



**Precision Flow  
Measurement Solutions**



# Introduction

Badger Meter is a leading innovator, manufacturer and marketer of flow measurement and control products, serving water and gas utilities, municipalities and industrial customers worldwide. Measuring a variety of fluids, products from Badger Meter are known for accuracy, durability and providing valuable measurement information to customers.

Cox Precision metering products by Badger Meter provide flow measurement solutions for the test and measurement market and precision industrial applications. Cox Precision flow meters have been the icon of turbine flow meters since their inception in the early 1940s. Each model uniquely presents a solution for a wide variety of precise flow measurement applications.

- Cox Precision: Superior wide turndown ratio
  - Minimizes viscosity effects
  - Extends the useable range
  - High pressure applications (HP)
- Cox Exact Dual Rotor: Extended UVC capability and range
  - Eliminates the need for flow straighteners or piping straight runs
  - Provides bearing diagnostics (with flow straighteners)
  - Inherently bi-directional
  - Delivers high-shock design
- Cox Precision LoFlo: Robust low flow meter
  - Reduced friction with ceramic ball bearings
- Cox Precision Gas Flow Meters
- Badger Meter Industrial Oval Gear: Viscous fluids
- Research Control® Valves: Precise control of flow
- Flow Dynamics: Primary standard calibration laboratory

A host of electronic signal conditioners and flow processors will complete the transmission of your precision flow data. These features are augmented by superior calibrations from Flow Dynamics Primary Standard Calibration laboratory offered by Badger Meter.

## Credentials

Cox Flow Measurement is certified compliant to AS9100 and ISO 9001 and accredited to ISO/IEC 17025 and accredited to ANS/NCSL Z540 by NVLAP (Lab Code 200668-0).



FM 78587  
AS9100 Rev. C and  
ISO 9001:2008



\*NVLAP accreditation applies only to the Badger Meter Flow Dynamics calibration Lab, located in Racine WI.

# Solutions for Demanding Applications

## Fuel Component Test Stand

- Cox Exact Dual Rotor Turbine Flow Meter with EC80 Flow Processor
- Extended UVC range capability
- Fully temperature compensated with a process latency of 100 microseconds



## Diesel Engine Test Cell

- Cox Exact Dual Rotor Turbine Flow Meter and RCV Precision Flow Valve
- Most precise for flow control and measurement



## Hydraulic Test Stand

- Cox Precision Turbine Flow Meters with pre-amplifier
- Superior linearity for improved viscosity tolerance



## Jet Engine Fuel Test Stand

- Cox Exact Dual Rotor Turbine Flow Meter with Integral Mount Flow Processor
- Exceptional UVC and extended range capability



# Test and Measurement Solutions

Cox Precision flow meters have superior linearity, exceptional corrosion resistant ceramic bearings and microsecond-responsive flow processors. These features are designed into the Cox flow meters to provide solutions for the test and measurement, aircraft and automotive markets.

**Problem: Meter reading deviation due to temperature/viscosity variations.**

**Cox Solution 1: Improved temperature/viscosity characteristics.**

Cox Precision Turbine Flow Meters provide exceptional linear mechanical turndown, which makes the meter less sensitive to temperature/viscosity variations. This extended linearity, as much as 100:1, will produce excellent flow data when fluid temperature varies. Exceptional wide-range linearity sets Cox apart from the traditional 10:1 turndown flow meters.

**Cox Solution 2: Exceptional UVC performance.**

The strength of the Cox Exact Dual Rotor Turbine Flow Meter is its ability to provide exceptional UVC plots over an extended flow range. All of the flow data points fit the curve over a wider range than that of a single rotor and will produce a UVC with a 60:1 turndown, or better. Increased resolution, flow range and curve fit, all combined, produce high-quality compensated flow output in varying fluid temperature environments.

**Problem: Short bearing life causes frequent calibrations.**

**Cox Solution: Superior bearing system.**

Ceramic ball bearings offer superior roundness, a harder surface, lighter weight and increased resistance to pitting. Ceramic bearings can be used in water, hydrocarbons and cryogenic applications. Generally, calibration drift is more likely to be contamination in the raceways rather than bearing wear. Avoid raceway contamination by installing proper filtration.



Cox Precision Meters

EC80 Flow Processor  
& Exact Dual  
Rotor Meter

Ceramic Ball Bearing

# Test and Measurement Solutions

**Problem:** Inability to respond to dynamic flow.

**Cox Solution:** Rotor speed-of-response with reduced flow processor time.

The Cox unique helical 3D single rotor design has a three milliseconds or less speed of response with a low-friction ceramic bearing. This is enhanced with a flow processor, which has a latency of 100 microseconds and provides an excellent flow response, as compared to other technologies on the market.

**Problem:** No indication of monitoring bearing health.

**Cox Solution:** Bearing diagnostics.

Cox Exact dual rotor patented technology, coupled with a flow processor and flow straighteners, is capable of comparing the two rotor frequencies to determine a ratio change. If either bearing is contaminated, the ratio will change, indicating bearing friction issues. This could prevent bad data from going unnoticed over the life of a test. It also indicates when cleaning and calibration maintenance is required.

**Problem:** Space constraints do not allow for adequate pipe straight runs.

**Cox Solution:** Compensation for swirl effects.

Flow straighteners are especially a problem when space is not available for the extra length of pipe required to negate swirl effects. Using Cox Exact dual rotor patented technology and the remote mounted EC80 Flow Processor will eliminate the need for flow straighteners. Swirl will advance the revolutions per minute (rpm) of the first rotor and retard the rpm of the second rotor. By averaging the two rotors, it will negate the effect of the measurement caused by the swirl.



Cox Helical 3D Rotor



Exact Dual Rotor Internals



Cox Exact Dual Rotor Meter

# Test and Measurement Solutions

**Problem:** Susceptibility for hydraulic shock and/or need for bi-directional flow.

**Cox Solution:** Utilizing minimal moving parts.

Exact dual rotor turbine meters use a rod-through clamping system that secures the internals on a machined step in the housing. This method of securing the internals makes a solid contact with the housing. The only moving member remaining is the rotation of the rotor. The Exact flow meter internal clamping system contributes to the ability to maintain a repeatability of  $\pm 0.02$  percent. This type of clamping system not only facilitates bi-directional flow but also provides a solution for high shock applications.

**Problem:** Need for a compact system with the flow meter and electronics in one package.

**Cox Solution:** Integrated electronics.

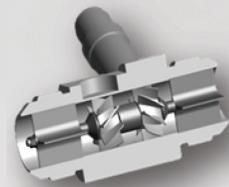
The Exact dual rotor meter lends itself to OEM packaging that provides a compact system with an embedded flow processor. Customizable multiple outputs, combined with pressure, temperature/viscosity compensation and bearing diagnostics, create a powerful embedded electronic processor package. These designs are custom packaged and use the standard dual rotor internals. Special end connections for hydraulics, aircraft fuel and high pressure fittings are available.

**Problem:** Need for assurance of calibration accuracy.

**Cox Solution:** Flow Dynamics primary standard calibrations.

A flow meter's performance is dependent on its calibration. That is why Badger Meter supplies primary standard calibrations having  $\pm 0.05$  percent uncertainties with  $\pm 0.02$  percent repeatability in our Flow Dynamics NVLAP (Lab Code 200668-0) accredited calibration facility, traceable to NIST.

Note: NVLAP accreditation applies only to the Badger Meter Flow Dynamics calibration Lab, located in Racine WI.



Cox Exact Dual Rotor  
Clamped Internals



Flight OEM Flow  
Meters with Embedded  
Flow Processors



Primary Standard  
Calibrations

# Precision Turbine Flow Meters

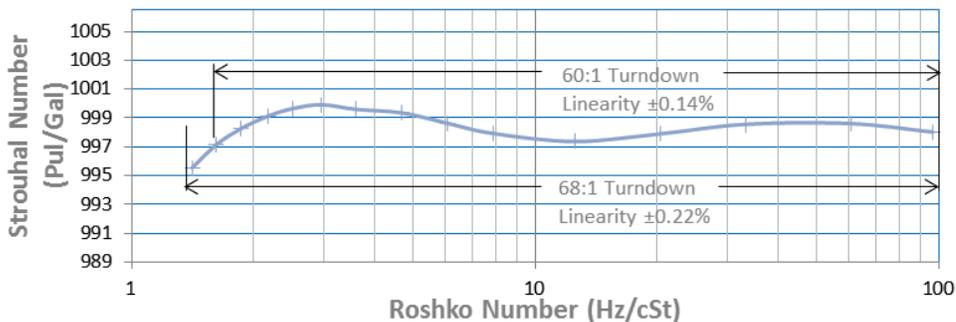
## Wide Linear Flow Range Solution

Cox Precision Turbine Flow Meters by Badger Meter are known around the world for providing highly accurate linear flow measurements. Users in the automotive, aerospace, and test and measurement environment experience the abundant performance advantages of Cox turbine flow meters. The following performance features are packaged in a small footprint with an array of available pipe connections.

## Unsurpassed Linearity

Cox is the icon for turbine meter performance with mechanical linearity of 60:1 on mid-sized turbine flow meters and 100:1 on meters up to two inches. With the widest known linear turbine meter range available, Cox turbine meters will, in most applications, eliminate or minimize temperature viscosity flow measurement shifts. This performance is a result of a unique helical rotor design and bearing system that will improve measurement readings under variable temperature/viscosity fluid conditions.

ANC 20 Typical Linearity Plot



## High Performance Bearings

All of the Cox turbine flow meters utilize superior ceramic bearings which are suitable for both water and hydrocarbon fluid media. This advanced bearing configuration will withstand temperatures from -450...800° F. Our ceramic bearings contribute to the versatility of the Cox flow meter by decreasing bearing friction and extending the linearity at the low end, while increasing bearing life. In fact, our experience tells us that most ceramic bearings are not worn, but instead contaminated with particulates. Simple cleaning restores the bearing to its original performance, while proper filtering prevents it.



Highly Accurate Linear Flow Measurements



Unique Helical Rotor Design



Superior Ceramic Bearings

# Precision Turbine Flow Meters

## Pickoff Selections

Pickoffs serve two functions: to sense the rotor blades and to generate a pulse output. In order to do this under varying temperature conditions, wiring, coils and soldering/brazing must be able to resist process temperatures, which are often as high as 750° F. Cox flow meters provide various pickoff temperature solutions and embedded amplifier options.

Magnetic pickoffs are self-generating and do not need power, but they do create a magnetic braking effect on the rotor, which is detected at low flow rates. Modular carrier pickoffs require power, but do not influence the rotation of the rotor, providing better linearity and a wider turndown or lower range capability.

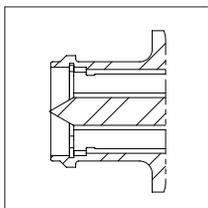
## Cox Single Rotor Meter Specifications

<b>Flow Ranges</b>	Six overlapping ranges from 0.20...310 gpm
<b>Repeatability</b>	±0.02% of reading
<b>Linearity</b>	±0.25% of reading, over specified ranges
<b>Response Time</b>	2...3 ms
<b>Calibration</b>	±0.05% Uncertainty—Primary Standard
<b>Housing</b>	316 Stainless Steel—housing exceeds end connection pressure rating
<b>Pressure Rating*</b>	Dependent on end fitting and temperature
<b>Rotor</b>	17-4 Stainless Steel – no trimming required to obtain linearity
<b>Bearing Type</b>	Ceramic—long life
<b>Compatible Fluids</b>	Water, hydrocarbons and cryogenic fluids
<b>Fluid Temperature</b>	-450...800° F

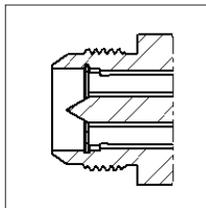
NOTE: Specifications developed in 1.2 cSt Solvent. \*see Cox Precision Turbine Meters Data Sheet.

## Standard Fittings

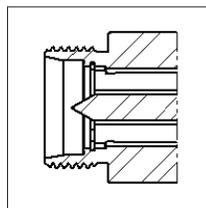
Cox flow meters offer an assortment of standard fittings to mate with piping connections and also provides custom fittings.



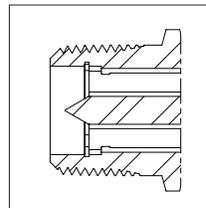
Hose Barb Connection  
(Per MS 33658)



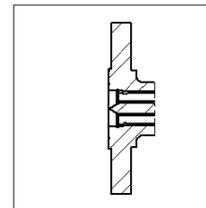
AN Connection  
(Per AS 4395)



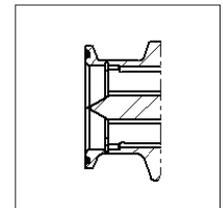
High Pressure Connection  
(Per AS 33514)



Pipe Thread Connection  
(Per NPT)



Flange Connection  
(Per ASME B16.5)



Sanitary Connection A.K.A. Tri-clamp  
(Per ASME BPE)

## Pickoff Choices:

- High or low temperature
- Amplified output
- Embedded RTD
- Bayonet or MS connectors
- NPT wire leads
- High vibration



Cox Precision Single Rotor Meter

# Precision Low Flow Metering

The Cox Precision LoFlo meter is ideal for resolving low flow measurements in high pressure applications. The meter is comprised of a robust axial turbine rotor, using a ceramic ball bearing suitable for water, hydrocarbon or cryogenic fluids. The Precision LoFlo meter is inherently nonlinear, but is exceptionally repeatable within  $\pm 0.25$  percent. When paired with an EC80 Flow Processor, the meter output is linearized to within  $\pm 0.1$  percent. The Precision LoFlo meter is available in six meter sizes, which measure flow from 0.006...1.25 gpm.

Flow straighteners are recommended, however, the meter may be calibrated in the applications piping configuration to nullify calibration shift.



## Cox LoFlo Meter Specifications

<b>Repeatability</b>	$\pm 0.25\%$ of reading
<b>Linearity</b>	$\pm 0.1\%$ , when paired with a flow processor
<b>Response Time</b>	20...30 ms
<b>Calibration</b>	$\pm 0.05\%$ Uncertainty—Primary Standard
<b>Housing</b>	316 Stainless Steel housing exceeds end connection pressure rating
<b>End Fitting</b>	3/8 in. AN (MS) 37° flare fittings
<b>Pressure Rating</b>	5000 psi at 75° F
<b>Rotor</b>	17-4 Stainless Steel
<b>Bearing Type</b>	Ceramic—long life—water, hydrocarbons and cryogenic fluids
<b>Compatible Fluids</b>	Water, hydrocarbons and cryogenic fluids
<b>Fluid Temperature</b>	-450...800° F

NOTE: Specifications developed in 1.2 cSt solvent.

## Application Examples Include:

- Attitude and Position Control Rocket Engines
- Exotic Fuels and Oxidizers
- Leak Detection
- Fuel Monitoring
- Batching

# High Performance Dual Rotor Meters

## Advanced Performance Solutions

The Cox Exact Dual Rotor Turbine Flow Meter offers features unattainable in single rotor designs. Essentially, three flow measurement signals are provided; leading rotor, trailing rotor and the sum or average of the two. These combinations provide usable information for bearing diagnostics, viscosity indication and negating swirl effects on measurement. Exact dual rotor flow meters have many solution-based attributes. The internals are designed for bi-directional and high shock applications and have the following feature rich capabilities.

## No Flow Straighteners Required

Having two hydraulically coupled rotors, turning in opposite directions, renders fluid swirl influences insignificant over a wide turndown range. While the front rotor may accelerate due to swirl, the opposite effect happens on the trailing rotor. By summing both rotors and averaging the output, the swirl effect is canceled out. This allows Exact flow meters to be installed into tight space, without flow straighteners.

## Bearing Diagnostics

Using flow straighteners, bearing diagnostics are achieved by monitoring the rotor revolutions per minute ratio. If one bearing is contaminated, the rotor ratio will change, alerting the user of a bearing problem. This is useful in applications such as subsea, aircraft fuel monitoring, long-term test monitoring, and for alerts on precision batching. This is also an excellent feature if running a life test over several months or years. With proper filtering, bearing contamination can be eliminated.



## Extended Range Capability

The Cox Exact Dual Rotor Turbine Flow Meter has one of the widest flow range capabilities offered. This is achieved by having two rotors freely suspended and rotating in opposite directions. Straightening support vanes reduce the flow swirl prior to impacting the first rotor, which spins counterclockwise. As the flow exits the first rotor, it approaches the second rotor with a nearly perpendicular angle of attack, thereby transferring additional momentum to the clockwise rotation of the second rotor. This additional momentum to the second rotor greatly extends the turndown capability to as much as 500:1.

## Features:

- Dual rotors
- Helical Rotor Design
- High-performance ceramic ball bearings
- Extended UVC range
- High shock design

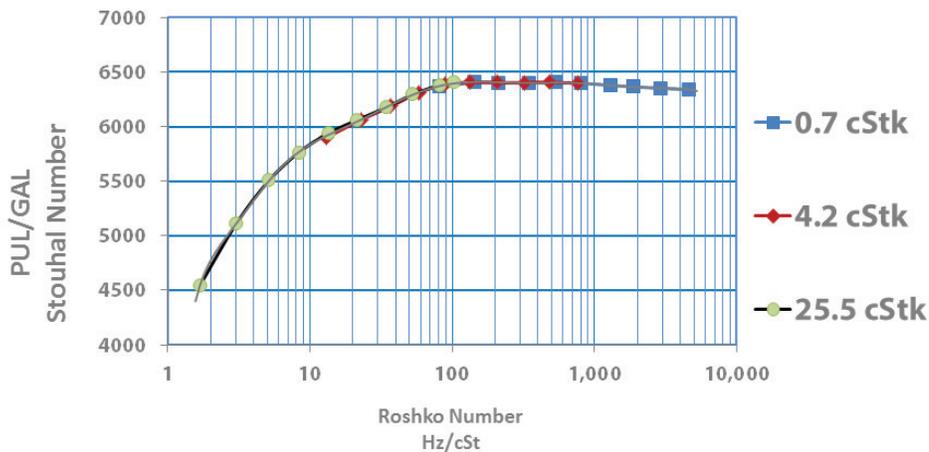


Cox Exact Dual Rotor Meter

# Extended Range UVC Plots

One of the major strengths of the Exact dual rotor flow meter is the ability to develop a superior blended Universal Viscosity Curve (UVC) over an extended range. The following dual rotor UVC plot demonstrates a nicely blended curve, which represents a flow range from 0.06...30 gpm (500:1 turndown). The curve reproduces the viscosities of Jet A, JP5 and JP8 fuels, over a temperature range of -65...300° F.

**UVC Plot, Meter Size - 12 (3/4 in.)**



The EC80 remote mounted flow processor will receive inputs from the dual rotors and temperature sensor. In combination with the UVC plot and using Strouhal-Roshko algorithms, the viscosity variance of the known fluid will be temperature-corrected and the flow meter output will be linearized. The flow processor will scale the flow data, amplify the signal, convert the signal to analog or digital, and output a fully temperature-compensated flow rate over an extended range.



# OEM Custom Packaging with Integrated Electronics

## Custom Meter Solutions

Innovative Cox Flow Measurement design efforts result in unequalled performance achieved through mini-integration, utilizing embedded concepts to reduce cost, space, and piping connections. A family of special flow meters has been developed from the dual rotor platform, of which many are onboard advanced aircraft, such as the Joint Strike Fighter - STOVL, X51 Wave Rider - Scram Jet, UACV - Predator Avenger. Formula 1 race cars have also tapped into the lightweight aluminum body dual rotor for onboard fuel management. Our latest aluminum body meter incorporates a turbine mass flow design for both flight and ground applications. In most applications, no flow straighteners are required, further improving application flexibility. Integrated systems provided by Cox Flow Measurement reflect the most advanced turbine flowmeter technology, which incorporates flow, temperature and pressure measurements in one flow sensor package.

## Aerospace Flight Flow Meters



Jet Engine Fuel Meter



Differential Hydraulic Flight Fuel Meter



Onboard Mass Flow Fuel Measurement



Defense Scram Jet Fuel Meter



Race Car Aluminum Fuel Meter with Embedded Flow Computer



Agricultural Spray Meter (Injection Molded)

## Hydraulic High Pressure Flow Meters



5000 psig, AS 33514 (Compliant with AS4375)



SAE62 Flange - 6000 psig



Hydraulic Manifold Capable of 10,000 psi Line Pressure



# Precision Gas Flow Meters

Cox Precision Gas Flow Meters offer a lower cost solution than mass or ultrasonic flow meters and have  $\pm 0.25$  percent repeatability with exceptionally long-lasting ceramic bearings. Cox turbine gas flow meters offer three different rotor designs for low, medium and high density gases, which cover a density range from 0.01...15 pounds per cubic foot with flow ranges from 0.4...250 acfm, depending on density.

DENSITY RANGES	LOW	MEDIUM	HIGH
Density (lb/cu ft)	0.01...0.75	0.38...3.0	1.5...15
Atmosphere of air	0.125...10	5...40	20...200

Cox gas meters have a pressure tap installed in the flow meter body to facilitate pressure measurements during operation. This eliminates the need for additional pressure taps penetrating the piping system.

## Sonic Nozzles

Cox Sonic Nozzles are mass flow instruments which are not affected by downstream flow disturbances and remain constant even with downstream pressure fluctuations. Sonic nozzles have exceptional repeatability of  $\pm 0.25$  percent of reading in the choked or sonic flow condition. While in the choked state, the flow rate through the nozzle becomes nearly a linear function of the inlet pressure. Our standard offering covers a flow range from 0.04...10,000 standard cubic feet per minute with diameters from 0.011...1.0 inches.

Cox Sonic Nozzles are a good choice for:

- Calibration standards
- Gas flow metering
- Valve CV tests
- Flow limiting
- Combustion engine inlet and outlet air
- Compressor discharge capacity tests



Precision Gas Flow Meter



Sonic Nozzle

# Precision Gas Flow Meters

## Gas Meter Calibrations

Calibrations are performed using primary standard bell provers in air, with an uncertainty of  $\pm 0.20$  percent of reading. Sonic Nozzle banks are also used to calibrate gas meters for gases, other than air, with an uncertainty of  $\pm 0.35$  percent of reading. Uncertainties stated are from NVLAP (Lab Code 200688-0) Scope of Accreditation to ISO/IEC 17025.

Cox flow meters also provide:

- Gas correlation for toxic gases
- Partial vacuum calibrations to 500 psia (3447 kPa)
- Pressurized calibrations to 400 psia (2758 kPa)
- Lifetime storage of calibration data by meter serial number



Primary standard 100 cubic foot bell prover capable of producing flow rates from 0.00035...1000 scfm (0.01...28,317 slpm).

- Helium
- Argon
- Nitrogen
- Methane
- Hydrogen



# Industrial Oval Gear Flow Meters

## High viscosity flow measurement solution

The Industrial Oval Gear (IOG) flow meter is an ideal solution for additive fuel blending, oils, gear lubrication, and applications involving high-viscosity fluids up to 1000 centisokes. Based on a true positive displacement design, IOG meters are very easy to install.

Industrial Oval Gear meters offer eight models, covering ranges from 0.067...185 gpm. Several standard pipe connections are available, with maximum pressure ratings of 3000 psi, depending on the end fitting and port size. The output is the result of a magnet passing by a Reed switch to create a pulse. Each pulse equals a unit of measurement, which is sent to a register for rate, total and signal transmission to a control system. Different materials of construction are available for caustic fluid applications:



## Electronics

Several choices of registers, or a terminal housing, can be selected to process the signal or connect to system wiring. Badger Meter also offers a batcher for blending of liquid materials, which provides a ticket printer and display.



EC80 remote mount



EC80 integral mount



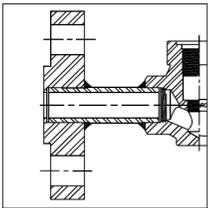
Model EC80\_XP1  
Explosion-proof housing  
mounted directly on the  
flow meter.



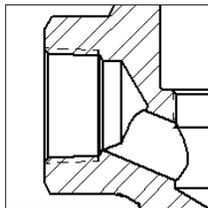
# Control Valves and Actuators

Research Control® Valves (RCV) by Badger Meter include a line of precision control valves and actuators to control the flow of fluid for both gas and liquid. RCV specializes in low flow applications, with a variety of configurations in line sizes from 1/4...3 inches covering Cv ranges from 0.0000018...90. RCV valves solve issues with high-temperature (1500° F) and high-pressure (60,000 psi), with an array of body and trim alloys for caustic fluids.

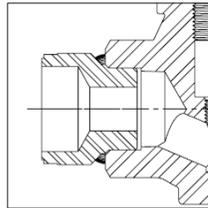
## Precision Control Valve End Fittings:



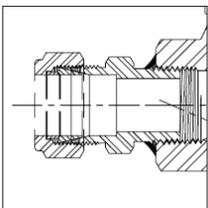
Flanged Body



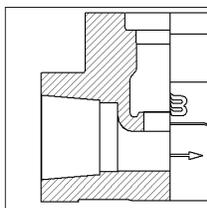
NPT Body



Socket Weld Body



Swagelok Body



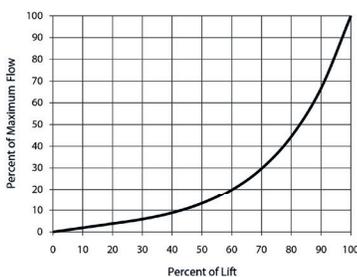
Wafer Body

Compatible materials include, but are not limited to:

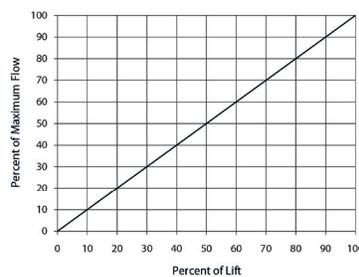
- 316/316L stainless steel
- 304/304L stainless steel
- Bronze
- Carbon steel
- Monel
- Alloy 20
- Alloy B
- Alloy C
- Inconel
- Titanium
- Kynar
- Duplex stainless steel

## Trim Flow Characteristics

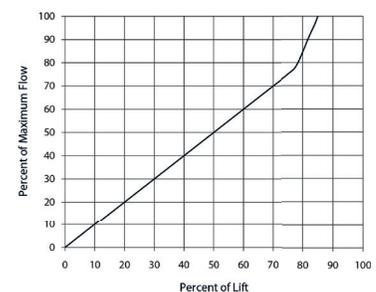
Equal Percentage



Linear



Double Taper



# Secondary Standard Field Flow Calibration System

Calibrating meters using the same process lines and fluid requires a secondary standard flow calibrator. The solution is a Flow Transfer Standard, using precision turbine master meters to compare with the unit under test. The benefits of using the same piping and fluid can produce real world results that are difficult to duplicate in a calibration laboratory.

This type of calibration system can be accomplished by using the Flow Gator FTS. This powerful but small handheld device is a portable data acquisition system, containing signal conditioners for analog or frequency flow meter outputs, along with temperature. Having automatic viscosity and density corrections provides fluid compensation in the field.

The Flow Gator will collect the output from the meter under test and the master meter to produce a correlation calibration report using a USB printer port. A software interface program allows the data to be uploaded to a PC for report generation and viewing. The Flow Gator can store up to five master meters and five fluid property tables.



A typical Flow Gator master meter system uses a temperature sensor in the downstream flow straightener and a dual rotor turbine master meter.



A Flow Gator system comes in a carrying case with a master meter, cable and power supply.



# Manifold Calibration Systems

Frequently used in the U.S. Air Force and by large aircraft manufacturers, multiple flow meter manifold systems provide a portable single-source calibration system capable of extending flow ranges up to 1500:1 turndown. These systems perform viscosity compensation based on the temperature of a known fluid and allow for calibration of flow meters without removal from the piping. Manifold calibration systems can be kitted in transportation containers or assembled on carts. The manifold systems contain two or three flow meters, providing a very wide flow range.

Three-meter manifold mounted on a cart using air injection into the electronic boxes for explosion-proof protection.



Two-meter manifold using Dual Rotor Turbine Flow Meters and Flow Gator control.



# Primary Standard Flow Calibration Solutions

The Test and Measurement industry requires a variety of calibrations to meet their unique fluid and temperature variants. These precision calibrations include various viscosity blends and gas densities. Badger Meter offers Flow Dynamics solutions, which easily resolve these complex calibrations through a system of solvent and oil blends for liquid and pressurized gas.

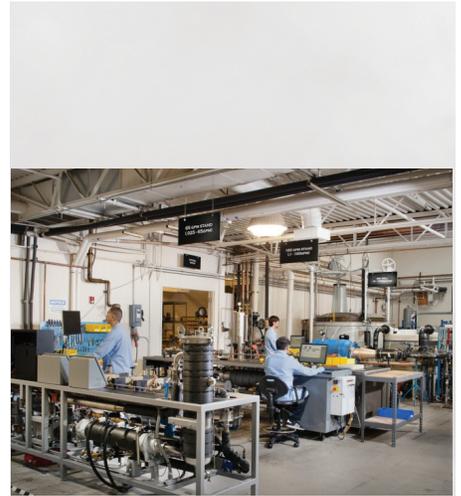
Because Badger Meter has an arsenal of liquid and gas primary standard calibrators, we can ensure prompt turnaround time at a competitive price. Specializing in calibrations for all types of meters, Badger Meter offers best-in-class solutions when it comes to meters and calibration labs. NVLAP (Lab Code 200668-0) accreditation, coupled with being an active participant in NIST Round Robin Proficiency Testing, lends credibility to the unprecedented uncertainty statements of Flow Dynamics calibrations.

Badger Meter is a leader in the manufacture of primary standard liquid calibrators used by government metrology labs around the world. Installation and training is provided with every calibrator, along with annual on-site certification and maintenance service agreements.

## Specifications

- Flow Ranges:

PCDL 10	0.01...10 gpm (0.04...37.9 lpm)
PCDL 60	0.06...60 gpm (0.189...227 lpm)
PCDL 400	0.1...400 gpm (.38...1514 lpm)
- Uncertainty:  $\pm 0.05\%$  of rate
- Repeatability:  $\pm 0.02\%$  of rate
- Flow Meter Inputs: Analog and Frequency
- Temperature Control:
  - Heat Exchanger and Heater
  - Water chiller (furnished by end user)



A partial segment of Flow Dynamics liquid and gas primary standards laboratory, Racine, WI



PDCL 400—Primary Standard Liquid Calibrator



**Control. Manage. Optimize.**

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