SSRDC100V, SSR330, SSR660, SSRINT660, SSR3PH660, SSRDIN660 Series
Solid State Relays
### Servicing North America:

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| USA and Canada: | Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®  
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| Toll Free in France: 0800-4-06342  
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| Tel: +49 (0)7056 9398-0 | Fax: +49 (0)7056 9398-29  
| Toll Free in Germany: 0800 639 7678  
| E-mail: info@omega.dl |
| --- | --- |
| United Kingdom: | One Omega Drive, River Bend Technology Centre  
| ISO 9002 Certified | Northbank, Irlam, Manchester  
| | M44 5BD United Kingdom  
| Tel: +44 (0)161 777 6611 | Fax: +44 (0)161 777 6622  
| Toll Free in United Kingdom: 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 CE 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.
PRECAUTIONS

A number of essential safety precautions must be observed in the installation and use of a Solid State Relay (SSR).

The SSR’s should be installed and serviced by qualified technicians familiar with high voltage and current circuits. Note that an SSR has a small leakage current when the contacts are “open”. Normal failure condition is contacts “closed”. A special Fast Blowing FT fuse and a mechanical interrupt switch are recommended in the load circuit. In certain applications a mechanical interrupt switch should be installed in the control circuit.

GENERAL DESCRIPTION

The OMEGA® Solid State Relays (SSR’s) are a series of normally open, solid state switching devices with no moving parts, capable of tens of millions of cycles of operation. They are designed to control 120V, 240V, 440V, or 660V alternating current (VAC), and provide zero voltage switching and 4000VAC isolation between the load terminals and the control signal. A control signal causes the SSR to switch the AC load ON or OFF just as a conventional mechanical contact switch does but without the problems associated with moving contact relays, such as corrosion, pitting, arcing radio frequency interference (RFI) and bounce.

FINNED HEAT SINKS (FHS)

To dissipate the heat developed naturally in an SSR due to a nominal voltage drop across the device, the panel mount SSR’s must be mounted on a Finned Heat Sink (FHS), or on a metal plate of adequate size (see Derating Curves on page 8). The Finned Heat Sinks (FHS) are anodized, aluminum fabrications which come complete with tapped mounting holes. Use with thermally conductive compound (Omega part number OT-201) for panel mount SSR’s. The DIN rail mount SSR’s come with integrated heatsinks. It is advisable to install an SSR where the ambient temperature is relatively low because its current-switching rating is decreased as its temperature increases. For SSR’s with integral heatsinks leave at least 1 inch (25mm) of space between relays and space above and below each heatsink equivalent to the height of the unit.

FUSE PROTECTION

The load side of the SSR’s should be protected by a Semiconductor I2T fuse. Although a semiconductor relay is designed for virtually countless operation cycles, it can be destroyed by an over-voltage or a short circuit, unless protected adequately by a fast fuse.

Bussman or equivalent fuses should be used. Select a fuse with a current and voltage rating less than the maximum rating of the relay. It is essential that a proper semiconductor (I2T) fuse is used. SSR’s normal failure mode on overloaded circuits is closed contacts (ON-STATE).

LEAKAGE CURRENT

In the OFF state, all SSR’s have a small leakage current through their contacts, typically 5 to 15 milliamperes (mA). As a result, a voltage potential will always exist on the LOAD SIDE, even where the “contacts” are “open.” The voltage level is a function of the load resistance. In accordance with $E = IR$, the voltage level equals leakage current times load resistance.

The voltage level will rise to FULL LINE VOLTAGE under NO LOAD (open circuit) or high resistance condition. Under normal operating conditions, however, it is very small. A 120-watt (W) load has a resistance of 1 ohm. With “open contacts,” a leakage current of 15mA will cause 15mV across the load ($E = 15 \text{ mA} \times 1 \text{ ohm}$).
AC Output Single Phase Relays

### DC Control Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Load Min</th>
<th>Control Range (Ams)</th>
<th>Min Control Voltage &amp; Current Draw</th>
<th>Max Control Voltage &amp; Current Draw</th>
<th>Release Voltage &amp; Current Draw</th>
<th>Schematics</th>
<th>Mechanical Derating</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSR330DC10</td>
<td>24 to 330 Vac</td>
<td>0.05 to 10</td>
<td>4 Vdc/5.4 mA</td>
<td>32 Vdc/10 mA</td>
<td>1 Vdc</td>
<td>D</td>
<td>1</td>
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<tr>
<td>SSR330DC25</td>
<td>24 to 330 Vac</td>
<td>0.10 to 25</td>
<td>4 Vdc/5.4 mA</td>
<td>32 Vdc/10 mA</td>
<td>1 Vdc</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>SSR330DC50</td>
<td>24 to 330 Vac</td>
<td>0.10 to 50</td>
<td>4 Vdc/3.5 mA</td>
<td>32 Vdc/8.0 mA</td>
<td>1 Vdc</td>
<td>D</td>
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<tr>
<td>SSR330DC75</td>
<td>24 to 330 Vac</td>
<td>0.10 to 75</td>
<td>4 Vdc/3.5 mA</td>
<td>32 Vdc/8.0 mA</td>
<td>1 Vdc</td>
<td>D</td>
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<tr>
<td>SSR660DC50</td>
<td>24 to 660 Vac</td>
<td>0.10 to 50</td>
<td>4 Vdc/3.5 mA</td>
<td>32 Vdc/8.0 mA</td>
<td>1 Vdc</td>
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<td>2</td>
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<tr>
<td>SSR660DC75</td>
<td>24 to 660 Vac</td>
<td>0.10 to 75</td>
<td>4 Vdc/3.5 mA</td>
<td>32 Vdc/8.0 mA</td>
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<tbody>
<tr>
<td>SSR330AC10</td>
<td>24 to 330 Vac</td>
<td>0.05 to 10</td>
<td>100 Vac/2.0 mA</td>
<td>280 Vac/19 mA</td>
<td>20 Vac</td>
<td>D</td>
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<tr>
<td>SSR330AC25</td>
<td>24 to 330 Vac</td>
<td>0.10 to 25</td>
<td>100 Vac/2.0 mA</td>
<td>280 Vac/19 mA</td>
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<tr>
<td>SSR330AC50</td>
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<td>2</td>
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<tr>
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<td>0.10 to 75</td>
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<th>Release Voltage &amp; Current Draw</th>
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<th>Mechanical Derating</th>
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<tbody>
<tr>
<td>SSDIN660DC25</td>
<td>24 to 660 Vac</td>
<td>0.10 to 25</td>
<td>4 Vdc/3.5 mA</td>
<td>32 Vdc/8.0 mA</td>
<td>1 Vdc</td>
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<tr>
<td>SSDIN660DC40</td>
<td>24 to 660 Vac</td>
<td>0.10 to 40</td>
<td>4 Vdc/3.5 mA</td>
<td>32 Vdc/8.0 mA</td>
<td>1 Vdc</td>
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### AC Control Specifications

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<th>Model Number</th>
<th>Load Min</th>
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<th>Max Control Voltage &amp; Current Draw</th>
<th>Release Voltage &amp; Current Draw</th>
<th>Schematics</th>
<th>Mechanical Derating</th>
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<tbody>
<tr>
<td>SSDIN660AC25</td>
<td>24 to 660 Vac</td>
<td>0.10 to 25</td>
<td>100 Vac/9 mA</td>
<td>280 Vac/25 mA</td>
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<tr>
<td>SSDIN660AC40</td>
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<td>0.10 to 40</td>
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<td>280 Vac/25 mA</td>
<td>20 Vac</td>
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</table>

### DC Control Specifications

<table>
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<th>Model Number</th>
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<th>Min Control Voltage &amp; Current Draw</th>
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<th>Release Voltage &amp; Current Draw</th>
<th>Schematics</th>
<th>Mechanical Derating</th>
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<tbody>
<tr>
<td>SSRINT660DC50</td>
<td>48 to 660 Vac</td>
<td>0.10 to 50</td>
<td>4 Vdc/6 mA</td>
<td>28 Vdc/9 mA</td>
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<tr>
<td>SSRINT660DC75</td>
<td>48 to 660 Vac</td>
<td>0.10 to 75</td>
<td>4 Vdc/6 mA</td>
<td>28 Vdc/9 mA</td>
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<tr>
<td>SSRINT660DC100</td>
<td>48 to 660 Vac</td>
<td>0.10 to 100</td>
<td>4 Vdc/6 mA</td>
<td>28 Vdc/9 mA</td>
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### AC Control Specifications

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<th>Model Number</th>
<th>Load Min</th>
<th>Control Range (Ams)</th>
<th>Min Control Voltage &amp; Current Draw</th>
<th>Max Control Voltage &amp; Current Draw</th>
<th>Release Voltage &amp; Current Draw</th>
<th>Schematics</th>
<th>Mechanical Derating</th>
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<tbody>
<tr>
<td>SSRINT660AC50</td>
<td>48 to 660 Vac</td>
<td>0.10 to 50</td>
<td>100 Vac/5 mA</td>
<td>280 Vac/15 mA</td>
<td>20 Vac</td>
<td>A</td>
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<tr>
<td>SSRINT660AC75</td>
<td>48 to 660 Vac</td>
<td>0.10 to 75</td>
<td>100 Vac/5 mA</td>
<td>280 Vac/15 mA</td>
<td>20 Vac</td>
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<tr>
<td>SSRINT660AC100</td>
<td>48 to 660 Vac</td>
<td>0.10 to 100</td>
<td>100 Vac/5 mA</td>
<td>280 Vac/15 mA</td>
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</table>
## AC Output Three Phase Relays

### DC Control Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Line Voltage Range (Vac)</th>
<th>Load Current Range (Arms)</th>
<th>Min Control Voltage &amp; Current Draw</th>
<th>Max Control Voltage &amp; Current Draw</th>
<th>Release Voltage (VDC)</th>
<th>Schematic</th>
<th>Mechanical</th>
<th>Derating</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSR3PH660DC30</td>
<td>48 to 660 Vac</td>
<td>0.10 to 30</td>
<td>4 Vac/10 mA</td>
<td>32 Vac/18 mA</td>
<td>1 Vac</td>
<td>6</td>
<td>E</td>
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</tbody>
</table>

### AC Control Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Line Voltage Range (Vac)</th>
<th>Load Current Range (Arms)</th>
<th>Min Control Voltage &amp; Current Draw</th>
<th>Max Control Voltage &amp; Current Draw</th>
<th>Release Voltage (VAC)</th>
<th>Schematic</th>
<th>Mechanical</th>
<th>Derating</th>
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<tbody>
<tr>
<td>SSR3PH660AC30</td>
<td>48 to 660 Vac</td>
<td>0.10 to 30</td>
<td>100 Vac/10 mA</td>
<td>280 Vac/33 mA</td>
<td>20 Vac</td>
<td>6</td>
<td>E</td>
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### DC Output / DC Control Relays

### DC Control Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Line Voltage Range (Vac)</th>
<th>Load Current Range (A DC)</th>
<th>Min Control Voltage &amp; Current Draw</th>
<th>Max Control Voltage &amp; Current Draw</th>
<th>Release Voltage (VDC)</th>
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<th>Mechanical</th>
<th>Derating</th>
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</thead>
<tbody>
<tr>
<td>SSR3CT00VDC8</td>
<td>0-100 Vac</td>
<td>8</td>
<td>4 Vdc/11 mA</td>
<td>28 Vdc/16 mA</td>
<td>1 Vdc</td>
<td>7</td>
<td>D</td>
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<tr>
<td>SSR3CT00VDC12</td>
<td>0-100 Vac</td>
<td>12</td>
<td>4 Vdc/11 mA</td>
<td>28 Vdc/16 mA</td>
<td>1 Vdc</td>
<td>7</td>
<td>D</td>
<td>5</td>
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<tr>
<td>SSR3CT00VDC20</td>
<td>0-100 Vac</td>
<td>20</td>
<td>4 Vdc/11 mA</td>
<td>28 Vdc/16 mA</td>
<td>1 Vdc</td>
<td>7</td>
<td>D</td>
<td>6</td>
</tr>
<tr>
<td>SSR3CT00VDC40</td>
<td>0-100 Vac</td>
<td>40</td>
<td>4 Vdc/11 mA</td>
<td>28 Vdc/16 mA</td>
<td>1 Vdc</td>
<td>7</td>
<td>D</td>
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### Accessories

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Description</th>
<th>Rating</th>
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<tbody>
<tr>
<td>KAX-10</td>
<td></td>
<td>10A</td>
</tr>
<tr>
<td>KAX-25</td>
<td></td>
<td>25A</td>
</tr>
<tr>
<td>KAX-30</td>
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<td>30A</td>
</tr>
<tr>
<td>KAX-50</td>
<td>Semiconductor</td>
<td>50A</td>
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<tr>
<td>KAX-70</td>
<td>Fuses</td>
<td>75A</td>
</tr>
<tr>
<td>KAX-SEMI-50 *</td>
<td></td>
<td>63A</td>
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<tr>
<td>KAX-SEMI-100 *</td>
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<td>100A</td>
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</table>

* Replacement fuses for built-in fuses on SSRINT-series

### How to Use Tables

Product specifications are listed after each model number. After these product specs, codes for schematics, mechanical drawings and derating curves are listed. Schematics can be found on pages 4 and 5, Mechanical drawings on pages 6 and 7 and Derating curves are listed on page 8.

**Example:** SSR330DC10 - Refer to Schematic 1 on page 4, Mechanical drawing D on page 5 and Derating curve 1 on page 8.
Schematics

1
SSR330DC
SSR660DC

2
SSRDINDC

3
SSR330AC
SSR660AC

4
SSRDINAC

5
SSRINT660

6
SSR3PH660

*Note: A fuse should be installed in series from the AC hot prior to connecting.
**Schematics**

Note: A fuse should be installed in series prior to connecting, as shown above.

**Mechanicals**

**Dimensions in Inches (mm)**

**A** SSRINT Series-50 Amp

**B** SSRINT Series-75 Amp

**C** SSRINT Series-100 Amp

**D** SSR

**E** SSR3PH Series-30 Amp

50/75/100A SSRINT Series

Sideview of A, B, C
Mechanicals
Dimensions in Inches (mm)

F  SSRDIN Series-25 Amp  G  SSRDIN Series-40 Amp

H  FHS-7 Finned Heat Sink

I  FHS-8 Finned Heat Sink
Wiring Examples

Typical Wiring

**ac Controlled SSR used with Temperature Controller with dc Voltage SSR Driver Output**

![Diagram of ac Controlled SSR used with Temperature Controller with dc Voltage SSR Driver Output]

**ac Controlled SSR used with Temperature Controller with Mechanical Relay Output**

![Diagram of ac Controlled SSR used with Temperature Controller with Mechanical Relay Output]

**ac Controlled SSR used with Temperature Controller with Triac Output**

![Diagram of ac Controlled SSR used with Temperature Controller with Triac Output]
Derating Curves

Show maximum steady state current for given temperatures and relays. Current switching rating decreases as temperature increases. Free Air = SSR without any heatsink.

1. SSR 10 & 25 Amp (330 VAC)
2. SSR 50 & 75 Amp (330 VAC)
3. SSR DIN 25 & 40 Amp
4. SSR INT 50, 75, 100 Amp (660 VAC)
5. SSR DC 8 & 12 Amp (100 VDC)
6. SSR DC 20 & 40 Amp (100 VDC)
7. SSR 3PH - 30 Amp 3 Phase
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 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, 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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