MEAN WELL RSP-3000-24

User Manual

MEAN WELL RSP-3000-24 3000W Single Output Power Supply

Model: RSP-3000-24 | Brand: MEAN WELL

1. Introduction

The MEAN WELL RSP-3000-24 is a reliable and high-efficiency 3000 W industrial-grade power supply designed for demanding 24 V DC applications. It features a rugged metal chassis and active Power Factor Correction (PFC), supporting universal 3-phase AC input (340–550 VAC) and delivering up to 125 A continuous current with peak efficiency over 94 %. Built for harsh environments, it operates from -25 °C to +70 °C and includes comprehensive protections: short circuit, overload, overvoltage, overtemperature, and fan failure. This power supply is ideal for large-scale automation, EV charging systems, LED displays, laser cutting machines, telecom, and data-center backup systems. With current sharing, DC OK signal output, remote ON/OFF control, and compliance with UL, CE & TUV safety standards, the RSP-3000-24 offers robust, scalable power with global reliability.

2. Safety Instructions

Please read these safety instructions carefully before installing or operating the RSP-3000-24 power supply. Failure to follow these instructions may result in electric shock, fire, or damage to the unit.

- **Qualified Personnel:** Installation and servicing must be performed by qualified personnel only.
- **Proper Grounding:** Ensure the unit is properly grounded to prevent electric shock.
- **Input Voltage:** Verify that the input voltage range matches the power supply's specifications before connection.
- **Ventilation:** Ensure adequate ventilation around the unit to prevent overheating. Do not block ventilation openings.
- **Environmental Conditions:** Do not operate the unit in environments exceeding its specified temperature and humidity ranges. Avoid exposure to moisture or corrosive substances.

- **Disconnect Power:** Always disconnect the AC input power before performing any installation, wiring, or maintenance.
- **Output Load:** Do not exceed the maximum output current or wattage specified for the unit.
- **Internal Components:** Do not open the power supply casing. There are no user-serviceable parts inside.

3. Product Overview

The RSP-3000-24 is designed for high-power industrial applications. Below are its mechanical specifications, pin assignments, and internal block diagram.

3.1 Mechanical Specification and Pin Assignments

Figure 3.1: Mechanical dimensions, fan airflow, and pin assignments for AC input and control signals.

AC Input Terminal Pin Assignment

Pin No.	Assignment
1	AC/L
2	AC/N
3	FG (Frame Ground)

Control Pin No. Assignment (CN1, CN2): HRS DF11-8DP-2DS or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	RCG	HRS DF11-8DS or equivalent	HRS DF11-*SC or equivalent
2	RC		
3	PV		
4	PS		
5,7	-S		
6,8	+S		

RCG: Remote ON/OFF Ground, RC: Remote ON/OFF, PV: Output Voltage External Control, PS: Output Voltage Internal Control. -S/+S: Remote Sensing.

Control Pin No. Assignment (CN3): HRS DF11-10DP-2DS or equivalent

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
1	P OK GND	6	RCG	10	OL-SD	HRS DF11-10DS or equivalent	HRS DF11-*SC or equivalent
2	P OK	7	RC				
3	P OK2	8	OLP				
4	AUX	9	AUXG				

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
5	P OK GND2						

P OK: Power OK Signal (Relay Contact), P OK2: Power OK Signal (TTL Signal), RCG: Remote ON/OFF Ground, RC: Remote ON/OFF, OLP: OLP/OL-SD: OLP mode select, AUX: Auxiliary Output, AUXG: Auxiliary Ground.

3.2 Block Diagram

Figure 3.2: Internal block diagram of the RSP-3000-24 power supply.

4. Installation and Connections

Proper installation is crucial for the safe and efficient operation of the RSP-3000-24. Follow these guidelines for connecting the power supply.

4.1 Three-Phase Connection

The RSP-3000-24 can be configured for various 3-phase power systems. Refer to the diagrams below for proper wiring.

Figure 4.1: 3-phase 3-wire 220VAC system connection.

Figure 4.2: 3-phase 4-wire 220/380VAC system connection.

Figure 4.3: 3-phase 4-wire 190/110VAC system connection.

5. Operation

5.1 Remote ON/OFF Control

The power supply features a remote ON/OFF control function, available by applying voltage in CN1 & CN2 & CN3. Refer to the table and diagrams for connection methods.

SW Logic	Output off	Output on
SW Open	SW Close	SW Open

Figure 5.1: Examples of connecting remote ON/OFF.

5.2 Alarm Signal Output

The alarm signal is sent out through 'P OK', 'P OK GND' and 'P OK2 & P OK GND2' pins. An external voltage source is required for this function. The table below explains the alarm function built-in the power supply.

Function	Description	Output of alarm (P OK, Relay Contact)	Output of alarm (P OK2, TTL Signal)

Function	Description	Output of alarm (P OK, Relay Contact)	Output of alarm (P OK2, TTL Signal)
P OK	The signal is "Low" when the power supply is above 80% of the rated output voltage-Power OK	Low (0.5V max at 500mA)	Low (0.5V max at 10mA)
	The signal turns to be "High" when the power supply is under 80% of the rated output voltage-Power Fail	High or open (External applied voltage, 500mA max.)	High or open (External applied voltage, 10mA max.)

Table 5.1: Explanation of alarm.

Figure 5.2: Internal circuit of P OK (Relay, total is 10W) and P OK2 (Open collector method).

5.3 Output Voltage Trim

The output voltage can be trimmed using an external 1-6V signal connected to the PV pin (PIN3) and PS pin (PIN4) of CN1 or CN2. The power supply must be disconnected if the "Output Voltage TRIM" function is used. Adjustment of output voltage is possible between 20-110% (Typ.) of the rated output which is shown in the figure below. Reducing output current is required when the output voltage is trimmed up.

Figure 5.3: Output voltage trimming characteristics.

5.4 Current Sharing

Parallel operation is available by connecting the units as shown in the diagram. The voltage difference among each output should be minimized to less than 0.2V. The total output current must not exceed the value determined by the following equation: (Output current at parallel operation) = The rated current per unit × number of unit × 0.9. For parallel operation with 3 units, please consult the manufacturer for other applications. Wires of remote sensing should be kept at least 10 cm from input wires. When in parallel operation, the minimum output load should be greater than 3% of total output load. The "output voltage trim" function is not available in parallel operation.

Figure 5.4: Current sharing connection diagram.

5.5 Overload Protection (OLP) Mode

The RSP-3000-24 offers different Overload Protection (OLP) modes. Removing the shorting connector on CN3 (as shown in Fig 5.5) sets the O.L.P. mode to "continuous constant current limiting". Inserting the shorting connector on CN3 (as shown in Fig 5.6) sets the O.L.P. mode to "constant current limiting with delay shutdown after 5 seconds, re-power on to recover".

Figure 5.5: OLP Mode configurations.

6. Specifications

Detailed technical specifications for the MEAN WELL RSP-3000-24 power supply.

Feature	Specification
Brand	MEAN WELL

Feature	Specification
Model Number	RSP-3000-24
Output Wattage	3000 Watts
Output Voltage	24 Volts DC
Output Current	125 Amps
Minimum Input Voltage	180 Volts AC (3-phase)
Form Factor	1U
Cooling Method	Air (Fan)
Fan Count	1
Item Dimensions (L x W x H)	10.94 x 7 x 2.5 inches
Item Weight	0.01 Ounces (Note: This weight seems incorrect, typical for such a unit would be several pounds/kg)
Compatible Devices	Personal Computer (Note: This is a general industrial power supply, not typically for consumer PCs)

7. Performance Characteristics

Understanding the performance characteristics helps ensure optimal operation within specified limits.

7.1 Derating Curve

Figure 7.1: Derating curve (Load % vs. Ambient Temperature °C).

7.2 Static Characteristics

Figure 7.2: Static characteristics (Load % vs. Input Voltage V 60Hz).

8. Maintenance

The RSP-3000-24 power supply is designed for long-term reliability with minimal maintenance. However, periodic checks can help ensure optimal performance and longevity.

- **Cleaning:** Keep the ventilation openings clear of dust and debris. Use a soft, dry cloth or compressed air to clean the exterior. Do not use liquid cleaners.
- **Fan Check:** Periodically check the cooling fan for proper operation. A malfunctioning fan can lead to overheating.
- **Connections:** Ensure all input and output connections remain secure. Loose connections can cause intermittent operation or damage.
- **Environmental Monitoring:** Regularly verify that the operating environment (temperature, humidity) remains within the specified limits.
- **No User Serviceable Parts:** Do not attempt to open the power supply unit. All repairs must be performed by

authorized service personnel.

9. Troubleshooting

If you encounter issues with your RSP-3000-24 power supply, refer to the following common troubleshooting steps. If the problem persists, contact technical support.

- **No Output Voltage:**
  - Check AC input power and connections.
  - Verify the remote ON/OFF control is correctly configured and enabled.
  - Check for tripped circuit breakers or blown fuses in the input line.
- **Output Voltage Too Low/High:**
  - Ensure the output voltage trim function (PV pin) is correctly set or disconnected if not in use.
  - Check the load for excessive current draw, which might trigger overload protection.
  - Verify remote sensing connections (+S/-S) are correct.
- **Overheating:**
  - Ensure adequate airflow around the unit and that ventilation openings are not blocked.
  - Check if the cooling fan is operating correctly.
  - Reduce the output load if operating near the derating curve limits.
- **Alarm Signal Active:**
  - Refer to the Alarm Signal Output section (5.2) to understand the cause (e.g., power fail, overvoltage).
  - Address the underlying issue (e.g., restore input power, reduce load).

10. Warranty and Support

MEAN WELL products are manufactured under strict quality control. This product is covered by a standard manufacturer's warranty against defects in materials and workmanship. For specific warranty terms and conditions, please refer to the documentation provided with your purchase or visit the official MEAN WELL website.
For technical support, service, or inquiries regarding your RSP-3000-24 power supply, please contact your authorized MEAN WELL distributor or reseller. When contacting support, please have your product model number (RSP-3000-24) and purchase information readily available.