

JOHN C. ERNST INC

DIGITAL TURBINE FLOW METERS AND TOTALIZERS





Electronic Digital Meters are versatile enough to address the demanding needs of the fluid handling market.

Use with accessories to report flow data to other collecting and reporting devices.

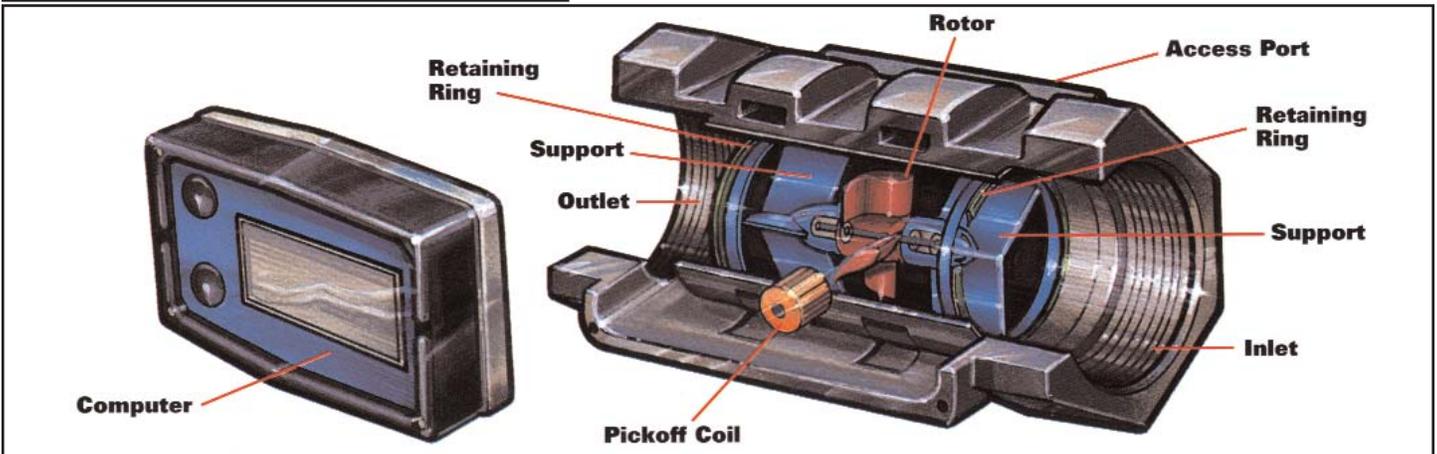


Electronic Digital Meters offer durable, compact, high precision fluid measurement systems at a fraction of the price you'd expect to pay for comparable systems with similar features and benefits. By combining a turbine, a basic flow sensing device, with a direct-mounted, microprocessor-based computer, the entire system is incorporated into one device which is Factory Mutual Approved for Intrinsically Safe Class 1, Division 1 uses.

Thanks to innovative design and engineering, these components are versatile enough to address the demanding needs of the fluid handling market. The turbine housings are designed to work directly with the computers or, through the accessories, to report flow data to other collection and reporting devices. Match the turbine directly to an on-board computer and expect an impressive 20:1 turndown ration. Or, take advantage of the turbine's dependable 10:1 range by combining it with an accessory to transmit data directly to your choice of recording peripheral, eliminating the need for additional signal conditioning equipment.

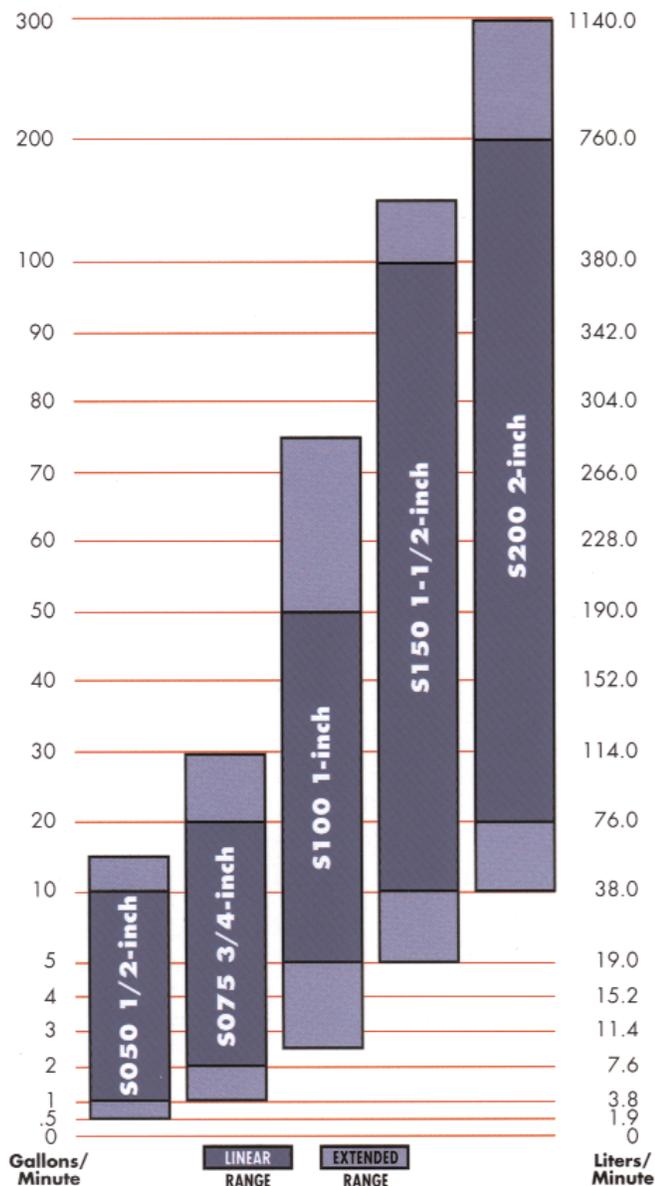
The modular design allows for maximum flexibility. Any one of five turbines, designed to address specific flow ranges, can be matched with your choice of several standard computer configurations. Add to that the additional output options provided by the accessories as well as custom computer configurations and you have the ability to build a metering system that meets your specific needs, however demanding they might be.

These field-proven meters perform impressively in fluid handling applications such as processing, maintenance, refining, production, transportation, assembly, and service. While precise enough to meet the exacting specifications of laboratory conditions, they are also rugged enough to work dependably in severe, refinery environments. And, all the while, each meter is easy to access, and easy to service without compromising accuracy.



TURBINE HOUSINGS

Turbine housings are constructed of 316 Stainless Steel to address a wide range of chemical compatibility and high pressure applications. Two pressure grade models are offered, standard pressure and extended pressure. They are sized to address five specific flow ranges.



From conception, common industry requirements were considered. Flow ranges from 0.5 to 300 GPM (1 to 1100 LPM) are addressed with extensive range overlap throughout the five sizes. Standard end connections are female NPT or ISO threads. These turbines can be mounted vertically or horizontally without effecting accuracy or performance. Wetted parts are held to a minimum and conform to industry standards for chemical compatibility. Internal parts are easily removed for routine maintenance and service.

COMPUTER ELECTRONICS

Aside from the advantages of improved turndown range, when the on-board computer is mounted directly to a turbine, user calibration addresses specific viscosity and volumetric needs. When the installation effects accuracy, these same procedures adjust the system to your specific physical and environmental factors.

The CMOS, microprocessor-based electronics have extremely low power requirements and data retention capabilities in both RAM & ROM. Information is clearly displayed on a large 6-digit liquid crystal display with two-point floating decimal for totals from .01 to 999,999. All operations are accessed with two buttons which simplify operations.

Standard calibration is provided in gallons or liters per minute with other specialized units of measure, such as barrels per day or ounces per hour, available upon request with custom ordering.

Other features include automatic on and off, manual on, multiple totalizers, single-point calibration curve, signal output, rate of flow, total flow, or a combination of both. All of these features have been refined to simplify record keeping requirements without ever compromising accuracy and dependability.

ACCESSORIES

The Remote Kit Assembly, available with or without Factory Mutual Approval, allows the separation of the turbine and computer for remote indication. This option expands applications into wider fluid temperature ranges to 250°F.

The Conditioned Signal Output Module provides an amplified, digital signal output capable of transmission up to 5,000 feet (1,525m). This module, combined with a turbine, eliminates the need for additional signal conditioning or amplification devices.

The 4-20mA Output Module provides an industry standard analog signal for connection to a wide variety of chart recorders, display equipment, and process control equipment.

The Pulse Access Module doubles the usability of your meter by providing an open collector signal output in addition to the on-board, computer readout.

TURBINE HOUSING SPECIFICATIONS

| Stainless Steel Models | S050 | S075 | S100 | S150 | S200 |
|--|-------------------------|-------------------------|-------------------------|---------------------------|---------------------------|
| FLOW RANGES | | | | | |
| Linear:* | | | | | |
| Gallons/Minute | 1-10 GPM | 2-20 GPM | 5-50 GPM | 10-100 GPM | 20-200 GPM |
| Liters/Minute | 3.8-37.9 LPM | 7.6 -75.7 LPM | 18.9-190 LPM | 38-380 LPM | 76-760 LPM |
| Extended:* | | | | | |
| Gallons/Minute | 0.5-10 GPM | 1-20 GPM | 2.5-50 GPM | 5-100 GPM | 10-200 GPM |
| Liters/Minute | 1.9-37.9 LPM | 3.8-75.7 LPM | 9.5-190 LPM | 19-380 LPM | 38-760 LPM |
| Maximum Flow:* | 15 GPM | 30 GPM | 75 GPM | 150 GPM | 300 GPM |
| | (56.8 LPM) | (113.6 LPM) | (284 LPM) | (568 LPM) | 1,1136 LPM) |
| PERFORMANCE | | | | | |
| Linear Range Accuracy | 10:1 @ ±2.0% | 10:1 @ ±1.5% | 10:1 @ ±1.5% | 10:1 @ ±1.0% | 10:1 @ ±1.0% |
| | of reading | of reading | of reading | of reading | of reading |
| Extended Range Accuracy | 20:1 @ ±5% | 20:1 @ ±5% | 20:1 @ ±5% | 20:1 @ ±5% | 20:1 @ ±5% |
| | of reading | of reading | of reading | of reading | of reading |
| Repeatability | ±0.1% | ±0.1% | ±0.1% | ±0.1% | ±0.1% |
| Maximum Pressure Drop in 10:1 Range | 8 PSIG (0.55 BAR) | 7.5 PSIG (0.5 BAR) | 10 PSIG (0.68 BAR) | 4 PSIG (0.28 BAR) | 4 PSIG (0.28 BAR) |
| Pressure Rating** | 1,500 PSIG (103 BAR) | 1,500 PSIG (103 BAR) | 1,500 PSIG (103 BAR) | 1,500 PSIG (103 BAR) | 1,500 PSIG (103 BAR) |
| Frequency Range | 45-450 HZ @ 1-10 GPM | 37-370 Hz @ 2-20 GPM | 45-475 Hz @ 5-50 GPM | 35-350 Hz @ 10-100 GPM | 33-330 Hz @ 20-200 GPM |
| CONNECTION | | | | | |
| Inlet/Outlet | 1/2" Female | 3/4" Female | 1" Female | 1-1/2" Female | 2" Female |
| Threads | NPT or ISO | NPT or ISO | NPT or ISO | NPT or ISO | NPT or ISO |
| TEMPERATURE RANGES*** | | | | | |
| Fahrenheit | -40° to +250°F | -40° to +250°F | -40° to +250°F | -40° to +250°F | -40° to +250°F |
| Centigrade | -40° to +121°C | -40° to +121°C | -40° to +121°C | -40° to +121°C | -40° to +121°C |
| SHIPPING WEIGHT | | | | | |
| Turbine and Computer | 2.2 lbs. (1.0 kg) | 2.4 lbs. (1.1 kg) | 2.8 lbs. (1.3 kg) | 4.6 lbs. (2.1 kg) | 7.0 lbs. (3.2 kg) |
| Turbine Only | 2.0 lbs. (1.0 kg) | 2.2 lbs. (1.0 kg) | 2.6 lbs. (1.2 kg) | 4.4 lbs. (2.0 kg) | 6.7 lbs. (3.1 kg) |
| DIMENSIONS | | | | | |
| Height+ | 1.8" (4.6 cm) | 2" (5.1 cm) | 2.2" (5.6 cm) | 2.8" (7.1 cm) | 3.2" (8.2 cm) |
| Width | 2" (5.1 cm) | 2" (5.1 cm) | 2" (5.1 cm) | 2.7" (6.9 cm) | 3.3" (8.4 cm) |
| Length | 4.2" (10.7 cm) | 4.3 (10.9 cm) | 4.5" (11.4 cm) | 5.3" (13.5 cm) | 6.3" (16 cm) |

Wetted Materials and components include 316 Stainless Steel housings, Ceramic (96% Alumina) journal bearings, Tungsten Carbide shaft, PVDF rotor and supports, and 316 Stainless Steel retaining rings.

*All data on Model S050, S075, and S100 is determined with 1 centipoise stoddard solvent test fluid at 70°F (21°C). Data on Models S150 and S200 is determined with water at 70°F (21°C).

** Contact the factory for information on 3,000 PSIG (207 BAR) models.

*** These temperature ranges are for the turbine only, without computer electronics. Final operational temperature range is determined by computer electronics or accessories.

+ Computer electronics add 0.7" (1.8cm) to turbine housing height.



COMPUTER ELECTRONICS FEATURES

| STANDARD MODELS | Readout Label | 03 | 04 | 05 | 06 | 07 | 08 |
|--------------------------------|----------------|-----|-----|-----|-----|-----|-----|
| POWER SOURCE | | | | | | | |
| Field Replaceable Batteries | | Yes | Yes | Yes | Yes | Yes | Yes |
| ON / OFF | | | | | | | |
| Automatic On | | Yes | Yes | Yes | Yes | Yes | Yes |
| Manual On | | Yes | Yes | Yes | Yes | Yes | Yes |
| Automatic Off | | Yes | Yes | Yes | Yes | Yes | Yes |
| TOTALIZERS | | | | | | | |
| Cumulative Total | Total 1 Locked | Yes | Yes | Yes | Yes | Yes | No |
| First Batch Total | Total 2 | Yes | Yes | Yes | Yes | Yes | No |
| Second Batch Total | Total 3 | No | No | Yes | No | Yes | No |
| CALIBRATION | | | | | | | |
| Factory Calibration Curve | Cal A Present | Yes | Yes | Yes | Yes | Yes | Yes |
| First Field Calibration Curve | Cal B | Yes | Yes | Yes | No | Yes | Yes |
| Second Field Calibration Curve | Cal C | No | No | Yes | No | Yes | No |
| FLOW RATE | | | | | | | |
| Rate of Flow | Flowrate | No | Yes | No | No | Yes | Yes |
| BYPASS | | | | | | | |
| Bypass | Bypass | No | No | Yes | No | Yes | No |

Computer electronics operate from +14° to +140°F (-10° to +60°F). If wider operating temperature range is desired, reference information on the Remote Kit. Accuracy details are listed on the reverse side. Expect a turndown ratio of 20:1.

FEATURES:

Power Source is two lithium batteries which provide at least 4,000 hours of actual use.

Automatic or Manual On and Automatic Off are incorporated in most models.

The **Batch Total** is the total liquid measured since the last manual clearing of this total.

The locked **Cumulative Total** is the total of all liquid metered since battery connections.

The **Field Calibration Curve** is set and changed by the user.

The **Factory Calibration Curve** is preset by the manufacturer.

Flow Rate allows the display of rate of flow, as opposed to volume of flow.

Bypass conserves power in continuous flow applications by automatically turning the readout off.

