AC/DC 960W DIN-Rail Power Supply

LITF960-26BxxS Series

MORNSUN®

CE Report EN62368-1 UKCA BS EN62368-1 RoHS 3 years Warranty

FEATURES

- Wide 3x 320-575VAC and 450-820VDC Input voltage range
- Operating ambient temperature range: -40℃ to +70℃
- Active PFC, PF up to 0.95
- Standard DIN-Rail mounting
- High efficiency, high reliability
- DC OK, Supporting parallel (3+1 current sharing)
- Double-sided conformal coating
- Output short circuit, over-current, over-voltage protection, over-temperature protection
- Operating altitude up to 5000m
- Safety according to UL/EN/IEC62368, EN/IEC61000, UL/EN61010, CISPR32/EN55032, UL508
- 3 years warranty

LITF960-26BxxS is one of Mornsun's three-phase Din-Rail switching power supply. It features cost-effective, high efficiency, high reliability and security isolation. It offer excellent EMC performance and meet UL/EN/IEC62368, EN/IEC61000, UL/EN61010, CISPR32/EN55032, UL508 standards and they are widely used in areas of industrial control equipment, factory automation and mechanical and electrical equipment and other industrial control fields.

Selection Guide

Certification	Part No.	Cooling Method	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 3x400VAC (%) Typ.	Max. Capacitive Load (uF)
EN	LITF960-26B24S	Air cooling	960	24V/40A	24-28	95	40000
	LITF960-26B48S			48V/20A	48-56	96	20000

Note：The product picture is for reference only. For details, please refer to the actual product.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	Rated input (Certified voltage)		380	--	480	VAC
	AC input		320	--	575	VAC
	DC input		450	--	820	VDC
Input Voltage Frequency	Rated input (Certified voltage)		50	--	60	Hz
	AC input		47	--	63	
Input Current	Rated input (Certified voltage)		--	--	2	A
	400VAC		--	--	2	
	500VAC		--	--	1.5	
Inrush Current	400VAC	Cold start	--	60	--	
Power Factor	400VAC		0.94	0.95	--	--
	500VAC		0.93	0.94	--	
Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low)		275	--	--	VAC
	Under-voltage protection release (Input voltage rises from low to high)		--	--	305	
Input Fuse	Built-in fuse		6.3A/600V			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range		--	±1	--	%
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	0% - 100% load		--	±1	--	
Minimum Load			0	--	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	24V	--	--	180	mV
		48V	--	--	250	
Temperature Coefficient			--	±0.03	--	%/℃
Hold-up Time	400VAC		--	20	--	ms
	500VAC		--	20	--	
Short Circuit Protection			Constant current mode, continuous, self-recover			
Over-current Protection			⩾120% Io, continue1 to 3 seconds protection, and auto-reset after fault clearance			
Over-voltage Protection	24V		⩽35VDC (Hiccup, self-recover)			
	48V		⩽63VDC (Hiccup, self-recover)			
Over-temperature Protection			Output voltage turn off, self-recover after fault clearance			

Note: *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.

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation*	Input - ⏚	Electric strength test for 1min, leakage current＜10mA	Isolation Test need to remove the screw at the mark position ♲	2000	--	--	VAC
	Input - output	Electric strength test for 1min, leakage current＜5mA		4000	--	--	
	Output - ⏚	Electric strength test for 1min, leakage current＜10mA		500	--	--	
	Output - DC OK	Electric strength test for 1min, leakage current＜1mA		500	--	--	
Insulation Resistance	Input - ⏚	Environment temperature: 25±5℃ Relative humidity: ＜95%, non-condensing Test voltage: 500VDC		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			100	--	--	
Touch Leakage Current		3x 480VAC		--	--	2	mA
Operating Temperature				-40	--	70	℃
Storage Temperature				-40	--	85	
Operating Humidity		Non-condensing		20	--	90	%RH
Storage Humidity				10	--	95	
Switching Frequency				55	--	75	kHz
Power Derating		Operating temperature derating	-40℃ to -30℃	5	--	--	%/℃
			-30℃ to +50℃	0	--	--	
			+50℃ to +70℃	2.5	--	--	
		Input voltage derating	320VAC - 340VAC (Three phase operation)	1	--	--	%/VAC
Safety Standard**				EN/BS EN62368-1(report) safety approved; Design refer to UL/IEC62368-1, UL/EN61010-1, UL508, UL/EN61010-2-201			
Safety Class				CLASS I, ANSI/ISA71.04-2013			
MTBF		MIL-HDBK-217F@25℃		⩾250,000 h			
Warranty				3years			

Pollution Degree		2

Note: 1. * ①Remove the screw at the mark ⏚ when the product is subjected to isolation withstand voltage test; ② The gas discharge tube built into the device effectively protects the power supply against damage by asymmetric disturbance variables (e.g. EN 61000-4-5). Each power supply continuous isolation 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 Isolation Withstand voltage Test description of page 4 for specific operation methods;
2. * Indoor use meets UL 61010 certification standards.

Functional Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Current Sharing Accuracy	When multiple units are connected in parallel, the sub-modules shunt more than 50% of the rated load		-5	--	+5	%
DC OK Signal	Resistive load		30VDC/1A Max.			
LED Signal	Main output status indication	Normal output >90%Vo	Green On			

Environmental Characteristics

Item	Operating Conditions	Standard
Low Temperature Working	-40℃	GB2423.1, IEC60068-2-1
High Temperature Working	+70℃	GB2423.2, IEC60068-2-2
Sinusoidal Vibration	10 - 500Hz, 2G, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
Low Temperature Storage	-40℃	GB2423.1, IEC60068-2-1
High Temperature Storage	+85℃	GB2423.2, IEC60068-2-2
High Temperature Aging	+50℃	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25℃	GB2423.1, IEC60068-2-1
Temperature Shock	-40℃ to +85℃	GB2423.22, IEC60068-2-14
Temperature Cycle	-30℃ to +50℃	GB2423.22, IEC60068-2-14
Hot and Humid	+70℃, 85%RH	GB2423.50, IEC60068-2-67

Mechanical Specifications

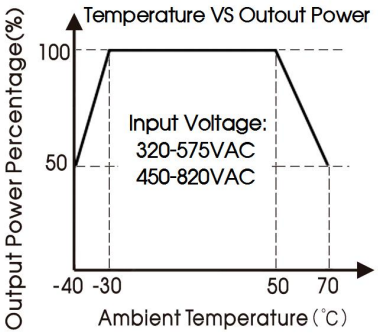
Case Material	Metal (AL5052, SPCC)
Dimensions	110.00mm x 124.00mm x 127.00mm
Weight	1650g (Typ.)
Cooling Method	Free air convection

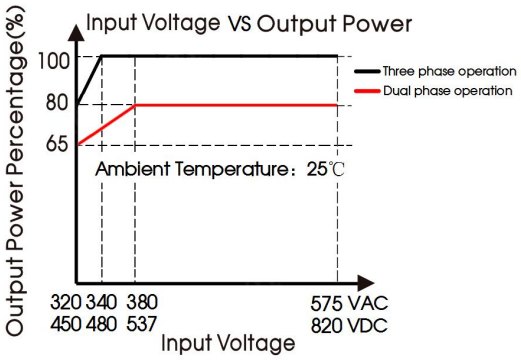
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
	Harmonic current	IEC/EN61000-3-2	CLASS A	
	Voltage flicker	EN61000-3-3		
Immunity	ESD	IEC/EN61000-4-2	Contact ±8KV/Air ±15KV	perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT (Input)	IEC/EN61000-4-4	±4KV	perf. Criteria A
	EFT (Output)	IEC/EN61000-4-4	±2KV	perf. Criteria A
	EFT (DC OK)	IEC/EN61000-4-4	±1KV	perf. Criteria A
	Surge (Input)	IEC/EN61000-4-5	line to line ±3KV/line to PE ±6KV	perf. Criteria A
	Surge (Output)	IEC/EN61000-4-5	Vo+ to Vo- ±500V/Vo+/Vo- to PE ±1KV	perf. Criteria A
	Surge (DC OK)	IEC/EN61000-4-5	DC OK to PE ±1KV	perf. Criteria A
	CS	IEC/EN61000-4-6	20 Vr.m.s	perf. Criteria A
	MS	IEC/EN61000-4-8	30A/m	perf. Criteria A

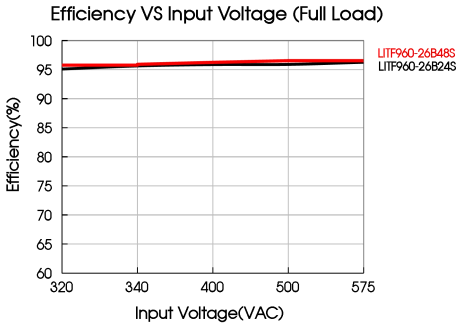
	Voltage variations*	IEC61000-6-2/IEC61000-4-11	70% Un, 25/30 cycle(50/60Hz) 40% Un, 0/12 cycle(50/60Hz) 0% Un, 1 cycle	perf. Criteria B
	Voltage interruptions*	IEC61000-6-2/IEC61000-4-11	0% Un, 250/300 cycle(50/60Hz)	perf. Criteria C
Note: *Un is the maximum input nominal voltage.				

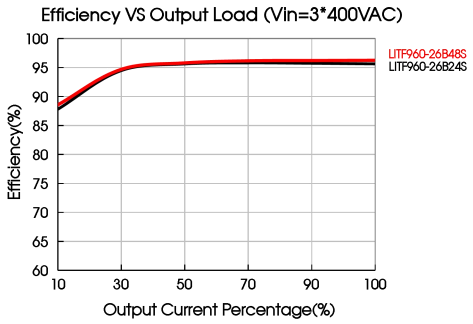
Installation Diagram





Note:
1. With an AC input voltage between 320-340VAC/320-380VAC and a DC input between 450-480VDC/450-537VDC, the output power must be derated as per the temperature derating curves.
2. This product is suitable for applications using air cooling; for applications in closed environment please consult Mornsun FAE.

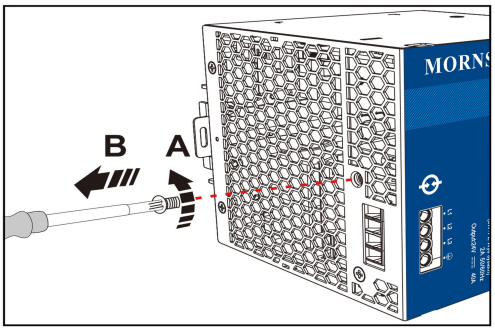




Isolation Withstand Voltage Test description

1. The screw at the side mark of the casing should be removed when the product is tested for isolation withstand voltage test .

2. The built-in gas discharge tube protects the power supply from asymmetric interference variables (e.g. EN 61000-4-5). Each power supply sustained voltage test will cause a very high load on the power supply. Therefore, unnecessary load or damage to the power supply caused by high test voltage should be avoided. Disconnect the device's built-in gas discharge tube if necessary to use a higher test voltage. Reconnect the gas discharge tube after successful completion of the test.



Danger: Using the wrong gas discharge tube bolts can result in an electric shock hazard or power supply damage.To connect the gas discharge tube, use only the gas discharge tube bolts originally installed in the power supply.

Disconnect the gas discharge tube by performing the following steps.

① Disconnect the power supply to the unit ;

② Completely unscrew the bolt to ensure that the gas discharge tube is connected to a safe position. Now that the gas discharge tube has been disconnected, it no longer functions;

③ Perform sustained voltage test on the power supply;

④ After successful voltage test, screw the gas discharge tube back to the power supply completely.

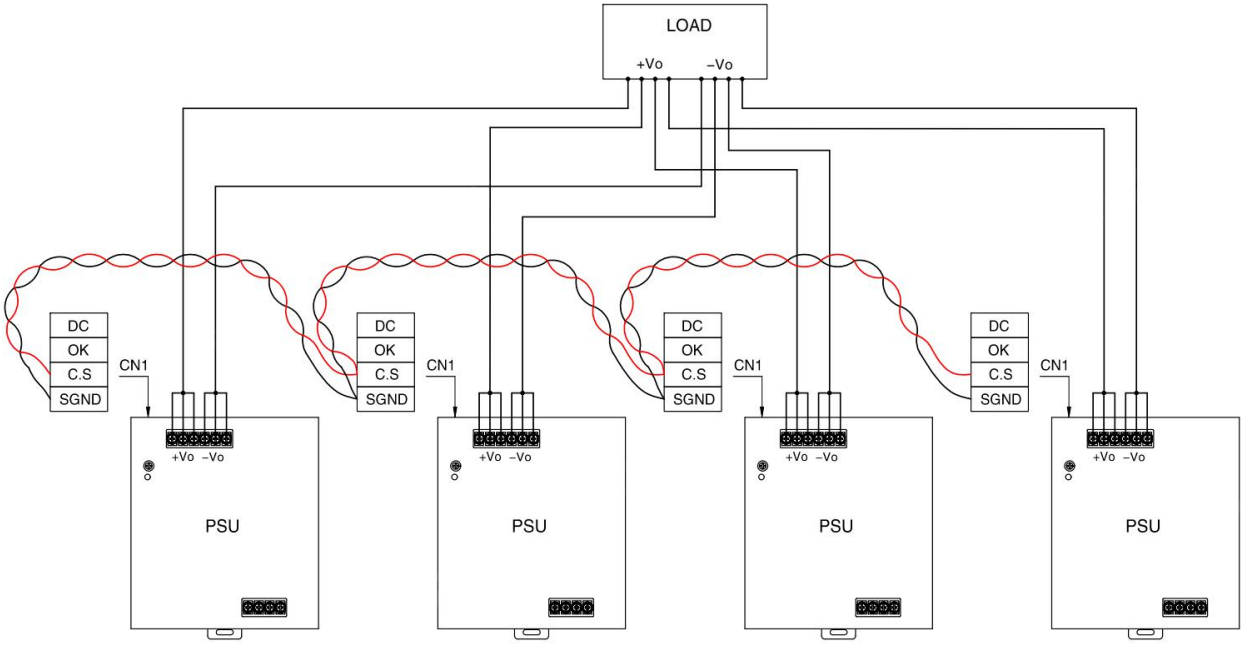
Parallel function description

1. The wiring method of parallel operation is shown in the figure below(PCS parallel connection).

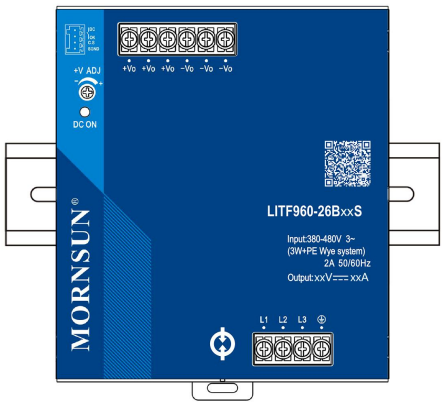
2. The output voltage difference between the parallel units should be as small as possible.

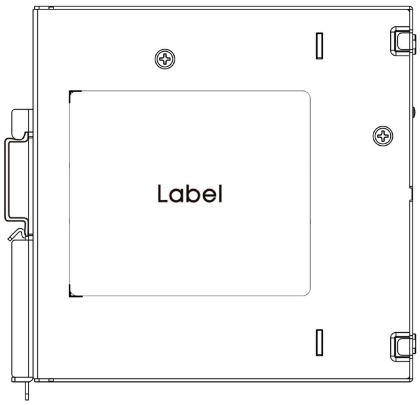
3. Supports 3+1 parallel to increase power and current sharing, please consult our FAE for details.

4. The power supply should be connected to the load with short and thick parallel wires.



Installation Diagram



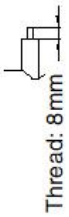


Materials required in the installation		
1	Product	1PCS
2	Phillips screwdriver Slotted screwdriver	1PCS
3	TS35/7.5 or TS35/15	1PCS
4	24–10AWG Wire	/ PCS
5	The content is for reference only. Regarding the actual wire diameter and tightening torque, refer to the dimensional drawing.	

Product

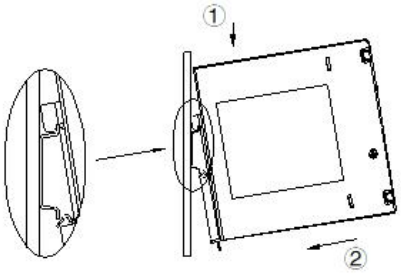
Phillips screwdriver
Slotted screwdriver
Diameter : 3mm

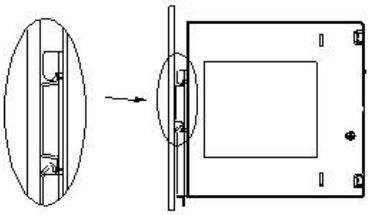
TS35/7.5 or TS35/15



Installation steps ①–②

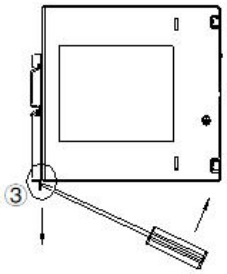
①Clamp the buckle of the product into the TS35 DIN rail.

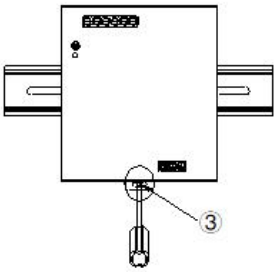




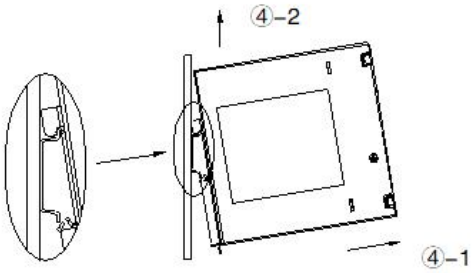
②Push the product vertically towards the TS35 DIN rail until hearing the sound of the buckle snapping into it.

Disassembly Steps ③–④



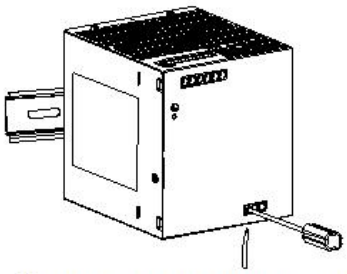


③After inserting the slotted screwdriver into the square groove at the bottom of the buckle, push the slider of the buckle downward in the direction shown in the figure.

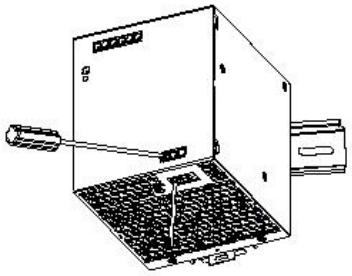


④Hold the bottom of the product and push it outwards while pushing down the slider, then lift the product up to take the product out of the DIN rail.

Wiring / Unwiring Steps ⑤–⑥



⑤Turn the Phillips screwdriver to the left to loosen the terminal screws, insert the head of the wire into the bottom of the terminal, and then turn the screwdriver to the right to tighten the terminal screws

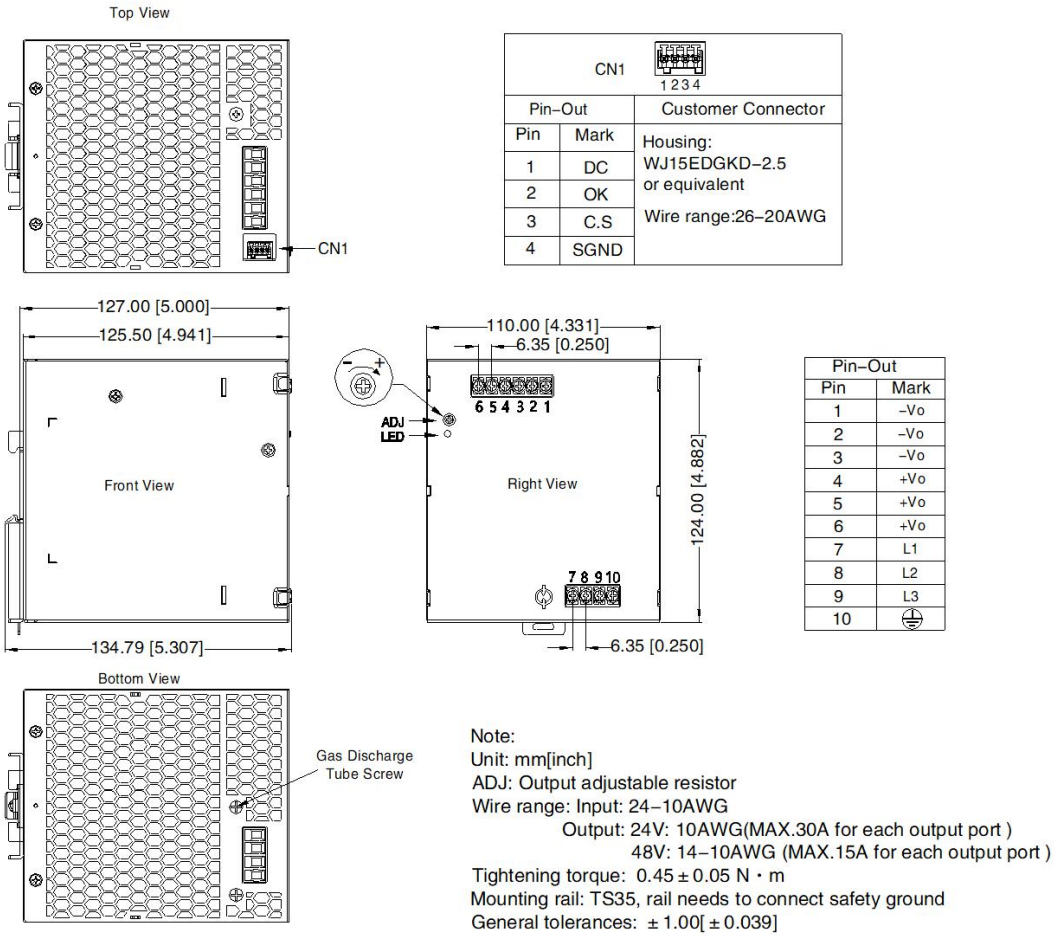


⑥Turn the Phillips screwdriver to the left to loosen the terminal screw and pull the wire out of the bottom of the terminal

Note: Keep the following installation clearances: 20mm on top, 20mm on the bottom, 5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



CN1 (1 2 3 4)	
Pin-Out	Customer Connector
Pin / Mark	Housing: WJ15EDGKD-2.5 or equivalent Wire range:26-20AWG
1 / DC	
2 / OK	
3 / C.S	
4 / SGND	

Pin-Out	
Pin	Mark
1	-Vo
2	-Vo
3	-Vo
4	+Vo
5	+Vo
6	+Vo
7	L1
8	L2
9	L3
10	⏚

Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Wire range: Input: 24-10AWG
Output: 24V: 10AWG(MAX.30A for each output port)
48V: 14-10AWG (MAX.15A for each output port)
Tightening torque: 0.45 ± 0.05 N・m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

WARNING Risk of electrical shock, fire, personal injury or death:
AVERTISSEMENT AVERTISSEMENT Risque de choc électrique, d'incendie, de blessures corporelles ou de décès :

1. 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;
2. 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;
3. 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;
4. Do not modify or repair the unit;
   Ne modifiez pas ou ne réparez pas l'appareil;
5. Do not open the unit as high voltages are present inside;
   Ne modifiez pas ou ne réparez pas l'appareil;
6. 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;
7. 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;
8. 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.
9. Use copper conductors only;
   N'utiliser que des conducteurs en cuivre;
10. OPEN EQUIPMENT: Adequate protection against contact with live parts and ingress of dust and water must be ensured through installation in a suitable enclosure(e.g. control cabinet, control box console or similar).

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com, Packaging bag number: 58220640;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. The room temperature derating of 3.5℃/1000m is needed for operating altitude greater than 2000m;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. The out case needs to be connected to the earth (⏚)of system when the terminal equipment in operating;
9. The output voltage can be adjusted by the ADJ, clockwise to increase;
10. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
11. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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