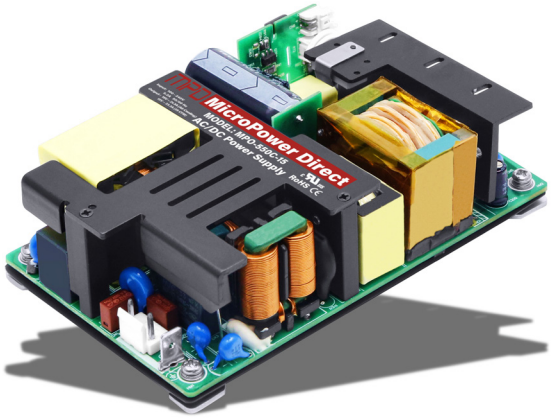
# MPO-550C

# Very Compact, 550W Industrial AC/DC Power Supplies




## Key Features:

- 550W Output Power
- Very Small 5" x 3" Size
- UL 62368 Approval
- Insulation 2 x MOPP
- -40° to +70°C Operation
- Suitable For BF Apps
- Power Good Signal
- Meets EN 55032 B
- Meets EN 60335
- Meets EN 61558
- <0.1mA Leakage Current
- Active PFC

## Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

### Input

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Input Voltage Range | | 90 | | 264 | VAC |
| | | 127 | | 370 | VDC |
| Input Frequency | | 47 | | 63 | Hz |
| Input Current | 115 VAC | | | 6.5 | A |
| | 230 VAC | | | 4.0 | |
| Leakage Current | 264 VAC | Contact <0.1 mA; Earth <0.5 mA | | | |
| Inrush Current, Cold Start | 115 VAC | | 50 | | A Pk |
| | 230 VAC | | 80 | | |
| Power Factor | 115 VAC | 0.98 | | | --- |
| | 230 VAC | 0.95 | | | |

### Output

| Parameter | Conditions | | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage Accuracy, 0-100% Load | 36V/48V/54V Output | | | ±1.0 | | % |
| | All Other Models | | | ±2.0 | | |
| Line Regulation | At Rated Load | | | ±0.5 | | % |
| Load Regulation | 0 - 100% Load | | | ±1.0 | | % |
| Ripple & Noise (20 MHz) | See Note 2 | | | | 200 | mV |
| Hold-Up Time | 115 VAC Input | | 10 | | | mSec |
| | 230 VAC Input | | 10 | | | |
| Temperature Coefficient | | | | ±0.03 | | %/°C |
| Temperature Derating | 25CFM | -40°C to +50°C | 0 | | | %/°C |
| | | +50°C to +70°C | 2.5 | | | |
| | 230V/320W | +45°C to +50°C | 4.0 | | | W/°C |
| | | +50°C to +60°C | 6.0 | | | |
| | 115V/310W | +30°C to +40°C | 1.0 | | | |
| | | +40°C to +50°C | 6.0 | | | |
| | | +50°C to +60°C | 4.0 | | | |
| Input Voltage Derating | 90 - 115VAC | | 1.0 | | | %/VAC |
| | 115 - 264VAC | | 0 | | | |
| | 127 - 160VDC | | 0.76 | | | %/VDC |
| | 160 - 370VDC | | 0 | | | |
| Standby Power Consumption | 18V/19V/27V/36V Output | | | | 0.50 | W |
| | All Other Models | | | | 0.60 | |
| Fan Power | | | 12V @ 0.50A | | | |
| Over Current Protection | Self Recovery | | 105 | | | %IOUT |
| Over Temperature Protection | See Note 3 | | | | | |
| Short Circuit Protection, See Note 4 | Continuous (Autorecovery) | | | | | |

### General

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Isolation Voltage, See Note 5 | Input to Output | 4,000 | | | VAC |
| | Input to Ground | 2,000 | | | |
| | Output to Ground | 1,500 | | | |
| Insulation Resistance | See Note 6 | 100 | | | MΩ |
| Isolation Level | Input to Output | 2 x MOPP | | | |
| | Input to Ground | 1 x MOPP | | | |
| | Output to Ground | 1 x MOPP | | | |
| Switching Frequency | | | 95 | | kHz |

### Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Operating Temperature Range | Ambient | -40 | | +70 | °C |
| Storage Temperature Range | | -40 | | +85 | °C |
| Cooling | Free Air Convection (See Derating Curves) | | | | |
| Humidity, RH, Non-condensing | Operating | 20 | | 90 | % |
| | Storage | 10 | | 95 | |

### Physical

| | |
|---|---|
| Size | 5.00 x 3.00 x 1.59 in. (See Mechanical Drawing on Page 5) |
| Weight | 17.28 oz (490g) (See Mechanical Drawing on Page 5) |

### Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 200 | | | kHours |
| Safety Standards | UL/cUL 62368-1 recognition (UL certificate) | | | | |
| | EN60335 | | | | |
| Safety Class | Class I | | | | |


**MicroPower Direct**
46 Eastman Street
Unit 1
Easton, MA 02375
USA

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.com


MICROPOWER DIRECT

**www.micropowerdirect.com**

## Model Selection Guide



| | Model Number | Cooling Method | Output | | | | Over Voltage Protection (VDC) See Note 7 | Output Capacitive Load (μF Max) | Efficiency @ 230 VAC (%, Typ) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Voltage (VDC) | Current (A) | | Power (W) | Adj Range (VDC) | | | |
| | | | | Rated | % Min. | | | | | |
| | MPO-550C-12 | Air Cooling | 12.0 | 26.70 | 0.00 | 320.4 | 11.40 - 12.60 | 15.6 | 6,000 | 91.0 |
| | | 25 CFM | | 41.60 | | 499.2 | | | | |
| *UL* | MPO-550C-15 | Air Cooling | 15.0 | 21.30 | 0.00 | 319.5 | 14.25 - 15.75 | 19.5 | 6,000 | 92.0 |
| | | 25 CFM | | 33.30 | | 499.5 | | | | |
| | MPO-550C-18 | Air Cooling | 18.0 | 17.80 | 0.00 | 320.4 | 17.10 - 19.90 | 23.4 | 6,000 | 92.5 |
| | | 25 CFM | | 27.80 | | 500.4 | | | | |
| | MPO-550C-19 | Air Cooling | 19.0 | 16.80 | 0.00 | 319.2 | 17.10 - 19.90 | 23.4 | 6,000 | 92.5 |
| | | 25 CFM | | 26.30 | | 499.7 | | | | |
| *UL* | MPO-550C-24 | Air Cooling | 24.0 | 13.40 | 0.00 | 321.6 | 22.80 - 25.20 | 31.2 | 6,000 | 93.0 |
| | | 25 CFM | | 22.90 | | 549.6 | | | | |
| | MPO-550C-27 | Air Cooling | 27.0 | 11.90 | 0.00 | 321.3 | 25.65 - 28.35 | 35.1 | 4,000 | 93.5 |
| | | 25 CFM | | 20.40 | | 550.8 | | | | |
| | MPO-550C-36 | Air Cooling | 36.0 | 8.90 | 0.00 | 320.4 | 34.20 - 37.80 | 46.8 | 3,000 | 94.0 |
| | | 25 CFM | | 15.30 | | 550.8 | | | | |
| | MPO-550C-48 | Air Cooling | 48.0 | 6.70 | 0.00 | 321.6 | 45.60 - 50.40 | 60.0 | 2,000 | 94.0 |
| | | 25 CFM | | 11.46 | | 550.0 | | | | |
| | MPO-550C-54 | Air Cooling | 54.0 | 5.75 | 0.00 | 310.5 | 51.30 - 56.70 | 63.0 | 1,500 | 94.0 |
| | | 25 CFM | | 10.20 | | 550.8 | | | | |
| | * MPO-550C-15, -24 have UL/cUL 62368-1 recognition (UL certificate). Contact the factory for safety standard status of other models. | | | | | | | | | |

**Notes:**

1. Units that are marked with the "UL" in the model selection table above are approved to UL 62368 and UL 60601. Other models meet these specifications.
2. Output ripple is measured at 20 MHz bandwidth using a 0.1 μF ceramic capacitor, and a 47 μF electrolytic capacitor connected in parallel as close to the power supply terminals as possible.
3. After an overtemperature fault, the unit will recover automatically when the temperature drops.
4. Output short circuit protection is provided by a "hiccup mode" circuit. The unit recovers <5 seconds after the fault condition is removed for the 18V, 19V, 27V and 36V output models. Recovery time is 10 seconds for all other models.
5. Input-output, input-ground and output-ground isolation are tested for 60 seconds with a leakage current of <5 mA.
6. Insulation resistance is tested at an ambient temperature of 25°C ± 5°C, at a relative humidity of <95%RH (no condensation) with a test voltage of 500 VDC. It is given for input to output, input to ground and output to ground.
7. After an overvoltage fault, the unit power must be recycled for the unit to recover.
8. All units include an on-board slow blow fuse.

The **MPO-550C** is also available with a compact metal case. Contact the factory for more information. (Example **MPO-550C-12-C**)

## EMC Characteristics

| Parameter | Conditions | Criteria | Level |
|---|---|---|---|
| Conducted Emissions | EN 55032 | | Class B |
| Radiated Emissions | EN 55032 | | Class B (Category I) |
| | | | Class A (Category II) |
| Harmonic Current | EN 61000-3-2 | | Class A & Class D |
| Voltage Flicker | EN 61000-3-3 | | |
| ESD | EN 61000-4-2 | A | ±15 kV Air |
| | | | ±8 kV Contact |
| RS | EN 61000-4-3 | A | 10V/m |
| EFT | EN 61000-4-4 | A | ±2 kV |
| Surge | EN 61000-4-5 | A | ±2 kV Line to Line |
| | | | ±4 kV Line to Gnd |
| CS | EN 61000-4-6 | A | 10V rms |
| Dips | EN 61000-4-11 | B | 0%, 70% |

**Notes:**

1. All EMC tests are conducted on a metal plate measuring 360 x 360 mm with a thickness of 1mm. Contact the factory for more information.

## Operating Signals

Power On and Power Good signals are provided to help monitor power supply operation. A couple of notes are:

1. The PG signal goes high with 10 mS to 500 mS delay after the power supply start up.
2. The PG signal goes low at least 1 mS before the output voltage reaches 90% of nominal value.

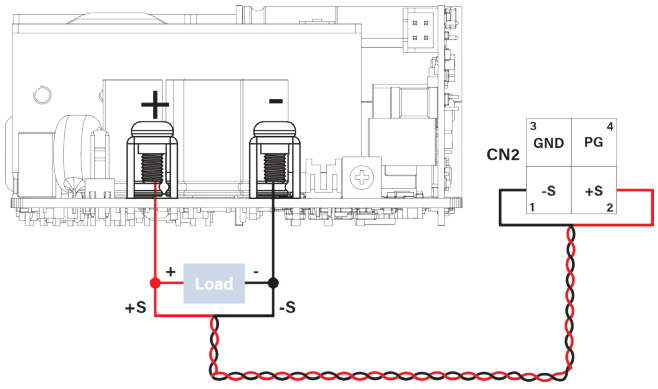
See page 5 for connection information.

| Signal | Conditions | | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| PS ON Input Signal | Power ON | PS_ON High | 2.0 | | 5.0 | VDC |
| | Power OFF | PS_ON Low | 0 | | 0.5 | |
| PG Signal | Power On, See Note 1 | | 10 | | 500 | mS |
| | Power Off/Power Fail, See Note 2 | | 1 | | | mS |
| | High Level | High | 2.0 | | 6.0 | VDC |
| | Low Level | Low | 0 | | 0.6 | |

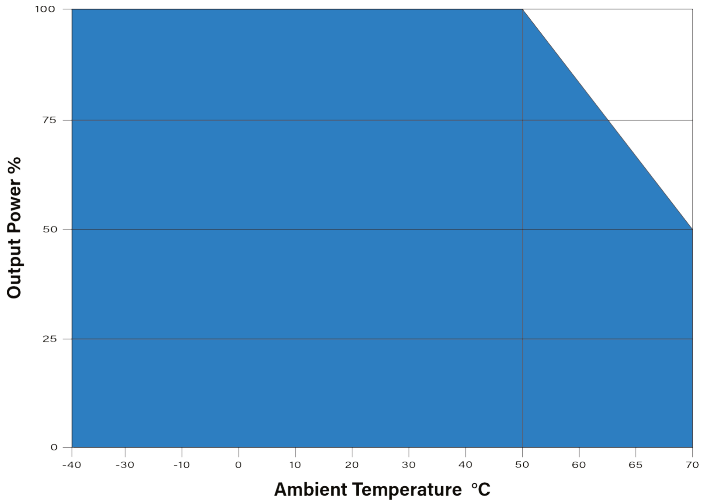
## Remote Sensing

The remote sense connection may be used to compensate for a voltage drop on the output cable. If used, the connection is made as shown in the figure at right. Some precautions include:

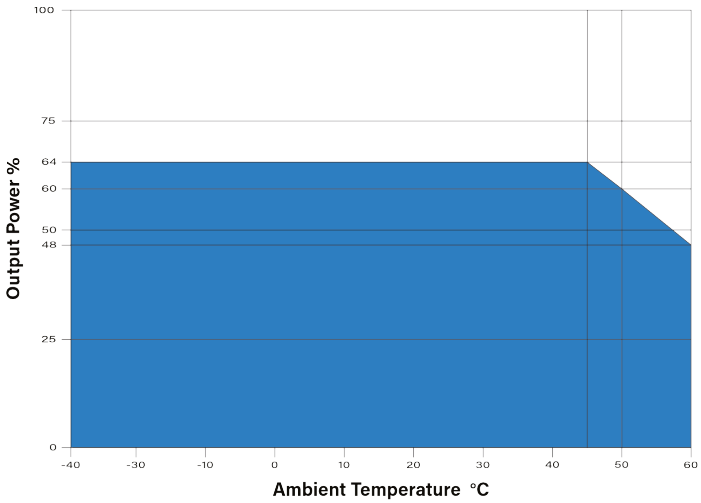
1. The +S and -S terminals cannot be reversed or shorted. The power supply would be damaged if this occurs.
2. The remote compensation connection must be made with twisted pair wires (as shown in the diagram at left). Otherwise, damage to the unit may occur.



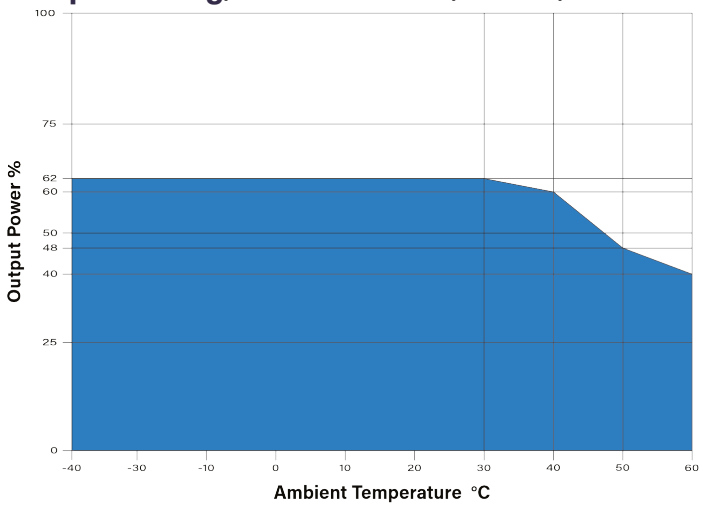
## Temperature Derating, All Models, 25 CFM



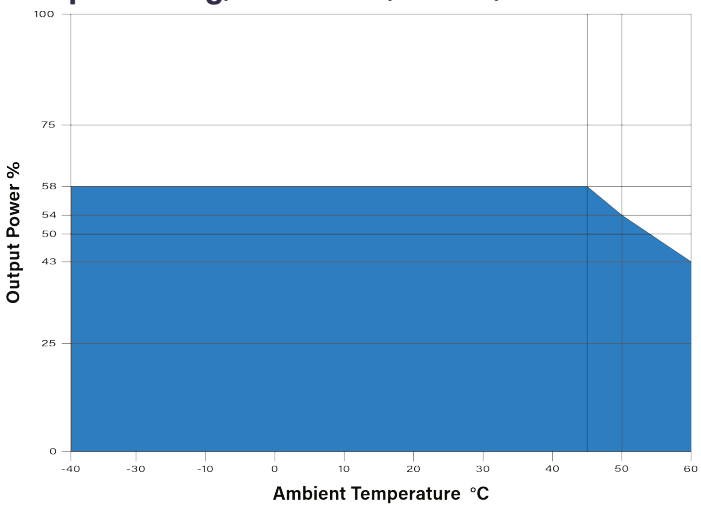

## Temp Derating, 12/15/18/19 VOUT, 230 VAC, Convection



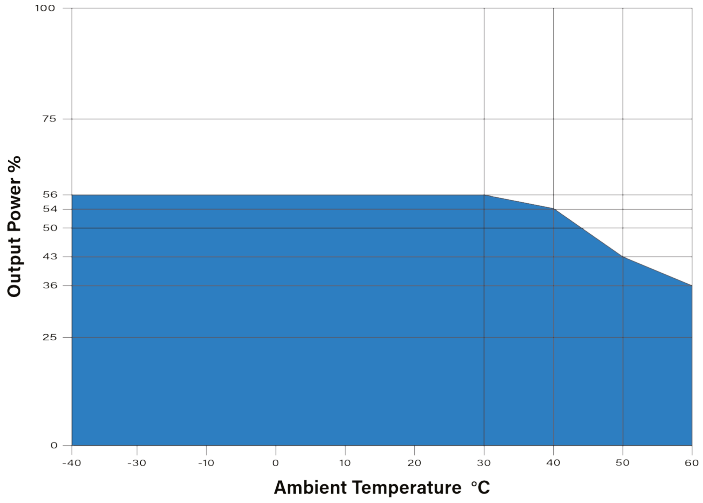

## Temp Derating, 12/15 /18/19 VOUT, 115 VAC, Convection



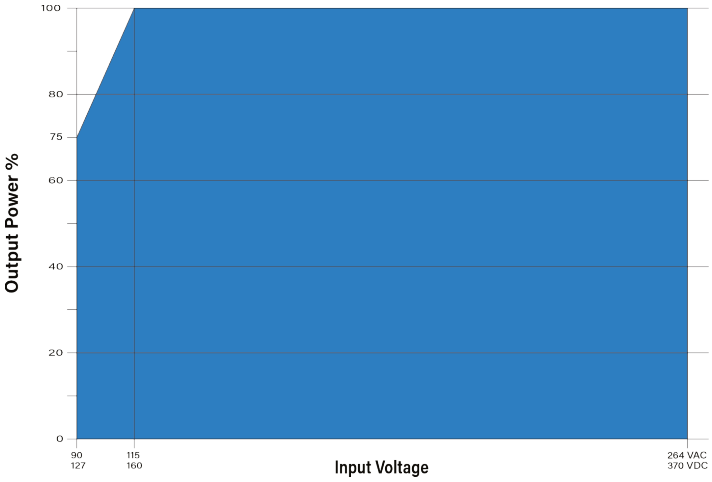

## Temp Derating, Other Models, 230 VAC, Convection



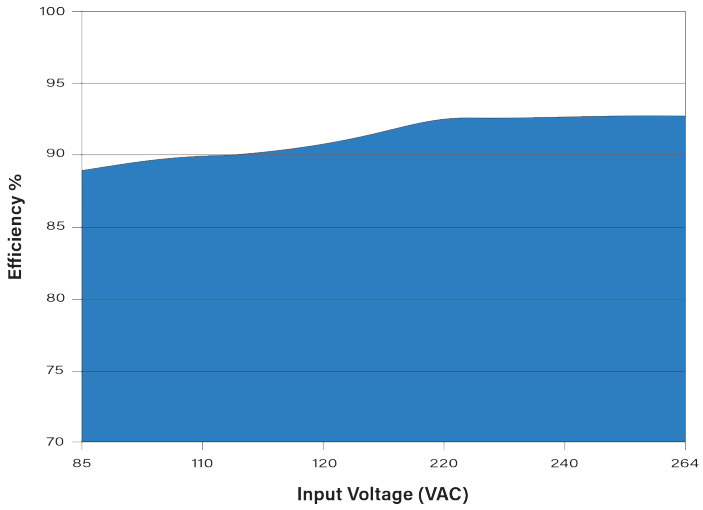

## Temp Derating, Other Models, 115 VAC, Convection



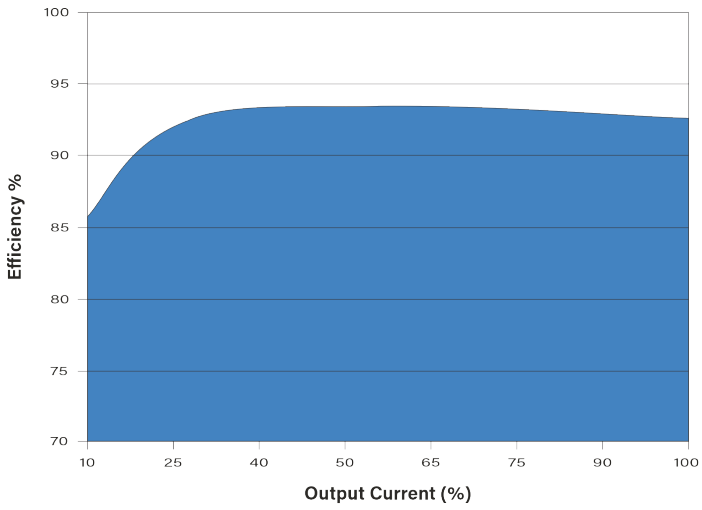

## Input Voltage Derating



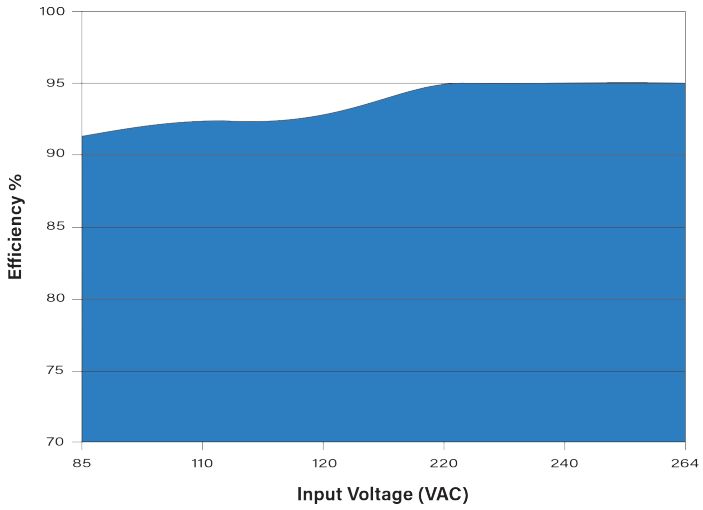
## Efficiency vs Input Voltage: 12 VOUT



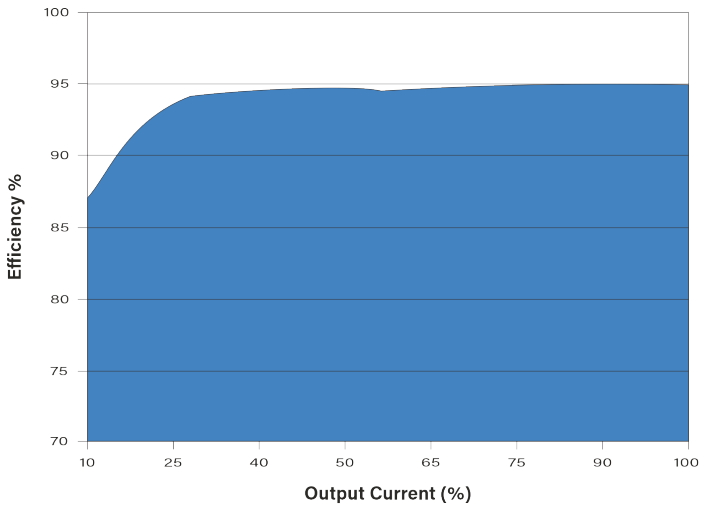

## Efficiency vs Output Load: 12 VOUT



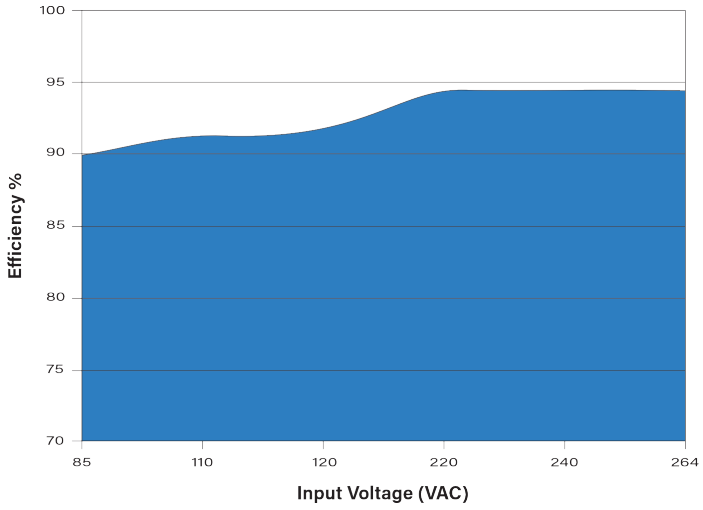

## Efficiency vs Input Voltage: 24 VOUT



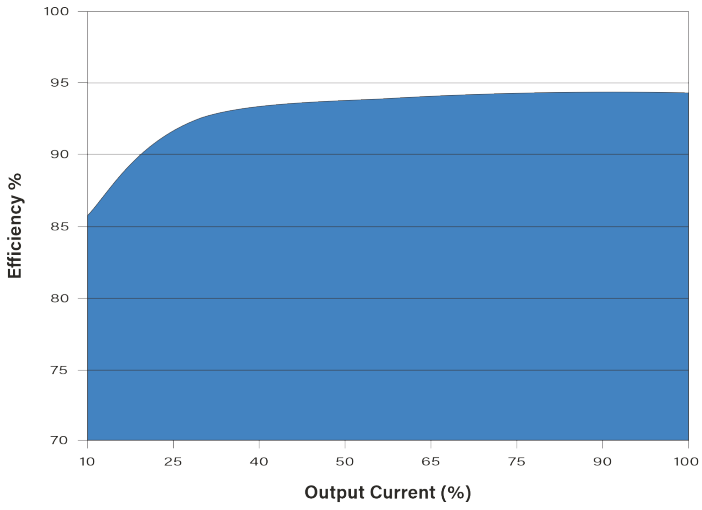

## Efficiency vs Output Load: 24 VOUT




## Efficiency vs Input Voltage: 48 VOUT

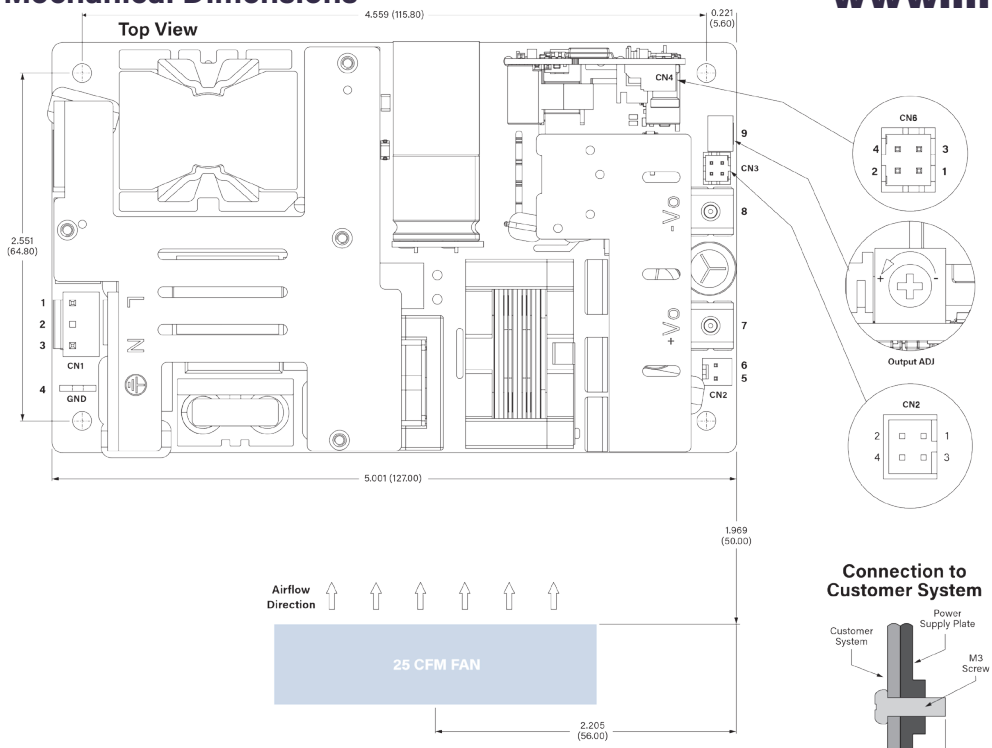


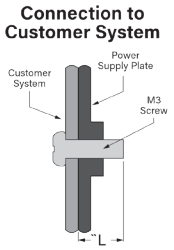

## Efficiency vs Output Load: 48 VOUT

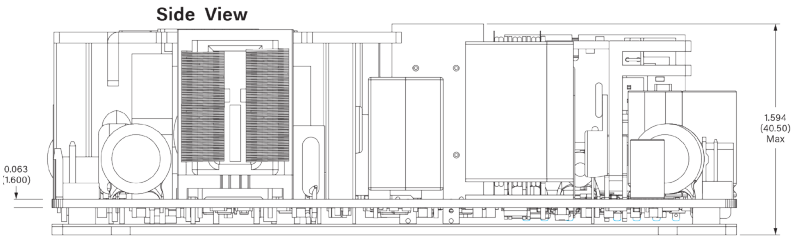


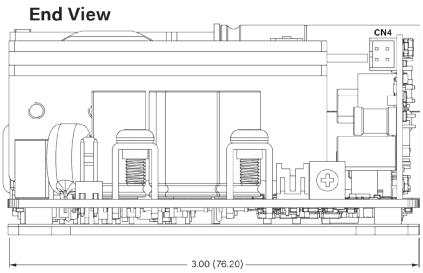
## Mechanical Dimensions

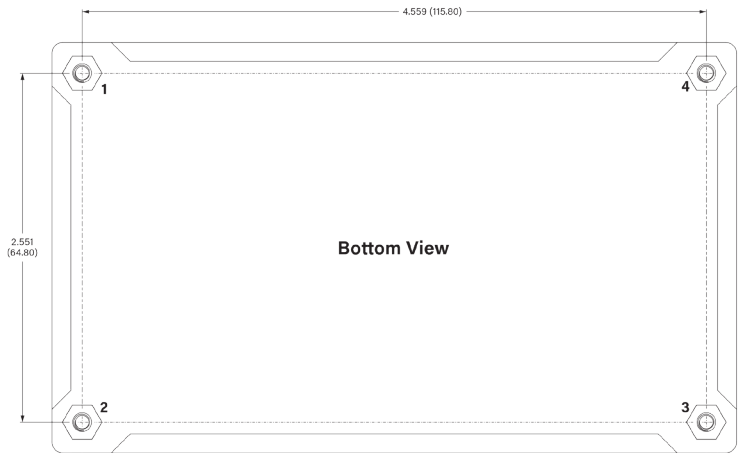





## Power Connections

**Input Connector (CN1):**

- Mating Terminal: JST VHR
- Contact: JST SVH-21T-P1.1

| Pin | Function |
|---|---|
| 1 | AC-Line |
| 2 | No Connection |
| 3 | AC-Neutral |

**Ground Connection:** Ferrule Wire

**Output Connection:**

- Screw Terminals (7, 8) M4
  Max Tightening Tourqe 1.2N•m
- Adjust. Resistor (9)

| Pin | Function |
|---|---|
| 7 | +VOUT |
| 8 | -VOUT |
| 9 | VADJ |

## Signal Connections

**CN2: Fan Connector**

- Mating Terminal: TKP 2502
- Contact: TKP 8811

| Pin | Function |
|---|---|
| 5 | +Fan |
| 6 | -Fan |

**Remote Sense (CN2):**

- Mating Terminal: TKP DH2-4P
- Contact: TKP DHT

| Pin | Function |
|---|---|
| 1 | RS - |
| 2 | RS + |

See Page 2 for more Info

**Power Good (CN2):**

| Pin | Function |
|---|---|
| 3 | GND |
| 4 | Power Good |

See Page 2 for more Info

**Standby Output (CN6):**

- Mating Terminal: TKP DH2-4P
- Contact: TKP DHT

| Pin | Function |
|---|---|
| 1 | + 5V |
| 2 | GND |

**Power On Signal (CN4):**

| Pin | Function |
|---|---|
| 3 | PS-ON |
| 4 | GND |

See Page 2 for more Info

**Unit Mounting Screws:**

| Position | Screw | L (Recommended) | Max Torque |
|---|---|---|---|
| 1, 2, 3, 4 | M3 | 2.5 mm | 0.4N•m |

For class I systems, points 1, 2 & 3 must be connected to earth grnd.
For class II systems, points 1, 2 & 3 must be connected together.

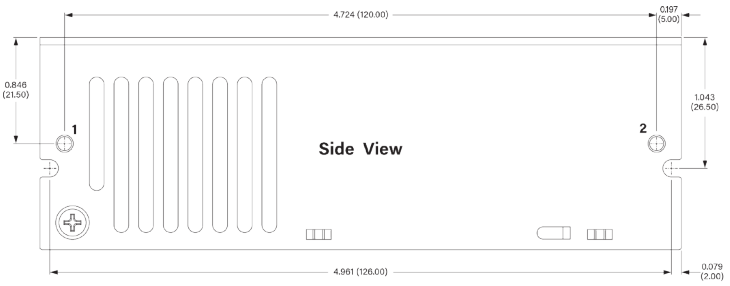
**Notes:**

- All dimensions are typical in inches (mm)
- General Tolerance = ±0.039 (±1.0)
- Weight (Typ) = 17.28 Oz (490g)
- The Fan Power output (CN2) should not be used to power other devices
- The unit should be connected to PE before operating. This connection can be made at any position (1 to 4) as shown on the mechanical diagram.
- A minimum of 10 mm should be maintained between the power supply and any other components
- The unit uses double pole, neutral fusing. Disconnect the mains before servicing.

**MPD:** Eastman Street, Unit 1, Easton, MA 02375 • Tel: (781)-344-8226) • Fax: (781)-344-8481 • E-Mail: sales@micropowerdirect.com

# Mechanical Dimensions, MPO-550C-C






## Power Connections

**CN1: Input Connector**
- Mating Terminal: JST VHR
- Contact: JST SVH-21T-P1.1

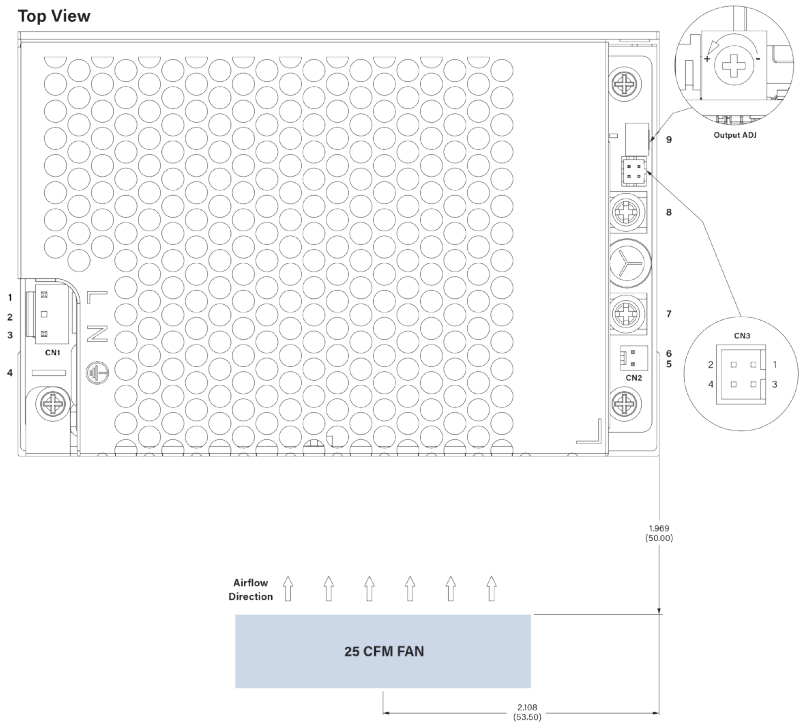
| Pin | Function |
|---|---|
| 1 | AC-Line |
| 2 | No Connection |
| 3 | AC-Neutral |

**Ground Connection:** Ferrule Wire

**Output Connection:**
- Screw Terminals (7, 8) M4
  Max Tightening Tourqe 1.2N•m
- Adjust. Resistor (9)

| Pin | Function |
|---|---|
| 7 | +VOUT |
| 8 | -VOUT |
| 9 | VADJ |

Top View




## Signal Connections

**CN2: Fan Connector**
- Mating Terminal: TKP 2502
- Contact: TKP 8811

| Pin | Function |
|---|---|
| 5 | +Fan |
| 6 | -Fan |

**CN4: Standby Output**
- Mating Term: TKP DH2-4P
- Contact: TKP DHT

| Pin | Function |
|---|---|
| 1 | + 5V |
| 2 | GND |

**CN4: Power On Signal**

| Pin | Function |
|---|---|
| 3 | PS-ON |
| 4 | GND |

See Page 2 for more Info

**CN3: Remote Sense**
- Mating Term: JST PHD-2*2Y
- Contact: JST PHD-TE

| Pin | Function |
|---|---|
| 1 | RS - |
| 2 | RS + |

See Page 4 for more Info

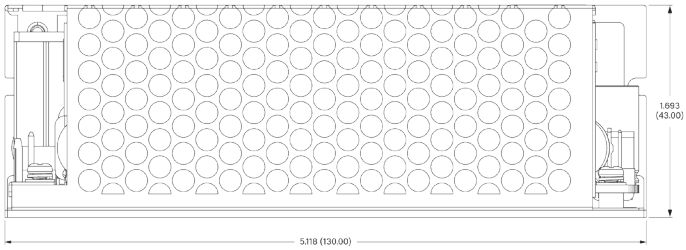
**CN3: Power Good**

| Pin | Function |
|---|---|
| 3 | GND |
| 4 | Power Good |

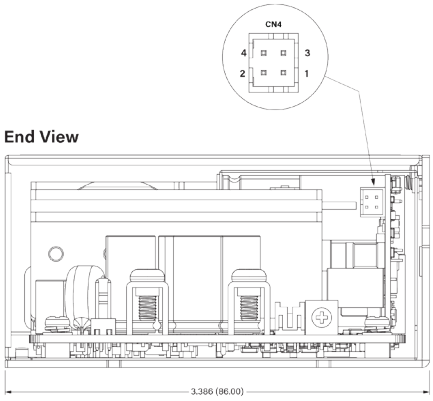
See Page 2 for more Info



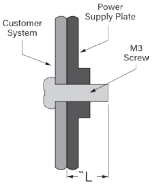

Side View




End View




**Connection to Customer System**



**Unit Mounting Screws:**

| Position | Screw | L (Recommended) | Max Torque |
|---|---|---|---|
| 1, 2 | M3 | 4.0 mm | 0.4N•m |
| 3, 4, 5, 6 | M3 | 2.0 mm | 0.4N•m |

1. The outer case needs to be connected to the system PE

**Notes:**
- All dimensions are typical in inches (mm)
- General Tolerance = ±0.039 (±1.0)
- Weight (Typ) = 21.34 Oz (605g)
- The Fan Power output (CN2) should not be used to power other devices
- The unit should be connected to PE before operating. This connection can be made at any position (1 to 6) as shown on the mechanical diagram.
- A minimum of 10 mm should be maintained between the power supply and any other components
- The unit uses double pole, neutral fusing. Disconnect the mains before servicing.

MicroPower Direct
46 Eastman Street, Unit 1, Easton, MA 02375 • TEL: (781) 344-8226 • FAX: (781) 344-8481 • E-Mail: sales@micropowerdirect.com