Power relay K (open and sealed)


Powertrain Systems


Chassis Systems


Safety


Security


Body


Driver Information

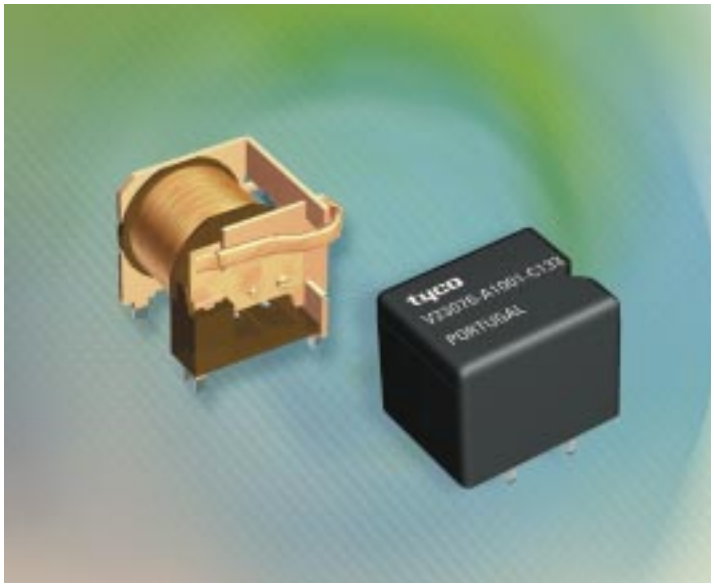

Convenience

Features

- High continuous current
- Wide voltage range

Typical applications

- Lamp control circuits
- Seat adjustment motors
- Window defoggers
- Starter solenoid switches etc.



133_3d01/76_3d01


Car Industry


Truck Industry


Other Industry

Design

Open or sealed;
sealed version: sealing in accordance with IEC 68;
immersion cleanable: protection class IP 67 to IEC 529 (EN 60 529)

Weight

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

Nominal voltage

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

Terminals

PCB terminals, for assembling in printed circuit boards

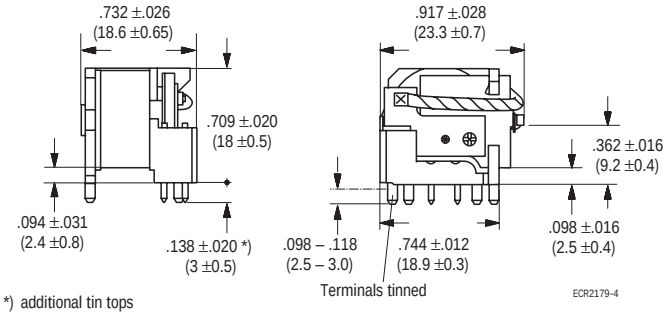
Conditions

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, 29.5 ± 1.0" Hg
(998.9 ±33.9 hPa).

Power relay K (open)

Dimensional drawing

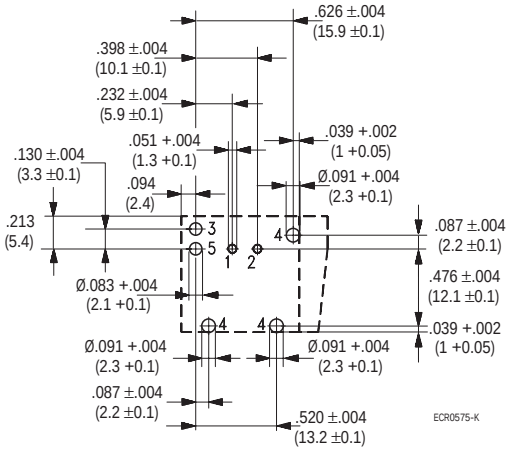
Open version



*) additional tin tops
max. .59 inch (1.5 mm)

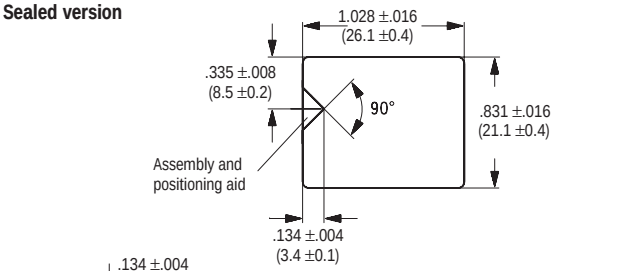
Mounting holes

View of the terminals (bottom view)



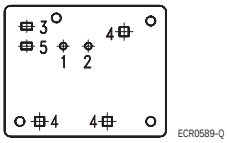
Power relay K (sealed)

Sealed version



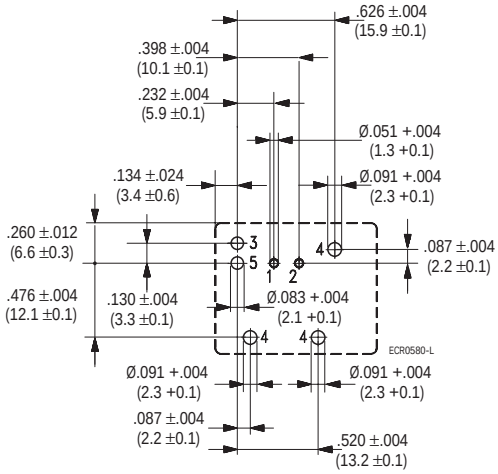
*) additional tin tops
max .059 inch (1.5 mm)

View of the terminals (bottom view)



Mounting holes

View of the terminals (bottom view)



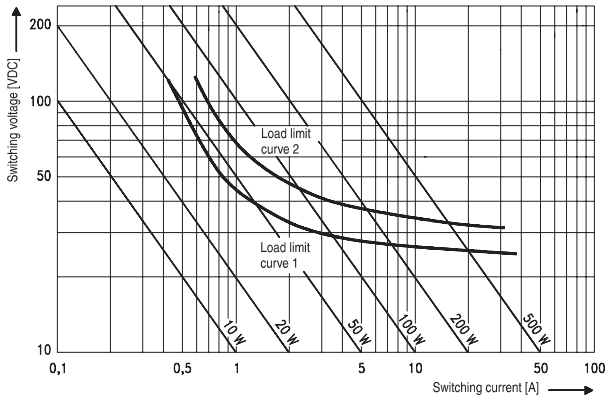
Power relay K (open and sealed)

Contact data

Typical areas of application	Resistive / inductive loads		Indicator lamps	Headlights, capacitive loads	
Contact configuration	Make contact/ Form A	Changeover contact/ Form C	Make contact/ Form A	Make contact/ Form A	Changeover contact/ Form C
Contact material	AgNi0.15		$AgSnO_2$	$AgSnO_2$	
Circuit symbol (see also Pin assignment)					
Max. switching voltage	See load limit curve				
Max. switching 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	12 A	60 A	30/60 A
Limiting continuous current		NC/NO			NC/NO
at 23 °C	45 A	30/45 A	12 A	40 A	25/40 A
at 85 °C	30 A	25/30 A	10 A	25 A	20/25 A
Voltage drop (initial) at 10 A	Typ. 15 mV	Typ. 20/15 mV	Typ. 40 mV	Typ. 20 mV	Typ. 25/20 mV
Increase in coil temperature at 10 A load	Typ. 3 °C	Typ. 5/3 °C	Typ. 10 °C[4]	Typ. 5 °C	Typ. 7/5 °C
Mechanical endurance (without load)	> 10^7 operations				
Electrical endurance	> 2 x 10^5 operations at 13.5 V / 40 A		> 2.2x 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 load or inductive load with suitable spark suppression.
[2] This current may flow for a maximum of 3 sec for a make/break ratio of 1 : 10.
[3] Corresponds to the peak inrush current on initial actuation (cold filament).
[4] At 50 % ON period.

Load limit curve

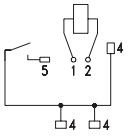


Load limit curve 1 ≙ arc extinguishes, during transit time (changeover contact)

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

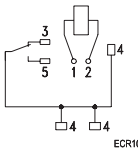
Pin assignment

1 make contact/
1 form A



ECR1091 - B

1 make contact/
1 form A



ECR1066 - A

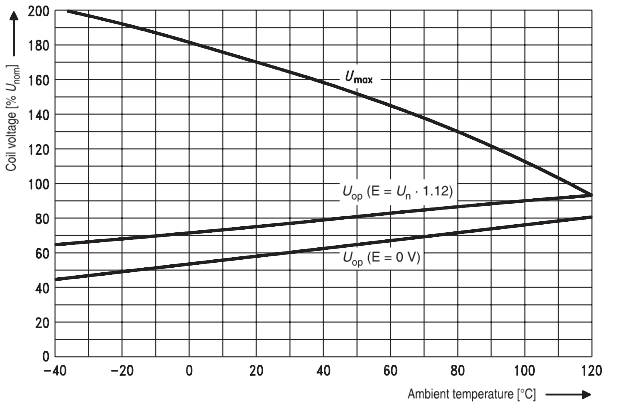
Power relay K (open and sealed)

Coil data

Available for nominal voltages	12, 24 VDC
Nominal power consumption of the unsuppressed coil at nominal voltage	1.6 W
Test voltage winding/contact	500 VAC_{rms}
Upper limit temperature for the coil	155 °C
Maximum ambient temperature range[1)]	– 40 to + 85 °C
Max. switching rate without contact loading	20 Hz
Operate time[2)]	Typ. 5 msec
Release time[2)]	Typ. 3 msec

[1)] See also operating voltage range diagram
[2)] Measured at nominal coil voltage without coil supression unit
N.B.
A low resistive device in parallel to the relay coil slows down the armature movement
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

Mechanical data

Enclosures	
Sealed	Sealed relay is suitable for immersion cleaning of PCB assembly or conformal coating.

Operating conditions

Temperature range, storage	-40 °C to 155 °C			
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	Ca	56 days	
Corrosive gaz[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	No change in the
	acceleration, acc. to position		20 … 40 g	switching state > 10 msec
Shock resistance	IEC 68-2-27 (half-sine pulse form)		8 msec	No change in the
	acceleration		30 g	switching state > 10 µsec
Solderability	IEC 68-2-20	Ta, Method 1		Aging 3 (4 h/155 °C)
				Dewetting
Resistance to soldering heat	IEC 68-2-20	Tb, Method 1A		10 sec ± 1 sec
				with thermal screen
Sealing[1)]	IEC 68-2-17	Qc, Method 2		1 min / 70 °C

[1)] Only sealed version

Power relay K (open and sealed)

Ordering information

Part number (Replace * with "Coil designator") Power K	Contact arrangement	Contact material	Enclosure	Terminals
V23076-A1*-C133	Form C	AgNi0.15	Sealed	Printed circuit
V23076-A1*-D143	Form C	$AgSnO_2$	Sealed	Printed circuit
V23076-A3*-D152	Form A	$AgSnO_2$ [1)]	Sealed	Printed circuit
V23076-A3*-C132	Form A	AgNi0.15	Sealed	Printed circuit
V23076-A3*-D142	Form A	$AgSnO_2$	Sealed	Printed circuit
V23133-A1*-C133	Form C	AgNi0.15	Open	Printed circuit
V23133-A1*-D143	Form C	$AgSnO_2$	Open	Printed circuit
V23133-A3*-D152	Form A	$AgSnO_2$[1)]	Open	Printed circuit
V23133-A3*-C132	Form A	AgNi0.15	Open	Printed circuit
V23133-A3*-D142	Form A	$AgSnO_2$	Open	Printed circuit

[1)] Special $AgSnO_2$ as replacement of the PdCu15/AgNi0.15 (especially for flashers).

Coil versions

Coil designator Power K	Rated coil voltage (V)	Coil resistance +/- 10% (Ω)	Must operate voltage (VDC)	Must release voltage (VDC)	Allowable overdrive (VDC) at 23 °C[1)]	Allowable overdrive (VDC) at 85 °C[1)]
001	12	90	6.9	1.2	20.8	15.5
022	24	362	14.1	2.4	41.2	32.5

[1)] Allowable overdrive is stated with no load current flowing through the relay contacts and minimum coil resistance.

Standard delivery packs (orders in multiples of delivery pack)
Open version: 500 pieces
Sealed version: 300 pieces