

## Warranty

All Products from NEWPORT ELECTRONICS, INC. are warranted against defective material and workmanship for a period of one (1) year from the date of delivery.

If the unit should malfunction, it must be returned to the factory for evaluation. NEWPORT's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by Newport, if the unit is found to be defective it will be repaired or replaced at no charge. However, 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 NEWPORT's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

In addition to NEWPORT's standard warranty period, NEWPORT ELECTRONICS will extend the warranty period for one (1) additional year only if the warranty card enclosed with each instrument is returned to NEWPORT.

**Newport is glad to offer suggestions on the use of its various products. Nevertheless, NEWPORT warrants only that the parts manufactured by it will be as specified and free of defects. NEWPORT 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 NEWPORT 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 NEWPORT be liable for consequential, incidental or special damages.**

Every precaution for accuracy has been taken in the preparation of this manual; however, NEWPORT neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the products in accordance with the information contained in the manual.

**SPECIAL CONDITIONS:** Should this equipment be used in any nuclear installation or activity, purchaser will indemnify NEWPORT and hold NEWPORT harmless from any liability or damage whatsoever arising out of the use of the equipment in such a manner.

## Return Requests

Direct all warranty and repair requests/inquiries to the NEWPORT Customer Service Department. BEFORE RETURNING ANY PRODUCTS(S) TO NEWPORT, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM NEWPORT'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. NEWPORT's warranty does not apply to defects resulting from action of the buyer, mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting NEWPORT:

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 NEWPORT for current repair charges. Have the following information available BEFORE contacting NEWPORT:

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.

Additional products from



THE NEW STANDARD FOR QUALITY

|                  |                   |
|------------------|-------------------|
| Clock/Timers     | Recorders         |
| Counters         | Relative Humidity |
| Flow Sensors     | RTDs              |
| Frequency Meters | Soldering Iron    |
| Multimeters      | Testers           |
| On/Off           | Strain Gauge      |
| Controllers      | Meter             |
| pH Controllers   | Thermistors       |
| pH Electrodes    | Thermocouples     |
| pH Pens          | Thermowells       |
| PID Controllers  | Timers            |
| Printers         | Totalizers        |
| Process Meters   | Transmitters      |
| Rate Meters      | Voltmeters        |
|                  | Wire              |

In the USA and Canada: 800-NEWPORT  
In Mexico 95-800-NEWPORT  
Or call your local Newport Office.

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This product may be covered by one or more of the following patents:  
United States Patents Des. 336,895; 5,274,577  
France Brevet No. 91 12756  
Spain 2039150  
United Kingdom Patent No. 2248954  
and other international patents pending

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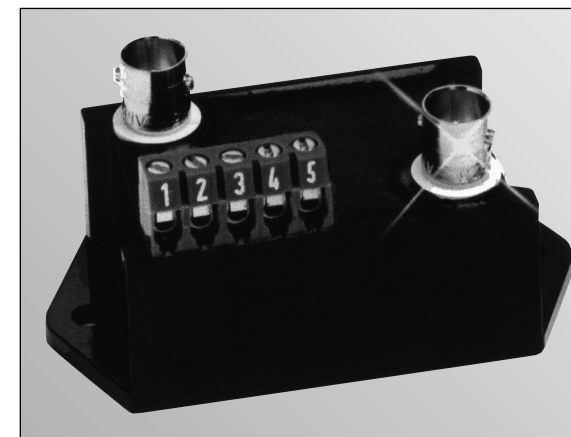
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# PHAMP-3

## pH Preamplifier

With Automatic Temperature Compensation

### Operator's Manual



 **Newport Electronics, Inc.**

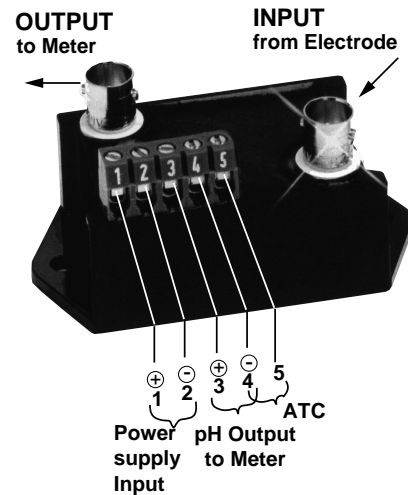
## General Description

The PHAMP-3 is a unity gain preamplifier which converts the high impedance mV signal of a pH electrode to a low impedance signal which has been compensated for variations in temperature. The signal can travel 1,000 feet over ordinary wire and connectors to process meters and controllers (such as the IDP and INFC).

The PHAMP-3 requires an external power source between 10-40 volt DC. It can be powered by the excitation of a process meter (such as the NEWPORT IDP) or the optional PSU-12V power supply. The PHAMP-3 uses a 1000 ohm RTD sensor for automatic temperature compensation. (RTD not included). Fixed resistors must be connected for applications not using an RTD). The electronics are entirely encapsulated in a compact epoxy filled enclosure designed for easy mounting in a manufacturing process. The PHAMP-3 offers redundant outputs from either a BNC connection, terminal strip or both at the same time.

## Operating Instructions

Connect as shown below: Power supply connects to Terminals 1&2. pH input from electrode connects to BNC connector. pH output to meter(s) can be connected to Terminals 3&4 or BNC. RTD (1K ohm) connects to Terminals 4&5. (Terminal #4 is common for pH output & ATC).



## Specifications

|                               |  |
|-------------------------------|--|
| <b>Output Offset:</b>         | 3 mV typical; (.05 pH)                           |
| <b>Input:</b>                 | -1 to 15 pH                                      |
| <b>Input Impedance:</b>       | 10 <sup>13</sup> Ohms                            |
| <b>Output Impedance:</b>      | 20K Ohms   |
| <b>Output Voltage:</b>        | 472mV to -472mmV                                 |
| <b>Operating Temperature:</b> | 0 to 60°C  |
| <b>Power:</b>                 | 10 to 40 Vdc                                     |
| <b>Dimensions:</b>            | 38.1 H x 76.2 W x 38.1mm D<br>(1.5" x 3" x 1.5") |

## Automatic Temperature Compensation

The table (below) shows how the millivolt output of a pH electrode and the resistance of a 1k Ω RTD varies with temperature. The PHAMP-3 compensates temperature to 25°C.

### Temperature Compensation

| Temp.   | 0°C    | 25°C   | 40°C   | 50°C   | 70°C   | 90°C   | 100°C  |
|---------|--------|--------|--------|--------|--------|--------|--------|
| pH      | mv.    | mv.    | mv.    | mv.    | mv.    | mv.    | mv.    |
| 0       | +379.3 | +414.0 | +434.9 | +448.8 | +476.6 | +504.4 | +518.2 |
| 1       | +325.1 | +354.9 | +372.8 | +384.7 | +408.5 | +432.3 | +444.2 |
| 2       | +270.1 | +295.8 | +310.7 | +320.6 | +340.5 | +360.3 | +370.2 |
| 3       | +216.8 | +236.6 | +248.5 | +256.5 | +272.4 | +288.2 | +296.1 |
| 4       | +162.6 | +177.5 | +186.4 | +192.4 | +204.3 | +216.2 | +222.1 |
| 5       | +108.4 | +118.3 | +124.2 | +128.2 | +136.2 | +144.1 | +148.1 |
| 6       | +54.19 | +59.15 | +62.13 | +64.12 | +68.09 | +72.05 | +74.03 |
| 7       | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| 8       | -54.19 | -59.15 | -62.13 | -64.12 | -68.09 | -72.05 | -74.03 |
| 9       | -108.4 | -118.3 | -124.2 | -128.2 | -136.2 | -144.1 | -148.1 |
| 10      | -162.6 | -177.5 | -186.4 | -192.4 | -204.3 | -216.2 | -222.1 |
| 11      | -216.8 | -236.6 | -248.5 | -256.5 | -272.4 | -288.2 | -296.1 |
| 12      | -270.1 | -295.8 | -310.7 | -320.6 | -340.5 | -360.3 | -370.2 |
| 13      | -325.1 | -354.9 | -372.8 | -384.7 | -408.5 | -432.3 | -444.2 |
| 14      | -379.3 | -414.0 | -434.9 | -448.8 | -476.6 | -504.4 | -518.2 |
| 1KΩ RTD | 1000Ω  | 1097Ω  | 1155Ω  | 1194Ω  | 1271Ω  | 1347Ω  | 1385Ω  |

## PHAMP-3 Accessories

- BNC-(M) to BNC-(M) 3 ft extension cable (part number BNC-C-36/N)
- 12 Volt dc power supply (part number PSU-12 V/N).