

GENERAL

The Badger Meter Model 3050 Energy Monitor is an economical full featured compact unit designed for HVAC sub-metering applications, and general hydronic thermal transfer systems. Outputs include one mechanical relay and one solid-state pulse output, both featuring unit/pulse and set-point control independently based on flow or energy rate/total, supply return, or delta temperature readings. Also driven by the same variables, an optional Analog 4-20mA or 0-20mA output is provided. Additionally, the optional USB, RS-485 MODBUS, and BACnet/MSTP provide high-level communication.

A two line by 16-character 3/8" high backlit LCD display is configured by the user to display flow rate, flow total, energy rate, energy total, supply and return temperatures, and/or delta T. In addition to many pre-programmed units of measure, many custom units can be created during field set-up.

The two required temperature inputs can be standard Badger Meter two wire 10k thermistors, or three wire 100 Ω platinum RTD's. A unique programming feature permits custom RTD or thermistors to be accommodated.

The flow sensor input features flexible scaling options and signal type selections that permit the use of most Badger Meter sensors, or other frequency sine/pulse or linear analog devices.

PROGRAMMING

Programming is very easy and can be done using the five front panel push buttons, or optionally by using Windows® based software via a USB port.

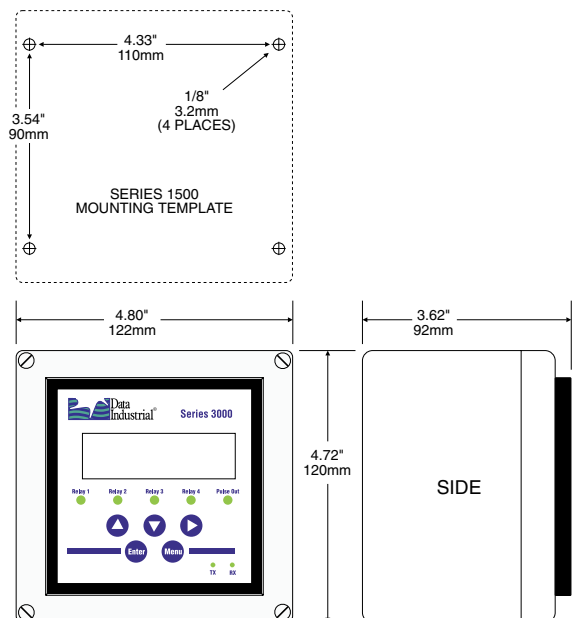
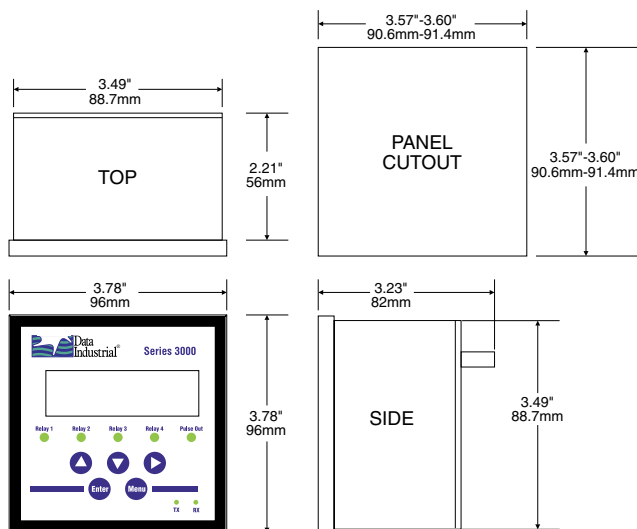
OPTIONS

NEMA4x panel mount conforms to DIN standard 96 mm x 96 mm for meter size and cutouts. NEMA4x wall mount is available as an option.



Advanced features include the following:

1. Infinite Impulse Response Filter (IIRF) smooths the flow rate, temperature, and energy rate calculations. This proprietary smoothing software provides accurate energy calculations by compensating for a wide variety of flow and temperature signal variables.
2. Temperature sensor zeroing effectively makes any two similar sensors a matched pair at the actual operating temperature.
3. Password restricted access to programming, reset total, or both.
4. Non-volatile memory of totals and field configuration, without need for battery backup.
5. Efficient switching power supply permits 12-24VAC/DC operations.



Flow Sensor Inputs

| Type | Threshold | Signal Limit | Frequency | Pull-up | Impedance | Aux. Power | Calibration |
|-------------------|-----------|--------------|----------------|-------------|-----------|------------|-------------|
| Pulse-DI | 2.5 VDC | 30VDC | 0.4Hz to 10kHz | 1K to 12VDC | - | 12VDC@30mA | K + Offset |
| Pulse-K Factor | 2.5 VDC | 30VDC | 0.4Hz to 10kHz | - | - | 12VDC@30mA | Pulse/Gal |
| Pull-up-K Factor | 2.5 VDC | 30VDC | 0.4Hz to 10kHz | 1K to 12VDC | - | 12VDC@30mA | Pulse/Gal |
| Sine-K Factor | 10mVPP | 30VDC | 0.4Hz to 10kHz | - | 10k Ω | 12VDC@30mA | Pulse/Gal |
| Analog – 4-20mA | - | 50mA Fused | - | - | 100 Ω | 12VDC@30mA | Linear |
| Analog – 0-20mA | - | 50mA Fused | - | - | 100 Ω | 12VDC@30mA | Linear |
| Analog – 0-1 VDC | - | 30VDC | - | - | 100k Ω | 12VDC@30mA | Linear |
| Analog – 0-5 VDC | - | 30VDC | - | - | 100k Ω | 12VDC@30mA | Linear |
| Analog – 0-10 VDC | - | 30VDC | - | - | 100k Ω | 12VDC@30mA | Linear |

Rate Units of Measure: GPM; gal/sec; gal/hr; Mgal/day; LPS; LPM; LPH; ft3/Sec; ft3/min; ft3/hr; m3/sec; m3/min; m3/hr; acre-ft/min; acre-ft/hr; bbl/sec; bbl/min; bbl/hr; and field programmed custom units 0.00 to 999999999

Total Units: gallons; Mgal; liters; ft3; m3; acre-ft; bbl; and field programmed custom units 0.00 to 999999999

SPECIFICATIONS

Voltage

12-24 VDC / VAC

(Limit: 8-35VDC)

(Limit: 8 – 28VAC)

DC current draw (~280mA)

AC power rating (~5 VA)

Display

16 character by two line alphanumeric dot matrix 7.95mm high backlit LCD

Operating Temperature

-20°C to +70°C

Storage Temperature

-30°C to +80°C

Dimensions

Panel Mount:

3.78"W x 3.78"H x 3.23"D
(96mm x 96mm x 63mm)

Wall Mount:

4.80"W x 4.72"H x 3.63"D
(120mm x 120mm x 92mm)

Weight:

panel mount 12 oz

Temperature Inputs

Two of 2 wire 10k type II thermistor (25.0°F to 170.0°F); or custom field defined

3 wire platinum 100Ω RTD; (25.0°F to 250.0°F); or custom field defined

Units of measure: °F and °C

Energy Computations

Energy Rate units: kBtu/hr; Btu/min; kW;

Tons; J/Sec; and field programmed custom units.

Operating Mode: T1<T2; T1>T2; absolute.

Defines how reverse energy flows are handled.

(T1 should be installed in the same pipe as the flow sensor.)

Zeroing: Compensate for variances between temperature elements by adjusting T2 reading to match T1 reading.

Constant: Single point correction for variances in specific heat of transfer liquid.

Energy Total units: kBtu; Mbtu; kWh; MWh; kJ; and field programmed custom units

Pulse and Relays

Both pulse and relay are fully functional as either totalizing, or set-point outputs.

Pulse Electrical

1 Amp @ 35VDC/ 30VAC

Closed: 0.5Ω @ 1 AMP Open: >10⁹Ω

Relay Electrical

Resistive load: 5Amp@ 120VAC/30VDC

Inductive load: 1Amp @ 120VAC/30VDC

Pulse/Unit Volume (Totalizer)

Driving Source: flow total; Btu total

Units: any predefined or custom unit

Rate: 1 Pulse per 1.0000000 to 99999999 units

Contact Time: 1 to 9999 mS

Set-Point (Alarm)

Driving Source: flow rate; Btu rate;

temperature 1; temperature 2, delta T

Units: Any predefined or custom unit

Set-Point: 1.0000000 to 999999999

Delay to Set: 1 to 9999 Seconds

Release-Point: 1.0000000 to 999999999

Delay to Release: 1 to 9999 seconds

Optional Analog Output

Driving Source: flow rate; Btu rate;

temperature 1; temperature 2, delta T, PID control

Range: 4-20mA; 0-20mA (isolated current sinking or sourcing)

Sinking: 30VDC @ 0mA maximum; 3 volts @ 20mA minimum

Sourcing: 600 W maximum load

USB Communication

Provides complete access to all programming and operation features.

Requirements:

USB 2.0 A to Mini-B 5-Pin Cable (example: SYSONIC model UAM56 GWT/B)

RS-485 Communication

Supports: Modbus and BACnet/MSTP

Accessories

Programming kit

Wall mount kit

| Series | Example: | 3050 | - | x | x |
|---|----------|------|---|---|---|
| Btu Monitor | 3050 | | | | |
| Option - Analog Output, RS485 (BACnet / Modbus), and USB | | | | | |
| No Option | | | | 0 | |
| Analog Output, RS485 with BACnet and Modbus, and USB | | | | 1 | |
| Option - Mounting | | | | | |
| Panel Mount | | | | | 0 |
| Wall Mount | | | | | 1 |

Model 3050 Ordering Matrix

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