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Aircraft and Medical Instruments

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## 1 1/4" & 2 1/4" EGT and CHT THERMOCOUPLE INDICATOR

### Installation Instructions:

- Thermocouple and extension wires sold separate.
- **Polarity of thermocouple connection does matter.**
- Do not cut the thermocouple metal braided lead.

**EGT uses Type K thermocouple probes.**

**CHT uses Type J thermocouple probes.**

1. Mount indicator in desired location in aircraft's instrument panel.
2. Install thermocouple on engine.
  - For EGT thermocouple with clamp style, drill 3/16 inch hole in exhaust pipe. Refer to engine manufacturer specs for hole position. Best if drilled on top to prevent oil leakage. Make sure the tip of probe locates in the center of pipe. If needed stack washers between probe and pipe to make shorter. For single carb engines you can use one probe. It is best to place the probe where the exhaust headers meet. With multi-carb engines, it is best to mount one probe for each cylinder.
  - For CHT thermocouple spark plug ring style, remove the spark plug washer and mount the proper probe size under the spark plug. In a single carb engine it best to monitor the hottest (leanest) cylinder. With multi-carb engines its best to monitor all cylinders.
3. Next route wire from thermocouple to instrument panel. Connect thermocouples **white-CHT or yellow-EGT (+)** lead to the positive input on gauge (Pin 5 on DB-9 connector) and **red (-)** to the negative input (Pin 4). Make sure all connections allow for good continuity. Keep wire away from any AC source; like lighting coils, spark plug wires, tach wire, radio transmitter, etc.
4. If extension wires are needed to reach engine, use 18-20 GA. copper stranded wire for extension. Keep wire lengths to minimum, max. extension length 8 ft. If longer, 14-16 GA. wires should be used.
5. Connect a wire from switched power source of aircraft to Pin 1 of connector (or red wire). Use a 1 amp inline fuse or use power from fuse/breaker panel. Connect Pin 9 (or black wire) on back of indicator to a suitable aircraft ground, ensure this ground is connected to engine block. Use #18 to 24 AWG size wire for power and ground connections.

### Thermocouple Principle

A thermocouple produces a small voltage as temperature increases, this is caused by connecting to dissimilar metals together. A milivolt meter is used to measure this output voltage. When you connect the voltmeter to the thermocouple you actually create another thermocouple called a cold junction. The meter actually reads the differential voltage between the thermocouple and the cold junctions. Each indicator is calibrated at a junction temperature of 75° F, so actual reading depends on junction temperature. If junction temperature is higher than 75° F then indicator will read one degree lower for every degree higher and vice versa. In order to minimize this error locate the cold junctions in a temperature stable environment. Keep away from engine heat or extreme cold.



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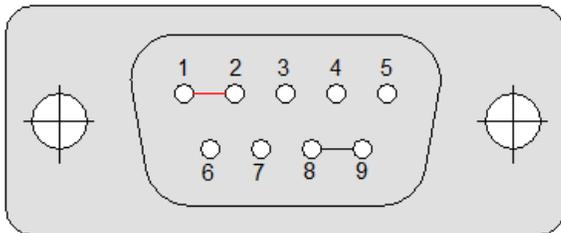
Power Supply Voltage: 12 - 30 Volts DC  
Current Drain: Typically 90 - 110 mA

#### Installation Hints:

- 1.) If indicator reading stays below zero, after engine has warmed up, make sure all connections are correct. (Positive and negative may be backwards)
- 2.) If indicator reading stays on zero with engine warm, allow probe to cool and check probe resistance (Should be 1-4 ohms).

UMA carries a full line of instruments this size including other Thermocouple Ranges and indicator Types such as Voltmeters, Ammeters, Temperature Indicators, Pressure indicators, as well as Flap Position Indicators, and Fuel Level Indicators.

All electronic instruments are available with internal electroluminescence lighting.



- 1 Voltage In-RED-Input
- 2 ->internally connected to pin#1
- 3
- 4 Signal (-) Secondary Input (Thermocouple RED)
- 5 Signal (+) Primary-Input ( WHITE-CHT or YELLOW-EGT)
- 6 EL Lighting Input (Internal Lighting)-optional
- 7 EL Lighting Input (Internal Lighting)-optional
- 8 ->internally connected to pin#9
- 9 Ground-BLACK-Input

## Warranty

UMA, Inc. warrants all products to be free from defects in material and workmanship under normal use and operation. UMA does not warrant any product which has been damaged as the result of accident, abuse, negligence, improper operational voltage, lightning, fire, flood, or other acts of nature. Any indication that the unit has been opened can void warranty. Under no circumstances shall UMA be liable for any loss or damage, direct, consequential or incidental, arising from the use of or inability to use this product.

This warranty is limited to the repair or replacement, at the manufacturer's option, of any product or part thereof, which has been returned to UMA within the specified warranty period, and which after examination shall disclose to the customer service department's satisfaction that the product is defective. Transportation to the factory or authorized service center must be prepaid; the product after repair or replacement will be returned at the expense of the dealer or end customer. This warranty does not apply to any product or integral part thereof, which has been altered or serviced by other than the manufacturer or authorized service center.

The warranty period is twelve (12) months to the user.

This warranty supersedes all other warranties either expressed or implied and shall be governed and executed under the laws of the Commonwealth of Virginia, USA