SYSTEM-20

BTU METER

ONICON'S System-20 BTU Meter accurately measures thermal energy, flow and temperature. The versatile design can be used with a variety of flow meter and temperature sensor options allowing you to match accuracy and performance requirements to your application.

• Chilled Water • Hot Water • Domestic Water •

DESCRIPTION

The System-20 BTU Meter provides highly accurate thermal energy measurement in water and water/glycol cooling, heating 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 energy, flow and temperature data on the local display via analog and pulse outputs, and over BACnet® MS/TP or MODBUS® RTU networks. Three auxiliary inputs are also provided to totalize pulses from other devices and communicate these totals directly to the network.

Chilled water, hot water and condenser water systems for:

- Central plant monitoring
- Campus energy monitoring and cost allocation
- Performance/efficiency evaluations
- Energy monitoring for performance contracts
- AHU and CRAC units for commercial office tenant billing
- Solar, geothermal and ground-source energy monitoring

CALIBRATION

Each System-20 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 conformance is provided.

* National Institute of Standards and Technology

FEATURES

Multiple Outputs - Three programmable pulse outputs, three pulse inputs and one analog output are provided with each meter. An RS485 output is also provided for BACnet MS/TP or MODBUS RTU.

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.
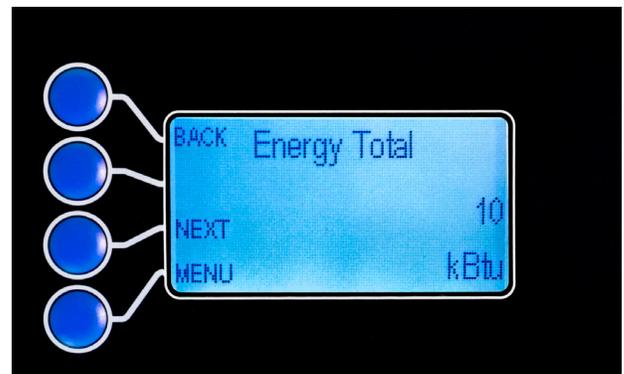
Multiple Flow Meter Options - The System-20 may be ordered with any of ONICON's inline, insertion, or clamp-on style flow meters. This allows you to match specific flow meter features and benefits to your application.

Multiple Temperature Sensor Options - The System-20 may be ordered with ONICON's precision current based sensors or a pair of matched platinum RTDs. Each option offers exceptional accuracy and reliability.

Ideal Submetering Solution - Three user defined pulse inputs are provided standard. Pulses from water, gas, or electric meters may be totalized in the System-20 to simplify network connectivity at the metering location.

Built-In Interval Data Logger - Energy and volume totals are date/time stamped and logged within the meter along with operating status and other analytical data. Data is available via BACnet MS/TP or MODBUS RTU.

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

Smart button technology
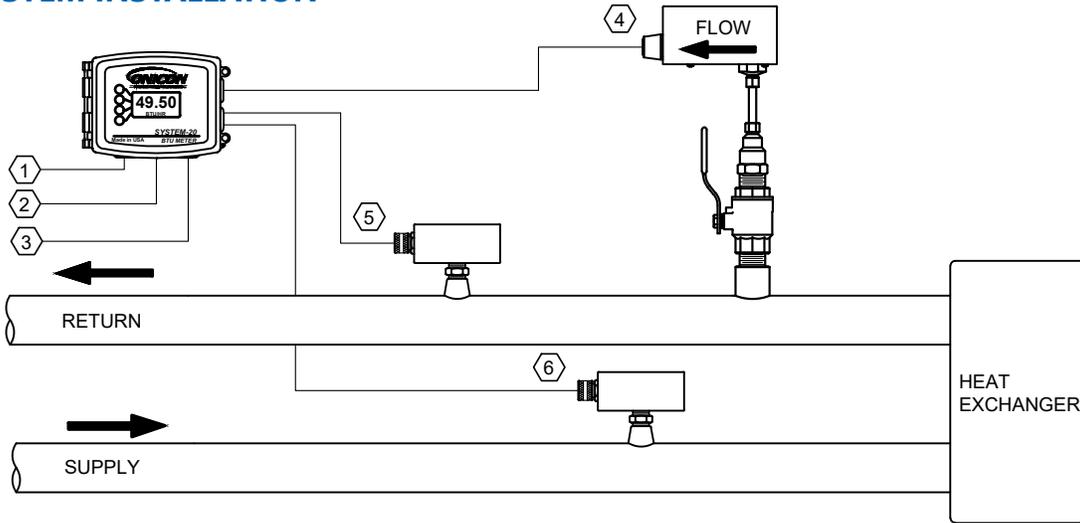simplifies menu page navigation

SPECIFICATIONS*

LIQUID FLOW RATE	See accuracy statement provided with the flow meter (ordered separately)	
DIFFERENTIAL TEMPERATURE	Meets EN1434/C900.1 accuracy requirements for 3K sensors	
	AVAILABLE OPTIONS	• Precision solid state current based sensors. Signal (mA) is unaffected by wire length. Overall differential temperature measurement uncertainty of ± 0.15°F over the application range. Liquid temperature range: 32°F to 200°F • 1000Ω platinum RTDs calibrated to a differential measurement uncertainty of ± 0.18°F over the stated range
CALCULATOR	Meets EN1434 Class 1 requirements with 3K minimum Δt	
	COMPUTATION ERROR	≤0.09% at 30°F ΔT
MECHANICAL	DIMENSIONS	5.5" H x 6.5" W x 4.25" D
MATERIALS	ENCLOSURE	Glass filled polycarbonate with a UL 94 V-0 flammability rating suitable for use in plenum spaces
ENVIRONMENTAL	Meets EN1434/C900.1 Class B requirements	
	OPERATING TEMPERATURE RANGE	-13°F to 140°F
	ENCLOSURE RATING	NEMA 12K
POWER SUPPLY REQUIREMENTS	20 - 28V AC/DC, 50/60 Hz 500 mA DC or 1A AC maximum input current	
ISOLATED ANALOG OUTPUT	May be programmable for energy rate, flow rate, supply temperature, return temperature or Δt	
	CONFIGURABLE	4-20 mA, 0-5 V or 0-10 V output
ISOLATED TOTALIZING SOLID STATE CONTACT CLOSURE PULSE OUTPUTS	May be programmed for energy, volume, alarm indication, mode indication or MODBUS coil indication	
	CONTACT RATINGS	50 mA, 30 V
	CONTACT PULSE DURATION	50, 100, 500 or 1000 ms
ISOLATED TOTALIZING PULSE INPUTS	For use with devices providing sinking open collector or dry contact outputs	
NETWORK CONNECTION	Isolated RS485 serial interface	
COMMUNICATION PROTOCOLS	AVAILABLE OPTIONS	• BACnet MS/TP per ASHRAE Standard 135.1: 2009 • MODBUS RTU
NETWORK CONFIGURATION & ADDRESSING	BAUD RATES	4800, 9600, 19200, 38400, 76800, or 115200
	DEVICE ADDRESS RANGE	1 – 127 (1 - 247 MODBUS RTU)
	DEVICE INSTANCE RANGE	1 – 4,194,303 (BACnet only)
	PARITY	None, Even, Odd (MODBUS RTU only)
APPROVALS	FCC	Part 15, Subpart B
	BTL	Certified to ASHRAE 135:2009
	UL	
	CE	

* SPECIFICATIONS subject to change without notice.

TYPICAL SYSTEM INSTALLATION

1. Class II Input Power 20-28V AC/DC, 50/60 Hz
2. Input and output signals
   - Three (3) pulse inputs,
   - Three (3) pulse outputs
   - One (1) analog output
3. RS485 BACnet or MODBUS

4. ONICON Water Flow Meter (ordered separately)
5. Return Temperature Sensor
6. Supply Temperature Sensor

DESIGNED FOR NETWORKING

The System-20 has a single RS485 interface, providing either native BACnet MS/TP or MODBUS RTU. Interval data for energy and volume are provided along with trend data, operating status and diagnostic data. The single analog output provides energy rate, flow rate or temperature data in a 4-20 mA, 0-10 V or 0-5 V format.

BACnet® / MODBUS® Data	
Data	**Available Data Objects**
Energy	Instantaneous Rate / Total / Y-T-D Total / Prev. Yr. Total / User Resettable Total
Volume	Instantaneous Rate / Total / Y-T-D Total / Prev. Yr. Total / User Resettable Total
Temperature	Supply Temp / Return Temp / Delta Temp
Status	Operating Status / Mode Status (heating /cooling)
Trend	Energy Total / Volume Total / Peak Energy / Average Delta Temp / Operating Status

METER ORDERING INFORMATION

Meter Model Number Coding = SYS-20-ABCD-EFGG

A = Electronics Enclosure
   1 = NEMA 12 K

B = Input Power
   1 = 24 VAC/DC, 24 VA

C = Serial Communications
   1 = RS485, BACnet or MODBUS

D = Analog Output
   1 = One (1) analog output, user programmable

EF = Auxiliary Pulse Input / Output
   11 = Three (3) pulse inputs, three (3) pulse outputs, user programmable

GG = Temperature Sensor Options
   01 = Includes CHW pair of matched current based (mA) temp sensors, 32°F to 200°F
   02 = Includes HW pair of matched current based (mA) temp sensors, 32°F to 200°F
   R2 = Includes pair of matched 4-wire RTDs, 0.5" to 2.5" line size, 32°F to 250°F
   R3 = Includes pair of matched 4-wire RTDs, 3" to 24" line size, 32°F to 250°F
   00 = Temp sensors to be provided separately