

**System
1010E**

Flowmeters for the Thermal Energy Industry



*Highly Accurate Revenue Grade
Thermal Energy Submetering &
Energy Efficiency Monitoring*

*Easy Installation & Maintenance
Completely Non-Intrusive*



Its technical
advancements provide you
with the ultimate in revenue
grade performance for
Thermal Energy Metering.

What are its Specifications?

Typical Performance on 6" (DN 150) Schedule 40 Steel Pipe

Calibratable Accuracy	High Precision, 0.25% to 0.5% (0.2% on special order) Universal, 1% to 2% of rate
Flow Range	0 to ±60 ft/sec (18 m/sec) bi-directional
Sensitivity	0.001 ft/sec (.0003 m/s)
Repeatability.....	High Precision, 0.15% Universal, 0.25%
Flow Slew Rate	80 ft/sec ²
Pipe Diameter Range	0.25" - 360" (6 mm - 9 Meters)
Wall Thickness Range.....	0.02" - 3.0" (0.5 mm to 76 mm)
Precision Matched RTD's	1000 Ohm platinum, four wire
RTD Differential Temp. Match	0.02°F (0.01°C)
Temperature Calibration	Factory Calibrated Built-In Field Calibrator
Data Outputs	4-20mA, 0-10 Volts, Assignable Pulse Generator (0-5000Hz) Relays (Alarm/Status/ Total)
Data Inputs (Optional) ..	RTD Temperature Sensors 4-20mA (Pressure, KW, etc.) Totalizer Commands (Clear/Hold)
Digital Communication	RS-232 Serial Digital Port Modbus RTU Metasys N2 TCP/IP
Datalogger Memory	1 MB to 4 MB compressed
Display.....	Graphic - 240 x 128 pixels
Cable Length	Standard up to 300 ft (91 M) Up to 1000 ft (300 M) with factory approval
Temperature Range	
Flow Computer w/display	0°F to 122°F (-18°C to 50°C)
Flow Computer w/o display	0°F to 140°F (-18°C to 60°C)
Transducers	
Standard	-40°F (-40°C) to 250°F (121°C)
High Temperature	-80°F (-62°C) to 450°F (232°C) max
Power (AC)	100/120 or 220/230VAC, 1Ø, 25VA, 50/60Hz
Power (DC) (optional)	9 to 36VDC, 12W
Enclosure Rating	NEMA 4X (IP65)

Revenue Grade Billing Performance with Minimum 1000 : 1 Turn Down Ratio

Non-Intrusive dual channel thermal energy measurement - hot and chilled water at the same time!



Why Is 1010E The Energy Flowmeter For You?

This powerful instrument utilizes Phase Marked MultiPulse Transit-Time ultrasonic flow measurement to achieve the highest possible sensitivity and noise immunity. Detection of the Phase Marker assures ultimate flow rate detection accuracy.

System 1010's non-intrusive, Clamp-On WideBeam™ Transducers match your pipe's sonic waveguide parameters to assure the highest possible accuracy and immunity from changing application conditions. For added flexibility, System 1010 offers our award-winning Fast-Fourier Transform Reflexor Doppler technology if your application suffers from periodic or continual liquid aeration conditions.

1010E can be supplied as a rugged high precision, Clamp-On and/or Clamp-On Spool Thermal Energy Flowmeter. Single and Dual Channel models are available in both Portable and Dedicated NEMA 4X models. Dual Channel models can be configured to measure two different pipes, or to apply the second channel as a Dual Path for applications with convoluted piping configurations.

The system utilizes precision matched (to within 0.02°F (0.01°C)) 1000 Ohm Platinum RTD pairs and four-wire temperature cables to assure ultimate accuracy independent of the distance between transducers and flow computer.

As a stand-alone Thermal Energy Meter, System 1010E also becomes a remote communication module by accepting 4-20 mA inputs from other data sources, such as for electrical KW load, pressure, steam flow, etc. This information is integrated into 1010E's built-in datalogger and allows you to time-stamp all data and download it for your billing, efficiency and operation analysis.

What Can System 1010E Do For You?

System 1010E is intended for high precision revenue grade sub-metering of thermal energy production and use in Chilled or Hot Water HVAC installations. It is also a valuable tool for energy efficiency monitoring of major HVAC equipment. It is available for pipes 1/4" (6 mm) to 360" (9 M) diameter, for flow rates up to 40 ft/sec (12 m/sec), and temperatures from -40°F (-40°C) to +450°F (232°C). It offers all industry standard analog and digital data outputs (with modem and Modbus options), large backlit LCD digital graphics data display and integral Datalogger and Stripchart printout.

What Are System 1010E's Capabilities?



Rugged Clamp-On Spool Configuration

Application Diagnostics Condition Monitoring & Preventative Maintenance

- Detects Aeration and Cavitation caused by worn or damaged impellers, misaligned shafts, etc.
- Internal pipe wall build-up detection (i.e. Calcium, Zebra Mussels, etc.)
- Pipe Wall Thickness Measurement (Portable Models Only)
- Liquid Interface Detection
- Reverse Flow and Empty Pipe Detection
- Built-in signal coherence diagnostic test graphics continuously verify integrity of installation and application conditions

Math Functions and Configuration Flexibility

- Simultaneous measurement (Dual Channel) of two separate pipes
- Summing of the flow in two separate pipes
- Difference of the flow in two separate pipes
- Average of the flow in two separate pipes
- Dual Path Flow Measurement of one pipe for convoluted piping
- Reflexor Operation (Fast Fourier Doppler) Mode for aerated liquids

Convenient Features

- Security password protection for individual sites
- Pipe simulator for system integrity check out
- External Analog Inputs for 4-20mA and 0-10Vdc for inclusion of other parameters (KW, PSI, etc.) into the System 1010E datalogger
- Direct Digital Temperature Measurement via precision matched Clamp-On or Insert 1000 Ohm Platinum RTD pair and four-wire cable connection
- Internal Quick/Rapid Charging Battery in portable models
- Wide choice of large Multi-Graph Data Display Screens for real time trending.

Digital communication options

- ModBus RTU Interface Module
- Dial-up modem
- Metasys N2 connectivity
- RJ45 TCP/IP addressable ethernet



Why Is System 1010E The Best Energy Measurement System?

How Can System 1010E Eliminate Conventional Flowmeter Problems?

Non-intrusive System 1010E avoids the performance and reliability problems that afflict conventional intrusive Thermal Energy Flowmeters. Its high accuracy, wide bi-directional rangeability & high sensitivity prevent the loss of energy cost billing now suffered when flow rates fall below the operating range of intrusive heat meters. Absolutely no pressure drops means lowest operating costs. Shutdown is never needed for installation, maintenance, or calibration check, saving additional cost & inconvenience. Non-intrusive Clamp-On “no-wear” flow sensing delivers intrinsic high reliability.

By employing clamp-on or insert precision-matched 1000 Ohm Platinum RTD's (to within 0.02°F (0.01°C)) and utilizing four-wire direct connect cable digitally linked to the integrated energy flowmeter, System 1010E avoids the errors associated with self-heating, cable lead length, resolution, and A to D conversions typically found in conventional analog Thermal Energy Meters.



Clamp-On and Insert precision-matched 1000 Ohm Platinum RTD's and four-wire direct cable



Typical Portable Clip-On Transducers for small pipes



High Precision Clamp-On Flow Sensors with pin-stop Spacer Bar

What are System 1010E's Functions and Features?

More Economical than Intrusive Energy Flowmeters

- Installs in minutes without cutting pipe
- No shutdown for installation
- No pressure drop or friction loss

More Reliable than Intrusive Energy Flowmeters

- Flow and RTD Sensors mount outside pipe
- No shutdown for calibration check
- Virtually Maintenance Free

Site Setup with Help Function

- Tamper-Proof Menu with security password protection

User Selectable English or Metric units for Energy and Volumetric rates and totals



Stainless Steel Flow Tube for Steam Condensate Applications

What Models Are Available?

System 1010E offers any model needed for your application, whether completely Portable or Permanent NEMA 4X (IP 65). It offers a choice of AC or DC power sources. Choose from economical "Blind" units to models with large integrated LCD Graphics Display, with programmable electronic Stripchart and Datalogger. All data can be downloaded to a PC database without the need for special software.



1010EWDP Dual Channel Portable Thermal Energy Flowmeter

Dual Channel 1010 EWDP is essentially identical to the Single Channel 1010EP, except for its ability to measure energy flow in two different pipes simultaneously, with resultant economy in a more rugged case.

1010EN/EDN Fixed Single/Dual Channel Thermal Energy Flowmeter

This standard NEMA 4X/IP65 system is provided with precision-matched clamp-on or insert RTD temperature sensors.

1010EP Compact Portable Thermal Energy Flowmeter

System 1010EP is ideal for periodic check of thermal energy and liquid flow rates at locations not needing continuous measurement. Also use 1010EP to check the calibration of conventional intrusive thermal energy flowmeters. Built-in pipe wall thickness gauge capability.

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