

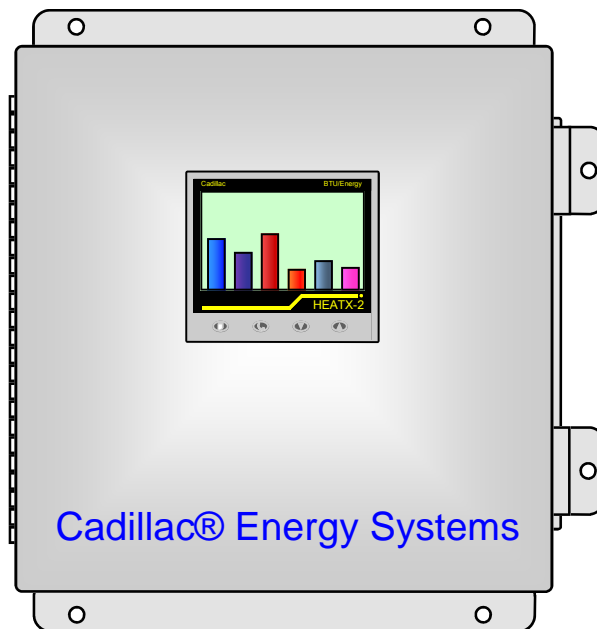
Cadillac Meter

ACCURATE & RELIABLE ENERGY METERS

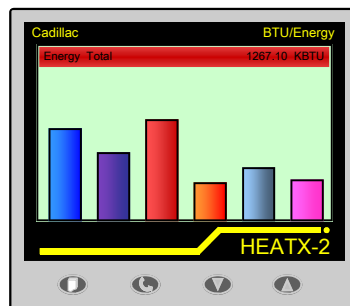
GENERAL INFORMATION

Cadillac® HEATX-2

Wall Mount



Panel Mount



THE ENERGY SYSTEM OF CHOICE

The Cadillac® HEATX-2 BTU / Energy system *is the first* single or dual measurement system, designed to measure the energy consumed in hot water heating and/or chilled water cooling systems while providing a graphical color 3.5" TFT VGA display, 50 MB of flash onboard memory storage, exportable archive data via 10/100base T Ethernet in a wide range of communication protocols or via a USB connection. The device measures then calculates, displays, and stores energy consumption, which include Volume, Energy, Power, and Temperatures. Combined with Cadillac®'s superior flow meter technologies the HEATX-2 provides the most accurate, repeatable, and maintenance free dual measurement energy system available in the industry.

The Cadillac® HEATX-2 was designed with 50 MB of flash memory for data archiving for redundancy, if connected to a BAS/BMS, or stand alone for users without a building automation system. Data can be transferred via Ethernet or USB and can be viewed on Energy Review archiving software provided with each HEATX-2 system. With sample parameters and rates selectable the HEATX-2 can store 12 months worth of historical data before overwriting in a first-in-first-out format. Using a binary encrypted storage protocol data will always be secure if used for energy billing purposes. Note: If data is tampered with the file will indicate that it has been corrupted.

THE NEW INDUSTRY STANDARD

Combined with Cadillac®'s superior flow meter technologies the HEATX-2 BTU / Energy meter is the first and only dual measurement BTU/Energy measurement platform currently in the industry. Customers choose the Cadillac® HEATX-2 BTU / Energy Meter because of proven accuracy, dependability, and maintenance free longevity.

APPLICATIONS

- Energy consumption data source for energy management system, DCS, district-wide systems.
- Energy-Customer Billing from accurately totalized Energy / BTU measurements.
- Basis for internal cost distribution using campus-wide systems.
- Efficiency measuring and monitoring from central control rooms.
- Direct Energy / BTU measurements at both Boiler and point of use locations.

FEATURES

MODES OF OPERATION

- **Heating Mode:**
Where Positive ΔT 's only are totalized.
- **Cooling Mode:**
Where Negative ΔT 's only are totalized.
- **Heating/Cooling Mode:**
Where the flow of energy may be for either heating or cooling. In this mode the energy total is increased regardless of whether the ΔT is positive or negative.
- **Charge/Discharge Mode:**
Where two separate registers totalize positive and negative totals.

PRINCIPLE OF OPERATION

The Cadillac® HEATX-2 BTU / Energy Meter measures the temperature in the feed and return lines via two precision matched RTD's and from this calculates the density and enthalpy of the water. In addition, by also measuring the volume of water flowing in the system via the Cadillac® flow meter, the HEATX will then compute, display, and output the Energy consumed.

Power is Calculated:

$$P = V \times \rho \times (h_{tv} - h_{tr})$$

Where:

P = Power (Btu/Hr)

V = Volumetric flow Rate (Gal/Min)

ρ = Density

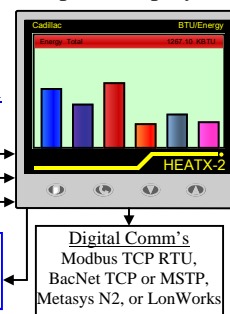
h_{tv} = Specific enthalpy at Feed temperature (Btu/Lb)

h_{tr} = Specific enthalpy at Return temperature (Btu/Lb)

Heat/Cool Application (A)

- 1) Flow Measurement
- 2) Feed Temperature
- 3) Return Temperature

Output (4-20 mdc) Select one:
Power, Flow Rate, Feed Temp,
Return Temp, or Δ Temp



Heat/Cool Application (B)

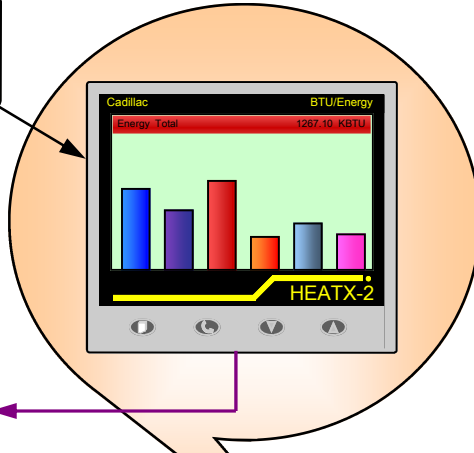
- 1) Flow Measurement
- 2) Feed Temperature
- 3) Return Temperature

(Output (4-20 mdc) Select one:
Power, Flow Rate, Feed Temp,
Return Temp, or Δ Temp

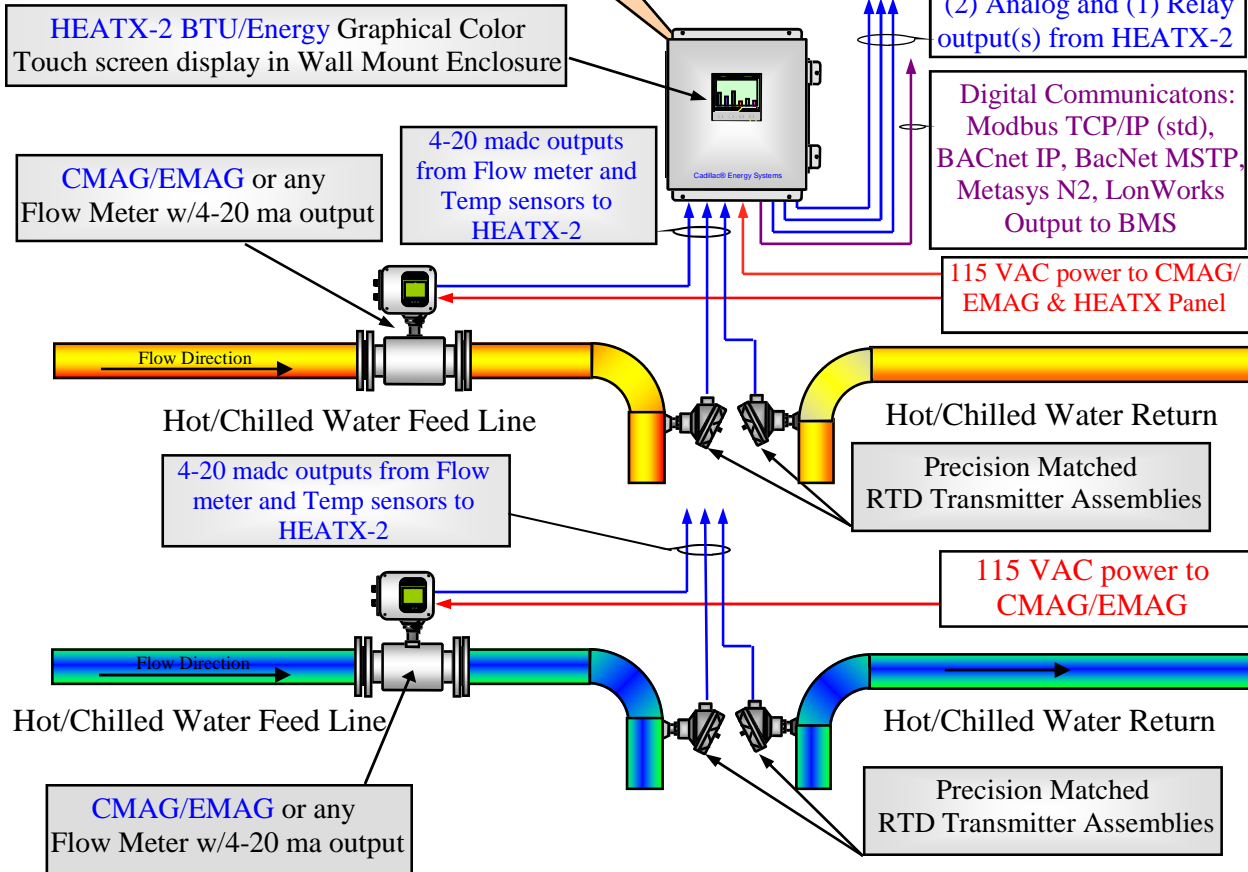
HEATX-2 Single or Dual Btu/Energy Measurement and Data Archiving system for any Hot/Chilled water application

The HEATX-2 BTU / Energy meter conforms to OIML R75 Class 4 and EN1434 Standards.

The HEATX-2 single or dual channel BTU/energy measurement system provides local storage via 50 MB onboard flash memory, that can be retrieved via Ethernet or USB connection to PC based Energy Review software provided with every HEATX-2 System.

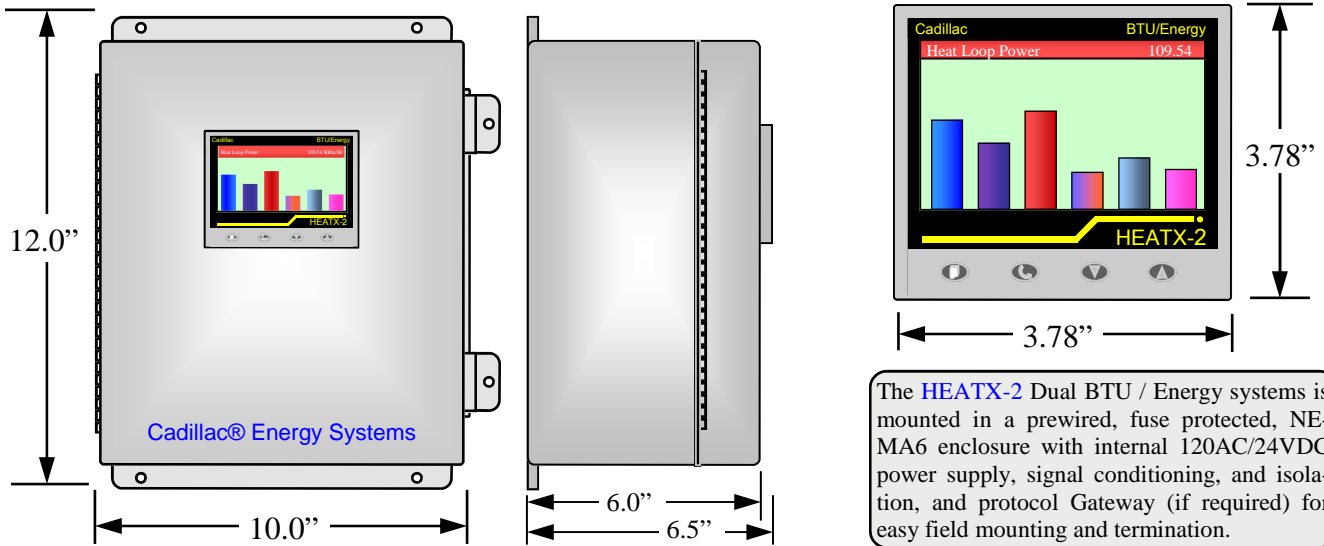


By implementing the CMAG flow meters as part of the HEATX-2 Energy System, users remove the most inaccurate component of the system and in turn now have the highest accuracy volumetric flow device available for measuring energy usage. With a 300:1 turn down and +/- 0.25% of rate accuracy the CMAG flow meter effectively doubles the overall accuracy of the entire system by itself, while providing a maintenance free non-mechanical flow technology.



By implementing the CMAG flow meters as part of the HEATX-2 Energy System, users remove the most inaccurate component of the system and in turn now have the highest accuracy volumetric flow device available for measuring energy usage. With a 300:1 turn down and +/- 0.25% of rate accuracy the CMAG flow meter effectively doubles the overall accuracy of the entire system by itself, while providing a maintenance free non-mechanical flow technology.

However, if an existing flow meter technology is installed or preferred the HEATX-2 will accept a flow signal from any flow meter that provides an analog (4-20 mADC) output. This allows the end user flexibility for retrofits or where the features of the HEATX-2 are desired, but the high accuracy flow measurement is not required.



The HEATX-2 Dual BTU / Energy systems is mounted in a prewired, fuse protected, NEMA6 enclosure with internal 120AC/24VDC power supply, signal conditioning, and isolation, and protocol Gateway (if required) for easy field mounting and termination.

CADILLAC® HEATX-2 BTU / ENERGY MEASUREMENT SYSTEM GENERAL SPECIFICATIONS

ENERGY SYSTEM SPECIFICATION:

- ◆ The entire HEATX-2 Energy Measurement System(s) shall be supplied, calibrated, and commissioned (if necessary) by a single manufacture, Central Station Steam Co, and shall consist of a Single or Dual Energy / BTU system, one or two non-mechanical flow meter(s), and two or four precision matched temperature transmitters/thermowells. A certificate of NIST traceable calibration for all primary elements shall be provided with each system.

ENERGY / BTU METER:

- ◆ Provide a Cadillac® HEATX-2 Energy / BTU Meter. The BTU meter shall provide the following measurements at the local display and as outputs* to a Building Control System. Instantaneous Power, Heat Energy Total, Cooling Energy Total, Heat/Cool Energy Total, Charge, and Discharge Energy Total. Additional measurement parameters available via Comms. Feed/Return Temps, ΔT's, Flow Rates, and Flow Totals. Output signals shall be (2) Analog (4-20) made and (1) Relay. Communications Options include: Modbus TCP/IP, BacNet/IP, BacNet MSTP, Metasys N2, and LonWorks. Each meter shall be factory configured for its specific application, and shall be reprogrammable using the front panel keypad (no special tools or computer required). Meter will be field adjustable for zero adjustment to any ΔT offset for specific application conditions. *Output options vary by model code for digital communications.

TEMPERATURE SENSORS:

- ◆ Temperature sensors shall be precision matched, bath calibrated, NIST Traceable, RTD transmitters. Temperature sensors will be power by 24 VDC power supply prewired in enclosure, and will include thermowell assembly and junction style head with terminations for landing field wiring. Temperature sensors shall be accurate to +/- 0.01% of temperature span. (with meter adjustment capability) system differential temperature accuracy will be +/- 0.10°F or better .

FLOW METER:

- ◆ Provide a Cadillac® CMAG Magnetic flow meter. The meter will have no moving parts, provide no flow obstruction, create no head loss / heat gain, will not be orientation sensitive, and may be installed in any location it may physically fit into the piping system, while providing an accuracy of +/- 0.50% of rate. If meter is installed with 1.5 pipe diameters up and downstream from its centerline the meter will be accurate to +/- 0.25% of rate. (In meter sizes 1/2" thru 3" the 1.5 diameter straight run requirement is met within flow tube). Meter will have minimum 300:1 turndown at stated accuracy (+/- 0.25% of rate). Meter will be provided with integral or remote electronics including a local 2-line backlit LCD for parameter viewing and easy interface / configuration. Meter will be preconfigured for application, but may be field adjusted through local display (no special tool or computer required).

HEATX-2 MODEL NUMBER STRUCTURE

HEATX2		Cadillac Energy / BTU System
1		Single Measurement System
2		Dual Measurement System
	0	Comms: Modbus TCP/IP
	1	Comms: BacNet MSTP
	2	Comms: BacNet IP
	3	Comms: Metasys N2
	4	Comms: LonWorks
	AC	Power Supply: 100-130 VAC
	X	No Temp transmitters supplied
	Y	User Specified Insertion Length
	X	User supplied Flow Meter
	C	With CMAG/EMAG flow meter
	S	Approvals: cUL & OIML R75

Notes:

- 1) If using user supplied Temperature transmitters, 24 VDC power to the transmitters must be supplied by the HEATX-2 panel to avoid ground loop or noise on HEATX-2 input channels.
- 2) If using CMAG or EMAG Flow meters those must be specified separately. Please consult factory for assistance
- 3) Field wiring between primary elements (Temp Transmitter and Flow meters) must be supplied by end user or installing entity. Belden #'s (or equivalent) will be supplied for proper selection.