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 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on
	all models, recovering to 1% of final
	value within 500 us after a 25% step

load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0°C to +70°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +50°C linearly to 50% at +70°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 ±5 KHz
Efficiency:	70% minimum on single output model
	with Vo \geq 12V, 68% minimum on the
	others
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	10 A @ 115 VAC or 25 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:	500,000 hours at full load at 25 $^\circ\!\!\mathbb{C}$ 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

This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

PM25 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Outp	ut #1		Output #2				Outpu				
		Min.	Max.			Min.	Max.			Min.	Max.		Max. Output
Model ⁽¹⁾	V1	Current	Current	Tol.	V2	Current	Current	Tol.	V3	Current	Current	Tol.	Power
PM25-10A	5.1 V	0 A	5.5 A	±2%	N/A					N/.		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/.		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//	4			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%.

Ripple and noise is maximum peak-to-peak voltage value measured at output within 20 MHz bandwidth, at rated line 3. 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



- 1. Dimensions shown in inches [mm]
 - 2. Tolerance 0.03 [0.76] maximum
 - Input connector P1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent. 3.
 - Output connector P2: Molex header 09-65-2048 or equivalent for single output models, mating with Molex housing 09-50-1041 or 4.
 - 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 PM25-12A PM25-13A	PM25-14A PM25-15A	V1 Return	V1 Return	+V1	+V1	N.A.	N.A.
PM25-23A	PM25-25A	V2	V1	V1	Commo	n Return	N.C.
PM25-31A PM25-32A	PM25-39A	V2	V1	V1	Commo	n Return	V3

This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

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

nput voltage:	90-264 VAC
nput frequency:	47-63 Hz
nput 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

See rating chart.
See rating chart.
100 mV peak to peak on 3.3 V & 5.0 V models, 1% peak to peak on other models
Provided on output #1 only; set at
All outputs protected to short circuit conditions
All outputs ±0.04% /°C maximum
Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating:

-10℃ to +70℃ -40°℃ to +85°℃ 5% to 95% non-condensing Derate from 100% to +50°C linearly to 50% at +70°C

PM42 SERIES





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

Switching frequency:	62 K±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:	±0.5% maximum at full load						
Inrush current:	25 A @ 115 VAC, or 50 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:	400,000 hours at full load at 25 $^\circ\!\!\mathbb{C}$ 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						

PM42 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Outpu	ıt #1		Output #2				Output #3				Max.
		Min.	Max.			Min.	Max.			Min.	Max.		Output
Model ⁽¹⁾	V1	Current	Current	Tol.	V2	Current	Current	Tol.	V3	Current	Current	Tol.	Power
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:

Safety approvals are for PCB form only. To order unit with cover fitted, change suffix "A" to "C". 1.

6

The output voltages of a multiple output model may go outside of the stated tolerance when an output load current is out of 2. 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





NOTES:

- Dimensions shown in inches [mm] 1.
- Tolerance 0.02 [0.5] maximum 2.
- Connector CN1: Molex header 09-65-2038 or equivalent, mating with Molex З. housing 09-50-1031 or equivalent.
- Connector CN2: Molex header 09-65-2068 or equivalent, mating with Molex 4. housing 09-50-1061 or equivalent.
- Ground tab is 0.25 [6.35] x 0.032 [0.8] 5.
- To ensure compliance with level B emissions, connect the two "*" marked 6.
- 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 PM42-12A	PM42-13A PM42-14A	PM42-18A	+/	V1	V1 R	eturn	N.C.		
PM42-23A	PM42-25A		V	′1	Commo	n Return	N.C	V2	
PM42-31A PM42-31-3A	PM42-32A PM42-31-5A	PM42-39A	V	′ 1	Commo	n Return	V3	V2	

OUTPUT POWER DERATING CURVE

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 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 vs after a 25% ctop load
	within 500 us after a 25% step load
	cnange

ENVIRONMENTAL SPECIFICATIONS

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

PM60 SERIES

C E (LVD) RoHS



SAFETY STANDARD APPROVALS



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

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

EC 60601-1

1 TÜV EN 60601-1

TÜV EN 60950-1

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:	±0.5% maximum at full load
Inrush current:	30 A @ 115 VAC, or 60 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:	400,000 hours at full load at 25 $^\circ\!{\rm C}$ 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

PM60 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Output #1				Output #2				Output #3				
		Min.	Max. Current	Max. Current			Min.	Max.			Min.	Max.		Max. Output
Model ⁽¹⁾	V1	Current	at convection	at 5 CFM (2)	Tol.	V2	Current	Current	Tol.	V3	Current	Current	Tol.	Power ⁽³⁾
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%	6 (N/A)				(N/A)				64 W
PM60-18A	48 V	0 A	1.35 A	(N/A)	±2%	(N/A) (N/A)				'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 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS



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] fast-on connector.
- 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
PM60-10A PM60-14A	PM60-12A PM60-18A	PM60-13A	+V1	+V1	V1 Return	V1 Return	N.C.	N.C.
PM60-23A	PM60-25A		V1	V1	Commo	n 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

OUTPUT POWER DERATING CURVE

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

In

- 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 .

PM66 SERIES

RoHS



SAFETY STANDARD APPROVALS



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



TÜV EN 60601-1

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 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4%
	or better on all models, recovering to
	1% of final value within 500 us after a
	25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating:

0°C to +70°C -40°℃ to +85°℃ 5% to 95% non-condensing Derate from 100% at +50℃ linearly to 50% at +70°C

Switching frequency:	42 ±5 KHz
Efficiency:	75% minimum on single output model
	with Vo \geq 12V, 68% minimum on the
	others
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	17 A @ 115 VAC or 40 A @ 230 VAC, at 25 $^\circ\!\!\mathbb{C}$
	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 $^\circ\!\!\mathbb{C}$ ambient ,
	calculated per MIL-HDBK-217F
EMC Performance (E	N60601-1-2)
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

PM66 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Efficiency (typical)					
Model	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽¹⁾	Max. Output Power	@ Max. Output Power 115 / 230 Vac
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 μF tantalum capacitor in parallel with a 0.1 μF ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS



NOTES:

- 1. Dimensions shown in inches [mm]
- 2. Tolerance 0.02 [0.5] maximum
- 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 ±sense connections, mating with Molex housing 22-01-1023 or equivalent.
- 7. Weight: 330 grams (0.726 lbs.) approx.

PIN CHART

CONN			P1		P2			F	93			P	4
MODEL	PIN	1	2	3	1	1	2	3	4	5	6	1	2
PM66-10A	PM66-13-1A												
PM66-12A	PM66-14A	AC Live	Void	AC Neutral	AC		+V1		V	1 Retu	rn	+Sense	-Sense
PM66-13A	PM66-15A	LIVC		Realia	Ciculta								

OUTPUT POWER DERATING CURVE



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" x 4" x 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 us after a 25% step load
	change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating:

Cooling:

-10℃ to +70℃ -40°℃ to +85°℃ 5% to 95% non-condensing Derate from 100% at +50°C linearly to 50% at +70℃ Convection

PM100 SERIES





SAFETY STANDARD APPROVALS



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

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



TÜV EN 60601-1



FCC:

TÜV EN 60950-1

GENERAL SPECIFICATIONS

Switching frequency: 100 KHz (typical) Efficiency: 88-90% @ 230 VAC full load 12 ms minimum at 110 VAC Hold-up time: 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 MTRF. 270,000 hours at full load at 25 $^\circ\!\mathbb{C}$ ambient temperature, calculated per MIL-HDBK-217F **EMC** Performance EN55011 /EN55022: Class B conducted, class B radiated Class B conducted, class B radiated Class B conducted, class B radiated VCCI: EN61000-3-2: Harmonic distortion, class A EN61000-3-3: Line flicker ESD, ±8 KV air and ±6 KV contact EN61000-4-2: Radiated immunity, 3 V/m EN61000-4-3: Fast transient/burst, ±2 KV EN61000-4-4: Surge, ±1 KV diff., ±2 KV com. EN61000-4-5: 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)

PM100 MEDICAL & ITE SERIES

OUTPUT POWER DERATING CURVE

OUTPUT VOLTAGE/CURRENT RATING CHART

		Output												
Model ⁽¹⁾	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	Efficiency (typical) @ 115/230 Vac							
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.

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:

1. Dimensions shown in inches [mm]

- 2. Tolerance 0.02 [0.5] maximum
- Connector P1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
- 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		_	_	_	_	_
MODEL			1	2	3	4	5	6
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 weigh •
- 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 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on
	all models, recovering to 1% of final
	value within 500 us 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

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° C to +70 $^{\circ}$ C Storage temperature: Relative humidity: Derating:

Cooling:

-40°℃ to +85°℃ 5% to 95% non-condensing Derate from 100% at +50℃ linearly to 50% at +70℃ 72-110 watts continuous output power at 25 CFM forced air cooling or 60-80 watts at convection cooling

Switching frequency:	20-250 KHz, varied with load and line
Efficiency:	70% minimum on single output model
	with Vo \geq 12V, 65% minimum on the
	others
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	15 A @ 115 VAC or 30 A @ 230 VAC, at $25^\circ\!\mathrm{C}$
	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 $^\circ\!\mathrm{C}$ ambient,
	calculated per MIL-HDBK-217F
EMC Performance (E	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

PM110 MEDICAL SERIES

OUTPUT POWER DERATING CURVE

OUTPUT VOLTAGE/CURRENT RATING CHART

	(Output	#1 ⁽²⁾			0ι	utput #	2			Outpu	it #3			Outpu	ut #4		Max. Output
Model ⁽¹⁾	V1	lmin.	Imax.	Tol.	V2	lmin.	Imax.	Ipeak ⁽⁴⁾	Tol.	V3	lmin.	Imax.	Tol.	V4	lmin.	Imax.	Tol.	Power ⁽³⁾
PM110-10-1A	3.3 V	0 A	22 A	±3%			(N/A)				(N/A	N)			(N/	A)		60 W / 72 W
PM110-10A	5.0 V	0 A	22 A	±3%			(N/A)				(N/A	N)			(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	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 1. "A" to "B" for L-bracket format, to "C" for enclosed form with cover, e.g. PM110-14C. (mechanical details shown in Annex H) 2.

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 3. 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. 4.

5. 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 6. 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] 1.
- Tolerance 0.02 [0.5] maximum 2.

Connector P1: Molex header 09-65-2058 or equivalent, mating with Molex housing 09-50-1051 or equivalent. 3.

Connector P2 mates with Molex 09-50-3131 or equivalent. 4.

The copper pad of the mounting hole near P1 is for system grounding through a metallic stand-off to system chassis. 5.

6. Weight: 640 grams (1.408 lbs.)

PIN CHART

MODEL	1, 2, 3	4, 5	6, 7	8, 9	10	11	12	13
PM110-10-1A PM110-13A	+\/1	V1 Return	V1 Return	⊥\/1	PED	NC	KEV	NC
PM110-12A PM110-16A	1.01	Vinceum	Vinciani		TTD	N.O.		N.O.
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 PM110-45-1	A							
PM110-41A PM110-45-2	A	Common Boturn	Common Boturn	1/2	DED	1/2	KEV	1/4
PM110-42A PM110-46A	VI	Common Return	Common Return	٧Z	PFD	V3		v4
PM110-45A								

55W

40W

-36W

-30W

70

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.

FEATURES

- 2 x 4 inch footprint with 1.3 inch low profile
- 100-240 VAC input with active PFC
- Less than 275 µA 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:	2.0 A (rms) for 115 VAC
	1.0 A (rms) for 230 VAC
Earth leakage current:	275 µA 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all
	models, recovering to 1% of final value
	within 500 us after a 25% step load
	change
Fan power:	12 V at 1.0 A maximum (isolated)

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating:

0°C to +70°C -40°℃ to +85°℃ 5% to 95% non-condensing Derate from 100% at +50°C linearly to 50% at +70°C, applicable to convection and forced-air cooling conditions

PM150 SERIES

RoHS

SAFETY STANDARD APPROVAL

Preliminar

Switching frequency:	133 KHz (typical)
Efficiency:	See rating chart.
Hold-up time:	10 ms minimum at 120 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	30 A @ 115 VAC or 60 A @ 230 VAC, at 25℃
	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°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

PM150 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

					Out	put				Efficiency	(typical)
				Max.	Max.	(1)				Max. Power	Max. Power
			Min.	Current	Current	Peak ⁽¹⁾		Ripple &		at convection	at 30 CFM
Model	<u>۱</u>	/nom.	load	at convection	at 30 CFM	Current	Tol.	Noise	Max. Power ⁽²⁾	115/230 Vac	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 %
	V1	+3.3 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV			
PM150-31-3A	V2	+5 V	0 A	5.0 A	9.0 A	10.0 A	±5%	50 mV	80 W / 130 W	80/82 %	81/83 %
	V3	+12 V	0 A	1.0 A	2.3 A	2.3 A	±5%	120 mV			
	V1	+5 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV			
PM150-31A	V2	+12 V	0 A	5.0 A	9.0 A	10.0 A	±5%	120 mV	80 W / 130 W	81/83 %	82/84 %
	V3	-12 V	0 A	1.0 A	2.0 A	2.0 A	±5%	120 mV			
	V1	+5 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV			
PM150-32A	V2	+15 V	0 A	4.0 A	7.2 A	8.0 A	±5%	150 mV	80 W / 130 W	81/83 %	82/84 %
	V3	-15 V	0 A	1.0 A	1.5 A	2.0 A	±5%	150 mV			
	V1	+5 V	0 A	13.0 A	18.0 A	20.0 A	±2%	50 mV			
PM150-36A	V2	+24 V	0 A	1.5 A	3.0 A	3.5 A	±7%	240 mV	80 W / 130 W	81/83 %	82/84 %
	V3	+12 V	0 A	1.0 A	2.3 A	2.3 A	±5%	120 mV			

NOTES:

Peak output current with 10% duty cycle maximum for less than 15 seconds. The total peak power of triple output models must 1. not exceed 130 W.

The first value of max. power is at convection cooling. The second value is with 30 CFM forced air provided by user. 2.

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



- Dimensions shown in inches [mm] 1.
- Tolerance 0.02 [0.5] maximum 2.

Input connector P1: JST header P/N V3P-VH-B, mating with JST housing P/N VHR-3N or equivalent. 3.

- 4. Output connector P2: JST header P/N V8P-VH-B, mating with JST housing P/N VHR-8N or equivalent.
- Connector P3: Molex header 53253-0470, mating with Molex housing 51065-400 or equivalent. 5.
- FAN connector P4: Molex header 53253-0470, mating with Molex housing 51065-400 or equivalent. 6.
- Ground tab is 0.25 [6.35] × 0.032 [0.8] fast-on connector. 7.
- 8. Weight: 200 grams (0.44 lbs.) approx.

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 Probleman State St

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	PM150-14A												
PM150-12A	PM150-16A	Moutrol	Void	Livo		Commo	n Doturn				/1		
PM150-13A	PM150-17A	Neutrai	voiu	Live		Commo	n Kelum			+	VI		
PM150-13-1A	PM150-18A												

	CONN		Р	3		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	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	1	2	3	4				
PM150-31-3A								
PM150-31A	DED	Common	+V1	-V1				
PM150-32A	110	Return	Sense	Sense				
PM150-36A								

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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us 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.
- Inhihit[.] 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



ENVIRONMENTAL SPECIFICATIONS

Operating temperature:
Storage temperature:
Relative humidity:
Derating:
Coolina:

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

Switching frequency:	88-112 KHz
Efficiency:	70% minimum on all models
Hold-up time:	20 ms minimum at 110 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	20 A @ 115 VAC or 40 A @ 230 VAC, at 25 $^\circ\!\mathbb{C}$
	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 $^\circ\!\!\mathbb{C}$ ambient,
	calculated per MIL-HDBK-217F
EMC Performance (E	N60601-1-2)
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

PM201 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Outpu	ıt #1 ⁽⁴⁾			Output #2 ⁽²⁾⁽⁴⁾		Output #3				Output #4 ⁽³⁾					
															Imax		Max. Output
Model	V1	Imin.	Imax.	Tol.	V2	Imin.	Imax.	Tol.	V3	lmin.	Imax.	Tol.	V4	Imin.		Tol.	Power ⁽⁴⁾
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:

1. 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.

2. Peak output current is 12 A on +12 V, 9 A on +15 V and 6 A on +24 V.

3. 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.

- 6. All models may be operated at no-load. At no-load, output voltage tolerance increases to $\pm 10\%$.
- 7. 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



This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

PM201 MEDICAL & ITE SERIES

MECHANICAL SPECIFICATIONS



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.

	CONN		Ρ2									P3				P5	
MODEL	PIN	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 µA 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 μA max. @ 264 VAC, 63 Hz
Touch current:	100 µA 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change
Fan power:	12 V at 250 mA maximum

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0° C to +70°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +50°C linearly to 50% at +70°C, applicable to convection and forced-air cooling conditions

PM202 SERIES





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

Switching frequency:	100 KHz (typical)
Efficiency:	87% minimum on all models
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	±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:	300,000 hours at full load at 25 $^\circ\!\mathrm{C}$ 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

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

			Efficiency (typical)						
		Min.	Max. Current	Max. Current		Ripple &		@ 150 W	@ 200 W
Model ⁽¹⁾	V1	Current	at convection	at 5.3 CFM (2)	Tol.	Noise ⁽³⁾	Max. Power ⁽²⁾	115/230 Vac	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, 1. 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 2. 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 3. 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 2.01 [51.1] 0 P4 🚺 Ó .33 33.7 P3 3.00 [76.0] 2.55 [64.8] • 3.00 [76.0] 2.55 [64.8] : . : 0.20 [5.0] 5.0] 0.20 0.20 [5.0] 0.20 [5.0] 4.55 [115.6] 0.157 [4.00] DIA.MOUNTING HOLE (4 PLS) 4.55 [115.6]).157 [4.00] DIA.MOUNTING HOLE (4 PLS) 5.00 [127.0] 5.00 [127.0 FAN 1.17 [29.6] 1.97 [50.0] 1.17 [30.4] 1.50 [38.0] 53 [38.8] 0 K 2

NOTES:

- Dimensions shown in inches [mm] 1.
- Tolerance 0.02 [0.5] maximum 2.
- З. 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. 4.
- Fan connector P3: Molex header 53048-0210 or equivalent, mating with Molex housing 51021-0200 or equivalent. 5.
- Connectors P4: Molex header 22-05-7055 or equivalent, mating with Molex housing 50-37-5053 or equivalent. 6.
- Weight: 390 grams (0.86 lbs.) approx. for U-bracket form, 440 grams (0.97 lbs.) for enclosed form 7.
- Fixing of units to end equipment is through standoffs and the four mounting holes in PCB. 8. 9.
- Ground tab is 0.25 [6.35] × 0.032 [0.8] fast-on connector.

PM202 MEDICAL & ITE SERIES

\sim	CONN			P1					Pź	2		
MODEL	PIN	1	2	3	4	5	1	2	3	4	5	6
PM202-12B	PM202-15B											
PM202-13B	PM202-17B	Cround	Vaial	Live	Void	Neutral	. \ / 4			Common Doturn		
PM202-13-1B	PM202-18B	Giouna	voiu	Live	voiu	ineuliai		+ V I		0	mmon Kei	um
PM202-14B												

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

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 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all
	models, recovering to 1% of final value
	within 500 us 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

- TTL logic high for normal operation and TTL logic low PFD: 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.
- Requires an external TTL high level signal to inhibit Inhibit: outputs for standard models

PM300 SERIES

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: Storage temperature: Relative humidity: Derating:

Cooling:

0°C to +70°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +50°C, linearly to 50% at +70°C 200 /250 /300 watts continuous output power at 35 CFM forced air cooling or 100 /125 /150 watts at convention cooling

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: Inrush current:	±0.2% maximum at full load 30 A @ 115 VAC or 60A @ 230 VAC, at 25 $^\circ\!\!\mathbb{C}$
Withstand voltage:	cold start 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° C ambient, calculated per MIL-HDBK-217F
EMC Performance (E	N60601-1-2)
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

PM300 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Output	#1 ⁽³⁾⁽⁵⁾		(Output #	#2 ⁽³⁾⁽⁵⁾		Output #3 ⁽⁴⁾			Output #4 ⁽⁴⁾				Max. Output	
Model ⁽¹⁾⁽²⁾⁽⁶⁾	V1	lmin.	Imax.	Tol.	V2	lmin.	Imax.	Tol.	V3	Imin.	Imax.	Tol.	V4	Imin.	Imax.	Tol.	Power ⁽⁵⁾
PM300-10-3B	3.3 V	3.0 A	60.0 A	±3%		(N/A	4)			(N/	'A)		(N/A)				100 W / 200 W
PM300-10B	5.1 V	3.0 A	60.0 A	±2%		(N/A	۹)			(N/	'A)		(N/A)				150 W / 300 W
PM300-12B	12 V	1.2 A	25.0 A	±2%		(N/A	۹)			(N/	′A)			(N	I/A)		150 W / 300 W
PM300-13B	15 V	1.0 A	20.0 A	±2%		(N/A	۹)			(N/	'A)			(N	I/A)		150 W / 300 W
PM300-14B	24 V	0.6 A	12.5 A	±2%		(N/A	4)			(N/	′A)			(N	I/A)		150 W / 300 W
PM300-16B	30 V	0.5 A	10.0 A	±2%		(N/A	A)			(N/	'A)			(N	I/A)		150 W / 300 W
PM300-18B	48 V	0.5 A	6.3 A	±2%		(N/A	A)			(N/	'A)			(N	I/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 Å	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:

1. 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.

- 2. All outputs are floating. They can be connected externally for positive or negative output.
- 3. Output #1 & #2 can be adjusted within ±5% of their nominal voltage.
- 4. 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.
- 6. 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.
- 7. Single output models may be operated at no-load. At no-load, output voltage tolerance increases to ±10%.
- 8. 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



This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

OUTPUT POWER DERATING CURVE



PM300 MEDICAL & ITE SERIES

Multiple Output Models U-bracket Form





NOTES:

- Dimensions shown in inches [mm] 1
- Tolerance 0.02 [0.5] maximum 2.
- Input connector P1 is Dinkle DT-35-B01W-03 with M3, nickel-plated screws. 3.
- Connector P4 mates with Molex housing 50-37-5103 and pins 5263. 4.
- Connectors P2, P3, P5 and P6: M3*0.5 screw connections 5.
- Output connector P7 mates with Molex housing 09-50-3041 and Molex 2878 series crimp terminal. 6.
- 7. Weight: 1.10 Kgs. (2.42 lbs.) approx. for U-bracket form, 1.24 Kgs. (2.73 lbs.) approx. for Enclosed form.
- Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis. 8.

PIN CHAR	Т											
	CONN		P1 (AC)			D 2	D5	DC	P7			
MODEL	PIN	1	2	3	P2	P3	FJ	FU	1	2	3	4
PM300-10-3B PM300-10B PM300-12B PM300-13B	PM300-14B PM300-16B PM300-18B	Live	Neutral	Ground	+,	V1	V1 R	eturn		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

	.	
PIN	CHA	RT

	CONN						P4				
MODEL	PIN	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.

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 $+50^{\circ}$ 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

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 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
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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4%, recovering to
	1% of final value within 500 us 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: Storage temperature: Relative humidity: Derating: -10°C to +70°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +50°C linearly to 50% at +70°C, applicable to convection and forced-air cooling conditions

PM400 SERIES



SAFETY STANDARD APPROVALS

(Pending)



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:	±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 $^\circ\!{\rm C}$ 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

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	5%
PS OFF: TTL high to turn off output	

OUTPUT POWER DERATING CURVE



OUTPUT VOLTAGE/CURRENT RATING CHART

		Output Effic										
		Min.	Max. Current	Max. Current		Ripple &	Max. Output	@ 300 W	@ 400 W			
Model ⁽¹⁾	V1	Current	at convection	at 7 CFM ⁽²⁾	Tol.	Noise ⁽³⁾	Power	115/230 Vac	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 0	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 0	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

 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.

Enclosed Form

MECHANICAL SPECIFICATIONS

U-bracket Form





NOTES:

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

PM400 MEDICAL & ITE SERIES

CONN		P1 (AC)		P2	P3	F	25
MODEL	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

CONN				F	94			
MODEL	1	2	3	4	5	6	7	8
PM400-12B PM400-15B PM400-13B PM400-17B PM400-13-1B PM400-18B PM400-14B 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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or
	better on all models, recovering
	to 1% of final value within 500us
	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° C to +70°CStorage temperature:-40°C to +85Relative humidity:5% to 95% nDerating:Derate from

-40°C to +85°C 5% to 95% non-condensing Derate from 100% at +50°C linearly to 50% at +70°C

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:	±0.2% maximum at full load
Inrush current:	40 A @ 115 VAC or 80 A @ 230 VAC, at
	25℃ 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 $^\circ\!\!\mathbb{C}$
	ambient, calculated per MIL-HDBK-217F
EMC Performance (I	EC60601-1-2)
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

PM450 MEDICAL & ITE SERIES

2010 MEDICAL

OUTPUT VOLTAGE/CURRENT RATING CHART

		Output	#1 ⁽³⁾⁽⁵⁾			Outpu	t #2 ⁽⁵⁾				Max Output		
Model ⁽¹⁾	V1	Imin.	Imax.	Tol.	V2	lmin.	Imax.	Tol.	V3	Imin.	Imax.	Tol.	Power ⁽⁵⁾
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	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.
- 3. Output #1 can be adjusted within ±5% of its nominal voltage.
- 4. 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%.



MECHANICAL SPECIFICATIONS



PM450 MEDICAL & ITE SERIES

Multiple Output Models



NOTES: Dimensions shown in inches [mm] 1.

DINI CULA DT

- Tolerance 0.02 [0.5] maximum 2.
- Input connector P1 is Dinkle DT-35-B01W-03 with M3, nickel plated screws. 3.
- 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 Output connector P5 is Dinkle DT-35-B01W-04 with M3, nickel plated screws. 6.
- 7. Weight: 1.8 Kgs (3.96 lbs.) approx. for U-bracket form, 2.0 Kg (4.4 lbs.) approx. for enclosed form
- Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis. 8.

	1											
	CONN	P1 (AC)			D 2	D 2	P5					
MODEL	PIN	1	2	3	F2	FJ	1	2	3	4		
PM450-12B	PM450-16B											
PM450-13B	PM450-17-1B	Live	Neutral	Cround	1)/4	V/1 Doturn		N	^			
PM450-14B	PM450-18B	Live	neutrai	Ground	+ V I	vi Retum		IN.	А.			
PM450-15B	PM450-19B											
PM450-20B	PM450-23B							1/0				
PM450-21B	PM450-24B	Live	Neutral	Ground	+V1	V1 Return	+V2	V2 Roturn	N.C.	N.C.		
PM450-22B								Return				
PM450-30B	PM450-34B											
PM450-31B	PM450-35B	Live	Mautral	Crownad		V/A Deturn		V2	.\/2	V3		
PM450-32B	PM450-36B	Live	Neutral	Ground	+ 1	vi Return	+v2	Return	+v3	Return		
PM450-33B	PM450-37B											

	CONN	P4									
MODEL	PIN	1	2	3	4	5	6	7	8	9	10
PM450-12B	PM450-16B										
PM450-13B	PM450-17-1B	PFD	11/1 Sanca	V/1 Sanca	DED	Inhibit	Inhibit	NC	NC	Fan	+12V
PM450-14B	PM450-18B	Return	+vi Sense	-vi Sense	PFD	+V	-V	N.C.	N.C.	Return	Fan
PM450-15B	PM450-19B										
PM450-20B	PM450-23B					labibit	Inhihit			For	121/
PM450-21B	PM450-24B	Return	+V1 Sense	-V1 Sense	PFD		-\/	+V2 Sense	-V2 Sense	Return	+12V Fan
PM450-22B		Return				τv	- v			Return	i ali
PM450-30B	PM450-34B										
PM450-31B	PM450-35B	PFD	+\/1 Sonso	-V/1 Sonso	DED	Inhibit	Inhibit	+1/2 Sonso	-V/2 Sonso	Fan	+12V
PM450-32B	PM450-36B	Return	+vi Sense	-vi Sense	FFD	+V	-V	+vz Sense	-vz Sense	Return	Fan
PM450-33B	PM450-37B										

This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all
	models, recovering to 1% of final value
	within 500 us 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



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

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:	±0.2% maximum at full load
Inrush current:	50 A @ 115 VAC or 100 A @ 230 VAC at
	25℃ 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°C ambient, calculated per
	MIL-HDBK- 217F
EMC Performance (II	EC60601-1-2)
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

PM650 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Output #	#1 ⁽³⁾⁽⁵⁾		Output #2 ⁽⁵⁾			Output #3 ⁽⁴⁾					
Model ⁽¹⁾	V1	lmin.	Imax.	Tol.	V2	lmin.	Imax.	Tol.	V3	lmin.	Imax.	Tol.	Max. Output Power ⁽⁵⁾
PM650-12B	12 V	0 A	54.2 A	±2%		(N/A	A)			(N/A		325 W / 650 W	
PM650-13B	15 V	0 A	43.4 A	±2%		(N/A	A)		(N/A)				325 W / 650 W
PM650-14B	24 V	0 A	27.1 A	±2%		(N/A	۹)		(N/A)				325 W / 650 W
PM650-15B	27 V	0 A	24.1 A	±2%		(N/A	A)			(N/A	.)		325 W / 650 W
PM650-16B	30 V	0 A	21.7 A	±2%		(N/A	۹)			(N/A	.)		325 W / 650 W
PM650-17B	36 V	0 A	18.1 A	±2%		(N/A	A)			(N/A	.)		325 W / 650 W
PM650-18B	48 V	0 A	14.6 A	±2%		(N/A	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:

1. 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 2 output.

3. Output #1 can be adjusted within +/- 5% of their nominal voltage.

4

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" 5 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.

- 6 All models may be operated at no-load. At no-load, output voltage tolerance increases to +/- 10%.
- 7. 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



This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

PM650 MEDICAL & ITE SERIES

MECHANICAL SPECIFICATIONS

Multiple Output Models U-bracket 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.

	CONN P1 (AC))	D2	D2				Р	5			
MODEL	PIN	1	2	3	F2	гэ	1	2	3	4	5	6	
PM650-12B	PM650-16B										•		
PM650-13B	PM650-17B	Livo	Noutral	Ground	. \/4	V/1 Poturo				N	NL A		
PM650-14B	PM650-18B	LIVE	Neuliai	Giouna	Giouna	τv1	VIReluin				IN.	Α.	
PM650-15B													
PM650-20B	PM650-23B												
PM650-21B	PM650-24B	Live	Neutral	Ground	+V1	V1 Return	+\	/2	V2 R	eturn	N.A.	N.A.	
PM650-22B													
PM650-30B	PM650-34B												
PM650-31B	PM650-35B	Livo	Noutral	Ground	1)/1	V/1 Poturn		12		oturo	1/2	V/2 Poturo	
PM650-32B	PM650-36B	LIVE	neullai	Ground	τVI	viiteluiii	- T	v 2	VZR	Gluill	+v5	vonetum	
PM650-33B	PM650-37B												

	CONN					P4					
MODEL	PIN	1	2	3	4	5	6	7	8	9	10
PM650-12B	PM650-16B										
PM650-13B	PM650-17B	PFD	11/1 Sanaa	V/1 Sanaa	DED	Inhibit	Inhibit	NC	NC	Fan	+12V
PM650-14B	PM650-18B	Return	+vi Sense	-vi Sense	FFD	+V	-V	N.C.	N.C.	Return	Fan
PM650-15B											
PM650-20B	PM650-23B					Inhihit	Inhihit			For	121/
PM650-21B	PM650-24B	Poturn	+V1 Sense	-V1 Sense	PFD			+V2 Sense	-V2 Sense	Poturn	+12V Ean
PM650-22B		Retuin				τv	- v			Return	Fair
PM650-30B	PM650-34B										
PM650-31B	PM650-35B	PFD	11/1 Sanaa	V/1 Sanaa	DED	Inhibit	Inhibit	11/2 50000	V/2 Sonoo	Fan	+12V
PM650-32B	PM650-36B	Return	+vi Sense	-vi Sense	FFD	+V	-V	+vz Sense	-vz Sense	Return	Fan
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 C C C (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

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% /℃ maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step
	load change

ENVIRONMENTAL SPECIFICATIONS

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

SAFETY STANDARD APPROVALS



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



TÜV EN 60601-1

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 $^\circ\!C$ cold start
Withstand voltage:	4000 VAC from input to output
MTBF:	300,000 hours at full load at 25 $^\circ\!\mathrm{C}$
	ambient, calculated per
	MIL-HDBK-217F
EMC Performance (IE	C60601-1-2)
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

PMP15 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

			Average Active				
Model ⁽¹⁾	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Output Power	Efficiency (typical) @ 115 / 230 Vac
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 µF tantalum capacitor in parallel with a 0.1 µF 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.

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

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 or all models, recovering to 1% of final value within 500 us after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating $0^\circ\mathbb{C}$ to $+40^\circ\mathbb{C}$ -40 $^\circ\mathbb{C}$ to $+85^\circ\mathbb{C}$ 10% to 90% non-condensing Derate from 100% at +40 $^\circ\mathbb{C}$ linearly to 50% at +60 $^\circ\mathbb{C}$



SAFETY STANDARD APPROVALS



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



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 $^\circ\!\!\mathbb{C}$ ambient,
	calculated per MIL-HDBK-217F
EMC Performance (IEC6	60601-1-2)
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

PMP31 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

		Output						
Model	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽¹⁾	Max. Output Power	Efficiency (typical) @ 115 / 230 Vac	
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 µF tantalum capacitor in parallel with a 0.1 µF 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 VACInput frequency:47-63 HzInput current:1.50 A (rms) for 115 VAC0.90 A (rms) for 230 VACEarth leakage current:300 μA max. @ 264 VAC, 63 Hz(Touch current)

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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all
	models, recovering to 1% of final value
	within 500 us after a 25% step load
	change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0°C to +70°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +50°C linearly to 50% at +70°C

PMP55 SERIES



RoHS



SAFETY STANDARD APPROVALS



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



TÜV EN 60601-1

Switching frequency:	40 KHz ±5 KHz
Efficiency:	65% minimum
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	15 A @ 115 VAC or 30 A @ 230 VAC, at $25^\circ\!\mathrm{C}$
	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 (IE	EC60601-1-2)
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

PMP55 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

	Output #1				Output #2				Output #3				Мах
Model	V1	Min. Current	Max. Current	Tol.	V2	Min. Current	Max. Current	Tol.	V3	Min. Current	Max. Current	Tol.	Output Power
PMP55-23	+5 V	1.0 A	5.0 A	±5%	+12 V	0.5 A	3.0 A	±5%		(N/A	۹)		45 W
PMP55-24	+5 V	1.0 A	5.0 A	±5%	+15 V	0.4 A	2.5 A	±5%		(N/A	A)		45 W
PMP55-25	+5 V	1.0 A	5.0 A	±5%	+24 V	0.3 A	2.0 A	±5%		(N/#	۹)		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:

1. 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.



NOTES:

1. Dimensions shown in inches [mm]

- 2. Tolerance 0.02 [0.5] maximum
- 3. Weight : 700 grams (1.54 lbs.) approx.
- 4. 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
- 6. To order a model with an on/off switch, add suffix "S" to the model number, e.g. PMP55-31-K2-S

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 ≥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:	200 µA max. @ 264 VAC, 63 Hz
(Touch current)	

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 ±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on
	all models, recovering to 1% of final
	value within 500 us after a 25% step
	load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0° C to + 60° C - 40° C to + 85° C 5% to 95% non-condensing Derate from 100% at + 40° C linearly to 50% at + 60° C



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

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:	±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,
	1500 VAC from input to ground,
	500 VAC from output to ground
MTBF:	150,000 hours minimum at full load at 25° C
	ambient, calculated per MIL-HDBK-217F
EMC Performance (IE	C60601-1-2)
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

PMP60 MEDICAL & ITE SERIES

OUTPUT POWER DERATING

OUTPUT VOLTAGE/CURRENT RATING CHART

	Output #1			Output #2				Output #3					
											Max.		Max.
		Min.	Max.			Min.	Max.			Min.	curren		Output
Model	V1	current	current	Tol.	V2	current	current	Tol.	V3	current	t	Tol.	Power
PMP60-12	11-13 V	0 A	5.46 A	±5%		(N//	4)		(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//	4)			(N//	A)		60 W
PMP60-17	33-39 V	0 A	1.82 A	±3%		(N//	4)			(N//	A)		60 W
PMP60-18	46-50 V	0 A	1.31 A	±3%		(N//	4)			(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:

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

MECHANICAL SPECIFICATIONS



NOTES:

- 1. Dimensions shown in inches [mm]
- 2. Tolerance 0.02 [0.5] maximum
- 3. Weight: 600 grams (1.33 lbs.) approx.
- 4. Output connector is 5 pin DIN plug, mating with Switchcraft P/N 57GB5F receptacle or equivalent.
- 5. Refer to Section titled "OPTIONAL OUPUT 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.
- 6. To order a model with on / off switch, add suffix "S" to the model number, e.g. PMP60-12-B2-S

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

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, PMP90-10-1and 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 $\mu\mathrm{A}\mathrm{max.}$ @ 264 VAC, 63 Hz
Touch current:	100 $\mu\mathrm{A}\mathrm{max.}$ @ 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 \cdots , 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:	±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0° C to + 60° C -40°C to + 85° C 5% to 95% non-condensing Derate from 100% at + 40° C linearly to 50% at + 60° C



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:	±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,
	1500 VAC from input to ground,
	500 VAC from output to ground
MTBF:	150,000 hours at full load at 25 $^\circ\!\mathrm{C}$ ambient ,
	calculated per MIL-HDBK-217F
EMC Performance (IE	C60601-1-2)
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

This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

PMP90 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

Мо	del ⁽¹⁾	Output					Average Active	
			Min.	Max.		Ripple &		Efficiency (typical)
Class I	Class II	V1	Current	Current	Tol.	Noise ⁽²⁾	Max. Power	@ 115 / 230 Vac
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:

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

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.



NOTES:

- 1. Dimensions shown in inches [mm]
- 2. Tolerance 0.02 [0.5] maximum
- 3. Weight: 658 grams (1.45 lbs.) approx.
- 4. Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- 5. 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.

MODEL	PIN	1	2	3	4
PMP90-10	PMP90F-10				
PMP90-10-1	PMP90F-10-1				
PMP90-11	PMP90F-11				
PMP90-12	PMP90F-12				
PMP90-12-1	PMP90F-12-1				
PMP90-13	PMP90F-13	V1 Return	+V1	V1 Return	+V1
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 µA max. @ 264 VAC, 63 Hz
Touch 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
Overvoltage protection:	Provided and set at 112-140% of its nominal output voltage
Overcurrent protection:	Protected to short circuit conditions
Temperature coefficient: Transient response:	$\pm 0.04\%$ /°C maximum Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0°C to +60°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +40°C linearly to 50% at +60°C



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

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:	±0.5% maximum at full load					
Inrush current:	60 A @ 115 VAC or 120 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:	150,000 hours at full load at $25^\circ\!\!\!C$ ambient ,					
	calculated per MIL-HDBK-217F					
EMC Performance (IE	C60601-1-2)					
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					

PMP120 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

Mod	lel ⁽¹⁾	Output					Average Active	
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	Efficiency (typical) @ 115 / 230 Vac
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:

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

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.



 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.

MODEL	PIN	1	2	3	4
PMP120-12	PMP120F-12				
PMP120-13	PMP120F-13				
PMP120-13-1	PMP120F-13-1				
PMP120-13-2	PMP120F-13-2				
PMP120-13-3	PMP120F-13-3	V1 Return	+V1	V1 Return	+V1
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.

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

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 µA max. @ 264 VAC, 63 Hz
Touch current:	100 µA max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage /current: Maximum output power: Ripple and noise: Overvoltage protection:

Overcurrent protection: Temperature coefficient: Transient response: See rating chart. See rating chart. 1% peak to peak maximum at the full load Provided and set at 115-140% of its nominal output voltage Protected to short circuit conditions

 $\pm 0.04\%$ /°C maximum Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0°C to +60°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +40°C linearly to 50% at +60°C

PMP135 SERIES



SAFETY STANDARD APPROVALS

PENDING

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:	±0.5% maximum at full load
Inrush current:	80 A @ 115 VAC or 160 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:	150,000 hours at full load at $25^\circ\!C$ ambient ,
	calculated per MIL-HDBK-217F
EMC Performance (IE	C60601-1-2)
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

PMP135 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

Мос	lel ⁽¹⁾	Output					Average Active	
						Ripple &		Efficiency (typical)
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Noise ⁽²⁾	Max. Power	@ 115 / 230 Vac
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:

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

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.



5. 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)

MODEL	PIN	1	2	3	4
PMP135-12	PMP135F-12				
PMP135-12-1	PMP135F-12-1				
PMP135-13	PMP135F-13				
PMP135-13-1	PMP135F-13-1	V1 Return		V1 Return	+V1
PMP135-13-3	PMP135F-13-3		+\/1		
PMP135-14	PMP135F-14	Viritotani		v i itotaini	
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 µA max. @ 264 VAC, 63 Hz
Touch current:	100 µA max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage /current: Maximum output power: Ripple and noise: Overvoltage protection:

Overcurrent protection:

Temperature coefficient: Transient response: See rating chart. See rating chart. 1% peak to peak maximum at full load Provided and set at 112-140% of its nominal output voltage Protected to short circuit conditions

 ± 0.04 /°C maximum Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: Storage temperature: Relative humidity: Derating: 0°C to +60°C -40°C to +85°C 5% to 95% non-condensing Derate from 100% at +40°C linearly to 50% at +60°C



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

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:	±0.5% maximum at full load
Inrush current:	60 A @ 115 VAC or 120 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:	150,000 hours at full load at $25^\circ\!\!\mathbb{C}$ ambient ,
	calculated per MIL-HDBK-217F
EMC Performance (IEC6	0601-1-2)
EN55011 /EN55022:	Class B conducted, class B radiated

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

PMP150 MEDICAL & ITE SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

Мос	lel ⁽¹⁾	Output			Average Active			
Class I	Class II	V1	Min. Current	Max. Current	Tol.	Ripple & Noise ⁽²⁾	Max. Power	Efficiency (typical) @ 115 / 230 Vac
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:

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

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. Weight: 960 grams (2.1 lbs.) approx.
- 4. Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- 5. 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.

MODEL	PIN	1	2	3	4
PMP150-12	PMP150F-12				
PMP150-13	PMP150F-13				
PMP150-13-2	PMP150F-13-2	V1 Return	+\/1	V1 Return	+\/1
PMP150-14	PMP150F-14	VIItotuini		VIItotaini	
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.



SAFETY STANDARD APPROVALS



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



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 $^\circ\!\mathrm{C}$
	cold start
Withstand voltage:	2000 VAC from input to output
MTBF:	100,000 hours at full load at 25 $^\circ\!\mathrm{C}$ ambient,
	calculated per MIL-HDBK-217F
EMC Performance (IEC6	60601-1-2)
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

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

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 us after a 25% step

load change

ENVIRONMENTAL SPECIFICATIONS

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

This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

PMP180 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

Мос	lel ⁽¹⁾	Output			Average Active			
			Min.	Max.		Ripple &		Efficiency (typical)
Class I	Class II	V1	Current	Current	Tol.	Noise ⁽²⁾	Max. Power	@ 115 / 230 Vac
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:

1. Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C8 inlet.

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 47 μF electrolytic capacitor in parallel with a 0.1 μF ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS



NOTES:

- 1. Dimensions shown in inches [mm]
- 2. Tolerance 0.02 [0.5] maximum
- 3. Weight: 950 grams (2.09 lbs.) approx.
- 4. Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- 5. 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 MODEL	1	2	3	4	Shield
PMP180-14	+\/1	+V1	V1 Return &	V1 Return &	V1 Return &
PMP180-15			AC Ground	AC Ground	AC Ground
PMP180SF-14	+V1	+V1	V1 Return	V1 Return	V1 Return

IPC - FLEX

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



FSP-MP Series (180W)





INPUT SPECIFICATION

90 ~ 265 Vac
47 ~ 63 Hz
6.0A max at 115V
3.0A max at 230V
50 A peak at 115V
80A peak at 230V
Not exceed 0.5mA at 264Vac, 63Hz

OUTPUT SPECIFICATION

Output Voltage/ Current	See Product Series List
Output Regulation Load	+3.3V, +5V, +12V, +5VSB: ±5%
	-12V: ±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
ENIC & Safety	
Salety Standard	

Emission EN55011 and FCC Part 18 Subpart C

IPC - FLEX

FSP-MP Series (180W)

PRODUCT SERIES LIST

	Total	Output Current													
Model Name	Output	+3	.3V	+{	5V	+12	2V1	-1	2V	+5∖	/SB				
	Watt.	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)	
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

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

FSP-MP Series (300W~500W)



SAFETY STANDARD APPROVAL

INPUT SPECIFICATION

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 Output Regulation Load	See Product Series List +3.3V, +5V, +12V, +5VSB: ±5% -12V, -5V: ±10%
Ripple and noise	+3.3V, +5V, +5VSB: 50mVp-p / -5V: 100mVp-p
Over Voltage Protection	+12V, -12V: 120mVp-p +3.3V output: +3.7V ~ +4.5V
ever verage i recoccien	$+5V$ output: $+5.7V \sim +6.5V$
	+12V output: +13.3V ~ + 15.6V
Short Circuit Protection	Output short circuit is defined to be a short circuit load of less than o.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

	Total Output		Output Current													
Model Name		+3.3V		+5	5V	+12	2V1	+12	2V2	-1:	2V	+5\	/SB	-5	5V	
	Watt.	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 otput 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 otput shall not exceed 180watts. The +3.3V, +5V and +12V total output shall not exceed 380W and the total outpt power is 400watts.

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

Mechanical Drawing

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



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



FSP-MU Series (250W)

SAFETY STANDARD APPROVAL

INPUT SPECIFICATION

90 ~ 265 Vac Input Voltage 47 ~ 63 Hz Input Frequency 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 Output Regulation Load	See Product Series List +3.3V, +5V, +12V, +5VSB: ±5% -12V, -5V: ±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

This content is subject to change, please refer to Specification for more detail. FSP reserve the right to change the content without prior noitce.

FSP-MU Series (250W)

PRODUCT SERIES LIST

	Total Output	Output Current														
Model Name		+3.3V		+5	ōV	+12	2V1	+12	2V2	-1	2V	+5\	/SB	-5	δV	
	Watt.	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



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



FSP-MU Series (300W~350W)



INPUT SPECIFICATION

INPUT SPECIFICATION	С	B	CE	FC	7
Input Voltage	90 ~ 265 Vac				E19
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 c	old s	start		

Earth leakage current Not exceed 0.3mA at 264Vac, 63Hz

OUTPUT SPECIFICATION

Output Voltage/ Current Output Regulation Load	See Product Series List +3.3V, +5V, +12V, +5VSB: ±5% -12V, -5V: ±10%
Ripple and noise	+3.3V, +5V, +5VSB: 50mVp-p / '+12V, -5V: 120mVp-p
Over Voltage Protection	+3.3V output: +3.5V ~ +4.8V +5V output: +5.5V ~ +7.0V
Short Circuit Protection	+12V output: +13.4V ~ + 15.8V 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
FMC & Safety	
Safety Standard	IEC 60601-1
Emission	EN55011 and FCC Part 18 Subpart C

FSP-MU Series (250W~350W)

PRODUCT SERIES LIST

	Total Output	Output Current														
Model Name		+3.3V		+{	δV	+12	2V1	+12	2V2	-1	2V	+5\	/SB	-5	δV	
	Watt.	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

