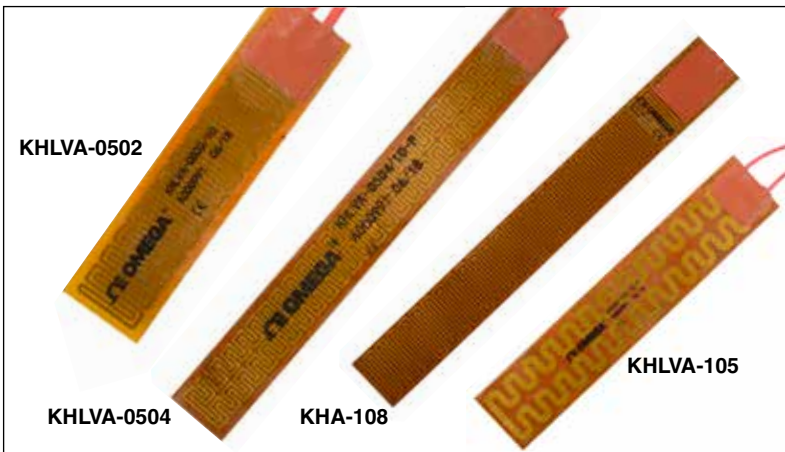


1 YEAR
WARRANTY

Ω OMEGA™ **User's Guide**

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Smaller than actual size

KHA, KHRA, KHLVA SERIES Polyimide Flexible Heaters



GENERAL DESCRIPTION

Polyimide Insulated Flexible Heaters are available in a variety of shapes, sizes, and wattages. Watt density ratings are 2.5, 5, or 10 W/in² at 28 or 115 or 230 volts. Polyimide offers a high degree of resistance to chemicals, and has excellent outgassing properties in high vacuum environments. KHA models are rectangular 115 or 230 Volts; KHLVA models are rectangular 28 volt units, and KHRA models are round 115 or 230 volt units. Contact Omega sales department for specific part numbers: 800-872-9436

Typical construction consists of an etched foil element of 0.001" thickness, which is encapsulated between two layers of 0.002" Polyimide film. For rectangular heaters, lead wires exit centrally from the width (W) side of the heater. Leads exit round heaters radially. Pressure sensitive adhesive (PSA) is available as an option on all heaters. The heaters can also be mechanically clamped or epoxy mounted by the user.

SPECIFICATIONS

Heating Element Design:	Inconel Etched Circuit
Operating Temperature:	-57 to 150°C (-70 to 302°F) for heaters without pressure sensitive adhesive (PSA). Operating temperature for heaters with sensitive adhesive is -40 to 149°C (-40 to 300°F)
Voltage:	KHA, KHRA Series: 115 Volts, 230 Volts KHLVA Series: 28 Volts
Watt Density:	2.5, 5, or 10 W/in ²
Pressure Sensitive Adhesive (PSA):	Optional
Lead Wire:	12" of PTFE Insulated UL 1180 (wire gauge varies with heater) For strain relief, a silicone patch has been added to these heaters.
Dielectric Strength:	1250 Vac
Minimum Bending Radius:	0.032"
Heater Thickness:	0.010" except at lead wire exit thickness is 0.060" max



INSTALLATION AND OPERATION

CAUTION

Use a method of temperature control (e.g., thermostat, thermocouple and temperature controller, or variable voltage transformer) to prevent heaters from exceeding maximum operating temperature ratings. Place temperature sensor close enough to the heater to sense heater temperature.

1. DO NOT immerse heaters in liquids.
2. DO NOT operate heaters at a voltage higher than the specified or rated voltage.
3. DO NOT cut, punch holes in or otherwise mishandle heaters.
4. AVOID exposing heaters to chemicals, acids, alkalies, oils, fluids or other substances that could ignite or cause damage to the heaters.
5. DO NOT insulate heaters unless adequate measures are taken to control heater temperature.
6. DO NOT leave heaters operating unattended unless adequate controls are installed to ensure safety.
7. Heaters can be bent around curved surfaces; however, DO NOT exceed minimum bending radius.
8. Exercise care in attaching heaters to flat or curved surfaces. Heaters can be attached by mechanical clamping, by using factory applied pressure sensitive adhesive (PSA), or with a thin layer of conductive epoxy. Make sure that the entire heater is in contact with the surface with no air pockets trapped underneath. This is especially important for high watt density heaters, i.e. heaters with a watt density of 10 watts/square inch, to prevent heater failure. DO NOT overlap heaters.
9. Heaters must be attached to an appropriate heat sink and should NOT be mounted free-standing in air.
10. Make sure heaters are installed and used by qualified personnel. DO NOT attempt to repair damaged heaters.



omega.com info@omega.com

Servicing North America:

U.S.A.
Headquarters:

Omega Engineering, Inc.
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.

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 trademark of OMEGA ENGINEERING, INC.

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