

Flow Transfer Standard Continuous Loop Calibrator

The principal purpose of the Flow Transfer Standard - Continuous Loop Calibrator is to perform accurate liquid flow calibrations on various types of flow meters, including turbine meters, rotameters, orifice plate meters and slow response flow meters that require long settling time.



Application

The FTS-CL calibrator is used for calibrating meters that do not require Primary Standard Calibrator uncertainties of $\pm 0.05\%$. The FTS-CL will obtain uncertainties of $\pm 0.15\%$, which is acceptable for meters that require $\pm 0.5\%$ of reading calibration accuracy. Typical meters ran on this type of calibrator are rotameters and water meters used in less precision applications. Users are OEM commercial meter manufacturers, government calibration labs, FFA repair centers, etc.

System Configuration

The FTS-CL major system components consist of:

Mechanical Components

Manifold Dual-rotor Turbine Flow Meters
Repeatability: $\pm 0.02\%$

Positive Displacement Pumps Continuous Flow
Heat exchanger (chiller not included)
Heater
2 meter test section
8 gallon reservoir

Motor and speed controller
10 HP air-cooled motor with programmable controller

Electronic Components

Personal Computer
Flow Dynamics Electronic Interface Module
Counter/Timer Card
Analog-Digital card

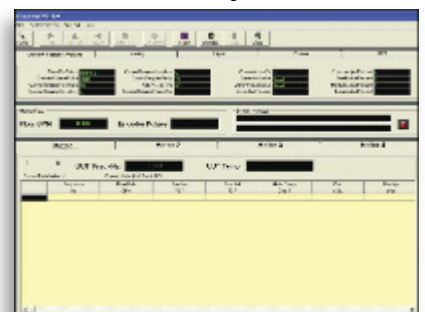
Performance Specifications

Fluid	Typically water, solvents and oil
Range:	.35 to 250 GPM
Uncertainty:	$\pm 0.15\%$ of Reading
Operating Temperature:	40 to 140F
Operating Pressure up to:	100 psig

Description

The Flow Transfer Standard-Continuous Loop Flow Calibrator (FTS-CL) system is a bench-type, self-contained calibrator. The heart of the calibrator is a precision and highly repeatable Dual-rotor Turbine Flow Meter manifold system. When properly sized, the FTS-CL will produce uncertainties of $\pm 0.15\%$. The FTS-CL system consists of a minimum of two Dual-rotor Turbine Flow Meters with flow conditioners in a manifold configuration, three positive displacement pumps with clutch and motor speed controller, an Electronic Interface Module and a Personal Computer with Flow Dynamics Flo-Cal Software. The calibrator provides an adjustable test section for units under test as well as a fluid reservoir and fluid filters incorporating a continuous flow loop calibrator system.

The data acquisition system records important flow calibration data and provides a means for maintaining historical flow meter calibration data. The operator may record data, prepare graphs, and perform calibrations on various types of liquid flow meters.



Calibration Main Screen

www.flow-dynamics.com

15555 N. 79th Place • Scottsdale, Arizona 85260 USA
Telephone: 480.948.3789 • Fax: 480.948.3610

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System Overview

The Flow Transfer Standard – Continuous Loop Flow Calibrator

The calibrator uses Dual-rotor Turbine Flow Meters as Master Meters. Each dual-rotor meter has two rotors suspended on low drag ceramic ball bearings in such a way that the rotors can spin freely as the liquid passes through the meter body. A pickup mounted above each rotor generates an electrical pulse as each rotor blade passes. These pulses are amplified by the electronics module and used to compute the volumetric flow passing through the flow meter. Each flow meter must be individually calibrated to determine the relationship between the frequency of the flow meter signals and the flow rate. A thermistor temperature sensor is used to measure the temperature of the fluid passing through the meter body. This temperature can then be used to calculate the viscosity and density of the fluid. These parameters are used in calculations performed by the computer. The two master meters are arranged in a manifold configuration. An actuator and bypass valve are used to divert flow through the small meter at designated flow rates.

The counter timer card in the Electronic Interface Module is used to precisely measure the frequency from the turbine meter rotors, as well as frequencies from any devices under test.

An analog-to-digital converter card is used to convert temperature, voltage and current signals to digital counts, which can be read by the computer. This card also converts digital to analog signals to produce voltage outputs.

Three positive displacement pumps driven by a motor and speed controller provide flow in the system. Each pump is selected as necessary by engaging its clutch and opening its isolation valve.

A personal computer collects the information from the flow meters, temperature sensor and other inputs and provides a means of manipulating this information to perform calibrations.

Frame size:
164" Long
31" wide
78" tall (top of tank)

About Flow Dynamics

Flow Dynamics is also the world's largest manufacturer of full-featured flow meter calibration equipment, offering a proven line of liquid positive displacement calibrators ranging from .001 GPM to 300 GPM.

Flow Dynamics' primary standard calibration laboratory is NVLAP accredited, supplying both manufacturers and end users with dependable calibration results. All types of flow meter technologies are calibrated in liquid and gas. Throughout the global metrology industry, we are recognized as the calibration-lab-of-choice for customers demanding high-accuracy flowmeter calibrations traceable to the most rigorous international standards.



Two meter manifold used as secondary standard master meters for the FTS-CL calibrator



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