



# PCTI

*Power Conversion Solutions*



***Solid State  
Frequency Converters***

# PCTI Frequency Converters

Power Conversion Technologies, Inc. offers a wide variety of frequency converter configurations to meet any application be it avionics, ground power, ship board or others. Our versatile designs can accommodate a range of aircraft from commuters, to fighter jets to commercial wide-bodies. PCTI's state of the art technology incorporates DSP (digital signal processor) control to be able to achieve the lowest total harmonic distortion (1%) available globally. This technology provides real time control and correction of numerous operational parameters resulting in increased performance, lower energy consumption and better reliability. PCTI inverter technology sets a new industry standard.



90KVA Frequency Converter with selectable input (480V/220V/380V, 50/60Hz) and dual output

## Standard Specifications

### Input

- ▶ Voltage:  $\pm 10\%$   
Single Phase: 110, 115, 120, 130, 200, 208, 230  
Three Phase: 208, 220, 230, 380, 400, 415, 440, 450, 480, 575
- ▶ Frequency: 50/60Hz
- ▶ Power Factor: better than 0.98 lagging from 10% to full load

### Output

- ▶ Voltage: 36V, 115/200V, or 208/120V
- ▶ Frequency: 400Hz, 50Hz, or 60Hz  $\pm 0.05\%$  crystal controlled
- ▶ Power Ratings: 15 to 320KVA (please specify)
- ▶ Regulation: 1% independent phase regulation for combined no load to full load at rated input voltage change
- ▶ Control Technology: Digitally Synthesized Pulse Width Modulation
- ▶ Transient Response: 500microsecond for a 90% load change on any phase or combination of phases (exceeds MIL-STD-704F)
- ▶ Wave Shape: Sinewave
- ▶ Crest Factor: 1.41 + 0.1
- ▶ THD: less than 2% THD, 1% on any single frequency, and less than 4% for non-linear loads
- ▶ Current Limit: 110% of load
- ▶ Power Factor: 0.8 lead to 0.8 lag. Continuous zero lead to zero lag at full rated output without damage to the unit.
- ▶ Overload Capacity:
  - 110% for 1 hour (60 minutes)
  - 125% for 10 minutes
  - 150% for 2 minutes
  - 200% for 20 seconds
  - 300% for 6 seconds

### Protection

- ▶ Input Short Circuit (Circuit Breaker with enclosure door interlock)
- ▶ Input Phase Loss
- ▶ Phase Rotation - unit will correct for any phase rotation
- ▶ Electronic overvoltage shutdown
- ▶ Electronic undervoltage shutdown
- ▶ Electronic Overcurrent shutdown
- ▶ Electronic Overtemperature shutdown
- ▶ Load Imbalance (greater than 25%) shutdown

# Standard Specifications

## Features

- ▶ Superior DSP Control Technology (see below)
- ▶ Wave Shape: Pure Sinewave
- ▶ Lightest weight in industry
- ▶ The limits over-voltage and under-voltage shall be as defined in MIL-STD-704 plus or minus 2 percent.
- ▶ High efficiency for low operating costs (92% or better)
- ▶ Automatic line drop compensation

## DSP Control Technology

- ▶ IGBT based on DSP (digital signal processor)-digitally synthesized Pulse Width Modulation (PWM)
- ▶ Lowest total harmonic distortion (1%THD) in the industry
- ▶ Increased performance. The fast math-intensive functions and high execution speed allow for faster control response and correction to achieve desired parameters
- ▶ Input active power factor correction
- ▶ Reduced energy consumption. Active harmonic cancellation and better energy management is achieved by the real-time control of the DSP software
- ▶ Increased design flexibility - can change control functionality and performance specifications via software rather than hardware; permits easy modifications in the field in the event of application changes
- ▶ Single control board increases reliability over multiple control boards
- ▶ Optional PWM multilevel technology for very high power, low dv/dt, low EMI/RFI emissions
- ▶ Optional communications package for troubleshooting in the field via internet

## Front Panel Devices/Instrumentation

- ▶ Start Pushbutton, Stop/Reset Pushbutton
- ▶ Indicators: Power ON, Run, Fault, Overvoltage, Undervoltage
- ▶ Ammeter, Voltmeter with three phase selector switches
- ▶ Frequency Meter
- ▶ Output Voltage Trim adjust ( $\pm 10\%$ )

## Environmental/Mechanical

- ▶ Enclosure type: Nema 12 ventilated
- ▶ Cooling: Forced Air
- ▶ Altitude: Up to 10,000ft without derating
- ▶ Temperature: Operating: -40 to 50°C; Storage: -40°C to 65°C
- ▶ Humidity: up to 98% non-condensing
- ▶ Acoustical Noise: 65dBA maximum at 1 meter

## Codes and Standards

- ▶ MIL-STD-704F
- ▶ UL1012
- ▶ CE Compliant

## Options

- ▶ Remote Control via analog signal
- ▶ Computer Interface (RS232,RS485, IEEE488, GPIB)
- ▶ Parallel and Load Sharing
- ▶ Dual input
- ▶ 12 pulse input rectification for low input current harmonics
- ▶ 28.5V DC Output (specify amps or power)
- ▶ Cart Mounted with towbar
- ▶ Running gear with towbar
- ▶ Indoor, Outdoor, Stainless, totally enclosed enclosures (Nema or IP)
- ▶ Input cables
- ▶ Output cables with plug
- ▶ E&F Interlock Status Indicator
- ▶ 28V Bypass Mode Indicator
- ▶ Emergency Mushroom Power Off Pushbutton
- ▶ Push to Test Indicators,
- ▶ Digital Meters
- ▶ Elapsed Time Meter
- ▶ Field communications troubleshooting package-internet
- ▶ Multilevel PWM control technology

# Power Electronic Equipment

## About PCTI

Power Conversion Technologies, Inc. is a regular manufacturer of innovative power electronic products including control components, subassemblies and power electronic apparatus. With products like our IGBT drivers and Universal DSP Controller, we are addressing a new era in power electronics as applied to industrial equipment. Our engineering staff has indepth knowledge in the key areas of power conversion such as power semiconductor analysis and application, thermal exchange, magnetic design and packaging. Let our extensive industrial applications expertise in power conversion benefit your products and markets.

## Products

### ▶ Aircraft Ground Support

- 400Hz Frequency Converters
- 28.5V DC Power Supplies
- Gateboxes
- Switchboard
- Line Drop Compensators
- Line Protection Modules

### ▶ Power Supplies (AC & DC)

- Switched Mode
- Linear
- Custom Power Supplies
  - High Precision
  - High Frequency
  - High Current
  - High Voltage
  - Low Voltage

### ▶ Battery Chargers

- High Current
- Switched Mode
- Linear

### ▶ Inverters

- AC/AC, DC/DC, DC/AC/DC
- For 50/60Hz or 60/50Hz conversion, Fuel Cells, Solar, Wind
- Power, Transportation

### ▶ Control Products

- IGBT Drive OEM Board
- SCR Firing Circuit
- DSP Control for OEM or Retrofit Applications
- Load Sensing Circuits

## Partial List of Customers

### Industrial/Commercial/Aerospace

- BAE Systems
- General Dynamics
- Bechtel International Systems, Inc.
- Ford Motor Company
- Boeing Corporation
- NASA
- Raytheon Missile Systems
- Delphi Automotive
- Caterpillar
- Mitsubishi
- Occidental Petroleum
- Cutler Hammer
- Hughes Research Laboratories
- Massachusetts Bay Transportation
- Glegg Water Conditioning
- Chang Hua Water Refiners
- Vermont Yankee Nuclear
- Duquense Light
- Georgia Power
- General Motors Power Train Division
- National Institute of Standards & Technology
- New York Power Authority
- Port Authority of Allegheny County
- Westinghouse Science & Tech. Center

### Department of Defense/Military

#### US Navy

- Bayview Large Scale Vehicles
- Los Alamitos Naval Air Station
- China Lake Naval Weapons Center
- Jacksonville Naval Air Station
- Pacific Missile Range, Hawaii
- Naval Surface Warfare Center
- Ocean Surveillance Center
- Sigonella Naval Air Station-Italy
- Miramar Naval Air Station
- Seal Beach Naval Weapons Station

#### US Army

- Fort Campbell
- Army Corps of Engineers
- Fort Bragg, Aberdeen Proving Ground
- Fort Rucker
- Corpus Christi Army Depot

#### US Marines

- Camp Le Jeune
- Camp Pendleton

#### US Air Force

- McClellan Air Force Base
- Tyndall Air Force Base
- Miramar Air Force Base
- Spangdahlem Air Force Base
- Sigonella Air Force Base

#### US Coast Guard

- Los Alamos National Laboratory
- Bureau of Reclamation/Dept. of Interior
- Western Area Power Administration/DOE
- Taiwan Navy
- Canadian Department of National Defense



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