



System-10
BTU Meter

ONICON's System-10 BTU Meter is the premier platform for accurately measuring and reporting the thermal energy usage, flow and temperatures required by today's High Performance Buildings.



• Chilled Water • Heating Hot Water • Condenser Water •



DESCRIPTION

The System-10 BTU Meter provides highly accurate thermal energy measurement in chilled water, hot water and condenser water systems. Energy measurements are based on signal inputs from a matched pair of temperature sensors and any of ONICON's flow meters that are ordered separately.

The flexible design provides a local indication of energy, flow and temperature data through a backlit display. An isolated solid state dry contact is provided for energy total. Optional analog outputs and network communications are also available.

Whether it's used for chiller plant optimization, CEP monitoring and control, or sub-metering the hydronic energy use across a campus, the System-10 has the versatility and functionality required to integrate seamlessly with your BMS/EMS.

Typical applications include chilled and heating hot water or 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

CALIBRATION

Each System-10 is subjected to a comprehensive series of conformance tests which ensures that each meter is fully functional and meets the published performance and accuracy specifications. The absolute accuracy of conformance test equipment is directly traceable to NIST*. A certificate of calibration is provided.

FEATURES

Multiple Outputs Options - Three (3) pulse outputs are provided for totalization and mode status. RS485 and/or IP network communications as well as single (1) and multiple (4) analog outputs are also available as optional 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.

Multiple Flow Meter Options - The System-10 may be ordered with any of ONICON's inline, insertion, or clamp-on style flow meters. This ensures the best metering technology can be chosen for all application and installations.

Multiple Temperature Sensor Options - The System-10 may be ordered with a pair of matched ONICON's precision current based sensors or a pair of platinum RTDs. Each option offers exceptional accuracy and reliability.

User-friendly Interface - Commissioning is easy via the backlit display and smart button technology. No special configuration tools needed!

Serial Communication – Optional RS485 and/or IPv4 communications report energy, flow, and temperature data directly to the EMS/BMS through a single network connection. A pulse input is also available for totalizing pulse inputs from an external device such as a domestic water meter.

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.

**National Institute of Standards and Technology*

SPECIFICATIONS*

SYSTEM-10 TRANSMITTER		
PERFORMANCE	CALCULATOR ACCURACY	Computing nonlinearity within ±0.05% Calculator meets EN1434 CSA C900.1 Class 1 accuracy requirements for 2K sensors for all applications.
	TEMPERATURE ACCURACY	Overall differential temperature measurement uncertainty of ≤ ±0.15°F over the stated range. (Includes uncertainty associated with the sensors, transmitters, cable and calculator input circuitry).
	ONICON CURRENT BASED TEMPERATURE SENSOR ACCURACY	Temperature sensors meet EN1434/CSA C900.1 accuracy requirements for 1K sensors for cooling applications, 32°F to 77°F. Temperature sensors meet EN1434/CSA C900.1 accuracy requirements for 2K sensors for heating applications, 140°F to 212°F.
OPERATING CONDITIONS	AMBIENT TEMPERATURE	-20°F to 140°F
	FLUID TEMPERATURE	25°F to 500°F. Fluid temperature ranges vary based on application. See Meter Ordering Information for more details.
INPUT POWER**	24 VAC	20-28 VAC @ 50/60 Hz, 12 VA
	120 VAC	108-132 VAC @ 50/60 Hz, 15 VA
	240 VAC	207-253 VAC @ 50/60 Hz, 15 VA
I/O SIGNAL**	ISOLATED SOLID STATE DRY CONTACT PULSE OUTPUT(S)	Three (3) pulse outputs available. Mode 1: scaled pulse output for Energy Total. Mode 2: scaled pulse output for Energy Total. Mode Status: indicates mode 1 or mode 2 operation. Contact ratings: 100 mA, 50V max. Pulse duration: 0.5, 1, 2 or 6 sec (field programmable)
	ISOLATED ANALOG OUTPUT(S)	Optional one (1) or four (4) analog output board. Available for: Flow Rate, Energy Rate, Supply Temp, Return Temp and Delta-T. Output type: Field selectable 4-20 mA, or 0-10 V. Note: 0-5 V also available with 4 A/O option.

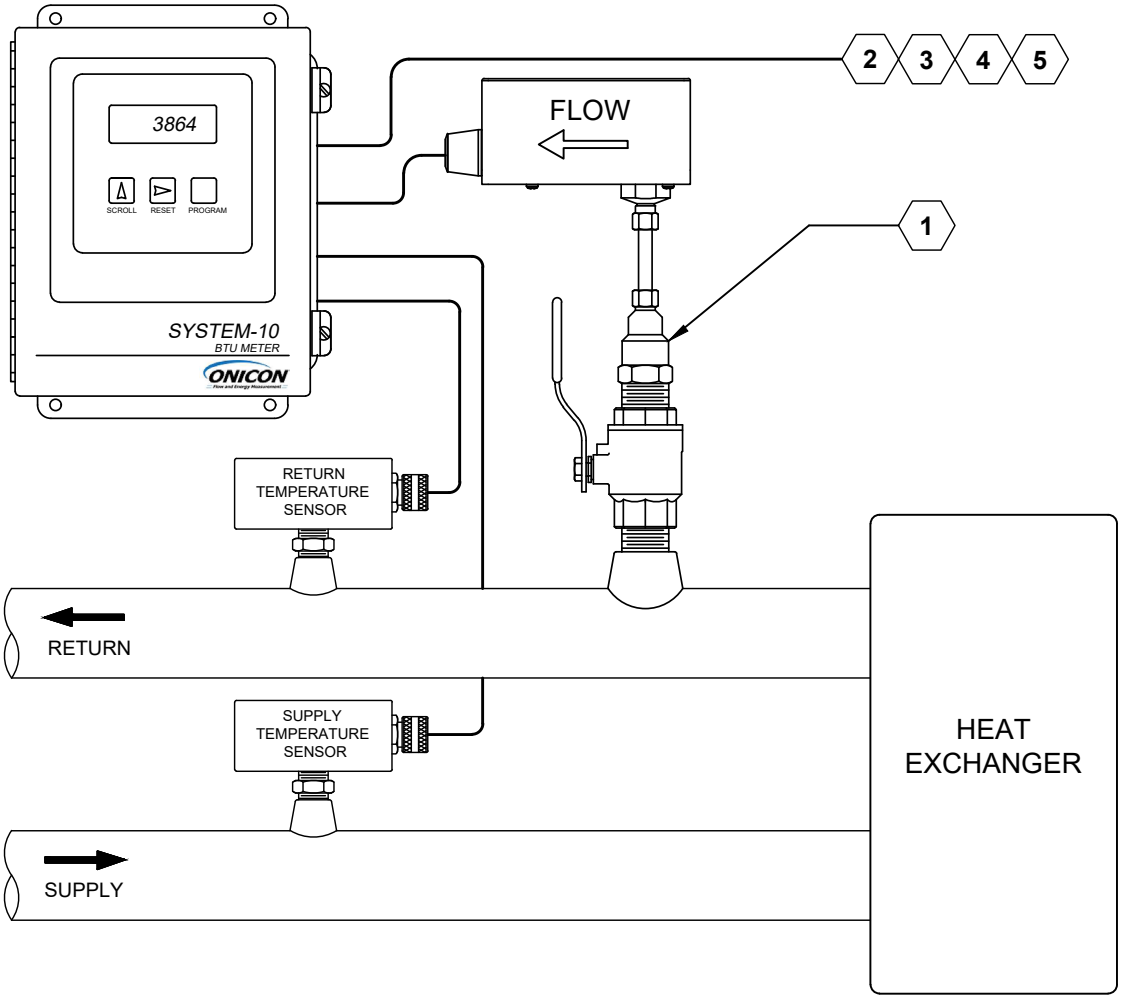
* SPECIFICATIONS subject to change without notice.
**See model codification for additional information regarding option selections.

SPECIFICATIONS CONTINUED*

SYSTEM-10 TRANSMITTER (CONTINUED)		
ELECTRONICS ENCLOSURE**	AVAILABLE OPTIONS	• NEMA 13 enclosure with LCD display • NEMA 4 enclosure with LCD display Both options include four (4) 3/4" conduit openings
	DISPLAY	White, backlit, 16-character alpha, 8-line numeric LCD displays total energy, total flow, energy rate, flow rate, supply temperature, return temperature, serial number and alarm status.
	MEMORY	Non-volatile EEPROM memory retains all program parameters and totalized values in the event of power loss.
PROGRAMMING	Field programmable via front panel interface with factory programmed for specific application	
ELECTRICAL CONNECTIONS	INPUT POWER	24 VAC input power: Use PVC jacketed copper cable with a wire gauge suitable for the length of run and required maximum current carrying capacity. The installation must comply with all local, state and federal building codes. 120/240 VAC input power: Use a three (3) wire service with one (1) wire a protective earth ground. The installation must comply with all local, state and federal building codes.
	TEMPERATURE SIGNALS	Use 18-22 ga. twisted shielded pair
	FLOW SIGNALS	Use 18-22 ga. shielded cable. See flow meter specification sheet or flow meter IOM for the correct number of conductors.
TEMPERATURE SENSOR**	Solid state sensors are custom calibrated using NIST traceable temperature standard. Current based signal (mA) is unaffected by wire length.	
NETWORK CONNECTIONS**	AVAILABLE OPTIONS	• BACnet MS/TP or BACnet IP • MODBUS RTU or MODBUS TCP/IP • LonWorks - TP/FT-10F • Siemens Apogee - P1 FLN • Johnson Controls Metasys - N2 • DualNet, IP and RS485 (BACnet/ MODBUS)
APPROVALS	c UL us LISTED NEMA 13 ENCLOSURE VERSION ONLY	

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**See model codification for additional information regarding option selections.

TYPICAL METER INSTALLATION



1. ONICON insertion flow meter (ordered separately)
2. Provide a power supply (Class 2 power supply for 24 VAC) with sufficient power for the connected flow meter:
   - 24 VAC: 20-28 VAC, 50/60 Hz, 12 VA
   - 120 VAC: 108-132 VAC, 50/60 Hz, 15 VA
   - 240 VAC: 207-253 VAC, 50/60 Hz, 15 VA
3. Optional serial communications:
   - BACnet MS/TP or BACnet IP
   - MODBUS RTU or MODBUS TCP/IP
   - LonWorks
   - Siemens P1
   - JCI N2
   - DualNet, IP and RS485 (BACnet/ MODBUS)
4. Outputs are available for Energy Total and Operating Mode.
5. Optional Analog Outputs are available for Energy Rate, Flow Rate, Supply Temp, Return Temp and Delta-T.

METER ORDERING INFORMATION
Meter Model Number Coding = SYS-10-ABCD-EFGG

A = Electronics Enclosure
- 1 = NEMA 13 enclosure with LCD display
- 2 = NEMA 4 enclosure with LCD display

B = Input Power
- 1 = 24 VAC, 12 VA
- 2 = 120 VAC, 15 VA
- 3 = 240 VAC, 15 VA

C = Serial Communications
- 0 = No serial communications provided
- 1 = RS485, BACnet MS/TP
- 2 = RS485, MODBUS RTU
- 3 = BACnet IP
- 4 = MODBUS TCP/IP
- 5 = DualNet serial communications, IP and RS485 (BACnet/MODBUS)
- 6 = JCI N2
- 7 = Siemens P1
- 8 = LonWorks

D = Analog Output
- 0 = No analog output
- 1 = Single (1) isolated analog output
- 2 = Four (4) isolated analog outputs (Not available when C=5)

E = Auxiliary Pulse Inputs
- 0 = (1) Directional pulse input only
- 1 = (1) Directional pulse and auxiliary pulse input (Not availalbe when C = 0)

F = Auxiliary Pulse Outputs
- 1 = Three (3) pulse outputs, dry contact

GG = Temperature Sensor
- O1 = Matched pair of current (mA) based sensors, CHW/CW range
- O2 = Matched pair of current (mA) based sensors, HHW range
- S1 = Matched pair of PT100 current (mA) based sensors, 122°F to 302°F *
- S4 = Matched pair of PT100 current (mA) based sensors, 80°F to 400°F *

*Note: S1 and S4 are only recommended for use in applications that exceed 212°F. They are designed for use in applications where the average delta temperature is ≥ 25°F.