



**SIERRA®**



**PRODUCT LINE CATALOG**

Flow meter solutions for those who demand precision.

LOW

# Industrial Flow Meters



QuadraTherm®

## THERMAL MASS / QuadraTherm

### Models

- 640i Insertion Probe
- 780i Inline

### Description

- Highest accuracy thermal meter in the world
- Multivariable outputs: Mass flow rate, temperature, pressure
- Patented "QuadraTherm" 4-Sensor thermal technology
- Patented no-drift DrySense™ sensor, lifetime warranty
- Inline version has built-in flow conditioning
- No moving parts, low pressure drop, high 100:1 turndown

- Free user software
- Change gas in the field
- Change pipe size in field (insertion version)
- Validate in field for in-situ calibration
- Certified for GHG measurement meeting EPA (40 CFR Part 98)
- Hazardous-area location approvals

### Fluids Measured

- Measure all non-condensing clean gases
- Flammable gases

### Flow Ranges (100:1 Turndown)

- Very low flows and high flows up to 60000 sfpm (305 smps)

### Accuracy\*

- 780i Inline**
  - +/- 0.5% of reading above 50% of full scale
- 640i Insertion**
  - +/- 0.75% of reading above 50% of full scale

\* Verified by an independent NIST & NVLAP accredited lab

### Repeatability

- +/- 0.15% of full scale

### Digital Communications

- HART, Modbus RTU

### Approvals

- cFMus, ATEX, IECEx, PED, GOST R, Chinese Pattern, CE



TM100™ / TM500™

## THERMAL MASS TM100 / TM500

### Models

- TM100
- TM500

### Description

- Direct measurement of gas mass flow / No volume to mass calculations
- DigiSense™ robust sensor design
- AC or DC power (TM500)
- Use optional Gas-Mix™ feature to easily change gas selection or create gas mixes in the field - no recal required
- Insertion and Inline versions
- Integral and remote electronic configurations available

- Microprocessor based, field-programmable electronic
- TM-Cal: In-situ, operator-initiated calibration validation
- Turndown: up to 1000:1; 100:1 typical

### Flow Ranges

- TM100:** 15 to 25,000 SFPM (0.07 to 120 NMPS)
- TM500:** 15 to 45,000 SFPM (0.07 to 212 NMPS)

### Accuracy

- TM100**
  - +/- 1.0% of reading +/- 0.2% of full scale Air, Nitrogen
  - +/- 1.5% of reading +/- 0.5% full scale All other gases

### Accuracy

- TM500**
  - +/- 1.0% of reading +/- 0.2% of full scale Air, Nitrogen
  - +/- 1.5% of reading +/- 0.5% full scale All other gases

### Repeatability

- +/- 0.2% of full scale

### Digital Communications

- TM100**
  - HART with pulse output or Modbus RTU (RS485), BACnet MS/TP (RS485)

### TM500

- HART or Modbus RTU (RS485)



BioTrak™

## THERMAL MASS / BioTrak

### Models

- BioTrak 645i
- BioTrak 645S
- BioTrak 745i
- BioTrak 745S

### Description

- Field-Selectable Gases-air, methane, digester gas
- Direct mass flow measurement maintains precise control of aeration, digestion, and cogeneration
- Insertion and inline versions
- AC or DC power input available
- Optional hot top packing gland and retractor

- Integral and remote electronic configurations available
- Microprocessor based, field-programmable electronics
- BioView™ software provides access to meter data / Configure meter settings in field
- BioCal verifies calibration within five minutes

### Flow Ranges (100:1 Turndown)

- 15 to 25,000 sfpm (0.07 to 120 nmps)

### Accuracy

- 645i/745i**
  - Air: +/- 1.0% of reading +/- 0.2% of full scale
  - Other gases: +/- 1.5% of reading +/- 0.5% full scale

- Accuracy specification applies to customer's selected flow range
- 645S/745S**
  - Accuracy: +/- 2.0% of full scale

### Repeatability

- +/- 0.2% of full scale

### Digital Communications

- HART, Modbus RTU

### Approvals

- FM (U.S.) and FMc (CANADA) approved for Class I, Div 1; ATEX/IECEx approved for Zone 1, CE



FlatTrak® / SteelMass®

## THERMAL MASS FlatTrak / SteelMass

### Models

- SteelMass 640S Insertion probe
- FlatTrak 780S Inline
- FlatTrak 780S Inline Ultra High Purity

### Description

- Insertion, Inline and multi point configurations
- Patented no-drift DrySense™ sensor, lifetime warranty
- No moving parts, low pressure drop, high turndown 100:1
- Insertion and inline, totalizing gas mass flow

- Inline version built-in flow conditioning for only 3-diameters up, zero downstream
- Free user software
- Validate in field for in-situ calibration
- Economical NEMA 4X enclosure available
- High temperature to 800°F (430°C) available
- Axial and purge designs for dirty gases
- Certified for GHG measurement meeting EPA (40 CFR Part 98)
- Hazardous-area location approvals

### Fluids Measured

- All non-condensing clean gases
- Flammable gases

### Flow Range (100:1 Turndown)

- Wide flow range from 0 to 20,000 sfpm (100 smps)

### Accuracy

- +/- 1.0% of reading plus +/- 0.5% of full scale

### Repeatability

- +/- 0.2% of full scale

### Digital Communications

- Modbus RTU

### Approvals

- FM, CSA, CRN, ATEX, PED, GOST R, Chinese Pattern, CE

# Thermal / Vortex / Ultrasonic



BoilerTrak™

## THERMAL MASS BoilerTrak / FastFlo

### Models

- BoilerTrak 620S-BT Insertion probe
- FastFlo 620S Insertion probe

### Description

- Increase efficiency with fast response time within 200 milliseconds
- No moving parts, low pressure drop, high turndown 100:1
- BoilerTrak optimized for methane, propane and natural gas
- FastFlo optimized for air, nitrogen, and inert gas measurement
- Free user software

- Validate in the field for easy in-situ calibration
- Certified for GHG measurement meeting EPA (40 CFR Part 98)
- Easily install in the field or retrofit

### Flow Range (100:1 Turndown)

- Wide flow range from 0 to 20,000 sfpm (100 mps)

### Accuracy

- +/- 1% of full scale

### Repeatability

- +/- 0.2% of full scale

### Digital Communications

- Modbus RTU

### Fluids Measured

#### FastFlo 620S

- Measure all non-condensing clean gases

#### BoilerTrak 620S-BT

- Flammable gases: methane, propane, natural gas

### Approvals

- CE, GOST R, Chinese Pattern



InnovaMass®

## VORTEX / InnovaMass

### Models

- 240S Inline
- 240S-R Reducer
- 241S Insertion

### Description

- 5-in-1: Mass & volumetric flow rate, temperature, pressure, density
- Mass & volumetric flow measurement of gas, liquid, and steam
- Loop-powered design simplifies wiring and signal processing
- Insertion probe for pipes/ducts up to 72 in. (2M); Opt. hot tap - no process shutdown
- Thermal energy / BTU measurement
- Field-configurable ranges, alarms, outputs and displays
- Temp. -330°F (-200°C) up to 750°F (400°C)

### Fluids Measured

- Steam, Gases, and Liquids

### Flow Range (30:1 turndown)

- Liquids:  
1.0 ft/s (0.3 m/s) Velocity Min.  
30 ft/s (9.14 m/s) Velocity Max.

### Gas & Steam:

Velocity Minimum /  $\rho$  = fluid density

$$\sqrt{\frac{25}{\rho}} \text{ ft/s (see note 1)} \quad \sqrt{\frac{37}{\rho}} \text{ m/s (see note 2)}$$

Velocity Maximum / 300 ft/s (91.5 m/s)

Note 1:  $\rho$  in lb<sub>m</sub>/ft<sup>3</sup> Note 2:  $\rho$  in kg/m<sup>3</sup>

### Digital Communications

- HART (with DD), BACnet, RS-485, Modbus RTU, Ethernet available for Modbus and BACnet

### Hazardous Area Approvals

- CE, cFMus, ATEX, PED, IECEx

### INLINE VERSION

#### Accuracy

- Mass flow: +/-1.0% of reading (liquids); +/-1.5% of reading (gas & steam)
- Volumetric: +/-0.7% of reading (liquids); +/-1.0% of reading (gas & steam)

#### Repeatability

- Mass flow: +/- 0.2% of reading
- Volumetric: +/- 0.1% of reading

### INSERTION VERSION

#### Accuracy

- Mass flow: +/-1.5% of reading (liquids); +/-2.0% of reading (gas & steam)
- Volumetric: +/-1.2% of reading (liquids); +/-1.5% of reading (gas & steam)

#### Repeatability

- Mass flow: +/- 0.2% of reading
- Volumetric: +/- 0.1% of reading



InnovaSonic®

## ULTRASONIC / InnovaSonic

### Models

- 203 Fixed installation economical
- 210 Portable

### Description

- Transit-time ultrasonic
- Clamp-on outside of pipe for easy set up
- Thermal energy/BTU measurement
- Fixed installation and portable versions
- High accuracy at low and high flows

### Fluids Measured

- Water and liquids; Tolerant of liquids with small amounts of air bubbles or suspended solids

### Flow Range (30:1 turndown)

- Bi-directional flow range of 0.16 ft/s to 40 ft/s (0.05 to 12 m/s) version dependent
- Pipe sizes from 2 to 236 inches (50 to 6000 mm) version dependent

### Digital Communications

- RS-232, RS-485, USB, Modbus RTU

### Accuracy & Repeatability

#### 203 Economical

- Accuracy: +/- 1.0% of reading
- Repeatability: +/- 0.3% of reading

#### 210 Portable

- Accuracy: +/- 0.5% of reading
- Repeatability: +/- 0.3% of reading



InnovaSwitch®

## FLOW SWITCH InnovaSwitch

### Models

- 615

### Description

- Ultra sensitive with fast response time
- Switches on a flow/no flow condition
- Ideal for industrial pump protection
- Unique high temperature to 850°F (454°C)
- 2-year workmanship warranty
- Buy online, next day shipment

### Fluids Measured

- Gases and liquids

### Accuracy

- Range of 0.01 to 5 sfps (0.003 to 1.524 smps) in liquids and 0.1 to 500 sfps (0.03 to 152.4 smps) gases

### Repeatability

- +/- 1% of set point (Flow) or 1/32" (0.8mm) Level

### Stability

- Drift <0.5% from calibrated set point over a range of +/-50°F

### Operating Temperature Range

- Standard -100°F to 390°F (-73.3°C to 200°C)
- Medium Temperature to 572°F (300°C)
- High Temperature to 850°F (454°C)

## GAS / Industrial

- QuadraTherm 640i, 780i (Thermal)
- BioTrak 645i / S, 745i / S (Thermal)
- TM100 & TM500 (Thermal)
- SteelMass 640S (Thermal)
- FlatTrak 780S (Thermal)
- BoilerTrak 620S (Thermal)
- FastFlo 620S (Thermal)
- InnovaMass 240S, 241S (Vortex)
- InnovaSwitch Flow / Level 615

## GAS / Flow Conditioning

- FlowTrak (Dual-Plate Inline)

## SELECT BY APPLICATION

### GAS / MFCs – OEM & Scientific

- SmartTrak 100 (Capillary Thermal)
- SmartTrak 50 (Capillary Thermal)
- TopTrak 820 (Capillary Thermal)
- RedySmart (MEMS-based Thermal)
- RedyCompact (MEMS-based Thermal)
- RedyIndustrial (MEMS-based Thermal)

## GAS / Calibration

- CalTrak 800, XL  
(Primary standard piston prover)

## LIQUID

- InnovaSonic 203, 210 (Ultrasonic)
- InnovaMass 240S, 241S (Vortex)
- InnovaSwitch Flow/Level 615

## STEAM

- InnovaMass 240S, 241S (Vortex)
- InnovaSwitch Flow/Level 615

# Scientific Flow Meters



SmartTrak® 100

### DIGITAL / SmartTrak 100

#### Models

- 100L Low Flow
- 100M Medium Flow
- 100H High Flow

#### Description

- Highest performance multi-gas MFC
- Navigate easily with large multi-function display interface
- Free user software
- Primary Standard calibration & NIST traceability
- Make adjustments in the field
- Proprietary frictionless-hovering, direct-acting control/shut-off valve

- User-friendly pilot module display interface is front-mounted, hand-held, or remote mounted
- Leak integrity  $5 \times 10^{-9}$  sml/sec of helium
- CE Approved

#### Fluids Measured

- All clean gases including toxics and corrosives
- Dial-A-Gas allows you to change between 10 gases with one unit

#### Accuracy

- +/- 1.0% of full scale
- +/- 0.5% of full scale available

#### Repeatability

- +/- 0.2% of full scale

#### Digital Communications

- Modbus RTU

#### Flow Range

(Turndown - Meters 100:1 / Controllers 50:1)

##### 100L Low Flow

- 0 to 10 sccm (smlm) to 0 to 50 slpm (nlpm)

##### 100M Medium Flow

- 0 to 200 slpm (nlpm)

##### 100H High Flow

- 0 to 1000 slpm (nlpm)

Contact factory for higher flows



SmartTrak® 50

### DIGITAL / SmartTrak 50

#### Models

- 50L Low Flow
- 50M Medium Flow

#### Description

- Economical digital mass flow meter and controller
- Powerful digital high-performance at OEM pricing
- Save money with volume discounts
- Navigate easily with large display
- Free user software
- Choice of aluminum or 316 stainless-steel construction

- Compact size makes drop-in replacement easy
- Local display and digital setpoint
- Optional analog setpoint/output signals
- Field adjustable zero and span
- Primary Standard calibration & NIST traceability
- Leak integrity  $5 \times 10^{-9}$  sml/sec of helium
- CE Approved

#### Fluids Measured

- All clean gases including toxics and corrosives

#### Accuracy

- +/- 1.0% of full scale

#### Repeatability

- +/- 0.25% of full scale

#### Digital Communications

- RS-232, RS-485 (Multi-drop)

#### Flow Range

(Turndown - Meters 100:1 / Controllers 50:1)

##### 50L Low Flow

- 0 to 10 sccm (smlm) to 0 to 50 slpm (nlpm)

##### 50M Medium Flow

- 0 to 200 slpm (nlpm)

Higher flows available upon request



TopTrak®

### ECONOMICAL MFM / MFC TopTrak

#### Models

- 820 Nylon
- 820S Stainless Steel

#### Description

- Proven flow measurement with affordable OEM pricing
- Choice of nylon or stainless-steel construction
- Save money with volume discounts

- Large, tiltable display readout
- Compact size makes drop-in replacement easy
- Precision measurement with low pressure drop
- CE Approved

#### Fluids Measured

- All clean gases; check compatibility with wetted materials

#### Accuracy

- +/- 1.5% of full scale

#### Repeatability

- +/- 0.5% of full scale

#### Flow Ranges (100:1 Turndown)

##### 820 Nylon

- 0 to 50 slpm (nlpm)

##### 820S Stainless Steel

- 0 to 500 slpm (nlpm)

# Scientific Flow Meters



RedySmart™ / Industrial™

## DIGITAL / RedySmart / Industrial

### Models

- RedySmart meters and controllers
- RedyIndustrial meters and controllers with IP67 & EX protection

### Description

- Ultimate OEM solution, make gas mixing blocks
- Direct mass flow rate measurement/control
- Large digital display, free user software
- Micro Electro-Mechanical System (MEMS) technology
- Direct mass flow using thermal CMOS sensor

- Primary standard calibration & NIST traceability
- CE approved
- Lifetime no-drift sensor warranty

### Fluids Measured

- Air, N<sub>2</sub>, O<sub>2</sub>, He, Ar, CO<sub>2</sub>, H<sub>2</sub>, CH<sub>4</sub>, C<sub>3</sub>H<sub>8</sub>
- Other gases and mixes upon request

### Accuracy

- Actual gas calibration over entire range
- RedySmart: +/- 1.0% full scale
- RedyIndustrial: +/- 1.0% full scale

### Repeatability

- RedySmart: +/- 0.2% full scale
- RedyIndustrial: +/- 0.2% full scale

### Flow, Temp. & Pressure Ranges

- Flow: 0 to 500 slpm (nlpm)
- Temperature: 32 - 122°F (0 - 50°C)
- Pressure: 3 - 160 psia (0.2 - 11 bara)

### Additional Features:

- **RedySmart™**
- Modbus RTU included on every instrument
- Precision electromagnetic control valve
- Fast response (80 ms)
- 18 - 30 VDC power



RedyCompact™

## DIGITAL / RedyCompact

### Models

- RedyCompact meters and regulators

### Description

- Ultimate OEM solution, make gas mixing blocks
- Direct mass flow rate measurement/control
- Large digital display, free user software
- Micro Electro-Mechanical System (MEMS) technology
- Direct mass flow using thermal CMOS sensor

- Primary standard calibration & NIST traceability
- CE approved
- Lifetime no-drift sensor warranty

### Fluids Measured

- Air, N<sub>2</sub>, O<sub>2</sub>, He, Ar, CO<sub>2</sub>, H<sub>2</sub>, CH<sub>4</sub>, C<sub>3</sub>H<sub>8</sub>
- Other gases and mixes upon request

### Accuracy

- Actual gas calibration over entire range
- RedyCompact: +/- 2.0% full scale

### Repeatability

- RedyCompact: +/- 0.5% full scale

### Flow, Temp. & Pressure Ranges

- Flow: 0 to 500 slpm (nlpm)
- Temperature: 32 - 122°F (0 - 50°C)
- Pressure: 3 - 160 psia (0.2 - 11 bara)

### Additional Features:

- Compact footprint
- Designed to replace VA meters
- Battery operated
- Large touch screen with rotational adjustment
- Precision needle valve to regulate flow



CalTrak®

## GAS FLOW CALIBRATORS

### CalTrak

### Models

- 800 Premium
- XL High Flow

### Description

- Quick, easy to use, automatic data capture using free software
- Portable and battery operated
- Results directly traceable to NIST
- Highest accuracy primary standard for labs & industry (compare at ± 0.15% of reading)
- Innovative – 100:1 turndown ratio

- Proven dimensionally-based primary standard accuracy backed by a rigorous uncertainty analysis
- Manufactured to ISO 17025 Standards at a NVLAP accredited lab

### Fluids Measured

- All clean gases; toxic and corrosive gas versions available

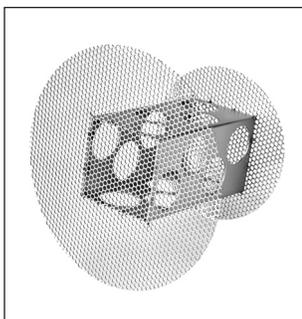
### Accuracy

- Highest accuracy of ± 0.15% of reading gas mass flow rate

Note: At gas pressure of 760 mmHg, (1 atm) and a gas temperature of 25°C (77°F) with standardization temperature set to 21.1°C (69.98°F)

### Flow Ranges

- **800 Premium**  
0.5 sccm to 100 slpm (Across five flow cells)
- **XL High Flow**  
5 slpm to 1500 slpm



FlowTrak™

## CONDITIONERS / FlowTrak

### Description

- Creates uniform flow profile to maximize accuracy in constrained piping areas
- Reduce upstream piping diameters to less than 3 diameters
- Use upstream of any gas flow meter
- Proven Dual-Plate inline flow conditioning technology
- Creates uniform flow profile at an economical price
- Low pressure drop

- May be used in very large diameter pipes
- Designed for use with ANY point velocity flow measurement device

### Fluids Measured

- Gas metering applications

### Straight Length Improvement

- Diameters relative to flow profile disturbance in brackets ( )
- One 90° Elbow: FlowTrak (1); Orifice plate (28)
- Two 90° Elbows Same Plane: FlowTrak (3); Orifice plate (36)

- Two 90° Elbows Different Planes: FlowTrak (5); Orifice plate (62)
- Reducer - 4/1: FlowTrak (3); Orifice plate (14)
- Globe Valve - Fully Open: FlowTrak (2); Orifice plate (32)

# GLOBAL LOCATIONS



California / USA



The Netherlands



India



China

Find other Sierra Flow Centers of Excellence in Mexico, Singapore, and South Korea.



**SIERRA**<sup>®</sup>  
**Measurably Different.**<sup>™</sup>

[sierrainstruments.com](http://sierrainstruments.com)

#### NORTH AMERICA

5 Harris Court, Building L / Monterey, CA 93940 / USA  
1.831.373.0200

#### EMEA

Bijlmansweid2 / 1934RE Egmond aan den Hoef / The Netherlands  
+31 72 5071400 / fx +31 72 5071401

#### ASIA - PACIFIC

Second Floor Building 5 / Senpu Industrial Park  
25 Hangdu Road Hangtoun Town / Pu Dong New District  
Shanghai, P.R. China Post Code 201316  
+8621 5879 8521/22 / fx +8621 5879 8586