

1 YEAR
WARRANTY



Ω OMEGA™ **User's Guide**

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Model DFG-RSA
Configurable Load Cell Adapter



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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.

Thank you...

Thank you for purchasing an Omega Model DFG-RSA adapter and software, used to connect common strain gage-based load cells, force sensors, and torque sensors to Omega models DFG-RS5 and DFG-RS3 indicators.

With proper usage, we are confident that you will get many years of great service with this product. Omega instruments are ruggedly built for many years of service in laboratory and industrial environments.

This User's Guide provides setup, safety, and operation instructions. For additional information or answers to your questions, please do not hesitate to contact us. Our technical support and engineering teams are eager to assist you.

Before use, each person who is to use this product should be fully trained in appropriate operation and safety procedures.

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1 OVERVIEW

1.1 List of included items

Qty.	Item
1	DFG-RSA adapter
1	Strain relief
1	Resource CD (Adapter Configuration software, USB driver, user's guides)

1.2 General Overview

The DFG-RSA adapter is designed to interface a user-supplied load cell, force sensor, or torque sensor with Omega indicators. The adapter may be programmed to the appropriate load capacity with a software utility through USB or RS-232 connection to the indicator.

All configuration and calibration information is saved within the adapter, allowing for interchangeability between multiple sensors (including certain standard Omega sensors).

1.3 Compatible Equipment

The DFG-RSA adapter is compatible with load cells and sensors meeting the following specifications:

- **Type: Full bridge**
- **Resistance: 300 – 1000 ohms**
- **Sensitivity: 1 – 3 mV/V full scale**

2 MECHANICAL SETUP

Sensors meeting the above specifications are supplied with a cable with four leads, for the following functions:

EXCITATION +
EXCITATION –
SIGNAL +
SIGNAL –

These leads are typically color coded. Refer to the sensor's data sheet for details.

Note: Ensure that the signal leads have been installed into the appropriate terminal blocks. Some sensor manufacturers consider SIGNAL + to be a compression value, while others consider it to be a tension value. If these leads are installed incorrectly, the indicator will display the opposite tension/compression indicator, and calibration cannot take place. Switching the leads will fix the issue. Refer to the indicators' user's guides for details.

The DFG-RSA adapter contains a circuit board with a screw terminal block to allow for the connection of these leads. Refer to the following procedure for setup instructions:

1. Access the circuit board inside the DFG-RSA adapter by loosening two Phillips head screws and removing the cover, as shown in the image below:



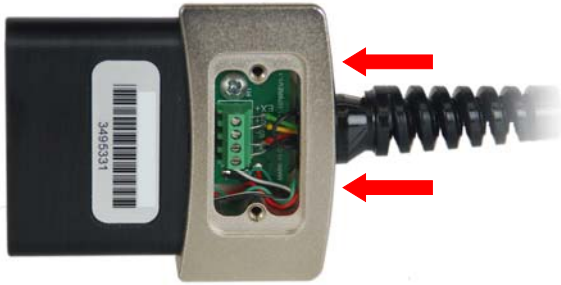
The screw terminal block will be visible, along with labels referencing the functions listed above:



2. Feed the four leads through the supplied strain relief (pictured above) and into the body of the adapter.
3. Using a flat screwdriver, loosen the four screws in the terminal block until the sensor leads can be inserted into the appropriate receptacles. After insertion of the leads, tighten the screws, as shown in the image below:



4. Install the strain relief by pressing it into the receptacle in the DFG-RSA housing, as illustrated below:



5. Reinstall the cover and tighten the two Phillips screws.

3 SOFTWARE INSTALLATION

The DFG-RSA adapter is programmed by a PC running the included software utility. Communication is achieved through an Omega indicator and a USB or RS-232 connection.

3.1 Computer requirements

A PC running Windows 2000 or later operating system with screen resolution of 1024 x 768 minimum, is required to run the software. An RS-232C serial port or USB port (virtual COM port) is required to communicate with the indicator. A CD-ROM drive is needed for software installation. If USB communication is required, be sure to install the appropriate USB driver. A USB driver and user's guide are provided in the contents of the *Resource CD*.

3.2 Installation instructions

Installing from a CD

Insert the CD into the computer's CD-ROM drive. If *AutoRun* is enabled on the computer, the setup program will run automatically. If not, the setup program may be run manually. Click the **START** button on the Windows task bar, select "Run...", type "D:\setup" in the dialog box and press **ENTER**. Alternately, using *My Computer* or *Windows Explorer*, navigate to the CD-ROM drive and double-click the file "setup.exe". Follow the prompts on the screen to install the software.

Installing from the website

If downloading from the website, it is important to unzip/extract the files first, and then run the file "setup.exe". Follow the prompts on the screen to install the software.

3.3 Running the software

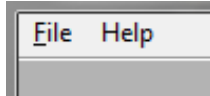
When the installation is complete, the program can be found in:

Programs > Omega Software > DFG-RSA Adapter Configuration

4 USING THE SOFTWARE

When software installation has been completed, plug the DFG-RSA adapter into the indicator, and connect a USB or RS-232 cable between the indicator and the PC.

4.1 General Menus



File

Close – Click to exit the program.

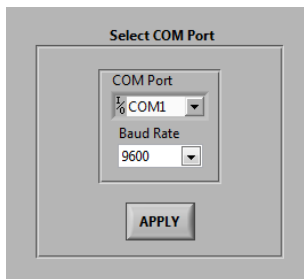
Help

User's Guide – Click to open the user's guide PDF document (Adobe Reader is required and is downloadable from the Adobe website).

About

Click to display general software information, including the version number.

4.2 COM Port Settings



Use this screen to configure the PC's COM port to which the indicator is connected.

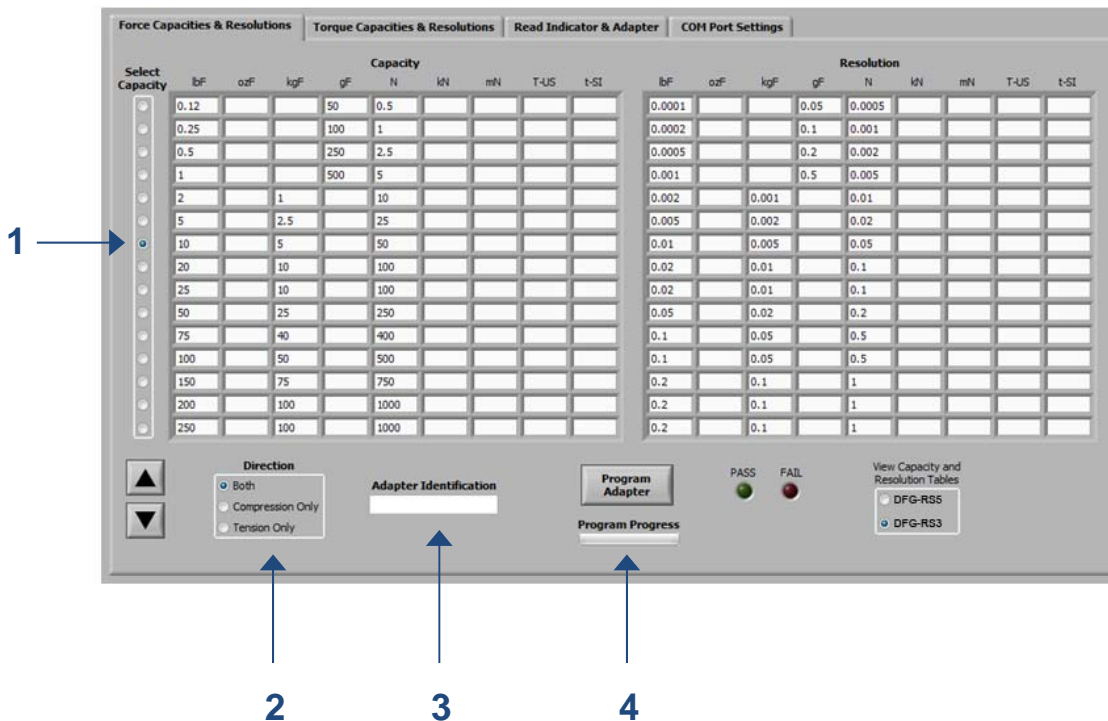
COM Port

Select the appropriate COM port from the dropdown list. Clicking **Refresh** updates the list with all installed ports. The COM port associated with the indicator can be identified under the *Ports* sub-section of *Device Manager* in *Windows*.

Baud Rate

Select the baud rate of the serial port. The default setting is 9600 baud. Be sure to configure the baud rate to match that of the indicator.

4.3 Force / Torque Capacities & Resolutions



Use the **Force Capacities & Resolutions** and **Torque Capacities & Resolutions** screens to program the capacity appropriate for the sensor. The number of available units of measurement and displayed resolution depend on the indicator being used. Refer to Section 5 for detailed information.

Refer to the following procedure:

1. Select the appropriate capacity. Use the ▲ and ▼ arrows to scroll through additional capacities. The Capacity table shows the available units of measurement and their corresponding capacities. The Resolution table displays the increment size for each of the available units.

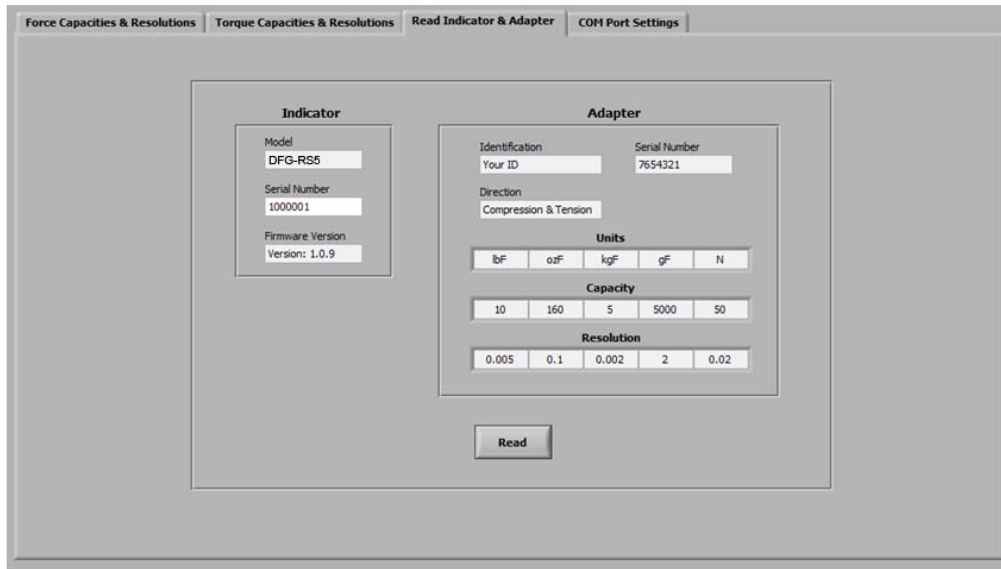
Select the **Model DFG-RS5** or **Model DFG-RS3** radio button in the lower right corner of the screen to display the units and resolutions available for each indicator.

2. The software may be used to configure a bi-directional sensor, such as an S-beam, or single direction sensor, such as a load button. Select the appropriate direction.
3. Optionally enter an identification number for the sensor. This number will be displayed in the indicator's power-up sequence and **Information** screen.

Note: The identification number may not begin with the letter sequence "MR".

4. Click **Program Adapter**. A progress bar is supplied below this button, for visual convenience. **Do not** disconnect the communication cable until this process is complete, denoted by the **PASS** or **FAIL** indicator.

4.4 Read Indicator & Adapter



Use this screen to view information about the sensor and indicator. Click **Read** to view the indicator model number, serial number, and firmware version. The sensor's identification number, serial number, direction(s), capacities, and resolutions are also visible.

Note: The adapter's serial number is programmed at the factory and cannot be modified.

5 CAPACITIES & RESOLUTIONS

5.1 Force Capacities & Resolutions – with Model DFG-RS5

Capacity									Resolution								
lbF	ozF	kgF	gF	N	kN	mN	T-US*	t-SI*	lbF	ozF	kgF	gF	N	kN	mN	T-US*	t-SI*
0.12	2	-	50	0.5	-	500	-	-	0.00005	0.001	-	0.02	0.0002	-	0.2	-	-
0.25	4	-	100	1	-	1000	-	-	0.0001	0.002	-	0.05	0.0005	-	0.5	-	-
0.5	8	-	250	2.5	-	2500	-	-	0.0002	0.005	-	0.1	0.001	-	1	-	-
1	16	-	500	5	-	5000	-	-	0.0005	0.01	-	0.2	0.002	-	2	-	-
2	32	1	1000	10	-	-	-	-	0.001	0.02	0.0005	0.5	0.005	-	-	-	-
5	80	2.5	2500	25	-	-	-	-	0.002	0.05	0.001	1	0.01	-	-	-	-
10	160	5	5000	50	-	-	-	-	0.005	0.1	0.002	2	0.02	-	-	-	-
20	320	10	10000	100	-	-	-	-	0.01	0.2	0.005	5	0.05	-	-	-	-
25	400	10	10000	100	-	-	-	-	0.01	0.2	0.005	5	0.05	-	-	-	-
50	800	25	25000	250	-	-	-	-	0.02	0.5	0.01	10	0.1	-	-	-	-
75	1200	40	40000	400	-	-	-	-	0.05	0.5	0.02	20	0.2	-	-	-	-
100	1600	50	50000	500	-	-	-	-	0.05	1	0.02	20	0.2	-	-	-	-
150	2400	75	75000	750	-	-	-	-	0.1	2	0.05	50	0.5	-	-	-	-
200	3200	100	100000	1000	-	-	-	-	0.1	2	0.05	50	0.5	-	-	-	-
250	4000	100	-	1000	1	-	-	-	0.1	2	0.05	-	0.5	0.0005	-	-	-
300	4800	150	-	1500	1.5	-	-	-	0.2	5	0.1	-	1	0.001	-	-	-
500	8000	250	-	2500	2.5	-	-	-	0.2	5	0.1	-	1	0.001	-	-	-
750	12000	400	-	4000	4	-	-	-	0.5	10	0.2	-	2	0.002	-	-	-
1000	16000	500	-	5000	5	-	-	-	0.5	10	0.2	-	2	0.002	-	-	-
1500	24000	750	-	7500	7.5	-	-	-	1	20	0.5	-	5	0.005	-	-	-
2000	-	1000	-	-	10	-	1	1	1	-	0.5	-	-	0.005	-	0.0005	0.0005
2500	-	1000	-	-	10	-	1	1	1	-	0.5	-	-	0.005	-	0.0005	0.0005
3000	-	1500	-	-	15	-	1.5	1.5	2	-	1	-	-	0.01	-	0.001	0.001
5000	-	2500	-	-	25	-	2.5	2.5	2	-	1	-	-	0.01	-	0.001	0.001
7500	-	4000	-	-	40	-	4	4	5	-	2	-	-	0.02	-	0.002	0.002
10000	-	5000	-	-	50	-	5	5	5	-	2	-	-	0.02	-	0.002	0.002
15000	-	7500	-	-	75	-	7.5	7.5	10	-	5	-	-	0.05	-	0.005	0.005
20000	-	10000	-	-	100	-	10	10	10	-	5	-	-	0.05	-	0.005	0.005
25000	-	10000	-	-	100	-	10	10	10	-	5	-	-	0.05	-	0.005	0.005
30000	-	15000	-	-	150	-	15	15	20	-	10	-	-	0.1	-	0.01	0.01
50000	-	25000	-	-	250	-	25	25	20	-	10	-	-	0.1	-	0.01	0.01
75000	-	40000	-	-	400	-	40	40	50	-	20	-	-	0.2	-	0.02	0.02
100000	-	50000	-	-	500	-	50	50	50	-	20	-	-	0.2	-	0.02	0.02
150000	-	75000	-	-	750	-	75	75	100	-	50	-	-	0.5	-	0.05	0.05
200000	-	100000	-	-	1000	-	100	100	100	-	50	-	-	0.5	-	0.05	0.05
250000	-	100000	-	-	1000	-	100	100	100	-	50	-	-	0.5	-	0.05	0.05
300000	-	150000	-	-	1500	-	150	150	200	-	100	-	-	1	-	0.1	0.1
500000	-	250000	-	-	2500	-	250	250	200	-	100	-	-	1	-	0.1	0.1
750000	-	400000	-	-	4000	-	400	400	500	-	200	-	-	2	-	0.2	0.2

* T-US = US ton
t-SI = metric ton

5.2 Force Capacities & Resolutions – with Model DFG-RS3

Capacity					Resolution				
lbF	kgF	gF	N	kN	lbF	kgF	gF	N	kN
0.12	-	50	0.5	-	0.0001	-	0.05	0.0005	-
0.25	-	100	1	-	0.0002	-	0.1	0.001	-
0.5	-	250	2.5	-	0.0005	-	0.2	0.002	-
1	-	500	5	-	0.001	-	0.5	0.005	-
2	1	-	10	-	0.002	0.001	-	0.01	-
5	2.5	-	25	-	0.005	0.002	-	0.02	-
10	5	-	50	-	0.01	0.005	-	0.05	-
20	10	-	100	-	0.02	0.01	-	0.1	-
25	10	-	100	-	0.02	0.01	-	0.1	-
50	25	-	250	-	0.05	0.02	-	0.2	-
75	40	-	400	-	0.1	0.05	-	0.5	-
100	50	-	500	-	0.1	0.05	-	0.5	-
150	75	-	750	-	0.2	0.1	-	1	-
200	100	-	1000	-	0.2	0.2	-	2	-
250	100	-	1000	-	0.2	0.2	-	2	-
300	150	-	1500	-	0.5	0.2	-	2	-
500	250	-	2500	-	0.5	0.2	-	2	-
750	400	-	4000	-	1	0.5	-	5	-
1000	500	-	5000	-	1	0.5	-	5	-
1500	750	-	7500	-	2	1	-	10	-
2000	1000	-	10000	-	2	1	-	10	-
2500	1000	-	10000	-	2	1	-	10	-
3000	1500	-	15000	-	5	2	-	20	-
5000	2500	-	25000	-	5	2	-	20	-
7500	4000	-	40000	-	10	5	-	50	-
10000	5000	-	50000	-	10	5	-	50	-
15000	7500	-	75000	-	20	10	-	100	-
20000	10000	-	100000	-	20	10	-	100	-
25000	10000	-	100000	-	20	10	-	100	-
30000	15000	-	150000	-	50	20	-	200	-
50000	25000	-	250000	-	50	20	-	200	-
75000	40000	-	400000	-	100	50	-	500	-
100000	50000	-	500000	-	100	50	-	500	-
150000	75000	-	750000	-	200	100	-	1000	-
200000	100000	-	-	1000	200	100	-	-	1
250000	100000	-	-	1000	200	100	-	-	1
300000	150000	-	-	1500	500	200	-	-	2
500000	250000	-	-	2500	500	200	-	-	2
750000	400000	-	-	4000	1000	500	-	-	5

5.3 Torque Capacities & Resolutions – with Model DFG-RS5

Capacity								Resolution							
IbFin	ozFin	IbFft	Ncm	Nm	Nmm	kgFmm	kgFm	IbFin	ozFin	IbFft	Ncm	Nm	Nmm	kgFmm	gFcm
-	10	-	7	-	70	7	700	-	0.005	-	0.005	-	0.05	0.005	0.5
-	20	-	14	-	140	14	1400	-	0.01	-	0.01	-	0.1	0.01	1
-	50	-	35	-	350	35	3500	-	0.02	-	0.02	-	0.2	0.02	2
-	100	-	70	-	700	70	7000	-	0.05	-	0.05	-	0.5	0.05	5
-	1000	-	700	-	7000	700	70000	-	0.5	-	0.5	-	5	0.5	50
12	192	1	135	1.35	-	-	-	0.005	0.1	0.0005	0.1	0.001	-	-	-
20	320	1.5	220	2.2	-	-	-	0.01	0.2	0.001	0.1	0.001	-	-	-
25	400	2	290	2.9	-	-	-	0.02	0.2	0.002	0.2	0.002	-	-	-
50	800	4	570	5.7	-	-	-	0.02	0.5	0.002	0.5	0.005	-	-	-
100	1600	8	1150	11.5	-	-	-	0.05	1	0.005	0.5	0.005	-	-	-
150	-	12.5	1700	17	-	1700	-	0.1	-	0.01	1	0.01	-	1	-
200	-	16	2200	22	-	2200	-	0.1	-	0.01	1	0.01	-	1	-
250	-	20	2800	28	-	2800	-	0.2	-	0.02	2	0.02	-	2	-
400	-	32	4500	45	-	4500	-	0.2	-	0.02	2	0.02	-	2	-
500	-	40	5800	57	-	5800	-	0.2	-	0.02	2	0.02	-	2	-
600	-	50	6900	69	-	6900	-	0.5	-	0.05	5	0.05	-	5	-
1000	-	80	11500	115	-	11500	-	0.5	-	0.05	5	0.05	-	5	-
1500	-	125	17000	170	-	17000	-	1	-	0.1	10	0.1	-	10	-
2000	-	150	22000	220	-	22000	-	1	-	0.1	10	0.1	-	10	-
2500	-	200	29000	290	-	29000	-	1	-	0.1	20	0.2	-	20	-
5000	-	400	57000	570	-	58000	-	2	-	0.2	20	0.2	-	50	-
6000	-	500	69000	690	-	69000	-	5	-	0.5	50	0.5	-	50	-
10000	-	800	115000	1150	-	-	-	5	-	0.5	50	0.5	-	-	-
15000	-	1250	170000	1700	-	-	-	10	-	1	100	1	-	-	-
20000	-	2000	220000	2200	-	-	-	10	-	1	100	1	-	-	-
50000	-	4000	570000	5700	-	-	-	20	-	2	200	2	-	-	-
100000	-	8000	-	11500	-	-	-	50	-	5	-	5	-	-	-
150000	-	12500	-	17000	-	-	-	100	-	10	-	10	-	-	-
200000	-	15000	-	22000	-	-	-	100	-	10	-	10	-	-	-
500000	-	40000	-	57000	-	-	-	200	-	20	-	20	-	-	-

5.4 Torque Capacities & Resolutions – with Model DFG-RS3

Capacity						Resolution					
IbFin	ozFin	Ncm	Nm	kgFmm	kgFm	IbFin	ozFin	Ncm	Nm	kgFmm	kgFm
-	10	7	-	7	-	-	0.01	0.01	-	0.01	-
-	20	14	-	14	-	-	0.02	0.02	-	0.02	-
-	50	35	-	35	-	-	0.05	0.05	-	0.05	-
-	100	70	-	70	-	-	0.1	0.1	-	0.1	-
-	1000	700	-	700	-	-	1	1	-	1	-
12	192	135	-	-	-	0.01	0.2	0.1	-	-	-
20	320	220	-	-	-	0.02	0.5	0.2	-	-	-
25	400	290	-	-	-	0.02	0.5	0.2	-	-	-
50	800	570	-	-	-	0.05	1	0.5	-	-	-
100	1600	1150	-	-	-	0.1	2	1	-	-	-
150	-	1700	-	1700	-	0.2	-	2	-	2	-
200	-	2200	-	2200	-	0.2	-	2	-	2	-
400	-	4500	-	4500	-	0.5	-	5	-	5	-
500	-	5800	-	5800	-	0.5	-	5	-	5	-
600	-	6900	-	6900	-	1	-	10	-	10	-
1000	-	11500	-	11500	-	1	-	10	-	10	-
1500	-	17000	-	17000	-	2	-	20	-	20	-
2000	-	22000	-	22000	-	2	-	20	-	20	-
2500	-	29000	-	29000	-	2	-	20	-	20	-
5000	-	57000	-	58000	-	5	-	50	-	100	-
6000	-	69000	-	69000	-	5	-	50	-	100	-
10000	-	115000	-	-	115	10	-	100	-	-	0.1
15000	-	170000	-	-	170	20	-	200	-	-	0.2
20000	-	220000	-	-	220	20	-	200	-	-	0.2
50000	-	570000	-	-	580	50	-	500	-	-	1
100000	-	-	11500	-	1150	100	-	-	10	-	1
150000	-	-	17000	-	1700	200	-	-	20	-	2
200000	-	-	22000	-	2200	200	-	-	20	-	2
500000	-	-	57000	-	5800	400	-	-	50	-	10

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 it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS 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.

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