PCB/plug-in relay for DC voltage, neutral, monostable

Features

- High-temperature relay with contact-side Faston terminals
- Switching capacity 4000 VA at 125 °C ambient temperature
- Nominal coil power 360 mW
- Mechanical and electrical characteristics comply with the “Rules for electrical relays in power installations” (VDE 0435/9.72)
- Clearance/creepage distances > 8 mm between coil and contact
- Tracking resistance of the plastics to PTI 250
- Used for safe electrical insulation in the following applications
  - open and closed-loop control equipment for domestic use (VDE 0631)
  - electrical equipment for domestic use (EN 60 335-1/VDE 0700)

Typical applications

- Oven timers
- Electric heaters
- Microwave ovens
- Air-conditioning equipment
- Power supply equipment

ECR3029-2

Approx. original size

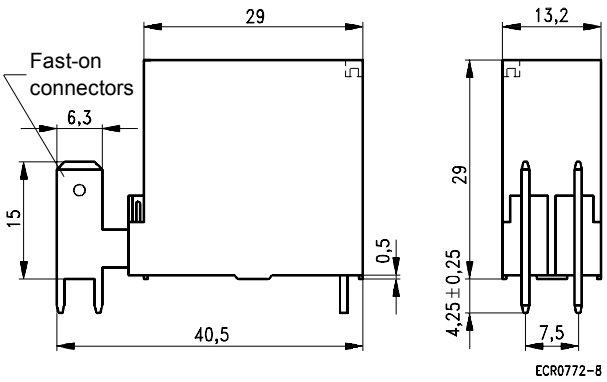
Design

- With 1 make contact
  or
  with 1 break contact
  (changeover contact on request)
- For printed circuit assembling
- With PCB terminals (coil) and flat terminals (contacts) for 6.35 mm fast-on connectors
- Dust-protected

Approvals

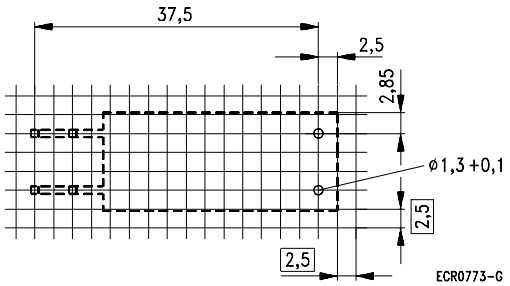
VDE	VDE	Mark of conformity 5081
SEV	SEV	91.1 11672.01
CSA	CSA	LR 89731-12
UL	UL	File E 48393
SEMKO	SEMKO	9330076
ÖVE	ÖVE	22905/E
BEAB	BEAB	C 0573

Dimensional drawing (in mm)



Mounting hole layout

View on the terminals



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

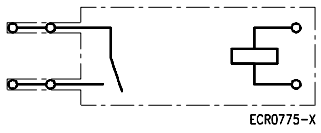
Note

The dust-protected version must be checked to ensure that the clearances and creepage distances required by VDE are not compromised by conductor paths running between the relay and the board.

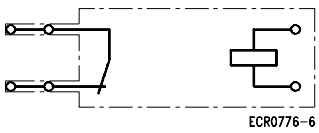
Terminal assignment

View on the terminals

1 make contact



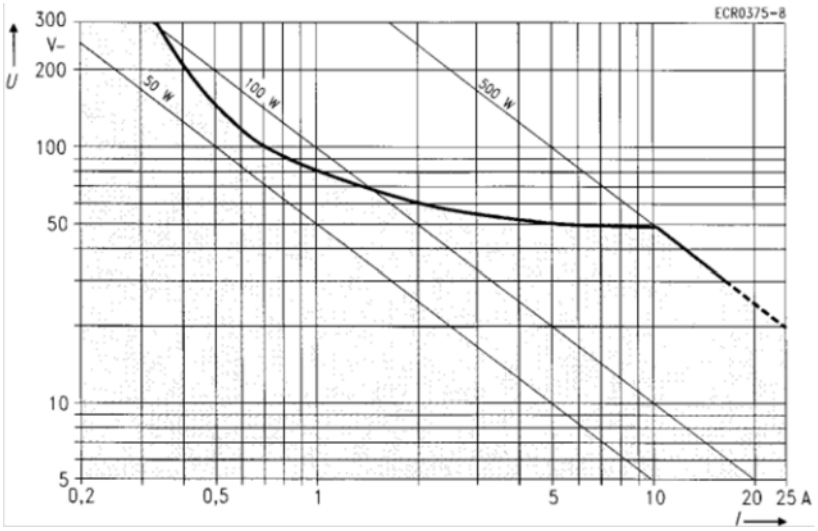
1 break contact



Contact data		
Contact category III according to VDE 0435 Part 120/10.81, Appendix B		
Ordering code, block 3	A402	A403
Number of contacts and type	1 make contact	1 break contact
Contact assembly	Single contacts	
Contact material	AgCdO ($AgSnO_2$ on request)	
Max. continuous current at max. ambient temperature	16 A	16 A
Inrush current (max. 4 s for 10% duty cycle)	25 A	25 A
Maximum switching voltage	440 V~ 300 V–	
Maximum switching capacity AC voltage DC voltage	 4000 VA See load limit curve	
Recommended for loads greater than	500 mA, 12 V~	
Contact resistance (initial value)/ measuring current/driver voltage	≤ 100 mΩ/1 A/24 V	

Note: Inrush currents up to 150 A available on request.

Load limit curve



I = switching current
U = switching voltage
■ = recommended application field

Load limit curve: Safe switch-off, no stationary arc > 10 ms

Coil data

Nominal voltages	From 3 V– to 110 V–
Nominal power consumption, typ., at 20 °C	360 mW
Pull-in power, typ., at 20 °C	140 mW
Operating range/pickup class according to IEC 255-1-00 and VDE 0435 Part 201	2/b
Minimum release voltage	10 % of nominal voltage

Coil versions

Nominal voltage U_{nom} V–	Operate voltage at 20 °C $U_{op\ cold}$ V–	Operating voltage range at 20 °C Min. voltage U_I V–	Operating voltage range at 20 °C Max. voltage U_{II} V–	Resistance at 20 °C Ω	Coil number Ordering code block 2
3	1.9	2.1	8.5	25 ± 2.5	001
6	3.8	4.2	16.9	100 ± 10	003
12	7.5	8.4	33.8	400 ± 40	005
24	14.9	16.8	67.7	1600 ± 160	007
48	30.0	33.6	135.3	6400 ± 640	009
60	37.2	42.0	169.1	10000 ± 1000	010
110	68.2	77.0	310.1	33610 ± 3360	012

Other coil versions available on request

$U_{op\ cold}$= Operate voltage at 20 °C without pre-energizing the coil

U_I = Minimum voltage at 20 °C after pre-energizing with U_{nom} without contact current

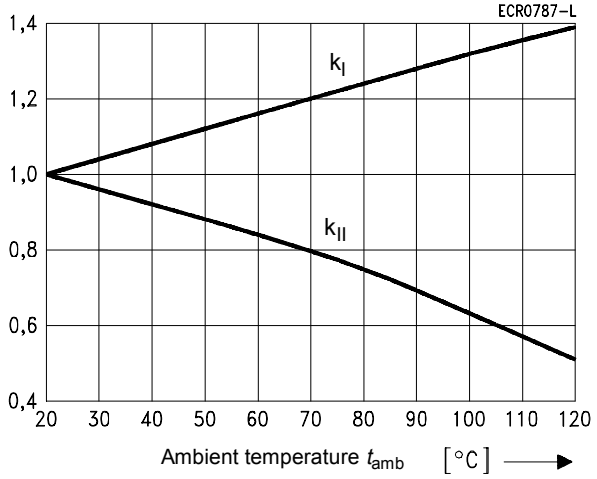
U_{II} = Maximum continuous voltage at 20 °C for $T_{c\ max}$ = 115 °C without contact loading

U_{nom} = Nominal voltage

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

$U_{I\ tamb}$ = $k_I \cdot U_{I\ 20\ °C}$ and $U_{II\ tamb}$= $k_{II} \cdot U_{II\ 20\ °C}$

t_{amb} = Ambient temperature
$U_{I\ tamb}$ = Minimum voltage at ambient temperature t_{amb}
$U_{II\ tamb}$= Maximum voltage at ambient temperature t_{amb}
k_I a. k_{II}= Factors (dependent on temperature), see diagram
$T_{c\ max}$ = Maximum coil temperature



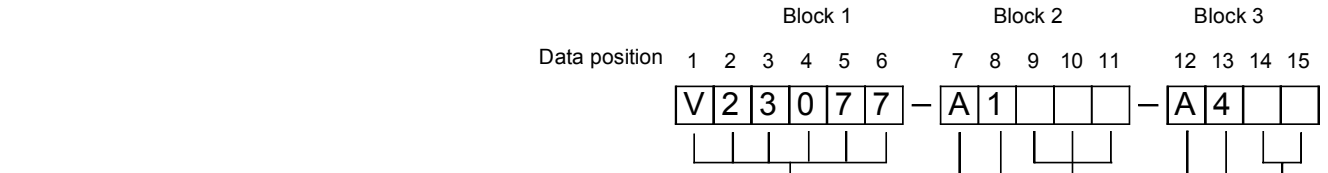
General data

Operate time at U_{nom} and 20 °C, typ.	10 ms
Release time without/with diode in parallel, typ.	2 ms / 14 ms
Bounce time, make/break contact, typ.	1/2 ms
Maximum switching rate without load	1200 min^{-1}
Maximum switching rate with rated load	10 min^{-1}
Ambient temperature range according to IEC 255 Part 1-00 or VDE 0435 Part 201	-40 °C ... +125 °C
Thermal resistance	65 K/W
Maximum permissible coil temperature	155 °C
Degree of protection according to IEC 529/ VDE 0470 Part 1	dust-protected IP 54
Electrical endurance	1 x 10^5 operations
Mechanical endurance	3 x 10^7 operations
Flammability according to UL 94	V-0
Solder bath temperature/max. duration	260 °C / 5 s
Mounting position	any
Weight (mass)	approx. 26 g

Insulation

According to IEC 664/VDE 110 (1/89): rated voltage pollution severity overvoltage category	 250 V 3 III
According to VDE 0110 (2/79): insulation group/rated voltage	C/250 B/380
Dielectric test voltage (1 min): contact/coil between open contacts	 4000 $V\sim_{rms}$ 1000 $V\sim_{rms}$
Clearances/creepage distances	8 mm / 8 mm
Tracking resistance of the fundamental frame according to IEC 112	PTI 250

Ordering code



Identifier for
Miniature Power Relay IF - Faston

Design
A = dust-protected; PCB terminals (coil)
and flat terminals (contacts)

Version
1 = Standard

Coil number
001 = 3 V– nominal voltage
003 = 6 V–
005 = 12 V–
007 = 24 V–
009 = 48 V–
010 = 60 V–
012 = 110 V–

Type of contact
A = Single contact

Contact material
4 = AgCdO

Contact arrangement
02 = 1 make contact
03 = 1 break contact

Ordering example: V23077-A1005-A402
Miniature Power Relay IF, with 1 make contact, coil 12 V nominal voltage,
contact material silver cadmium oxide (AgCdO)

Note:
Special designs can be carried out to customer specifications. Please contact your local representative.
The addresses are given below.