MEAN WELL LRS-50-24

MEAN WELL LRS-50-24 Power Supply User Manual

50W 24V Single Output Switching Power Supply

1. Introduction

The MEAN WELL LRS-50-24 is a 50W single-output enclosed type power supply designed with a low profile of 30mm. It accepts a full range AC input from 85V to 264V. This model specifically provides a 24V DC output.

Key features include:

- Universal AC input / Full range (85~264VAC)
- Withstands 300VAC surge input for 5 seconds
- No load power consumption less than 0.2W
- Miniature size and 1U low profile design
- High operating temperature up to 70°C
- Protections: Short circuit, Overload, Over voltage
- Cooling by free air convection
- Compliance with IEC/EN 60335-1(PD3) and IEC/EN61558-1, -2-16 for household appliances
- Operating altitude up to 5000 meters
- Withstands 5G vibration test
- High efficiency, long life, and high reliability
- LED indicator for power on
- 100% full load burn-in test

Figure 1: Overview of MEAN WELL LRS-50-24 features and applications.

2. Safety Information

Please read this section carefully before installation and operation to ensure safe use and prevent damage to the unit or connected equipment.

- **Electrical Safety:** Installation should be performed by qualified personnel. Ensure all wiring complies with local and national electrical codes.
- **Input Voltage:** Verify that the AC input voltage is within the specified range of 85-264VAC before connecting the power supply.
- **Grounding:** Always connect the Frame Ground (FG) terminal to a proper earth ground to prevent electric shock.
- **Ventilation:** Ensure adequate free air convection around the unit. Do not obstruct ventilation holes. Maintain sufficient clearance from other components to prevent overheating.
- **Overload Protection:** Do not exceed the rated output power of 50W. Overloading can cause the unit to shut down or be damaged.
- **Environmental Conditions:** Operate the power supply within the specified temperature and humidity ranges. Avoid exposure to moisture, dust, and corrosive substances.

3. Product Overview

The LRS-50-24 power supply features a compact, enclosed metal case with a perforated design for heat dissipation. It includes a terminal block for secure wiring connections and an LED indicator for operational status.

Figure 2: General view of the MEAN WELL LRS-50-24 power supply.

4. Installation and Wiring

Follow these steps for proper installation and wiring of the LRS-50-24 power supply:

1. **Mounting:** Mount the power supply in a location that allows for adequate free air circulation. Ensure the unit is securely fastened.
2. **Input Wiring:** Connect the AC input wires to the terminal block. The terminals are typically labeled 'L' (Line), 'N' (Neutral), and 'FG' (Frame Ground). Ensure correct polarity and a secure ground connection.
3. **Output Wiring:** Connect the DC output wires to the terminal block. The terminals are typically labeled '+V' (Positive Output) and '-V' (Negative Output). Ensure correct polarity for your connected device.
4. **Voltage Adjustment:** If necessary, the output voltage can be finely adjusted using the '+V ADJ' potentiometer located near the output terminals. Use a small screwdriver for this adjustment.
5. **Final Check:** Before applying power, double-check all connections for tightness and correct polarity.

Figure 3: Close-up view of the terminal block and labels for wiring connections.

5. Operation

Once properly installed and wired, apply AC power to the unit. The built-in LED indicator will illuminate, signifying that the power supply is operational and providing output voltage. The unit is designed for continuous operation within its specified parameters.

6. Protections and Troubleshooting

The LRS-50-24 power supply incorporates several protection mechanisms:

- **Short Circuit Protection:** The unit will protect against short circuits at the output.
- **Overload Protection:** If the output current exceeds the rated limit, the unit will enter protection mode.
- **Over Voltage Protection:** Protects connected devices from excessive output voltage.

In case of an issue, consider the following troubleshooting steps:

- **No Output / LED Off:** Check the AC input voltage and ensure all input connections are secure. Verify the input fuse (if external) is intact.
- **Intermittent Output:** This may indicate an overload condition. Reduce the load connected to the power supply.
- **Incorrect Output Voltage:** Check the '+V ADJ' potentiometer setting. If still incorrect, verify the load is within specifications.
- **Overheating:** Ensure proper ventilation and ambient temperature are within the specified range. Remove any obstructions to airflow.

If problems persist after performing these checks, discontinue use and contact technical support.

7. Technical Specifications

Detailed specifications for the MEAN WELL LRS-50-24 power supply:

Parameter	Specification
Model	LRS-50-24
Output Voltage	24V DC
Rated Current	2.2A
Rated Power	50W
Voltage Adjustment Range	21.6 ~ 28.8V
Input Voltage Range	85 ~ 264VAC, 120 ~ 373VDC
Frequency Range	47 ~ 63Hz
Efficiency (Typ.)	88%
Operating Temperature	-30 ~ +70°C
Storage Temperature	-40 ~ +85°C
Operating Humidity	20 ~ 90% RH non-condensing
Vibration	10 ~ 500Hz, 5G 10min/1cycle
Safety Standards	UL60950-1, TUV EN60950-1, EN60335-1, EN61558-1/-2-16, CCC GB4943 approved
Withstand Voltage	I/P-O/P:3.75KVAC, I/P-FG:2KVAC, O/P-FG:1.25KVAC
Dimensions (L x W x H)	99 x 82 x 30mm (3.9 x 3.23 x 1.18 inches)

Parameter	Specification
Item Weight	0.23 kg (0.48 lbs)
Cooling Method	Free air convection

Figure 4: Detailed specifications table for the LRS-50 series, including LRS-50-24.

8. Performance Characteristics and Block Diagram

Understanding the performance characteristics and internal block diagram can aid in system design and troubleshooting.

8.1. Block Diagram

The block diagram illustrates the internal architecture of the power supply, showing the main functional stages from AC input to DC output.

8.2. Derating Curve

The derating curve indicates the maximum permissible output load as a function of ambient temperature. Operating within the specified curve ensures optimal performance and longevity.

8.3. Static Characteristics

The static characteristics graph shows the relationship between input voltage and output load, demonstrating the power supply's stability across its operating range.

Figure 5: Block diagram, derating curve, and static characteristics for the LRS-50 series.

9. Warranty and Support

The MEAN WELL LRS-50-24 power supply comes with a**3-year warranty** from the date of purchase, covering defects in materials and workmanship under normal use.

For technical support, warranty claims, or further assistance, please contact your authorized MEAN WELL distributor or the manufacturer directly. Provide your product model number (LRS-50-24) and purchase details when seeking support.