

• **SYSTEM-10 BTU METER** •



PROCESS CONTROL EQUIPMENT
3GF5

DESCRIPTION

The System-10 BTU Meter provides highly accurate thermal energy measurement in chilled water, hot water and condenser water systems based on signal inputs from two matched temperature sensors (included) and any of ONICON's insertion or inline flow meters (ordered separately). The basic model provides a local indication of energy, flow and temperature data through an alphanumeric display. An isolated solid state dry contact is provided for energy total. Optional analog outputs and network communications are also available.

APPLICATIONS

Chilled water, hot water and condenser water systems for:

- Commercial office tenant billing
- Central plant monitoring
- University campus monitoring
- Institutional energy cost allocation
- Performance/efficiency evaluations
- Performance contracting energy monitoring

FEATURES

Simple Installation and Commissioning - Factory programmed and ready for use upon delivery. All process data and programming functions are accessible via front panel display and keypad.

Single Source Responsibility - One manufacturer is responsible for every aspect of the energy measurement process ensuring component compatibility and overall system accuracy.

N.I.S.T. Traceable Calibration with Certification - Each Btu measurement system is individually calibrated using application specific flow and temperature data and is provided with calibration certificates.

Precision Solid State Temperature Sensors - Custom calibrated and matched to an accuracy better than $\pm 0.15^\circ$ F over calibrated range.

Highly Accurate Flow Meters - ONICON offers a wide variety of insertion and inline type flow measurement technologies including turbine, electromagnetic and vortex sensing. Each type offers unique advantages depending on the application. All ONICON flow meters are individually wet calibrated and designed to operate over a wide flow velocity range with accuracies ranging from $\pm 0.2\%$ to $\pm 2.0\%$ of rate depending on the model.

Complete Installation Package - All mechanical installation hardware, color coded interconnecting cabling and installation instructions are provided to ensure error-free installation and accurate system performance.

Serial Communications - Optional communications card provides complete energy, flow and temperature data to the control system through a single network connection, reducing installation costs.

ORDERING INFORMATION

The System-10 BTU Meter is sold complete with temperature sensors. Thermowell installation kits and flow meters are purchased separately.

ITEM #	DESCRIPTION
SYSTEM-10	System-10 BTU Meter
SYSTEM-10-OPT8	High temperature sensors (over 200° F)
SYSTEM-10-OPT9	Add one analog output
SYSTEM-10-OPT10	Add four analog outputs
Choose from the following commonly used thermowell installation kits:	
SYSTEM-10-OPT4	Upgrade to outdoor thermowells (pair)
BTU-ST-INSTL32	Brass kit for welded steel pipe (¾" - 5")
BTU-ST-INSTL52	Brass kit for threaded steel pipe (¾" - 2½")
BTU-ST-INSTL34	SS kit for welded steel pipe (¾" and up)
BTU-ST-INSTL36	Brass kit for copper tube (¾" - 2")
BTU-ST-INSTL37	Brass kit for copper tube (2½" - 3")
Choose from the following flow meters:	
F-1100 / F-1200	Insertion Turbine Flow Meter (1¼" - 72")
F-1300	Inline Turbine Flow Meter (¾" - 1")
F-3100 / F-3200	Inline Electromagnetic Flow Meter (¼" - 48")
F-3500	Insertion Electromagnetic Flow Meter (3" - 72")
F-4200	Clamp-on Ultrasonic Flow Meter (½" - 48")
F-2000 Series	Inline Vortex Flow Meter (½" - 12")
Refer to catalog for flow meter installation kits. Consult with ONICON for additional thermowell installation kit and flow meter options.	

SYSTEM-10 BTU METER SPECIFICATIONS

CALIBRATION

Flow meters and temperature sensors are individually calibrated followed by a complete system calibration.
Field commissioning is also available.

ACCURACY

TEMPERATURE

Overall differential temperature measurement uncertainty of $\leq \pm 0.15^\circ \text{ F}$ over the stated range
(Includes uncertainty associated with the sensors, transmitters, cabling and calculator input circuitry)
Temperature sensors meet EN1434 / CSA C900.1 accuracy requirements for 1K sensors for cooling applications, $32^\circ \text{ F} - 77^\circ \text{ F}$
Temperature sensors meet EN1434 / CSA C900.1 accuracy requirements for 2K sensors for heating applications, $140^\circ \text{ F} - 212^\circ \text{ F}$

CALCULATOR

Computing nonlinearity within $\pm 0.05\%$
Calculator meets EN1434 / CSA C900.1 class 1 accuracy requirements for 2K sensors for all applications

PROGRAMMING

Factory programmed for specific application
Field programmable via front panel interface

MEMORY

Non-volatile EEPROM memory retains all program parameters and totalized values in the event of power loss.

DISPLAY

Alphanumeric LCD displays total energy, total flow, energy rate, flow rate, supply temperature, return temperature, serial number and alarm status
Alpha: 16 character, 0.2" high
Numeric: 8 digit, 0.4" high
Rate Display Range: 0 - 9,999,999
Total Display Range: 0 - 9,999,999
The totals will roll over to zero when the maximum count is exceeded.

OUTPUT SIGNALS

Standard:
Isolated solid state dry contact for energy total:
Contact rating: 100 mA, 50 V
Contact duration: 0.5, 1, 2, or 6 sec
Optional:
Analog Output(s) (4-20 mA, 0-10 V or 0-5 V):
One or four analog output(s) available for flow rate, energy rate, supply/return temps, or delta-T.
Serial Communications:

BACnet IP or MS/TP	LONWORKS - TP/FT-10F
Siemens Apogee - P1	Johnson Controls Metasys - N2
MODBUS RTU RS485 or TCP/IP	

TEMPERATURE SENSORS

Solid state sensors are custom calibrated using N.I.S.T. traceable temperature standards.
Current based signal (mA) is unaffected by wire length.

TEMPERATURE RANGE

Standard liquid temperature range: 32° F to 200° F
Optional extended temperature ranges available
Ambient temperature range: -20° F to 140° F

LIQUID FLOW SIGNAL INPUT

0-15 V pulse output from any ONICON flow meter

MECHANICAL

Electronics Enclosure:

Standard: Steel NEMA 13, wall mount, 8"x 10"x 4"
Optional: NEMA 4 (Not UL listed)
Approximate weight: 12 lbs

Temperature Sensor Thermowell Kits:

Thermowells and other kit components vary by fluid type, fluid temperature, pipe material and pipe size. Commonly used kits are listed on the previous page. Contact ONICON for additional thermowell kit options, including hot tap installation kits for retrofit installations.

ELECTRICAL

Input Power: Based on Btu meters configured for network connection without the optional analog outputs

Standard: 24 VAC, 50/60 Hz, 500 mA
Optional: 120 VAC, 50/60 Hz, 200 mA
230 VAC, 50 Hz, 150 mA

Internal Supply:

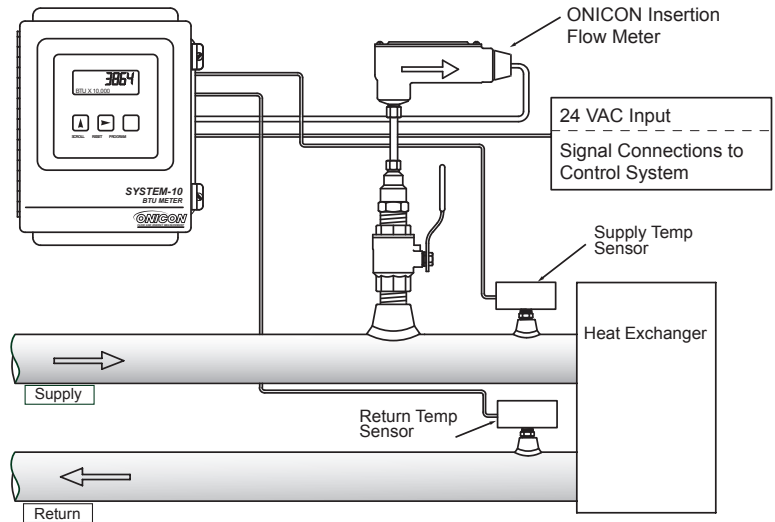
Provides 24 VDC at 200 mA to electronics and flow meter

Wiring:

Temperature signals: Use 18-22 ga twisted shielded pair
Flow signals: Use 18-22 ga - see flow meter specification sheet for number of conductors.

Note: Specifications are subject to change without notice.

TYPICAL SYSTEM-10 INSTALLATION



Insertion turbine flow meter shown. Any ONICON flow meter may be used with the System-10 BTU Meter. Consult with ONICON for additional flow meter types.