

Micro power relay A

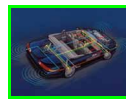
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**Powertrain
Systems**



**Chassis
Systems**



Safety



Security



Body



**Driver
Information**



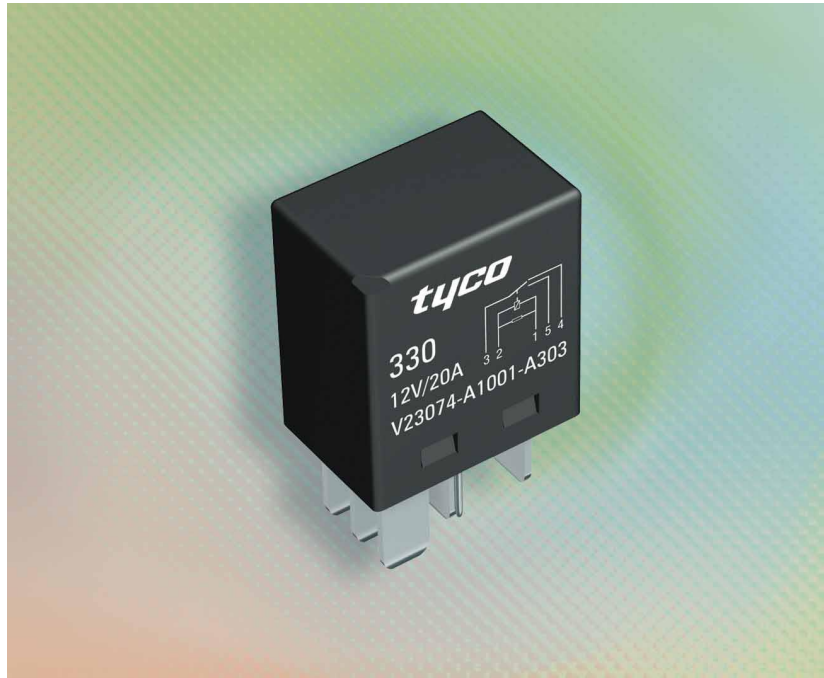
Convenience

Features

- Limiting continuous currents 25/15 A at the NO contact/ NC contact
- Pin assignment to ISO 7588 part 3
- Positions of quick connect terminals to ISO 7588 part 3
- Compact dimensions

Typical applications

- Heaters (seat, front/rear windows)
- Motors (fan, pump, wiper)
- Valves, lifting magnets, interlocks
- Headlights, lighting



Car Industry



**Truck
Industry**



**Other
Industry**

74_3d01

Design

Dustproof; protection class IP 54 to IEC 60 529 (EN 60 529)
Optional cover markings; color-coded

Weight

Approx. 0.5 - 0.7 oz. (16 - 20 g) depending on contact

Nominal voltage

12 V or 24 V, VFM (see page 82) also 6 V;
other nominal voltages available on request

Terminals

Quick connect terminals similar to ISO 8092-1
Coil and break contact 4.8 x 0.8 mm,
other load terminals 6.3 x 0.8 mm;
surfaces tin-plated

Accessories

Connectors see page 180

Special models on request

- 1 component (diode or varistor) parallel to the coil
- Special labels
- Special cover shapes

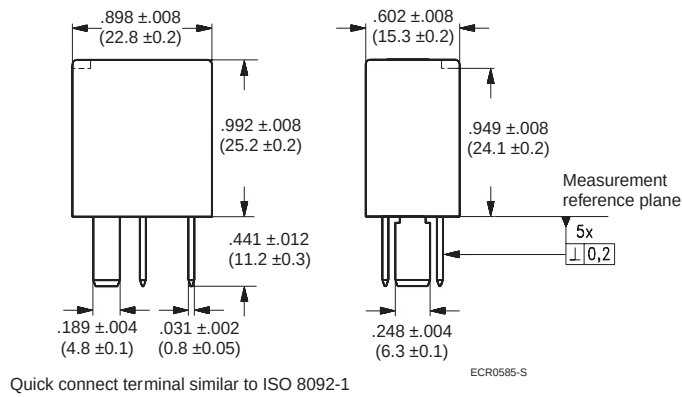
Conditions

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).

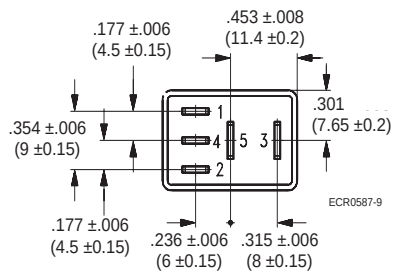
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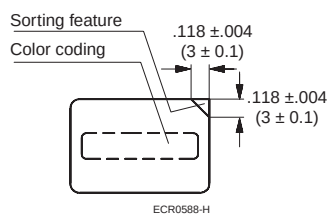
Dimension drawing



View on the terminals (bottom view)



Cover markings
(view from above)



Models with color coded covers on request

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Contact data	12 V nominal voltage, test voltage 13 VDC			
Typical areas of application	Resistive/inductive loads		Lamp loads	
Contact configuration	Make contact/ Form A	Changeover contact/ Form C	Make contact/ Form A	Changeover contact/ Form C
Contact material	AgNi0.15		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⁾ On ²⁾	90 A	NC/NO 20/90 A	120 A ³⁾	NC/NO 40/120 A
Off	30 A	15/30 A	30 A	15/30 A
Limiting continuous current				
at 23 °C	25 A	NC/NO 15/25 A	25 A	NC/NO 15/25 A
at 85 °C	15 A	10/15 A	15 A	10/15 A
Voltage drop (initial) at 10 A	Typ. 20 mV			
Increase in coil temperature at 10 A load	Typ. 5 °C			
Mechanical endurance (without load)	> 10 ⁶ operations			
Electrical endurance	See page 81			

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 of a lamp on initial actuation (cold coil filament).

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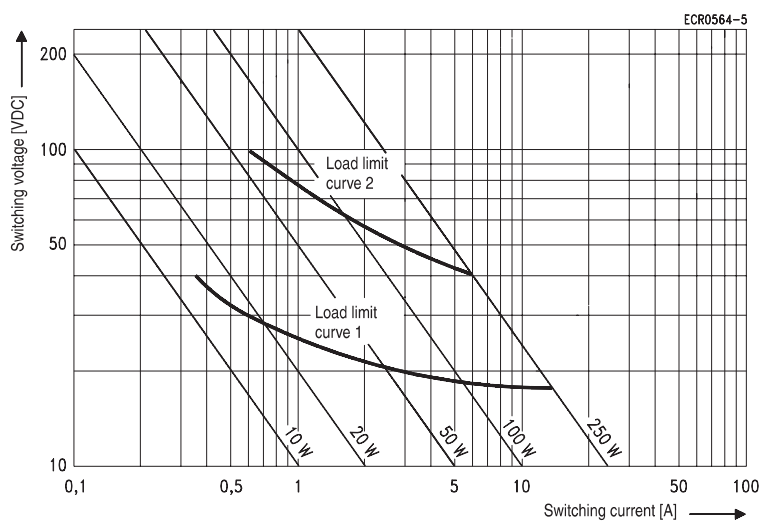
Contact data	24 V nominal voltage, contact gap ≥ 0.6 mm, test voltage 27 VDC		
Typical areas of application	Resistive/inductive loads		Lamp loads
Contact configuration	Make contact/ Form A	Changeover contact/ Form C	Make contact/ Form A
Contact material	AgNi0.15		AgSnO ₂
Circuit symbol (see also Pin assignment)			
Max. switching voltage	See load limit curve		
Max. switching power	See load limit curve		
Max. switching current ¹⁾ On ²⁾	40 A	NC/NO 20/40 A	80 A ³⁾
Off	20 A	10/20 A	15 A
Limiting continuous current			
at 23 °C	25 A	NC/NO 15/25 A	25 A
at 85 °C	15 A	10/15 A	15 A
Voltage drop (initial) at 10 A	Typ. 20 mV		
Increase in coil temperature at 10 A load	Typ. 5 °C		
Mechanical endurance (without load)	Typ. 10 ⁷ operations		
Electrical endurance	See page 81		

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 of a lamp on initial actuation (cold coil filament).

Load limit curve

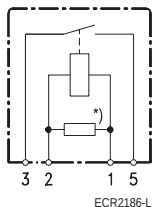


Load limit curve 1 $\triangleq$ arc extinguishes during transit time (changeover contact)

Load limit curve 2 $\triangleq$ safe shutdown, no stationary arc (make contact)

Pin assignment

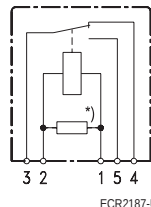
1 make contact/
1 form A



ECR2186-L

^{*)} Models with diode in parallel to the coil on request.

1 changeover contact/
1 form C



ECR2187-U

^{*)} Models with diode in parallel to the coil on request.

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Coil data

Available for nominal voltages	12 VDC	24 VDC
Nominal power consumption at nominal voltage	1.4 W	1.6 W
Resistor parallel to the coil	680 Ω	1800 Ω
Test voltage winding/contact	1000 VAC _{rms}	
Upper limit temperature for the coil	180 °C	
Maximum ambient temperature range ¹⁾	- 40 to + 125 °C	
Max. switching rate without contact loading	20 Hz	
Operate time ²⁾	Typ. 5 msec	
Release time ²⁾	Typ. 2 msec	

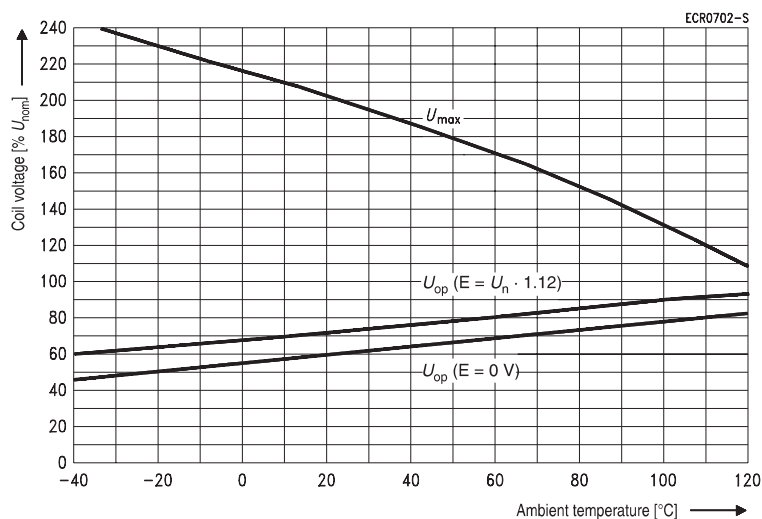
¹⁾ See also operating voltage range diagram

²⁾ Measured at nominal voltage without coil suppression unit

N.B.

A low resistive device in parallel to the relay coil slows the armature movement down 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

Cover retention	
pull	100 N (22.5 lbs)
push	100 N (22.5 lbs)
Terminals	
Pull force	100 N (22.5 lbs)
Push force	100 N (22.5 lbs)
Resistance to bending, force applied to front	10 N (2.25 lbs)
Resistance to bending, force applied to side	10 N (2.25 lbs)
Torsion	0.3 Nm
Enclosures	
Dust cover	Protects relay from dust. For use in passenger compartment or enclosures

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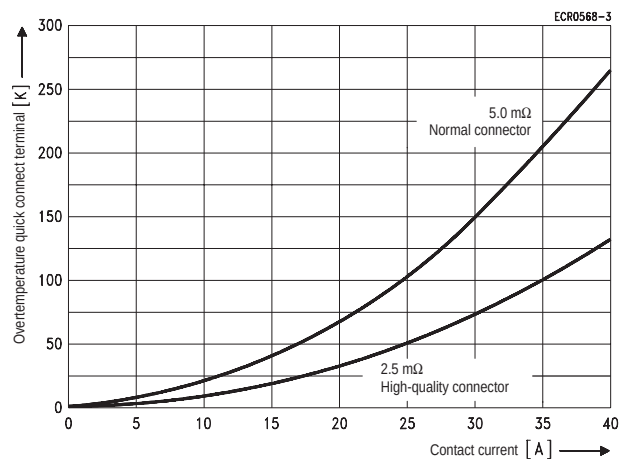
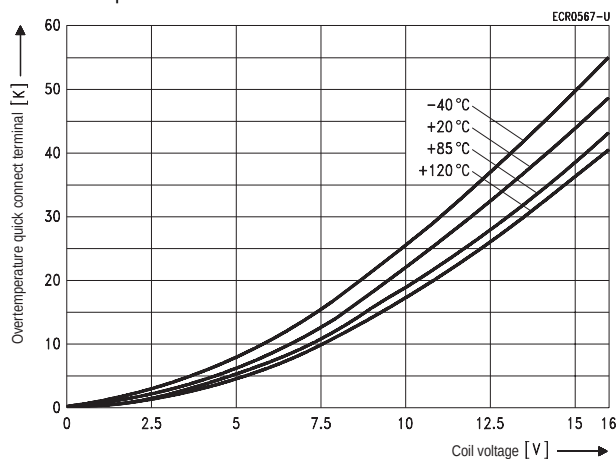
Operating conditions

Temperature range, storage	-40 °C to 155 °C			
Test	Relevant standard	Testing as per	Dimension	Comments
Climatic cycling with condensation	EN ISO 6988		6 cycles	Storage 8/16 h
Temperature cycling	IEC 60 068-2-14	Nb	10 cycles	- 40/+ 85 °C (5 °C per min.)
Damp heat				
cyclic	IEC 60 068-2-30	Db, Variant 1	6 cycles	Upper air temperature 55 °C
constant	IEC 60 068-2-3	Ca	10 days	
Corrosive gas	IEC 60 068-2-42	10 ± 2 cm ³ /m ³ SO ₂	10 days	
	IEC 60 068-2-43	1 ± 0.3 cm ³ /m ³ H ₂ S	10 days	
Vibration resistance	IEC 60 068-2-6 (sine pulse form) acceleration, acc. to position		20 - 500 Hz min. 5 g	No change in the switching state > 10 µsec
Shock resistance	IEC 60 068-2-27 (half-sine pulse form) acceleration, acc. to position		min. 20 g	No change in the switching state > 10 µsec
Load dump	ISO 7637	DIN 40 839 Part 1		
Jump start	5 s 16 V 15 s 28 V 10 s 16 V		3 cycles	
Drop test	Capable of meeting specifications after 1.0 m (3.28 foot) drop onto concrete			
Flammability	UL94-HB			

Temperature curves for the quick connect terminals

Parameter:

Ambient temperature Contact circuit release incl. connector

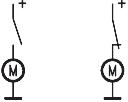
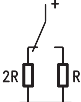


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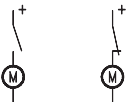
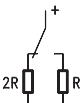
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Electrical endurance

12 V nominal voltage, test voltage 13 V

	Make contact	Break contact	Order number
Motor load			V23074-A1001-A302 (make contact) V23074-A1001-A303 (changeover contact)
Make current	40 A	20 A	
Break current	20 A	10 A	
Duty cycle t_{on}/t_{off}	2 sec/2 sec		
Operations	$> 10^5$		
Resistive load			
Nominal load current	20 A	10 A	
Duty cycle t_{on}/t_{off}	2 sec/2 sec		
Operations	$> 10^5$		
Lamp load			V23074-A1001-A402 (make contact) V23074-A1001-A403 (changeover contact)
(bounce free coil control circuit)			
Max. make current	120 A	40 A	
Break current	20 A	10 A	
Duty cycle t_{on}/t_{off}	2 sec/2 sec		
Operations	$> 10^5$		

24 V nominal voltage, test voltage 27 V

	Make contact	Break contact	Order number
Motor load			V23074-A1002-A302 (make contact) V23074-A1002-A303 (changeover contact)
Make current	38 A	28 A	
Break current	15 A	6 A	
Duty cycle t_{on}/t_{off}	2 sec/2 sec		
Operations	$> 10^5$		
Resistive load			
Nominal load current	20 A	10 A	
Duty cycle t_{on}/t_{off}	2 sec/2 sec		
Operations	$> 10^5$		
Lamp load, 2 H4 lamps			V23074-A1002-A402 (make contact)
(bounce free coil control circuit)			
Max. make current	70 A		
Break current	7 A		
Duty cycle t_{on}/t_{off}	2 sec/2 sec		
Operations	$> 10^5$		

Ordering information

Part number (Replace * with "Coil designator") Micro A ¹⁾	Contact arrangement	Contact material	Enclosure	Terminals
V23074-A1*-A302	1 Form A	AgNi0.15	dust cover, black	quick connect
V23074-A1*-A303	1 Form C	AgNi0.15	dust cover, black	quick connect
V23074-A1*-A402	1 Form A	AgSnO ₂	dust cover, black	quick connect
V23074-A1*-A403	1 Form C	AgSnO ₂	dust cover, black	quick connect

¹⁾ Versions with varistor or diode parallel to the coil on request. Versions with special labels or color shapes on request

Coil versions

Coil designator Micro A (with resistor)	Rated coil voltage (V)	Coil resistance +/- 10% (Ω)	Must operate voltage (VDC)	Must release voltage (VDC)	Allowable overdrive (VDC)	
					at 23 °C ¹⁾	at 85 °C ¹⁾
001	12	124	7.2	1.8	24	18
002	24	441	14.4	3.6	45	33

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)

Micro power relay A: 480 pieces