# ADTF480-xxS Series

## DESCRIPTIONS

AC/DC 480W DIN-Rail Power Supply

RoHS

3 Years Warranty

CE Report EN62368-1

UKCA Report BS EN 62368-1

## FEATURES

- Universal 3x320-550VAC or 450-800VDC Input voltage three-phase input (two or three phase are available)
- Input withstand 3x600VAC/5s
- Active PFC, PF up to 0.95
- Operating ambient temperature range: -40℃ to +70℃ (50℃ full load)
- Standard DIN-Rail mounting
- High efficiency, high reliability
- LED indicator for output status
- 150% peak power lasts for 3s
- Output short circuit, over-current, over-voltage, over-temperature protection
- DC OK function
- Double-sided conformal coating
- Operating altitude up to 5000m
- OVC III, 2000m altitude (design refer to EN61010)
- Design refer to UL508, UL/IEC62368
- 3 years warranty

## APPLICATIONS

- Industrial control
- Electromechanical equipment
- Automation equipment

## Selection Guide

| Certification | Part No. | Output Power (W) | Nominal Output Voltage and Current (Vo/Io) | Output Voltage Adjustable Range ADJ (V)* | Efficiency at 400VAC (%) Typ. | Max. Capacitive Load (μF) |
|---|---|---|---|---|---|---|
| EN/BS EN | ADTF480-24S | 480 | 24V/20A | 24-28 | 94 | 20000 |
| | ADTF480-48S | | 48V/10A | 48-55 | 95 | 10000 |

Note: 1.*The actual adjustment range may extend outside the values stated, care should be exercised to ensure that the output voltage and power levels remain within the published maximum values.

2.*The product picture is for reference only, for details, please refer to the actual product.

## Specifications

| characteristics | Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Input Specifications | Input Voltage Range | Rated input (Certified voltage) | | 380 | -- | 480 | VAC |
| | | AC input | | 320 | -- | 550 | |
| | | DC input | | 450 | -- | 800 | VDC |
| | Input Voltage Frequency | | | 47 | -- | 63 | Hz |
| | Input Current | 400VAC | | -- | -- | 0.85 | A |
| | | 500VAC | | -- | -- | 0.7 | |
| | Inrush Current | 400VAC | Cold start | -- | 50 | -- | |
| | Power Factor | 400VAC | Normal temperature, rated load | 0.93 | 0.95 | -- | -- |
| | | 500VAC | | 0.92 | 0.95 | -- | |
| | Start-up Delay Time | | | -- | 0.8 | -- | s |
| | Input Temporary Over-voltage | Rated load output, 600VAC input | | 5s/time, interval 10s, product without damaging | | | |
| | Hot Plug | | | Unavailable | | | |
| Output Specifications | Output Voltage Accuracy | Full load range | | -- | ±1 | -- | % |
| | Line Regulation | Rated load | | -- | ±0.5 | -- | |
| | Load Regulation | 0% - 100% load | | -- | ±1 | -- | |
| | Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | | -- | -- | 150 | mV |
| | Temperature Coefficient | 0℃ to +50℃ | | -- | ±0.03 | -- | %/℃ |
| | Minimum Load | | | 0 | -- | -- | % |
| | Dynamic Minimum Load | | | 10 | -- | -- | % |
| | Stand-by Power Consumption | 400VAC | | -- | 3.5 | -- | W |
| | Hold-up Time | 400VAC/500VAC | | -- | 20 | -- | ms |
| | 150% peak load power | | | Continuous work 3s | | | |
| | Short Circuit Protection | | | Enter hiccup mode after constant current operation for 3s (typ.), continuous, self-recovery | | | |
| | Over-current Protection | | | ≥130% Io, enter hiccup mode after constant current operation for 3s (typ.), self-recovery | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Over-voltage Protection | | 24V | ≤33VDC | Hiccup, self-recovery | | |
| | | | 48V | ≤63VDC | | | |
| | Over-temperature Protection | | Over-temperature Protection start | -- | -- | 80 | ℃ |
| | | | Over-temperature Protection release | 55 | -- | -- | |
| General Specifications | Isolation | Input - output | Electric strength test for 1min., leakage current < 5mA | 4000 | -- | -- | VAC |
| | | Input - ⏚ | | 2000 | -- | -- | |
| | | Output - ⏚ | | 500 | -- | -- | |
| | | Output - DC OK | Electric strength test for 1min., leakage current < 1mA | 500 | -- | -- | |
| | Insulation Resistance | Input - output | Test voltage: 500VDC | 100 | -- | -- | MΩ |
| | | Input - ⏚ | | | | | |
| | | Output - ⏚ | | | | | |
| | | Output - DC OK | | | | | |
| | Operating Temperature | | | -40 | -- | 70 | ℃ |
| | Storage Temperature | | | -40 | -- | 85 | |
| | Operating Humidity | | Non-condensing | -- | -- | 95 | %RH |
| | Storage Humidity | | | -- | -- | 95 | |
| | Output Power Derating | | Operating temperature derating: -40℃ to -30℃ | 5.0 | -- | -- | %/℃ |
| | | | Operating temperature derating: +50℃ to +70℃ | 2.5 | -- | -- | |
| | | | Input voltage derating: 320 - 340VAC, Three-phase input | 1.0 | -- | -- | %/VAC |
| | | | Input voltage derating: 320 - 380VAC, Two-phase input (80%Io) | 0.25 | -- | -- | |
| | Leakage Current | | 480VAC | < 0.5mA RMS | | | |
| | Safety Standard | | | / | | | |
| | Safety Class | | | CLASS I, ANSI/ISA71.04-2013 | | | |
| | MTBF | | MIL-HDBK-217F@25℃ | ≥300,000 h | | | |
| Environmental Characteristics | Item | | Operating Conditions | Standard | | | |
| | Sinusoidal Vibration | | 10 - 500Hz, 2g, three directions of X, Y, Z axis | GB2423.10, IEC60068-2-6 | | | |
| Mechanical Specifications | Case Material | | Metal (AL5052, SPCC) | | | | |
| | Dimensions | | 80.00 x 124.00 x 127.00mm | | | | |
| | Weight | | 1080g (Typ.) | | | | |
| | Cooling Method | | Free air convection | | | | |

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;

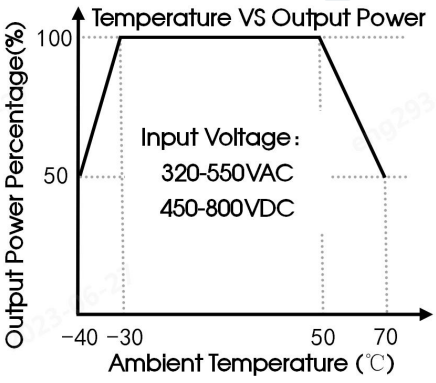
2.*Full input voltage at room temperature, <5%Io range, 300mv (Max.).

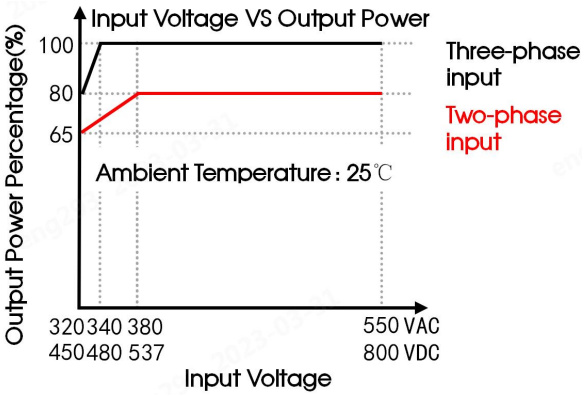
## Electromagnetic Compatibility (EMC)

| | | | | | |
|---|---|---|---|---|---|
| Electromagnetic Compatibility (EMC) | Emissions | CE | CISPR32/EN55032 | CLASS B | |
| | | RE | CISPR32/EN55032 | CLASS B | |
| | | Harmonic current | IEC/EN 61000-3-2 | CLASS A | |
| | | Voltage flicker | IEC/EN 61000-3-3 | Fulfilled | |
| | Immunity | ESD | IEC/EN 61000-4-2 | Contact ±8KV/Air ±15KV | Perf. Criteria A |
| | | RS | IEC/EN 61000-4-3 | 10V/m | Perf. Criteria A |
| | | EFT (input port) | IEC/EN 61000-4-4 | ±4KV | Perf. Criteria A |
| | | EFT (output port) | IEC/EN 61000-4-4 | ±2KV | Perf. Criteria A |
| | | EFT (DC OK port) | IEC/EN 61000-4-4 | ±1KV | Perf. Criteria A |
| | | Surge (input port) | IEC/EN 61000-4-5 | Line to line ±2KV/line to PE ±4KV | Perf. Criteria A |
| | | Surge (output port) | IEC/EN 61000-4-5 | Vo+ to Vo- ±500V; Vo+/Vo- to PE ±1KV | Perf. Criteria A |
| | | Surge (DC OK port) | IEC/EN 61000-4-5 | DC OK to PE ±1KV | Perf. Criteria A |
| | | CS | IEC/EN 61000-4-6 | 10Vr.m.s | Perf. Criteria A |
| | | PFMF | IEC/EN 61000-4-8 | 30A/m | Perf. Criteria A |
| | | Voltage variations* | IEC61000-6-2/IEC61000-4-11 | 70% $U_n$ , 25/30 cycle(50/60Hz);<br>40% $U_n$ ,10/12 cycle(50/60Hz);<br>0% $U_n$ ,1 cycle | Perf. Criteria B |
| | | Short interruptions* | IEC61000-6-2/IEC61000-4-11 | 0% $U_n$ , 250/300 cycle(50/60Hz) | Perf. Criteria C |

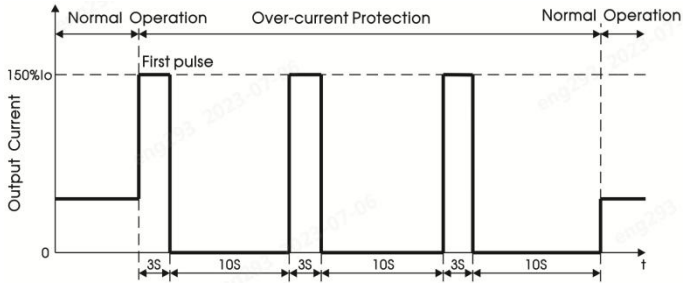
Note: *Both the two-phase and three-phase systems meet the requirements. The derating of the two-phase system must reach 80%, $U_n$ Maximum input nominal voltage.

## Characteristic Curve

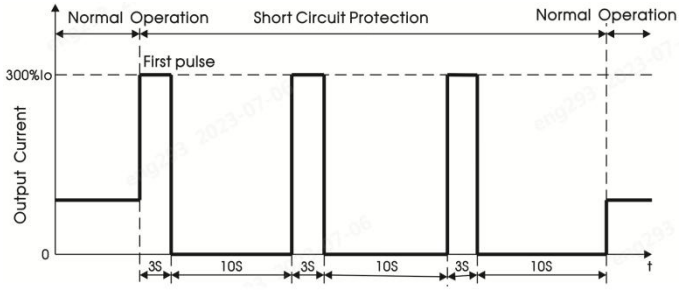


Over-current protection curve (Typ.)

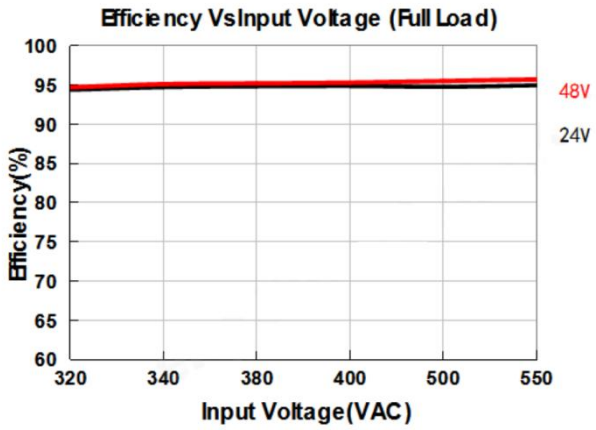


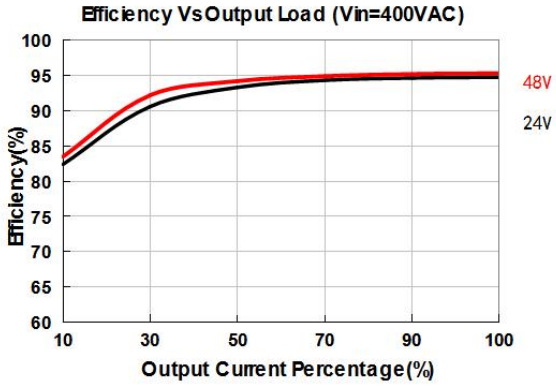

Short circuit protection curve (Typ.)



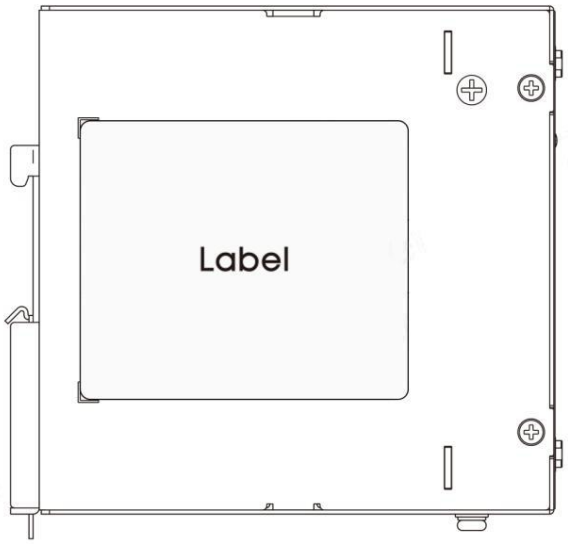

Note: 1. With an AC input voltage between 320 - 380VAC/450 - 537VDC the output power must be derated as per the temperature derating curves;

2. This product is suitable for applications using natural air cooling;

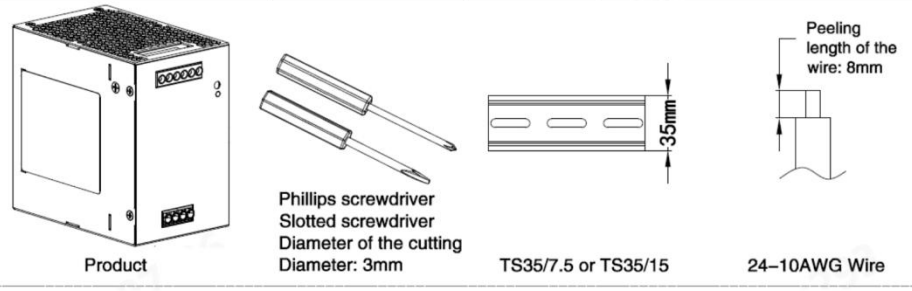


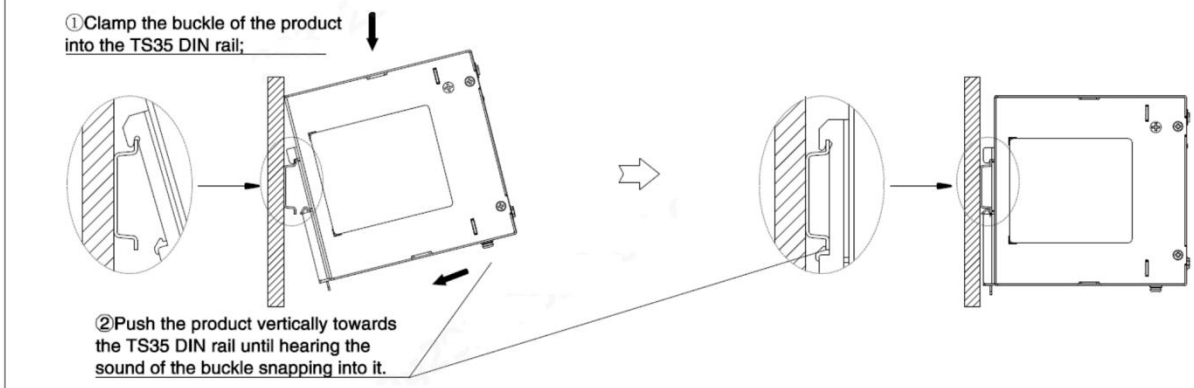

## Installation Diagram



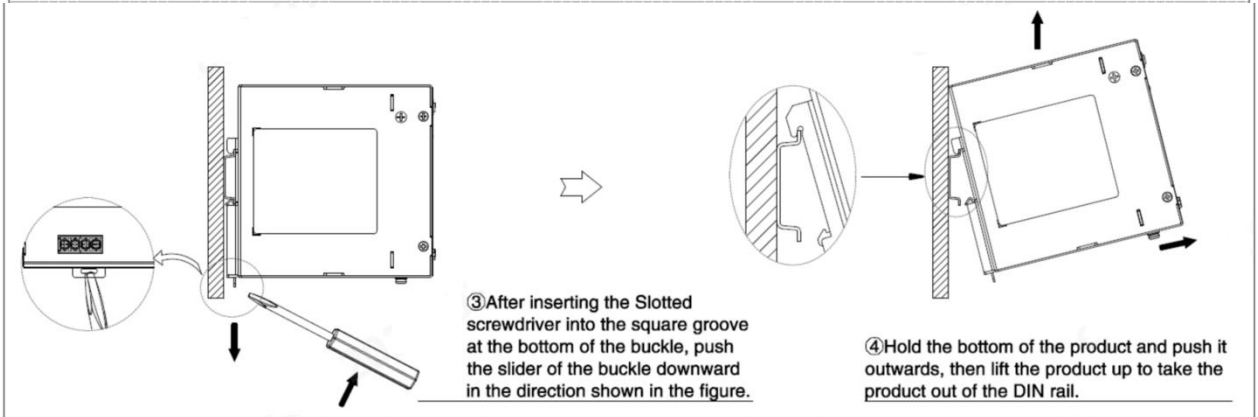
| Materials required in the installation | | |
|---|---|---|
| 1 | Product | 1 PCS |
| 2 | Phillips screwdriver<br>Slotted screwdriver | 1 PCS |
| 3 | TS35/7.5 or TS35/15 | 1 PCS |
| 4 | 24–10AWG Wire | / PCS |
| | The content is for reference only. Regarding the actual wire diameter and tightening torque,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



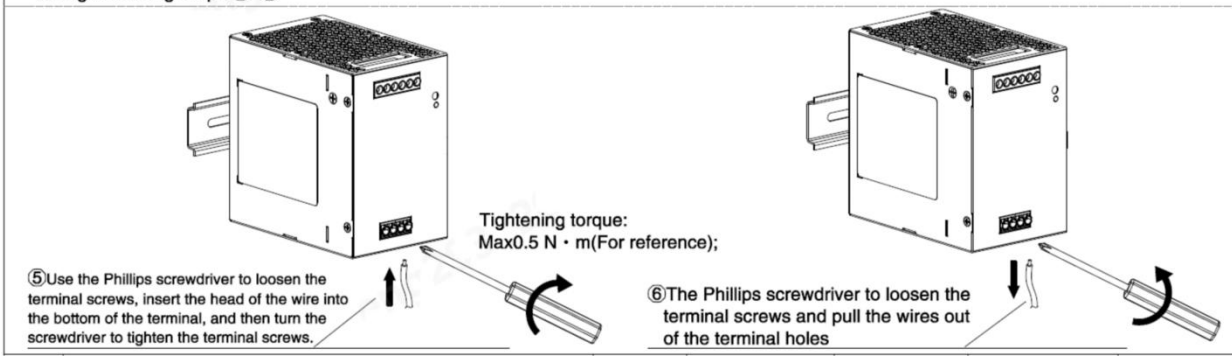

Installation Steps ①–②




Disassembly Steps ③–④

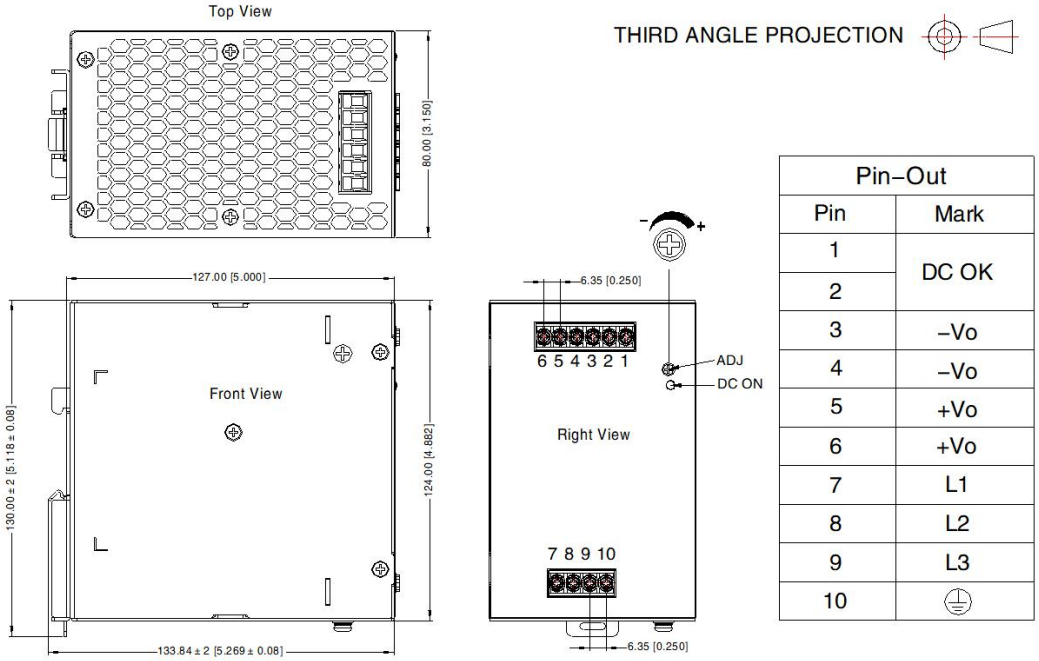



Wiring / Unwiring Steps ⑤–⑥



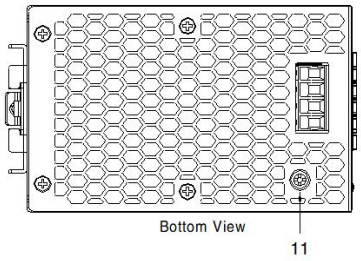

Note: Keep the following installation clearances: 20mm on top, 20mm on the bottom, 5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power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

## Dimensions and Recommended Layout




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

10, 11 any position must be connected to the earth( ⏚ )




Note:
Unit: mm[inch]
DC ON: Output status indicator LED
ADJ: Output adjustable resistor
Wire range: Input: 26–10AWG(12–10AWG for pin10)
Output: 24V：10AWG
48V：14–10AWG
Tightening torque: Max 0.5N · 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. For ambient temperature ≤60℃, use ≥90℃ - copper wire only; for ambient temperature >60℃ to 85℃, use ≥105℃ - copper wire only; use only wires with a minimum dielectric strength of 300V (input) and 60V (output);
   Température ambiante ≤60℃, utiliser ≥90℃ - seulement fils de cuivre; Température ambiante >60℃ et 85℃, utiliser ≥105℃ - seulement fils de cuivre; Uniquement pour l'ulilisation de fils de cuivre d'une résisitance d'isolation minimale de 300V (d'entrée) et 60V (de sortie).

Note:

1. 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;
2. The room temperature derating of 3.5℃/1000m is needed for operating altitude greater than 2000m;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. 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;
5. We can provide product customization service;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. The out case needs to be connected to the earth ( ⏚ )of system when the terminal equipment in operating;
8. The output voltage can be adjusted by the ADJ, clockwise to decrease;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
10. 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.