

Data Sheet	6000 Series Products	Rev. AA
6410/6413 Differential Flow Computers	Overview	

BENEFITS

- “Smart” transducer accuracy
- Comprehensive custody quality data history
- Local display
- Quick, easy installation

The model series 6400 differential (orifice, v-cone, annubar, etc.) flow computers are optimized to provide unequalled value on remote measurement sites. With low power, accuracy and system integrity built in, these flow computers are proven daily on thousands of sites. Totalflow products provide users the best opportunity for successful projects – site by site or system by system.

Model 6410: Is optimized for lowest installed cost when communications equipment is not integrated within the same enclosure.

Model 6413: Fits installations that require an integrated enclosure that houses the Flow Computer Unit and a remote communications device.

DESCRIPTION

The 6410 and 6413 are both compact units. Each is powered by internal batteries that can be charged by a solar panel for remote unattended operation. Differential and static pressure transducers are housed in a shielded environmentally protected enclosure. This transducer enclosure is mounted inside the main electronics compartment and is certified and calibrated at Totalflow's factory before shipment. Users simply need to mount the unit on site and program the correct parameters such as ID, location, etc., using the Totalflow handheld (PCCU) or a laptop computer running handheld emulation software (PCCU32).

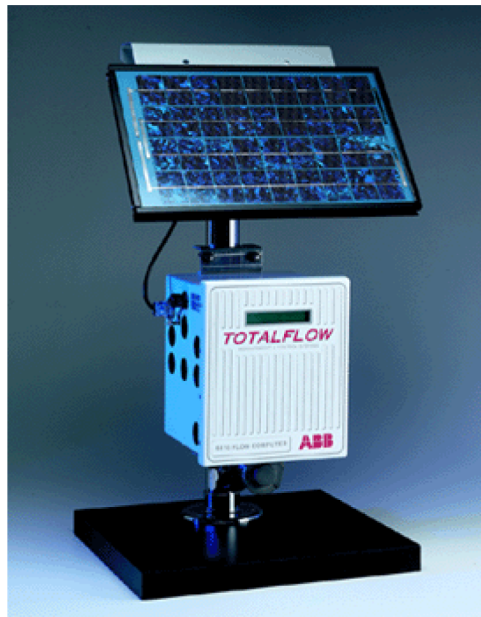
In addition to basic flow computer inputs (differential pressure, absolute pressure and flowing temperature), the standard hardware includes: two analog inputs (0-5 volts), two digital outputs, and two state inputs configurable as either digital inputs or pulse accumulator inputs.

Communications are modular and are user selectable for RS232 and/or RS485. Communications throughput is rated to 19,200 bps. Protocols can include Totalflow low power, modbus RTU, Enron modbus, and others.

The series 6400 Flow Computer Units are supplied with an efficient charging system that can be optimized for most solar applications. Additional charging supplies are available in 120 VAC and 24 VDC configurations. The unit can be powered directly by DC voltages from 12 to 16 volts.

FEATURES

- Low cost, high reliability design
- Aluminum enclosure, powder coated
- Low power digital main electronics board



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- LCD 2 × 24 character display standard
- Crystal controlled clock provides stable time base
- Industrial grade battery included (various sizes)
- Charging source 13-18 VDC
- 128K RAM (5-year lithium battery back-up); 512K optional
- Cold-start diagnostics – results displayed on LCD
- 512K ROM standard
- Security code protection of data
- Monitors operation limits for detection, reporting, and maintenance of static conditions
- Calculation of flow rates and volumes in accordance with AGA 3-85 or AGA 3-92 or ISO-5167-1
- Super compressibility calculations per NX-19 or AGA
- 8-92 Gross or AGA 8-92 Detail Methods
- Smart DP and AP transducers included
- High Speed Synchronous Digital AP/DP Data Link
- Transducers factory calibrated
- Extrapolation of flow during field sensor calibrations
- User selectable three or five point field calibration
- Programmable differential pressure zero cut-off
- 100 ohm platinum RTD with 10 foot lead included
- Automatic internal calibration of RTD with user programmable bias adjustment
- Plug-in modular communications (RS232/RS485)
- Two analog inputs (0-5 VDC or 4-20mA)
- Two pulse/digital inputs (rated to 5 KHz)
- Two digital outputs (open drain FET, 100mA)
- Designed to meet Class I, Division 2 (or optional Division 1), Groups C and D, F.M. and CSA Hazardous Area Classifications
- Dimensions: Model 6410 – 8.50" W × 10.00" H × 9.35" D (215.90mm × 254.00mm × 237.49mm), Model 6413 – 11.12" W × 14.62" H × 10.25" D (282.45mm × 371.35mm × 260.35mm)
- Installed Depth: 6410 – 12.35" (311.15mm), 6413 – 13.75" (349.25mm)
- Approximate Weight: 6410 – 26.0 lbs (12.02kg), 6413 – 28.0 lbs (12.70kg)
- Meets FCC Part 15, Class A Certification
- Independent lab tested for EMI/RFI susceptibility from 26 mhz to 1000 mhz at 32V/meter
- Advanced embedded trending database optional

ANALOG MEASUREMENT UNIT (AMU)

The AMU provides a controlled environment for processing the analog measurements. It provides the isolation needed to protect sensitive low-level signals from EMI/RFI, environmental effects, as well as high-speed digital logic. Major features of the AMU include:

- 18 bits of A/D range
- Differential inputs for Totalflow smart transducers
- E2PROM for holding factory calibration data
- Accuracy statements include power supply effect
- Tested for EMI/RFI susceptibility
- Dedicated 100 ohm platinum RTD input
- Two 0 to 5 volt analog inputs
- Temperature Limits
 - Compensated -20 to 140°F (-29 to 60°C)
 - Operational -40 to 200°F (-40 to 93°C)
 - Storage -60 to 225°F (-51 to 107°C)

Performance Specifications as Per SAMA Guidelines

Reference Conditions, zero-based spans at calibration temperature.

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Accuracy

Includes effects of linearity, hysteresis, and repeatability.

- Standard Accuracy: $< \pm 0.2\%$ of Upper Range Limit (URL)
- Accuracy After Turn Down: $< \pm 100 \times (0.2\% \text{ of URL} + 0.13\% \text{ of Span}) / \text{Span}$ for spans 1:1 to 5:1.
- Optional Accuracy: $< \pm 0.05\%$ of factory calibrated span (After calibration, NIST traceable, additional charge)
- Accuracy after turn down: $< \pm 100 \times (0.05\% \text{ of URL} + 0.13\% \text{ of Span}) / \text{Span}$ for spans 1:1 to 5:1

Stability

$\pm 0.25\%$ of URL for 6 months

Static Pressure Effect (DP Units)

- Zero Error: $\pm 0.1\%$ of calibrated span.
- Span Error: $\pm 0.15\%$ per 1000 psi (6895 kPa)

Temperature Effect (DP Units)

- $\pm 0.25\%$ Total temperature effect including zero and span errors. Temperature effect on AP transducers same as DP.

Residual Thermal Effects

- Thermal Hysteresis
 - Typically $\pm 0.15\%$ of URL for 200°F (93°C).
 - Temperature cycle without recalibration.
 - Worst case $\pm 0.3\%$ of URL for 200°F (93°C).
 - Temperature cycle without recalibration.
- Thermal Repeatability
 - Typically $\pm 0.15\%$ of URL for 200°F (93°C).
 - Temperature cycle without recalibration.
 - Worst case $\pm 0.3\%$ of URL for 200°F (93°C).
 - Temperature cycle without recalibration.

Over Pressure Effects (Toggle)

- $\pm 0.6\%$ of URL for < 1000 psi (6895 kPa)
- $\pm 1.0\%$ of URL for > 1000 < 2000 psi (13790 kPa)

Vibration Effect

The total maximum effect at any point on scale at frequencies to 200 Hz and amplitude up to 0.25" peak-peak, or for accelerations up to 1 "g" (10 m/s²), which-ever is smaller, is less than 0.25% of span.

Shock

Maximum of 25 G's in any axis, 11ms duration.

Humidity

0-95% R.H. 12 hours exposure non-condensing over compensated range.

For more information, contact your local ABB Totalflow Sales Office or visit www.abb.com/totalflow.