

240W AC to DC Power Supply DIN Rail Mount

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**RoHS
Compliant**



Features

- Universal 85 - 277V AC or 120 - 390V DC Input voltage
- Efficiency up to 95.5%
- Operating ambient temperature range: -40°C to +85°C
- 150% peak load
- Active PFC, PF>0.99
- DC OK function
- Double-sided conformal coating, salt-spray proof, explosion-proof
- Operating altitude up to 5000m
- 5 years warranty
- Output short circuit, over-current, over-voltage, over-temperature protection
- Safety according to ATEX, IECEx increased safety type explosion-proof certification
- Meets ANSI/ISA 71.04-2013 G3 corrosion test
- Safety according to IEC/UL62368, UL508

MPIMF240-23Bxx is explosion-proof Din-rail power supply featuring with energy saving, high performance, high reliability, high efficiency. With 150% peak load capacity is enough to support heavy loads such as DC motors or capacitive loads, up to 95.5% efficiency can greatly improve power supply reliability and service life. With good EMC performance and compliant with international standards of IEC/EN/UL/BS EN 62368, UL61010, UL508, ANSI/ISA 71.04-2013 for EMC and safety. The power supply meets the “ec” increased safety and “nC” isolation short-circuit n-type explosion-proof certification and is suitable for explosive environment where the equipment protection level is Gc in zone 2. They are widely used in the wind power industry, DCS, industrial control equipment, machine control, LED, street light control, electric power, security, 5G communication and other fields.

Selection Guide

Part Number	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 400V AC (%) Typ.	Max. Capacitive Load (µF)
MPIMF240-23B12	192	12V/16A	12-14	94	100000
MPIMF240-23B24	240	24V/10A	24-28	95.5	50000
MPIMF240-23B48		48V/5A	48-53		25000

Note: 1. *When the output voltage rises, the total power of the product should not exceed the rated power;
 2. *Please refer to the derating curve, when the 48V output voltage is adjusted to 53V - 56V;
 3. *This product is suitable for indoor use, if it is used in outdoor environment.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	Rated input (Certified voltage)	100	--	240	V AC
	AC input	85		277	
	DC input	120		390	V DC
Maximum Input Voltage	Lasts for 2h without damage	-		305	V AC
Input Voltage Frequency		47		63	Hz
Input Switching Voltage		--	80	--	V AC
Input Turn-off Voltage			60		

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Item	Operating Conditions		Min.	Typ.	Max.	Unit		
Input Current	115V AC		--	--	3	A		
	230V AC				1.5			
Inrush Current	115V AC			Cold start	14		--	A ² s
	230V AC				26			
Inrush Current Integral (I ² t)	115V AC		0.25		0.867	--		A
	230V AC		0.867					
Power Factor	Rated load	115V AC	0.98	0.99	--	--		
		230V AC	24V/48V				0.95	
	12V		0.98					
THD	230V AC, rated load		--	3	--	%		
Start-up Delay Time	115V AC/230V AC, rated load			520		ms		
Rise Time				19				
Input Fuse				Built-in fuse			8	A
DC OK Signal	Resistive load		30V DC/1A Max.					
Hot Plug			Unavailable					

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range		--	±1	-	%
Line Regulation	Rated load			±0.25		
Load Regulation	0%-100% load			±0.5		
Power Consumption*	230V AC, rated load	12V		11.5	W	
		24V/48V		10.8		
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	12V/48V		--	150	mV
		24V			100	
Hold-up Time			37	--	ms	
Over-current Protection*	115V AC/230V AC		Hiccup mode, constant current works 1s (Typ.), turn off 10s, continuous, self-recovery			
Short Circuit Protection*						
Over-voltage Protection	12V		≤18V DC (Hiccup, self-recover)			
	24V		≤35V DC (Hiccup, self-recover)			
	48V		≤60V DC (Hiccup, self-recover)			
Over-temperature Protection*	230V AC, rated load	Over-temperature protection start	--	--	105	°C
		Over-temperature protection release	60	--	--	

Note: 1. *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to Enclosed Switching Power Supply Application Notes for specific information;
2. *Over-temperature protection: Put the product into a high temperature box. After the ambient temperature stabilizes, increase the temperature slightly (3°C to 5°C), and the load remains unchanged. After the product reaches thermal equilibrium, increase the temperature until the product triggers over-temperature protection;
3. *Power consumption curve, over-current protection mode and short circuit protection mode see product characteristic curve.

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General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Test*	Input - ⊕	Electric strength test for 1min., leakage current <5mA (Isolation Test need to remove the screw at the mark shall ⚡*)	2500	--	--	V AC
	Input - output		4000			
	Output - ⊕		500			
	DC OK - output		500			
Insulation Resistance	Input - ⊕	At 500VDC	500	--		MΩ
	Input - output					
	Output - ⊕					
Operating Temperature			-40		+85	°C
Storage Temperature			-40		+85	
Operating Humidity		Non-condensing	5		95	%RH
Storage Humidity			5		90	
Switching Frequency	PFC		40	--	130	kHz
	DC-DC		50	--		
	Auxiliary source		--	65		
Power Derating	Operating temperature derating	+40°C to +25°C	3.34	--	--	%°C
		+60°C to +70°C	3.75			
		+70°C to +85°C	3.17			
	Input voltage derating	85V AC - 100V AC	1			%V AC
Leakage Current	240V AC	Input - output	<0.5mA			
		Input - ⊕	<0.88mA			
Safety Standard		UL61010-1 safety approved & EN62368-1, BS EN62368-1(Report) Design refer to IEC/UL62368-1, UL508, IEC60079-0, IEC60079-7, IEC60079-15, ANSI/ISA 71.04-2013				
Safety Class		CLASS I				
MTBF	MIL-HDBK-217F@25°C		980,000 h			
	MIL-HDBK-217F@40°C		878,000 h			
Pollution degree		2				
OVC		2				
Warranty		Ambient temperature: <40°C		5 years		
High and Low Voltage Crossing		NB/T 31111-2017				
<p>Note: 1. *The gas discharge tube built into the device effectively protects the power supply against damage by asymmetric disturbance variables (eg EN 61000-4-5). Each power supply continuous withstand voltage test will cause extremely high load to the power supply. Therefore, unnecessary loading or damage to the power supply due to excessive test voltage should be avoided. If necessary, disconnect the gas discharge tube built into the device to use a higher test voltage. After successful completion of the test, reconnect the gas discharge tube. Please refer to the "LIMF240-23Bxx Installation and Application Manual" for specific operation methods;</p> <p>2. *The power supply has three converters with three different switching frequencies. Auxiliary source frequency is nearly constant, other switching frequencies depend on input voltage and load.</p>						

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Environmental Characteristics		
Item	Operating Conditions	Standard
High and Low Temperature Working	+85°C, -40°C	GB2423.1, IEC60068-2-1
Sinusoidal Vibration	10 - 500Hz, 2g, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
Salt Mist	+35°C, 5%NaCl, 48h	GB2423.17, IEC60068-2-11
Alternating Hot and Humid	+25°C, 95%RH - +60°C, 95%RH	GB2423.4, IEC60068-2-30
Low Temperature Storage	-40°C	GB2423.1, IEC60068-2-1
High Temperature Storage	+85°C	GB2423.2, IEC60068-2-2
High Temperature Aging	+60°C	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25°C	GB2423.1, IEC60068-2-1
Temperature Shock	-40°C to +85°C	GB2423.22, IEC60068-2-14
Temperature Cycle	-25°C to +60°C	GB2423.22, IEC60068-2-14
Hot and Humid	+85°C, 85%RH	GB2423.50, IEC60068-2-67
High Temperature Elevation	+60°C, 54KPa	GB2423.26, IEC60068-2-41
Low Temperature Elevation	-25°C, 54KPa	GB2423.25, IEC60068-2-40
Constant Humid and Hot	+40°C, 95%RH	GB2423.3, IEC60068-2-78
Random Vibration	5 - 10Hz, ASD 0.3 - 10g ² /Hz, three directions of X, Y, Z axis	GB/T 4798.2-2008, IEC60721-3-2
Sinusoidal Vibration Response	10 - 150Hz, 1g, three directions of X, Y, Z axis	GB/T 11287-2000, IEC60255-21-1
Sinusoidal Vibration Endurance Test		
Sinusoidal Impulse Response	15g, pulse duration 11ms, three times in each direction of X, Y, Z axis	GB/T 114537-1993, IEC60255-21-2
Sinusoidal Impact Endurance Test		
Packaging Drop	1m, one corner, three edges and six sides	GB2423.8, IEC68-2-32

Mechanical Specifications	
Case Material	Metal (AL5052, SUS304)
Dimensions	124mm x 121mm x 48mm
Weight	570g (Typ.)
Cooling Method	Free air convection

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Electromagnetic Compatibility (EMC)

EMC	Item	Standard	Range	Judge		
Emissions	CE (Input port)	CISPR32 EN55032	150K - 30MHz	CLASS B		
	CE (Output port)	CISPR32 EN55032	150K - 30MHz	CLASS A		
	RE	CISPR32 EN55032	30MHz - 2GHz	CLASS B		
	Harmonic current	IEC/EN61000-3-2		CLASS A and CLASS D		
	Voltage flicker	EN61000-3-3				
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 8KV$ /Air $\pm 15KV$	perf. Criteria A		
	RS	IEC/EN61000-4-3	20V/m			
	EFT (Input port)	IEC/EN61000-4-4	$\pm 4KV$			
	EFT (Output port)	IEC/EN61000-4-4	$\pm 2kv$			
	Surge (Input port)	IEC/EN61000-4-5	L to N $\pm 3KV$ /L or N to PE $\pm 6KV$			
	Surge (Output port)	IEC/EN61000-4-5	line to line $\pm 1KV$ /line to ground $\pm 2KV$			
	MS	IEC/EN61000-4-8	30A/m			
	AC power port harmonics	IEC61000-4-13	CLASS 3			
	Harmonic and network signal					
	Low frequency immunity					
	CS	IEC/EN61000-4-6	0.15 - 80MHz 20Vr.m.s			
	Voltage dips		IEC/EN61000-4-11		0% of 100V AC, 0V AC, 20ms	perf. Criteria A
					40% of 100V AC, 40V AC, 200ms	perf. Criteria C
					70% of 100V AC, 70V AC, 500ms	perf. Criteria A
0% of 200V AC, 0V AC, 20ms				perf. Criteria A		
40% of 200V AC, 80V AC, 200ms				perf. Criteria A		
70% of 200V AC, 140V AC, 500ms				perf. Criteria A		
Voltage interruption	IEC/EN61000-4-11	0% of 200V AC, 0V AC, 5000ms	perf. Criteria C			

Note: perf. Criteria:

A: The equipment shall continue to operate as intended without operator intervention;

B: After the test, the equipment shall continue to operate as intended without operator intervention;

C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Product Characteristic Curve

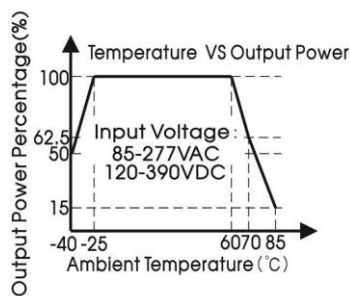


Figure 1

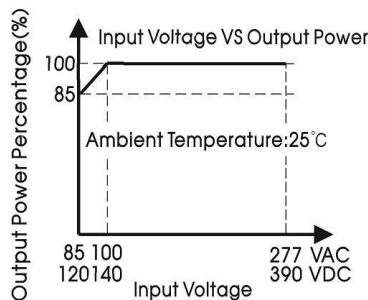


Figure 2

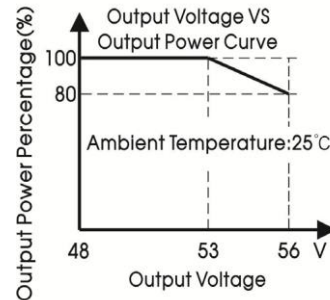


Figure 3

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Output voltage VS Output current curve (Typ.)

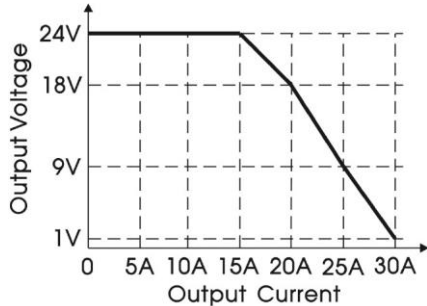


Figure 4

DC OK behavior curve (Typ.)

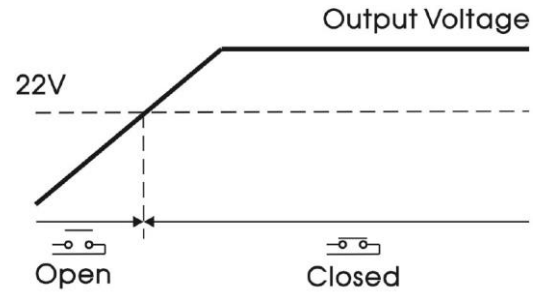


Figure 5

Over-current protection curve (Typ.)

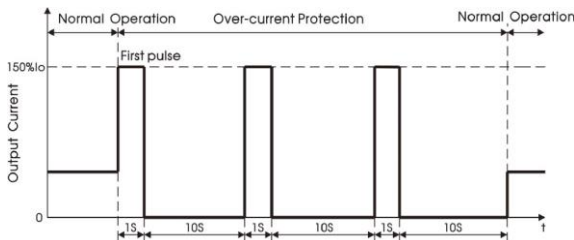


Figure 6

Short circuit protection curve (Typ.)

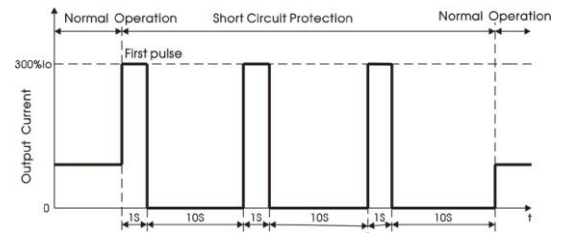


Figure 7

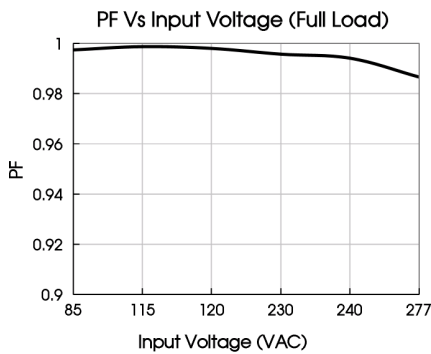


Figure 8

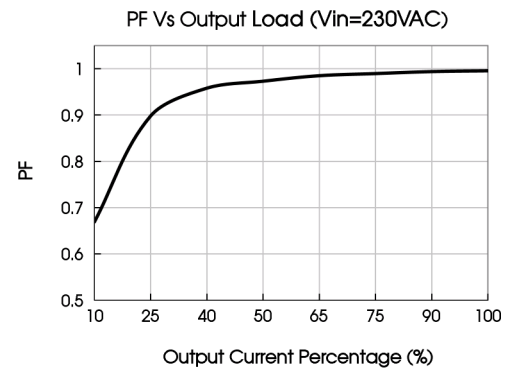
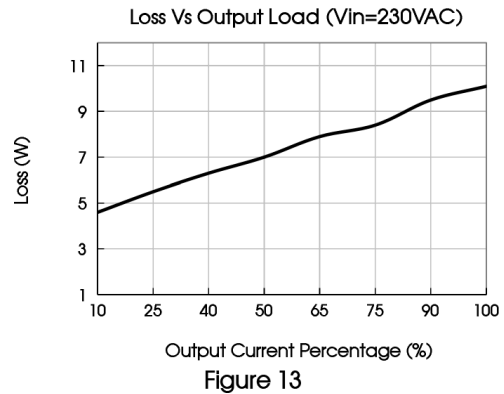
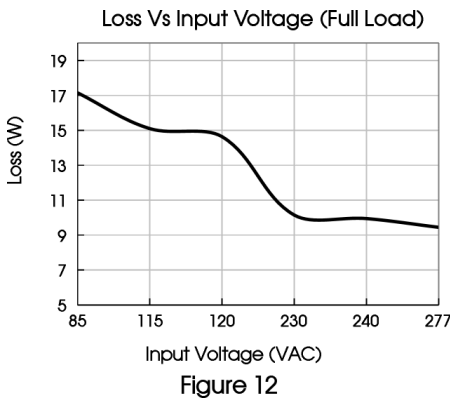
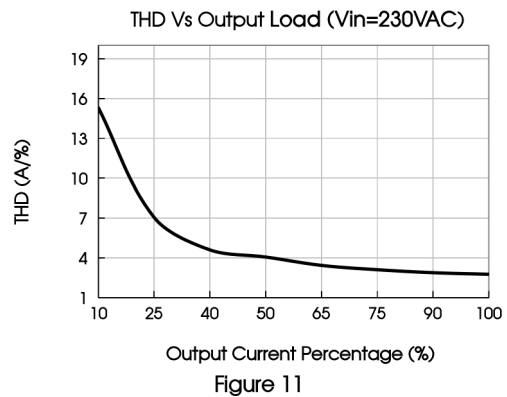
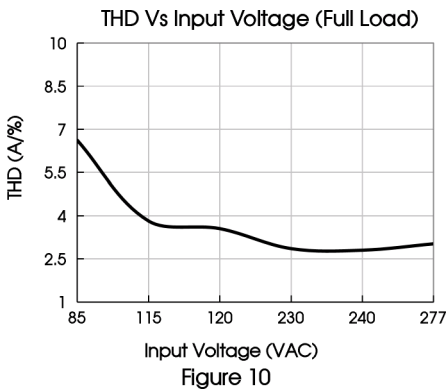


Figure 9



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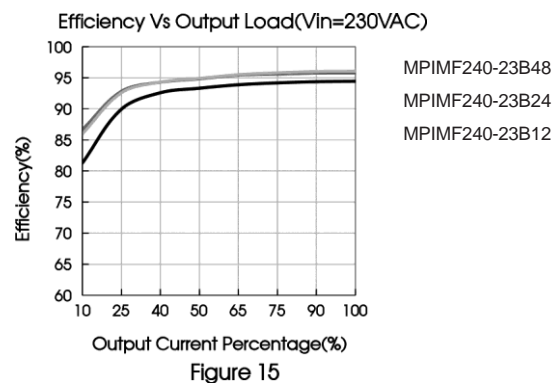
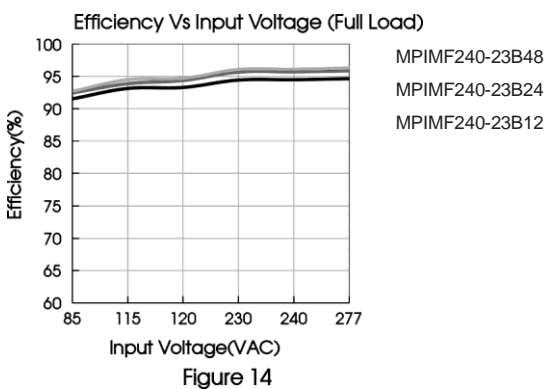


Note: 1. All curves are for 24V output, measured at input 230V AC, 50Hz, output I_o , ambient temperature 25°C, unless otherwise stated;

2. Figure 3 shows that the product will enter the overload state when the rated output current increases to 100%-150% I_o (TYP.), and enter the overcurrent protection when the current > 150% I_o (TYP.), and the output voltage will decrease with the increase of the output current. When the output current increases to a certain value, the product will enter the constant current mode;

3. With an AC input voltage between 85-100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;

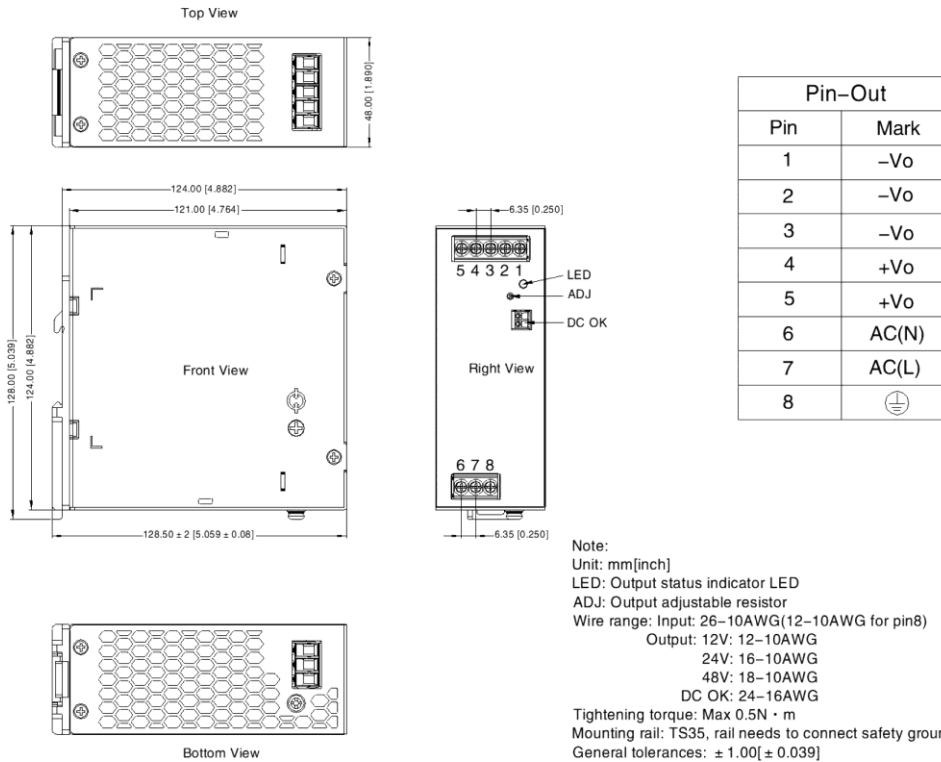
4. This product is suitable for applications using natural air cooling.



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Dimensions and Recommended Layout



WARNING Risk of electrical shock, fire, personal injury or death:

AVERTISSEMENT AVERTISSEMENT Risque de choc électrique, d'incendie, de blessures corporelles ou de décès :

- Do not use the power supply without proper grounding (Protective Earth). Use the terminal on the input block for earth connection and not one of the screws on the housing; N'utilisez pas l'alimentation électrique sans mise à la terre appropriée (Terre protectrice). Utilisez le terminal sur le bloc d'entrée pour la connexion terrestre et non pas une des vis sur le boîtier;
- Turn power off before working on the device, protect against inadvertent re-powering; Éteignez l'alimentation avant de travailler sur l'appareil, protégez-vous contre la réénergisation accidentelle;
- Make sure that the wiring is correct by following all local and national codes; Assurez-vous que le câblage est correct en suivant tous les codes locaux et nationaux;
- Do not modify or repair the unit; Ne modifiez pas ou ne réparez pas l'appareil;
- Do not open the unit as high voltages are present inside; Ne modifiez pas ou ne réparez pas l'appareil;
- Use caution to prevent any foreign objects from entering the housing; Faire preuve de prudence pour empêcher les objets étrangers d'entrer dans le logement;
- Do not use in wet locations or in areas where moisture or condensation can be expected; Faire preuve de prudence pour empêcher les objets étrangers d'entrer dans le logement;
- Do not touch during power-on, and immediately after power-off, hot surfaces may cause burns; Ne touchez pas pendant l'alimentation et, immédiatement après l'alimentation, les surfaces chaudes peuvent causer des brûlures.
- For ambient temperature ≤60°C, use ≥90°C - copper wire only; for ambient temperature >60°C to 85°C, use ≥105°C - copper wire only; use only wires with a minimum dielectric strength of 300V (input) and 60V (output); Température ambiante ≤60°C, utiliser ≥90°C - seulement fils de cuivre; Température ambiante >60°C et 85°C, utiliser ≥105°C - seulement fils de cuivre; Uniquement pour l'utilisation de fils de cuivre d'une résistance d'isolation minimale de 300V (d'entrée) et 60V (de sortie).

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Notes:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
2. The room temperature derating of 5°C/1000m is needed for operating altitude greater than 2000m;
3. The out case needs to be connected to PE (⊕) of system when the terminal equipment in operating;
4. The output voltage can be adjusted by the ADJ, clockwise to increase;
5. WARNING Risk of electrical shock, fire, personal injury or death

Part Number Table

Description	Part Number
AC-DC DIN Rail Mount Power Supply, 1 Phase, 12V, 16A	MPIMF240-23B12
AC-DC DIN Rail Mount Power Supply, 1 Phase, 24V, 10A	MPIMF240-23B24
AC-DC DIN Rail Mount Power Supply, 1 Phase, 48V, 5A	MPIMF240-23B48

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