BEC CONTROLS CORP.

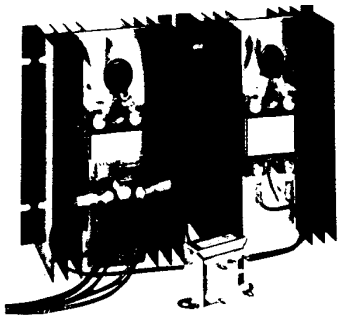
Bulletin B-1631

SERIES PC31

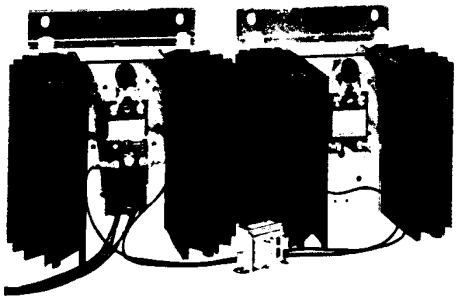
POWER CONTROLLER

0-5, 0-10VDC or Potentiometer Command Signal
Three Phase, 120, 240, 480V; 10-70 Amp Loads

CONTROLS POWER TO A LOAD PROPORTIONAL TO COMMAND SIGNAL



10 - 40 AMP



70 AMP

Description

Model PC31 using solid state relays, controls the power to a three-phase load. The PC31 provides line voltage compensation, zero-cross operation, electrical isolation, and a choice of voltage or potentiometer command signals.

The electrically isolated PC31 circuit determines the ratio of ON to OFF cycles such that the load power is directly proportional to the command signal.

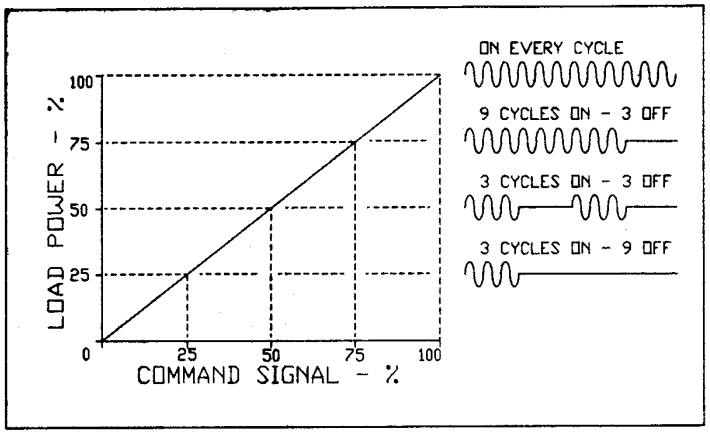
Because the PC31 provides line voltage compensation and accepts voltage or potentiometer commands, it is an ideal choice for applications where auto and manual control capabilities are desired.

Design Features

- Zero cross, solid state control
- Compact size for best space utilization
- Voltage or Potentiometer command signals
- Line Voltage Compensation
- Electrically isolated command signal
- Linear power control with respect to the command signal
- Electrically isolated heat sink
- Solid State Relay On/Off Indicator

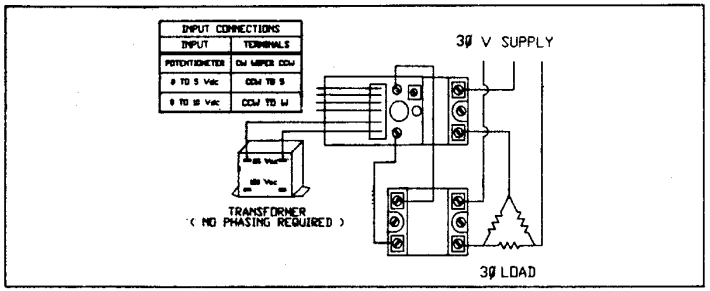
- Environmental Chambers
- Contactor Replacement
- Electric Furnaces
- Resistance Heating
- Extruders
- Platen Heaters

Operation



The duty cycle of a zero-cross solid state relay is adjusted such that the Average load voltage is proportional to the command signal. At 50% power, the relay is ON for 3 cycles and OFF for 3 cycles. At higher power levels, the ratio of ON cycles to OFF cycles increases. At lower power the ratio decreases.

Electrical Connections



The PC31 is designed to be mounted on a vertical surface. An insulation displacement connector for 22 AWG wire is provided for connection of the command signals and the transformer. For optimum compensation, the 120 Volt input to the transformer should be referenced to the load supply.

The controllers are connected between the supply and load on two of the three leads. The command inputs are connected Pin 3 to Pin 3 and Pin 4 to Pin 4 as shown.

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Specifications

Operating Voltage:
120/240/480 (+10-20%) 50/60 Hertz

Command Signals and Input Impedance:

0 to 5 Vdc	100K
0 to 10 Vdc	200K
Potentiometer	200K
(1K recommended, 20K max.)	

Control Mode:
Three-phase, two-leg, solid state zero cross

Linearity:
With respect to the command signal, the average load power is linear within 2% of span.

Control Range:
0 to 100%

Solid state zero cross operation provides transient and RFI free operation. Load power is turned On or Off only when the AC supply voltage is zero. Solid state switching eliminates contact bounce and has no inherent wear out mode. The fast On/Off solid state switching provides superior process performance over that achieved by relays, contactors or other solid state time proportional controls.

Span Adjustment:
±10% typical

dV/dT and MOV Protection:
200 volts/μsec minimum

A dV/dT snubber and an MOV network are used to protect against high frequency transients (dV/dT and voltage spikes).

Mounting:
Vertical surface with fins vertical

The convection cooled units must be mounted vertically, but they may be mounted adjacent to each other. The heat sink is electrically isolated.

MODEL	CURRENT (AMPS)		
	CONTINUOUS	SURGE	
	RMS	Peak	RMS
		1 cycle	1 second
PC31-10	10	120	22
PC31-20	20	250	40
PC31-30	30	625	80
PC31-40	40	625	80
PC31-70	70	1000	150

Conservatively rated solid state relays require no derating over rated temperature ranges of 0 to 55 C. High surge ratings allow operation of loads with low cold resistance. A wide choice of current and voltage ratings provide a cost effective solution for solid state control.

Note: Controller current = $\frac{\text{Load Power (Watts)}}{\text{Line Voltage X1.732}}$

Isolation:
2500 Volts RMS Command Signals to Load and Line Voltages

The electrically isolated command signal and heat sink are ideal for process controllers with floating, grounded or electrically hot sensors. The heat sink may be mounted to grounded or ungrounded panels.

Status Indicator:
LED On/Off Indicator

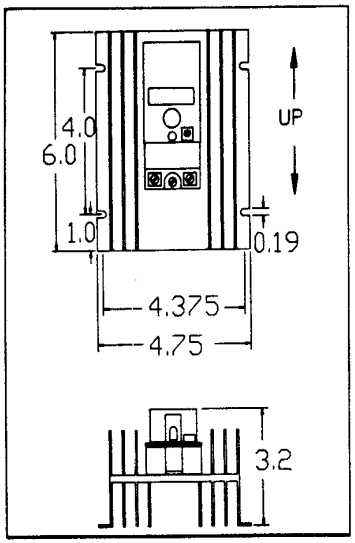
An LED turns on whenever the solid state relay is turned on. This feature provides the means for personnel to quickly and safely determine if the controller is operating correctly and diagnose the problems should they occur.

Physical:
Weight: 10, 20,30, & 40 Amp - 2 lbs.
70 Amp - 12 lbs.
Dimensions: Refer to installation drawing

Environment:

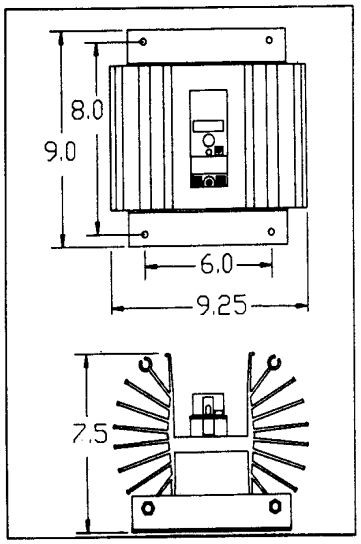
Temperature
Operating: 0 to 55 C (32 to 131 F)
Storage: -20 to 70 C (-4 to 158 F)
Humidity:
0 - 90% (non-condensing)

Installation Drawings



10, 20, 30, & 40 AMP

Uses TWO of the above assemblies.



70 AMP

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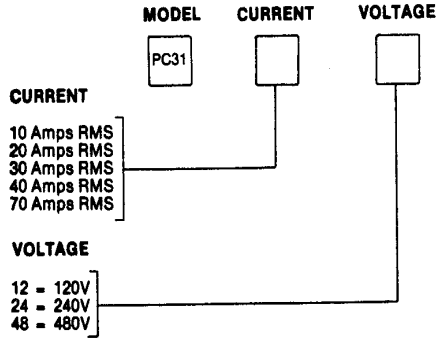
Ordering Guide



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