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800-842-5578



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QUALITY INSTRUMENTATION FOR YOUR  
CUSTOM PANEL REQUIREMENTS



[www.umo-instruments.com](http://www.umo-instruments.com)

Catalog Release  
March 2022





<http://www.umainstruments.com>





Aircraft And Medical Instruments

UMA, Inc.

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UMA, Inc. proudly manufactures quality instrumentation in the heart of the Shenandoah Valley in Dayton, Virginia. My father, Awad Da'Mes, moved the business to Virginia in the late 1970's with two lifelong friends and partners from New York. He decided to continue running the company as a sole proprietor and engineer in the 1980's, until his passing in 2019. His company became his greatest legacy he hoped to pass along to his children. Thereby, allowing each of his four children to start their careers within the business, finding their strengths and individual talents. Each of us spent countless hours in his office going over design control, production reports, and old memories with his favorite customers and suppliers. My dad loved this company, appreciated his staff, and made lifelong relationships with business associates. Most of all, he took pride in manufacturing parts in-house, and ensuring that quality machined parts were made for our customer's instrumentation requirements. His pride continues today through the legacy established over 45 years ago.

UMA's team is grateful to our many customers for allowing us to provide custom products and experienced service to the aviation industry. Contact our skilled sales and engineering staff to help in completing your next project.

Best regards,

Nadia Dames  
President

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- Service: All UMA instruments are manufactured in the U.S.A. and are quality ensured to meet the needs of the general aviation industry. UMA's facility is located in Virginia with a staff available to answer your questions and serve your immediate needs.
- Prices: Call your favorite dealer/distributor for competitive pricing.
- Shipping: All orders are shipped UPS Ground unless otherwise requested.
- Warranty: All UMA instruments carry a one year warranty from buyers initial receipt of order. UMA is not responsible for damages incurred from improper installation, unauthorized repair or misuse.

**FOR CUSTOMER SERVICE USE OUR Toll Free NUMBER**

**1-800-842-5578**

\* Refer to our Website: [www.umainstruments.com](http://www.umainstruments.com)  
for the latest information about UMA instrumentation



## 2 1/4" & 3 1/8" TSO Certified Electronic Tachometers

UMA offers a TSO certified 2 1/4" & 3 1/8" analog tachometer with or without a built in hourmeter. Applications available for most Continental & Lycoming engines with a mechanical drive or a magneto ignition. To use the mechanical drive, purchase our Sending Unit (T1A3-4), it is set up for a 1:2 drive ratio, and replaces the mechanical cable for a mechanical tachometer. Another option is to install our magneto pickup T1A9-(x) that installs in the inspection plug (air vent) of the magneto housing. Please specify if your engine is 4 or 6 cylinder and uses Slick or Bendix magnetos.

### 3 1/8" Analog Tachometer

Also available without hourmeter



**Weight:** 5-9.0 oz. **Case:** Valox 420 plastic

### 2 1/4" Analog Tachometer



**Mounting Info:** Page 35, Figure #14

### TSO'd Sending Units



#### Part # T1A3-4

Includes: 6 ft harness, Sending Unit, and 0.156 dia. tang adapter.

Dimensions: 4.5" overall length, 1.3" max. diameter



#### Part# T1A9-(x)

Magnetic pickup for Slick or Bendix Magnetos included as above, if selected.

x-(1) Slick  
x-(2) Bendix  
(6 ft. cable length) alternative to P-lead connections.

### For T1A3-4 Sending Units:

3 1/8" Part #	2 1/4" Part #	Range	Dial Markings
T19-801-102	T19-501-102	0-3500 RPM	B&W, (hourmeter in 3 1/8" tachs only)
T19-801-112	T19-501-112	0-3500 RPM	GA 500-2700, RR @ 2700 (hourmeter in 3 1/8" tachs only)
T19-801-102N		0-3500 RPM	B&W, without hourmeter
T19-801-112N		0-3500 RPM	GA 500-2700, RR @ 2700, without hourmeter

### For T1A9-x Magneto pickup:

3 1/8" Part #	2 1/4" Part #	Range	Dial Markings
T19-801-101	T19-501-101	0-3500 RPM	B&W, 1pulse/rev, for 4 cyl engine, (w/hourmeter, 3 1/8" only)
T19-801-111	T19-501-111	0-3500 RPM	GA 500-2700, RR @ 2700, for 4 cyl, (w/hourmeter, 3 1/8" only)
T19-801-10C	T19-501-10C	0-3500 RPM	B&W, 1.5 pulse/rev, for 6 cyl engine, (w/hourmeter, 3 1/8" only)
T19-801-11C	T19-501-11C	0-3500 RPM	GA 500-2700, RR @ 2700, for 6 cyl, (w/hourmeter, 3 1/8" only)
T19-801-101N		0-3500 RPM	B&W, 1pulse/rev, for 4 cyl engine, without hourmeter
T19-801-111N		0-3500 RPM	GA 500-2700, RR @ 2700, for 4 cyl, without hourmeter
T19-801-10CN		0-3500 RPM	B&W, 1.5 pulse/rev, for 6 cyl engine, without hourmeter
T19-801-11CN		0-3500 RPM	GA 500-2700, RR @ 2700, for 6 cyl, without hourmeter

## TACHOMETER FEATURES

**3 1/8" w/hour meter:** Records engine time above a RPM set point. Standard set point is 1800 RPM; Other settings available upon request. If replacing old mechanical tach with new UMA electronic tach, engine hours can be pre-set to any number of hours, to match old tach.  
**2 1/4" tachometer** does not have internal hourmeter, but have a hourmeter +12 volts out for external hourmeter, also available at UMA.

TSO'd to meet C49b, with installation limited to non-pressurized, fixed wing, reciprocating or turboprop, single or multi-engine aircraft operating up to 25,000 ft MSL.

**All tachs 10-30VDC operation ----- Optional custom range markings and internal lighting available upon request!**



## 3 1/8" TSO Airspeed Indicator

Now offering our line of ever popular 3 1/8" Airspeed Indicator's in a fully FAA TSO'd model.



UMA Indicators are fully FAA TSO'd to C2d specifications. Installable in a fixed wing aircraft with a reciprocating or Turboprop Engine. Must be installed in a temperature controlled environment from -55 to +85 °C, to a max altitude of 25,000 ft.

UMA offers indicators with full scale ranges available, from 160 to 300 in MPH or Knots. Refer below for part numbers. Dials marked in Kilometers are also available.

➡ *Optional Special range markings and/or internal lighting are available upon request.*

### Single Scale

### Dual Scale

Part #	Range	Part #	Outside Scale/ Inside Scale
T16-310-141	20-140 MPH	T16-310-141D	20-140 MPH / 20-120 KNOTS
T16-310-160	40-160 MPH	T16-310-161D	20-160 MPH / 20-135 KNOTS
T16-310-161	20-160 MPH	T16-310-160D	40-160 MPH / 40-135 KNOTS
T16-310-180	40-180 MPH	T16-310-180D	40-180 MPH / 40-150 KNOTS
T16-310-200	40-200 MPH	T16-310-200D	40-200 MPH / 40-170 KNOTS
T16-310-240	40-240 MPH	T16-310-240D	40-240 MPH / 40-205 KNOTS
T16-310-260	40-260 MPH	T16-310-260D	40-260 MPH / 40-225 KNOTS
T16-310-280	40-280 MPH	T16-310-300D	40-300 MPH / 40-250 KNOTS
T16-310-300	40-300 MPH		
T16-311-160	40-160 Knots	T16-311-200D	40-205 KNOTS / 40-240 MPH
T16-311-161	20-160 Knots	T16-311-240D	40-240 KNOTS / 50-270 MPH
T16-311-180	40-180 Knots	T16-311-260D	40-260 KNOTS / 50-300 MPH
T16-311-200	40-200 Knots	T16-311-300D	40-300 KNOTS / 50-350 MPH
T16-311-240	40-240 Knots		
T16-311-260	40-260 Knots		
T16-311-280	40-280 Knots		
T16-311-300	40-300 Knots		

**Weight:** 8.6 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 34, Figure #11



## 2 1/4" TSO Airspeed Indicator

2 1/4" Airspeed Indicator by popular demand in a fully FAA TSO'd model.



UMA Airspeed Indicators are FAA TSO'd to C2d specifications.

Installable in a fixed wing aircraft with a reciprocating or Turboprop Engine. Must be installed in a temperature controlled environment from -55 to +85 °C, to a max altitude of 25,000 ft.

UMA offers indicators with full scale ranges available, from 160 to 300 in MPH or Knots. Refer below for part numbers. Dials marked in Kilometers are also available.

➡ *Optional Special range markings and/or internal lighting are available upon request.*

### Single Scale

### Dual Scale

Part #	Range	Part #	Outside Scale/ Inside Scale
T16-210-140	30-140 MPH	T16-210-140D	40-140 MPH / 20-120 KNOTS
T16-210-161	20-160 MPH	T16-210-161D	20-160 MPH / 20-135 KNOTS
T16-210-160	40-160 MPH	T16-210-160D	40-160 MPH / 20-135 KNOTS
T16-210-180	40-180 MPH	T16-210-180D	40-180 MPH / 40-135 KNOTS
T16-210-200	40-200 MPH	T16-210-200D	40-200 MPH / 40-150 KNOTS
T16-210-240	40-240 MPH	T16-210-240D	40-240 MPH / 40-170 KNOTS
T16-210-260	40-260 MPH	T16-210-260D	40-260 MPH / 40-205 KNOTS
T16-210-300	40-300 MPH	T16-210-300D	40-300 MPH / 40-225 KNOTS
T16-210-400	40-400 MPH	T16-210-400D	40-400 MPH / 40-250 KNOTS
T16-211-120	20-120 Knots	T16-211-200D	40-205 KNOTS / 40-240 MPH
T16-211-140	30-140 Knots	T16-211-240D	40-240 KNOTS / 50-270 MPH
T16-211-161	20-160 Knots		
T16-211-160	40-160 Knots	T16-211-260D	40-260 KNOTS / 50-300 MPH
T16-211-180	40-180 Knots	T16-211-200D	40-205 KNOTS / 40-240 MPH
T16-211-200	40-200 Knots	T16-211-300D	40-300 KNOTS / 50-350 MPH
T16-211-240	40-240 Knots		
T16-211-260	40-260 Knots		
T16-211-300	40-300 Knots		
T16-211-400	40-400 Knots		
T16-212-340	40-340 Kmh		
T16-212-360	40-360 Kmh		

Weight 6.9 oz. **Case:** Valox 420 plastic

**Mounting Info:** Page 34, Figure #11



# 1 1/4" TSO Certified Electronic Temperature Gauges

We offer two sizes for TSO temperature instrumentation, 1 1/4" or 2 1/4". Both use a remote mounted thermocouple probe for sensing temperature. All TSO'd temperature gauges meet C43c standards using a full sweep aircore meter movement. Connections are made using a DB-9 connector on rear of gauge. All require 10-28 DC input voltage.

Standard markings are black and white. Temperature probes are sold separately.

## 1 1/4" Cyl Head Temp.



<u>Part #</u>	<u>Range</u>	<u>Sender</u>
T12-116K-530C-000	50-300 °C	(type K)
T12-116K-600F-000	100-600 °F	(type K)
T12-116J-600F-000	100-600 °F	(type J)
T12-116J-530C-000	50-300 °C	(type J)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## 1 1/4" Exhaust Gas Temp.



<u>Part#</u>	<u>Range</u>	<u>Sender</u>
T12-117K-900C-000	400-900°C	(type K)
T12-117K-1K7F-000	700-1700°F	(type K)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## 1 1/4" Oil Temperature.



<u>Part #</u>	<u>Range</u>	<u>Sender</u>
T12-113K-150C-000	40-150°C	(Type K)
T12-113K-430F-000	40-300°F	(Type K)
T12-113K-300F-000	100-300°F	(Type K)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## 1 1/4" Water Temperature



<u>Part #</u>	<u>Range</u>	<u>Sender</u>
T12-115K-150C-000	40-150°C	(type K)
T12-115K-430F-000	40-300°F	(type K)
T12-115K-300F-000	100-300°F	(type K)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## Also Available:

All above instruments (except EGT) are available in a large variety of ranges where VDO and UMA Probes are not TSO approved

*-Optional special range markings and/or internal lighting available upon request*



## 2 1/4" TSO Electronic Temperature Gauges – Full Sweep

All TSO'd temperature gauges meet TSO-C43c specifications. Standard markings are black and white. Temperature probes are sold separately.

### 2 1/4" Cyl Head Temp.



<u>Part #</u>	<u>Range</u>	<u>Sender</u>
T12-216K-300C-000	40-300 °C	(type K)
T12-216K-600F-000	100-600 °F	(type K)

**Weight:** 5.0 oz. **Case:** Valox 420 plastic

**Mounting Info:** Page 35, Figure #16

### 2 1/4" Exhaust Gas Temp.



<u>Part #</u>	<u>Range</u>	<u>Sender</u>
T12-217K-900C-000	400-900°C	(type K)
T12-217K-1K7F-000	700-1700°F	(type K)

**Weight:** 5.0 oz. **Case:** Valox 420 plastic

**Mounting Info:** Page 35, Figure #16

### 2 1/4" Oil Temperature



<u>Part #</u>	<u>Range</u>	<u>Sender</u>
T12-213K-150C-000	40-150 °C	(type K)
T12-213K-430F-000	40-300 °F	(type K)

**Weight:** 5.0 oz. **Case:** Valox 420 plastic

**Mounting Info:** Page 35, Figure #16

### 2 1/4" Carb. Temperature



<u>Part #</u>	<u>Range</u>	<u>Sender</u>
T12-118K-120F-000	-60-120°F	(type K)
T12-118K-050C-000	-50 +50°C	(type K)

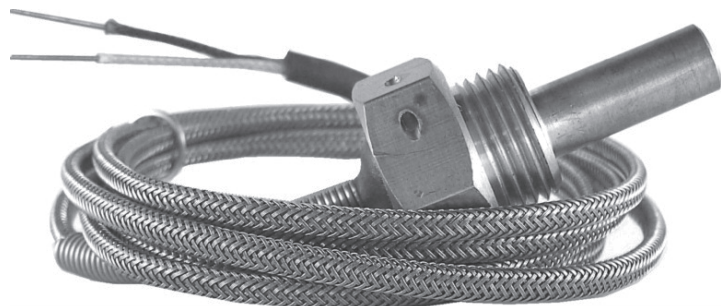
**Weight:** 5.0 oz. **Case:** Valox 420 plastic

**Mounting Info:** Page 35, Figure #16

***-Optional special range markings and/or internal lighting available upon request***

# TSO Temperature Probes

All Certified temperature probes meet TSO-C43c specifications and use a Type "K" thermocouple.



All this TSO'd probes are NON-grounded!

Part #	Thread size (all w/ Type "K" thermocouple)
T3B1	1/8 NPT, 1/2" hex head, Tip length 0.305"
T3B1-A	1/8 NPT, Lg, 1/2" hex head, Tip length 0.51"
T3B1-S	1/8 NPT, Lg, 1/2" hex head, Tip length 1.0"
T3B2	3/8-24, 5/8" hex head (Automobile), Tip length 0.51"
T3B3	5/8-18, 7/8 hex head (Lycoming)(longer threads), Tip 0.5"
T3B3A	5/8-18, 7/8 hex head (Lycoming)(short threads), Tip 0.8" L
T3B3-2.5	5/8-18, Lg, 7/8 hex head, Tip length 1.92"
T3B4	10mm X 1.5 pitch (Rotax 912 & 914), Tip length 0.4"
T3B6	16mm X 1.5 pitch, 7/8 hex head, Tip length 1.78"
T3B7	12mm X 1.5 pitch, 5/8 hex head, Tip length 0.51"
T3B8	1/4-20 (Carb. Temp.), 3/8 hex head, Tip length 0.25"
T3B8S	1/4-20 (Carb. Temp.), 3/8 hex head, Tip length 0.5"
T3B9	7/16-20, 3/8 hex head, Tip length 0.515"
T3B10	1/4-28 (Carb. Temp.), 3/8 hex head, Tip length 0.25"
T3B10-S	1/4-28 (Carb. Temp.), 3/8 hex head, Tip length 0.5"
T3B11	1/4-18 NPT, 7/8 hex head, Tip length 0.50"
T3B12	6mm x 1.0 pitch, 1/2" hex head, Tip length 1.0"
T3B13	1/8-27 NPT, 1/2" hex head, tip length 0.515"

# Non-TSO Temperature Probes

(U) All 1BX Temperature Probes contain a 5K thermistor for temperature sensing. (6" lead unless specified otherwise)

NOTE: All these UMA thermistor probes are SAME housings like ABOVE T3Bx probes!



Part #	Thread size
1B1	1/8 NPT, 1/2 Hex Head
1B2	3/8-24, 5/8 Hex Head (Automobile)
1B2-1	3/8-24 1 1/4" OAT w/6' shielded cable
1B3	5/8-18, 7/8 Hex Head (Lycoming)
1B4	10mm X 1.5 Pitch (Rotax 912 & 914)
*1B5F	3/8-24, 2 1/4" OAT F° w/ 6 ft. shielded cable
*1B5C	3/8-24, 2 1/4" OAT C° w/ 6 f. shielded cable
1B6	16mm X 1.5 Pitch
1B7	12mm X 1.5 Pitch
1B8	1/4-20 (Carb. Temp.)
1B9	7/16-20
1B10	1/4-28
1B11	1/4-18 NPT

(J) All 2B1X & 2B0X Temperature probes use a Type "J" thermocouple sensor. 6' Lead wires

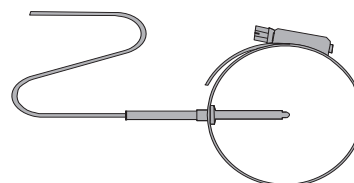
Type "K" available  
NON grounded available upon request!



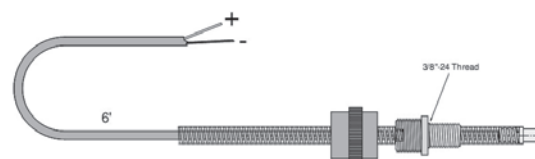
Part #	Ring diam. size
2B10	10mm Spark Plug Ring
2B12	12mm Spark Plug Ring
2B14	14mm Spark Plug Ring
2B18	18mm Spark Plug Ring

Part #	Bayonette type
2B01	1/8 NPT
2B02	3/8"-24, w/snap
2B03	5/8-18
2B04	10mm-1.5 (Rotax)
2B11	1/4-18 NPT

(K) All 2B2X & 2B3X Temperature probes use a Type "K" thermocouple sensor. 6' Lead Wires



Part #	Clamp Size	Length
2B20	1 5/8 - 2 1/2"	1" Tip
2B21	1 - 2 "	1" Tip
2B30	8mm, Bayonet	(Rotax)



NOTE: All brass probes above are available with 100 ohm RTD & custom value & type thermistors and/or 3Pin waterproof connector!

\*1B5F & 1B5C OAT probes use a precision temperature sensor (10mV per °C or °F)!

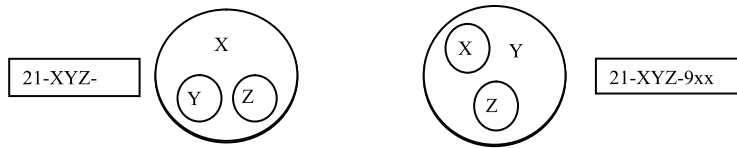
-Call for availability of different probe thread sizes or lengths.

-Additional Thermocouple extension wire available. Call for quote.



## 3 1/8" Triple Electronic Gauges

Now offering the 3-IN-1, 3 1/8" Electronic Gauges. One can specify any three of our 1 1/4" gauges inserted into a 3 1/8" case for easy panel mounting.



Part #	Type	UMA Gauge #
T/N 21-ABC-100	A) Oil Temp.	T/N12113U150C000
	B) Fuel Press.	T/N04112U050P000
	C) Oil Press.	T/N04113U150P000
T/N 21-DCA-100	D) CHT	T/N12116V300F020
	C) Oil Press.	T/N04113V130P070
	A) Oil Temp.	T/N12113V300F0A0



**Now available in TSO'd Cert. in limited configuration**

***\*Many additional configurations are available - specify range and markings***

## Opti-Alert Warning Instruments

UMA, Inc. is proud of it's unique line of engine gauges, the 2 1/4", full sweep Opti-Alert warning gauges. These 2 1/4" gauges signal the pilot when there is a problem by illuminating a Light Emitting Diode (LED). This warning indicates that an improper range condition has arisen. Two bright LED's can be set to turn on below and/or above a normal operating range. All gauges use a MS standard 2 1/4" size case with a full sweep analog dial for easy readability with a lightweight design using an aircraft meter for rugged trouble free operation. All gauges are electronic and operate from 10 to 28 volts.

Pressure and temperature gauges use remote mounted sensors which are sold separately.

- LED warning lights are available in amber or red
- Instruments can be ordered with 1 or 2 warning lights
- Specify LED color and exact set points when ordering.
- (LED set points are set at the factory and cannot be changed in the field.)
- Optional colored range markings available.
- Optional internal lighting available



## TSO'd Pressure Senders



Signal voltage output 0÷5VDC

### UMA Press. Sender (U)

1/8"-27 NPTF Connection(s)—1' cable  
5/8-18 Mounting Thread

Part#	Description
N/T2EU07D	0-7 PSI differential
N/T2EU07G	0-7 PSI gauge
N/T2EU35G	0-35 PSI
N/T2EU50A	0-60 In Hg ABS
N/T2EU70G	0-70 PSI
N/T2EU100G	0-100 PSI
N/T2EU150G	0-150 PSI
N/T2EU07S	0-14 In Hg Suction



Signal voltage output 0.2÷4.7VDC

### UMA Press. Sender (U)

1/8"-27 NPTF Connection(s)—1' cable  
5/8-18 Mounting Thread

Part#	Description
N/T1EU07D	0-7 PSI differential
N/T1EU07G	0-7 PSI gauge
N/T1EU35G	0-35 PSI
N/T1EU50A	0-60 In Hg ABS
N/T1EU70G	0-70 PSI
N/T1EU100G	0-100 PSI
N/T1EU150G	0-150 PSI
N/T1EU07S	0-14 In Hg Suction



Waterproof  
3 Pin connector

Signal voltage output 0.2÷4.7VDC

### UMA Press. Sender(short body)

1/8" NPT hose nipple

Part #	Description
N/T1EU07D-CS	0-7 PSI differential
N/T1EU07G-CS	0-7 PSI
N/T1EU35G-CS	0-35 PSI
N/T1EU50A-CS	0-60 IN HG ABS
N/T1EU70G-CS	0-70 PSI
N/T1EU100G-CS	0-100 PSI
N/T1EU150G-CS	0-150 PSI
N/T1EU07S-CS	0-14 IN HG suction

NOTE: All of these senders have optional  
1/8-27NPT male mounting thread.  
Available upon request!

UMA's pressure senders offer high reliability  
and accuracy at an affordable cost. They use  
precision solid state sensors and are designed  
for rugged use in just about any environment.

◆ TSO APPROVED-replace N with T ◆

## 2 1/4" Dual Electronic Gauges

Dual 2 1/4" full sweep aircore meters. We now offering the following configurations:

Part #	Range Left	Range Right
D2-AM100C-VT0917-00	AMP 100-0-100	Volt 9-17 volts
D2-BT120U-AT110U-00	Carb Temp. (-60) to 120 °F	OAT (-10) to 110 °F
D2-CT600J-CT600J-00	CHT 100 to 600 °F	CHT 100 to 600 °F
D2-ET1K7K-CT600J-00	EGT 700 to 1700 °F	CHT 100 to 600 °F
D2-ET1K7K-ET1K7K-00	EGT 700 to 1700 °F	EGT 700 to 1700 °F
D2-FP015U-FF020E-00	Fuel Press. 0-15 PSI	Fuel Flow 0-20 GPH
D2-FP015U-OP100U-00	Fuel Press. 0-15 PSI	Oil Press. 0-100 PSI
D2-FQ01C1-FQ01C1-00	Fuel Qty, E to F, 240°	Fuel Qty, E to F, 240°
D2-MP050U-FF020E-00	Man. Press. 10-50 IN HG	Fuel Flow 0-20 GPH
D2-OP100U-TAC35U-00	Oil Press. 0-100 PSI	Tach 0-3500 RPM
D2-OP100U-OT300U-00	Oil Press. 0-100 PSI	Oil Temp. 100-300 °F
D2-TAC35U-TAC35U-00	Tach. 0-3500 RPM	Tach. 0-3500 RPM



**\*Other combinations and ranges are available only specifically for OEM's.**

**\*Optional markings / internal light available upon request.**



## TSO Certified Electronic Pressure

We offer two sizes for TSO Pressure instrumentation, 1 1/4" or 2 1/4". Both use a remote mounted transducer for sensing pressure. All TSO'd pressure gauges use a DB-9 connector for electrical connections. They were tested to TSO-C47 standards. **Standard markings are black and white. Pressure senders are sold separately.**

### 1 1/4" Fuel Pressure



Part #	Range(Psi)	Sender
T04-112U-007P-000	0-7	(7U)
T04-112U-015P-000	0-15	(35U)
T04-112U-030P-000	0-30	(35U)
T04-112U-060P-000	0-60	(70U)
T04-112U-100P-000	0-100	(100U)

### 1 1/4" Oil Pressure



Part #	Range(Psi)	Sender
T04-113U-100P-000	0-100	(100U)
T04-113U-150P-000	0-150	(150U)
T04-213U-130P-000	0-130	(150U)

### 1 1/4" Water Pressure



Part#	Range(Psi)	Sender
T04-115U-015P-000	0-15	(35U)
T04-115U-030P-000	0-30	(35U)

Weight: 4.0 oz. Case: aluminum  
Mounting Info: Page 34, Figure #8

**-Optional special range markings and/or internal lighting available upon request**  
**-Optional, this units can be calibrated for various voltage, resistance or current values!**

## 2 1/4" TSO'd Electronic Pressure – Full Sweep Pressure

### 2 1/4" Fuel Pressure



Part #	Range(Psi)	Sender
T04-212U-007P-000	0-7	(7U)
T04-212U-015P-000	0-15	(35U)
T04-212U-030P-000	0-30	(35U)
T04-212U-060P-000	0-60	(70U)
T04-212U-100P-000	0-100	(100U)

### 2 1/4" Oil Pressure



Part#	Range(Psi)	Sender
T04-213U-100P-000	0-100	(100U)
T04-213U-150P-000	0-150	(150U)
T04-213U-130P-000	0-130	(150U)

### 2 1/4" Water Pressure



Part#	Range (Psi)	Sender
T04-215U-015P-000	0-15	(35U)
T04-215U-030P-000	0-30	(35U)

Weight: 5.0 oz. Case: Valox 420 plastic  
Mounting Info: Page 35, Figure #16

**-Optional special range markings and/or internal lighting available upon request**  
**-Other type senders compatibility available upon request!**

## 1 1/4" TSO Electronic Fuel Quantity Indicator

Again we manufacture two lines of Fuel Quantity Indicators, available in 1 1/4" or 2 1/4". They were certified to meet TSO-C55 standards. We only supply the indicators, and manufacture many types for standard resistance float (F) or capacitance (C) senders.

### 1 1/4" Fuel Quantity (180°)



Part #	Range	Sender
T18-1125-2C10-000	E to F	(C) 0-5 volts
T18-112F-2F10-000	E to F	(F) 240-30 ohms
T18-112F-2F20-000	E to F	(F) 0-30 ohms
T18-112F-2F30-000	E to F	(F) 0-90 ohms
T18-112F-2F40-000	E to F	(F) 78-6 ohms

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 1 1/4" Fuel Quantity (270°)



Part #	Range	Sender
T18-1125-1C10-000	E to F	(C) 0-5 volts
T18-112F-1F10-000	E to F	(F) 240-30 ohms
T18-112F-1F20-000	E to F	(F) 0-30 ohms
T18-112F-1F30-000	E to F	(F) 0-90 ohms
T18-112F-1F40-000	E to F	(F) 78-6 ohms

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## 2 1/4" TSO Electronic Fuel Quantity Indicator

### 2 1/4" Fuel Quantity (180°)



Part #	Range	Sender
T18-2125-2C10-000	E to F	(C) 0-5 volts
T18-212F-2F10-000	E to F	(F) 240-30 ohms
T18-212F-2F20-000	E to F	(F) 0-30 ohms
T18-212F-2F30-000	E to F	(F) 0-90 ohms
T18-212F-2F40-000	E to F	(F) 78-6 ohms

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 2 1/4" Fuel Quantity (270°)



Part #	Range	Sender
T18-2125-1C10-000	E to F	(C) 0-5 volts
T18-212F-1F10-000	E to F	(F) 240-30 ohms
T18-212F-1F20-000	E to F	(F) 0-30 ohms
T18-212F-1F30-000	E to F	(F) 0-90 ohms
T18-212F-1F40-000	E to F	(F) 78-6 ohms

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

**-Optional special range markings and/or internal lighting available upon request**



## Electronic Water Pressure - 270° Aircore

Electronic Water Pressure gauges connect to a pressure transducer and connects to the gauge with wires. Parts listed below with (V) require a VDO, and (U), a UMA, sender (see page 17 for senders ). The gauges below are a small sample of what is available. **Standard dial markings are black and white. Pressure senders are sold separately.**

### 1 1/4" Water Pressure



270° Aircore

Part #	Range	Sender
N04-115V-015P-000	0-15 PSI	(V)
N04-115V-030P-000	0-30 PSI	(V)
N04-115U-015P-000	0-15 PSI	(35U)
N04-115U-030P-000	0-30 PSI	(35U)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 2 1/4" Water Pressure



Part #	Range	Sender
N04-215V-015P-000	0-15 PSI	(V)
N04-215V-030P-000	0-30 PSI	(V)
N04-215U-015P-000	0-15 PSI	(35U)
N04-215U-030P-000	0-30 PSI	(35U)

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 2 1/4" Water Pressure

Opti-Alert w/ DB9 connector



Part #	Range	Sender
N04-265U-015P	0-15 PSI	(35U)
N04-265U-030P	0-30 PSI	(35U)

(specify LED set points & markings.)

**Weight:** 4.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

-Optional special range markings and/or internal lighting available upon request on all above models.

## Mechanical Coolant / Water Pressure

Mechanical, direct connection



### 1" Water Pressure

Part #	Range(Psi)	Dial Markings
3-270-10	2-10	B&W

**Weight:** 1.4 oz. **Case:** ABS plastic  
**\*Mounting Info:** Page 33, Figure #1



### 1 1/4" Water Pressure

Part #	Type*	Range(Psi)	Dial Markings
3-311-52	A	(-15)-15	B&W
3-312-11	D	(-5)-25	B&W

**Weight:** 1.4 oz. **Case:** ABS plastic  
**\*Mounting Info:** Page 33, Figure #2



### 2 1/4" Water Pressure

Part #	Name	Range(Psi)	Dial Markings
3-102-20	Water	(-15)-15	B&W
3-102-75	Cool	0-30	B&W

**Weight:** 4.7 oz. **Case:** cast aluminum  
**Mounting Info:** Page 33, Figure #3

-Optional special markings available per request on 1", 1 1/4" & 2 1/4"

-Optional internal lighting available on 2 1/4"

## Electronic Oil Pressure - 270° Aircore

Electronic Oil Pressure gauges use a remote mounted pressure transducer for sensing pressure. Parts listed below with (V) require a VDO, and (U), a UMA, sender (see page 17 for senders ). **Standard markings are black and white. Pressure senders are sold separately.**

### 1 1/4" Oil Pressure



Part #	Range(Psi)	Sender
N04-113U-060P-000	0-60	(70U)
N04-113V-080P-000	0-80	(V)
N04-113U-100P-000	0-100	(100U)
N04-113V-130P-000	0-130	(V)
N04-113U-150P-000	0-150	(150U)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 2 1/4" Oil Pressure



Part #	Range(Psi)	Sender
N04-213U-060P-000	0-60	(70U)
N04-213V-080P-000	0-80	(V)
N04-213U-100P-000	0-100	(100U)
N04-213U-150P-000	0-150	(150U)
N04-213U-130P-000	0-130	(150U)

**Weight:** 4.7 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### Opti-Alert w/ DB9 connector 2 1/4" Oil Pressure



Part#	Range(Psi)	Sender
N04-263U-060P-000	0-60	(70U)
N04-263V-080P-000	0-80	(V)
N04-263U-100P-000	0-100	(100U)
N04-263U-150P-000	0-150	(150U)

(Specify LED set points and markings)

**Weight:** 4.7 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

**-Optional special range markings and/or internal lighting available upon request**

## Electronic Fuel Pressure - 270° Aircore

Electronic Fuel Pressure gauges use a remote mounted pressure transducer for sensing pressure. Parts listed below with (V) require a VDO, and (U), a UMA, sender (see page 17 for senders ). **Standard markings are black and white. Pressure senders are sold separately.**

### 1 1/4" Fuel Pressure



Part #	Range(Psi)	Sender
N04-112U-007P-000	0-7	(7U)
N04-112U-015P-000	0-15	(35U)
N04-112U-030P-000	0-30	(35U)
N04-112U-060P-000	0-60	(70U)
N04-112U-100P-000	0-100	(100U)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 2 1/4" Fuel Pressure



Part #	Range(Psi)	Sender
N04-212U-007P-000	0-7	(35U)
N04-212U-015P-000	0-15	(35U)
N04-212U-060P-000	0-60	(70U)
N04-212U-100P-000	0-100	(100U)

**Weight:** 4.7 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### Opti-Alert w/ DB9 connector 2 1/4" Fuel Pressure



Part#	Range(Psi)	Sender
N04-262U-015P-000	0-15	(35U)
N04-262U-030P-000	0-30	(35U)
N04-262U-060P-000	0-60	(70U)
N04-262U-100P-000	0-100	(100U)

(Specify LED set points and markings)

**Weight:** 4.7 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

**- Optional special range markings and/or internal lighting available upon request**



# Mechanical Fuel & Oil Pressure

These lightweight pressure gauges read off of a direct hook-up and are offered in three mounting sizes: 1", 1 1/4" and 2 1/4" and are available in many ranges and dial configurations with easy readability. We are capable of providing ranges not readily available at your request.

## 1" Pressure

Part #	Name	Range	Dial Markings
3-250-10	Fuel	2-10 PSI	B & W
3-260-125	Oil	25-125 PSI	B & W

**Weight:** 1.4 oz. **Case:** molded ABS plastic  
**Mounting Info:** Page 33, Figure #1



## 1 1/4" Pressure

Part #	Name	Type	Range	Dial Markings
3-311-10	Fuel	C	0-50 PSI	GA 15-50, YA 5-15, RR 5
3-311-12	Fuel	C	0-50 PSI	B & W
3-311-20	Fuel	D	0-10 PSI	B & W
3-311-22	Fuel	D	0-10 PSI	GA 2.0-8.0, RR 2.0 & 8.0
3-311-23	Fuel	D	0-10 PSI	GA 0.5-8.0, RR 0.5 & 8.0
3-311-24	Fuel	D	0-10 PSI	GA 3.0-8.0
3-311-30	Oil	C	0-125 PSI	YA 40-80, GA 80-100, RR 40 & 120
3-311-32	Oil	C	0-125 PSI	B & W
3-311-35	Oil	C	0-125 PSI	GA 70-80, RR 40 & 80
3-311-40	Oil	C	0-150 PSI	WA 25-50 & WA 140-150
3-311-41	Oil	C	0-150 PSI	YA 50-90, GA 90-130, RR 50 & 130
3-312-10	Fuel	D	(-5)-25 PSI	B & W
3-312-12	Fuel	D	(-5)-25 PSI	GA (-4)-25, RR (-4)
3-312-20	Fuel	D	0-25 PSI	B & W
3-313-10	Fuel	C	0-35 PSI	B & W
3-313-12	Fuel	C	0-35 PSI	GA 0.5-30, RR 0.5 & 30
3-313-13	Fuel	C	0-35 PSI	GA 5.0-30, RR 5.0&30

**Weight:** 1.4 oz. **Case:** molded ABS plastic  
**Mounting Info:** Page 33, Figure #2



## 2 1/4" Pressure

Part #	Name	Range	Dial Markings
3-102-30	FUEL PRESS	0-25 PSI	B & W
3-102-40	FUEL PRESS	0-50 PSI	B & W
3-102-41	OIL PRESS	0-50 PSI	B & W
3-102-50	FUEL PRESS	0- 5 PSI	B & W
3-102-60	FUEL PRESS	0-10 PSI	B & W
3-102-61	FUEL PRESS	0-10 PSI	GA 3.0-6.0 RR 3.0 & 6.0
3-102-70	FUEL PRESS	0-30 PSI	B & W
3-102-71	FUEL PRESS	0-30 PSI	YA 5-10 GA 10-25 RR 5&25
3-102-80	FUEL PRESS	10-100 PSI	B & W
3-102-81	FUEL PRESS	10-100 PSI	GA 50-70, YA 70-80, RR 80
3-102-82	OIL PRESS	10-100 PSI	B & W
3-102-90	TURBO PRESS	0-40 PSI	B & W
3-331-10	OIL PRESS	10-130 PSI	B & W
3-331-12	OIL PRESS	10-130 PSI	YA 40-85, GA 85-105, RR 105
3-331-14	OIL PRESS	10-130 PSI	GA 30-60, RR 30 & 100

**Weight:** 4.7 oz. **Case:** cast aluminum  
**Mounting Info:** Page 33, Figure #3



**- Optional special markings available per request on 1", 1 1/4" & 2 1/4"**  
**- Optional internal lighting available on 2 1/4"**

## Electronic Manifold Pressure - Full Sweep Aircore

Electronic Manifold Pressure gauges connect to a pressure transducer which connects to the aircraft's engine and indicates the absolute pressure in the intake manifold of the aircraft. These units are very precise and avoid plumbing issues.

**Standard markings are black and white. Pressure sender sold separately. (page 17)**



Required N1EU50A Sender  
But, can also be calibrated to any other sender too!



N1EU50A Sender



Required N1EU50A Sender  
But, can also be calibrated to any other sender too!

### 1 1/4" Manifold Pressure

Part#	Range	Sender
N07-11MU-A35H-000	5-35 InHg	(U)
N07-11MU-A50H-000	5-50 InHg	(U)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 2 1/4" Manifold Pressure

Part#	Range	Sender
N07-21MU-A35H-000	5-35 InHg	(U)
N07-21MU-A50H-000	5-50 InHg.	(U)

(See page 18 for Opti-Alert/LED option)

**Weight:** 4.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

**-Optional special range markings and/or internal lighting available upon request**

## Mechanical Manifold Pressure

Our conventional 2 1/4" Manifold gauge (series 7-100-xx) is lightweight with a slim design and uses a single diaphragm. Our newer 3 1/8" and 2 1/4" gauges, 7-300-xx and 7-200-xx, incorporate a dual diaphragm design which improves the longevity and reliability of the instrument. **Standard markings are black and white.**

### 3 1/8" Manifold Press.



(Dual Diaphragm)

Part #	Range	Dial Markings
7-300-35	10-35 InHg.	B & W
7-300-50	10-50 InHg.	B & W

**Weight:** 9.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #13

### 2 1/4" Manifold Press.



Part #	Range	Dial Markings
7-200-35	10-35 InHg.	B & W
7-200-50	10-50 InHg..	B & W
7-200-60	10-60 InHg.	B & W
7-200-90	10-90 InHg.	B & W

**Weight:** 7.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #15

### 2 1/4" Manifold Press.



Part #	Range	Dial Markings
7-100-10	10-50 InHg	B & W
7-100-11	10-50 InHg.	GA 15-34, YA 34-36, RR 36
7-100-12	10-50 InHg.	GA 15-24, RR 30
7-100-20	10-35 InHg.	B & W
7-100-30	10-40 InHg.	B & W

**Weight:** 4.7 oz **Case:** cast aluminum  
**Mounting Info:** Page 33, Figure #3

**-Optional special range markings and/or internal lighting available upon request**



## Electronic Carb. Air Temperature

### 1 1/4" Carb. Air Temp.



Part#	Range
N12-118U-050C-000	(-40) to 50 °C
N12-118U-120F-000	(-60) to 120 °F

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 2 1/4" Carb. Air Temp.



Part #	Range
N12-218U-060C-000	(-40) to 60 °C
N12-218U-120F-000	(-60) to 120 °F

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 2 1/4" Carb. Air Temp. Opti-Alert w/DB9 connector



Part#	Range
N12-268U-060C-000	(-40) to 60 °C
N12-268U-110F-000	(-60) to 120 °F

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

*-Optional special range markings and/or internal lighting available upon request*

## Electronic Outside Air Temperature

### 1 1/4" Analog OAT



(270° Aircore)

Part #	Range
N12-119U-040C-000	(-25) to 40 °C
N12-119U-110F-000	(-10) to 110 °F

Probe:(Included ) 1B2-1 (see page 28)  
Current Draw: 100 mA @ 12 volts DC

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 2 1/4" Digital OAT Available in Red or Green LED's and in Fahrenheit's or Celsius



This unit goes with 1B5x probe!

12-100-100F (1B5F)
12-100-100C (1B5C)

Probes included w/6' cable!

### 2 1/4" Analog OAT



(270° Aircore)

Part #	Range
N12-2119U-060C-000	(-40) to 60 °C
N12-2119U-140F-000	(-40) to 140 °F

Probe:(Included) 1B2-1 (see page 28)  
**See page 15 for Opti-Alert/LED options)**

**Weight:** 4.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

Note: Probe & 6' cable included with all above models.

*-Optional special range markings and/or internal lighting available upon request*

## 1 1/4" Fuel Quantity Indicator

UMA manufacturing two lines of fuel quantity indicators-gauges, available in 1 1/4" and 2 1/4" size. UMA is not making or selling any kind of senders for this gauges. We just manufacturing the gauges for many types of senders, either resistance or capacitance type.

### 1 1/4" Fuel Quantity (180°)



Part #	Range	Sender
N18-1125-2C10-000	E to F	(C) 0-5 volts
N18-112F-2F10-000	E to F	(F) 240-30 ohms
N18-112F-2F20-000	E to F	(F) 0-30 ohms
N18-112F-2F30-000	E to F	(F) 0-90 ohms
N18-112F-2F40-000	E to F	(F) 78-6 ohms

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 1 1/4" Fuel Quantity (270°)



Part #	Range	Sender
N18-1125-1C10-000	E to F	(C) 0-5 volts
N18-112F-1F10-000	E to F	(F) 240-30 ohms
N18-112F-1F20-000	E to F	(F) 0-30 ohms
N18-112F-1F30-000	E to F	(F) 0-90 ohms
N18-112F-1F40-000	E to F	(F) 78-6 ohms

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

*-Optional special range markings and/or internal lighting available upon request*

## 2 1/4" Electronic Fuel Quantity Indicator

### 2 1/4" Fuel Quantity (180°)



Part #	Range	Sender
N18-2125-2C10-000	E to F	(C) 0-5 volts
N18-212F-2F10-000	E to F	(F) 240-30 ohms
N18-212F-2F20-000	E to F	(F) 0-30 ohms
N18-212F-2F30-000	E to F	(F) 0-90 ohms
N18-212F-2F40-000	E to F	(F) 78-6 ohms

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 2 1/4" Fuel Quantity (270°)



Part #	Range	Sender
N18-2125-1C10-000	E to F	(C) 0-5 volts
N18-212F-1F10-000	E to F	(F) 240-30 ohms
N18-212F-1F20-000	E to F	(F) 0-30 ohms
N18-212F-1F30-000	E to F	(F) 0-90 ohms
N18-212F-1F40-000	E to F	(F) 78-6 ohms

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

*-Optional special range markings and/or internal lighting available upon request*

# Electronic Oil Temperature

These rugged aircore gauges work with either thermocouple or thermistor probes. UMA has many different probes for these instruments for many applications and can make custom types to meet your requirements. Specify your required probe size when ordering. Gauges below are a small sample of what is available. **Standard markings are black and white. Probes sold separately (see page 28).**

## 1 1/4" Oil Temperature



Part#	Range	Sender*
N12-113U-150C-000	40 -150°C	(U)
N12-113U-300F-000	100-300°F	(U)
N12-113V-300F-000	100-300°F	(V)
N12-113U-430F-000	40-300°F	(U)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## 2 1/4" Oil Temperature



Part #	Range	Sender*
N12-213U-150C-000	40-150°C	(U)
N12-213U-300F-000	100-300°F	(U)
N12-213V-300F-000	100-300°F	(V)
N12-213U-430F-000	40-300°F	(U)

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

## 2 1/4" Oil Temperature

Opti-Alert w/DB9 connector



Part#	Range	Sender*
N12-263U-150C-000	40-150 °C	(U)
N12-263U-300F-000	100-300 °F	(U)

(Specify LED set points and markings)

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

\*Note: -Parts with a (U) require a thermistor probe, (K) a Type K thermocouple (See page 28 for sizes & part #'s)  
-Parts with a (V) use existing VDO probe on Rotax 912/914 engines.

**-Optional special range markings and/or internal lighting available upon request**

# Electronic Water Temperature

These rugged aircore gauges work with either thermocouple or thermistor probes. UMA has many different probes for these instruments for many applications and can make custom types to meet your requirements. Specify your required probe size when ordering. Gauges below are a small sample of what is available. **Standard markings are black and white. Probes sold separately (see page 10).**

## 1 1/4" Water Temperature



Part#	Range	Sender*
N12-115U-150C-000	40-150°C	(U)
N12-115U-300F-000	100-300°F	(U)
N12-115V-300F-000	100-300°F	(V)
N12-115U-430F-000	40-300°F	(U)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## 2 1/4" Water Temperature



Part #	Range	Sender*
N12-215U-150C-000	40-150°C	(U)
N12-215U-300F-000	100-300°F	(U)
N12-215V-300F-000	100-300°F	(V)
N12-215U-430F-000	40-300°F	(U)

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

## 2 1/4" Water Temperature

Opti-Alert w/ DB9 connector



Part#	Range	Sender*
N12-265U-150C-000	40-150 °C	(U)
N12-265U-300F-000	100-300 °F	(U)

(Specify LED set points and markings)

**Weight:** 4.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

\*Note: Parts with a (U) require a thermistor probe, (K) a Type K thermocouple (See page 28 for sizes & part #'s)  
-Parts with a (V) use existing VDO probe on some engines.

**-Optional special range markings and/or internal lighting available upon request**



# Electronic Tachometers & Sending Units

UMA has one of the most extensive line of tachometers available on today's market. We manufacture tachometers for a wide variety of engines and ignition systems used in ultralights, kit planes, and most general aviation aircraft. Since their inception, UMA's line of tachometers has grown to meet a wide range of customer needs. UMA is capable of developing tachs to meet your engines specifications. Available in three different sizes with an analog full sweep readout.

## 3 1/8" Analog Tachometer w/ hourmeter



(Aircore Movement)

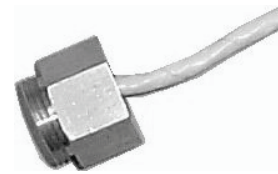
0-3,500 RPM or 0-7,000 RPM  
**Weight:** 9.0 Oz. **Case:** Valox 420  
**Mounting Info:** Page 35, Figure #14

## Sending Units for Tachometers



Part # 1A3-4

**Includes:** 6 ft harness, Sending Unit, and .156 dia. tang adapter  
**Dimensions:** 4.5" overall length, 1.3" max. diameter  
 (Included with Part#'s 19-811-102, or 19-511-102)



TSO'd  
 Part# T1A9-(x)  
 Magnetic pickup for Slick or Bendix Magnets.  
 included as above if selected. -(2) Bendix -(1) Slick  
 (6 ft. cable length) Alternative to p-lead connections.

## 2 1/4" Analog Tachometer 0-3500 RPM



Full sweep aircore movement  
 0-3,500 RPM or 0-4,000 RPM

**Weight:** 5.0 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

## 1 1/4" Analog Tachometer 0-3500 RPM



Full sweep aircore movement  
 0-3,500 RPM

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

## 2 1/4" Analog Tachometer 0-7000 RPM



Full sweep aircore movement  
 0-7,000 RPM or 0-8,000 RPM

**Weight:** 5.0 oz. **Case:** Valox 420  
**Mounting Info:** Page 35, Figure #16

## TACHOMETER FEATURES

Hour meter: Records engine time above a set RPM point. Standard set point is 1800 RPM; Other settings available upon request.  
 2 1/4" Aircore tachs now available with hour meter plus wire output, 12V hourmeter drive output above 1800 RPM's.

All tachs 10-28VDC operation ----**Optional custom range markings and internal lighting available upon request.**

# Tachometer Application Chart

To help our customers receive the right tachometers for their needs, an Application Chart is provided. First look under Engine Type and see if your engine is listed. If not, call for possible cross references. If you are using a modified automobile engine, look under Ignition Systems.

<u>ENGINE TYPE</u>	<u>Signal Source</u>	<u>PART NUMBERS</u>		
		(Aircore) <u>1 1/4" Analog</u>	(Aircore) <u>2 1/4" Analog</u>	(W/ hourmeter) <u>3 1/8" Analog</u>
<b>CONTINENTAL / LYCOMING</b>	W/ Mech. Tach Port	*19-211-102	*19-511-102	*19-811-102
	W/ Mag. Pickup -4cyl	^19-211-101	^19-511-101	^19-811-101
	-6cyl	^19-211-10C	^19-511-10C	^19-811-10C
<b>JABIRU</b>	10 pole mag generator	19-219-105	19-519-105	19-819-105
	12 pole mag generator	19-219-106	19-519-106	19-819-106
<b>ROTAX</b>	Bosch Alt., lighting coil	19-219-202	19-519-202	19-819-202
	Ducati Alternator	19-219-206	19-519-206	19-819-206
	912/914, ignition coil	19-219-201	19-519-201	19-819-201

\* = Tach sending unit (1A3-4) & 6' harness included.    ^ = Mag pickup (1A9-x) with 6' cable

## IGNITION SYSTEM

Ignition coil/module	0-3500 RPM	19-219-10#	19-519-10#	19-819-10#
(negative side of coil or up to 12V square wave)	0-7000 RPM	19-219-20#	19-519-20#	19-819-20#

# = Number of pulses per revolution, 4 cyl = 2, 6 cyl = 3, 8 cyl = 4

**For Continental and Lycoming** engines two different tachometer signal sources can be used. Some prefer to attach a tach sending unit (TSU) to the mechanical drive port on the engine and other applications are better with a magneto pick-up installed in the inspection (vent) plug of the magneto.

- For Magneto pick-up tachs, specify whether you have a 4 cyl or 6 cyl engine and either a Slick (-1) or Bendix (-2) magneto. Each requires a different thread size.
- The Tach Sending Unit (TSU) connects directly to the mechanical drive port on most Continental and Lycoming engines. The TSU replaces the troublesome mechanical cable and tachometer. The sending unit generates pulses, either clockwise or counter-clockwise, which are picked up by an electronic tachometer, for an accurate RPM reading at all times. Requires a wiring harness (standard 6').

Wiring harness and Sending Unit (1A3-4) or T1A9, are included with each TSU type tach purchased or can be purchased separately for use with a CPU system. TSU tachometers are available in any of UMA's three available sizes.

**- Optional triple calibration tachometer available. With simple switch on the back of the tach you can change the number of PPR, without sending the tach back for recalibration!**

It can be precalibrated for many different configurations, like 1, 1 1/2 & 2 PPR or 2, 4 & 6 PPR or else!

**- Optional custom range markings and internal lighting available upon request..**

# Pressure Switches

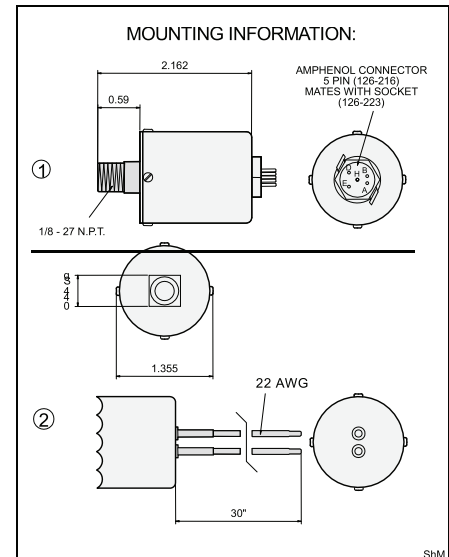


## 1 1/4" Pressure Switches

Part #	Switch Name	Type	Connect.	Range
17-400-10	Manifold Overboost	1	N/A	Close 39.5, Reopen 37.5 In. Hg.
17-400-20	Manifold Overboost	1	N/A	Close 37, Reopen 35.5 In. Hg.
17-400-30	Manifold Overboost	1	N/A	Close 33, Reopen 31.5 In. Hg.
17-500-10	Low Press. Warning	2	N.O.	Close 5.0 PSI, Reopen 5.6 PSI
17-500-12	Low Press. Warning	2	N.O.	Close @ 3 PSI
17-500-20	Altitude Warning Switch	2	N.C.	Set Pt. 11,000 Ft/ Ascend
17-500-21	Altitude Warning Switch	2	N.C.	Set Pt. 10,000 Ft. Ascend
17-500-30	Altitude Warning Switch	4	N/A	Set Pt 10K +/-100,9K Descend +0/-1K
17-500-31	Altitude Warning Switch	2	N.C.	Set Pt. Between 12-13,000 Ft.
17-500-32	Altitude Warning Switch	2	N.C.	10,000 Ascend 9,000 Descend
17-500-40	Low Suction Warning	2	N.C.	Open -6.0, Close -5.0 In..Hg.
17-500-41	Low Suction Warning	2	N.O.	Close -4.5, Open -3.5 In. Hg.
17-600-10	Cabin/Diff. Switch	3	N.O.	Close @ 6 PSI
17-700-10	High Pressure Warning	2	N.O.	Close @ 34.5 PSI
17-700-11	High Pressure Warning	2	N.O.	Close @ 40 PSI
17-700-12	High Pressure Warning	2	N.O.	Close @ 33 PSI

Note: other switching ranges available, call for requests

Weight: 1.8 oz. Case



# Electronic Airspeed Warning Switch

Part #	Contact type	Set Point
17-80X-12	NO	closure @ 140 KTS
17-80X-13	NO	closure @ 110 KTS
17-80X-14	NO	closure @ 60 KTS
17-80X-15	NO	closure @ 104 MPH
17-80X-16	NO	closure @ 65 KTS
17-80X-17	NC	opens @ 90 KTS
17-80X-18	NC	opens @ 100 KTS
17-80X-19	NO	closure @ 40 KTS



The airspeed switch can be used to turn on warning lights, activate a motor, or trigger any electronic device when a specific airspeed is detected. It uses a very accurate electronic sensor and the range is adjustable from 0 to 275mph. Power requirements are 10 to 28 VDC at 100ma. The SPDT contacts will handle 5 amps at 28Vdc. For switches of this type that will handle higher speeds and pressures, contact UMA with your requirements.

# Hourmeters

## Miniature Hourmeter

(Not manufactured by UMA, Inc.)

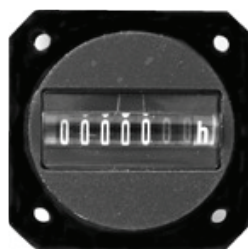
Part #	Voltage	Range
13-300-10	5-35V DC	99999.99

Weight: 1.8 oz. Case: plastic

## 1 1/4" Hourmeter

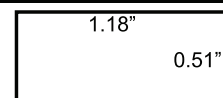
Matches our 1 1/4" Gauges

Part #	Voltage	Range
13-400-10	5-35V DC	99999.



13-400-10

## Panel Cutout:



13-300-10



## Electronic Hydraulic Pressure - 270° Aircore

Electronic Hydraulic Pressure gauge connects to a precision, high pressure transducer which mounts directly to the aircraft's hydraulic system. **Standard markings are black and white. Pressure transducer sold separately (see below).**

### 1 1/4" Hydraulic Pressure



Part #	Range	Sender
N04-114M-2K0P-000	0-2000 PSI	(M)
(requires 1EM2K5 sender)		

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### 2 1/4" Hydraulic Pressure



Part #	Range	Sender
N04-214M-2K0P-000	0-2000 PSI	(M)
(requires 1EM2K5 sender)		

**Weight:** 5 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

NOTE: Gauges above can be calibrated for any high pressure senders (Ashcroft or MSI) or different sender outputs per customer request!

***-Optional special range markings and/or internal lighting available upon request***

## Fuel / Airbox Differential Pressure - 270° Aircore

Electronic, Fuel/Air-box Differential Pressure gauges and senders are designed for the Rotax 914 engine but have other applications where differential pressures need to be measured. It eliminates having to calculate the fuel/air-box differential pressure by looking at two separate gauges and having two separate senders. The gauges require a 1EU07D UMA differential sender. **Sender sold separately. (see page 17)**

### 2 1/4" Fuel Airbox Pressure



Part#	Range	Dial Markings
N04-218U-007P-000	0-7 Diff. PSI (U)	B & W
N04-218U-007P-010	0-7 Diff. PSI (U)	YA 2.2-2.9, GA 2.9-5.1, RR @ 2.2 & 5.1

**Weight:** 4.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 1 1/4" Fuel Airbox Pressure



Part#	Range	Dial Markings
N04-118U-007P-000	0-7 Diff. PSI (U)	B & W
N04-118U-007P-010	0-7 Diff. PSI (U)	YA 2.2-2.9, GA 2.9-5.1, RR @ 2.2 & 5.1

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure # 8

-Note: N1EU07D Pressure Sender is required on above gauges (see page 17).

***-Optional special range markings and/or internal lighting available upon request***

## Electronic Cylinder Head Temperature

These gauges are available for either thermocouple or thermistor probes. UMA has many different probes for these instruments for many applications and can make custom types to meet your requirements. Specify your required probe size when ordering. Gauges below are a small sample of what is available. **Standard markings are black and white. Probes sold separately (see page 28).**

1 1/4" Cylinder Head Temp.



Part#	Range	Sender*
N12-116V-150C-000	40-150 °C	(V)
N12-116U-300F-000	100-300 °F	(U)
N12-116V-300F-000	100-300 °F	(V)
N12-116J-600F-000	100-600 °F	(J)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

2 1/4" Cylinder Head Temp.



Part#	Range	Sender*
*12-450-600	100-600°F	(J)

**\*This gauge doesn't  
require DC power!**

**Weight:** 5.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #12

2 1/4" Cylinder Head Temp.



Part#	Range	Sender*
N12-216V-150C-000	40-150 °C	(V)
N12-216V-300F-000	100-300 °F	(V)
N12-216J-600F-000	100-600°F	(J)

**(Opti-Alert gauges also available)**

**Weight:** 4.7 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

\* Note: -Parts with a (U) require a thermistor probe (see page 28 for options).  
- Parts with a (V) use existing VDO probe on Rotax 912/914 engines  
-Parts with a (J) require a Type J thermocouple probe (see page 28 for options).

**-Optional special range markings and/or internal lighting available upon request**

## Electronic Exhaust Gas Temperature

Specify your required probe size when ordering. All EGT gauges require a Type K Thermocouple temperature probe. The gauges below are a small sample of what is available. **Standard markings are black and white. Probes sold separately (see page 10)**

1 1/4" Exhaust Gas Temp.



Part#	Range	Sender*
N12-117K-900C-000	400-900°C	(K)
N12-117K-1K7F-000	700-1700°F	(K)

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

2 1/4" Exhaust Gas Temp.



Part#	Range	Sender*
12-500-10	700-1700°F	(K)

**\*This gauge doesn't  
require DC power!**

**Weight:** 5.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #12

2 1/4" Exhaust Gas Temp.



Part#	Range	Sender*
N12-217K-900C-000	400-900 °C	(K)
N12-217K-1K7F-000	700-1700 °F	(K)

**(Opti-Alert gauges also available)**

**Weight:** 4.7 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

\*Note: -Parts with a (K) require a Type K thermocouple probe (see page 10 for probe options.)

**-Optional special range markings and/or internal lighting available upon request**

## Fuel Flow Indicator - 270° Aircore

These affordable indicators display gallons/hour fuel flow in a conventional analog instrument package. Standard markings are black and white. Other ranges available. Transducer are sold separately, and are not manufactured by UMA.

### 1 1/4" Fuel Flow



#### MORE TYPES AVAILABLE

Part #:	Range:
N20-112E-008-0000	0-8 GpH
N20-112E-020-0000	0-20 GpH
N20-112E-030-0000	0-30 GpH
N20-112E-060-0000	0-60 GpH
N20-112E-120-0000	0-120 GpH

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

### Turbine Flow Transducer



(Made by Electronics International)-Ei

Part #:	Range:
FT-60	6-70 GpH
FT-90	2-125 GpH
FT-180	2-250 GpH

(See page 15 for Opti-Alert/LED options.)

### 2 1/4" Fuel Flow



Part #:	Range:
N20-212E-008-0000	0-8 GpH
N20-212E-020-0000	0-20 GpH
N20-212E-030-0000	0-30 GpH
N20-212E-060-0000	0-60 GpH
N20-212E-120-0000	0-120 GpH

**Weight:** 4.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

**Note:** UMA no longer carries Flo-scan senders, but we can still calibrate gauges for them, change "E" to "F" in Part number.

*-Optional special range markings and/or internal lighting available upon request*

## Flap/Trim/Rudder Position Indicators - Aircore

### 2 1/4" Flap Position Indicators



Part #	Range	Markings
N09-2100-0301-000	0-30 degrees	B & W
N09-2100-0401-000	0-40 degrees	B & W
N09-2100-0501-000	0-50 degrees	B & W
N09-2100-0601-000	0-60 degrees	B & W

**Weight:** 9.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 1 1/4" Flap Position Indicator & 1H1 Sender (Not-Included)

NOT TO SCALE



Part #	Range	Markings
N09-1100-0301-000	0-30 degrees	B & W
N09-1100-0401-000	0-40 degrees	B & W
N09-1100-U2F0-000	Up-Full	B & W

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

#### MORE TYPES AVAILABLE

-All above models require a 1H1 sender or equivalent, 20' harness is included.



## 1 1/4" Electronic Voltmeter & Ammeter

All our ammeters require an external shunt which is included with the gauge. Aircore ammeters require DC power. Standard markings are black and white. These units have passed identical testing to our TSO'd units, the FAA has no TSO available.

### 1 1/4" Ammeter (0 Centered)



### 1 1/4" Ammeter(0 to +)



### Shunts



(Remote Mounting: 50mV shunt for ALL ammeters)

Part #	Range	Shunt
N15-1100-03CA-000	-30/+30A	1CU1
N15-1100-06CA-000	-60/+60A	1CU2
N15-1100-08CA-000	-80/+80A	1CU3
N15-1100-10CA-000	-100/+100A	1CU4

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

Part #	Range	Shunt
N15-1100-030A-000	0 to +30A	1CU1
N15-1100-060A-000	0 to +60A	1CU2
N15-1100-080A-000	0 to +80A	1CU3
N15-1100-100A-000	0 to +100A	1CU4

**Weight:** 4.0 oz. **Case:** aluminum  
**Mounting Info:** Page 34, Figure #8

Part #	Amperage
1CU1	30 Amps
1CU2	60 Amps
1CU3	80 Amps
1CU4	100 Amps
1CU5	150 Amps
1CU6	200 Amps
1CU7	250 Amps
1CU8	300 Amps
1CU9	10 Amps

**-Optional special range markings and/or internal lighting available upon request**



### 2 1/4" Voltmeter

Part#	Range
N14-2100-917V-000	9-17V
N14-2100-232V-000	20-32V

**Weight:** 4.8 oz **Case:** Valox 420 plastic  
**Mounting info:** Page 35, Figure #16

### 1 1/4" Voltmeter

Part#	Range
N14-1100-917V-000	9-17V
N14-1100-232V-000	20-32V

**Weight:** 4.0 oz **Case:** aluminum  
**Mounting info:** Page 34, Figure #8



**-Optional special range markings and/or internal lighting available upon request**

## 2 1/4" Ammeter & Dual Volt/Ammeter

### 2 1/4" Ammeter (0 center)



Part #	Range
N15-2100-03CA-000	-30 to +30 amps
N15-2100-06CA-000	-60 to +60 amps
N15-2100-08CA-000	-80 to +80 amps
N15-2100-10CA-000	-100 to +100 amps

**Weight:** 4.8 Oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 2 1/4" Ammeter (0 to +)



Part#	Range
N15-2100-030A-000	0 to 30 amps
N15-2100-060A-000	0 to 60 amps
N15-2100-080A-000	0 to 80 amps
N15-2100-100A-000	0 to 100 amps

**Weight:** 4.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #16

### 2 1/4" Dual (Volt/Ammeter)



Part#	Range
15-200-030	0- 30 amps/ 0-30 volts
15-200-060	0- 60 amps/ 0-30 volts
15-200-080	0- 80 amps/ 0-30 volts
15-200-100	0-100 amps/0-30 volts
15-200-150	0-150 amps/0-30 volts

**Weight:**9.8 oz. **Case:** Valox 420 plastic  
**Mounting Info:** Page 35, Figure #12

**-Optional special range markings and/or internal lighting available upon request**

# Mechanical Gyro Suction

## 1" Gyro Suction



Part #	Range	Dial Markings
3-200-10	3-7 IN.HG.	B & W
3-200-11	3-7 IN.HG.	YA 3.0-4.3&6.1-7.0, GA 4.3-6.1
<b>*3-200-12</b>	<b>3-7 IN.HG.</b>	<b>GA 4.5-5.4</b>
3-200-13	3-7 IN.HG.	GA 3.5-5.0, RR 3.5 & 5.0
3-200-14	3-7 IN.HG.	GA 4.5-5.6

**\*FAA-PMA certified**

**Weight:** 1.4 oz. **Case:** molded ABS plastic

**Mounting Info:** Page 33, Figure #1

## 1 1/4" Gyro Suction



Part #	Name	Type	Range	Dial Markings
3-310-50	GYRO SUCTION	A	3-7 IN HG.	GA 4.5-5.2, RR 4.5 & 5.2
3-310-52	GYRO SUCTION	A	3-7 IN HG.	GA 4.75-5.25, RR 4.75 & 5.25
3-310-53	GYRO SUCTION	A	3-7 IN.HG.	GA 4.5-5.0
3-310-54	GYRO SUCTION	A	2-6 IN.HG.	GA 3.8-4.4, RR 3.8 & 4.4
3-310-55	SUCTION	B	3-7 IN.HG.	B&W
3-310-56	GYRO SUCTION	A	2-6 IN.HG.	GA 4.0-5.0
3-310-57	GYRO SUCTION	A	2-6 IN.HG.	GA 4.5-5.4, YA 2.0-4.5, RR 6.0
3-310-58	GYRO SUCTION	A	2-6 IN.HG.	GA 3.5-5.0, RR 3.5 & 5.0
3-310-60	SUCTION SOURCE	B	0-10 IN.HG.	B&W

**Weight:** 1.4 oz. **Case:** Molded ABS plastic

**Mounting Info:** Page 33, Figure



## 2 1/4" Gyro Suction

Part #	Name	Range	Dial Markings
3-102-10	SUCTION	2 - 8 IN Hg.	GA 4.6-5.4
3-102-12	SUCTION	0-10 IN Hg.	B & W
3-102-13	SUCTION	0-10 IN Hg.	GA 4-5, RR 5
3-102-15	SUCTION	0-10 IN Hg.	GA4.2-4.4, RR 4.2 & 5.3

**Weight:** 4.7 oz. **Case:** cast aluminum

**Mounting Info:** Page 33, Figure #3

**-Optional internal lighting available on 2 1/4" Gyro Suction/Pressure only**

**-Optional special marking available on 1", 1 1/4" & 2 1/4" Gyro Suction/Pressure.**

## Cabin Altitude Differential Pressure



### 2 1/4" Cabin Altitude / Differential Pressure

Part #	Range	Dial Markings
11-210-21	0-25,000 Ft. 0-6 PSI	B & W GA 0-4.25, RR 4.45
11-210-31	0-30,000 Ft. 0-6 PSI	GA 0-10, YA 10-28 GA 0-5.65, RR 5.65
11-210-32	0-30,000 Ft. 0-6 PSI	GA 0-10, YA 10-28 GA 0-5.15, RR 5.15
11-211-41	0-35,000 Ft. 0-8 PSI	B & W GA 0-8

**Weight:** 7.4 oz. **Case:** Valox 420 plastic  
**Mounting info:** Page 33, Figure #4

*-Optional special range markings and/or internal lighting available upon request*

## Mechanical Gyro Pressure

The following items are designed to save space in cockpit panels. These gauges utilize an internal diaphragm for accuracy and reliability.

### 1 1/4" Gyro Pressure



Part #	Type	Range	Dial Markings
3-310-20	A	3-7 IN. HG.	GA 4.25-6.25
3-310-21	A	3-7 IN. HG.	GA 4.25-5.2, RR 4.25 & 5.2
3-310-22	A	3-7 IN. HG.	GA 4.5-5.2, YA 3.8-4.5, RR 3.8 & 5.2

**Weight:** 1.4 oz. **Case:** molded ABS plastic  
**Mounting Info:** Page 33, Figure #2

### 2 1/4" Gyro Pressure



Part #	Range	Dial Markings
3-102-01	2-8 IN. HG.	B & W
3-102-02	2-8 IN. HG.	GA 4.5-5.5

**Weight:** 4.7 oz. **Case:** cast aluminum  
**Mounting Info:** Page 33, Figure #3

## Pneumatic Pressure

### 1 1/4" Pneumatic Pressure

Part #	Name	Type	Range	Dial Markings
3-310-41	Pneumatic Press.	A	0-25 PSI	GA 5.0-10, YA 10-21
3-310-43	Pneumatic Press.	A	0-25 PSI	GA 15-21, YA 21-25, RR 14.9
3-310-45	Pneumatic Press.	A	0-25 PSI	GA 15-21, RR 24
3-310-46	Pneumatic Press.	A	0-25 PSI	GA 2.5-7.5, YA 7.5-21

**Weight:** 1.4 oz. **Case:** molded ABS plastic  
**Mounting Info:** Page 33, Figure #2





## 3 1/8" Airspeed Indicator

This highly accurate Airspeed Indicator uses a diaphragm to sense the difference between the pitot pressure and static pressure. **UMA airspeed indicators come in either the MS standard 2 1/4" or 3 1/8" size. Models are available that cover a wide range of speeds with scale readings in MPH, KNOTS, or Kilometers/Hr. Standard dial markings are black and white. Color range markings can be added upon request.**



### 3 1/8" Airspeed Indicator

\*\* FOR KNOTS USE PART NUMBER 16-311-XXX

\*\* FOR KILOMETERS USE PART NUMBER 16-312-XXX

### 3 1/8" Dual Range Airspeed Indicator

\*\* **Other Dual Ranges scale are available, like Knots/Kmh, call for details.**

Part #	Range	Dial Markings
16-310-080	20- 80 MPH	B & W
16-310-100	20-100 MPH	B & W
16-310-120	20-120 MPH	B & W
16-310-140	20-140 MPH	B & W
16-310-160	20-160 MPH	B & W
16-310-180	40-180 MPH	B & W
16-310-200	40-200 MPH	B & W
16-310-240	40-240 MPH	B & W
16-310-260	40-260 MPH	B & W
16-310-280	40-280 MPH	B & W
16-310-300	40-300 MPH	B & W

Part #	OUTSIDE / INSIDE
16-310-140D	20-140 MPH / 20-120 Knots
16-310-160D	40-160 MPH / 35-135 Knots
16-310-180D	40-180 MPH / 35-155 Knots
16-310-200D	40-200 MPH / 35-175 Knots
16-310-240D	40-240 MPH / 40-205 Knots
16-310-260D	40-260 MPH / 35-225 Knots
16-310-300D	40-300 MPH / 40-250 Knots
16-310-350D	40-350 MPH / 40-300 Knots
16-311-200D	40-205 Knots / 40-240 MPH
16-311-260D	40-260 Knots / 50-300 MPH
16-311-300D	40-300 Knots / 40-340 MPH

**Weight:** 8.6 oz. **Case:** Valox 420 plastic

**Weight:** 8.6 oz. **Case:** Valox 420 plastic

**Mounting Info:** Page 34, Figure #11

**-Optional special range markings and/or internal lighting available upon request**

## 2 1/4" Airspeed Indicator

### 2 1/4" Airspeed Indicator

### 2 1/4" Airspeed Indicator Dual scale available!

Part #	Range	Dial Markings
16-210-100	20-100 MPH	B & W
16-210-120	20-120 MPH	B & W
16-210-140	30-140 MPH	B & W
16-210-160	40-160 MPH	B & W
16-210-180	40-180 MPH	B & W
16-210-200	40-200 MPH	B & W
16-210-240	40-240 MPH	B & W
16-210-260	40-260 MPH	B & W
16-210-300	40-300 MPH	B & W
16-210-400	40-400 MPH	B & W



\* Same Ranges Also Available in KNOTS.  
Part Number changes to 16-211-XXX.

See pictures!

**Weight:** 6.9 oz. **Case:** Valox 420 plastic

**Mounting Info:** Page 34, Figure #10

**-Optional special range markings and/or internal lighting available upon request**

## Altimeter

Our standard Altimeters are high quality, simple type (single pointer) designed to meet the needs of the low cost Non-IFR user. Ranges of 10K or 20K feet are available in 3 1/8" or 2 1/4" sizes, with increment markings every 100 feet. A metric scale 0-3000 meters is also available. Both altimeters utilize a knob adjustable barometric scale, viewed through a Kollsman Window which can be ordered to read in inches of mercury or millibars.

### 3 1/8" Altimeter

\*UNSEALED CASE



Part #	Range	Dial Markings	Baro. Dial
5-300-10	0-20,000 Ft.	B & W	w/ IN HG
5-300-20	0-10,000 Ft.	B & W	w/ IN HG
5-300-21	0-10,000 Ft.	B & W	w/ IN HG, extended
5-300-30	0-5,500 Ft.	B & W	w/ IN HG
5-300-40	0-5,500 Ft.	B & W	w/ millibar
5-300-41	0-10,000 Ft.	B & W	w/ millibar
5-300-42	0-20,000 Ft.	B & W	w/ millibar
5-300-50	0-3,000 M.	B & W	w/ millibar

**Weight:** 10.6 oz. **Case:** aluminum casting

**Mounting info:** Page 34, Figure #7

### 2 1/4" Altimeter

SEALED CASE



Part #	Range	Dial Markings	Baro. Dial
5-410-10	0-10,000 Ft.	B & W	w/ IN HG
5-410-20	0-20,000 Ft.	B & W	w/ IN HG
5-411-10	0-10,000 Ft.	B & W	w/ millibar
5-411-20	0-20,000 Ft.	B & W	w/ millibar
5-410-30	0-30,000 Ft.	B&W	w/in/Hg
5-411-50	0-30,000 Mtr	B&W	w/milibar

**Weight:** 5.0 oz.

**Case:** Valox 420 plastic

**Mounting info:** Page 34, Figure #9

\* Do not connect to aircraft static system.

## Vertical Speed Indicator



### 3 1/8" Vertical Speed Indicator

Part #	Label	Range	Dial Markings
8-310-20	Vertical Speed	±2,000 ft/min.	B & W
8-310-30	Vertical Speed	±3,000 ft/min.	B & W
8-310-40	Vertical Speed	±4,000 ft/min.	B & W
8-310-60	Vertical Speed	±6,000 ft/min.	B & W
8-311-10	Vertical Speed	±10 M/S	B & W

**Weight:** 8.8 oz.

**Case:** Valox 420 plastic

**Mounting info:** Page 33, Figure #6



### 2 1/4" Vertical Speed Indicator

Part #	Label	Range	Dial Markings
8-210-20	Vertical Speed	±2,000 ft/min.	B & W
8-210-30	Vertical Speed	±3,000 ft/min.	B & W
8-210-40	Vertical Speed	±4,000 ft/min.	B & W
8-210-60	Vertical Speed	±6,000 ft/min.	B & W
8-211-10	Vertical Speed	±10 M/S	B & W

**Weight:** 7.4 oz.

**Case:** Valox 420 plastic

**Mounting info:** Page 33, Figure #5

**-Optional special range markings and/or internal lighting available upon request**

Vertical Speed Indicators are available Labeled: Climb (-x2), Rate of Change (-x3), or Cabin Climb (-x4). Just change last digit of Part Number. Example: 8-310-62, = 3 1/8", 6000 ft/min., Climb Indicator.

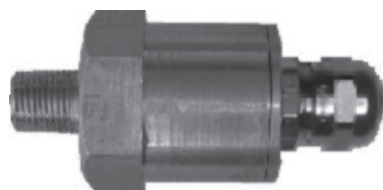
Zero adjusting screw is located in the bottom left screw hole.

## New ceramic type pressure senders, TSO'd & non TSO'd!



**5/8-18 Mounting threads**

**1/8-27 NPTF conn. threads**



**1/8-27 NPTM threads**

N/T2EUMA010G-A20	0-10 PSI	0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA015G-A20	0-15 PSI	0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA030G-A20	0-30 PSI	0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA050G-A20	0-50 PSI	0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA080G-A20	0-80 PSI	0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA100G-A20	0-100 PSI	0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA150G-A20	0-150 PSI	0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA050A-A20	0-50 InHg	ABS 0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT
N/T2EUMA070A-A20	0-70 InHg	ABS 0-5V OUTPUT;	2' LEAD;	1/8 MNPT PORT

NOTE: We also manufacturing same type of senders with 0.5 to 4.5V output voltage and 0.2 to 4.7V output voltage for direct replacements for UMA N/T1EUxxx senders  
N/T1EUMAxxxx are 0.2 to 4.7V out and N/T3EUMAxxxx are 0.5 to 4.5V out voltage

## TSO'd Vertical Speed Indicator

Now offering our new line of popular 2 1/4" & 3 1/8" Vertical Speed Indicator's in a fully FAA TSO'd model!

This indicators are FAA TSO'd to C-8E specifications. Installable in a fixed wing aircrafts with a reciprocating or Turboprop Engines. Must be installed in a temperature controlled environment from -55 to +85°C, to a max. altitude of 25,000 ft.



### 3 1/8" TSO'd Vertical Speed Indicator

Part #	Label	Range	Dial Markings
T 8-310-20	Vertical Speed	±2,000 ft/min.	B & W
T8-310-30	Vertical Speed	±3,000 ft/min.	B & W
T8-310-40	Vertical Speed	±4,000 ft/min.	B & W
T8-310-60	Vertical Speed	±6,000 ft/min.	B & W
T8-311-10	Vertical Speed	±10 M/S	B & W

**Weight:** 8.8 oz. **Case:** Valox 420 plastic  
**Mounting info:** Page 33, Figure #6

### 2 1/4" TSO'd Vertical Speed Indicator

Part #	Label	Range	Dial Markings
T8-210-20	Vertical Speed	±2,000 ft/min	B & W
T8-210-30	Vertical Speed	±3,000 ft/min.	B & W
T8-210-40	Vertical Speed	±4,000 ft/min.	B & W
T8-210-60	Vertical Speed	±6,000 ft/min.	B & W
T8-211-10	Vertical Speed	±10 M/S	B & W

**Weight:** 7.4 oz. **Case:** Valox 420 plastic  
**Mounting info:** Page 33, Figure #5

**-Optional special range markings and/or internal lighting available upon request**

Vertical Speed Indicators are available Labeled: Climb (-x2), Rate of Change (-x3), or Cabin Climb (-x4). Just change last digit of Part Number. Example: T8-310-62, = 3 1/8", 6000 ft/min., Climb Indicator.

Zero adjusting screw is located in the bottom left screw hole.



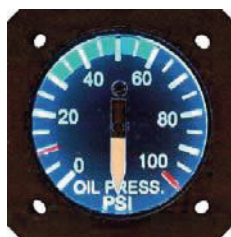
## Internal and Bezel Lighting

UMA offers a technologically advanced lighting system. Replace your existing post lights or indirect lighting system with an electro-luminescent light bezel placed directly on your existing flight and engine instruments. The EL Light does not use bulbs, but an electro-luminescent light strip housed in a black injection molded enclosure ready to install. This light strip draws very low current and produces virtually no heat. Inside the strip, semiconductor crystals convert electrical energy directly into light energy. EL Bezels require AC voltage for illumination. A small inverter converts DC to AC required by the EL light strip. Colors available are Aviation Green, \*White/blue, and Red. (\* FAA-PMA, see page 30)

Internal lighting is also available as an option on all of our 1 1/4", 2 1/4", and 3 1/8" instruments (except for altimeters). The internal lighting uses the same EL light that is used in our bezel. This light strip is mounted around the existing dial of the instrument. See pages 31 for additional information.



No Light



Blue-White Int'l Light



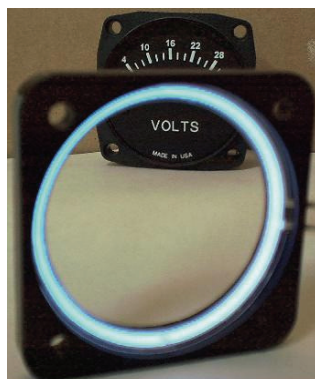
Aviation Green Int'l Light



Red Int'l Light



(Int'l Lighting in daylight)



Int'l lighting- Aviation Green



(Int'l Light w/minimal outside light source)



(Int'l Lighting w/total darkness)



## Electro-Luminescent Instrument Lighting System

UMA's technologically advanced lighting system is the ideal replacement for your existing post lights or indirect lighting system. The EL (electro-luminescent) light does not use bulbs, but an electro-luminescent light strip housed in a black injection molded enclosure ready to install. The light strip draws very low current and produces virtually no heat. Inside the strip, semiconductor crystals convert electrical energy directly into light energy. EL Bezels require AC voltage for illumination. A small inverter (see next page) converts battery DC to AC required by the EL. Light colors available are Aviation Green, Blue/White (FAA/PMA'd)\* and Red.

EL Lights are easy to install onto your existing instruments in just minutes. Simply place the light bezel between the instrument and the panel or between the instrument panel and the panel overlay. The EL Light, unlike conventional lighting systems, will not burn out and is guaranteed for the life of your panel. Bezels are available to fit MS standard 2 1/4" and 3 1/8" instrument cases. We have bezels with left or right cutouts, center cutouts, or dual cutouts to fit all your instrument needs.



Weight: 2 1/4" = 0.5 oz., 3 1/8" = 0.6 oz.

Housing: ABS Plastic

### Standard Sizes:

3 1/8"	<u>Knob cut-out</u>	<u>No cut-out</u>	<u>Center cut-out</u>	<u>Double cut-out</u>	<u>Vertical Speed</u>
	2-30-W*	2-31-W*	2-33-W*	2-34-W*	2-35-W*
	2-30-G	2-31-G	2-33-G	2-34-G	2-35-G
	2-30-R	2-31-R	2-33-R	2-34-R	2-35-R
2 1/4"	<u>Knob cut-out</u>	<u>No cut-out</u>			
	2-20-W*	2-21-W*			
	2-20-G	2-21-G			
	2-20-R	2-21-R			

**-W\* = Blue/White light\*FAA/PMA'd, -G = Aviation Green light, -R = Red light.**

### Features

- EASY INSTALLATION
- LIFETIME GUARANTEE
- BULBLESS DESIGN
- DIMMABLE
- LIGHTWEIGHT
- 360° LIGHTING

### Specifications for UMA EL Light Bezels

Type:	Electro-luminescent
Temperature Range:	-40 to 90°C
Useful Life:	over 3000 hrs.
Operating Voltage:	40-220 VAC
Operating Frequency:	60-3000 Hz
Spectral Output:	500nm for Aviation Green @ 400 Hz
Bezel Material:	ABS Plastic
Weight:	0.5 Oz.

See Page 35 (FIGURE #17) for dimensional drawings.

\*Blue/White Bezels only are FAA/PMA'd under STC# SA01640NY. The installation Eligibility is Raytheon Aircraft Company (Beechcraft) 65-A90-1 and 65-A90-4. Installation documentation is available on our website or call UMA, Inc.

-Copies of existing 337's are available upon request for other installations. Check with your local FSDO office before installing.

# Lighting Inverters & Accessories

This inverter package is designed to power a whole panel of UMA's EL light bezels and/or internally lighted instruments (up to 12). Models are available for 5V, 14V and 28V systems. Package has a dimmable DC input (use dimmer pot 1G01) and screw lugs to allow for a secure mounting.

Part #	Power
*10-700-05	5 Volts D.C.@100ma.
*10-700-14	14 Volts D.C.@100ma.
*10-700-28	28 Volts D.C.@100ma.

\*Inverters are FAA/PMA'd under STC# SA01640NY. (See page 30 for details)

**Weight:** 3.0 oz.      **Size:** 1.41 " L X 1.41 " W X 1.12 " H



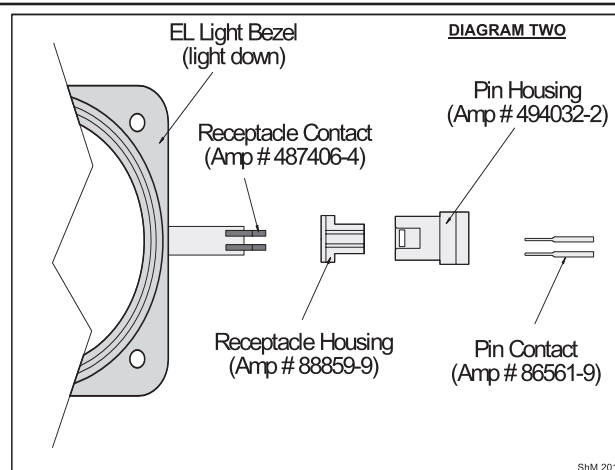
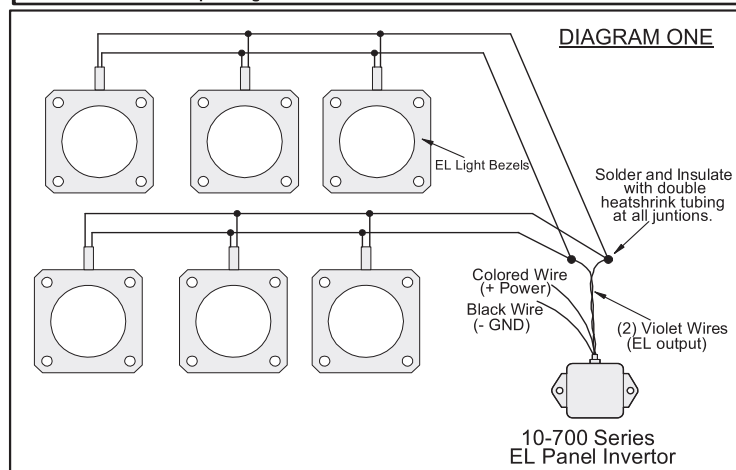
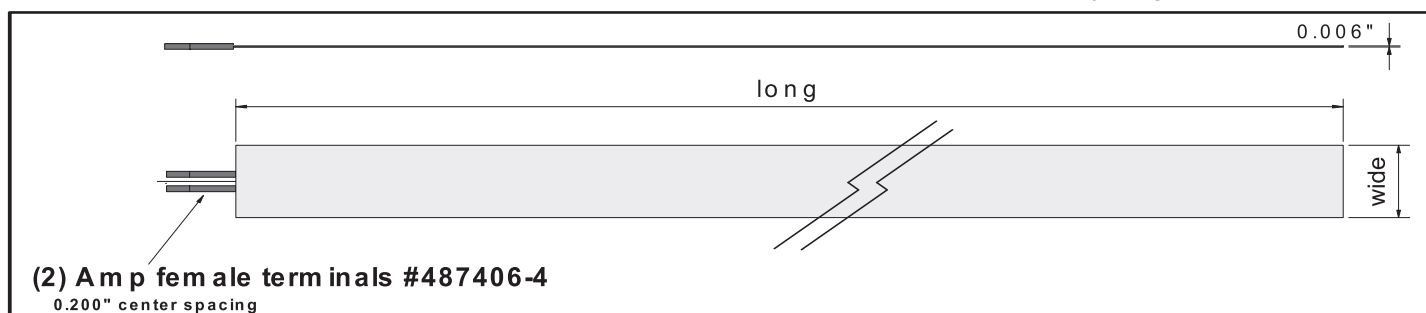
Dimmer Potentiometer:      Part # 1G01-1      1K ohms 5 watt, wire wound potentiometer with on/off switch

Optional connector kit:      Part # \*1G02, kit includes 1 male connector housing that slides over bezel light strip connector and 1 female quick disconnect connector housing with 1 ft. lg. pigtail wires.

\*1G02 connector kits are FAA/PMA'd under STC# SA01640NY. (See page 30 for details)

Light Strips for Glare Shields	Part# 2-425-050X	.50" Wide X 25" Long	(X=(W)White/Blue or (G)Aviation Green.)
	Part# 2-423-075X	.75" Wide X 23" Long	(X=(W)White/Blue or (G)Aviation Green.)
	Part# 2-411-120X	1.2" Wide X 11.5" Long	(X=(W)White/Blue or (G)Aviation Green.)
	Part# 2-418-150X	1.5" Wide X 18" Long	(X=(W)White/Blue or (G)Aviation Green.)

Note: Strips are self-adhesive and can be cut on non-connector side to modify length.



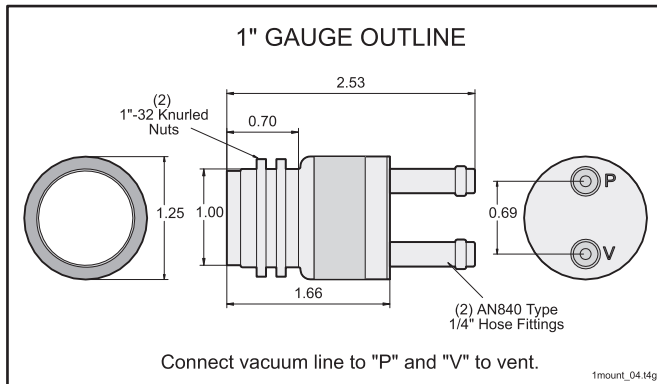
# Internal Lighting

Internal lighting is available as an option on all of our 2 1/4", 3 1/8" instruments (except for altimeters) and on our 1 1/4" electronic engine gauges. The internal lighting uses the same EL light that is used in our bezel. This light strip is mounted around the existing dial of the instrument, which allows for the instruments to be closer to the instrument panel and easier to read. Available only for UMA manufactured products.

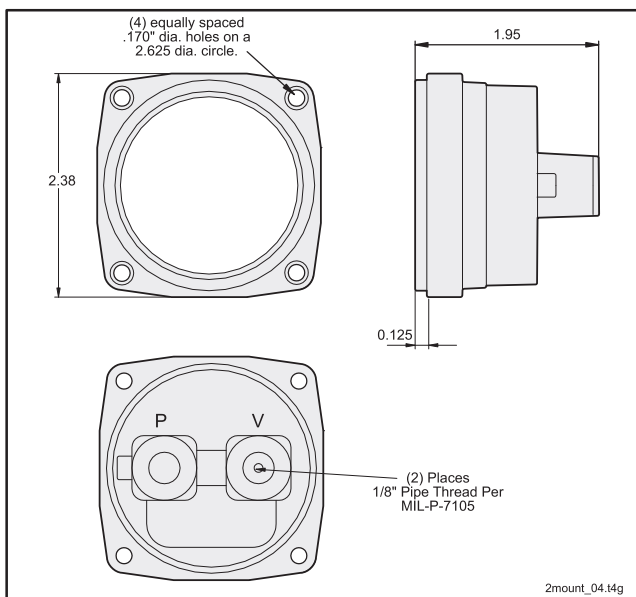
Call for more information on UMA's EL Lighting Systems \_ 1-800-842-5578



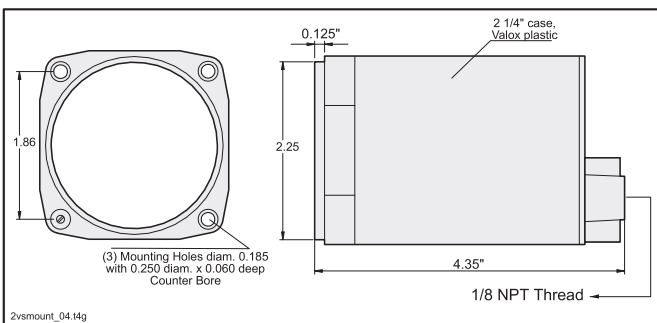
# Mounting Information



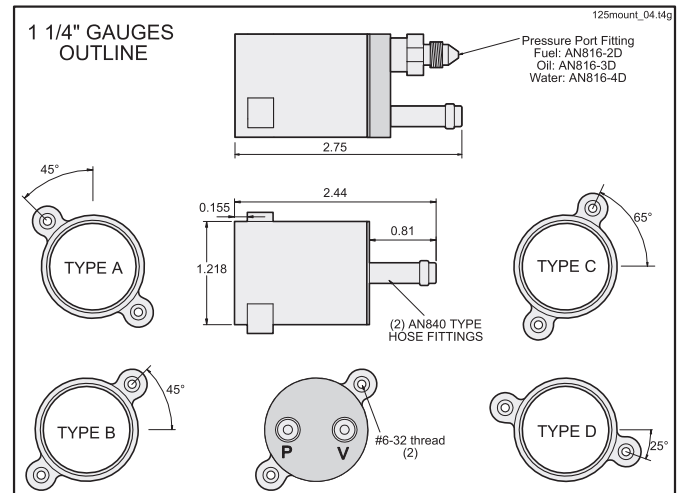
**FIGURE #1: 1" GAUGE**



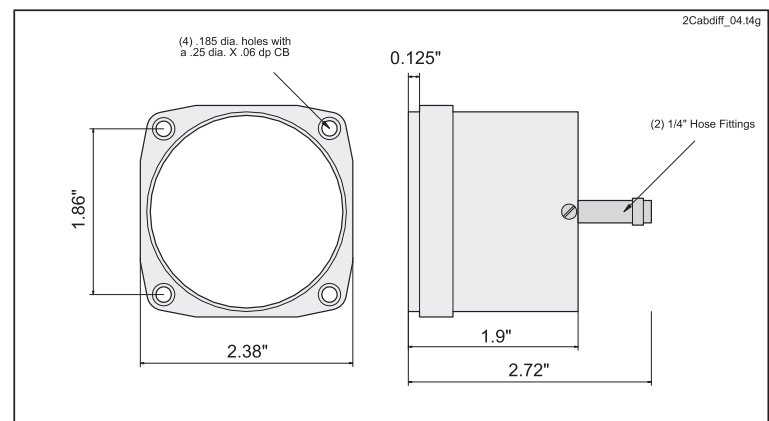
**FIGURE #3: 2 1/4" MECHANICAL SUCTION/PRESSURE**



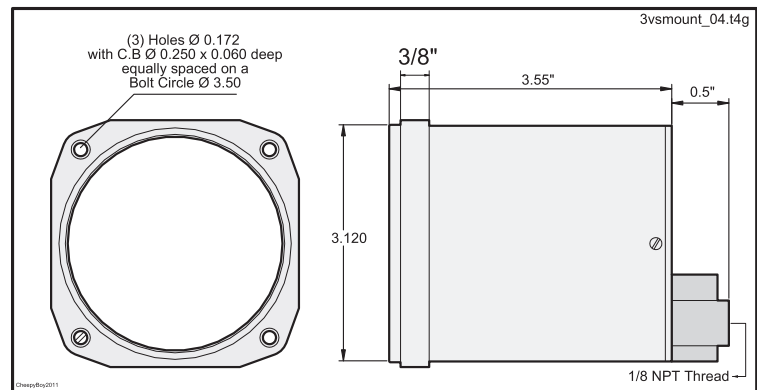
**FIGURE #5: 2 1/4" VERTICAL SPEED INDICATOR**



**FIGURE #2: 1 1/4" MEC MECHANICAL GAUGE**



**FIGURE #4: 2 1/4" CABIN ALT./DIFF.PRESSURE**



**FIGURE #6: 3 1/8" VERTICAL SPEED INDICATOR**

# Mounting Information

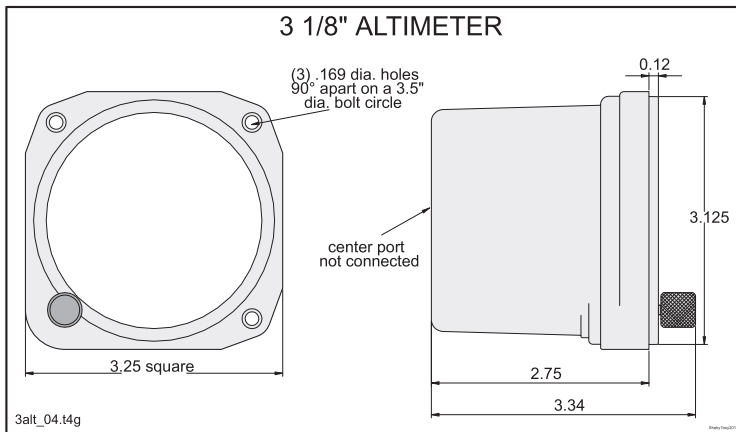


FIGURE #7: 3 1/8" ALTIMETER

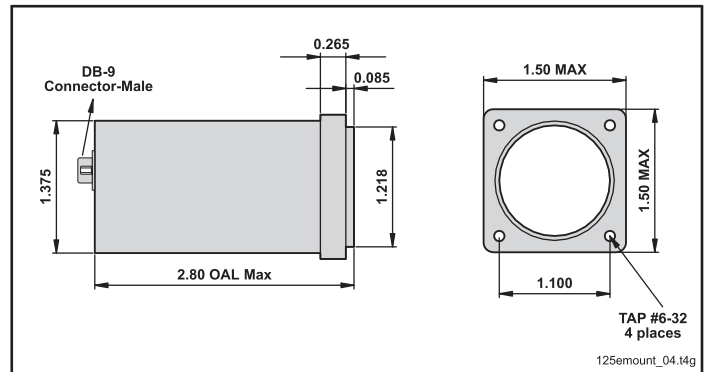


FIGURE #8: 1 1/4" ELECTRONIC GAUGE & 1 1/4" MECHANICAL GAUGE With INTERNAL LIGHTING

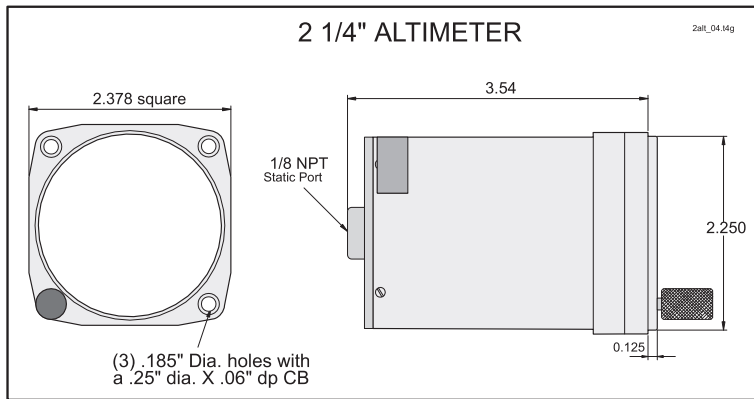


FIGURE #9: 2 1/4" ALTIMETER

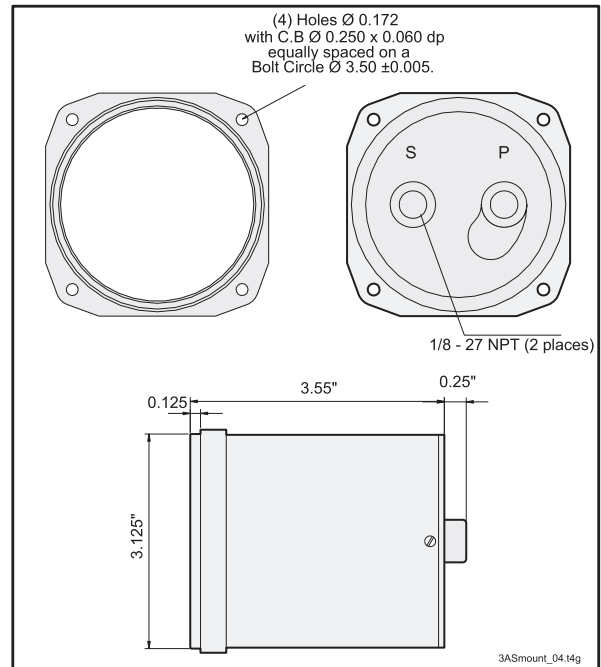


FIGURE #11: 3 1/8" TSO'D/NON-TSO'D AIRSPEED IND.

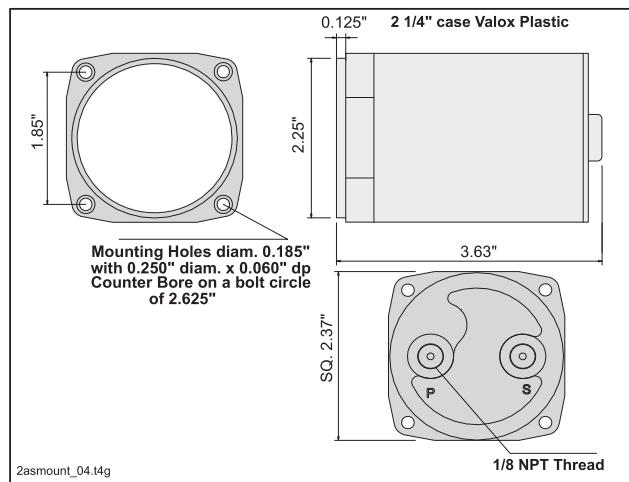
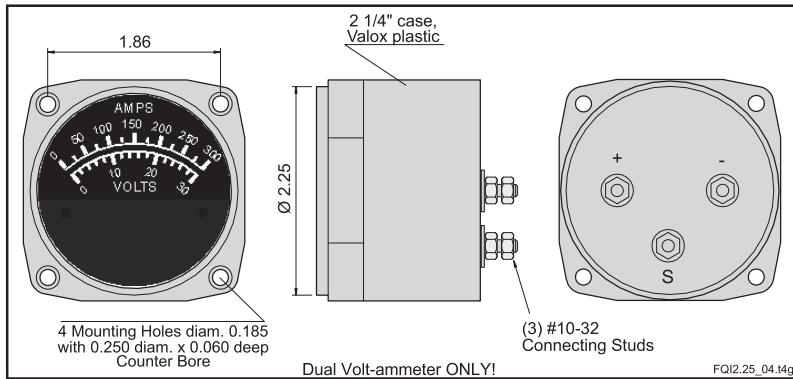
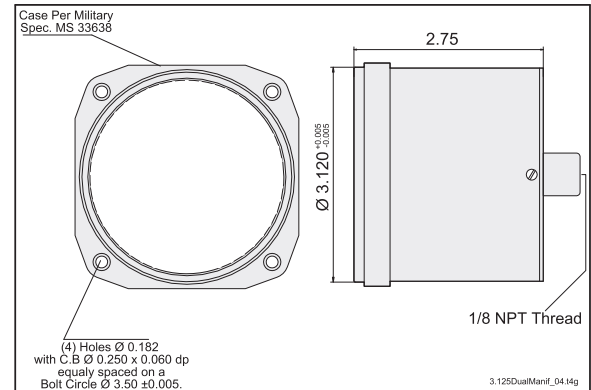


Figure #10 2 1/4" AIRSPEED INDICATOR

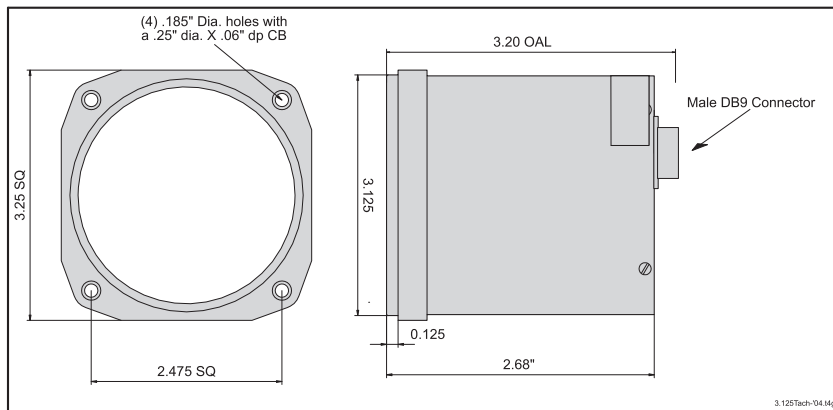
# Mounting Information



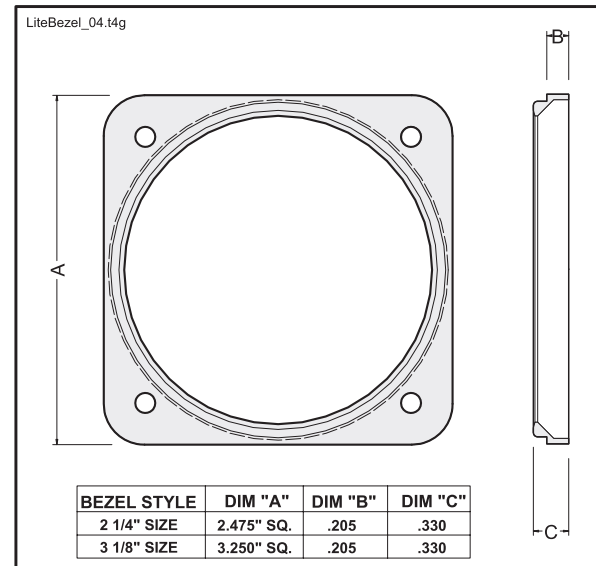
**FIGURE #12: 2 1/4" ELECTRONIC (90° SWEEP)**



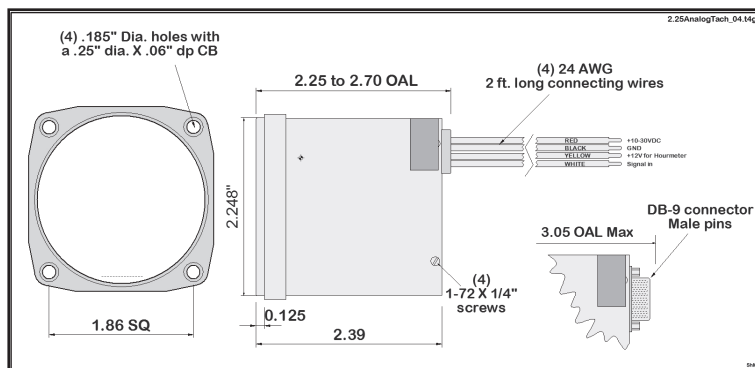
**FIGURE #13: 3 1/8" MANIFOLD PRESSURE**



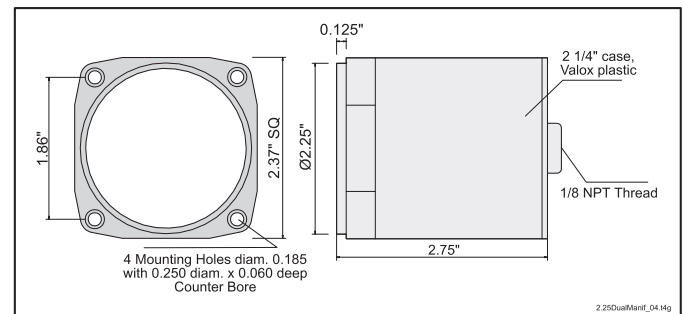
**FIGURE #14: 3 1/8" TACHOMETER**



**FIGURE #17: 2 1/4" & 3 1/8" LIGHT BEZELS**



**FIGURE #16: 2 1/4" TACHOMETER & 2 1/4" ELECTRONIC AIR-CORE/OPTI ALERT**



**FIGURE #15: 2 1/4" MANIFOLD PRESSURE**

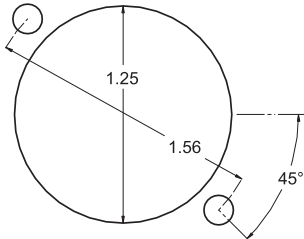
FOR SPECIFIC GAUGE DIMENSIONS , PLEASE CONTACT UMA INC.



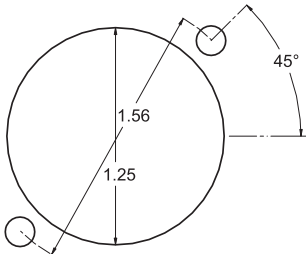
# Panel Cut-Out Dimensions

**Note: Drawings not to scale**

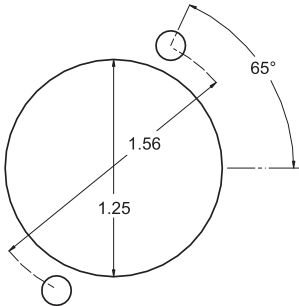
Panel Cut-out for  
1 1/4" Mechanical Instrument  
Type A



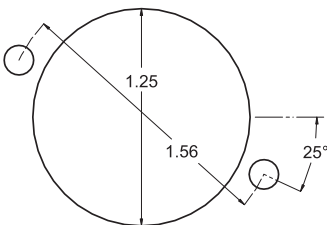
Panel Cut-out for  
1 1/4" Mechanical Instrument  
Type B



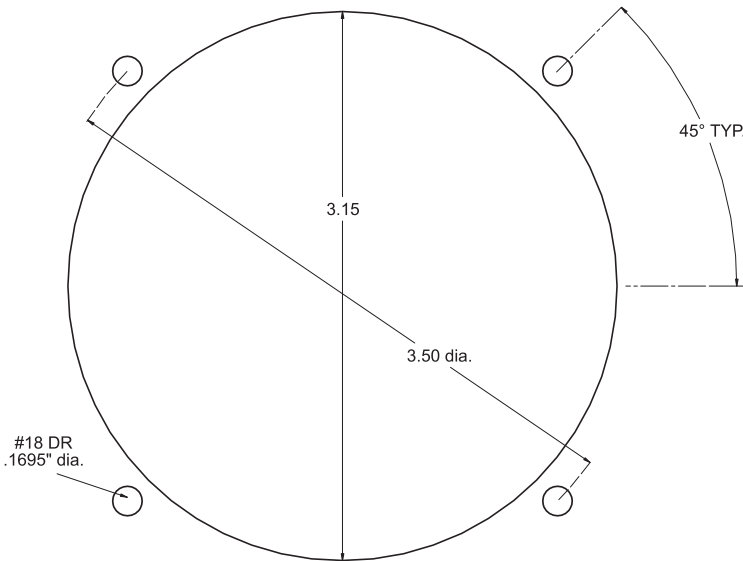
Panel Cut-out for  
1 1/4" Mechanical Instrument  
Type C



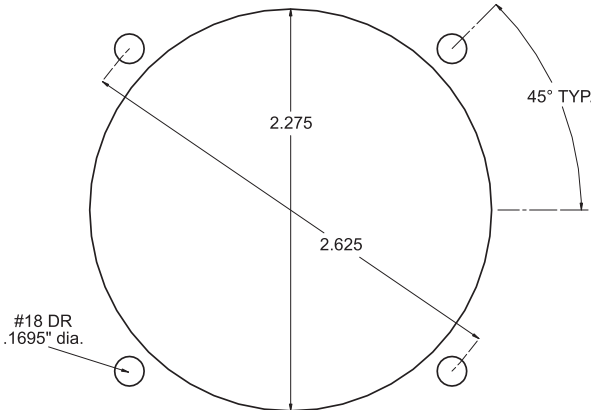
Panel Cut-out for  
1 1/4" Mechanical Instrument  
Type D



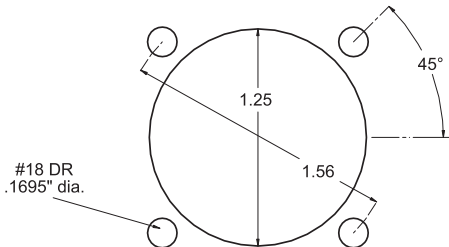
Panel Cut-out for typical 3 1/8" Instrument



Panel Cut-out for typical 2 1/4" Instrument



Panel Cut-out for  
1 1/4" Electronic Instrument



cutouts\_04.t4g

# Notes

# Notes



## Also Manufactured by UMA Inc.:



**Plethysmo Analyzer PA-100**



**Plethysmo Analyzer PA-150  
(recording)**

UMA Plethysmo Analyzers are developed to assist the physician in diagnosing peripheral vascular disease, diabetic screening for ischemia and to monitor arterial grafts. Plethysmography is an indirect measurement of blood flow into a limb. UMA Plethysmo Analyzers accurately measure these volume changes!



**Ultrasound Watt Meter UMT-2A**

The UMT-2A was designed for a quick test of output of ultrasound therapy generators. Applicable for 1 MHz, 10cm<sup>2</sup> transducer set at continuous output!



**Ultrasound Watt Meter UMR-3D**

The UMR-3D is a highly accurate portable wattmeter designed to service 1 MHz and 3 MHz continuous output therapy level ultrasound generators!



**UMA Inc. was founded in New York, NY in 1936 as a medical manufacturer of blood pressure gauges such as the Collens Sphygmopo-Oscillometer.**

**During the 1940's, UMA diversified its business by developing aircraft instruments for the war effort. Three engineers from Grumman Aircraft Company purchased the company in 1974. UMA moved from New York to Virginia in 1978.**

**While visiting the Shenandoah Valley please stop by our facility in Dayton, VA. You are welcome to come in and discuss your needs with our experienced sales staff at UMA Inc.**

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