

284-889<sup>TD</sup> 932

## Miniature Power Relay E1

V23056

for DC operation, neutral, monostable








### Features

- Used as switching element for electrical separation of low-power control circuits and power load circuits
- High making/breaking capacity despite small size
- Mechanical and electrical characteristics comply with the "Regulations for Electrical Relays in Power Installations" (VDE 0435/9.72) and "Safe Electrical Isolation of Telecommunications and Power Circuits" (VDE 0804)
- Meets the requirements of VDE 0720, part 1/2.72 § 22 n and VDE 0730, part 1/3.72 § 22 n with respect to creepage distances, clearances and test voltages for protection class II
- Complies with CEE publications 10 and 11
- Complies with the relevant regulations for use in domestic appliances (VDE 0700 or VDE 0730), one of the reasons being the leakage current stability of the frame in accordance with CTI  $\geq 250$ . Example for washing machines: VDE 0730, part 2 J/8.77 § 30 c; meets also the requirements of VDE 0730, part 2 J/8.77 § 22 l (flammability test)
- Complies with the "Safety Requirements for Mains Operated Electronic and Related Apparatus for Household and Similar General Use" as per VDE 0860 (DIN IEC 65) and with the regulations for temperature controllers and limiters as per VDE 0631
- Creepage distances and clearances  $\geq 8$  mm

### Versions

- Standard or heat-resistant (thermostable materials); heat-resistant version withstands ambient temperatures of up to 110 °C, upper limit temperature for continuous operation 155 °C
- Contact arrangement: 1 make, 1 break or 1 changeover
- Single or twin base terminals
- Termination: printed circuit terminals
- Plastic cover
- Dust-protected

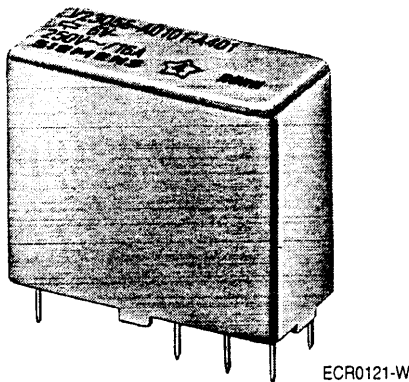
### Approvals

	VDE	Mark of conformity 
	DEMKO	63385 HK and 78889 HK
	SEMKO	8403030 and ...031 and 8401092
	SEV	89,5 50653.01
	CSA	File LR 50227
	UL	File E 48393

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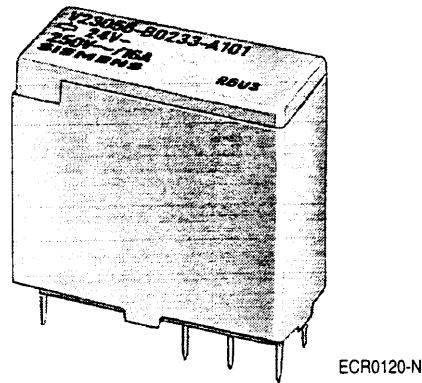
# Miniature Power Relay E1

V23056-A0★★★ standard



ECR0121-W

V23056-B0★★★ heat-resistant



ECR0120-N

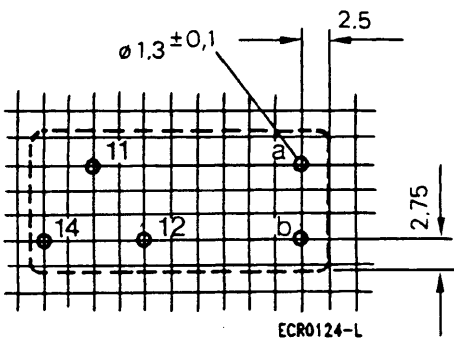
Illustrations approx. original size  
Approx. weight 20 g

1 changeover, 1 make or 1 break contact  
Single or twin base terminals

Dust-protected

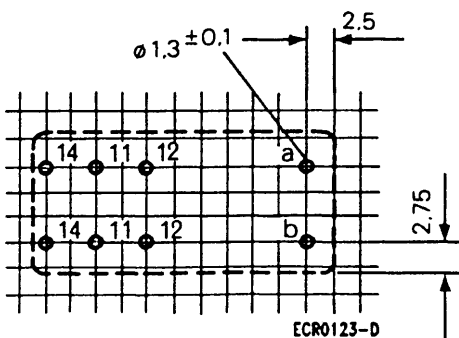
For printed circuit mounting,  
pin arrangement suits 2.5 mm and  
2.54 mm grid in acc. with DIN 40801

Relay with single base terminals for  
max. continuous current of 10 A



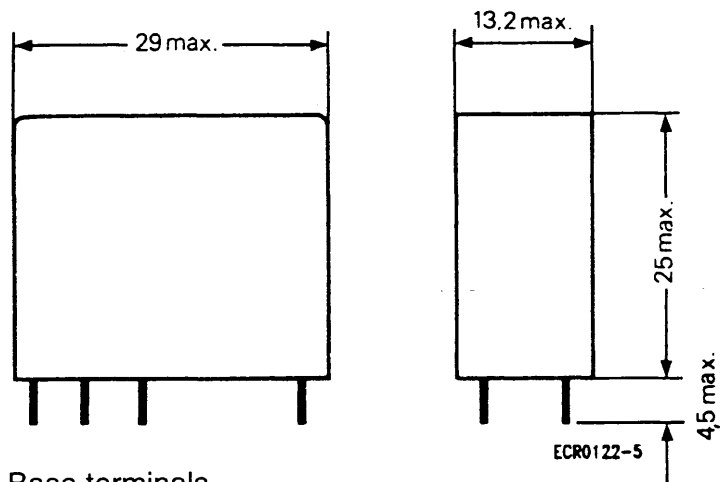
ECR0124-L

Relay with twin base terminals for  
max. continuous current of 16 A



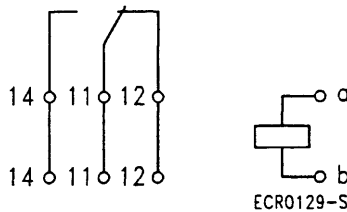
ECR0123-D

Mounting hole layout  
View onto the terminals



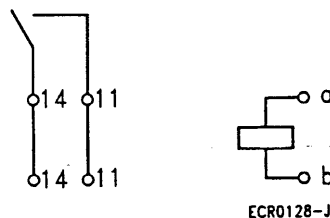
Base terminals

1 changeover



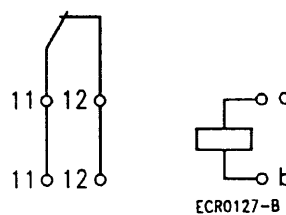
ECR0129-S

1 make



ECR0128-J

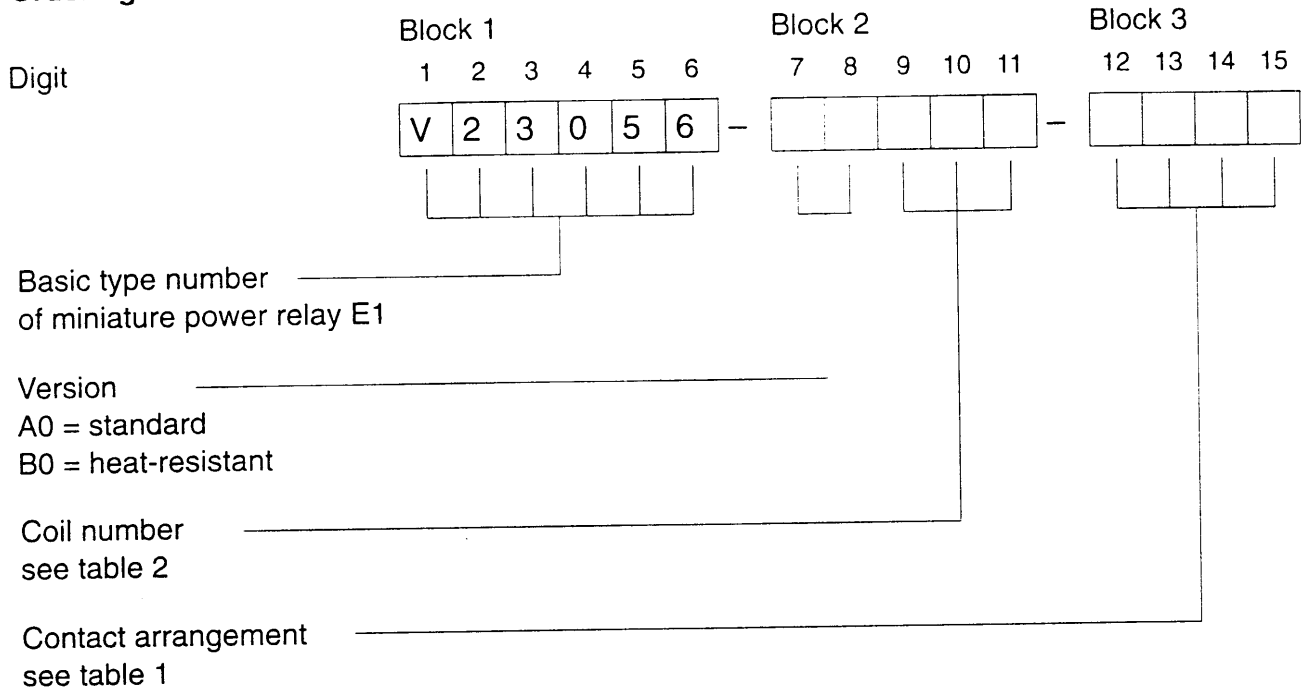
1 break



ECR0127-B

# Miniature Power Relay E1

## Ordering code



Ordering example: V23056-A0102-A101

Miniature power relay E1, standard version, coil 12 V nominal voltage, 1 changeover, twin base terminals, contact material silver

### SCS – Preferred standard types

V23056-A0101-A101	V23056-A0105-A101
-A0101-A401	-A0105-A401
-A0102-A101	-A0105-A402
-A0102-A104	-A0105-A404
-A0102-A401	
-A0102-A402	

# Miniature Power Relay E1

**Table 1 Characteristics**

## Energising side

Operating voltages		V DC	see table 2
Power consumption	standard version heat-resistant version	W W	approx. 0.65 approx. 0.8
Maximum temperature	standard version heat-resistant version	°C °C	115 155
Continuous thermal load at 20 °C ambient temperature	standard version heat-resistant version	W W	1.3 2
Thermal resistance		K/W	65

## Contact side

Contact class III in acc. with VDE 0435, part 120 /10.81, appendix B

Contact arrangement	twin base terminals	A101	A102	A103	A401	A402	A403
Ordering code block 3	single base terminals	A104	A105	A106	A404	A405	A406
Contact material		silver			silver-cadmium oxide		
Contact description		21	1	2	21	1	2
Symbols (see also base terminals)							
Maximum switching voltage as per VDE 0110 group C	V DC V AC	300 250					
Maximum switching current	A	16			25 <sup>1)</sup>		
Maximum power rating <sup>2)</sup> DC voltage	W	50 ... 330			35 ... 500		
		see fig. 2 (voltage-dependent)					
AC voltage	VA	2000			4000		
Maximum continuous current twin base terminals single base terminals	A A				16 10		

## General

Permissible ambient temperature standard version heat-resistant version	°C °C	- 40 ... + 60 - 40 ... + 110	
Operate time <sup>3)</sup>	ms	approx. 8	
Release time <sup>3)</sup>	ms	approx. 3	
Maximum switching rate	operations/s	20	
Test voltage: contact/winding	V AC <sub>ms</sub>	4000	
Electrical life <sup>2)</sup> AC voltage 220 V, 10 A AC voltage 220 V, 16 A	operations operations	approx. 10 <sup>5</sup>	approx. 2 × 10 <sup>5</sup> approx. 10 <sup>5</sup>
Mechanical life standard version heat-resistant version	operations operations	approx. 10 <sup>7</sup> approx. 3 × 10 <sup>5</sup>	

<sup>1)</sup> The current of 25 A may flow for a maximum of 4 seconds up to 10% on-time.

<sup>2)</sup> The ratings apply to resistive or inductive load with appropriate spark suppression and have been determined at 0.1 operations/s.

<sup>3)</sup> Measured at nominal voltage without series resistor

# Miniature Power Relay E1

Table 2 Coil versions

Nominal voltage V DC	Operating voltage range at 20 °C		Resistance at 20 °C Ω	Coil number Ordering code block 2
	Minimum voltage $U_I$ V DC	Maximum voltage $U_{II}$ V DC		
Standard version				
6	4.4	9.5	60 ± 6	101
12	8.8 <i>7.32</i>	18.5 <i>15.4-2</i>	215 ± 22	102
24	17.5 <i>11.9</i>	36.5 <i>15.2-1</i>	875 ± 130	105
48	35	72	3300 ± 495	104
60	44	90	5200 ± 780	103
Heat-resistant version				
12	7.6	23.6	195 ± 20	232
24	15.1	47.5	790 ± 80	233

Other coil versions upon request.

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

$$U_{I,t_u} = k_I \cdot U_{I,20^\circ\text{C}} \text{ and } U_{II,t_u} = k_{II} \cdot U_{II,20^\circ\text{C}}$$

$t_u$  = ambient temperature

$U_{I,t_u}$  = minimum voltage at ambient temperature  $t_u$

$U_{II,t_u}$  = maximum voltage at ambient temperature  $t_u$

$k_I$  and  $k_{II}$  = factors

$t_u$	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C	90 °C	100 °C	110 °C
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Standard version

$k_I$	1.0	1.04	1.08	1.12	1.16	–	–	–	–	–
$k_{II}$	1.0	0.94	0.88	0.81	0.75	–	–	–	–	–

Heat-resistant version

$k_I$	1.0	1.04	1.08	1.12	1.16	1.2	1.24	1.28	1.31	1.35
$k_{II}$	1.0	0.96	0.92	0.88	0.84	0.79	0.75	0.69	0.64	0.58

Information on operating range and response class in accordance with DIN IEC 255, part 1-00/ VDE 0435, part 201 upon request.

# Miniature Power Relay E1

## Heat-resistant version

Temperature rise of the coil ( $\Delta \vartheta$ ) as a function of continuous contact current ( $I_D$ )

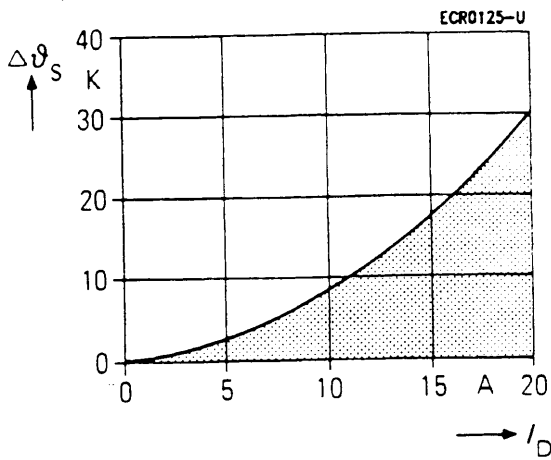


Figure 1

## Limit curve

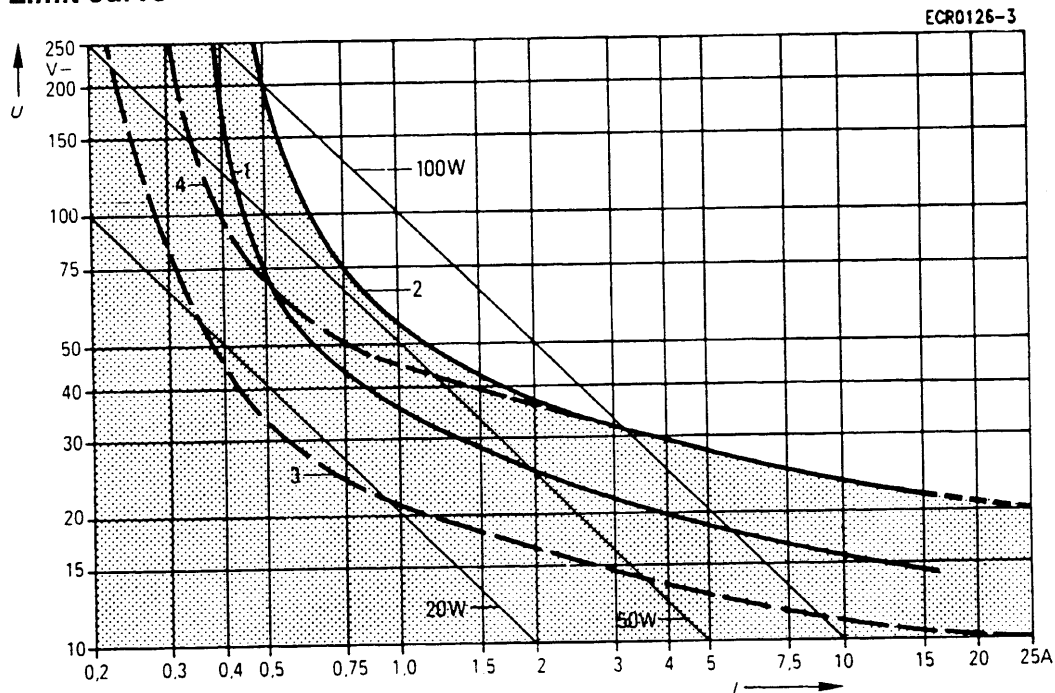


Figure 2

$I$  = switching current

$U$  = switching voltage

Curves 1 and 3: Arc extinguishes during transit period (limit curve I)  
Max. 12.5 operations/s

Curves 2 and 4: Safe breaking, no stationary arc (limit curve II)  
Max. 1 operation/s

———— Contact material  
silver

----- Contact material  
silver-cadmium oxide