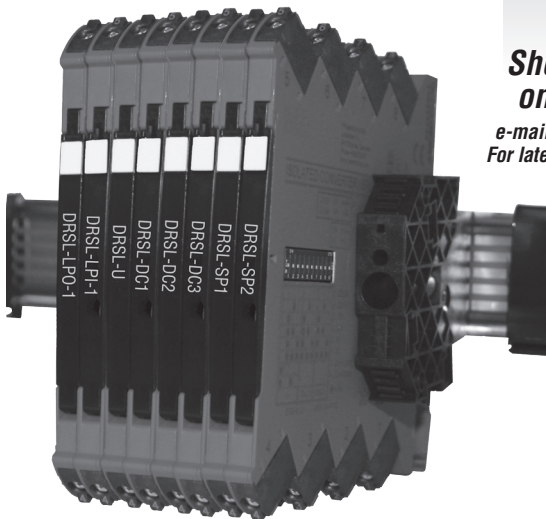


1 YEAR
WARRANTY



OMEGA[®] User's Guide



*Shop online at
omega.com[®]*

*e-mail: info@omega.com
For latest product manuals:
omegamanual.info*

**DRSL SERIES DIN RAIL ISOLATORS
and SIGNAL CONDITIONERS
DRSL-DC1, DRSL-DC2, DRSL-DC3,
DRSL-SP1, and DRSL-SP2**



omega.com info@omega.com

Servicing North America:

U.S.A.: Omega Engineering, Inc., One Omega Drive, P.O. Box 4047
Stamford, CT 06907-0047 USA
Toll-Free: 1-800-826-6342 (USA & Canada only)
Customer Service: 1-800-622-2378 (USA & Canada only)
Engineering Service: 1-800-872-9436 (USA & Canada only)
Tel: (203) 359-1660 Fax: (203) 359-7700
e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide

The information contained in this document is believed to be correct, but OMEGA 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, human applications.

DRSL SERIES OF ISOLATORS AND SIGNAL CONDITIONERS

DRSL-DC1 / DRSL-DC2 / DRSL-DC3 / DRSL-SP1 / DRSL-SP2 CONTENTS

Warning.....	2
Safety instructions.....	4
UL installation	4
Flexible supply.....	7
Mounting and demounting of system DRSL SERIES.....	8
Installation on DIN rail	9
Supply of power rail.....	9
Side label.....	9
Highlights.....	10
Applications.....	10
Product overview.....	11
Electrical specifications.....	13
Connections	15
Installation on power rail.....	16
Marking	16
DIP-switch programming	17
DRSL-DC2	17
DRSL-DC3	18
DRSL-SP2	18
LED indication	19

NB.: Click on the entries in the table of contents to go to the desired section.



GENERAL

WARNING

To avoid the risk of electric shock and fire, the safety instructions of this manual must be observed and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the following.

Prior to the commissioning of the device, this manual must be examined carefully.

Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Until the device is fixed, do not connect hazardous voltages to the device.

Repair of the device must be done by OMEGA ENGINEERING only.



**HAZARD-
OUS
VOLTAGE**

WARNING

In applications where hazardous voltage is connected to in-/outputs of the device, sufficient spacing or isolation from wires, terminals and enclosure to surroundings (incl. neighbouring devices), must be ensured to maintain protection against electric shock.



CAUTION

Potential electrostatic charging hazard. To avoid the risk of explosion due to electrostatic charging of the enclosure, do not handle the units unless the area is known to be safe, or appropriate safety measures are taken to avoid electrostatic discharge.

SYMBOL IDENTIFICATION



Triangle with an exclamation mark: Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage.



The CE mark proves the compliance of the device with the essential requirements of the directives.

SAFETY INSTRUCTIONS

RECEIPT AND UNPACKING

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until this has been permanently mounted.

ENVIRONMENT

Avoid direct sunlight, dust, high temperatures, mechanical vibrations and shock, as well as rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation. All devices can be used for Measurement/Overvoltage Category II and Pollution Degree 2. The module is designed to be safe at least under an altitude up to 2 000 m.

MOUNTING

Only technicians who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these should connect the device.

Should there be any doubt as to the correct handling of the device, please contact,
OMEGA Engineering, Inc.
www.omega.com

Mounting and connection of the device should comply with national legislation for mounting of electric materials, i.e. wire cross section, protective fuse, and location.

Descriptions of input / output and supply connections are shown in this manual and on the side label.

The device is provided with field wiring terminals and shall be supplied from a Power Supply having double / reinforced insulation. A power switch should be easily accessible and close to the device. The power switch shall be marked as the disconnecting unit for the device.

DRSL Series must be mounted on a DIN rail according to EN 60715.

UL INSTALLATION

Use 60/75°C copper conductors only.

Wire size AWG 26-12

UL file number E70366

The device is an Open Type Listed Process Control Equipment. To prevent injury resulting from accessibility to live parts the equipment must be installed in an enclosure.

The power supply unit must comply with NEC Class 2, as described by the National Electrical Code® (ANSI / NFPA 70).

CLEANING

When disconnected, the device may be cleaned with a cloth moistened with distilled water.

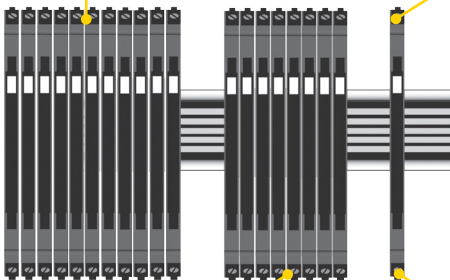
FLEXIBLE SUPPLY

The units can be supplied with 24 VDC \pm 30% via direct wiring and a loop between the devices. This permits the supply of up to 130 units.

The power connector unit DRSL-PCU is a standalone supply unit which supplies the power rail. With DRSL-PCU, up to 100 units can be supplied.

Protective fuse: 2.5 A.

Protective fuse: 2.5 A.



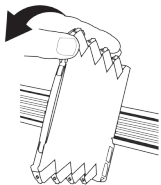
Protective fuse: 0.4 A.

DRSL-PCU

Alternatively, the 24 V supply voltage can be distributed via a power rail that receives the voltage from another connected unit (DRSL-DC1, DRSL-DC2, DRSL-DC3, DRSL-SP1, DRSL-SP2, or DRSL-U). In this way up to 20 units can be supplied.

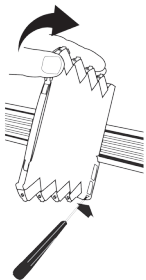
Fuse characteristics: The 2.5 A fuse must break after not more than 120 seconds at 6.4 A.

MOUNTING AND DEMOUNTING OF SYSTEM DRSL-SERIES



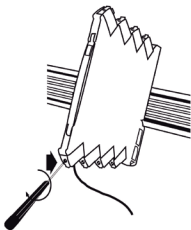
Picture 1:

Mounting on DIN rail / power rail.
Click the device onto the rail



Picture 2:

Demounting from DIN rail / power rail .
First, remember to demount the connectors with hazardous voltages. Detach the device from the rail by lifting the bottom lock.

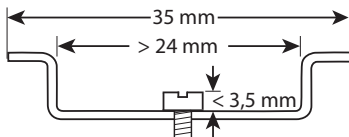


Picture 3:

Wire size 0.13 x 2.5 mm² stranded wire.
Screw terminal torque 0.5 Nm.

INSTALLATION ON DIN RAIL

To avoid short circuit between the power rail connectors on the DRSL devices and the screws holding the 7.5 mm DIN rail, the head of the screws shall be no more than 3.5 mm high.



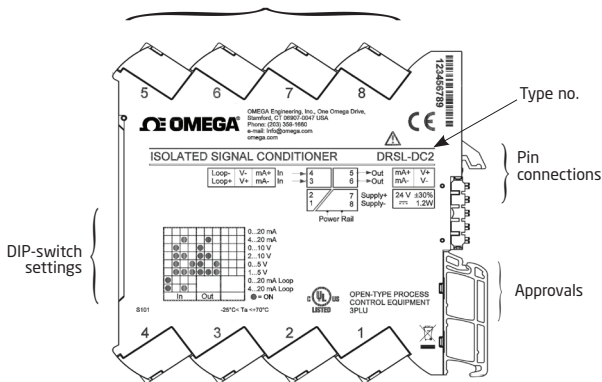
SUPPLY OF POWER RAIL

It is possible to supply the power rail via the supply terminals.

The terminals can pass a current of max. 400 mA.

SIDE LABEL

Terminal numbers



DRSL SERIES OF ISOLATORS AND SIGNAL CONDITIONERS DRSL-DC1 / DRSL-DC2 / DRSL-DC3 / DRSL-SP1 / DRSL-SP2

The product family DRSL-DC1, DRSL-DC2, DRSL-DC3, DRSL-SP1 & DRSL-SP2 are slimline isolators for 24 VDC fixed supply and can be used for different purposes.

Highlights

- *Can be supplied separately or installed on power rail*
- *Can be delivered with customer scaling on request*
- *Approvals by CE, and UL*
- *Possibility of loop supply output*

Applications

The DRSL isolator family are designed for the automation and process industries. These devices are the result of extensive development and test procedures making them very well suited for conversion and galvanic isolation in the following applications:

- Isolation and 1:1 conversion of current signals in the range 0...20 mA.
- Isolation and conversion of standard DC signals.
- Power supply and signal isolator for 2-wire transmitters.
- Isolation and splitting of standard DC signals.

Product overview

Model no.	DRSL-DC1	DRSL-DC2	DRSL-DC3
Product name	Isolated repeater	Isolated signal conditioner	Isolated signal conditioner
Description	Fixed loop isolator / repeater.	Loop isolator / signal conditioner for standard DC signals. DIP-switch setup.	Loop isolator / signal conditioner for standard DC signals. DIP-switch setup. Low cost.
Parameterisation	None	DIP-switch	DIP-switch
Input signal	0...20 mA	0/2...10 V 0/1...5 V 0/4...20 mA	0/2...10 V 0/1...5 V 0/4...20 mA
2-wire supply		>17 V @ 20 mA	
Output signal (active)	0...20 mA (1:1)	0/2...10 V 0/1...5 V 0/4...20 mA	0/2...10 V 0/1...5 V 0/4...20 mA
Approvals	UL, safety	UL, safety	UL, safety

Model no.	DRSL-SP1	DRSL-SP2
Product name	Isolated repeater / splitter	Isolated signal conditioner/ splitter
Description	Fixed loop isolator / repeater with dual output.	Loop isolator / signal conditioner for standard DC signals. DIP-switch setup. Dual output.
Parameterisation	None	DIP-switch
Input signal	0...20 mA	0/2...10 V 0/1...5 V 0/4...20 mA
2-wire supply		>17 V @ 20 mA
Output signal (active)	0...20 mA (1:1)	0/2...10 V 0/1...5 V 0/4...20 mA
Approvals	UL, safety	UL, safety

Electrical specifications

Specifications range	-25°C to +70°C
Specifications range, DRSL-DC3	0 to +70°C
Storage temperature	-40°C to +85°C

Supply voltage, DC	16.8...31.2 VDC
Internal consumption, typ. / max.	0.4 W / 0.65 W
Max. consumption.....	≤ 1.2 W
Max. consumption, DRSL-DC1, DRSL-DC3, DRSL-SP1	≤ 0.8 W
Isolation voltage, test.....	2.5 kVAC
Isolation voltage, working.....	300 VAC
Double isolation.....	Input / output 1 / output 2 / supply
Accuracy	< ±0.05% of span
Accuracy, DRSL-DC3.....	< ±0.2% of span
Temperature coefficient.....	< ±0.01% of span / °C
Temperature coefficient, DRSL-DC3.....	< ±0.015% of span / °C

EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Signal / noise ratio	Min. 60 dB
Response time (0...90%, 100...10%): mA / V input	< 7 ms
Calibration temperature	20...28°C
2-wire supply (terminal 3...4).....	> 17 VDC / 20 mA
Relative humidity.....	< 95% RH (non-cond.)
Dimensions (HxWxD).....	113 x 6.1 x 115 mm
DIN rail type.....	EN 60715 - 35 mm
Protection degree.....	IP20
Weight	70 g

Current input

Measurement range.....	0...20.5 mA
Programmable measurement ranges.....	0...20 and 4...20 mA
Functional range	0...23 mA
Input voltage drop.....	< 1.5 VDC
Input resistance.....	Nom. 20 Ω + PTC 50 Ω

Voltage input

Measurement range.....	0...10.25 VDC
Programmable measurement ranges.....	0...10 / 2...10 / 0...5 / 1...5 VDC
Functional range	0...11.5 VDC / 0...5.75 VDC
Input resistance.....	≥ 500 kΩ

Current output

Signal range (span)	0...20.5 mA
Programmable signal ranges.....	0...20 / 4...20 mA
Load (max.), DRSL-DC1, DRSL-DC2, DRSL-DC3	23 mA / 600 Ω / 13.8 VDC
Load (max.), DRSL-SP1, DRSL-SP2.....	23 mA / 300 Ω / 6.9 VDC
Load stability	< 0.002% of span / 100 Ω
Current limit	≤ 28 mA

Voltage output

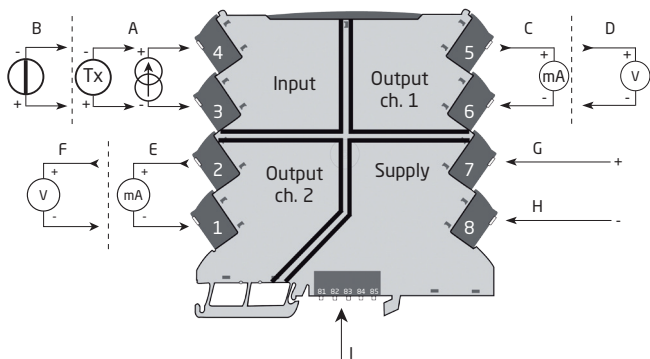
Signal range	0...10 VDC
Programmable signal ranges.....	0...10 / 2...10 / 0...5 / 1...5 VDC
Load (min.)	> 10 kΩ

of span = of the selected range

Approvals

EMC 2004/108/EC	EN 61326-1
LVD 2006/95/EC.....	EN 61010-1
UL, Standard for Safety	UL 61010-1
Safe Isolation.....	EN 61140

CONNECTIONS

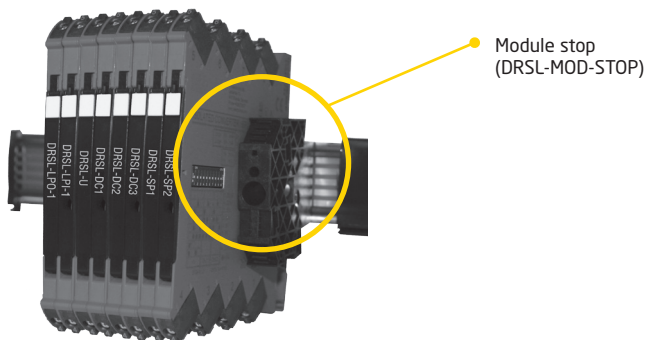


	Input signals	DRSL-DC1	DRSL-DC2	DRSL-DC3	DRSL-SP1	DRSL-SP2
A	Current	x	x	x	x	x
B	Voltage		x	x		x

	Output signals	DRSL-DC1	DRSL-DC2	DRSL-DC3	DRSL-SP1	DRSL-SP2
C	Current 1	x	x	x	x	x
D	Voltage 1		x	x		x
E	Current 2				x	x
F	Voltage 2					x

	Supply	DRSL-DC1	DRSL-DC2	DRSL-DC3	DRSL-SP1	DRSL-SP2
G	Supply +	x	x	x	x	x
H	Supply -	x	x	x	x	x
I	Power rail connections	x	x	x	x	x

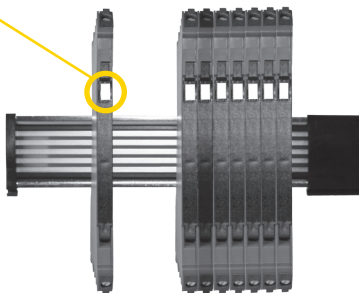
INSTALLATION ON POWER RAIL



All devices can be installed on a power rail (part number DRSL-PWR-RAIL). Power supply units can be mounted on the power rail according to customer requirements.

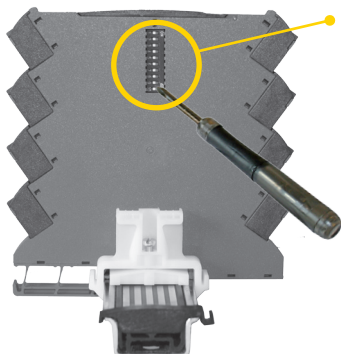
MARKING

The front cover of the DRSL series has been designed with an area for affixation of a click-on marker. The area assigned to the marker measures 5 x 7.5 mm. Markers from Weidmüller's MultiCard System, type MF 5/7.5, are suitable.



DIP-SWITCH PROGRAMMING

The devices DRSL-DC2, DRSL-DC3 and DRSL-SP2 can be configured via DIP-switches. The DIP-switches are located on the side of the device and can be adjusted with a small screwdriver or other implement.



Adjustment of DIP-switches.

Default factory settings are:

Input = 0...20 mA

Output = 0...20 mA

All DIP-switches in the OFF position

The tables below show the configuration based on DIP-switch settings.

NA = no function of DIP-switch.

DRSL-DC2

Input setup					Output setup						
	1	2	3	4		5	6	7	8	9	10
0...20 mA	OFF	OFF	OFF	OFF	0...20 mA	OFF	OFF	OFF	NA	NA	NA
4...20 mA	OFF	OFF	ON	OFF	4...20 mA	OFF	ON	OFF	NA	NA	NA
0...10 V	OFF	ON	OFF	OFF	0...10 V	ON	OFF	OFF	NA	NA	NA
2...10 V	OFF	ON	ON	OFF	2...10 V	ON	ON	OFF	NA	NA	NA
0...5 V	OFF	ON	OFF	ON	0...5 V	ON	OFF	ON	NA	NA	NA
1...5 V	OFF	ON	ON	ON	1...5 V	ON	ON	ON	NA	NA	NA
0...20 mA Tx	ON	OFF	OFF	OFF							
4...20 mA Tx	ON	OFF	ON	OFF							

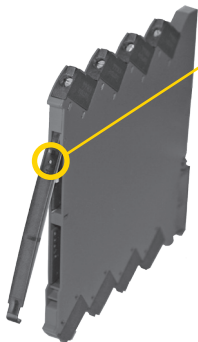
DRSL-DC3

Input setup					Output setup						
	1	2	3	4		5	6	7	8	9	10
0...20 mA	NA	OFF	OFF	OFF	0...20 mA	OFF	OFF	OFF	NA	NA	NA
4...20 mA	NA	OFF	ON	OFF	4...20 mA	OFF	ON	OFF	NA	NA	NA
0...10 V	NA	ON	OFF	OFF	0...10 V	ON	OFF	OFF	NA	NA	NA
2...10 V	NA	ON	ON	OFF	2...10 V	ON	ON	OFF	NA	NA	NA
0...5 V	NA	ON	OFF	ON	0...5 V	ON	OFF	ON	NA	NA	NA
1...5 V	NA	ON	ON	ON	1...5 V	ON	ON	ON	NA	NA	NA

DRSL-SP2

Input setup					Output setup						
					Channel 1			Channel 2			
	1	2	3	4		5	6	7	8	9	10
0...20 mA	OFF	OFF	OFF	OFF	0...20 mA	OFF	OFF	OFF	OFF	OFF	OFF
4...20 mA	OFF	OFF	ON	OFF	4...20 mA	OFF	ON	OFF	OFF	ON	OFF
0...10 V	OFF	ON	OFF	OFF	0...10 V	ON	OFF	OFF	ON	OFF	OFF
2...10 V	OFF	ON	ON	OFF	2...10 V	ON	ON	OFF	ON	ON	OFF
0...5 V	OFF	ON	OFF	ON	0...5 V	ON	OFF	ON	ON	OFF	ON
1...5 V	OFF	ON	ON	ON	1...5 V	ON	ON	ON	ON	ON	ON
0...20 mA Tx	ON	OFF	OFF	OFF							
4...20 mA Tx	ON	OFF	ON	OFF							

LED INDICATION



The device is equipped with a green power LED in the front to indicate the operation status, see the table below.

LED	Condition	Output and loop supply	Action required
OFF	No supply / device error or code-flash CRC error	De-energized	Connect supply / replace device
1 Flash (0.5 s OFF + 0.5 s ON)	Power-up or restart	De-energized	-
Flashing 13 Hz (15 ms ON)	Device OK	Energized	-
Flashing 1 Hz (15 ms ON)	Illegal DIP-switch setting	De-energized	Correct setting and re-power device
Flashing 1 Hz (0.5 s ON)	Restarting due to: Supply error/hardware. RAM or program flow error	De-energized	Adjust supply / replace device

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's 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 malfunctions, 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 having been 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 in which wear is not warranted, include but are 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 the company 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. Purchase Order 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. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the 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 2014 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 the prior written consent of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!**

Shop online at omega.comSM

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 Gages
- ☑ Load Cells & Pressure Gages
- ☑ 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
- ☑ Data Logging 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