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› MEAN WELL LRS-35-24 35W 24V 1.5A Enclosed AC/DC Power Supply User Manual

MEAN WELL LRS-35-24

MEAN WELL LRS-35-24 35W 24V 1.5A Enclosed AC/DC Power Supply User Manual

Model: LRS-35-24

1. INTRODUCTION

This manual provides detailed instructions for the MEAN WELL LRS-35-24 35W 24V 1.5A Enclosed AC/DC Power Supply. Please read this manual thoroughly before installation and operation to ensure safe and efficient use of the product.



■ Features

- Universal AC input / Full range
- Withstand 300VAC surge input for 5 second
- No load power consumption<0.2W
- Miniature size and 1U low profile
- High operating temperature up to 70°C
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- Compliance to IEC/EN 60335-1(PD3) and IEC/EN61558-1, -2-16 for household appliances
- Operating altitude up to 5000 meters (Note.8)
- Withstand 5G vibration test
- High efficiency, long life and high reliability
- LED indicator for power on
- Over voltage category III
- 100% full load burn-in test
- 3 years warranty

■ Applications

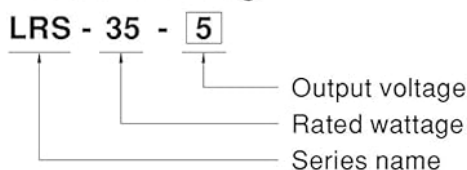
- Industrial automation machinery
- Industrial control system
- Mechanical and electrical equipment
- Electronic instruments, equipments or apparatus
- Household appliances

■ Description

LRS-35 series is a 35W single-output enclosed type power supply with 30mm of low profile design. Adopting the full range 85~264VAC input, the entire series provides an output voltage line of 5V, 12V, 15V, 24V, 36V and 48V.

In addition to the high efficiency up to 89%, the design of metallic mesh case enhances the heat dissipation of LRS-35 that the whole series operates from -30°C through 70°C under air convection without a fan. Delivering an extremely low no load power consumption (less than 0.2W), it allows the end system to easily meet the worldwide energy requirement. LRS-35 has the complete protection functions and 5G anti-vibration capability; it is complied with the international safety regulations such as TUV EN60950-1, EN60335-1, EN61558-1/-2-16, UL60950-1 and GB4943. LRS-35 series serves as a high price-to-performance power supply solution for various industrial applications.

■ Model Encoding



File Name:LRS-35-SPEC 2017-08-18

Figure 1.1: Overview of LRS-35 series features and typical applications.

1.1 Key Features

- Universal AC input / Full range (85 ~ 264 VAC).
- Withstands 300 VAC surge input for 5 seconds.
- No load power consumption <0.2W.
- Compact size and 1U low profile.
- 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.

2. SAFETY INSTRUCTIONS

WARNING: Improper installation or use can lead to electric shock, fire, or other hazards. Always follow these safety guidelines.

- **Qualified Personnel:** Installation and maintenance should only be performed by qualified personnel.
- **Power Disconnection:** Always disconnect the AC power before any installation, wiring, or maintenance work.
- **Proper Grounding:** Ensure the power supply is properly grounded to prevent electric shock.
- **Ventilation:** Do not obstruct the ventilation openings. Ensure adequate airflow for cooling.
- **Environment:** Do not operate in environments with excessive moisture, dust, or extreme temperatures outside the specified range.
- **Overload Protection:** Do not exceed the specified output current or power ratings to prevent damage and fire hazards.
- **Insulation:** Ensure all connections are properly insulated to prevent short circuits.
- **Voltage Adjustment:** The output voltage adjustment potentiometer should only be adjusted by qualified personnel using appropriate tools.

3. PRODUCT OVERVIEW

The LRS-35-24 is a 35W single-output enclosed type power supply with a 30mm low profile design. It features a metallic mesh case for enhanced heat dissipation.



Figure 3.1: Front view of the LRS-35-24 power supply.



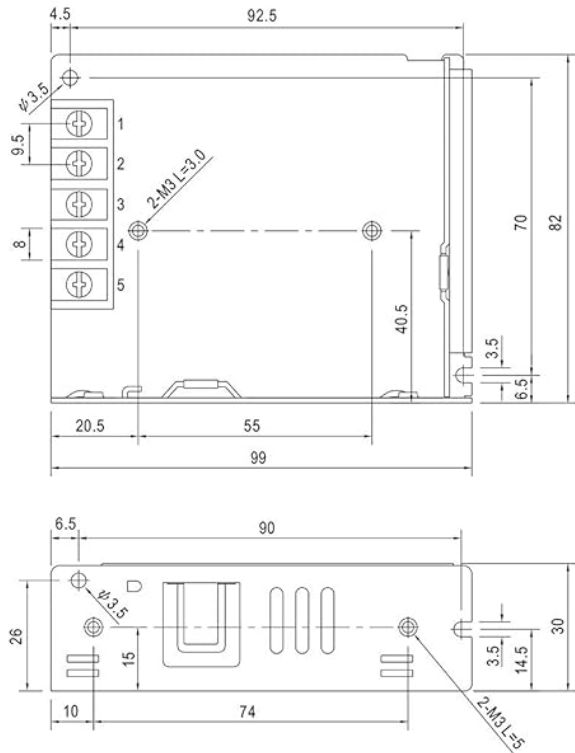
Figure 3.2: Top view of the LRS-35-24 power supply showing input and output terminals.

3.1 Terminal Pin Assignment

Refer to the diagram below for the correct terminal connections.

Mechanical Specification

Case No.239A Unit:mm



Terminal Pin No. Assignment

| Pin No. | Assignment | Pin No. | Assignment |
|---------|------------|---------|--------------|
| 1 | AC/L | 4 | DC OUTPUT -V |
| 2 | AC/N | 5 | DC OUTPUT +V |
| 3 | FG \perp | | |

Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>

Figure 3.3: Mechanical specification and terminal pin assignment. Pin 1: AC/L, Pin 2: AC/N, Pin 3: FG (Frame Ground), Pin 4: DC Output -V, Pin 5: DC Output +V.

Table 3.1: Terminal Pin Assignment

| Pin No. | Assignment |
|---------|-----------------------------------|
| 1 | AC/L (Live AC Input) |
| 2 | AC/N (Neutral AC Input) |
| 3 | FG (Frame Ground) |
| 4 | DC OUTPUT -V (Negative DC Output) |
| 5 | DC OUTPUT +V (Positive DC Output) |

4. SETUP AND INSTALLATION

Follow these steps for proper installation of the power supply.

- Mounting:** Mount the power supply in a well-ventilated area. Ensure sufficient clearance around the unit for proper air convection. The unit can be mounted horizontally or vertically, but consider the airflow direction for optimal cooling. Refer to the mechanical specifications for mounting hole dimensions (Figure 3.3).
- Wiring Input (AC):**
 - Connect the AC Live wire to the 'L' terminal (Pin 1).
 - Connect the AC Neutral wire to the 'N' terminal (Pin 2).
 - Connect the Frame Ground wire to the 'FG' terminal (Pin 3). This connection is critical for safety.
 - Ensure all input wires are securely fastened and have appropriate gauge for the current draw.
- Wiring Output (DC):**
 - Connect the positive (+) load wire to the '+V' terminal (Pin 5).
 - Connect the negative (-) load wire to the '-V' terminal (Pin 4).
 - Verify correct polarity before connecting to the load device.
 - Ensure all output wires are securely fastened and have appropriate gauge for the current draw.
- Voltage Adjustment:** The output voltage can be finely adjusted using the 'V ADJ' potentiometer located near the output terminals. Use a non-conductive screwdriver for adjustment. **Do not exceed the specified voltage range.**
- Final Check:** Before applying power, double-check all wiring connections for correctness, security, and proper insulation.

5. OPERATING INSTRUCTIONS

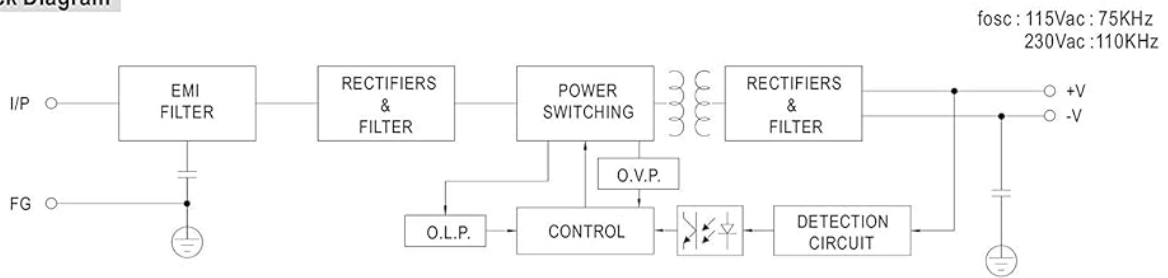
Once the power supply is correctly installed and wired, it is ready for operation.

- Power On:** Apply AC power to the input terminals. The green LED indicator on the unit will illuminate, indicating that the power supply is active and providing output voltage.
- Output Voltage:** The power supply will provide a stable 24V DC output. If adjustment is needed, refer to the "Voltage Adjustment" step in the Setup section.
- Load Connection:** Connect your DC load device to the output terminals, ensuring correct polarity.
- Monitoring:** Observe the LED indicator. If it is off, check the input power and connections.

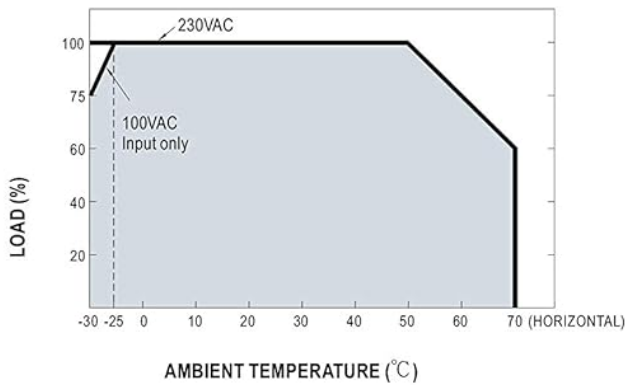
5.1 Derating Curve and Static Characteristics

The performance of the power supply can be affected by ambient temperature and input voltage. Refer to the following curves for optimal operation.

■ Block Diagram



■ Derating Curve



■ Static Characteristics

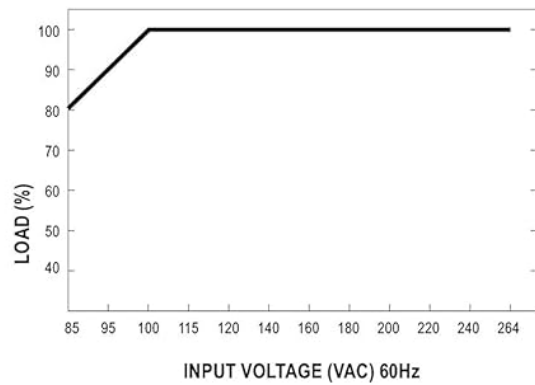


Figure 5.1: Derating curve showing load percentage vs. ambient temperature, and static characteristics showing load percentage vs. input voltage.

- **Derating Curve:** Shows the maximum permissible load at different ambient temperatures. For temperatures above 50°C, the output power must be derated to prevent overheating.

- **Static Characteristics:** Illustrates how the output load capacity is maintained across the input voltage range.

6. MAINTENANCE

The LRS-35-24 power supply is designed for long-term reliability with minimal maintenance. However, periodic checks can help ensure optimal performance.

- **Cleaning:** Ensure the ventilation holes are free from dust and debris. Use a soft, dry brush or compressed air to clean the unit if necessary. Do not use liquid cleaners.
- **Connection Checks:** Periodically inspect all input and output wiring connections to ensure they remain secure. Loose connections can cause intermittent operation or overheating.
- **Environmental Conditions:** Verify that the operating environment remains within the specified temperature and humidity ranges.
- **Visual Inspection:** Look for any signs of physical damage, discoloration, or unusual odors. If any issues are observed, disconnect power immediately and consult a qualified technician.

7. TROUBLESHOOTING

This section provides solutions to common issues you might encounter.

Table 7.1: Troubleshooting Guide

| Problem | Possible Cause | Solution |
|---|---|---|
| No output voltage / LED off | No AC input power Loose wiring connections Internal fault | Check AC power source and circuit breaker. Verify all input and output wiring connections are secure. If power is present and connections are good, the unit may be faulty. Contact support. |
| Output voltage fluctuates or is incorrect | Overload condition Faulty load Voltage adjustment potentiometer disturbed | Reduce the load to within specifications. Disconnect the load and test the power supply independently. Carefully adjust the 'V ADJ' potentiometer to the desired voltage. |
| Unit is excessively hot | Insufficient ventilation Overload condition High ambient temperature | Ensure adequate airflow around the unit. Clear any obstructions. Reduce the load. Check the derating curve (Figure 5.1). Relocate the unit to a cooler environment if possible. |
| Audible noise from unit | Normal operation (slight hum) Overload or fault condition | A slight hum can be normal. If noise is loud or unusual, check for overload. Disconnect power and contact support if noise persists and is concerning. |

For issues not covered here, please contact MEAN WELL technical support.

8. SPECIFICATIONS

Detailed technical specifications for the LRS-35-24 power supply.

SPECIFICATION

| MODEL | | LRS-35-5 | LRS-35-12 | LRS-35-15 | LRS-35-24 | LRS-35-36 | LRS-35-48 |
|-----------------------|---|---|--------------|----------------|--------------|--------------|--------------|
| OUTPUT | DC VOLTAGE | 5V | 12V | 15V | 24V | 36V | 48V |
| | RATED CURRENT | 7A | 3A | 2.4A | 1.5A | 1A | 0.8A |
| | CURRENT RANGE | 0 ~ 7A | 0 ~ 3A | 0 ~ 2.4A | 0 ~ 1.5A | 0 ~ 1A | 0 ~ 0.8A |
| | RATED POWER | 35W | 36W | 36W | 36W | 36W | 38.4W |
| | RIPPLE & NOISE (max.) Note.2 | 80mVp-p | 120mVp-p | 120mVp-p | 150mVp-p | 200mVp-p | 200mVp-p |
| | VOLTAGE ADJ. RANGE | 4.5 ~ 5.5V | 10.2 ~ 13.8V | 13.5 ~ 18V | 21.6 ~ 28.8V | 32.4 ~ 39.6V | 43.2 ~ 52.8V |
| | VOLTAGE TOLERANCE Note.3 | ±2.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% |
| | LINE REGULATION Note.4 | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| | LOAD REGULATION Note.5 | ±1.0% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| | SETUP, RISE TIME | 1000ms, 30ms/230VAC 2000ms,30ms/115VAC at full load | | | | | |
| HOLD UP TIME (Typ.) | 30ms/230VAC 12ms/115VAC at full load | | | | | | |
| INPUT | VOLTAGE RANGE | 85 ~ 264VAC 120 ~ 373VDC | | | | | |
| | FREQUENCY RANGE | 47 ~ 63Hz | | | | | |
| | EFFICIENCY (Typ.) | 82% | 86% | 86% | 88% | 88% | 89% |
| | AC CURRENT (Typ.) | 0.7A/115VAC 0.42A/230VAC | | | | | |
| | INRUSH CURRENT (Typ.) | COLD START 45A/230VAC | | | | | |
| | LEAKAGE CURRENT | <0.75mA / 240VAC | | | | | |
| PROTECTION | OVER LOAD | 110 ~ 150% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed | | | | | |
| | OVER VOLTAGE | 5.75 ~ 6.9V | 13.8 ~ 16.2V | 18.75 ~ 21.75V | 28.8 ~ 33.6V | 41.4 ~ 48.6V | 55.2 ~ 64.8V |
| ENVIRONMENT | WORKING TEMP. | -30 ~ +70°C (Refer to "Derating Curve") | | | | | |
| | WORKING HUMIDITY | 20 ~ 90% RH non-condensing | | | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +85°C, 10 ~ 95% RH non-condensing | | | | | |
| | TEMP. COEFFICIENT | ±0.03%/°C (0 ~ 50°C) | | | | | |
| | VIBRATION | 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes | | | | | |
| | OVER VOLTAGE CATEGORY | III, According to EN61558, EN50178, altitude up to 2000 meters | | | | | |
| SAFETY & EMC (Note 9) | 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 | | | | | |
| | ISOLATION RESISTANCE | I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH | | | | | |
| | EMC EMISSION | Compliance to EN55032 (CISPR32), GB9254 Class B, EN55014, EN61000-3-2,-3 | | | | | |
| OTHERS | EMC IMMUNITY | Compliance to EN61000-4-2,3,4,5,6,8,11, EN61000-6-2 (EN50082-2), heavy industry level, criteria A | | | | | |
| | MTBF | 763.6K hrs min. MIL-HDBK-217F (25°C) | | | | | |
| | DIMENSION | 99*82*30mm (L*W*H) | | | | | |
| | PACKING | 0.23Kg ; 60pcs/14.8Kg/0.88CUFT | | | | | |
| NOTE | <p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.</p> <p>3. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>4. Line regulation is measured from low line to high line at rated load.</p> <p>5. Load regulation is measured from 0% to 100% rated load.</p> <p>6. Length of set up time is measured at cold first start. Turning ON/OFF the power supply very quickly may lead to increase of the set up time.</p> <p>7. 5V when the load factor 0~50%, the switching power less is reduced by burst operation, which will cause ripple and ripple noise to go beyond the specifications.</p> <p>8. The ambient temperature derating of 5°C/1000m is needed for operating altitude greater than 2000m(6500ft).</p> <p>9. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com)</p> | | | | | | |

Figure 8.1: Comprehensive technical specifications for the LRS-35 series, including input, output, protection, and environmental data.

Table 8.1: LRS-35-24 Technical Specifications

| Parameter | Value |
|------------------------|---|
| Model | LRS-35-24 |
| DC Voltage | 24V |
| Rated Current | 1.5A |
| Rated Power | 36W |
| Voltage Range (Input) | 85 ~ 264 VAC |
| Frequency Range | 47 ~ 63 Hz |
| Efficiency | 88% |
| Operating Temperature | -30 ~ +70 °C |
| Dimensions (L x W x H) | 99 x 82 x 30 mm |
| Weight | 0.23 kg |
| Protection | Short circuit, Overload, Over voltage |
| Safety Standards | UL60950-1, TUV EN60950-1, EN60335-1, EN61558-1/-2-16, CCC GB4943 approved |

9. WARRANTY

This MEAN WELL LRS-35-24 power supply comes with a **2-year warranty** from the date of purchase. This warranty covers defects in materials and workmanship under normal use. It does not cover damage caused by improper installation, misuse, unauthorized modifications, or external factors such as power surges or natural disasters.

For warranty claims, please retain your proof of purchase and contact your retailer or MEAN WELL customer support.

10. SUPPORT AND CONTACT INFORMATION

For technical assistance, troubleshooting, or further information regarding the MEAN WELL LRS-35-24 power supply, please refer to the official MEAN WELL website or contact their customer support.

- **Official Website:** www.meanwell.com
- **Manuals:** Specific product manuals can often be found at www.meanwell.com/manual.html
- **Contact:** Refer to the "Contact Us" section on the official website for regional support details.