Model 5202
Remote Type BTU Calculating Unit

Measures the total energy used or transferred in a liquid system. BTUs are calculated by multiplying the system temperature difference by the flow. An ideal choice for simple, compact, and cost-efficiency.

FEATURES

- Automatic Heat/Cool Changeover
- Battery or 24V Powered
- Pulse Output for Energy Value
- Additional Meter Inputs
- Liquid Crystal Display
- Chip Card Technology
- Data Storage

APPLICATIONS

- Combination Heat/Cool Systems
- Heating Only Systems
- Cooling Only Systems
- Solar Systems
- Geothermal Systems
- Efficiency Measuring Verification
- Heat Reclaimers

SYSTEM OVERVIEW

ISTEC BTU Meters measure energy usage by multiplying flow and temperature difference, e.g., BTUs = Flow x ΔT.

As the water (or other liquid) passes through the system piping, the flow meter's turbine rotates and sends impulses to the electronic calculating unit. The sensors of the electronic calculating unit measure the supply and return water temperature. Flow and ΔT are used to calculate BTUs which are displayed on a non-resettable LCD.

HOW TO SELECT A 5000 SERIES BTU METERING SYSTEM

1) Calculating Unit Model 5202 with 6-Year Battery & Open Collector Pulse
2) Power Supply (Choose One):
   - 10-Year Lithium Battery (P/N 5016)
   - 24V AC Power Adapter w/Dry Contact Pulse* (P/N 5011)
3) Sensor Set (Choose One):
   - Pipe Sizes to 1" (P/N 5601)
   - Pipe Sizes 1-1/4" to 3" (P/N 5602)
   - Pipe Sizes 4" + (P/N 5603)
4) Immersion Well Set (Choose One):
   - P/N 5701 use with P/N 5601
   - P/N 5702 use with P/N 5602
   - P/N 5703 use with P/N 5603
5) Options & Accessories:
   - Chip Card Reader (P/N 5301)
   - M-Bus Module** (P/N 5012)
6) Flow Meter with Pulse: **IMPORTANT** – Verify maximum system temperature and pressure as well as flow rate and pipe size before selecting flow meter. Flow Meter must be equipped with pulse output for connection to BTU Meter. See 1700 Series Engineering Manual or 1800 Series Engineering Manual for details.

** Transformer Required*

*** M-Bus Hub Required*

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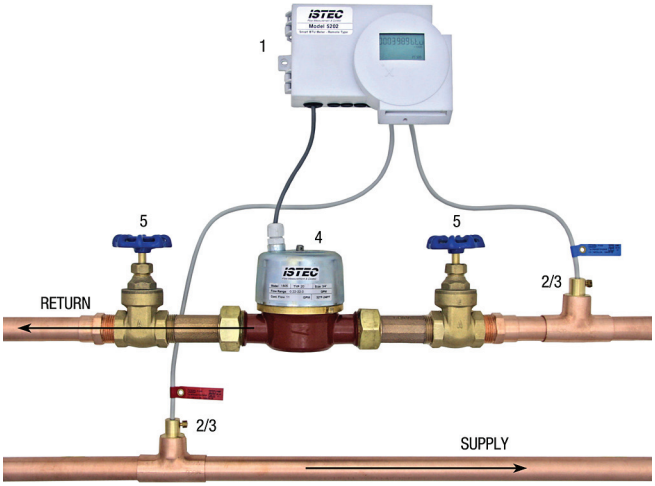
COMPONENT DESCRIPTION

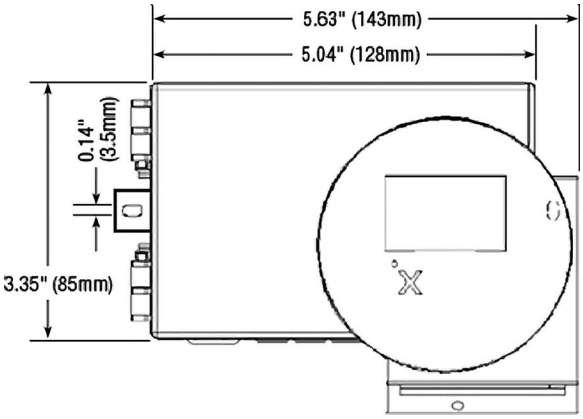


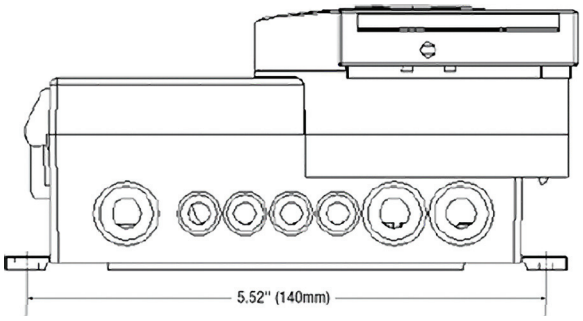
All ISTEC BTU Meter Systems consists of the following components:

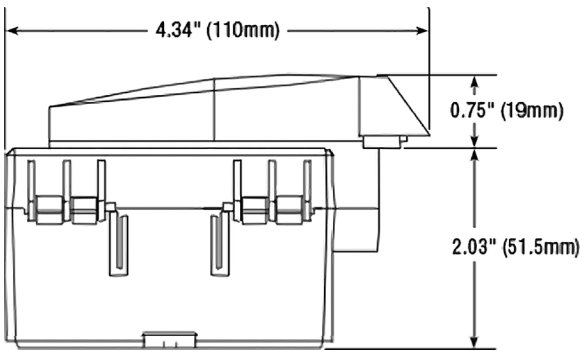
1) **Electronic Calculating Unit** (Model 5202) – Solid-state circuitry for accurate and reliable operation with automatic compensation for water density. Non-resettable LCD indicates flow, temperatures and BTU's.
2) **Temperature Sensors** – Platinum RTDs for fast response and high accuracy. Sensors are available in lengths of 1-1/2", 3-1/2" and 5-3/4".
3) **Sensor Wells** – Wells are available in three sizes: 1-1/2",4" and 6".
4) **Flow Meter** – Industrial grade multi-wing turbine type with pulse output. Sizes up to 1-1/2" have union connections, 2" and larger have ANSI standard 150# flanges.
5) **Stop Valves** – The flow meter should always be installed with a stop valve on each side for easier servicing.

TECHNICAL SPECIFICATIONS

- Temperature Range: 23°F to 356°F (5°C to 180°C)
- ΔT Range: 0.225°F to 333°F (0.125°K to 185°K)
- Ambient Conditions: 14°F to 158°F (-10°C to 70°C)
- LCD: 7-Digit
- Sensors: Platinum RTD
- Power Supply: Battery or 24V AC
- Output: Open Collector or Dry Contact
- Dimensions: L – 5.04" (128mm)
  L1 – 5.63" (143mm)
  H – 3.35" (85.1mm)
  D – 0.14" (3.5mm)







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BTU METERING SYSTEM SPECIFICATION:
MODEL 5202 AS MANUFACTURED BY ISTEC CORPORATION

The contractor shall furnish and install as shown on the plans an electronic BTU Metering System. The system shall be designed and programmed exclusively for energy (BTU) metering. It shall be factory assembled, calibrated and tested, incorporating the following features:

ELECTRONIC CALCULATING UNIT

The Electronic Calculating Unit, Model 5202, shall be of solid state microprocessor based construction incorporating Chip Card Technology.

It shall be capable of measuring heating and/or cooling energy (BTU's). The changeover from heating to cooling energy measurement shall be performed automatically. The unit shall contain a non-resettable Liquid Crystal Display (LCD) to continually indicate the total accumulated heating BTU's. The unit shall allow the user to access the following information on the LCD: supply temperature, return temperature, temperature difference, total flow, momentary energy consumption, momentary flow rate, maximum energy consumption and maximum flow rate. In addition, the LCD shall provide status and error indication, including segment test, days-of operation as well as type of error. The Electronic Calculating Unit shall automatically compensate for fluid density. It shall contain a terminal strip for connection to the temperature sensors and flow meter.

CHIP CARD SYSTEM

The Electronic Calculating Unit shall incorporate Chip Card Technology to provide error-free transfer of data to a Chip Card. The Chip Card shall be capable of storing information from approximately 80 units. A Chip Card Reader and software shall be available to transfer the data from the Chip Card into a computer for trend logging and billing purposes.

POWER SOURCE

The Electronic Calculating Unit shall be powered by an integral 6-year battery. An optional 10-year battery or 24V, 60Hz Power Adapter is available.

SENSORS

Temperature sensors shall be the Platinum RTD type to provide high accuracy, stability and long term reliability. The sensor probe shall be available in lengths of; 1-1/2", 3-1/2" and 5-3/4" to accommodate different pipe sizes. They shall be designed to fit tightly into immersion wells that are inserted into the water flow.

SENSOR WELLS

Sensor Wells shall be 1-1/2" long x 3/8" NPT for pipe sizes up to 1", 4" long x 1/2" NPT for pipe sizes 1-1/4" to 3" and 6" long x 1/2" NPT for pipe sizes 4" and above. A locking screw is incorporated to secure the sensor.

OUTPUT

The Electronic Calculating Unit shall provide an open collector or dry contact pulse output proportional to the heating energy count.

FLOW METER

(See 1700 Series Engineering Manual or 1800 Series Engineering Manual for details.)

A separate Flow Meter shall be utilized so various temperatures, pressures and flow rates can be accommodated. It shall be the multi-wing turbine type, Istec Model _____. It shall have a line size of _____ inch(s) (_____mm). The body shall be constructed of brass/cast iron. The unit shall have a hermetically sealed mechanical counter, which shall be non-resettable. It shall be constructed so that the flow insert assembly and counter can be replaced without removing the meter body. The Flow Meter shall have an accuracy of + 1.5% at_____ gpm (_____ lph). It shall have a continuous flow rating of_____ gpm (_____ m 3ph). The peak flow, which the meter cannot be subjected to for more than one hour per day, shall be_____ gpm (_____ m 3ph). The Flow Meter shall provide a "pulse" type output of 1 contact closure for every 1/10/100 gallon(s) of flow (metric counters provide 1 pulse for every 1/10/100 liter(s) of flow).

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ISTEC's BTU Meters are modern, high-accuracy measuring instruments that calculate how much energy each tenant has used so that the cost can be allocated. BTU Meters measure the temperature difference between the heating supply and the return lines; they also measure how much hot water has gone through the piping system. This allows the Meter to calculate the exact energy that has been used. Allocation of energy cost is encouraged because it promotes conservation, which is of major importance worldwide.

ALLOCATION METHOD BASED ON ENERGY METER READING AND SQUARE FOOTAGE OF APARTMENT

This sample allocation method is for six tenants and is based on Energy Meter readings and area of the tenant's apartment (base cost). The apartments in this example have three different square foot areas. 50% of the total Energy cost will be allocated based on the square foot area of each apartment and 50% will be allocated on the Energy Meter readings.

1) Monthly Cost of Energy (Oil, Gas, Electricity) $480
2) Operating Cost (Electricity, Maintenance, Meter Reading, Invoicing Tenants) $56
3) Total Energy Cost $536

DISTRIBUTION OF ENERGY COST

Size of Apartment 50%
Meter Reading 50%

4) Cost Allocation of Square Foot Area (amount allocated) $268
   Total Square Footage (all tenants) 3350
   Cost per Square Foot (3350 @ 8¢) $268
   Tenant A (500 sq. ft. @ 8¢) $40
   Tenant B (600 sq. ft. @ 8¢) $48
   Tenant C (550 sq. ft. @ 8¢) $44
   Tenant D (550 sq. ft. @ 8¢) $44
   Tenant E (550 sq. ft. @ 8¢) $44
   Tenant F (600 sq. ft. @ 8¢) $48
   Total $268

5) Cost Allocation on Meter Reading (amount allocated) $268
   Total Energy Units Used (all tenants) 6700
   Cost per Energy Unit (6700 @ 4¢) $268
   Tenant A Energy Units (1100 @ 4¢) $44
   Tenant B Energy Units (1300 @ 4¢) $52
   Tenant C Energy Units (800 @ 4¢) $32
   Tenant D Energy Units (1000 @ 4¢) $40
   Tenant E Energy Units (1600 @ 4¢) $64
   Tenant F Energy Units (900 @ 4¢) $36
   Total Energy Units (6700 @ 4¢) $268

6) Individual Billing to Tenants
   Tenant A Square Footage Base Cost $40 + Energy Units Used (1100 @ 4¢) = $44, Total $84
   Tenant B Square Footage Base Cost $48 + Energy Units Used (1300 @ 4¢) = $52, Total $100
   Tenant C Square Footage Base Cost $44 + Energy Units Used (800 @ 4¢) = $32, Total $76
   Tenant D Square Footage Base Cost $44 + Energy Units Used (1000 @ 4¢) = $40, Total $84
   Tenant E Square Footage Base Cost $44 + Energy Units Used (1600 @ 4¢) = $64, Total $108
   Tenant F Square Footage Base Cost $48 + Energy Units Used (900 @ 4¢) = $36, Total $84
   Total $536