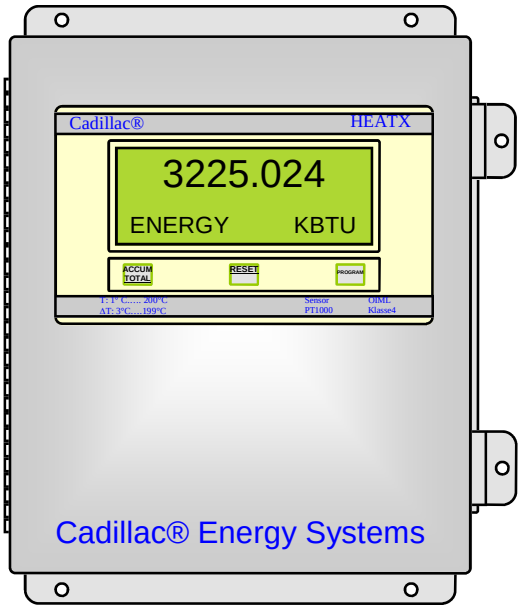
Cadillac Meter

ACCURATE & RELIABLE ENERGY METERS

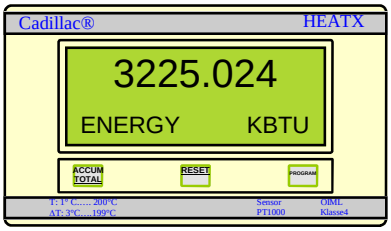
GENERAL INFORMATION

Cadillac® HEATX

Wall Mount



Panel Mount



CENTRAL STATION STEAM CO.® 15615 SW 74TH AVE., STE #150 TIGARD, OR 97224 PHONE: 888-556-3913 FAX: 503-624-6131 @ WWW.CADILLACMETER.COM

THE ENERY SYSTEM OF CHOICE

The Cadillac® HEATX BTU / Energy Meter is designed to measure the energy consumed in hot water heating and chilled water cooling systems. The meter is a rate and totalizing device, which is capable of calculating and displaying Volume, Energy, Temperatures and Peak Energy usage. Combined with Cadillac®'s superior flow meter technologies the HEATX provides the most accurate, repeatable, and maintenance free energy system available in the industry.

The Cadillac® HEATX BTU / Energy Meter measures the temperature in the feed and return lines via two precision matched 4-wire 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.

THE NEW INDUSTRY STANDARD

Combined with Cadillac®'s superior flow meter technologies the HEATX BTU / Energy meter has quickly become acknowledged as the industry standard. Customers choose the Cadillac® HEATX BTU / Energy Meter because of proven:

- **ACCURACY, DEPENDABILITY, CONSISTENCY, LOW MAINTENANCE, RANGEABILITY**

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 NegativeΔT'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 BTU / Energy Meter measures the temperature in the feed and return lines via two precision matched 4-wire 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.

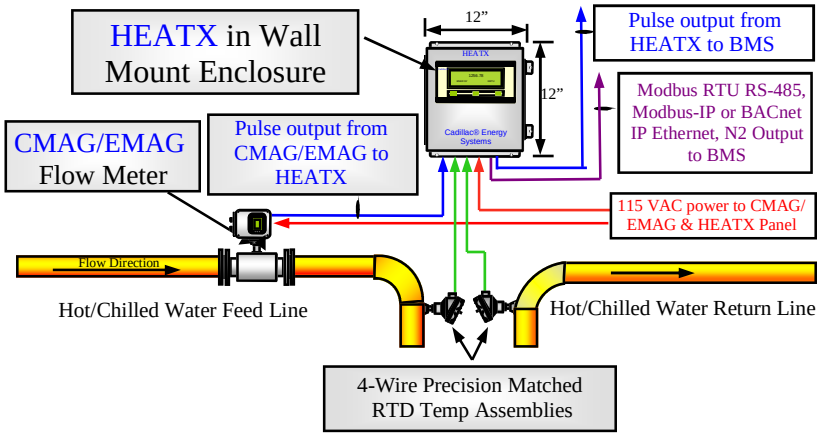
Power is Calculated:

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

Where:

P = Power (watts)
V = Volumetric flow Rate
ρ = Density
h_{tv} = Specific enthalpy at Feed temperature
h_{tr} = Specific enthalpy at Return temperature

CMAG/EMAG HEATX HOT/CHILLED WATER ENERGY SYSTEM

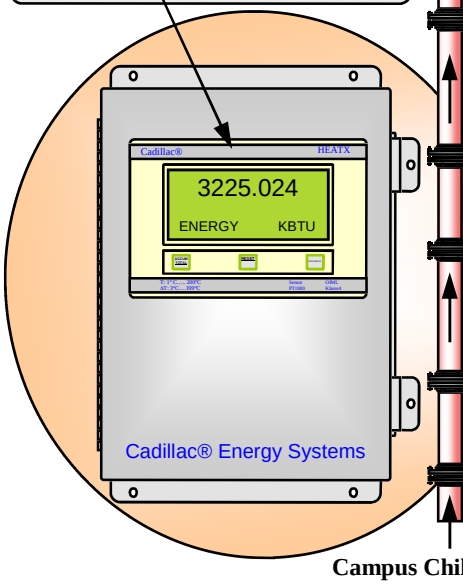


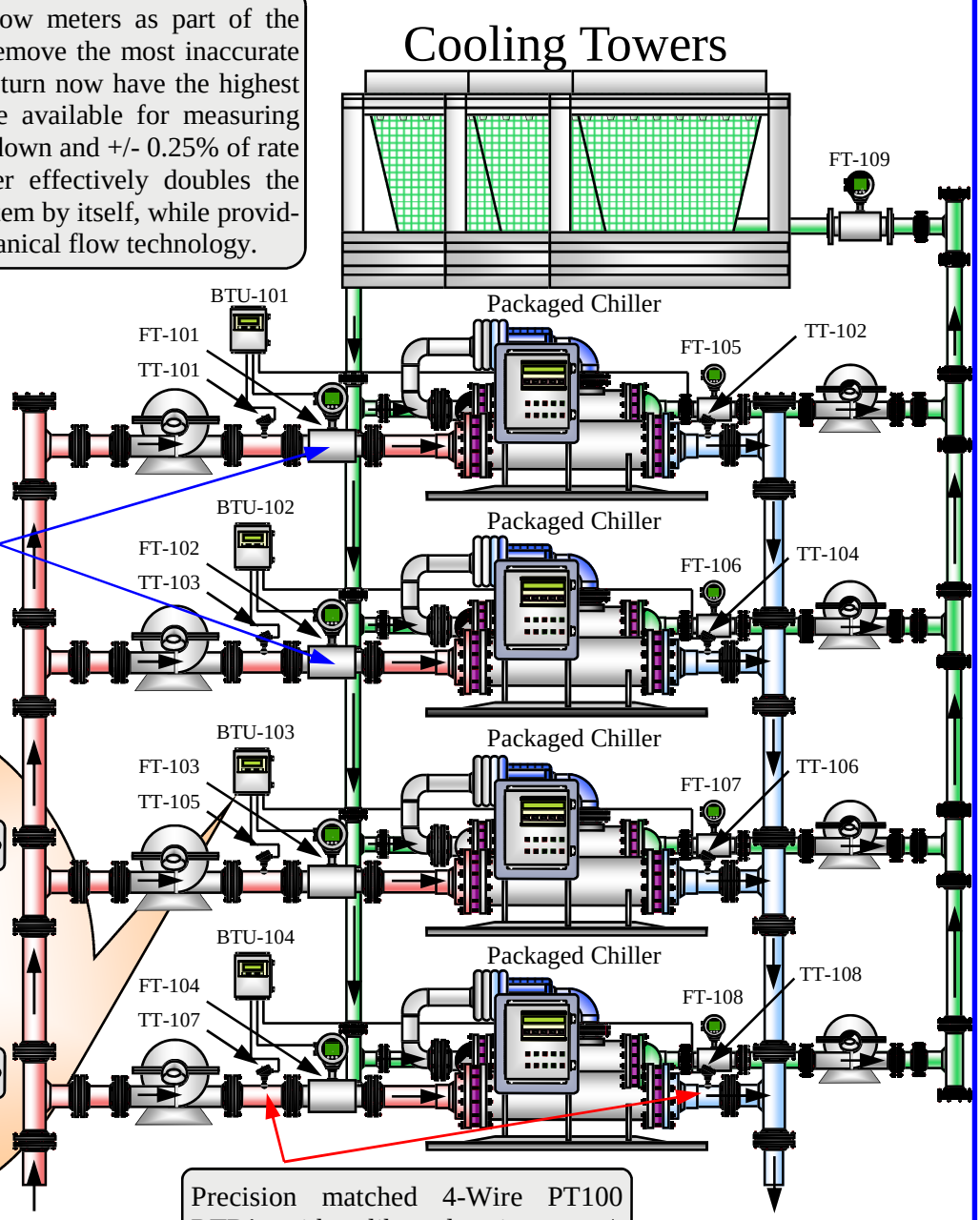
Energy and Flow Measurement for Campus and Central Utility Plants

By implementing the CMAG flow meters as part of the HEATX 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.

With **4-times** the accuracy of mechanical or differential pressure flow elements, such as turbine, variable orifice, pitot tube, orifice plates, etc., the CMAG provides the HEATX system with the ultimate volumetric flow measuring solution.

The HEATX BTU / Energy meter is accurate to OIML R75 Class 4 and EN1434 Standards.





Precision matched 4-Wire PT100 RTD's with calibrated resistance +/- 0.01% at 0ºC, provides unparalleled system temperature accuracy.

With no moving parts or flow line obstruction the CMAG has no mechanical drift, which require re-calibration, and does not cause system head loss creating an unwanted heat source (for chilled water systems), as do all other mechanical and differential pressure flow technologies typically used.

The flow profile independent tube design makes the CMAG ideal for retrofits, requiring only enough piping straight run to fit the meter in-line. Mounting next to turbulence generating devices such as elbows, tees, valves and pumps are of no concern for the CMAG!

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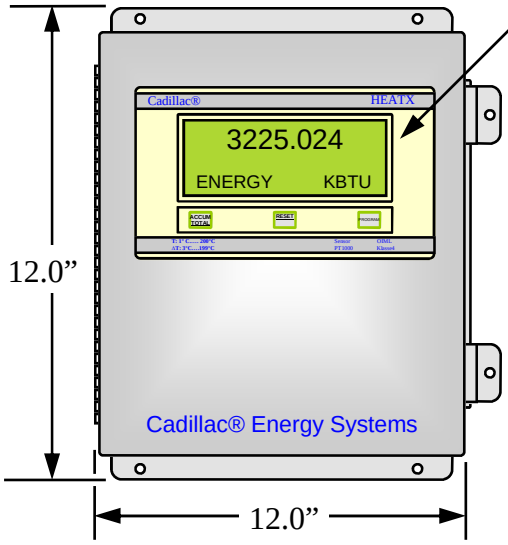
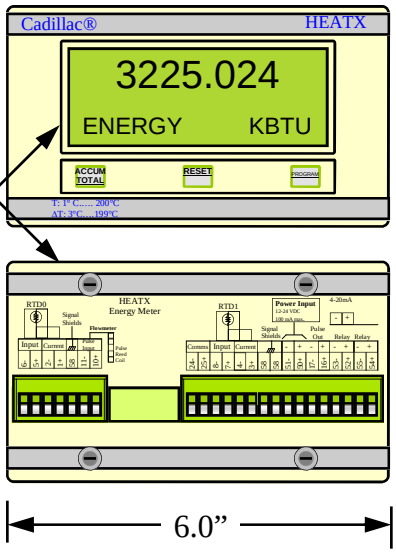
Wall Mount

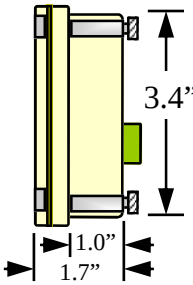


Wall Mount HEATX provided in a prewired, fuse protected, NEMA6 enclosure with internal 120AC/24VDC power supply for easy field mounting and termination.

Panel Mount HEATX for those installations where electrical panel already exists in the field.

Panel Mount





CADILLAC® ENERGY AND FLOW MEASUREMENT SYSTEM GENERAL SPECIFICATIONS

ENERGY SYSTEM SPECIFICATION:

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

ENERGY / BTU METER:

♦ Provide a Cadillac® HEATX Energy / BTU Meter. The BTU meter shall provide the following measurements at the local display and as outputs* to an Building Control System. Energy Total, Energy Flow Rate, Volumetric Flow rate, Volume Total, Feed Temp, Return Temp, or ΔT. Output signals shall be either Serial RS-485 (Modbus RTU), Modbus TCP/IP, BACnet/IP, N2, and pulse (Open Collector). 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 and digital communications.

TEMPERATURE SENSORS:

♦ Temperature sensors shall be shall be precision matched, bath calibrated, NIST Traceable, 4-Wire PT100 RTD’s. Temperature sensors will require no external power, 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 MODEL NUMBER STRUCTURE

HEATX								Cadillac Energy / BTU Meter
	P							Panel Mount
	W							Wall Mount
		0						Output(s): Pulse & Serial Modbus RTU
		1						Output(s): Pulse & Modbus TCP/IP
		2						Output(s): Pulse & BACnet/IP Client
		3						Output(s): Pulse & N2
			DC					Power Supply: 12-24 VDC
			AC					Power Supply: 100 130 VAC
				X				No RTD Temp sensors supplied
				Y				User Specified Insertion Length
					S			Approvals: OIML R75 Compliant
					X			Approvals: None

Remote Display for Saturated Steam Mass Flow

Central Station Steam Co. provides a Cadillac® CDIS remote display station option for Saturated Steam ***Mass*** flow measurements for use with the CV-P, CV-HS, CV-U Vortex flow meters. The CDIS display has the same electronics platform and enclosure as the HEATX BTU / Energy meter and configures in a similar fashion for the same look and feel. Please contact Central Station Steam Co. for more information on this offering.

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