User's Guide

OMEGA
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DRN-PS-1000

UNIVERSAL SWITCHING POWER SUPPLY
Compact DIN-Rail 24 Volt

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1 General Information and Features

The compact DRN power supplies are designed to supply well-regulated 24 volt DC power to sensors, signal conditioners, data acquisition systems and high level logic equipment.

Features

Significant DRN features include:

- Tested isolation, primary to output
- Recessed live parts and connector screws
- Either 32mm or 35mm DIN rail mounting
- Wide input voltage tolerances
- Protective varistor input shunt
- Input AC spike rejection with LC filters
- LED power-on lamp
- Over-temperature protection
- Short circuit protection
- Low-ripple, well-regulated design

SAFETY CONSIDERATIONS 2

This device is marked with the international Caution symbol. It is important to read this manual before installing or commissioning this device as it contains important information relating to Safety and EMC (Electromagnetic Compatibility).

Unpacking & Inspection

Unpack the instrument and inspect for obvious shipping damage. Do not attempt to operate the unit if damage is found.

This instrument is a DIN rail mount device. Installation of this instrument should be done by Qualified personnel. In order to ensure safe operation, the following instructions should be followed.

This instrument has no power-on switch. An external switch or circuit-breaker shall be included in the building installation as a disconnecting device. It shall be marked to indicate this function, and it shall be in close proximity to the equipment within easy reach of the operator. The switch or circuit-breaker shall not interrupt the Protective Conductor (Earth wire), and it shall meet the relevant requirements of IEC 947–1 and IEC 947-3 (International Electrotechnical Commission). The switch shall not be incorporated in the mains supply cord.

Furthermore, to provide protection against excessive energy being drawn from the mains supply in case of a fault in the equipment, an overcurrent protection device shall be installed.

- The **Protective Conductor** must be connected for safety reasons. Check that the power cable has the proper Earth wire, and it is properly connected. It is not safe to operate this unit without the Protective Conductor Terminal connected.

- Do not exceed voltage rating on the label located on the top of the instrument housing.
- Always disconnect power before changing signal and power connections.
- Do not use this instrument on a work bench without its case for safety reasons.
- Do not operate this instrument in flammable or explosive atmospheres.
- Do not expose this instrument to rain or moisture.
- Unit mounting should allow for adequate ventilation to ensure instrument does not exceed operating temperature rating.
- Use electrical wires with adequate size to handle mechanical strain and power requirements. Install without exposing bare wire outside the connector to minimize electrical shock hazards.

EMC Considerations

- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use signal wire connections with twisted-pair cables.
- Install Ferrite Bead(s) on signal wires close to the instrument if EMC problems persist.

3 INSTALLATION AND REMOVAL

Warning!

If a rail assembly is to be transported, then disconnection, dismounting and separate packing of the power supply is recommended.

For units that must be shipped installed on the rail, additional bracing to resist transportation shocks is recommended.

Do not attempt to install or connect to the power supply when the mains are energized.

3.1 Installation Clearance

Ensure that there is enough room for mounting the power supply unit. There should be a minimum of 1" [25mm] spacing to allow sufficient air circulation for proper cooling.

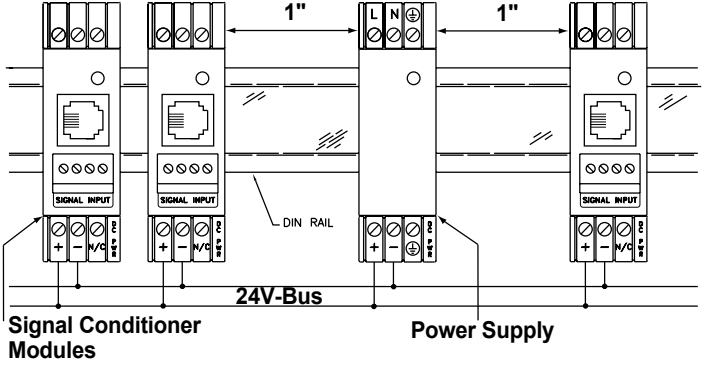


Figure 3.1 — Mounting

3.2 Mounting on DIN Rail

To install unit onto DIN Rail

1. Tilt unit position mounting guide onto DIN Rail, as shown.
2. Push unit towards DIN Rail and it will snap into place.

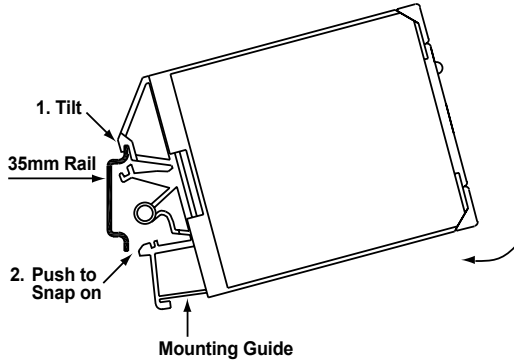


Figure 3.2 – Mounting on 35mm DIN Rail

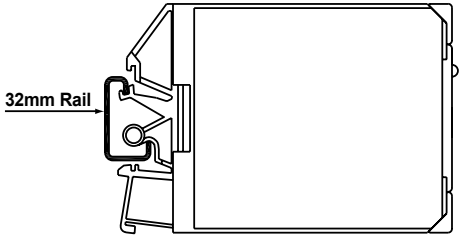


Figure 3.3 – Mounted on 32mm DIN Rail

3.3 Removal of Unit

The mounting guide can remain on DIN Rail and Power Supply can be removed.

1. While holding mounting guide, push unit upwards and unit will detach from mounting guide.

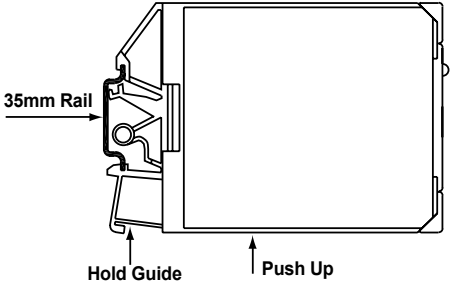


Figure 3.4 — Removal of Unit

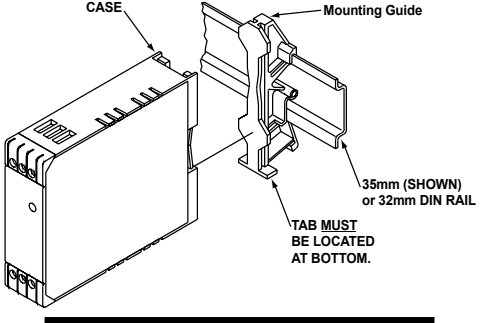


Figure 3.5 — Unit Removed

4.1 Block Diagram of Power Supply

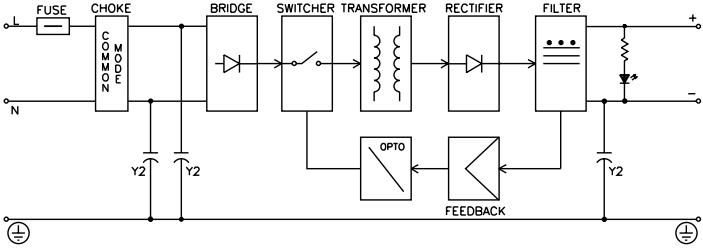


Figure 4.1 — Block Diagram

4.2 Wiring

Warning: Do not turn on the ac power to the power supply unit until you have completed all output connections. Failure to do so may result in injury!

This device must only be installed electrically by a specially trained electrician with corresponding qualifications.

Warning: To avoid potential electric shock use National Electrical Code (NEC) safety practices when wiring and connecting this unit to a power source.

4.2 Wiring (Continued)

115Vac - Single phase power wiring

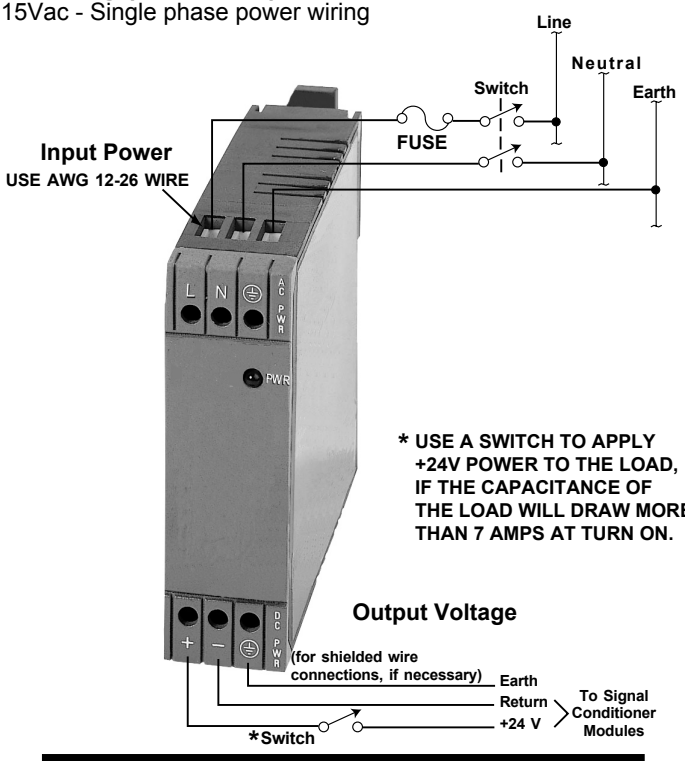


Figure 4.2— Wiring for 115Vac - Single Phase

4.3 Wiring (Continued)

230Vac - Two phase power wiring

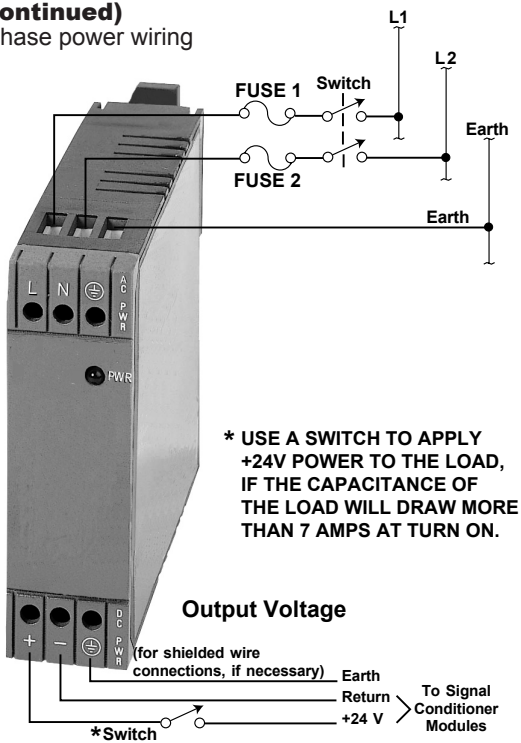


Figure 4.3— Wiring for 230Vac - Two Phase

INPUT POWER

Input Voltage:	115 - 240Vac ±10%
Frequency:	50/60 Hz
Current:	0.400A @ 103Vac 0.190A @ 265Vac
Overvoltage Protection:	275 Volt Varistor
Overcurrent Protection:	Fuse TR-5 800mA Time-lag / IEC 127-3
Input Wattage:	26 Watts

OUTPUT POWER

Output Voltage:	24Vdc ±2% @ 850mA (Resistive Load)
Output Wattage:	20 Watts*

* For higher output wattage greater than 20 watts follow the chart on section 7, Figure 6.2.

Ripple:	less than 100 mVrms
Operating Indicator:	Front Panel LED
Short-Circuit/ Overload Protection:	Current limiting with automatic short-circuit protection and temperature shutdown accomplished by the switcher.
Maximum number of Signal Conditioner modules powered:	Depends on module used and configuration (6-10 modules)

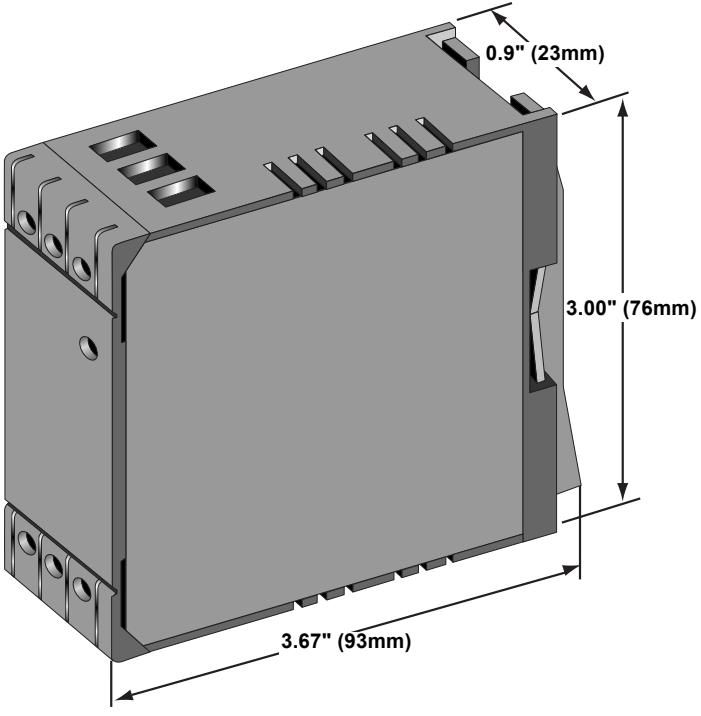
5 SPECIFICATIONS

GENERAL

Operating Temperature:	23° to 122°F(-5° to 50°C)
Storage Temperature:	-40° to 176°F(-40° to 80°C)
Mounting:	32 and 35mm DIN Rail
Size:	Height: 3.00" (76mm) Width: 0.9" (23mm) Depth: 3.67" (93mm)
Weight:	0.3 lbs. (0.14 kg)
Equipment Type: Overvoltage: Pollution Degree:	CLASS I CAT II 2
Insulation input to ouput:	Dielectric strength to 2500V transient based on EN61010 for 265Vrms working voltage

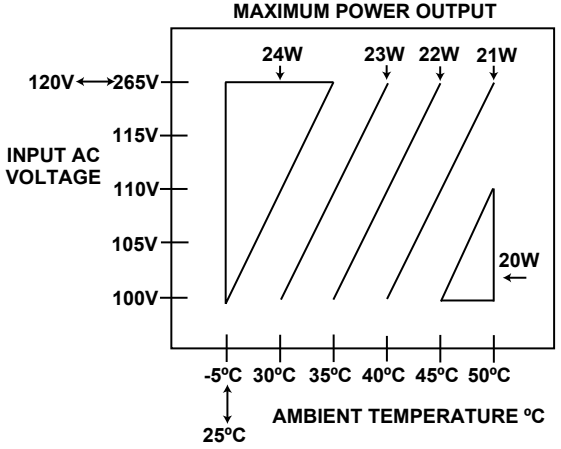
WIRE CONNECTIONS

Screw down wire clamps, AWG 12 to 26 (ferrules recommended for stranded wire).



7 INPUT AC VOLTAGE / POWER OUTPUT

AC INPUT CURRENT @ 100VAC INPUT	
OUTPUT POWER	**AC CURRENT**
20W	338mA
21W	355mA
22W	373mA
23W	392mA
24W	412mA



Example: If ambient is 50ºC, maximum wattage is 21W max. for 120-265Vac. If unit is operated at 21W at an input voltage of 100V, the maximum ambient temperature allowed is 40ºC.

Figure 6.2 — Temperature Derating Graph

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

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RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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PATENT NOTICE: This product is covered by one or more of the following patents: U.S. Pat. No. Des. 336,895; 5,274,577 / Canada 2052599; 2052600 / Italy 1249456; 1250938 / France Brevet No. 91 12756 / Spain 2039150; 2048066 / UK Patent No. GB2 249 837; GB2 248 954 / Germany DE 41 34398 C2
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