

User's Guide



Shop on line at

omega.com[®]

Ω OMEGA[®]

www.omega.com

e-mail: info@omega.com

iDRN-PS-1000
UNIVERSAL SWITCHING POWER SUPPLY
Compact DIN-Rail 24 Volt

omega.com[®]

Ω OMEGA

OMEGAnet™ On-Line Service
<http://www.omega.com>

Internet e-mail
info@omega.com

Servicing North America:

USA: One Omega Drive, P.O. Box 4047
ISO 9001 Certified Stamford, CT 06907-0047
TEL: (203) 359-1660 FAX: (203) 359-7700
e-mail: info@omega.com

Canada: 976 Bergar
Laval (Quebec) H7L 5A1
TEL: (514) 856-6928 FAX: (514) 856-6886
e-mail: info@omega.ca

For immediate technical or application assistance:

USA and Canada: Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®
Customer Service: 1-800-622-2378 / 1-800-622-BEST®
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN®
TELEX: 996404 EASYLINK: 62968934 CABLE: OMEGA

Mexico TEL: (001)800-TC-OMEGASM FAX: (001) 203-359-7807
En Español: (001) 203-359-7803 e-mail: info@omega.com.mx

Servicing Europe:

Benelux: Postbus 8034, 1180 LA Amstelveen, The Netherlands
TEL: +31 (0)20 6418405 FAX: +31 (0)20 6434643
Toll Free in Benelux: 0800 0993344
e-mail: nl@omega.com

Czech Republic: Rudé armády 1868, 733 01 Karviná 8
TEL: +420 (0)69 6311899 FAX: +420 (0)69 6311114
e-mail: czech@omega.com

France: 9, rue Denis Papin, 78190 Trappes
TEL: +33 (0)130 621 400 FAX: +33 (0)130 699 120
Toll Free in France: 0800406342
e-mail: france@omega.com

Germany/Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
TEL: +49 (0)7056 9398-0 FAX: +49 (0)7056 9398-29
Toll Free in Germany: 0800 TC-OMEGASM
e-mail: germany@omega.com

United Kingdom: One Omega Drive
ISO 9002 Certified River Bend Technology Centre
Northbank, Irlam
Manchester M44 5EX United Kingdom
TEL: +44 (0)161 777 6611 FAX: +44 (0)161 777 6622
Toll Free in the UK: 0800 488 488
e-mail: sales@omega.co.uk

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient connected applications.



This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as it contains important information relating to safety and EMC.



1.	General Information and Features	2
2.	Safety Considerations	3
3.	Installation and Removal	4
	3.1 Installation Clearance	5
	3.2 Mounting on DIN Rail	6
	3.3 Removal of Unit	7
4.	Input and Output Connections	8
	4.1 Block Diagram	8
	4.2 Wiring for 115 Vac - Single Phase	9
	4.3 Wiring for 230 Vac - Two Phase	10
5.	Specifications	11
	Input Power	11
	Output Power	11
	General	12
	Wire Connections	12
6.	Dimensions	13
7.	Temperature Derating Graph	14

GENERAL INFORMATION AND FEATURES

The compact iDRN 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 iDRN features include:

- Tested isolation, primary to output
- Recessed live parts and connector screws
- 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



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).

Note

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.

Note

- 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.

**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.

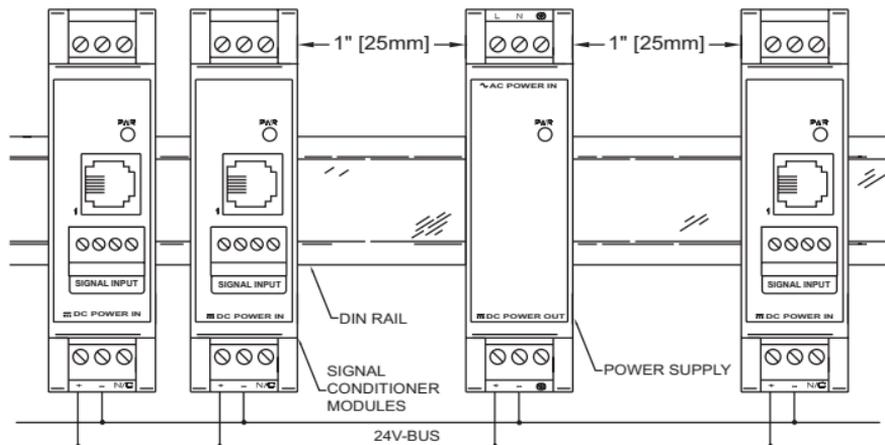


Figure 3.1 — Mounting

3.2 Mounting on DIN Rail

To install unit onto DIN Rail

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

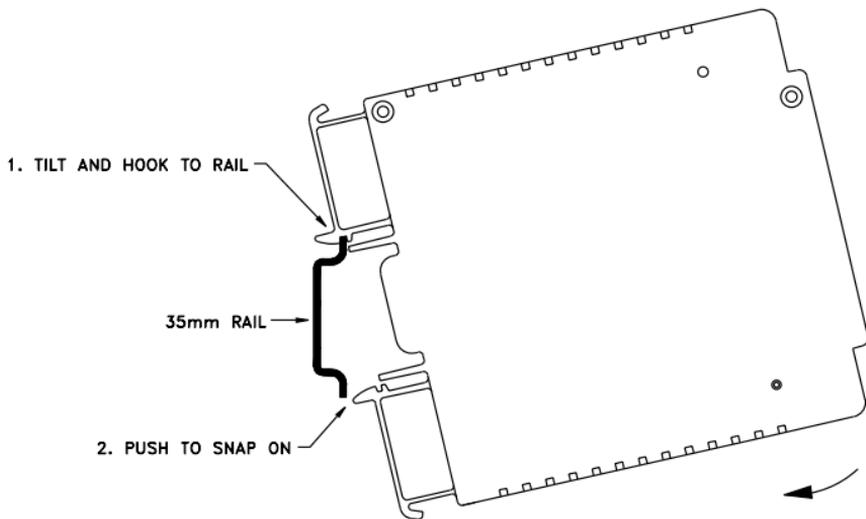


Figure 3.2 — Mounting on 35mm DIN Rail

3.3 Removal of Unit

1. Insert flat screw-driver into tab and push downwards.
2. Unit will detach from DIN Rail.

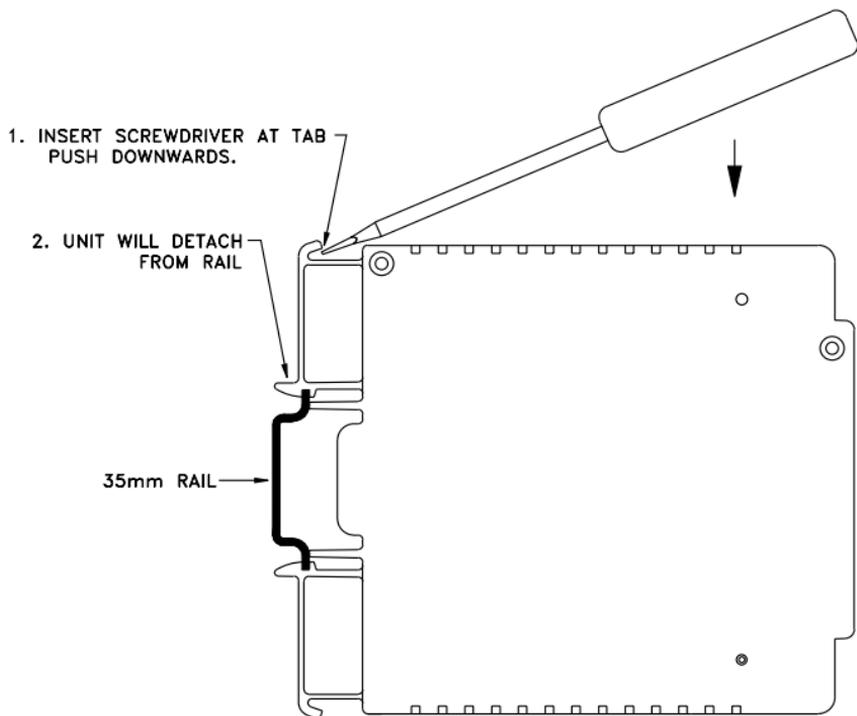


Figure 3.3 — Removal of Unit

4.1 Block Diagram of Power Supply

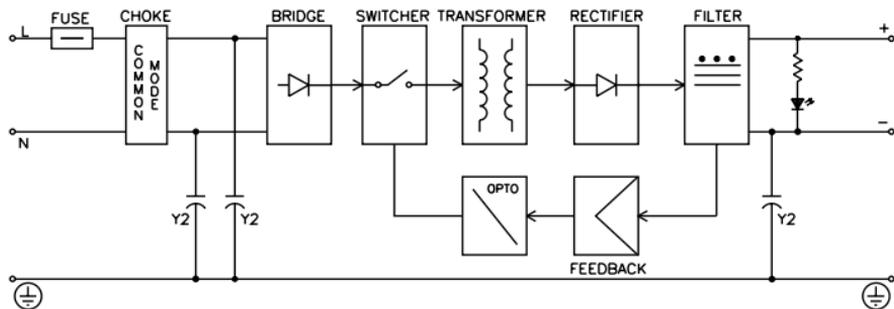


Figure 4.1 — Block Diagram

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.

INPUT AND OUTPUT CONNECTIONS

4

4.2 Wiring (Continued)

115Vac - Single phase power wiring

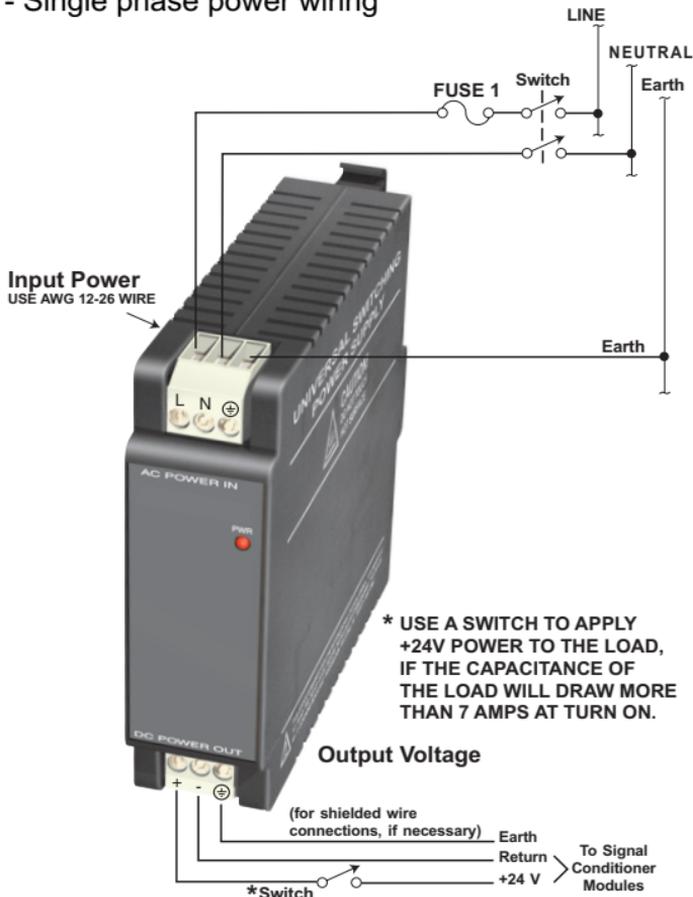
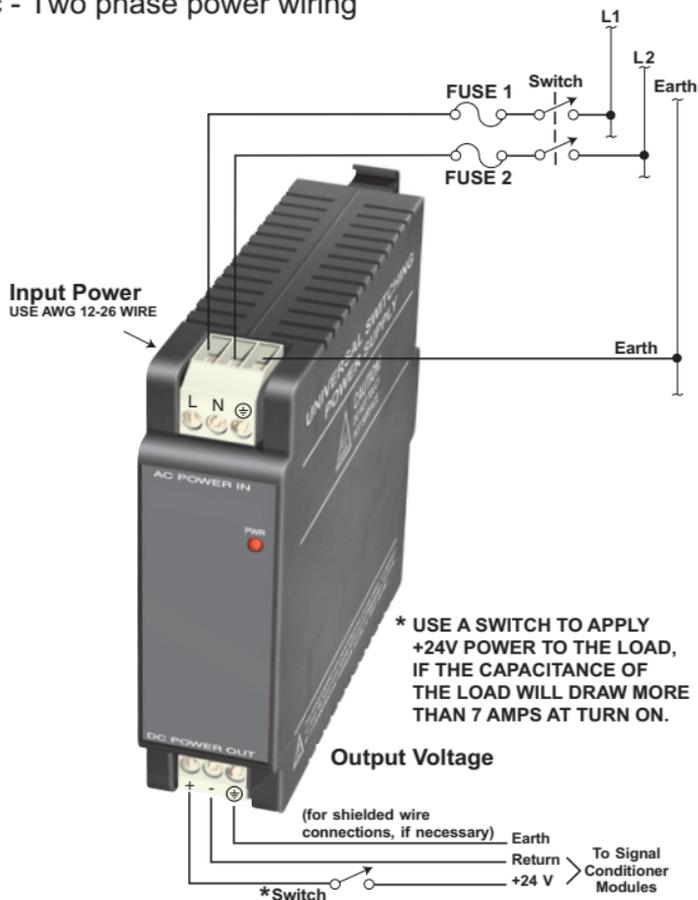


Figure 4.2— Wiring for 115Vac - Single Phase

4.3 Wiring (Continued)

230Vac - Two phase power wiring

**Figure 4.3— Wiring for 230Vac - Two Phase**

INPUT POWER

Input Voltage:	115 - 240Vac \pm 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 \pm 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.
--	---

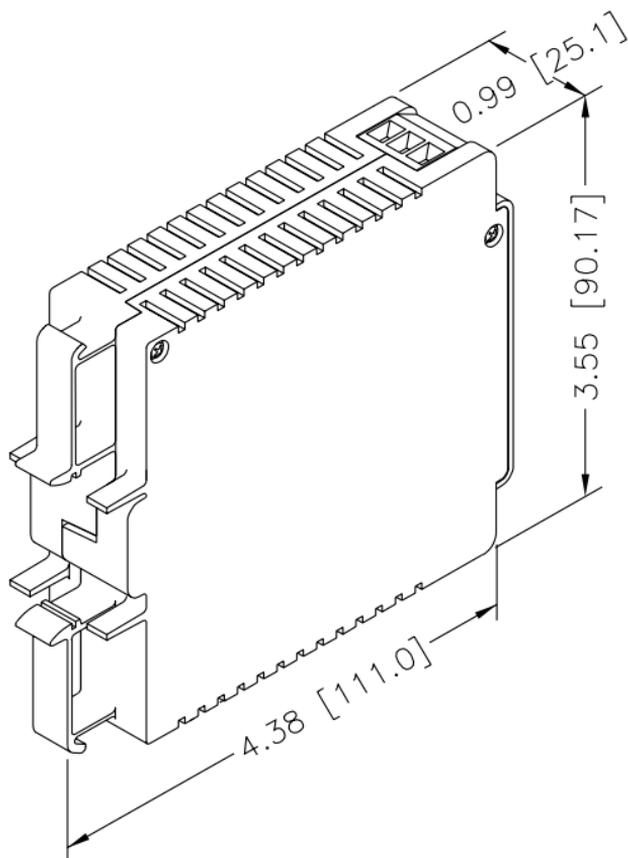
Maximum number of Signal Conditioner modules powered:	Depends on module used and configuration (6-10 modules)
---	---

GENERAL

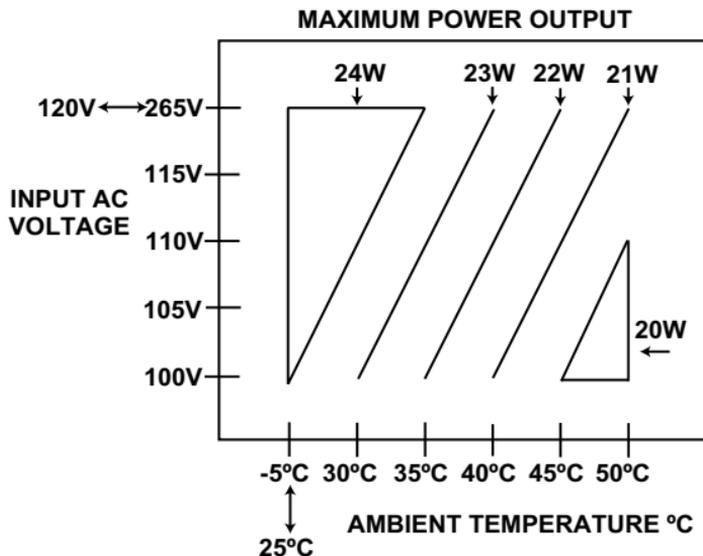
Operating Temperature:	23° to 122°F (-5° to 50°C)
Storage Temperature:	-40° to 176°F (-40° to 80°C)
Mounting:	35mm DIN Rail
Size:	Height: 3.55" (90mm) Width: 0.99" (25mm) Depth: 4.38" (111mm)
Weight:	0.3 lbs. (0.14 kg)
Equipment Type:	CLASS I
Overvoltage:	CAT II
Pollution Degree:	2
Insulation input to output:	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).



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



Example: If ambient is 50°C, 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 40°C.

Figure 6.2 — Temperature Derating Graph

NOTES





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.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

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.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 2002 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without prior written consent of OMEGA ENGINEERING, INC.

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

Used Under License. Other International Patents Pending.

Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!** *Shop on line at www.omega.com*

TEMPERATURE

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- ☑ Transducers & Strain Gauges
- ☑ Load Cells & Pressure Gauges
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

FLOW/LEVEL

- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

pH/CONDUCTIVITY

- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

DATA ACQUISITION

- ☑ Data Acquisition & Engineering Software
- ☑ Communications-Based Acquisition Systems
- ☑ Plug-in Cards for Apple, IBM & Compatibles
- ☑ Datalogging Systems
- ☑ Recorders, Printers & Plotters

HEATERS

- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- ☑ Metering & Control Instrumentation
- ☑ Refractometers
- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
- ☑ pH, Conductivity & Dissolved Oxygen Instruments