

VF4 A (Standard, Shrouded and Weatherproof)



Features

- Limiting continuous current 40 A
- Pin assignment according to ISO 7588 part 1
- Plug-in terminals

Customized Versions on Request

- Integrated components (e.g. resistor, diode)
- Customized marking
- Special covers (e.g. brackets, shrouded)
- For latching (bistable) version refer to Mini Relay Latching

Typical Applications

- Cross carline up to 40 A for example:
- ABS control
 - Blower fans
 - Car alarm
 - Cooling fan
 - Electric Power Steering
 - Energy management
 - Engine control
 - Fuel pump
 - Heated front screen
 - Ignition
 - Immobilizer
 - Lamps front, rear, fog light
 - Main switch/supply relay
 - Seatbelt pretensioner
 - Trunk lock
 - Valves
 - Window lifter
 - Wiper control

Please contact Tyco Electronics for relay application support.



VF4_301

Design

- ELV compliant
- Dustproof; protection class IP54 to IEC 529 (EN 60 529)
- Sealed: protection class IP67 to IEC 529 (EN 60 529)
- Shrouded: protection class IP67 to IEC 529 (EN 60 529) if used with special connector

Weight

Approx. 35 g (1.2 oz.)

Nominal Voltage

12 V or 24 V

Terminals

Quick connect terminals similar to ISO 8092-1, coil and load 6.3 x 0.8 mm; surfaces tin plated

Accessories

Connectors see page 233 ff

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/>

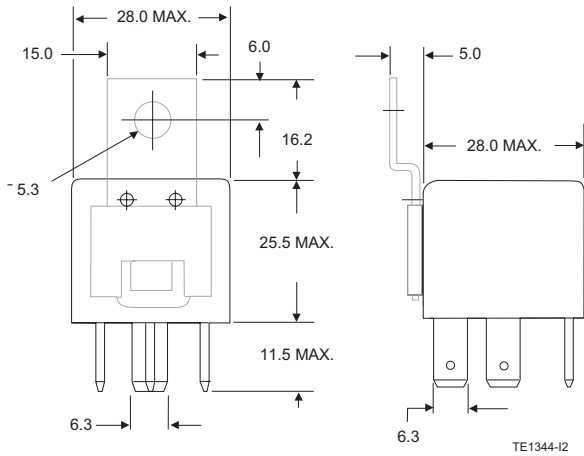
Disclaimer

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 Electronics are reserved.

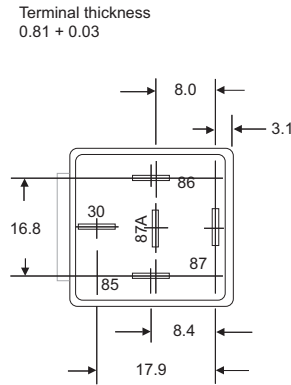
VF4 A (Standard, Shrouded and Weatherproof)

Dimensional Drawing

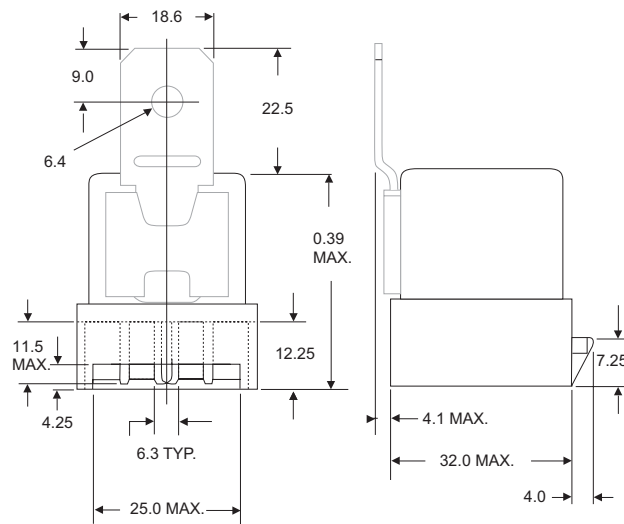
VF4 A with Dust Cover
VF4-1**** (without bracket) and VF4-4**** (with bracket)



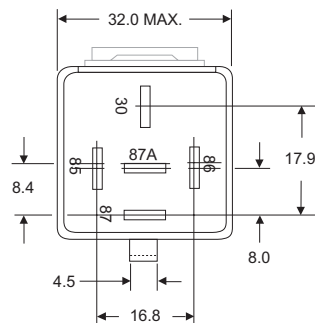
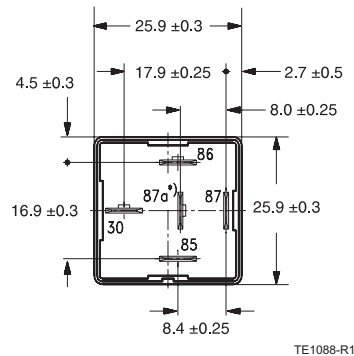
View of the Terminals (bottom view)



VF4 A with Shrouded Dust Cover
VF4-2**** (without bracket) and VF4-5**** (with bracket)



View of the Terminals (bottom view)

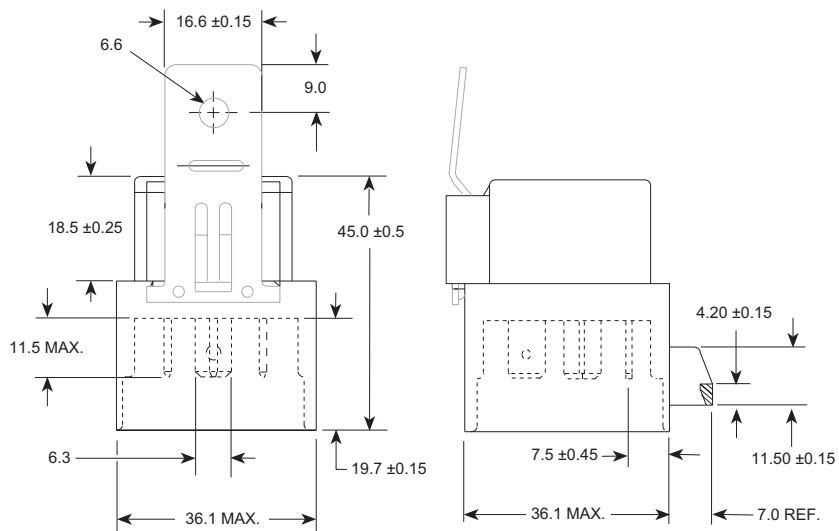


VF4 A (Standard, Shrouded and Weatherproof)

Dimensional Drawing

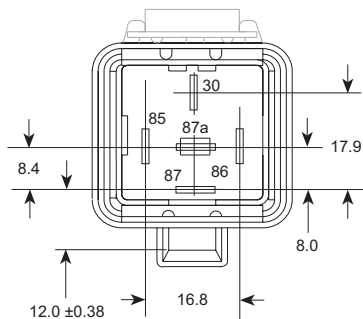
VF4 A with Weatherproof Cover

VF4-3**** (without bracket) and VF4-6**** (with bracket)




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View of the Terminals (bottom view)



VF4 A (Standard, Shrouded and Weatherproof)

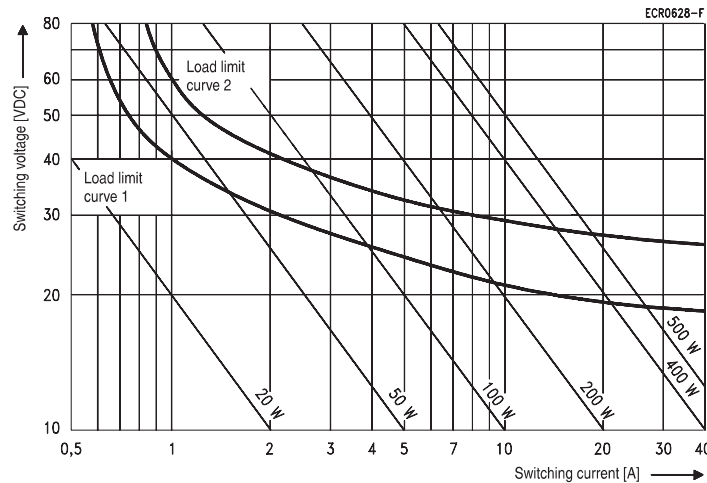
Contact Data	
Contact configuration	1 Changeover contact/ 1 Form C
Circuit symbol	
Rated voltage	12 V
Rated current	20/14 A
Limiting continuous current	NC/NO
23°C	45/60 A
85°C	30/40 A
125°C	12/17 A
Contact material	Silver based
Max. switching voltage/power	See load limit curve
Max. switching current ¹⁾	NC/NO
On ²⁾	45/120 A
Off	40/60 A
Min. recommended load ³⁾	1 A at 12 V/0.5 at 24 V
Voltage drop (initial)	
NO contact	Typ. 60 mV, 200 mV max. at 40 A
NC contact	Typ. 60 mV, 250 mV max. at 30 A
Mechanical endurance (without load)	Typ. 10 ⁶ operations
Electrical endurance (example of resistive load, further information on request)	> 1 x 10 ⁵ operations 40 A, 13.5 V (NO contact) > 1 x 10 ⁵ operations 30 A, 13.5 V (NC contact)
Max. switching rate at nominal load	6 operations per minute (0.1 Hz)

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⁾ See chapter Diagnostics of Relays in our Application Notes page 31 or consult the internet at <http://relays.tycoelectronics.com/appnotes/>

Load Limit Curve

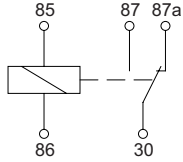


Load limit curve 1 ≙ arc extinguishes during transit time (changeover contact)
Load limit curve 2 ≙ safe shutdown, no stationary arc (make contact)

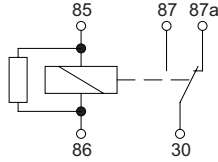
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Circuit Diagram

C0
1 Changeover contact/1 Form C



CR
1 Changeover contact/1 Form C
with Resistor



Coil Data

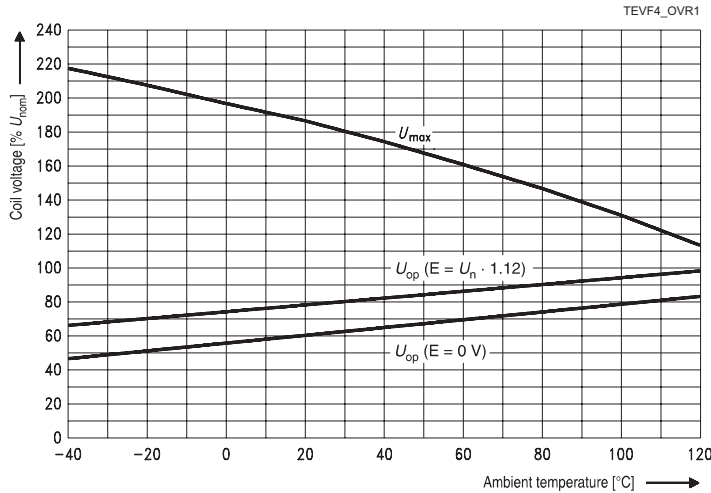
Available for nominal voltages	12 V / 24 V
Nominal power consumption of the unsuppressed coil at nominal voltage	1.6 W
Nominal power consumption at nominal voltage with suppression resistor	1.8 W / 2.1 W (standard/high performance 24 V)
Test voltage winding/contact	500 VAC _{rms}
Ambient temperature range	-40 to +125°C
Operate time at nominal voltage	Typ. 7 ms
Release time at nominal voltage ¹⁾	Typ. 2 ms

¹⁾ 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

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Mechanical Data	
Cover retention	
Axial force	150 N
Pull force	200 N
Push force	200 N
Terminals	
Pull force	100 N
Push force	100 N
Resistance to bending, force applied to front	10 N ¹⁾
Resistance to bending, force applied to side	10 N ¹⁾
Torsion	0.3 Nm
Enclosures	
Dust cover	Protects relay from dust. For use in passenger compartment or enclosures
Shrouded dust cover	Protects relay and relay connector (order separately) from dust and splash
Weatherproof cover	Mates with a connector (order separately) to seal relay from salt spray etc. Recommended for under hood application

¹⁾ 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.

Environmental Conditions				
Temperature range, storage	Refer to <i>Storage</i> in the "Glossary" catalog page 23 or http://relays.tycoelectronics.com/appnotes/			
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	No change in the switching state > 1 ms
			11 ms	
Jump start	24 V for 5 minutes conducting nominal current at 23°C			
Drop test	Capable of meeting specifications after 1.0 m (3.28 ft) drop onto concrete			
Flammability	UL94-HB or better (meets FMVSS 302) ¹⁾			internal external
Overload Current ²⁾	54 A, 1800 s 80 A, 60 s 240 A, 1 s			

¹⁾ FMVSS: Federal Motor Vehicle Safety Standard.

²⁾ Current and time are compatible with circuit protection by a typical 40 A automotive fuse. Relay will make, carry and break the specified current.

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Ordering Information

Part Numbers (see table below for coil data)		Circuit/Contact Arrangement	Contact Material	Enclosure	Coil Suppression	Bracket
Relay Description	Part Number					
12 V Plug-In Relays ¹⁾						
VF4-15F11	6-1393298-0	C0/1 Form C	AgNi0.15	Dust cover		
VF4-15F11-C05	6-1393298-2	CR/1 Form C	AgNi0.15	Sealed	Resistor 680 Ω	
VF4-15F11-S01	6-1393298-4	CR/1 Form C	AgNi0.15	Dust cover	Resistor 680 Ω	
VF4-15F21-S01	7-1393298-3	CR/1 Form C	AgSnO ₂	Dust cover	Resistor 680 Ω	
VF4-45F11	8-1393298-8	C0/1 Form C	AgNi0.15	Dust cover		Yes
VF4-45F11-S01	1-1393302-0	CR/1 Form C	AgNi0.15	Dust cover	Resistor 680 Ω	Yes
VF4-55F11-S01	8-1393305-7	CR/1 Form C	AgNi0.15	Weatherproof cover	Resistor 680 Ω	Yes
VF4-65F11-S01	9-1393305-5	CR/1 Form C	AgNi0.15	Weatherproof cover	Resistor 680 Ω	Yes
24 V Plug-In Relays ¹⁾						
VF4-15H11	8-1393298-1	C0/1 Form C	AgNi0.15	Dust cover		
VF4-15H11-S08	5-1393305-7	C0/1 Form C	AgNi0.15	Dust cover	Resistor 2700 kΩ	
VF4-45H11	1-1393302-1	C0/1 Form C	AgNi0.15	Dust cover		Yes

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

Coil Versions

Coil Data for VF4 A	Rated Coil Voltage (V)	Coil Resistance ²⁾ ±10% (Ω)	Must Operate Voltage (V)	Must Release Voltage (V)	Allowable Overdrive ¹⁾ Voltage (V)	
					at 23°C	at 85°C
VF4-**F**-**	12	90	7.2	1.2	20.2	15.7
VF4-**H**-**	24	360	14.4	2.4	40.5	31.5

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

²⁾ Including parallel resistor.

Standard Delivery Packs (orders in multiples of delivery pack)

VF4-1:	357 pieces
VF4-2, VF4-3:	165 pieces
VF4-4:	136 pieces
VF4-5, VF4-6:	110 pieces