VelociCalc® and VelociCalc® Pro Ventilation Meters

Models 9600 Series

VelociCalc Pro
(Model 9650)

The VelociCalc® 9600 Series Multi-Function Ventilation Meters use guided workflows programmed for professionals allowing you to customize the instrument performance to meet your needs with the touch of one button.

VelociCalc
(Model 9630)

The high-resolution color screen displays multiple measurements simultaneously in real-time with on-screen prompts to guide you through instrument setup and operation.

The VelociCalc® Multi-Function Ventilation Meter 9600 series includes a built-in workflow for calculating the percentage of outside air used to determine ventilation effectiveness in a building or room. The VelociCalc® Pro adds built-in workflows for heat flow calculation and four methodologies for performing a duct traverse.

It's ergonomic design includes a probe holder and integrated magnets allowing for attachment to exposed ductwork, chemical fume hoods and biological safety cabinet frames for hands-free operation. These instruments are available with or without a differential pressure sensor, and are designed to work with a wide range of plug-in probes.

Applications
- HVAC testing and balancing
- Cleanroom testing
- Biological safety cabinet and laboratory fume hood testing
- HVAC commissioning and troubleshooting
- IAQ investigations
- Ventilation effectiveness with percent outside air calculation

Features and Benefits
- Large, high-resolution color display
- Intuitive menu structure allows for ease of use and setup
- Optional smart plug-in probes, including thermoanemometer, rotating vane and CO_2 probes with calibration certificates
- User-customizable soft keys for quick access to common functions
- Integrated magnets for hands-free operation
- Programmable for local language
- Air density compensation with on board barometric pressure sensor and temperature input

Additional Features for Model 9630 and 9650
- Static and differential pressure measurement
- Pitot probe duct traverse
- Programmable K-factors

Additional Features for Model 9650
- Step by step guided workflows including heat flow calculation
- Duct traverse grid measurements for
    - ASHRAE 111 log-Tchebycheff
    - ASHRAE 111 Equal Area
    - EN 12599
    - EN 16211
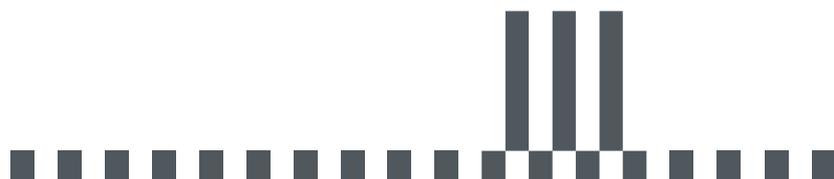
Models 9600, 9630, 9650

VelociCalc® Plug-In Probes
The plug-in probes allow users to make various measurements by simply plugging in a different probe that has the features and functions best suited for a particular application. Plug-in probes for the VelociCalc® series can be ordered at any time and include a data sheet with certificate of traceability. When it's time for servicing, only the probe needs to be returned since all the calibration data is stored within the probe.

Thermoanemometer Air Velocity Probes
TSI offers four models featuring multiple measurements in a compact, robust probe design. These telescopic probes are available in straight or articulating construction, and with or without a relative humidity sensor. Models with a relative humidity sensor can also calculate wet bulb and dewpoint temperature. Common applications include duct traversing, face velocity testing of chemical fume hoods, biological safety cabinets and HEPA filters.

Rotating Vane Anemometer Probe
The 4" (100 mm) rotating vane probe measures air velocity and temperature with flow calculation. Measurement applications include face velocity as well as air velocity in turbulent airstreams. An optional telescopic articulating probe and Aircone kit are also available.

Pitot Probes
Pitot probes are used to obtain air velocity and air volume measurements within ductwork by performing a duct traverse. Pitot probes and tubing can be connected to the models 9630 and 9650 which contain a differential pressure sensor to measure the velocity pressure and calculate air flow. Consult factory for sizes and part numbers.

Indoor Air Quality (IAQ) Probes
A good indicator of proper ventilation is the level of CO_2 present in a space. Carbon dioxide is a normal by-product of occupant respiration. Elevated levels of CO_2 may indicate that additional dilution ventilation is required. IAQ probes are available to measure temperature, humidity, CO and CO_2 of indoor environments. Calculations include percent outside air, wet bulb and dew point temperatures.

Velocity (Pitot probe, Model 9630 and 9650)

Range[3]	250 to 15,500 ft/min (1.27 to 78.7 m/s)
Accuracy[2]	±1.5% at 2,000 ft/min (10.16 m/s)
Resolution	1 ft/min (0.01 m/s)
Duct Size Dimensions	1 to 500 inches in increments of 0.1 in. (2.5 to 1,270 cm in increments of 0.1 cm)

Volumetric Flow Rate
Range Actual range is a function of velocity, pressure, duct size, and K factor

Static/Differential Pressure (Model 9630 and 9650)

Range	-15 to +15 in. H_2O (-28.0 to +28.0 mm Hg, -3,735 to +3,735 Pa)
Accuracy	±1% of reading ±0.005 in. H_2O (±0.01 mm Hg, ±1 Pa)
Resolution	0.001 in. H_2O (0.1 Pa, 0.01 mm Hg)

Barometric Pressure

Range	20.36 to 36.648 in. Hg (517.15 to 930.87 mm Hg)
Accuracy	±2% of reading

Instrument Temperature Range

Operating (Electronics)	40° to 113°F (5° to 45°C)
Storage	-4° to 140°F (-20° to 60°C)

Data Storage Capabilities

Range	200 test IDs/162,200 samples (a sample is 1 or more measurements)

Sample Interval
1 second to 1 hour

Time Constant
1, 5, 10, 20, 30, 60, 90 seconds

External Meter Dimensions
3.2 in. x 9.5 in. x 1.6 in. (8.1 cm x 24.1 cm x 4.1 cm)

Meter Weight with Batteries
0.9 lbs (0.41 kg)

Power Requirements
Four AA-size batteries or AC adapter

Probe Specifications

Model	Description	Range	Accuracy	Resolution
960	Thermoanemometer Telescopic Straight Probe Velocity and Temperature	0 to 9,999 ft/min (0 to 50 m/s)	±3% of reading or ±3 ft/min (±0.015 m/s), whichever is greater[4&5]	1 ft/min (0.01 m/s)
		0 to 200°F (-18 to 93°C)	±0.5°F (±0.3°C)[6]	0.1°F (0.1°C)
962	Thermoanemometer Telescopic Articulating Probe Velocity and Temperature	0 to 9,999 ft/min (0 to 50 m/s)	±3% of reading or ±3 ft/min (±0.015 m/s), whichever is greater[4&5]	1 ft/min (0.01 m/s)
		0 to 200°F (-18 to 93°C)	±0.5°F (±0.3°C)[6]	0.1°F (0.1°C)
964	Thermoanemometer Telescopic Straight Probe Velocity, Temperature and Humidity	0 to 9,999 ft/min (0 to 50 m/s)	±3% of reading or ±3 ft/min (±0.015 m/s), whichever is greater[4&5]	1 ft/min (0.01 m/s)
		14 to 140°F (-10 to 60°C)	±0.5°F (±0.3°C)[6]	0.1°F (0.1°C)
		5 to 95% RH	±3% RH[7]	0.1% RH
966	Thermoanemometer Telescopic Articulating Probe Velocity, Temperature and Humidity	0 to 9,999 ft/min (0 to 50 m/s)	±3% of reading or ±3 ft/min (±0.015 m/s), whichever is greater[4&5]	1 ft/min (0.01 m/s)
		14 to 140°F (-10 to 60°C)	±0.5°F (±0.3°C)[6]	0.1°F (0.1°C)
		5 to 95% RH	±3% RH[7]	0.1% RH
995	Rotating Vane 4 in. (100 mm) Probe Velocity and Temperature	50 to 6,000 ft/min (0.25 to 30 m/s)	±1% of reading or ±4 ft/min (±0.02 m/s)	1 ft/min (0.01 m/s)
		32 to 140°F (0 to 60°C)	±2.0°F (±1.0°C)	0.1°F (0.1°C)
980	IAQ Probe CO_2, Temperature and Humidity	0 to 5,000 ppm CO_2	±3% of reading or ±50 ppm CO_2, whichever is greater[8]	1 ppm CO_2,
		5 to 95% RH	±3% RH[7]	0.1% RH
		14 to 140°F (-10 to 60°C)	±1.0°F (±0.5°C)[6]	0.1°F (0.1°C)
982	IAQ Probe Model CO, CO_2, Temperature and Humidity	0 to 500 ppm CO	±3% of reading or ±3 ppm CO, whichever is greater[9]	0.1 ppm CO
		0 to 5,000 ppm CO_2	±3% of reading or ±50 ppm CO_2, whichever is greater[8]	1 ppm CO_2
		5 to 95% RH	±3% RH[7]	0.1% RH
		14 to 140°F (-10 to 60°C)	±1.0°F (±0.5°C)[6]	0.1°F (0.1°C)
800220	Telescopic Air Temperature and Relative Humidity Probe	14 to 140°F (-10 to 60°C)	±0.5°F (±0.3°C)	0.1°F (0.1°C)
		5 to 95% RH	±3% RH	0.1% RH
792	Thermocouple Surface Temperature Probe (Type K)	-40 to 1200°F (-40 to 650°C)	±0.1% of reading +4°F (±0.056% of reading +2.2°C)	0.1°F (0.1°C)
794	Thermocouple Air Temperature Probe (Type K)	-40 to 1200°F (-40 to 650°C)	±0.1% of reading +4°F (±0.056% of reading +2.2°C)	0.1°F (0.1°C)

1. Pressure velocity measurements are not recommended below 1,000 ft/min (5 m/s) and are best suited to velocities over 2,000 ft/min (10.00 m/s). Range can vary depending on barometric pressure.
2. Accuracy is a function of converting pressure to velocity. Conversion accuracy improves when actual pressure values increase.
3. Overpressure range = 190 in. H_2O, 48 kPa (360 mmHg).
4. Temperature compensated over an air temperature range of 40 to 150 °F (5 to 65 °C).
5. The accuracy statement begins at 30 ft/min through 9,999 ft/min (0.15 m/s through 50 m/s).
6. Accuracy with instrument case at 77 °F (25 °C), add uncertainty of 0.05 °F/°F (0.03 °C/°C) for change in instrument temperature.
7. Accuracy with probe at 77 °F (25 °C). Add uncertainty of 0.1% RH/ °F (0.2% RH/ °C) for change in probe temperature. Includes 1% hysteresis.
8. At calibration temperature. Add uncertainty of ±0.28%/ °F (0.5%/ °C) for change in temperature.
9. At 77 °F (25 °C). Add uncertainty of ±0.2%/ °F (0.36%/ °C) for change in temperature.

Parameter/Function	9600	9630	9650-NB	9650
Barometric Pressure	■	■	■	■
Differential Pressure		■	■	■
Thermocouple (1)	■	■	■	■
Thermoanemometer Probes (960, 962, 964, 966)	□	□	□	□
Rotating Vane Probe (995)	□	□	□	□
IAQ Probes (980, 982)	□	□	□	□
Pitot Probe		□	□	□
Air Density Correction	■	■	■	■
Calculate Flow	■	■	■	■
K-factor Flow		■	■	■
% Outside Air Calculation	■	■	■	■
ASHRAE 111 Log-Tchebycheff Duct Traverse Workflow			■	■
ASHRAE 111 Equal Area Duct Traverse Workflow			■	■
EN 16211 Duct Traverse Workflow			■	■
EN 12599 duct Traverse Workflow			■	■
Heat Flow Calculation (BTU/h, kW)			■	■
Wired USB Printer	□	□	□	□
Bluetooth® Printer				□

□ = Optional
Note: Displayed workflows are dependent on instrument model and attached probe.

Specifications are subject to change without notice.

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To Order

Model	Description
9600	Includes the meter, carrying case, 4 AA alkaline batteries, USB cable, owner's manual and calibration certificate
9600-980	9600 with 980 probe
9600-982	9600 with 982 probe
9600-995	9600 with 995 probe
9600-960	9600 with 960 probe
9600-962	9600 with 962 probe
9630	Includes the meter, carrying case, 4 AA alkaline batteries, USB cable, one static pressure probe, 8 ft. (2.4 m) tubing, owner's manual and calibration certificate
9630-982	9630 with 982 probe
9630-964	9630 with 964 probe
9630-966	9630 with 966 probe
9650	Includes the meter, carrying case, 4 AA alkaline batteries, USB cable, one static pressure probe, 8 ft. (2.4 m) tubing, owners manual and accredited calibration certificate
9650-964	9650 with 964 probe
9650-966	9650 with 966 probe
9650-NB	Includes the meter, carrying case, 4 AA alkaline batteries, USB cable, one static pressure probe, 8 ft. (2.4 m) tubing, owners manual and accredited calibration certificate
9650-NB-964	9650-NB with 964 probe
9650-NB-966	9650-NB with 966 probe

TSI
Knowledge Beyond Measure.