

Battery Disconnect Switch BDS-A



Features

- Limiting continuous current 190 A at 85°C
- Electrically settable and resettable ON/OFF bistable device
- Suitable for voltage levels up to 42 V
- High peak current carrying capability up to 1500 A

Typical Applications

- Preheating systems (e.g. for diesel engines, catalytic converters)
- Battery disconnection to prevent fire caused by short circuits during an accident
- Dual battery applications provide the start reliability by a separate starter battery
- Energy-management
- Keeps the power net in balance and to control and secure the health of the energy storage systems
- Seasonal, service and transport deactivation

Please contact Tyco Electronics for relay application support.



130-C_3D2

Design

- ELV/RoHS/WEEE compliant
- Dustproof; protection class IP54 to IEC 529 (EN 60 529)
- Weatherproof protection

Weight

Approx. 210 g (7.41 oz.)

Nominal Voltage

12 V or 24 V

Terminals

- Quick connect terminals (coil)
- Screw terminals (load)

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.

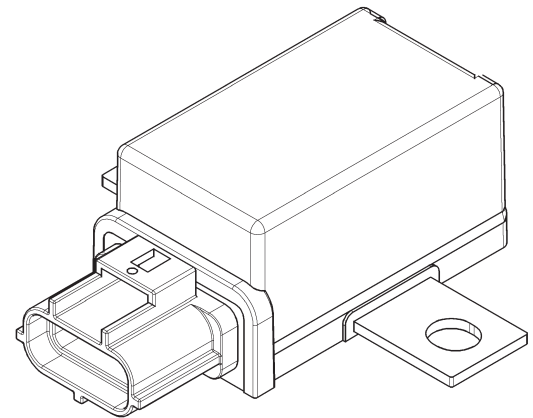
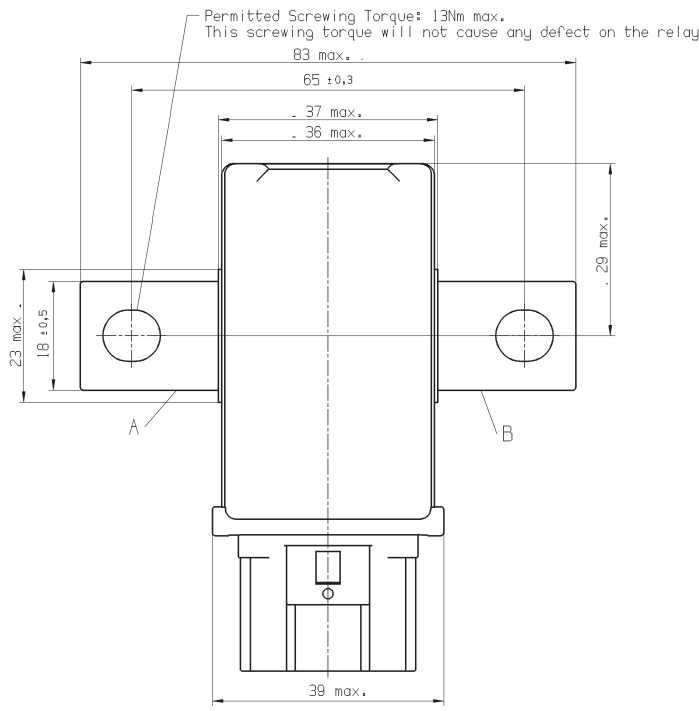
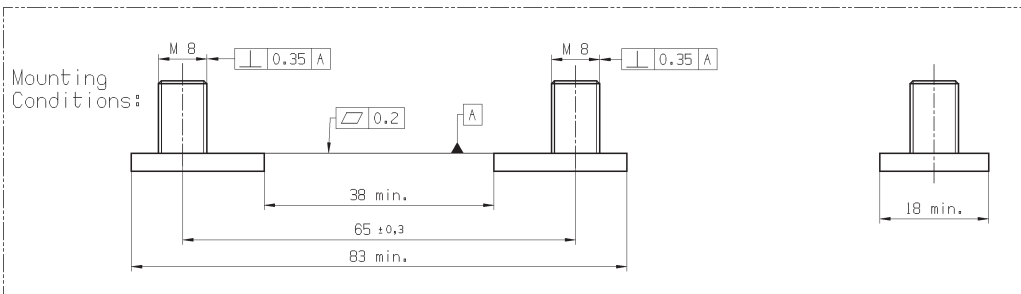
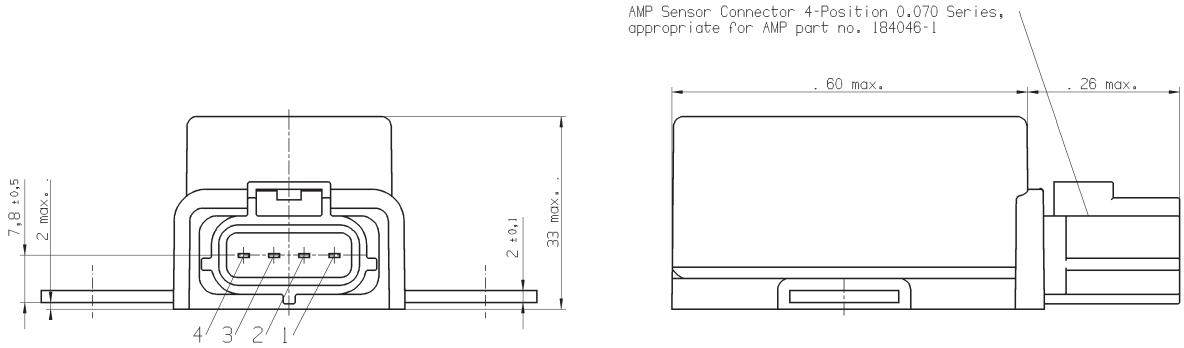
For general storage and processing recommendations please refer to our Application Notes and especially to *Storage* in the "Glossary" page 23 or at <http://relays.tycoelectronics.com/appnotes/>

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.

Battery Disconnect Switch BDS-A


Dimensional Drawing



130C_DD_3

Battery Disconnect Switch BDS-A

Contact Data for cable size $\geq 50 \text{ mm}^2$

Contact configuration	Form X	
Circuit symbol ^{1), 2)}		
Rated voltage	12 V	24 V
Rated current	190 A	
Limiting continuous current	23°C: 260 A 85°C: 190 A 125°C: 88 A	
Contact material	Silver based	
Load current	From terminal B to A	
Carrying capability: 1000 A 1 s on, 9 s off, 23°C, 50 mm ²	50.000 operations ³⁾	
Carry starter current: 1500 A-0.2 s/600 A-5 s on, 60 s off, 23°C, 50 mm ²	50.000 operations ³⁾	
Voltage drop at 100 A (initial, after 1 min)	< 40 mV	
Electrical endurance: 180 A 0.1 mH 1.5 s on, 5 s off, (-40/25/120)°C/2 h each, 35 mm ²	13.000 operations	-
Electrical endurance: 100 A 0.1 mH 1.5 s on, 5 s off, (-40/25/120)°C/2 h each, 35 mm ²	50.000 operations	-
Electrical endurance: 150 A 0.1 mH 0.5 s on, 5 s off, (-40/25/120)°C/2 h each, 35 mm ²	-	25.000 operations
Electrical endurance: 100 A 0.1 mH 0.5 s on, 5 s off, (-40/25/120)°C/2 h each, 35 mm ²	-	70.000 operations
Switching capability: 1500 A 0.5 s on, 10 min off, 23°C, 50 mm ² resistive load	5 operations ³⁾	
Max. temperature at load terminals	140°C	
Mechanical shock, half sine, 6 ms, 6 directions (OFF→ON)	40 g ³⁾	

¹⁾ Delivery status "ex works".

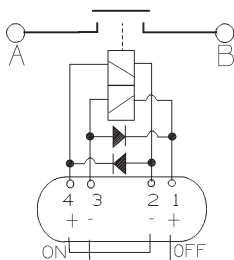
²⁾ Refer to *Latching Relay* in the "Glossary".

³⁾ Values are influenced by system temperature and load current. For further details please consult our Technical Application Engineers.

Circuit Diagram

X2C2D

1 Double make contact/1 Form X
with 2 Coils and 2 Diodes



Terminal	Function
4	Set Coil (+)
3	Reset Coil (-)
2	Set Coil (-)
1	Reset Coil (+)
A	Load Terminal
B	Load Terminal

Set = A and B get connected

130C_PA_3

Coil Data

Available for nominal voltages	12 V	24 V
Must operate voltage at 20°C (ON→OFF→ON) ¹⁾	6 V	12 V
Non operate voltage at 20°C ¹⁾	2 V	4 V
Test voltage winding/contact, contact-contact ¹⁾	500 VAC _{rms}	
Ambient temperature range	-40 to +120°C	
Coil excitation pulse length recommended/maximum	50 ms/100 ms	
Switching time at 14 V	ON-OFF typ. 5 ms/OFF-ON typ. 5 ms	
Noise level ²⁾	Typ. 86 dB (A)	

¹⁾ Values are influenced by system temperature and load current. For further details please consult our Technical Application Engineers.

²⁾ Equivalent average sound pressure level l_{eq} , switch cycled with 1 Hz, microphone distance 10 cm, measuring time 15 s.

Battery Disconnect Switch BDS-A

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⁾	IEC 68-2-6 (sine sweep)		22 - 500 Hz, min. 10 g	No change in the switching state > 10 μs
Shock resistance ¹⁾	IEC 68-2-27		11 ms, min. 40 g	No change in the switching state > 10 μs
Sealing	EN 60529 (IEC 529)		IP54	

¹⁾ Values are influenced by system temperature and load current. For further details please consult our Technical Application Engineers.

Ordering Information

Part Numbers (see table below for coil data)		Circuit/Contact Arrangement	Contact Material	Enclosure
Relay Description	Part Number			
V23130-C2021-A412	1-1414939-4	1 Form X/1 Double make contact	Silver based	IP54
V23130-C2421-A431	7-1414778-3	1 Form X/1 Double make contact	Silver based	IP54

Coil Versions

Coil Data for BDS-A	Rated Coil Voltage (V)	Coil Resistance ±10% (Ω)	Must Operate Voltage at 20°C (V)	Must Release Voltage at 20°C (V)
V23130-C2021-****	12	4.7	6.0 (Set-Reset)	6.0 (Set-Reset)
V23130-C2421-****	24	19.9	12.0 (Set-Reset)	12.0 (Set-Reset)

Standard Delivery Packs (orders in multiples of delivery pack)

BDS-A: 24 pieces

High Current Relay 150



Features

- Limiting continuous current 150 A at 85°C
- Current switching ability up to 300 A
- Suitable for voltage levels up to 42 V
- Heat, moisture and vibration resistant
- Minimal contact resistance
- Dustproof and sealed versions

Typical Applications

- Engine control
- Glow Plug
- Heated front screen
- Preheating systems (e.g. for diesel engines, catalytic converters)
- Switches for loading ramps

Please contact Tyco Electronics for relay application support.



132_305

Design

- ELV/RoHS/WEEE compliant
- Dustproof; protection class IP 54 to IEC 529 (EN 60 529)
- Sealed: sealing in accordance with IEC 68; immersion cleanable: protection class IP67 to IEC 529 (EN 60 529)

Weight

Approx. 220 g (7.8 oz.)

Nominal Voltage

12 V, 24 V or 42 V

Terminals

- Quick connect terminals (coil)
- Screw terminals (load)

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.

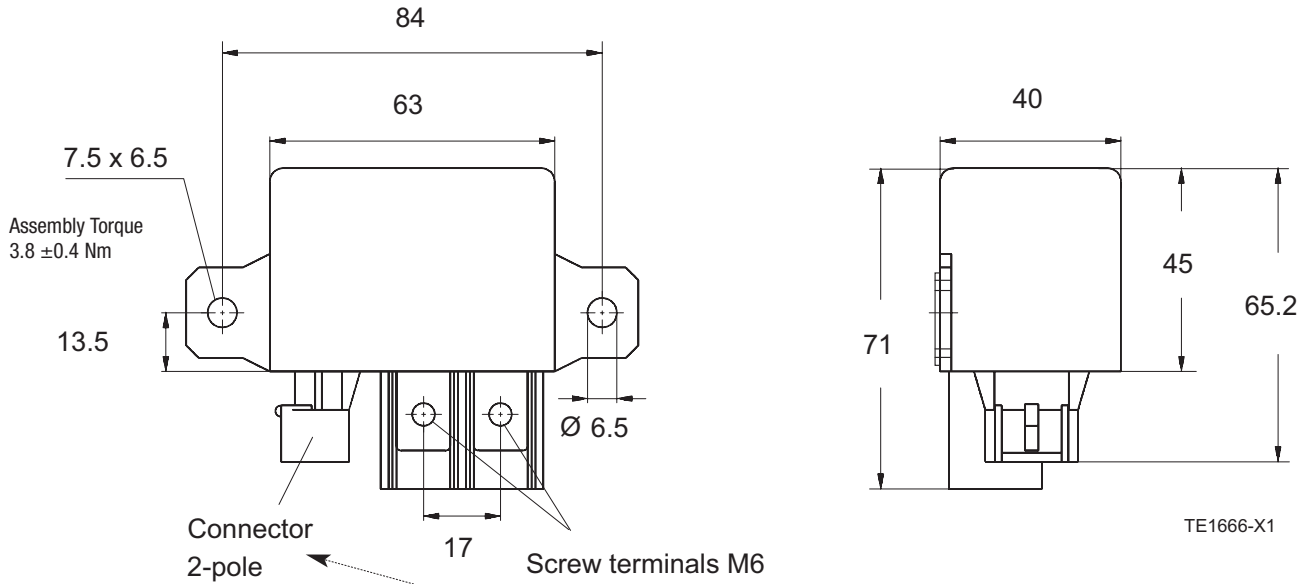
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Disclaimer

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High Current Relay 150

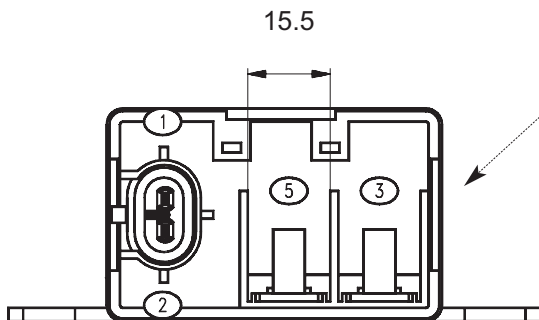
Dimensional Drawing



Connector Information
AMP SUPERSEAL 1.5 SERIES

- Coil side
 - Receptacle connector 282080-1
 - Single wire seal 281934-2
 - Contact 282110-1
 Load side
 - Thimble 710026-0

View of the Terminals (bottom view)



TE1667-61

High Current Relay 150

Contact Data

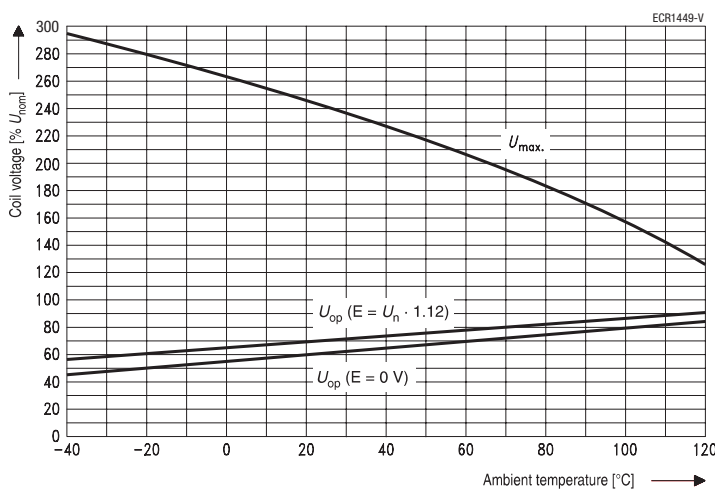
Contact configuration	1 Make contact/ 1 Form A		1 Double make contact/ 1 Form X	
Circuit symbol (see also Pin Assignment)				
Rated voltage	12 V	12 V	24 V	24 V
Rated current				
Cable 16 mm ²	130 A	120 A	120 A	100 A
Cable 25 mm ²	150 A	130 A	135 A	120 A
Limiting continuous current				
Cable 16 mm ²	23°C	150 A	130 A	140 A
	85°C	130 A	120 A	120 A
	125°C	70 A	60 A	60 A
Cable 25 mm ²	23°C	200 A	180 A	180 A
	85°C	150 A	130 A	135 A
	125°C	80 A	70 A	70 A
Contact material	AgNi0.15	AgSnO ₂	AgNi0.15	AgSnO ₂
Max. switching current ¹⁾				
On ²⁾	150 A	300 A	150 A	300 A
Off	150 A	300 A	150 A	300 A
Min. recommended load ³⁾	1 A at 5 V			
Voltage drop at 100 A (initial)	Typ. 50 mV, 100 mV max.	Typ. 70 mV, 200 mV max.	Typ. 70 mV, 200 mV max.	Typ. 70 mV, 400 mV max.
Mechanical endurance (without load)	> 10 ⁷ operations			
Electrical endurance at 23°C; 1 s: on, 5 s: off (example of resistive load)	> 3 x 10 ⁴ operations 150 A, 13.5 V	> 5 x 10 ⁴ operations 300 A, 13.5 V	> 1 x 10 ⁴ operations 150 A, 27 V	> 5 x 10 ⁴ operations 200 A, 27 V
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/>

Operating Voltage Range

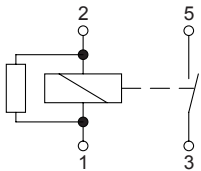


Does not take into account
the temperature rise due to
the contact current
E = pre-energization

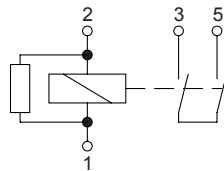
High Current Relay 150

Circuit Diagram

AR
1 Make contact/1 Form A
with Resistor



XR
1 Double make contact/1 Form X
with Resistor



Coil Data

Available for nominal voltages	12 V / 24 V (other coils on request)
Nominal power consumption of the unsuppressed coil at nominal voltage	3.3 W
Nominal power consumption at nominal voltage with suppression resistor	4.1 W
Test voltage winding/contact	1000 VAC _{rms}
Maximum ambient temperature range	-40 to +125°C
Operate time at nominal voltage	Typ. 25 ms
Release time at nominal voltage ¹⁾	Typ. 8 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.

Mechanical Data

Cover retention	
Axial force	500 N
Pull force	500 N
Push force	500 N
Terminals	
Pull force	150 N
Push force	150 N
Resistance to bending, force applied to front	20 N ¹⁾
Resistance to bending, force applied to side	20 N ¹⁾
Max. torsion of screw bolts	5 Nm
Enclosures	Protects relay from dust. For use in passenger compartment or enclosures. Please refer to the Application Notes in this catalog.
Dust cover	

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.

High Current Relay 150

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
Temperature cycling	IEC 68-2-14	Nb	10 cycles	-40/+85°C (5°C per min)
Dry heat	IEC 68-2-2	Ba	500 h	100°C
Damp heat constant	IEC 68-2-3	Ca	500 h	40°C, 93% RH
Industrial atmosphere	IEC 68-2-60	Method 4	21 days	25°C
Corrosive gas	IEC 68-2-42	10 ±2 cm ³ /m ³ SO ₂	10 days	No change in the switching state > 10 μs Valid for NC contacts, NO contact values significantly higher
	IEC 68-2-43	1 ±0.3 cm ³ /m ³ H ₂ S	10 days	
Vibration resistance	IEC 68-2-6 (sine sweep)		10 - 200 Hz 5 g	Valid for NC contacts, NO contact values significantly higher
Shock resistance	IEC 68-2-27 (half sine form single pulses)		6 ms min. 20 g	
Load dump	ISO 7637-1 (12 V)	Test pulse 5	Vs = +86.5 V	
	ISO 7637-2 (24 V)	Test pulse 5	Vs = +200 V	
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⁾			

¹⁾ FMVSS: Federal Motor Vehicle Safety Standard.

Ordering Information

Part Numbers (see table below for coil data)		Nominal Voltage	Circuit/Contact Arrangement	Contact Material	Protection Class according to IEC 529 (EN 60 529)
Relay Description	Part Number				
12 V					
V23132-A2001-A100	1393315-1	12 V	AR/1 Form A	AgNi0.15	IP54
V23132-A2001-A200	1393315-2	12 V	AR/1 Form A	AgSnO ₂	IP54
V23132-A2001-B100	1393315-3	12 V	AR/1 Form A	AgNi0.15	IP67
V23132-A2001-B200	1416010-1	12 V	AR/1 Form A	AgSnO ₂	IP67
24 V					
V23132-B2002-A100	1393315-8	24 V	XR/1 Form X	AgNi0.15	IP54
V23132-B2002-A200	1393315-9	24 V	XR/1 Form X	AgSnO ₂	IP54
V23132-B2002-B100	1-1414428-0	24 V	XR/1 Form X	AgNi0.15	IP67
V23132-B2002-B200	1-1393315-1	24 V	XR/1 Form X	AgSnO ₂	IP67

Coil Versions

Coil Data for HCR 150	Rated Coil Voltage (V)	Coil Resistance		Must Operate Voltage (V)	Must Release Voltage (V)	Allowable Overdrive ¹⁾ Voltage (V)	
		without suppression device ±10% (Ω)	with suppression device ±10% (Ω)			at 23°C	at 85°C
V23132-**001-****	12	44	37	7.2	1.2	27	20
V23132-**002-****	24	178	141	14.4	2.4	54	38

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

Standard Delivery Packs (orders in multiples of delivery pack)

HCR 150: 10 pieces

High Current Relay 75



Features

- Limiting continuous current 75 A

Typical Applications

- Rear window defogger
- Battery disconnection
- Power distribution (clamp 15)
- Glow plug relay

Please contact Tyco Electronics for relay application support.



232_301

Design

- ELV/RoHS/WEEE compliant
- Dustproof; protection class IP54 to IEC 529 (EN 60 529)
- Sealed: sealing in accordance with IEC 68; immersion cleanable: protection class IP67 to IEC 529 (EN 60 529)

Weight

Approx. 38 g (1.3 oz.)

Nominal Voltage

12 V or 24 V

Terminals

- Quick connect terminals (coil)
- Screw terminals (load)

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.

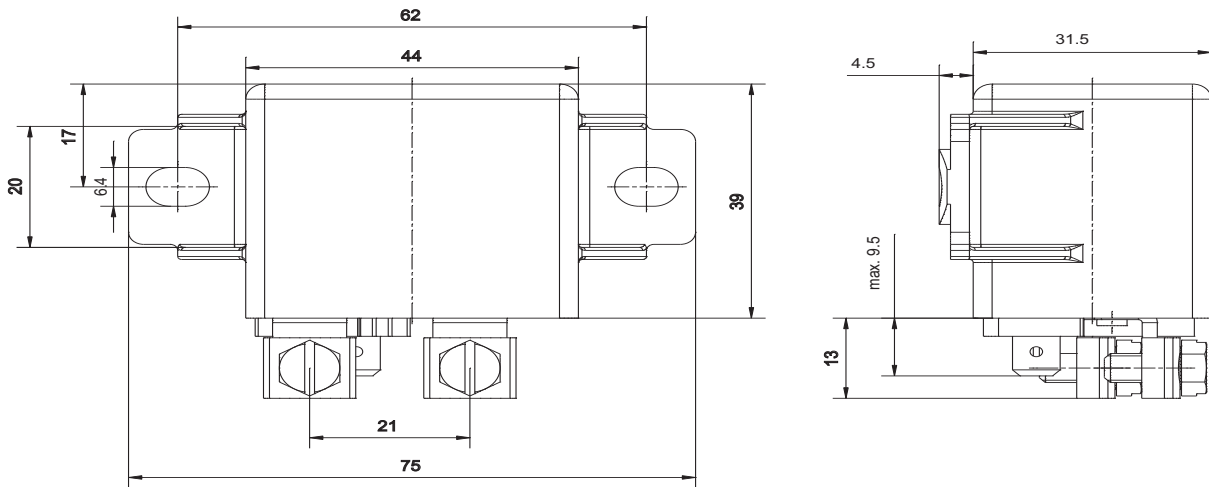
For general storage and processing recommendations please refer to our Application Notes and especially to *Storage* in the "Glossary" page 23 or at <http://relays.tycoelectronics.com/appnotes/>

Disclaimer

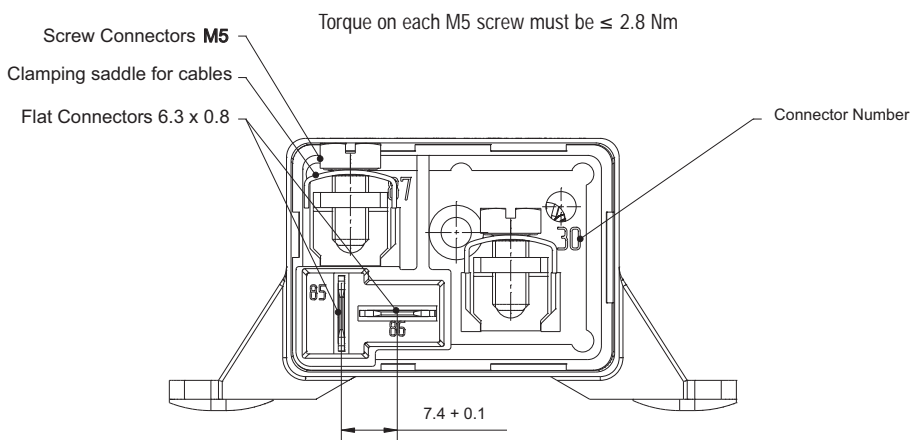
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High Current Relay 75

Dimensional Drawing





View of the Terminals (bottom view)



Fitting connector for coil terminals 85 and 86 is Tyco Electronics' 2 way FF receptacle housing Part Number 180907

High Current Relay 75

Contact Data

Contact configuration	1 Make contact/ 1 Form A		1 Bifurcated contact (Double contact make)/ 1 Form A (bifurcated)
Circuit symbol (see also Pin Assignment)			
Rated voltage	12 V	24 V	12 V
Rated current	50 A	30 A	50 A
Limiting continuous current			
23°C	75 A	50 A	75 A
85°C	50 A	30 A	50 A
105°C	20 A	8 A	20 A
Contact material	Silver based		
Max. switching voltage/power	See load limit curve		
Max. switching current ¹⁾			
On ²⁾	75 A	50 A	150 A
Off	75 A	50 A	100 A
Min. recommended load ³⁾	1 A at 5 V		
Voltage drop at 100 A (initial)	Typ. < 100 mV, 200 mV max.		Typ. < 50 mV, 200 mV max.
Mechanical endurance (without load)	> 10 ⁶ operations		
Example of electrical endurance with resistive load and copper wire with cross section ≥ 10 mm ²	> 1.25 x 10 ⁵ operations at 23°C 75 A on NO, 13.5 V	> 1 x 10 ⁵ operations at 85°C 75 A on NO, 13.5 V	> 5 x 10 ⁴ operations at 23°C 50 A on NO, 27 V
Max switching rate at nominal load	6 operations per minute (0.1 Hz)		

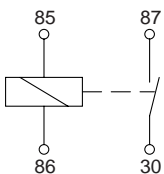
¹⁾ The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5 V for 12 V or 27 V for 24 V load voltages.

²⁾ For a resistive load of maximum 1 s on and a minimum of 45 s off.

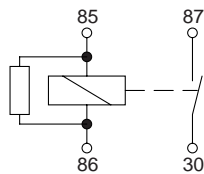
³⁾ See chapter Diagnostics of Relays in our Application Notes page 31 or consult the internet at <http://relays.tycoelectronics.com/appnotes/>

Circuit Diagram

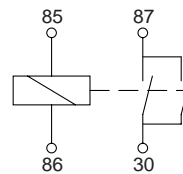
A0
1 Make contact/1 Form A



AR
1 Make contact/1 Form A
with Resistor



E0
1 Bifurcated contact (Double contact make)/
1 Form A (bifurcated)



Polarity for all HCR 75: Terminals 30 and 86 on +

Coil Data

Available for nominal voltages	12 V / 24 V
Nominal power consumption of the unsuppressed coil at nominal voltage	3.1 W / 4.4 W
Nominal power consumption at nominal voltage with suppression resistor	7.2 W / n.a.
Test voltage winding/contact	500 VAC _{rms}
Maximum 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.

High Current Relay 75

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
Torsion	0.3 Nm
Enclosures	
Dust cover	Protects relay from dust. For use in passenger compartment or enclosures.

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
Climatic cycling with condensation	EN ISO 6988		6 cycles	Storage 8/16 h
Temperature cycling	IEC 68-2-14	Nb	10 cycles	-40/+85°C (5°C per min)
Damp heat				
cyclic	IEC 68-2-30	Db	6 cycles	Upper air temperature 55°C
constant	IEC 68-2-3	Ca	56 days	
Corrosive gas	IEC 68-2-42	10 ±2 cm ³ /m ³ SO ₂	10 days	
	IEC 68-2-43	1 ±0.3 cm ³ /m ³ H ₂ S	10 days	
Vibration resistance	IEC 68-2-6 (sine sweep)		10 - 500 Hz min. 5 g	No change in the switching state > 10 µs Valid for NC contacts, NO contact values significantly higher
Shock resistance	IEC 68-2-27 (half sine form single pulses)		11 ms min. 20 g	
Load dump	ISO 7637-1 (12 V) ISO 7637-2 (24 V)	Test pulse 5 Test pulse 5	Vs = +86.5 V Vs = +200 V	
Jump start	24 V for 5 minutes conducting nominal current at 23°C			
Flammability	UL94-HB or better (meets FMVSS 302) ¹⁾			

¹⁾ FMVSS: Federal Motor Vehicle Safety Standard.

Ordering Information

Part Numbers (see table below for coil data)		Circuit/Contact Arrangement	Contact Material	Enclosure	Coil Suppression
Relay Description	Part Number				
12 V					
V23232-D0001-X001	1904000-1	E0/1 Form A (bifurcated)	Silver based	Dust cover	
V23232-A0001-X005	2-1904001-3	AR/1 Form A	Silver based	Dust cover	Resistor
24 V					
V23232-A0002-X008	1904001-4	A0/1 Form A	Silver based	Dust cover	

Coil Versions

Coil Data for HCR 75	Rated Coil Voltage (V)	Coil Resistance ³⁾ ±10% (Ω)	Must Operate Voltage (V)	Must Release Voltage (V)	Allowable Overdrive ¹⁾ Voltage (V)	
					at 23°C	at 100°C
V23232-D0001-X001	12	46	8.8	1.5	22	15
V23232-A0001-X005	12	20 ²⁾	7.5	0.5	22	15
V23232-A0002-X008	24	130	19.0	1.0	32	32

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

²⁾ Including resistor as suppression device.

³⁾ Measured between the terminals 85 and 86.

Standard Delivery Packs (orders in multiples of delivery pack)

HCR 75: 50 pieces

Power Relay F7/VF7



Features

- Limiting continuous current 70 A
- Pin assignment according to ISO 7588 part 1

Customized Versions on Request

- 24 V versions with contact gap > 0.8 mm
- Plug-in or PCB terminals
- Integrated components (e.g. resistor, diode)
- Customized marking/color
- Special covers (e.g. notches, release features, brackets)
- For shrouded/weatherproof dust cover versions refer to Shrouded Power Relay F7 A and VF7 A

Typical Applications

- ABS control
- Cooling fan
- Energy management
- Engine control
- Glow plug
- Heated front screen
- Ignition
- Lamps front, rear, fog light
- Main switch/supply relay

Please contact Tyco Electronics for relay application support.



134J_3Deco_1

Design

- ELV/RoHS/WEEE compliant
- Dustproof: protection class IP 54 to IEC 529 (EN 60 529)
- Sealed: protection class IP67 to IEC 529 (EN 60 529)

Weight

Approx. 38 g (1.3 oz.)

Nominal Voltage

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

Terminals

Quick connect terminals similar to ISO 8092-1, coil 6.3 x 0.8 mm, load 9.5 x 1.2 mm; surfaces tin plated or PCB terminals

Accessories

Connectors see page 234

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/>

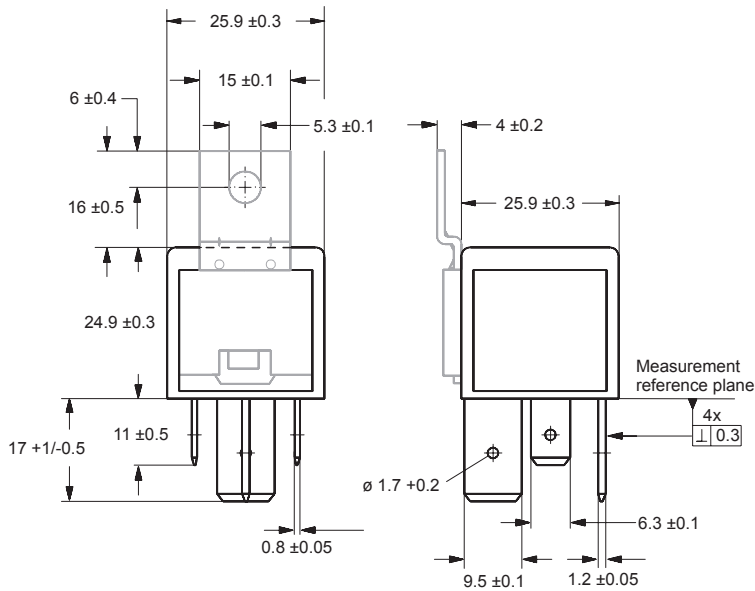
Disclaimer

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.

Power Relay F7/VF7

Dimensional Drawing

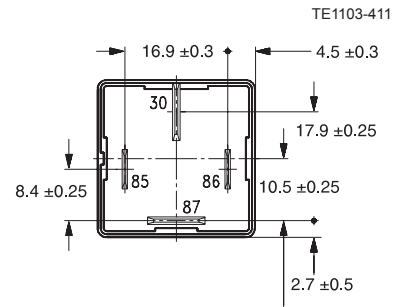
Power Relay F7/VF7 with Quick Connect Terminals



Quick connect terminal similar to ISO 8092-1

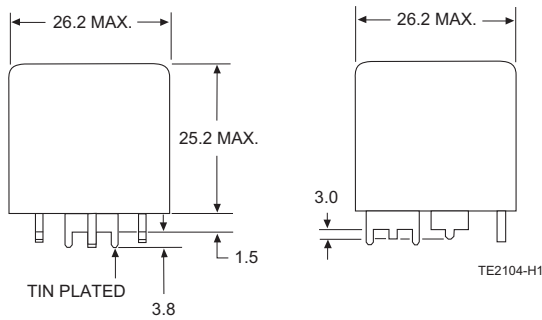
TE1098-Y1

View of the Terminals (bottom view)



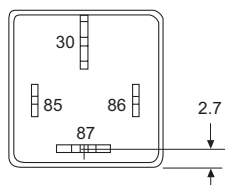
TE1103-411

Power Relay F7/VF7 with PCB Terminals

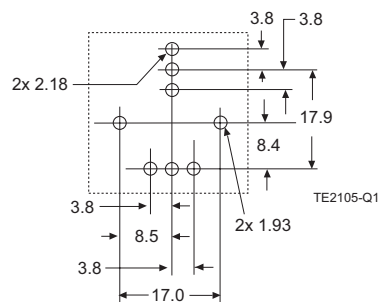


TE2104-H1

View of the Terminals (bottom view)




Mounting Holes (bottom view)



TE2105-Q1

Power Relay F7/VF7

Contact Data

Contact configuration	1 Make contact/ 1 Form A		
Circuit symbol (see also Pin assignment)			
Rated voltage	12 V	24 V	24 V ³⁾
Rated current	50 A	25 A	40 A
Limiting continuous current	23°C: 70 A 85°C: 50 A 125°C: 30 A		
Contact material	AgNi0.15		AgSnO ₂
Max. switching voltage/power	See load limit curve		
Max. switching current ¹⁾			
On ²⁾	240 A	240 A	240 A
Off	70 A	25 A	40 A
Min. recommended load ⁴⁾	1 A at 5 V		
Voltage drop at 10 A (initial)	Typ. 10 mV, 300 mV max.		
NO contact			
Mechanical endurance (without load)	> 10 ⁷ operations		
Electrical endurance	> 1 x 10 ⁵ operations 70 A, 13.5 V > 2 x 10 ⁵ operations 50 A, 13.5 V		
(example of resistive load, without component in parallel to the coil, further information on request)			
Max. switching rate at nominal load	6 operations per minute (0.1 Hz)		

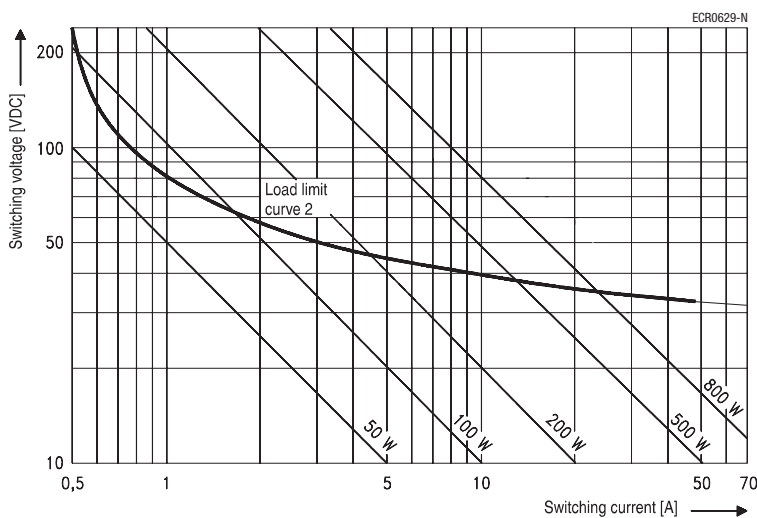
¹⁾ The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5 V for 12 V or 27 V for 24 V load voltages.

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

³⁾ Special high performance 24 V version with contact gap > 0.8 mm, part number V23134-J0056-X408 (see ordering information).

⁴⁾ See chapter Diagnostics of Relays in our Application Notes page 31 or consult the internet at <http://relays.tycoelectronics.com/apnotes/>

Load Limit Curve

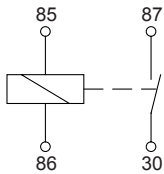


Load limit curve 2 ≙ safe shutdown,
no stationary arc (make contact)

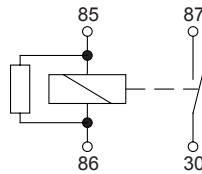
Power Relay F7/VF7

Circuit Diagram

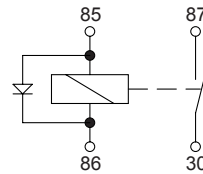
A0
1 Make contact/1 Form A



AR
1 Make contact/1 Form A
with Resistor



AD
1 Make contact/1 Form A
with Diode



Coil Data

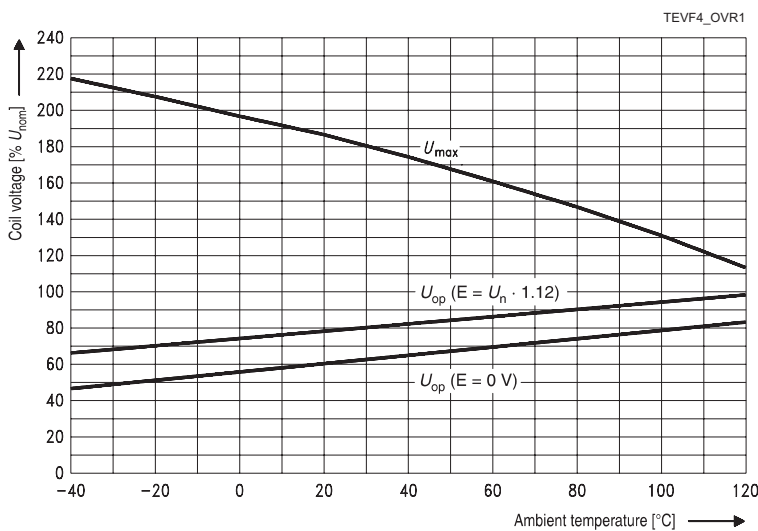
Available for nominal voltages	12 V / 24 V
Nominal power consumption of the unsuppressed coil at nominal voltage	1.6 V / 2.0 W (F7/VF7)
Nominal power consumption at nominal voltage with suppression resistor	1.8 W / 2.2 W / 2.6 W (F7/VF7/high performance 24 V)
Test voltage winding/contact and contact/contact	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

Power Relay F7/VF7

Mechanical Data

Cover retention	
Axial force	150 N
Pull force	150 N
Push force	150 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.

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
Climatic cycling with condensation	EN ISO 6988		6 cycles	Storage 8/16 h
Temperature cycling	IEC 68-2-14	Nb	10 cycles	-40/+85°C (5°C per min)
Damp heat				
cyclic	IEC 68-2-30	Db, Variant 1	6 cycles	Upper air temperature 55°C
constant	IEC 68-2-3	Ca	56 days	
Corrosive gas	IEC 68-2-42	10 ±2 cm ³ /m ³ SO ₂	10 days	
	IEC 68-2-43	1 ±0.3 cm ³ /m ³ H ₂ S	10 days	
Vibration resistance	IEC 68-2-6 (sine sweep)		10 - 500 Hz min. 10 g	No change in the switching state > 10 μs
Shock resistance	IEC 68-2-27 (half sine form single pulses)		min. 30 g 6 ms	
Load dump	ISO 7637-1 (12 V) ISO 7637-2 (24 V)	Test pulse 5 Test pulse 5	Vs = +86.5 V Vs = +200 V	
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⁾			
Overload current for relays with rated currents as shown in contact data table ²⁾			67.5 A, 1800 s 100 A, 5 s 175 A, 0.5 s 300 A, 0.2 s	

¹⁾ FMVSS: Federal Motor Vehicle Safety Standard.

²⁾ Current and time are compatible with circuit protection by a typical 50 A automotive fuse. Relay will make, carry and break the specified current.

Power Relay F7/VF7

Ordering Information

Part Numbers (see table below for coil data)		Part Number	Circuit/Contact Arrangement	Contact Material	Enclosure	Coil Suppression	Bracket
Relay Description	Internal Reference						
12 V Plug-In Relays							
V23134-J0052-D642		7-1393303-3	A0/1 Form A	Silver based	Dust cover		
V23134-J1052-D642		1393304-9	A0/1 Form A	Silver based	Dust cover		Yes
V23134-J0052-X429		1-1414147-0	AR/1 Form A	Silver based	Dust cover	Resistor 680 Ω	
V23134-J0052-X439		1-1414286-0	AD/1 Form A	Silver based	Dust cover	Diode (cathode at 86)	
V23134-J0052-X461 ¹⁾		1-1414469-0	AR/1 Form A	Silver based	Dust cover	Resistor 560 Ω	
12 V PCB Relays							
V23134-J0052-X455		1-1414478-0	AR/1 Form A	Silver based	Dust cover	Resistor 470 Ω	
24 V Plug-In Relays							
V23134-J0053-D642		9-1393303-7	A0/1 Form A	Silver based	Dust cover		
V23134-J1053-D642		1-1393304-1	A0/1 Form A	Silver based	Dust cover		Yes
V23134-J0056-X408 ²⁾		1393304-5	AR/1 Form A	Silver based	Dust cover	Resistor 1200 Ω	
12 V Plug-In Relays							
VF7-11F11	V23134-J0055-X834	4-1393306-5	A0/1 Form A	Silver based	Dust cover		
VF7-11F11-S01	V23134-J0055-X836	4-1393306-6	AR/1 Form A	Silver based	Dust cover	Resistor 680 Ω	
VF7-41F11	V23134-J1055-X845	5-1393306-8	A0/1 Form A	Silver based	Dust cover		Yes
VF7-41F11-C05	V23134-J1056-X846	1432055-1	AR/1 Form A	Silver based	Dust cover, sealed	Resistor 680 Ω	Yes
VF7-41F11-S01	V23134-J1055-X849	1-1393302-6	AR/1 Form A	Silver based	Dust cover	Resistor 680 Ω	Yes
12 V PCB Relays							
VF7-11F12	V23134-J0055-X838	1-1393302-3	A0/1 Form A	Silver based	Dust cover		
VF7-11F12-C05	V23134-J0055-X864	1432556-1	AR/1 Form A	Silver based	Dust cover, sealed	Resistor 680 Ω	
24 V Plug-In Relays							
VF7-11H11	V23134-J0065-X839	1-1393302-4	A0/1 Form A	Silver based	Dust cover		
VF7-41H11	V23134-J1065-X853	1-1393302-7	A0/1 Form A	Silver based	Dust cover		Yes
VF7-41H11-S08	V23134-J1065-X855	6-1393306-7	AR/1 Form A	Silver based	Dust cover	Resistor 2700 Ω	Yes
24 V PCB Relays							
VF7-11H12	V23134-J0065-X497	3-1414937-3	A0/1 Form A	Silver based	Dust cover		

¹⁾ Special feature: 14.5 mm load terminals.

²⁾ Special feature: contact gap > 0.8 mm.

Coil Versions

Coil Data for Power F7/VF7	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
V23134-**052****	12	90	7.2	1.6	22	17
V23134-**053****	24	324	14.4	3.2	41	30
V23134-**056****	24	268	16.0	4.0	38	29
VF7-**F**..**	12	72	7.2	1.2	18	14
VF7-**H**..**	24	288	14.4	2.4	36	28

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

Standard Delivery Packs (orders in multiples of delivery pack)

Power F7:	Plug-in version:	210 pieces
	Plug-in version with bracket:	208 pieces
	PCB version:	200 pieces
VF7:		300 pieces

Application Examples of Power Module Relay F4/F7 and Base



Description

Examples of customization with one or more relays, electronics or other components of modular unit based on Power Relay F4/F7.

Examples

- Base Power Relay F4 (V23140)
- Base + Power Relay F4 (V23140)
- Base + Power Relay F4 with printed circuit board (V23141)
- Base + additional relay mounted on printed circuit board (V23141)
- Base + Power Relay F4 and additional relay mounted on leadframe (V23141)
- Base + Power Relay F4 and 2 additional relays mounted with overmolded leadframe (V23141)

Typical Applications

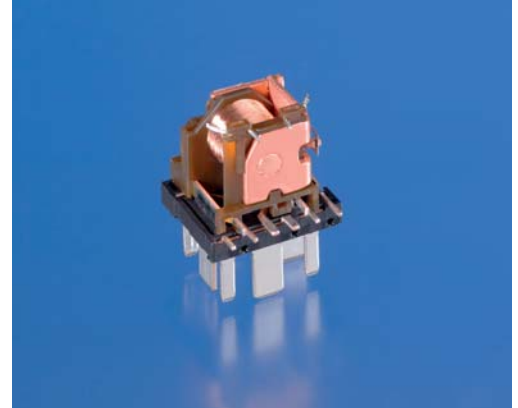
- Automatic wash/wiper control
- Battery disconnection
- Cooling fan controls
- Energy distribution
- Fuel/water pump control unit
- Flexible control unit functions
- Light control applications
- Motor antennas
- Over voltage protection
- Power management
- Power outlet control
- Power window actuator
- Rear window defogger
- Seat adjustment
- Seat and stationary heating
- Timer
- Wiper control

Please contact Tyco Electronics for relay application support.



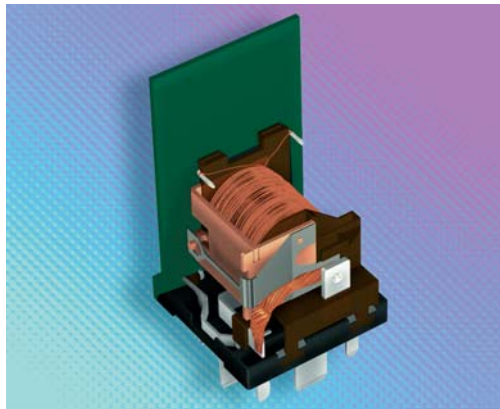
V23140 Base Power Relay F4

141_3004



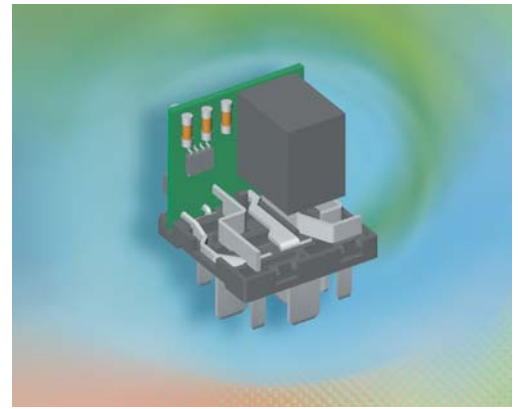
V23140 Base + Power Relay F4

141_3004



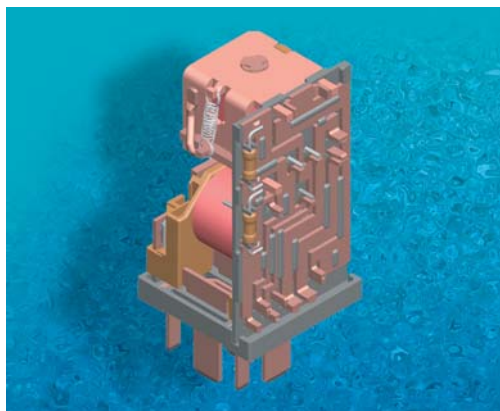
V23141 Base + Power Relay F4 with PCB

141_3003



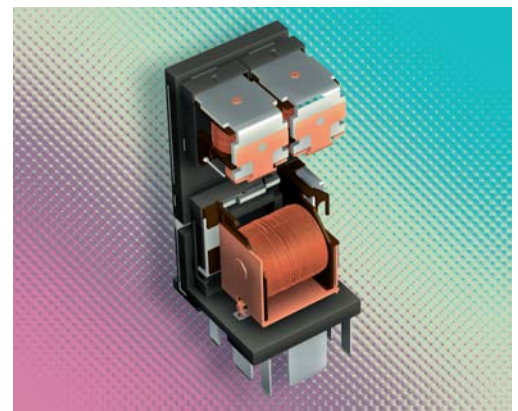
V23141 Base + additional relay mounted on PCB

141_3004



V23141 Base + Power Relay F4 and additional relay mounted on leadframe

141_3002



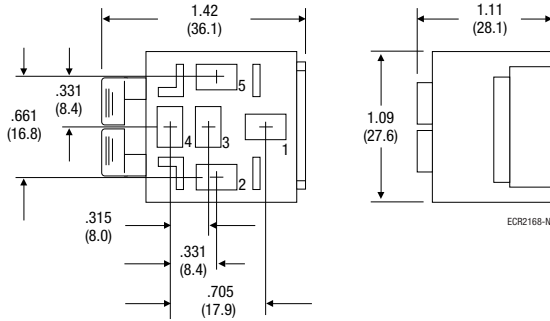
V23141 Base + Power Relay F4 and 2 additional relays mounted with overmolded leadframe

141_3001

Connectors for Mini (Shrouded) / Maxi ISO Relays

Connectors for Use with Mini ISO Relays with Shrouded Dust Cover
VCF4-1003

(Terminals to be ordered separately)

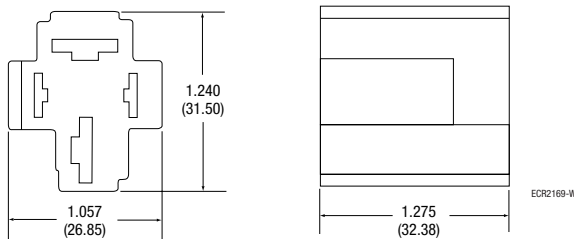


Ordering Information

Connector Description	Tyco Electronics Part Number	Part Numbers for Connectors and Crimp Terminals		Quantity Required Wire mm ²	Form A	Form C
		Part Number Crimp Terminals	Tyco Electronics Part Number			
VCF4-1003	1-1393305-3	26A1348A	1-1393310-8	0.5 - 0.8	4	5
		26A1348B	1-1393310-9	1.3 - 2.1		
		26A1348C	2-1393310-0	3.3 - 5.3		

Connectors for Use with Maxi ISO Relays
VCF7-1000

(Terminals to be ordered separately)



Ordering Information

Connector Description	Tyco Electronics Part Number	Part Numbers for Connectors and Crimp Terminals		Wire mm ²	Quantity Required
		Part Number Crimp Terminals	Tyco Electronics Part Number		
VCF7-1000	1393310-4	AMP280756-4	280756-4	3.3 - 5.3	2 (contacts)
		AMP280755-4	280755-4	5.3 - 13.3	2 (contacts) and
		AMP42281-1	42281-1	0.8 - 2.1	2 (coils)