SYSTEM-20
BTU METER

Chilled Water • Hot Water • Condenser Water

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.

ONICON
Flow and Energy Measurement

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.

APPLICATIONS

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.[1] A certificate of conformance is provided.

[1] - National Institute of Standards and Technology

FEATURES

Multiple Outputs - Three programmable pulse outputs, three pulse inputs and one analog output are provided standard 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.

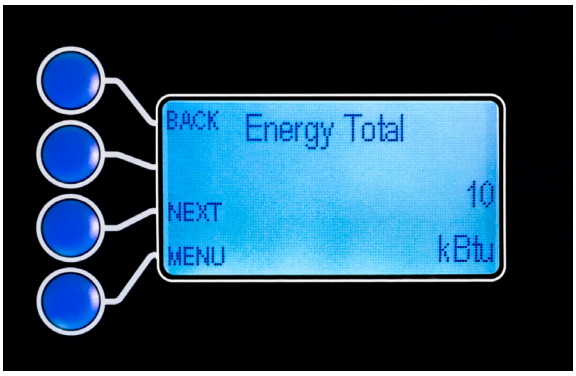
Multiple Flow Meter Options - The System-20 may be ordered with any of ONICON's inline, insertion, or clamp-on style flow meters. This allows you to match specific flow meter features and benefits to your application.

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!

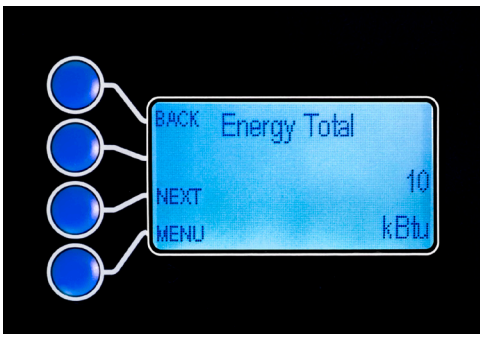


Smart button technology
simplifies menu page navigation

VERSATILE DESIGN

The System-20 is designed for maximum flexibility, allowing multiple flow and temperature sensor input options - simplifying installation. Multiple output options allow for connectivity to a wide variety of building automation and control systems from one device.

- The System-20 accepts frequency (pulse) or analog flow signals from most flow meters.
- Temperature sensor inputs support include current based (mA) and 1000Ω RTD's.
- Each of the three programmable pulse outputs can be used for totalization, alarm status or mode indication.
- User defined auxiliary pulse inputs totalize pulses from external devices. Pulse counts may be viewed at the System-20 and over the network.



The System-20 accepts ONICON or 1000Ω RTD temperature sensors

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

ONICON offers a wide variety of flow meter options including insertion, inline and clamp-on designs. Please ask us how we can assist you with selecting the right flow meter technology for your application!

GENERAL SPECIFICATIONS*

ACCURACY

LIQUID FLOW RATE

See accuracy statement provided with the flow meter (ordered separately)

DIFFERENTIAL TEMPERATURE

Option 1: 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. Meets EN1434/C900.1 accuracy requirements for 3K sensors
Standard liquid temperature range: 32 to 200°F

Option 2: 1000Ω platinum RTDs calibrated to a differential measurement uncertainty of ± 0.18°F over the stated range
Meets EN1434/C900.1 accuracy requirements for 3K sensors

CALCULATOR

Computation error: ≤ 0.09% @ 30°F ΔT
Meets EN1434 Class 1 requirements with 3K minimum 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 to 140°F
Enclosure Rating: NEMA12K

ELECTRICAL

Power Supply Requirements

20 - 28V AC/DC, 50/60 Hz
500 mA DC or 1A AC maximum input current

ELECTRICAL (Continued)

Isolated analog output: May be programmed for energy rate, flow rate, supply temperature, return temperature, or ΔT
Configurable as: 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 sinking open collector or dry contact outputs

NETWORK CONNECTION

Isolated RS485 serial interface

COMMUNICATION PROTOCOLS

BACnet MS/TP per ASHRAE Standard 135.1: 2009 or 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
CE CE
BTL Certified to ASHRAE 135:2009
UL

*Note: Specifications are subject to change without notice.

METER ORDERING INFORMATION

Meter Model Number Coding = SYS-20-ABCD-EFGG(-SPC)

SYS-20= BTU Metering System

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

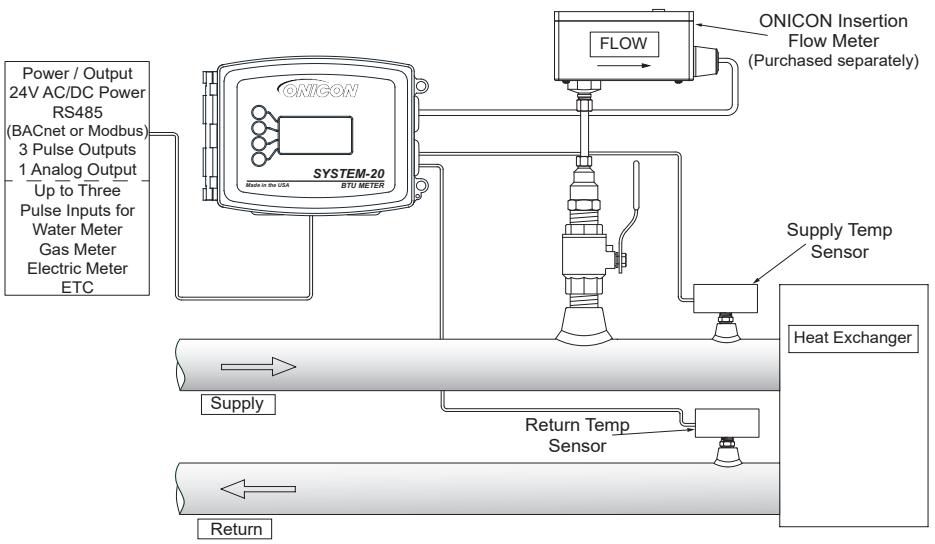
EF = Auxiliary Pulse Input/ Output

11	Three (3) pulse inputs, three (3) pulse outputs, user configurable

GG = Temperature Sensor Options

O1	Includes CHW pair of matched current based (mA) temp. sensors, 32 to 200°F
O2	Includes HW pair of matched current based (mA) temp. sensors, 32 to 200°F
R2	Includes pair of matched 4 wire RTD's, 0.5" to 2.5" line size, 32 to 250°F
R3	Includes pair of matched 4 wire RTD's, 3" to 24" line size, 32 to 250°F
00	Temperature sensors to be provided separately

SPC = Special Configuration



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