

25-28 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PM25 series of compact, open PCB constructed, AC-DC switching power supplies are capable of delivering 25 to 28 watts of continuous output power. They operate at 85-264 VAC input voltage without the need of voltage selection. They are ideally suited for use in medical equipment, safety systems and monitoring equipment, not for life-support equipment.

FEATURES

- Low safety ground leakage current
- 100% burn-in
- Wide input range 85-264 VAC
- Input surge current protection
- Overvoltage protection
- Overcurrent protection
- Open PCB construction
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	85-264 VAC
Input frequency:	47-63 Hz
Input current:	0.70 A (rms) for 115 VAC 0.40 A (rms) for 230 VAC
Earth leakage current:	220 μ 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 112-132% 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 μ s after a 25% step load change

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

PM25 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1

GENERAL SPECIFICATIONS

Switching frequency:	42 $\pm$ 5 KHz
Efficiency:	70% minimum on single output model with $V_o \geq 12$ V, 68% minimum on the others
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	10 A @ 115 VAC or 25 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	500,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance (EN60601-1-2)	
EN55011:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PM25 MEDICAL SERIES

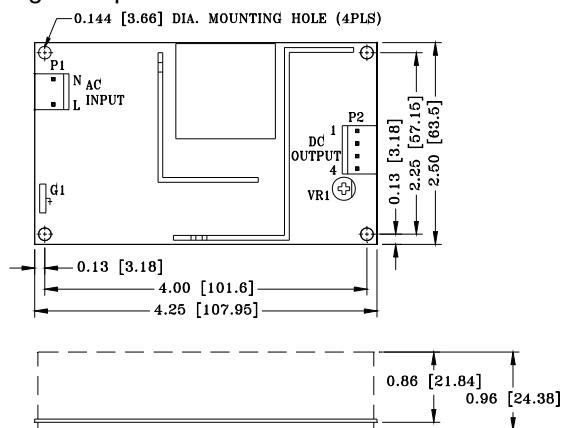
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output #1				Output #2				Output #3				Max. Output Power
	V1	Min. Current	Max. Current	Tol.	V2	Min. Current	Max. Current	Tol.	V3	Min. Current	Max. Current	Tol.	
PM25-10A	5.1 V	0 A	5.5 A	±2%	N/A				N/A				28 W
PM25-12A	12 V	0 A	2.3 A	±1%	N/A				N/A				28 W
PM25-13A	15 V	0 A	1.9 A	±1%	N/A				N/A				28 W
PM25-14A	24 V	0 A	1.2 A	±1%	N/A				N/A				28 W
PM25-15A	28 V	0 A	1.0 A	±1%	N/A				N/A				28 W
PM25-23A	+5.1 V	0.4 A	2.5 A	±3%	+12 V	0.2 A	1.5 A	±5%	N/A				25 W
PM25-25A	+5.1 V	0.4 A	2.5 A	±3%	+24 V	0.1 A	0.8 A	±5%	N/A				25 W
PM25-31A	+5.1 V	0.4 A	2.5 A	±3%	+12 V	0.2 A	1.5 A	±5%	-12 V	0.05 A	0.2 A	±4%	25 W
PM25-32A	+5.1 V	0.4 A	2.5 A	±3%	+15 V	0.1 A	1.0 A	±5%	-15 V	0.05 A	0.2 A	±4%	25 W
PM25-39A	+5.1 V	0.4 A	2.5 A	±3%	+24 V	0.1 A	0.8 A	±5%	-12 V	0.05 A	0.2 A	±4%	25 W

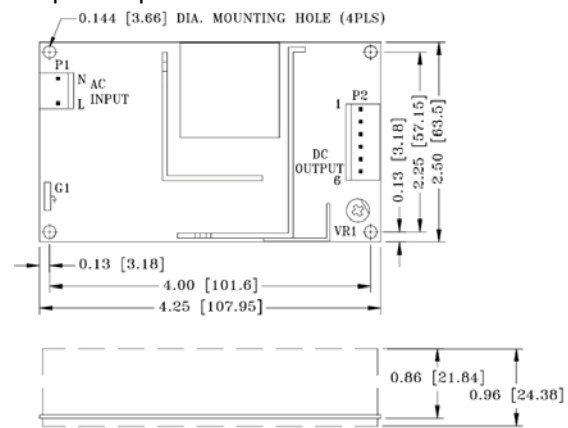
- NOTES:
1. Safety agency approvals are for the above listed models in PCB form. To order a model with a metallic L-bracket or box, change suffix "A" to "B" for L-bracket form, to "C" for enclosed form, e.g. PM25-31C.
 2. All models may be operated at no-load without damage. At no-load, output voltage tolerance increases to ±10%.
 3. 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.

MECHANICAL SPECIFICATIONS

Single Output Models

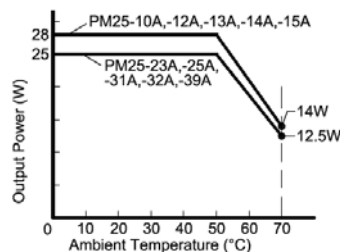


Multiple Output Models



- NOTES:
1. Dimensions shown in inches [mm]
 2. Tolerance 0.03 [0.76] maximum
 3. Input connector P1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
 4. Output connector P2: Molex header 09-65-2048 or equivalent for single output models, mating with Molex housing 09-50-1041 or equivalent. Molex 09-65-2068 or equivalent for multiple output models, mating with Molex 09-50-1061 or equivalent.
 5. Weight: 163 grams (0.3586 lbs.) approx. for single output models, 175 grams (0.385 lbs.) approx. for multiple output models.

OUTPUT POWER DERATING CURVE



PIN CHART

MODEL \ PIN		1	2	3	4	5	6	
PM25-10A	PM25-14A	V1 Return	V1 Return	+V1	+V1	N.A.	N.A.	
PM25-12A	PM25-15A							
PM25-13A								
PM25-23A	PM25-25A	V2	V1	V1	Common Return		N.C.	
PM25-31A	PM25-39A	V2	V1	V1	Common Return		V3	
PM25-32A								

30-48 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM42 series of compact, open PCB constructed, AC-DC switching power supplies are capable of delivering 30-48 watts of continuous output power at convection cooling. They operate at 90-264 VAC input voltage without the need of voltage selection, and are suited for medical, information technology and industrial applications. Approval to both EN60601-1 and EN60950-1 Safety Standards improves design-in time and reduces end equipment compliance costs.

FEATURES

- Medical and ITE approvals
- Compact size 2" x4" x1.18"
- Single, dual and triple outputs
- Wide-range input 90-264 VAC
- Low earth leakage current
- Level B emissions
- RoHS compliant

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	0.9 A (rms) for 100 VAC 0.5 A (rms) for 240 VAC
Earth Leakage current:	150 µA max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	100 mV peak to peak on 3.3 V & 5.0 V models, 1% peak to peak on other models
Overvoltage protection:	Provided on output #1 only; set at 112–132% of its nominal output voltage
Overcurrent protection:	All outputs protected to short circuit conditions
Temperature coefficient:	All outputs $\pm 0.04\%$ / $^{\circ}\text{C}$ maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	-10 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$
Storage temperature:	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% to +50 $^{\circ}\text{C}$ linearly to 50% at +70 $^{\circ}\text{C}$

PM42 SERIES



CE (LVD)
RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



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



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	62 K $\pm$ 5 KHz
Efficiency:	80-88% typical except PM42-31-3A and PM42-31-5A at 75% typical
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	25 A @ 115 VAC, or 50 A @ 230 VAC, at 25 $^{\circ}\text{C}$ cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	400,000 hours at full load at 25 $^{\circ}\text{C}$ ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011/EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PM42 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

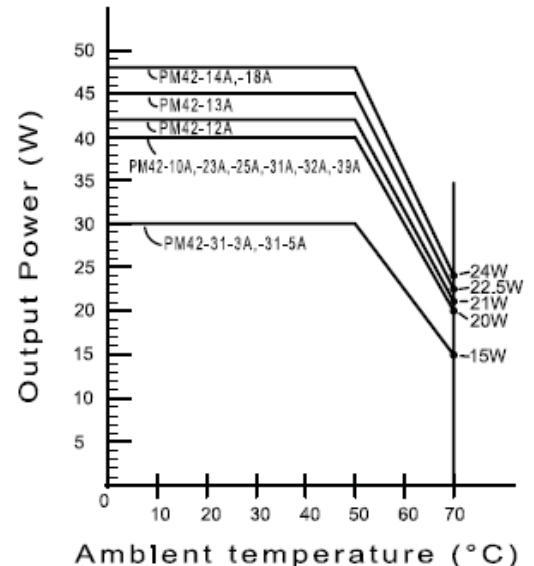
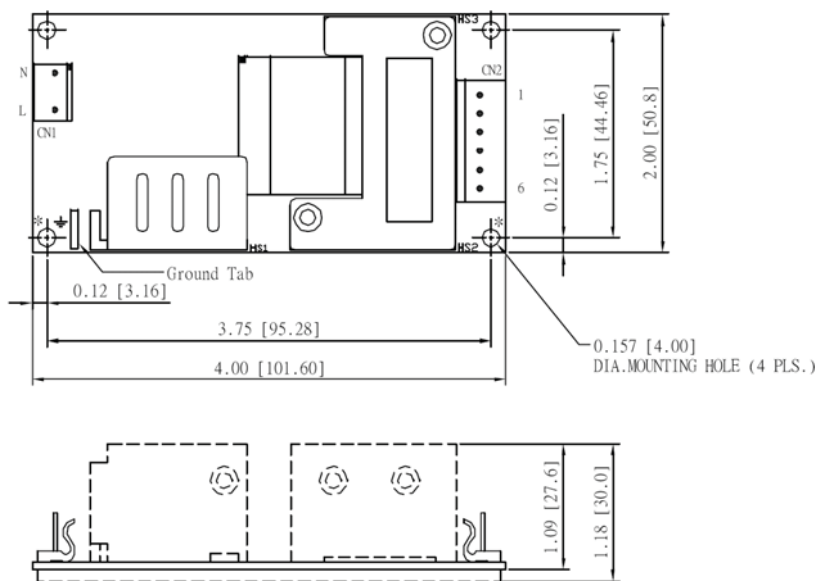
Model ⁽¹⁾	Output #1				Output #2				Output #3				Max. Output Power
	V1	Min. Current	Max. Current	Tol.	V2	Min. Current	Max. Current	Tol.	V3	Min. Current	Max. Current	Tol.	
PM42-10A	5 V	0 A	8.0 A	±2%	(N/A)				(N/A)				40 W
PM42-12A	12 V	0 A	3.5 A	±2%	(N/A)				(N/A)				42 W
PM42-13A	15 V	0 A	3.0 A	±2%	(N/A)				(N/A)				45 W
PM42-14A	24 V	0 A	2.0 A	±2%	(N/A)				(N/A)				48 W
PM42-18A	48 V	0 A	1.0 A	±2%	(N/A)				(N/A)				48 W
PM42-23A	+5 V	0.5 A	6.0 A	±3%	+12 V	0.1 A	2.0 A	±5%	(N/A)				40 W
PM42-25A	+5 V	0.5 A	6.0 A	±3%	+24 V	0.1 A	1.0 A	±5%	(N/A)				40 W
PM42-31A	+5 V	0.5 A	6.0 A	±3%	+12 V	0.1 A	2.0 A	±5%	-12 V	0 A	0.3 A	±4%	40 W
PM42-31-3A	+3.3 V	0.8 A	6.0 A	±3%	+5 V	0.1 A	2.0 A	±5%	+12 V	0 A	0.3 A	±4%	30 W
PM42-31-5A	+5 V	0.5 A	6.0 A	±3%	+3.3 V	0 A	1.5 A	±5%	+12 V	0 A	0.3 A	±4%	30 W
PM42-32A	+5 V	0.5 A	6.0 A	±3%	+15 V	0.1 A	1.5 A	±5%	-15 V	0 A	0.3 A	±4%	40 W
PM42-39A	+5 V	0.5 A	6.0 A	±3%	+24 V	0.1 A	1.0 A	±5%	-12 V	0 A	0.3 A	±4%	40 W

NOTE:

1. Safety approvals are for PCB form only. To order unit with cover fitted, change suffix "A" to "C".
2. The output voltages of a multiple output model may go outside of the stated tolerance when an output load current is out of stated limits. All models may be operated at no-load without damage.
3. 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.

MECHANICAL SPECIFICATIONS

OUTPUT POWER DERATING CURVE



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Connector CN1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
4. Connector CN2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
5. Ground tab is 0.25 [6.35] x 0.032 [0.8]
6. To ensure compliance with level B emissions, connect the two "*" marked mounting holes with metallic standoffs to chassis.
7. Weight: 205 grams (0.45 lbs.) approx.

PIN CHART

MODEL	PIN	1	2	3	4	5	6
PM42-10A PM42-13A PM42-18A		+V1		V1 Return		N.C.	
PM42-12A PM42-14A							
PM42-23A PM42-25A		V1		Common Return		N.C.	V2
PM42-31A PM42-32A PM42-39A		V1		Common Return		V3	V2
PM42-31-3A PM42-31-5A							

37.5-64 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM60 series of compact, open PCB constructed, AC-DC switching power supplies are capable of delivering 37.5-64 watts of continuous output power at convection cooling. They operate at 90-264 VAC input voltage without the need of voltage selection, and are suited for medical, information technology and industrial applications. Approval to both EN60601-1 and EN60950-1 safety standards improves design-in time and reduces end equipment compliance costs.

FEATURES

- Medical and ITE approvals
- Compact size 2" x 4" x 1.18"
- Single, dual and triple outputs
- Wide-range input 90-264 VAC
- Low earth leakage current
- Level B emissions
- RoHS compliant

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	1.3 A (rms) for 100 VAC 0.7 A (rms) for 240 VAC
Earth leakage current:	150 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	100 mV peak to peak on 3.3 V & 5.0 V models, 1% peak to peak on other models
Overvoltage protection:	Provided on output #1 only; set at 112-132% 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 μ s after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	-10 $^{\circ}$ 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

PM60 SERIES



CE (LVD)
RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1
(except PM60-31-3A by UL)



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	62 K ± 5 KHz
Efficiency:	80-88% typical except PM60-31-3A and PM60-31-5 A at 75% typical
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	30 A @ 115 VAC, or 60 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	400,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011 /EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, >95% reduction for 10 ms

UNIVERSAL INPUT

PM60 MEDICAL & ITE SERIES

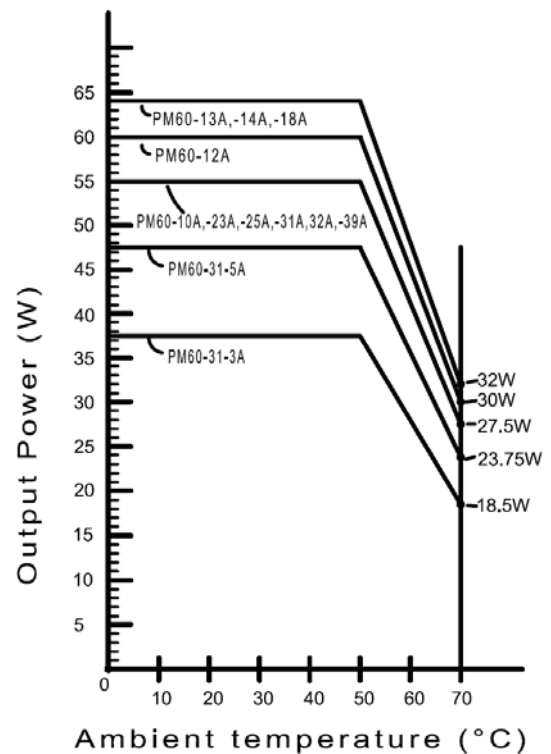
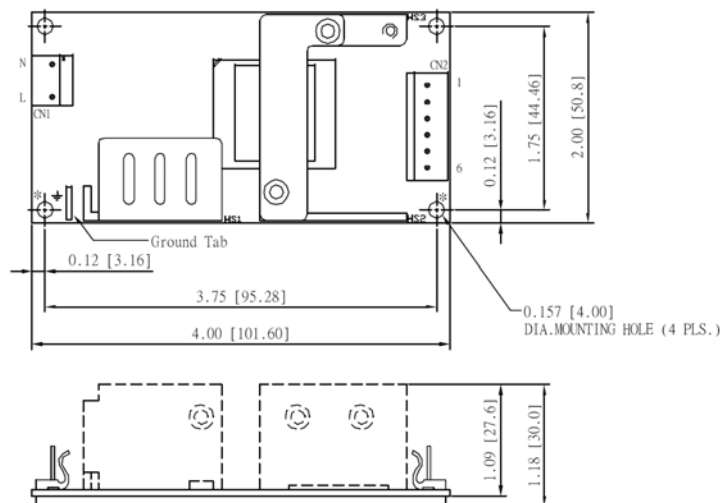
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output #1					Output #2				Output #3				Max. Output Power ⁽³⁾
	V1	Min. Current	Max. Current at convection	Max. Current at 5 CFM ⁽²⁾	Tol.	V2	Min. Current	Max. Current	Tol.	V3	Min. Current	Max. Current	Tol.	
PM60-10A	5 V	0 A	11.0 A	(N/A)	±2%	(N/A)				(N/A)				55 W
PM60-12A	12 V	0 A	5.0 A	(N/A)	±2%	(N/A)				(N/A)				60 W
PM60-13A	15 V	0 A	4.3 A	(N/A)	±2%	(N/A)				(N/A)				64 W
PM60-14A	24 V	0 A	2.7 A	(N/A)	±2%	(N/A)				(N/A)				64 W
PM60-18A	48 V	0 A	1.35 A	(N/A)	±2%	(N/A)				(N/A)				64 W
PM60-23A	+5 V	0.5 A	6.0 A	8 A	±3%	+12 V	0.1 A	3.0 A	±5%	(N/A)				55 W
PM60-25A	+5 V	0.5 A	6.0 A	8 A	±3%	+24 V	0.1 A	1.5 A	±5%	(N/A)				55 W
PM60-31A	+5 V	0.5 A	6.0 A	8 A	±3%	+12 V	0.1 A	3.0 A	±5%	-12 V	0 A	0.5 A	±4%	55 W
PM60-31-3A	+3.3 V	0.8 A	6.0 A	8 A	±3%	+5.2 V	0.1 A	3.0 A	±5%	+12 V	0 A	0.5 A	±4%	37.5 W
PM60-31-5A	+5 V	0.5 A	6.0 A	8 A	±3%	+3.3 V	0 A	1.5 A	±5%	+12 V	0 A	0.5 A	±4%	37.5 W/47.5 W
PM60-32A	+5 V	0.5 A	6.0 A	8 A	±3%	+15 V	0.1 A	2.4 A	±5%	-15 V	0 A	0.5 A	±4%	55 W
PM60-39A	+5 V	0.5 A	6.0 A	8 A	±3%	+24 V	0.1 A	1.5 A	±5%	-12 V	0 A	0.5 A	±4%	55 W

- NOTES: 1. Safety approvals are for PCB form only. To order unit with cover fitted, change suffix "A" to "C".
2. Maximum current of output #1 of multi-output models can be 8 A at 5 CFM forced air provided by user.
3. 47.5 W with 5 CFM forced air provided by user
4. The output voltages of a multiple output model may go outside of the stated tolerance when an output load current is out of stated limits. All models may be operated at no-load without damage.
5. 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS

OUTPUT POWER DERATING CURVE



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Connector CN1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
- Connector CN2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
- Ground tab is 0.25 [6.35] x 0.032 [0.8] fast-on connector.
- To ensure compliance with level B emissions, connect the two "*" marked mounting holes with metallic standoffs to chassis.
- Weight: 205 grams (0.45 lbs.) approx.

PIN CHART

MODEL	PIN	1	2	3	4	5	6
PM60-10A	PM60-12A	PM60-13A	+V1	+V1	V1 Return	V1 Return	N.C.
PM60-14A	PM60-18A						N.C.
PM60-23A	PM60-25A		V1	V1	Common Return	N.C.	V2
PM60-31A	PM60-32A	PM60-39A	V1	V1	Common Return	V3	V2
PM60-31-3A	PM60-31-5A		V1	V1	Common Return	V3	V2

51-65 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PM66 series of compact, open PCB constructed, AC-DC switching power supplies are capable of delivering 45-65 watts of continuous output power. They operate at 90-264 VAC input voltage without the need of voltage selection. They are ideally suited for use in medical equipment not for life-supporting equipment. All models meet the safety requirements of UL, CSA and IEC.

FEATURES

- Recognized or certified by UL, CSA and TÜV
- 3x5 inches footprint
- 100% burn-in
- Wide input range 90-264 VAC
- Input surge current protection
- Overvoltage protection
- Overcurrent protection
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	85-264 VAC
Input frequency:	47-63 Hz
Input current:	0.70 A (rms) for 115 VAC 0.40 A (rms) for 230 VAC
Earth leakage current:	150 μ 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 112-132% 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 μ s after a 25% step load change

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

PM66 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1

GENERAL SPECIFICATIONS

Switching frequency:	42 $\pm$ 5 KHz
Efficiency:	75% minimum on single output model with $V_o \geq 12$ V, 68% minimum on the others
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	17 A @ 115 VAC or 40 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	400,000 hours at full load at 25 $^{\circ}$ C ambient , calculated per MIL-HDBK-217F
EMC Performance (EN60601-1-2)	
EN55011:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m @ 80-2500 MHz
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PM66 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

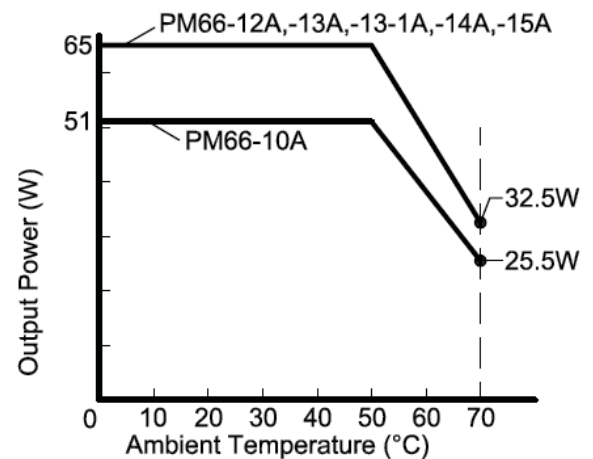
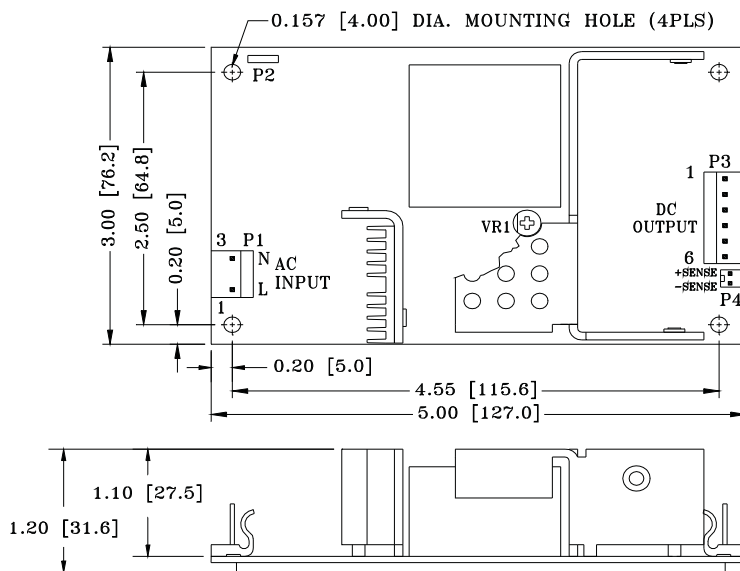
Model	Output						Efficiency (typical) @ Max. Output Power 115 / 230 Vac
	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽¹⁾	Max. Output Power	
PM66-10A	5.1 V	0 A	10.0 A	±3%	51 mV	51 W	71 / 71 %
PM66-12A	12 V	0 A	5.5 A	±2%	120 mV	65 W	79 / 80 %
PM66-13A	15 V	0 A	4.4 A	±2%	150 mV	65 W	79 / 81 %
PM66-13-1A	18 V	0 A	3.7 A	±2%	180 mV	65 W	80 / 81 %
PM66-14A	24 V	0 A	2.8 A	±2%	240 mV	65 W	80 / 81 %
PM66-15A	28 V	0 A	2.4 A	±2%	280 mV	65 W	81 / 80 %

NOTES:

1. 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS

OUTPUT POWER DERATING CURVE



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Connector P1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
4. Connector P2 is 0.25 [6.35] × 0.032 [0.8] for earth grounding.
5. Connector P3: Molex 09-65-2068 or equivalent, mating with Molex 09-50-1061 or equivalent.
6. Connector P4: Molex header 22-04-1021 or equivalent for $\pm$ sense connections, mating with Molex housing 22-01-1023 or equivalent.
7. Weight: 330 grams (0.726 lbs.) approx.

PIN CHART

CONN		P1			P2	P3						P4	
MODEL	PIN	1	2	3	1	1	2	3	4	5	6	1	2
PM66-10A	PM66-13-1A	AC Live	Void	AC Neutral	AC Ground	+V1		V1 Return				+Sense	-Sense
PM66-12A	PM66-14A												
PM66-13A	PM66-15A												

100 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM100 series of compact, open PCB constructed, AC-DC switching power supplies are capable of delivering 100 watts of continuous output power at convection cooling. They are suited for medical, information technology and industrial applications, but not for life-supporting medical equipment. Approval to both EN60601-1 and EN60950-1 safety standards improves design-in time and reduces end equipment compliance costs.

FEATURES

- Medical and ITE approvals
- Compact size 2" × 4" × 1.26"
- High power density 10 W/cubic inch
- 100 W output with convection cooling up to +50°C
- Low earth leakage current
- EN55011 /55022 class B emissions
- RoHS compliant

INPUT SPECIFICATIONS

Input voltage:	90-132 /180-264 VAC (Universal mains supply operation)
Input frequency:	47-63 Hz
Input current:	1.9 A (rms) for 100-120 VAC 1.1 A (rms) for 200-240 VAC
Earth leakage current:	150 µA max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Total output power:	100 watts maximum
Ripple and noise:	150 mV peak to peak on 5.0 V model, 1% peak to peak on other models
Overvoltage protection:	Provided on output; set at 110-140% of its nominal output voltage
Overcurrent protection:	All outputs protected to short circuit conditions
Temperature coefficient:	All outputs ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	-10°C to +70°C
Storage temperature:	-40°C to +85°C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +50°C linearly to 50% at +70°C
Cooling:	Convection

PM100 SERIES



CE (LVD)
RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



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



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	100 KHz (typical)
Efficiency:	88-90% @ 230 VAC full load
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	±0.2% maximum at full load
Inrush current:	40 A @ 115 VAC or 80 A @ 230 VAC, at 25°C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	270,000 hours at full load at 25°C ambient temperature, calculated per MIL-HDBK-217F

EMC Performance

EN55011 /EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±8 KV air and ±6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms (criteria A @ 230 VAC, criteria B @ 100 VAC), 60% reduction for 100 ms (criteria B), >95% reduction for 10 ms (Criteria A)

UNIVERSAL INPUT

PM100 MEDICAL & ITE SERIES

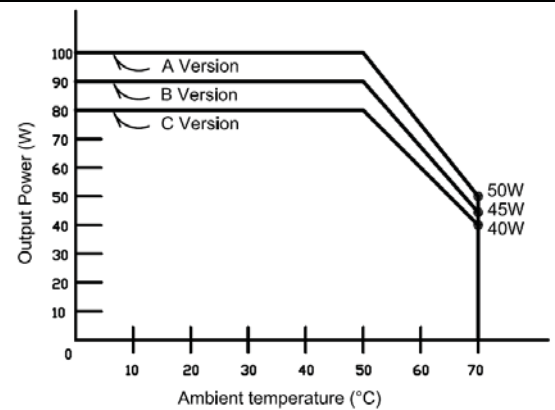
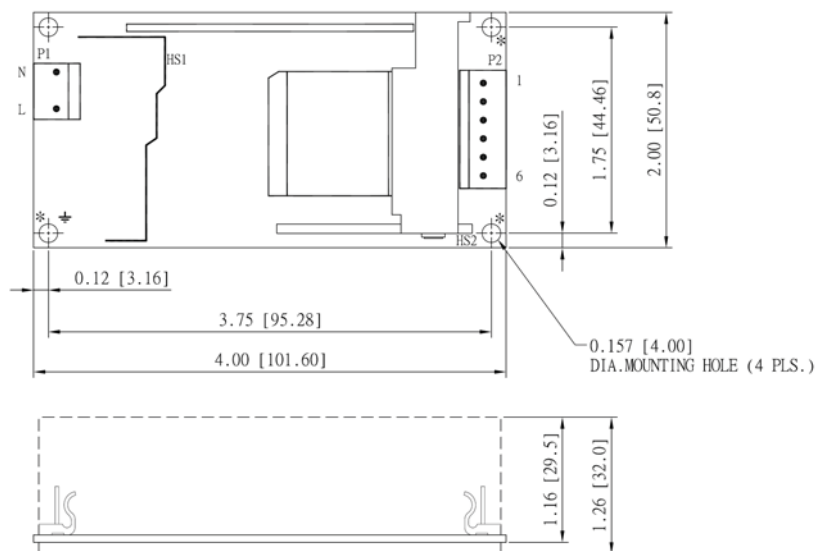
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output						Average Active Efficiency (typical) @ 115/230 Vac
	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	
PM100-10A	5 V	0 A	20.00 A	±2 %	150 mV	100 W	85/88%
PM100-12A	12 V	0 A	8.34 A	±2 %	120 mV	100 W	86/89%
PM100-13A	15 V	0 A	6.70 A	±2 %	150 mV	100 W	86/89%
PM100-13-1A	18 V	0 A	5.56 A	±2 %	180 mV	100 W	86/89%
PM100-14A	24 V	0 A	4.20 A	±2 %	240 mV	100 W	87/90%
PM100-15A	28 V	0 A	3.58 A	±2 %	280 mV	100 W	87/90%
PM100-17A	36 V	0 A	2.78 A	±2 %	360 mV	100 W	87/89%
PM100-18A	48 V	0 A	2.10 A	±2 %	480 mV	100 W	87/89%

- NOTES: 1. Safety approvals are for PCB form only. To order models with metallic L-bracket or box, change suffix "A" to "B" for L-bracket form, to "C" for enclosed form (see Outline Drawing of Cased Internal Switchers), e.g. PM100-14C.
2. 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.

MECHANICAL SPECIFICATIONS

OUTPUT POWER DERATING CURVE



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Connector P1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
4. Connector P2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
5. To ensure compliance with level B emissions, connect the three "*" marked mounting holes with metallic standoffs to chassis.
6. Weight: 190 grams (0.44 lbs.) approx.

PIN CHART

PIN			1	2	3	4	5	6
MODEL								
PM100-10A	PM100-13-1A	PM100-17A						
PM100-12A	PM100-14A	PM100-18A	V1 Return	V1 Return	V1 Return	+V1	+V1	+V1
PM100-13A	PM100-15A							

72-110 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PM110 series of compact, open PCB constructed, AC-DC switching power supplies are specially designed for medical applications. They are capable of delivering 72-110 watts of continuous power at 25 CFM forced air cooling or 60-80 watts at convection cooling. They operate at 85-264 VAC input voltage without the need of a selector strap. All models meet the safety requirements of UL, CSA and IEC for non-patient contact medical equipment.

FEATURES

- Low safety ground leakage current
- Meet EN55011 and FCC Class B
- Small size, light weight
- 100% burn-in
- Wide input range 85-264 VAC
- Input surge current protection
- Overvoltage protection
- Overcurrent protection
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	85-264 VAC
Input frequency:	47-63 Hz
Input current:	3.20 A (rms) for 115 VAC 1.80 A (rms) for 230 VAC
Earth leakage current:	220 μ 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 112-132% 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 μ s after a 25% step load change

INTERFACE SIGNALS

PFD:	TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1ms prior to +5V output dropping 5% below its nominal value. This signal also provides a minimum delay of 100ms after +5V is within regulation
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PM110 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1

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
Cooling:	72-110 watts continuous output power at 25 CFM forced air cooling or 60-80 watts at convection cooling

GENERAL SPECIFICATIONS

Switching frequency:	20-250 KHz, varied with load and line
Efficiency:	70% minimum on single output model with $V_o \geq 12V$, 65% minimum on the others
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	15 A @ 115 VAC or 30 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	400,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance (EN60601-1-2)	
EN55011:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m @ 80-2500 MHz
EN61000-4-4:	Fast transient /burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

UNIVERSAL INPUT

PM110 MEDICAL SERIES

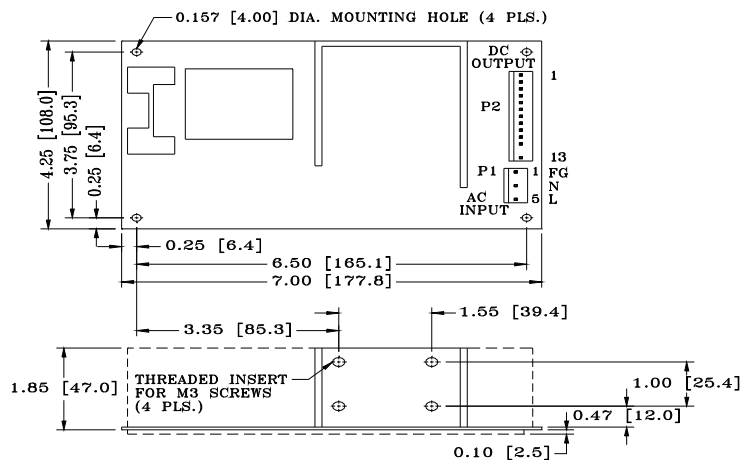
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output #1 ⁽²⁾				Output #2					Output #3				Output #4				Max. Output Power ⁽³⁾
	V1	Imin.	Imax.	Tol.	V2	Imin.	Imax.	Ipeak ⁽⁴⁾	Tol.	V3	Imin.	Imax.	Tol.	V4	Imin.	Imax.	Tol.	
PM110-10-1A	3.3 V	0 A	22 A	±3%	(N/A)					(N/A)				(N/A)				60 W / 72 W
PM110-10A	5.0 V	0 A	22 A	±3%	(N/A)					(N/A)				(N/A)				80 W / 110 W
PM110-12A	12 V	0 A	9.0 A	±2%	(N/A)					(N/A)				(N/A)				80 W / 110 W
PM110-13A	15 V	0 A	7.5 A	±2%	(N/A)					(N/A)				(N/A)				80 W / 110 W
PM110-14A	24 V	0 A	4.5 A	±2%	(N/A)					(N/A)				(N/A)				80 W / 110 W
PM110-16A	30 V	0 A	3.6 A	±3%	(N/A)					(N/A)				(N/A)				80 W / 110 W
PM110-23A	+5.1 V	0 A	10 A	±3%	+12 V	0 A	5 A	9.0 A	±3%	(N/A)				(N/A)				80 W / 110 W
PM110-31A	+5.1 V	0 A	10 A	±3%	+12 V	0 A	5 A	9.0 A	±3%	-12 V	0 A	1 A	±4%	(N/A)				80 W / 110 W
PM110-32A	+5.1 V	0 A	10 A	±3%	+15 V	0 A	4 A	7.5 A	±3%	-15 V	0 A	1 A	±4%	(N/A)				80 W / 110 W
PM110-40A	+5.1 V	0 A	10 A	±3%	+12 V	0 A	5 A	9.0 A	±3%	-12 V	0 A	1 A	±4%	-5 V	0 A	1 A	±4%	80 W / 110 W
PM110-41A	+5.1 V	0 A	10 A	±3%	+15 V	0 A	4 A	7.5 A	±3%	-15 V	0 A	1 A	±4%	+24 V	0 A	1 A	±4%	80 W / 110 W
PM110-42A	+5.1 V	0 A	10 A	±3%	+12 V	0 A	5 A	9.0 A	±3%	-12 V	0 A	1 A	±4%	+12 V	0 A	1 A	±4%	80 W / 110 W
PM110-45A	+5.1 V	0 A	10 A	±3%	+12 V	0 A	5 A	9.0 A	±3%	-12 V	0 A	1 A	±4%	+24 V	0 A	1 A	±4%	80 W / 110 W
PM110-45-1A	+5.1 V	2 A	10 A	±3%	+12 V	0 A	5 A	9.0 A	±3%	-12 V	0 A	1 A	±4%	+24 V	1.5 A	3 A	±10%	80 W / 110 W
PM110-45-2A	+5.1 V	0 A	10 A	±3%	+24 V	0 A	3 A	5.0 A	±3%	-12 V	0 A	1 A	±4%	+12 V	0 A	1 A	±4%	80 W / 110 W
PM110-46A	+5.1 V	0 A	10 A	±3%	+15 V	0 A	4 A	7.5 A	±3%	-15 V	0 A	1 A	±4%	-5 V	0 A	1 A	±4%	80 W / 110 W

NOTES:

- Safety agency approvals are for the above listed models in PCB format. To order a model with a metallic L-bracket or box, change suffix "A" to "B" for L-bracket format, to "C" for enclosed form with cover, e.g. PM110-14C. (mechanical details shown in Annex H)
- The output #1 of model PM110-45-1A needs a minimum current of 2A to support the other outputs at their maximum rated load.
- 110 watts maximum at 25 CFM forced air cooling or 80 watts maximum at convection cooling, except model PM110-10-1A which is rated at 60 watts maximum at convection cooling or 72 watts maximum at 25 CFM forced air cooling.
- Peak output current with 10% maximum duty cycle for less than 60 seconds. Total peak power must not exceed 130 watts.
- 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.

MECHANICAL SPECIFICATIONS



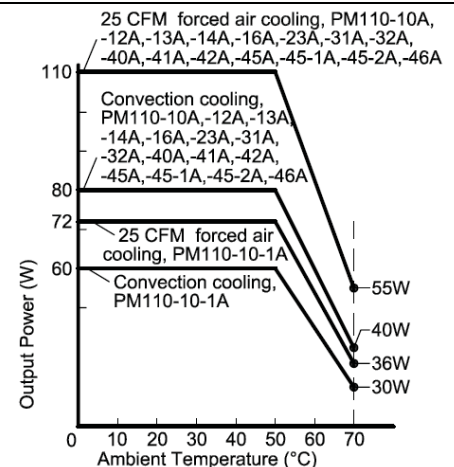
NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Connector P1: Molex header 09-65-2058 or equivalent, mating with Molex housing 09-50-1051 or equivalent.
- Connector P2 mates with Molex 09-50-3131 or equivalent.
- The copper pad of the mounting hole near P1 is for system grounding through a metallic stand-off to system chassis.
- Weight : 640 grams (1.408 lbs.)

PIN CHART

MODEL	PIN	1, 2, 3	4, 5	6, 7	8, 9	10	11	12	13
PM110-10-1A	PM110-13A	+V1	V1 Return	V1 Return	+V1	PFD	N.C.	KEY	N.C.
PM110-10A	PM110-14A								
PM110-12A	PM110-16A								
PM110-23A		V1	Common Return	Common Return	V2	PFD	N.C.	KEY	N.C.
PM110-31A	PM110-32A	V1	Common Return	Common Return	V2	PFD	V3	KEY	N.C.
PM110-40A	PM110-45-1A	V1	Common Return	Common Return	V2	PFD	V3	KEY	V4
PM110-41A	PM110-45-2A								
PM110-42A	PM110-46A								
PM110-45A									

OUTPUT POWER DERATING CURVE



80-150 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM150 series of AC-DC switching power supplies in a package of 2 x 4 x 1.3 inches are capable of delivering 120-150 watts of continuous power at 30 CFM forced air cooling or 80-100 watts at convection cooling. The units are constructed on a printed circuit board. They are specially designed for medical applications, but not for life-supporting equipment. The units are certified also to IEC /EN /UL /CSA 60950-1 and suitable for data networking, computer and telecommunication applications.

PM150 SERIES

RoHS

FEATURES

- 2 x 4 inch footprint with 1.3 inch low profile
- 100-240 VAC input with active PFC
- Less than 275 μ A leakage current
- Meet EN55011 /55022 and FCC Class B
- Power Factor 0.98 typical
- Short-circuit protection
- Power Fail Detect (PFD) signal
- Inhibit - TTL high to disable output
- Compliant with RoHS requirements
- Efficiency greater than 87%

SAFETY STANDARD APPROVAL

Preliminary

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	2.0 A (rms) for 115 VAC 1.0 A (rms) for 230 VAC
Earth leakage current:	275 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Total output power:	See rating chart.
Ripple and noise:	1% peak to peak maximum
Overvoltage protection:	set at 112-140% of its nominal output voltage
Overcurrent protection:	Output 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 μ s after a 25% step load change
Fan power:	12 V at 1.0 A maximum (isolated)

GENERAL SPECIFICATIONS

Switching frequency:	133 KHz (typical)
Efficiency:	See rating chart.
Hold-up time:	10 ms minimum at 120 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	30 A @ 115 VAC or 60 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	250,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011/EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, >95% reduction for 10 ms

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, applicable to convection and forced-air cooling conditions

UNIVERSAL INPUT

PM150 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

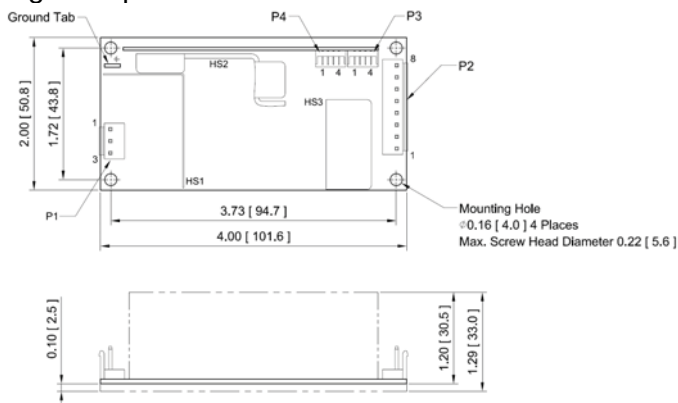
Model	Output								Efficiency (typical)	
	Vnom.	Min. load	Max. Current at convection	Max. Current at 30 CFM	Peak ⁽¹⁾ Current	Tol.	Ripple & Noise ⁽³⁾	Max. Power ⁽²⁾	Max. Power at convection 115/230 Vac	Max. Power at 30 CFM 115/230 Vac
PM150-10A	V1 5 V	0 A	16.0 A	24.0 A	30.0 A	±2%	50 mV	80 W / 120 W	86/86 %	86/86 %
PM150-12A	V1 12 V	0 A	8.3 A	12.5 A	14.0 A	±2%	120 mV	100 W / 150 W	87/89 %	86/88 %
PM150-13A	V1 15 V	0 A	6.7 A	10.0 A	11.0 A	±2%	150 mV	100 W / 150 W	87/89 %	86/88 %
PM150-13-1A	V1 18 V	0 A	5.56 A	8.34 A	9.2 A	±2%	180 mV	100 W / 150 W	87/89 %	86/88 %
PM150-14A	V1 24 V	0 A	4.2 A	6.3 A	7.0 A	±2%	240 mV	100 W / 150 W	87/89 %	86/88 %
PM150-16A	V1 30 V	0 A	3.34 A	5.0 A	5.6 A	±2%	300 mV	100 W / 150 W	87/89 %	86/88 %
PM150-17A	V1 36 V	0 A	2.78 A	4.17 A	4.6 A	±2%	360 mV	100 W / 150 W	87/89 %	86/88 %
PM150-18A	V1 48 V	0 A	2.1 A	3.1 A	3.5 A	±2%	480 mV	100 W / 150 W	87/89 %	86/88 %
PM150-31-3A	V1 +3.3 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV	80 W / 130 W	80/82 %	81/83 %
	V2 +5 V	0 A	5.0 A	9.0 A	10.0 A	±5%	50 mV			
	V3 +12 V	0 A	1.0 A	2.3 A	2.3 A	±5%	120 mV			
PM150-31A	V1 +5 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV	80 W / 130 W	81/83 %	82/84 %
	V2 +12 V	0 A	5.0 A	9.0 A	10.0 A	±5%	120 mV			
	V3 -12 V	0 A	1.0 A	2.0 A	2.0 A	±5%	120 mV			
PM150-32A	V1 +5 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV	80 W / 130 W	81/83 %	82/84 %
	V2 +15 V	0 A	4.0 A	7.2 A	8.0 A	±5%	150 mV			
	V3 -15 V	0 A	1.0 A	1.5 A	2.0 A	±5%	150 mV			
PM150-36A	V1 +5 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV	80 W / 130 W	81/83 %	82/84 %
	V2 +24 V	0 A	1.5 A	3.0 A	3.5 A	±7%	240 mV			
	V3 +12 V	0 A	1.0 A	2.3 A	2.3 A	±5%	120 mV			

NOTES:

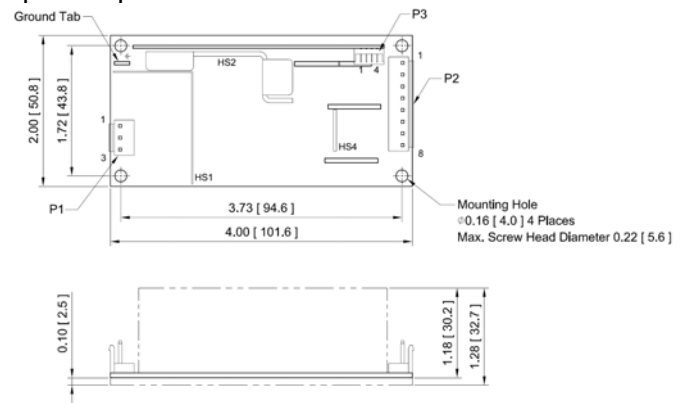
1. Peak output current with 10% duty cycle maximum for less than 15 seconds. The total peak power of triple output models must not exceed 130 W.
2. The first value of max. power is at convection cooling. The second value is with 30 CFM forced air provided by user.
3. Ripple and noise is maximum peak-to-peak voltage value measured at output within 20 MHz bandwidth, at rated line voltage and output load ranges, and with a 10 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS

Single Output Models



Triple Output Models



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1: JST header P/N V3P-VH-B, mating with JST housing P/N VHR-3N or equivalent.
4. Output connector P2: JST header P/N V8P-VH-B, mating with JST housing P/N VHR-8N or equivalent.
5. Connector P3: Molex header 53253-0470, mating with Molex housing 51065-400 or equivalent.
6. FAN connector P4: Molex header 53253-0470, mating with Molex housing 51065-400 or equivalent.
7. Ground tab is 0.25 [6.35] $\times$ 0.032 [0.8] fast-on connector.
8. Weight: 200 grams (0.44 lbs.) approx.

UNIVERSAL INPUT

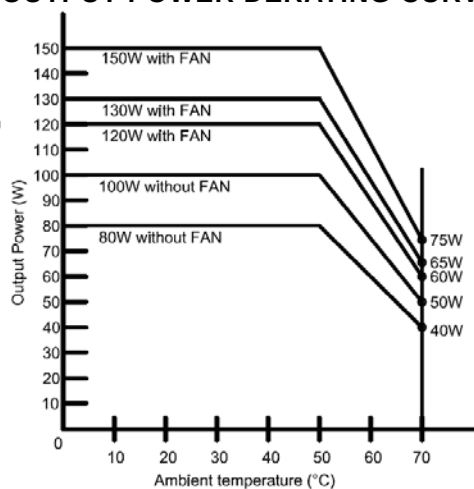
PM150 MEDICAL & ITE SERIES

INTERFACE SIGNALS

PFD: TTL high for normal operation,
low upon loss of input power,
turn-on delay time 100-1000 ms,
turn-off delay time 1 ms minimum

Inhibit: TTL high to turn off output

OUTPUT POWER DERATING CURVE



PIN CHART

Single Output Models

CONN		P1			P2							
MODEL	PIN	1	2	3	1	2	3	4	5	6	7	8
PM150-10A PM150-12A PM150-13A PM150-13-1A	PM150-14A PM150-16A PM150-17A PM150-18A	Neutral	Void	Live	Common Return				+V1			

CONN		P3				P4			
MODEL	PIN	1	2	3	4	1	2	3	4
PM150-10A PM150-12A PM150-13A PM150-13-1A	PM150-14A PM150-16A PM150-17A PM150-18A	Common Return	PFD	-Sense	+Sense	+12V Fan	+12V Fan	Fan Return (Isolated)	Fan Return (Isolated)

Triple Output Models

CONN		P1			P2							
MODEL	PIN	1	2	3	1	2	3	4	5	6	7	8
PM150-31-3A PM150-31A PM150-32A PM150-36A		Neutral	Void	Live	V1	V1	Common Return				V2	V3

CONN		P3			
MODEL	PIN	1	2	3	4
PM150-31-3A PM150-31A PM150-32A PM150-36A		PFD	Common Return	+V1 Sense	-V1 Sense

150-200 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM201 series comprising single and multiple output models for 150 to 200 watts of continuous output power is specially designed for medical and ITE applications, not for life-support. They operate at 90 to 264 VAC input voltage without the need of a selector strap. All auxiliary outputs are with magnetic amplifier linear regulator to keep regulation. 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

- Low safety ground leakage current
- Meet EN55011, EN55022 and FCC Class B
- Power Factor 0.98 typical
- Short-circuit protection
- Power Fail Detect (PFD) signal
- 100% burn-in at full rated load
- Optional cover-and-fan assembly
- 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:	3.20 A (rms) for 115 VAC 1.60 A (rms) for 230 VAC
Earth leakage current:	220 µA 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 112-132% of its nominal output voltage
Overcurrent protection:	All outputs protected to short circuit conditions
Temperature coefficient:	All outputs $\pm 0.04\%$ /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change
Fan power:	12 V at 200 mA maximum, except 24 V at 200 mA maximum for PM201-25B and PM201-27B, and 5 V at 380 mA maximum for PM201-40-3B

INTERFACE SIGNALS

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

PM201 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020
UL 60950-1
File No. E137410



TÜV EN60601-1



TÜV EN60950-1

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0°C to +70°C
Storage temperature:	-40°C to +85°C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +50°C linearly to 50% at +70°C
Cooling:	10.8 CFM forced air provided on "C" version; 25 CFM forced air to be provided for "B" version by user.

GENERAL SPECIFICATIONS

Switching frequency:	88-112 KHz
Efficiency:	70% minimum on all models
Hold-up time:	20 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	20 A @ 115 VAC or 40 A @ 230 VAC, at 25°C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	350,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F
EMC Performance (EN60601-1-2)	
EN55011 EN55022:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

UNIVERSAL INPUT

PM201 MEDICAL & ITE SERIES

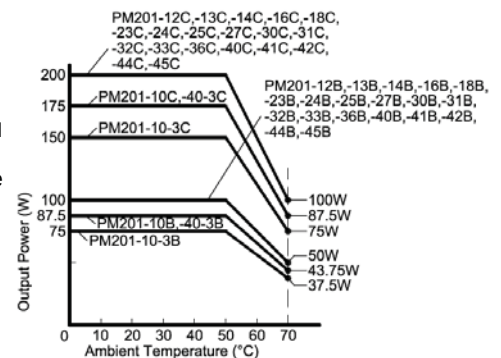
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output #1 ⁽⁴⁾				Output #2 ⁽²⁾⁽⁴⁾				Output #3				Output #4 ⁽³⁾				Max. Output Power ⁽⁴⁾
	V1	Imin.	Imax.	Tol.	V2	Imin.	Imax.	Tol.	V3	Imin.	Imax.	Tol.	V4	Imin.	Imax.	Tol.	
PM201-10B	5.1 V	3.0 A	35.0 A	±2%	(N/A)				(N/A)				(N/A)				87.5 W / 175 W
PM201-10-3B	3.3 V	3.0 A	46.0 A	±3%	(N/A)				(N/A)				(N/A)				75 W / 150 W
PM201-12B	12 V	1.2 A	16.7 A	±2%	(N/A)				(N/A)				(N/A)				100 W / 200 W
PM201-13B	15 V	1.0 A	13.4 A	±2%	(N/A)				(N/A)				(N/A)				100 W / 200 W
PM201-14B	24 V	0.6 A	8.4 A	±2%	(N/A)				(N/A)				(N/A)				100 W / 200 W
PM201-16B	30 V	0.5 A	6.7 A	±2%	(N/A)				(N/A)				(N/A)				100 W / 200 W
PM201-18B	48 V	0.5 A	4.2 A	±2%	(N/A)				(N/A)				(N/A)				100 W / 200 W
PM201-23B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	(N/A)				(N/A)				100 W / 200 W
PM201-24B	+5.1 V	3.0 A	30.0 A	±2%	+15 V	0 A	6 A	±4%	(N/A)				(N/A)				100 W / 200 W
PM201-25B	+5.1 V	3.0 A	30.0 A	±2%	+24 V	0 A	4 A	±4%	(N/A)				(N/A)				100 W / 200 W
PM201-27B	+12 V	1.0 A	8.7 A	±2%	+24 V	0 A	4 A	±4%	(N/A)				(N/A)				100 W / 200 W
PM201-30B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	-5 V	0 A	6 A	±4%	(N/A)				100 W / 200 W
PM201-31B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	-12 V	0 A	4 A	±4%	(N/A)				100 W / 200 W
PM201-32B	+5.1 V	3.0 A	30.0 A	±2%	+15 V	0 A	6 A	±4%	-15 V	0 A	4 A	±4%	(N/A)				100 W / 200 W
PM201-33B	+5.1 V	3.0 A	30.0 A	±2%	+15 V	0 A	6 A	±4%	-12 V	0 A	4 A	±4%	(N/A)				100 W / 200 W
PM201-36B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	24 V	0 A	4 A	±4%	(N/A)				100 W / 200 W
PM201-40B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	-12 V	0 A	4 A	±4%	5 V	0 A	6 A	±4%	100 W / 200 W
PM201-41B	+5.1 V	3.0 A	30.0 A	±2%	+15 V	0 A	6 A	±4%	-15 V	0 A	4 A	±4%	24 V	0 A	4 A	±4%	100 W / 200 W
PM201-42B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	-12 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	100 W / 200 W
PM201-44B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	-15 V	0 A	4 A	±4%	15 V	0 A	4 A	±4%	100 W / 200 W
PM201-45B	+5.1 V	3.0 A	30.0 A	±2%	+12 V	0 A	8 A	±4%	-12 V	0 A	4 A	±4%	24 V	0 A	4 A	±4%	100 W / 200 W
PM201-40-3B	+3.3 V	3.0 A	30.0 A	±3%	+5.1 V	0 A	8 A	±4%	-12 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	87.5 W / 175 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. PM201-45C.
- Peak output current is 12 A on +12 V, 9 A on +15 V and 6 A on +24 V.
- Output #4 is floating. It can be connected externally for positive or negative output.
- 200 watts for "C" version with a cover-and-fan assembly. 100 watts for "B" version without moving air (maximum current of output #1 & #2 derated to 50%), or 200 watts with 25 CFM forced air provided by user.
- When the remote Sense facility is not used, +Sense must be connected to +V, and -Sense to return, on P2 connector.
- 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.

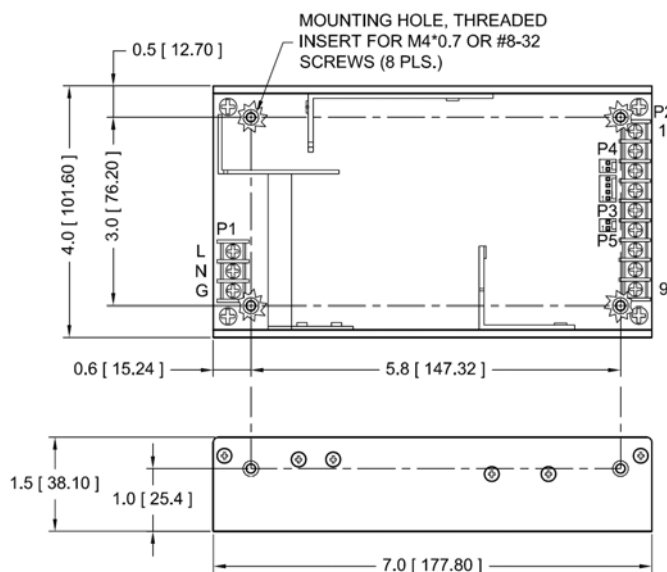
OUTPUT POWER DERATING CURVE



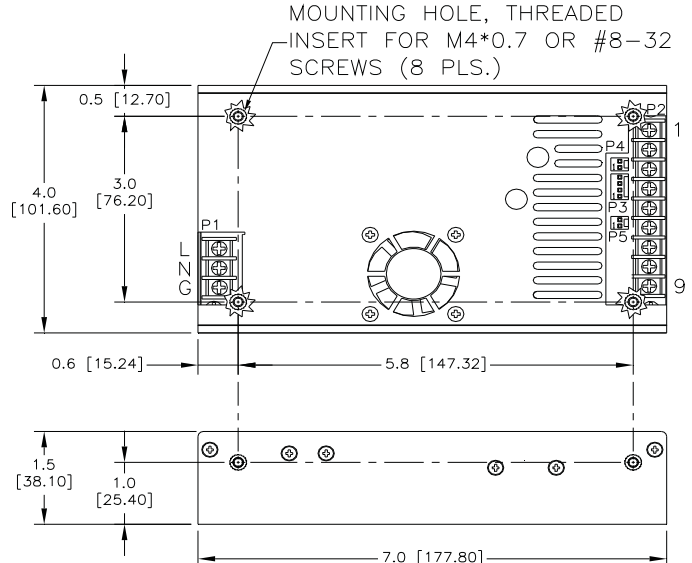
MECHANICAL SPECIFICATIONS

Single Output Models

U-bracket Form



Enclosed Form



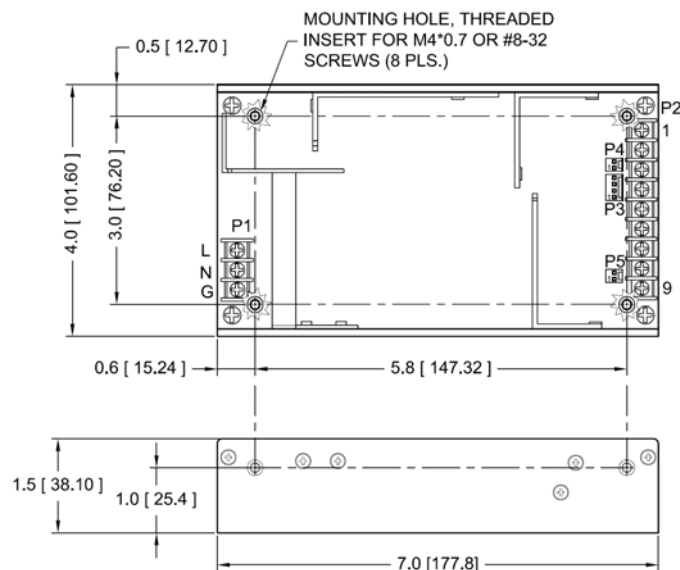
UNIVERSAL INPUT

PM201 MEDICAL & ITE SERIES

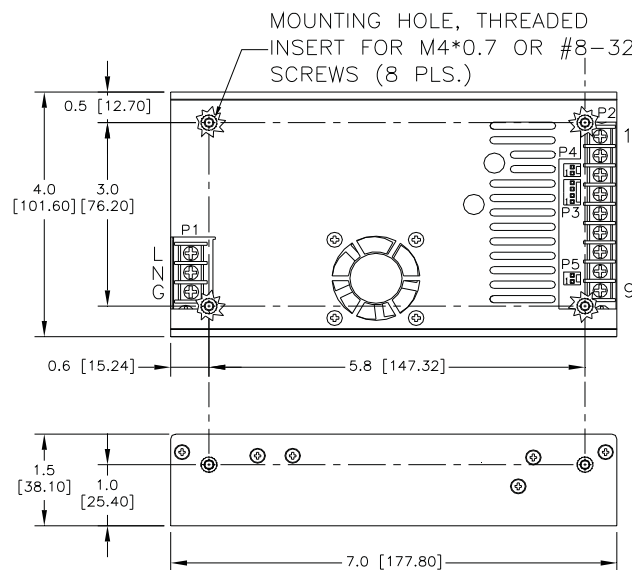
MECHANICAL SPECIFICATIONS

Multiple Output Models

U-bracket Form



Enclosed Form



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle DT-35-B01W-03. Output connector P2 is Dinkle DT-35-B01W-09. Screws are M3, nickel plated.
4. Connector P3 mates with Molex housing 22-01-1043 and Molex 40445 series crimp terminal.
5. Connectors P4 and P5 mate with Molex housing 22-01-1023 and Molex 40445 series crimp terminal.
6. P4 is for DC fan, 12 V/0.2 A rated, Pin 1 +V and Pin 2 -V; except 24 V/0.2 A rated for models PM201-25 and PM201-27, and 5 V/0.38 A rated for models PM201-40-3).
7. Weight: 820 grams (1.8 lbs.) approx. for U-bracket form, 960 grams (2.1 lbs.) approx. for enclosed form.
8. Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis.

PIN CHART

MODEL	CONN PIN	P2									P3				P5	
		1	2	3	4	5	6	7	8	9	1	2	3	4	1	2
PM201-10B PM201-10-3B PM201-12B PM201-13B	PM201-14B PM201-16B PM201-18B	-Sense	Com. Ret.	Com. Ret.	Com. Ret.	Com. Ret.	+V1	+V1	+V1	+Sense	Fan +V	Com. Ret.	Com. Ret.	PFD	Inhibit +V	Inhibit -V
PM201-23B PM201-24B	PM201-25B PM201-27B	V1	V1	Com. Ret.	Com. Ret.	Com. Ret.	V2	N.C.	N.C.	N.C.	Fan +V	Com. Ret.	Com. Ret.	PFD	Inhibit +V	Inhibit -V
PM201-30B PM201-31B	PM201-32B PM201-33B	V1	V1	Com. Ret.	Com. Ret.	Com. Ret.	V2	V3	N.C.	N.C.	Fan +V	Com. Ret.	Com. Ret.	PFD	Inhibit +V	Inhibit -V
PM201-36B		V1	V1	Com. Ret.	Com. Ret.	Com. Ret.	V2	N.C.	V3 Return	+V3	Fan +V	Com. Ret.	Com. Ret.	PFD	Inhibit +V	Inhibit -V
PM201-40B PM201-41B PM201-42B	PM201-44B PM201-45B PM201-40-3B	V1	V1	Com. Ret.	Com. Ret.	Com. Ret.	V2	V3	V4 Return	+V4	Fan +V	Com. Ret.	Com. Ret.	PFD	Inhibit +V	Inhibit -V

200 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM202 series of AC-DC switching power supplies in a package of 3 x 5 x 1.5 inches are capable of delivering 200 watts of continuous power at 5.3 CFM forced air cooling or 150 watts at convection cooling. 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 for 200 watt output. They are specially designed for medical applications, but not for life-supporting equipment. The units are certified also to IEC /EN /UL /CSA 60950-1 and suitable for data networking, computer and telecommunication applications.

FEATURES

- 3 x 5 inch footprint with 1.5 inch low profile
- 100-240 VAC input with active PFC
- Less than 220 μ A leakage current
- Meet EN55011 /55022 and FCC Class B
- Power Factor 0.98 typical
- Short-circuit protection
- Power Fail Detect (PFD) signal
- Inhibit - TTL high to disable output
- Compliant with RoHS requirements
- Efficiency greater than 87%

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	2.5 A (rms) for 115 VAC 1.25 A (rms) for 230 VAC
Earth leakage current:	220 μ A max. @ 264 VAC, 63 Hz
Touch current:	100 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Total output power:	See rating chart.
Ripple and noise:	1% peak to peak maximum
Overvoltage protection:	set at 112-140% of its nominal output voltage
Overcurrent protection:	Output 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 μ s after a 25% step load change
Fan power:	12 V at 250 mA maximum

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, applicable to convection and forced-air cooling conditions

PM202 SERIES



CE (LVD)
RoHS

SAFETY STANDARD APPROVAL



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



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



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	100 KHz (typical)
Efficiency:	87% minimum on all models
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	20 A @ 115 VAC or 40 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	300,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011/EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, >95% reduction for 10 ms

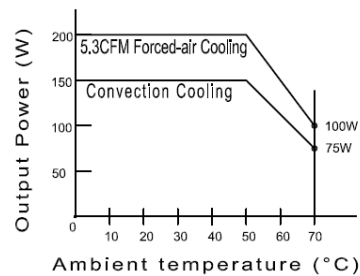
UNIVERSAL INPUT

PM202 MEDICAL & ITE SERIES

INTERFACE SIGNALS

- PFD: TTL high for normal operation,
low upon loss of input power,
turn-on delay time 100-1000 ms,
turn-off delay time 1 ms minimum
- Inhibit: TTL high to turn off output

OUTPUT POWER DERATING CURVE



OUTPUT VOLTAGE/CURRENT RATING CHART

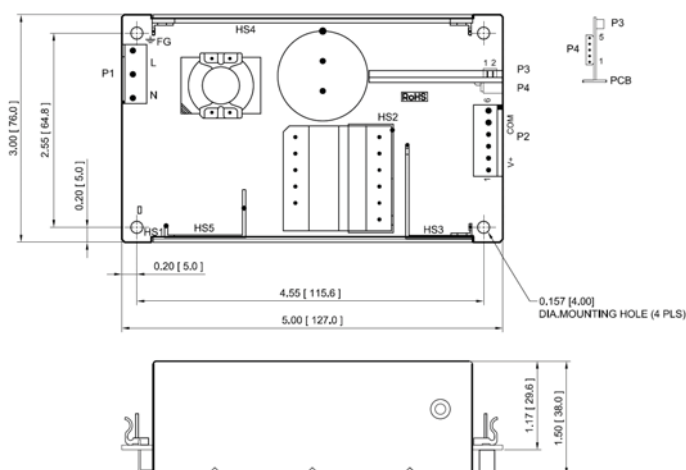
Model ⁽¹⁾	Output							Efficiency (typical)	
	V1	Min. Current	Max. Current at convection	Max. Current at 5.3 CFM ⁽²⁾	Tol.	Ripple & Noise ⁽³⁾	Max. Power ⁽²⁾	@ 150 W 115/230 Vac	@ 200 W 115/230 Vac
PM202-12B	12 V	0 A	12.50 A	16.67 A	±2%	120 mV	150 W/200 W	88/91%	88/90%
PM202-13B	15 V	0 A	10.00 A	13.34 A	±2%	150 mV	150 W/200 W	88/91%	88/91%
PM202-13-1B	18 V	0 A	8.34 A	11.12 A	±2%	180 mV	150 W/200 W	88/91%	88/91%
PM202-14B	24 V	0 A	6.25 A	8.34 A	±2%	240 mV	150 W/200 W	88/91%	88/91%
PM202-15B	28 V	0 A	5.36 A	7.15 A	±2%	280 mV	150 W/200 W	88/91%	88/91%
PM202-17B	36 V	0 A	4.17 A	5.56 A	±2%	360 mV	150 W/200 W	88/91%	88/91%
PM202-18B	48 V	0 A	3.13 A	4.17 A	±2%	480 mV	150 W/200 W	89/92%	89/92%

NOTES:

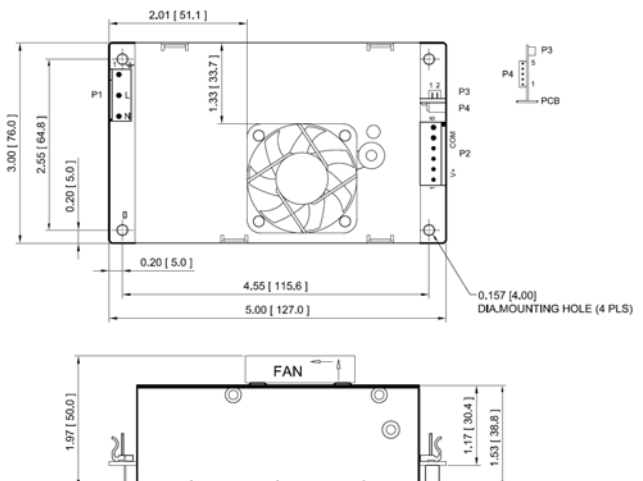
- Suffix "B" in model numbers denotes U-bracket form. Change suffix "B" to "C" for enclosed form with cover-and-fan assembly, e.g. PM202-14C
- 150 W without moving air or 200 W with 5.3 CFM forced air provided by user for "B" version, 200 W for "C" version with cover-and-fan assembly. The adequacy of cooling air is judged by the measured core temperature of transformer T1 below 75°C at 25°C ambient, or below 100°C at 50°C ambient.
- 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.

MECHANICAL SPECIFICATIONS

U-bracket Form



Enclosed Form



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1: Molex header 09-65-2058 or equivalent, mating with Molex housing 09-50-1051 or equivalent.
- Output connector P2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
- Fan connector P3: Molex header 53048-0210 or equivalent, mating with Molex housing 51021-0200 or equivalent.
- Connectors P4: Molex header 22-05-7055 or equivalent, mating with Molex housing 50-37-5053 or equivalent.
- Weight: 390 grams (0.86 lbs.) approx. for U-bracket form, 440 grams (0.97 lbs.) for enclosed form
- Fixing of units to end equipment is through standoffs and the four mounting holes in PCB.
- Ground tab is 0.25 [6.35] x 0.032 [0.8] fast-on connector.

UNIVERSAL INPUT

PM202 MEDICAL & ITE SERIES

PIN CHART

CONN		P1					P2					
MODEL	PIN	1	2	3	4	5	1	2	3	4	5	6
PM202-12B	PM202-15B	Ground	Void	Live	Void	Neutral	+V1			Common Return		
PM202-13B	PM202-17B											
PM202-13-1B	PM202-18B											
PM202-14B												

CONN		P3		P4				
MODEL	PIN	1	2	1	2	3	4	5
PM202-12B	PM202-15B	+12V Fan	Common Return	-Sense	+Sense	PFD	Inhibit	Common Return
PM202-13B	PM202-17B							
PM202-13-1B	PM202-18B							
PM202-14B								

200-300 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM300 series comprising single and multiple output models for 200-300 watts of continuous output power is specially designed for medical and ITE applications, not for life-supporting equipment. They operate at 90-264 VAC input voltage without the need of a selector strap. All auxiliary outputs are with magnetic amplifier to keep regulation. 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
- 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:	4.7 A (rms) for 115 VAC 2.3 A (rms) for 230 VAC
Earth leakage current:	300 μ 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 μ s after a 25% step load change
Fan power:	12 V at 350 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

PM300 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1
File No. E137410



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
Cooling:	200 /250 /300 watts continuous output power at 35 CFM forced air cooling or 100 /125 /150 watts at convention cooling

GENERAL SPECIFICATIONS

Switching frequency:	70 KHz ± 10 KHz
Power factor:	0.98 typical
Efficiency:	70% minimum on all models
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	$\pm 0.2\%$ maximum at full load
Inrush current:	30 A @ 115 VAC or 60A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 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 (EN60601-1-2)	
EN55011:	Class B conducted, Class B radiate
EN61000-3-2:	Harmonic distortion, Class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PM300 MEDICAL & ITE SERIES

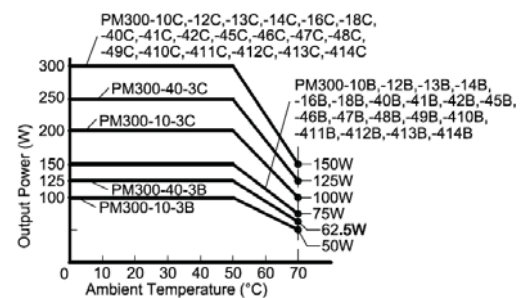
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾⁽²⁾⁽⁶⁾	Output #1 ⁽³⁾⁽⁵⁾				Output #2 ⁽³⁾⁽⁵⁾				Output #3 ⁽⁴⁾				Output #4 ⁽⁴⁾				Max. Output Power ⁽⁵⁾
	V1	Imin.	I _{max.}	Tol.	V2	Imin.	I _{max.}	Tol.	V3	Imin.	I _{max.}	Tol.	V4	Imin.	I _{max.}	Tol.	
PM300-10-3B	3.3 V	3.0 A	60.0 A	±3%	(N/A)				(N/A)				(N/A)				100 W / 200 W
PM300-10B	5.1 V	3.0 A	60.0 A	±2%	(N/A)				(N/A)				(N/A)				150 W / 300 W
PM300-12B	12 V	1.2 A	25.0 A	±2%	(N/A)				(N/A)				(N/A)				150 W / 300 W
PM300-13B	15 V	1.0 A	20.0 A	±2%	(N/A)				(N/A)				(N/A)				150 W / 300 W
PM300-14B	24 V	0.6 A	12.5 A	±2%	(N/A)				(N/A)				(N/A)				150 W / 300 W
PM300-16B	30 V	0.5 A	10.0 A	±2%	(N/A)				(N/A)				(N/A)				150 W / 300 W
PM300-18B	48 V	0.5 A	6.3 A	±2%	(N/A)				(N/A)				(N/A)				150 W / 300 W
PM300-40-3B	3.3 V	3.0 A	35.0 A	±3%	5.1 V	2.0 A	22 A	±2%	12 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	125 W / 250 W
PM300-40B	5.1 V	2.0 A	35.0 A	±2%	12 V	1.0 A	10 A	±2%	12 V	0 A	4 A	±4%	5.1 V	0 A	4 A	±4%	150 W / 300 W
PM300-41B	5.1 V	2.0 A	35.0 A	±2%	15 V	0.8 A	8 A	±2%	15 V	0 A	4 A	±4%	24 V	0 A	2.5 A	±4%	150 W / 300 W
PM300-42B	5.1 V	2.0 A	35.0 A	±2%	12 V	1.0 A	10 A	±2%	12 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	150 W / 300 W
PM300-45B	5.1 V	2.0 A	35.0 A	±2%	12 V	1.0 A	10 A	±2%	12 V	0 A	4 A	±4%	24 V	0 A	2.5 A	±4%	150 W / 300 W
PM300-46B	5.1 V	2.0 A	35.0 A	±2%	12 V	1.0 A	10 A	±2%	12 V	0 A	4 A	±4%	15 V	0 A	4 A	±4%	150 W / 300 W
PM300-47B	5.1 V	2.0 A	35.0 A	±2%	24 V	0.5 A	5 A	±2%	12 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	150 W / 300 W
PM300-48B	5.1 V	2.0 A	35.0 A	±2%	24 V	0.5 A	5 A	±2%	5.1 V	0 A	4 A	±4%	15 V	0 A	4 A	±4%	150 W / 300 W
PM300-49B	5.1 V	2.0 A	35.0 A	±2%	12 V	1.0 A	10 A	±2%	5.1 V	0 A	4 A	±4%	24 V	0 A	2.5 A	±4%	150 W / 300 W
PM300-410B	24 V	0.5 A	6.3 A	±2%	12 V	1.0 A	10 A	±2%	5.1 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	150 W / 300 W
PM300-411B	24 V	0.5 A	6.3 A	±2%	12 V	1.0 A	10 A	±2%	5.1 V	0 A	4 A	±4%	24 V	0 A	2.5 A	±4%	150 W / 300 W
PM300-412B	24 V	0.5 A	6.3 A	±2%	12 V	1.0 A	10 A	±2%	12 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	150 W / 300 W
PM300-413B	24 V	0.5 A	6.3 A	±2%	24 V	0.5 A	5 A	±2%	5.1 V	0 A	4 A	±4%	15 V	0 A	4 A	±4%	150 W / 300 W
PM300-414B	24 V	0.5 A	6.3 A	±2%	24 V	0.5 A	5 A	±2%	12 V	0 A	4 A	±4%	12 V	0 A	4 A	±4%	150 W / 300 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. PM300-45C.
- All outputs are floating. They can be connected externally for positive or negative output.
- Output #1 & #2 can be adjusted within ±5% of their nominal voltage.
- Output #3 & #4 can be adjusted within ±15% of their nominal voltage.
- 300 watts for "C" version with cover-and-fan assembly, 150 watts for "B" version without moving air (maximum current of output #1 & #2 derated to 50%), or 300 watts with 35 CFM forced air provided by user.
- PM300-10-3B is rated 200 watts with 35 CFM forced air cooling or 100 watts convection cooled. PM300-40-3B is rated 250 watts with 35 CFM forced air cooling (maximum current of output #1 & #2 derated to 50%) or 125 watts convection cooled.
- Single output 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.

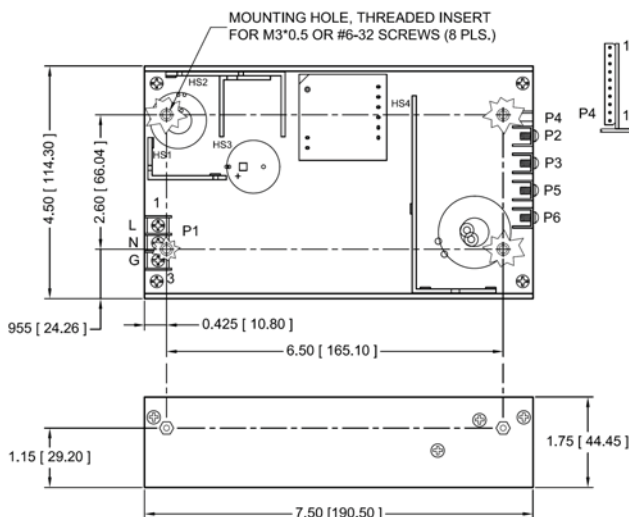
OUTPUT POWER DERATING CURVE



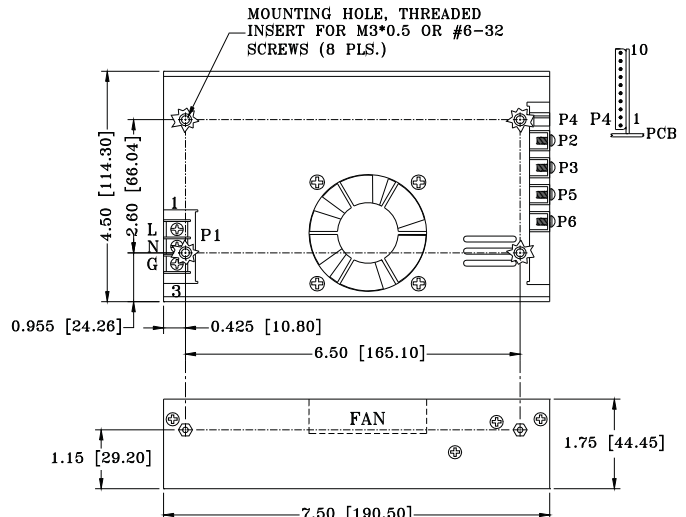
MECHANICAL SPECIFICATIONS

Single Output Models

U-bracket Form



Enclosed Form

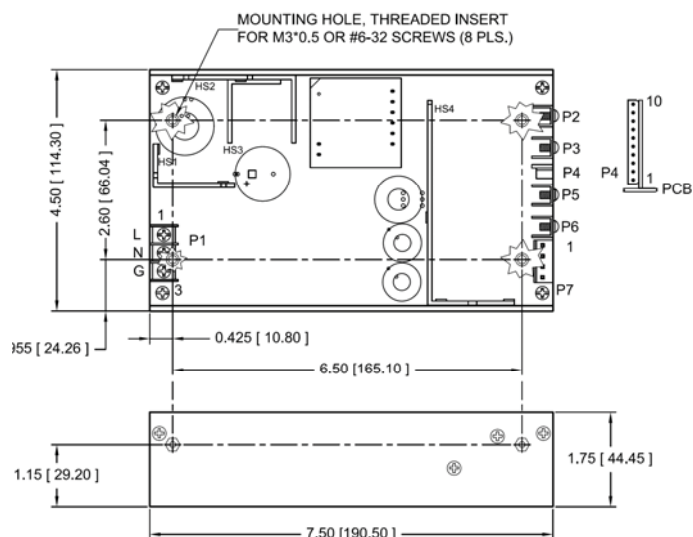


UNIVERSAL INPUT

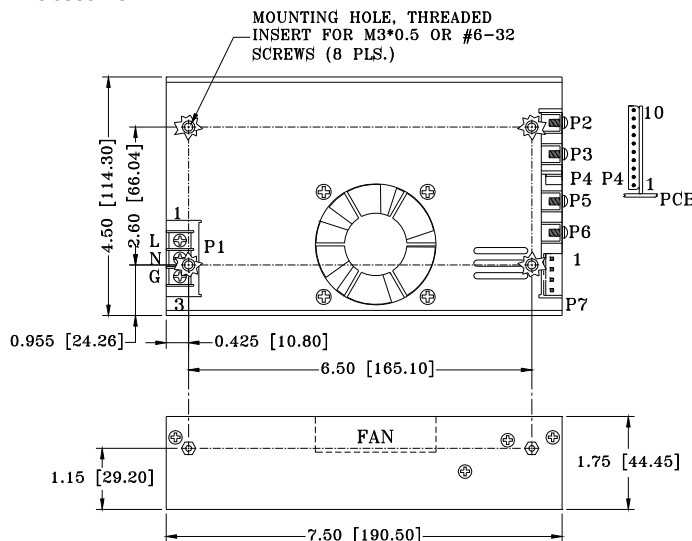
PM300 MEDICAL & ITE SERIES

Multiple Output Models

U-bracket Form



Enclosed Form



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle DT-35-B01W-03 with M3, nickel-plated screws.
4. Connector P4 mates with Molex housing 50-37-5103 and pins 5263.
5. Connectors P2, P3, P5 and P6: M3*0.5 screw connections
6. Output connector P7 mates with Molex housing 09-50-3041 and Molex 2878 series crimp terminal.
7. Weight: 1.10 Kgs. (2.42 lbs.) approx. for U-bracket form, 1.24 Kgs. (2.73 lbs.) approx. for Enclosed form.
8. 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	P6	P7			
		1	2	3					1	2	3	4
PM300-10-3B PM300-10B PM300-12B PM300-13B	PM300-14B PM300-16B PM300-18B	Live	Neutral	Ground	+V1		V1 Return		N.A.			
PM300-40-3B PM300-40B PM300-41B PM300-42B PM300-45B PM300-46B PM300-47B	PM300-48B PM300-49B PM300-410B PM300-411B PM300-412B PM300-413B PM300-414B	Live	Neutral	Ground	+V1	V1 Return	+V2	V2 Return	+V3	V3 Return	+V4	V4 Return

MODEL	CONN PIN	P4									
		1	2	3	4	5	6	7	8	9	10
PM300-10-3B PM300-10B PM300-12B PM300-13B	PM300-14B PM300-16B PM300-18B	Signal Common Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	N.C.	N.C.	N.C.	Fan Return	+12V Fan
PM300-40-3B PM300-40B PM300-41B PM300-42B PM300-45B PM300-46B PM300-47B	PM300-48B PM300-49B PM300-410B PM300-411B PM300-412B PM300-413B PM300-414B	Signal Common Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	N.C.	+V2 Sense	-V2 Sense	Fan Return	+12V Fan

400 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM400 series of AC-DC switching power supplies in a package of 4 x 7 x 1.58 inches are capable of delivering 400 watts of continuous power at 7 CFM forced air cooling or 300 watts at convection cooling. 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 for 400 watt output without the change of any dimension. They are designed for medical applications, but not for life-supporting equipment. The units are certified also to IEC/EN/UL 60950-1 and suitable for data networking, computer and telecommunication applications.

PM400 SERIES



FEATURES

- 4 x 7 inch footprint with 1.58 inch low profile
- 100-240 VAC input with active PFC
- Less than 300 μ A leakage current
- 300 watt convection rating up to +50°C
- 400 watt output with 7 CFM forced air
- Standby output 5VDC at 100mA
- EN55011 / 55022 Class B conducted emissions
- Inhibit - TTL low to disable output
- Standard PS Off and DC OK signals
- Efficiency greater than 88%
- Compliant with RoHS requirements

SAFETY STANDARD APPROVALS

(Pending)

Preliminary

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	4.2 A (rms) @115 VAC, 60 Hz 2.1 A (rms) @ 230 VAC, 50 Hz
Earth leakage current:	300 μ 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
Remote sense	Compensation for cable losses up to 0.5V
Overvoltage protection:	Set at 115-140% of nominal output voltage
Overcurrent protection:	Protected to output short circuit conditions
Thermal shutdown	Protected to overtemperature conditions
Temperature coefficient:	All outputs $\pm 0.04\%$ /°C maximum
Transient response:	Maximum excursion of 4%, recovering to 1% of final value within 500 μ s after a 25% step load change
Standby power	5 V at 100 mA maximum
Fan power	12 V at 250 mA maximum

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	-10°C to +70°C
Storage temperature:	-40°C to +85°C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +50°C linearly to 50% at +70°C, applicable to convection and forced-air cooling conditions

GENERAL SPECIFICATIONS

Switching frequency:	85 KHz (typical)
Efficiency:	Typical 89% @ 115 VAC, 92% @ 230 VAC
Hold-up time:	12 ms minimum at 110 VAC & 400 W
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	20 A @ 115 VAC, or 40 A @ 230 VAC, at 25°C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	350,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011/EN55022:	Class B conducted, class A radiated
FCC:	Class B conducted, class A radiated
VCCI:	Class B conducted, class A radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PM400 MEDICAL & ITE SERIES

INTERFACE SIGNALS

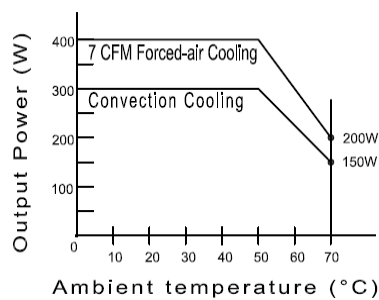
PFD: TTL high for normal operation,
low upon loss of input power,
turn-on delay time 100-500 ms,
turn-off delay time 5 ms minimum

Inhibit: TTL low to turn off output

DC OK: TTL high when output voltage >95%

PS OFF: TTL high to turn off output

OUTPUT POWER DERATING CURVE



OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output							Efficiency (typical)	
	V1	Min. Current	Max. Current at convection	Max. Current at 7 CFM ⁽²⁾	Tol.	Ripple & Noise ⁽³⁾	Max. Output Power	@ 300 W 115/230 Vac	@ 400 W 115/230 Vac
PM400-12B	12 V	0 A	25.00 A	33.34 A	±2%	120 mV	300 W/400 W	90/92 %	88/91 %
PM400-13B	15 V	0 A	20.00 A	26.67 A	±2%	150 mV	300 W/400 W	90/92 %	88/91 %
PM400-13-1B	18 V	0 A	16.67 A	22.23 A	±2%	180 mV	300 W/400 W	90/92 %	88/91 %
PM400-14B	24 V	0 A	12.50 A	16.67 A	±2%	240 mV	300 W/400 W	90/92 %	89/92 %
PM400-15B	28 V	0 A	10.72 A	14.29 A	±2%	280 mV	300 W/400 W	90/92 %	89/92 %
PM400-17B	36 V	0 A	8.34 A	11.12 A	±2%	360 mV	300 W/400 W	90/92 %	89/92 %
PM400-18B	48 V	0 A	6.25 A	8.34 A	±2%	480 mV	300 W/400 W	90/92 %	89/92 %

NOTES: 1. Change suffix "B" for U-Bracket form to "C" for enclosed form with cover-and-fan assembly, e.g. PM400-14C.

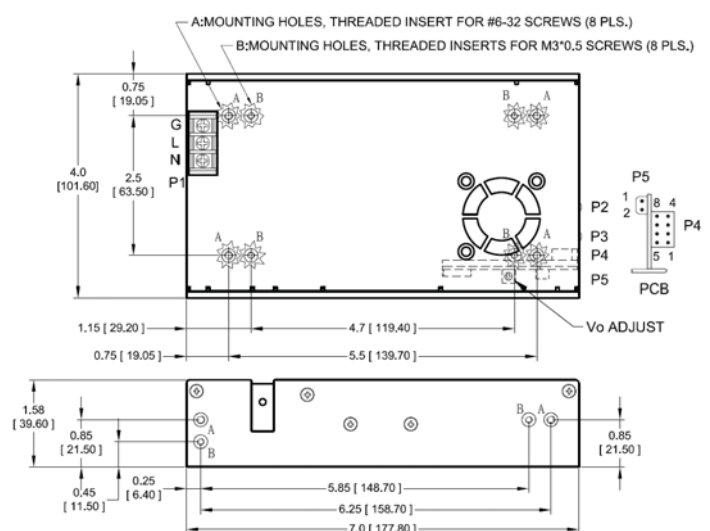
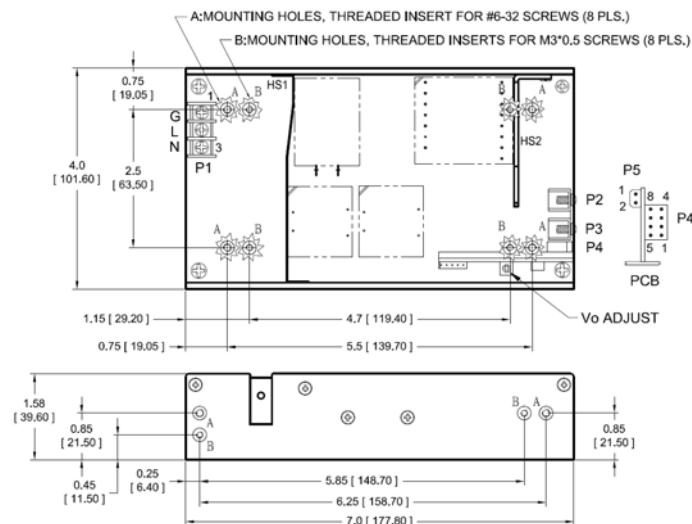
2. 300 W without moving air or 400 W with 7 CFM forced air provided by user for "B" version, 400 W for "C" version with cover-and-fan assembly

3. 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS

U-bracket Form

Enclosed Form



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle terminal P/N DT-35-B01W-03, with nickel plated M3 screws.
- P2, P3: M3 x 0.5 screw connectors
- Connector P4: Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Fan connector P5: Molex header 53048-0210 or equivalent, mating with Molex housing 51021-0200 or equivalent.
- Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kg (2.52 lbs.) approx. for enclosed form
- Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis.

UNIVERSAL INPUT

PM400 MEDICAL & ITE SERIES

PIN CHART

MODEL \ CONN PIN	P1 (AC)			P2	P3	P5	
	1	2	3			1	2
PM400-12B PM400-15B PM400-13B PM400-17B PM400-13-1B PM400-18B PM400-14B	Ground	Live	Neutral	+V1	Common Return	+12V Fan	Common Return

MODEL \ CONN PIN	P4							
	1	2	3	4	5	6	7	8
PM400-12B PM400-15B PM400-13B PM400-17B PM400-13-1B PM400-18B PM400-14B	Common Return	+V1 Sense	-V1 Sense	PFD	Inhibit	+5V Standby	DC OK	PS OFF

Preliminary

450-480 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM450 series comprising single and multiple output models for 450-480 watts of continuous output power is specially designed for medical and ITE applications, not for life-supporting equipment. 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:	7.1 A (rms) for 115 VAC 3.5 A (rms) for 230 VAC
Earth leakage current:	240 µA 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 $\pm 0.04\%$ / $^{\circ}\text{C}$ maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500µs after a 25% step load change
Fan power:	12 V at 400 mA for B version, 12 V at 100 mA 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 1ms 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.

PM450 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



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



TÜV EN 60950-1

ENVIRONMENTAL SPECIFICATIONS

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

GENERAL SPECIFICATIONS

Switching frequency:	60 KHz ± 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:	40 A @ 115 VAC or 80 A @ 230 VAC, at 25 $^{\circ}\text{C}$ cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	300,000 hours at full load at 25 $^{\circ}\text{C}$ ambient, calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011 / EN55022	Class B conducted, Class A radiated
FCC:	Class B conducted, Class A radiated
VCCI:	Class B conducted, Class A radiated
EN61000-3-2:	Harmonic distortion, Class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 3 V/ms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

UNIVERSAL INPUT

PM450 MEDICAL & ITE SERIES

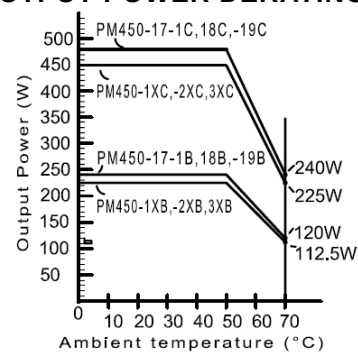
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output #1 ⁽³⁾⁽⁵⁾				Output #2 ⁽⁵⁾				Output #3 ⁽⁴⁾				Max. Output Power ⁽⁵⁾
	V1	Imin.	Imax.	Tol.	V2	Imin.	Imax.	Tol.	V3	Imin.	Imax.	Tol.	
PM450-12B	12 V	0 A	37.5 A	±2%	(N/A)				(N/A)				225 / 450 W
PM450-13B	15 V	0 A	30.0 A	±2%	(N/A)				(N/A)				225 / 450 W
PM450-14B	24 V	0 A	18.75 A	±2%	(N/A)				(N/A)				225 / 450 W
PM450-15B	27 V	0 A	16.7 A	±2%	(N/A)				(N/A)				225 / 450 W
PM450-16B	30 V	0 A	15.0 A	±2%	(N/A)				(N/A)				225 / 450 W
PM450-17-1B	40 V	0 A	12.0 A	±2%	(N/A)				(N/A)				240 / 480 W
PM450-18B	48 V	0 A	10.0 A	±2%	(N/A)				(N/A)				240 / 480 W
PM450-19B	55 V	0 A	8.73 A	±2%	(N/A)				(N/A)				240 / 480 W
PM450-20B	24 V	1.0 A	12.0 A	±2%	12 V	1.00 A	17 A	±5%	(N/A)				225 / 450 W
PM450-21B	24 V	1.0 A	12.0 A	±2%	15 V	0.75 A	15 A	±5%	(N/A)				225 / 450 W
PM450-22B	48 V	0.5 A	6.0 A	±2%	24 V	0.50 A	10 A	±5%	(N/A)				225 / 450 W
PM450-23B	48 V	0.5 A	6.0 A	±2%	12 V	1.00 A	17 A	±5%	(N/A)				225 / 450 W
PM450-24B	48 V	0.5 A	6.0 A	±2%	15 V	0.75 A	15 A	±5%	(N/A)				225 / 450 W
PM450-30B	24 V	1.0 A	12.0 A	±2%	12 V	1.00 A	17 A	±5%	3.3 V	0 A	8 A	±3%	225 / 450 W
PM450-31B	24 V	1.0 A	12.0 A	±2%	15 V	0.75 A	15 A	±5%	3.3 V	0 A	8 A	±3%	225 / 450 W
PM450-32B	24 V	1.0 A	12.0 A	±2%	12 V	1.00 A	17 A	±5%	5.1 V	0 A	8 A	±3%	225 / 450 W
PM450-33B	24 V	1.0 A	12.0 A	±2%	15 V	0.75 A	15 A	±5%	5.1 V	0 A	8 A	±3%	225 / 450 W
PM450-34B	48 V	0.5 A	6.0 A	±2%	12 V	1.00 A	17 A	±5%	3.3 V	0 A	8 A	±3%	225 / 450 W
PM450-35B	48 V	0.5 A	6.0 A	±2%	15 V	0.75 A	15 A	±5%	3.3 V	0 A	8 A	±3%	225 / 450 W
PM450-36B	48 V	0.5 A	6.0 A	±2%	12 V	1.00 A	17 A	±5%	5.1 V	0 A	8 A	±3%	225 / 450 W
PM450-37B	48 V	0.5 A	6.0 A	±2%	15 V	0.75 A	15 A	±5%	5.1 V	0 A	8 A	±3%	225 / 450 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. PM450-14C.
- All outputs are floating. They can be connected externally for positive or negative output.
- Output #1 can be adjusted within ±5% of its nominal voltage.
- Output #3 can be adjusted within ±15% of its nominal voltage.
- 450-480 watts for "C" version with cover-and-fan assembly. 225-240 watts for "B" version without moving air (maximum current of output #1 & 2 derated to 50%), or 450 watts with 40 CFM forced air provided by user.
- All models may be operated at no-load. At no-load, output voltage tolerance increases to ±10%.

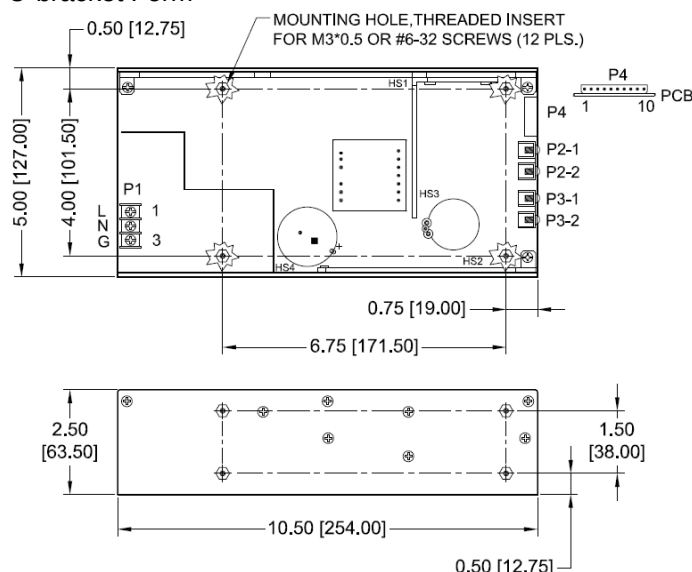
OUTPUT POWER DERATING CURVE



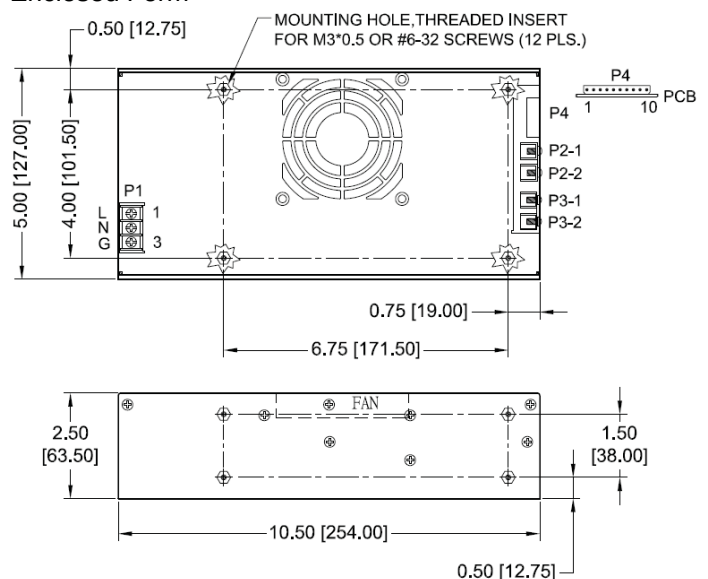
MECHANICAL SPECIFICATIONS

Single Output Models

U-bracket Form

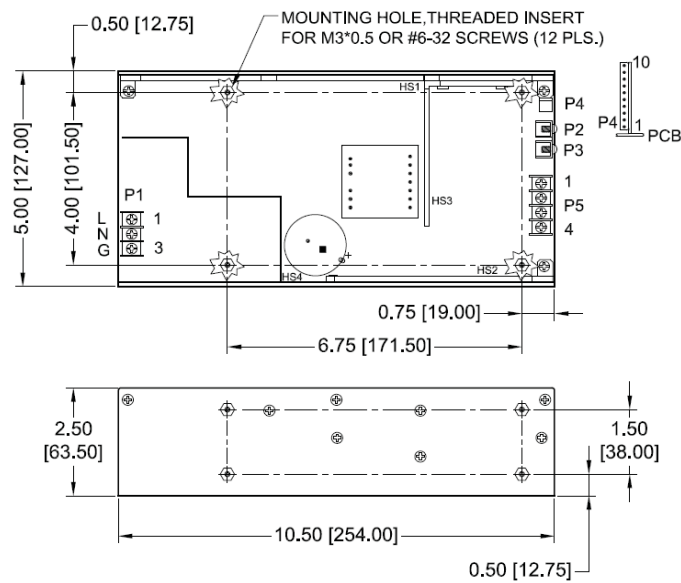


Enclosed Form

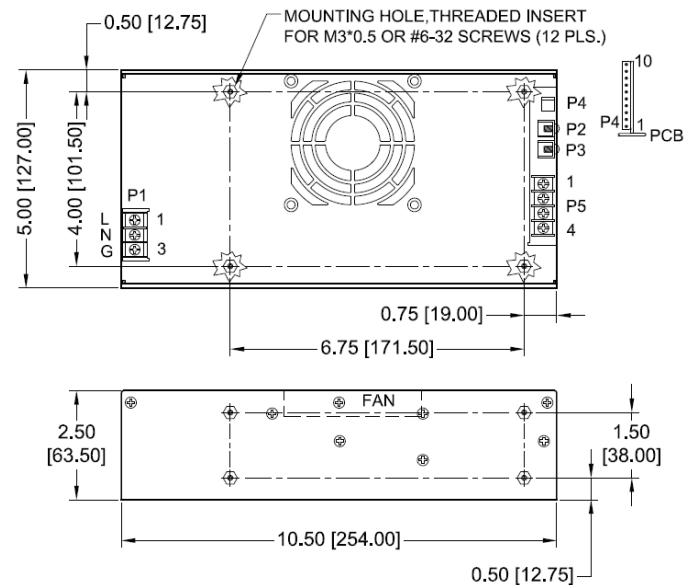


UNIVERSAL INPUT

PM450 MEDICAL & ITE SERIES

Multiple Output Models
U-bracket Form

Enclosed Form



- NOTES:
1. Dimensions shown in inches [mm]
 2. Tolerance 0.02 [0.5] maximum
 3. Input connector P1 is Dinkle DT-35-B01W-03 with M3, nickel plated screws.
 4. Connector P4 mates with Molex housing 50-37-5103 and pins 5263.
 5. P2, P2-1, P2-2, P3, P3-1 & P3-2: M3*0.5 screw connections
 6. Output connector P5 is Dinkle DT-35-B01W-04 with M3, nickel plated screws.
 7. Weight: 1.8 Kgs (3.96 lbs.) approx. for U-bracket form, 2.0 Kg (4.4 lbs.) approx. for enclosed form
 8. 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
PM450-12B PM450-13B PM450-14B PM450-15B	PM450-16B PM450-17-1B PM450-18B PM450-19B	Live	Neutral	Ground	+V1	V1 Return	N.A.			
PM450-20B PM450-21B PM450-22B	PM450-23B PM450-24B	Live	Neutral	Ground	+V1	V1 Return	+V2	V2 Return	N.C.	N.C.
PM450-30B PM450-31B PM450-32B PM450-33B	PM450-34B PM450-35B PM450-36B PM450-37B	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
PM450-12B PM450-13B PM450-14B PM450-15B	PM450-16B PM450-17-1B PM450-18B PM450-19B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	N.C.	N.C.	Fan Return	+12V Fan
PM450-20B PM450-21B PM450-22B	PM450-23B PM450-24B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	+V2 Sense	-V2 Sense	Fan Return	+12V Fan
PM450-30B PM450-31B PM450-32B PM450-33B	PM450-34B PM450-35B PM450-36B PM450-37B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	+V2 Sense	-V2 Sense	Fan Return	+12V Fan

650-700 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM650 series comprising single and multiple output models for 650-700 watts of continuous output power is specially designed for medical and ITE applications, not for life-support. 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 µA 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 $\pm 0.04\%$ / $^{\circ}\text{C}$ maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs 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

PM650 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



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



TÜV EN 60950-1

ENVIRONMENTAL SPECIFICATIONS

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

GENERAL SPECIFICATIONS

Switching frequency:	70 KHz ± 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 $^{\circ}\text{C}$ cold start
Withstand voltage:	4000 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 $^{\circ}\text{C}$ ambient, calculated per MIL-HDBK- 217F

EMC Performance (IEC60601-1-2)

EN55011:	Class B conducted, Class A radiated
EN61000-3-2:	Harmonic distortion, Class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PM650 MEDICAL & ITE SERIES

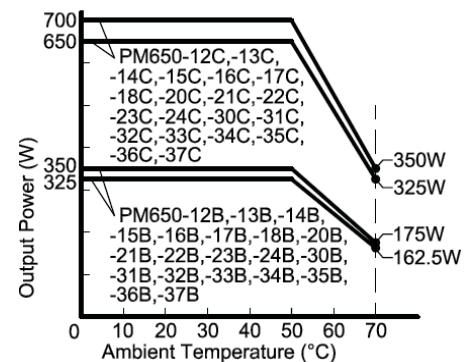
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output #1 ⁽³⁾⁽⁵⁾				Output #2 ⁽⁵⁾				Output #3 ⁽⁴⁾				Max. Output Power ⁽⁵⁾
	V1	Imin.	Imax.	Tol.	V2	Imin.	Imax.	Tol.	V3	Imin.	Imax.	Tol.	
PM650-12B	12 V	0 A	54.2 A	±2%	(N/A)				(N/A)				325 W / 650 W
PM650-13B	15 V	0 A	43.4 A	±2%	(N/A)				(N/A)				325 W / 650 W
PM650-14B	24 V	0 A	27.1 A	±2%	(N/A)				(N/A)				325 W / 650 W
PM650-15B	27 V	0 A	24.1 A	±2%	(N/A)				(N/A)				325 W / 650 W
PM650-16B	30 V	0 A	21.7 A	±2%	(N/A)				(N/A)				325 W / 650 W
PM650-17B	36 V	0 A	18.1 A	±2%	(N/A)				(N/A)				325 W / 650 W
PM650-18B	48 V	0 A	14.6 A	±2%	(N/A)				(N/A)				350 W / 700 W
PM650-20B	24 V	1.50 A	18.0 A	±2%	12 V	N/A	22 A	±5%	(N/A)				325 W / 650 W
PM650-21B	24 V	1.50 A	18.0 A	±2%	15 V	1.0 A	18 A	±5%	(N/A)				325 W / 650 W
PM650-22B	48 V	0.75 A	9.0 A	±2%	24 V	0.6 A	12 A	±5%	(N/A)				325 W / 650 W
PM650-23B	48 V	0.75 A	9.0 A	±2%	12 V	1.2 A	22 A	±5%	(N/A)				325 W / 650 W
PM650-24B	48 V	0.75 A	9.0 A	±2%	15 V	1.0 A	18 A	±5%	(N/A)				325 W / 650 W
PM650-30B	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
PM650-31B	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
PM650-32B	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
PM650-33B	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
PM650-34B	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
PM650-35B	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
PM650-36B	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
PM650-37B	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. PM650-14C.
- 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

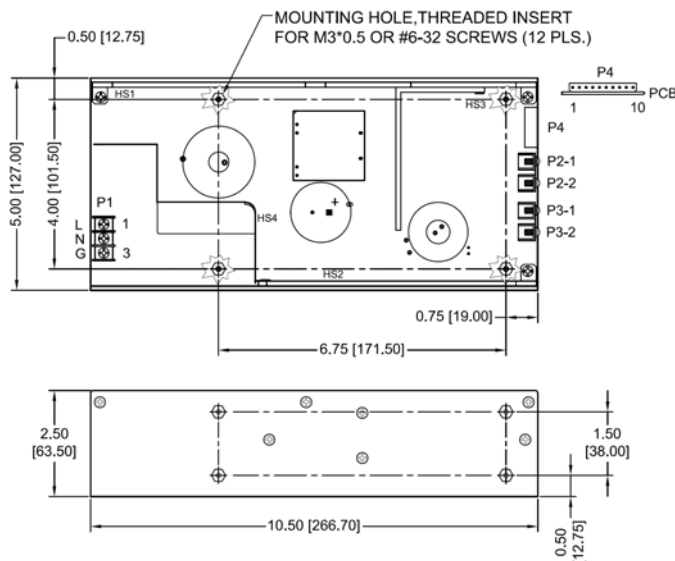
OUTPUT POWER DERATING CURVE



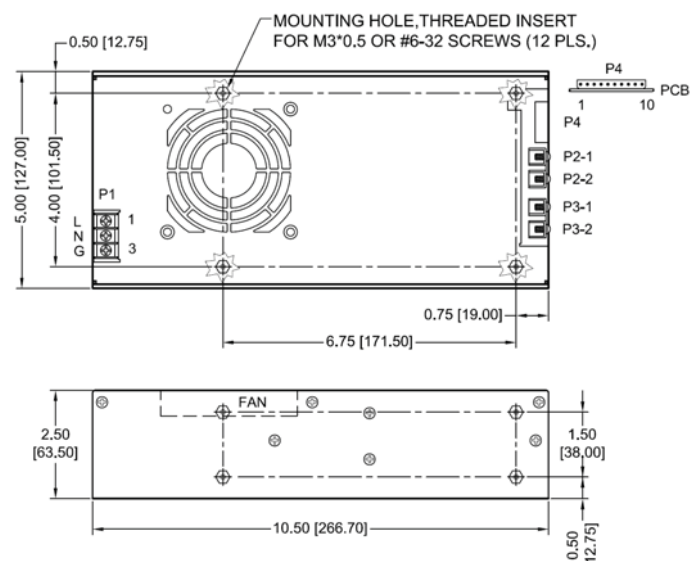
MECHANICAL SPECIFICATIONS

Single Output Models

U-bracket Form



Enclosed Form



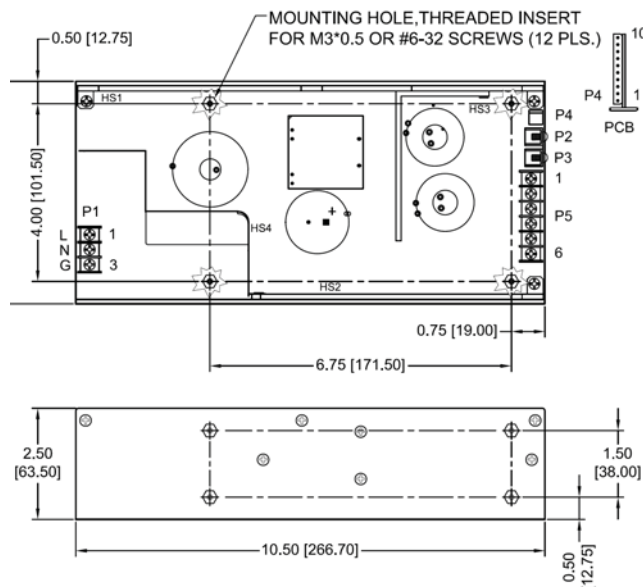
UNIVERSAL INPUT

PM650 MEDICAL & ITE SERIES

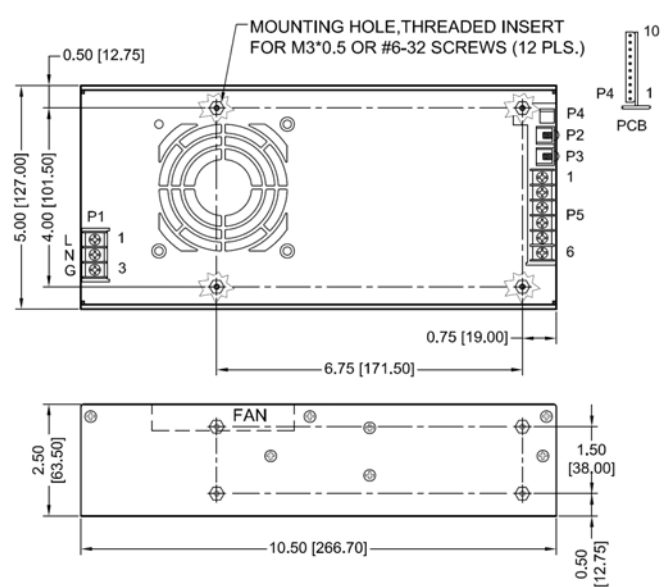
MECHANICAL SPECIFICATIONS

Multiple Output Models

U-bracket Form



Enclosed Form



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle DT-4C-B01W-03 with M3, nickel-plated screws.
4. Connector P4 mates with Molex housing 50-37-5103 and pins 5263.
5. Connector P2-1, P2-2, P3-1 & P3-2: M3*0.5 screw connections.
6. Connectors P2, P3: M3*0.5 screw connections
7. Output connector P5 is Dinkle DT-35-B01W-06. Screws are M3, nickel plated.
8. Weight: 2.0 Kgs. (4.4 lbs.) approx. for U-bracket form, 2.2 Kgs. (4.84 lbs.) approx. for enclosed form.
9. 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
PM650-12B	PM650-16B	Live	Neutral	Ground	+V1	V1 Return	N.A.					
PM650-13B	PM650-17B											
PM650-14B	PM650-18B											
PM650-15B												
PM650-20B	PM650-23B	Live	Neutral	Ground	+V1	V1 Return	+V2		V2 Return		N.A.	N.A.
PM650-21B	PM650-24B											
PM650-22B												
PM650-30B	PM650-34B	Live	Neutral	Ground	+V1	V1 Return	+V2		V2 Return		+V3	V3 Return
PM650-31B	PM650-35B											
PM650-32B	PM650-36B											
PM650-33B	PM650-37B											

MODEL	CONN PIN	P4									
		1	2	3	4	5	6	7	8	9	10
PM650-12B	PM650-16B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	N.C.	N.C.	Fan Return	+12V Fan
PM650-13B	PM650-17B										
PM650-14B	PM650-18B										
PM650-15B	PM650-20B										
PM650-21B	PM650-23B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	+V2 Sense	-V2 Sense	Fan Return	+12V Fan
PM650-22B	PM650-24B										
PM650-30B	PM650-34B										
PM650-31B	PM650-35B	PFD Return	+V1 Sense	-V1 Sense	PFD	Inhibit +V	Inhibit -V	+V2 Sense	-V2 Sense	Fan Return	+12V Fan
PM650-32B	PM650-36B										
PM650-33B	PM650-37B										

15 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PMP15 series of AC/DC wall mount switching power supplies are for 15 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with four types of interchangeable AC plugs: European plug, UK plug and North American plugs. All models meet EN55011 and FCC class B emission limits, and are designed for medical application, not for life-supporting equipment.

PMP15 SERIES



CE (LVD)

RoHS



FEATURES

- Interchangeable AC plugs
- High efficiency
- Low ripple & noise
- Overvoltage protection
- Short-circuit protection
- 100% burn-in at full rated load
- Standby consumption less than 0.3 W
- Compliant with CEC and ENERGY STAR efficiency level V requirements
- Compliant with RoHS requirements

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E 211696



TÜV EN 60601-1

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	0.5 A (rms) for 115 VAC 0.3 A (rms) for 230 VAC
Enclosure leakage current:	100 µA 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(except 70 mVp-p max. for PMP15M-10)
Overvoltage protection:	Set at 116% to 230% of its nominal output voltage
Overcurrent protection:	Protected to short circuit conditions
Temperature coefficient:	±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0°C to +40°C
Storage temperature:	-40°C to +85°C
Relative humidity:	10% to 90% non-condensing
Derating:	Derate from 100% at +40°C linearly to 50% at +60°C

GENERAL SPECIFICATIONS

Hold-up time:	8 ms minimum at 115 VAC
Turn on delay time:	3 s maximum at 115 VAC
Efficiency:	Compliant with Energy Star efficiency level V requirements (see rating chart)
Line regulation:	±0.5% maximum at full load
Inrush current:	30 A @ 115 VAC or 60 A @ 230 VAC (80 A for PMP15M/D/E-10) at 25°C cold start
Withstand voltage:	4000 VAC from input to output
MTBF:	300,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011:	Class B conducted, Class B radiated
FCC:	Class B conducted, Class B radiated
VCCI:	Class B conducted, Class B radiated
EN61000-3-2:	Harmonic distortion, Class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±8 KV air and ±6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and > 95% reduction for 10 ms

UNIVERSAL INPUT

PMP15 MEDICAL SERIES

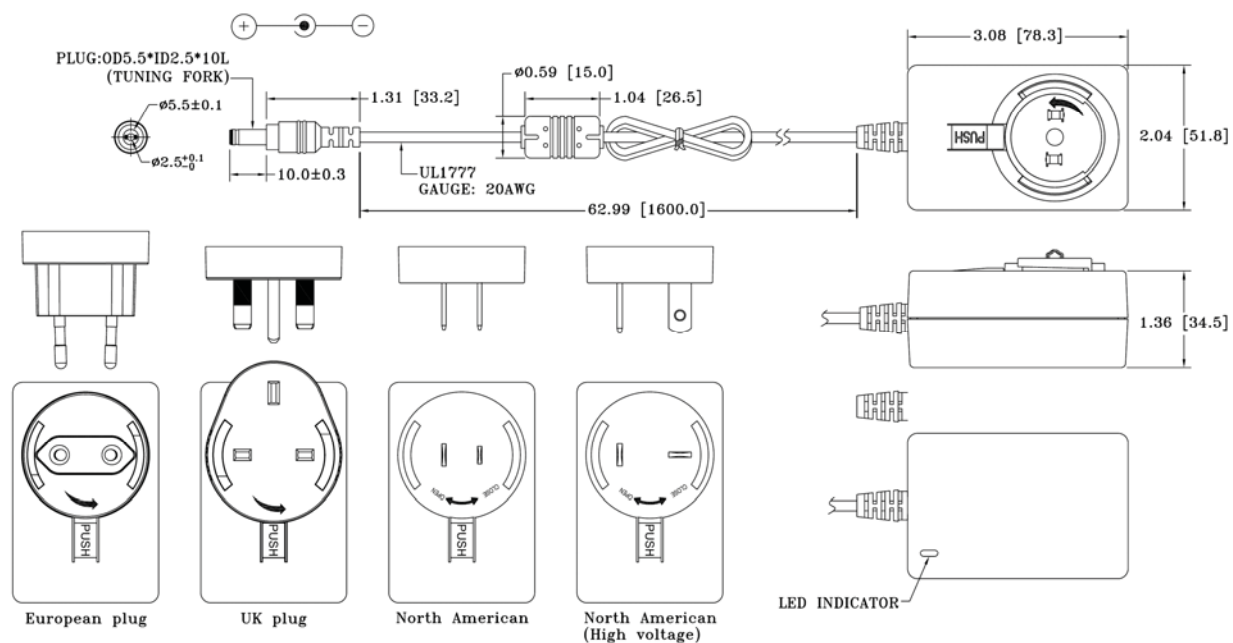
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output						Average Active Efficiency (typical) @ 115 / 230 Vac
	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Output Power	
PMP15M-10	5 V	0 A	3.0 A	±5%	70 mV	15 W	78 / 77 %
PMP15M-10-1	6 V	0 A	2.5 A	±5%	60 mV	15 W	80 / 78 %
PMP15M-11	9 V	0 A	1.67 A	±5%	90 mV	15 W	82 / 80 %
PMP15M-12	12 V	0 A	1.25 A	±5%	120 mV	15 W	82 / 80 %
PMP15M-13	15 V	0 A	1.0 A	±5%	150 mV	15 W	83 / 80 %
PMP15M-14	24 V	0 A	0.625 A	±5%	240 mV	15 W	85 / 81 %
PMP15D-10	5 V	0 A	3.0 A	±5%	50 mV	15 W	78 / 77 %
PMP15D-12	12 V	0 A	1.25 A	±5%	120 mV	15 W	82 / 80 %
PMP15D-14	24 V	0 A	0.625 A	±5%	240 mV	15 W	85 / 81 %
PMP15E-10	5 V	0 A	3.0 A	±5%	500 mV	15 W	78 / 77 %
PMP15E-12	12 V	0 A	1.25 A	±5%	120 mV	15 W	82 / 80 %
PMP15E-14	24 V	0 A	0.625 A	±5%	240 mV	15 W	85 / 81 %

NOTES:

1. PMP15M models are for interchangeable AC plugs which are to be ordered separately. PMP15D models are with fixed North American AC plug, and PMP15E models with fixed European AC plug.
2. 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Weight: 200 grams (0.44 lbs.) approx.
4. Output cable is 1600 mm 20 AWG except 1000 mm 16 AWG for 5V and 6V output models, and 1200 mm 18 AWG for 9V output model, so as to comply with CEC and Energy Star efficiency level V requirements.
5. Output connector is 5.5 mm O.D., 2.5 mm I.D., 10 mm long barrel female connector, center positive voltage.

25-30 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PMP31 series of AC/DC switching power supplies are for 25-30 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an inlet of the IEC320/C14 to mate with interchangeable cord for world-wide use. All models meet EN55011 and FCC class B emission limits, and are designed for medical applications, not for life-supporting equipment.

PMP31 SERIES

CE (LVD)

RoHS



FEATURES

- High efficiency
- Low ripple & noise
- Overvoltage protection
- Short-circuit protection
- Overpower protection
- 100% burn-in at full rated load
- Standby consumption less than 0.3 W
- Compliant with CEC and ENERGY STAR efficiency level V requirements
- Compliant with RoHS requirements

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E211696



TÜV EN 60601-1

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	1.0 A (rms) for 115 VAC 0.6 A (rms) for 230 VAC
Earth leakage current:	100 µA 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, except 75 mVp-p max. for PMP31-10
Overvoltage protection:	Set at 116% to 230% of its nominal output voltage
Overcurrent protection:	All models protected to short-circuit conditions
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0°C to +40°C
Storage temperature:	-40°C to +85°C
Relative humidity:	10% to 90% non-condensing
Derating	Derate from 100% at +40°C linearly to 50% at +60°C

GENERAL SPECIFICATIONS

Hold-up time:	8 ms minimum at 115 VAC
Turn on delay time:	3 s maximum at 115 VAC
Efficiency:	Compliant with Energy Star efficiency level V requirements (see rating chart)
Line regulation:	±0.5% maximum at full load
Inrush current:	50 A @ 115 VAC or 100 A @ 230 VAC, at 25°C cold start
Withstand voltage:	4000 VAC from input to output
MTBF:	300,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±8 KV air and ±6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

UNIVERSAL INPUT

PMP31 MEDICAL SERIES

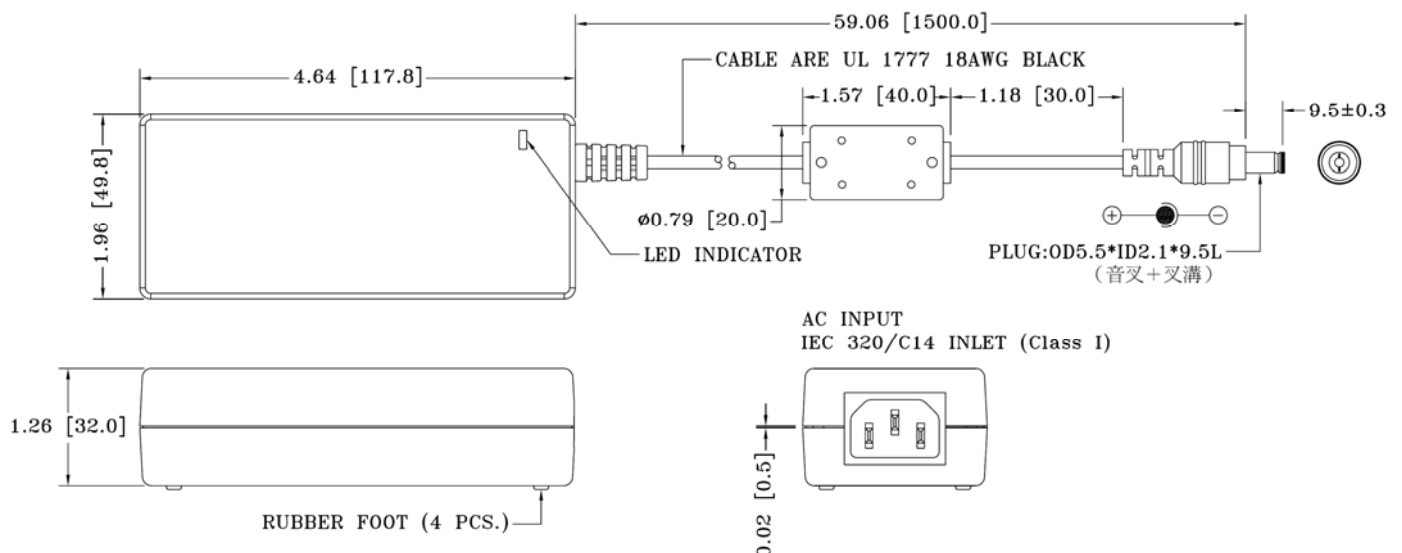
OUTPUT VOLTAGE/CURRENT RATING CHART

Model	Output						Average Active Efficiency (typical) @ 115 / 230 Vac
	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽¹⁾	Max. Output Power	
PMP31-10	5 V	0 A	5.0 A	±5%	75 mV	25 W	83 / 81 %
PMP31-11	9 V	0 A	3.33 A	±5%	90 mV	30 W	86 / 84 %
PMP31-12	12 V	0 A	2.5 A	±5%	120 mV	30 W	86 / 85 %
PMP31-13	15 V	0 A	2.0 A	±5%	150 mV	30 W	88 / 86 %
PMP31-13-1	18 V	0 A	1.66 A	±5%	180 mV	30 W	88 / 86 %
PMP31-14	24 V	0 A	1.25 A	±5%	240 mV	30 W	89 / 87 %
PMP31-18	48 V	0 A	0.625 A	±5%	480 mV	30 W	91 / 90 %

NOTES:

1. 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Weight: 260 grams (0.57 lbs.) approx.
4. Output cable is 1500 mm, 18 AWG, except 1000 mm 16 AWG for 5V and 9V output models, so as to comply with CEC and Energy Star efficiency level V requirements.
5. Output connector is 5.5 mm O.D., 2.1 mm I.D., 9.5 mm long barrel female connector, center positive voltage.

45 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PMP55 series of AC/DC multiple output switching power supplies are for 45 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an IEC320/C14 inlet to mate with interchangeable cord for world-wide use. An on /off switch can be added at request. All models meet EN55011 and FCC class B emission limits, and are designed for medical applications not for life-supporting equipment.

FEATURES

- 5 standard desktop models
- Dual or triple outputs
- Optional output connectors
- Optional on /off switch
- 100% burn-in
- Wide input range 85-264 VAC
- Input surge current protection
- Overvoltage protection
- Overcurrent protection
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	85-264 VAC
Input frequency:	47-63 Hz
Input current:	1.50 A (rms) for 115 VAC 0.90 A (rms) for 230 VAC
Earth leakage current: (Touch current)	300 μ 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 112-132% 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 μ s after a 25% step load change

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

PMP55 SERIES



CE (LVD)

RoHS

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1

GENERAL SPECIFICATIONS

Switching frequency:	40 KHz ± 5 KHz
Efficiency:	65% minimum
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	15 A @ 115 VAC or 30 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	450,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011 / EN55022:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

UNIVERSAL INPUT

PMP55 MEDICAL SERIES

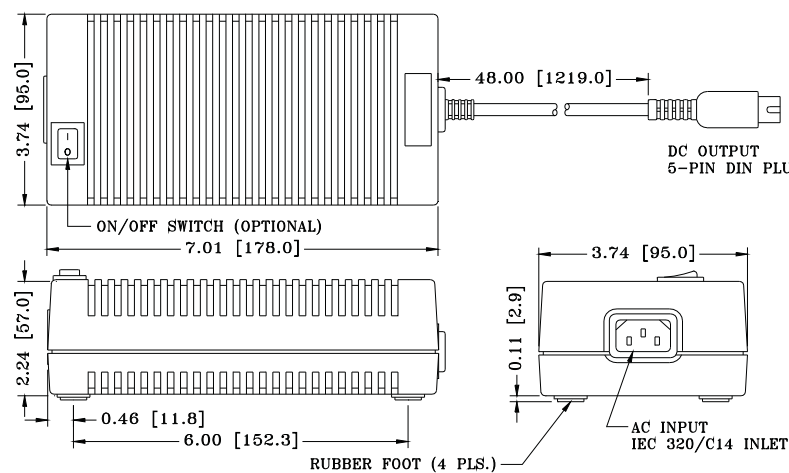
OUTPUT VOLTAGE/CURRENT RATING CHART

Model	Output #1				Output #2				Output #3				Max. Output Power
	V1	Min. Current	Max. Current	Tol.	V2	Min. Current	Max. Current	Tol.	V3	Min. Current	Max. Current	Tol.	
PMP55-23	+5 V	1.0 A	5.0 A	±5%	+12 V	0.5 A	3.0 A	±5%	(N/A)				45 W
PMP55-24	+5 V	1.0 A	5.0 A	±5%	+15 V	0.4 A	2.5 A	±5%	(N/A)				45 W
PMP55-25	+5 V	1.0 A	5.0 A	±5%	+24 V	0.3 A	2.0 A	±5%	(N/A)				45 W
PMP55-31	+5 V	1.0 A	5.0 A	±5%	+12 V	0.5 A	3.0 A	±5%	-12 V	0.1 A	0.5 A	±10%	45 W
PMP55-32	+5 V	1.0 A	5.0 A	±5%	+15 V	0.4 A	2.5 A	±5%	-15 V	0.1 A	0.5 A	±10%	45 W

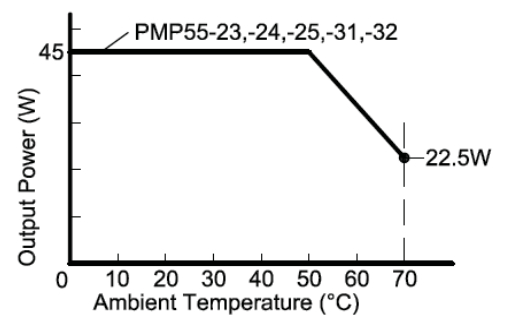
NOTES:

- The output voltages of a model may go outside of the stated tolerance when an output load current is out of stated limits.
- 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.

MECHANICAL SPECIFICATIONS



OUTPUT POWER DERATING CURVE



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight : 700 grams (1.54 lbs.) approx.
- Output connector is 5 pin DIN plug, mating with Switchcraft P/N 57GB5F receptacle or equivalent.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS". Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP55-31-K2, for ordering
- To order a model with an on/off switch, add suffix "S" to the model number, e.g. PMP55-31-K2-S

PIN CHART

MODEL \ PIN	1	2	3	4	5
PMP55-23 PMP55-24 PMP55-25	Common Return	Common Return	V1	Common Return	V2
PMP55-31 PMP55-32	Common Return	Common Return	V1	V3	V2

30-60 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PMP60 series of AC/DC switching power supplies are for 30-60 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an IEC320/C14 inlet to mate with interchangeable cord for world-wide use. All models meet EN55011, EN55022 and FCC class B emission limits, and are designed for medical and ITE applications, not for life supporting equipment.

FEATURES

- 12 standard desktop models
- Single, dual or triple outputs
- Optional output connectors
- Optional on/off switch
- 100% burn-in
- Wide input range 85-264 VAC
- Input surge current protection
- Overvoltage protection
- Overcurrent protection
- Single output models compliant with CEC and Energy Star Efficiency level IV requirements
- * No load power consumption less than 0.5 W
- * Average active efficiency $\geq 85\%$
- Compliant with RoHS requirement

INPUT SPECIFICATIONS

Input voltage:	85-264 VAC
Input frequency:	47-63 Hz
Input current:	1.22 A (rms) for 100 VAC 0.68 A (rms) for 240 VAC
Earth leakage current: (Touch current)	200 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage /current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	66 mVp-p maximum on 3.3 V output, 100 mVp-p maximum on 5 V output and 1% maximum on other voltage outputs (12 V, 15 V ..., 48 V etc.)
Overvoltage protection:	Provided on output #1 only, set at 112-140% 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 μ s after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0 $^{\circ}$ C to +60 $^{\circ}$ C
Storage temperature:	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +40 $^{\circ}$ C linearly to 50% at +60 $^{\circ}$ C

PMP60 SERIES



CE (LVD)

RoHS



SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1
(except PMP60-14 by UL)



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	40 KHz-130 KHz
Efficiency:	85% minimum on single output models, 68-74% minimum on the others
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	50 A @ 115 VAC or 100 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	150,000 hours minimum at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011 / EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m for 80-2500 MHz
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PMP60 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

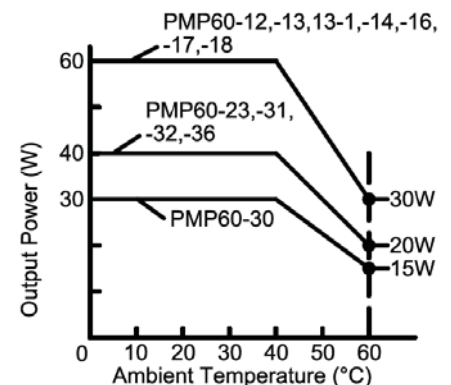
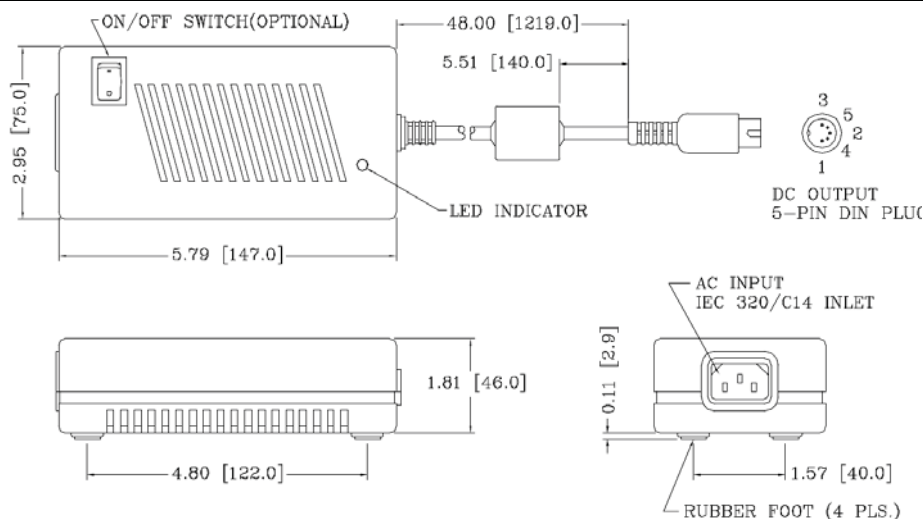
Model	Output #1				Output #2				Output #3				Max. Output Power
	V1	Min. current	Max. current	Tol.	V2	Min. current	Max. current	Tol.	V3	Min. current	Max. current	Tol.	
PMP60-12	11-13 V	0 A	5.46 A	±5%	(N/A)				(N/A)				60 W
PMP60-13	13-17 V	0 A	4.62 A	±5%	(N/A)				(N/A)				60 W
PMP60-13-1	17-21 V	0 A	3.53 A	±5%	(N/A)				(N/A)				60 W
PMP60-14	21-27 V	0 A	2.86 A	±5%	(N/A)				(N/A)				60 W
PMP60-16	27-33 V	0 A	2.23 A	±3%	(N/A)				(N/A)				60 W
PMP60-17	33-39 V	0 A	1.82 A	±3%	(N/A)				(N/A)				60 W
PMP60-18	46-50 V	0 A	1.31 A	±3%	(N/A)				(N/A)				60 W
PMP60-23	+5.0 V	1 A	5.0 A	±5%	+12 V	0.5 A	3.0 A	±5%	(N/A)				40 W
PMP60-30	+3.3 V	1 A	6.0 A	±5%	+5 V	0.5 A	3.0 A	±5%	+12 V	0.1 A	0.7 A	±10%	30 W
PMP60-31	+5.0 V	1 A	5.0 A	±5%	+12 V	0.5 A	3.0 A	±5%	-12 V	0.1 A	0.7 A	±10%	40 W
PMP60-32	+5.0 V	1 A	5.0 A	±5%	+15 V	0.4 A	2.3 A	±5%	-15 V	0.1 A	0.7 A	±10%	40 W
PMP60-36	+5.0 V	1 A	5.0 A	±5%	+24 V	0.3 A	1.5 A	±5%	+12 V	0.1 A	0.7 A	±10%	40 W

NOTES:

- The output voltages of a multiple output model may go outside of the stated tolerance when an output load current is out of stated limits. All models may be operated at no-load without damage.
- 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS

OUTPUT POWER DERATING CURVE



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight: 600 grams (1.33 lbs.) approx.
- Output connector is 5 pin DIN plug, mating with Switchcraft P/N 57GB5F receptacle or equivalent.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS" for optional output connectors. Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP60-12-B2, for ordering.
- To order a model with on / off switch, add suffix " S " to the model number, e.g. PMP60-12-B2-S

PIN CHART

MODEL \ PIN	1	2	3	4	5
PMP60-12 PMP60-14 PMP60-17	V1 Return	V1 Return	+V1	V1 Return	+V1
PMP60-13 PMP60-16 PMP60-18					
PMP60-13-1					
PMP60-23	Common Return	Common Return	V1	N.C.	V2
PMP60-30 PMP60-32 PMP60-36	Common Return	Common Return	V1	V3	V2
PMP60-31					

60-90 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PMP90 series of AC/DC switching power supplies are for 60-90 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an IEC320/C14 or IEC320/C18 inlet to mate with interchangeable cord for world-wide use. All models meet EN55011, EN55022 and FCC class B emission limits, and are designed for medical and ITE applications, not for life-supporting equipment.

FEATURES

- Low safety ground leakage current
- Both Class I and Class II models are certified to medical and ITE safety standards.
- Wide input range 85 to 264 VAC
- Optional output connectors
- 100% burn-in
- Overvoltage protection
- Overcurrent protection
- Compliant with CEC and Energy Star Efficiency level IV requirements (except models PMP90-10, PMP90-10-1 and PMP90-11)
 - * No load power consumption less than 0.5 W
 - * Average active efficiency greater than 85%
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	1.20 A (rms) for 115 VAC 0.60 A (rms) for 230 VAC
Earth leakage current:	180 μ A max. @ 264 VAC, 63 Hz
Touch current:	100 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage /current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	100 mVp-p maximum on 5 V, 6 V and 9 V outputs, 1% maximum on other voltage outputs (12 V, 13.5 V ..., 48 V etc.)
Overvoltage protection:	Provided and set at 112-140% of its nominal output voltage
Overcurrent protection:	Protected to short circuit conditions
Temperature coefficient:	$\pm 0.04\%$ / $^{\circ}$ C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 μ s after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0 $^{\circ}$ C to +60 $^{\circ}$ C
Storage temperature:	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +40 $^{\circ}$ C linearly to 50% at +60 $^{\circ}$ C

PMP90 SERIES



CE (LVD)

RoHS



SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1
File No. E137410



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	50-110 KHz
Power factor:	0.98 Typical
Efficiency:	85% min. (except 77% min. for PMP90-10, PMP90-10-1, PMP90-11 and PMP90-12)
Hold-up time:	15 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	50 A @ 115 VAC or 100 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	150,000 hours at full load at 25 $^{\circ}$ C ambient , calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011/EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

UNIVERSAL INPUT

PMP90 MEDICAL & ITE SERIES

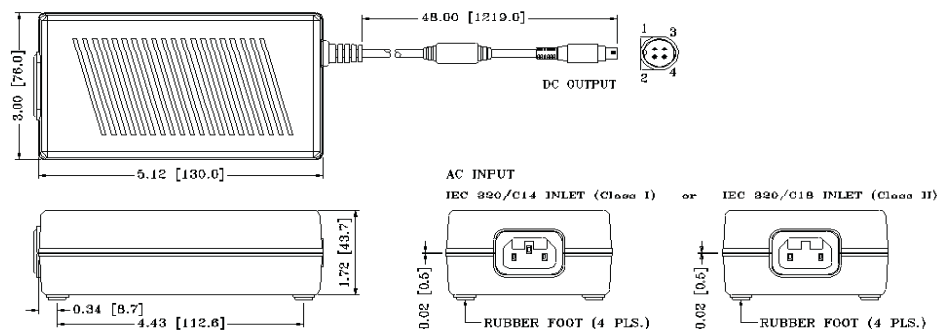
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾		Output						Average Active Efficiency (typical) @ 115 / 230 Vac
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	
PMP90-10	PMP90F-10	5.0 V	0 A	12.0 A	±5%	100 mV	60 W	78 / 79 %
PMP90-10-1	PMP90F-10-1	6.0 V	0 A	10.0 A	±5%	100 mV	60 W	78 / 79 %
PMP90-11	PMP90F-11	9.0 V	0 A	7.78 A	±5%	100 mV	70 W	81 / 82 %
PMP90-12	PMP90F-12	12.0 V	0 A	6.67 A	±5%	120 mV	80 W	86 / 85 %
PMP90-12-1	PMP90F-12-1	13.5 V	0 A	6.30 A	±5%	135 mV	85 W	86 / 85 %
PMP90-13	PMP90F-13	15.0 V	0 A	5.67 A	±5%	150 mV	85 W	86 / 85 %
PMP90-13-1	PMP90F-13-1	18.0 V	0 A	5.00 A	±5%	180 mV	90 W	86 / 85 %
PMP90-13-2	PMP90F-13-2	19.0 V	0 A	4.74 A	±5%	190 mV	90 W	86 / 86 %
PMP90-14	PMP90F-14	24.0 V	0 A	3.75 A	±5%	240 mV	90 W	87 / 86 %
PMP90-16	PMP90F-16	30.0 V	0 A	3.00 A	±5%	300 mV	90 W	87 / 86 %
PMP90-18	PMP90F-18	48.0 V	0 A	1.87 A	±5%	480 mV	90 W	88 / 87 %

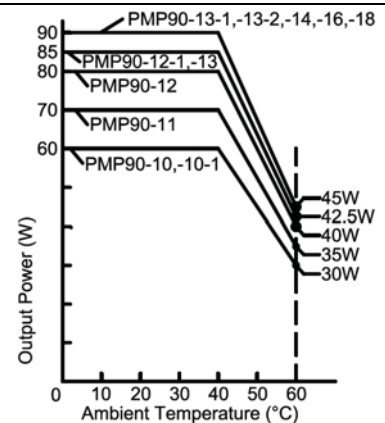
NOTES:

- Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C18 inlet.
- 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.

MECHANICAL SPECIFICATIONS



OUTPUT POWER DERATING CURVE



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight: 658 grams (1.45 lbs.) approx.
- Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS". Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP90-14-B1, for ordering.

PIN CHART

MODEL	PIN	1	2	3	4
PMP90-10	PMP90F-10	V1 Return	+V1	V1 Return	+V1
PMP90-10-1	PMP90F-10-1				
PMP90-11	PMP90F-11				
PMP90-12	PMP90F-12				
PMP90-12-1	PMP90F-12-1				
PMP90-13	PMP90F-13				
PMP90-13-1	PMP90F-13-1				
PMP90-13-2	PMP90F-13-2				
PMP90-14	PMP90F-14				
PMP90-16	PMP90F-16				
PMP90-18	PMP90F-18				

96-120 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PMP120 series of AC/DC switching power supplies are for 96-120 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an IEC320/C14 or IEC320/C18 inlet to mate with interchangeable cord for world-wide use. All models meet EN55011, EN55022 and FCC class B emission limits, and are designed for medical and ITE applications, not for life-supporting equipment.

FEATURES

- Low safety ground leakage current
- Both Class I and Class II models are certified to medical and ITE safety standards.
- Wide input range 90 to 264 VAC
- Optional output connectors
- 100% burn-in
- Overvoltage protection
- Overcurrent protection
- Compliant with CEC and Energy Star Efficiency level IV requirements
 - * No load power consumption less than 0.5 W
 - * Average active efficiency $\geq 85\%$
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	1.60 A (rms) for 115 VAC 0.80 A (rms) for 230 VAC
Earth leakage current:	180 μ A max. @ 264 VAC, 63 Hz
Touch current:	100 μ 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 and set at 112-140% of its nominal output voltage
Overcurrent protection:	Protected to short circuit conditions
Temperature coefficient:	$\pm 0.04\%$ / $^{\circ}$ C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 μ s after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0 $^{\circ}$ C to +60 $^{\circ}$ C
Storage temperature:	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +40 $^{\circ}$ C linearly to 50% at +60 $^{\circ}$ C

PMP120 SERIES



CE (LVD)

RoHS



SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1
File No. E137410



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	50-110 KHz
Power factor:	0.98 Typical at 115 VAC
Efficiency:	85% min. at full load
Hold-up time:	15 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	60 A @ 115 VAC or 120 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	150,000 hours at full load at 25 $^{\circ}$ C ambient , calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011 /EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PMP120 MEDICAL & ITE SERIES

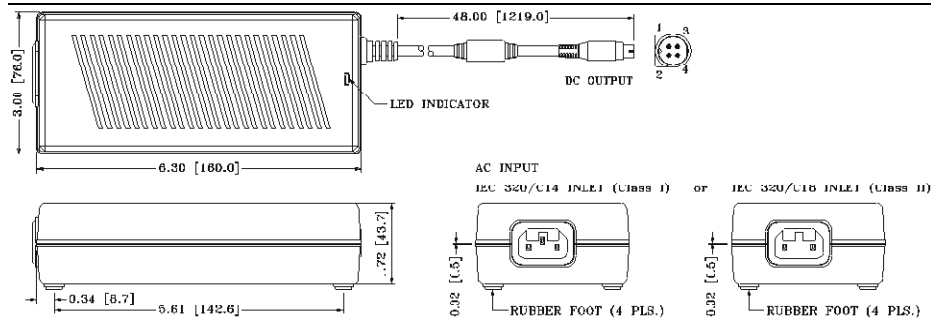
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾		Output						Average Active Efficiency (typical) @ 115 / 230 Vac
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	
PMP120-12	PMP120F-12	12 V	0 A	8.00 A	±5%	120 mV	96 W	86 / 86 %
PMP120-13	PMP120F-13	15 V	0 A	7.00 A	±5%	150 mV	105 W	86 / 86 %
PMP120-13-1	PMP120F-13-1	18 V	0 A	6.67 A	±5%	180 mV	120 W	87 / 86 %
PMP120-13-2	PMP120F-13-2	19 V	0 A	6.32 A	±5%	190 mV	120 W	87 / 86 %
PMP120-13-3	PMP120F-13-3	20 V	0 A	6.00 A	±5%	200 mV	120 W	87 / 86 %
PMP120-14	PMP120F-14	24 V	0 A	5.00 A	±5%	240 mV	120 W	88 / 88 %
PMP120-16	PMP120F-16	30 V	0 A	4.00 A	±5%	300 mV	120 W	89 / 88 %
PMP120-17	PMP120F-17	36 V	0 A	3.34 A	±5%	360 mV	120 W	89 / 88 %
PMP120-18	PMP120F-18	48 V	0 A	2.50 A	±5%	480 mV	120 W	88 / 88 %

NOTES:

- Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C18 inlet.
- 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

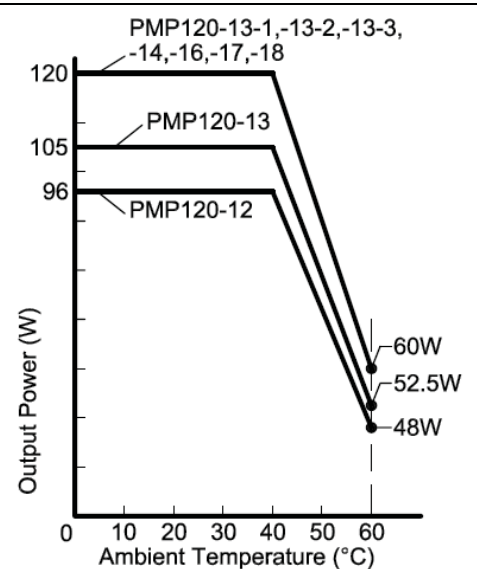
MECHANICAL SPECIFICATIONS



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight: 780 grams (1.716 lbs.) approx.
- Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS". Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP120-14-B1, for ordering.

OUTPUT POWER DERATING CURVE



PIN CHART

MODEL	PIN	1	2	3	4
PMP120-12	PMP120F-12	V1 Return	+V1	V1 Return	+V1
PMP120-13	PMP120F-13				
PMP120-13-1	PMP120F-13-1				
PMP120-13-2	PMP120F-13-2				
PMP120-13-3	PMP120F-13-3				
PMP120-14	PMP120F-14				
PMP120-16	PMP120F-16				
PMP120-17	PMP120F-17				
PMP120-18	PMP120F-18				

120-135 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PMP135 series of AC/DC switching power supplies are for 120-135 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an IEC320/C14 or IEC320/C18 inlet to mate with interchangeable cord for world-wide use. All models meet EN55011, EN55022 and FCC class B emission limits, and are designed for medical and ITE applications, not for life-supporting equipment.

PMP135 SERIES



FEATURES

- Low safety ground leakage current
- Class I models are to be certified to medical and ITE safety standards, Class II models to medical standards only.
- Wide input range 90 to 264 VAC
- Optional output connectors
- 100% burn-in
- Overvoltage protection
- Overcurrent protection
- Compliant with CEC and Energy Star Efficiency level V requirements
 - * No load power consumption less than 0.5 W
 - * Average active efficiency greater than 87%
- Compliant with RoHS requirements

SAFETY STANDARD APPROVALS

PENDING

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	1.60 A (rms) for 115 VAC 0.80 A (rms) for 230 VAC
Earth leakage current:	200 μ A max. @ 264 VAC, 63 Hz
Touch current:	100 μ 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 at the full load
Overvoltage protection:	Provided and set at 115-140% of its nominal output voltage
Overcurrent protection:	Protected to short circuit conditions
Temperature coefficient:	$\pm 0.04\%$ / $^{\circ}$ C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 μ s after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0 $^{\circ}$ C to +60 $^{\circ}$ C
Storage temperature:	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +40 $^{\circ}$ C linearly to 50% at +60 $^{\circ}$ C

GENERAL SPECIFICATIONS

Switching frequency:	90-160 KHz
Power factor:	0.98 Typical at 115 VAC
Efficiency:	87% min. at full load
Hold-up time:	15 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	80 A @ 115 VAC or 160 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	150,000 hours at full load at 25 $^{\circ}$ C ambient , calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011 /EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PMP135 MEDICAL & ITE SERIES

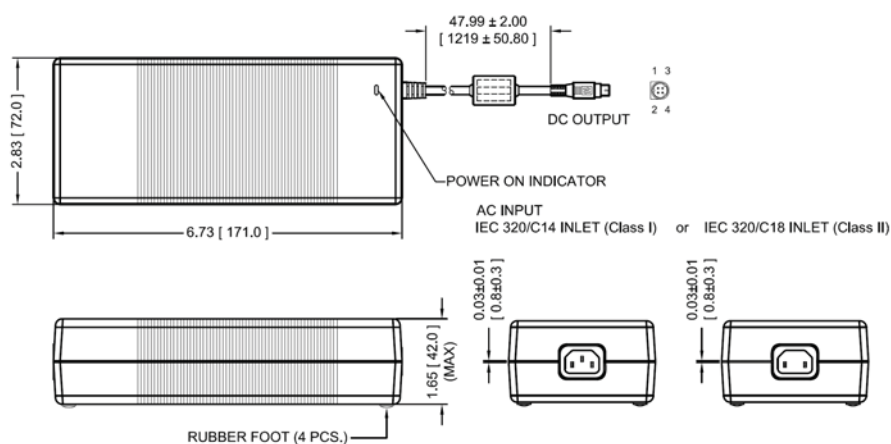
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾		Output						Average Active Efficiency (typical) @ 115 / 230 Vac
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	
PMP135-12	PMP135F-12	12 V	0 A	10.00 A	±5%	120 mV	120 W	88 / 89 %
PMP135-12-1	PMP135F-12-1	13 V	0 A	9.23 A	±5%	130 mV	120 W	87 / 89 %
PMP135-13	PMP135F-13	14 V - 16 V	0 A	9.29 A	±5%	150 mV	130 W	87 / 89 %
PMP135-13-1	PMP135F-13-1	18 V - 19 V	0 A	7.50 A	±5%	180 mV	135 W	88 / 89 %
PMP135-13-3	PMP135F-13-3	20 V - 21 V	0 A	6.75 A	±5%	200 mV	135 W	87 / 89 %
PMP135-14	PMP135F-14	24 V - 25 V	0 A	5.63 A	±5%	240 mV	135 W	88 / 90 %
PMP135-15	PMP135F-15	28 V - 29 V	0 A	4.83 A	±5%	280 mV	135 W	88 / 90 %
PMP135-16	PMP135F-16	30 V - 32 V	0 A	4.50 A	±5%	300 mV	135 W	89 / 90 %
PMP135-17	PMP135F-17	36 V - 38 V	0 A	3.75 A	±5%	360 mV	135 W	89 / 91 %
PMP135-18	PMP135F-18	46 V - 50 V	0 A	2.94 A	±5%	480 mV	135 W	90 / 91 %

NOTES:

- Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C18 inlet.
- 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.

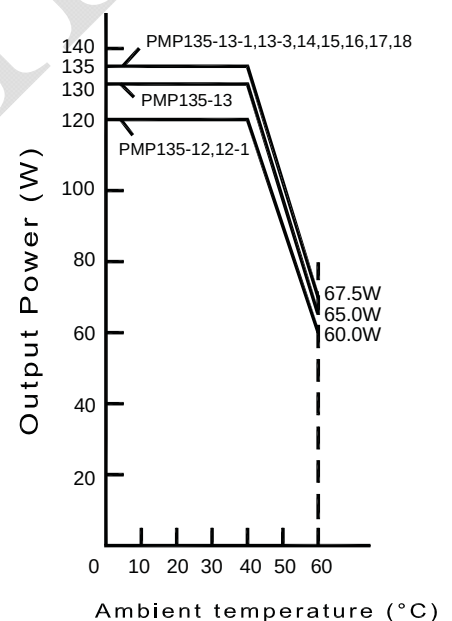
MECHANICAL SPECIFICATIONS



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight: 681 grams (1.505 lbs.) approx.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS". Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP135-14-B1, for ordering.
- The length of output cable for PMP135-12, PMP135-12-1, PMP135-13, PMP135F-12, PMP135F-12-1, and PMP135F-13 is 37.4 (950)

OUTPUT POWER DERATING CURVE



PIN CHART

MODEL	PIN	1	2	3	4
PMP135-12	PMP135F-12	V1 Return	+V1	V1 Return	+V1
PMP135-12-1	PMP135F-12-1				
PMP135-13	PMP135F-13				
PMP135-13-1	PMP135F-13-1				
PMP135-13-3	PMP135F-13-3				
PMP135-14	PMP135F-14				
PMP135-15	PMP135F-15				
PMP135-16	PMP135F-16				
PMP135-17	PMP135F-17				
PMP135-18	PMP135F-18				

132-150 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PMP150 series of AC/DC switching power supplies are for 132-150 watts of continuous output power. They are enclosed in a 94 V-1 rated polyphenylene-oxide case with an IEC320/C14 or IEC320/C18 inlet to mate with interchangeable cord for world-wide use. All models meet EN55011, EN55022 and FCC class B emission limits, and are designed for medical and ITE applications, not for life-supporting equipment.

FEATURES

- Low safety ground leakage current
- Both Class I and Class II models are certified to medical and ITE safety standards.
- Wide input range 90 to 264 VAC
- Optional output connectors
- 100% burn-in
- Overvoltage protection
- Overcurrent protection
- Compliant with CEC and Energy Star Efficiency level V requirements (except PMP150-12 and PMP150-13 to level IV)
 - * No load power consumption less than 0.5 W
 - * Average active efficiency $\geq 87\%$
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	2.0 A (rms) for 115 VAC 1.0 A (rms) for 230 VAC
Earth leakage current:	220 μ A max. @ 264 VAC, 63 Hz
Touch current:	100 μ 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 at full load
Overvoltage protection:	Provided and set at 112-140% of its nominal output voltage
Overcurrent protection:	Protected to short circuit conditions
Temperature coefficient:	± 0.04 / $^{\circ}$ C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 μ s after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0 $^{\circ}$ C to +60 $^{\circ}$ C
Storage temperature:	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +40 $^{\circ}$ C linearly to 50% at +60 $^{\circ}$ C

PMP150 SERIES



CE (LVD)

RoHS

IV / V

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E178020



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1
File No. E137410



TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency:	30-110 KHz
Power factor:	0.98 Typical at 115 VAC
Efficiency:	Average active 87% min. (except 85% min. for PMP150-12 and PMP150-13)
Hold-up time:	15 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	60 A @ 115 VAC or 120 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	150,000 hours at full load at 25 $^{\circ}$ C ambient , calculated per MIL-HDBK-217F

EMC Performance (IEC60601-1-2)

EN55011 /EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8 KV air and ± 6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms and >95% reduction for 10 ms

UNIVERSAL INPUT

PMP150 MEDICAL & ITE SERIES

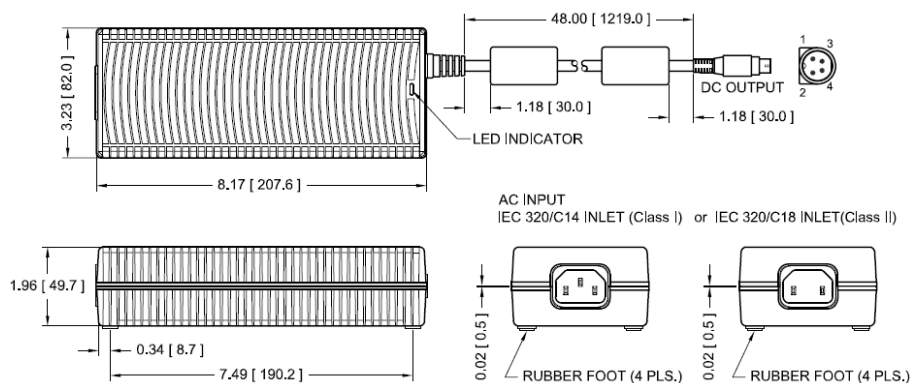
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾		Output						Average Active Efficiency (typical) @ 115 / 230 Vac
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	
PMP150-12	PMP150F-12	12.0 V	0 A	11.00 A	±5%	120 mV	132 W	87 / 86 %
PMP150-13	PMP150F-13	15.0 V	0 A	9.00 A	±5%	150 mV	135 W	87 / 86 %
PMP150-13-2	PMP150F-13-2	19.0 V	0 A	7.90 A	±5%	190 mV	150 W	88 / 88 %
PMP150-14	PMP150F-14	24.0 V	0 A	6.25 A	±5%	240 mV	150 W	88 / 88 %
PMP150-15	PMP150F-15	27.0 V	0 A	5.56 A	±5%	270 mV	150 W	89 / 88 %
PMP150-18	PMP150F-18	48.0 V	0 A	3.13 A	±5%	480 mV	150 W	88 / 88 %

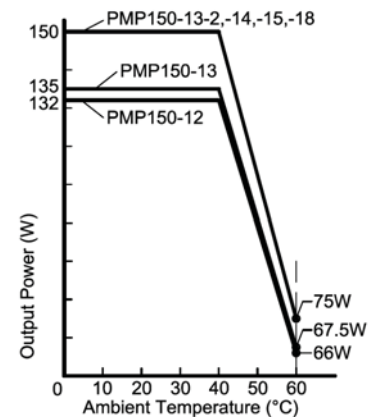
NOTES:

- Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C18 inlet.
- 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.

MECHANICAL SPECIFICATIONS



OUTPUT POWER DERATING CURVE



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight: 960 grams (2.1 lbs.) approx.
- Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS". Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP150-14-B1, for ordering.

PIN CHART

MODEL \ PIN		1	2	3	4
PMP150-12	PMP150F-12	V1 Return	+V1	V1 Return	+V1
PMP150-13	PMP150F-13				
PMP150-13-2	PMP150F-13-2				
PMP150-14	PMP150F-14				
PMP150-15	PMP150F-15				
PMP150-18	PMP150F-18				

180 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PMP180/PMP180SF series of AC/DC switching power supplies are for 180 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an inlet of the IEC320/C14 or IEC320/C8 to mate with interchangeable cord for world-wide use. All models meet EN 55011 and FCC class B emission limits, and are designed for medical applications not for life-supporting equipment.

PMP180 SERIES



CE (LVD)

RoHS



FEATURES

- High efficiency
- Low ripple & noise
- Overvoltage protection
- Short-circuit protection
- Overpower protection
- Over temperature protection
- 100% burn-in at full rated load
- Standby consumption less than 0.5 W
- Compliant with CEC and ENERGY STAR efficiency level V requirements
- Compliant with RoHS requirements

SAFETY STANDARD APPROVALS



UL 60601-1, CSA C22.2 No. 601.1
File No. E211696



TÜV EN 60601-1

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	50-60 Hz
Input current:	2.4 A (rms) for 115 VAC 1.2 A (rms) for 230 VAC
Earth leakage current:	200 µA max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage /current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	380 mV peak to peak maximum
Overvoltage protection:	Set at 130% to 150% of its nominal output voltage
Overcurrent protection:	All models protected to short-circuit conditions
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change

GENERAL SPECIFICATIONS

Hold-up time:	5 ms minimum at 100 VAC
Turn on delay time:	3 s maximum at 100 VAC
Power Factor:	0.95 typical
Efficiency:	87% min. at 100 VAC or 240 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	45 A @ 115 VAC or 90 A @ 230 VAC at 25°C cold start
Withstand voltage:	2000 VAC from input to output
MTBF:	100,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±8 KV air and ±6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0°C to +40°C
Storage temperature:	-20°C to +80°C
Relative humidity:	10% to 90% non-condensing
Derating	Derate from 100% at +40°C linearly to 50% at +60°C

UNIVERSAL INPUT

PMP180 MEDICAL SERIES

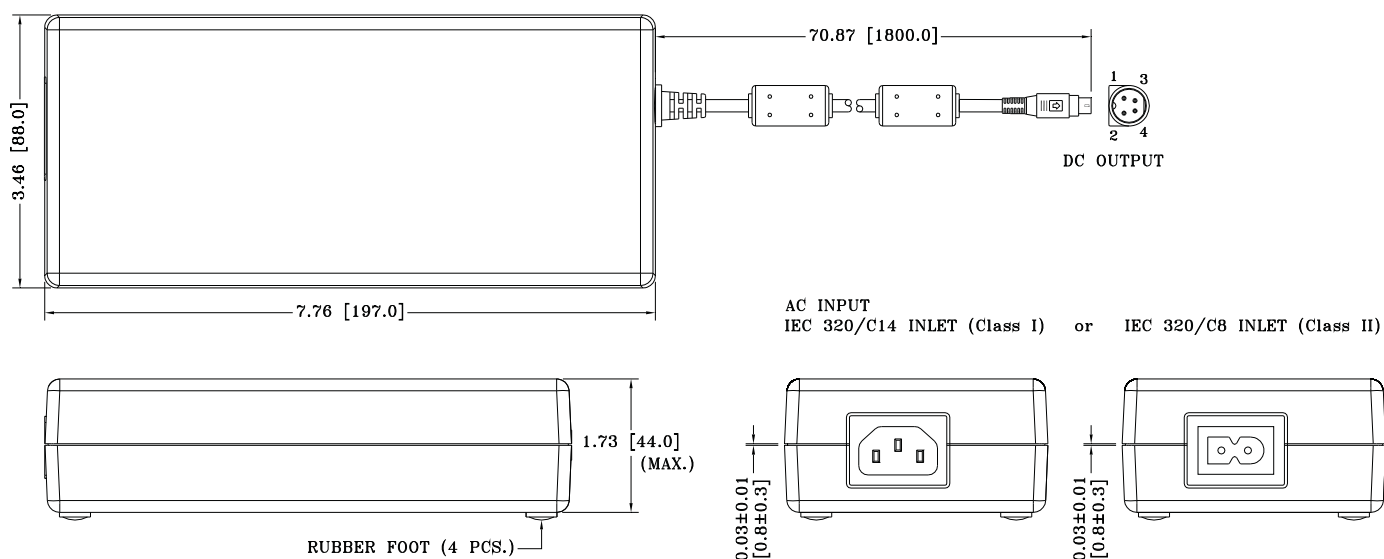
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾		Output						Average Active Efficiency (typical) @ 115 / 230 Vac
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	
PMP180-14	PMP180SF-14	24 V	0 A	7.50 A	±5%	380 mV	180 W	91 / 92 %
PMP180-15		28 V	0 A	6.42 A	±5%	380 mV	180 W	91 / 92 %

NOTES:

- Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C8 inlet.
- 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 47 µF electrolytic capacitor in parallel with a 0.1 µF ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight: 950 grams (2.09 lbs.) approx.
- Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS". Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP180-14-B1, for ordering.

PIN CHART

MODEL \ PIN	1	2	3	4	Shield
PMP180-14 PMP180-15	+V1	+V1	V1 Return & AC Ground	V1 Return & AC Ground	V1 Return & AC Ground
PMP180SF-14	+V1	+V1	V1 Return	V1 Return	V1 Return

IPC - FLEX**FSP-MP Series (180W)****FEATURE**

- Full Range AC input design
- Build in Active PFC circuit
- Meet SFX 12V 2.0
- Meet the harmonic with the EN61000-3-2
- Meet IEC 60601-1 and EMI EN55011 regulation

**SAFETY STANDARD APPROVAL****INPUT SPECIFICATION**

Input Voltage	90 ~ 265 Vac
Input Frequency	47 ~ 63 Hz
Input Current	6.0A max at 115V 3.0A max at 230V
Inrush Current	50 A peak at 115V 80A peak at 230V
Earth leakage current	Not exceed 0.5mA at 264Vac, 63Hz

OUTPUT SPECIFICATION

Output Voltage/ Current	See Product Series List
Output Regulation Load	+3.3V, +5V, +12V, +5VSB: $\pm 5\%$ -12V: $\pm 10\%$
Ripple and noise	+3.3V, +5V, +5VSB: 50mVp-p +12V, -12V: 120mVp-p
Over Voltage Protection	+3.3V output: +3.7V ~ +4.5V +5V output: +5.7V ~ +6.5V +12V output: +13.3V ~ + 15.6V
Short Circuit Protection	Output short circuit is defined to be a short circuit load of less than 0.1 ohm.
Hold Up Time	Min. 17mS at 115V/60Hz and 230V/50Hz

ENVIROMENTAL

Operating Temperature	0°C~50°C
Storage Temperature	-20°C~80°C
Operating Humidity	85% RH, Non-condensing
Storage Humidity	95% RH, Non-condensing
MTBF	Min. 100,000 hours at Max. load and 25°C ambient predicted by MIL-HDBK-217

EMC & Safety

Safety Standard	IEC 60601-1
Emission	EN55011 and FCC Part 18 Subpart C

IPC - FLEX

FSP-MP Series (180W)

PRODUCT SERIES LIST

Model Name	Total Output Watt.	Output Current											
		+3.3V		+5V		+12V1		-12V		+5VSB			
		Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)
FSP180-50MP	180W	0.3	16.8	0.5	12.0	1.5	12.0	0.0	0.8	0.0	2.0		

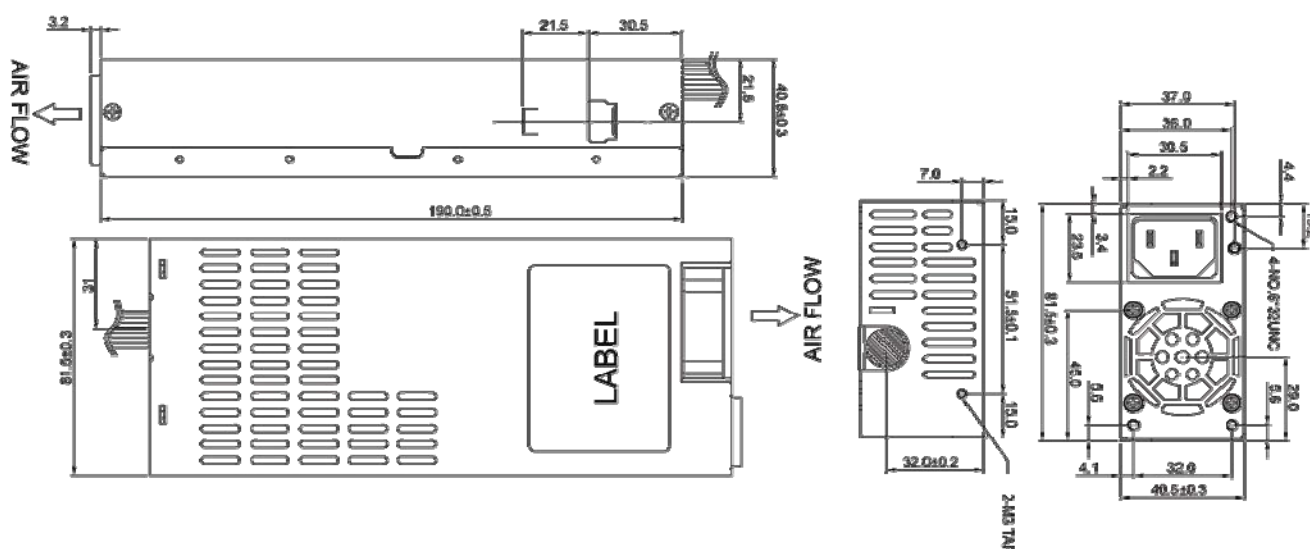
Note:

-12V, +3.3V, +5V, +12V will have the regulation to $\pm 10\%$ when all load take off.

The +3.3V and +5V total output shall not exceed 61watts. The +3.3V, +5V and +12V total output shall not exceed 161watts and the total output for this subject power supply is 180watts.

Mechanical Drawing

Dimension 190.0(L) x 81.5(W) x 40.5(H) mm



IPC - ATX**FSP-MP Series (300W~500W)****FEATURE**

- Full Range AC input design
- Build in Active PFC circuit
- Meet the harmonic with the EN61000-3-2
- Meet IEC 60601-1 and EMI EN55011 regulation

**SAFETY STANDARD APPROVAL****INPUT SPECIFICATION**

Input Voltage	90 ~ 265 Vac
Input Frequency	47 ~ 63 Hz
Input Current	6.0A max at 115V: FSP300-70MP / 8.0A max at 115V: FSP400-70MP 10A max at 115V: FSP500-70MP
Inrush Current	No Damage
Earth leakage current	Not exceed 0.3mA at 264Vac, 63Hz

OUTPUT SPECIFICATION

Output Voltage/ Current	See Product Series List
Output Regulation Load	+3.3V, +5V, +12V, +5VSB: $\pm 5\%$ -12V, -5V: $\pm 10\%$
Ripple and noise	+3.3V, +5V, +5VSB: 50mVp-p / -5V: 100mVp-p +12V, -12V: 120mVp-p
Over Voltage Protection	+3.3V output: +3.7V ~ +4.5V +5V output: +5.7V ~ +6.5V +12V output: +13.3V ~ + 15.6V
Short Circuit Protection	Output short circuit is defined to be a short circuit load of less than 0.1 ohm.
Hold Up Time	Min. 20mS at 115V/60Hz and 230V/50Hz

ENVIROMENTAL

Operating Temperature	0°C~50°C
Storage Temperature	-20°C~80°C
Operating Humidity	85% RH, Non-condensing
Storage Humidity	95% RH, Non-condensing
MTBF	Min. 100,000 hours at Max. load and 25°C ambient predicted by MIL-HDBK-217

EMC & Safety

Safety Standard	IEC 60601-1
Emission	EN55011 and FCC Part 18 Subpart C

IPC - ATX

FSP-MP Series (300W~500W)

PRODUCT SERIES LIST

Model Name	Total Output Watt.	Output Current													
		+3.3V		+5V		+12V1		+12V2		-12V		+5VSB		-5V	
		Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)
FSP300-70MP	300W	0.5	25.0	0.3	30.0	1.0	17.0	1.0	17.0	0.0	0.8	0.0	2.0	0	0.3
FSP400-70MP	400W	0.5	30.0	0.3	30.0	1.0	17.0	1.0	17.0	0.0	0.8	0.0	2.0	0	0.3
FSP500-70MP	500W	0.5	30.0	0.3	30.0	1.0	17.0	1.0	17.0	0.0	0.8	0.0	2.0	0	0.3

Note:

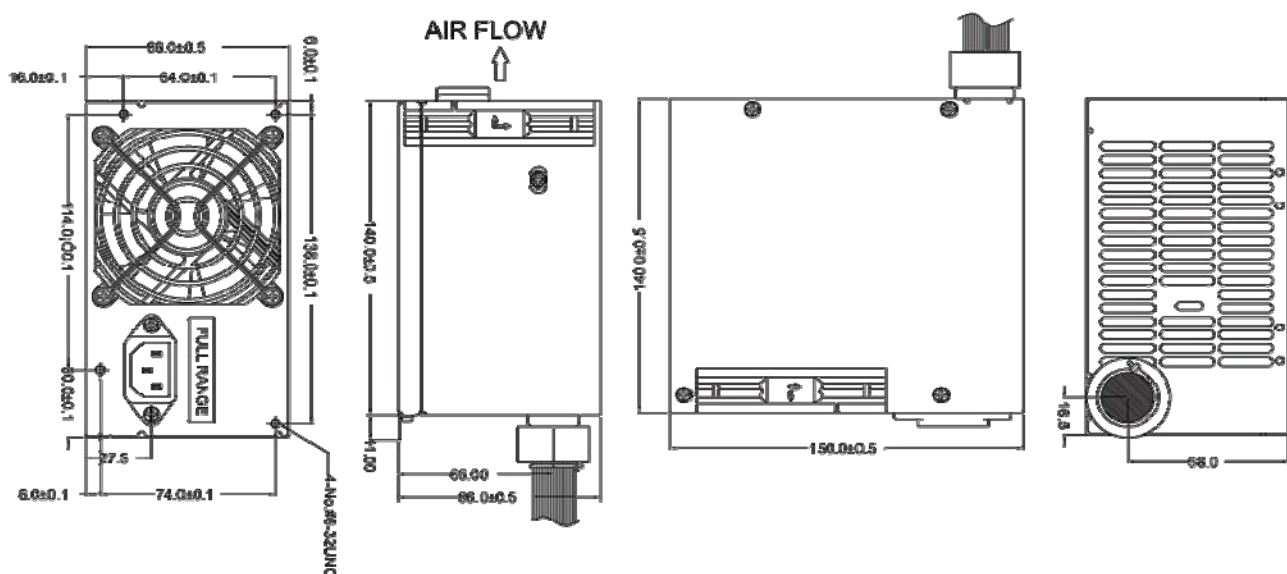
FSP300-70MP: The +3.3V and +5V total output shall not exceed 150watts. The 12V1 and 12V2 total shall not exceed 22A. The +3.3V, +5V and +12V total output shall not exceed 280W and the total output power is 300watts.

FSP400-70MP: The +3.3V and +5V total output shall not exceed 180watts. The +3.3V, +5V and +12V total output shall not exceed 380W and the total output power is 400watts.

FSP500-70MP: The +3.3V and +5V total output shall not exceed 200watts. The +3.3V, +5V and +12V total output shall not exceed 480W and the total output power is 500watts.

Mechanical Drawing

Dimension 140.0(L) x 150(W) x 86.0(H) mm



IPC - 1U**FSP-MU Series (250W)****FEATURE**

- Full Range AC input design
- Build in Active PFC circuit
- Meet the harmonic with the EN61000-3-2
- Meet IEC 60601-1 and EMI EN55011 regulation

**SAFETY STANDARD APPROVAL****INPUT SPECIFICATION**

Input Voltage	90 ~ 265 Vac
Input Frequency	47 ~ 63 Hz
Input Current	Max. 4.0A at 115V: FSP250-70MU
Inrush Current	60A/115V and 100A/230V at 25°C cold start
Earth leakage current	Not exceed 0.3mA at 264Vac, 63Hz

OUTPUT SPECIFICATION

Output Voltage/ Current	See Product Series List
Output Regulation Load	+3.3V, +5V, +12V, +5VSB: $\pm 5\%$ -12V, -5V: $\pm 10\%$
Ripple and noise	+3.3V, +5V, +5VSB: 50mVp-p / +12V, -5V: 120mVp-p -12V: 150mVp-p
Over Voltage Protection	+3.3V output: +3.5V ~ +4.8V +5V output: +5.5V ~ +7.0V +12V output: +13.4V ~ +15.8V
Short Circuit Protection	Output short circuit is defined to be a short circuit load of less than 0.1 ohm.
Hold Up Time	Min. 17mS at 115V/60Hz and 230V/50Hz

ENVIROMENTAL

Operating Temperature	0°C~50°C
Storage Temperature	-20°C~80°C
Operating Humidity	85% RH, Non-condensing
Storage Humidity	95% RH, Non-condensing
MTBF	Min. 100,000 hours at Max. load and 25°C ambient predicted by MIL-HDBK-217

EMC & Safety

Safety Standard	IEC 60601-1
Emission	EN55011 and FCC Part 18 Subpart C

IPC - 1U

FSP-MU Series (250W)

PRODUCT SERIES LIST

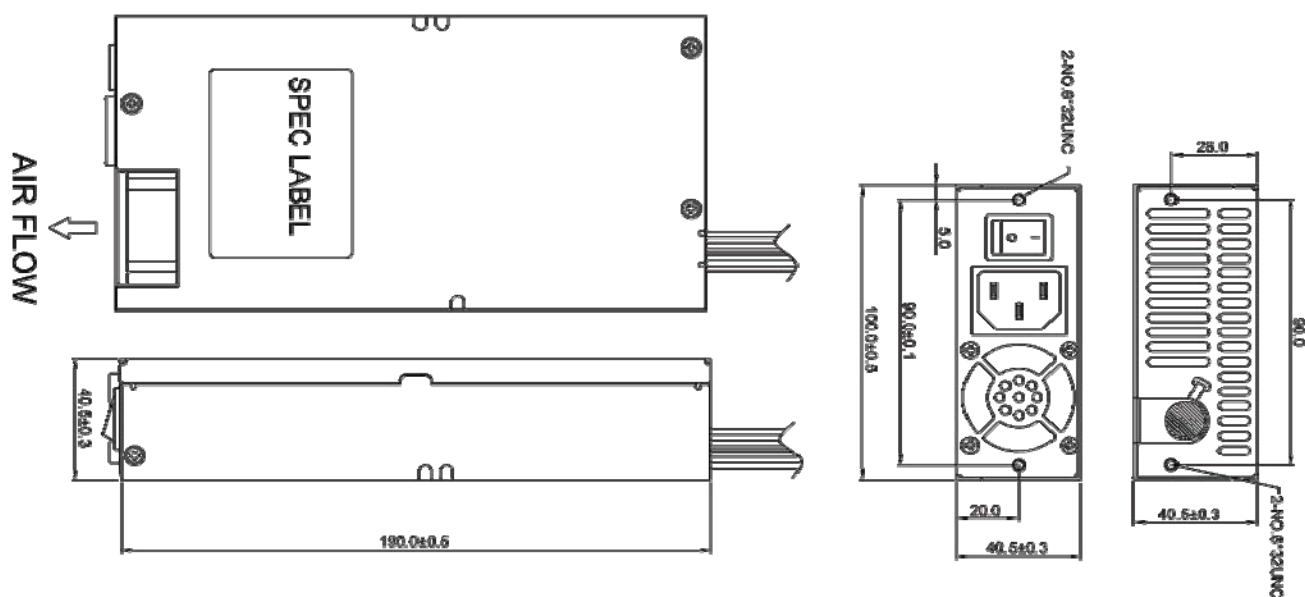
Model Name	Total Output Watt.	Output Current													
		+3.3V		+5V		+12V1		+12V2		-12V		+5VSB		-5V	
		Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)
FSP250-70MU	250W	0.5	16.0	0.5	18.0	1.0	16.0	1.0	16.0	0.0	0.5	0.0	0.2	0	2.5

Note:

FSP250-70MU: The +12V1, +12V2, +5V and +3.3V total output shall not exceed 231W. The +12V1, +12V2 total output shall not exceed 17A. The +3.3V and +5V total output shall not exceed 110watts. Total output for this subject power supply is 250watts.

Mechanical Drawing

Dimension 190.0(L) x 100(W) x 40.5(H) mm



IPC - 1U**FSP-MU Series (300W~350W)****FEATURE**

- Full Range AC input design
- Build in Active PFC circuit
- Meet the harmonic with the EN61000-3-2
- Meet IEC 60601-1 and EMI EN55011 regulation

**SAFETY STANDARD APPROVAL****INPUT SPECIFICATION**

Input Voltage	90 ~ 265 Vac
Input Frequency	47 ~ 63 Hz
Input Current	Max. 5.0A at 115V: FSP300-70MU Max. 6.0A at 115V: FSP350-70MU
Inrush Current	60A/115V and 100A/230V at 25°C cold start
Earth leakage current	Not exceed 0.3mA at 264Vac, 63Hz

OUTPUT SPECIFICATION

Output Voltage/ Current	See Product Series List
Output Regulation Load	+3.3V, +5V, +12V, +5VSB: $\pm 5\%$ -12V, -5V: $\pm 10\%$
Ripple and noise	+3.3V, +5V, +5VSB: 50mVp-p / '+12V, -5V: 120mVp-p -12V: 150mVp-p
Over Voltage Protection	+3.3V output: +3.5V ~ +4.8V +5V output: +5.5V ~ +7.0V +12V output: +13.4V ~ + 15.8V
Short Circuit Protection	Output short circuit is defined to be a short circuit load of less than 0.1 ohm.
Hold Up Time	Min. 17mS at 115V/60Hz and 230V/50Hz

ENVIRONMENTAL

Operating Temperature	0°C~50°C
Storage Temperature	-20°C~80°C
Operating Humidity	85% RH, Non-condensing
Storage Humidity	95% RH, Non-condensing
MTBF	Min. 100,000 hours at Max. load and 25°C ambient predicted by MIL-HDBK-217

EMC & Safety

Safety Standard	IEC 60601-1
Emission	EN55011 and FCC Part 18 Subpart C

IPC - 1U

FSP-MU Series (250W~350W)

PRODUCT SERIES LIST

Model Name	Total Output Watt.	Output Current													
		+3.3V		+5V		+12V1		+12V2		-12V		+5VSB		-5V	
		Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)	Min(A)	Max(A)
FSP300-70MU	300W	0.5	16.0	0.5	18.0	1.0	16.0	1.0	16.0	0.0	0.5	0.0	0.2	0	2.5
FSP350-70MU	350W	0.5	16.0	0.5	18.0	1.0	16.0	1.0	16.0	0.0	0.5	0.0	0.2	0	2.5

Note:

FSP300-70MU: The +12V1, +12V2, +5V and +3.3V total output shall not exceed 281W. The +12V1, +12V2 total output shall not exceed 20A. The +3.3V and +5V total output shall not exceed 120watts. Total output for this subject power supply is 300watts.

FSP350-70MU: The +12V1, +12V2, +5V and +3.3V total output shall not exceed 331W. The +12V1, +12V2 total output shall not exceed 24A. The +3.3V and +5V total output shall not exceed 130watts. Total output for this subject power supply is 350watts.

Mechanical Drawing

Dimension 190.0(L) x 100(W) x 40.5(H) mm

