

## DESCRIPTION

The PU650 series comprising single and multiple output models for 650-700 watts of continuous output power is specially designed for ITE and industrial applications. They operate at 90-264 VAC input voltage without the need of a selector strap. The units are constructed on a printed circuit board with a U-bracket for mechanical support and heat sinking. A cover-and-fan assembly can be added during manufacturing.

## FEATURES

- EN61000-3-2 class A and D compliant
- Power Factor 0.98 typical
- Overvoltage protection
- Short-circuit protection
- Thermal protection
- Power Fail Detect (PFD) signal
- 100% burn-in at full rated load
- Remote sense on output #1 and output #2
- Remote inhibit – TTL high to disable output
- Compliant with RoHS requirements

## INPUT SPECIFICATIONS

Input voltage: 90-264 VAC  
 Input frequency: 47-63 Hz  
 Input current: 10 A (rms) for 115 VAC  
 5 A (rms) for 230 VAC  
 Earth leakage current: 240  $\mu$ A max. @ 264 VAC, 63 Hz

## OUTPUT SPECIFICATIONS

Output voltage/current: See rating chart.  
 Maximum output power: See rating chart.  
 Ripple and noise: 1% peak to peak maximum  
 Overvoltage protection: Provided on output #1 only; set at 115-140% of its nominal output voltage  
 Overcurrent protection: All outputs protected to short circuit conditions  
 Temperature coefficient: All outputs  $\pm 0.04\%$  / $^{\circ}$ C maximum  
 Transient response: Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500  $\mu$ s after a 25% step load change  
 Fan power: 12 V at 400 mA maximum for B version, 12 V at 100 mA maximum for C version

## INTERFACE SIGNALS

PFD: TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1 ms prior to master output dropping 5% below its nominal value. This signal also provides a minimum delay of 100 ms after master output is within regulation.  
 Inhibit: Requires an external TTL high level signal to inhibit outputs for standard models

## PU650 SERIES



CE (LVD)

RoHS

## SAFETY STANDARD APPROVALS



UL 60950-1, CSA C22.2 No. 60950-1



TÜV EN 60950-1

## ENVIRONMENTAL SPECIFICATIONS

Operating temperature: 0 $^{\circ}$ C to +70 $^{\circ}$ C  
 Storage temperature: -40 $^{\circ}$ C to +85 $^{\circ}$ C  
 Relative humidity: 5% to 95% non-condensing  
 Derating: Derate from 100% at +50 $^{\circ}$ C, linearly to 50% at +70 $^{\circ}$ C

## GENERAL SPECIFICATIONS

Switching frequency: 70 KHz  $\pm 10$  KHz  
 Power factor: 0.98 typical  
 Efficiency: 80% minimum on all models  
 Hold-up time: 12 ms minimum at 110 VAC  
 Line regulation:  $\pm 0.2\%$  maximum at full load  
 Inrush current: 50 A @ 115 VAC or 100 A @ 230 VAC at 25 $^{\circ}$ C cold start  
 Withstand voltage: 3000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground  
 MTBF: 300,000 hours minimum at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK- 217F

## EMC Performance

EN55022: Class B conducted, Class A radiated  
 EN61000-3-2: Harmonic distortion, Class A and D  
 EN61000-3-3: Line flicker  
 EN55024  
 EN61000-4-2: ESD,  $\pm 8$  KV air and  $\pm 4$  KV contact  
 EN61000-4-3: Radiated immunity, 3 V/m  
 EN61000-4-4: Fast transient/burst,  $\pm 1$  KV  
 EN61000-4-5: Surge,  $\pm 1$  KV diff.,  $\pm 2$  KV com.  
 EN61000-4-6: Conducted immunity, 3 Vrms  
 EN61000-4-8: Magnetic field immunity, 1 A/m  
 EN61000-4-11: Voltage dip immunity, 30% reduction for 500 ms and >95% reduction for 10 ms

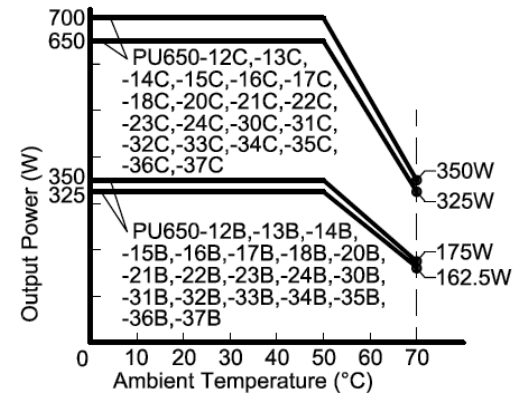
## OUTPUT VOLTAGE/CURRENT RATING CHART

Model <sup>(1)</sup>	Output #1 <sup>(3)(5)</sup>				Output #2 <sup>(5)</sup>				Output #3 <sup>(4)</sup>				Max. Output Power <sup>(5)</sup>
	V1	Imin.	I <sub>max.</sub>	Tol.	V2	Imin.	I <sub>max.</sub>	Tol.	V3	Imin.	I <sub>max.</sub>	Tol.	
PU650-12B	12 V	0 A	54.2 A	±2%	(N/A)				(N/A)				325 W / 650 W
PU650-13B	15 V	0 A	43.4 A	±2%	(N/A)				(N/A)				325 W / 650 W
PU650-14B	24 V	0 A	27.1 A	±2%	(N/A)				(N/A)				325 W / 650 W
PU650-15B	27 V	0 A	24.1 A	±2%	(N/A)				(N/A)				325 W / 650 W
PU650-16B	30 V	0 A	21.7 A	±2%	(N/A)				(N/A)				325 W / 650 W
PU650-17B	36 V	0 A	18.1 A	±2%	(N/A)				(N/A)				325 W / 650 W
PU650-18B	48 V	0 A	14.6 A	±2%	(N/A)				(N/A)				350 W / 700 W
PU650-20B	24 V	1.50 A	18.0 A	±2%	12 V	N/A	22 A	±5%	(N/A)				325 W / 650 W
PU650-21B	24 V	1.50 A	18.0 A	±2%	15 V	1.0 A	18 A	±5%	(N/A)				325 W / 650 W
PU650-22B	48 V	0.75 A	9.0 A	±2%	24 V	0.6 A	12 A	±5%	(N/A)				325 W / 650 W
PU650-23B	48 V	0.75 A	9.0 A	±2%	12 V	1.2 A	22 A	±5%	(N/A)				325 W / 650 W
PU650-24B	48 V	0.75 A	9.0 A	±2%	15 V	1.0 A	18 A	±5%	(N/A)				325 W / 650 W
PU650-30B	24 V	1.50 A	18.0 A	±2%	12 V	1.2 A	22 A	±5%	3.3 V	0 A	10 A	±3%	325 W / 650 W
PU650-31B	24 V	1.50 A	18.0 A	±2%	15 V	1.0 A	18 A	±5%	3.3 V	0 A	10 A	±3%	325 W / 650 W
PU650-32B	24 V	1.50 A	18.0 A	±2%	12 V	1.2 A	22 A	±5%	5.1 V	0 A	10 A	±3%	325 W / 650 W
PU650-33B	24 V	1.50 A	18.0 A	±2%	15 V	1.0 A	18 A	±5%	5.1 V	0 A	10 A	±3%	325 W / 650 W
PU650-34B	48 V	0.75 A	9.0 A	±2%	12 V	1.2 A	22 A	±5%	3.3 V	0 A	10 A	±3%	325 W / 650 W
PU650-35B	48 V	0.75 A	9.0 A	±2%	15 V	1.0 A	18 A	±5%	3.3 V	0 A	10 A	±3%	325 W / 650 W
PU650-36B	48 V	0.75 A	9.0 A	±2%	12 V	1.2 A	22 A	±5%	5.1 V	0 A	10 A	±3%	325 W / 650 W
PU650-37B	48 V	0.75 A	9.0 A	±2%	15 V	1.0 A	18 A	±5%	5.1 V	0 A	10 A	±3%	325 W / 650 W

### NOTES:

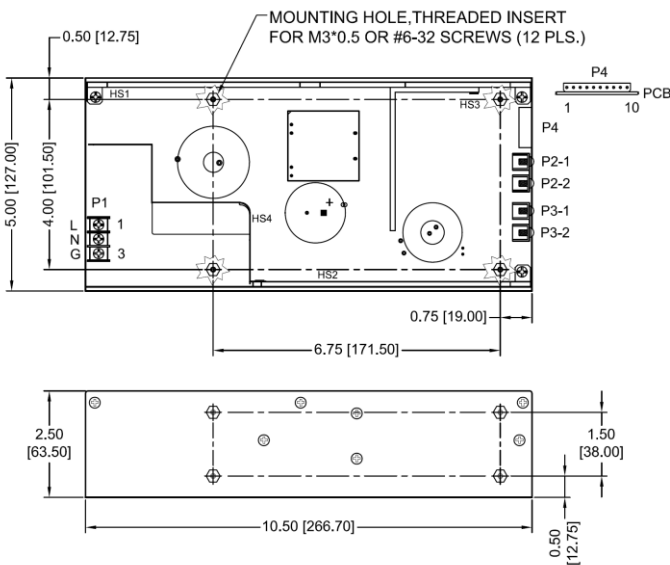
- Suffix "B" in model numbers denotes U-bracket form. Change "B" to "C" for enclosed form with cover-and-fan assembly, e.g. PU650-14C.
- All outputs are floating. They can be connected externally for positive or negative output.
- Output #1 can be adjusted within +/- 5% of their nominal voltage.
- Output #3 can be adjusted within +/- 15% of their nominal voltage.
- 650-700 watts for "C" version with cover-and-fan assembly. 325-350 watts for "B" version without moving air (maximum current of output #1 and #2 derated to 70%), or 650-700 watts with 50 CFM forced air provided by user.
- All models may be operated at no-load. At no-load, output voltage tolerance increases to +/- 10%.
- Ripple and noise is maximum peak-to-peak voltage value measured at output within 20 MHz bandwidth, at rated line voltage and output load ranges, and with a 10 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor across the output.

### OUTPUT POWER DERATING CURVE

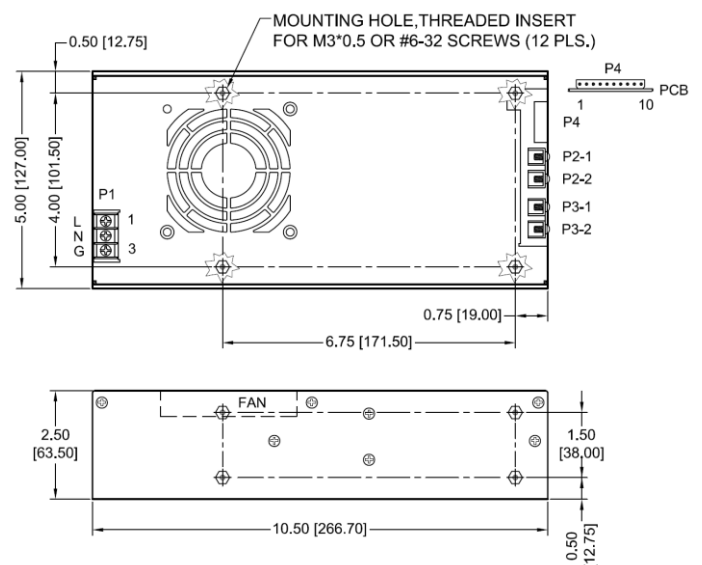


## MECHANICAL SPECIFICATIONS

### Single Output Models U-bracket Form

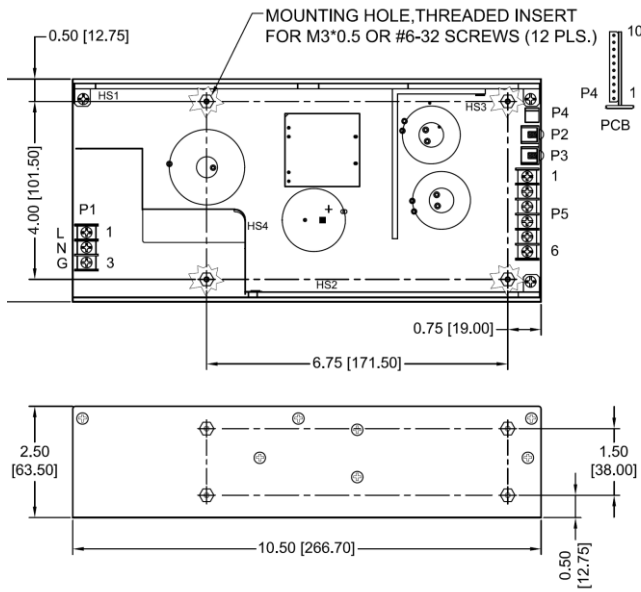


### Enclosed Form

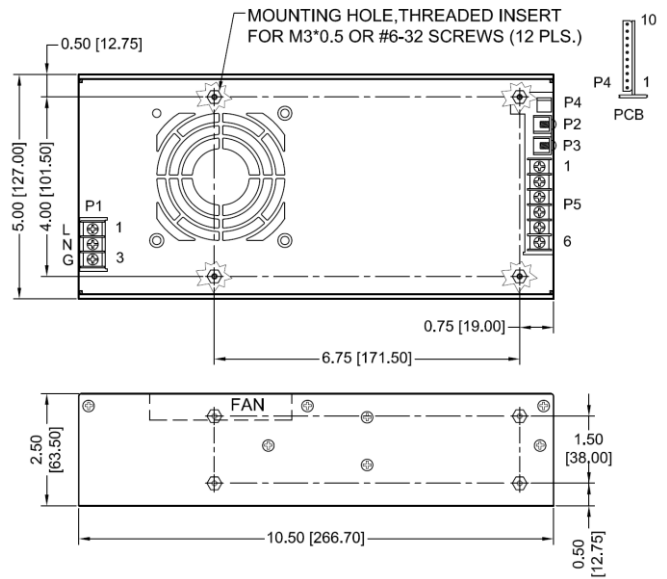


## MECHANICAL SPECIFICATIONS

Multiple Output Models  
U-bracket Form



Enclosed Form



### NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle DT-4C-B01W-03 with M3, nickel-plated screws.
- Connector P4 mates with Molex housing 50-37-5103 and pins 5263.
- Connector P2-1, P2-2, P3-1 & P3-2: M3\*0.5 screw connections.
- Connectors P2, P3: M3\*0.5 screw connections
- Output connector P5 is Dinkle DT-35-B01W-06. Screws are M3, nickel plated.
- Weight: 2.0 Kgs. (4.4 lbs.) approx. for U-bracket form, 2.2 Kgs. (4.84 lbs.) approx. for enclosed form.
- Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis.

### PIN CHART

MODEL	CONN PIN	P1 (AC)			P2	P3	P5					
		1	2	3			1	2	3	4	5	6
PU650-12B PU650-13B PU650-14B PU650-15B	PU650-16B PU650-17B PU650-18B	Live	Neutral	Ground	+V1	V1 Return	N.A.					
PU650-20B PU650-21B PU650-22B	PU650-23B PU650-24B	Live	Neutral	Ground	+V1	V1 Return	+V2	V2 Return	N.A.	N.A.		
PU650-30B PU650-31B PU650-32B PU650-33B	PU650-34B PU650-35B PU650-36B PU650-37B	Live	Neutral	Ground	+V1	V1 Return	+V2	V2 Return	+V3	V3 Return		

MODEL	CONN PIN	P4									
		1	2	3	4	5	6	7	8	9	10
PU650-12B PU650-13B PU650-14B PU650-15B	PU650-16B PU650-17B PU650-18B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	N.C.	N.C.	Fan Return	+12V Fan
PU650-20B PU650-21B PU650-22B	PU650-23B PU650-24B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	+V2 Sense	-V2 Sense	Fan Return	+12V Fan
PU650-30B PU650-31B PU650-32B PU650-33B	PU650-34B PU650-35B PU650-36B PU650-37B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	+V2 Sense	-V2 Sense	Fan Return	+12V Fan