



Badger Meter Europa

# Cox turbine meters

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## Highly-precise single and dual rotor flow meters

With an unsurpassed repeatability and linearity, the Cox turbine meters fit into every liquid and gas application in the industry. They can be found in applications ranging from fuels, demineralized water and chemicals, to cryogenic flow measurement of CO<sup>2</sup>. With a variety of end-fittings to mate with piping and an array of electronics for signal processing, the meters provide the right solution for demanding flow applications.

The standard single rotor turbine meters are more used in applications like coolant for cutting and forming operations, process control flow measurement, component test stands for the military, batch flow metering, fuel consumption measurement in machines, motors and actuator aggregates, as well as for a great number of R&D applications.

The highly accurate turbine meters with the patented dual rotor technology have a 60:1 extended range on the universal viscosity curve. They are best suited for applications where a highly-accurate flow measurement is required, where minimum room is given for the flow meter and/or where no space is available for flow straighteners.



### Features

- Very high accuracy
- Unsurpassed repeatability
- Superior linearity
- Low flow applications
- High pressure applications
- Liquid or gas applications

\*Cox is a Division of Badger Meter, Inc.



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## Cx series – Single rotor turbine meters

The superior performance is credited to the axial helical rotor design, which enhances linearity, repeatability and speed-of-response and reduces pressure drop. A single-bearing design minimizes friction and delivers linearity beyond that of the standard 10:1 range. This bearing system also extends the repeatable range to 60:1 on small meters and up to 150:1 on large meters.

Coupled with an advanced EC80 flow computer, these meter systems provide fully compensated precision flow measurements. The EC80 flow computer will linearize the meter within  $\pm 0.1\%$  linearity over the entire repeatable range. The flow computer offers temperature and pressure compensation with multiple outputs for frequency and analog in engineering units.

The meters utilize an improved, extended 6-vane support to reduce fluid swirl from entering the rotor. Ceramic ball bearings are standard for improved durability. The 316 SS housing exceeds the pressure ratings of the AN (MS) fittings. Hex or square housings make it easy for tightening the threaded fittings during installation and removal.

### Performance specifications

Calibrator uncertainty	$< \pm 0.05\%$ of reading
Accuracy	$\pm 0.25\%$ of reading
Repeatability	$\pm 0.02\%$ of reading
Linearity	$\pm 0.5\%$ of reading
With electronic linearizer	$\pm 0.1\%$ of reading
Max. frequency output	500 to 1500 Hz standard
Output signal	0-10 V (square wave pulse)
Response time	2-3 mS or better



### Features

- Superior linearity
- Exceptional repeatability
- Wide flow range
- Fast response to rate changes
- 316 SS housing standard
- Ceramic bearings
- CE-approved
- Primary standard calibrations traceable to NIST & NVLAP accredited

## LoFlo™ series – For low flow applications

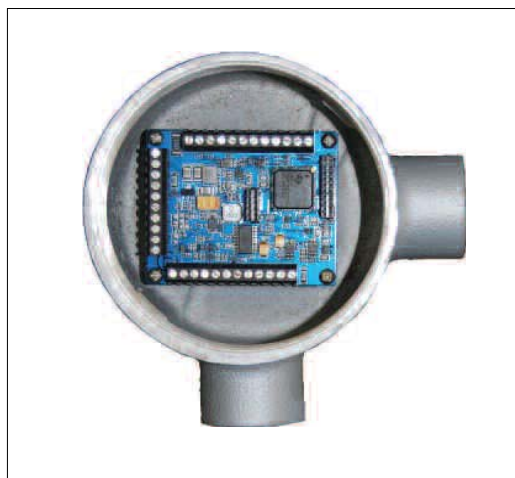
The LoFlo™ series is a robust axial turbine flow meter with exceptional repeatability of  $\pm 0.25\%$  of reading. When paired with the EC80 flow computer, the calibration data is linearized to within  $\pm 0.1\%$  of reading, allowing for precision flow measurement over the entire usable range of the meter. COX LoFlo™ series flow meters are not position-sensitive and can be mounted in any piping orientation.

The custom long-life, ceramic low-friction ball bearing system used in the LoFlo™ series meets the demands of water, hydrocarbons and cryogenic fluids. Capable of measuring flows as low as 0.024 l/min (0.006 gpm), this meter is an ideal solution for a multitude of applications. Typical uses include fuel injection production systems, blending of costly chemical additives, onboard fuel consumption, refrigerants, dye injections, and more.

Ceramic ball bearings have much less friction than journal bearings and provide a wider measurable flow range with superior repeatability. The LoFlo™ series is designed to be rugged and repeatable with the assurance of the most accurate calibration provided on the positive displacement primary standard calibrators.

### Performance specifications

Accuracy	$\pm 0.25\%$ of reading
Repeatability	$\pm 0.25\%$
Frequency output	1500 - 1800 Hz
Pressure rating	40 bar
Response time	20-30 mS
Body construction	316 SST, fittings -6 AN (MS)



### Features

- Low-friction ceramic ball bearings
- Suitable for water, hydrocarbons and cryogenic service
- 17-4 helical rotor
- Compact size (2.22" face dimension)

### Meter mounted EC80 flow computer

Housing	Explosion-proof cast aluminum
Power	24 VDC nominal
Inputs	Single/dual rotor frequency, RTD
Outputs	2 frequency outputs 2 analog (4-20 mA, 0-10 VDC)
Digital outputs	0-5 V TTL, RS485

## Exact™ series – Dual rotor turbine meter

The Exact™ series is the world's most precise meter of its kind, providing extended range performance not obtainable with traditional single rotor designs. It is used for aerospace, automotive, industrial and OEM applications.

The Exact™ series provides an extended flow range capability, which often eliminates the need for manifold systems and thus simplifies installation and lowers costs. The meter's exceptional performance, enabled by the innovative dual rotor configuration, enhances UVC\* curves and extends the usable measurement flow range.

With the Exact™ series (standard model CDX/CDL), flow straighteners are not required to control process fluid swirl, as the dual rotor system cancels out the rotor acceleration effect. With flow straighteners, bearing diagnostics can be determined by monitoring the ratio of the rotors to detect wear or cleanliness. The Exact™ series meters also utilize a unique pickoff system, which is impervious to vibration and minimizes space. This allows for direct coupling of electronics on a robust mount having a lower profile. Both integral and remote electronics are available to process the signal output.

The dual rotor technology is ideal for a wide range of applications. The meter is designed for bi-directional flow and high shock environments. It utilizes a robust bearing system having dual ceramic bearings on each rotor with the internals securely locked in place, resulting in excellent repeatability. The dual rotor meter allows for installation in applications that do not have space for flow straighteners without loss of measurement accuracy. Pressures of up to 2065 bar can be contained, while compensating for viscosity changes using integrated pressure sensors.



### Features

- No need for flow straighteners
- Enhanced performance due to helical rotors
- Superior absolute accuracy
- Excellent repeatability
- Wider operating flow range
- Extended UVC\* flow range
- Integral pickoff impervious to vibration
- NVLAP calibration uncertainty

### Performance specifications

Calibration uncertainty	< ± 0.05% of reading
Accuracy	± 0.1% of reading
Repeatability	± 0.02% of reading
Linearity (with linearizer)	± 0.01% of reading
Process temperature	-270 °C to +150 °C standard
Operating pressure	Up to 2065 bar depending on size and end-fittings
Pressures drop	0,9 bar at max. flow rate @1.2 cSt
Bearing	Ceramic std. (water & hydrocarbons)

\*Universal viscosity curve