

# AMP-15

## OPERATOR'S MANUAL

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Version 1.2

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**Christiansburg, VA 24073**

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**Fax: (540) 953-3010**

**WARNING:** Read instructions carefully and completely before operating the AMP-15. Improper usage may damage the unit. Save this manual for safety and operating instructions, as well as warranty information.

## **FORWARD**

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Thank you for purchasing the AMP-15 signal conditioning amplifier. The AMP-15 was designed to be used with Vatell Corporation's line of Thermogage sensors. It has customer specified gains, is simple to operate, and can be configured for battery or AC power continuous use.

To fully appreciate the capabilities of your AMP-15, please read this Operator's Manual thoroughly. If you have any questions or need any assistance please contact:

Vatell Corporation  
Attn.: Amplifier Assistance  
P.O. Box 66  
Christiansburg, VA 24073

Phone: (540) 961-3576  
Fax: (540) 951-3010

Please indicate model and serial number in all correspondence. The model and serial number is printed on the bottom of the amplifier.

## **CONVENTIONS**

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As you go through this manual, certain conventions are consistently used:

- All front and rear panel control label references are italicized capitals - for example, reference to the sensor input would be shown as *SENSOR INPUT*.
- All safety alerts will be preceded by **“WARNING:”**
- Necessary, but not safety related information will be preceded by **“NOTE:”**
- Referenced information will be in *italics*.

# AMP-15 Operators Manual

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## UNPACKING AND INSPECTION

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Included with each AMP-15 are the following items:

- 1) Operator's manual
- 2) AC-to-DC adapter (for continuous power option only)
- 3) Gain Calibration Sheet

If any of these items are missing or damaged, contact Vatech Corporation at the address listed in the Foreword section of this manual.

## AMP-15 EQUIPMENT OVERVIEW

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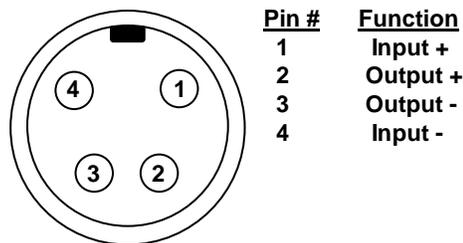
### DESCRIPTION OF AMP-15 CONNECTIONS

**Sensor Input:** 4-pin connector with two pins for input and two pins for output.

**Power 5-18 VDC:** The connecting point between the AC-to-DC adapter and the amplifier. This jack is not present in the battery powered option. For application systems that can provide a 5-18 VDC power source red (V+) and black (V-) hook-up wires can be provided.

**WARNING:** The power adapter for the AMP-15 is rated for 110 V at 60 Hz. Use of the adapter with other electrical systems without a transformer may result in damage to the adapter.

Figure 1 illustrates the connections on each of the 4 pins of the connector and their respective orientations.



**Figure 1 – AMP-15 Female Connector Pin Out**

# **OPERATION**

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## **PRINCIPLES OF OPERATION**

The AMP-15 is a single channel signal-conditioning instrumentation amplifier designed to be used with Vatech Corporation Thermogage sensors. The Thermogage is a circular-foil sensor which requires low-noise, precision amplification. The AMP-15 is designed specifically with these requirements in mind to give the user quality data. A frequent application is when fast response phenomena are to be measured. There is an engineering trade-off between speed and sensitivity for a circular-foil transducer; the faster it is the less sensitive it becomes. The use of an amplifier can boost the sensor output while maintaining its fast response time.

## **TAKING MEASUREMENTS**

In order to collect data from the sensor, proceed with the following steps.

1. The amplifier should be placed in a position that avoids strong electromagnetic fields and large temperature excursions.
2. Turn the amplifier on with the slide switch on the end. AC powered units should be plugged into the wall first.
3. Attach sensor input/output cable to the end of the amplifier. The cable connectors are keyed to assure proper pin alignment.
4. Connect the output pigtailed to a measuring device (chart recorder, oscilloscope, voltmeter, etc.).
5. Allow amplifier to warm-up (become temperature stable). This takes approximately eight minutes from the time the amplifier is turned on. *See step 2.*
6. Zero the output from the amplifier using the Zero pot located on the side of the amplifier.
7. System is now ready for measurement of heat flux and temperature.

## **NOISE REDUCTION**

All precision amplifiers working with small signals are susceptible to Electromagnetic Interference (EMI). Special care should be taken in the placement of the sensor and

amplifier relative to any source of EMI noise. The following actions will tend to reduce EMI noise problems:

- Avoid creating ground loops.
- Do not subject the amplifier, sensor, or cables to large electrical fields.
- High frequency PWM (Pulse Width Modulated) motors tend to be very noisy. If possible, avoid data collection when motors are on.
- Use shielded, twisted pair for any connections beyond the cable supplied with the sensor and amplifier.

## **CARE AND MAINTENANCE**

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The AMP-15 is a durable instrument. If handled carefully, it should last for years. The AMP-15 can be cleaned with a soft dry cloth. Avoid the use of strong chemicals and solvents, especially when cleaning around connector surfaces. In case of any difficulty with operation or maintenance of this amplifier, contact Vatel Corporation for further assistance.

## **AMP-15 SPECIFICATIONS**

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**Gain range:** 99-1000 (customer specified and factory set)

**Bandwidth:** 333 Hz

**Input Impedance:** 0.95 Mohm

**Output Impedance:** 1 ohm

**Maximum Output Voltage:**  $\pm 2$  V

**Temperature Stability:**  $80\mu\text{V}/^\circ\text{C}$

**Dimensions:** 3.2 cm x 3.8 cm x 10.2 cm (1¼" x 1½" x 4")

**Weight:** 150g (5.3 oz.)

## **WARRANTY**

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Vatell Corporation warrants that this product will be free from defects in materials and workmanship for a period of 90 days from the date of shipment. If the product proves defective during this warranty period, Vatell Corporation, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, the customer must notify Vatell Corporation in writing of the defect before the expiration of the warranty period and make arrangements for service. The customer shall be responsible for packaging and shipping of the defective product to Vatell Corporation with shipping charges prepaid. Vatell Corporation will pay for the return of the product to the customer, if the shipment is to a location within the United States of America. The customer is responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to locations outside of the USA.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care.

**THIS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. VATELL CORPORATION DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. VATELL CORPORATION'S REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR WARRANTED DEFECTS. VATELL CORPORATION WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.**