

## for DC operations, polarised, monostable or bistable

### Features

- Permits optimum matching to an extremely wide variety of circuit conditions
- Complies with the requirements of LSI semiconductor technology
- Applications include measuring and control systems, process control engineering, entertainment electronics telecommunication, signalling systems and medical equipment
- Very high level of shock resistance



ECR0984-9

Picture approx. 1,5 x actual size

### Typical applications

- Coupling and linking element in electronic modules
- Interface relay element for microcomputer systems
- Storage element for input and output equipment
- Data and communications technology
- Medical equipment
- Measurement and control equipment

### Versions

- Relay types: monostable, 1 winding or bistable, 2 windings or bistable, 1 winding
- Standard- and sensitive versions
- With 1 changeover contact
- With bifurcated contacts
- For printed circuit assembling
- Metal cover for screening against interference fields; optionally with earth terminal for reducing coupling capacitances
- Immersion cleanable
- Cleaning agent resistant

### Approvals



CSA

File LR 45064-2



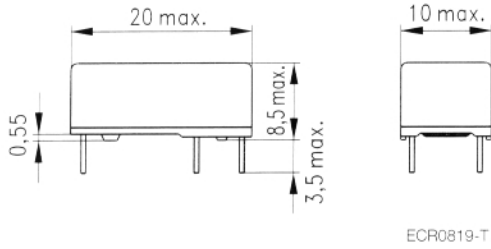
UL

File E 48393

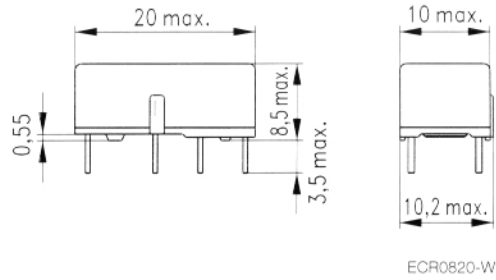
# Miniature Relay D1

## Without earth terminal

### Dimensions (in mm)

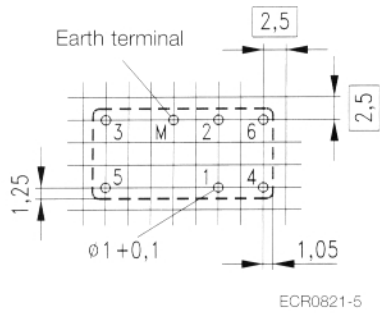


## With earth terminal



## Mounting hole layout

View onto the terminals

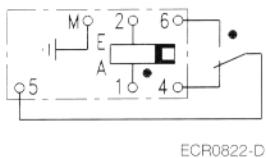


Pin arrangement suits 2,5 mm and 2,54 mm in acc. with DIN EN 60097 and DIN 40803

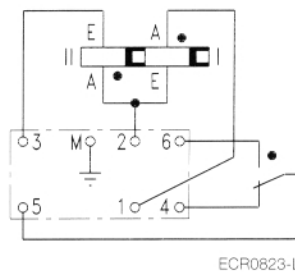
## Base terminals

View onto the terminals

Monostable und bistable,  
1 winding



Bistable,  
2 windings



M= Earth terminal

Circuit symbols drawn in the release condition  
If a positive potential is applied to the start of the winding,  
the relay changes to operate position.

M= Earth terminal

The contact position illustrated shows the release condition.  
If a negative potential is applied to terminal 1  
or a positive potential to terminal 3 as against terminal 2,  
the relay changes to release condition. If a positive potential  
is applied to terminal 1 or a negative potential to terminal 3 as  
against terminal 2, the relay changes to operate condition.

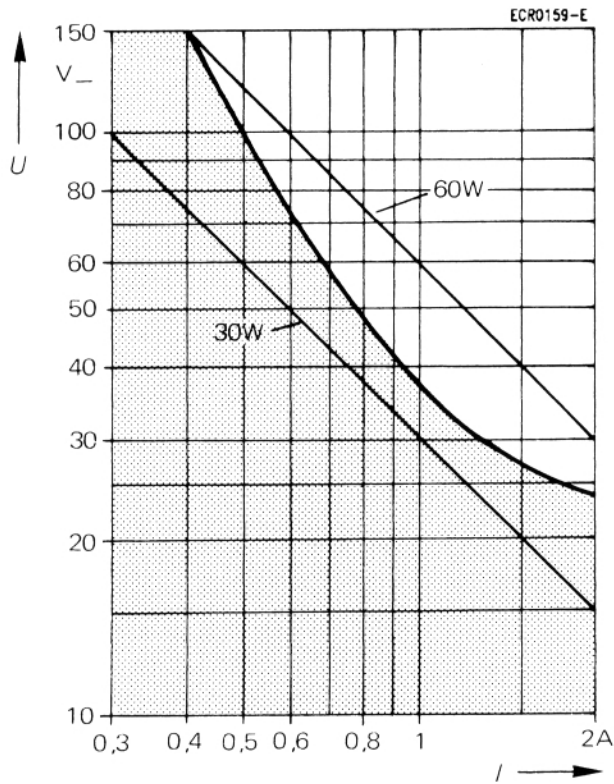
# Miniature Relay D1

## Contact data

Number of contacts and type	1 changeover contact
Contacts assembly	Bifurcated contacts
Contact material	Pd Ni, Au Rh coated
Limiting continuous current at max. ambient temperature	2 A
Maximum switching current	2 A
Maximum switching voltage	125 V~ 150 V-
Minimum switching voltage	3 mV
Maximum switching capacity	
DC Voltage	35...60 W, (see load limit curve)
AC Voltage	60 VA
Contact resistance (initial value) / measuring current / driver voltage	100 mΩ / 10 mA / 20 mV

## Load limit curve

(12,5 Operations/s)



$I$  = switching current

$U$  = switching voltage

■ = recommended application field

Load limit curve: Safe shutdown, no stationary arc > 10 ms

# Miniature Relay D1

## Coil data

Nominal voltage	From 5 V- to 24 V-
Nominal power consumption	
monostable, 1 winding	65...130 mW
bistable, 2 windings	80...200 mW
bistable, 1 winding	35...100 mW
	depending on relay version and winding (see table)
Operative range/pick-up class according to DIN IEC 255 Part 1-00 and VDE 0435 Part 201	1/a
Maximum operate voltage	76 % of nominal voltage
Maximum release voltage (bistable)	76 % of nominal voltage
Minimum release voltage (monostable)	10 % of nominal voltage

$U_I$  = Minimum voltage at 20 °C after pre-energising with nominal voltage without contact current

$U_{II}$  = Maximum continuous voltage at 20 °C

The operating voltage limits  $U_I$  and  $U_{II}$  are dependent on the temperature according to the formulae:

$$U_{I\ t_{amb}} = k_I \cdot U_{I\ 20\ ^\circ C}$$

and

$$U_{II\ t_{amb}} = k_{II} \cdot U_{II\ 20\ ^\circ C}$$

$T_{amb}$  = Ambient temperature

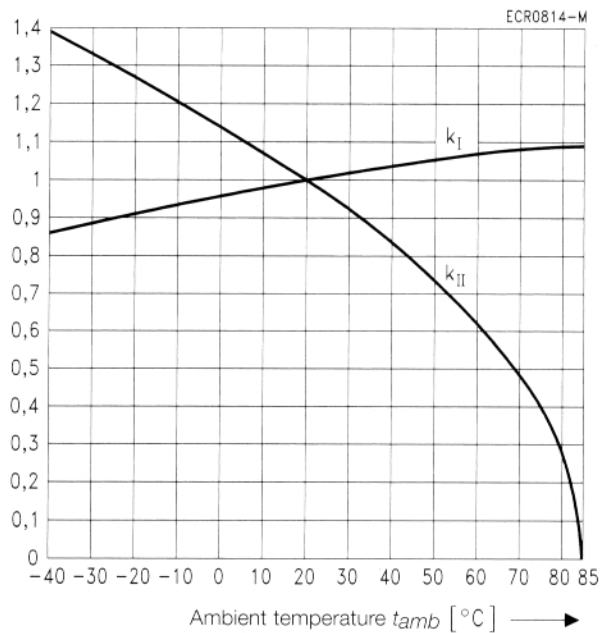
$U_{I\ t_{amb}}$  = Minimum voltage at ambient temperature  $t_{amb}$

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

$k_I$  and  $k_{II}$  = Factors (dependant on temperature), see diagram

The sum of the ambient temperature and coil over temperature must not exceed 85 °C.

The maximum voltage is calculated such that with factor  $k_{II}$  taken into account the maximum permissible temperature of the relay will not be exceeded during continuous operation.



# Miniature Relay D1

Coil versions				
Nominal voltage $U_{nom}$	Operating voltage range at 20°C		Resistance at 20°C	Coil number Ordering code
	Minimum voltage $U_I$	Maximum voltage $U_{II}$		
V-	V-	V-	$\Omega$	
Standard version				
monostable, 1 winding				A0***/-A2***
5	3,75	16,5	320 ± 32	001
12	9	30	1140 ± 170	002
24	18	60	4370 ± 650	004
bistable, 2 windings				B0 ***/-B2***
5	3,75	16	315 ± 47	101
12	9	30	1110 ± 165	102
15	11,25	37	1760 ± 265	103
24	18	46	2800 ± 420	104
bistable, 1 winding				-C0***/-C2***
5	3,75	20	500 ± 75	051
12	9	38	1850 ± 275	052
24	18	67	5650 ± 845	054

Coil versions for sensitive versions are available on request.

# Miniature Relay D1

## General data

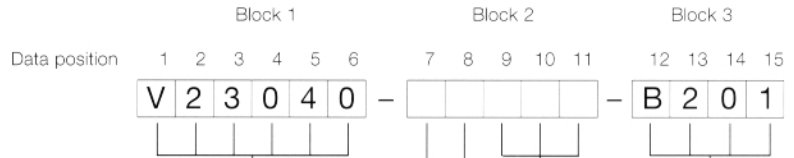
Operate time at $U_{nom}$ and at 20 °C, typ.	2 ms
Release time at $U_{nom}$ and at 20 °C (bistable), typ.	2 ms
Release time without diode in parallel (monostable), typ.,	0,6 ms
Bounce time	$\leq 1$ ms
Maximum switching rate without load	100 operations/s
Ambient temperature according to DIN IEC 255 Part 1-00 and VDE 0435 Part 201	-40 °C...+70 °C
Maximum permissible coil temperature	85 °C
Continuous thermal load	850 mW
Vibration resistance (function), frequency range according to ICE 68-2-6	20 g, 200 to 2000 Hz 40 g, 10 to 200 Hz
Shock resistance (function), half sinus, 11 ms according to IEC 68-2-27	100 g
Degree of protection according to DIN VDE 0470 Part 1/IEC 529	Immersion cleanable IP 67 Sealing corresponds to DIN IEC 68 Part 2-17, method Qc
Electrical endurance for resistive load: 6 V-, 100 mA 24 V-, 1 A	Approx. $10^8$ operations Approx. $10^7$ operations
Mechanical endurance	Approx. $10^9$ operations
Flammability	Flame resistant according to DIN IEC 695 Part 2-2
Mounting position	Any
Processing information	Ultrasonic cleanable Cleaning agent resistant according to DIN IEC 68 Part 2-45
Weight (mass)	Approx. 6 g

## Insulation

Insulation resistance at 500 V	$\geq 10^9 \Omega$
Dielectric test voltage contact/winding (1 min)	
Contact/winding	1500 V~rms
Open contact	750 V~rms
Winding/cover	1000 V~rms
Contact/cover	1000 V~rms

# Miniature Relay D1

## Ordering code



Identification of the Miniature Relay D1

Relay type

- A = monostable, 1 winding
- B = bistable, 2 windings
- C = bistable, 1 winding

Relay versions

- 0 = standard
- 2 = standard with earth terminal
- 3 = sensitive
- 5 = sensitive with earth terminal

Coil number

- monostable, 1 winding
- 001 = 5 V nominal voltage
- 002 = 12 V
- 004 = 24 V

bistable, 2 windings:

- 101 = 5 V nominal voltage
- 102 = 12 V
- 103 = 15 V

bistable, 1 winding:

- 051 = 5 V nominal voltage
- 052 = 12 V
- 054 = 24 V

Contact arrangement/material

B201 = 1 changeover contact; Palladium-Nickel, gold-plated, rhodium-coated

Ordering example:

V23040-C0052-B201

Miniature Relay D1, bistable, 1 winding, standard version, coil 12 V nominal voltage

Note:

Special designs can be carried out to meet customer specifications. Please contact your local representative for more information.