




# DWYER INSTRUMENTS, INC.

[www.dwyer-inst.com](http://www.dwyer-inst.com)

- pressure
- air quality
- flow
- temperature
- level
- process control
- test equipment
- valves




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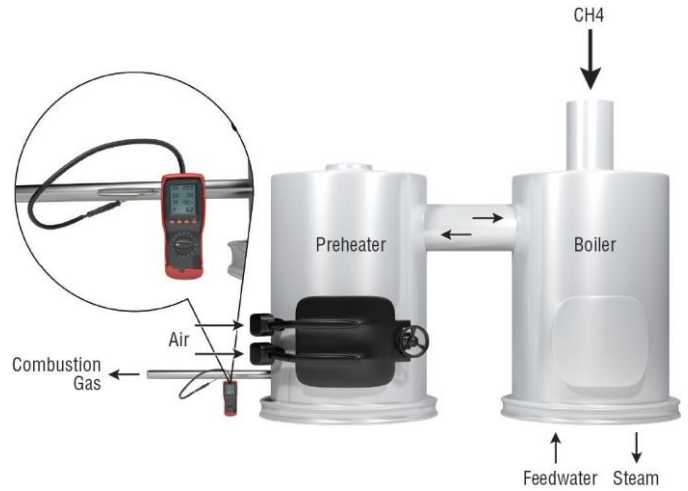
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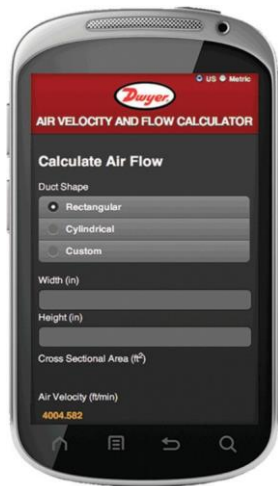
### Current/voltage signal generator used to calibrate panel meters.

The Model CSG Digital Signal Generator is perfect for generating or simulating input signals to panel meters and process controllers. The signal generator is capable of sourcing up to 10 VDC or 20 mA in 1 VDC or 1 mA steps. The backlit digital display allows users to quickly compare the reading on the Model CSG to that of the panel meter or process controller. The signal from the Model CSG can be used to set up the upper and lower limits of the process range. It can also be used to insure that set point and alarm functions are working properly on the panel meter or process controller.



### Combustion analyzer maximize boiler efficiency while monitoring harmful products of combustion.

There are several critical factors in attaining efficient combustion for boilers and other combustors. Monitoring the temperature of combustion and minimizing the amount of excess air in the system are undoubtedly essential steps. A Dwyer 1207-NO<sub>x</sub> Flue Gas Analyzer can break down the products of combustion, giving an accurate volumetric composition of harmful NO<sub>x</sub> compounds, O<sub>2</sub>, CO<sub>2</sub>, and CO. Additionally, the 1207-NO<sub>x</sub> will monitor differential temperature, excess air and poison index. Results can be easily viewed on screen or uploaded to a PC via the user-friendly software.



### FREE DOWNLOAD!

Download the phone App or use the Web version of our Air Velocity and Flow Calculator on our website at: [www.dwyer-inst.com/flowcalc](http://www.dwyer-inst.com/flowcalc).



Scan here to watch product video

### HVAC mobile application

For those customers in the HVAC or Building Automation Systems Industry, Dwyer offers the Air Velocity and Flow Calculator App available on the iOS® and Google Play® Markets. One can easily convert velocity pressure to air velocity or air velocity to air volume. Converting velocity pressure to air volume is advantageous for effortlessly changing the pressure on your Magnehelic® Differential Pressure Gage or manometer to velocity. Moreover, this Calculator also includes air density factors from humidity levels. By utilizing the air velocity to air volume functionality, one can simplistically convert the air velocity to air flow rates from duct dimensions, with just the tap of a button.



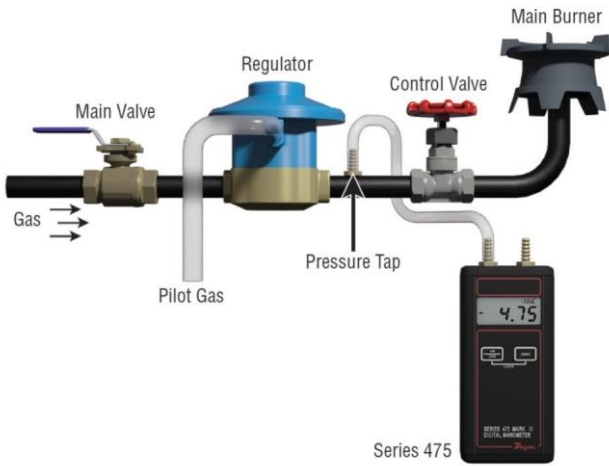
### Field calibrate and certify pressure gauges.

Using the series PHP-1 with a DPG-100, a technician can calibrate or certify process pressure gauges up to 1% accurate. The PHP-1 hand pump can easily supply pressures up to 600 PSI by squeezing the handle and adjusting the volume control valve. The pump has two connections to be connected with a test gauge, such as the Dwyer Model DPG-100, and a process gauge, such as the Dwyer SGL series.



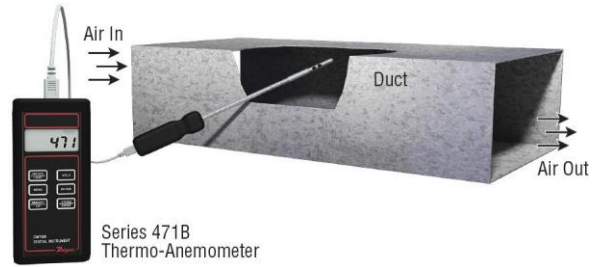
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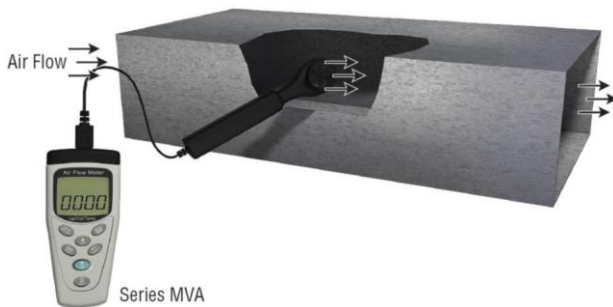
### Digital Manometers used to check gas pressure to a heating burner.

Checking the gas pressure to a heating unit on the burner side of the regulator is a standard installation and service routine. The Dwyer® Series 475 Handheld Digital Manometer is a low-cost, durable device that is easily transportable in a pocket or briefcase. Units are highly accurate with 0.5% full scale accuracy. Some servicemen prefer our portable Dwyer Magnehelic® differential pressure gage with dial type scale for field use.



### Determine air velocity and temperature levels in ducts or air supply grills.

The Dwyer® Series 471B Digital Thermo-Anemometer is the ideal portable product for determining air velocity and temperature levels in ducts or air supply grills. With a push of a button, FPM and Fahrenheit readings are converted to MPS and Celsius. Readings may be stored and retrieved which allows the user greater efficiency with HVAC balancing at various locations in a building.



### Handheld anemometer enables measuring duct flow measurements.

Handheld anemometers are an excellent, portable tool for performing tests on HVAC system performance; however, large rotating vanes can prevent easy access to ducts. Dwyer introduces the MVA Mini-Vane Thermo-Anemometer to eliminate this problem. Additionally, simple keypad programming enables the user to view volumetric flow rates in CFM or CMM.



### Quickly measure humidity and temperature levels in ambient air.

The Dwyer® THI-10 Handheld Digital Hygrometer is a simple, portable device for quickly measuring humidity and temperature levels in ambient air. The dew point and wet-bulb temperature readings are derived from relative humidity and temperature measurements. The THI-10 is often used in agricultural applications where proper humidity and temperature levels are critical in plant or animal well being.





# Air Velocity Measurement

## Introduction

In air conditioning, heating and ventilating work, it is helpful to understand the techniques used to determine air velocity. In this field, *air velocity* (distance traveled per unit of time) is usually expressed in feet per minute (FPM). By multiplying air velocity by the cross section area of a duct, you can determine the air volume flowing past a point in the duct per unit of time. *Volume flow* is usually measured in cubic feet per minute (CFM).

Velocity or volume measurements can often be used with engineering handbook or design information to reveal proper or improper performance of an airflow system. The same principles used to determine velocity are also valuable in working with pneumatic conveying, flue gas flow and process gas systems. However, in these fields the common units of velocity and volume are sometimes different from those used in air conditioning work.

To move air, fans or blowers are usually used. They work by imparting motion and pressure to the air with either a screw propeller or paddle wheel action. When force or pressure from the fan blades causes the air to move, the moving air acquires a force or pressure component in its direction of motion due to its weight and inertia. Because of this, a flag or streamer will stand out in the air stream. This force is called *velocity pressure*. It is measured in inches of water column (w.c.) or water gage (w.g.). In operating duct systems, a second pressure is always present. It is independent of air velocity or movement. Known as *static pressure*, it acts equally in all directions. In air conditioning work, this pressure is also measured in inches w.c.

In pressure or supply systems, static pressure will be positive on the discharge side of the fan. In exhaust systems, a negative static pressure will exist on the inlet side of the fan. When a fan is installed midway between the inlet and discharge of a duct system, it is normal to have a negative static pressure at the fan inlet and positive static pressure at its discharge.

*Total pressure* is the combination of static and velocity pressures, and is expressed in the same units. It is an important and useful concept to use because it is easy to determine and, although velocity pressure is not easy to measure directly, it can be determined easily by subtracting static pressure from total pressure. This subtraction need not be done mathematically. It can be done automatically with the instrument hook-up.

## Sensing Static Pressure

For most industrial and scientific applications, the only air measurements needed are those of static pressure, total pressure and temperature. With these, air velocity and volume can be quickly calculated.

To sense static pressure, six types of devices are commonly used. These are connected with tubing to a pressure indicating instrument. Fig. 1-A shows a simple thru-wall static pressure tap. This is a sharp, burr-free opening through a duct wall provided with a tubing connection of some sort on the outside. The axis of the tap or opening must be perpendicular to the direction of flow. This type of tap or sensor is used where air flow is relatively slow, smooth and without turbulence. If turbulence exists, impingement, aspiration or unequal distribution of moving air at the opening can reduce the accuracy of readings significantly.

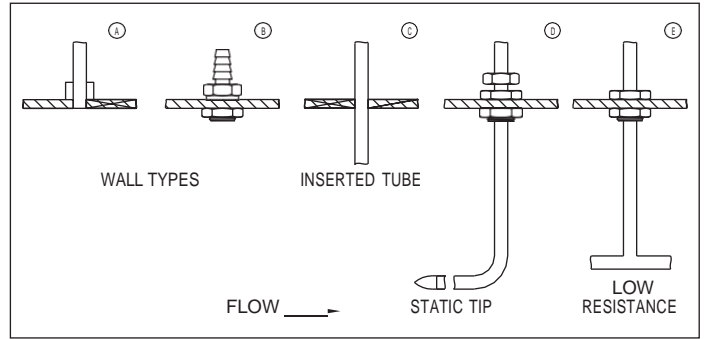


Figure 1 - Types of Static Pressure Devices

Fig. 1-B shows the Dwyer® No. A-308 Static Pressure Fitting. Designed for simplified installation, it is easy to install, inexpensive, and provides accurate static pressure sensing in smooth air at velocities up to 1500 FPM.

Fig. 1-C shows a simple tube through the wall. Limitations of this type are similar to wall type Fig. 1-A.

Fig. 1-D shows a static pressure tip which is ideal for applications such as sensing the static pressure drop across industrial air filters and refrigerant coils. Here the probability of air turbulence requires that the pressure sensing openings be located away from the duct walls to minimize impingement and aspiration and thus insure accurate readings. For a permanent installation of this type, the Dwyer® No. A-301 or A-302 Static Pressure Tip is used. It senses static pressure through radially-drilled holes near the tip and can be used in air flow velocities up to 12,000 FPM.

Fig. 1-E shows a Dwyer® No. A-305 low resistance Static Pressure Tip. It is designed for use in dust-laden air and for rapid response applications. It is recommended where a very low actuation pressure is required for a pressure switch or indicating gage — or where response time is critical.

## Measuring Total Pressure and Velocity Pressure

In sensing static pressure we make every effort to eliminate the effect of air movement. To determine velocity pressure, it is necessary to determine these effects fully and accurately. This is usually done with an impact tube which faces directly into the air stream. This type of sensor is frequently called a "total pressure pick-up" since it receives the effects of both static pressure and velocity pressure.



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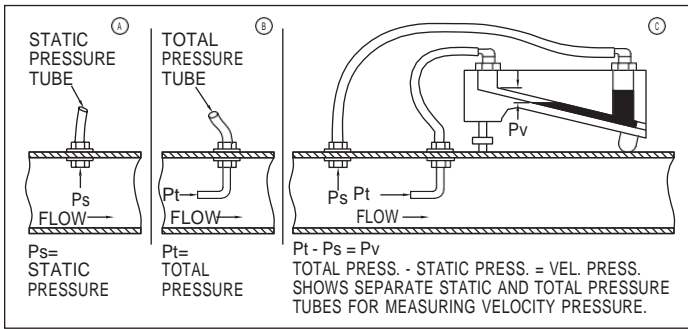


Figure 2 - Types of Pressure Measurements

In Figure 2, note that separate static connections (A) and total pressure connections (B) can be connected simultaneously across a manometer (C). Since the static pressure is applied to both sides of the manometer, its effect is cancelled out and the manometer indicates only the velocity pressure.

To translate velocity pressure into actual velocity requires either mathematical calculation, reference to charts or curves, or prior calibration of the manometer to directly show velocity. In practice this type of measurement is usually made with a Pitot tube which incorporates both static and total pressure sensors in a single unit.

Essentially, a Pitot tube consists of an impact tube (which receives total pressure input) fastened concentrically inside a second tube of slightly larger diameter which receives static pressure input from radial sensing holes around the tip. The air space between the inner and outer tubes permits transfer of pressure from the sensing holes to the static pressure connection at the opposite end of the Pitot tube and then, through connecting tubing, to the low or negative pressure side of a manometer. When the total pressure tube is connected to the high pressure side of the manometer, velocity pressure is indicated directly. See Figure 3.

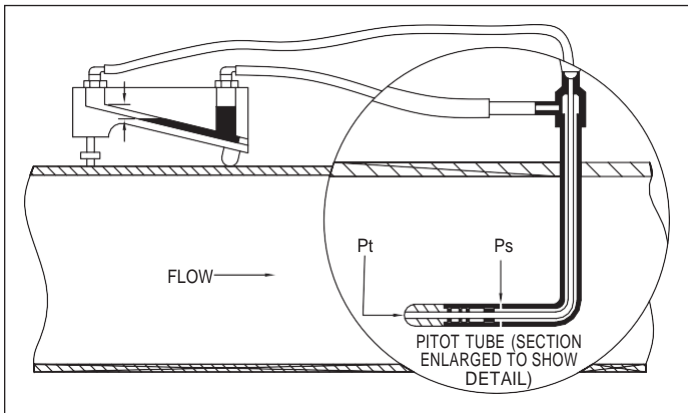


Figure 3 - Pitot Tube Senses Total and Static Pressures. Manometer Measures Velocity Pressure – (Difference Between Total and Static Pressures).

Since the Pitot tube is a primary standard device used to calibrate all other air velocity measuring devices, it is important that great care be taken in its design and fabrication. In modern Pitot tubes, proper nose or tip design — along with sufficient distance between nose, static pressure taps and stem — will minimize turbulence and interference. This allows use without correction or calibration factors. All Dwyer® Pitot tubes are built to AMCA and ASHRAE standards and have unity calibration factors to assure accuracy.

To insure accurate velocity pressure readings, the Pitot tube tip must be pointed directly into (parallel with) the air stream. As the Pitot tube tip is parallel with the static pressure outlet tube, the latter can be used as a pointer to align the tip properly. When the Pitot tube is correctly aligned, the pressure indication will be maximum.

Because accurate readings cannot be taken in a turbulent air stream, the Pitot tube should be inserted at least 8-1/2 duct diameters downstream from elbows, bends or other obstructions which cause turbulence. To ensure the most precise measurements, straightening vanes should be located 5 duct diameters upstream from the Pitot tube.

How to Take Traverse Readings



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In practical situations, the velocity of the air stream is not uniform across the cross section of a duct. Friction slows the air moving close to the walls, so the velocity is greater in the center of the duct.

To obtain the average total velocity in ducts of 4" diameter or larger, a series of velocity pressure readings must be taken at points of equal area. A formal pattern of sensing points across the duct cross section is recommended. These are known as traverse readings. Figure 4 shows recommended Pitot tube locations for traversing round and rectangular ducts.

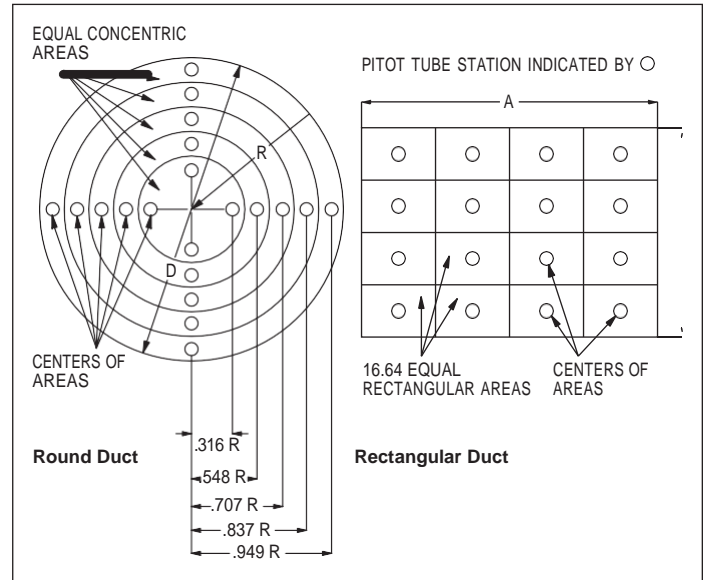


Figure 4 - Traverse on Round and Rectangular Duct Areas

In round ducts, velocity pressure readings should be taken at centers of equal concentric areas. At least 20 readings should be taken along two diameters. In rectangular ducts, a minimum of 16 and a maximum of 64 readings are taken at centers of equal rectangular areas. Actual velocities for each area are calculated from individual velocity pressure readings. This allows the readings and velocities to be inspected for errors or inconsistencies. The velocities are then averaged.

By taking Pitot tube readings with extreme care, air velocity can be determined within an accuracy of ±2%. For maximum accuracy, the following precautions should be observed:

1. Duct diameter should be at least 30 times dia. of Pitot tube.
2. Locate the Pitot tube in a duct section providing 8-1/2 or more duct diameters upstream and 1-1/2 or more diameters down stream of Pitot tube free of elbows, size changes or obstructions.
3. Provide an egg-crate type of flow straightener 5 duct diameters upstream of Pitot tube.
4. Make a complete, accurate traverse.

In small ducts or where traverse operations are otherwise impossible, an accuracy of ±5% can frequently be achieved by placing Pitot tube in center of duct. Determine velocity from the reading, then multiply by 0.9 for an approximate average.

## Calculating air velocity from velocity pressure



Scan here to watch product video

Manometers for use with a Pitot tube are offered in a choice of two scale types. Some are made specifically for air velocity measurement and are calibrated directly in feet per minute. They are correct for standard air conditions: i.e. air density of .075 lb per ft<sup>3</sup> corresponds to dry air at 70°F, barometric pressure of 29.92 inches Hg. To correct the velocity reading for other than standard air conditions, the actual air density must be known. It may be calculated if relative humidity, temperature and barometric pressure are known.

Most manometer scales are calibrated in inches of water. Using readings from such an instrument, the air velocity may be calculated using the basic formula:

$$V = 1096.7 \sqrt{\frac{h_v}{d}} = 4004.4 \sqrt{\frac{h_v}{d}} \text{ for } .075 \text{ lb/ft}^3 \text{ dry air @ } 70^\circ\text{F, } 29.92 \text{ in. Hg Baro.}$$

Where: V = Velocity in feet per minute.  
 $h_v$  = Velocity pressure in inches of water.  
 $d$  = Density of air in pounds per cubic foot.

To determine dry air density, use the formula:

$$d = 1.325 \frac{P_B}{T}$$

Where:  $d$  = Air density in pounds per cubic foot.  
 $P_B$  = Barometric (or absolute) static pressure in inches of mercury.  
 $T$  = Absolute temperature (indicated temperature in °F plus 460°).

With dry air at 29.9 inches mercury, air velocity can be read directly from curves on the following page. For partially or fully saturated air a further correction is required. To save time when converting velocity pressure into air velocity, the Dwyer® Air Velocity Calculator may be used. A simple slide rule, it provides for all the factors needed to calculate air velocity quickly and accurately. It is included as an accessory with each Dwyer® Pitot tube.

To use the Dwyer® Calculator:

1. Set relative humidity on scale provided. On scale opposite known dry bulb temperature, read correction factor.
2. Set temperature under barometric pressure scale. Read density of air over correction factor established in 1 (above).
3. On the other side of calculator, set air density reading just obtained on the scale provided.
4. Under Pitot tube reading (velocity pressure, inches of water) read air velocity, feet per minute.

### Determining Volume Flow

Once the average air velocity is known, the air flow rate in cubic feet per minute is easily computed using the formula:

$$Q = AV$$

Where: Q = Quantity of flow in cubic feet per minute.  
 $A$  = Cross sectional area of duct in square feet.  
 $V$  = Average velocity in feet per minute.

### Determining Air Volume by Calibrated Resistance

Manufacturers of air filters, cooling and condenser coils and similar equipment often publish data from which approximate air flow can be determined. It is characteristic of such equipment to cause a pressure drop which varies proportionately to the square of the flow rate. Figure 5 shows a typical filter and a curve for air flow versus resistance. Since it is plotted on logarithmic paper, it appears as a straight line. On this curve, a clean filter which causes a pressure drop of .50 in w.c. would indicate a flow of 2,000 c.f.m.

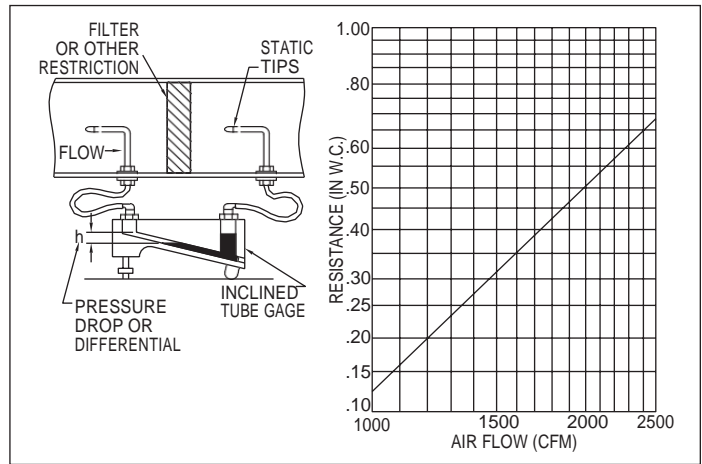


Figure 5 - Differential Measurement Across Duct Restriction

For example, assuming a manufacturer's specification for a filter, coil, etc:

Given Flow Q (ft<sup>3</sup>/min.) = at differential "h"  
 (inches w.c.)

To determine flow at other differentials the formula is:

$$Q_n \text{ (other flows)} = Q \sqrt{\frac{h_n}{h}}$$

Where: Q = Quantity of flow in cubic feet per minute  
 $h$  = differential in inches water column  
 $h_n$  = differential (other flow conditions)

### Other Devices for Measuring Air Velocity

A wide variety of devices are commercially available for measuring air velocities. These include hot wire anemometers for low air velocities, rotating and swinging vane anemometers and variable area flowmeters.

The Dwyer® No. 460 Air Meter is one of the most popular and economical variable area flowmeter type anemometers. Quick and easy to use, it is a portable instrument calibrated to provide a direct reading of air velocity.

A second scale is provided on the other side of the meter to read static pressure in inches w.c. The 460 Air Meter is widely used to determine air velocity and flow in ducts, and from supply and return grilles and diffusers. Two scale ranges are provided (high and low) with calibrations in both f.p.m. and in w.c.

### To Check Accuracy

Use only devices of certified accuracy. All anemometers and to a lesser extent portable manometers should be checked regularly against a primary standard such as a hook gage or high quality micromanometer. If in doubt return your Dwyer® instrument to the factory for a complete calibration check at no charge.

### HVAC Mobile Application

Easily converts velocity pressure to air velocity or air velocity to air volume. <sup>2</sup>

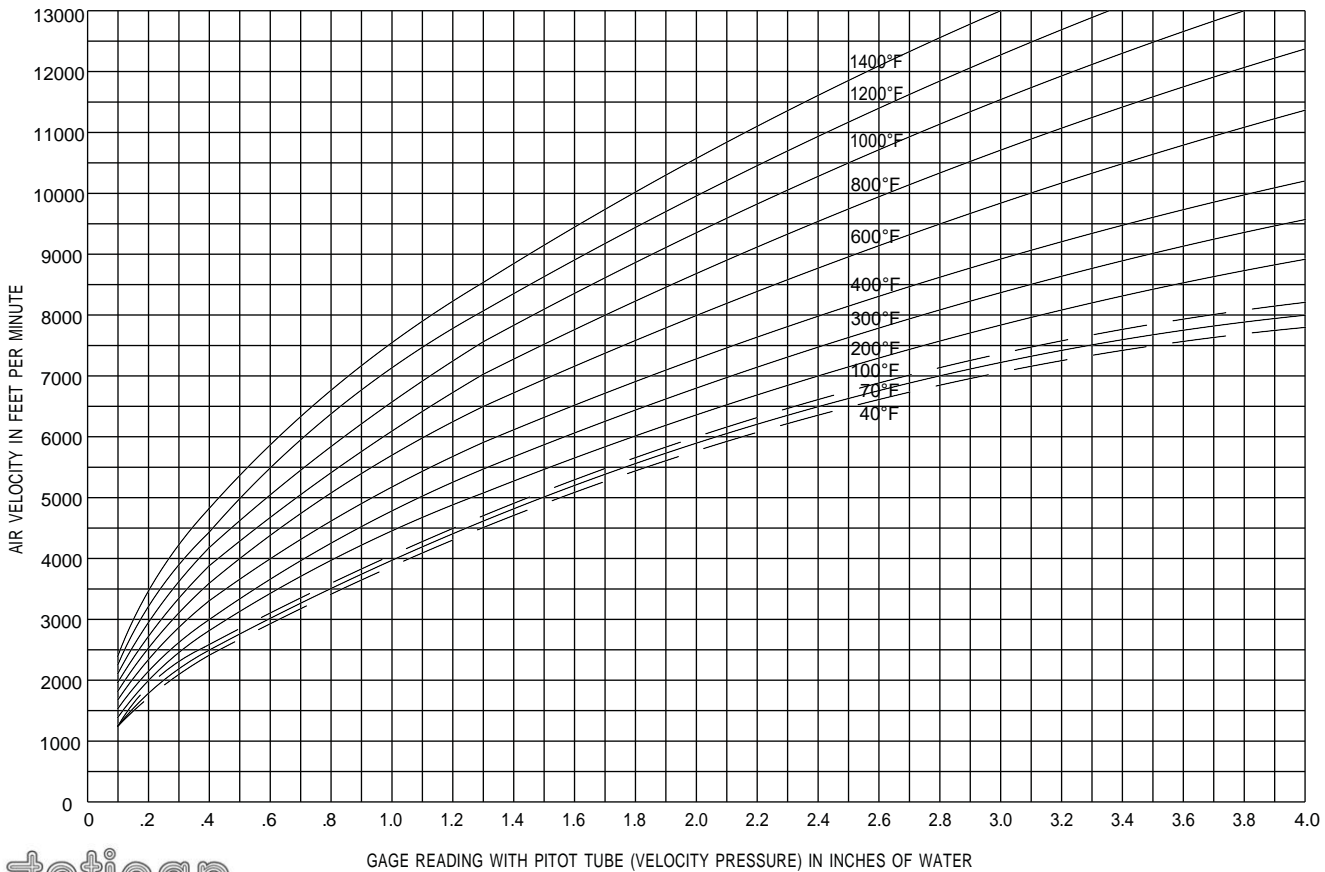
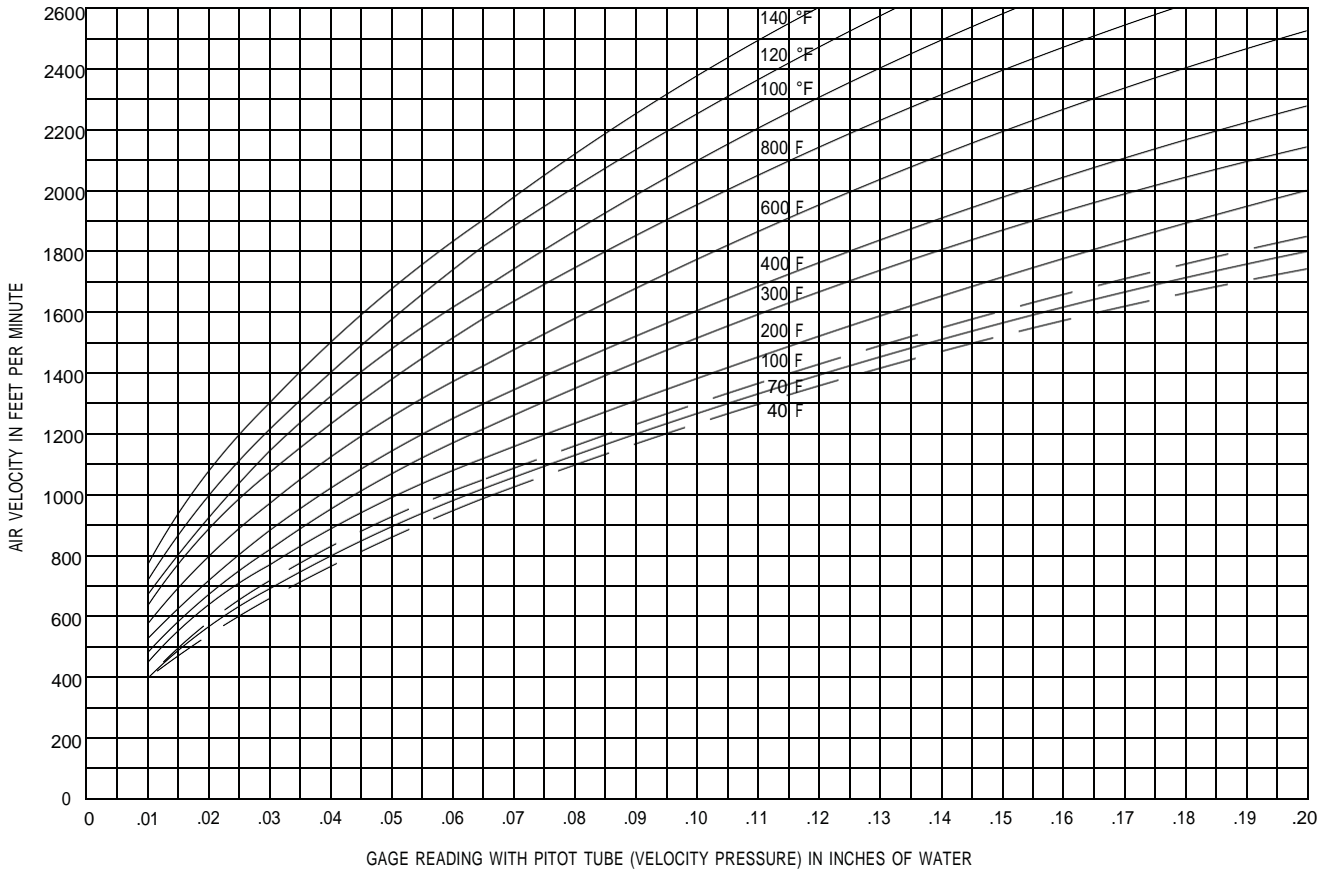


<sup>2</sup> See page 554 (HVAC Mobile Application)





# AIR VELOCITY FLOW CHARTS



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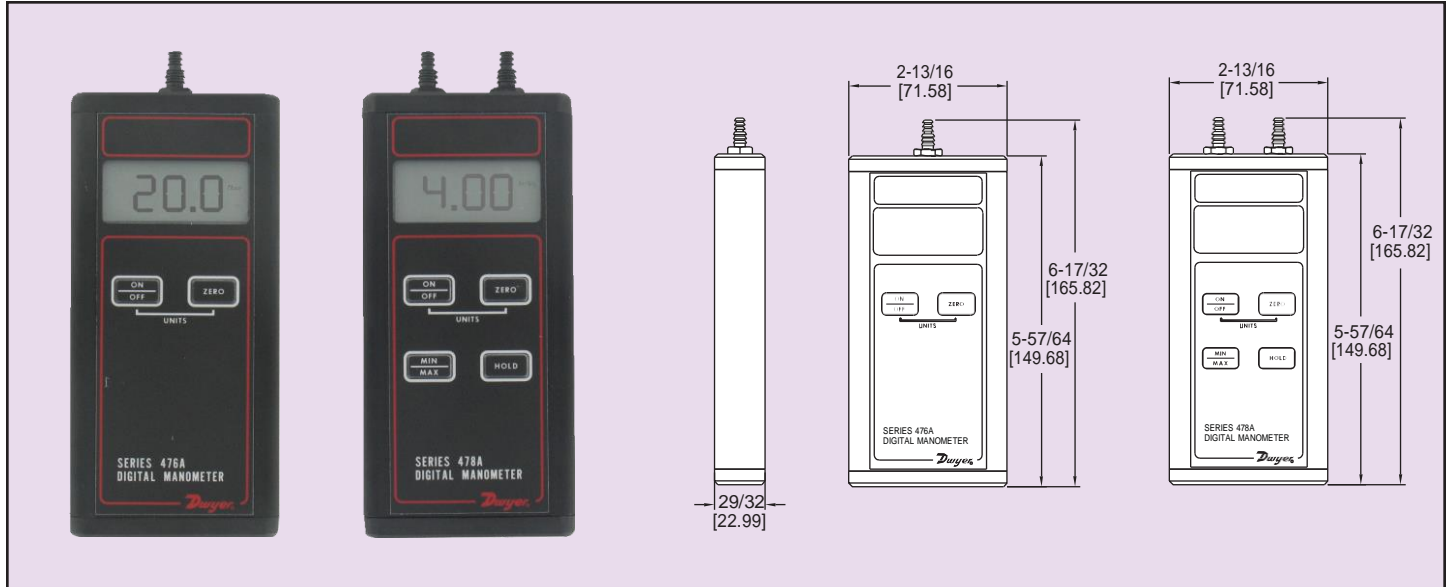


Series **476A Single Pressure Digital Manometer & 478A Digital Manometer**  
**Electronic Zeroing, ±1.5% Accuracy**



TEST EQUIPMENT

Manometers, Portable



**Ideal for field or laboratory use**, the Model 476A Single Pressure Digital Manometer measures low pressures from -20 to 20 in w.c. with ±1.5% full scale accuracy. Designed especially for the HVAC contractor, the Model 476A can be used to set supply pressures, verify pressure switch operation, adjust regulators, check pneumatic systems and computer peripherals. The rugged, handheld unit is constructed with an extruded aluminum case for exceptional durability.

The Series 478A manometer can be used to measure positive, negative, or differential pressures. The unit features selectable units, auto zero, hold and a Min/Max function. Press the Hold key to freeze the current pressure measurement on the display. The 478A manometer includes a zeroing button to null out any minor pressure differences.

**FEATURES**

- One-button auto-zero function
- Auto power off.
- Large, easy-to-read display.
- Extruded aluminum case.
- Instant selection from up to eight english/metric units.

- Model 476A-0**, Digital Manometer, -20 to 20 in w.c.
- Model 478A-0**, Digital Differential Manometer, -4-0-4 in w.c.
- Model 478A-1**, Digital Differential Manometer, -60-0-60 in w.c.

**OPTION**

For NIST traceable calibration certificate, add suffix -NIST to model numbers.  
 Example: 478A-1-NIST.

**SPECIFICATIONS**

- Service:** Air and compatible gases.
- Wetted Materials:** Consult factory.
- Accuracy:** ±1.5% full-scale at 72°F (22.2°C). Includes linearity and repeatability.
- Pressure Hysteresis:** ±0.1% of full-scale.
- Pressure Limits:** 5 psig (.74 bar).
- Temperature Limits:** 0 to 140°F (-17.8 to 60°C).
- Compensated Temperature Limits:** 32 to 104°F (0 to 40°C).
- Thermal Effect:** 0.05% FS/°F.
- Display:** 4 digit LCD (.425"H x .234"W digits).
- Power Requirements:** 9 V alkaline battery, installed non-functional, user replaceable.
- Process Connections:** For use with 3/16" or 1/4" ID tubing.
- Weight:** 10.8 oz (306 g).
- Agency Approvals:** CE.

**ACCESSORIES**

**A-402A, Carrying Case** — Tough gray nylon pouch protects any Series 476A/478A Manometer. Double zippered for quick and easy access. With belt loop that snaps closed.

7-1/2"H x 3"W x 2-1/4"D (191 x 76 x 57 mm)

**UHH-C1**, Soft carrying case



Model	Range in w.c.	Available Pressure Units								Resolution in w.c.	Maximum Pressure
		bar	psi	in Hg	kPa	in w.c.	mm Hg	mbar	mm w.c.		
476A-0	-20.0 to 20.0	.0498	0.723	1.471	4.98	20.00	37.4	49.8	508	0.02	5 psig

Model	Range in w.c.	Available Pressure Units								Resolution in w.c.	Maximum Pressure
		bar	psi	in Hg	kPa	in w.c.	mm Hg	mbar	mm w.c.		
478A-0	-4.00 to 4.00	.1445	.294	0.996	4.00	7.47	9.96	101.6	996	0.01	5 psig
478A-1	-60.0 to 60.0	.1495	2.168	4.41	14.95	60.0	112.1	149.5	1524	0.1	5 psig



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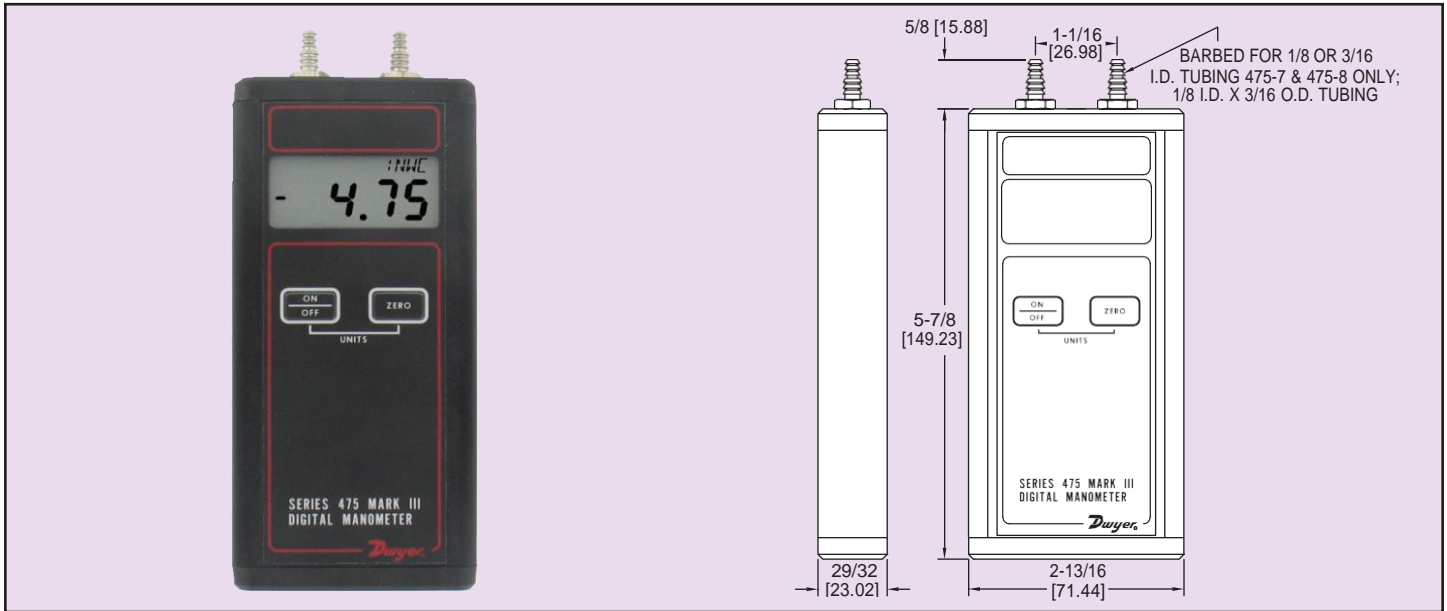
Process Tubing Options: See page 547 (Gage Tubing Accessories)



Series  
475

# Mk III Handheld Digital Manometer

Ranges from 1 in. w.c. to 150 psid, ±0.5% Accuracy



The Dwyer® Series 475-FM Mark III Handheld Digital Manometer is ideal for field calibration, monitoring or trouble shooting HVAC systems, clean rooms, or a wide range of other low pressure pneumatic systems. This handy instrument measures positive, negative or differential pressures of air and natural gases in ranges from 1 in w.c. (0.249 kPa) to 150 psid (10.34 bar). The Series 475-FM is approved and is intrinsically safe for hazardous locations, Class 1, Div. 1, Group A, B, C, D, T4. Its simple operation and easy to read digital display make it an indispensable test instrument for the plant engineer, industrial hygienist and HVAC technician. When used with a Dwyer® Pitot tube (2), the Series 475-FM Mark III can also be used as an air velocity gage. See the complete 475-1-FM-AV kit.

The Series 475-FM Mark III is housed in a durable extruded aluminum case with its solid state circuitry mounted on a tough fiberglass epoxy circuit board. To meet the most demanding applications and to provide stability of instrument reading, the 1 in w.c. range is compensated for position sensitivity through the use of a unique patented dual sensor system. A standard 9 V battery provides up to 100 hours of operation. Dual push pads on the front panel control on-off, auto zero, and pressure unit selection. No set-up or leveling. The large 0.42" LCD display is easy to read, minimizing data collection errors. Units include a "low battery" indicator. The pressure sensor used is a highly stable silicon piezoresistive device. Standard connections are dual sized for 1/8" or 3/16" ID vinyl or rubber tubing. Complete instructions are conveniently printed on rear of housing.

## FEATURES

- New low range option 0-1.000 in w.c.
- Measures positive, negative and differential pressures
- Rugged, extruded aluminum case
- Lightweight, fast and easy to use
- Selectable english/metric units
- FM approved

Model	English Range	Metric Range	Maximum Pressure
475-000-FM	0-1.000 in w.c.	.2491 kPa	5 psig
475-00-FM	0-4.000 in w.c.	0.996 kPa	5 psig
475-0-FM	0-10.00 in w.c.	2.491 kPa	5 psig
475-1-FM	0-20.00 in w.c.	4.982 kPa	10 psig
475-2-FM	0-40.00 in w.c.	9.96 kPa	10 psig
475-3-FM	0-200.0 in w.c.	49.82 kPa	30 psig
475-4-FM	0-10.00 psi	.6895 bar	30 psig
475-5-FM	0-20.00 psi	1.379 bar	60 psig
475-6-FM	0-30.00 psi	2.069 bar	60 psig
475-7-FM	0-100.0 psi	6.895 bar	150 psig
475-8-FM	0-150.0 psi	10.34 bar	200 psig

## OPTION



## SPECIFICATIONS

**Service:** Air and compatible combustible gases.

**Wetted Materials:** Consult factory.

**Accuracy:** ±0.5% full-scale, 60 to 78°F (15.6 to 25.6°C); ±1.5% full-scale from 32 to 60°F and 78 to 104°F (0 to 15.6°C and 25.6 to 40°C).

**Pressure Hysteresis:** ±0.1% of full-scale.

**Pressure Limits:** See chart.

**Temperature Limits:** 0 to 140°F (-17.8 to 60°C).

**Compensated Temperature Limits:** 32 to 104°F (0 to 40°C).

**Storage Temperature Limits:** -4 to 176°F (-20 to 80°C).

**Display:** 0.42" (10.6 mm) 4 digit LCD.

**Resolution:** See chart.

**Power Requirements:** 9 V alkaline battery, installed non-functional, user replaceable.

**Weight:** 10.8 oz (306 g).

**Process Connections:** Two barbed connections for use with 1/8" (3.18 mm) or 3/16" (4.76 mm) ID tubing. Two compression fittings for use with 1/8" (3.18 mm) ID x 1/4" (6.35 mm) OD tubing for 475-7-FM & 475-8-FM only.

**Agency Approvals:** CE, FM.



**475-AV, Air Velocity Kit** — Includes the Series 475-FM Manometer, two A-303 static pressure tips two 9' lengths 3/16" ID rubber tubing, no. 166-6-CF Pitot tube, A-397 step drill, A-532 air velocity slide chart and instruction bulletin H-11, all packed in a tough, molded plastic carrying case with die cut foam liner. To order, add AV suffix to any standard 475 model no.

Example: 475-1-FM-AV  
475-000-FM-AV

## ACCESSORIES

**A-402A, Carrying Case** — Tough gray nylon pouch protects any Series 475 Manometer. Double zippered for quick and easy access. With belt loop that snaps closed.

7-1/2"H x 3"W x 2-1/4"D (191 x 76 x 57 mm)

For NIST traceable numbers. Example: 475-1-FM-NIST. calibration certificate, add suffix -NIST to model



TEST EQUIPMENT

Manometers,  
Portable

Process Tubing Options: See page 547 (Gage Tubing Accessories)





② Pitot tube: See pages 107-138 (Air Quality section)



tetisan



Series  
477

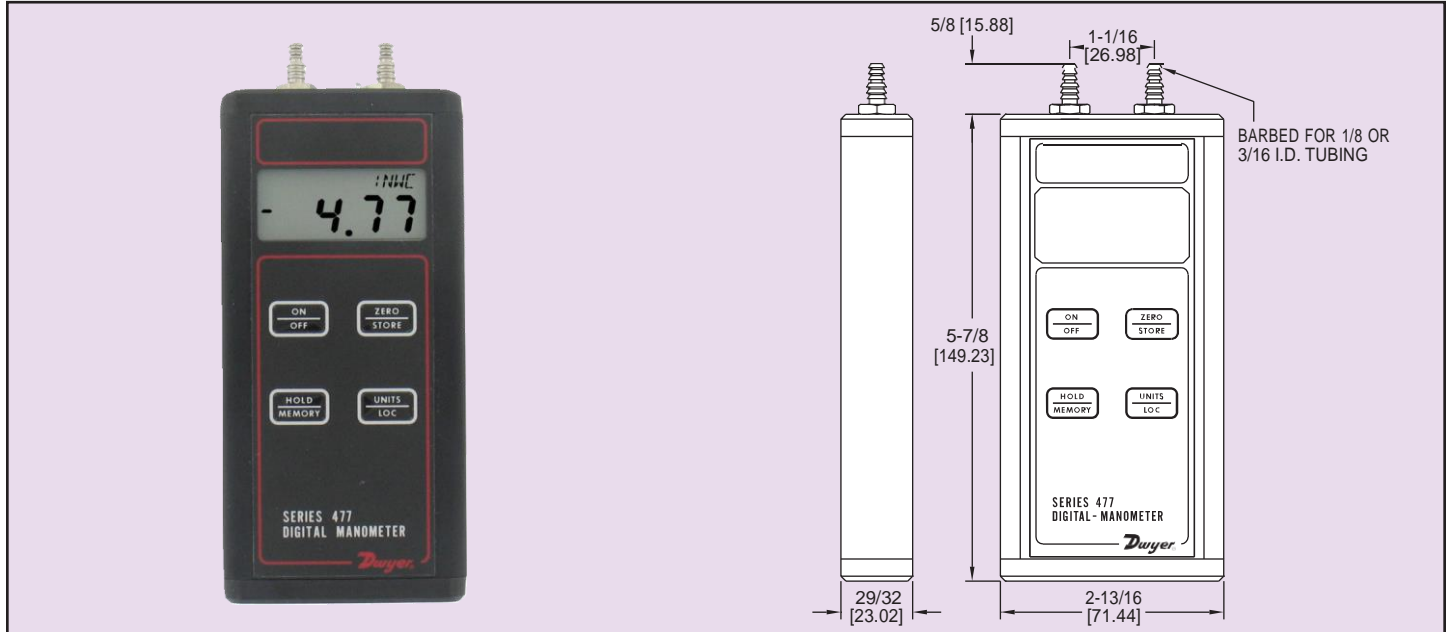
# Handheld Digital Manometer

Selectable Pressure Units, ±0.5% Accuracy, FM Approved Intrinsically  
Safe for Hazardous Locations, Class 1, Div. 1, Group A, B, C, D, T4



TEST EQUIPMENT

Manometers,  
Portable



**Series 477 Handheld Digital Manometers** are packed with features you need to make pressure measurement and recording faster, easier and more accurate than ever. First, you can instantly select from up to nine of the most widely used pressure units without having to waste time and risk mistakes with tedious conversions. Next, a non-volatile memory function enables storage of up to 40 readings — perfect for HVAC technicians making Pitot tube traverses of airflow readings across a duct. The FM approved models are intrinsically safe for hazardous locations, Class 1, Div. 1, Group A, B, C, D, T4.

When working in poorly lighted areas, just switch on the handy backlight feature. It automatically shuts itself off after 20 minutes to minimize battery drain. Electronic zeroing means you simply touch a single key to perfectly null out any minor pressure differences. A display HOLD key freezes the current pressure for those all-too-common situations where readings fluctuate. We even included an audible alarm to warn you of overpressure plus a visual alarm warning in case ambient noise levels are too high to hear the alarm. Audible alarm also confirms a value has been stored, eliminating the need to observe display during a duct traverse.

### FEATURES

- New low pressure ranges
- Instant selection from up to nine english/metric units
- Stores 40 readings in memory for later reference
- Measure positive, negative or differential pressures
- Large easy-to-read 0.4" LCD display includes switchable backlight for great visibility — anywhere
- Both audible and visual overpressure alarms
- Includes + and - indicators plus low battery warning
- Operates up to 100 Hours on a single 9 V battery

### SPECIFICATIONS

**Service:** Air and compatible gases. FM models air and compatible combustible gases.

**Wetted Materials:** Consult factory.

**Accuracy:** ±0.5% full-scale, 60 to 78°F (15.6 to 25.6°C); ±1.5% full-scale from 32 to 60°F and 78 to 104°F (0 to 15.6°C and 25.6 to 40°C).

**Pressure Hysteresis:** ±0.1% of full-scale.

**Pressure Limits:** See chart.

**Temperature Limits:** 0 to 140°F (-17.8 to 60°C).

**Compensated Temperature Limits:** 32 to 104°F (0 to 40°C).

### ACCESSORIES

**A-402A, Carrying Case** — Tough gray nylon pouch protects any Series 477 Manometer. Double zippered for quick and easy access. With belt loop that snaps closed.

7-1/2"H x 3"W x 2-1/4"D (191 x 76 x 57 mm)

**UHH-C1**, Soft carrying case

### OPTION

For NIST traceable calibration certificate, add suffix -NIST to model numbers. Example: 477-1-FM-NIST.

**Storage Temperature Limits:** -4 to 176°F (-20 to 80°C).

**Display:** 0.42" (10.6 mm) 4 digit LCD.

**Response Time:** 1 s.

**Resolution:** See chart.

**Power Requirements:** 9 V alkaline battery, installed non-functional, user replaceable.

**Weight:** 10.2 oz (289 g).

**Process Connections:** Two barbed connections for use with 1/8" (3.18 mm) or 3/16" (4.76 mm) ID tubing. Two compression fittings for use with 1/8" (3.18 mm) ID x 1/4" (6.35 mm) OD tubing for 477-7-FM & 477-8-FM only.

**Agency Approvals:** CE, FM.



Model*	Range	Available Pressure Units									Maximum Pressure
		bar	psi	in Hg	kPa	in w.c.	mm Hg	mbar	mm w.c.	Pa	
477-000-FM	0-1.000 in w.c.			.0736	.2491	1.000	1.868	2.491	25.40	249.1	5 psig
477-00-FM	0-4.000 in w.c.		.1445	.2942	0.996	4.000	7.473	9.96	101.6	996	5 psig
477-0-FM	0-10.00 in w.c.		.3613	.7355	2.491	10.00	18.68	24.91	254.0	2491	5 psig
477-1-FM	0-20.00 in w.c.	.0498	.7225	1.471	4.982	20.00	37.36	49.82	508.0	4982	10 psig
477-2-FM	0-40.00 in w.c.	.0996	1.445	2.942	9.96	40.00	74.73	99.6	1016	9964	10 psig
477-3-FM	0-200.0 in w.c.	.4982	7.225	14.71	49.82	200.0	373.6	498.2	5080		30 psig
477-4-FM	0-10.00 psi	.6895	10.00	20.36	68.95	276.8	517.1	689.5	7031		30 psig
477-5-FM	0-20.00 psi	1.379	20.00	40.72	137.9	553.6	1034	1379			60 psig
477-6-FM	0-30.00 psi	2.069	30.00	61.08	206.9	830.4	1551	2069			60 psig
477-7-FM	0-100.0 psi	6.895	100.0	203.6	689.5	2768	5171	6895			150 psig
477-8-FM	0-150.0 psi	10.34	150.0	305.4	1034	4152	7757				200 psig

Process Tubing Options: See page 547 (Gage Tubing Accessories)



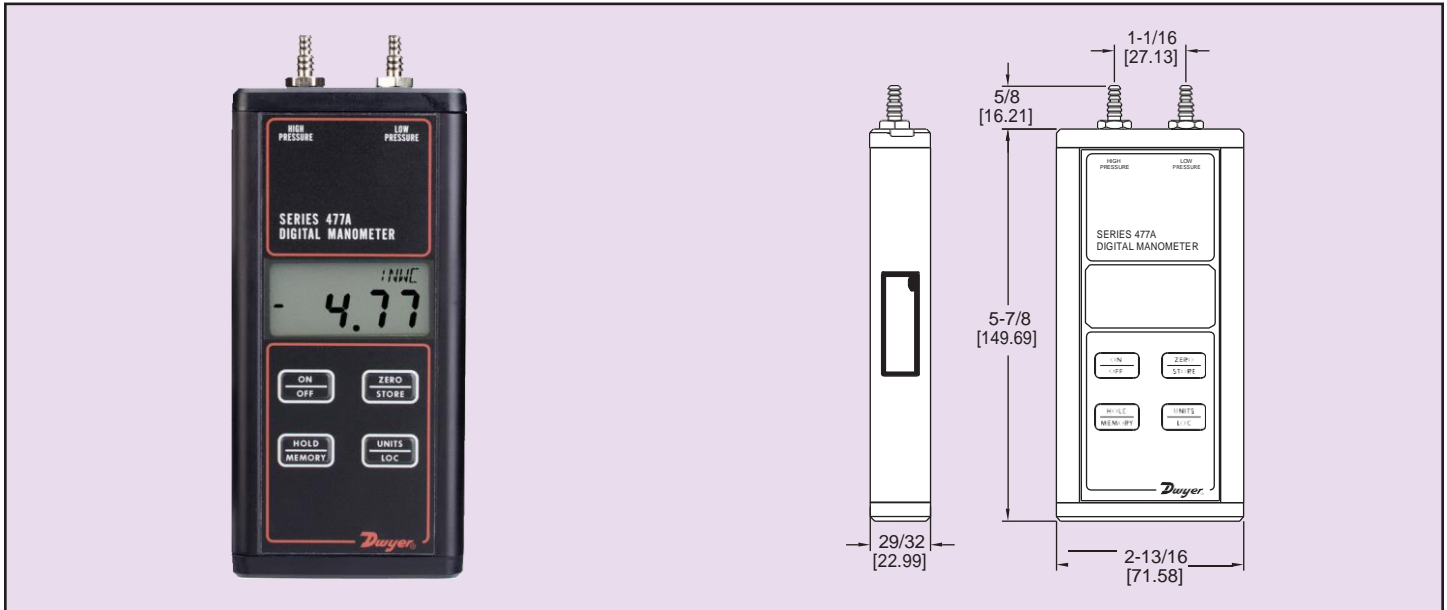
TETISAN



Series  
477A

# Handheld Digital Manometer

Precise Air Pressure Measurement,  $\pm 0.1\%$  F.S. Accuracy



The Popular Model 477 is now available with 0.1% full-scale accuracy in the new Series 477A. The 477A contains a highly accurate differential pressure sensor that offers a 0.1% full-scale accuracy on air ranges from 20 in w.c. to 100 psid. Series 477A Handheld Digital Manometers are packed with features needed to make pressure measurement and recording faster, easier and more accurate than ever. Instantly select from up to nine of the most widely used pressure units without having to waste time and risk mistakes with tedious conversions. A non-volatile memory function enables storage of up to 40 readings — perfect for HVAC technicians making Pitot tube traverses of airflow readings across a duct. The 477A is also ideal for maintenance personnel or technicians that require a highly accurate standard to check their instrumentation or equipment to ensure proper performance. When working in poorly lighted areas, just switch on the handy backlight feature. The manometer automatically shuts itself off after 20 minutes to minimize battery drain. Electronic zeroing means you simply touch a single key to perfectly null out any minor pressure differences. A display HOLD key freezes the current pressure for those all-too-common situations where readings fluctuate. Included is an audible alarm to warn of overpressure plus a visual alarm warning in case ambient noise levels are too high to hear the alarm. Audible alarm also confirms a value has been stored, eliminating the need to observe display during a duct traverse. Clear, concise operating instructions for all functions are printed on the rear of the rugged extruded aluminum case for quick reference. One-piece front membrane fully protects all keys from dust and moisture; wipes clean in seconds. Detailed written instructions, a wrist strap and 9 V alkaline battery are included.

## FEATURES

- Measure positive, negative, or differential pressures
- Instant selection from up to nine english/metric units
- Stores 40 readings in memory for later reference
- Both audible and visual overpressure alarms
- Operates up to 100 hours on a single 9 volt battery
- New adjustable damping feature for averaging fluctuating reading

## SPECIFICATIONS

- Service:** Air and non-combustible compatible gases.
- Wetted Parts:** Consult factory.
- Accuracy:**  $\pm 0.10\%$  of full-scale from 60 to 78°F (15.6 to 25.6°C);  $\pm 1\%$  of full scale from 32 to 60 and 78 to 104°F (0-15.6 and 25.6-40°C).
- Pressure Hysteresis:**  $\pm 0.1\%$  of full-scale.
- Pressure Limits:** See chart.
- Temperature Limits:** 32 to 140°F (0 to 60°C).
- Storage Temperature Limits:** -4 to 176°F (-20 to 80°C).
- Display:** 0.42" (10.6 mm) 4 digit LCD.
- Resolution:** See chart.
- Power Requirements:** 9 V alkaline battery, installed non-functional, user replaceable.
- Weight:** 10.2 oz. (289 g).
- Process Connections:** Two barbed connections for use with 1/8" (3.18 mm) or 3/16" (4.76 mm) ID tubing for 477A-1, 477A-2, 477A-3, 477A-4 and 477A-5 only. Two compression fittings for use with 1/8" (3.18 mm) ID x 1/4" (6.35 mm) OD tubing for 477A-6 and 477A-7 only.

## ACCESSORIES

**A-402A, Carrying Case** — Tough gray nylon pouch protects any Series 477A Manometer. Double zippered for quick and easy access. With belt loop that snaps closed.

7-1/2"H x 3"W x 2-1/4"D (191 x 76 x 57 mm)

**UHH-C1**, Soft carrying case

## OPTION

For NIST traceable calibration certificate, add suffix -NIST to model numbers. Example: 477A-1-NIST.

TEST EQUIPMENT  
Manometers,  
Portable



Model	Range	Available Pressure Units										Maximum Pressure
		bar	psi	in Hg	kPa	in w.c.	mm Hg	mbar	FTWC	mm w.c.	Pa	
477A-1	0-20.00 in w.c.	.0498	.7225	1.471	4.982	20.00	37.36	49.82	1.667	508.0	4982	3 psig
477A-2	0-40.00 in w.c.	.0996	1.445	2.942	9.96	40.00	74.73	99.6	3.333	1016	9964	3 psig
477A-3	0-200.0 in w.c.	.4982	7.225	14.71	49.82	200.0	373.6	498.2	16.67	5080		15 psig
477A-4	0-10.00 psi	.6895	10.00	20.36	68.95	276.8	517.1	689.5	23.07	7031		30 psig
477A-5	0-30.00 psi	2.069	30.00	61.08	206.9	830.4	1551	2069	69.20			60 psig
477A-6	0-50.00 psi	3.447	50.00	101.8	344.7	1384	2585	3447	115.3			100 psig
477A-7	0-100.0 psi	6.895	100.0	203.6	689.5	2768	5171	6895	230.7			200 psig



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Process Tubing Options: See page 547 (Gage Tubing Accessories)





Series  
HM35

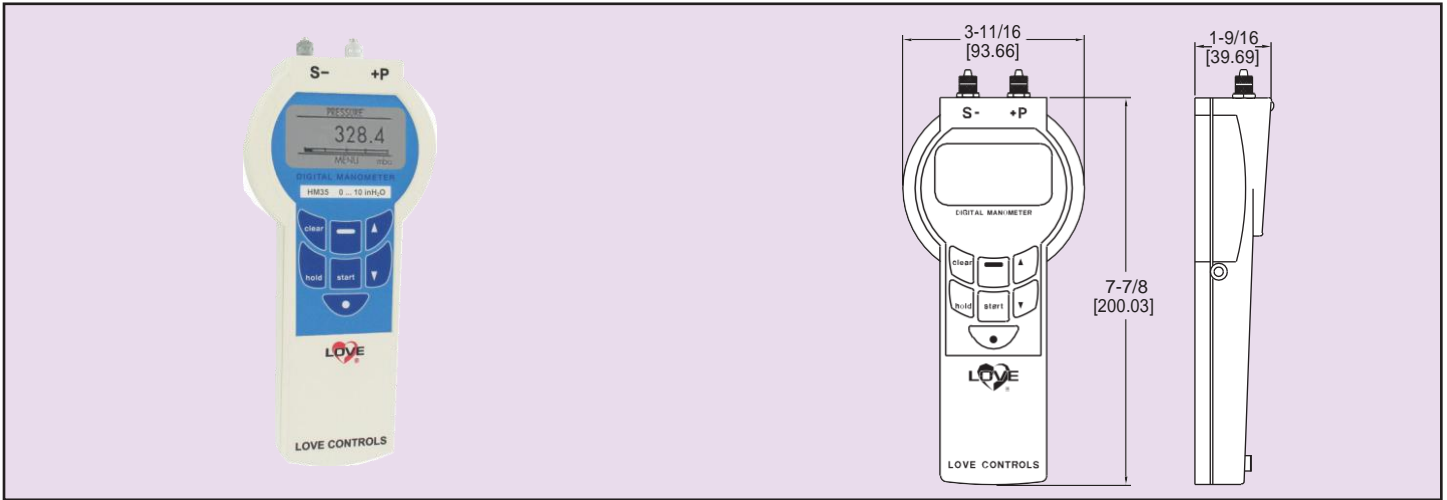
# Precision Digital Pressure Manometer

Up to 0.05% Accuracy, Graphical Display, Data Logging Capability



TEST EQUIPMENT

Manometers,  
Portable



The High Precision Series HM35 Digital Manometer is designed to reliably measure and log pressure measurements for critical applications. This family of manometer can measure absolute pressure, differential pressure or gage pressure with up to 0.05% accuracy. The data logging function can store up to 10,742 readings and transmit the readings to a PC through an IR serial port. The large display can graphically display trends in the data as well as peaks and valleys. The series HM35 comes standard with a calibration certificate so that the instrument can be used as a secondary calibration standard when testing other pressure instrumentation. This manometer is ideal for laboratories, calibration facilities, and other critical pressure applications.

## ACCESSORIES

**HM28-0**, 1/8" NPT Adapter (1 Piece)

**HM35-1**, Communication software

**HM35-2**, Infrared RS-232 Serial Adapter. Required to download stored data to a PC

**HM35-3**, External Power Converter with U.S. plug adapter. Input 100 to 240 VAC, 50/60 Hz

## Error Limit 0.2% FS for gauge, vacuum, and differential pressure

Model	Range	Over Pressure
HM3531DLB300	0-10 in w.c. (0-2.5 kPa)	50 in w.c.
HM3531DLC300	0-28 in w.c. (0-7 kPa)	140 in w.c.
HM3531DLE300	0-80 in w.c. (0-20 kPa)	600 in w.c.
HM3531DLF300	0-120 in w.c. (0-30 kPa)	600 in w.c.
HM3531DLG300	0-200 in w.c. (0-50 kPa)	58 psi
HM3531DLH300	0-14.5 psi (0-100 kPa)	58 psi

For higher accuracy models change the 10th digit from a 3 to a 1 (0.05% FS), 2 (0.1% FS), or 6 (0.1% of reading). For example, 0 to 28 in of w.c. with 0.05% accuracy would be model number HM3531DLC100. Higher accuracies are only available on 0 to 28 in of w.c. range or higher.

## OPTION

For NIST traceable calibration certificate, use order code NISTCAL-MD.

## SPECIFICATIONS

**Service:** Air and compatible gases.

**Wetted Materials:** 18/8 stainless steel.

**Accuracy:** (Includes linearity, hysteresis, and repeatability): Depending on model.

±0.20% full-scale ±1 digit;

±0.10% full-scale ±1 digit;

±0.05% full-scale ±1 digit.

**Temperature Limits:** 32 to 122°F (0 to 50°C).

**Storage Temperature:** -4 to 140°F (-20 to 60°C).

**Humidity:** Maximum 95% RH non-condensing.

**Display:** Graphical back lit LCD. 128 x 64 points.

**Power Requirements:** (3) 1.5 V AA alkaline batteries, installed functional, user replaceable. Can operate on 6 to 9 VDC external power.

**Current Consumption:** 25 mA without back lit display, IR, or buzzer.

**Memory:** 10,742 readings. Recording intervals adjustable from 1 s to 24 hrs or manual.

**Case Protection:** IP54 (NEMA 3).

**Weight:** 10.5 oz (300 g).

**Process Connections:** Hose 4/6 mm or 1/8" NPT.

**Agency Approval:** CE.



tetisan



Series  
HM28

# Handheld Digital Manometer

High Accuracy (0.2%, 0.1% or 0.05%), Differential, Gage or Absolute



The Series HM28 Digital Hand-Held Manometer is a precision instrument designed to measure a wide range of pressures to a very high accuracy. The unit incorporates a variety of features in an easy to use format that makes it useful in a wide variety of applications. Features include: measurement in all common pressure ranges, display resolution to 0.001, differential or relative measurement, two line liquid crystal display, and adjustable auto power off to conserve battery. We are so proud of the accuracy of the HM28 that we provide a certificate of calibration with the unit at no additional cost. Depending on your application, the HM28 can be used as a secondary calibration standard for your other pressure instrumentation.

Part Number	Features
<b>Error limit 0.2% F.S. for gage, underpressure and differential pressure</b>	
HM28D3B10000	0-10 in w.c. (2.5 kPa)
HM28D3C10000	0-28 in w.c. (7 kPa)
HM28D3F10000	0-120 in w.c. (30 kPa)
<b>Error limit 0.05% F.S. for gage, underpressure and differential pressure</b>	
HM28D3C30000	0-28 in w.c. (7 kPa)
HM28D3F30000	0-120 in w.c. (30 kPa)
HM28D3K30000	0-100 psi (700 kPa)
<b>For Absolute pressure</b>	
HM28A310000	0-15.9 psia (0.2% F.S. (110 kPa abs))

Consult factory for 0.10% models.

#### ACCESSORIES

- HM28-0, 1/8" NPT Adaptor 1 piece
- HM28-1, Communication Software & Cable
- HM28-2, Universal Power Adaptor

#### SPECIFICATIONS

**Service:** Air and compatible gases.  
**Accuracy:** (Includes linearity, hysteresis, and repeatability): per order code.  
 ±0.20% full-scale ±1 digit  
 ±0.10% full-scale ±1 digit  
 ±0.05% full-scale ±1 digit.  
**Wetted Materials:** 18/8 stainless steel.  
**Temperature Limits:** 23 to 122°F (-5 to 50°C).  
**Storage Temperature:** -4 to 140°F (-20 to 60°C).  
**Humidity:** 30 to 95% rH, non-condensing.  
**Display:** 2 line, 16 character, dot matrix LCD, with switchable display sizes.  
**Power Requirements:** 9 V alkaline battery, installed functional, user replaceable. Can operate from external power supply of 7 to 14 VDC.

**Current Consumption:** < 9 mA.  
**Memory:** 964 measured values. Recording intervals adjustable from manual, 1, 5, 10, 20, 30 seconds, 1, 2, 3, 5, 10, 30, 60 minutes.  
**Case Protection:** IP54 (NEMA 3).  
**Case Dimensions:** 6" x 3.27" x 1.34" (152 x 83 x 34 mm).  
**Weight:** 9.5 oz (270 g).  
**Process Connections:** Hose; 4/6 mm or 1/8" NPT.  
**Maximum Measurement Rates:** Stand alone: 2-1/2 readings/s (0.1% and 0.05% ratings), 5 readings/s (0.2% rating). Output to RS-232: 20 measurements/s (0.2% rating). 10 measurements/s (0.1% and 0.05% ratings).  
**RS-232 Baud Rate:** Adjustable, 1200, 2400, 4800, or 9600 baud.  
**Agency Approvals:** CE.

#### OPTION

For NIST traceable calibration certificate, use order code NISTCAL-MD.

TEST EQUIPMENT

Manometers, Portable



Series  
490

# Wet/Wet Handheld Digital Manometer

Liquid & Gas Pressure Measurement, ±0.5% FS Accuracy



Series 490 Digital Manometers are versatile, hand-held, battery operated manometers available in several basic ranges for positive or positive differential pressure measurement and can tolerate most liquid media compatible with 316LSS. A memory function allows storage of up to 40 readings for later recall and a backlight provides auxiliary lighting for hard-to-see locations. Standard are a hold feature and both visual and audible overpressure alarms. A new feature added to the Series 490 is a field adjustable damping. This allows the user to choose the level of display averaging rate corresponding to the fluctuation level common in many applications. A 9 V alkaline battery is included that provides up to 100 hours of operation.

Model	Range (psi)	Available Pressure Unit						Maximum Pressure		
		bar	psi	in Hg	kPa	ftWC	in w.c.			
490-1	0-15.00	1.034	15.00	30.54	103.4	34.60	415.2	175.7	1034	30 psig
490-2	0-30.00	2.069	30.00	61.08	206.9	69.20	830.4	1551	2069	60 psig
490-3	0-50.00	3.447	50.00	101.8	344.7	115.3	1384	2585	3447	100 psig
490-4	0-100.0	6.895	100.0	203.6	689.5	230.7	2768	5171	6895	200 psig
490-5	0-500.0	34.47	500.0	1018	3447	1153				1000 psig
490-6	0-200.0	13.79	200.0	407.2	1379	461.3	5536			400 psig

#### SPECIFICATIONS

**Service:** Compatible gases & liquids.  
**Wetted Materials:** Without valve: 316L SS; Additional wetted parts with 3-way valve option: Buna-N, silicone grease, PTFE, brass 360, copper, reinforced acetel copolymer.  
**Accuracy:** ±0.5% full-scale, 60 to 78°F (15.6 to 25.6°C); ±1.5% full-scale from 32 to 60°F and 78 to 104°F (0 to 15.6°C and 25.6 to 40°C).  
**Pressure Hysteresis:** ±0.1% of full scale.  
**Pressure Limits:** See chart.

**Temperature Limits:** 32 to 140°F (0 to 60°C).  
**Storage Temperature Limits:** -4 to 176°F (-20 to 80°C).  
**Display:** 0.42" (10.6 mm) 4 digit LCD.  
**Resolution:** See chart.  
**Power Requirements:** 9 V alkaline battery, installed non-functional, user replaceable.  
**Weight:** 14.1 oz (400 g).  
**Process Connections:** Two 1/8" (3.18 mm) female NPT.  
**Agency Approvals:** CE.

Wet/Wet Handheld Digital Manometer. Double zippered for quick and easy access. With belt loop that snaps closed. 7-1/2"H x 3"W x 2-1/4"D (191 x 76 x 57 mm)

A-402A, Carrying Case — Tough gray nylon pouch protects any Series 490



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**OPTION**

For NIST traceable calibration certificate, add suffix -NIST to model numbers.  
Example: 490-1-NIST.



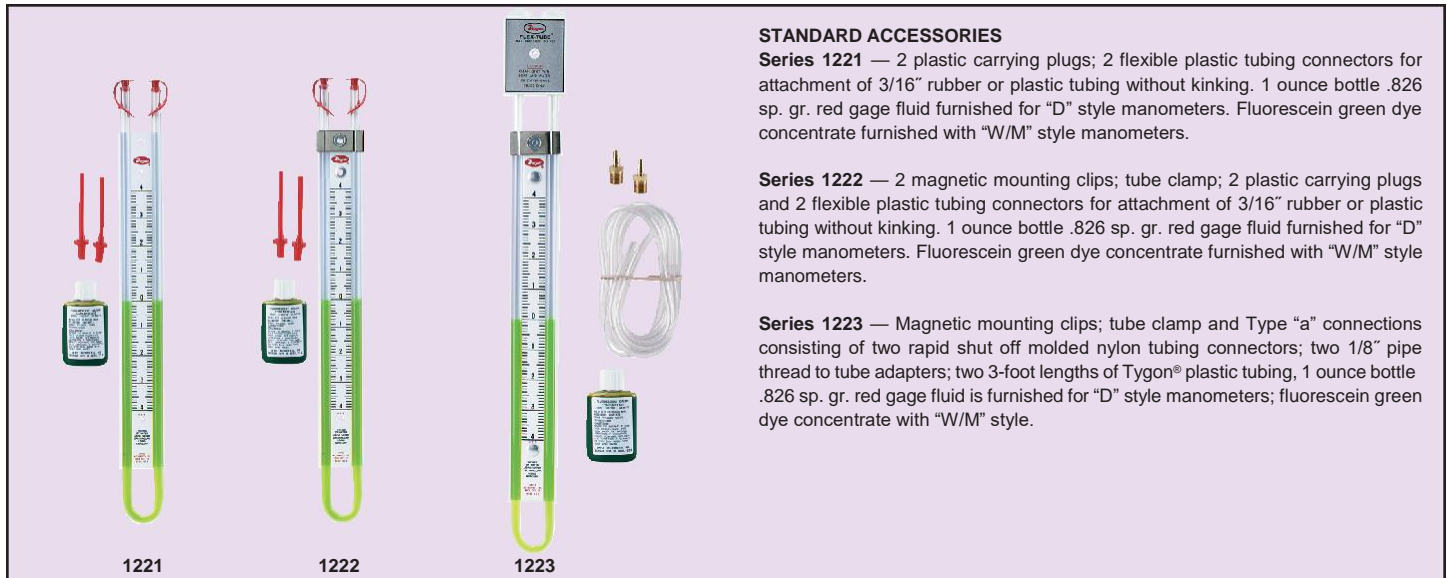
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Series  
1221  
1222  
1223

# Flex-Tube® U-Tube Manometers



### STANDARD ACCESSORIES

**Series 1221** — 2 plastic carrying plugs; 2 flexible plastic tubing connectors for attachment of 3/16" rubber or plastic tubing without kinking. 1 ounce bottle .826 sp. gr. red gage fluid furnished for "D" style manometers. Fluorescein green dye concentrate furnished with "W/M" style manometers.

**Series 1222** — 2 magnetic mounting clips; tube clamp; 2 plastic carrying plugs and 2 flexible plastic tubing connectors for attachment of 3/16" rubber or plastic tubing without kinking. 1 ounce bottle .826 sp. gr. red gage fluid furnished for "D" style manometers. Fluorescein green dye concentrate furnished with "W/M" style manometers.

**Series 1223** — Magnetic mounting clips; tube clamp and Type "a" connections consisting of two rapid shut off molded nylon tubing connectors; two 1/8" pipe thread to tube adapters; two 3-foot lengths of Tygon® plastic tubing, 1 ounce bottle .826 sp. gr. red gage fluid is furnished for "D" style manometers; fluorescein green dye concentrate with "W/M" style.

Range		Hg Required to Fill		1221, 2 & 3 Scale Length "A"		1221 & 2 O.A. Length "B"		1223 O.A. Length "B"		2-1/6 1-1/8 [52.39] [28.58]	
Inches H <sub>2</sub> O	Millimeters H <sub>2</sub> O	Grams	Ounces	W/M	D	W/M	D	W/M	D	W/M	D
8 (4-0-4)	M200 (100-0-100)	178.5	6.3	12-1/4	14	15-1/4	17	18-1/2	19-7/8		
12 (6-0-6)	M300 (150-0-150)	225.5	7.9	16-1/4	18-7/8	19-1/4	21-3/4	21-1/8	24-5/8		
16 (8-0-8)	M400 (200-0-200)	269	9.5	20-3/8	23-5/8	23-1/4	26-1/2	26-1/8	30-3/8		
20 (10-0-10)	M600 (300-0-300)	314.5	11.1	24-1/4	28-1/2	27-1/4	31-1/2	30-1/8	34-3/8		
24 (12-0-12)		353.1	12.4	27-7/8	32-7/8	30-3/4	35-3/4	33-5/8	38-5/8		
36 (18-0-18)	M1000 (500-0-500)	379.7	13.4	28-1/4	33-3/8	31-1/2	36-1/4	33-3/8	39-1/8		
		491.1	17.3	40-1/4	47-7/8	43-1/4	50-3/4	46-1/8	53-5/8		
		526.6	18.5	43-5/8	52	46-1/2	55	49-3/8	57-7/8		

Not recommended for vacuum service above 5 in. Hg (68 in w.c.).

These inexpensive manometers measure positive, negative and differential pressures. Dwyer® Flex-Tube® U-Tube Manometers combine the inherent accuracy of the simple "U" Tube with the durability of tough, long-lasting plastic construction. Columns are of .375" OD flexible and shatter proof clear butyrate tubing. They are easily accessible for cleaning. Indicating tube is backed by white scale channel to provide maximum color contrast. Scales are extruded high impact polystyrene plastic, formed to hold columns in perfect alignment. Stark white scales have graduations and numbers silkscreen-printed in black for maximum legibility.

You can choose from numerous models and features including over-pressure safety traps, in full-scale ranges from 8" to 36" of water or mercury. All are suitable for total pressures to 100 psi — for determining velocity and static pressures, leakage, fan and blower efficiency, filter resistance, and gas pressures. Ideal wherever a portable, direct reading manometer is needed. Standard ranges and markings as shown, or special ranges, colors, logos and brand names for OEM quantity orders are available.

**Minor Divisions** of 1/10 in w.c. (or 2 mm w.c. on metric units) are silkscreened in jet black on stark white scale for positive definition. Easy to read, even at a distance, they are acrylic coated for permanence. All models are furnished with one 1 ounce bottle of fluorescein green color concentrate with special wetting agent for W/M models, or 1 ounce bottle of red gage fluid for "D" units.

**Series 1221 Manometer**, Our simplest, lowest cost basic U-gage. A dependable U-tube manometer that withstands hard use and provides accurate, high visibility readings. For use with water, mercury or red gage fluid. For mercury filled manometers, a scale clamp bar, Dwyer® Part No. A-363 (available as an extra for Series 1221 — and standard on Series 1222) is recommended. One pair of carrying plugs and a pair of non-kink vinyl tube connectors are included with each manometer.

**Series 1222 Manometer**, All the features of the 1221 plus magnetic clips for mounting to any vertical steel surface, and clamp bar to insure against U-tube slipping. (Especially recommended for manometers used with mercury.) Both magnets are easily removed and replaced at the user's convenience.

**Series 1223 Manometer**, Our finest U-gage — for either portable or stationary use. Safety traps prevent loss of indicating fluid in case of accidental over-pressure. Tubing is permanently bonded to a molded, high impact acrylic plastic top that contains safety traps. Large magnetic clips and clamp bar are provided. Standard type "a" connections include two rapid shut-off type molded nylon tubing connections, two 3-foot lengths of flexible Tygon® plastic tubing, and two 1/8" pipe thread to tube adapters.

1221	1222	1223	Ranges
Model	Model	Model	
1221-8-W/M	1222-8-W/M	1223-8-W/M	8 (4-0-4) in w.c.
1221-12-W/M	1222-12-W/M	1223-12-W/M	12 (6-0-6) in w.c.
1221-16-W/M	1222-16-W/M	1223-16-W/M	16 (8-0-8) in w.c.
1221-20-W/M	1222-20-W/M	1223-20-W/M	20 (10-0-10) in w.c.
1221-24-W/M	1222-24-W/M	1223-24-W/M	24 (12-0-12) in w.c.
1221-36-W/M	1222-36-W/M	1223-36-W/M	36 (18-0-18) in w.c.
1221-M200-W/M	1222-M200-W/M	1223-M200-W/M	M200 (100-0-100) mm w.c.
1221-M300-W/M	1222-M300-W/M	1223-M300-W/M	M300 (150-0-150) mm w.c.
1221-M400-W/M	1222-M400-W/M	1223-M400-W/M	M400 (200-0-200) mm w.c.
1221-M600-W/M	1222-M600-W/M	1223-M600-W/M	M600 (300-0-300) mm w.c.
1221-M1000-W/M	1222-M1000-W/M	1223-M1000-W/M	M1000 (500-0-500) mm w.c.

### OPTION

For NIST traceable calibration certificate, add suffix -NIST to model numbers. Example: 1230-8-W/M-NIST.



TETISAN

TEST EQUIPMENT

Manometers,  
Portable

instrument to metal surface. Flexible red vinyl plastic  
terminal tube 1/4" diameter x 8" long. One terminal tube  
pipe thread to plastic tubing. One 4-1/2' length of Tygon®  
bottle .826 sp. gr. red gage fluid. Vinyl carrying case.

1227M (Metric Units)



tetisan

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Series  
1211

# Slack Tube® Manometers



**Slack Tube® Manometer**  
rolled up for easy  
handling and storage.



**Model 1212**  
Gas Pressure Kit

Dwyer® Slack Tube® Manometers are as accurate as the finest laboratory "U" gages — yet they are made to roll up compactly for easy carrying and to withstand rough usage. Simply unroll the Dwyer® Slack-Tube® Manometer and set up to read static pressure, vacuum, or differential pressure. Magnetic clips hold it firmly to any steel surface or hang it on a nail. Turn connectors one revolution to open. When the pressure is imposed, add the number of inches one column travels up to the number of inches the other column travels down. When reading is completed turn connectors to seal columns, roll up manometer into compact coil and tuck it away in its plastic case or a tool box. No fluid lost. No loose caps or inserts to lose.

Dwyer® Slack Tube® Manometers cover a wide range of pressure readings — from 4-0-4 inches up to 60-0-60 inches. Use them in determining velocity and static pressures, for leakage, fan and blower tests, calibrating control devices, checking gas pressure and many other applications. All models have flexible vinyl-plastic columns and flexible spring steel scale calibrated in inches of water using water, and inches of mercury using mercury. Scale is center-mounted between columns to eliminate parallax error and has a full 2" sliding zero adjustment.

Slack Tube® Manometers are suitable for intermittent total pressure to 50 psi and vacuum not exceeding 20 in Hg. Avoid temperatures above 130°F and continuous high total pressure. Not for use with red gage fluid; use only water or mercury.

**Model 1212, Gas Pressure Kit**

**STANDARD ACCESSORIES**

Plastic case, magnetic mounting clips, two rapid shutoff type molded nylon rubber tubing connectors and one bottle of fluorescein green color concentrate with wetting agent.

A handy, complete kit containing a 16" Slack Tube® Manometer, necessary tubing and connection fittings for checking gas pressures in virtually all gas appliances such as water heaters, furnaces, stoves and dryers. Different range manometers may be specified at corresponding prices. Compared to the cost of purchasing items separately the assembly of component parts into kit form represents substantial savings.

**What the kit consists of:**

- 1 – #1211-16 Slack Tube® Manometer, reads pressure to 16" water.\*
- 1 – Carrying case, plastic, 8-1/2" x 7" x 3-1/8"
- 1 – 1 oz. bottle Fluorescein green color concentrate with wetting agent
- 2 – 1/8" pipe thread rubber tubing adapters
- 1 – 1/8" to 1/4" pipe thread bushing
- 1 – 3' L 3/16" rubber tubing
- 1 – Rubber tubing adapter to fit standard 7/16" dia. spud.

\*Other ranges available.

Model	Range, In.	Hg Req'd (oz.)	Metric	Range, CM	Hg Req'd (oz.)
1211-8	4-0-4	6	1211-50	25-0-25	11
1211-12	6-0-6	7	1211-100	50-0-50	18-1/2
1211-16	8-0-8	9	1211-200	100-0-100	35
1211-24	12-0-12	12-1/2			
1211-30	15-0-15	15			
1211-36	18-0-18	17-1/2			
1211-48	24-0-24	22-1/2			
1211-60	30-0-30	27			
1211-72	36-0-36	32			
1211-120	60-0-60	57			

TEST EQUIPMENT

Manometers,  
Portable



Series  
1227

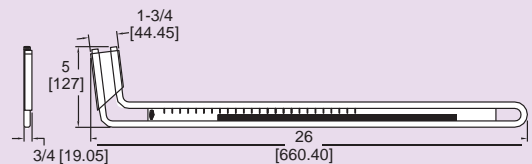
# Dual Range Flex-Tube® U-Inclined Manometers



**Model 1227**  
Dual Range



**Model 1227**  
Mounted in incline position



As Vertical U-Tube Manometer	As Inclined Manometer
0-16" water with 1" major divisions, .2" minor divisions	Scale is 17" long, reading .20-0-2.6" water with .02" minor divisions
Model 1227M (metric)	Model 1227M (metric) is
is 0-400 mm water column	-5 to 0 to 70 mm water column

Use Series 1227 as a regular U-tube manometer to read high-range pressure on the right leg (shown to the right), or as an inclined manometer (shown below) to read low-range pressure on the bottom leg. Simply incline manometer until fluid levels read zero. No spirit level required. Magnetic clips hold the gage in position on a steel duct surface.

**Series 1227 Manometer** - Most versatile and useful low cost manometer we know of. Designed for installation and servicemen. A sturdy, clear plastic manometer, it offers single, direct readings in two ranges: As a U-tube, it reads from 0 to 16" of water; as an inclined gage, it reads from -.20 to 0 to 2.6" of water. Model 1227M (Metric) is 0 - 400mm water column as a U-tube and -5 to 0 to 70mm water column as an inclined gage. "How-to-use" instructions are printed directly on the scale.

**STANDARD ACCESSORIES**

Two plastic carrying plugs with retainers for use when manometer is not in service.

**Indicating Tube** - Clear .400" OD, tough, shatterproof butyrate. Pressure connection end is bent to provide over pressure protection when used as an inclined gage. One 4-1/2" x 3/8" Tygon® tube included for pressure source connection.

**Scale** - Stark white high-impact styrene, 21" long. Adjustable for precise zeroing.

**Markings** - 1" major, .2" minor graduations on high range; .02" graduations on low range (50 mm major, 10 mm minor graduations on high range, 10 mm major, 1 mm minor graduations on low range model). Silkscreened in black on stark white for positive definition. Acrylic-coated for permanence.

**Series 1227 & 1227M**  
1227 (English Units)



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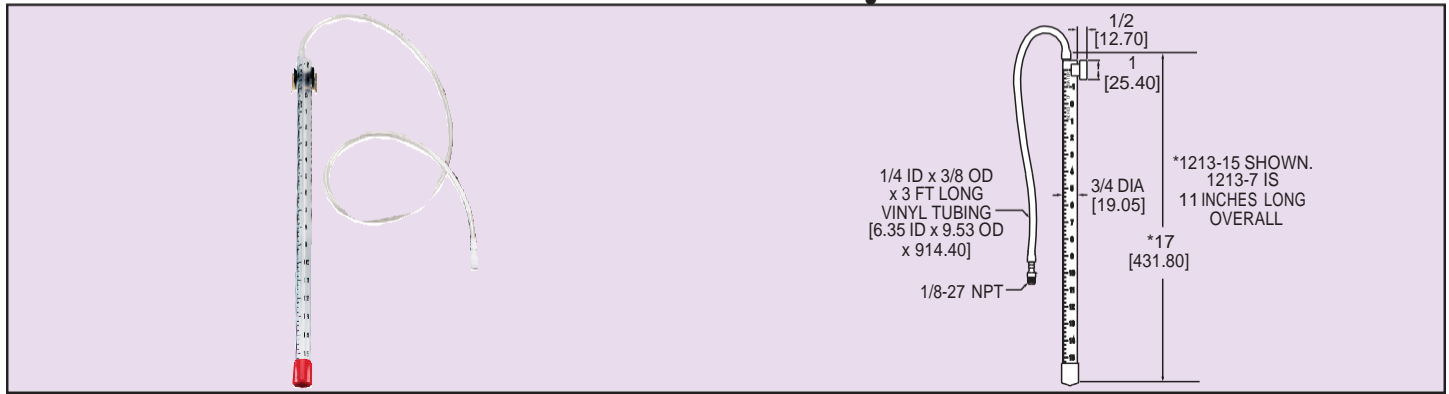


Series  
1213

# Gas Pressure Manometer

The "Tube in a Tube" Direct Reading Manometer

TEST EQUIPMENT



Provide visual indication of pressure with the Series 1213 Gas Pressure Manometer. Designed for use with natural gas, the manometer can also be used to monitor any compatible gases up to 15 inches of water column. Tap water is used as the sensing media and a magnetic clip provides temporary or permanent mounting. Economically priced and made of durable plastic for years of trouble-free service. Includes 3' of vinyl tubing and 1/8" nylon male NPT to barb fitting.

### SPECIFICATIONS

- Temperature Limit:** 140°F (60°C) maximum.
- Pressure Limits:** 15 in. w.c. (381 mm).
- Piping Connections:** 1/8" male NPT connector provided.
- Wetted Materials:** Vinyl, PVC and nylon.
- Weight:** 5 oz (142 g).

Model	Length (mm)
1213-15	7" (177.8)

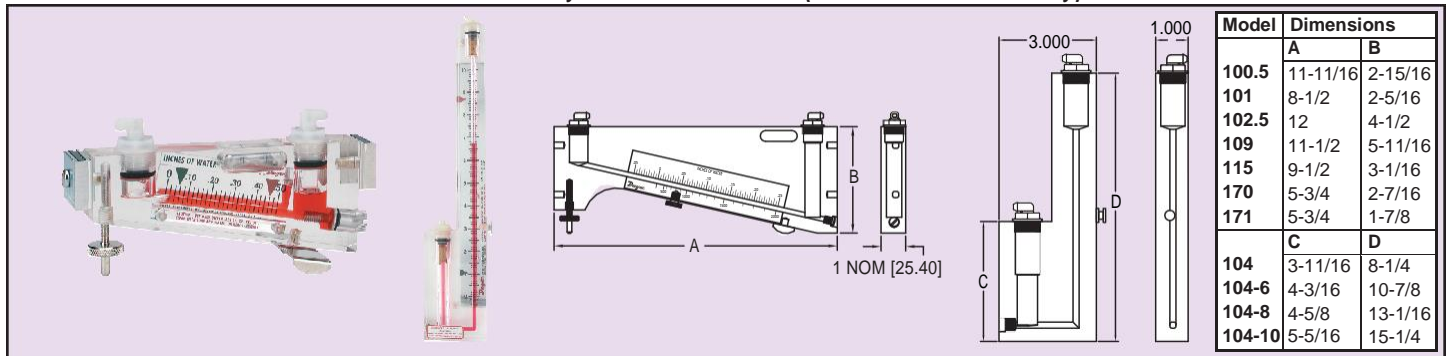
Manometers,  
Portable



Series  
100

# Durablock® Solid Plastic Portable Gages

Suitable for Total Pressures Up to 100 psig, Temperatures Up to 150°F, Accuracy ±2% of Full Scale (1% on Model 115 Only)



Model	Dimensions	
	A	B
100.5	11-11/16	2-15/16
101	8-1/2	2-5/16
102.5	12	4-1/2
109	11-1/2	5-11/16
115	9-1/2	3-1/16
170	5-3/4	2-7/16
171	5-3/4	1-7/8
		C
104	3-11/16	8-1/4
104-6	4-3/16	10-7/8
104-8	4-5/8	13-1/16
104-10	5-5/16	15-1/4

Dwyer® solid plastic portable manometers are precision instruments in inclined and vertical (well-type) styles for the measurement of static pressure, vacuum or differential pressure.

To assure the accuracy required in instruments of this type, all machining of bores and wells is to the highest standards of precision backed by Dwyer's years of experience in the fabrication of acrylic instruments.

### STANDARD ACCESSORIES

Plastic or steel carrying case (plastic pouch for 170, 171 and 172), two magnetic mounting clips, two rapid shut-off nylon tubing connections, one 9' length rubber tubing, terminal tube and extra bottle .826 red gage fluid.

Inclined Type						
Model	Range Inches of Water	Minor Scale Divisions	Scale Length	Carrying Case Type	Dimensions	Weight lb-oz.
100.5	.10-0-1.0	.01	8-1/4"	Plastic	13-1/2 x 10 x 2-3/8	5-1
101	.05-0-.50	.01	5"	Plastic	12-1/4 x 6-1/4 x 1-3/4	3-5
102.5	.20-0-2.0	.01	8-3/4"	Plastic	13-1/2 x 10 x 2-3/8	5-10
109	.20-0-3.0	.02	8-3/4"	Plastic	13-1/2 x 10 x 2-3/8	6
115	.05-0-.25	.005	6"	Plastic	12-1/4 x 6-1/4 x 1-3/4	3-10
170	0-.50	.02	2-1/2"	Plastic	7 x 9	1-7
171	0-.25	.01	2-1/2"	Plastic	7 x 9	1-6
Vertical Type						
104	0-4	.10	4-1/2"	Plastic	12-1/4 x 6-1/4 x 1-3/4	3-0
104-6	0-6	.10	7-3/4"	Plastic	13-1/2 x 10 x 2-3/8	4-8
104-8	0-8	.10	9"	Metal	18-1/2 x 4-3/8 x 2-1/4	4-12
104-10	0-10	.10	11-1/8"	Metal	18-1/2 x 4-3/8 x 2-1/4	4-15



100.5, solid plastic portable gage with .10-0-1.0 in w.c. range. Shown with carrying case and standard accessories.



104, solid plastic portable vertical manometer shown attached to inside of carrying case cover. Gage may also be removed from case and used in standing position or attached to any vertical steel surface with magnetic clips provided.







Series  
100 AV

# Durablock® Air Velocity Gage Kits

Suitable for Total Pressures to 100 psig (6.89 bar), Temperatures to 150°F (65.6°C)



Designed to measure air velocity, static pressure, vacuum or differential pressure, where the additional range of the 400 Series gages is not required. Series 100 Gages offer superb accuracy combined with portability. In Dwyer's® Durablock® precision machined solid acrylic plastic construction, the wells and inclined bore are machined to tolerances of  $\pm 0.002$ ".

**Design and service features:**

**Plastic Body,** A 1" thick solid acrylic block, virtually unbreakable. It is stable and free of the danger of distortion.

**Drilled Bore,** Permanently free of bends, never requires recalibration due to distortion.

**Reflective Chrome Finish Scales,** Easily eliminate parallax errors in reading. Adjustable, with thumbscrew locking for easy zeroing. (Model 125 AV uses screw plunger to adjust zero setting).

**Red Gage Fluid,** .826 specific gravity. Forms a well-shaped, easy-to-read meniscus, the result of high wettability.

**Leveling Adjustment,** Screw allows quick, accurate leveling. Integral ground glass bubble level provides ready reference.

Model	Range, Inches of Water	Velocity, Feet per Minute	Minor Scale Divisions	Scale Length	Dimensions, In Inches		Pitot Tube Model-Length
					A	B	
102-AV	.20-0-2.0	400-5500	.02	8-1/4"	11-1/2"	4-5/16"	166-12 12"
115-AV	.05-0-.25	400-2000	.005	6"	9-1/2"	3-1/16"	166-12 12"

Model	Carrying Case Dimensions
102-AV	13-1/2 X 10 X 2-1/2
115-AV	13-1/2 X 10 X 2-1/2

**Complete Air Velocity Kits include:**

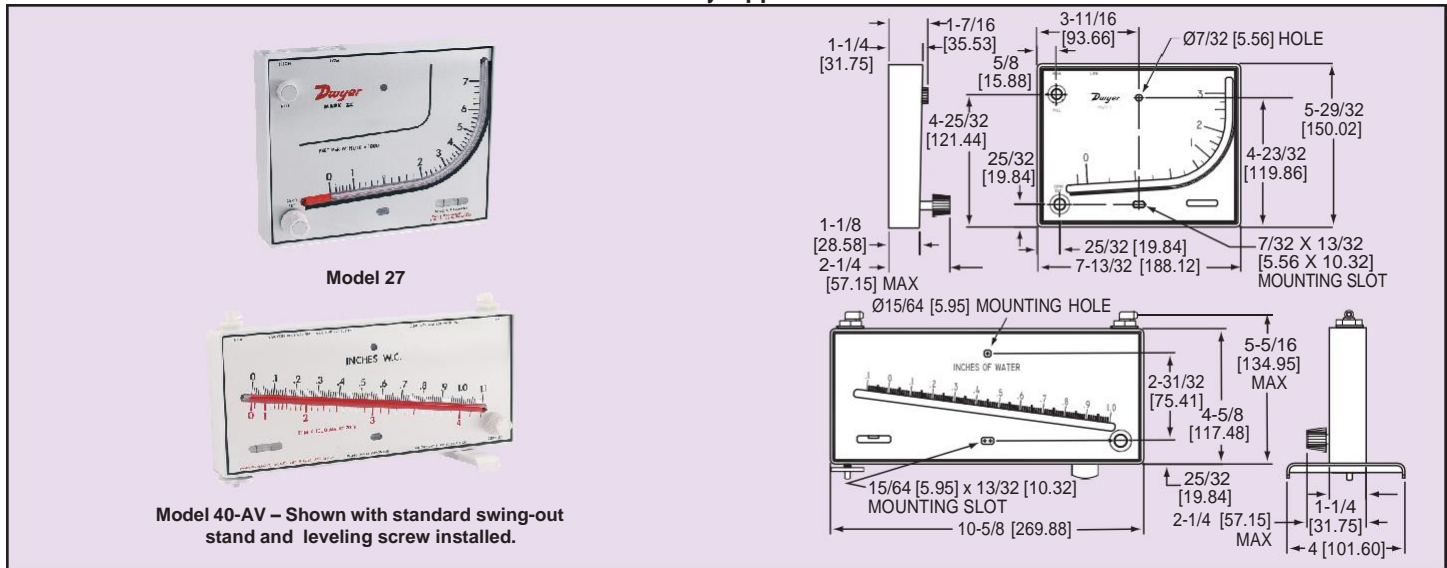
Dwyer® Inclined Manometer described above, stainless steel Pitot tube (12" with Models 102-AV & 115-AV), two 9' lengths of rubber tubing with connectors, extra red gage fluid, instruction card H-7, Bulletin H-11, magnetic mounting clips, air velocity calculator slide rule and carrying case.



Series  
Mark II

# Molded Plastic Air Velocity Meters

Low in Cost, Direct Reading Scales Offer 3% Accuracy, For Portable or Stationary Applications



**Construction and installation features:**

Construction is simple with virtually indestructible molded white styrene-acrylonitrile housing, indicating tube and fluid wells, molded ABS knobs and zero adjust plunger, shock mounted glass level vial and leak proof O-ring seals. Scales are lithograph printed on aluminum and epoxy coated.

For stationary applications, the Mark II air velocity meters can be easily mounted on any vertical surface with the two screws provided. A built in spirit level simplifies leveling. Just fill the reservoir, adjust fluid level to zero, connect the pitot tube, and it is ready for operation. For portable applications, the Model A-612 portable stand is available for Models 27 and 28.

A molded plastic swing-out stand and leveling screw for user-installation are provided with the Model 40-AV which also features rapid shutoff tubing connectors and built in over pressure traps.

Additional standard accessories include plastic connection tubing, mounting screws, 1 oz. bottle of indicating fluid and instructions. Metric ranges are also available for model 100. Model 102.5 replaces model 102.

Model	Range
Mark II 27	0-7,000 FPM
Mark II 28	0-10,500 FPM
Mark II 40-250 Pa-AV	0-21 MPS

Pitot tube not included with models above.

**ACCESSORY**

A-612, Portable Stand (for models 27, 28)

**OEM Specials** — All models of the Dwyer® Mark II molded plastic air velocity meters can be supplied with your logo or special scale in OEM quantities. Consult factory for details. See also our Digital Manometers and Pitot tubes.

TEST EQUIPMENT  
Manometers,  
Air Velocity





# Series 400 Air Velocity Meters

TEST EQUIPMENT

Manometers, Air Velocity



Complete Kit, Model 400-10  
Size\* 11 1/2"H x 20 1/4"W x 1 1/2"D  
Only 13 1/4 lb with equipment

Contact factory for extra long steel cases for use with longer Pitot tubes

Our most popular precision air velocity instrument, the Series 400 is used to balance air conditioning systems, measure pressure drop across filters, and test fan and blower discharge and inlet pressures, as well as air velocity in ducts. It offers the convenience of a dual purpose instrument — plus high accuracy on easy-to-read scales. The Series 400 includes leveling adjustment and glass bubble level, which makes it a versatile all around manometer for the air conditioning and balancing contractor or industrial plant.

Series 400 Air Velocity Meters with Combination Inclined/Vertical Scales  
Rated for total pressures to 100 psig (6.89 bar); temperatures to 150°F (65°C)

Model	Range in w.c.	Velocity FPM	Minor Div.; Range, in w.c.		Pitot Tube
			Inclined Scale	Vertical Scale	
400-10-Kit	0-10	400-12,600	.01, 0-1.0	.10, 1-10	18 in
400-10-Gage	0-10	400-12,600	.01, 0-1.0	.10, 1-10	None

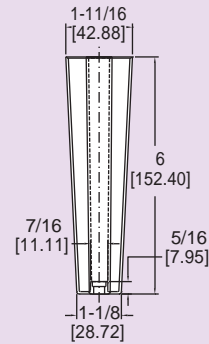
### FEATURES

- Measure both pressure and air velocity
- Read the red figures directly in FPM of velocity (from 400 to 10,000 FPM)
- No conversion tables needed for air at standard conditions.
- Read the black figures in inches of water column air pressure (from 0 to 10 in w.c.)



# Model 460 Air Meter

## A Low-Cost, Direct Reading Instrument Used for Air Velocity & Static Pressure Tests



Simple and quick, the 460 Air Meter is popular for servicing air conditioning, heating and ventilating equipment. Direct reading velocity and static pressure scales — both low and high ranges — show supply and return grille velocities, furnace draft, pressure drop across filters, etc. The 460 gives consistent, accurate results with no tedious calibration. Rugged plastic for rough daily use. Dual velocity ranges read 260-1200 and 1000-4000 FPM; pressure ranges from .005-.09 and .05 -1.0 in w.c.

nylon high range orifice cleaner

Model 460, Air Meter, complete kit

### ACCESSORIES

- A-378, Tube of 3 replacement floats
- A-379, Supply grille probe
- A-380, Return grille probe
- A-381, Cleaning kit including 1 anti-static chemically treated pipe stem cleaner and



# tetisan

**A Complete Pocket-Size Kit**

Includes air meter, return and supply grille probes, angle connector, cleaning materials, instruction card, air velocity calculator and carrying case.

**Furna  
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(left)**

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Series  
475  
&  
477

# Air Velocity Kits

## Digital Manometer and Pitot Tube for Balancing System Air Flows

**Convenient all-in-one kit** is small, light and easy to use. No set-up or leveling needed. Digital manometer reads from 0-19.99 in w.c. with  $\pm 0.5\%$  FS accuracy and minor divisions to 0.01. Large 1/2" LCD readout is easy to see in poorly lighted areas and has "low battery" warning. Included is a 6" SS Pitot tube with integral compression fitting to hold it securely when taking readings. Also, two static pressure tips with magnetic mounting measure pressure drop across filters, condenser coils, etc. Kit comes complete with rubber tubing, 9 V battery, step drill, AV calculator slide rule, and custom fitted carrying case. An indispensable test kit for the plant engineer, and HVAC technician that must balance system air flows at start-up.

Model	Range
475-00-FM-AV	0-4.000 in w.c.
475-0-FM-AV	0-10.00 in w.c.
475-1-FM-AV	0-20.00 in w.c.
475-2-FM-AV	0-40.00 in w.c.

**Convenient all-in-one kit** is small, light and easy to use. No set-up or leveling needed. Digital manometer reads from 0-19.99 in w.c. with  $\pm 0.5\%$  FS accuracy and minor divisions to 0.01. Large 1/2" LCD readout is easy to see in poorly lighted areas and has "low battery" warning. Kit includes convenient telescoping Pitot tube, Model 166T, fully adjustable from 11.5" to 36" (29.2 to 91.4 cm). Also, two static pressure tips with magnetic mounting measure pressure drop across filters, condenser coils, etc. Kit comes complete with rubber tubing, 9 V battery, step drill, AV calculator slide rule, and custom fitted carrying case. An indispensable test kit for the plant engineer, and HVAC technician that must balance system air flows at start-up.

Model	Range
475-00T-FM-AV	0-4.000 in w.c.
475-0T-FM-AV	0-10.00 in w.c.
475-1T-FM-AV	0-20.00 in w.c.

**Convenient all-in-one kit** is small, light and easy to use. No set-up or leveling needed. Digital manometer reads from 0-20 in w.c. with  $\pm 0.5\%$  FS accuracy. The Series 477 stores up to 40 readings in memory for later reference, instantly selecting up to nine English/Metric pressure units that are visible on a large, backlit 0.4" LCD readout. Both audible and visual overpressure alarms and a "low battery" warning are standard features. Each kit includes convenient telescoping Pitot tube, Model 166T which is fully adjustable from 11.5" to 36" (29.2 to 91.4 cm). In addition, two static pressure tips with magnetic mountings measure pressure drop across filters, condenser coils, etc. Kit comes complete with rubber tubing, 9 V battery, step drill, AV calculator slide rule, and custom fitted carrying case. An indispensable test kit for the plant engineer, and HVAC technician that must balance system air flows at start-up.

Model	Range
477-000T-FM-AV	0-1.000 in w.c.
477-00T-FM-AV	0-4.000 in w.c.
477-0T-FM-AV	0-10.00 in w.c.
477-1T-FM-AV	0-20.00 in w.c.

### Complete Kit Includes:

- Series 475 Digital Manometer, range 0-19.99 in w.c.
- Model 166-6-CF, 6" Pitot Tube with Compression Fitting
- Two No. A-303 Static Pressure Tips with Magnetic Mounting
- Two 9' Lengths 3/16" ID Rubber Tubing
- No. A-397 Step Drill for 3/16"-1/2" Holes in 1/16" Increments
- No. A-532 AV Slide Chart
- 9 V Battery
- Fitted Polyethylene Case



### Complete Kit Includes:

- Series 475 Digital Manometer, range 0-19.99 in w.c.
- Model 166T, 36" Telescoping SS Pitot Tube
- Two No. A-303 Static Pressure Tips with Magnetic Mounting
- Two 4-1/2' L 3/16" ID Rubber Tubing
- No. A-397 Step Drill for 3/16"-1/2" Holes in 1/16" Increments
- No. A-532 AV Slide Chart
- 9 V Alkaline Battery
- Fitted Polyethylene Case



### Complete Kit Includes:

- Series 477 Digital Manometer, range 0-20 in w.c.
- Model 166T, 36" Telescoping SS Pitot Tube
- Two No. A-303 Static Pressure Tips with Magnetic Mounting
- Two 4-1/2' L 3/16" ID Rubber Tubing
- No. A-397 Step Drill for 3/16"-1/2" Holes in 1/16" Increments
- No. A-532 AV Slide Chart
- 9 V Alkaline Battery
- Fitted Polyethylene Case



TEST EQUIPMENT

Manometers,  
Air Velocity



tetisan





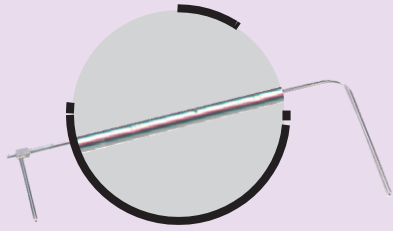
Series  
160

# Stainless Steel Pitot Tubes

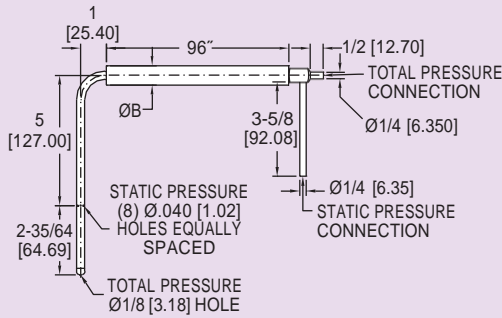
ASME Design Meets AMCA and ASHRAE Codes

TEST EQUIPMENT

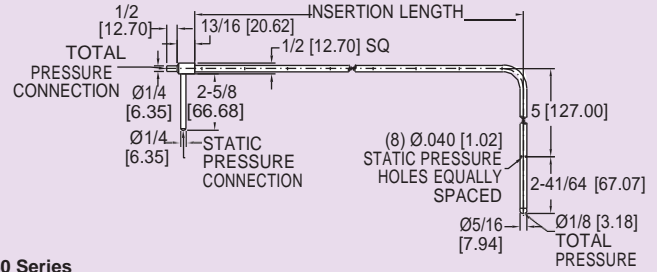
Pitot Tubes



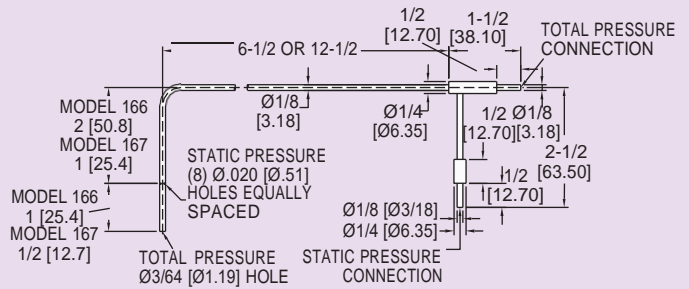
Standard Model 160 Pitot Tube



160 Series  
96" and longer with stiffener



160 Series



166/167 Series

Ideal for use with our precision manometers and air velocity gages, Dwyer® Pitot Tubes are constructed from corrosion resistant stainless steel for a lifetime of service. ASME design meets AMCA and ASHRAE specifications for maximum accuracy over a wide variety of flow conditions. No correction factors required as ASHRAE tip design yields a calibration factor of 1. ASHRAE design needs no calibration! Permanent, stamped insertion depth graduations on sides of 160 series facilitate accurate positioning. Static pressure port is parallel to sensing tube allowing quick, easy alignment of tube with air flow. Low sensitivity to misalignment gives accurate reading even when tube is misaligned up to 15 degrees. Various standard sizes are available for use in ducts as small as 4" dia, or as large as 36 ft dia. A universal model fits user supplied 3/4" schedule 40 (standard) pipe in any length. Several convenient mounting options are available for permanent installations.

## FEATURES

- No calibration needed
- Precisely located, burr-free static pressure holes
- Hemispherical tip design, best for accuracy if imperfectly aligned and nearly impossible to damage
- Long lasting 304 SS construction
- Silver soldered connections for leak-proof operation
- Coefficient of "1"
- 5/16" models rated to 1500°F
- Extended static connection helps guide tip within recommended 15° of air flow direction
- Inch graduations on sides of 160 series to quickly determine exact insertion depth
- Dwyer® Air Velocity Calculator, direct reading flow charts and instructions included
- Use 1/8" models in ducts as small as 4", 5/16" models in ducts 10" or larger
- Optional mounting gland or split flange make permanent installation fast and simple

## Series 160 is designed to meet:

- ASME "Fluid Meters" 6th Ed.
- ANSI/AMCA 210-99
- ANSI/ASHRAE 51-1999
- British Standard 1042

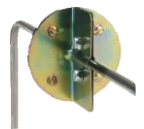
Standard 5/16" Diameter		Longer Length w/ Stiffener	
Model	Insertion Length	Model	Insertion Length
160-8	8-5/8"	160-96	96"
160-12	12-5/8"	<b>Pocket Size 1/8" Diameter</b>	
160-18	18-5/8"	Model	Insertion Length
160-24	24-5/8"	166-6	6"
160-36	36-5/8"	166-12	12"
160-48	48-5/8"	167-6	6"
160-60	60-5/8"	167-12	12"

## ACCESSORIES & OPTIONS

**A-156**, Flange Mounting Plate 1/2" female NPT

**A-158**, Split Flange Mounting

Can be added to any Dwyer® No. 160 Standard Pitot Tube. Cadmium plated steel. Gasket is pattern for mounting holes. Secure flange loosely to tube, adjust tube depth and tighten screws. Gasket of 1/16" Neoprene fits tightly around tube and against duct for leak-proof seal. Nuts, washers included.



**A-159**, Mounting Gland

Versatile adapter slips on any Series 160, 5/16" standard Pitot tube made after Dec. 1990. Two-part stainless steel fitting slides over tube and provides permanent, secure mounting. Where duct interior is accessible, use the washers and jam nut supplied. For blind applications or in thicker materials, use model A-156 flange mounting plate. Once tube is adjusted to proper depth and angle, tighten smaller hex bushing to lock position. Graphite bushing inside assures leak-proof seal even at higher temperatures. TFE bushing also available. **Note:** For full insertion with this fitting, order next longer Pitot tube.



A-159 Mounting Gland is used for both duct mounting and flange mounting. To flange mount, the A-159 must be used with the A-156 flange mounting plate.

**A-397**, Step Drill

For fast, convenient installation of Pitot tubes in sheet metal ducts. No center punch needed; automatic de-burring. Drills six sizes from 3/16"-1/2" in 1/16" increments.



**1/8" male NPT compression fitting**, mounting option for Series 166/167. Add -CF suffix (166-6-CF).



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Series  
160S

# "S" Type Stainless Steel Pitot Tubes

Large, Open Tip Design Resists Fouling; Optional Permanent Mount Models

Model	Dim A
160S-18	18 [457.20]
160S-24	24 [609.60]
160S-36	36 [914.40]
160S-48	48 [1219.20]
160S-60	60 [1524.00]

**Series 160S Pitot Tubes** are designed specifically for flow measurement of dirty, particulate laden air or gas streams typical in smoke stack and other environmental testing. Large 5/16" dia. stainless steel tubing resists plugging under harsh, sooty conditions which quickly block conventional flow sensors. Total and static pressure tubes are precisely aligned and welded together every six inches for maximum accuracy, strength, and long term durability. Versatile 1/8" female NPT connections easily adapt to any type of pipe or tubing. A pair of 1/8" NPT to 3/16" ID tubing adapters is included plus a handy molded vinyl cap to protect tip when not in use. Supplied with complete instructions.

### FEATURES

- Meets EPA specification 40 CFR (ch. 1)
- Long lasting, welded stainless steel construction
- 1/8" female NPT connections, permanently welded
- Rated to 1500°F (815°C)
- Rated to 100 psig (6.89 bar)
- 0.84 flow coefficient

Model	Insertion In Inches	Perm. Mtg. Model	Insertion In Inches
160S-18	18	160S-18PM	18
160S-24	24	160S-24PM	24
160S-36	36	160S-36PM	36
160S-48	48		
160S-60	60		
160S-72	72		

**Permanent Mounting (PM)** models include 1 inch dia. welded stainless steel sleeve and adjustable compression fitting with 1 inch male NPT mounting treads. Adjust depth, lock in place.



Model  
166T

# Telescoping Stainless Steel Pitot Tube

Adjustable Design Extends Insertion Length to 36 Inches

The **Model 166T Telescoping Pitot tube** is a unique air flow sensor which can quickly and easily be adjusted for any duct insertion length from 11.5 to 36 inches (29.2 to 91.4 cm). Now, this single compact unit can replace up to five conventional fixed length Pitot tubes. For even greater convenience, it is securely protected by a custom fitted polyethylene carrying case. Telescoping sections lock in place as they are extended, enabling use of the handle grip to gauge proper alignment of the tip within the airstream. Stainless steel construction resists corrosion. Hemispherical tip has 1.0 flow coefficient, is 1/8" dia. (3.2 mm). Largest section is 3/8" (9.5 mm). Weight (with case) 1 lb, 9 oz (709 g). Case: 12.5 x 6.25 x 1.75 in.

**Model 166T**



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Series 160E

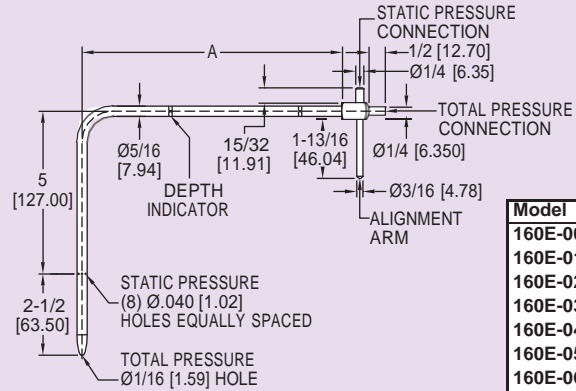
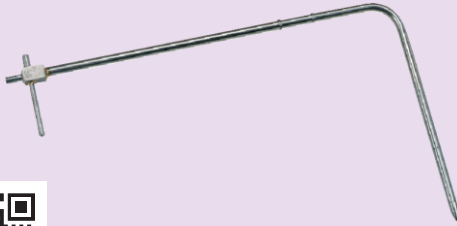
# Ellipsoidal Tip Pitot Tube

Designed to Meet British Standard 1042

TEST EQUIPMENT



Scan here to watch product video



Model	Dim A
160E-00	7-7/8 [200.03]
160E-01	11-7/8 [301.63]
160E-02	18-7/8 [479.43]
160E-03	31-1/2 [800.10]
160E-04	39-1/2 [1003.30]
160E-05	48 [1219.20]
160E-06	59-7/8 [1520.83]

Series 160E Pitot Tubes are widely used in the U.K. and Europe for applications demanding high accuracy when measuring the flow of air or other compatible gases. Precision crafted tip configuration allows air to pass smoothly with minimum turbulence for consistent, reliable readings. Exterior indicator arm is aligned parallel to the 5 in. (13 cm) sensing tip so you always know that unit is properly positioned inside duct. Sliding depth indicators grip firmly to ensure uniform insertion — critical when making multiple measurements as part of a complete traverse; the best way to determine average velocity. Total and static pressure taps are 1/4" (6 mm), permanently silver soldered to the connection block, leak-proof and durable.

Model	Insertion in Meters
160E-00	0.2
160E-01	0.3
160E-02	0.48
160E-03	0.8
160E-04	1.0
160E-05	1.22
160E-06	1.52

### FEATURES

- Ellipsoidal tip design for improved accuracy, 1.0 coefficient
- 304 SS construction adds strength, resists corrosion
- Adjustable depth indicators for fast, consistent traverses
- Alignment indicator helps keep tip parallel to flow



Handy A-532 Slide Chart speeds air velocity calculations. All plastic, stays clean for years. Included with each Pitot tube.

Pitot Tubes

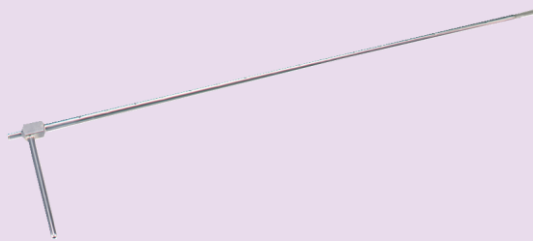


Model 160F

# Straight Stainless Steel Pitot Tubes



Scan here to watch product video



Sensing Profile

Series 160F Pitot Tubes are ideal for use with our precision air velocity gages, transmitters and digital test instruments. The Series 160F Pitot Tubes are constructed from corrosion resistant stainless steel for a lifetime of service. Permanent, stamped insertion depth graduations on sides of the 160F Pitot facilitate accurate positioning. Static pressure port is parallel to sensing tube allowing quick, easy alignment of tube with the air flow. Straight design allows for easy insertion into ducts through grills and pressure taps as well as aids in positioning in hard to reach locations where a hook style Pitot tube may not allow access.

### SPECIFICATIONS

- Wetted Material:** 304 SS.
- Accuracy:** ±2% FS, 0 to 9000 FPM (45 M/s).
- K-Factor:** 0.81.
- Temperature Limit:** 1500°F (815°C).
- Insertion Length:** 18" (44 cm).
- Process Connections:** 1/4" OD.
- Weight:** 4.3 oz (122 g).

### ACCESSORIES

- A-156, Flange Mounting Plate 1/2" female NPT
- A-158, Split Flange
- A-159, Mounting Gland
- A-397, Step Drill

Model 160F, Straight Stainless Steel Pitot Tube



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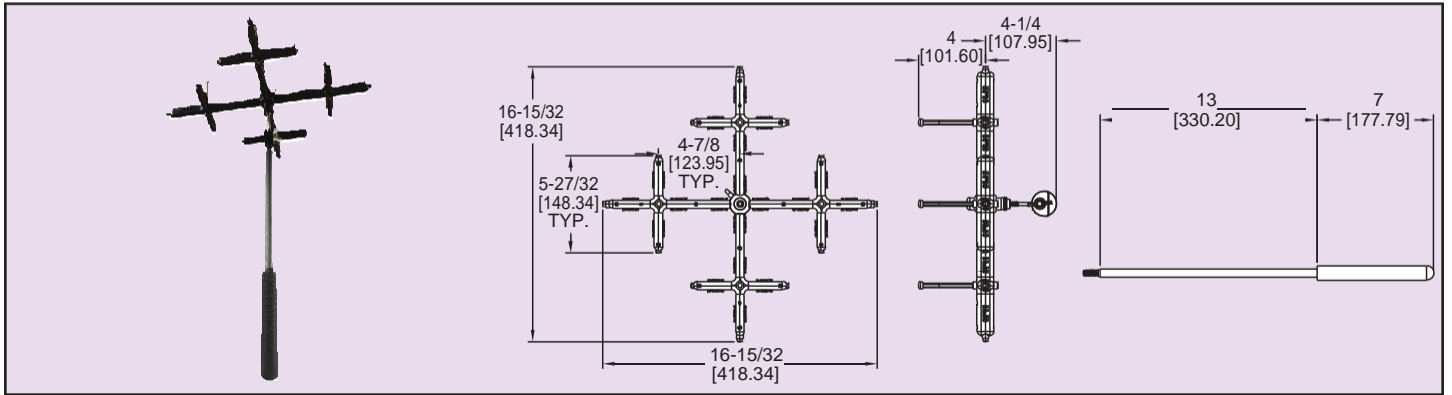
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Model 160G

# Averaging Air Flow Grid

Extends Over 50" to Aid in Air Flow Output Checks



The Model 160G Averaging Air Flow Grid is a precision sensing instrument used to measure face air velocity on grills, diffusers, registers, exhaust hoods, coils, filters, dampers and similar restrictions. With its 16 sensing points, the 160G Air Flow Grid provides an average flow sensing area across its 16.5" length and width. Included color coded tubing connects to the integral barbed fittings, providing a differential pressure signal to a gage or manometer where the readings can be converted into a velocity or flow reading. The 160G comes standard with an 18" handle and two 17" extensions offering a maximum reach of approximately 52". The uniquely designed swivel and tightening nut allows the user to position the sensing grid at any angle for ease of use in hard to reach locations. Store in the separate UHH-C2 hard carrying case with foam cut-outs perfectly sized for the 160G, as well as various other instruments in the AQTI Air Quality Test Instruments line.

### SPECIFICATIONS

**Service:** Air or compatible gases.

#### Wetted Materials:

- Grid: Black polycarbonate;
- Swivel: Carbon steel;
- Handle: SS;
- Bolts: SS;
- Wing Nut: SS;
- Standoffs: Aluminum with rubber bumpers, two sets: 1.25" (31.7 mm) and 2" (50.8 mm), 1/8" ID / 1/4" OD;
- Tubing: Two 10' (3 m) lengths of silicone rubber.

**Accuracy:** ±2% FS.

**Temperature Limits:** -40 to 257°F (-40 to 125°C).

**K Factor:** 0.84.

**Range:** 1000 to 5000 FPM (5 to 25 m/s).

**Process Connection:** 1/8 to 1/4" ID tubing.

**Weight:** 3.5 lb (1.587 kg).

**Agency Approvals:** RoHS.

Model 160G, Averaging Air Flow Grid

#### ACCESSORY

UHH-C2, Protective Hard Case



TEST EQUIPMENT

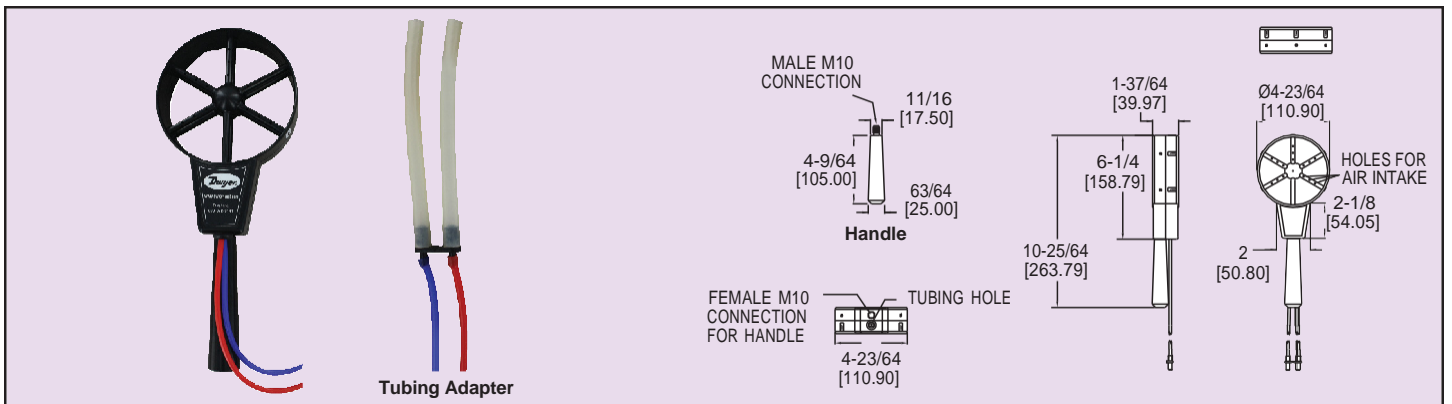
Air Flow Grids



Model ANE-1

# Differential Pressure Anemometer

Bi-Directional Anemometer, No Sensing Electronics



The Model ANE-1 Differential Pressure Anemometer is a robust and durable bi-directional anemometer with no moving parts or sensing electronics. With the installed tubing, the ANE-1 connects easily to any manometer or applicable pressure sensing device and is capable of measuring a wide velocity range. The air velocity range and accuracy is dependent on the installed manometer, and the ANE-1 retains the accuracy as long as it is dust free. The ANE-1 is made from high quality ABS plastic, comes with a convenient handle, and includes 5' of blue and 5' of red silicone tubing (2 mm ID x 4.5 mm OD) with removable adapter sized 2 mm OD to 3/16" OD that has two removable 5" clear silicone 3/16" ID x 3/8" OD tubing versatile process options.

### SPECIFICATIONS:

**Service:** Clean air only.

#### Wetted Materials:

- Anemometer: ABS;
- Tubing: Silicone;
- Handle: Phenolic.

#### Dimensions:

- Tubing: 2 mm ID x 4.5 mm OD;
- Adapter: 2 mm OD to 3/16" OD connections.

**Temperature Limits:** 23 to 122°F (-5 to 50°C).

**K-Factor:** 0.843.

**Process Connections:** 2 removable 5" (12.7 cm) tubing 3/16" ID.

**Weight:** 7.7 oz (220 g).

Model ANE-1, Differential Pressure Anemometer



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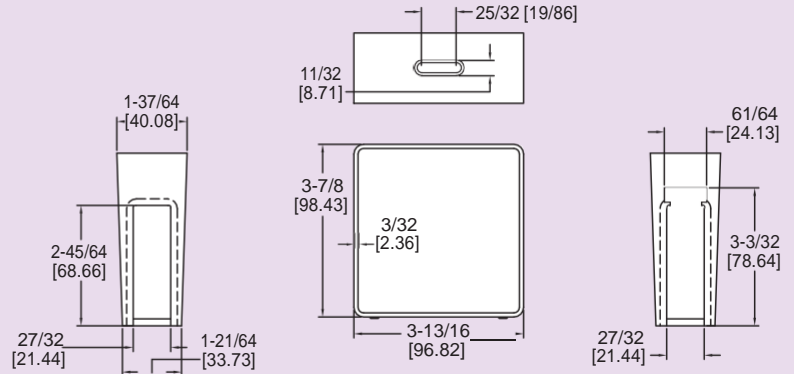
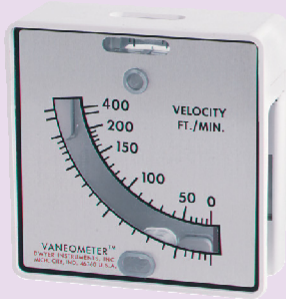
Model  
480

# Vaneometer™ Swing Vane Anemometer

Use This Sensitive Dwyer Unit to Measure Low Air Velocities - at Low Cost \*

TEST EQUIPMENT

Vane Anemometers



The 480 Vaneometer™ Swing Vane Anemometer is a durable low-priced instrument specifically designed to simplify the measurement of low air velocities from 25 to 400 FPM. OSHA, EPA and other safety ventilation requirements for spray booths and at fume, smoke and dust exhaust hoods can now be quickly checked, even by untrained personnel. Its small size and light weight — only four ounces make it ideal to carry from one work station to another. A versatile steel mounting bracket for continuous monitoring is also included. The Vaneometer™ Swing Anemometer is accurate to ±5% of full-scale to 100 FPM and ±10% from 100 FPM to top of scale. It has a spirit level to ensure accurate readings and the large scales are easy to read and visible from both sides. The housing is molded from tough ABS plastic and easy to clean with soap and water. The polyester vane can be cleaned with lacquer thinner. A spare vane is provided.

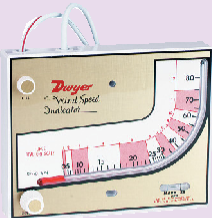


Use a Vaneometer™ Swing Vane Anemometer to measure velocity of air flow into laboratory fume hoods and at paint spray booths to determine when to change filters. Or wherever needed to meet OSHA standards of ventilation for smoke, dust or fume removal.

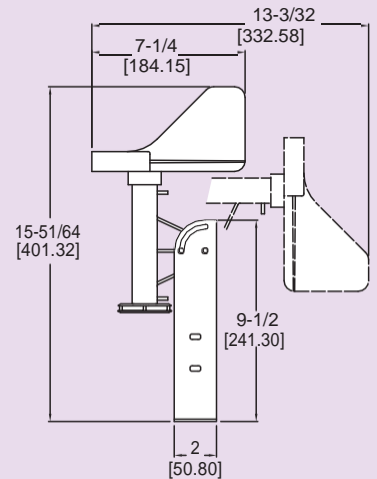
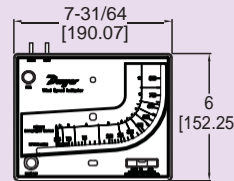
Model	Description
480	25 to 400 FPM
M480	0 to 2.0 m/s
A-390	Extra vanes, pkg. of 2
A-406	Molded carrying case
A-407	Plastic carrying pouch



# Mark II Wind Speed Indicator



Includes ABS plastic vane, 50' tubing, mounting hardware and gage fluid.



Perfect for your living room, den, workshop or office. Instruments are accurate, low-cost and practical. Standard model indicates wind speed directly on liquid filled scale reading ) and Beaufort scale (1 to 12). Also available is metric model, to 130 kilometers per hour. To order, specify Mk II Wind Speed Indicator, KPH.

Mark II WSI, mph scale  
Mark II WSI Metric, kph scale

**Note:** Standard discounts do not apply to the Wind Speed Indicator. Sporting goods dealers and distributors: Contact factory for quantity discounts.



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Model  
MW-1

# Pocket Wind Meter

Measures Wind Speed and Temperature, Wide Range



**Measure wind speed and temperature** with the Series MW Pocket Wind Meter. Easily view readings on the four digit 2" (51 mm) high LCD display with wind speed bar graph. Selectable air velocity ranges include m/s, ft/min, km/h, mph, and knots. Ambient temperature recorded in °F or °C. The MW also features automatic shut-off, detailed instruction manual and protective plastic water resistant housing that floats. Accessories include a lanyard.

**Model MW-1**, Hand-held, Mini-vane Thermo-Anemometer

#### ACCESSORY

**A-166**, Replacement vane for MW-1

#### SPECIFICATIONS

**Air Velocity Range:** 0 to 30 m/s, 0 to 5860 ft/min, 0 to 90 km/h, 0 to 65 mph, 0 to 55 knots.

**Temperature/Wind-chill Ranges:** 14 to 113°F (-10 to 45°C).

**Temperature Resolution:** 0.36°F (0.2°C).

**Accuracy:** Wind speed: ±5% of reading. Temperature: ±3.6°F (±2°C).

**Resolution:** 0.1 m/s, 19 ft/min, 0.3 km/h, 0.2 mph, 0.2 knots.

**Sample Time:** 1 reading per second.

**Water-resistant:** Up to 3' (1 meter).

**Power Requirements:** 3 V CR2032 or BR1225 lithium metal battery, installed functional, user replaceable.

**Auto-off:** 14 minutes after last key is pressed.

**Impeller:** Plastic, replaceable.

**Case:** Plastic.

**Display:** 2.32 x 2" (59 x 51 mm).

**Weight:** 1.84 oz (52.1 g).

**Agency Approvals:** CE.

TEST EQUIPMENT

Wind Meters



Model  
89088

# Pocket Wind Meter

Measures Wind Speed, Wind Chill and Temperature



The **Model 89088** measures wind speed, temperature and wind chill accurately with its rotating vane and thermo-anemometer sensor. The body and rotating vane are constructed of light weight, sturdy ABS plastic. The ABS impeller spins on a high precision jewel bearing allowing for max performance. Wind speed, max wind speed, temperature and wind chill can quickly be viewed on the LCD display in user selectable measuring units of degrees F or C, m/s, ft/min, knots, mph, k/hr and beauforts. The 89088 also features a data hold button and a 5 minute automatic shut-off to conserve battery life. Accessories include a battery and a cloth carrying pouch.

BF 1 to 8 1

#### Units vs. Range as shown on display

Unit	Range	Resolution
M/S	1.1 to 20.0	0.1
FT/MIN	60 to 3937	0.1
KNT	0.4 to 38.8	0.1
KMH	0.8 to 72.0	0.1
M/H	0.5 to 44.7	0.1



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## SPECIFICATIONS

**Air Velocity Range:** 1.1-20.0 m/s, 60-3937 ft/min, 0.4-38.8 knots, 0.8-72.0 k/hr, 0.5-44.7 mph, 1-8 beaufort.

**Wind Speed Limits:** 0.5-44.7 mph (60-3937) ft/min.

**Temperature/Wind Chill Limits:** 0 to 50°C (32 to 122°F).

**Accuracy:** Velocity:  $\pm 5\%$  or  $\pm$  last significant digit (whichever is greater); Temperature:  $\pm 1^\circ\text{C}$  ( $\pm 2^\circ\text{F}$ ).

**Resolution:** Temperature:  $0.1^\circ$ ; Air velocity: See chart.

**Power Requirements:** 3 V CR2032 lithium metal battery, included, userreplaceable.

**Battery Life:** 48 hour life under continuous usage. Auto-off: After 5 minutes.

**Materials:** Impeller: ABS; Case: ABS.

**Display:** 28 (L) x 16 (W) mm.

**Weight:** 50 g (1.76 oz).

**Agency Approvals:** CE.

**Model 89088, Pocket Wind Meter**

) and Beaufort scale (1 to 12). Also available is metric model, to 130 kilometers per hour. To order, specify Mk II Wind II Wind Speed Indicator, KPH.

**Note:** Standard discounts do not apply to the Wind Speed Indicator. Sporting goods dealers and distributors: Contact factory for quantity discounts.



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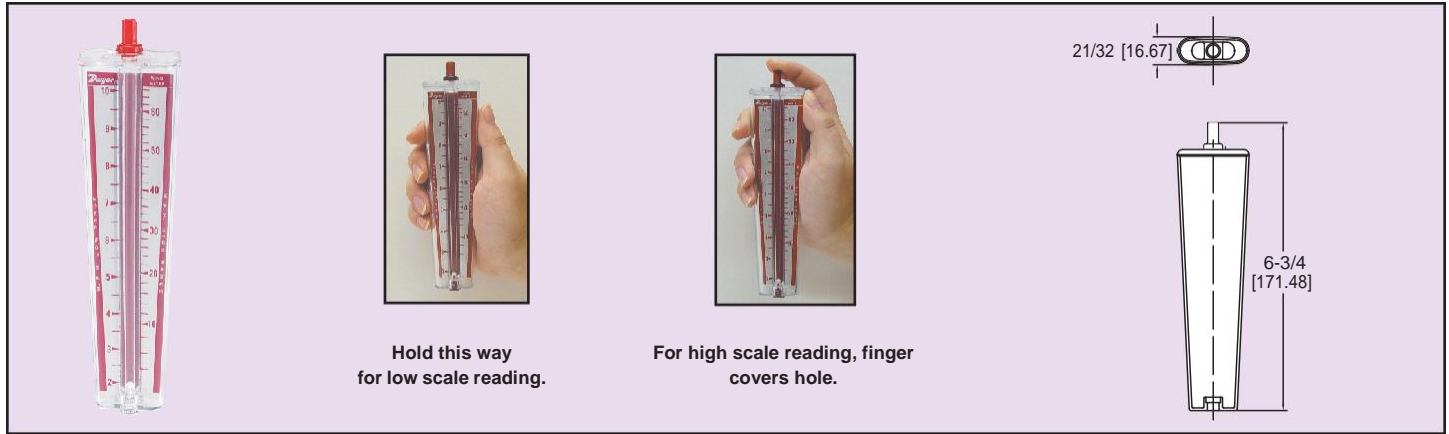
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# Portable Wind Meter

TEST EQUIPMENT

Vane Thermo-Anemometers



Hold this way for low scale reading.

For high scale reading, finger covers hole.

Ideal for yachtsmen, outdoorsmen, farmers, etc. A welcome gift. Use anywhere. Direct reading, no calculations. Hold meter at eye level, back of unit to wind. White ball in tube indicates wind speed. Meter has two scales for max accuracy and easy reading — low, 2 to 10 and high, 4 to 66 mph range. For high range, cover hole with finger. Pocket size, sturdy plastic, has case.

**Note:** Standard discounts do not apply to the Windmeter. Sporting goods dealers and distributors: Contact factory for quantity discounts.

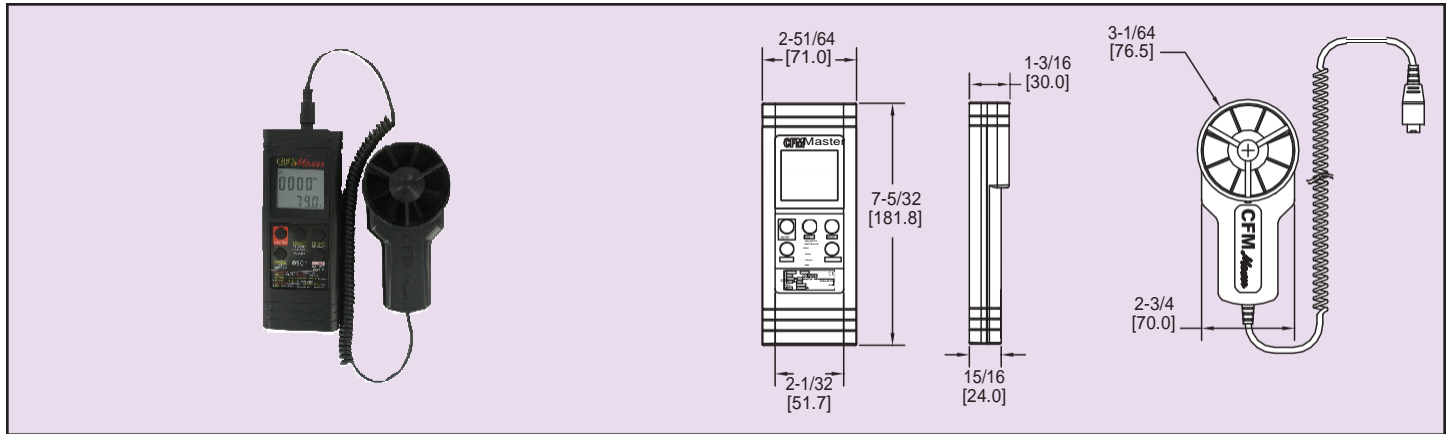
**Dimensions:** 5/8" W X 6-3/4" H X 17/32" D.

- Wind Meter-MPH, mph scale
- Wind Meter-KNOT, knots scale
- Wind Meter-KPH, kph scale
- Wind Meter-MPS, mps scale
- A-376, Replacement floats for windmeter, tube of 3



## Model 8901 Vane Thermo-Anemometer

Measures Air Volume, Air Velocity, and Temperature



**Model 8901 Vane Thermo-Anemometer** is ideal for balancing air conditioning and heating ducts or checking the operation of fans and blowers. Model 8901 measures air volume in cubic feet per minute and cubic centimeters per second, as well as air velocity in ft/min, m/s, knots, km/hr and mph with  $\pm 2\%$  accuracy. The multifunction LCD can simultaneously display air velocity and temperature or air flow and temperature in selectable units. Built-in temperature sensor provides measurements with an accuracy of  $\pm 2$  with the capability to display the results in  $^{\circ}\text{F}/^{\circ}\text{C}$ . Model 8901 can either store measurements or transfer the data to a PC via RS-232 communication. Additional features include data hold, as well as the ability to record minimum, maximum and average readings. These units also feature a detachable probe for easy replacement, if necessary. Model 8901 includes battery, carrying case and instruction manual.

**Model 8901, Vane Thermo-Anemometer**

### ACCESSORIES

- A-550, Replacement Probe with Vane
- A-552, USB Cable and RS-232 Software



### SPECIFICATIONS

#### AIR VELOCITY

- Range:** 80 to 6900 ft/min (0.4 to 35 m/s).
- Accuracy:**  $\pm 2\%$  of reading or last significant digit (whichever is greater).
- Resolution:** 1 ft/min (0.01 m/s).
- Response Time:** 1 second.

#### AIR VOLUME

- Range:** 9999 (CFM,  $\text{m}^3/\text{s}$ ).
- Accuracy:**  $\pm 2\%$  of reading or last significant digit (whichever is greater).
- Resolution:** 0.1 (0 to 999.9) or 1 (1000 to 9999).
- Response Time:** 1 second.

### TEMPERATURE

- Range:** 14 to 122 $^{\circ}\text{F}$  (-10 to 50 $^{\circ}\text{C}$ ).
- Accuracy:**  $\pm 1^{\circ}\text{F}$  ( $\pm 0.6^{\circ}\text{C}$ ).
- Resolution:** 0.1 $^{\circ}\text{F}/^{\circ}\text{C}$ .
- Response Time:** 60 seconds.

### METER

- LCD Size:** 1-1/4 x 1-5/8" (37 x 42 mm).
- Serial Communications:** 2400 bps, 8 data bits.
- Power Requirements:** 9 V alkaline battery, included, user replaceable.
- Battery Life:** 100 hours (approx.).
- Vane Diameter:** 2-7/8" (70 mm).
- Weight:** 6 oz (170 g).
- Agency Approvals:** CE.

- Weight:** 6 oz (170 g).
- Agency Approvals:** CE.

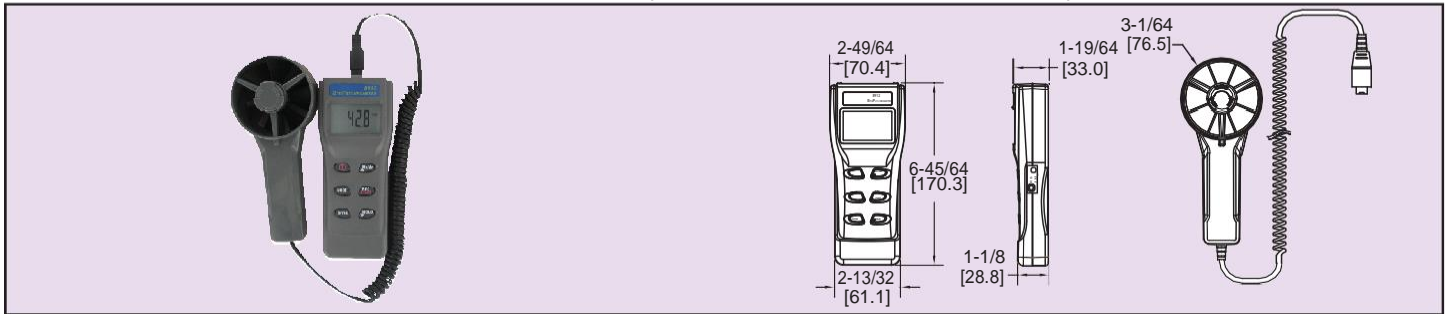




Model 8912

# Vane Thermo-Anemometer

Measures Air Velocity, Air Volume, Temperature, Humidity, and BTU



Measure air velocity, air volume, temperature, humidity, and BTU with the Model 8912 Vane Thermo-Anemometer. The large 1.7" (44 mm) display allows users to easily view readings. User-selectable wind speed units include ft/min, m/s, knots, mph, and km/hr. In addition to these functions, the 8912 is capable of measuring relative humidity, wet bulb temperature, dew point, and BTU capacity. A built-in sensor records ambient temperature in °F or °C. Model 8912 features include data hold, the ability to record minimum, maximum, and average readings on a single point, and an RS-232 interface setting. The Model 8912 also features a detachable probe for easy replacement, if necessary. The units can record and average up to 2 hours of data while displaying the continuous running average. Each unit includes hard carrying case, batteries, calibration data tag and instruction manual. This versatile meter is perfect for HVAC inspection, energy audits and balancing applications.

Model 8912, Vane Thermo-Anemometer

### ACCESSORIES

- A-549, Replacement Probe with Vane
- A-552, USB Cable and RS-232 Software

### SPECIFICATIONS

**AIR VELOCITY**  
**Range:** 188 to 6299 ft/min (0.6 to 32 m/s).  
**Accuracy:** ±5% of reading or last significant digit (whichever is greater).  
**Resolution:** 0.1 ft/min (0.1 m/s).  
**Response Time:** 1 second.

**TEMPERATURE**  
**Range:** -4 to 140°F (-20 to 60°C).  
**Accuracy:** ±1°F (±0.6°C).  
**Resolution:** 0.1°F/°C.  
**Response Time:** 60 seconds.

**RELATIVE HUMIDITY**  
**Range:** 0 to 100%.  
**Accuracy:** ±3% @ 25°C from 10 to 90% RH. Outside this range: ±5%.  
**Resolution:** 0.10%.  
**Response Time:** 60 seconds.

**AIR VOLUME**  
**Range:** 0 to 99999 (CFM or m³/s).  
**Accuracy:** ±5% of reading or last significant digit (whichever is greater).  
**Resolution:** 0.1 (0 to 9999.9) or 1 (10000 to 99999).  
**Response Time:** 1 second.

**WET BULB**  
**Range:** -7.6 to 158°F (-22 to 70°C).  
**Resolution:** 0.1°F/°C.

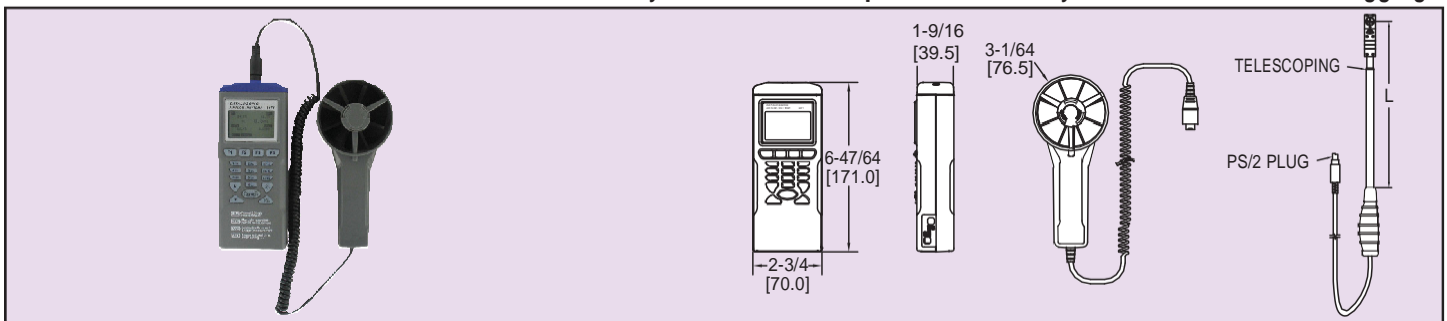
**METER**  
**Display:** 1 x 1.8" (26 x 45 mm).  
**Serial Communications:** 9600 bps, 8 data bits, no parity.  
**Power Requirements:** (4) AAA alkaline batteries, included, user replaceable.  
**Battery Life:** 100 hours.  
**Vane Diameter:** 3" (77 mm).  
**Weight:** 6 oz (170 g).  
**Agency Approvals:** CE.



Model 9671

# Multi-Function Vane Thermo-Anemometer

Measures Air Velocity, Air Volume, Temperature, Humidity, and BTU; Built-In Datalogging



Measure air velocity, air volume, temperature, humidity, and BTU with the Model 9671 Multi-function Anemometer. The large 1.8" (45 mm) display allows users to easily view readings. User-selectable wind speed units include ft/min, m/s, knots, mph and km/hr. In addition to these functions, the 9671 is capable of measuring relative humidity, wet bulb temperature, dew point and BTU capacity. A built-in sensor records ambient temperature in °F or °C. Model 9671 features include data hold, along with the ability to record minimum, maximum and average readings on a single point. Additional features include an RS-232 interface setting that allows the unit to download data, as well as upload up to 99 measurements through pre-edited PC files. The 9671 also has a detachable probe for easy replacement, if necessary, or to attach a miniature vane probe. Each unit includes hard carrying case, batteries, software CD, cable and instruction manual.

Model 9671, Vane Thermo-Anemometer

### ACCESSORIES

- A-551, Replacement Probe with Vane
- A-VT-300P, Replacement Probe with Miniature Vane

**SPECIFICATIONS**  
**AIR VELOCITY**  
**Range:** 118 to 6299 ft/min (0.6 to 32 m/s).  
**Accuracy:** ±5% of reading or last significant digit (whichever is greater).  
**Resolution:** 0.1 ft/min (0.1 m/s).  
**Response Time:** 1 second.

**TEMPERATURE**  
**Range:** -4 to 140°F (-20 to 60°C).  
**Accuracy:** ±1°F (±0.6°C).  
**Resolution:** 0.1°F/°C.  
**Response Time:** 60 seconds.

**RELATIVE HUMIDITY**  
**Range:** 0 to 100%.  
**Accuracy:** ±3% @ 25°C from 10 to 90% RH. Outside this range: ±5%.  
**Resolution:** 0.10%.  
**Response Time:** 60 seconds.

**AIR VOLUME**  
**Range:** 0 to 99999 (CFM or m³/s).  
**Accuracy:** ±5% of reading or last significant digit (whichever is greater).  
**Resolution:** 0.1 (0 to 9999.9) or 1 (10000 to 99999).  
**Response Time:** 1 second.

**WET BULB**  
**Range:** -7.6 to 158°F (-22 to 70°C).  
**Resolution:** 0.1°F/°C.

**METER**  
**Display:** 1 x 1.8" (26 x 45 mm).  
**Serial Communications:** 9600 bps, 8 data bits, no parity.  
**Power Requirements:** (4) AAA alkaline batteries, included, user replaceable.  
**Battery Life:** 100 hours.  
**Vane Diameter:** 3" (77 mm).

TEST EQUIPMENT

Vane Thermo-Anemometers



tetisan



Model 8904

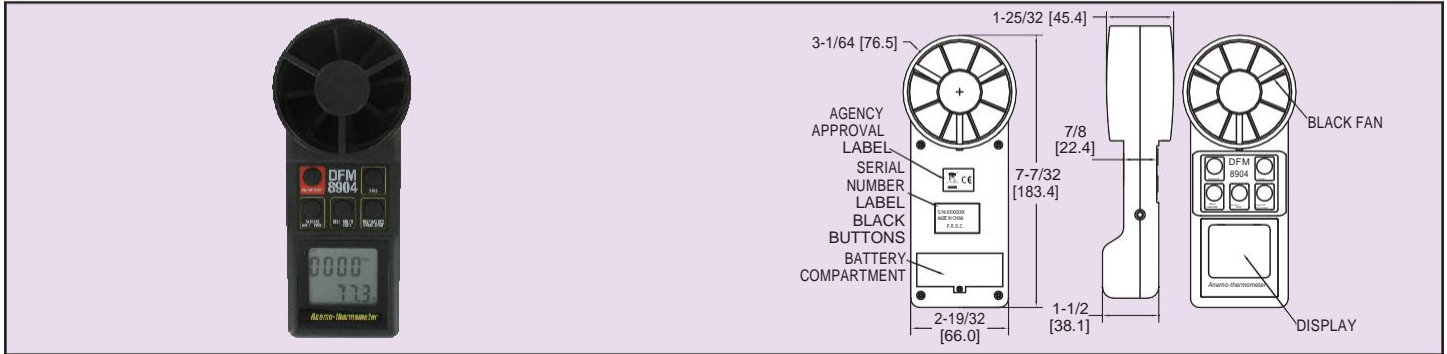
# Integral Vane Thermo-Anemometer

Large 1.3" Dual Display, One Hand Operation



TEST EQUIPMENT

Thermo-Anemometers



Simultaneously measure air velocity and temperature with the Model 8904 Integral Vane Thermo-Anemometer. The large 1.3" (34 mm) display allows users to easily view readings. User-selectable wind speed units include ft/min, m/sec, knots, mph and km/hr. Additionally, a built-in sensor records ambient temperature in °F or °C. Model 8904 features include data hold, the ability to record minimum, maximum and average readings on a single point and an RS-232 interface setting. The units can also record and average up to 2 hours of data while displaying the continuous running average. Model 8904 includes hard carrying case, battery and instruction manual. This compact meter is ideal for HVAC inspection, energy audits and balancing applications.

### APPLICATIONS

This meter is most ideal for measuring heat, ventilation, air conditioning, refrigerating wind flow and temperature.

Model 8904, Integral Vane Thermo-Anemometer

### SPECIFICATIONS

#### AIR VELOCITY

Range: 80 to 5900 ft/min (0.4 to 30 m/s).

Accuracy: ±3% of reading or last significant digit (whichever is greater).

Resolution: 1 ft/min (0.01 m/s).

Response Time: 1 second.

#### TEMPERATURE

Range: 14 to 122°F (-10 to 50°C).

Accuracy: ±1°F (±0.6°C).

Resolution: 0.1°F/°C.

Response Time: 60 seconds.

#### ACCESSORY

A-552, USB Cable and RS-232 Software

### METER

Display: 1.3 x 1.6" (34 x 40 mm).

Serial Communications: 2400 bps, 8 data bits.

Power Requirements: 9 V alkaline battery, included, user replaceable.

Battery Life: 100 hours.

Vane Diameter: 2-7/8" (70 mm).

Weight: 5.3 oz (150 g).

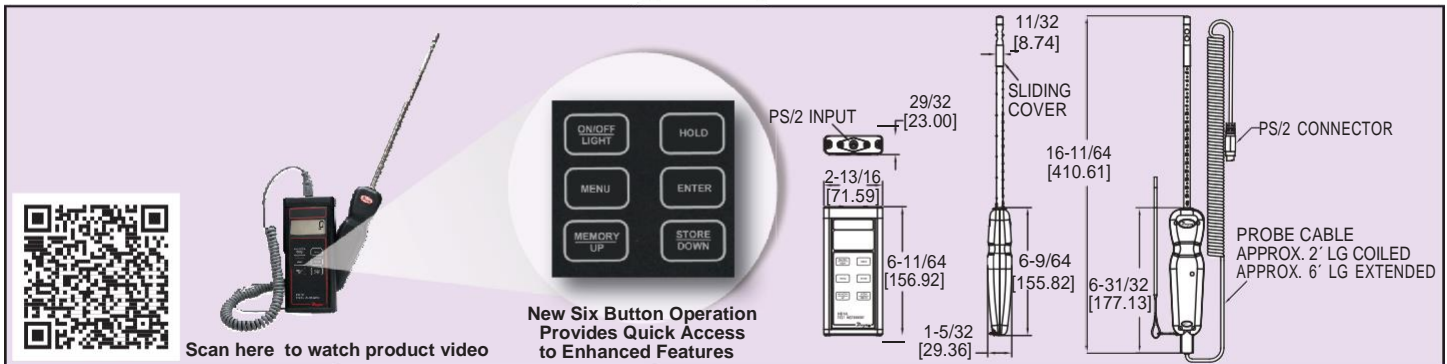
Agency Approvals: CE.



Model 471B

# Thermo-Anemometer Test Instrument

Measures Air Velocity or Air Volume and Temperature Simultaneously



The Model 471B Digital Thermo Anemometers are versatile dual function instruments that quickly and easily measure air velocity or volumetric flow plus air temperature in imperial or metric units. High contrast LCD display shows both selected readings simultaneously. Convenient backlight provides perfect visibility in low light conditions. Light automatically shuts off after 2-1/2 minutes to prolong battery life. Low battery warning is included. Stainless steel probe with comfortable hand grip is etched with insertion depth marks from 0 to 8 inches and 0 to 20 cm. Extruded aluminum housing fully protects electronics, yet is lightweight and comfortable to hold even when taking multiple readings as part of duct traverses. Up to 99 readings may be stored for later retrieval. An integral sliding cover protects sensors when not in use. Items included with the 471B are 9 volt alkaline battery, sensing probe, wrist strap and custom carrying case.

### SPECIFICATIONS

Service: Air velocity and temperature of clean, dry air.

#### Temperature Limits:

Process Air Velocity: -20 to 212°F (-29 to 100°C);

Process Temperature: -40 to 212°F (-40 to 100°C);

Ambient: 5 to 125°F (-15 to 51°C).

Display: 4.5 digit LCD.

Resolution: 0.1%, 0.1 °F/°C.

Range Air Velocity: 0 to 6000 FPM (0 to 30 m/s).

Accuracy Air Velocity: ±3% FS within temperature range of 40 to 90°F (4 to 32°C).

Range Volumetric Air Flow: 19,999 in selected flow units.

Range Temperature: -40 to 212°F (-40 to 100°C).

Accuracy Temperature: ±0.5°F (±0.28°C) from 32 to 122°F (0 to 50°C); ±1.5°F (±0.83°C) from -40 to 32°F (-40 to 0°C) & 122 to 212°F (50 to 100°C).

Probe Length: 8" (203 mm) insertion.

Cable Length: 28" (71 cm) retracted, 6 ft (183 cm) extended.

Power Requirements: 9 V alkaline battery, installed non-functional, user replaceable.

Weight: 16 oz (454 g).

Agency Approvals: CE.

Model 471B-1, Digital Thermo Anemometer includes 9V battery, sensing probe, wrist strap, soft carrying case and instructions

### ADDITIONAL PARTS

AP1, Thermo anemometer air velocity & temperature probe with coiled cable

UHH-C1, Soft carrying case



Soft Carrying Case  
Included with Every Unit



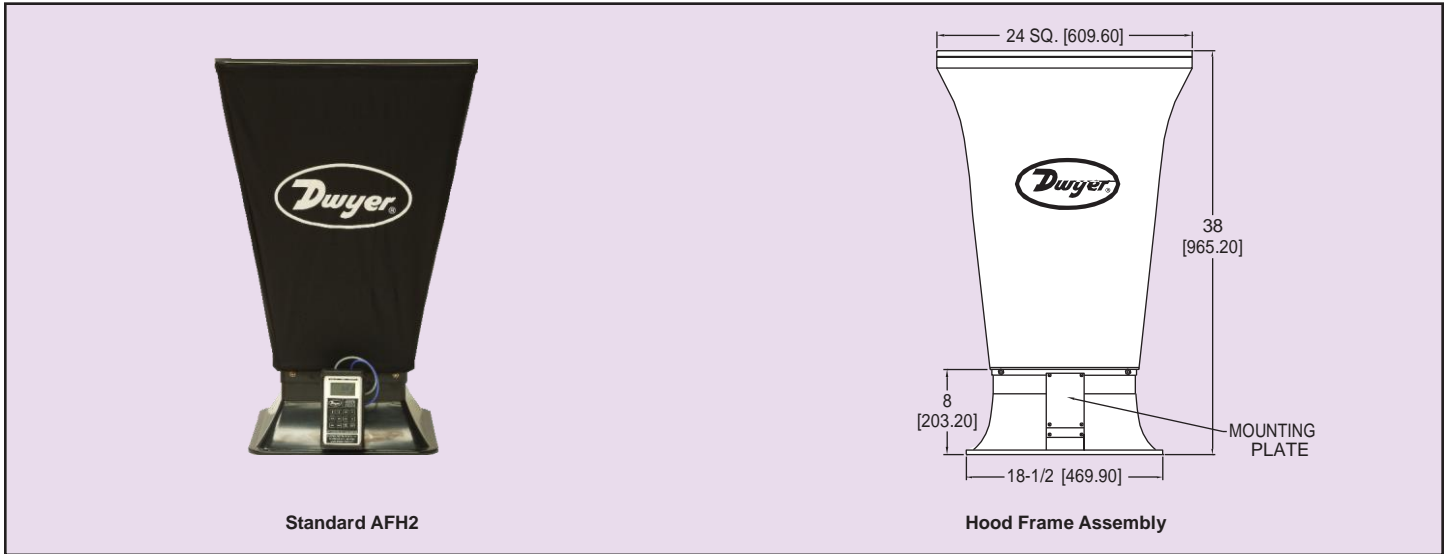




Model  
AFH2

# Air Flow Hood

Measures Volumetric Flow Rate with Highly Accurate Digital Manometer



Standard AFH2

Hood Frame Assembly

The Model AFH2 Air Flow Hood is designed to measure volumetric air flow from diffusers, grilles and registers. The AFH2 Air Flow Hood maintains a running average of measurements in the desired units, and provides the ability to manually record measurements with the manometer over a given time period. The highly accurate digital manometer has an auto-zero feature and will auto-zero at user-defined intervals. The digital manometer easily mounts to the flow hood with its magnet back-plate. Break down is very quick and easy as tools are not required. In addition to these features, the unit will alert you when its battery is running low in order to avoid recording inaccurate measurements. This lightweight flow hood is durable and easily stores into an included travel case. New low flow adapter kit allows easy conversion of any AFH2 into a low flow hood. All kits fit easily into the AFH2's travel case. The AFH2 comes with a calibration certificate for both hood and manometer.

## SPECIFICATIONS

**Service:** Air.

**Volume Flow Rate Units:** CFM, l/s, m<sup>3</sup>/hr.

### Volume Flow Ranges:

Supply: CFM: 41 to 1176; l/s: 19 to 555; m<sup>3</sup>/hr: 69 to 2000;  
Exhaust: CFM: 45 to 1176; l/s: 21 to 555; m<sup>3</sup>/hr: 76 to 2000.

### Volume Flow Ranges with Low Flow Kit:

Supply: CFM: 25 to 1176; l/s: 12 to 555; m<sup>3</sup>/hr: 43 to 2000;  
Exhaust: CFM: 29 to 1176; l/s: 14 to 555; m<sup>3</sup>/hr: 49 to 2000.

### Accuracy @ 20°C (68°F):

Supply: ±3% of reading ±9 CFM (±4 l/s, 14 m<sup>3</sup>/hr);  
Exhaust: ±3% of reading ±9 CFM (±4 l/s, 14 m<sup>3</sup>/hr).

**Span Stability v. Temperature:** Better than 0.1% of range in use per 2°F (1°C).

**Zero System Accuracy:** ±1 count (±0.05 Pascal typical; ±0.0002 in w.c.).

### Temperature Limits:

Operating: 32 to 122°F (0 to 50°C);  
Storage: 23 to 122°F (-5 to 50°C).

**Thermal Effect:** ±0.1% of range in use per 2°F (1°C).

**Zero Drift:** Negligible due to auto zero system. When auto zero set at 30 second intervals (2 minute warm up).

**Orientation Effect:** Any 45 degree change 0.0004 in w.c. (0.1 pascal) typical.

**System Air Leak:** 0.366 in<sup>3</sup>/hr (0.1 ml/min) @ 20 in w.c. (5 kPa) typical.

**Maximum Differential Pressure:** 60 in w.c. (15 kPa).

**Auto Ranging Display:** 0.375" high digits.

**Resolution:** 1 CFM, 1 l/s, 1 m<sup>3</sup>/hr.

**Output:** RS-232 serial interface (baud rate 9600).

**Memory Capability:** 2500 readings in any engineering unit.

**Power Requirements:** 8.4 V NiMH battery, installed functional, user replaceable (optional 9 V alkaline battery may be used in place of rechargeable).

**Dimensions:** 30" x 24" x 24" (965 x 610 x 610 mm). Hood only: 2' x 2' (600 mm x 600 mm).

**Weight:** 8.8 lb (4 kg).

**Agency Approval:** CE.

Model AFH2, Air Flow Hood with 2' x 2' hood

## ACCESSORIES

**A-174,** Low Flow Hood Adapter Kit

**A-175,** Hood Adapter Kit

(Required for use with below alternative hoods)

**A-176,** 1' x 4' canvas hood

**A-177,** 2' x 4' canvas hood

**A-178,** 1' x 5' canvas hood

**A-179,** 3' x 3' canvas hood

**A-190,** Software and cable



AFH2 with A-174 Low Flow Adapter



AFH2 Travel Case







# Mobile Meter™ Test Instrument App

Works With Most Android® Phones/Tablets; Wireless Probes


TEST EQUIPMENT

HVAC Balancing Instruments


Touch to access parameters

Touch to toggle between meter and gauge view

Connection status



Scan here to watch product video



The Mobile Meter™ Test Instrument Mobile App converts Android® based phones and tablets into a multi-function test instrument. The app is available for download in the Google® app market or by scanning the QR code below. Wireless probes connect to the phone or tablet using our mobile gateway, Model UHH-BTG, that utilizes wireless technology from Bluetooth SIG Inc. Parameters from multiple probes can be displayed simultaneously, or a single probe's parameters can be displayed as a meter or analog gauge. Measurements from a single probe can be saved to log files for future use. Log files can be viewed directly on the phone or emailed to another device or computer. The Mobile Meter™ Mobile App does the conversions for engineering units and calculations for flow or air velocity conversions.

### SPECIFICATIONS

- Operating Systems:** Android® firmware version 3.X or later.
- Wireless Protocol:** Conforms to Bluetooth SIG, Inc. low energy wireless technology.
- Wireless Distance:** 50' (15 m) or greater.
- Response Time:** 1 s.

Scan here to download for FREE from the Google® Play Store  
<http://www.dwyer-inst.com/m/mobilemeterapp>


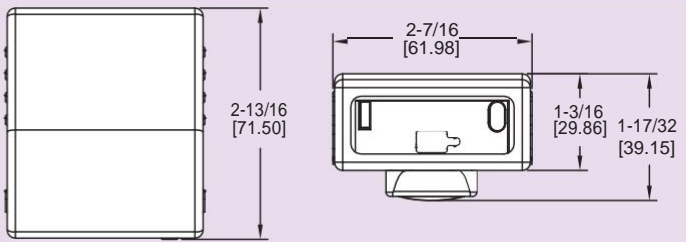



## Wireless Mobile Gateway



Model UHH-BTG

Converts UHH Probe Wireless Signals to Bluetooth SIG, Inc. Wireless Technology

Scan here to watch product video

The Model UHH-BTG Wireless Mobile Gateway transforms the wireless signal from any Dwyer Instruments, Inc. universal handheld probe or module into a Bluetooth SIG, Inc. Wireless Technology. Using this gateway, any iOS® Firmware version 5.X or later or Android® Firmware version 3.X or later smartphone or tablet can become the base instrument for measuring or logging. Once the gateway is paired with a phone or tablet, our Mobile Meter™ app or any other Dwyer Instruments, Inc. approved apps can detect available probes or modules. Wireless gateways can detect probes or modules that are 50 feet away or even greater distances depending on the environment. The wireless signal from the gateway to the mobile device adds at least another 25 feet of sensing distance. Model UHH-BTG is compact in size and clips on to most standard belts. The rechargeable battery can be charged using the same mini-USB cable and charger as the probes or modules. LED lights indicate the battery status and whether the gateway is communicating properly.

### SPECIFICATIONS

- Wireless Protocol:** Conforms to Bluetooth SIG, Inc. low energy wireless technology.
- Wireless Distances:** 50' (15 m) or greater.
- Response Time:** 1 s.
- Temperature Limits:**
  - Ambient: 5 to 125°F (-15 to 51°C);
  - Battery Charging: 32 to 113°F (0 to 45°C).
- Power Requirements:** 3.7 V YT562447 lithium ion battery, installed functional, user replaceable.
- Weight:** 2.5 oz (70.87 g).
- Agency Approvals:** CE with CE approved charger, RoHS, FCC.

Model UHH-BTG, Wireless Mobile Gateway  
 UHH-ICHRG, Dual USB Charger (Not Included)

Converts these wireless probes for use with our Mobile Meter™ app.

Model	Description
AP2	Wireless Thermo-Hygrometer Probe
RP2	Wireless Thermo-Anemometer Probe
VP2	Wireless 100 mm Vane Thermo-Anemometer Probe
WDPM-002	Wireless Differential Pressure Probe ±2 in w.c.
WDPM-005	Wireless Differential Pressure Probe ±5 in w.c.
WDPM-010	Wireless Differential Pressure Probe ±10 in w.c.
WDPM-020	Wireless Differential Pressure Probe ±20 in w.c.
WDPM-030	Wireless Differential Pressure Probe ±30 in w.c.
WDPM-100	Wireless Differential Pressure Probe ±100 in w.c.
WDPM-200	Wireless Differential Pressure Probe ±200 in w.c.
WDPM-350	Wireless Differential Pressure Probe ±350 in w.c.

Note: See Wireless Probe catalog page for full specifications. 2



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2 Wireless Probes: See page 427 (Models RP2, AP2 & VP2)





Series  
AQTI

# Air Quality Test Instrument Kits

AQTI Combines the UHH Universal Handheld with Compatible Probes



Scan here to watch product video



**AQTI-AP1/AP2: UHH + Thermo-Anemometer Probe**

**AQTI-VP1/VP2: UHH + 100 mm Vane Thermo-Anemometer Probe**

**AQTI-RP1/RP2: UHH + Thermo-Hygrometer Probe**

**WDPM: Wireless Differential Pressure Module**

The Series AQTI Air Quality Test Instruments combine the versatile Model UHH handheld base with various compatible probes and modules. This versatile combination provides a line of instruments capable of streamlining a technician's everyday testing by combining all into one product. All compatible probes and modules can be field adapted at any moment and are instantly recognized by any UHH handheld base instrument. The plug and play probes allow a user to run through various tests, eliminating the need to switch instruments and recall how to navigate all the various equipment from multiple vendors, reducing time and simplifying operation. Series AQTI Air Quality Test Instruments come prepackaged in differential pressure, thermo-anemometer, or thermo-hygrometer probe kits. Additional wired and wireless probes may be ordered separately to create any customized test package to suit your needs.

Model	Parameters	Range	Engineering Units Available	Connection
AQTI-WDPM-002	Pressure	±2 in wc; ± Pa	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-WDPM-005	Pressure	0 to 5 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-WDPM-010	Pressure	0 to 10 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-WDPM-020	Pressure	0 to 20 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-WDPM-030	Pressure	0 to 30 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-WDPM-100	Pressure	0 to 100 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-WDPM-200	Pressure	0 to 200 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-WDPM-350	Pressure	0 to 350 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTI-AP1	Velocity/ Temperature	0 to 6000 FPM; -20 to 212°F	Velocity: fpm, mph, knots, m/s, m/h, k/h, fps; Temperature: F, C	Wired
AQTI-RP1	Humidity/ Temperature	0 to 100% RH; -20 to 140°F	Humidity: %RH; D.P. / W.B.: F, C; Humidity: %RH; D.P./W.B.: F, C	Wired
AQTI-VP1	Velocity/Humidity/ Temperature	40 to 5000 FPM; 0 to 100% RH; -4 to 140°F	Velocity: fpm, mph, knots, m/s, m/h, k/h, fps; Temperature: F, C	Wired

AQTI Series supplied with: UHH, sensing probe with coiled cable, soft carrying case (UHH-C1), hand strap (UHH-STRAP), dual USB charger with international power adapters (UHH-ICHRG), charger cable (UHH-CBL).

Model	Parameters	Range	Engineering Units Available	Connection
AQTIP-WDPM-002	Pressure	0 to 2 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-WDPM-005	Pressure	0 to 5 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-WDPM-010	Pressure	0 to 10 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-WDPM-020	Pressure	0 to 20 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-WDPM-030	Pressure	0 to 30 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-WDPM-100	Pressure	0 to 100 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-WDPM-200	Pressure	0 to 200 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-WDPM-350	Pressure	0 to 350 in w.c.	in w.c., ft w.c., in Hg, psi, oz/in <sup>2</sup> ; mm w.c., cm w.c., mBar, Pa, hPa, kPa	Wireless
AQTIP-AP2	Velocity/ Temperature	0 to 6000 FPM; -20 to 212°F	Velocity: fpm, mph, knots, m/s, m/h, k/h, fps; Temperature: F, C	Wireless
AQTIP-RP2	Humidity/ Temperature	0 to 100% RH; -20 to 140°F	Humidity: %RH; D.P. / W.B.: F, C; Humidity: %RH; D.P./W.B.: F, C	Wireless
AQTIP-VP2	Velocity/Humidity/ Temperature	40 to 5000 FPM; 0 to 100% RH; -4 to 140°F	Velocity: fpm, mph, knots, m/s, m/h, k/h, fps; Temperature: F, C	Wireless

AQTIP Series supplied with: UHH, wireless sensing probe, soft carrying case (UHH-C1), hand strap (UHH-STRAP), dual USB charger with international power adapters (UHH-ICHRG), charger cable (UHH-CBL), 2 GB SD card (UHH-SD), heavy duty hard case with pre-cut foam inserts for additional sensors (UHH-C2), NIST Calibration Certificate.

Additional probes, modules & accessories: See pages 426-428

TEST EQUIPMENT

HVAC Balancing Instruments



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Model  
UHH

# Universal Handheld Test Instrument

Versatile Base Can Combine with Multiple Probes and Modules

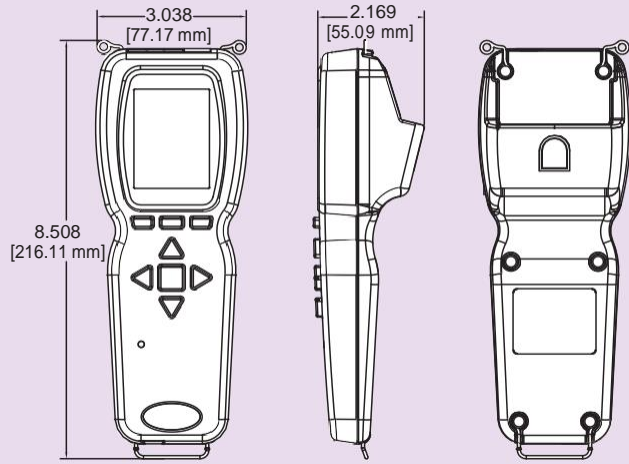


TEST EQUIPMENT

HVAC Balancing Instruments



Scan here to watch product video



The Model UHH Universal Handheld Test Instrument is a highly versatile instrument that offers the utmost flexibility and ease of user operation by having the capacity to work with a variety of Dwyer Instruments, Inc. compatible sensing modules and probes. Additional wired and wireless probes or modules are instantly recognized by the UHH without any user reprogramming or alteration, allowing seamless sensor addition, upgrade or replacement. <sup>2</sup> The Universal Handheld offers a slew of features that enable a technician to quickly set up and intuitively navigate through their daily activities. Data is stored via the internal memory or separate SD card in various auto or manual logging operations. Logged files can be quickly transferred to a device through a USB cable or by a portable SD card. The display can operate in standard numerical meter mode, gage mode with analog needle, gage mode with additional pass/fail operation zones, and strip chart mode which enables a simplified visual tracking of the process. The four directional buttons, combined with the three soft key buttons aligning to corresponding screen functions, allow for quick navigation through the four main operation menus. The rugged plastic case with protective thermo-plastic over-mold, along with the dust-shielding rubber caps, permit the unit to handle abuse and properly withstand dusty environments. The base UHH includes an integral molded compartment that securely holds wireless modules. The storage compartment offers convenient transportation of a module with the base instrument during testing. A flexible hand strap included with every UHH provides means for the base handheld to be safely connected to a belt, pipe, ladder or similar structure freeing the user's hands to focus on the sampling test. A 6-pin connector enables one wired probe at a time to be plugged in to the base instrument without worry of becoming disconnected during sampling. The rechargeable battery via the included USB cable provides long term operation to last through several days work. At just under 10 oz, the compact UHH base is lightweight. Included with the UHH is a soft carrying case which secures the provided accessories and added test probe.

## UHH INCLUDED ACCESSORIES

- UHH-STRAP: Hand strap.
- UHH-ICHRG: Dual USB wall or auto charger with international adapters.
- UHH-CBL: 3.2 ft (1 m) USB cable.
- UHH-C1: Soft carrying case.



UHH-C1  
Soft Carrying Case

UHH-ICHRG  
Dual USB Charger

UHH-STRAP  
Hand Strap

## SPECIFICATIONS

**Languages:** English, German, Italian, Portuguese, Spanish.

**Display:** OLED, color 240 x 320.

**Temperature Limits:** 5 to 125°F (-15 to 51°C);

**Note:** When using wireless function: 20 to 125°F (-6 to 51°C).

**Battery Charging Limits:** 32 to 113°F (0 to 45°C).

**Resolution:** 1 FPM, 0.1 MPS, 0.1 CFM & M<sup>3</sup>/HR; 0.1°F & °C; RH 0.1%.

**Units Air Velocity:** FPM, MPH, KN, M/H, M/S K/H, FPS.

**Units Flow:** CFM, M<sup>3</sup>/HR, M<sup>3</sup>/S, GPM, GPH, GPD, LPS, LPM, LPH.

**Units Temperature:** °F, °C.

**Housing:** Thermoplastic elastomer over polycarbonate.

**Power Requirements:** 3 V BR1225 lithium metal battery, installed functional, non-replaceable and 3.7 V lithium ion battery, installed functional, non-replaceable.

**(Note:** Intended to be operated with power cables less than 3 m in length).

**Maximum Wireless Distance:** 50' (15 m).

**Weight:** 10 oz (283 g).

**Agency Approval:** CE (not while charging), FCC compliant.

## UHH FEATURES

- UHH base quickly recognizes various wired or wireless probes and modules - eliminates need to have many test instruments on hand, reducing time to complete job.
- Easy navigation through 4 menus via directional arrow buttons and 3 soft keys.
- Large color display can operate in 4 process reading modes. <sup>2</sup>
- Inherent rubber overmold housing combed with protective caps enable units to withstand abuse in dusty environments.
- Integral strap clips allow units to be secured during testing with included hand strap to a belt, pipe, ladder, etc. providing hands free operation.
- LED status light transmits visual feedback when unit's long lasting lithium battery is being charged by the USB connection. Also indicates when a data point is stored.
- Manual or automatic data logging modes include several adjustable parameters that enable the user to obtain readings in a multitude of potential test scenarios.
- Internal memory or expanded memory with portable SD card provides ample data logging capacity. Data is transferable via the USB connection or by removing the SD card and inserting into compatible SD card device.
- Flexible ordering allows customization to fulfill personal needs by ordering UHH and additional probes a-la-carte or by pre-set test kits. <sup>3</sup>

<sup>2</sup> Available sensors: See pages 426-428

<sup>2</sup> Views of each mode: See page 425 (Series UHH)

<sup>3</sup> Pre-set test kits: See page 423 (Series AQT1)



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TETISAN TESİSAT TİCARET VE SANAYİİ A.Ş.

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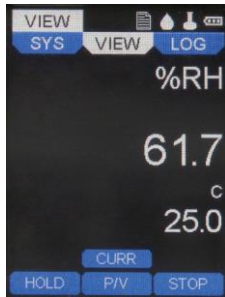
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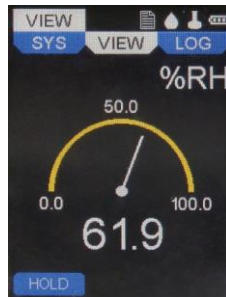
**User Selectable Display Operation**

**Meter Mode**



Standard numerical values. Peak/Valley, Average and (depending on sensor) Total values easily selectable with soft key.

**Gage Mode**



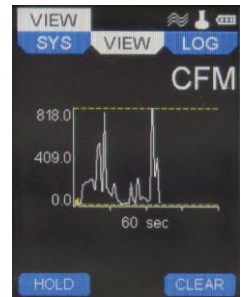
Analog Gage displays the pointers reading location on the full-scale dial plus the actual numerical value.

**Range Mode**



Similar to Gage mode with additional programmable green band for quick visual of test pass or fail status.

**Strip Chart Mode**



Strip chart shows the process over selectable period of time. The charts y-axis also can be adjusted.

Model	Description
UHH	Base model with hand strap, charger/cable in soft carrying case
AP1	Thermo anemometer air velocity & temperature probe with coiled cable
RP1	Thermo hygrometer humidity & temperature probe with coiled cable
AP2	Wireless thermo-anemometer air velocity & temperature probe
RP2	Wireless thermo-hygrometer humidity & temperature probe
VP1	100 mm vane thermo-anemometer air velocity, temperature and humidity probe with coiled cable
VP2	Wireless 100 mm vane thermo-anemometer air velocity, temperature and humidity probe

Note: For available sensors, see page reference 2 below.

**ACCESSORIES**

- UHH-STRAP, UHH hand strap
- UHH-ICHRG, UHH dual USB charger with international adapters (1.0 A) (Not CE approved)
- UHH-CBL, USB cable
- UHH-C1, Soft carrying case
- UHH-SD, 2 GB SD card
- KF-CC-304, Dual USB CHARGER with North American adapter (1.5 A)
- UHH-C2, Heavy duty hard case with pre-cut foam inserts for additional sensors

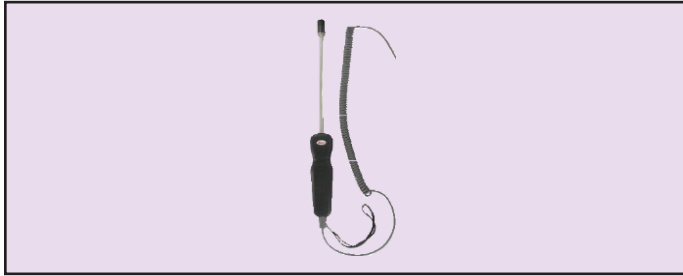




Model  
RP1

# Thermo-Hygrometer Probe

Wired, Measures Humidity, Temperature, Dew Point, & Wet Bulb Temperatures



Model RP1, Wired Thermo-Hygrometer Probe for the Model UHH

## SPECIFICATIONS

**Service:** Clean air.

### Temperature Limits:

Process: -40 to 176°F (-40 to 100°C);

Ambient: 5 to 125°F (-15 to 51°C).

### Range:

RH: 0 to 100% (non-condensing);

Temperature: -20 to 140°F (-29 to 60°C).

### Accuracy:

RH: ±2% @ 25°C (10 to 90% RH); ±4% (0 to 10, 90 to 100% RH);

Temperature: ±0.54 @ 77°F (±0.3 @ 25°C).

### Response Time:

1.5 s.

**Probe Length:** 8" (203 mm) insertion.

**Weight:** 12.8 oz (362 g).

**Agency Approvals:** CE, RoHS.

TEST EQUIPMENT

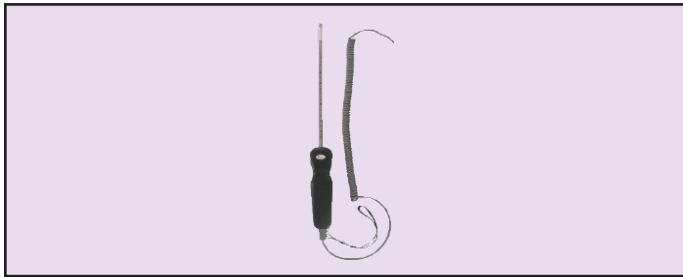
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Model  
AP1

# Thermo-Anemometer Probe

Wired, Measures Velocity, Flow, & Temperature



Model AP1, Wired Thermo-Anemometer Probe for the Model UHH

## SPECIFICATIONS

**Service:** Dry, clean air.

### Temperature Limits:

Process: -20 to 212°F (-29 to 100°C);

Ambient: 5 to 125°F (-15 to 51°C).

### Range:

Air Velocity: 0 to 6000 FPM (0 to 30 m/s);

Volumetric Air: 999,999 in selected flow units;

Temperature: -20 to 212°F (-29 to 100°C).

### Accuracy:

Air Velocity: ±3% FS within temperature range of 40 to 90°F (4 to 32°C);

Temperature: ±0.5°F (±0.28°C).

### Response Time:

1 s.

**Probe Length:** 8" (203 mm) insertion.

**Weight:** 12.8 oz (362 g).

**Agency Approvals:** CE, RoHS.



Model  
VP1

# 100 mm Vane Thermo-Anemometer Probe

Wired, Measures Velocity, Flow, Humidity, & Temperature



Model VP1, Wired 100 mm Vane Thermo-Anemometer Probe for the Model UHH

## SPECIFICATIONS

**Service:** Dry, clean air.

### Temperature Limits:

Process: -20 to 212°F (-29 to 100°C);

Ambient: 5 to 125°F (-15 to 51°C).

### Range:

Air Velocity: 0 to 6000 FPM (0 to 30 m/s);

Volumetric Air: 999,999 in selected flow units;

Temperature: -20 to 212°F (-29 to 100°C).

### Accuracy:

Air Velocity: ±3% FS within temperature range of 40 to 90°F (4 to 32°C);

Temperature: ±0.5°F (±0.28°C).

### Response Time:

1 s.

**Probe Length:** 8" (203 mm) insertion.

**Weight:** 15.2 oz (431 g).

**Agency Approvals:** CE, RoHS.



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Model  
RP2

# Thermo-Hygrometer Probe

Wireless, Measures Humidity, Temperature, Dew Point, & Wet Bulb Temperatures



Model RP2, Wireless Thermo-Hygrometer Probe for use with the Model UHH handheld meter and the Mobile Meter™ test instrument mobile app

## SPECIFICATIONS

**Service:** Clean air.

**Temperature Limits:**

Process: -4 to 140°F (-20 to 60°C);  
Ambient: 5 to 125°F (-15 to 51°C);  
Battery Charging: 32 to 113°F (0 to 45°C).

**Range:**

RH: 0 to 100% (non-condensing);  
Temperature: -22 to 140°F (-30 to 60°C).

**Accuracy:**

RH: ±2% @ 25°C (10 to 90% RH);  
±4% (0 to 10, 90 to 100% RH);  
Temperature: ±0.54°F @ 77°F  
(±0.3°C @ 25°C).

**Response Time:** 1.5 s.

**Probe Length:** 8" (203 mm) insertion.

**Power Requirements:** 3.7 V

YT562447 Lithium ion battery, installed functional, user replaceable. (**Note:** Intended to be operated with power cables less than 3 m in length). (Wireless Only).

**Maximum Wireless Distance:** 50' (15 m).

**Handle Enclosure:** Thermoplastic elastomer over polycarbonate.

**Supplied With:** Wrist strap.

**Weight:** 11.2 oz (331.22 g).

**Agency Approvals:** CE (not while charging), RoHS, FCC compliant.

TEST EQUIPMENT

HVAC Balancing Instruments



Model  
AP2

# Thermo-Anemometer Probe

Wireless, Measures Velocity, Flow, & Temperature



Model AP2, Wireless Thermo-Anemometer Probe for use with the Model UHH handheld meter and the Mobile Meter™ test instrument mobile app

## SPECIFICATIONS

**Service:** Dry, clean air.

**Temperature Limits:**

Process: -20 to 212°F (-29 to 100°C);  
Ambient: 5 to 125°F (-15 to 51°C).

**Range:**

Air Velocity: 0 to 6000 FPM  
(0 to 30 m/s);  
Volumetric Air: 999,999 in selected flow units;  
Temperature: -20 to 212°F  
(-29 to 100°C).

**Accuracy:**

Air Velocity: ±3% FS within temperature range of 40 to 90°F (4 to 32°C);  
Temperature: ±0.5°F (±0.28°C).

**Response Time:** 1 s.

**Probe Length:** 8" (203 mm) insertion.

**Battery Charging Limits:** 32 to 113°F (0 to 45°C). (Wireless Only).

**Power Requirements:** 3.7 V

YT562447 Lithium ion battery, installed functional, user replaceable. (**Note:** Intended to be operated with power cables less than 3 m in length). (Wireless Only).

**Maximum Wireless Distance:** 50' (15 m). (Wireless Only).

**Handle Enclosure:** Thermoplastic elastomer over polycarbonate.

**Supplied With:** Wrist strap.

**Weight:** 11.2 oz (317 g).

**Agency Approvals:** CE (not while charging), RoHS, FCC compliant.



Model  
VP2

# 100 mm Vane Thermo-Anemometer Probe

Wireless, Measures Velocity, Flow, Humidity, & Temperature



Model VP2, Wireless 100 mm Vane Thermo-Anemometer Probe for use with the Model UHH handheld meter and the Mobile Meter™ test instrument mobile app

## SPECIFICATIONS

**Service:** Dry, clean air.

**Temperature Limits:**

Process: -20 to 212°F (-29 to 100°C);  
Ambient: 5 to 125°F (-15 to 51°C).

**Range:**

Air Velocity: 0 to 6000 FPM  
(0 to 30 m/s);  
Volumetric Air: 999,999 in selected flow units;  
Temperature: -20 to 212°F  
(-29 to 100°C).

**Accuracy:**

Air Velocity: ±3% FS within temperature range of 40 to 90°F (4 to 32°C);  
Temperature: ±0.5°F (±0.28°C).

**Response Time:** 1 s.



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**Probe Length:** 8" (203 mm) insertion. **Battery Charging Limits:** 32 to 113°F (0 to 45°C). (Wireless Only).

**Power Requirements:** 3.7 V YT562447 Lithium ion battery, installed functional, user replaceable. (**Note:** Intended to be operated with power cables less than 3 m in length). (Wireless Only).

**Maximum Wireless Distance:** 50' (15 m). (Wireless Only).

**Handle Enclosure:** Thermoplasticelastomer over polycarbonate.

**Supplied With:** Wrist strap.

**Weight:** 13.6 oz (385 g).

**Agency Approvals:** CE (not whilecharging), RoHS, FCC compliant.



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Series  
WDPM

# Differential Pressure Modules

Wireless, Measures Differential Pressure, Air Velocity, & Flow



TEST EQUIPMENT



Wireless differential pressure modules for use with the Model UHH handheld meter and the Mobile Meter™ test instrument mobile app.

Model	Range	Maximum Pressure
WDPM-002	±2 in w.c.	10 psi
WDPM-005	±5 in w.c.	10 psi
WDPM-010	±10 in w.c.	10 psi
WDPM-020	±20 in w.c.	20 psi
WDPM-030	±30 in w.c.	20 psi
WDPM-100	±100 in w.c.	15 psi
WDPM-200	±200 in w.c.	45 psi
WDPM-350	±350 in w.c.	45 psi

## SPECIFICATIONS

**Service:** Non-corrosive dry gases.

**Wetted Materials:** Consult factory.

**Accuracy:** ±0.5% FS span @ 25°C (includes non linearity, hysteresis, and non repeatability).

**Pressure Limits:** See Table 1.

### Engineering Units:

Pressure: in w.c., ft w.c., in Hg, psi, OzSI, mm w.c., cm w.c., mBar, Pa, hPa, and kPa;

Velocity: fpm, mph, kn, m/s, m/h, k/h, and fps;

Flow: cfm, gpm, gph, gpd, m3/s, m3/h, lps, lpm, and lph.

### Temperature Limits:

Compensated: 32 to 140°F (0 to 60°C);

Process/Ambient: 14 to 140°F (-10 to 60°C).

**Thermal Effects:** ±0.01% FS/°F (±0.02% FS/°C).

**Battery Charging Limits:** 32 to 113°F (0 to 45°C).

**Power Requirements:** 3.7 V YT562447 lithium ion battery, installed functionally, user replaceable.

**Wireless Distance:** At least 50' (15 m).

**Connections:** Two barbed connections for use with 1/8" (3.18 mm) or 3/16" (4.76 mm) ID tubing.

**Weight:** 2.5 oz (70.87 g).

**Agency Approvals:** CE with CE approved charger, RoHS, FCC.

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Series  
UHH-ACC

# Universal Handheld Accessories



## ACCESSORIES

**UHH-STRAP,** UHH hand strap

**UHH-ICHRG,** UHH dual USB charger with international adapters (1.0 A) (Not CE approved)

**UHH-CBL,** USB cable

**UHH-C1,** Soft carrying case

**UHH-SD,** 2 GB SD card

**KF-CC-304,** Dual USB CHARGER with North American adapter (1.5 A)

**UHH-C2,** Heavy duty hard case with pre-cut foam inserts for additional sensors



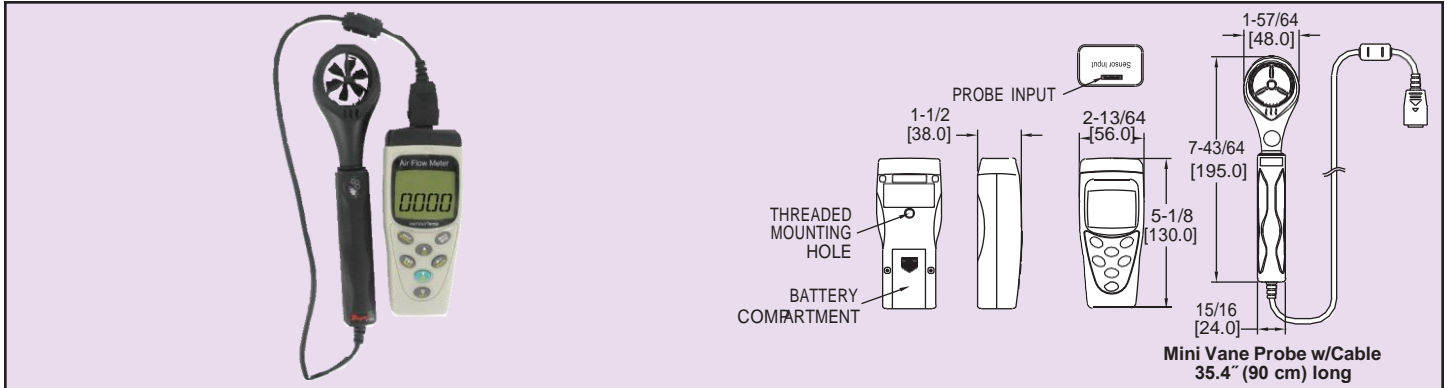
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Series  
MVA

# Mini-Vane Thermo-Anemometer

Capable of Measuring Air Volume, Air Velocity, Temperature, Humidity and Barometric Pressure



The Series MVA Mini-Vane Thermo-Anemometer has the ability, depending on the model, to measure air velocity, volume flow, temperature, relative humidity, and barometric pressure. With its 1.18" diameter (30 mm) vane, the Series MVA is ideal for spot measurements at air outlets. The MVA-02 is capable of detecting air flows up to 4921 ft/min (25 m/s) and temperatures up to 140°F (60°C). The MVA-03 additionally detects humidity from 0 to 100% with high accuracy. The MVA-04 can do all three of the above functions, plus adds the feature of measuring absolute pressure from 10.3 to 32" Hg (350 to 1100 hPa). The Series MVA anemometers include a wide variety of user selectable units. These units feature a 4-digit LCD display, data hold, ability to record maximum and minimum, storage up to 99 air velocity records, and an auto-shutoff to prolong life. The Series MVA also has a detachable probe for convenient replacing, if necessary. The unit includes a 6 blade mini-vane probe, nylon case, and a battery.

- Model MVA-02, Mini Vane Anemometer
- Model MVA-03, Mini Vane Anemometer with Humidity Sensor
- Model MVA-04, Mini Vane Anemometer with Humidity and Barometric Sensors

#### ACCESSORIES

- A-553, Spare attachable vane for MVA-02
- A-554, Spare attachable vane for MVA-03 & -04

#### SPECIFICATIONS

##### RANGES

**Air Velocity:** 79 to 4921 fpm, 0.4 to 25 m/s; 1.5 to 90 km/hr; 0.9 to 55 mph; 0.2 to 48 knots; 1 to 10 Beaufort.  
**Air Volume:** 0 to 9999 CFM & CMM.  
**Temperature:** -4 to 140°F (-20 to 60°C).  
**Humidity:** 0 to 100%.  
**Barometric Pressure:** 10.3 to 32 in Hg; 350 to 1100 hPa; 263 to 825 mm Hg.

##### ACCURACY

**Air Velocity:** ±2% FS (+0.2% of reading m/s; +0.8% of reading km/hr; +0.4% of reading mph and knots; +40% of reading fpm).  
**Relative Humidity:** 20 to 80%: 3.5%; 20 to 20% and 80 to 100%: 5%.  
**Temperature:** ±1.8°F; ±1°C.  
**Barometric Pressure:** ±0.1 in Hg; ±3 hPa; ±1.5 mm Hg.

##### RESOLUTION

**Air Velocity:** 0.1 (1 for ft/min and Beaufort).  
**Air Volume:** 1.  
**Temperature:** 0.1°C.  
**Humidity:** 0.1%.  
**Barometric Pressure:** 0.1.

##### RESPONSE TIME

**Air Velocity:** 2 seconds.  
**Air Volume:** 2 seconds.  
**Temperature:** 1 second.  
**Humidity:** 5 minutes to stabilize.  
**Barometric Pressure:** 1 minute.

**LCD Size:** 1.65" x 1.30" (42 x 33 mm).  
**Power Requirements:** 9 V alkaline battery, included, user replaceable.  
**Battery Life:** 50 hours continuous use.  
**Vane Diameter:** 1.18" (30 mm).  
**Cable Length:** 35.4" (90 cm).  
**Weight:** 9.2 oz (260 g).  
**Agency Approvals:** CE.

TEST EQUIPMENT

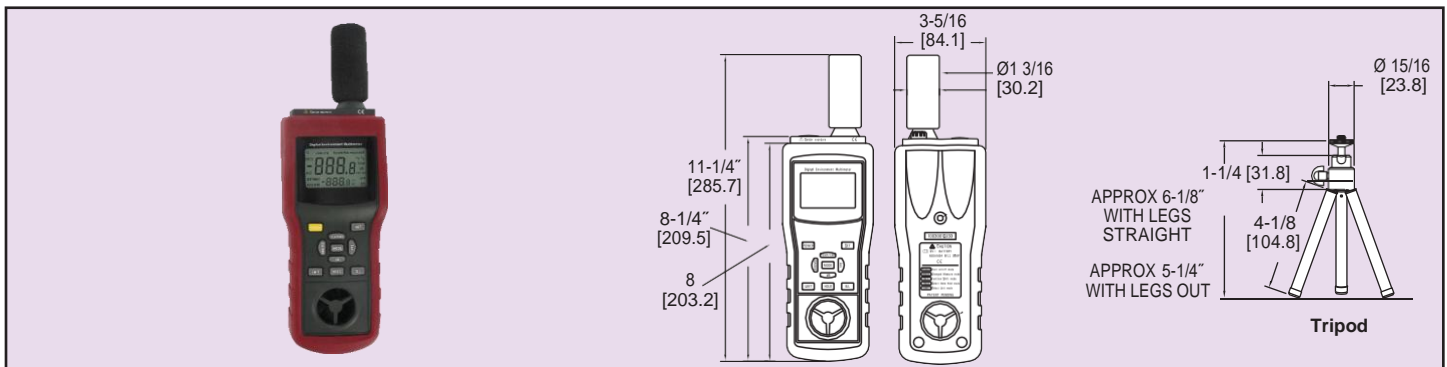
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Model  
EMMA

# Digital Multifunction Environmental Meter

Monitor Humidity, Temperature, Air Velocity and More



Monitoring the environmental conditions is more convenient with the Model EMMA multifunction meter. Humidity, temperature, air velocity, air flow, sound and light measurements are combined in one easy to use instrument. The large, dual-line 4-digit LCD display shows both the current and average reading. For reading measurements in dimly lit areas, the display has a built-in back light. Besides measuring the current and average reading, the Model EMMA allows the user to read the minimum, maximum and differential measurement for each of the parameters. Included with the meter is the carrying case, rubber boot, battery and tri-pod.

Model EMMA, Multifunction Environmental Meter

#### SPECIFICATIONS

##### Range:

**Temperature:** 14 to 140°F (-10 to 60°C);  
**Relative humidity:** 0 to 100% RH;  
**Sound level:** 30 to 130 dB(A), 35 to 130 dB(C);  
**Illumination:** 0 to 50,000 lux;  
**Wind speed:** 96 to 5913 fpm;  
**Air flow:** 0 to 999,900 cfm (0.5 to 30 m/s).

##### Accuracy:

**Temperature:** ±2.7°F (1.5°C);  
**Relative humidity:** ±3% RH (20 to 80% @ 25°C);

**Sound level:** ±1.5 dB; **Illumination:** ±5% of reading + 10; **Wind speed:** ±3% of reading + 10; **Air flow:** ±3% of reading + 10.



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**Display:** Dual line, 4-1/2 digit LCDdisplay.  
**Temperature Limits:** 14 to 140°F (-10 to 60°C).  
**Resolution:** Temperature: 0.1°F/°C; Relative humidity: 0.1%;  
Sound level: 0.1 dB;  
Illumination: 1 up to 2,000 lux; 10 up  
to 20,000 lux; 100 up to 50,000 lux.**Power Requirements:** 9 V alkaline  
battery, included, user replaceable. **Response Time:** 500 msec.  
**Weight:** 15.5 oz (430 g).  
**Agency Approvals:** CE.



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Model  
485B

# Thermo-Hygrometer

Measures % RH, Temperature, Dew Point and Wet Bulb



**Model 485B Digital Thermo-Hygrometer** is a versatile, compact, hand-held instrument for measuring percentage of relative humidity and temperature in °F or °C. Dew point and wet bulb temperature is derived from relative humidity and temperature measurements and displayed on the LCD. Hold key freezes the current temperature and relative humidity readings for situations where readings fluctuate. Store up to 99 readings with the non-volatile memory function – ideal for technicians needing to take multiple readings for later analysis.

**Model 485B-1**, Digital Thermo-Hygrometer includes 9V battery, sensing probe, wrist strap, soft carrying case and instructions

#### SPECIFICATIONS

**Service:** Humidity, temperature, wet bulb and dew point temperature detection in clean air.

#### Temperature Limits:

Process: -40 to 176°F (-40 to 80°C);  
Ambient: 5 to 125°F (-15 to 51°C).

**Range Relative Humidity:** 0 to 100% (non-condensing).

**Accuracy Relative Humidity:** ±2% FS over 10 to 90% @ 77°F (25°C).

**Range Temperature:** -20 to 140°F (-28 to 60°C).

**Accuracy Temperature:** ±0.54°F @ 72°F (±0.3°C @ 25°C).

**Display:** 4.5 digit LCD.

**Resolution:** 0.1%, 0.1 °F/°C.

**Probe Length:** 8" (203 mm) insertion.

**Power Requirements:** 9 V alkaline battery, included, user replaceable.

**Weight:** 16 oz (454 g).

**Agency Approvals:** CE.

#### ADDITIONAL PARTS

**RP1**, Thermo-hygrometer % RH and temperature probe with coiled cable

**UHH-C1**, Soft carrying case

TEST EQUIPMENT

Thermo-Hygrometers



Model  
THI-10

# Digital Thermo-Hygrometer

Large Memory, Dew Point and Wet Bulb Temperature Functions



The **Model THI-10 Digital Thermohygrometer** accurately measures relative humidity and ambient temperature. Up to 99 readings can be stored in non-volatile memory allowing the HVAC technician to record the data after returning to the office. This compact thermohygrometer also features user selectable engineering units, max/min functions, dew point and wet bulb temperature measurements. The Model THI-10 includes a soft carrying case with a belt loop for easy transportation.

#### SPECIFICATIONS

**Service:** Humidity and temperature detection in air.

**Range:** Relative humidity: 1 to 99% (non-condensing); Temperature: -4 to 140°F (-20 to 60°C).

**Accuracy:** Relative humidity: ±3%; Temperature: ±1.5°F (±0.8°C).

**Display:** Dual LCD display (4 digit upper display / 3 digit lower display).

**Temperature Limits:** Ambient: 32 to 144°F (0 to 60°C).

**Resolution:** Relative humidity: 0.1%; Temperature: 0.1°.

**Power Requirements:** 9 V alkaline battery, included, user replaceable.

**Battery Life:** 200 hours (approx.).

**Weight:** 5.6 oz (160 g).

**Agency Approvals:** CE.

**Model THI-10**, Digital Thermohygrometer



Model  
A-525

# Pocket Sling Psychrometer

Replaceable Wick, Psychrometric Slide Chart Included



The **Model A-525 Sling Psychrometer** can be used to measure relative humidity by measuring the dry bulb and wet bulb temperatures. Wet bulb temperatures are measured by wetting a wick with distilled water on one of the thermometer legs of the psychrometer. On the other leg, the dry bulb temperature is measured. An included slide chart eliminates

**Model A-525**, Pocket type sling Psychrometer. Furnished complete with Psychrometric charts. Psychrometric slide chart, and carrying case

#### ACCESSORIES

**A-527**, Replacement Wick for Psychrometer

**A-530**, Psychrometric Slide Chart



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the need to use of graphs to determine the humidity. Replacement wicks are available as an accessory. Each sling psychrometer includes psychrometric graphs, psychometric slide chart, and a carrying case.



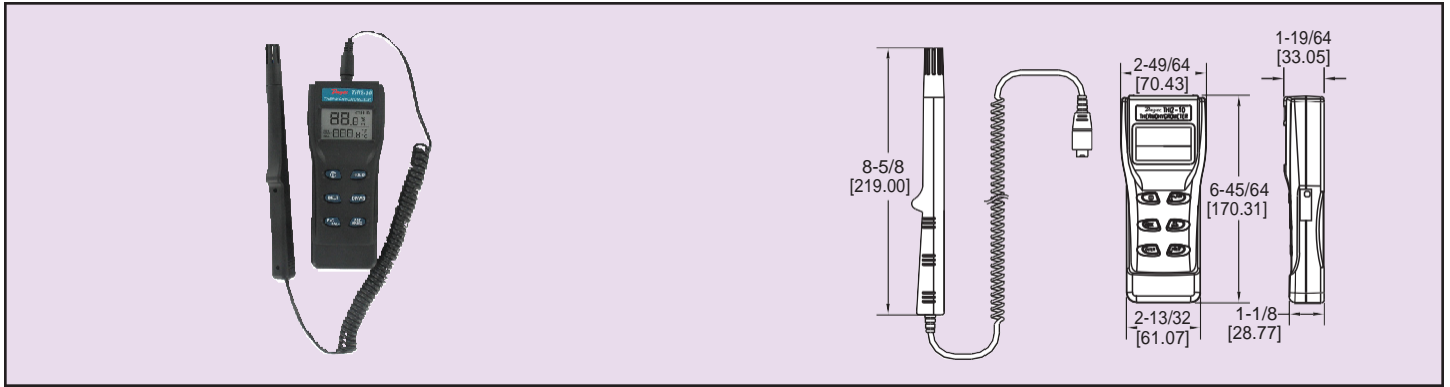
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Model  
THI2-10

# Digital Thermo-Hygrometer

Remote Probe, Push Button Calibration



The THI2-10 Digital Remote Sensing Thermohygrometer accurately takes humidity, temperature, dew point and wet bulb temperatures inside of ducts and hard to reach areas. English and metric engineering units as well as the type of measurement displayed can be easily selected using the push buttons. The push buttons also allow the user to freeze the current reading or retrieve the minimum and maximum readings. A large backlit LCD digital dual display allows the user to see both the temperature and humidity simultaneously and a low battery indicator shows the user when to change batteries. For hands free operation, the thermohygrometer can be mounted on a tripod. All units include batteries and a hard carrying case for safe transport.

THI2-10, Thermohygrometer with Remote Probe

#### ACCESSORY

TH-CAL, 33% and 75% Salt Bath Calibration Standards

#### SPECIFICATIONS

**Service:** Humidity and temperature detection in air.

#### Range:

Relative humidity measurement range: 0 to 100%;  
Temperature range: 14 to 140°F (-10 to 60°C);  
Dew point temperature range: -100 to 139.8°F (-73.4 to 59.9°C);  
Wet bulb temperature range: 7.88 to 139.8°F (-13.4 to 59.9°C).

#### Accuracy:

Relative humidity accuracy: ±3% from 10 to 90% (at calibration temperature); ±5% for others;  
Temperature accuracy: ±1°F (±0.6°C).

**Display:** Dual LCD display for temperature and humidity.

#### Temperature Limits:

Ambient: 32 to 122°F (0 to 50 C);  
Storage: 68 to 140°F (-20 to 60°C).

#### Resolution:

Temperature resolution: 0.1°C/°F;  
Humidity resolution: 0.1% RH.

**Power Requirements:** (4) AAA alkaline batteries, included, user replaceable.

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

**Agency Approval:** CE.

TEST EQUIPMENT

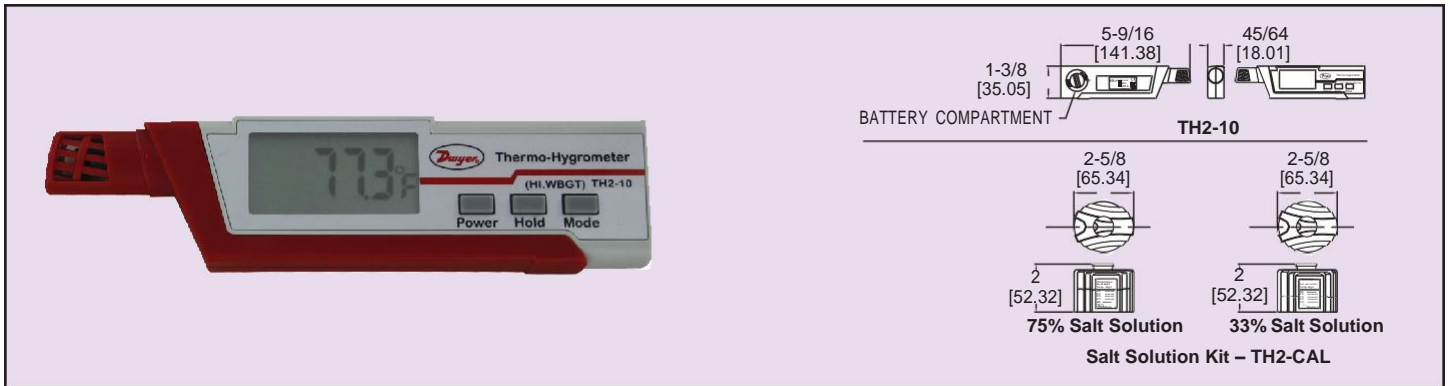
Thermo-Hygrometers



Model  
TH2-10

# Thermo-Hygrometer Pen

Measures Temperature, Humidity, Dew Point, Heat Index and Wet Bulb



The Model TH2-10 Thermo-Hygrometer Pen is a compact handheld device that measures temperature, humidity, dew point, wet bulb, and heat index. The TH2-10 has many applications including HVAC, home inspection for examining heating or cooling conditions, outdoor weather monitoring, and construction or industrial inspection. This product offers fahrenheit and celsius units, data hold function, and 0.1°F/°C resolution. Batteries are included.

Model TH2-10, Thermo-Hygrometer Pen

#### ACCESSORY

TH2-CAL, 33% and 75% RH Salt Bath Calibration Standards

#### SPECIFICATIONS

**Range:** RH: 0 to 99.99%; Temperature: -4 to 122°F (-20 to 50°C).

**Accuracy:** ±3% @ 25°C/10 to 90% RH (±5% @ 0 to 10%, 90 to 100%) ±1°F (0.6°C).

**Display:** 4-digit LCD.

**Resolution:** 0.1°F/°C.

**Power Requirements:** 3 V CR2032 Lithium metal battery included, user replaceable.

**Weight:** 3.2 oz (91 g).

**Agency Approvals:** CE.



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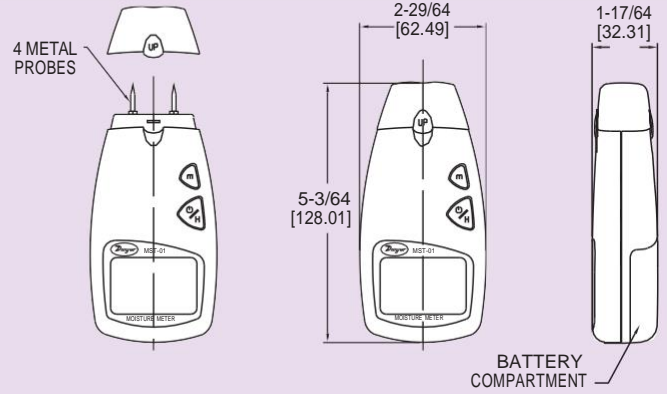
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Model  
MST-01

# Digital Moisture Meter

Measures Moisture from 2 to 70% with High Accuracy (1.5%)



The Series MST-01 Digital Moisture Meter is a high accuracy instrument used for determining the moisture content in wood, gypsum, bamboo, paper and other various materials. This unit features a durable and rugged enclosure which ensures a long life span. The large digital LCD makes measurements easy to read, while the hold function makes them easy to record. The MST-01 includes a nylon carrying case, protective cap, two replacement pins and battery.

### SPECIFICATIONS

- Range:** 2 to 70% moisture content.
- Accuracy:** ±1.5% moisture content.
- Temperature Limits:** 32 to 104°F (0 to 40°C).
- Humidity Limits:** 0 to 70%.
- Display:** 3-digit LCD.
- Resolution:** 0.5%.
- Power Requirements:** 9 V alkaline battery, included, user replaceable.
- Weight:** 4.1 oz (116 g).

Model MST-01, Digital Moisture Meter

### ACCESSORY

MST-RP, Replacement Pins

TEST EQUIPMENT

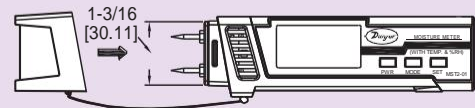
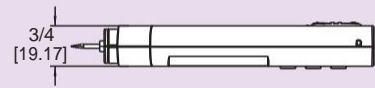
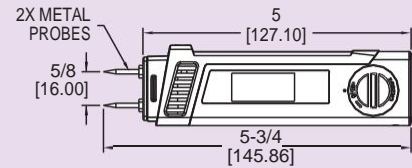
Moisture Meters



Model  
MST2-01

# Digital Moisture Meter

Measures Moisture, Temperature and Relative Humidity



The Model MST2-01 Digital Moisture Meter is a high-accuracy instrument used for determining the moisture content in wood, gypsum, bamboo, paper and other various materials. This unit also has the ability to measure ambient temperature and relative humidity. The large digital LCD makes measurements easy to read, while the hold function makes them easy to record. The MST2-01 includes a protective cap, two replacement pins, and one battery.

### SPECIFICATIONS:

- Range:**
  - Moisture: 2 to 70%;
  - Temperature: 14 to 122°F (-10 to 50°C);
  - Relative Humidity: 10 to 90% RH.
- Accuracy:**
  - Moisture: ±1%;
  - Temperature: ±2°F (±1°C);
  - Relative Humidity: ± 5% RH.
- Resolution:**
  - Moisture: 0.5%;
  - Temperature: ±0.1°F/°C;
  - Relative Humidity: 0.1% RH.
- Temperature Limits:** 32 to 104°F (0 to 40°C).
- Humidity Limits:** 0 to 70%.
- Size:** 5.75" x 1.5" x 0.75" (147 mm x 36 mm x 18 mm).
- Display:** 3-digit LCD.
- Power Requirements:** 3V CR2032 lithium metal battery, installed functional, user replaceable.
- Weight:** 2.4 oz (68 g).

Model MST2-01, Digital Moisture Meter

### ACCESSORY

MST2-RP, Replacement Pins



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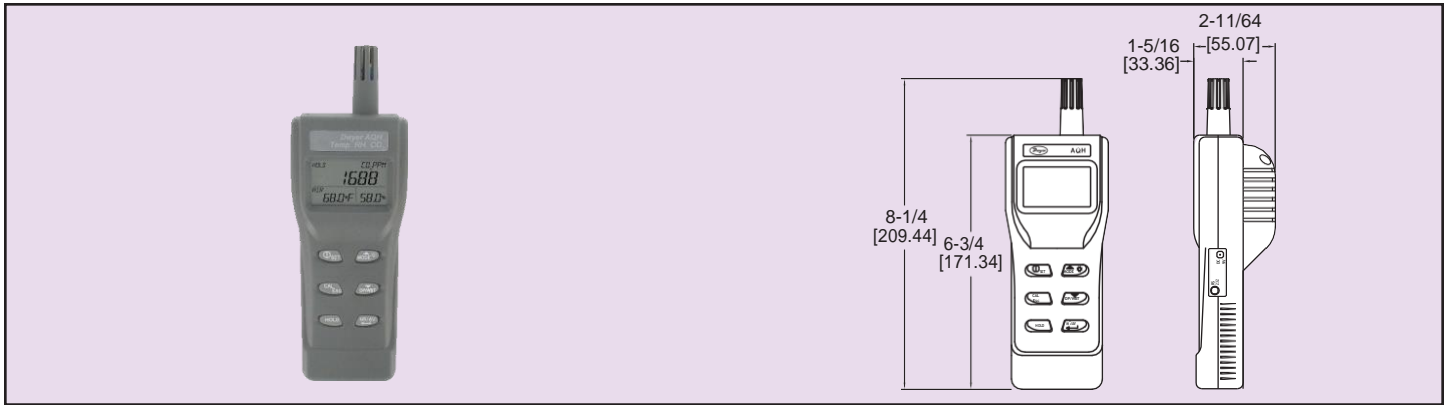




Model  
AQH-20

# Handheld Indoor Air Quality Meter

Measures CO<sub>2</sub>, Temperature and Humidity



The Model AQH-20 Indoor Air Quality Meter reduces the number of instruments a contractor has to carry by measuring the carbon dioxide concentration, air temperature, and humidity percentage in one device. A large backlit LCD display shows all three parameters simultaneously. The Model AQH-20 can display dew point or wet bulb temperatures in place of the ambient temperature. Minimum, maximum, and average readings are easily accessible through the function buttons. By pressing the hold key, the current values are held so that they can be recorded. An audible alarm warns the user that the current ambient conditions are becoming hazardous. The Model AQH-20 includes a hard carrying case and batteries.

Model	CO <sub>2</sub> Range	Humidity Range	Temperature Range
AQH-20	0 to 2000 ppm	0.0 to 99.9%	14 to 140°F (-10 to 60°C)

#### ACCESSORY

TH-CAL, 33% and 75% Salt Bath Calibration Standards

#### SPECIFICATIONS

##### Ranges:

CO<sub>2</sub>: 0 to 2000;  
Temperature: 14 to 140°F (-10 to 60°C);  
Relative Humidity: 0.0 to 99.9% RH.

##### Accuracy:

CO<sub>2</sub>: ±30 ppm ±5% of reading;  
Temperature: ±0.9°F (±0.6°C);  
Humidity: ±3% RH (10 to 90%), ±5% (0.0 to 9.9% or 90 to 99.9%).

##### Resolution:

CO<sub>2</sub>: 1 ppm;  
Temperature: 0.1°F (0.1°C);  
Humidity: 0.1% RH.

##### Response Time:

CO<sub>2</sub>: < 30 seconds;  
Temperature: < 2 minutes;  
Humidity: <10 minutes.

##### Display:

4 digits for temperature/CO<sub>2</sub> and 3 digits for humidity.

##### CO<sub>2</sub> Sensor:

Non-dispersive infrared.

##### Temperature Limits:

32 to 122°F (0 to 50°C).

##### Humidity Limits (Non-Condensing):

0 to 95% RH.

##### Power Requirements:

(4) 1.5 V AA alkaline batteries, included, user replaceable.

##### Warm Up Time:

30 seconds.

##### Weight:

6.76 oz (200 g).

##### Agency Approvals:

CE.

TEST EQUIPMENT

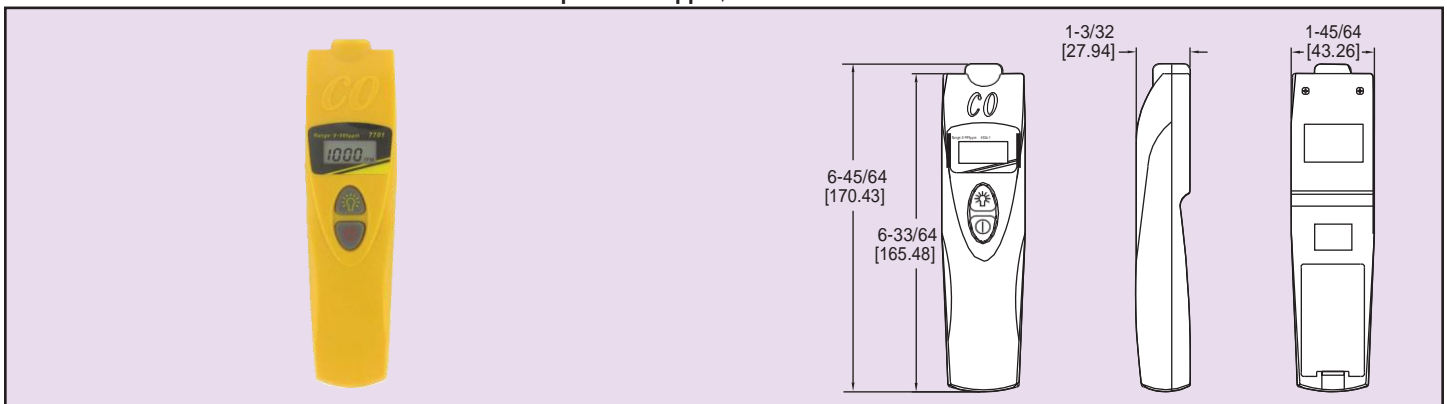
Gas Analyzers/Kits



Model  
450A-1

# Digital Pocket Size Carbon Monoxide Meter

Measures Up To 999 ppm, Audible Alarm



The Model 450A-1 Digital Pocket Size Carbon Monoxide Meter measures the ambient concentration of carbon monoxide (CO) in the environment and displays the measurement on the two line digital LCD screen. Besides the measurement, the maximum recorded CO value since the last reset is shown. An audible carbon monoxide alarm gives warning of CO levels above 25 ppm. For viewing in poorly lit environments, the built-in backlight brightens the display. Model 450A includes soft carrying case with belt loop, wrist strap, and batteries.

Model 450A-1, Digital Pocket Size Carbon Monoxide Meter

#### SPECIFICATIONS

##### Range:

0 to 999 ppm.

##### Accuracy (at 20 ±5°C, 50 ±20% RH):

±20% @ 0 to 100 ppm; ±15% @ 100 to 500 ppm.

##### Resolution:

1 ppm.

##### Display:

Dual digital LCD display.

##### Response Time:

Less than 60 seconds.

##### Sensor:

Electrochemical carbon monoxide sensor.

##### Temperature Limits:

-10 to 60°C (14 to 140°F).

##### Humidity Limits (Non-Condensing):

5 to 99% RH.

##### Power Requirements:

(3) 1.5 V AAA alkaline batteries, included, user replaceable.

##### Battery Life:

250 hours with backlight off; 35 hours with backlight on.

##### Weight:

4.23 oz (120 g).



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Alarms: Audible, preset at 25 ppm.  
Agency Approval: CE.



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Model  
1205B

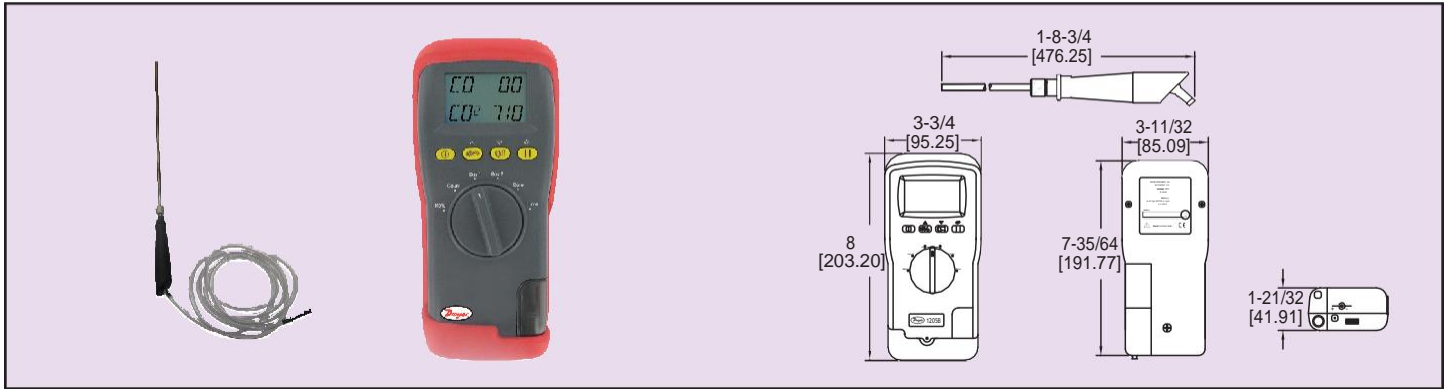
# Handheld CO/CO<sub>2</sub> Gas Analyzer

Measures Indoor Air Quality, Includes Sampling Probe with Hose



TEST EQUIPMENT

Gas Analyzers/Kits



The **Model 1205B Gas Analyzer** accurately measures the concentration of carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>) in a duct or space. The Gas Analyzer displays the measurement on a two line digital LCD display with backlight. The unit's memory stores up to 255 sets of readings that are logged manually or auto-logged with 1 to 10 minute intervals. Besides measurement recording, Model 1205B can provide a summary of average and maximum levels reached during recording. Results then can be printed via an optional infrared printer. Model 1205B includes batteries, 120V power supply, protective rubber boot with integral magnet, sampling probe, and a canvas carrying case.

**Model 1205B-0**, Gas Analyzer and Logger for CO and CO<sub>2</sub>

#### ACCESSORIES

**Model 1205B-US**, 120 VAC Power Adapter for 1205B

**Model 1205B-EU**, 240 VAC Power Adapter for 1205B

**Model 1205B-PR**, Replacement probe for 1205B

#### SPECIFICATIONS

**Ranges:** CO: 0 to 1000 ppm, overflow 2000 ppm; CO<sub>2</sub>: 200 to 4000 ppm, overflow 9999 ppm.

#### Accuracy:

CO:  $\pm 5$  ppm < 100 ppm;  
 $\pm 5\%$  > 100 ppm;  
 $\pm 10\%$  > 1000 ppm;  
CO<sub>2</sub>:  $\pm 20$  ppm < 400 ppm;  
 $\pm 5\%$  < 4000 ppm;  
 $\pm 10\%$  > 4000 ppm.

#### Resolution:

CO: 1 ppm;  
CO<sub>2</sub>: 1 ppm.

**Display:** Dual LCD display.

**Temperature Limits:** 32 to 104°F (0 to 45°C).

**Humidity Limits (Non-Condensing):** 10 to 90% RH.

**Power Requirements:** 100 to 240 VAC, 50 to 60 Hz or (5) AA NiMH batteries, internal, factory replaceable.

**Battery Life:** 6 hours with full charge and pump on.

**Weight:** 2.21 lb (1 kg).

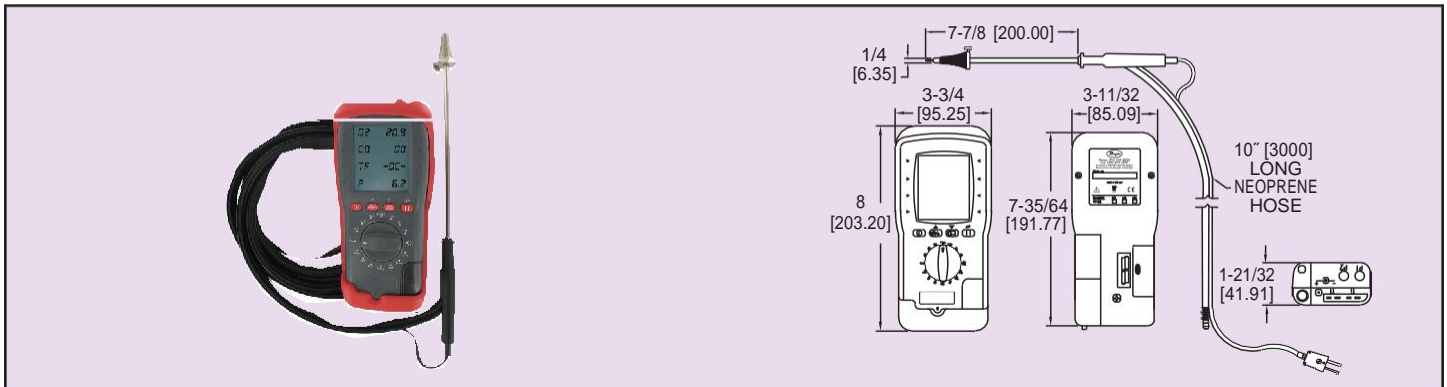
**Agency Approvals:** CE.



Model  
1207A

# Handheld Flue Gas Combustion Analyzer

Rotary Dial Selection, Display 4 Parameters Simultaneously



The versatile **Model 1207A Handheld Flue Gas Combustion Analyzer** makes adjusting boilers for optimum efficiency quicker and easier. With the large LCD display, users can monitor four parameters simultaneously and change the parameters shown using the rotary dial selection switch. For extra protection, the analyzer comes standard with a protective boot and magnetic back. In order to track the measurements, the 1207A can store up to 255 time stamped test sets in memory and can output measurements to a serial printer. The 1207A comes preprogrammed for natural gas, light oil, propane, butane, LPG, and wood pellets. Along with analyzing combustion measurements, the analyzer can be used as a CO/CO<sub>2</sub> indicator, pressure manometer, or thermocouple thermometer.

**Model 1207A**, Handheld Flue Gas Combustion Analyzer

#### ACCESSORIES

**1207A-US**, 120 VAC Power Adapter

**1207A-EU**, 230 VAC Power Adapter

**1207A-SP**, Serial Printer

**1207A-PP**, Printer Paper for 1207A-SP

**1207A-RF**, Replacement Filter

#### SPECIFICATIONS

**Range:** O<sub>2</sub>: 0 to 21%; CO: 0 to 2000 PPM (4000 PPM max for 15 minutes); CO<sub>2</sub>: 0 to 30%; Temp. (flue and net): 32 to 1112°F (0 to 600°C); Efficiency: 0 to 99.9%; Excess air: 0 to 250%.

**Accuracy:** O<sub>2</sub>:  $\pm 0.2\%$ ; CO:  $\pm 10$  PPM < 100 PPM else  $\pm 5\%$  of reading; CO<sub>2</sub>:  $\pm 0.3\%$  reading; Temp. (flue and net):  $\pm 2^\circ\text{C} \pm 0.3\%$  reading; Efficiency:  $\pm 1\%$  reading; Excess air:  $\pm 0.2\%$ .

**Resolution:** O<sub>2</sub>: 0.1%; CO: 1 PPM; CO<sub>2</sub>: 0.1%; Temp. (flue and net): 0.1°F/C; Efficiency: 0.1%; Excess air: 0.1%.

**Ambient Operating Temperature:** 32 to 104°F (0 to 40°C).

**Power Requirements:** (8) AA alkaline batteries, installed functional, user replaceable, (4) AA NiMH batteries, included, user replaceable (charger included) or optional power adapter.

**Pre-Programmed Fuels:** Natural gas, light oil, propane, butane, LPG, and wood pellets.

**Probe:** 11.8" (300 mm) length x 0.25" (6 mm) diameter with 7.8" (200 mm) stainless steel shaft.

**Hose:** 10 ft (3 m).

**Weight:** 1.7 lb (0.77 kg).

**Agency Approvals:** CE.



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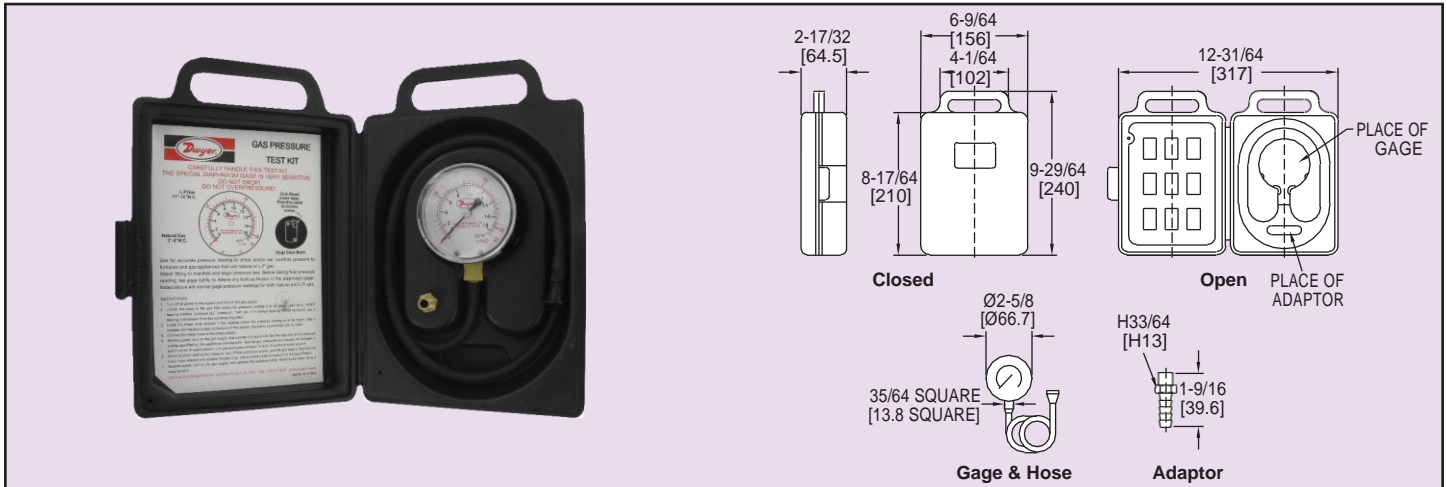
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Series  
LPTK

# Gas Pressure Test Kit

Convenient Kit Perfect For Testing LP and Natural Gas Controls



The **Model LPTK Gas Pressure Test Kit** is ideal for testing LP and natural gas lines and controls. The kit's gage shows if proper pressure is present or if a leak exists. The LPTK Gas Pressure Test Kit is available in two different gage ranges, and each gage is 3% full-scale accurate with an easy to use calibration screw on the back of the gage. It is easier to use than a manometer, and includes a sturdy case for added durability and safe handling.

Model	Range
LPTK-01	0 to 15 in w.c. & 0 to 8.6 oz/in <sup>2</sup>
LPTK-02	0 to 32 in w.c. & 0 to 18.5 oz/in <sup>2</sup>
LPTK-03	0 to 4 kPa & 0 to 40 mbar
LPTK-04	0 to 8 kPa & 0 to 80 mbar

\*Consult factory for other range options.

## SPECIFICATIONS

- Service:** Compatible gases.
- Wetted Materials:** Gage: brass, hose: rubber.
- Housing Materials:** Steel with black finish.
- Lens:** Polycarbonate.
- Accuracy:** ±3% full-scale.
- Pressure Limit:** 110% of range.
- Temperature Limits:** -40 to 150°F (-40 to 65°C).
- Size:** 2-1/2" (63 mm).
- Process Connections:** 1/8" NPT, brass hose barb.
- Case:** ABS plastic.
- Hose:** Rubber, 36" (91.4 cm).
- Tube Nipple:** Rubber.
- Weight:** 1.75 lb (0.8 kg).

TEST EQUIPMENT

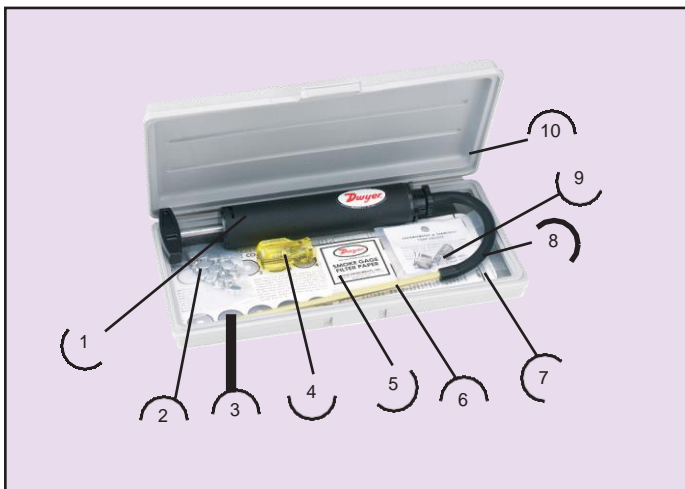
Gas Analyzers/Kits



Model  
920

# Smoke Gage Kit

Complete Kit, Includes 10 Components



**Easy-to-Use Smoke Gage Kit** enables you to quickly balance maximum CO<sub>2</sub> with minimum smoke for clean, efficient combustion. Simply take an actual sample of the smoke being tested and compare it to the standards on the smoke chart included. Just 10 full strokes of the pump produces an accurate test sample. Complete testing instructions are included.

Popular with professional heating engineers, the **Model 920 Smoke Gage Kit** includes these quality components:

- Dwyer® Smoke Gage Pump**  
Fast working; the first known unit to conform with ASTM D-2156-XX standards for testing smoke density in flue gases from burning distillate fuels. Filter paper clamps instantly into pump inlet.
- Hole Plugs**  
Packet of 20 to fill awl holes.
- Smoke Chart**  
For easy comparison with samples taken. Laminated plastic, wipes clean.
- Awl**  
Pierces smoke pipe for thermometer and sampling tubes. Large, comfortable plastic handle.
- Smoke Gage Filter Paper**  
An exclusive, time-saving Dwyer development. Roll of filter paper is contained in dispenser box, kept clean and convenient.
- Metal Terminal Tube**  
8-1/2" long, heavy gauge brass.
- How-to-Use Instructions**  
Simple with step-by-step illustrations.
- Rubber Tubing**  
Flexible, long-lived.
- Spring Holders**  
A superior design for holding thermometer and sampling tubes.
- Kit Case**  
Tough, durable, one piece high density polyethylene with living hinge and clasp. Foam liner protects contents.



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Model  
CLD20

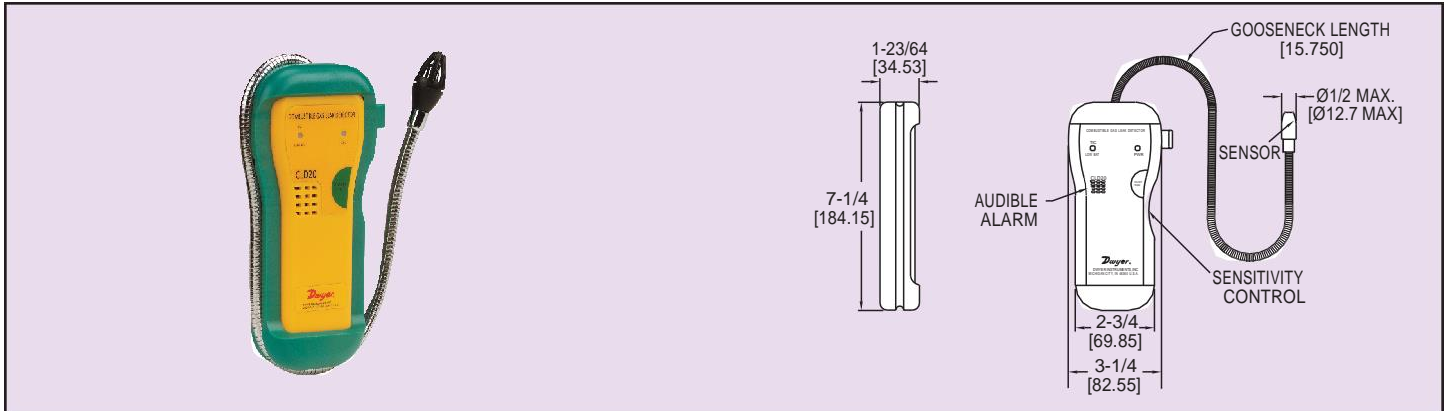
# Combustible Leak Detector

Adjustable Tick Rate, < 1 Second Response



TEST EQUIPMENT

Leak Detectors



Quickly locate leaks of combustible gases with the Model CLD20 Combustible Leak Detector. Unit provides accurate detection of Methane, Butane, Ammonia, Ethylene Oxide, Alcohols, Industrial Solvents and other combustible or toxic gases. Adjustable tick rate accelerates as the sensor tip approaches a leak and can be re-zeroed to pinpoint the exact location of the leak. The Model CLD20 offers visual LED indication of leak level and automatically recalibrates when turned off and on. Flexible gooseneck and small sensor head allows use in tight, difficult to reach areas.

Model CLD20, Combustible Leak Detector

## SPECIFICATIONS

**Sensitivity:** 50 ppm.

**Response Time:** Less than 1 s.

**Sensor:** Solid state semiconductor.

**Ambient Operating Temperature/RH:** 32 to 104°F (0 to 40°C), 0 to 80% RH (non-condensing).

**Power Requirements:** 9 V alkaline battery, installed functional, user replaceable.

**Battery Life:** Approximately 10 hours of continuous usage.

**Warm-up Time:** 10 s.

**Pre-programmed fuels:** (partial listing) Methane, Natural gas, Ammonia, Hydrogen, Butane, Propane, Acetone, Ethylene Oxide, Halon, Hydrogen Sulphide, Alcohol, Jet Fuel, Lacquer, and Thinners.

**Alarm Settings:** Audio: adjustable tick rate 75dB @ 1' (30 cm), Visual: flashing LED.

**Probe:** 16" (40 cm) L, flexible gooseneck.

**Dimensions:** 7.3"H x 3.4"W x 1.4"D (18.5 x 8.5 x 3.4 cm).

**Weight:** 18 oz (500 g).

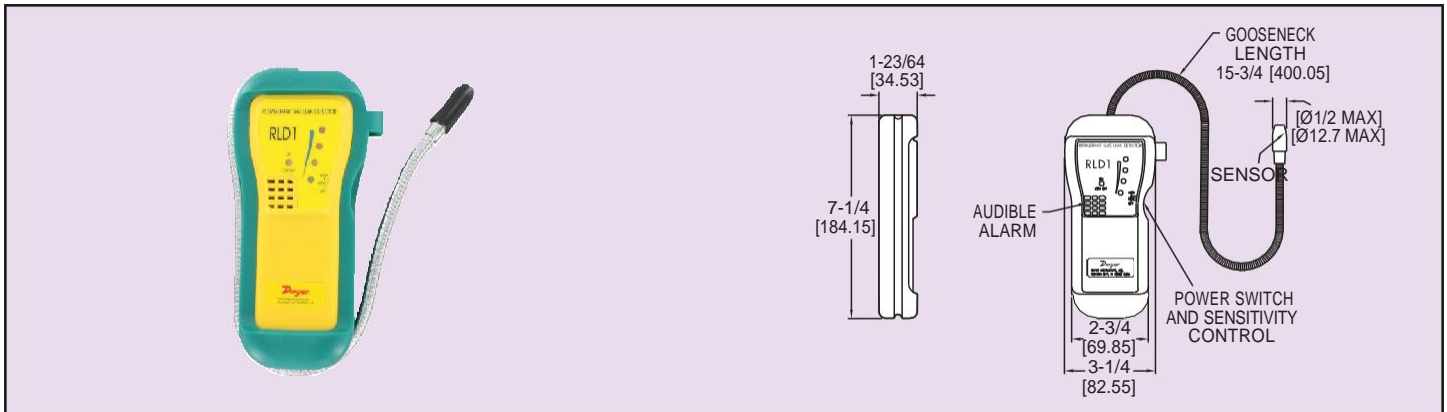
**Agency Approvals:** CE.



Model  
RLD1

# Refrigerant Leak Detector

Audio and Visual Indication, Flexible Gooseneck Design



Detect and pinpoint even small leaks of refrigerant gases using the Model RLD1 Refrigerant Leak Detector. The RLD1 is effective in detecting existing refrigerants including HFC, HCFC, CFC, SF6, R134a, and R123. Unit features thumbwheel operation to increase sensitivity and audio and visual indication. An increasing tick rate sounds as a leak is pinpointed and the red indication light flashes more rapidly. The flexible gooseneck probe is ideal for hard to reach areas. Use the model RLD1 in domestic and commercial refrigeration systems, automotive, air conditioning, and quality control testing environments.

Model RLD1, Refrigerant Leak Detector

## SPECIFICATIONS

**Sensitivity:** 0.4 oz/year (11 gm/year) R134a.

**Response Time:** Less than 1 second.

**Sensor:** Advanced ionization detection.

**Ambient Operating Temperature/RH:** 32 to 104°F (0 to 40°C), 0 to 80% RH (non-condensing).

**Power Requirements:** 9 V alkaline battery, installed functional, user replaceable.

**Battery Life:** Approximately 16 hours.

**Warm-up Time:** 10 s.



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**Pre-programmed gases:** (partial listing) CFCs: R11, R12, R13, HCFCs:R22, R502, R500, HFCs: R134a, R123, R125, R23, and other halogenbased compounds.  
**Alarm Settings:** Audio: adjustable tickrate, Visual: flashing LED.  
**Probe:** 15-3/4" (40 cm) length, flexiblegooseneck.  
**Dimensions:** 7.3"H x 3.4"W x 1.4"D(18.5 x 8.5 x 3.4 cm).  
**Weight:** 18 oz (500 g).  
**Agency Approvals:** CE.



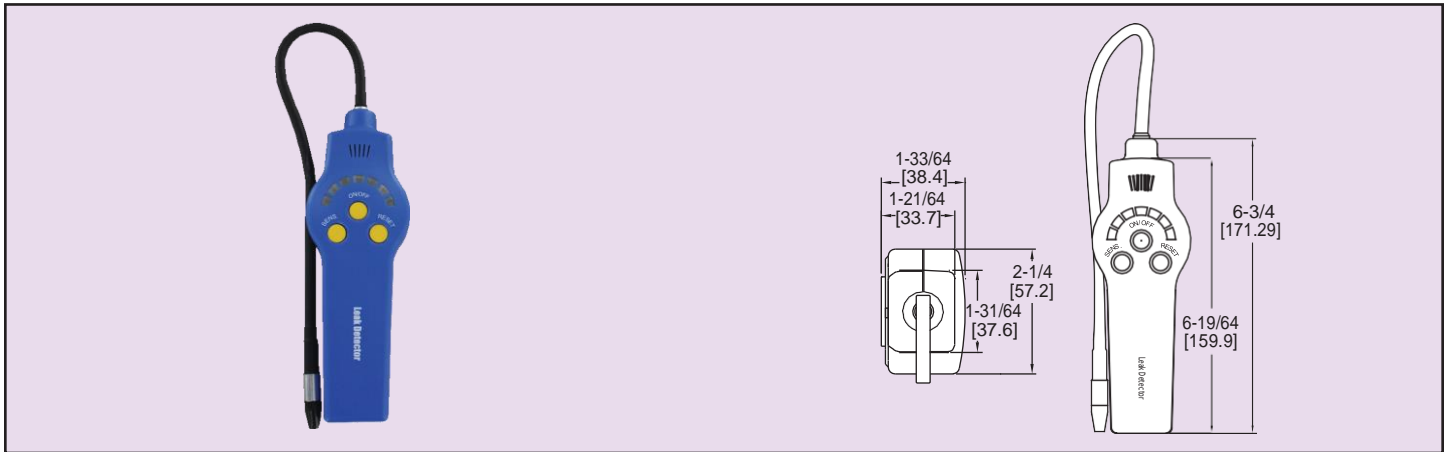
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Model  
RLD2

# Refrigerant Leak Detector

Audio and Visual Indication, 12" Flexible Gooseneck Design



The Model RLD2 is the most dependable negative corona refrigerant leak detector. The responsive elements have a wide sensitivity range. This unit utilizes a five level alarm system to detect excessive refrigerant in areas where there could be a potential leak. The dual-color LED indicator lights provide visual indication of the refrigerant gas concentration, various audio pitches facilitate detection, and its portable design is convenient for the user. The refrigerant leak detector can be utilized in residential and commercial refrigeration systems, automotive, air conditioning, and quality control testing environments.

Model RLD2, Refrigerant Leak Detector

### SPECIFICATIONS

- Sensor Type:** Negative corona.
- Sensitivity:** 3g/yr.
- Sensitivity Levels:** 5.
- Response Time:** Less than 1 s (pump driven).
- Temperature Limits:** 32 to 125°F (0 to 52°C).
- Power Requirements:** (2) 1.5 V AA alkaline batteries, included, user replaceable.
- Battery Life:** 30 hours.
- Warm Up Time:** 5 s.

- Pre-programmed gases:** Detects gases that contain chlorine, fluorine, bromine, ethylene oxide and SF-6, as well as: CFCs: R11, R12, R500, R503, etc.; HCFCs: R22, R123, R124, R502, etc.; HFCs: R134A, R404A, R125, etc.; Mixtures such as: AZ-50, HP62, MP39 etc.
- Alarm Setting:** Audio: Variable tick; Visual: Flashing LED.
- Probe Length:** 12" (30.48 cm).
- Duty Cycle:** Continuous.
- Weight:** 5.2 oz (147.4 g).
- Agency Approvals:** CE, RoHS.

TEST EQUIPMENT

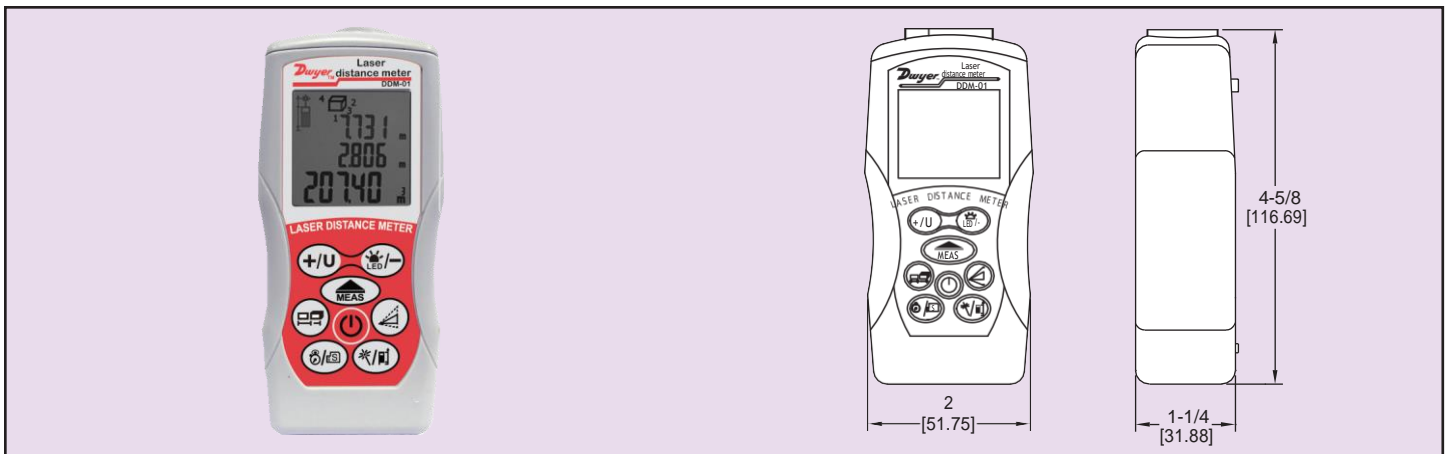
Leak Detectors



Model  
DDM-01

# Laser Distance Meter

Measures up to 70 Meters, Class II Laser



The Model DDM-01 Laser Distance Meter offers quick measurement of distances up to 229.7 feet (70 meters) with the click of a button. It is also able to easily make area and space calculations and volume measurements from what it records. Another feature of the Model DDM-01 is that it is able to use the Pythagorean Theorem to indirectly calculate the height of an object. The meter can read out in feet, inches, or meters and includes a backlight for use in dark areas.

### APPLICATIONS

- HVAC
- Construction/architecture
- Factory planning

### SPECIFICATIONS

- Range:** 0.16 to 229.7 feet (0.05 to 70 m).
- Accuracy:** ±0.005 feet (±1.5 mm).
- Display:** Three line LCD (top two with 4 digits/bottom with 5 digits).
- Resolution:** 0.001 feet (0.001 m).
- Response Time:** 0.5 s.
- Laser Type:** 650 nm, class 2, <1 mW.
- Beam Size:** 25 mm at 30 m.

### Temperature Limits:

- Operating: 23 to 104°F (-5 to 40°C); Storage: -4 to 140°F (-20 to 60°C).
- Power Requirements:** (2) 1.5 V AA carbon zinc batteries, included, user replaceable.
- Weight:** 21.6 oz (612.35 g).
- Agency Approvals:** CE, RoHS.



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Model SM-100

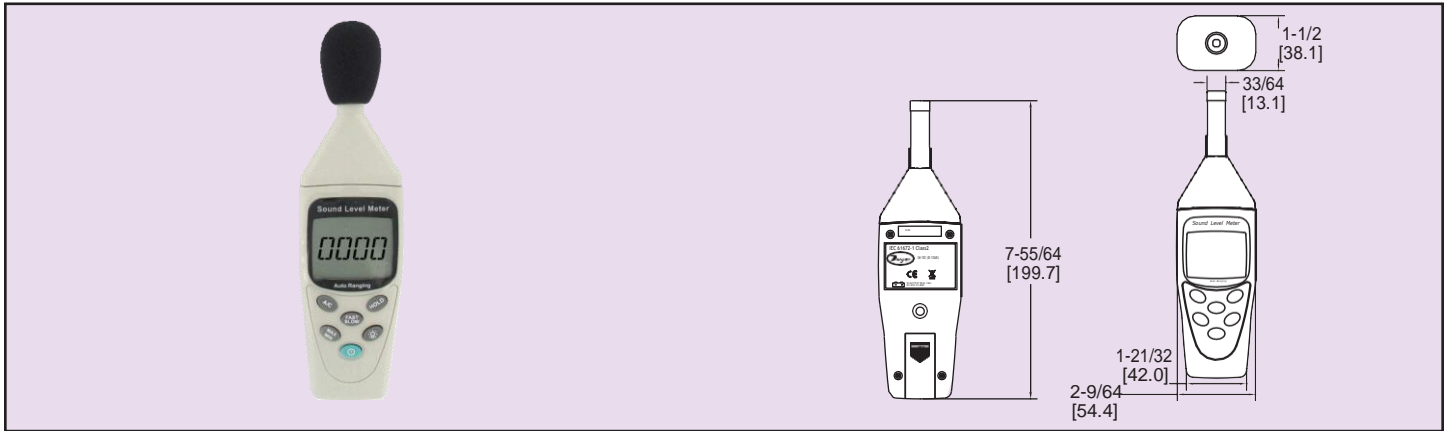
# Digital Sound Meter

Measures Noise Levels From 30 to 130 dB



TEST EQUIPMENT

Sound Meters



**Model SM-100 Digital Sound Meter** is ideal for measuring noise levels from 30 to 130 dB with accuracy of  $\pm 1.5$  dB. Model SM-100 has a frequency of 31.5 Hz to 8 kHz, three different dB ranges, and a 1/2" condenser microphone. The SM-100 has two frequency weightings: the "A" weighting ranges from 30 to 130 dB, while the "C" weighting ranges from 35 to 130 dB. The four digit LCD backlight display has the ability to update in 0.5 seconds when the unit is set to fast response. Model SM-100 features data hold, ability to record maximum/minimum, auto ranging, auto power-off, and a dynamic range of 50 dB. The compact size of the SM-100 makes it very easy to operate and store. Each unit includes battery, carrying case, black foam cover to protect the sensor, and instruction manual. The SM-100 is ideal for technicians measuring and recording sound levels in zones or rooms of buildings, musical halls, theaters and near equipment or machinery on the plant floor.

Model SM-100, Handheld Digital Sound Meter

### SPECIFICATIONS

**Dynamic Range:** 50 dB.

**Measuring Level Range:**

A weighting: 30 to 130 dB;

C weighting: 35 to 130 dB.

**Accuracy:**  $\pm 1.5$  dB (at 94 dB @ 1 kHz).

**Frequency Range:** 31.5 Hz to 8 kHz.

**Temperature Limits:**

Operating: 41 to 104°F (5 to 40°C);

Storage: 14 to 140°F (-10 to 60°C).

**Humidity Limits:**

Operating: Below 80% RH;

Storage: Store below 70% RH.

**Elevation Limit:** Maximum 6562 ft (2000 m) above sea level.

**Display:** 4 digit LCD with 0.5 second update when set to fast response.

**Resolution:** 0.1 dB.

**Power Requirements:** 9 V alkaline battery, included, user replaceable.

**Battery Life:** 50 hours with alkaline battery (approx.).

**Size:** 7.8" L x 2.1" W x 1.5" H (200 L x 55 W x 38 H mm).

**Weight:** 6 oz (170 g).

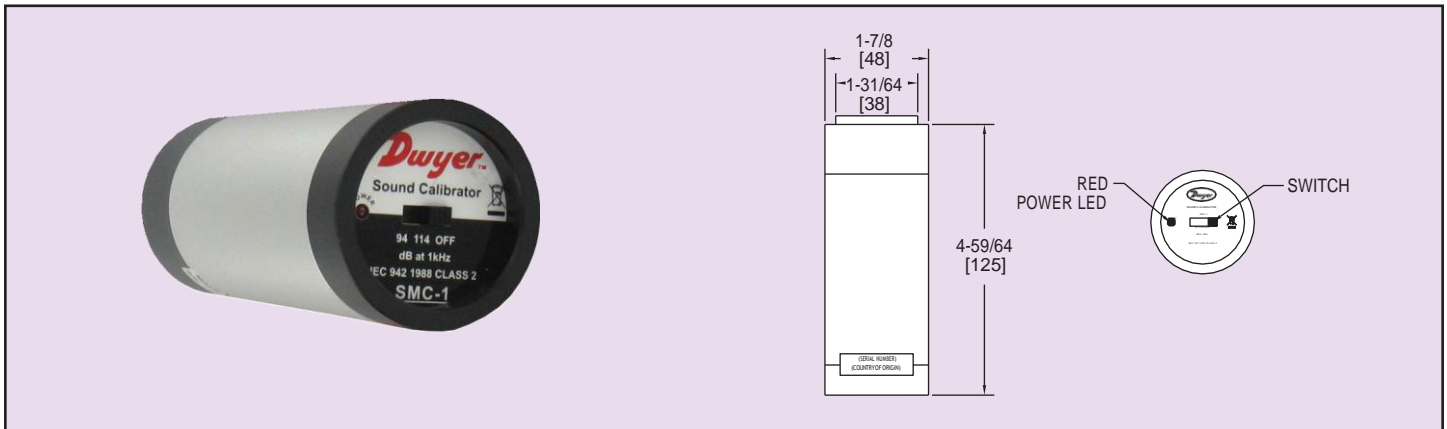
**Agency Approval:** CE.



Model SMC-1

# Sound Calibrator

Set Standard Noise Levels at Either 94 or 114 dB



**Model SMC-1 Sound Calibrator** is ideal for setting standard noise levels at 94 dB and 114 dB. The SMC-1 has an output frequency of 1 kHz,  $\pm 4\%$ . This unit functions best when environment conditions have a temperature of 68°F (20°C), relative humidity of 65%, and an atmospheric pressure of 29.9" Hg (1013 mbar). The SMC-1 features a measuring accuracy of  $\pm 0.5$  dB, a low battery indicator, and a 1/2" microphone adapter. This calibrator has a compact design that allows the user to conveniently operate and store the product. At 10 oz (283 g) including the battery, the SMC-1 is also extremely lightweight. Each unit includes carrying case, battery, and instruction manual. This calibrator is ideal for calibrating sound meters such as the Dwyer Series SM-100.

Model SMC-1, Sound Calibrator

### SPECIFICATIONS

**Selectable Sound Output Level:** 94 dB or 114 dB.

**Output Frequency:** 1 kHz  $\pm 4\%$ .

**Accuracy:**  $\pm 0.5$  dB.

**Temperature Limits:**

Operating: 32 to 104°F (0 to 40°C);

Storage: 14 to 140°F (-10 to 60°C).

**Humidity Limits:**

Operating: 10 to 70% RH;

Storage: 10 to 90% RH.

**Elevation Limit:** Maximum 6562 ft (2000 m) above sea level.

**Power Requirements:** 9 V alkaline battery, included, user replaceable.

**Battery Life:** 20 hours with alkaline battery (approx.).

**Size:** 1.89" diameter x 4.92" length (48 mm diameter x 125 mm length).

**Weight:** 10 oz (283 g).

**Standards:** ANSI S1.40-1984 and IEC 942 1988 Class 2.



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ance Meter

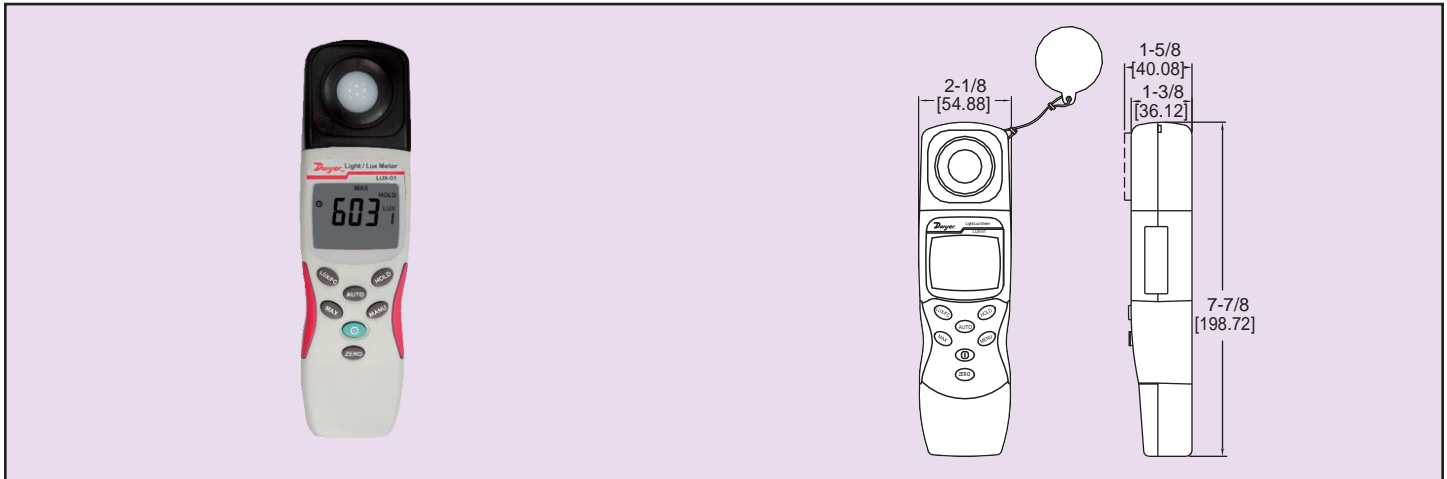




Model  
LUX-01

# Digital Light Meter

Silicon Photodiode Sensor, Reads up to 200,000 Lux



**Model LUX-01 Digital Light Meter** is able to measure the intensity of fluorescent, metal halide, high-pressure sodium, and incandescent light sources. This meter shows readings on a 3-1/2 digit LCD and can record measurement up to 200,000 lux and up to 20,000 foot-candles. The silicon photodiode sensor allows for use in high temperatures and has a strong angular correction for a highly accurate reading. Model LUX-01 also includes a protective cap for the sensor, ensuring that the meter is always zero calibrated. Applications include HVAC, medical facilities, photography, and cinematography.

Model LUX-01, Digital Light Meter

#### SPECIFICATIONS:

**Range:** Up to 200,000 lux; up to 20,000 foot-candles.  
**Accuracy:** ±3% of reading (Calibrated to standard incandescent lamp 4681°F (2583°C)) or ±6% other visible light source.  
**Display:** 3-1/2 digit LCD.  
**Resolution:** 1.0 lux; 1.0 foot-candle.  
**Sensor:** Silicon photodiode and filter.  
**Angle Deviation from Cosine**

**Characteristics:** 10° ±0.5%, 30° ±2%, 50° ±3%, 60° ±6%, 80° ±25%.

#### Temperature Limits:

Operating: 14 to 122°F (-10 to 50°C);  
Storage: 14 to 122°F (-10 to 50°C).

**Power Requirements:** 9 V carbon zinc battery, included, user replaceable.

**Battery Life:** 200 hours.

**Weight:** 22.4 oz (635 g).

**Agency Approvals:** CE, RoHS.

TEST EQUIPMENT

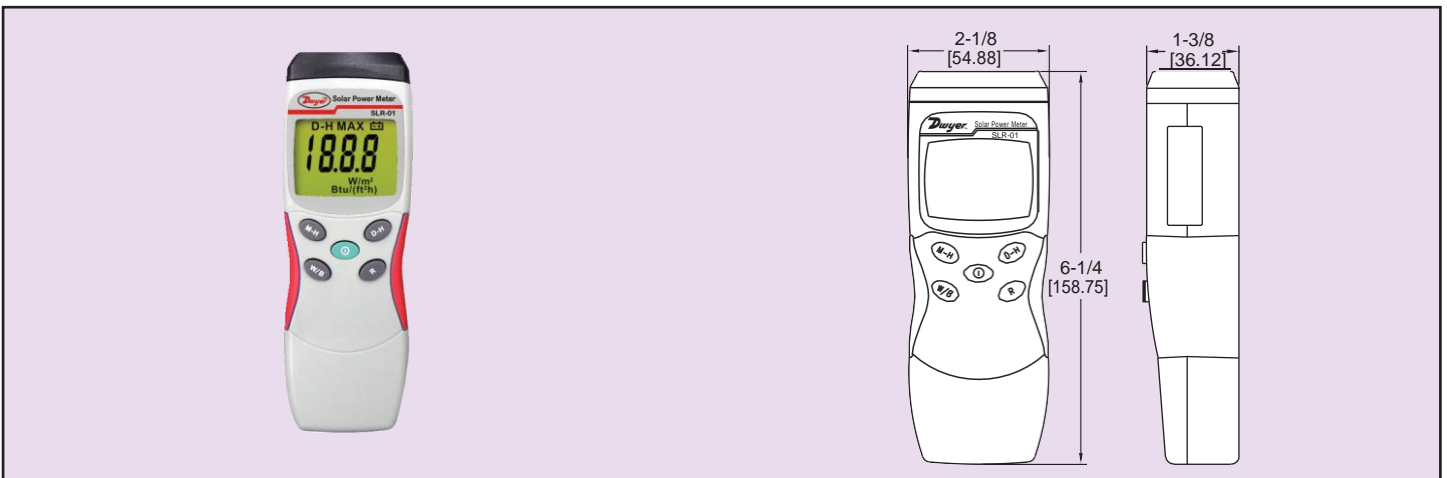
Light Meters



Model  
SLR-01

# Handheld Solar Power Meter

Measures up to 1999 W/m<sup>2</sup>, Auto-Ranging



**Model SLR-01 Handheld Solar Power Meter** measures the solar energy to determine the appropriate position or location for solar panels. It can be used to test the performance of solar receivers and solar window treatments. Using the end-mount light sensor, the meter is able to read and display in units of W/m<sup>2</sup> and BTU/(ft<sup>2</sup>·h). The large numbers and high contrast of the LCD make it easy to read the measurement, even in bright areas. Applications include solar farms, office buildings that utilize energy harvesting sensors, and telemetry systems.



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#### SPECIFICATIONS

**Range:** 0 to 1999 W/m<sup>2</sup>; 0 to 634 BTU/(ft<sup>2</sup>·h).  
**Accuracy:** ±10 W/m<sup>2</sup>; ±3 BTU/(ft<sup>2</sup>·h) or ±5%, whichever is greater; Additional temperature induced error above 77°F (25°C) ±0.38 W/m<sup>2</sup>, ±0.12 BTU/(ft<sup>2</sup>·h) per °C.  
**Display:** 3-1/2 digit LCD.

**Resolution:** 0.1 W/m<sup>2</sup>; 0.1 BTU/(ft<sup>2</sup>·h).

#### Temperature Limits:

Operating: 41 to 104°F (5 to 40°C);  
Storage: 14 to 140°F (-10 to 60°C).

**Power Requirements:** 9 V carbon zinc battery, included, user replaceable.

**Battery Life:** Approx. 100 hr.

**Weight:** 20 oz (567 g).

**Agency Approvals:** CE, RoHS.



Model  
BTK2

# Backflow Prevention Test Kit

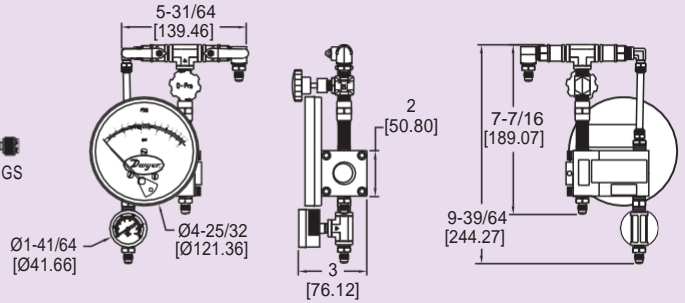
## Test Flow in Hydronic Systems

TEST EQUIPMENT

Backflow Test Kit



3' HOSE WITH FEMALE COUPLINGS  
[SHOWN UNATTACHED]



The Model BTK2 Backflow Prevention Test Kit is capable of testing hydronic systems with test procedures recommended by ASSE, AWWA, CSA, FCCC, HR-USV, and NEWWA. The BTK2 is comprised of three valves and is specially designed for testing backflow prevention assemblies. The tests can be completed in almost any area by mounting the unit with the included high performance elastic cord. PTFE-lined brass ball valves simplify the adjustment procedure. The large, easy-to-grip needle valve allows for quick adjustment. The kit includes a 4.5" diameter diaphragm differential pressure gage (0 to 15 psid), a 1.5" diameter in-line pressure gage (0 to 200 psig), three 3' long hoses (color-coded), three sets of brass adapter fittings for hookups to all standard size test cocks, an elastic cord for hanging/mounting, and a durable polyethylene carrying case.

### Model BTK2, Backflow Prevention Test Kit

Includes: 3 valve assembly, 4.5" differential pressure gage (attached), 1.5" in-line pressure gage (attached), three 3' hoses, three sets of brass adapter fittings, bungee cord, plumbers tape, polyethylene carrying case.

### SPECIFICATIONS

**Pressure Limits:** 175 psi (12 bar).

**Temperature Limits:** 210°F (99°C).

**Range:** 4.5" gage: 0 to 15 psid (0 to 1 bar); 1.5" gage: 0 to 200 psi (0 to 14 bar).

**Accuracy:** 4.5" gage: ±2% FS; 1.5" gage: ±3-2-3% FS.

### Wetted Parts:

4.5" Gage: Anodized aluminum;

4.5" Gage Diaphragm: Buna-N;

1.5" Gage: Brass;

Ball Valves: PTFE lined brass;

Needle Valve: Brass;

Hose Couplings: Brass;

Adaptors: Brass;

Hose: Rubber.

**Size:** Case: 9" H x 16" W x 9" D (228 mm H x 406 mm W x 228 mm D).

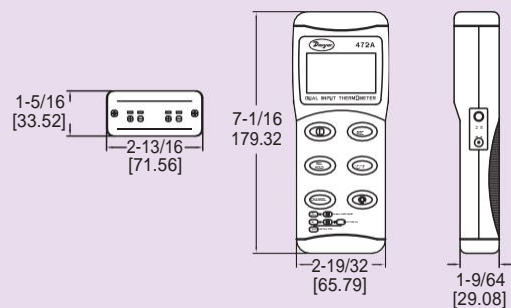
**Weight:** 8.9 lb (4 kg).



Model  
472A-1

# Dual Input Thermocouple Thermometer

## Accepts J, K, T Thermocouples, Differential Temperature Indication



The Model 472A-1 Dual Input Thermocouple Thermometer precisely measures up to two temperature measurements simultaneously. The large LCD display shows both temperature inputs or one temperature input and the differential temperature. Any J, K, or T type thermocouple with a mini-jack connector can be used as an input. For viewing in poorly lit environments, the built-in back light brightens the display. A hold button allows the user to freeze temperature data displayed. Minimum and maximum readings can be recorded over a set time period. Model 472A-1 includes a hard carrying case, battery, and one K type thermocouple.

### Model 472A-1, Digital Input Thermocouple Thermometer

### ACCESSORIES

472A-B, Rubber boot

1818-0074, Immersion probe

1818-0078, Penetration probe

1818-0082, Surface probe

1818-0085, Air duct probe

1718-0077, Remote probe handler

Digital Power Meter

### SPECIFICATIONS

**Inputs:** Type J, K, T thermocouples.

**Power Requirements:** 9 V alkaline battery, installed non-functional, user replaceable.

### Ranges:

J-type: -328 to 1400°F (-200 to 760°C);

K-type: -328 to 2498°F (-200 to 1370°C);

T-type: -328 to 734°F (-200 to 390°C).

**Accuracy:** ±0.1% reading + 1.4°F (0.7°C).

**Temperature Limits:** 32 to 122°F (0 to 50°C).

**Humidity Limits (Non-Condensing):** 0 to 85% relative humidity.

**Display:** Triple LCD display.

**Resolution:** 0.1°C up to 500°C.

**Weight:** 23.6 oz.

**Agency Approval:** CE.

### OPTION

For NIST traceable calibration certificate, use order code NISTCAL-TG.



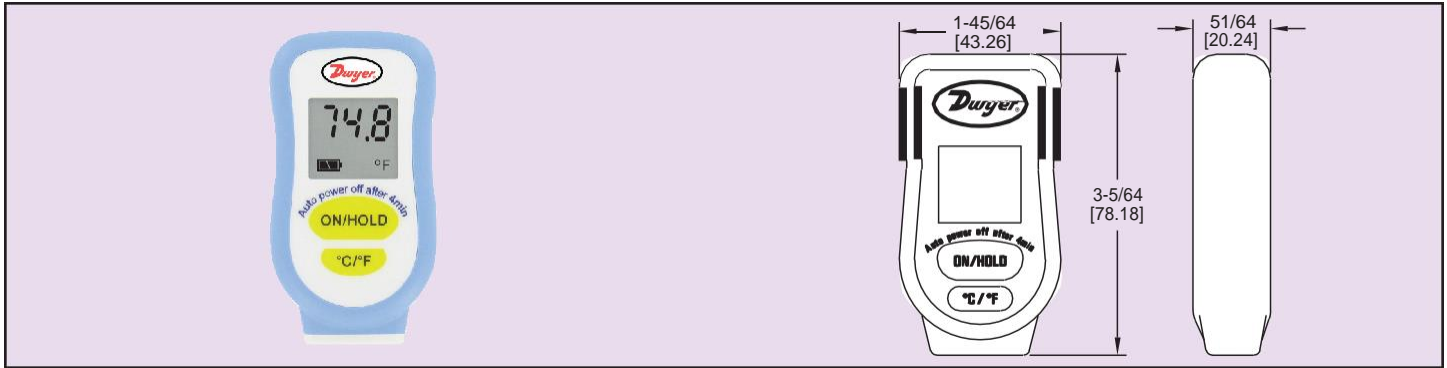
tetisan



Model  
DKT-1

# Pocket-Size Thermocouple Thermometer

Selectable °F/°C, Accepts Mini-Plug Input



The Model DKT-1 Pocket-Size Thermocouple Thermometer accurately monitors temperatures in a variety of applications. The wide measurement range and selectable engineering units allow users to easily view readings in either °F or °C. The automatic power down feature conserves battery life. This compact thermometer accepts any K-type thermocouple sensors (sold separately) with mini-plug connectors.

Model DKT-1, Thermocouple Thermometer

#### ACCESSORIES

- 1818-0074, Immersion Probe
- 1818-0078, Penetration Probe
- 1818-0082, Surface Probe
- 1818-0085, Air Duct Probe

#### SPECIFICATIONS

- Measurement Range:** -83.2 to 1999°F (-64 to 1400°C).
- Operating Temperature:** 32 to 122°F (0 to 50°C).
- Accuracy:** ± 1% of reading or 1.8°F (1.0°C).
- Probe Connection:** K type mini-jack.
- Resolution:** 0.1°F/°C.
- Power Requirements:** 3 V CR2032 lithium metal battery, installed functional, user replaceable.
- Battery Life:** Estimated 100 hours continuous use.
- Weight:** 1.42 oz (40.15 g).
- Agency Approvals:** CE.

#### OPTION

For NIST traceable calibration certificate, use order code NISTCAL-TG.

TEST EQUIPMENT

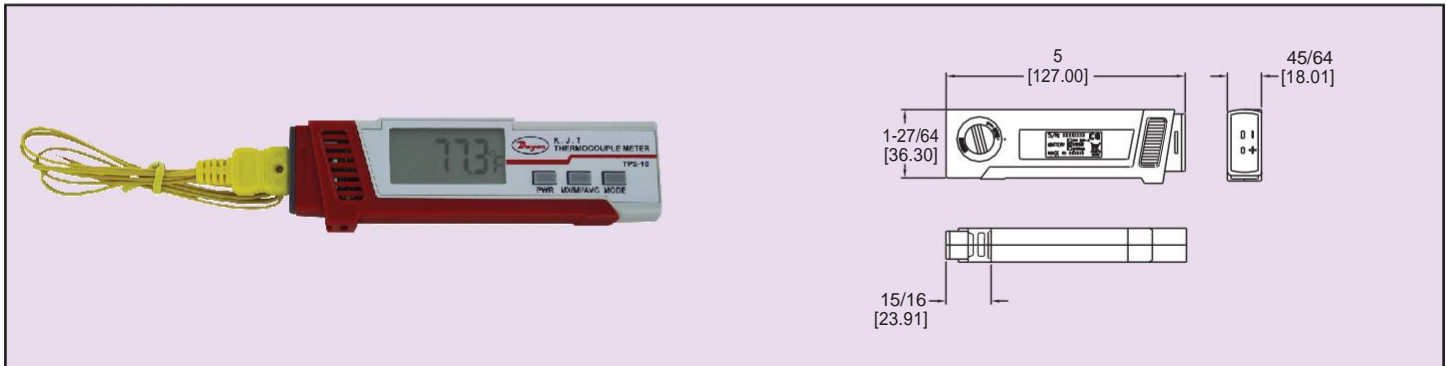
Thermometers,  
Thermocouple



Series  
TP2

# Thermocouple Thermometer

J/K/T Type Thermocouple Inputs; Ambient Temperature and RH



The Series TP2 Thermocouple Thermometers can accurately measure a large temperature range for a wide range of applications including food, safety inspection, lab testing, and HVAC. This hand-held thermometer offers three models that measure the probe temperature, ambient temperature, and relative humidity. Additional features include a data hold function, high/low audible alarm, and auto power off. Device includes a K type probe and battery.

Model	Thermocouple Input	Ambient Temperature/Relative Humidity
TP2-10	J/K/T	None
TP2-20	J/K/T	Ambient Temperature
TP2-30	K	Ambient Temperature and Relative Humidity

#### ACCESSORIES

- 1818-0074, Immersion probe
- 1818-0078, Penetration probe
- 1818-0082, Surface probe
- 1818-0085, Air duct probe
- 1718-0077, Remote probe handler

#### SPECIFICATIONS

##### Range:

- K: -328 to 2372°F (-200 to 1300°C);
- J: -202 to 1652°F (-130 to 900°C);
- T: -328 to 662°F (-200 to 350°C).

##### Accuracy:

- K: ±0.3% of reading + 1°C;
- J/T: ±0.1% of reading + 0.7°C.

##### Display:

##### Resolution:

- K: 0.1°F/°C: -328 to 1202°F (-200 to 650°C); 2°F/1°C (others); Over 1000°C 1°F/°C.
- J: 0.1°F/°C: -202 to 932°F (-130 to 500°C); 2°F/1°C (others);
- T: 0.1°F/°C: -328 to 662°F (-200 to 350°C).

##### Temperature Limits:

Ambient -4 to 122°F (-20 to 50°C).

##### Power Requirements:

3 V CR2032 Lithium metal battery included, user replaceable.

##### Agency Approvals:

CE.

1-5/8" [41.28]



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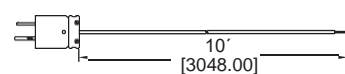
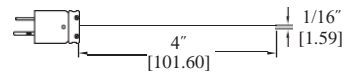
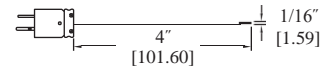
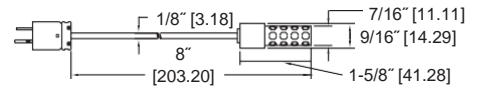
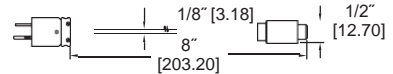
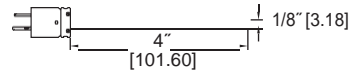
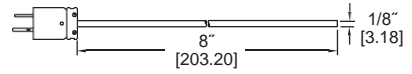


# Hand Held Thermocouples

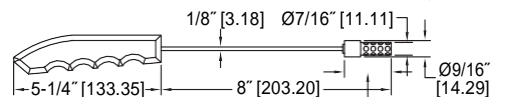
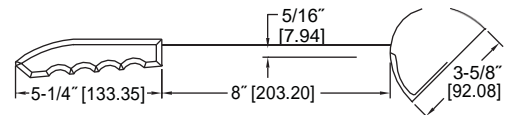
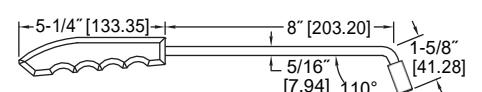
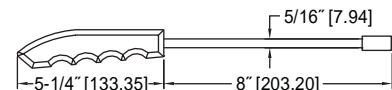
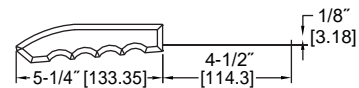
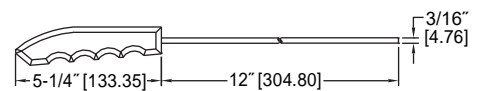
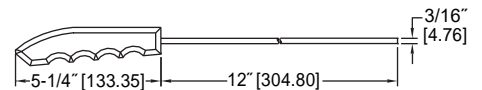
TEST EQUIPMENT

Hand Held Thermocouples

Description	Model	T/C Type
<b>Master Probe Handle</b> Probes plug into the master probe handle. The handle has a mini-jack at one end and a coiled cable with mini-plug on the other. Individual probes may be connected to allow easy reach to your process.	<b>1718-0076</b> <b>1718-0077</b>	J K
<b>Immersion Probe</b> This general purpose probe can be used in liquids and gases. Includes mini plug.	<b>1818-0073</b> <b>1818-0074</b>	J K
<b>Penetration Probe</b> Used for penetrating meat, plastic, rubber, asphalt, or other semi-soft materials. Includes mini plug.	<b>1818-0077</b> <b>1818-0078</b>	J K
<b>Surface Probe</b> For flat or semi-flat surfaces of metal, paper or plastic. Small gage spring contoured tip allows fast response. Includes mini plug.	<b>1818-0081</b> <b>1818-0082</b>	J K
<b>Air Duct Probe</b> Measures temperature in ducts for air or compatible gases, environmental chambers, ovens, rooms, etc. Perforated shield has good air flow and prevents heating by radiation. Includes mini plug.	<b>1818-0084</b> <b>1818-0085</b>	J K
<b>Exposed Junction Probe</b> Small gauge tip allows high sensitivity and quick response. The thermocouple junction is exposed for readings in air or compatible gases. Includes mini plug.	<b>1818-0088</b> <b>1818-0089</b>	J K
<b>Needle Probe</b> Small diameter penetrating probe gives fast response in soft materials and liquids. Made with mineral insulated sheath for extra durability. Includes mini plug.	<b>1818-0092</b> <b>1818-0093</b>	J K
<b>Bare Tip Probe</b> This probe consists of 10' of 24 gauge wire with fiberglass braided cable and a bare wired junction. Shipped with a spool for easy storage. Includes mini plug.	<b>1558-0030</b> <b>1558-0013</b>	J K



Description	Model	T/C Type
<b>General Purpose Probe</b> Featuring a built-in handle with coiled cord and mini-plug, this general purpose probe can be used in liquids and air compatible gases. For use to 800°F.	<b>1718-0001</b> <b>1718-0002</b>	J K
<b>High Temperature General Purpose Probe</b> Featuring a built-in handle with coiled cord and mini-plug, this general purpose probe can be used in liquids and air compatible gases. For use to 1600°F.	<b>1718-0005</b> <b>1718-0006</b>	J K
<b>Penetration Probe</b> Featuring a built-in handle with coiled cord and mini-plug, this probe is used for penetrating meat, plastic, rubber, asphalt, or other semi-soft materials.	<b>1718-0014</b> <b>1718-0015</b>	J K
<b>Straight Surface Probe</b> Featuring a built-in handle with coiled cord and mini-plug, this probe is used for flat or semi-flat surfaces of metal, paper or plastic. Small gauge spring contoured tip allows fast response.	<b>1718-0008</b> <b>1718-0009</b>	J K
<b>Angled Surface Probe</b> Featuring a built-in handle with coiled cord and mini-plug, this probe is used for flat or semi-flat surfaces of metal, paper or plastic. Small gauge spring contoured tip allows fast response.	<b>1718-0011</b> <b>1718-0012</b>	J K
<b>Round Surface Probe</b> Featuring a built-in handle with coiled cord and mini-plug, this probe measures temperature in ducts for rollers, convex surfaces. Spring stainless steel replaceable band stretched across C-shaped bow.	<b>1718-0022</b> <b>1718-0023</b>	J K
<b>Air Duct Probe</b> Featuring a built-in handle with coiled cord and mini-plug, this probe measures temperature in ducts for air or compatible gases, environmental chambers, ovens, rooms, etc. Perforated shield allows good air flow and prevents heating by radiation.	<b>1718-0018</b> <b>1718-0019</b>	J K



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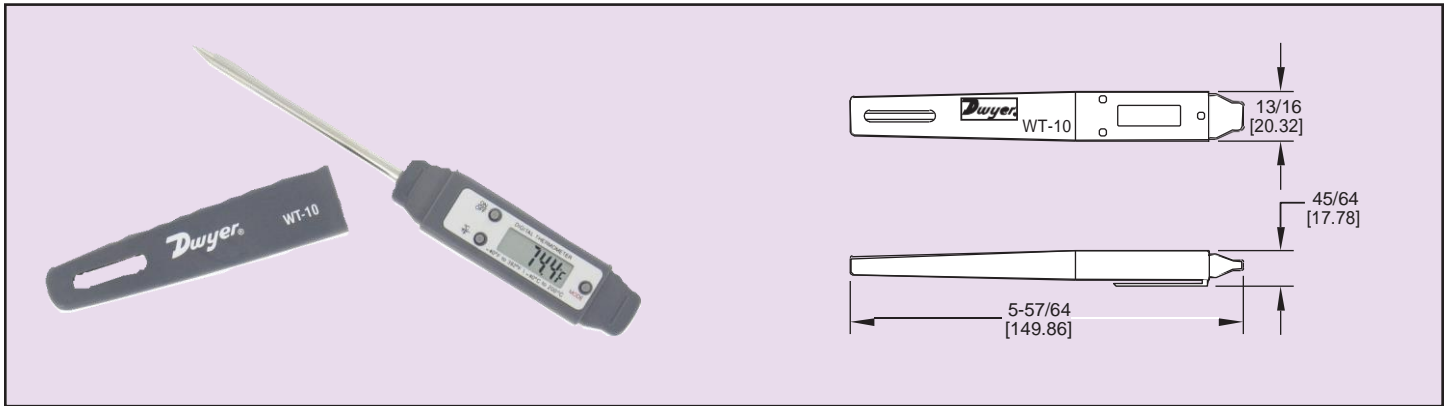




Model  
WT-10

# Waterproof Thermometer

Stainless Steel Stem, Selectable °F or °C, Max/Min Recall, Auto Off



Completely submersible, the pocket size Model WT-10 Waterproof Thermometer is designed with a waterproof housing and a 2.75" (70 mm) SS stem. The unit offers dual scale temperature measurements up to 392°F (200°C) on the 3-digit LCD display. The WT-10 comes complete with protective cover to store the unit while not in use. The features include MAX/MIN recall of high and low temperatures, hold, switchable °F or °C and auto shut off. Ideal applications include laboratory, food and beverage, HVAC and scientific markets.

Model WT-10, Waterproof Thermometer

#### OPTION

For NIST traceable calibration certificate, use order code NISTCAL-TG.

#### SPECIFICATIONS

**Temperature Range:** -40 to 392°F (-40 to 200°C).

**Accuracy:** ±2°F (±1°C) from -14 to 212°F (-26° to 100°C); all other temperature ranges ±3°F (±2°C).

**Display:** 3-digit LCD.

**Resolution:** 0.1°F/°C.

**Response Time:** 1 s.

**Power Requirements:** 1.5 V LR44 alkaline battery, installed functional, user replaceable.

**Battery Life:** Approximately 1 year.

**Construction:** 2.75" (70 mm) SS pointed stem and ABS waterproof housing.

**Weight:** 0.7 oz (20 g).

**Agency Approvals:** CE.

TEST EQUIPMENT

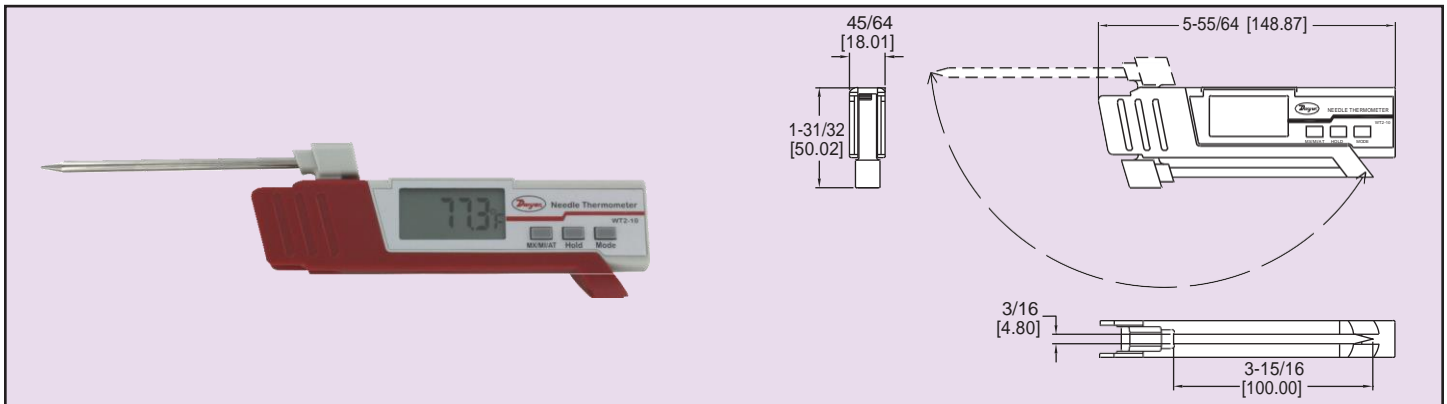
Thermometers,  
Immersion



Model  
WT2-10

# Retractable Needle Thermometer

Folding Stainless Steel Probe, Ambient Temperature, 0.1° C/F



The Model WT2-10 Stainless Steel Needle Thermometer provides accurate measurements for testing internal temperatures during food safety inspections. A retractable penetration probe automatically shuts off the meter when closed, as well as protects the user from the sharp tip while not in use. Additional features include minimum and maximum readings, audible and visual alarms, and a measurement hold function. Besides the probe temperature, the Model WT2-10 also measures the ambient air temperature.

Model WT2-10, Retractable Needle Thermometer

#### SPECIFICATIONS

**Range:** -40 to 302°F (-40 to 150°C).

**Accuracy:** ±1°F @ -4 to 248°F (1°C @ -19.99 to 119.9°C); ±2°F/C (others).

**Temperature Limits:** Ambient: -4 to 122°F (-20 to 50°C).

**Display:** 4 digit LCD.

**Resolution:** 0.1° F/C.

**Power Requirements:** 3 V CR2032 Lithium metal battery, included, user replaceable.

**Sensor:** Thermistor.

**Probe Diameter:** 0.19" (4.8 mm).

**Enclosure Rating:** IP54.

**Weight:** 3.2 oz (91 g).

**Agency Approvals:** CE.



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Model  
MIT

# Miniature Infrared Non-Contact Thermometer

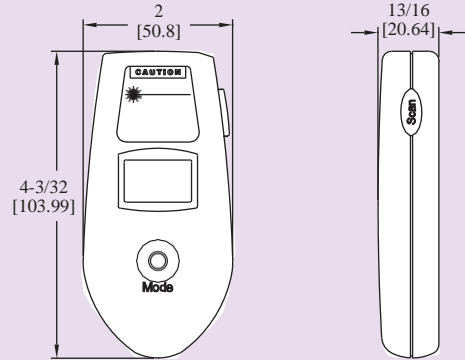
6:1 Distance-to-Target Ratio with Laser Sighting



TEST EQUIPMENT



Scan here to watch product video



The Model MIT Miniature Infrared Temperature Thermometer is the ultimate portable infrared solution. This unit has features such as MIN and MAX temperature, adjustable emissivity, battery life indicator, and laser sighting. This affordable thermometer also has a 6 to 1 distance to target ratio in key chain size housing.

Model MIT, Miniature Infrared Non-Contact Thermometer

## SPECIFICATIONS

**Measurement Range:** -67 to 482°F (-55 to 250°C).

**Operating Range:** 32 to 122°F (0 to 50°C).

**Accuracy:** 2% of reading or 4°F (2°C), whichever is greater.

**Resolution:** 0.1°F/0.1°C (switchable).

**Response Time:** 1 s.

**Distance To Target:** 6:1 optics ratio.

**Emissivity Range:** 0.95 default – adjustable 0.05 to 1.00 emissivity.

**Power Requirements:** (3) 3 V CR2032 lithium metal batteries, (2) installed functional, (1) included, user replaceable.

**Battery Life:** Typical 40 hours of continuous use (auto power off after 15 seconds).

**Weight:** 2.29 oz (65 g) including batteries.

**Agency Approvals:** CE.

Thermometers,  
Infrared



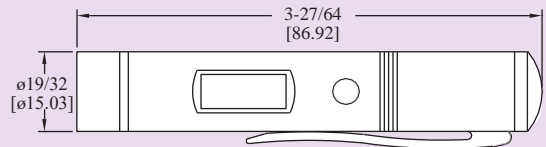
Model  
PIT

# Pocket Size Infrared Thermometer

1:1 Distance to Target Ratio, Pocket Clip



Scan here to watch product video



The Model PIT Pocket Size Infrared Thermometer is the most portable infrared thermometer on the market. The sturdy mounting clip can be attached to any pant or shirt pocket. The Model PIT can be field selected to read in °F or °C. The compact size and single button operation allow users to take quick accurate temperature readings.

Model PIT, Pocket Size Infrared Thermometer

## SPECIFICATIONS

**Measurement Range:** -27 to 428°F (-33 to 220°C).

**Accuracy:** ±2%.

**Resolution:** 0.1°F or °C.

**Distance to Target Ratio:** 1:1.

**Emissivity:** Fixed at 0.95.

**Power Requirements:** (2) 1.5 V button cell alkaline batteries, installed functional, user replaceable.

**Weight:** 4 oz (113.4 g).



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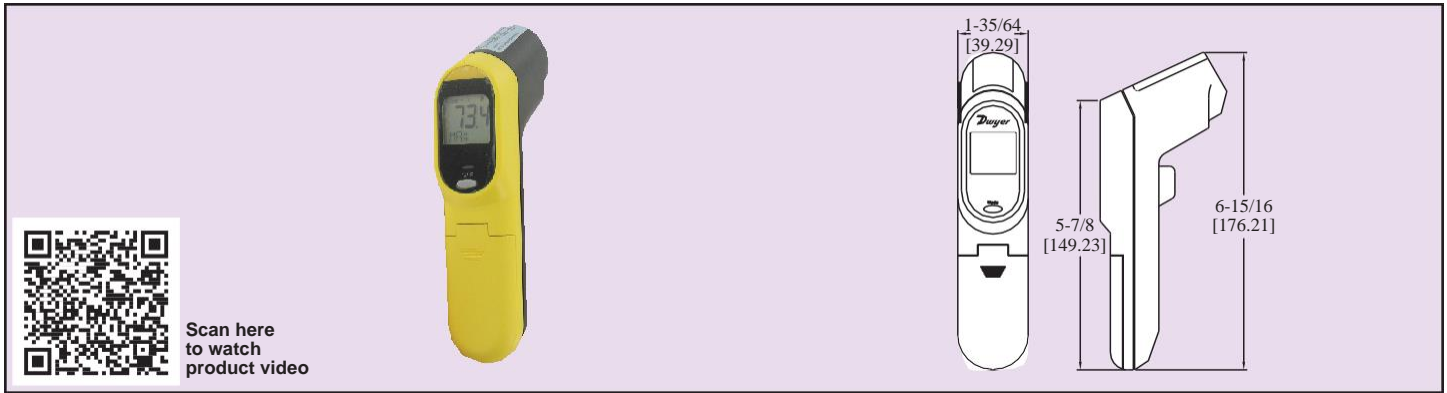


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# Model IR2 Infrared Non-Contact Thermometer

## 12:1 Distance-to-Target Ratio, Laser Sighting



The Model IR2 Infrared Temperature Thermometer allows users to economically take accurate measurements in hard to reach areas. Measurements can be taken at a safe distance with a 12:1 Distance to Target Ratio. The IR2 easily takes measurements within 2% accuracy using a built-in laser sighting. The fixed emissivity of 0.95 is perfect for measuring surface temperatures of concrete, asphalt, rubber or oxidized metals. Besides reading the process temperature, the back lit display also reads the maximum temperature seen. Excellent for monitoring surface temperatures of air ducts, boilers, engines or light fixtures.

Model IR2, Infrared Temperature Thermometer

### SPECIFICATIONS

- Measurement Range:** -76 to 932°F (-60 to 500°C).
- Operating Range:** 32 to 122°F (0 to 50°C).
- Accuracy:** 2% of reading or 4°F (2°C), whichever is greater.
- Resolution:** 0.1°F/0.1°C.
- Response Time:** 1 s.
- Distance to Target:** 12:1.
- Emissivity:** 0.95 fixed.
- Power Requirements:** (2) AAA alkaline batteries, included, user replaceable.
- Battery Life:** 180 hours continuous use (auto power off after 15 sec).
- Weight:** 3.61 oz (102 g).
- Agency Approvals:** CE.

TEST EQUIPMENT

Thermometers,  
Infrared



Model IR3 & IR4

# Infrared Temperature Thermometer

## Up to 20:1 Distance-to-Target Size Ratio, Thermocouple Input



The Model IR3 and IR4 Infrared Thermometers utilize infrared technology for precise, non-contact temperature measurement. For standard applications, the 12:1 distance to target ratio on the IR3 provides accurate measurements within 2% of reading. When measuring smaller objects or at greater distances, the 20:1 distance to target ratio of the IR4 can provide measurements within 1% of reading. Both models have single point laser sighting for aligning the beam to the target. In addition, both models can display maximum, minimum, differential and average temperature measurements. Adjustable emissivity allows the thermometers to measure the temperature of most surfaces without any external calculations. A K-type thermocouple can plug into the handle of the thermometers in order to take surface and internal temperatures simultaneously. Audible alarms can be used to for safety checks.

Model IR3, Infrared Temperature Thermometer  
Model IR4, Infrared Temperature Thermometer

### SPECIFICATIONS

- Measurement Range:** -76 to 932°F (-60 to 500°C).
- Operating Range:** Ambient: 32 to 122°F (0 to 50°C).
- Accuracy:** IR3: ±2% of reading or 4°F (2°C); IR4: ±1% of reading or 1.8°F (1°C), whichever is greater.
- Resolution:** 0.1°F/0.1°C.
- Response Time:** 1 s.
- Distance to Target:** IR3: 12:1; IR4: 20:1.
- Emissivity Range:** 0.95 adjustable; 0.5 to 1.0.
- Additional Input:** Type K.
- Power Requirements:** (2) AAA alkaline batteries, included, user replaceable.
- Battery Life:** 180 hours (without laser or LCD backlight).
- Weight:** 6.3 oz (179 g) with batteries.
- Agency Approvals:** CE.



tetisan







Series  
IR6/IR7

# Dual Laser Extended Range Infrared Thermometer

Up to 50:1 Distance to Target Ratio

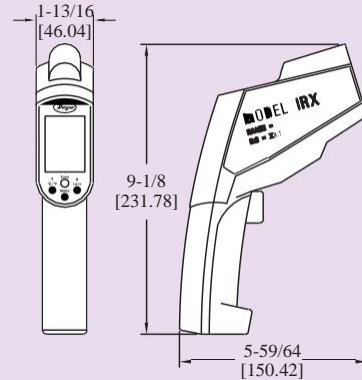


TEST EQUIPMENT

Thermal Imaging Camera



Scan here to watch product video



The Series IR6/IR7 Dual Laser Extended Range Infrared Thermometer is ideal for accurately measuring surface temperatures from long distances. This feature packed handheld device allows the user to read the max/min, average, and differential readings. The high and low alarms give audible and visual indication of the process temperature. When taking measurements in dark areas, a built-in white light can be used to illuminate the measurement area. For long term measurements, the unit includes a dual magnetic base attachment that allows hands-free measurements.

## SPECIFICATIONS

**Measurement Range:** IR6: -76 to 1600°F (-60 to 900°C); IR7: -76 to 1832°F (-60 to 1000°C).  
**Operating Range:** 32 to 122°F (0 to 50°C).  
**Accuracy:** ±2% of readings or 4°F (2°C) whichever is greater.  
**Resolution:** 0.1°F (0.1°C).  
**Response Time:** 1 s.  
**Distance to Target:** IR6: 30:1; IR7: 50:1.  
**Emissivity:** 0.95 default – adjustable 0.10 to 1.00 in 0.01 steps.  
**Power Requirements:** (2) AAA alkaline batteries, included, user replaceable.  
**Battery Life:** 180 hours continuous use.  
**Units:** User selectable F or C.  
**Weight:** 13.62 oz (386.1 g).  
**Agency Approvals:** CE.

Model	Distance to Target Ratio	NIST
IR6	30:1	No
IR7	50:1	No
IR6-NIST	30:1	Yes
IR7-NIST	50:1	Yes



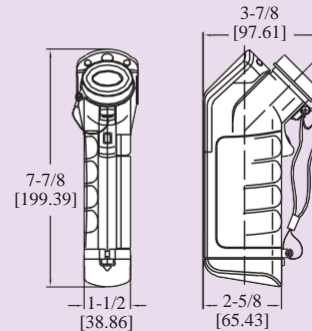
Series  
TIC

# Thermal Imaging Camera

160 x 120 Resolution, Visual Light/Thermal Blended View



Scan here to watch product video



The Series TIC Thermal Imaging Camera allows users to see heat contrasts to prevent plant equipment failures, detect air leaks in buildings, and many more applications. Infrared radiation is given off by objects according to how warm they are, and the camera translates the measured levels into visual light on the bright 2.5" 160 x 120 resolution LCD. For increased differentiation among temperatures, the camera can automatically adjust the color band for a narrower range of temperatures throughout the -4 to 482°F (-20 to 250°C) temperature range of the camera. Besides taking spot measurements, the camera can also be set for isothermal, area, or profile analysis. All cameras include a Li-Ion battery, battery charger, docking station, SD memory card, SD memory card reader, sun shield, lens cap, video cable, standard reporting software, and a calibration report. A Bluetooth® earphone and USB cable are also included in TIC-30 units for making voice annotations and real time recording.

Up to 9 movable temperature spots can be selected to get specific temperature measurements of objects on the display. On the TIC-20 and TIC-30, there are flash, visual light camera, and a laser pointer to help identify the objects in the picture better. The visual image can be blended with the thermal image for better illustration of where the hot or cold spots are in the image.

## SPECIFICATIONS

**Range:** -4 to 482°F (-20 to 250°C).  
**Accuracy:** ±2° C or ±2% of reading (whichever is greater).  
**Detector Type:** Focal Plane Array (FPA), uncooled microbolometer.  
**IR Resolution:** 160 x 120.  
**Visual Light Resolution:** 640 x 480 full color (TIC-20/TIC-30).  
**Display:** 2.5" TFT LCD.  
**Spectral Range:** 8 – 14 μm.  
**Field of View:** 20° x 15° (minimum 0.1 m).  
**I.F.O.V.:** 2.2 MRAD.  
**Thermal Sensitivity:** 0.1°C @ 30°C.

**Temperature Limits:** Ambient: 5 to 122°F (-15 to 50°C); Storage: -40 to 158°F (-40 to 70°C).  
**Humidity Limits:** 95% @ 77 to 104 F (non-condensing).  
**Power Requirements:** 7.2 V SON. FA-70 lithium ion battery, included, user replaceable or AC adapter.  
**Laser Pointer:** 1 mW / 635 nm red (TIC-20 / TIC-30 only).  
**Memory:** Up to 16 GB SD Card.  
**Shock/Vibration Rating:** 25 G/2 G.  
**Housing Rating:** IP54.  
**Weight:** 500 g.  
**Agency Approval:** CE.

## ACCESSORIES

A-TIC-CC, Hard carrying case  
A-TIC-AC, AC power adapter  
A-TIC-PC, Car charger  
A-TIC-BA, Replacement battery for Series TIC  
A-TIC-BC, Replacement battery charger

Model	Analysis Tools						Visual Camera
	# of Spots	Auto Hot/Cold Spot	ΔT	Isotherm	Area	Profile	
TIC-10	1	Yes	Yes	No	No	No	No
TIC-20	4	Yes	Yes	Yes	No	No	Yes
TIC-30	9	Yes	Yes	Yes	Yes	Yes	Yes

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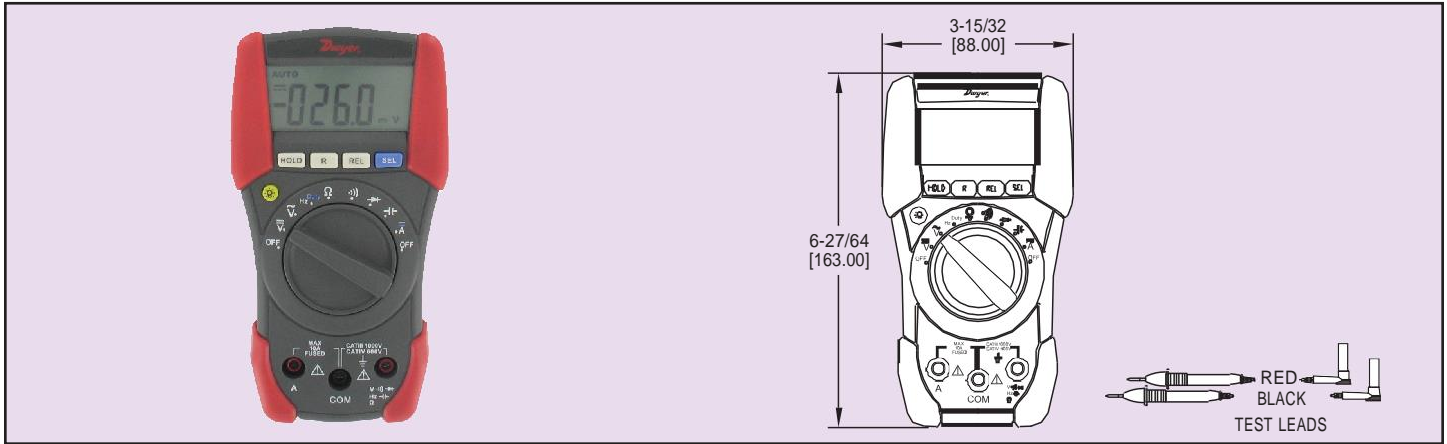
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Model  
MM-1

# Digital Auto-Range Multimeter

Measures DC/AC Voltage, DC/AC Current, Resistance, Frequency, Capacitance



Our compact, low cost **Model MM-1 Digital Auto-Range Multimeter** is ideal for general electrical testing and troubleshooting. This full function multimeter measures DC and AC voltage to 600 V, DC and AC current to 10 A and resistance to 400  $\Omega$ . In addition to volts, amps and ohms, this meter includes audible continuity, diode, LED and transistor hFE tests. The rotary switch allows you to select from any of the functions quickly and easily. The 4 digit backlit LCD features value, mode, and low battery indication. The rugged, high impact case is double injected for excellent strength and durability. The Model MM-1 is furnished with black and red test leads, batteries and carrying case with belt loop.

Model MM-1, Digital Auto-Range Multimeter

## SPECIFICATIONS

**Overvoltage Category:** CAT IV 600 V, CAT III 1000 V.

**DC Voltage:** 0.1 mV to 600 V (0.8% + 2 digit).

**AC Voltage:** 0.001 V to 600 V (0.8% + 3 digit).

**DC Current:** 0.01 A to 10 A (1.2% + 3 digit).

**AC Current:** 0.01 A to 10 A (1.2% + 3 digit).

**Resistance:** 400, 4K, 40K, 400K, 4M, 40M  $\pm$  (1.0% + 2 digit).

**Protection:** 600 Vrms.

**Continuity Test:** Audible buzzer.

**Frequency:** 0.01 Hz to 99.99 kHz.

**Duty Cycle:** 20 to 80%  $\pm$  (1.0% + 5 digit).

**Capacitance:** 5n, 50n, 500n, 5 $\mu$ , 50 $\mu$ , 100 $\mu$ F  $\pm$  (3% + 5 digit).

**Display:** Backlit, 4000 counts plus decimal point.

**Sampling Rate:** 2.5 x per s.

**Power Requirements:** (2) AAA alkaline batteries, included, user replaceable.

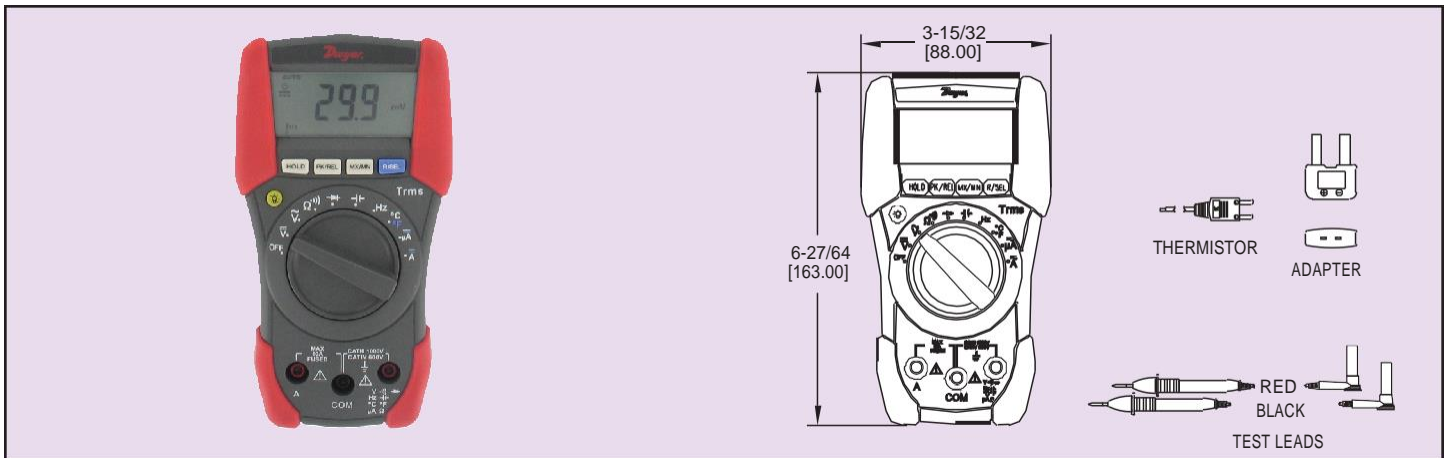
**Weight:** 23.5 oz (666 g).



Model  
MM-2

# Digital Multimeter with True RMS

Measures DC/AC Voltage, DC/AC Current Resistance, 4000 Count Digital Display



Our compact, low cost **Model MM-2 Digital Multimeter with True RMS** is ideal for general electrical testing and troubleshooting. This full function multimeter measures DC voltage to 1000 V and AC voltage to 750 V, DC and AC current to 10 A and resistance to 400  $\Omega$ . In addition to volts, amps and ohms, this meter includes audible continuity, diode, LED and transistor hFE tests. The rotary switch allows you to select from any of the functions quickly and easily. The 4 digit backlit LCD features value, mode, and low battery indication. The rugged, high impact case is double injected for excellent strength and durability. The Model MM-2 is furnished with black and red test leads, battery, thermistor with input adapter, and carrying case with belt loop.

Model MM-2, Digital Multimeter with True RMS

## SPECIFICATIONS

**Overvoltage Category:** CAT IV 600 V, CAT III 1000 V.

**DC Voltage:** 0.1 mV to 1000 V (0.5% + 2 digit).

**AC Voltage:** 0.1 mV to 750 V (1.3% + 5 digit).

**DC Current:** 0.1  $\mu$ A to 10 A (1.0% + 3 digit).

**AC Current:** 0.1  $\mu$ A to 10 A (1.5% + 5 digit).

**Resistance:** 400, 4K, 40K, 400K, 4M, 40M  $\pm$  (1.0% + 2 digit).

**Protection:** 1000 Vrms.

**Continuity Test:** Audible buzzer.

**Frequency:** 1 Hz to 40 MHz.

**Capacitance:** 4n, 40n, 400n, 4 $\mu$ , 40 $\mu$ , 400 $\mu$ , 4m, 40mF  $\pm$  (1% + 5 digit).

**Temperature:** -40 to 1382°F (-40 to 800°C).

**Display:** Backlit with bar graph. 4000 counts plus decimal point.

**Sampling Rate:** 2.5 x per s.

**Power Requirements:** 9 V alkaline battery, included, user replaceable.

**Weight:** 23.5 oz (666 g).



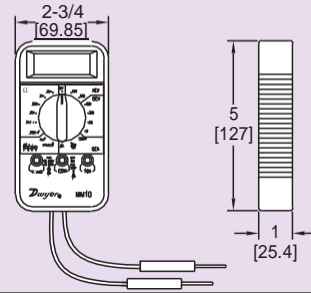
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Model  
MM10

# Digital Multimeter

Measures DC /AC Voltage, DC Current and Resistance, Overload Protection



Our compact, low cost Model MM10 Digital Multimeter is ideal for general electrical testing and troubleshooting. This full function multimeter measures DC and AC voltage to 600 V, DC current to 10 A and resistance to 20 MΩ. In addition to volts, amps and ohms, this meter includes audible continuity, diode, LED and transistor hFE tests. The 3-1/2 digit LCD features automatic polarity correction, low battery and overload indication. Rugged, high impact case comes equipped with built-in tilt-stand for versatile, hands-free operation. Overload protected to 600 VAC/600 VDC for voltage ranges and to 500 VAC/500 VDC for resistance, diode and continuity test ranges. Current ranges are protected by 0.5A/250V, replaceable fuse. Multimeter is furnished with 22" test leads, 9 V battery and instruction manual.

Model MM10, Digital Multimeter

## SPECIFICATIONS

### DC VOLTAGE

Ranges: 2 V, 20 V, 200 V, 600 V.

Resolution: 1 mV, 10 mV, 100 mV, 1 V.

Accuracy: 2V:  $\pm(0.5\% + 1 \text{ digit})$ ; 20 to 600V:  $\pm(1.5\% + 1 \text{ digit})$ .

### AC VOLTAGE

Ranges: 200 V, 600 V.

Resolution: 100 mV, 1V.

Accuracy: 200V:  $\pm(2\% + 3 \text{ digits})$ ; 600V:  $\pm(2.5\% + 3 \text{ digits})$ .

### RESISTANCE

Ranges: 200 Ω, 2 kΩ, 20 kΩ, 200 kΩ, 2 MΩ, 20 MΩ.

Accuracy: 200 Ω:  $\pm(2\% + 2 \text{ digits})$ ; 2 kΩ to 2 MΩ:  $\pm(1.5\% + 2 \text{ digits})$ ; 20 MΩ:  $\pm(2.5\% + 2 \text{ digits})$ .

### DC CURRENT

Ranges: 2 mA, 20 mA, 200 mA, 10 A.

Resolution: 1 μA, 10 μA, 100 μA, 10 mA.

Accuracy: 2 to 200 mA:  $\pm(1.5\% + 1 \text{ digit})$ ; 10A:  $\pm(2\% + 1 \text{ digit})$ .

## CONTINUITY TEST

Range: < 30 Ω. Resolution: 0.1 Ω.

## DIODE TEST

Resolution: 1 mV.

Test Current: 1 mA.

## TRANSISTOR (hFE) TEST

Type: NPN, PNP.

Range: 0-1000.

## LED TEST

Test Voltage: < 3 V.

Range: 1.5 - 3 V.

## GENERAL

Display: 3-1/2 digit LCD with a maximum reading of 1999.

Sampling Rate: 2.5 times per second.

Ambient Operating Temperature: 32 to 104°F (0 to 40°C), 0 to 80% RH.

Storage Temperature: 14 to 140°F (-10 to 60°C), 0 to 80% RH.

Power Requirements: 9 V alkaline battery, installed functional, user replaceable.

Battery Life: 150 hrs. approx.

Weight: 5.2 oz (150 g).

TEST EQUIPMENT

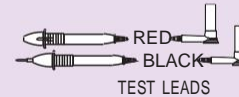
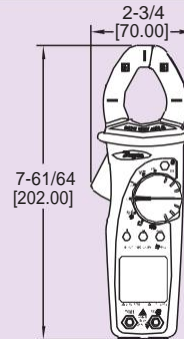
Multimeters



Model  
CM-3

# Digital Clamp Meter with True RMS, Peak Hold and Min/Max

Measures DC/AC Voltage, DC/AC Current, Energy, Resistance



Our compact, low cost Model CM-3 Digital Clamp Meter is ideal for general electrical testing and troubleshooting. A few applications include HVAC, automotive, electrical/power, and environmental monitoring uses. The CM-3 measures DC and AC voltage to 600 V, AC current to 400 A, and resistance to 2000 Ω. The digital clamp meter features data/range hold and auto range buttons to prevent the screen from updating when gathering values, as well as a zero function. Additional features include single and three phase energy measurement, MIN/MAX and average. The 3-3/4 digit backlit LCD features automatic polarity, overload, low battery indication and a bar graph. The Model CM-3 is furnished with red and black test leads, batteries and a carrying case with belt loop.

Model CM-3, Digital Clamp Meter with True RMS, Peak Hold and Min/Max

## SPECIFICATIONS

Over Voltage Category: CAT III 600 V.

AC Voltage: 0.1 V to 600 V  $\pm(1.0\% + 3 \text{ digit})$ .

DC Voltage: 0.1 V to 600 V  $\pm(1.0\% + 3 \text{ digit})$ .

AC Current: 0.1 A to 400 A  $\pm(1.0\% + 3 \text{ digit})$ .

Resistance: 0.1 to 2000 Ω  $\pm(1.0\% + 5 \text{ digit})$ .

Continuity Test: Audible buzzer.

Max Conductor Size: 1.18" diameter (30 mm).

Frequency: 40 Hz to 400 Hz  $\pm(0.5\% + 1)$ .

Active Power Range: 0 to 1000 kW  $\pm(3.5\% + 3)$ .

Display: Backlit with bar graph. 10,000 counts plus decimal point.

Power Requirements: (2) AAA alkaline batteries, included, user replaceable.

Weight: 9.88 oz (280 g).



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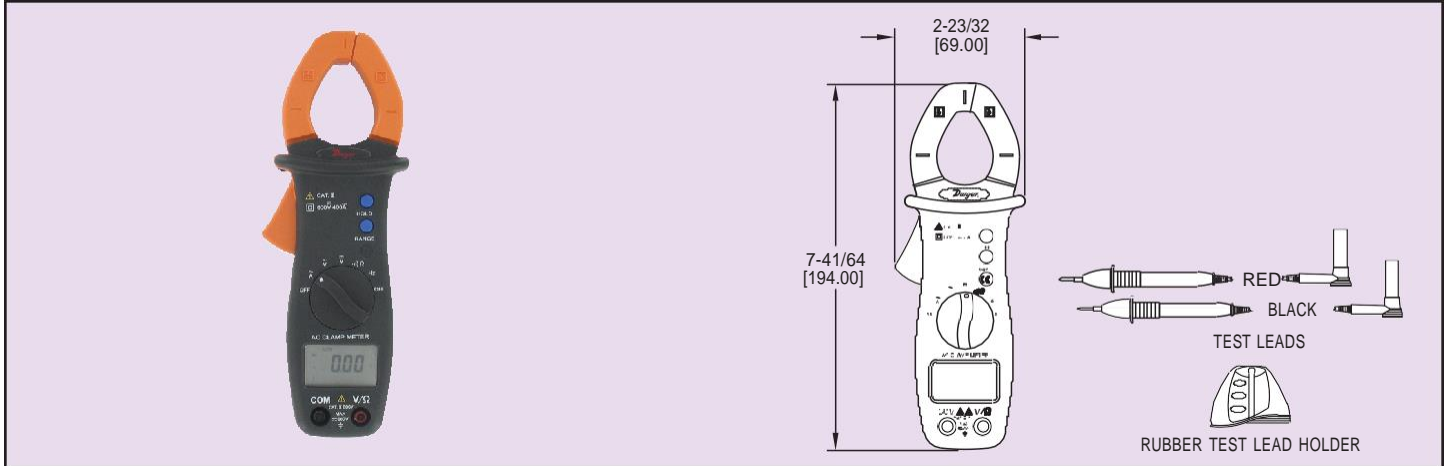
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Model  
CM-1

# Digital Clamp Meter

Measures DC/AC Voltage, AC Current, Resistance, Frequency



The compact, low cost **Model CM-1 Digital Clamp Meter** is ideal for general electrical testing and troubleshooting. A few applications include HVAC, automotive, electrical/power, and environmental monitoring uses. The digital clamp meter measures DC and AC voltage to 600 V, AC current to 400 A, and resistance to 400  $\Omega$ . In addition to volts, amps and ohms, this meter includes a frequency test to 400 Hz. The CM-1 also features data/range hold and auto range buttons to keep the screen from updating when gathering values. The 3-3/4 digit LCD features automatic polarity, overload and low battery indication. The Model CM-1 is furnished with red and black test leads, batteries and carrying case with belt loop.

## SPECIFICATIONS

**Over Voltage Category:** CAT III 600 V.

**AC Voltage:** 0.1 V to 600 V  $\pm$  (1.0% + 5 digit).

**DC Voltage:** 0.1 V to 600 V  $\pm$  (1.0% + 3 digit).

**AC Current:** 0.1 A to 400 A  $\pm$  (2.0% + 10 digit).

**Resistance:** 0.1 to 400  $\Omega$   $\pm$  (1.0% + 5 digit).

**Continuity Test:** Audible buzzer.

**Max. Conductor Size:** 1.18" diameter (30 mm).

**Frequency:** 1 Hz to 400 Hz  $\pm$  (0.8% + 3).

**Display:** 4000 counts plus decimal point.

**Sampling Rate:** 2 x per s.

**Power Requirements:** (2) AAA alkaline batteries, included, user replaceable.

**Weight:** 9.88 oz (280 g).

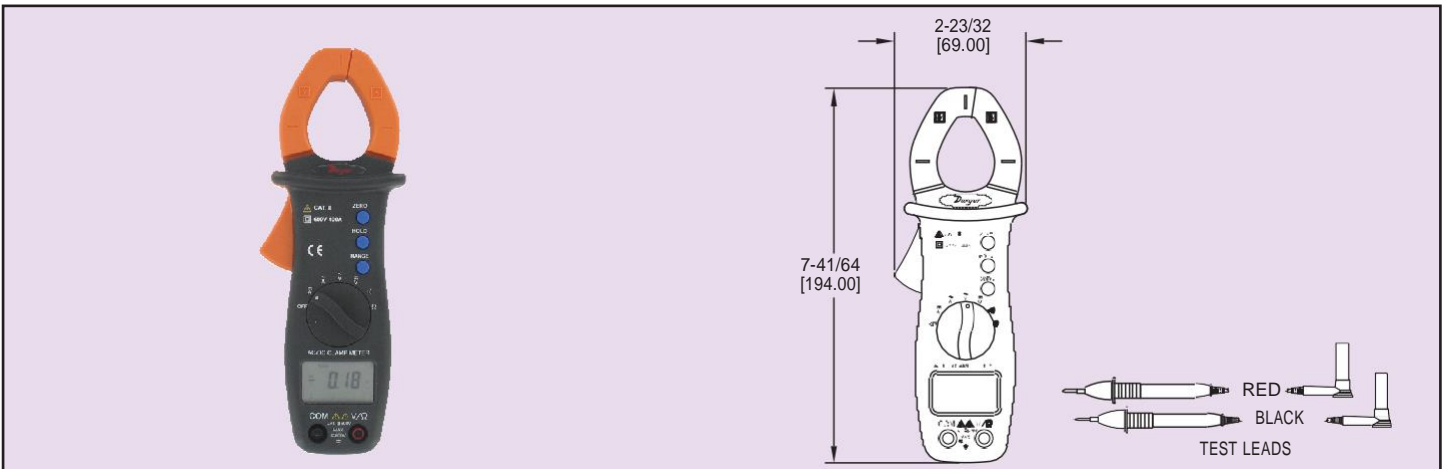
Model CM-1, Digital Clamp Meter



Model  
CM-2

# Digital Clamp Meter with True RMS

Measures DC/AC Voltage, DC/AC Current, Resistance



Our compact, low cost **Model CM-2 Digital Clamp Meter with True RMS** is ideal for general electrical testing and troubleshooting. A few applications include HVAC, automotive, electrical/power, and environmental monitoring uses. The Model CM-2 measures DC and AC voltage to 600 V, DC and AC current to 400 A, and resistance to 40 M $\Omega$ . The digital clamp meter features data/range hold and auto range buttons to prevent the screen from updating when gathering values, as well as a zero function. The 3-3/4 digit LCD features automatic polarity, overload and low battery indication. The Model CM-2 is furnished with red and black test leads, batteries and a carrying case with belt loop.

## SPECIFICATIONS

**Over Voltage Category:** CAT III 600 V.

**AC Voltage:** 0.1 mV to 600 V  $\pm$  (1.0% + 3 digit).

**DC Voltage:** 0.1 mV to 600 V  $\pm$  (0.8% + 2 digit).

**AC Current:** 10 mA to 400 A  $\pm$  (2.0% + 10 digit).

**DC Current:** 10 mA to 400 A  $\pm$  (2.0% + 10 digit).

**Resistance:** 0.1 to 40 M $\Omega$   $\pm$  (1.0% + 3 digit).

**Continuity Test:** Audible buzzer.

**Max. Conductor Size:** 1.18" diameter (30 mm).

**Display:** 4000 counts plus decimal point.

**Sampling Rate:** 2 x per s.

Model CM-2, Digital Clamp Meter with True RMS





**Power Requirements:** (2) AAA alkaline batteries, included, user replaceable.  
**Weight:** 8.64 oz (245 g).



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meter with Phase Rotation

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

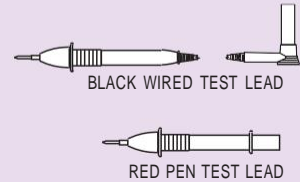
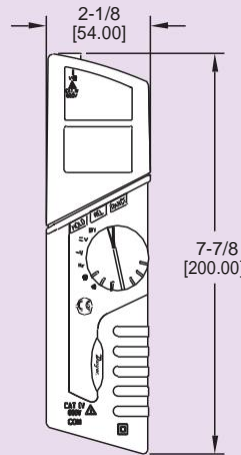




Model  
PM-1

# Digital Pen Meter

Measures DC/AC Voltage, Resistance, Continuity, Diode, Frequency



TEST EQUIPMENT

Pen Multimeters

Our compact, low cost **Model PM-1 Digital Pen Meter** is ideal for general electrical testing and troubleshooting. A few applications include HVAC, automotive, electrical/power, and environmental monitoring uses. This meter measures DC and AC voltage to 600 V and resistance to 40 MΩ. In addition to volts and ohms, the digital pen meter includes continuity, diode, and frequency tests to 10 kHz. This meter features data hold, REL (relative value), and auto range buttons. The 4 digit LCD displays value, mode, and low battery indication. The Model PM-1 is furnished with red and black test leads, batteries and carrying case with belt clip.

Model PM-1, Digital Pen Meter

## SPECIFICATIONS

**Over Voltage Category:** CAT IV 600 V.

**AC Voltage:** 1 mV to 600 V ± (1.0% + 3 digit).

**DC Voltage:** 0.1 mV to 600 V ± (0.8% + 2 digit).

**Resistance:** 0.1 to 40M Ω ± (1.0% + 3 digit).

**Continuity:** Audible buzzer.

**Diode Test:** 1.5 VDC.

**Frequency:** 0.001 Hz to 10 KHz ± (0.8% + 2 digit).

**Display:** 4000 counts plus decimal point.

**Power Requirements:** (2) AA alkaline batteries, included, user replaceable.

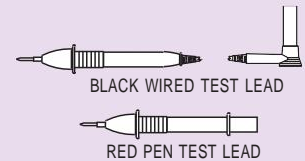
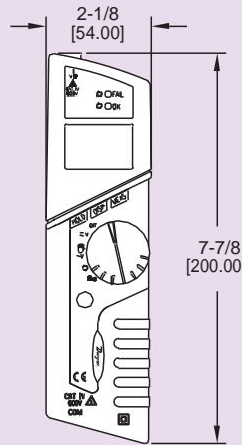
**Weight:** 5.3 oz (150 g).



Model  
PM-2

# Digital Pen Meter with Phase Rotation

Measures DC/AC Voltage, Resistance, Continuity, Frequency and Phase Rotation



Our compact, low cost **Model PM-2 Digital Pen Meter** is ideal for general electrical testing and troubleshooting. A few applications include HVAC, automotive, electrical/power, and environmental monitoring uses. This meter measures DC and AC voltage to 600 V and resistance to 1499 Ω. In addition to volts and ohms, this meter includes continuity, diode, and frequency tests to 69.9 Hz. Along with the mentioned functions, the PM-2 has the ability to perform a phase test from 100 to 600 V. This meter features data hold, display (to show voltage and frequency during AC tests), and clear screen buttons. The 4 digit LCD features value, mode, and low battery indication. The Model PM-2 is furnished with red and black test leads, batteries and carrying case with belt clip.

## SPECIFICATIONS

**Over Voltage Category:** CAT IV 600 V.

**AC Voltage:** 1.5 V to 600 V ± (1.5% rdg + 5 dgt).

**DC Voltage:** 1.5 V to 600 V ± (0.8% rdg + 1 dgt).

**Resistance:** 1 to 1499 ohm ± (1.0% + 5 dgt).

**Continuity:** Audible buzzer.

**Phase Test:** 100 to 600 V.

**Frequency:** 0.1 Hz to 69.9 Hz ± (1.0% + 2 dgt).

**Display:** 6000 counts plus decimal point.

**Power Requirements:** (2) AA alkaline batteries, included, user replaceable.



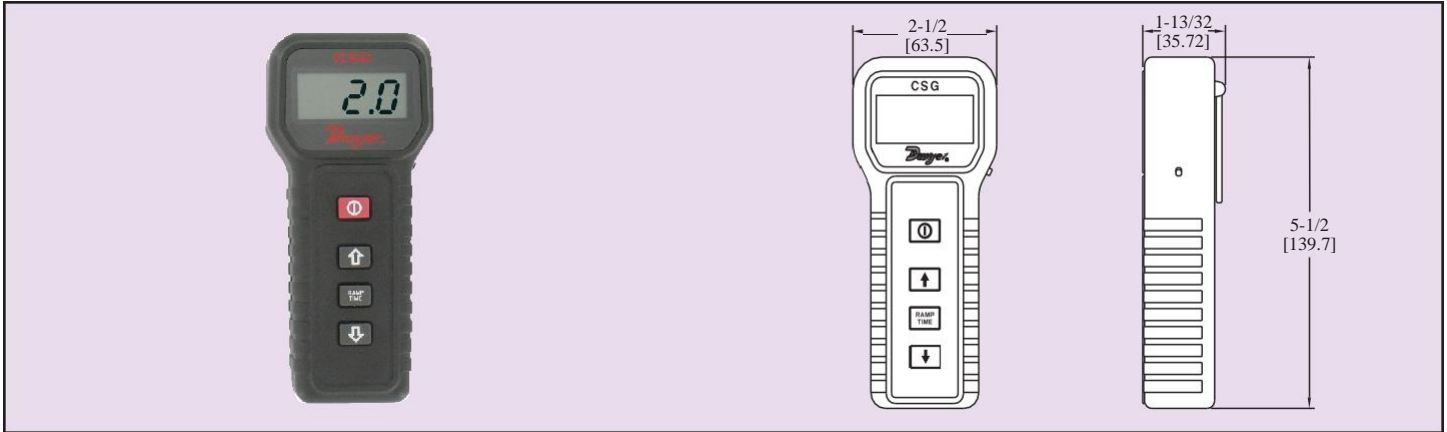
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Model  
CSG

# Current/Voltage Signal Generator

Ramp Function, Large Numeric LCD Display



The pocket size **CSG Current and Voltage Signal Generator** is an ideal tool for troubleshooting transmitters, transducers, motors, and actuators. The unit generates a 0 to 10 VDC signal in increments of 1 volt or a 0 to 20 mA signal in increments of 1 mA. The Model CSG features a large LCD display with a blue backlight for use in dimly lit areas. The Model CSG continuously ramps the output using user selected minimum, maximum, and ramp interval timing parameters. Units are furnished with a battery, 120 VAC plug-in power supply, test leads with alligator clips, carrying case, and instruction manual.

#### FEATURES

- Large backlit display
- Timed ramp function
- Auto power off

Model **CSG**, Current Voltage Signal Generator

#### SPECIFICATIONS

**Impedance:** **Voltage:** 1000 min. **Current:** 300 Ω max.  
**Output:** 0 to 20 mA (1 mA increments); 0-10 VDC (1 VDC increments).  
**Resolution:** 1 mA (current); 1 VDC (voltage).  
**Ramping Time Intervals:** 1 to 20 s (1 s increments).  
**Ambient Operating Temperature:** 32 to 122°F (0 to 50°C).  
**Power Requirements:** 9 V alkaline battery, included, user replaceable or 120 VAC (provided).  
**Auto Power Off:** 1 to 20 min.  
**Electrical Connections:** 6" (1.8 m) with alligator clips.  
**Weight:** 6 oz (170 g).

TEST EQUIPMENT

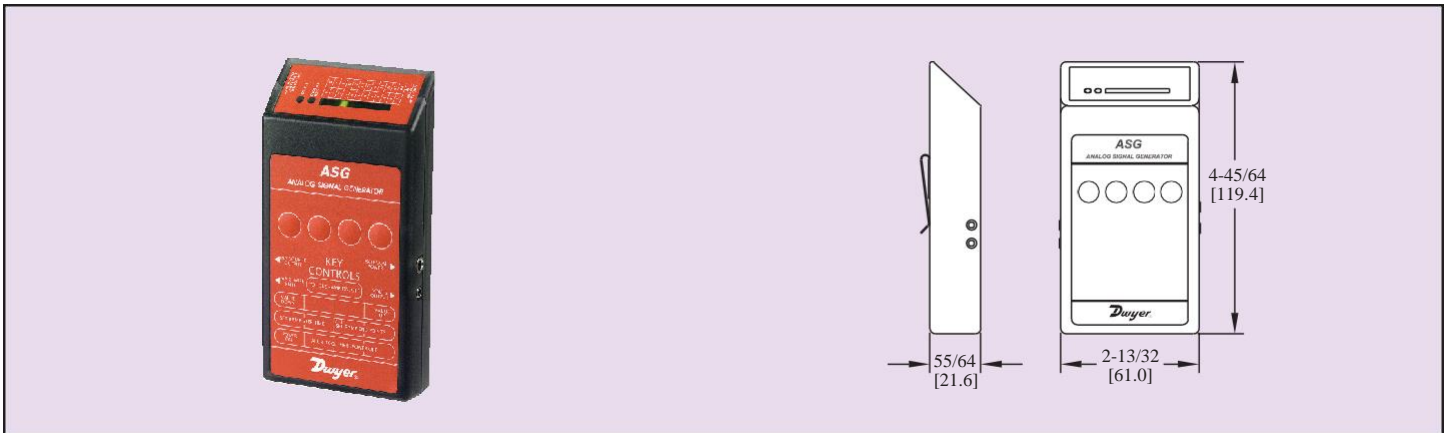
Signal Generators/  
Multimeters



Model  
ASG

# Analog Signal Generator

Ramp Function, Bar Graph LED, Selectable Auto Shut Off



The pocket size **model ASG Analog Signal Generator** is an ideal tool for troubleshooting transmitters, transducers, motors and actuators. The unit generates a 0 to 10 VDC signal in increments of 1 volt or a 4 to 20 mA signal in increments of 2 mA. An LED bar graph visually indicates analog signal level. The model ASG will also continuously ramp to user defined max and min values with user defined ramp interval timing. Units are furnished with 6" (1.8 m) leads with alligator clips, 120 VAC plug in adapter protective carrying case and instruction manual.

Model **ASG**, Analog Signal Generator

#### SPECIFICATIONS

**Impedance:** **Voltage:** 1000Ω min. **Current:** 300 Ω max.  
**Output:** 0 to 20 mA (2 mA increments); 0 to 10 VDC (1 VDC increments).  
**Resolution:** 2 mA (current). 1 VDC (voltage).  
**Ramping Time Intervals:** 2 to 20 sec (2 sec increments).  
**Ambient Operating Temperature:** 32 to 122°F (0 to 50°C).  
**Power Requirements:** 9 V alkaline battery, installed functional, user replaceable or 120 VAC (provided).  
**Auto Shutoff Times:** 2 to 20 min. (2 min. increments) (6 minute default).  
**Electrical Connections:** 6" (1.8 m) with alligator clips.  
**Weight:** 3.2 oz (without battery).

m/min).



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Series  
TAC3

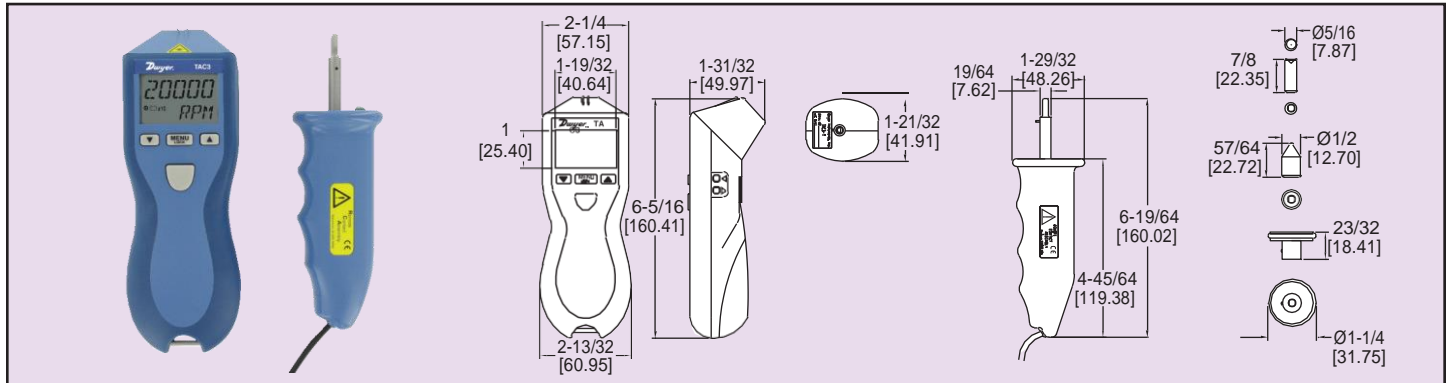
# Pocket Tachometer

Multi-Function, NIST Certified



TEST EQUIPMENT

Tachometers



The Series TAC3 Pocket Tachometer measures and displays rotational speed of saw blades, grinders, engines, motors, and conveyor belts. The unique ergonomic design provides direct line-of-sight viewing of display and target. Easy-to-read 5-digit alphanumeric dual LCD also displays on-target, continuous measurement, laser and low batter indication. Measurements of up to 999,999 can be viewed with the on-screen multiplier. The Model TAC3 is a 32 function tachometer/ratometer, totalizer/counter, and timer. It is programmable to read in English or Metric units. An input socket accepts remote sensing devices and an output socket allows for pulse output to external indicating devices. The Model TAC3 can be tripod mounted and "Locked-On" for accurate and continuous operation. This tachometer also stores min, max, and last measurement in memory. Model TAC3-K Kit comes with tachometer, plastic case, remote contact assembly, concave and convex contact tips, 3.9" (10 cm) circumference contact wheel, N.I.S.T. certification, and 5' (1.5 m) of reflective tape. Optional TAC3-91 Remote Optical Sensor allows this unit to measure rps, rpm, or rph in hard to reach locations.

**Model TAC3**, Pocket tachometer includes 12" of reflective tape and N.I.S.T. certification  
**Model TAC3-K**, Pocket tachometer plus kit

**ACCESSORIES**

**TAC2K-91**, Remote optical sensor includes mounting bracket and 8' (2.5 m) cable (optional 100')  
**TAC-5**, Reflective tape, 5' (1.5 m) roll, 1/2" (13 mm) wide  
**TAC3-1**, Remote contact assembly for TAC3 includes 6' (1.8 m) cable, convex and concave tips and 10 cm contact wheel

**SPECIFICATIONS**

**Accuracy:** Non-contact:  $\pm 0.01\%$  of reading; Contact:  $\pm 0.05\%$  of reading; Timer:  $\pm 0.2$  s.  
**Display:** Dual LCD display (5 digit upper display / scrolling 5 digit alphanumeric lower display).  
**Resolution:** User-selectable from 0.001 to 1 (10 above 99,999); Timer: 0.1 sec.

**Max. Measuring Distance:** 25' and up to 70° from perpendicular.

**Ambient Operating Temperature:** 40 to 105°F (5 to 40°C).

**Power Requirements:** (2) 1.5 V alkaline batteries, included, user replaceable.

**Weight:** 7 oz (210 g).

**Agency Approvals:** CE.

**Measurement Ranges**

Speed Ranges	Model TAC3	Model TAC3K	
Optical*	5 - 200,000 rpm	5 - 200,000 rpm	
Contact Tips*	N/A	0.5 - 20,000 rpm	
10 cm/12" Wheel*	N/A	0.5 - 12,000 rpm	
Linear Menu	Linear Menu	10 cm	12"
Inches/Min*	N/A	1.969 - 78,740	6.000 - 144,000
Feet/Min*	N/A	0.164 - 6,561.7	0.500 - 12,000
Yards/Min*	N/A	0.055 - 2,187.2	0.167 - 4,000.0
Miles/Hour	N/A	0.002 - 74.564	0.006 - 136.36
Centimeters/Min*	N/A	5.000 - 200,000	15.240 - 365,760
Meters/Min*	N/A	0.050 - 2,000.0	0.153 - 3,657.0
Totalizer/Counter	0 - 999,999 counts	0 - 999,999 revolutions**	
Timer (Stopwatch)	99 min, 59 sec, 0.9 sec	99 min, 59 sec, 0.9 sec	

\*Also reads units per second and per hour.

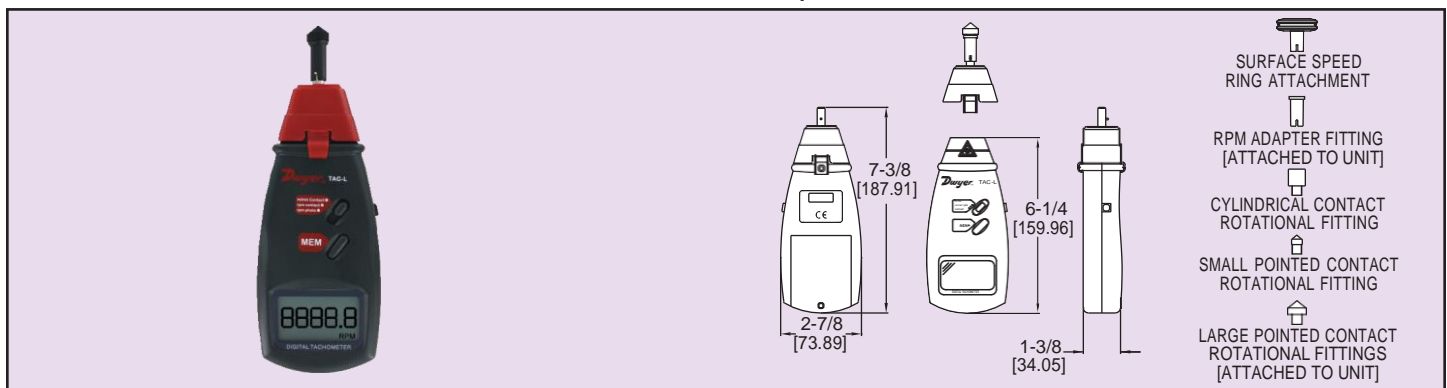
\*\*Also totalizes inches, feet, yards, centimeters, and meters.



Model  
TAC-L

# Portable Digital Tachometer

Contact or Photo Non-Contact Operation, Backlit LCD



**Model TAC-L Portable Digital Tachometer** measures rotational speed either by contacting a rotatable head to the shaft of the object, or using photo sensor to detect the reflections from the laser. The laser target can record from a distance of up to 20 inches and gives a more accurate measurement than LED targeting. Model TAC-L includes a large LCD with a backlight for use in dark areas. This tachometer is made of a strong, lightweight ABS plastic housing, which is designed to comfortably fit in the hand of the user. Supplied with this model are 3 contact rotational heads, a contact surface wheel, and a protective carrying case.

**Model TAC-L**, Contact/Non-Contact Digital Tachometer

**ACCESSORY**

**TAC-5**, Reflective tape, 5' (1.5 m) roll, 1/2" (13 mm) wide



**SPECIFICATIONS:**

**Accuracy:**  $\pm(0.05\% + 1 \text{ digit})$ .  
**Display:** Backlit LCD; 5 digits, 7 segments, 0.7" (1.8 cm) H.  
**Range:** Non-contact (RPM): 2.5 to 99,999 RPM; Contact (RPM): 0.5 to 19,999 RPM; Surface Speed (m/min): 0.05 to 1999.9 m/min.  
**Resolution:** Non-contact (RPM): 0.1 RPM (2.5 to 999.9 RPM), 1 RPM (1000 to 99,999 RPM); Contact (RPM): 0.1 RPM (0.5 to 999.9 RPM), 1 RPM (1000 to 19,999 RPM); Surface Speed (m/min): 0.01 m/min (0.05 to 99.99 m/min), 0.1 m/min (100.0 to 1999.9)

**Non-contact Measuring Distance**

**Range:** 2 to 20" (5 to 50 cm).  
**Sampling Time:** 0.8 s.  
**Temperature Limits:** 32 to 122°F (0 to 50°C).  
**Power Requirements:** (4) 1.5 V AA alkaline batteries, included, user replaceable.  
**Weight:** 1.37 lb (.620 kg).  
**Agency Approvals:** CE, RoHS.





Series  
WPH2

# Waterproof pH Testing Pen

pH and Temperature, Waterproof Large Display



The Series WPH2 pH Testing Pen accurately monitors pH and temperature levels in a variety of applications. This pocket-sized tester is ideal for pH level measurements in lab environments, industrial plants, or field environmental testing. It features an easy to replace electrode and automatically recognizes up to 3 calibration buffer solution ranges. Both pH and temperature, in both English and Metric units, appear on the large dual display. Both the electrode and battery compartment caps are sealed to provide an IP65 weatherproof rating.

Model	pH Ranges	pH Accuracy	pH Resolution
WPH2-10	0 to 14	±.2	.1
WPH2-20	0 to 14	±.05	.01

#### ACCESSORY

WPH2-RS, Replaceable Single Junction Sensor

#### SPECIFICATIONS

**Range:** pH: 0 to 14; Temperature: 32 to 122 F (0 to 50 C).  
**Accuracy:** WPH2-10: ±0.2 pH, ±1°C, WHP2-20: ±0.05 pH, ±0.5°C.  
**Display:** 30 mm H x 18 mm W LCD dual display.  
**Resolution:** WPH2-10: 0.1 pH, 0.1°C/°F, WPH2-20: 0.01 pH, 0.1°C/°F.  
**Operating Temperature Limits:** 32 to 122°F (0 to 50°C).  
**Storage:** 32 to 140°F (0 to 60°C).  
**Humidity Storage Limits:** <90%.  
**Power Requirements:** (4) 1.5 V LR44 alkaline batteries, included, user replaceable.  
**Calibration:** One touch auto-calibration up to 3 points.  
**Enclosure Rating:** IP65.  
**Electrode:** Detachable single junction, KCl filled glass.  
**Weight:** 3.9 oz (110 g).  
**Agency Approval:** CE.

TEST EQUIPMENT

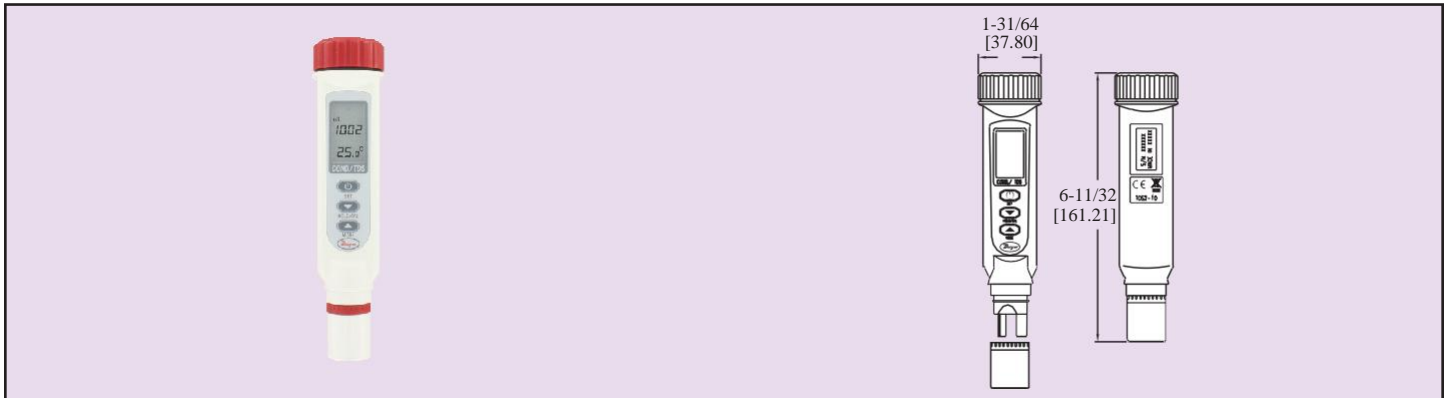
Liquid Analyzers



Model  
TDS2-10

# Waterproof Conductivity/TDS Testing Pen

Conductivity and TDS; ±1% FS Accuracy



The Model TDS2-10 Conductivity/TDS Testing Pen monitors both conductivity and total dissolved solids in streams, rivers, or any other body of water. It picks up impurities and dissolved solids while checking the conductivity at the same time. This pocket sized tester is constructed of a durable ABS plastic waterproof housing and 316 SS electrodes to protect against corrosion. A large LCD display is easy to read and shows both the conductivity/total dissolved solids and temperature measurements simultaneously. Since change in temperature can affect accuracy, the TDS2-10 has automatic temperature compensation. Batteries included in packaging.

Model TDS2-10, Conductivity/TDS Testing Pen

#### SPECIFICATIONS

**Wetted Materials:** ABS plastic and 316 SS.  
**Range:**  
 Conductivity: 0 to 1999 uS or 0 to 19.99 mS;  
 TDS: 0 to 1999 ppm or 0 to 19.99 ppt.  
**Accuracy:** ±1% FS.  
**Display:** 30 mm H x 18 mm W LCD dual display.  
**Resolution:**  
 Conductivity: 1uS or .01 mS;  
 TDS: 1 ppm or .01 ppt.  
**Temperature Limits:** 32 to 122°F (0 to 50°C).  
**Power Requirements:** (4) 1.5 V LR44 alkaline batteries, installed functional, user replaceable.  
**Enclosure Material:** ABS.  
**Enclosure Rating:** IP65.  
**Weight:** 4.3 oz (115 g).



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Model  
WSM-10

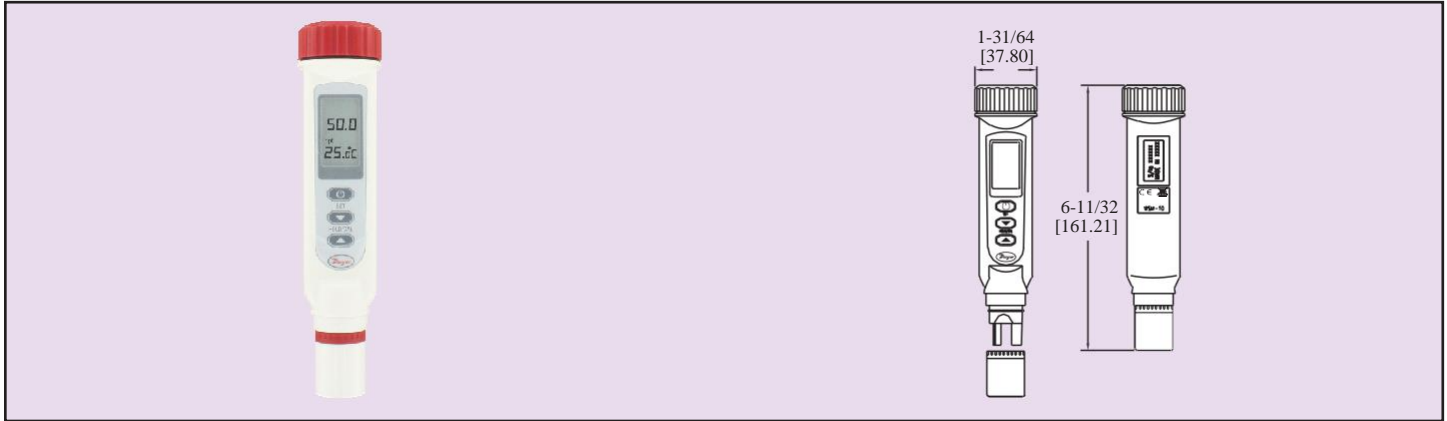
# Waterproof Salinity Testing Pen

Temperature and Salinity;  $\pm 1\%$  FS Accuracy



TEST EQUIPMENT

Liquid Analyzers



The Model WSM-10 Salinity Testing Pen can measure salt concentration of saltwater aquariums, determine the suitability of drinking water, and be used for ecological monitoring of aquatic habitats. This pocket sized tester is constructed of a durable ABS plastic waterproof housing and 316 SS electrodes to protect against corrosion. A large LCD display is easy to read and shows both the salinity and temperature measurements simultaneously. Since change in temperature can affect accuracy, the WSM-10 has automatic temperature compensation to achieve  $\pm 1\%$  accuracy. Batteries are included.

Model WSM-10, Salinity Testing Pen

## SPECIFICATIONS

**Wetted Materials:** ABS plastic and 316 SS.

**Range:** 0 to 10 ppt (NaCl) or 10.1 to 70 ppt (NaCl).

**Accuracy:**  $\pm 1\%$  FS.

**Display:** 30(H) x 18(W) mm LCD dual display.

**Resolution:** .01 ppt or .1 ppt for 0 to 10 ppt range and 10 to 70 ppt range respectively.

**Temperature Limits:** 32 to 122°F (0 to 50°C).

**Power Requirements:** (4) 1.5 V LR44 alkaline batteries, installed functional, user replaceable.

**Enclosure Material:** ABS.

**Enclosure Rating:** IP65.

**Weight:** 4.3 oz (115 g).

**Agency Approval:** CE.



Model  
EC2-10

# Waterproof Conductivity Testing Pen

Conductivity and Temperature, High Resolution and Accuracy



The Model EC2-10 Conductivity Testing Pen can monitor conductivity levels by determining the resistance between the electrodes. Conductivity of water is useful in monitoring the quality of public drinking water and deionized water for industrial applications. This pocket sized tester is constructed of a durable ABS plastic waterproof housing and 316 SS electrodes to protect against corrosion. A large LCD display is easy to read and shows both the conductivity and temperature measurements simultaneously. Since change in temperature can affect accuracy, the EC2-10 has automatic temperature compensation. Batteries are included in packaging.

Model EC2-10, Conductivity Testing Pen

## SPECIFICATIONS

**Wetted Materials:** ABS plastic and 316 SS.

**Range:** 0 to 1999  $\mu$ S or 0 to 19.99 mS.

**Accuracy:**  $\pm 1\%$  FS.

**Display:** 30 mm H x 18 mm W LCD dual display.

**Resolution:** 1 $\mu$ S or .01 mS.

**Temperature Limits:** 32 to 122°F (0 to 50°C).

**Power Requirements:** (4) 1.5 V LR44 alkaline batteries, installed functional, user replaceable.

**Enclosure Material:** ABS.

**Enclosure Rating:** IP65.

**Weight:** 4.3 oz (115 g).

**Agency Approval:** CE.



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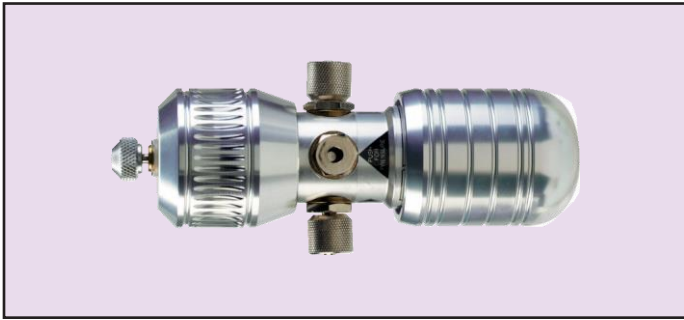
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Model  
HP

## Hand Pump

Generates Pressures up to 45 psig (3 bar), Single Hand Operation



**Model HP Hand Pump** provides a dual source of pneumatic pressure and vacuum for verifying the calibration of pressure instrumentation. Pump can generate pressures up to 45 psig (3 bar) and vacuum to -27 in Hg (-910 mbar). The compact pump is designed for portability and single hand operation.

Model HP features a pressure relief valve and fine adjustment for control better than 0.0015 psi (0.1 mbar). Pump includes two 39" (1 m) hoses terminating in 1/4" female NPT connections and instruction manual.

**Model HP-1, Hand Pump**

### ACCESSORIES

**Model HP-1K, Service Kit**

**Model HP-1C, Hard Case**



Series  
CHP

## Pneumatic Hand Pump

Vacuum or Pressure, Ranges up to 100 psig



The **Series CHP Pneumatic Hand Pump** is the most dependable and rugged pump for applications up to 100 psi or 28.8 in Hg vacuum. The durable Acetel plastic and anodized aluminum construction prevents body heat transfer, resulting in drift-free, accurate readings. The Series CHP is equipped with oversized check valves in order to provide smooth and controlled operation. Dual O-Rings on all pistons ensure the pump to be leak-free. The unit includes a 2' L hose, 1/8" female NPT gauge fitting, and 1/8" NPT pipe plug. An optional hose kit is available so that a tee is not required when connecting a sensor and a calibrator. The Series CHP is ideal for checking calibration of pressure or vacuum gauges, switches, or transmitters.

**Model CHP-P, Pressure Calibration Pump**

**Model CHP-V, Vacuum Calibration Pump**

### ACCESSORY

**CHP-KIT, 2' Hose and NPT Fitting**



Model  
A-396A

## Calibration Pump

Generates up to 72 psig, Integral Bleed Fitting



**Serves as pressure source** to calibrate gages and transmitters or to set pressure switches. Use with manometer or other pressure standard. Includes volume adjuster enabling fine pressure control and bleed valve. Generates pressures from a fraction of an in w.c. to 72 psig (5 bar). Includes barbed fitting, tee connector and three 36" lengths of vinyl tubing.

**Model A-396A, Calibration Pump**



Model  
A-350

## Aspirator Bulb

Single Hand Operation, Vacuum or Pressure



The **Model A-350 Aspirator Bulb** can be used to source pressure for calibration and leak checking tests. Simply squeeze the bulb after the tubing is connected to generate pressure. For applications such as our CO2 indicator, the aspirator bulb can be squeezed before inserting the tubing to draw a vacuum to pull the smoke or air from a duct or stack into the gage.

**A-350, Aspirator Bulb**



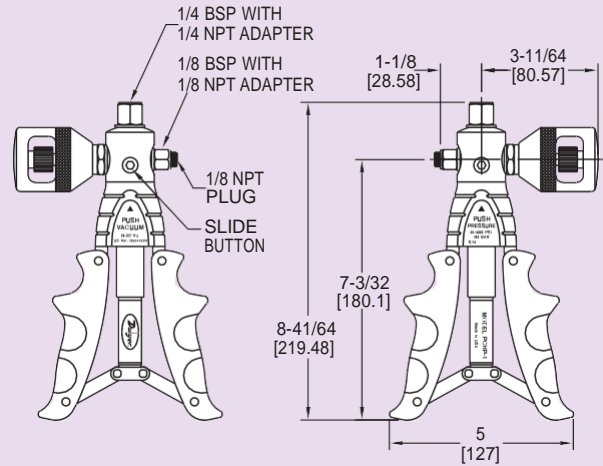
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Series  
PCHP

# Pneumatic Calibration Hand Pump

Generates up to 600 psi (40 bar), Comfort Grip Handles



The Series PCHP Pneumatic Hand Pump comfortably sources pressure and vacuum to check calibration of gages, switches, transmitters, and recorders. The contoured cushion handles provide extra comfort while preventing the pump from sliding. The oversized check valve provides smooth operation throughout the output range. The dual O-rings on all pistons ensure zero leakage.

**Model PCHP-1**, Pneumatic Calibration Hand Pump

**Model PCHP-1K**, Pneumatic Calibration Hand Pump with Hose Kit

#### ACCESSORY

**PCHP-HK**, High Pressure Hose

#### SPECIFICATIONS

**Output Ranges:** -28 in Hg to 600 psi (-0.945 to 40 bar).

**Process Connection:** 1/4" NPT/BSP.

**Gage Connection:** 1/8" NPT/BSP.

**Materials:** SS fittings, anodized aluminum housing, plastic/rubber handles, and nitrile O-rings.

**Weight:** 2 lb (0.91 kg).

TEST EQUIPMENT

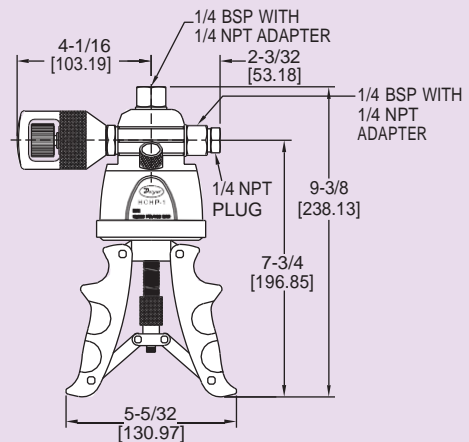
Calibration Pumps



Series  
HCHP

# Hydraulic Calibration Hand Pump

Triple Filtration, Generates pressure up to 10,000 psi (700 bar)



The Series HCHP Hydraulic Calibration Hand Pump utilizes a fully adjustable stroke control that allows for quick priming, easy pumping and fast pressure generation up to 10000 psi (700 bar). The ergonomically engineered handles provide extra comfort, while the triple filtration system ensures pump operation in spite of dirty conditions. The shatterproof reservoir and stainless steel construction guarantee leak free operation. The Series HCHP has oversized check valves to provide smooth controlled operation.

**Model HCHP-1**, Calibration Hand Pump

**Model HCHP-1K**, Calibration Hand Pump with Hose Kit

#### SPECIFICATIONS

**Output Ranges:** 0 to 10,000 psi (0 to 700 bar).

**Process Connection:** 1/4" NPT/BSP.

**Gage Connection:** 1/4" NPT/BSP.

**Materials:** SS, polyurethane, anodized hard-coat aluminum, PTFE, and nitrile.

**Weight:** 3 lb (1.36 kg).

#### ACCESSORY

**HCHP-1F**, Spare Washer and Filter Kit



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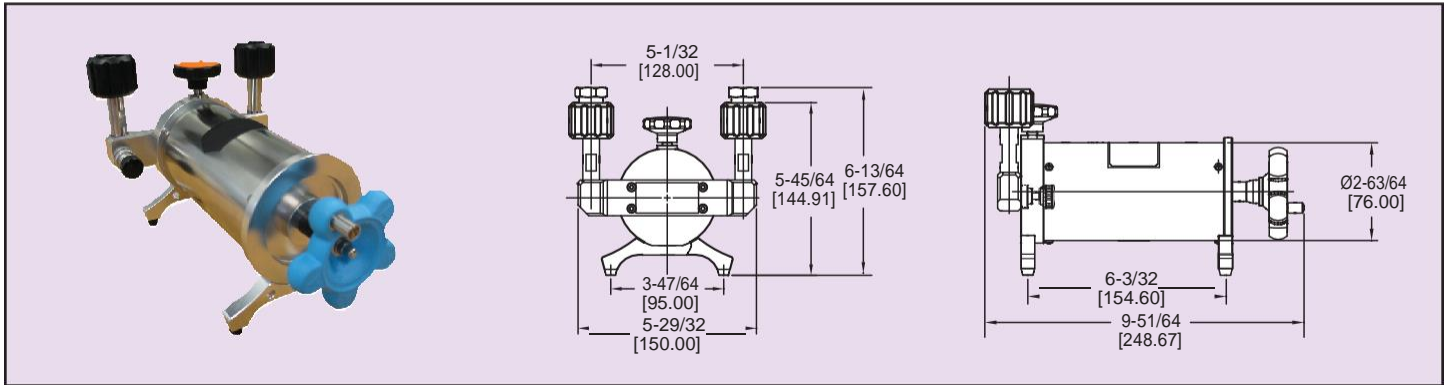
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Model  
LPCP

# Low Pressure Calibration Pump

## High Resolution for Calibrating Low Pressure Gages and Transmitters



The Model LPCP Low Pressure Calibration Pump is a low air pressure source with the ability to easily adjust and stabilize. This hand pump possesses a pressure range of ± 5.8 psi; uses air as the media, and can adjust the pressure easily with great stability. The LPCP is made up of quick connectors for fast instrument connect and disconnect. The pump has a heat-insulator between the cover and pressure chamber to lessen the heat effect during the micro-pressure calibration. The adjusting resolution is up to 0.01 Pa (0.0001 mbar). These features make the LPCP ideal for calibrating pressure transducers, precision pressure gages, and other pressure instruments.

### FEATURES

- Portable
- Pressure resolution: 0.01 Pa; 0.0001 mbar
- Heat insulation and heat preservation, no negative side effects from temperature changes
- Open structure for convenient maintenance of the pumps
- Easy to operate: pressure is precisely set with a simple turn of the handle, allowing you to calibrate gages quickly and accurately
- Great seal performance: minimum leakage

Model LPCP-2, Low Pressure Calibration Pump

### SPECIFICATIONS

**Media:** Air.

**Output Ranges:** 5.8 psi (0.4 bar) vacuum to 5.8 psi (0.4 bar) positive pressure.

**Pressure Resolution:** 0.01 Pa; 0.0001 mbar.

**Process Connection:** M20\*1.5 or 1/4" NPT.

**Gage Connection:** M20\*1.5 or 1/4" NPT.

**Material:**

Ram/adapters: 316 SS;

Body: Steel/aluminum;

Seals: Buna-N.

**Weight:** 2.21 lb (1.0 kg).

### ACCESSORY

A-113A, Fitting Kit

### Fitting Kit Includes:

- (1) 1/4" NPT to 1/8" quick connect fitting
- (1) 1/4" NPT to hose barb fitting
- (1) hose barb fitting to 1/8" quick connect fitting
- (2) 19.7" (0.5 m) length of blue 1/8" O.D. tubing
- (2) 12" (0.3 m) length of clear 1/4" O.D. tubing

TEST EQUIPMENT

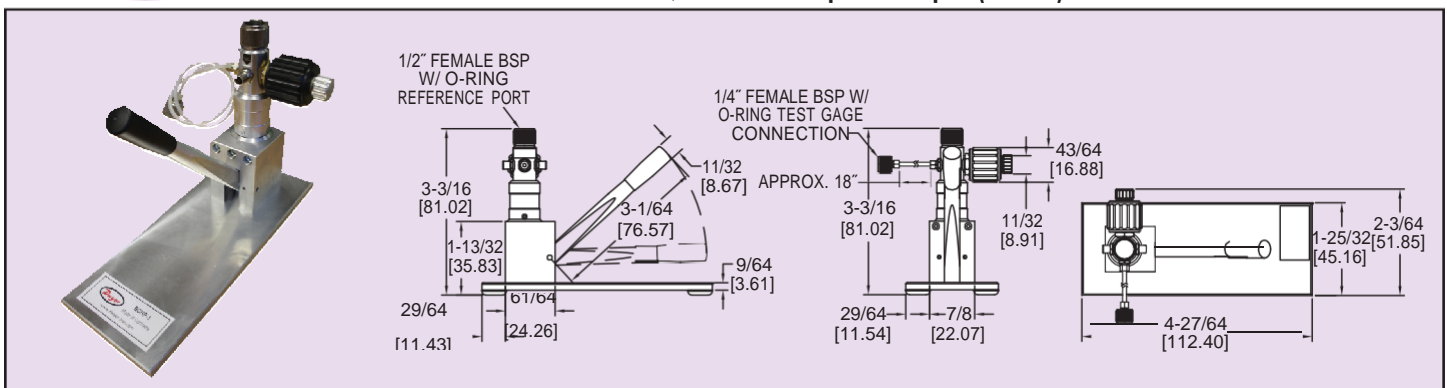
Calibration Pumps



Series  
BCHP

# Low Pressure Calibration Pump

## Vacuum or Pressure, Generates up to 870 psi (60 bar)



The Series BCHP Calibration Test Pump is able to generate pressure and vacuum for adjusting or calibrating pressure gauges, transmitters, or switches. The pump is hand operated and has a pneumatic pressure range of -28 in Hg to 870 psi (-0.95 bar to 60 bar). Dual pressure ports allow two instruments to be connected to the pump without additional fittings. The Series BCHP can be used in laboratories and production areas. The fine adjustment valve on this pump ensures precise measurements.

Model BCHP-1, Calibration Test Pump

Model BCHP-KIT, Test Pump with 1/4" NPT Connections, Fine Volume Adjustment

### SPECIFICATIONS:

**Media:** Air.

**Output Ranges:** -28 in Hg to 870 psi (-0.95 to 60 bar).

**Process Connections:** 1/4" female BSP

**Gauge Connection:** 1/2" female BSP.

**Materials:** Anodized aluminum, brass, and ABS.

**Weight:** 8.4 lb (3.8 kg).

### ACCESSORIES

A-BCHP-CASE, Case for BCHP-1

A-BCHP-NPT, 1/4" BSP to 1/8" NPT, 1/4" NPT, 3/8" NPT and 1/2" NPT Converter Set for Test Connection

A-BCHP-VAT, Fine Volume Adjustment Tool



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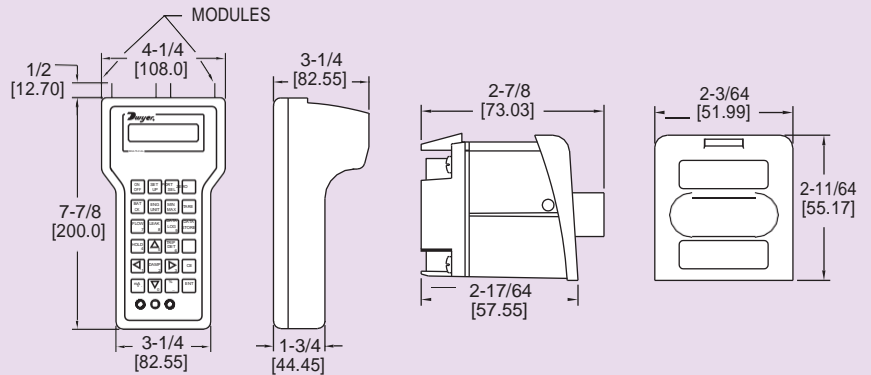
Series  
MC

# Multi-Cal Pressure Calibrator

Interchangeable Ranges,  $\pm 0.05\%$  Accuracy, Datalogging Capability, NIST Traceable

TEST EQUIPMENT

Pressure Calibrators



**Series MC Portable Multi-Cal Pressure Calibrator** performs a wide variety of simple and complex pressure based measurement, test, and calibration operations. Modular sensor design allows user to select pressure measurement range for application flexibility. Calibrator can accommodate up to two interchangeable pressure modules (sold separately below) in any combination of range or accuracy.

Simultaneously display two separate measurements on the two line, alphanumeric display. Readings can be displayed in a choice of 12 preprogrammed engineering units or any single user-defined unit. Calibrator features min/max recall, hi/lo alarm, percentage of full-scale pressure readings, mA/voltage measurement, leak rate and pressure decay measurement, switch testing capabilities, including trip point and deadband, and velocity/volume flow rates.

Quickly document calibration procedures using the data logging feature which stores up to 384 sets of pressure and time/date stamped measurements. Easily upload stored data to an IBM compatible computer via the RS232 port. Calibrators and modules include certification to NIST traceability—ideal as a secondary standard for calibrating pressure equipment.

Multi-Cal Pressure Calibrator includes utility software, test leads, protection module, adjustable hand strap, AC adapter, batteries, instruction manual, and hard carrying case.

## APPLICATIONS

Pressure measurement for clean room control, filter performance monitoring, HVAC testing and setup, draft measurement, airflow measurement control, differential pressure measurement in laminar flowhoods, paint booths, industrial ovens and fume hoods. Use as a secondary standard for calibrating pressure equipment.

**Multi-Cal Pressure Modules** are interchangeable and available in a wide selection of pressure ranges and accuracies. Handheld calibrator accepts up to two pressure modules. Modules include NIST calibration certification.

Model	Range
MC1000	0.25" H <sub>2</sub> O Differential Pressure, $\pm 0.07$
MC1001	0.50" H <sub>2</sub> O Differential Pressure, $\pm 0.07$
MC1004	5.00" H <sub>2</sub> O Differential Pressure, $\pm 0.06$
MC1006	25" H <sub>2</sub> O Differential Pressure, $\pm 0.06$
MC2010	5.0 psig Gauge Pressure, $\pm 0.05$
MC2012	15.0 psig Gauge Pressure, $\pm 0.05$
MC2016	100.0 psig Gage Pressure, $\pm 0.05$

## OPTIONS

Consult factory for other pressure ranges and accuracies. FM approved models are also available.

## SPECIFICATIONS

**Service:** Clean, dry, nonconductive, noncorrosive gases.

**Accuracy:** Differential pressure modules:  $\pm 0.06\%$  FS; Gauge pressure modules:  $\pm 0.05\%$  FS; Voltage input:  $\pm 0.025\%$  FS @ 0/10 VDC,  $\pm 0.10\%$  FS @ 0/30 VDC; Current input:  $\pm 0.03\%$  FS @ 0/20 mA,  $\pm 0.05\%$  FS @ 0/50 mA.

**Sensitivity:**  $\pm 0.002\%$  of span with dampening 1 part in 50,000 (max).

**Repeatability:** Ranges  $\leq 0/2$  psi:  $\pm 0.05\%$  of span; Ranges  $\geq 0/5$  psi:  $\pm 0.02\%$  of span.

**Output:** RS232 serial interface, 9-pin.

**Alarm Output:** SPST form C 110 VDC, 120 VDC (max), 1 A (max), 30 W, 62.5 VA (resistive).

**Display:** Alphanumeric LCD, 0.37" (9.5 mm) height per line, 2 lines, 16 characters/line.

**Display Update:** 100 ms.

**Ambient Operating Temperature:** 32 to 120°F (0 to 49°C).

**Storage Temperature:** -4 to 158°F (-20 to 70°C).

**Process Connection:** 1/8" female NPT.

**Electrical Connections:** Miniature recessed banana jacks.

**Power Requirements:** Internal: (2) 9 V alkaline batteries, included, user replaceable and VL1220 or BR1225 lithium metal battery, installed functional, user replaceable; External: AC adapter 9 VDC, 500 mA.

**Battery Life:** 30 hours (approximate).

**Engineering Units:** inH<sub>2</sub>O, psi, inHg, kPa, mbar, cmH<sub>2</sub>O, mmHg, and user-defined.

**Overpressure:** Differential pressure modules: 50 psi positive direction, 15 psi negative direction; Gauge pressure modules: 2x range (0/5 psi to 0/1000 psi).

**Temperature Compensation:** 20 to 120°F (-7 to 49°C).

**Temperature Error:** Maximum of  $\pm 0.004\%$  of span per °F over compensated range for zero and span.

**Temperature Effect Electrical Measurement:**  $\pm 0.001\%$  of span per °F over compensated range.

**Dampening:** (Measurement averaging) programmable from 0 to 16 consecutive readings.

**Baud Rate:** 300, 1200, 2400, or 9600, selectable.

**Housing Material:** ABS plastic.

**Weight:** Calibrator: 2.2 lb (1.3 kg); Pressure module: 0.5 lb (0.3 kg).

Model MC2K, Handheld Calibrator



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