FC-215

Thermal Energy Calculator

DESCRIPTION

The FC-215 Thermal Energy Calculator (BTU Monitor) measures consumed heating and/or cooling energy when combined with a flow meter and pair of RTDs. The calculator is delivered in user configuration mode with the ability to modify meter parameters and features, including units, mounting position, communication and other meter parameters. After the meter is operational, the settings cannot be changed to prevent unauthorized changes that may affect the readings.

FEATURES

- EN1434 heat and cool approval
- Ten-year battery life or external power options
- Modular communication options
- Integral data logger with time/date

BENEFITS

- Measure and record energy and flow totals
- View daily and previous semi-monthly totals

APPLICATIONS

Monitor thermal energy in water or water-glycol based heating and cooling systems:

- Residential apartment or condominium tenant billing
- Commercial building or office tenant billing

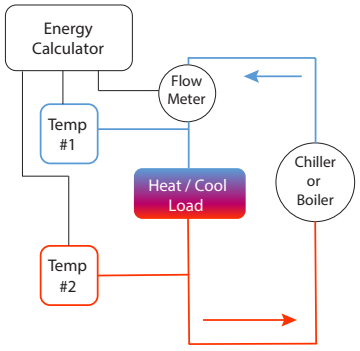
COMMUNICATION OPTIONS

- Wired M-Bus
- Modbus RTU
- Pulse output

OPERATION

The FC-215 calculator connects to a flow meter with a pulse output and two temperature sensors. By measuring the flow rate of the heating or chilling water and the temperature drop across a zone, the calculator of the meter determines the thermal energy used. The flow meter and temperature sensors approvals may be necessary for local regulations.

FC-215 Energy Calculator



Flow Rate, Temperature Delta⇨Energy

Product Data Sheet

METER SPECIFICATIONS

Accuracy	EN1434-2 with Class IB input
Thermal Energy Meter Directives and Standards	Measuring Instruments Directive 2014/32/EU EN1434 (2015) PTB-Richtlinie K7.1, (2006) OIML R75: (2002/2006) Canada sections 14 and 15 of the Weights and Measures Regulations

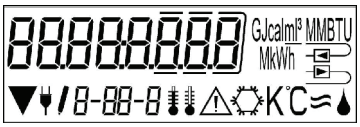
CALCULATOR FUNCTIONS

LCD Indicator

The device is equipped with 8-digits LCD (Liquid Crystal Display) with special symbols to display parameters, measurement units and operation modes.

The following information can be displayed:

- Total heat and/or cooling sinces start of operation
- Total flow volume
- Power and flow rate
- Inlet and outlet temperatures
- Temperature difference
- Semi-monthly values
- Maximum power, flow and temperatures



Optical Interface

Integrated into the front panel of the calculator, the optical interface is designed for reading data and parameters of the meter.

Data Logger History Values

Semimonthly values of the measured parameters are stored in internal memory for up to 15 months

- Heating energy
- Cooling energy
- Volume
- Tariff register

Maximum power, flow rate, inlet temperature, outlet temperature, and temperature difference

Time of storage of all measured integral data, also without power supply to the electronic unit.

CALCULATOR SPECIFICATIONS

LCD Display	8-digit plus special characters; Heat energy up to 3 decimal places
Ambient Temperature in the Field	41…131° F (5…55° C) at 95 % relative humidity
Transport Temperature	-13…158° F (-25…70° C) for maximal 168 h
Storage Temperature	-13…131° F (-25…55° C)
Units	kW, m^3, m^3/h; user selectable unit of energy (kWh, MWh, GJ) Energy unit can be set as long as the amount of energy is ≤ 10 kWh
Power	Battery 10 years, except pulse output at 6 years plus 1 year storage; 24V AC external power supply; or 230V AC external power
Volume Input	Pulse output class OA reed or OC open collector (according to EN1434-2), max 10 Hz, pulse width minimum 25 ms, off minimum 50 ms/ 1, 2.5, 10, 25, 100, 250, 1000, 2500 liters per pulse
Medium	Water; optional without approval: water with a propylene glycol or ethylene glycol content of 20%, 30%, 40% or 50%; glycol type/proportion adjustable at any time
Temperature Input	Pt 500, 2 wire, IEC 60751 compliant, class B or better
Temperature Sensor	Pt 500, cable length 9.8 ft, 32 ft (3 m, 10 m)
Temperature Difference Range	heat 3. . .100 k, cooling -3. . .-50
Minimum Temperature Difference ΔΘ	Cold <-0.05 K
Minimum Temperature Difference ΔΘHC	Heat/cold > 0.5 K < -0.5 K
Medium Temperature	Cooling 32…122° F (0…50° C); Heating/Cooling 0…302° F (0…150° C)
Measuring Energy Cycle Normal Operation	60 seconds for 10 years
Communication/Output Options	Wired M-Bus, Modbus RTU, Pulse
Data Storage	15 monthly and semi-monthly values via display or radio (compact mode); 24 monthly and semi-monthly values via optical interface or M-Bus 2 tariff registers individually adjustable; save energy or time Storage of the maximum values for flow, power and temperatures (VL, RL, ΔΘ), as well as the respective maximum values of the last 15 months
Calculator Mounting	DIN-rail or wall
Protection Class	IP54
Mechanical Class	M2
Electromagnetic Class	E2
Environmental Class CE	CE
Weight	0.77 lbs (0.35 kg)
Dimensions	Height x Width x Depth 5.9 x 5.1 x 1.4 in. (150 x 130 x 35 mm)

Communication/Output Options

NOTE: Only **ONE** option is supplied with the meter.

- Wired M-Bus
- Modbus RTU EIA-485, baud rate 1200, 2400, 4800, 9600, 1440, 19200, 38400, 56000, 57600, 115200; powered separately with supplied voltage 12…24V DC ± 10 % (SELV power supply only), maximum power consumption 500 mW; not available with Measurement Canada approval
- Pulse 1 open collector outputs: 30 V DC; width 100 ms

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