



EN62368-1



BS EN 62368-1



## FEATURES

- Universal 85- 264VAC or 120- 370VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40℃ to +70℃
- The efficiency is up to 94.5%
- High I/O Isolation test voltage up to 3000VAC
- DC OK function
- Active PFC, PF > 0.99
- Low ripple & noise
- Output short circuit, over-current, over-voltage, over-temperature protection, input undervoltage protection
- DIN rail TS-35/7.5 or 15 mountable
- Ultra slim design with 48mm width
- Withstand 305VAC input voltage 5S
- Safety according to IEC/UL62368, EN61558

LIF480-10BxxR2 is Mornsun AC-DC converter series featuring a cost-effective, energy efficient green power supply solution for standard DIN-rail mounting. The products offer a high level of stability and immunity to noise for industrial control equipment, machinery, and other industrial equipment in a variety of harsh environments. These light weight AC-DC converters have an extremely compact design and the standard rail installation for space saving. With good EMC performance, compliant with international IEC/EN/UL/BS EN 62368, UL61010, IS13252 (Part1), EN61558 standards for EMC and safety.

## Selection Guide

| Certification | Part No.*      | Output Power (W)* | Nominal Output Voltage and Current (Vo/Io) | Output Voltage Adjustable Range(V) | Efficiency at 230VAC (%) Typ. | Max. Capacitive Load (μF) |
|---------------|----------------|-------------------|--------------------------------------------|------------------------------------|-------------------------------|---------------------------|
| EN/BIS        | LIF480-10B24R2 | 480               | 24V/20A                                    | 24-28                              | 94.5                          | 20000                     |
|               | LIF480-10B48R2 |                   | 48V/10A                                    | 48-55                              |                               | 10000                     |

Note: 1. \*Use suffix "QQ" for double-faced conformal coating;

2. \*Under any conditions, the total power of the product should not exceed the 480W rated power, and the output current cannot exceed the rated output current.

## Input Specifications

| Item                           | Operating Conditions                                      |            | Min.        | Typ. | Max. | Unit |
|--------------------------------|-----------------------------------------------------------|------------|-------------|------|------|------|
| Input Voltage Range            | Rated input (Certified voltage)                           |            | 100         | --   | 240  | VAC  |
|                                | AC input                                                  |            | 85          | --   | 264  |      |
|                                | DC input                                                  |            | 120         | --   | 370  | VDC  |
| Input Voltage Frequency        |                                                           |            | 47          | --   | 63   | Hz   |
| Input Current                  | 115VAC                                                    |            | --          | --   | 5.5  | A    |
|                                | 230VAC                                                    |            | --          | --   | 2.5  |      |
| Inrush Current                 | 115VAC                                                    | Cold start | --          | --   | 35   |      |
|                                | 230VAC                                                    |            | --          | --   | 35   |      |
| Power Factor                   | 115VAC                                                    |            | 0.99        | --   | --   | --   |
|                                | 230VAC                                                    |            | 0.99        | --   | --   |      |
| Leakage Current                | 240VAC                                                    |            | <0.8mA      |      |      |      |
| Hot Plug                       |                                                           |            | Unavailable |      |      |      |
| Input Under-voltage Protection | Protection start (Input voltage drops from high to low)   |            | --          | 60   | --   | VAC  |
|                                | Protection release (Input voltage rises from low to high) |            | --          | 75   | --   |      |

## Output Specifications

| Item                         | Operating Conditions                                 |                                     | Min.                                                                                   | Typ.  | Max. | Unit |
|------------------------------|------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------|-------|------|------|
| Output Voltage Accuracy      | Full load range                                      |                                     | --                                                                                     | ±1.0  | --   | %    |
| Line Regulation              | Rated load                                           |                                     | --                                                                                     | ±0.5  | --   |      |
| Load Regulation              | 0% - 100% load                                       |                                     | --                                                                                     | ±1.0  | --   |      |
| Ripple & Noise*              | 20MHz bandwidth<br>(peak-to-peak value)              | 24V                                 | --                                                                                     | --    | 50   | mV   |
|                              |                                                      | 48V                                 | --                                                                                     | --    | 70   |      |
| Temperature Coefficient      |                                                      |                                     | --                                                                                     | ±0.03 | --   | %/°C |
| Minimum Load                 |                                                      |                                     | 0                                                                                      | --    | --   | %    |
| Hold-up Time                 |                                                      |                                     | 16                                                                                     | 22    | --   | ms   |
| DC OK Signal                 |                                                      |                                     | 30VDC/1A Max.                                                                          |       |      |      |
| Short Circuit Protection     | Recovery time 10s after the short circuit disappear. |                                     | Hiccup mode, constant current works 1s, turn off 10s, continuous, self-recovery        |       |      |      |
| Over-current Protection      | 230VAC, rated load                                   |                                     | 150% Io (Typ.), the output turned off after working continuously for 1s, self-recovery |       |      |      |
| Over-voltage Protection      | 24V                                                  |                                     | 29-35V (Output voltage hiccup)                                                         |       |      |      |
|                              | 48V                                                  |                                     | 56-60V (Output voltage hiccup)                                                         |       |      |      |
| Over-temperature Protection* | 230VAC, 100% Io                                      | Over-temperature protection start   | --                                                                                     | --    | 90   | °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: Output voltage turn off, self-recovery after the temperature drops.

## General Specifications

| Item                  |                | Operating Conditions                                    |               | Min.                                                                                                                                                  | Typ. | Max. | Unit  |
|-----------------------|----------------|---------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-------|
| Isolation Test        | Input - ⊕      | Electric strength test for 1min., leakage current <10mA |               | 2000                                                                                                                                                  | --   | --   | VAC   |
|                       | Input - output |                                                         |               | 3000                                                                                                                                                  | --   | --   |       |
|                       | Output - ⊕     |                                                         |               | 500                                                                                                                                                   | --   | --   |       |
| Insulation Resistance | Input - ⊕      | At 500VDC                                               |               | 100                                                                                                                                                   | --   | --   | MΩ    |
|                       | Input - output |                                                         |               | 100                                                                                                                                                   | --   | --   |       |
|                       | Output - ⊕     |                                                         |               | 100                                                                                                                                                   | --   | --   |       |
| Operating Temperature |                |                                                         |               | -40                                                                                                                                                   | --   | +70  | ℃     |
| Storage Temperature   |                |                                                         |               | -40                                                                                                                                                   | --   | +85  |       |
| Storage Humidity      |                | Non-condensing                                          |               | 10                                                                                                                                                    | --   | 95   | %RH   |
| Operating Humidity    |                |                                                         |               | 20                                                                                                                                                    | --   | 90   |       |
| Switching Frequency   |                |                                                         |               | --                                                                                                                                                    | --   | --   | kHz   |
| Power Derating        |                | Operating temperature derating                          | +50℃ to +70℃  | 2.5                                                                                                                                                   | --   | --   | %/℃   |
|                       |                | Input voltage derating                                  | 85VAC -100VAC | 1.0                                                                                                                                                   | --   | --   | %/VAC |
| Safety Standard       |                |                                                         |               | IS13252 (Part1) safety approved & EN62368-1, BS EN 62368-1 (Report); Design refer to UL61010-1, UL61010-2-201, IEC/UL62368-1, EN61558-1, EN61558-2-16 |      |      |       |
| Safety Class          |                |                                                         |               | CLASS I                                                                                                                                               |      |      |       |
| MTBF                  |                | MIL-HDBK-217F@25℃                                       |               | >300,000 h                                                                                                                                            |      |      |       |

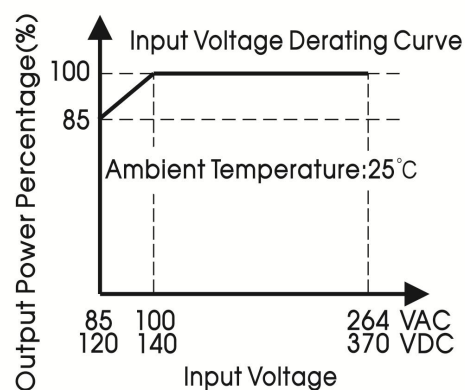
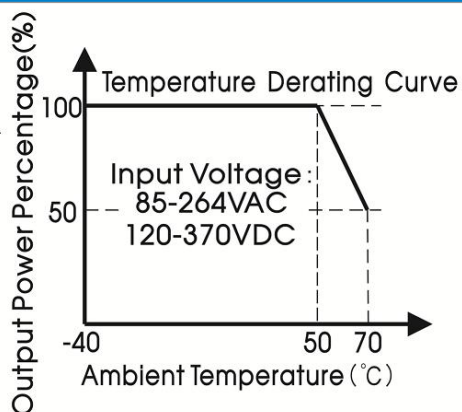
## Mechanical Specifications

|                |                                          |
|----------------|------------------------------------------|
| Case Material  | Metal (AL1100, SPCC) and Plastic (PC940) |
| Dimensions     | 131.50 x 48.00 x 125.00 mm               |
| Weight         | 980g (Typ.)                              |
| Cooling Method | Free air convection                      |

## Electromagnetic Compatibility (EMC)

|           |                                                                   |                  |                                       |                  |
|-----------|-------------------------------------------------------------------|------------------|---------------------------------------|------------------|
| Emissions | CE                                                                | CISPR32/EN55032  | CLASS B                               |                  |
|           | RE                                                                | CISPR32/EN55032  | CLASS B                               |                  |
|           | Harmonic current                                                  | IEC/EN 61000-3-2 | CLASS A and CLASS D                   |                  |
| Immunity  | ESD                                                               | IEC/EN 61000-4-2 | Contact ±8KV/Air ±15KV                | perf. CriteriaA  |
|           | RS                                                                | IEC/EN 61000-4-3 | 10V/m                                 | perf. Criteria A |
|           | EFT                                                               | IEC/EN 61000-4-4 | ±4KV                                  | perf. Criteria A |
|           | Surge                                                             | IEC/EN 61000-4-5 | line to line ±2KV/line to ground ±4KV | perf. Criteria A |
|           | CS                                                                | IEC/EN61000-4-6  | 10 Vr.m.s                             | perf. Criteria A |
|           | Voltage dips, short interruptions and voltage variations immunity | IEC/EN61000-4-11 | 0%, 70%                               | perf. Criteria A |

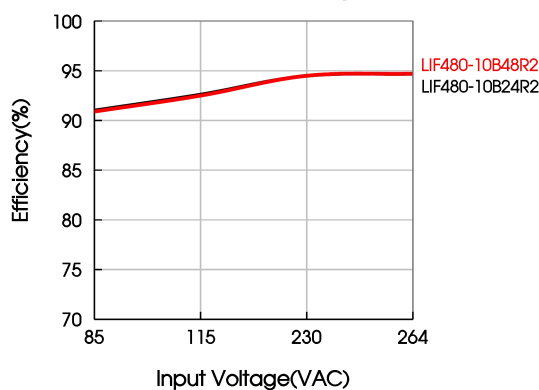
## Product Characteristic Curve



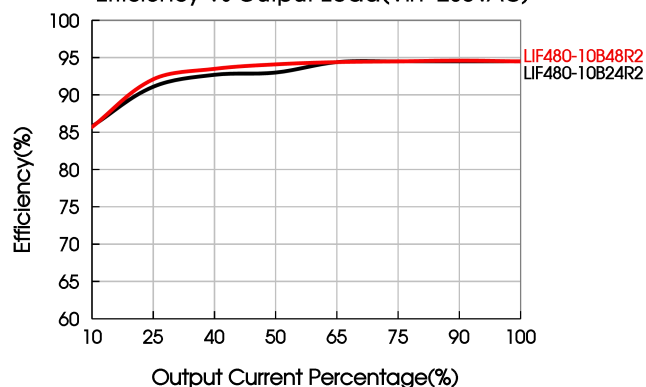
Note: 1. With an AC input voltage between 85 -100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;

2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.

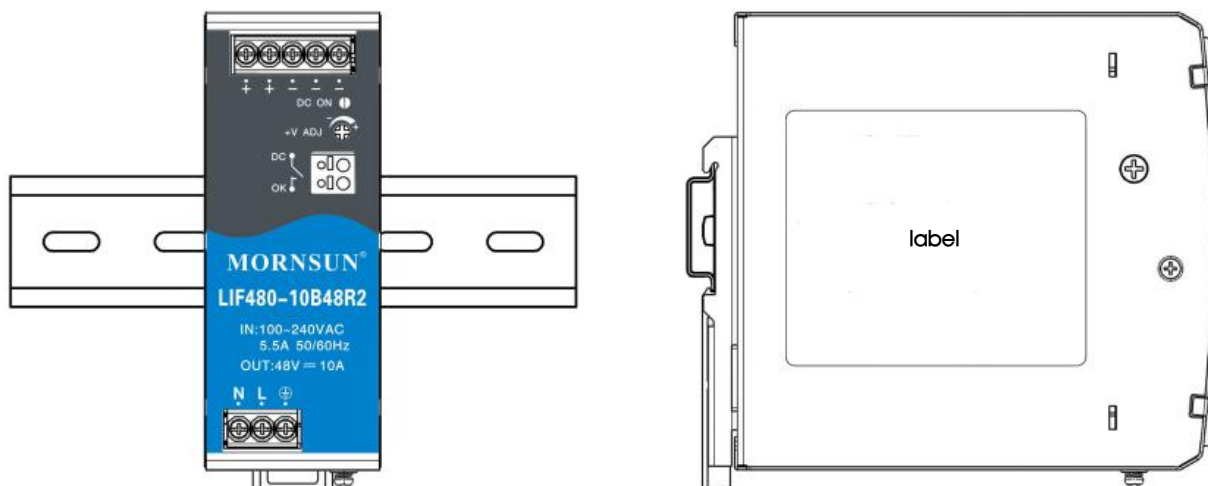
Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=230VAC)



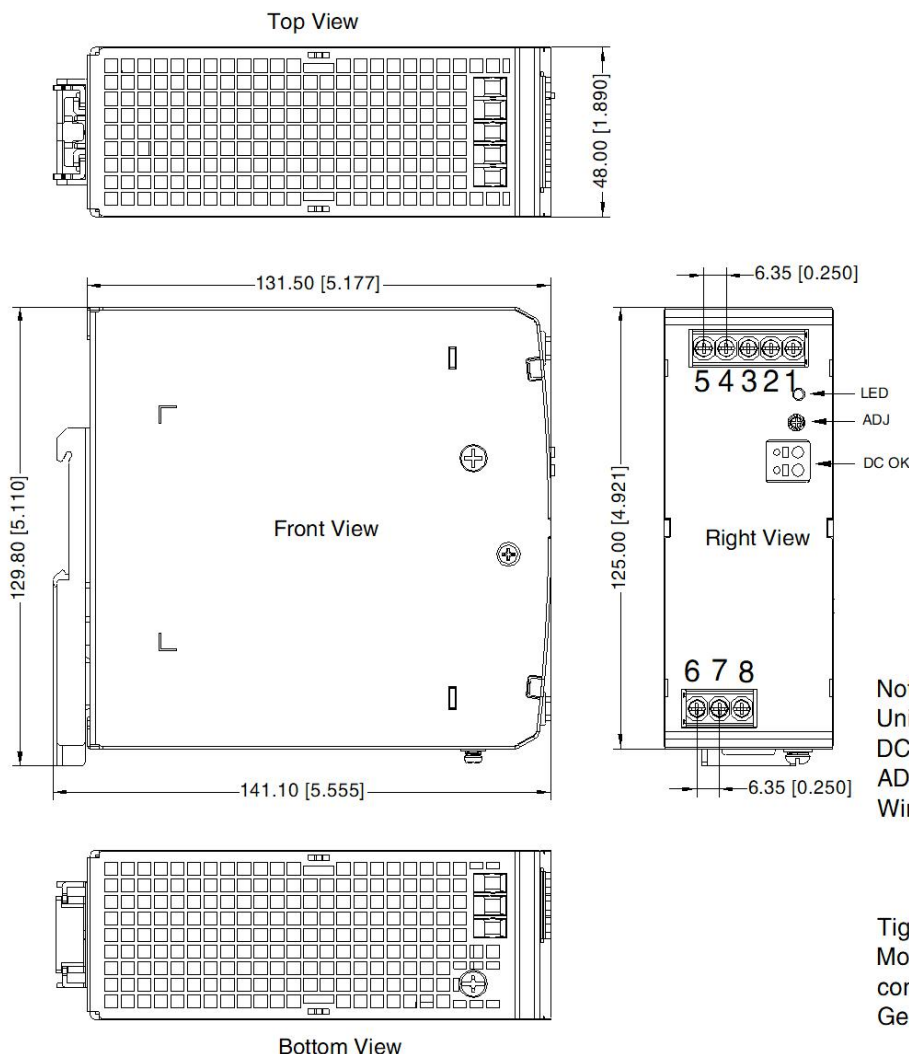
## Installation Diagram



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 works above 240W for a long time. 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



| Pin-Out |       |
|---------|-------|
| Pin     | Mark  |
| 1       | -Vo   |
| 2       | -Vo   |
| 3       | -Vo   |
| 4       | +Vo   |
| 5       | +Vo   |
| 6       | AC(N) |
| 7       | AC(L) |
| 8       | PE    |

Note:

Unit: mm[inch]

DC ON: Output status indicator LED

ADJ: Output adjustable resistor

Wire range: Input: 20-10 AWG

Output: 24V: 14-10AWG

48V: 18-10AWG

DC OK: 24-16AWG

Tightening torque: Max 0.79 N·m

Mounting rail: TS35, rail needs to

connect safety ground

General tolerances:  $\pm 1.00 [\pm 0.039]$



**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 réenergisation 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  $\leq 60^{\circ}\text{C}$ , use  $\geq 90^{\circ}\text{C}$  - copper wire only; for ambient temperature  $>60^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ , use  $\geq 105^{\circ}\text{C}$  - copper wire only;  
use only wires with a minimum dielectric strength of 300V (input) and 60V (output);  
Température ambiante  $\leq 60^{\circ}\text{C}$ , utiliser  $\geq 90^{\circ}\text{C}$  - seulement fils de cuivre; Température ambiante  $>60^{\circ}\text{C}$  et  $85^{\circ}\text{C}$ , utiliser  $\geq 105^{\circ}\text{C}$  - 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).

Note:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com), Packaging bag number: 58220210;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity  $<75\%$  RH with nominal input voltage and rated output load;
3. The room temperature derating of  $5^{\circ}\text{C}/1000\text{m}$  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 ( $\oplus$ ) of system when the terminal equipment in operating;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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