

VF28



**Description**

**Features**

- 30 A continuous contact rating at 85 °C
- Various enclosure options

**Typical applications**

- Fuel pump
- A/C compressor clutch
- Horn
- Lighting systems

Please contact Tyco Electronics for relay application support.



VF28\_3d1

**Design**

Various enclosure options (dust cover, shrouded/weatherproof cover); optional mounting bracket

**Weight**

Approx. 1.2 oz. (34 g) dust cover model

**Nominal voltage**

12 V, 24 V

**Terminals**

2.8 mm dual in-line quick connect terminals

**Accessories**

Connectors see page 191

**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).

Please also refer to the Application Recommendations in this catalog for general precautions.

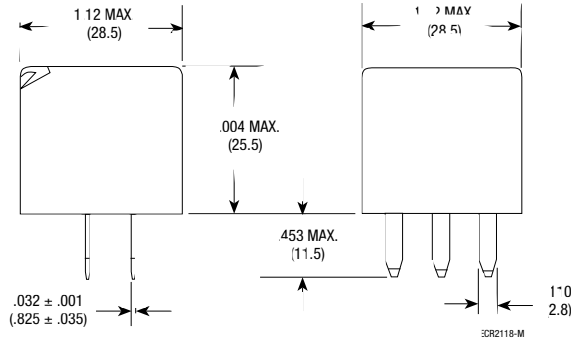
**Disclaimer**

All technical performance data apply to the relay as such, specific conditions of the individual application are not considered. Please always check the suitability of the relay for your intended purpose. We do not assume any responsibility or liability for not complying herewith. We recommend to complete our questionnaire and to request our technical service. Any responsibility for the application of the product remains with the customer only. All specifications are subject to change without notification. All rights of Tyco are reserved.

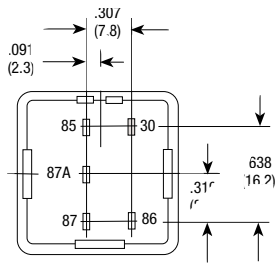
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Dimensional drawing

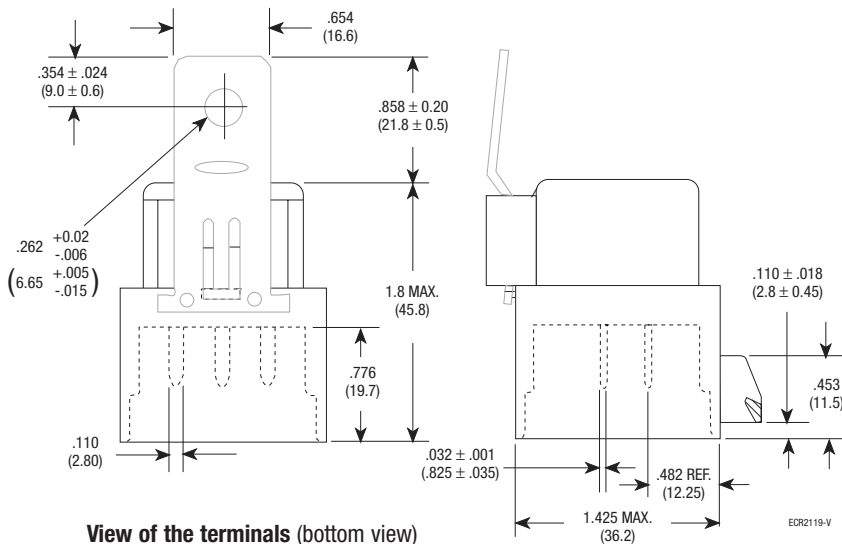
Dust cover with quick connect terminals  
VF28-1\*\*\*\*



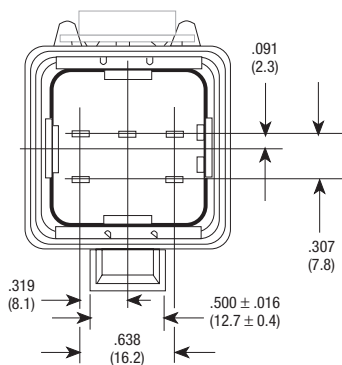
View of the terminals (bottom view)



Shrouded/weatherproof cover with quick connect terminals  
VF28-3\*\*\*\* and VF28-6\*\*\*\*



View of the terminals (bottom view)



TOLERANCE UNLESS OTHERWISE NOTED:  
2 DECIMAL: ± .004 (± 0.1)  
1 DECIMAL: ± .006 (± 0.15)

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**Contact data**

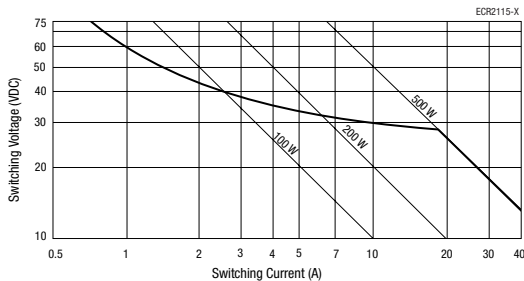
Contact configuration	Make contact/ Form A	Changeover contact/ Form C
Circuit symbol		
Rated voltage	12 V	12 V
Rated current at 85 °C	30 A	20/30 A
Contact material	AgNi0.15	Stationary and NO movable: AgNi0.15, NC movable: A
Max. switching voltage/power	See load limit curve	
Max. switching current <sup>1)</sup>		NC/NO
On <sup>2)</sup>	120 A	45/120 A
Off	40 A	30/45 A
Min. recommended load <sup>3)</sup>	1 A at 5 V	
Voltage drop A (initial) NO contact at 35 A NC contact at 20 A	200 mV max.	200 mV max. 250 mV max.
Mechanical endurance (without load)	Typ. 10 <sup>7</sup> operations	
Electrical endurance (example of resistive load, further information on request)	> 1 x 10 <sup>5</sup> operations 30 A, 14 V	> 1 x 10 <sup>5</sup> operations 30 A, 14 V (NO contact)
Max. switching rate at nominal load	6 operations per minute (0.1 Hz)	

<sup>1)</sup> The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5 V for 12 V.

<sup>2)</sup> For a load current duration of maximum 3 s for a make/break ratio of 1:10.

<sup>3)</sup> See chapter Diagnostics in our Application Recommendations on page 18 of this catalog or consult the internet at <http://relays.tycoelectronics.com/application.asp>

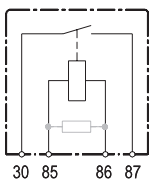
**Load limit curve**



Safe breaking, arc extinguished (normally open contact) for resistive loads with resistor suppression.

**Pin assignment**

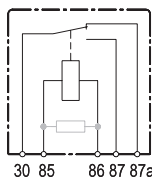
1 make contact/  
1 form A



ECR2159-P

Resistor if used

1 changeover contact/  
1 form C



ECR2160-S

Resistor if used

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**Coil data**

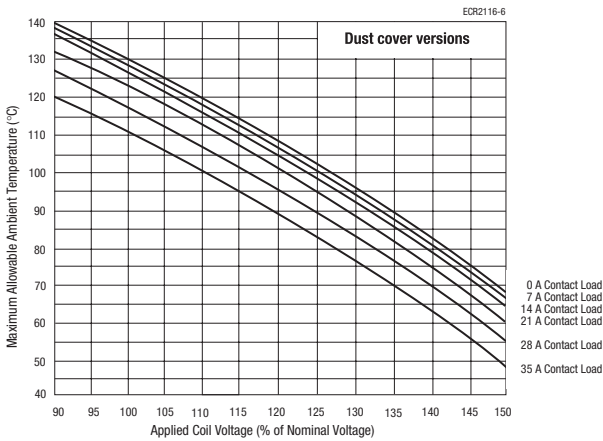
Available for nominal voltages	12, 24 V
Nominal power consumption of the unsuppressed coil at nominal voltage	1.6 W
Nominal power consumption at nominal voltage with suppression resistor	1.8 W
Test voltage winding/contact	500 VAC <sub>rms</sub>
Ambient temperature range	- 40 to + 125 °C
Operate time at nominal voltage	Typ. 7 ms
Release time at nominal voltage <sup>1)</sup>	Typ. 4 ms

<sup>1)</sup> For unsuppressed relay coil

N.B.

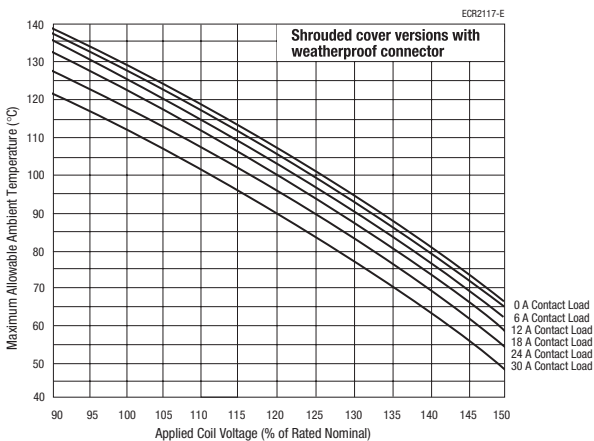
A low resistive suppression device in parallel to the relay coil increases the release time and reduces the lifetime caused by increased erosion and/or higher risk of contact tack welding.

**Ambient temperature vs. coil voltage for continuous duty**



Assumptions:

1. Still air
2. Nominal coil resistance
3. Maximum mean coil temperature = 180 °C
4. Coil temperature rise due to load
  - = 1.3 °C at 7 A
  - = 3.1 °C at 14 A
  - = 7.2 °C at 21 A
  - = 12.1 °C at 28 A
  - = 19 °C at 35 A
5. Thermal resistance and power dissipation based on coil resistance at 180 °C
6. Curves are based on 1.6 W at 23 °C



Assumptions:

1. Still air
2. Nominal coil resistance
3. Maximum mean coil temperature = 180 °C
4. Coil temperature rise due to load
  - = 0.8 °C at 6 A
  - = 3.6 °C at 12 A
  - = 6.3 °C at 18 A
  - = 11 °C at 24 A
  - = 16.8 °C at 30 A
5. Thermal resistance and power dissipation based on coil resistance at 180 °C
6. Curves are based on 1.6 W at 23 °C

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Mechanical data	
Cover retention	
Axial force	150 N (33.8 lbs)
Pull force	200 N (45 lbs)
Push force	200 N (45 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) <sup>1)</sup>
Resistance to bending, force applied to side	10 N (2.25 lbs) <sup>1)</sup>
Torsion	0.3 Nm
Enclosures	
Dust cover	Protects relay from dust. For use in passenger compartment or enclosures
Shrouded/Weatherproof cover	Mates with VC28-1003 connector for application where weather sealing is not required.

<sup>1)</sup> Values apply 2 mm from the end of the terminal. When the force is removed, the terminal must not have moved by more than 0.3 mm.

Operating conditions				
Temperature range, storage	Refer to <i>Storage</i> in the "Glossary"			
Test	Relevant standard	Testing as per	Dimension	Comments
Vibration resistance	1.27 mm double amplitude		10-40 Hz	Valid for NC contacts. NO contacts are significantly higher
	5 g constant		40-70 Hz	
	0.5 mm double amplitude		70-100 Hz	
	10 g constant		100-500 Hz	
Shock resistance	Half sine wave pulse		20 g 11 ms	No change in the switching state > 1 ms
Jump start	24 VDC for 5 minutes conducting nominal current at 23 °C			
Drop test	Capable of meeting specifications after 1.0 m (3.28 foot) drop onto concrete			
Flammability	UL94-HB or better (meets FMVSS 302)			Internal External
Overload Current <sup>1)</sup>	40.5 A, 1800 s 60 A, 30 s 105 A, 4 s 180 A, 1 s			

<sup>1)</sup> Current and time are compatible with circuit protection by a typical 30 A automotive fuse. Relay will make, carry, and break the specified current.

Ordering information

Part numbers (see table below for coil data)		Contact arrangement	Contact material	Enclosure	Terminals
Relay part number	Tyco order number				
VF28-11F14-S01	1393297-1	1 Form A	AgNi0.15	Dust Cover	680 Ω resistor in parallel
VF28-11F24-S01	2-1419084-3	1 Form A	AgSn02	Dust Cover	680 Ω resistor in parallel
VF28-15F14-S01	1393297-8	1 Form C	AgNi0.15	Dust Cover	680 Ω resistor in parallel
VF28-15F24-S01	1-1393297-3	1 Form C	AgSn02	Dust Cover	680 Ω resistor in parallel
VF28-61F14-S01	3-1393297-6	1 Form A	AgNi0.15	Weatherproof cover with bracket	680 Ω resistor in parallel
VF28-65F14-S01	4-1393297-5	1 Form C	AgNi0.15	Weatherproof cover with bracket	680 Ω resistor in parallel

Coil versions

Coil data for VF28	Rated coil voltage (V)	Coil resistance +/- 10% (Ω)	Must operate voltage (V)	Must release voltage (V)	Allowable overdrive <sup>1)</sup> voltage (V)	
					at 23 °C <sup>1)</sup>	at 85 °C
VF28-**F**-***	12	90	7.2	1.2	20.2	15.7
VF28-**H**-***	24	360	14.4	2.4	40.5	31.5

<sup>1)</sup> Allowable overdrive is stated with no load applied and minimum coil resistance.

Standard delivery packs (orders in multiples of delivery pack)

Dust cover version: 357 pieces  
Weatherproof version with bracket: 110 pieces