# Power Relay K (Open - Sealed)


## Features

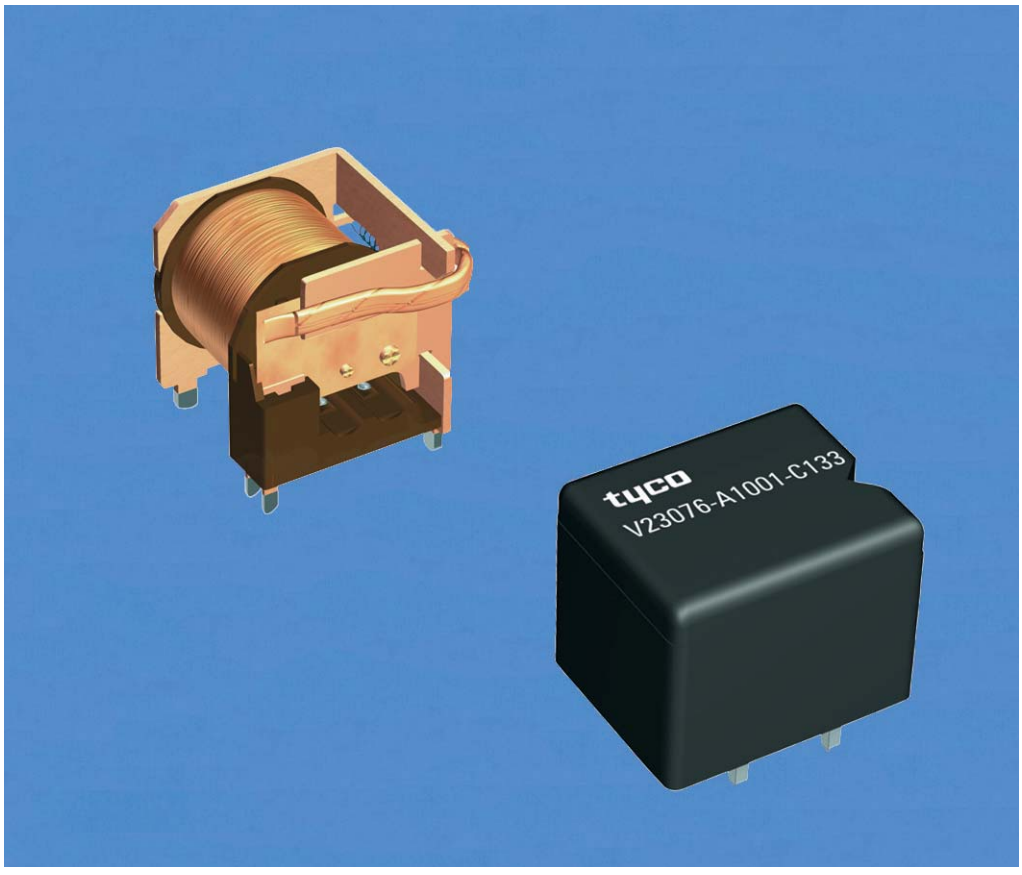
- Limiting continuous current 40 A
- Wide voltage range

- For high current version refer to Power Relay K-S

## Typical Applications

- ABS control
- Blower fans
- Car alarm
- Cooling fan
- Engine control
- Fuel pump
- Hazard warning signal
- Heated front screen
- Heated rear screen
- Ignition
- Lamps front, rear, fog light
- Interior lights
- Main switch/supply relay
- Seat control
- Seatbelt pretensioner
- Sun roof
- Turn signal
- Valves
- Window lifter
- Wiper control

Please contact Tyco Electronics for relay application support.




Power_Kos_3d_2

## Design

- ELV/RoHS/WEEE compliant
- Open: flux tight type
- Sealed: washable type

## Weight

Approx. 19 g (0.67 oz.) open version
Approx. 22 g (0.77 oz.) sealed version

## Nominal Voltage

12 V or 24 V; other nominal voltages available on request

## Terminals

PCB terminals for assembly on printed circuit boards

## Conditions

All parametric, environmental and endurance tests are performed according to EIA Standard RS-407-A at standard test conditions unless otherwise noted:
23°C ambient temperature,
20 - 50% RH, 998.9 ±33.9 hPa.

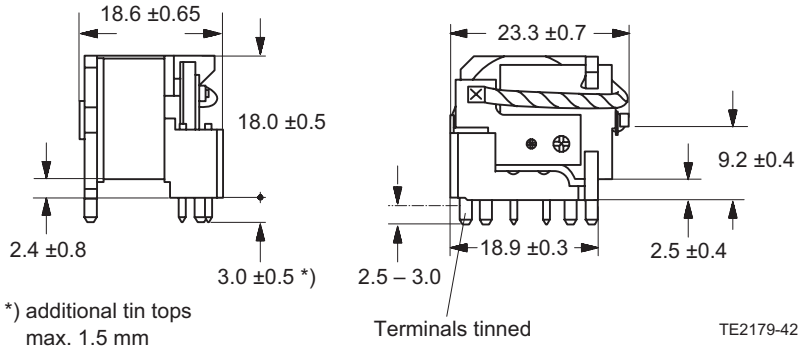
For general storage and processing recommendations please refer to our Application Notes and especially to *Storage* in the “Glossary” page 23 or at http://relays.tycoelectronics.com/appnotes/

## Disclaimer

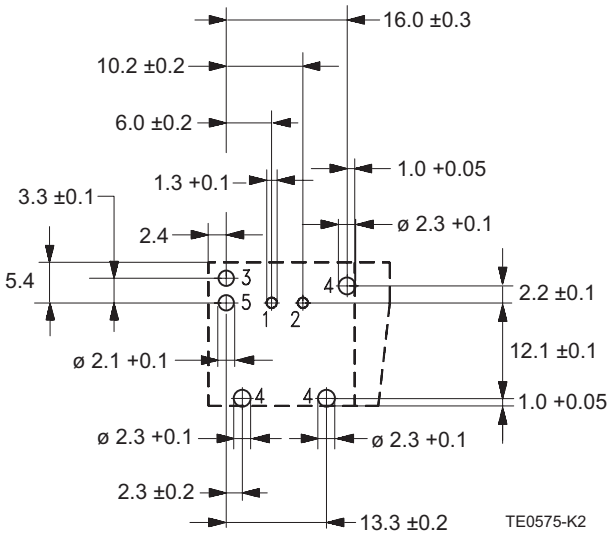
## Power Relay K (Open)

### Dimensional Drawing

**Power Relay K Open Version**



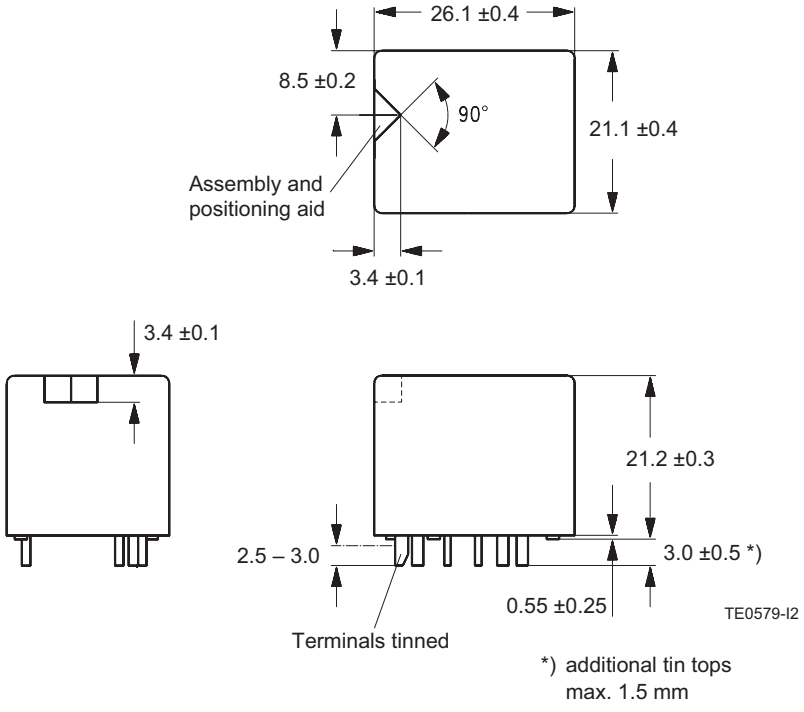

**Mounting Hole Layout** (bottom view)



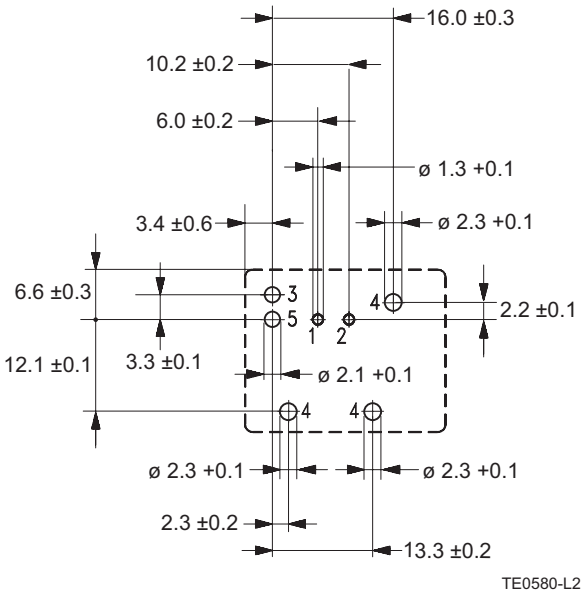
## Power Relay K (Sealed)

### Dimensional Drawing

**Power Relay K Sealed Version**

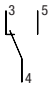
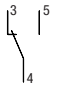



**Mounting Hole Layout** (bottom view)



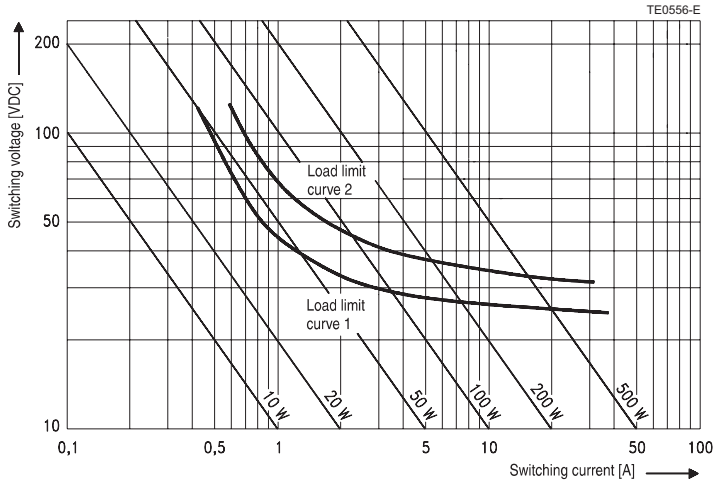
## Power Relay K (Open – Sealed)

### Contact Data

| Typical areas of application | Resistive/inductive loads | | Indicator lamps V23133-A3*-D152 | Headlights, capacitive loads V23133/076-*****-D142 | |
|---|---|---|---|---|---|
| Contact configuration | 1 Make contact/ 1 Form A | 1 Changeover contact/ 1 Form C | 1 Make contact/ 1 Form A | 1 Make contact/ 1 Form A | 1 Changeover contact/ 1 Form C |
| Circuit symbol (see also Pin assignment) |  |  |  | |  |
| Rated voltage | 12 V | 12 V | 12 V | 12 V | 12 V |
| Rated current | 30 A | NC/NO 25/30 A | 25 A | 25 A | NC/NO 20/25 A |
| Limiting continuous current | | | | | |
| 23°C | 45 A | 30/45 A | 30 A | 40 A | 25/40 A |
| 85°C | 30 A | 25/30 A | 25 A | 25 A | 20/25 A |
| Contact material | AgNi0.15 | | $AgSnO_2$ | | |
| Max. switching voltage/power | See load limit curve | | | | |
| Max. switching current [1] | | NC/NO | | | NC/NO |
| On [2] | 100 A | 30/100 A | 120 A [3] | 180 A | 60/180 A |
| Off | 60 A | 30/60 A | 60 A | 60 A | 30/60 A |
| Min. recommended load [4] | 1 A at 5 V | | | | |
| Voltage drop at 10 A (initial) | Typ. 20 mV, 300 mV max. | | | | |
| Mechanical endurance (without load) | > $10^7$ operations | | | | |
| Electrical endurance (example of resistive load) | > 2 x $10^5$ operations at 13.5 V/40 A | | > 2.2 x $10^6$ operations up to 8 x 21 W | > $10^5$ operations up to 4 x 60 W | |

[1] The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5 V for 12 V or 27 V for 24 V load voltages.
[2] For a load current duration of maximum 3 s for a make/break ratio of 1:10.
[3] Corresponds to a peak inrush current on initial actuation (cold filament).
[4] See chapter Diagnostics of Relays in our Application Notes page 31 or consult the internet at http://relays.tycoelectronics.com/appnotes/
[5] For 24 V please contact your nearest Tyco Electronics representative.

### Load Limit Curve



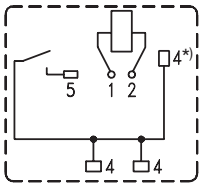

Load limit curve 1 ≙ arc extinguishes, during transit time (changeover contact)

Load limit curve 2 ≙ safe shutdown, no stationary arc (make contact)

## Power Relay K (Open – Sealed)

### Circuit Diagram

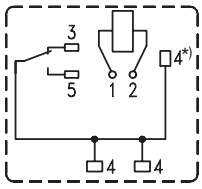
1 Make contact/1 Form A



TE1091-B1

*) Terminal 4 to be bridged

1 Changeover contact/1 Form C



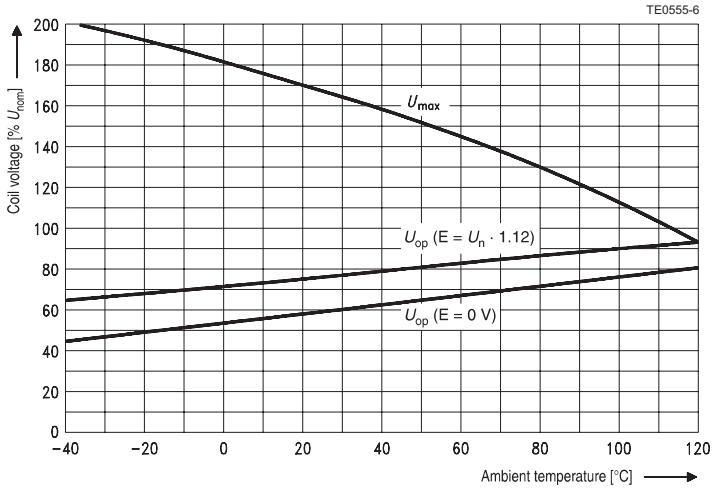
TE1086-A1

| Coil Data | |
|---|---|
| Available for nominal voltages | 12 V / 24 V |
| Nominal power consumption of the unsuppressed coil at nominal voltage | 1.6 W |
| Test voltage winding/contact | 500 $VAC_{rms}$ |
| Maximum ambient temperature range [1] | –40 to +85°C |
| Operate time at nominal voltage | Typ. 5 ms |
| Release time at nominal voltage [2] | Typ. 3 ms |

[1] See also operating voltage range diagram.
[2] For unsuppressed relay coil.

Note:
A low resistive suppression device in parallel to the relay coil increases the release time and reduces the lifetime caused by increased erosion and/or higher risk of contact tack welding.

### Operating Voltage Range




Does not take into account the temperature rise due to the contact current
E = pre-energization

## Power Relay K (Open – Sealed)

| **Environmental Conditions** | | | | |
|---|---|---|---|---|
| Temperature range, storage | Refer to *Storage* in the "Glossary" catalog page 23 or http://relays.tycoelectronics.com/appnotes/ | | | |
| Test | Relevant standard | Testing as per | Dimension | Comments |
| Climatic cycling with condensation [1] | EN ISO 6988 | | 3 cycles | Storage 8/16 h |
| Temperature cycling [1] | IEC 68-2-14 | Na | 20 cycles | –40/+85°C (dwell time 1 h) |
| Damp heat [1] | | | | |
| cyclic | IEC 68-2-30 | Db, Variant 1 | 6 cycles | Upper air temperature 55°C |
| constant | IEC 68-2-3 | Method Ca | 56 days | |
| Corrosive gas [1] | IEC 68-2-42 | | 10 days | |
| | IEC 68-2-43 | | 10 days | |
| Vibration resistance | IEC 68-2-6 (sine pulse form) | | 10 - 200 Hz | |
| | acceleration, acc. to position | | 20 - 40 g | No change in the |
| Shock resistance | IEC 68-2-27 (half sine form single pulses) | | 8 ms | switching state > 10 µs |
| | acceleration, acc. to position | | 30 g | |
| Solderability | IEC 68-2-20 | Ta, Method 1 | Hot dip 5 s | Aging 3 (4 h/155°C) |
| | | | 215°C | for leaded process (Tm = 183°C) |
| | | | | for Pb-free process (Tm = 217°C) |
| Resistance to soldering heat | IEC 68-2-20 | Tb, Method 1A | Hot dip 10 s | with thermal screen |
| | | | 260°C | |
| Sealing [1] | IEC 68-2-17 | Qc, Method 2 | | 1 min/70°C |

[1] Only sealed version.

## Ordering Information

| Part Numbers (see table below for coil data) | | Contact Arrangement | Contact Material | Enclosure | Terminals |
|---|---|---|---|---|---|
| **Relay Description** | **Part Number** | | | | |
| **12 V PCB Relays** | | | | | |
| V23133-A1001-C133 | 1393278-7 | 1 Form C | AgNi0.15 | Open | Printed circuit |
| V23133-A1001-D143 | 1-1393278-3 | 1 Form C | $AgSnO_2$ | Open | Printed circuit |
| V23133-A3001-C132 | 5-1393278-7 | 1 Form A | AgNi0.15 | Open | Printed circuit |
| V23133-A3001-D142 | 5-1393278-9 | 1 Form A | $AgSnO_2$ | Open | Printed circuit |
| V23133-A3001-D152 [1] | 1-1414173-0 | 1 Form A | $AgSnO_2$ | Open | Printed circuit |
| **24 V PCB Relays** | | | | | |
| V23133-A1022-C133 | 3-1393278-7 | 1 Form C | AgNi0.15 | Open | Printed circuit |
| V23133-A1022-D143 | 3-1393278-9 | 1 Form C | $AgSnO_2$ | Open | Printed circuit |
| V23133-A3022-C132 | 7-1393278-1 | 1 Form A | AgNi0.15 | Open | Printed circuit |
| V23133-A3022-D142 | 7-1393278-2 | 1 Form A | $AgSnO_2$ | Open | Printed circuit |
| V23133-A3022-D152 [1] | 1-1414174-0 | 1 Form A | $AgSnO_2$ | Open | Printed circuit |
| **12 V PCB Relays** | | | | | |
| V23076-A1001-C133 | 1393277-4 | 1 Form C | AgNi0.15 | Sealed | Printed circuit |
| V23076-A1001-D143 | 1393277-6 | 1 Form C | $AgSnO_2$ | Sealed | Printed circuit |
| V23076-A3001-C132 | 1-1393277-4 | 1 Form A | AgNi0.15 | Sealed | Printed circuit |
| V23076-A3001-D142 | 1-1393277-7 | 1 Form A | $AgSnO_2$ | Sealed | Printed circuit |
| V23076-A3001-D152 [1] | 1-1414175-0 | 1 Form A | $AgSnO_2$ | Sealed | Printed circuit |
| **24 V PCB Relays** | | | | | |
| V23076-A1022-C133 | 1393277-8 | 1 Form C | AgNi0.15 | Sealed | Printed circuit |
| V23076-A1022-D143 | 1393277-9 | 1 Form C | $AgSnO_2$ | Sealed | Printed circuit |
| V23076-A3022-C132 | 1-1393277-8 | 1 Form A | AgNi0.15 | Sealed | Printed circuit |
| V23076-A3022-D142 | 1-1393277-9 | 1 Form A | $AgSnO_2$ | Sealed | Printed circuit |

[1] For indicator lamps.

## Power Relay K (Open – Sealed)

### Coil Versions

| Coil Data for Power K | Rated Coil Voltage (V) | Coil Resistance ±10% (Ω) | Must Operate Voltage (V) | Must Release Voltage (V) | Allowable Overdrive[1] Voltage (V) | |
|---|---|---|---|---|---|---|
| | | | | | at 23°C | at 85°C |
| V23133-**001-**** | 12 | 90 | 6.9 | 1.2 | 20.8 | 15.5 |
| V23133-**022-**** | 24 | 362 | 14.1 | 2.4 | 41.2 | 32.5 |
| V23076-**001-**** | 12 | 90 | 6.9 | 1.2 | 20.8 | 15.5 |
| V23076-**022-**** | 24 | 362 | 14.1 | 2.4 | 41.2 | 32 |

[1] Allowable overdrive is stated with no load applied and minimum coil resistance.

Note: further coils on request.

**Standard Delivery Packs** (orders in multiples of delivery pack)

Power K – Open: 500 pieces
Power K – Sealed: 300 pieces