manufacturer.
Weight	20 g

Insulation

According to VDE 0110 (2/97): insulation group/rated voltage	C/250 B/380
Dielectric test voltage, contact – coil (1 min)	4000 V _{rms}
Dielectric test voltage between open contacts (1 min)	1000 V _{rms}
Clearance/creepage distances	Changeover contact: 4 mm Make contact: 4 or 8 mm Break contact: 8 mm
Insulation resistance at 500 V (initial value)	> 10 ⁴ MΩ

Ordering code

	Block 1						Block 2					Block 3			
Data position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	V	2	3	0	5	7	—		0			—			
Identifier for Card Relay E (KRE)															
Design															
A = flat with clearances/creepage dist. ≥ 4 mm (changeover contact or make contact)															
B = upright with clearances/creepage dist. ≥ 4 mm (changeover contact or make contact)															
C = flat with clearances/creepage dist. ≥ 8 mm (make contact or break contact)															
D = upright with clearances/creepage dist. ≥ 8 mm (make contact or break contact)															
Version															
0 = Standard															
Coil number															
001 = 6 V– nominal voltage															
002 = 12 V–															
006 = 24 V–															
013 = 48 V–															
023 = 60 V–															
Type of contact															
A = Single contact															
B = Double contact (for changeover contact only)															
Contact material															
1 = AgNi0,15, gold-flashed															
2 = AgNi20															
4 = AgCdO															
Contact arrangement															
01 = 1 changeover contact															
02 = 1 make contact															
03 = 1 break contact															

Ordering example: V23057-B0006-A101
Card Relay E, upright, with clearances/creepage distances ≥ 4 mm, with 1 changeover contact (single contact), contact material AgNi0,15, gold-flashed, coil 24 V nominal voltage

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