MEAN WELL LRS-350-24

Mean Well LRS-350-24 DC Switching Power Supply User Manual

Model: LRS-350-24 | Brand: MEAN WELL

1. Introduction

This manual provides essential information for the safe and efficient installation, operation, and maintenance of the Mean Well LRS-350-24 DC Switching Power Supply. This 350W single-output enclosed type power supply features a 30mm low profile design, accepting input of 115VAC or 230VAC (selectable by switch). It is designed for various industrial applications, including automation machinery, industrial control systems, mechanical and electrical equipment, and electronic instruments.

2. Safety Information

WARNING: Risk of electric shock. Installation and servicing should only be performed by qualified personnel.

- Before connecting the power supply, ensure the input voltage selection switch is set correctly to either 115VAC or 230VAC to match your local power grid. Incorrect setting can cause damage to the unit. The switch is set to 115VAC by default.
- Always disconnect the AC input power before making any connections or adjustments to prevent electric shock.
- Ensure proper grounding of the unit to prevent electrical hazards.
- Do not operate the power supply in environments with excessive moisture, dust, or extreme temperatures outside its specified operating range.
- Ensure adequate ventilation around the unit to prevent overheating. The built-in fan operates based on internal temperature.
- Do not open the power supply casing. There are no user-serviceable parts inside.

3. Features

- AC input range selectable by switch (90 ~ 132VAC / 180 ~ 264VAC).
- Withstands 300VAC surge input for 5 seconds.
- Comprehensive protections: Short Circuit, Overload, Over Voltage, Over Temperature.

- Forced air cooling by built-in DC fan.
- Built-in cooling fan ON-OFF control, activating when case temperature exceeds 122℉ (50℃).
- 1U low profile design.
- Withstands 5G vibration test.
- LED indicator for power on.
- No load power consumption less than 0.75W.
- 100% full load burn-in test.
- High operating temperature up to 70℃.
- Operating altitude up to 5000 meters.
- High efficiency, long life, and high reliability.

4. Applications

- Industrial automation machinery
- Industrial control system
- Mechanical and electrical equipment
- Electronic instruments and apparatus

5. Product Overview

Figure 1: Top-down view of the Mean Well LRS-350-24 power supply, showing the fan grille and general casing.

Figure 2: Detailed view of the power supply's terminal block for input and output connections, along with the product specification label. The input voltage selection switch is visible on the side.

6. Setup and Installation

6.1 Input Voltage Selection

The LRS-350-24 features an input voltage selection switch. Before connecting the AC power, ensure this switch is set to the correct voltage for your region (115VAC or 230VAC). The switch is typically located on the side of the unit, as shown in Figure 2. The factory default setting is 115VAC.

6.2 Wiring Instructions

Refer to Figure 2 for the terminal block layout. Connect the AC input and DC output wires as follows:

- **AC Input:** Connect the Live (L), Neutral (N), and Ground ( ) wires to the corresponding terminals.
- **DC Output:** Connect the positive (+) and negative (-) load wires to the respective output terminals. The LRS-350-24 provides multiple terminals for both positive and negative outputs to facilitate easier wiring for higher current applications.

Ensure all connections are secure and properly insulated. Use appropriate wire gauges for the expected current load.

6.3 Mounting

The power supply is designed for benchtop use or integration into systems. Mounting brackets are not included with the unit. Refer to the Mechanical Specification section for detailed dimensions and mounting hole locations if custom mounting is required.

7. Operating Instructions

7.1 Power On

Once all connections are secure and the input voltage is correctly selected, apply AC power. The power-on LED indicator will illuminate, signifying normal operation.

7.2 Output Voltage Adjustment

The LRS-350-24 features a trim-pot (potentiometer) for fine-tuning the output voltage. This adjustment allows for a

slight variation around the nominal 24V output. Use a small screwdriver to carefully turn the trim-pot clockwise to increase voltage or counter-clockwise to decrease it. Monitor the output voltage with a multimeter during adjustment.

7.3 Fan Operation

The built-in DC fan is thermostatically controlled. It will activate automatically when the internal case temperature exceeds 122°F (50°C) to maintain optimal operating temperatures and ensure longevity of the unit. The fan may not run continuously, depending on the load and ambient temperature.

8. Maintenance

The Mean Well LRS-350-24 power supply requires minimal maintenance. Follow these guidelines to ensure optimal performance and lifespan:

- Keep the unit clean and free from dust and debris, especially around the ventilation openings and fan grille. Use a soft, dry cloth for cleaning.
- Ensure that there is always adequate airflow around the power supply. Do not block the fan or ventilation holes.
- Periodically check all wiring connections to ensure they remain secure.
- Avoid operating the unit in environments that exceed its specified temperature and humidity ranges.

9. Troubleshooting

If the power supply is not functioning as expected, consider the following:

- **No Power Output:**
  - Check the AC input power source.
  - Verify the input voltage selection switch is set correctly (115VAC or 230VAC).
  - Ensure all input and output wires are securely connected.
  - Check if the power-on LED indicator is illuminated.
- **Intermittent Output or Shutdown:**
  - The unit may be triggering its overload or over-temperature protection. Reduce the load or ensure proper ventilation.
  - Check for short circuits in the output wiring or connected load.
- **Fan Not Running:**
  - The fan is thermostatically controlled and only activates when the internal temperature exceeds 122°F (50°C). If the unit is cool and under light load, the fan may not be active, which is normal.
  - If the unit is hot and the fan is not running, ensure the fan grille is not obstructed.

If issues persist after checking these points, contact technical support.

10. Specifications

Parameter	Value
Output Voltage	24V
Rated Current	14.6A
Rated Power	350W
Input Voltage Range	90 ~ 132VAC / 180 ~ 264VAC (selectable by switch)
Efficiency (Typ.)	88%
Frequency Range	47 ~ 63Hz
Overload Protection	110 ~ 140% rated output power, hiccup mode, auto-recovery
Over Voltage Protection	28.8 ~ 33.6V, hiccup mode, auto-recovery
Over Temperature Protection	Shut down and latch off o/p voltage, auto-recovery
Working Temp.	-25 ~ +70℃ (Refer to Derating Curve)
Working Humidity	20 ~ 90% RH non-condensing
Storage Temp., Humidity	-40 ~ +85℃, 10 ~ 95% RH
Vibration	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes
Dimensions (L x W x H)	215 x 115 x 30 mm (8.46 x 4.53 x 1.18 inches)
Weight	0.76kg (1.67 lbs)

SPECIFICATION

MODEL		LRS-350-3.3	LRS-350-4.2	LRS-350-5	LRS-350-12	LRS-350-15	LRS-350-24	LRS-350-36	LRS-350-48
OUTPUT	DC VOLTAGE	3.3V	4.2V	5V	12V	15V	24V	36V	48V
	RATED CURRENT	60A	60A	60A	29A	23.2A	14.6A	9.7A	7.3A
	CURRENT RANGE	0 ~ 60A	0 ~ 60A	0 ~ 60A	0 ~ 29A	0 ~ 23.2A	0 ~ 14.6A	0 ~ 9.7A	0 ~ 7.3A
	RATED POWER	198W	252W	300W	348W	348W	350.4W	349.2W	350.4W
	RIPPLE & NOISE (max.) Note.2	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	2.97 ~ 3.6V	3.6 ~ 4.4V	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	±4.0%	±4.0%	±3.0%	±1.5%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION Note.4	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION Note.5	±2.5%	±2.5%	±2.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	1300ms, 50ms/230VAC 1300ms,50ms/115VAC at full load							
	HOLD UP TIME (Typ.)	16ms/230VAC 12ms/115VAC at full load							
INPUT	VOLTAGE RANGE	90 ~ 132VAC / 180 ~ 264VAC by switch 240 ~ 370VDC (switch on 230VAC)							
	FREQUENCY RANGE	47 ~ 63Hz							
	EFFICIENCY (Typ.)	79.5%	81.5%	83.5%	85%	86%	88%	88.5%	89%
	AC CURRENT (Typ.)	6.8A/115VAC 3.4A/230VAC							
	INRUSH CURRENT (Typ.)	60A/115VAC 60A/230VAC							
	LEAKAGE CURRENT	<2mA / 240VAC							
PROTECTION	OVER LOAD	110 ~ 140% rated output power							
		3.3~36V Hiccup mode, recovers automatically after fault condition is removed. 48V Shut down and latch off o/p voltage, re-power on to recover.							
	OVER VOLTAGE	3.8 ~ 4.45V	4.6 ~ 5.4V	5.75 ~ 6.75V	13.8 ~ 16.2V	18 ~ 21V	28.8 ~ 33.6V	41.4 ~ 46.8V	55.2 ~ 64.8V
		3.3~36V Hiccup mode, recovers automatically after fault condition is removed. 48V Shut down and latch off o/p voltage, re-power on to recover.							
	OVER TEMPERATURE	3.3~36V Hiccup mode, recovers automatically after fault condition is removed. 48V Shut down and latch off o/p voltage, re-power on to recover.							
FUNCTION	FAN ON/OFF CONTROL (Typ.)	RTH3≧50℃ FAN ON, ≦40℃ FAN OFF							
ENVIRONMENT	WORKING TEMP.	-25 ~ +70℃ (Refer to "Derating Curve")							
	WORKING HUMIDITY	20 ~ 90% RH non-condensing							
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH							
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)							
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes							
SAFETY	SAFETY STANDARDS	IEC/UL 62368-1, BSMI CNS14336-1, EAC TP TC 004,KC K60950-1(for LRS-350-12/24 only) approved							
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC							
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC / 25℃/ 70% RH							
	EMC EMISSION	Compliance to BSMI CNS13438, EAC TP TC 020,KC KN32,KN35(for LRS-350-12/24 only)							
	EMC IMMUNITY	Compliance to EAC TP TC 020,KC KN32,KN35(for LRS-350-12/24 only)							
OTHERS	MTBF	327.9K hrs min. MIL-HDBK-217F (25℃)							
	DIMENSION	215*115*30mm (L*W*H)							
	PACKING	0.76Kg; 15pcs/12.4Kg/0.78CUFT							
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25 of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. Line regulation is measured from low line to high line at rated load. 5. Load regulation is measured from 0% to 100% rated load. 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. 7.The 150% peak load capability is built in for up to 1 second for 12~48V.LRS-350 will enter hiccup mode if the peak load is delivered for over 1 second and will recover once it resumes to the rated current level(115VAC/230VAC). 8. The ambient temperature derating of 5□ /1000m is needed for operating altitude greater than 2000m(6500ft). 9. This power supply does not meet the harmonic current requirements outlined by EN61000-3-2. Please do not use this power supply under the following conditions:								

Figure 3: Comprehensive technical specifications table for the LRS-350-24 series, including input, output, protection, environment, and safety data.

11. Technical Diagrams

11.1 Block Diagram

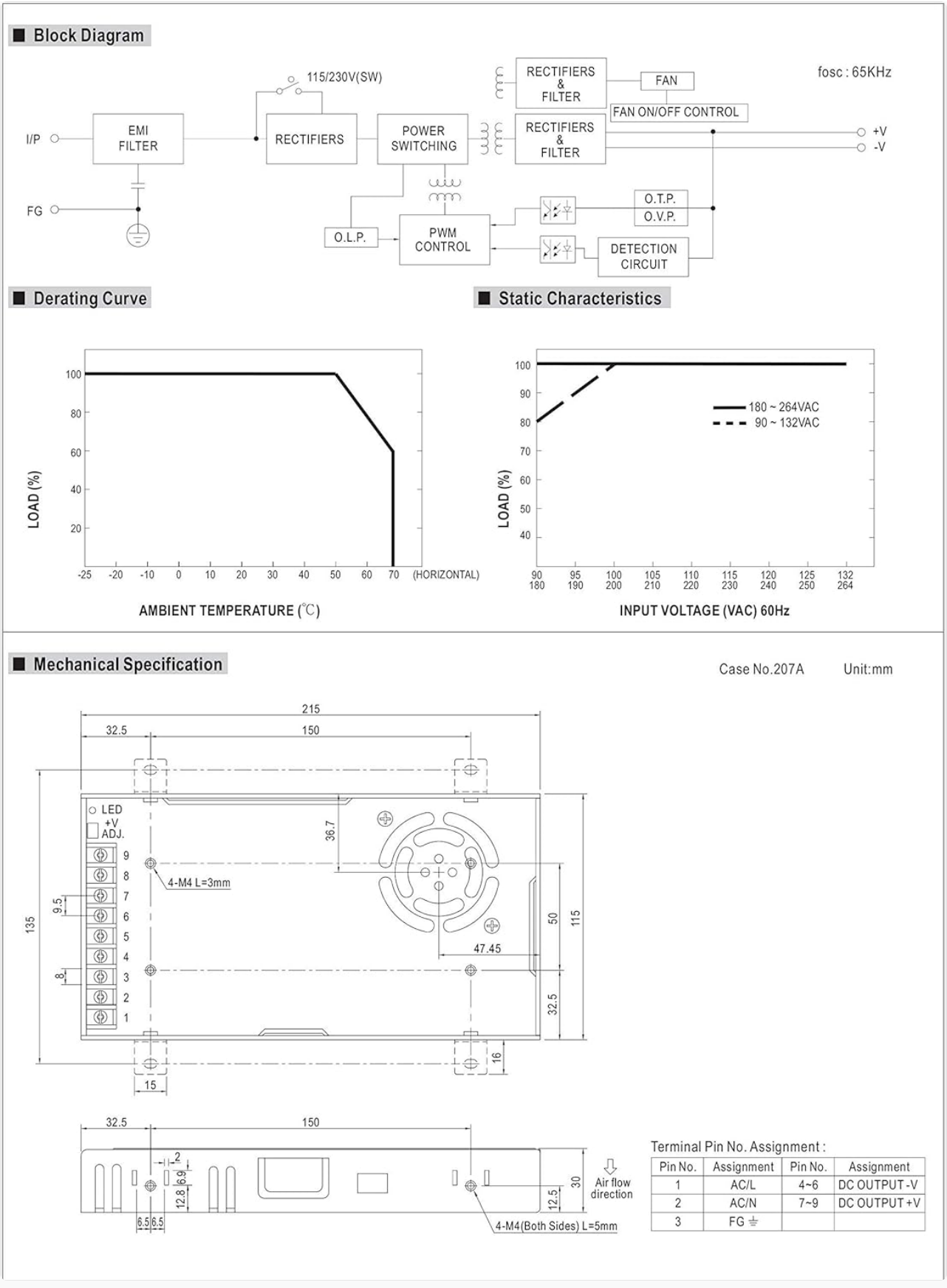

Figure 4: Internal block diagram illustrating the main functional stages of the LRS-350-24 power supply, including EMI filter, rectifiers, power switching, and control circuits.

11.2 Derating Curve

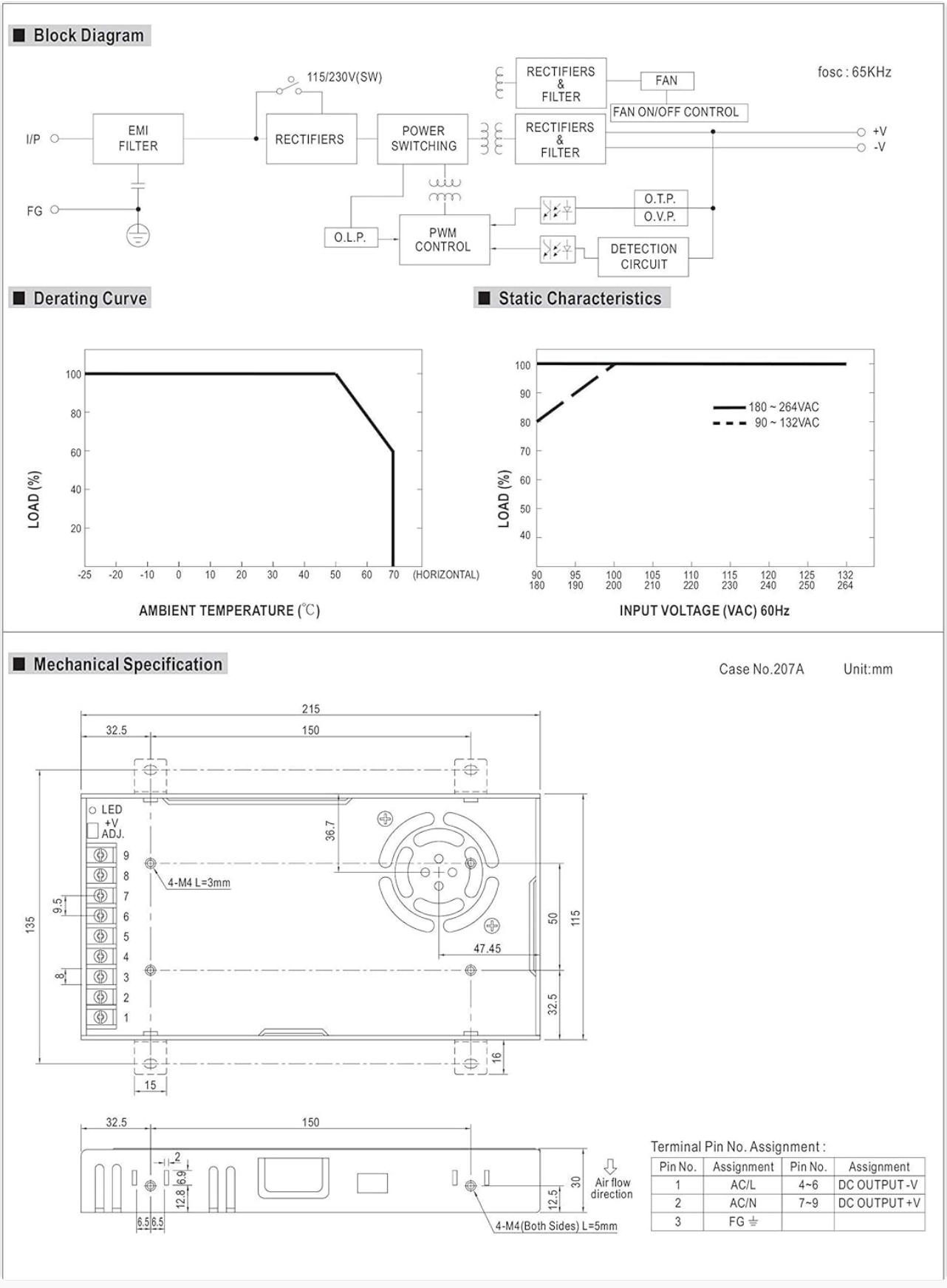

Figure 5: Derating curve indicating the maximum permissible output load percentage relative to ambient temperature. Load capacity decreases at higher temperatures.

11.3 Static Characteristics

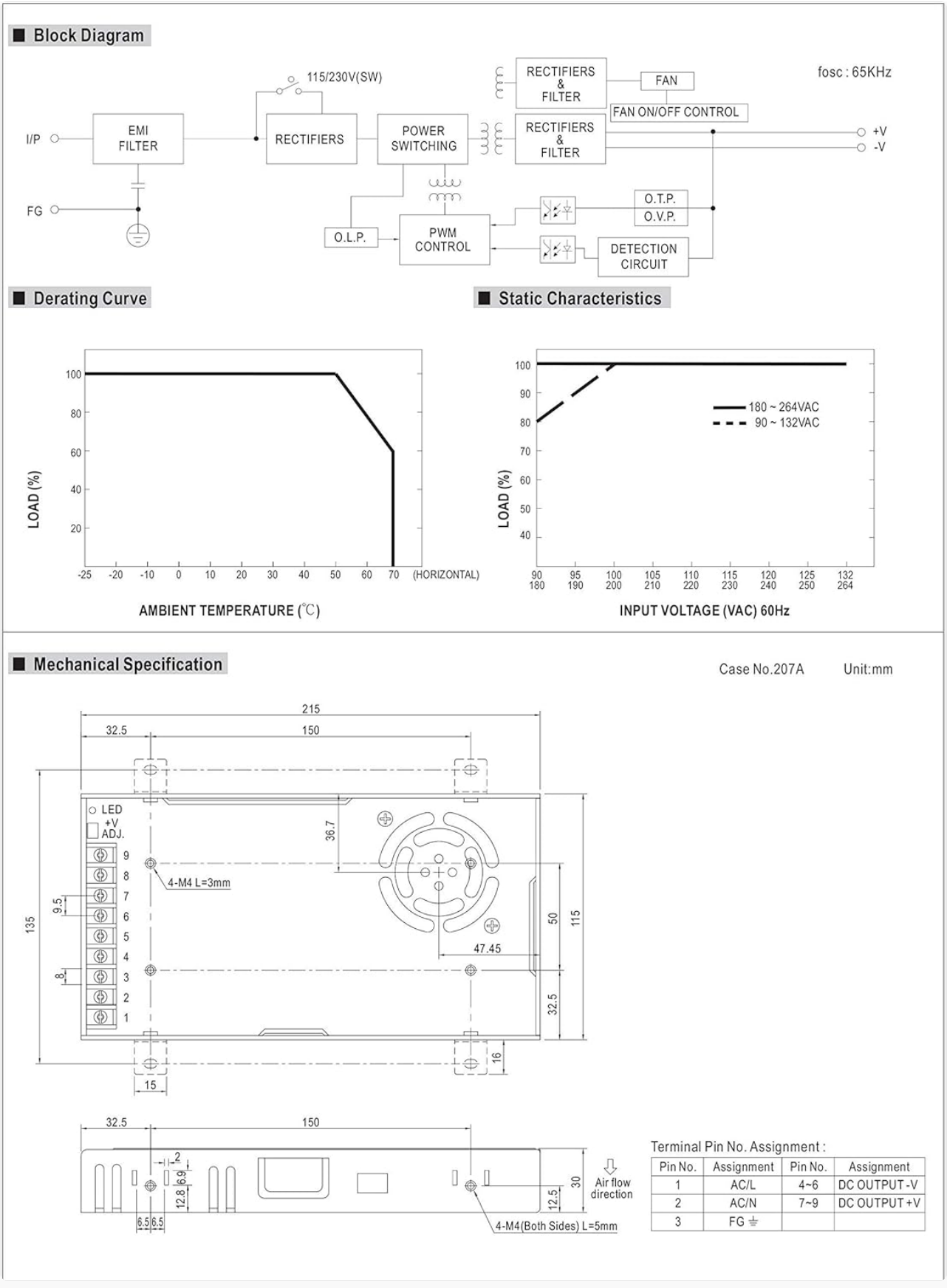

Figure 6: Graph illustrating the static characteristics, specifically the efficiency of the power supply across different input voltage ranges (180-264VAC and 90-132VAC).

11.4 Mechanical Specification

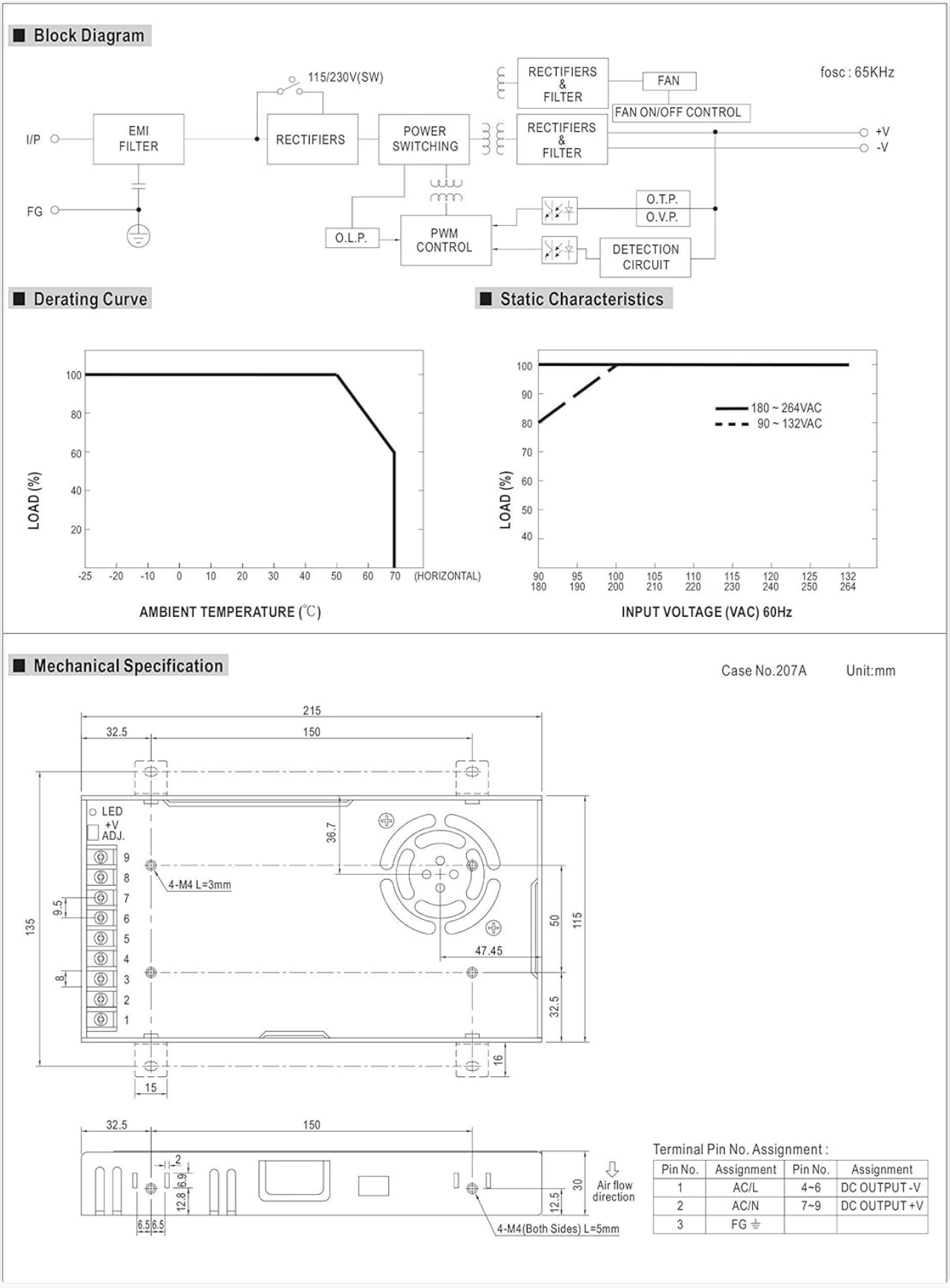

Figure 7: Detailed mechanical drawing showing the dimensions (in mm) and mounting hole locations for the LRS-350-24 power supply.

12. Warranty and Support

The Mean Well LRS-350-24 DC Switching Power Supply is manufactured to high-quality standards and typically comes with a manufacturer's warranty. Please refer to the warranty card included with your product or visit the official Mean Well website for specific warranty terms and conditions.

For technical support, troubleshooting assistance beyond this manual, or service inquiries, please contact your authorized Mean Well distributor or the manufacturer directly. Ensure you have your product model number (LRS-350-24) and purchase information available when seeking support.