



CE\*  
RoHS

## Tachometers and Tach/Hourmeters AT and ATH Series

### Installation Instructions

\*Products covered in this document comply with European Council electromagnetic compatibility directive 2014/30/EU and hazardous substances directive 2011/65/EU.

**IMPORTANT! These instructions are specific to tachometer models with a single calibration push button. If your tachometer is a type using selector switch or dip switch calibration, please locate installation instructions in the discontinued product literature section of the Enovation Controls Website ([enovationcontrols.com](http://enovationcontrols.com)). Refer to Tachometer and Tach/Hourmeter Installation Instructions Series: ATS, ATHS, ATA, ATHA, ATHI (00-02-0258).**

**Warranty** - A limited warranty on materials and workmanship is given with this Murphy product.  
A copy of the warranty may be viewed or printed by going to [www.enovationcontrols.com/warranty](http://www.enovationcontrols.com/warranty)



**BEFORE BEGINNING INSTALLATION OF THIS MURPHY  
PRODUCT:**

- A visual inspection of this product for damage during shipping is recommended before installation.
- It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.
- Disconnect all electrical power to the machine.
- Make sure machine cannot operate during installation.
- Follow all safety warnings of the machine manufacturer.
- Read and follow all installation instructions.
- Please contact Enovation Controls immediately if you have any questions.

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## **General Information**

The Murphy AT/ATH series tachometers indicate engine speed in revolutions per minute (RPM). Models equipped with an hourmeter also record elapsed engine running time when the engine speed is greater than 100 RPM.

There is no need to select a model specific to the input source as every tachometer will accept input signals from an alternator, a magnetic sensor or an ignition.

Calibration has also been improved and is now accomplished with a single push button on the back.

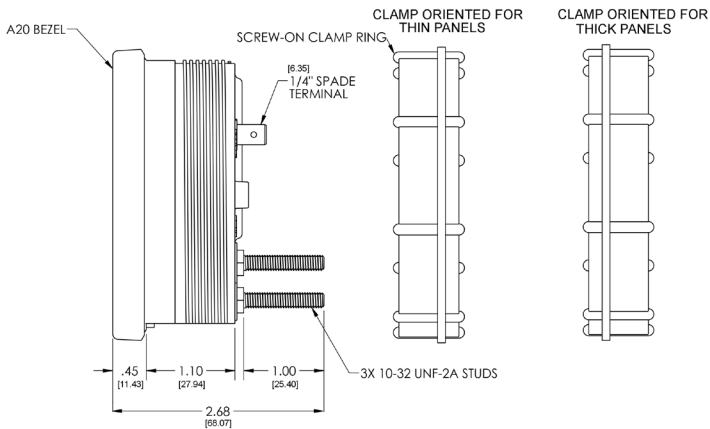
Engine speed is determined one of three ways:

1. Magnetically by the pulses obtained from the ring gear of an engine flywheel (having from 50 to 300 teeth).
2. Electrically by the engine-driven alternator producing pulses when it charges the battery. In this instance, the alternator must have a terminal for the tachometer.
3. From the coil or a tachometer output from the Ignition system.

The tachometer is for negative ground or isolated electrical systems. If the instrument is connected to reverse polarity, it will not operate until proper connections are made. It is powered by a 12- or 24-volt battery (operating range: 9-32 VDC).

## Case Mounting Instructions

It is preferred that the unit is mounted in a place where the back will be protected from rain and splashing water. A minimum distance of 12 in. (305mm) from any coil, coil leads or high voltage wiring should be maintained. The unit is intended for mounting on a flat panel with a cut out of 3-3/8 in. (86mm) diameter hole as shown in Figure 2. The maximum panel thickness recommended is 1/2 in. (13mm). Insert the instrument from the front side of the panel and place the screw-on clamp ring to secure the instrument in place.

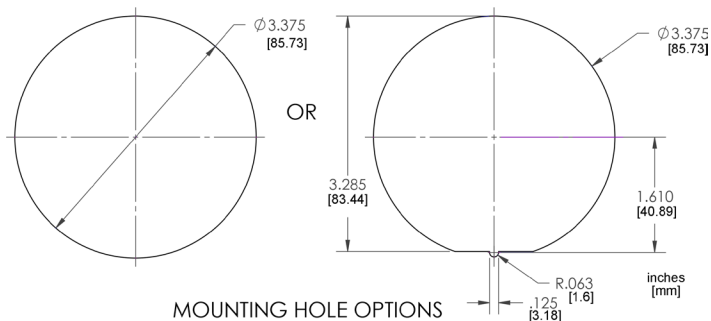


**Figure 1 – Side View of Tach**



# Mounting Requirements

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**Figure 2 – Tach  
Dimensions**

## Tools and Supplies Required for Installation

3/8" Nut Driver

Wire Cutting & Stripping Tool

Wire terminal Crimping Tool

#10 crimp on ring terminals, and Faston™ or slip-on crimp terminals (for backlight connection).

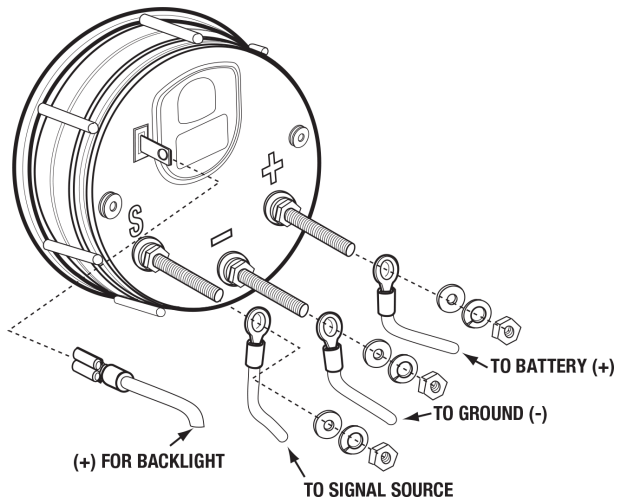
## Connection Instructions

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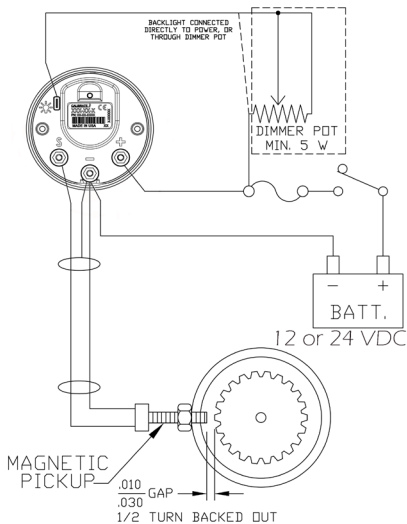


**CAUTION:** For safety of both personnel and equipment, disconnect the battery/power source before beginning installation.

Determine voltage and polarity of the application before wiring the unit. Use the appropriate wire size. To wire the magnetic sensor pickup, use 18 AWG (1.0mm) twisted pair, shielded cable. Use insulated crimp-on (solderless) ring-type wire terminals. Allow a few inches of extra wire (service loops) for ease of servicing.



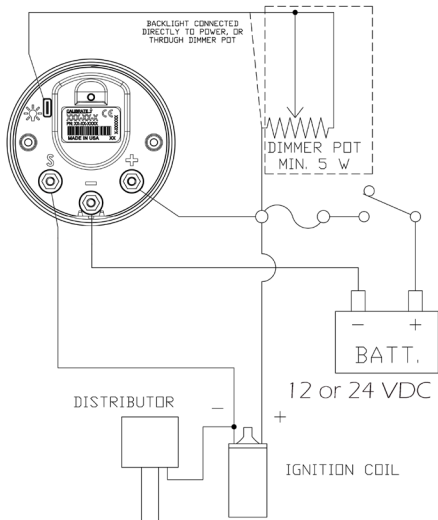
**Figure 3 – Connection Diagram**



**Fig 4: Magnetic Pickup Wiring Diagram**

## Notes:

- Backlight connected directly to power, or through dimmer pot
- Dimmer pot minimum 5 W
- Battery is 12 or 24 VDC
- Magnetic Pickup contains .010/.030 Gap, 1/2 turn backed out

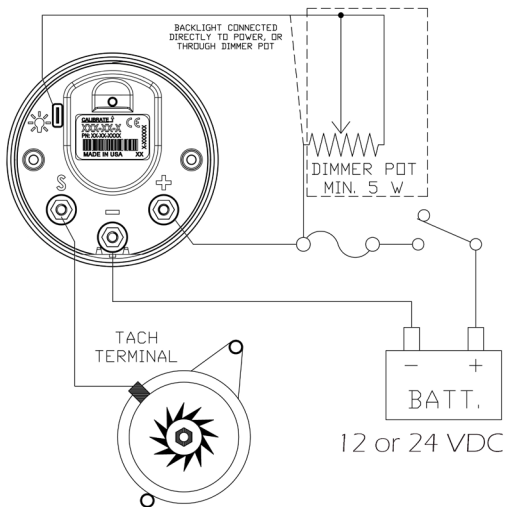


**Fig 5: Ignition Wiring Diagram**

## Notes:

- Backlight connected directly to power, or through dimmer pot
- Dimmer pot minimum 5 W
- Battery is 12 or 24 VDC





**Fig 6: Alternator Wiring Diagram**

## Notes:

- Backlight connected directly to power, or through dimmer pot
- Dimmer pot minimum 5 W
- Battery is 12 or 24 VDC

## Connecting to Power (All Models)

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**IMPORTANT:** The operating voltage range of these units is 9-32VDC only. Always ensure circuits have a fuse or a circuit breaker to protect wiring. Never connect the unit directly to a battery without a fuse or circuit breaker.

1. Connect a wire from + to Battery or Power Supply + through a fuse and the ignition switch.
2. Connect a wire from the - terminal to the negative voltage source (electrical ground).

## **Connecting to a Magnetic Sensor**

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The magnetic sensor (pickup) usually has two connections (terminals or wires) exiting from it. These connections are not polarized; either connection can be considered positive or negative signals. These two connections must be routed directly to the unit. Do NOT ground one of

the connections at the engine. (See Figure 3)

1. Connect one of the wires in the twisted pair (from magnetic sensor) to the S terminal.
2. Connect the other wire in the twisted pair (from the magnetic sensor) to the negative (-) terminal.

### **Connecting to an Ignition Coil**

Connect wire from the S terminal to the negative (-) side of the ignition coil or to the terminal marked TACH on solid state ignition systems (See Figure 4).

## **Connecting to an Alternator**


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Connect a wire from the S terminal to AC phase terminal (sometimes marked STA or R on the alternator [See Figure 5]).

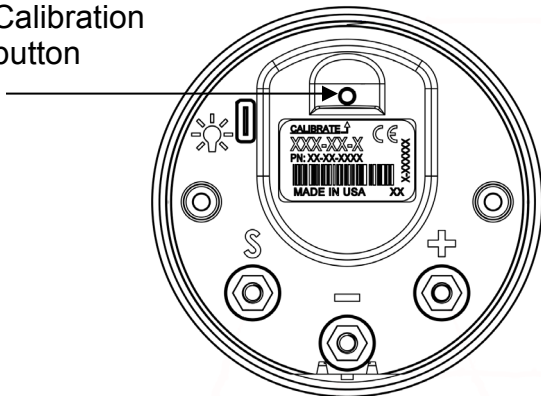
### **Calibration Instructions**

You can adjust calibration on all models with the calibration button on the back of the housing.

- (1)** The engine must be running at a known RPM during the calibration process.

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- (2) Once the tachometer is in calibration mode, it will exit the calibration mode and return to normal operating mode if the calibration button is not pressed for 5 seconds.

Calibration  
button



**Fig 7 – Calibration Button**

1. To enter the calibration mode, press and hold the calibration button for 2+ seconds. The pointer will fall to zero then swing up to 2500 RPM or higher. Release the

calibration button. The Tachometer is now in calibration mode.

2. Once in calibration mode, the pointer will need to be set to the RPM of the running engine. To move the pointer to the desired RPM:
  - a. Press and hold the calibration button. The pointer will sweep slowly in one direction.
  - b. To change the direction of the pointer sweep, release the calibration button for 0.5-3 seconds before pressing and holding the button again. Repeat this step as necessary to change direction of the pointer sweep.



- c. Fine adjustments can be made by pressing and releasing the calibration button quickly. If fine adjustments are needed in the opposite direction, repeat steps 2b-2c.
3. Once the pointer is set to the desired RPM, no further action is required. Release the calibration button for at least 5 seconds. The pointer will fall to 0 RPM and then sweep up to the RPM that was set in the calibration mode.

The calibration has been completed, and the tachometer is now in normal operating mode. If further refinement is needed,

repeat steps 1-3 until the desired setting is reached.

The AT/ATH series tachometers will accept the following signals:

- Magnetic sensor using a flywheel with 50 to 300 teeth
- Alternator putting out 3 to 52 pulses per engine revolution
- Ignitions, 2 to 10 cylinders (4-cycle)

## Specifications

**Operating Temperature Range:** -40°F to 185°F (-40°C to 85°C)

**IP Rating:** IP66 Front, IP32 Back (vented case)

**Input Voltage:** 12VDC or 24VDC (9 to 32 VDC).  
Not for use with Capacitive Discharge (CD) ignitions or magnetos.

**Frequency Input Range:** 2.5 Hz - 25KHz

Minimum Signal Amplitude: 1.5 Vrms

Maximum Signal Amplitude: 140 Vrms

**Mag Pickup:** 50 to 300 flywheel teeth

**Alternator:** 3 to 52 pulses per rev

**Ignition:** 2 to 10 cylinders (4 cycle)

**Operating Current:** 100 mA Max. (@32 VDC) (does not include backlight)

**Dial (Face Plate):** 240 degree sweep; white text and graphics on black background

**Scale:** 0 - 3000 RPM

**Accuracy:** +/- 2% Full scale

**Backlight:** Red LED

**Backlight Current:** 75 mA Max. (@32 VDC)

**Hourmeter:** LCD, 0 - 99,999.9 hours, 0.1 increments

Counts when receiving input signal (engine running), 100 RPM min.

**Hourmeter Accuracy:** +/- 0.02%

**Case:** Nylon, 30%; Glass-filled, black

**Lens:** Tempered glass

**Bezel:** 304 Stainless steel

**Clamp:** Screw-on ring, PBT, white

**Max Panel Thickness:** .50"

**Connections:** 10-32 UNF studs (Battery +, Ground, Signal), 1/4" Spade (Backlight)

**Electromagnetic Compatibility:**

2014/30/EU (EMC)

2011/65/EU (RoHS)

**- NOTES -**

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## **- NOTES -**

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In order to consistently bring you the highest quality, full-featured products, we reserve the right to change our specifications and designs at any time. The latest version of this manual can be found at [novationcontrols.com](http://novationcontrols.com).

**ENOVATION CONTROLS CORPORATE HEADQUARTERS**

5311 S 122ND EAST AVENUE  
TULSA, OK 74146

**ENOVATION CONTROLS LTD. – UNITED KINGDOM**

CHURCH ROAD LAVERSTOCK  
SALISBURY SP1 1QZ UK

**SUN MURPHY INTERNATIONAL TRADING (SHANGHAI) CO., LTD**

B15 ROOM, 6# BUILDING, 351 SIZHUAN ROAD  
SONGJIANG DISTRICT, SHANGHAI 201601, CHINA

**ENOVATION CONTROLS INDIA PVT. LTD.**

301, 3RD FLOOR, KRSNA CHAMBERS,  
11 GALAXY GARDENS, NORTH MAIN ROAD,  
KOREGAON PARK, PUNE 411001,  
MAHARASHTRA, INDIA

**U.S. SALES & SUPPORT**

PHONE: 918 317 4100  
EMAIL: SALES@ENOVATIONCONTROLS.COM  
WWW.ENOVATIONCONTROLS.COM

**MURPHY INDUSTRIAL PANEL DIVISION**

PHONE: 918 317 4100  
EMAIL: IPDSALES@ENOVATIONCONTROLS.COM

**INTERNATIONAL SALES & SUPPORT**

**EUROPE, MIDDLE EAST, AFRICA**  
PHONE: +44 1722 410055  
EMAIL: SALES@ENOVATIONCONTROLS.EU

**CHINA**  
PHONE: +86 21 6237 5885  
EMAIL: APSALES@ENOVATIONCONTROLS.COM

**INDIA**  
PHONE: +91 91581 37633  
EMAIL: INDIAALES@ENOVATIONCONTROLS.COM



FM 28221 (Tulsa, OK - USA)  
FM 29422 (UK)