

# MODEL 216 SINGLE PHASE POWER CONVERTER



## FEATURES

- COMPACT, SELF-CONTAINED
- LOW COST
- POSITIVE, FRONT ACCESS CONNECTION
- EASILY REMOVED, REPAIRED OR REPLACED
- CONSERVATIVELY RATED FOR RELIABILITY
- DESIGNED TO MEET UL and NEMA STANDARDS

## OPTIONS\*

- CROSSOVER (Armature and Field Control)
- CONTROL RELAY
- FIELD ECONOMIZING RELAY
- FIELD LOSS RELAY
- CURRENT FEEDBACK
- FUSING
- HIGHER CURRENT RATINGS
- ENCLOSURE

\*EXTERNAL TO BASIC ASSEMBLY

## TYPICAL APPLICATIONS

- DC MOTOR OR GENERATOR FIELD
- AC ALTERNATOR FIELD
- EDDY CURRENT CLUTCH OR BRAKE
- SATURABLE CORE REACTOR CONTROL
- REPLACEMENT FOR POWER RHEOSTATS
- OTHER APPLICATIONS REQUIRING AN ADJUSTABLE VOLTAGE DC POWER SUPPLY

NOTE: Synchronous Motor Fields May Require a Special Exciter

## GENERAL DESCRIPTION

The MODEL 216 POWER CONVERTER is a compact, rugged, adjustable voltage DC power supply for highly inductive fields or resistive loads.

A field-proven mounting arrangement provides reliable connection but allows easy removal without disturbing permanent wiring. Front access and comprehensive Trouble-shooting Manual make field service easy.

A simple on-board jumper allows Open-loop or Closed-loop control of output Voltage or Current (with optional sensing resistor). A second jumper allows selection of AC supply voltage.

An External Potentiometer provides control from zero to maximum. On-board adjustments allow for setting Minimum and Maximum output. Output is linear with respect to input.

A two stage integrator is used to produce a half-cosine signal to determine the firing angle for a full-wave thyristor power converter. Immunity to line noise provided by the double integration, and transient suppression for the thyristors allows direct connection to AC supply mains without an isolation transformer.

The MODEL 216 POWER CONVERTER can be used with other SERIES 200 SOLID-STATE CONTROL MODULES for control of Speed, Torque, Position, Tension or other process variables (see Bulletin SB200).

## SPECIFICATIONS

- ALTITUDE: to 3300 feet above sea level (unless derated)
- TEMPERATURE: 0° to 50°C (32° to 122°F)
- AC INPUT: Single Phase, 50/60 HZ nominal  
Control: 120 volts  $\pm$  10%  
Power: 120, 240 or 480 volts  
(Intermediate voltages with external calibration)
- DC OUTPUT: 0 to 10 amperes (inductive load)  
Voltage: 0 to 88% of AC Power Supply

# GEMINI MODEL 216 POWER CONVERTER

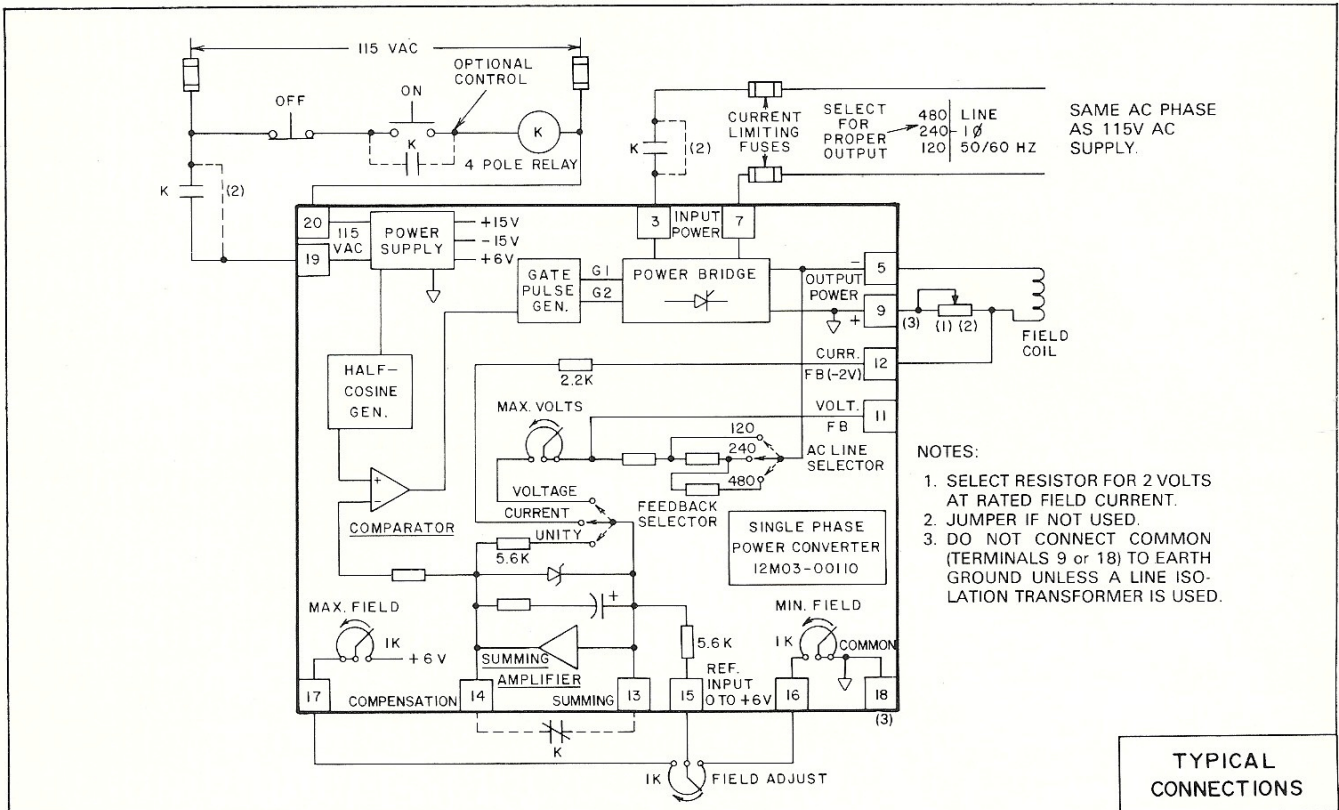
## DIMENSIONS

OPEN	ENCLOSED
3¼" high × 9½" wide × 6" deep	NEMA 1, 4 or 12 16" high × 12" wide × 8" deep
Net weight 2½ lbs.	Net weight 17½ lbs.
Options require enclosure or subpanel	

## RATINGS

VOLTS		AMPERES		
AC IN	DC OUT	LOAD	AC IN	DC OUT
120	0-105	Inductive	10	10
240	0-210	Resistive	10	9
480	0-420	Motor Armature	10	7

Fuse with 12A or less Buss Type FBP or equal.  
Consult factory for higher ratings and special applications.



**IN ADDITION TO THIS MODULE, CONTROL SYSTEMS INCLUDING RETROFITS FOR EXISTING MACHINES IN HORSEPOWERS FROM ¼ TO 2000 CAN BE PROVIDED. CALL FOR ASSISTANCE IN SOLVING YOUR MOST DIFFICULT APPLICATION PROBLEMS. WORLD-WIDE SERVICE AND TRAINING ARE AVAILABLE.**



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MODEL 216 SINGLE PHASE POWER CONVERTER

PART NUMBER 12M03-00110-01  
APPLICATION NOTES

1. The input op-amp 2IC(D) is a conventional inverting amplifier with its input and output brought out to terminals 13 and 14 respectively, allowing external scaling and integration according to the normal rules for operational amplifiers.
2. Several assemblies can be connected to one reference in a follower mode, provided a separate isolation transformer is provided for the AC input to each assembly.  
  
Use of an isolation transformer is also required where this assembly is tied into a system with other control modules and/or Power Converters.
3. Current feedback may be obtained from an external source (such as the armature loop of a DC generator) provided an isolated 2 volt signal proportional to current is applied between terminals 9 and 12 with terminal 12 negative.
4. Voltage feedback may be obtained from an external source (such as the output of an Alternator) with appropriate rectification, filtering, and scaling applied to terminal 11 or 13. An IR comp circuit may also be required.
5. Other Solid State Power Converters are available from REFLEX for special applications. Where system instability may be encountered as with large KW generators with fields having time constants of 1/3 to 1 second or greater, use of the 12M04-00004 or similar Power Converter with the 12M03-00117 Firing Circuit is preferred.
6. AC Control (terminals 19 and 20) must be connected to the same phase as the AC Power (terminals 3 and 7).
7. In noisy electrical environments a 10 MF, 16V filter capacitor on the output of the Summing Amplifier (terminal 14 (-) to terminal 18 (+) may be desirable).
8. If rapid reset is required, connect a normally closed relay contact around the Summing Amplifier (terminal 13 to 14). This will also ensure that the converter output is at zero when the power is turned on.

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9. When operated at higher output currents the Model 216 Converter should be the top-most chassis in the stack to insure adequate cooling.
10. Do not connect the common terminals 9 or 18 to earth ground unless an isolation transformer is used!  
  
DAMAGE TO THE ASSEMBLY WILL RESULT IF THE AC SUPPLY IS GROUNDED.
11. The input power circuit (terminals 3 and 7) must be properly fused.