

2CVR Series for 230 Vac Capacitor Start and Capacitor Start/Capacitor Run Motors

Basic Operation

Capacitor start/capacitor run motors and capacitor start motors provide continuous voltage sensing information which can be used to extract speed data from the voltage across the motor start (auxiliary) winding. By comparing this start (auxiliary) winding RPM-sensitive voltage to the main AC input voltage (which serves as a reference voltage), the switch determines when the start circuit should be de-energized. The electronic switch interrupts the start circuit current after the motor has accelerated to the cut out voltage (speed), and reconnects the start circuit whenever the motor voltage (speed) has decreased to a preselected cut in RPM level.

Capacitor start/capacitor run motor exhibit current transients and higher voltages across the start switch. These electrical stresses occur due to the switching of the two capacitors (start and run) that are connected in parallel during motor start and may have different voltages at time of restart. These stresses occur at restart with both mechanical and electronic start switches. The CVR switch has additional circuitry to eliminate the effects of these conditions.



Environmentally Protected
Immune to moisture, dust, dirt, shock and vibration.

Electrically Protected

Designed to filter out electrical noise, so there is no concern of random switch malfunction.

Zero Crossing Logic

Current spiking due to run capacitor no longer a problem.

Line Voltage Compensation

Operating voltage 190 to 260 Vac.

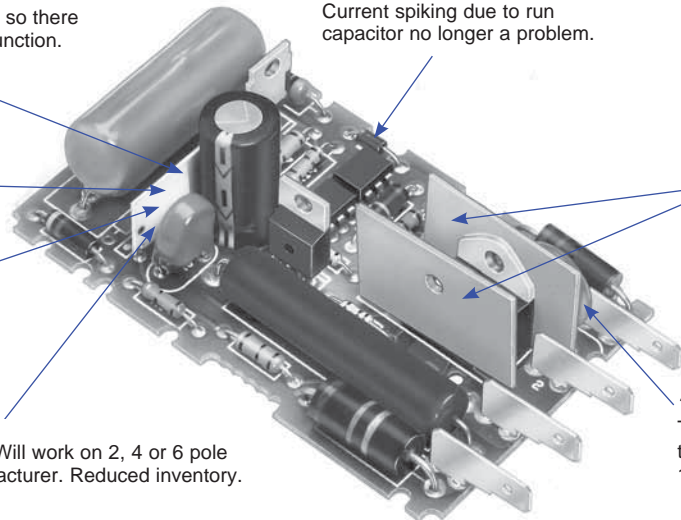
Soldered Heat Sink
High cycling.

Speed Sensitive
(cut in)

Universal Design

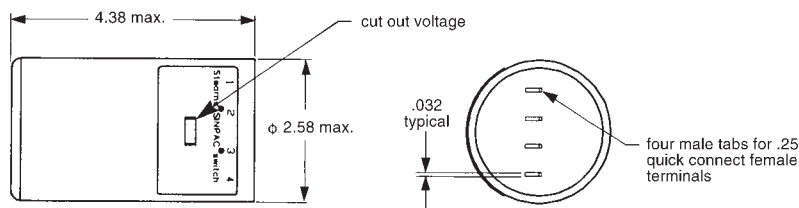
50/60 Hz operation. Will work on 2, 4 or 6 pole motors of any manufacturer. Reduced inventory.

Transient Protection
Transient protection tested per IEEE C62.41 - 1991 Category A3.



ADDITIONAL FEATURES

- **Silent Operation** - no switch noise
- **Completely Solid-State with No Moving Parts.** SINPAC Switches have no physical constraints to affect their operation. No wearing parts mean high cycling, no arcing contact.
- **Optional inductor for heavy duty operation.**
- **Ambient 40° to 65°C.**
- **Operating Temperature:** -40°C to 65 °C (-40 °F to 149°F) [for operation between 65°C and 85°C (149°F and 185°F), consult factory.]
- **Operating Voltage:** 230 Vac SINPAC Switch: 190-255 Vac.



Dimensions are for estimating only. Drawings for customer reference are available upon request.

Typical Maximum Motor hp	Typical Full Load Motor Nameplate Current Rating (amps)		Switch Rating and Permissible Maximum Start Capacitor Current (amps)	Start Circuit Voltage	Catalog Number	Part Number	Cut Out Voltage Typical	Cut In Voltage Typical	Package Style
	115 Volts	230 Volts							
7 1/2	—	35	70	230	2CVR-70-260	4-7-42070-17-NC1	260	70	17
7 1/2	—	35	70	230	2CVR-70-310	4-7-42070-17-N01	310	70	17

Selection

Motor hp ratings are typical. For an accurate selection procedure, measure start circuit current during a normal start or at locked rotor and select a SINPAC Switch with higher maximum current rating than that measured.

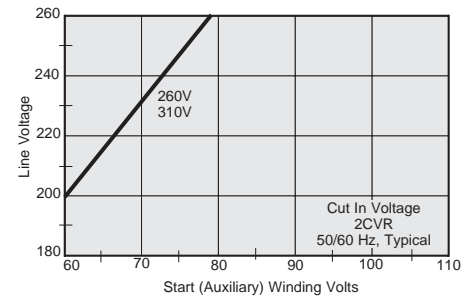
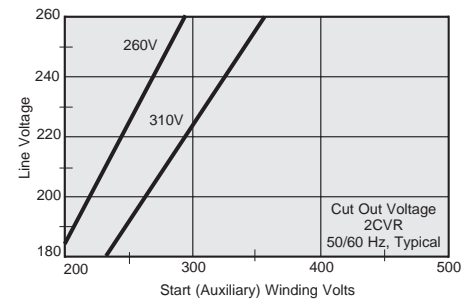
1. Be sure switch series matches motor type.
2. Be sure switch voltage rating matches auxiliary (start) circuit voltage rating.
3. Selection can be based on actual measurement of start capacitor current or two times the motor nameplate FLA rating.
4. Switch current rating must match or exceed the motor start capacitor requirements. Always select a SINPAC Switch with the next higher current rating for:
 - a) High cycling applications.
 - b) Long acceleration time.
 - c) High ambients: Greater than 55°C.
5. To assure proper motor operation, the voltage across the start (auxiliary) winding must reach the SINPAC Switch cut out voltage reference between 70% to 85% of motors synchronous speed.

Caution: SINPAC Switches are line voltage compensated. Changes in the line voltage will not effect system operation unless an overload condition causes reduced running speed, along with reduced voltage across the start (auxiliary) winding.

6. Higher current switches can be used in place of lower rated switches of the same series.

Line Voltage Compensation Charts

Induced voltage across the start winding is directly proportional to motor speed and line voltage. All SINPAC Switches use this voltage to switch the start capacitor out of the circuit. Your motor with a SINPAC Switch must generate a voltage that is 20% greater than the switch cut out voltage to assure cut out of the start capacitor. Refer to charts below.



Wiring Diagram

Catalog Number	SINPAC Switch Rating	115 Volt 50/60 Hz Motor Operation	230 Volt 50/60 Hz Motor Operation
2CVR-70 Connect to Capacitor Start Motors	230 Volts 	Not Applicable	
2CVR-70 Connect to Capacitor Start/ Capacitor Run Motors		Not Applicable	

C_S – Start capacitor, M – Motor main winding, C_R – Run capacitor, ST – Motor start winding