

LIQUID CONTROLS GROUP



Industrial Metering Applications

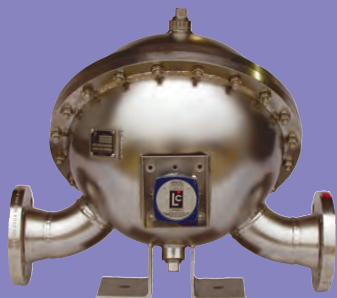
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Premier products, premier performance

The Liquid Controls Group (LCG) offers a broad selection of metering systems for industrial flow measurement applications including: positive displacement (PD), turbine (bladed-rotor and helical), ultrasonic, electromagnetic, and mass meters.

Applications

- Sweeteners
- Water
- Solvents
- Acids
- Paints and Varnishes
- Chemicals
- Food and Beverages
- Bitumen/Asphalt
- Printing Ink
- Fertilizers
- Caustics

In addition to a comprehensive selection of flow meters, the Liquid Controls Group can provide complete metering systems for applications needing simple registration or applications where precise automated control and data management are required.

Liquid Controls Group metering systems are sold and serviced by a worldwide network of qualified distributors and OEMs. Our products are backed by our established reputation for accuracy and reliability. That's why the Liquid Controls Group leads the industry in metering solutions and that's why you'll want LCG's quality as part of your process applications.

Positive Displacement Meters



The Liquid Controls Group's Positive Displacement Meters are exclusively engineered with no metal-to-metal contact inside the measuring chamber ensuring minimal wear and sustained accuracy. PD meters provide the necessary accuracy for batch processing, flow rate control, blending, and custody transfer of liquids across a broad range of products, viscosities, temperatures, pressures, and flow rates.

Common process meter model numbers

Application	Description	Model
Solvents	2", 100-GPM aluminum meter with counter	M-7-A-16
Ethanol	2", 100-GPM aluminum meter with counter	M-7-A-16
Liquid sweeteners	2", 100-GPM aluminum meter with counter	M-7-A-3
Water	2", 80-GPM brass meter with counter	M-7-A-20
Acids	2", 80-GPM 316 stainless steel meter with counter	M-7-A-8
Caustics	2", 100-GPM cast iron meter with counter	M-7-A-7



Positive Displacement Meters

Size	Model#	Maximum Nominal Flow Rate	Maximum Non-Shock Working Pressure
1 1/2"	M-5	60 GPM	150 PSI
2"	M-7, MS-7	100 GPM	150 PSI
2"	MSAA-7	100 GPM	275 PSI
2"	MA-7, MSA-7	100 GPM	300 PSI
3"	M-15, MS-15	200 GPM	150 PSI
3"	MSAA-15	200 GPM	275 PSI
3"	MA-15, MSA-15	200 GPM	300 PSI
3"	M-30	350 GPM	150 PSI
3"	MSAA-30	350 GPM	275 PSI
3"	MSA-30	350 GPM	300 PSI
4", 6"	M-60	600 GPM	150 PSI
4"	MS-75	700 GPM	150 PSI
4"	MSA-75	700 GPM	300 PSI
4"	MSAA-75	700 GPM	275 PSI
6"	MS-120, MSAA-120	1,000 GPM	275 PSI
6"	MSA-120	1,000 GPM	300 PSI

Linearity	Repeatability	Range	Registration
± .22%	.05%	10:1	Mechanical
± .10%	.03%	10:1	Electronic



Application class

Model	Metallurgy	(see table at bottom)
M-5, 7, 15, 30, 60	Aluminum	1, 2, 3, 12, 14, 15, 16
M-5, 7; MSAA-7, 15, 30, 120	Stainless steel	8
M-7, 30	Cast iron	7, 27, 37
M-7	Brass	20
MS/MSAA/MSA/MSB/MSC-7, 15, 30, 75, 120	Steel	1, 2, 10, 14, 16



Construction/application classes

Class 1 Refined petroleum products	Class 8 Acid pH liquids including: nitric, phosphoric, glacial acetic acids, citric juices, vinegar	Class 20 Batch process water meter service
Class 2 Aviation and jet fuel	Class 10 Liquid petroleum gas (LPG)	Class 27 Alkaline pH liquids: latex products, adhesives, liquid fertilizers
Class 3 Variety of products including: liquid sugars, sweeteners, syrups, vegetable oils	Class 12 Anhydrous ammonia (NH ₃)	Class 30 Herbicides
Class 4 Treated waters and solvents where no red metals are allowed	Class 14 Crude oil	Class 37 Sodium hydroxide solutions, high sulfur crude oil, alkaline pH liquids
Class 7 Chlorinated solvents	Class 15 Oil- or water-based latex products, polyester resins, adhesives, herbicides, nitrogen fertilizers	Class 47 Mildly abrasive liquids
	Class 16 General solvents, 200 proof alcohol	

Ultrasonic Meters

Fluid Velocity Range

1 m/s to 10 m/s
3.28 ft/s to 32.8 ft/s

Working Pressure Rating

150 - 600 ANSI

Connections

3" through 24"
Flanged

Accuracy

Capable of ±0.15% of rate over 10:1 range

Repeatability

In compliance with API recommendations



Materials of Construction

Carbon Steel, Low Temperature Steel, Austenitic Stainless Steel

The Liquid Controls Group's Faure Herman Ultrasonic Meter uses ultrasonic beams symmetrically angled across the product to provide a real-time, 3D view of the flow velocity profile. The angled beam configurations overcome viscosity changes and swirls to provide reliable, bi-directional measurement. Because Faure Herman Ultrasonic Meters do not require filters and cause no drop in line pressure, they can dramatically reduce maintenance costs at metering points and pumping stations.

Turbine Meters

Capacity (maximum nominal flow rate)

0.25 to 12,000 gpm

Working Pressure Rating

150 - 2,500 ANSI

Connections

¼" through 12"
ANSI, NPT (¼" to 2"), Flare
Tube, Wafer, Tri Clover

Accuracy

Capable of $\pm 0.25\%$ of rate
over 10:1 range

Repeatability

0.05% of reading over entire
range



Materials of Construction

Body: 304, 316, 316L SS

Rotor: 17-4 Ph SS

Bearing: Metal Ball, Carbide Sleeve, Cyro Ball,
Fluorosint Sleeve, PTFE Sleeve

Bladed Rotor

The Liquid Controls Group Sponsler Turbine Meter measures volume by means of a precision-crafted, hydraulically balanced rotor mounted in the liquid or gas flow stream. Sponsler Turbine Meters provide very accurate linear output and volumetric flow measurement for clean, low viscosity liquids and gases.

Capacity (maximum nominal flow rate)

44 to 13200 gpm

Working Pressure Rating

150 - 900 ANSI

Connections

½" through 20"

Accuracy

$\pm 0.15\%$ to $\pm 0.50\%$ of rate
over 10:1 range

Repeatability

0.04% of reading over entire
range



Materials of Construction

Body: Stainless Steel (DN25 - DN50), Carbon
Steel (DN80 - DN300)

Rotor: Aluminum or Titanium

Bearing: Tungsten Carbide

Helical

The robust construction of Faure Herman's Helical Turbine Meters consistently stand up to corrosion, high pressures, and extreme temperatures. Their simple design maintains accuracy across density and viscosity changes. Faure Herman Helical Turbine Meters are the smart choice for accurate measurement of low to medium viscosity liquids.

Mass Meters

Capacity (maximum nominal flow rate)

0.00022 to 50,000 lbs/min
0.1 g/min to 22,680 kg/min

Working pressure rating

150 -2,500 ANSI

Connections

1/4" through 12"
ANSI Flanged, Threaded,
Sanitary

Accuracy

Capable of $\pm 0.2\%$ of rate over
20:1 range

Repeatability

0.1% of flow rate



Materials of Construction

316 Ti Stainless Steel (Hastelloy and Tantalum
available on request)

Liquid Controls Group's LC Mass directly measures mass using Coriolis technology. The LC Mass meter is extremely accurate for variable density, multi-phase liquids and gases requiring measurement of mass flow.

Mag Meters

Capacity (maximum nominal flow rate)

0.05 to 500,000 gpm

Working Pressure Rating

150 -300 ANSI

Connections

1/8" through 80'
Flanged, Wafer, Threaded, Tri
Clover

Accuracy

Capable of ±0.2% of rate over
5:1 range for flow velocity
between 6 to 33 feet per
second range

Repeatability

0.1% of full scale



Liquid Controls Group's LC Mag (electromagnetic) meters are an accurate and economical volumetric measurement of electrically conductive liquids (5µs/cm minimum). LC Mag meters are ideal for products that must be cleaned in place, have high suspended solids, or must be completely purged from the line on a regular basis.

Materials of Construction

Housing: Carbon Steel - 304 SS

Electrodes: 316 SS Hastelloy B, C & Titanium

Liner: PTFE, Ebonite, EPDM & Polypropylene

Meter Choice by Application Characteristic

		APPLICATION																	
		CLEAR-LOW VISCOSITY (80 SSU or less)	HIGH VISCOSITY	GRAVITY FLOW MEASUREMENT	VARIABLE TEMPERATURE, PRESSURE and/or VISCOSITY CONDITIONS	CONDUCTIVE	NON-CONDUCTIVE	CORROSIVE	GASES	LIQUID SWEETENERS, VEGETABLE OIL & OTHER EDIBLE PRODUCTS	3A DAIRY PRODUCTS	CLEAN-IN PLACE	PRESSURE EXTREMES	TEMPERATURE EXTREMES	SUSPENDED SOLIDS	NON-ABRASIVE SLURRIES	ABRASIVE SLURRIES	BATCH PROCESSING	MECHANICAL OUTPUT AVAILABLE - NO ELECTRICAL POWER REQUIRED
LC METER TYPE	PD	A	A	A	A	A	A	B	D	A	D	D	B	B	B	B	C	A	A
	MASS	A	C	D	B	A	A	A	B	B	A	B	A	A	A	A	B	B	D
	MAG	A	A	B	B	A	D	B	D	C	A	A	B	A	A	A	A	C	D
	Bladed Rotor - TURBINE	A	D	B	D	A	A	A	A	B	A	A	A	A	D	D	D	B	B
	Helical - TURBINE	A	A	B	A	A	A	B	D	B	D	D	C	A	C	B	D	B	B
	ULTRASONIC	A	A	B	A	A	A	C	D	B	D	D	C	B	A	A	C	C	D

- A: Excellent meter choice for application
- B: Good meter choice for application
- C: Fair meter choice for application
- D: Do not use meter

Registers

Features

- Weights and Measures approved
- Operator-friendly controls
- High visibility displays



LectroCount Electronic Register



POD Pulsar



Sponsler Pulse Amplifier



IT 400 Electronic Register



Mechanical Register and Printer

Liquid Controls provides a choice of Weights and Measures-approved mechanical and electronic registration, ticket printing and control systems for truck-mounted or fixed-site meter applications. The Liquid Controls Group can package your meter with a selection of register and flow computer options. Engineered packages are available for high-end, automated batching and blending systems, as well as for basic electronic preset or mechanical registration systems.

Valves

Connections

2", 3", 4", 6", 7", 8"
Flanged, Grooved

Pressure Ratings

Ductile Iron 250-PSI Max.
Cast Steel 285-PSI Max.
Ductile Iron 400-PSI Max.
Cast Steel 400-PSI Max.

End Details

Flanged:
Ductile Iron, 150 & 300 ANSI (B16.42)
Cast Steel, 150 & 300 ANSI (B16.5)
Grooved:
Ductile Iron and Cast Steel



Materials of Construction

Ductile Iron or Cast Steel

Temperature Range

-40° to 180° F
Light Petroleum Product

Digital Control Valves

Liquid Control Group's Digital Control Valves are built for heavy use and harsh environments. Their design and construction assure a long life of dependable, trouble-free operation. They are diaphragm actuated and available in either globe or angle patterns.

Pressure Ratings

150 PSI (10.3 BAR)
300 PSI (20.7 BAR)

End Details

To 1½", 2", 3" & 4" NPT, BSPT, slip weld

Temperature Rating

-40° to 160° F



Materials of Construction

Aluminum, Stainless Steel, Brass and Cast Iron

V and VS Series Valves

V and VS Series Valves for industrial process applications are engineered to provide precise, controlled response and soft closure at shut off. The hydraulically balanced design ensures minimum head loss and maximum resistance to cavitation, regardless of system pressure and flow rate.

Air Eliminators

Working pressure rating

150 -350 PSI

Materials of Construction

Aluminum, Stainless Steel,
Steel and Cast Iron



M Series Cast Iron



High Capacity Air Eliminator and Strainer



M Series Stainless Steel

A wide selection of air eliminators is available for Liquid Controls Positive Displacement meters. Air eliminators sense and eliminate air or vapor before it enters the system safeguarding accurate fluid measurement. Air eliminators are available as individual components or as an integrated assembly supplied with the meter.

Strainers

Working pressure rating

150 - 350 PSI

Mesh

20, 40, 80, 100

Materials of Construction

Aluminum, Stainless Steel,
Steel and Cast Iron



F Series Strainer Housing



Strainer Basket



Bulk Plant Strainer and Air Eliminator

Strainers capture foreign particles and remove them from product flow in order to protect the metering system and extend system uptime. Strainers are available as individual components or as an integrated assembly supplied with the meter.

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