

FEATURES

- Operates over a wide DC power range: 10.5 to 35VDC and 24VAC
- Adjustable thresholds for cut-in and cut-out points between 1 to 30VDC and 0 to 150VAC
- 40 Amp SPDT relay contact
- Automatic reversible action with the cut-in and cut-out adjustments
- Adjustable 0 to 255 second time delay, selectable between cut-in or cut-out operation
- Compact size eliminates mounting problems

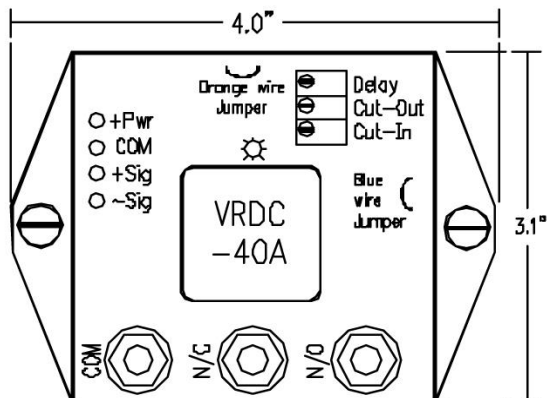
DESCRIPTION & OPERATION

The VRDC-40A is an Adjustable Voltage Relay for DC applications. The VRDC-40A can be used in applications where a varying DC voltage is used to switch an adjustable relay such as in generator control or a low battery voltage load disconnect. The “cut-in” voltage, “cut-out” voltage, and the time delay value are adjusted on multi-turn potentiometers by measuring the respective test points and adjusting the potentiometers per the set-up instructions and chart on the last page.

The VRDC-40A uses a half-wave rectifier filter circuit which allows the VRDC-40A to operate from either a 10.5 to 35VDC power source or a 24VAC power supply. The VRDC's input is internally scaled so that a 0 to 30VDC signal equals 0 to 5VDC as shown in the chart on the back side of this page. An LED lights when the relay is pulled in.



WIRING CONFIGURATION



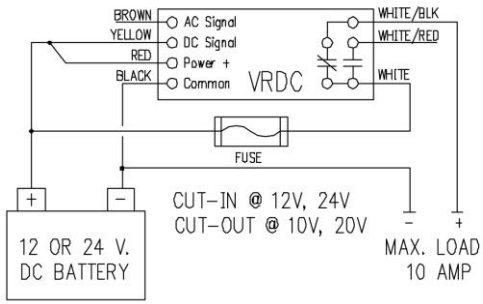
SPECIFICATIONS

Size:	3”W x 3”L x 1.2”H
Enclosure:	Epoxy potted in PVC plastic
Mounting:	2 - #8 x 3/4” screws (Not included)
Relay Capacity:	80A @ 14VDC, SPDT, 120A inrush 40A @ 28VDC, SPDT Not rated for AC voltages
Adjustments:	3 Potentiometers <ul style="list-style-type: none"> • Cut-in: 0 to 30V • Cut-out: 0 to 30V • Time Delay: 0 to 5 minutes
Module Power:	12 – 24VDC, Max 35VDC *Clip blue wire for 24VDC/VAC operation
Current Draw:	Continuous – less than 8mA Relay energized – 40mA
Input Signals:	+0 to 30V DC - yellow wire ~0 to 150V AC - brown wire - Common - black wire
Time Delay:	0 to 255 second delay
Delay Action:	Normal – Delay on Energize Orange Wire Cut Open – Delay on de-energize (See note 2)
Indication:	LED indicates relay is energized
Temperature:	-40 to 85°C
Relay Life:	100 million mechanical operations

ORDERING INFORMATION

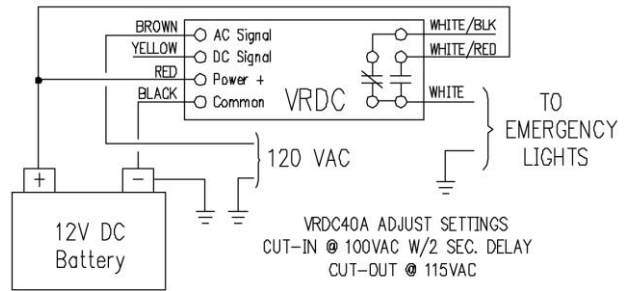
- VRDC-40A:** Adjustable AC or DC voltage threshold settings, 40 Amp relay with 0 to 255 seconds time delay.
- VRDC-40A/LVD:** Adjustable DC voltage threshold settings, 40 Amp relay with 0 to 255 seconds time delay. DC sense is internally connected to DC power.

APPLICATION 1 LOAD DISCONNECT



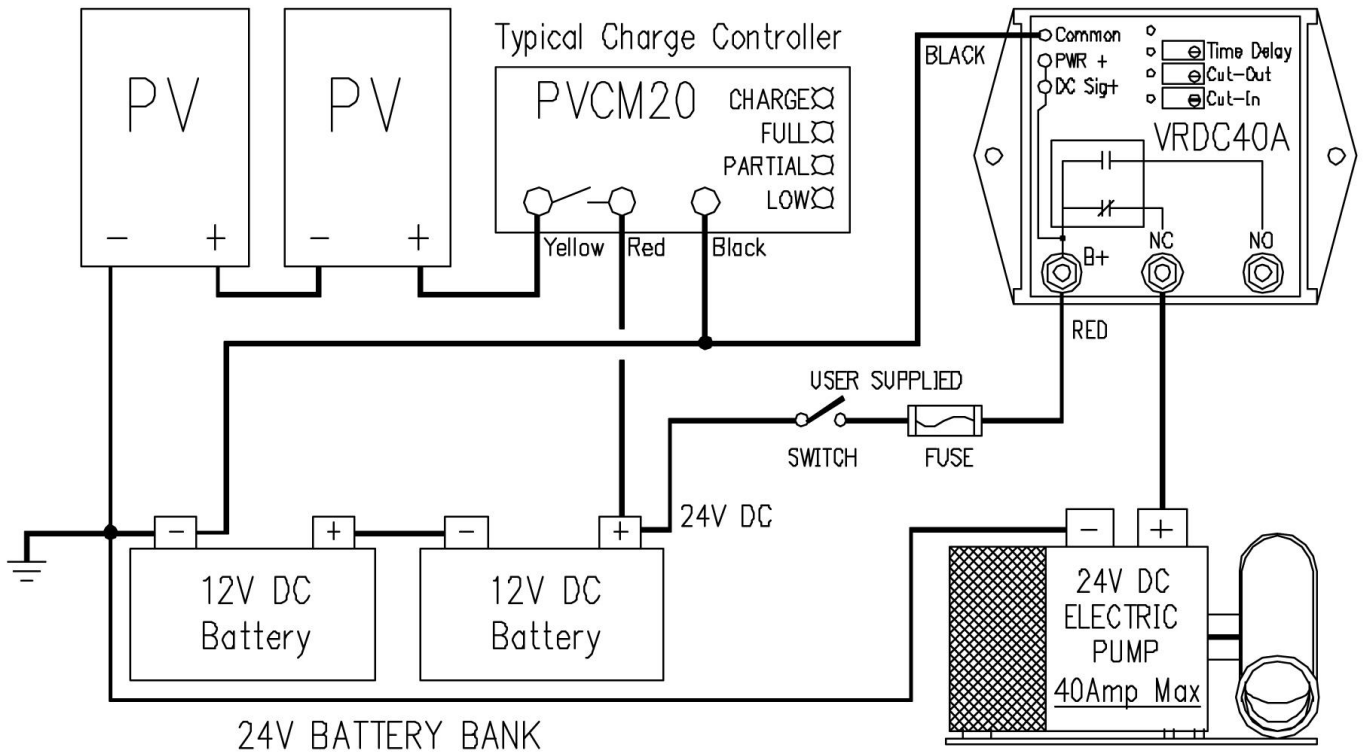
The VRDC-40A energizes and disconnects the load (with time delay) below the off voltage point to prevent further battery discharge. Use N.O. contacts for de-energize on low battery voltage condition.

APPLICATION 2 AC POWER – EMERGENCY LIGHTS



The VRDC-40A senses the 120VAC line voltage and switches on the emergency lights with a 2 second delay upon sensing a power failure. The emergency lights turn off when power returns.

APPLICATION 3 LOW VOLTAGE WATER PUMPING DISCONNECT – 40-AMPS



The VRDC-40A/LVD is a special high Amp switching version of the 10 Amp rated VRDC voltage sensitive relay. The VRDC40A/LVD monitors the battery voltage supplying the DC powered water pump, both power and DC signal inputs are connected internally. When the voltage drops below 11.0VDC for 5 continuous minutes then the VRDC40A relay energizes, disconnecting the pump to prevent further battery drain. The VRDC40A/LVD won't reconnect the pump to the battery until the battery voltage rises above 12VDC from charging. The recommended adjustments for a 24V system are to disconnect the pump (cut-in) below 22VDC and to reconnect the pump (cut-out) above 24VDC. Changes to the cut-in, cut-out and time delay adjustments are explained on page 4 of the VRDC data sheet. The VRDC40A/LVD relay draws about 40mA from the battery while it is energized.

WIRE JUMPERS

Module power: For 24VDC/VAC operation clip the BLUE wire! Failure to do so will cause excessive current draw and shorten the life of the relay.

Time Delay: For time delay on energize of the relay keep orange wire intact. For delay on de-energize of relay clip orange wire.

ADJUSTMENT FORMULAS

0 to 30VDC Vadj = 0.1667
 0 to 60VDC Vadj = 0.0833
 0 to 150VAC Vadj = 0.0333
 Time Delay Vadj = Time Delay (sec.) x 0.01961

Vadj: Adjustment voltage at cut-in & cut-out test points
 Vin: Input voltage signal
 Minimum
 Resolution: 0 to 5V adjust voltage/255 steps = 0.02VDC

ADJUSTMENT PROCEDURES

Input Voltage Ranges			Time Delay	cut-in/out & delay Tp volts
1-30VDC	2-60VDC	5-150VAC	0-255 Sec	0-5VDC
1.0v	2.0v	5.0v	8.5 sec	0.167v
2.0v	4.0v	10.0v	17 sec	0.333v
3.0v	6.0v	15.0v	25.5 sec	0.500v
4.0v	8.0v	20.0v	34 sec	0.667v
5.0v	10.0v	25.0v	42.5 sec	0.833v
6.0v	12.0v	30.0v	51 sec	1.000v
7.0v	14.0v	35.0v	59.5 sec	1.167v
8.0v	16.0v	40.0v	68 sec	1.333v
9.0v	18.0v	45.0v	76.5 sec	1.500v
10.0v	20.0v	50.0v	85 sec	1.667v
11.0v	22.0v	55.0v	93.5 sec	1.833v
12.0v	24.0v	60.0v	102 sec	2.000v
13.0v	26.0v	65.0v	110.5 sec	2.167v
14.0v	28.0v	70.0v	119 sec	2.333v
15.0v	30.0v	75.0v	127.5 sec	2.500v

Input Voltage Ranges			Time Delay	cut-in/out & delay Tp volts
1-30VDC	2-60VDC	5-150VAC	0-255 Sec	0-5VDC
16.0v	32.0v	80.0v	136 sec	2.667v
17.0v	34.0v	85.0v	144.5 sec	2.833v
18.0v	36.0v	90.0v	153 sec	3.000v
19.0v	38.0v	95.0v	161.5 sec	3.167v
20.0v	40.0v	100.0v	170 sec	3.333v
21.0v	42.0v	105.0v	178.5 sec	3.500v
22.0v	44.0v	110.0v	187 sec	3.667v
23.0v	46.0v	115.0v	195.5 sec	3.833v
24.0v	48.0v	120.0v	204 sec	4.000v
25.0v	50.0v	125.0v	212.5 sec	4.167v
26.0v	52.0v	130.0v	221 sec	4.333v
27.0v	54.0v	135.0v	229.5 sec	4.500v
28.0v	56.0v	140.0v	238 sec	4.667v
29.0v	58.0v	145.0v	246.5 sec	4.833v
30.0v	60.0v	150.0v	255 sec	5.000v

1. The cut-in, cut-out and time-delay pot adjustments are measured on the respective test points by a DC voltmeter. The cut-in and cut-out 0 to 5VDC represents 0 to 30VDC, 0 to 60VDC**, 0 to 150VAC input signal. The time delay 0 to 5VDC represents 0 to 255 second delay on energize. **For voltage range of 0 to 60VDC, a series resistor is added to the signal input wire.
2. If the cut-in pot is greater than the cut-out pot then the relay energizes when the signal voltage is greater than the cut-in point and de-energizes when the signal voltage drops below the "cut-out" point. If the cut-in point is less than the cut-out point then the relay energizes when the signal voltage drops below the "cut-in" point and de-energizes when the signal voltage rises above the cutout point. If the signal voltage differential between the cut-in and cut-out adjustments is not at least 0.25VDC in the 0 to 30V range then the relay will not operate.
3. The time delay pot's 0 to 5VDC represents 0 to 255 seconds of time delay for the relay to energize on cut-in for either reverse or direct mode. The input signal must exceed the cut-in point for the time delay value or the timing action will start over. The cut-out action is instantaneous.
4. After adjusting the VRDC-40A module, interrupt power to insure that the module operates properly. This re-sets the circuitry.