



# **LIQUID CONTROLS**

**Simply the Best™**



## **LCMAG™ Electromagnetic Flowmeters**

**IDEX®**  
IDEX CORPORATION



## Premier products, premier performance

Liquid Controls offers a broad selection of electromagnetic (Mag) flow meters for industrial, water, and waste water flow measurement applications worldwide. The LCMag family consists of five types of electromagnetic flow meters for specific applications. The five models include microflow, wafer, sanitary, flanged, and insertion meters. The units are offered in a wide variety of sizes and flow ranges for many industrial as well as OEM applications.

### Applications

Agricultural

Food & Beverage

Chemical

Pulp & Paper

Water & Waste Water

Others

### Features and benefits

The LCMag family of electromagnetic flow meters offers the best solution for measuring the flow of electrically conductive liquids ( $5\mu\text{S}/\text{cm}$  minimum), for the following reasons:

- Accuracy is not affected by fluid characteristics such as viscosity, density, temperature, or suspended solids
- No moving parts
- Virtually no pressure drop
- Clean-in-place construction
- Minimal maintenance.
- Easy to install and operate
- Wide range of nominal diameters from  $1/8"$  to  $80"$
- Wide range of flow rates from as low as 0.1 GPM to as high as 400,000 GPM
- Automatic, dual flow range capability
- Broad selection of liners, electrode materials, and process connections
- High, full-scale accuracy,  $\pm 0.2\%$  over a 10:1 range (for liquid velocity greater than 4 ft/second) with HML210 Converter

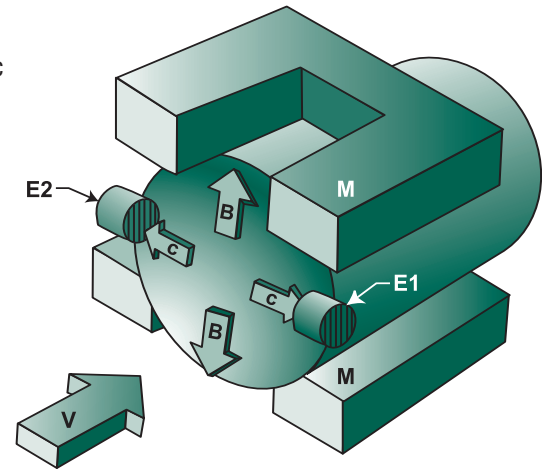
# General

LCMag meters are available in a full selection of configurations and sizes. Models are available in flow ranges from 0.10 GPM to 400,000 GPM and in process fittings from 1/8" NPT to 72" flanged meters and up to 80" insertion meters. Connections include flanged, threaded, wafer, pipe clamp, and sanitary. Scaled, digital pulse output is standard. Analog outputs of 0–20mA or 4–20mA are optionally available. RS-232 or RS-485 serial interfaces are available on various models. Profibus DP is available as an option for HML210 only.

## Function & Construction of the LCMag Flow Sensor

LCMag Meters consist of a sensor and an integrally mounted or remote mounted converter. The LCMag Flow Sensor consists of a lined flow tube, two electromagnetic coils (M), and two diametrically opposed electrodes (E1 & E2). Faraday's Law of Electromagnetic Induction is the basis for magnetic flow measurement.

Faraday's Law postulates that when a magnetic field is created at right angles to the flow tube through which a conductive liquid is flowing, the voltage induced in the electrodes (immersed in the fluid) is proportional to the velocity of the liquid. This induced voltage is converted to a scaled digital pulse output and, optionally, to a 4–20mA (or 0–20mA) analog output by the converter. The analog output signal is a linear output directly proportional to rate of flow.



The flow sensor consists of a stainless steel pipe section with an internal, insulating liner. PTFE, Polypropylene, Polyurethane, and Ebonite (hard rubber) liners are available. The two electrodes are positioned opposite each other on the internal surface of the pipe. The coils, which generate the magnetic field, are placed outside the pipe. The complete sensor has an IP67/68 protection rating. The choice of materials in contact with the fluid (lining, electrodes, etc.) depends on the temperature, the chemical aggressiveness of the liquid, and the degree of abrasiveness of the liquid.

# Meters

## Working pressure rating

225 PSI (16 BAR)  
575 PSI (40 BAR) Optional

## Connections

$\frac{1}{8}$ " to  $\frac{3}{4}$ "  
Threaded, Sanitary Clamp, ANSI Flange,  
DIN Sanitary, SMS, and others on request

## Body Material

304 stainless steel  
316 stainless steel

## Electrode Material

316 Stainless Steel, Titanium, Hastelloy C,  
Tantalum, Platinum

## Liner Material

PTFE

## O-Ring Material

FPM, EPDM



## HMS501 Micro-flow Stainless Steel

The HMS501 Micro-flow style has been designed for low flow and small volume dosing applications. Perfect for OEM filling machine applications, the Micro-flow is available with nominal diameters from  $\frac{1}{8}$ " to  $\frac{3}{4}$ ". Liquid temperature range is  $-4^{\circ}$  to  $212^{\circ}\text{F}$  ( $-20^{\circ}$  to  $100^{\circ}\text{C}$ ). The housing and external connections are manufactured in stainless steel with PTFE liners with the meter having a rating of IP67 or IP68 depending on the configuration.

## Working pressure rating

85 PSI (5.9 BAR)

## Connections

$\frac{1}{8}$ " to  $\frac{3}{4}$ "  
NPT Thread

## Body Material

Polypropylene

## Electrode Material

316 Stainless Steel, Titanium, Hastelloy C,  
Tantalum, Platinum

## Liner Material

Polypropylene

## O-Ring Material

FPM, EPDM



## HMS600 Micro-flow Polypropylene

The HMS600 Micro-flow style has been designed for low flow and small volume applications. Perfect for water applications, the Micro-flow is available with nominal diameters from  $\frac{1}{8}$ " to  $\frac{3}{4}$ ". Liquid temperature range is  $32^{\circ}$  to  $140^{\circ}\text{F}$  ( $0^{\circ}$  to  $60^{\circ}\text{C}$ ). The housing, external connections, and liner are polypropylene with the meter having a rating of IP67 or IP68 depending on the configuration.

# Meters

## Working pressure rating

225 PSI (16 BAR)  
575 PSI (40 BAR) Optional

## Connections

1" to 16"  
Wafer style

## Body Material

Carbon steel  
304 stainless steel (PTFE lining only)  
316 stainless steel (PTFE lining only)

## Electrode Material

316 Stainless Steel, Titanium, Hastelloy C,  
Tantalum (not with Polypropylene liner),  
Platinum (not with Polypropylene liner)

## Liner Material

Polypropylene, PTFE, Ebonite

## O-Ring Material

FPM, EPDM



## HMS1000 Wafer

The HMS1000 Wafer style has been designed for water and waste water applications. The wafer style is easy to install between two existing flanges with nominal diameters from 1" to 16". Electrodes are available in 316 Stainless Steel, Hastelloy C, Titanium, Tantalum, and Platinum. Liners are available in PTFE, Polypropylene, and Ebonite. Liquid temperature range depends on liner material.

- Polypropylene: 32° to 140°F (0° to 60°C)
- Ebonite: 23° to 176°F (-5° to 80°C)
- PTFE: -4° to 212°F (-20° to 100°C)

The meter has a rating of IP67 or IP68 depending on the configuration.

## Working pressure rating

225 PSI (16 BAR) or  
350 PSI (25 BAR) depending on  
connection and size

## Connections

1" to 4"  
Sanitary Clamp, DIN Sanitary, SMS

## Body Material

304 stainless steel, polished

## Electrode Material

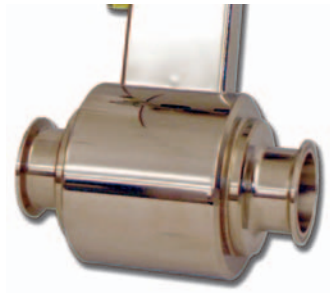
316 Stainless Steel

## Liner Material

PTFE

## O-Ring Material

FPM, EPDM



## HMS2410 Sanitary

The HMS2410 is an instrument specifically designed for sanitary, food grade applications with nominal diameters from 1" to 4" and flow rates from 8 to 1,200 GPM with PTFE liners and sanitary connections. These meters are 3A Certified.

# Meters

## Working pressure rating

225 PSI (16 BAR)  
575 PSI (40 BAR) Optional

## Connections

1" to 72"  
ANSI 150# raised face  
ANSI 300# raised face  
AWWA Class D, 8" to 40"

## Body Material

Carbon steel  
304 stainless steel  
316 stainless steel

## Electrode Material

316 Stainless Steel, Titanium, Hastelloy C,  
Tantalum (not with Polypropylene liner),  
Platinum (not with Polypropylene liner)

## Liner Material

Polypropylene, PTFE, Ebonite

## O-Ring Material

FPM, EPDM



## HMS2500 Flange

The HMS2500 is a flanged style meter perfect for general industrial applications as well as water and waste water applications. Meters are available with nominal diameters from 1" to 72" and flow rates from 8 to 400,000 GPM. PTFE liners are available in 1" to 72" models; Polypropylene liners are available in 1" to 6" models; Ebonite liners are available in 8" to 72" models. Electrodes available in 316 Stainless Steel, Hastelloy C, Titanium, Tantalum, and Platinum.

## Working pressure rating

85 PSI (6 BAR)

## Connections

3/4" to 3"  
Clamp-on

## Body Material

Polyurethane

## Electrode Material

316 Stainless Steel, Titanium, Hastelloy C

## Liner Material

Polyurethane

## O-Ring Material

FPM, EPDM



## HMS5000 Pipe Clamp

The HMS5000 is a pipe clamp style meter perfect for low pressure water and waste water applications. Meters are available with nominal diameters from 3/4" to 3" and flow rates from 5.5 to 800 GPM. The HMS5000 is a one piece, molded, polyurethane body and the electrodes are available in 316 Stainless Steel, Hastelloy C, and Titanium.

## Working pressure rating

225 PSI (16 BAR)

## Connections

HMS3700: 1" Threaded  
HMS3770: 1" Threaded

## Body Material

304 stainless steel

## Electrode Material

316 stainless steel

## Liner Material

PTFE



## HMS3700 & HMS3770 Insertion Flange

The HMS3700 and HMS3770 models are designed for water and waste water applications. HMS3700 is available with accessories for removal from pressurized lines and is available in three sizes for piping from 10" to 80" in diameter. HMS3770 is for installation in piping which is NOT under pressure and is available in four sizes for piping from 4" to 80" in diameter. PTFE liner available.

The signal generated by the sensor must be amplified and processed by an electronic device known as the converter. The converter provides power to the coils in the flow sensor for generating the magnetic field and provides electrical output signals proportional to the fluid flow rate. Calibration features and other options are based on the converter model selected. All converters are available with four programming languages (English, Italian, Spanish, and French). Refer to pages 13 and 14 for complete technical information.

## Features

- Three internal programming keys
- IP65 rating
- Optional 2 line, 16 character display
- Two digital outputs
- Four internal totalizers
- For use with all HMS sensors
- Optional 4-20 ma output

## Accuracy

Capable of  $\pm 0.8\%$  for liquid velocity  
> 4 ft/sec

Optional accuracy of  $\pm 0.4\%$

## Repeatability

Capable of 0.2% or better



## HML110

The HML110 Converter is for use with HMS1000, HMS2500 (less than 40"), HMS3700, and HMS3770 series flow sensors. The converter is a programmable, microprocessor-driven unit providing automatic zeroing, EEPROM data protection on loss of power, empty pipe detection, and self diagnostics. The unit has three internal programming keys and is available with an optional two-line (16 character per line) backlit display.

## Features

- Three external membrane programming keys
- IP67 rating
- LCD display, 8 lines, 16 characters, backlit
- Two digital outputs
- Four internal totalizers
- For use with all HMS sensors
- Data logging
- Panel mount configuration available

## Accuracy

Capable of  $\pm 0.2\%$  for liquid velocity  
> 4 ft/sec

## Repeatability

Capable of 0.01% or better



## HML210

The HML210 Converter is for use with all HMS series flow sensors. It is available in a painted aluminum or stainless steel housing. The converter is a programmable, microprocessor-driven unit providing automatic zeroing, EEPROM data protection on loss of power, empty pipe detection, and self diagnostics. The display matrix is 128 x 64, 8-line (16 characters per line) with three external membrane programming keys.

## Features

- Three external membrane programming keys
- IP67 rating
- LCD display, 2 lines, 16 characters
- For use with all HMS sensors (except HMS5000)
- Data logging
- Panel mount configuration available

## Accuracy

Capable of  $\pm 1\%$  for liquid velocity  
> 4 ft/sec

## Repeatability

Capable of 0.5% or better



## HML250

The HML250 Converter is a battery operated unit and is for use with all HMS series flow sensors. The converter is a programmable, microprocessor-driven unit providing automatic zeroing, EEPROM data protection on loss of power, empty pipe detection, and self diagnostics. The display matrix is 128 x 16, 2-line (16 characters per line) with three external membrane programming keys. This model may be powered by a line source, by lithium batteries, or by a 2-wire, 4-20mA loop.

Sample Time (Seconds)	1 Battery Life (Years)	4 Battery Life (Years)
1	3 months	1
5	1.5	6
15	2	8
30	4	10
60	7	10
90 and higher	10	10

## Features

- Programmable with IF2 or HMT200
- IP67 rating
- Sampling rate up to 400 Hz
- One digital output
- Two internal totalizers
- For use with HMS501 and HMS2410

## Accuracy

Capable of  $\pm 0.2\%$  of for liquid velocity  
> 4 ft/sec

## Repeatability

Capable of 0.01% or better



## HML3-F1

The HML3-F1 is a fast sampling, frequency converter (up to 400 samples per second) for use with HMS501 and HMS2410 flow sensors. The converter is a microprocessor driven unit providing automatic zeroing, EEPROM data protection on loss of power, empty pipe detection, and self diagnostics.



# Accessories

## Programming Options

### IF2 Features

- Connects through lap top or desktop PC
- 10 ft cable with DB9 female connector

### HMT200 Features

- Three external membrane programming keys
- Two line display
- 6.5 ft cable with male plug



IF2 interface



HMT200

### HMT200 and IF2

The IF2 is a PC interface for the HM3-F1, HML210, and HML250 blind converters. A program disk and interface cable allows the reading and programming of the converters using either a lap top or desk top PC.

The HMT200 is a hand-held programmer used for programming LCMags that are furnished with an HM3-F1, HML210 or HML250 blind converter. This device is used for programming the setup parameters of the LCMag and for viewing certain flow values such as total flow and rate of flow.

## Grounding Rings



### Grounding Rings

Grounding the flowmeter and the fluid being measured is critical for correct performance of magnetic flowmeters. If the pipe is non-metallic or insulated, the fluid cannot be grounded properly using a ground electrode. In this case, grounding rings are necessary.

Grounding rings are available in 304 and 316 stainless steel and are readily available in sizes from 1" to 18". Consult the factory for grounding rings larger than 18".

# Technical Data - Sensors

Specifications	Model					
	HMS501	HMS600	HMS1000	HMS2410	HMS2500	HMS5000
<b>Size</b>	1/8" to 3/4"	1/8" to 3/4"	1" to 16"	1" to 4"	1" to 72"	3/4" to 3"
<b>Flow Range</b>	0.1 to 1.0 GPM through 5.5 to 55 GPM	0.1 to 1.0 GPM through 5.5 to 55 GPM	8 to 80 GPM through 2,800 to 28,000 GPM	8 to 80 GPM through 200 to 2,000 GPM	8 to 80 GPM through 40,000 to 400,000 GPM	5.5 to 55 GPM through 80 to 800 GPM
<b>Connections</b>	Threaded Sanitary ANSI	NPT Threaded	Wafer style	Sanitary clamp	150# or 300# ANSI Flanges AWWA Class D 8" to 40"	Pipe Clamp
<b>Nominal Pressure</b>	225 PSI (16 BAR)	225 PSI (16 BAR)	225 PSI (16 BAR) for polypropylene liner 575 PSI (40 BAR) for PTFE (Teflon) liner	350 PSI (25 BAR) for 1" to 1 1/2" 225 PSI (16 BAR) for 2" to 4"	225 PSI (16 BAR)	85 PSI (6 BAR)
<b>Body Material</b>	304 stainless steel, polished	Polypropylene	Carbon steel 304 or 316 stainless steel optional	304 stainless steel, polished	Carbon steel 304 or 316 stainless steel optional	One Piece Molded Polyurethane
<b>Liner</b>	PTFE	Polypropylene	PTFE (Teflon), Ebonite, or Polypropylene depending on size	PTFE	PTFE (Teflon), Ebonite, or Polypropylene depending on size	Polyurethane
<b>Liquid Temperature</b>	Nominal 212°F (100°C) 300°F (150°C) with remote converter option B	Nominal 140°F (60°C)	140°F (60°C) with polypropylene liner 300°F (150°C) with PTFE liner with remote converter option B 175°F (80°C) with ebonite liner	Nominal 212°F (100°C) 300°F (150°C) with remote converter option B	140°F (60°C) with polypropylene liner 300°F (150°C) with PTFE liner with remote converter option B 175°F (80°C) with ebonite liner	Nominal 122°F (50°C)
<b>Electrode Material</b>	316 Stainless steel, Hastelloy C, Titanium, Tantalum, or Platinum	316 Stainless steel, Hastelloy C, Titanium, Tantalum, or Platinum	316 Stainless steel, Hastelloy C, Titanium, Tantalum, or Platinum	316 Stainless steel	316 Stainless steel, Hastelloy C, Titanium, Tantalum, or Platinum	316 Stainless steel, Hastelloy C, or Titanium
<b>Protection Rating</b>	IP67/68 with integral converter Complete submersion up to 5 feet (IP68) with remote converter option B.					
<b>Minimum Liquid Conductivity</b>	5µS/cm					

## Technical Data - Sensors

Specifications	Model	HMS3700 (Hot Tap)		HMS3770	
	Model Option	Pipe Diameter	Sensor Length <sup>1</sup>	Pipe Diameter	Sensor Length
For Insertion Into Existing Piping	1	3" to 20"	19"	3" to 20"	7"
	2	3" to 40"	24.5"	3" to 40"	9.5"
	3	3" to 80"	34.5"	3" to 80"	18"
<b>Connections</b>		1" Threaded Optional ball valve available		1" Threaded	
<b>Nominal Pressure</b>		225 PSI (16 BAR)			
<b>Body Material</b>		304 Stainless steel			
<b>Liner</b>		PTFE			
<b>Liquid Temperature</b>		Nominal 212°F (100°C) 300°F (150°C) with remote converter option B			
<b>Electrode Material</b>		316 Stainless steel			
<b>Protection Rating</b>		IP67/68 with integral converter Complete submersion up to 5 feet (IP68) with remote converter option B.			
<b>Minimum Liquid Conductivity</b>		5µS/cm			

<sup>1</sup>Sensor length varies due to the required insertion depth of 1/8 pipe diameter.

# Technical Data - Sensors

Meter Model & Style		HMS501 Micro-Flow	HMS600	HMS1000 Wafer Style	HMS2410 Sanitary	HMS2500 Flange Style	HMS5000	HMS3700 Insertion (1, 2, or 3)	HMS3770 Insertion (1, 2, or 3)
Meter Size (Inches)	Flow Range <sup>1</sup> (GPM)								
1/8	0.1 to 1.0	•	•						
1/4	0.4 to 4.0	•	•						
3/8	1.3 to 13.0	•	•						
1/2	2.6 to 26.0	•	•						
3/4	5.5 to 55	•	•				•		
1	8.0 to 80.0			•	•	•	•		
1 1/4	13 to 130			•	•	•	•		
1 1/2	20 to 200			•	•	•	•		
2	32 to 320			•	•	•	•		
2 1/2	53 to 530			•	•	•	•		
3	80 to 800			•	•	•	•		
4	120 to 1,200			•	•	•		•	•
5	200 to 2,000			•		•		•	•
6	280 to 2,800			•		•		•	•
8	500 to 5,000			•		•		•	•
10	780 to 7,800			•		•		•	•
12	1,110 to 11,100			•		•		•	•
14	1,500 to 15,000			•		•		•	•
16	2,000 to 20,000			•		•		•	•
18	2,500 to 25,000					•		•	•
20	3,100 to 31,000					•		•	•
24	4,500 to 45,000					•		•	•
26	5,200 to 52,000					•		•	•
28	6,200 to 62,000					•		•	•
30	7,000 to 70,000					•		•	•
32	7,900 to 79,000					•		•	•
34	9,000 to 90,000					•		•	•
36	10,000 to 100,000					•		•	•
40	12,500 to 125,000					•		•	•
48	17,600 to 176,000					•		•	•
56	24,200 to 242,000					•		•	•
64	31,700 to 317,000					•		•	•
72	40,000 to 400,000					•		•	•

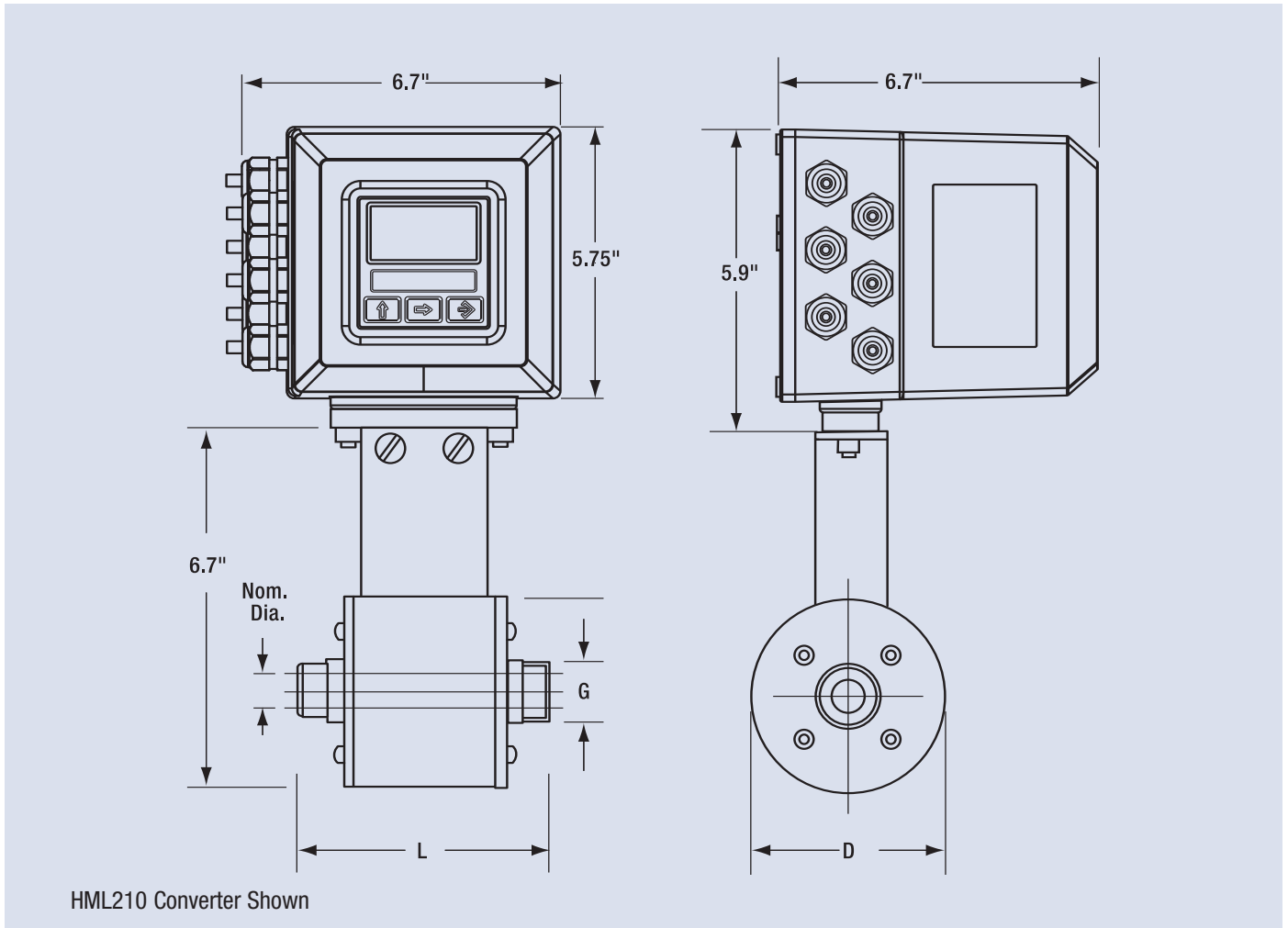
## Technical Data - Converters

Converter Model	HML110	HML210	HML250	HML3-F1
<b>Housing Material</b>	Nylon with glass fiber	Aluminum or Stainless	Aluminum	304 stainless steel
<b>Protection Rating</b>	IP65	IP67	IP67	IP67
<b>Panel Mount</b>	N/A	Available	Available	N/A
<b>Temperature Rating</b>	32° to 122°F	-4° to 140°F	-4° to 140°F	-4° to 140°F
<b>Display</b>	Optional 16 character 2 line	Optional 16 character 8 line	Optional 16 character 2 line	None
<b>Backlit</b>	No	Yes	No	N/A
<b>Keyboard</b>	3 internal keys	3 membrane keys	3 membrane keys	N/A
<b>Pulse/Frequency Output</b>	1,250 Hz max	100mA, 40VDC 1,250Hz	Optional	100mA, 40VDC 1,250Hz 12,500Hz optional
<b>Current Output 0/4-20mA</b>	Optional	Optional	Optional	Optional
<b>Alarm Output</b>	Programmable	Programmable	Optional	ON-OFF output
<b>Digital Input</b>		Programmable	Optional	Programmable
<b>Bi-Directional Flow</b>	Yes	Yes	Yes	Yes
<b>Dual Range</b>	No	Yes		No
<b>Empty Pipe Detection</b>	Yes	Yes	Yes	Yes
<b>Data Storage</b>	No	32 values 64 alarm events	Yes	No
<b>Programming Input</b>	PC hand held terminal	PC hand held terminal	PC hand held terminal	PC hand held terminal
<b>Batch Function</b>	No	Yes	No	Yes, with auto preset
<b>Serial Output</b>	No	RS485, RS232	Optional	No
<b>Accuracy</b>	±0.8% (±0.4% Optional)	±0.2%	±1%	±0.2%
<b>Repeatability</b>	0.2%	0.01%	0.5%	0.01%
<b>Power Supply</b>	90-265VAC@45-66Hz 10-63VDC 15-45VAC@45-66Hz	90-265VAC@45-66Hz 10-63VDC 15-45VAC@45-66Hz	1 Lithium Battery 4 Lithium Batteries 15-265VAC@44-66Hz 10-400VDC Loop powered	10-33VDC
<b>Power Consumption</b>	5VA 4VA (AC) 3W (DC)	25VA 23VA (AC) 21W (DC)	0.1W with battery 0.3W	10W max 5W typical
<b>Sensor Compatibility</b>	HMS501 HMS1000 HMS2410 HMS2500 up to 40" HMS3700 HMS3770 HMS5000	HMS501 HMS1000 HMS2410 HMS2500 HMS3700 HMS3770	HMS501 HMS1000 HMS2410 HMS2500 HMS3700 HMS3770	HMS501 HMS2410

## Technical Data - Converters

Converter Model	HML110	HML210	HML250	HML3-F1
<b>Mounting Style</b>	Meter Mount Wall Mount	Meter Mount Wall Mount Panel Mount	Meter Mount Wall Mount Panel Mount	Meter Mount
<b>Optional Additional Output Modules Available</b>	N/A	<p>2 ON/OFF outputs</p> <p>2 ON/OFF outputs; 1 at 10 kHz</p> <p>0/4-20 mA output and 2 ON/OFF outputs</p> <p>RS232 serial interface and 2 ON/OFF outputs</p> <p>RS232 serial interface, 0/4-20 mA and 2 ON/OFF outputs</p> <p>Profibus DP</p> <p><b>Data Logger Modules</b>            Data Logger, 2Mb            Data Logger, 2 Mb with RS232 serial interface  <b>or</b> RS232 &amp; RS485 serial interface, and 0/4-20 mA input  <b>or</b> 2 ON/OFF outputs  <b>or</b> 2 ON/OFF outputs, 1 at 10 KHz  <b>or</b> 0/4-20 mA output, 2 ON/OFF outputs  <b>or</b> RS232 serial interface, 2 ON/OFF outputs, and 1 ON/OFF input  <b>or</b> RS232 serial interface, 0/4-20 mA output, 2 ON/OFF outputs, 1 ON/OFF input  <b>or</b> 2 relay outputs  <b>or</b> 0/4-20 mA output, 1 ON/OFF output, and 1 ON/OFF input  <b>or</b> RS232 serial interface and 2 ON/OFF outputs  <b>or</b> RS232 serial interface and 2 ON/OFF outputs, 1 at 10 KHz</p> <p>2 relay outputs</p>	<p>0/4-20 mA output</p> <p>2 ON/OFF outputs and 1 digital input</p> <p>RS232 serial interface</p> <p>0/4-20 mA output, 2 ON/OFF outputs, 1 digital input, and RS232 serial interface</p>	<p>High frequency measuring range output; 12,500 kHz</p> <p>4-20 mA output</p>
<b>Internal Totalizers</b>	Four 10-digit totalizers	Four 10-digit totalizers		Two 10-digit totalizers

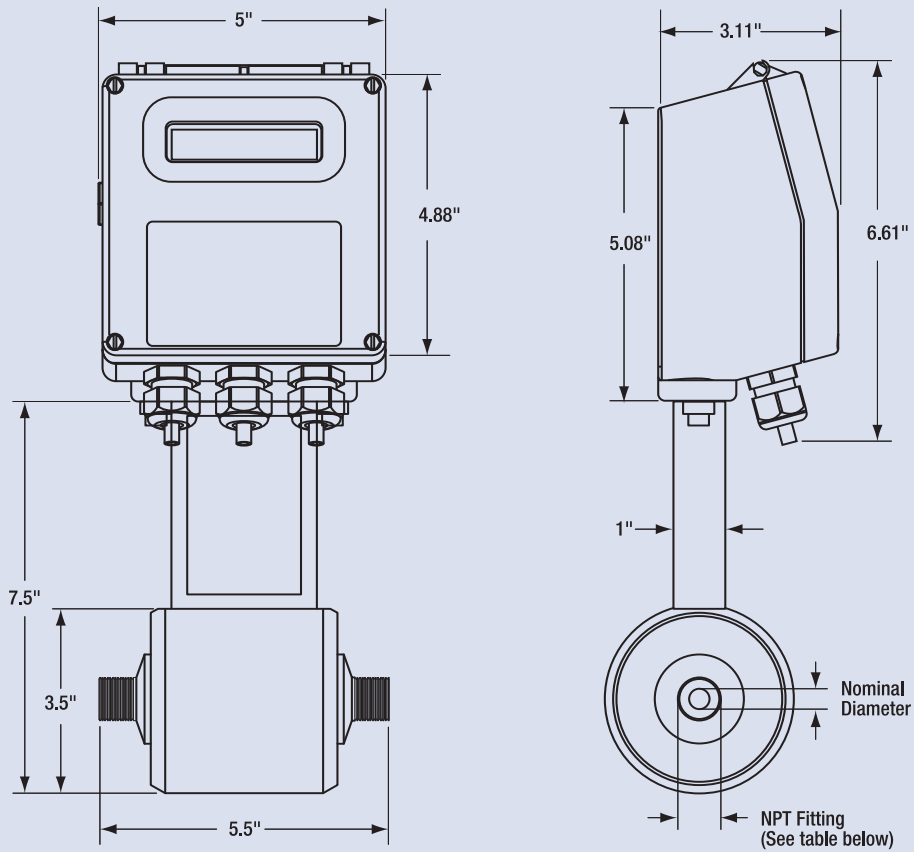
# Dimensions: HMS501 - Microflow Style



HMS501 Microflow Style Sensor Dimensions (Inches)						
Nominal Diameter		1/8"	1/4"	3/8"	1/2"	3/4"
Dimension	L	5	5	5	5	6
	D	3	3	3	3	3
	G	1/4	3/8	1/2	3/4	1
Weight (lbs)		7	7	7	7	7

**NOTE:** Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.

## Dimensions: HMS600 - Polypropylene Threaded Style



HML110 Converter Shown

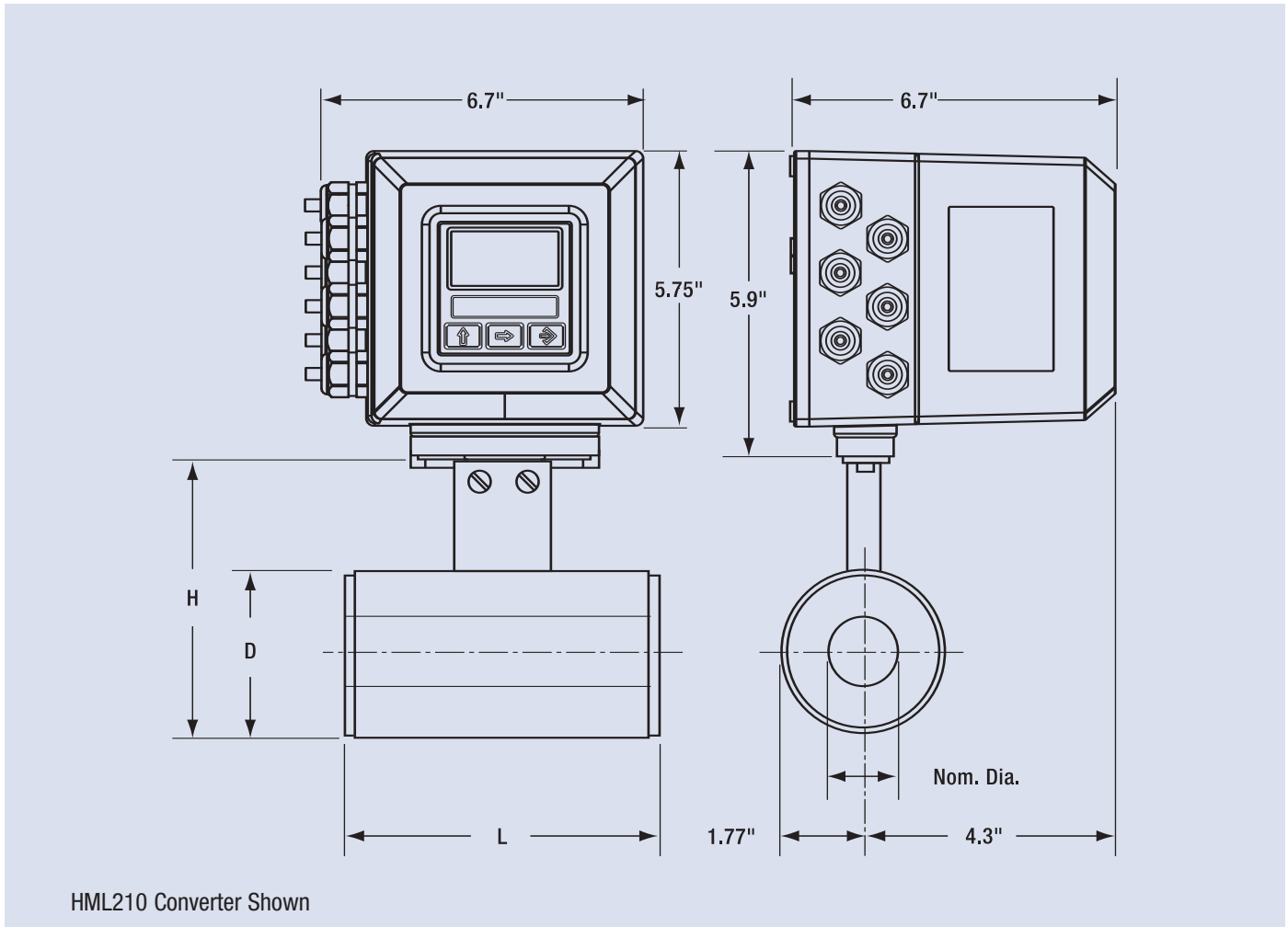
**HMS600 Polypropylene Threaded Style Dimensions (Inches)**

Nominal Diameter	1/8"	1/4"	3/8"	1/2"	3/4"
Dimension NPT Fitting	1/4	3/8	1/2	3/4	1
Weight (lbs)	3.1	3.1	3.1	3.1	3.1

**NOTE:** Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.



# Dimensions: HMS1000 - Wafer Style

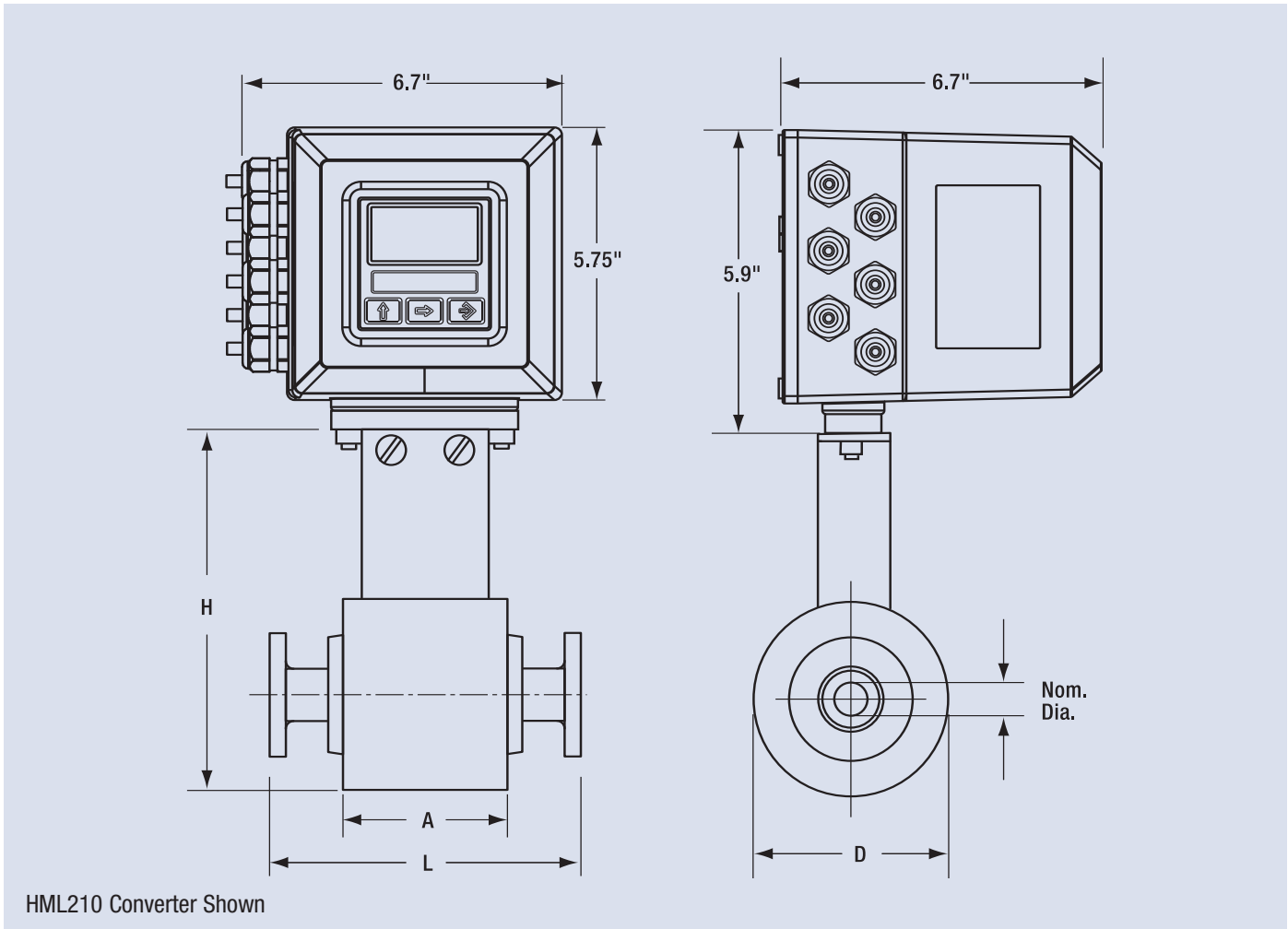


HMS1000 Wafer Style Sensor Dimensions (Inches)										
Nominal Diameter		1"	1 <sup>1</sup> / <sub>4</sub> "	1 <sup>1</sup> / <sub>2</sub> "	2"	2 <sup>1</sup> / <sub>2</sub> "	3"	4"	5"	6"
Dimension	L	4	4	4	4	6	6	6	7	7
	H	11.4	12.1	12.5	13.1	13.9	14.4	15.6	16.7	17.6
	D	2.2	2.4	2.8	3.4	4.3	4.6	5.7	6.8	7.9
Weight (lbs)		2.6	3.5	4	4.4	7.9	8.4	11	17.2	18.1

<sup>1</sup>For models larger than 6" (up to 16") contact the factory.

**NOTE:** Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.

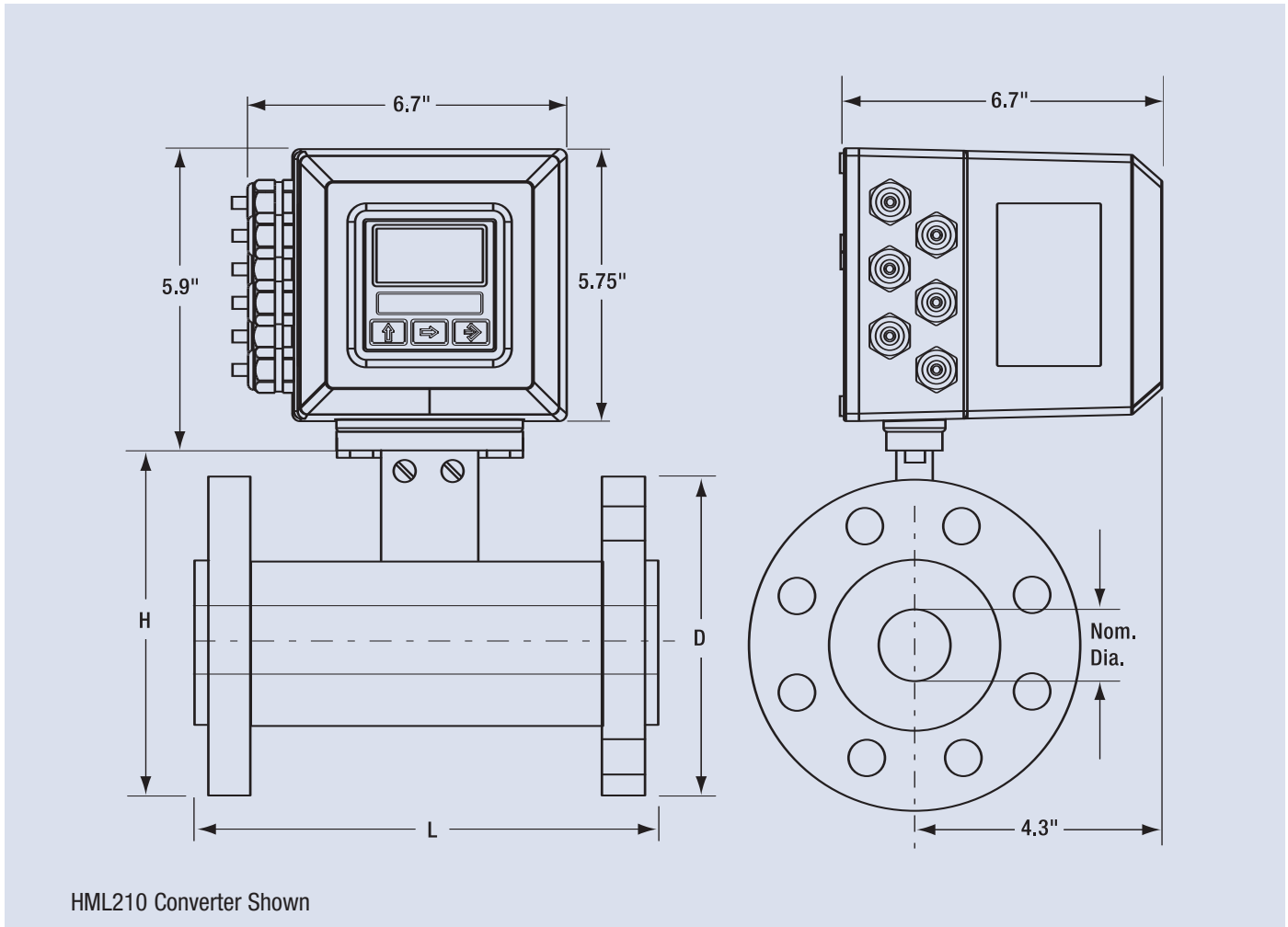
## Dimensions: HMS2410 - Sanitary Style



HMS2410 Sanitary Style Sensor Dimensions (Inches)								
Nominal Diameter		1"	1¼"	1½"	2"	2½"	3"	4"
Dimension	A	4	4	4	4	4	7	4
	L	7	7	7	7	7	7.9	7.9
	H	6.7	7.2	7.2	8.2	9.2	9.2	10.2
	D	3	3.5	3.5	4.5	5.5	5.5	6.5
Weight (lbs)		3.9	4.4	4.8	9.7	9.2	13.9	18.7

**NOTE:** Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.

# Dimensions: HMS2500 - Flange Style

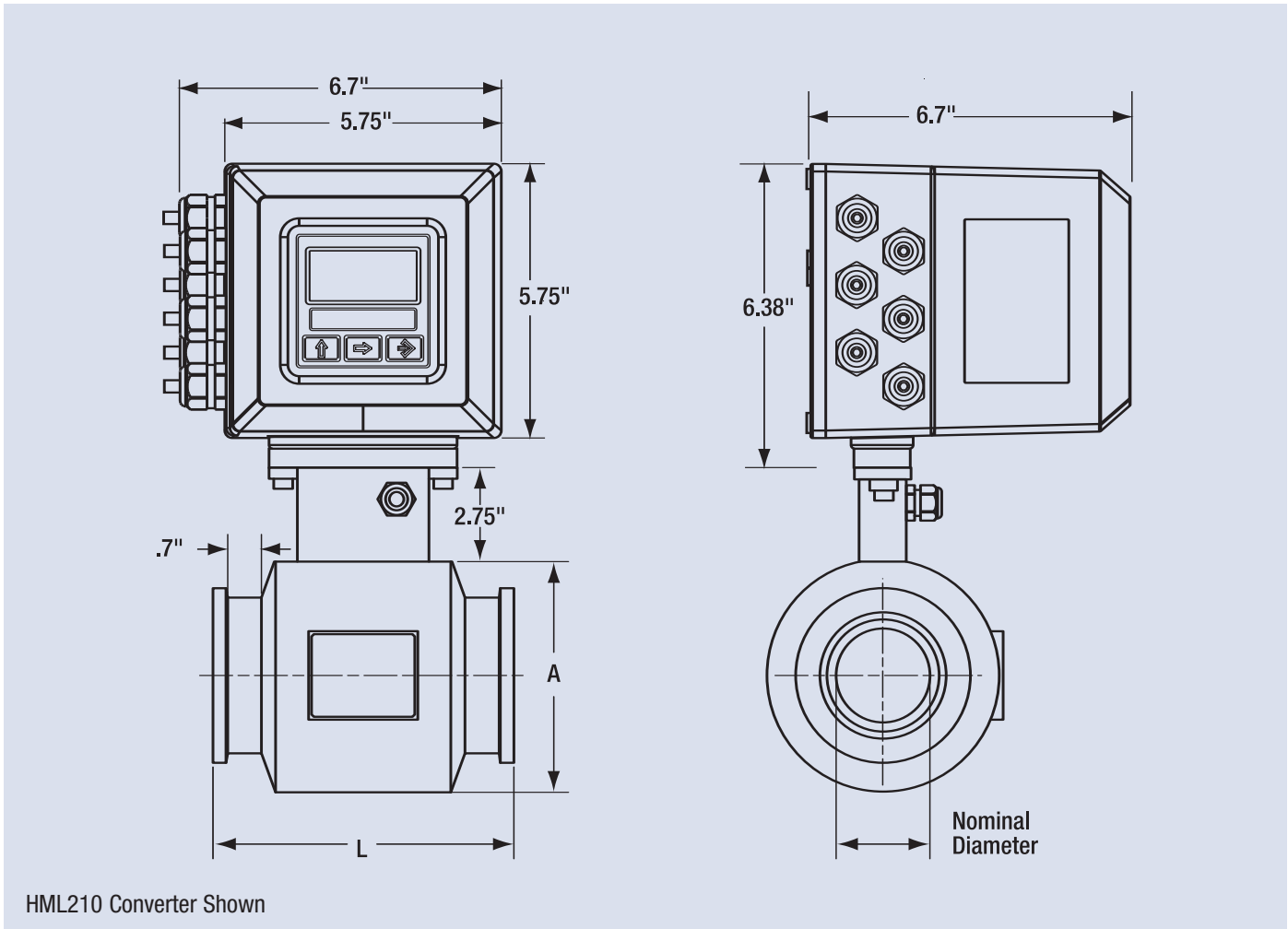


HMS2500 Flange Style Sensor Dimensions (Inches)																		
Nominal Diameter		1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24" <sup>1</sup>
Dimension	L	7.9	7.9	7.9	7.9	7.9	7.9	9.8	9.8	11.8	13.8	17.7	19.7	21.7	23.6	23.6	23.6	23.6
	H	7.3	8	8.4	9	9.8	10.4	11.1	12.3	13.5	15.7	18.1	20.3	22.6	24.8	27.2	29.8	34.6
	D	4.5	5.5	5.9	6.5	7.3	7.9	8.7	9.8	11.2	13.4	15.9	18.1	20.5	22.8	25.2	28.1	33.1
Weight (lbs)		20	26.5	30.9	33	35.3	50.7	57.3	88.2	94.8	154	221	331	441	551	604	706	902

<sup>1</sup>For models larger than 24" (up to 72") contact the factory.

**NOTE:** Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.

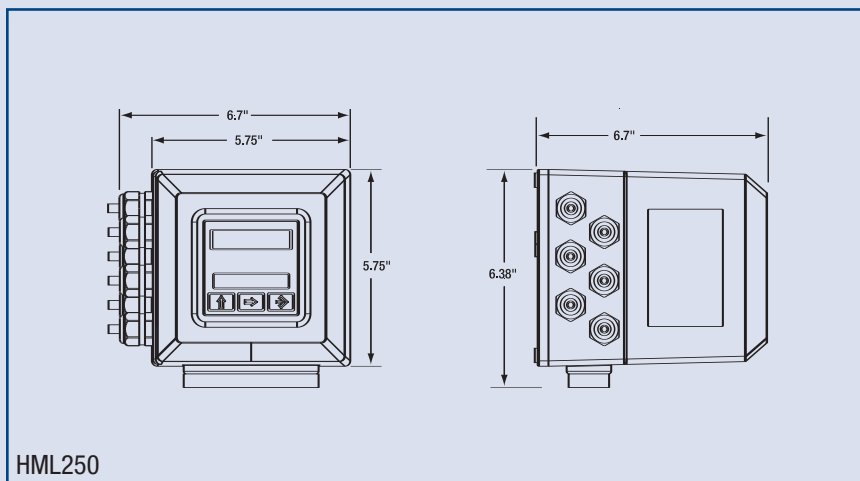
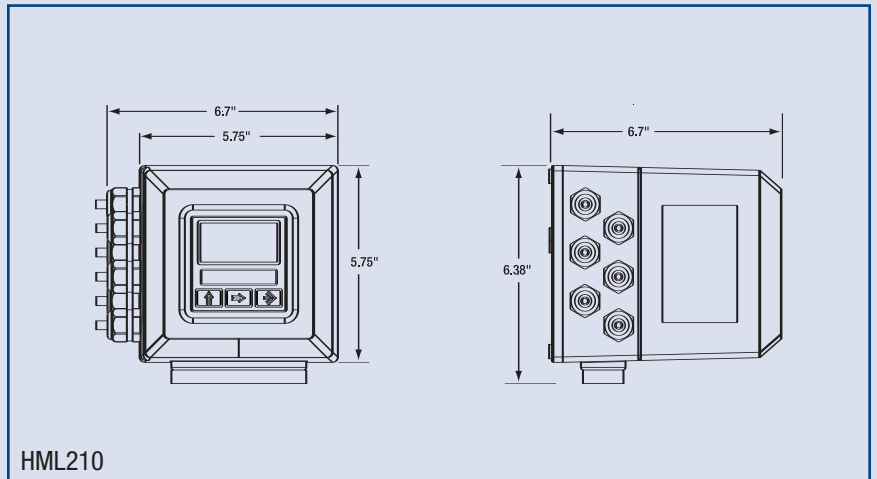
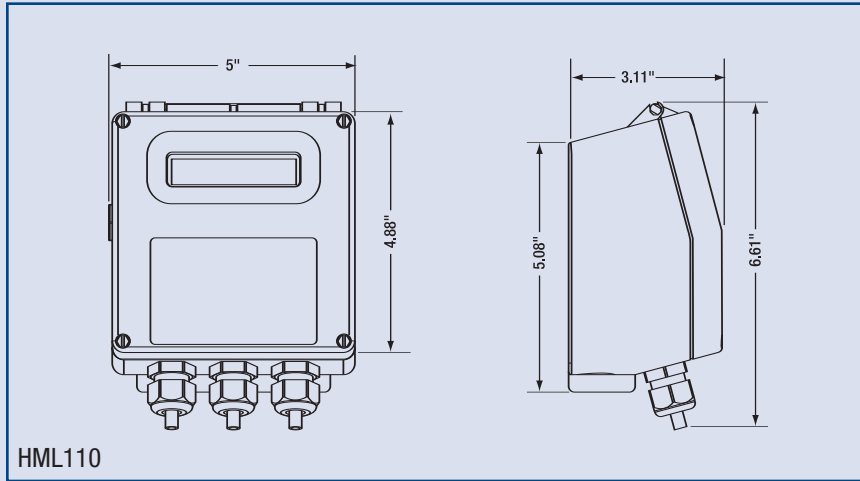
# Dimensions: HMS5000 - Pipe Clamp Polyurethane Style



HMS5000 Pipe Clamp Polyurethane Style Dimensions (inches)								
Nominal Diameter		3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
Dimension	A	2.75	3.1	3.5	3.9	4.9	5.1	6.1
	L	5.3	5.3	5.3	5.3	6.3	6.3	7.5
Weight (lbs)		1.8	2.4	3.3	4.0	4.9	6.0	7.5

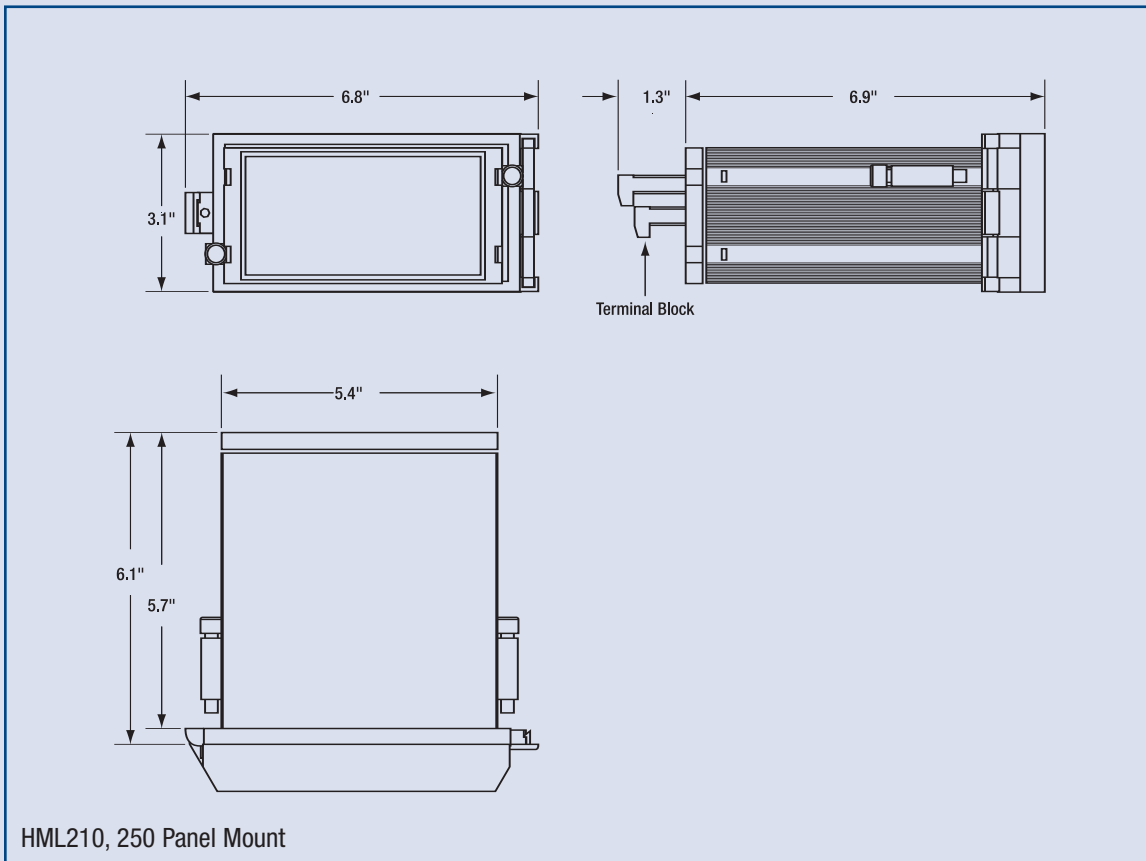
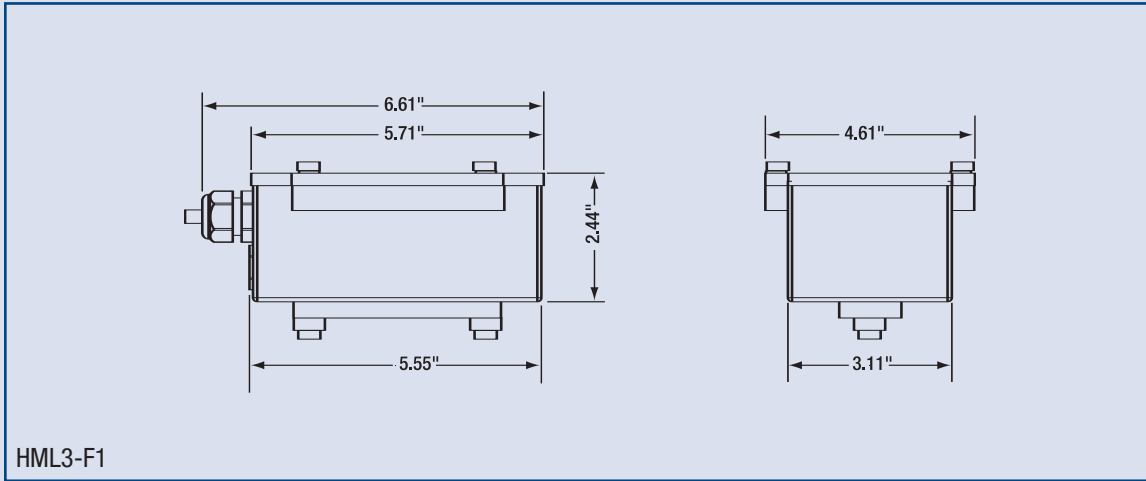
**NOTE:** Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.

# Dimensions: HML110 & HML210, and HML250



**NOTE:** Dimensions shown are not for construction use. Consult factory when certified engineering prints are required.

# Dimensions: HML3-F1 and Panel Mount HML200 and HML210



**NOTE:** Dimensions shown are not for construction use. Consult factory when certified engineering prints are required.

# LCMag Ordering Worksheet

Date: \_\_\_\_\_

## Distributor Information

Distributor Name/Contact Person: \_\_\_\_\_

## Customer Information

Customer Name: \_\_\_\_\_

Customer Address: \_\_\_\_\_

Contact Name/Telephone: \_\_\_\_\_

## Application Data

Meter to be used for:

Rate of Flow Indication: \_\_\_\_\_

Product (process fluid): \_\_\_\_\_

Totalization: \_\_\_\_\_

Conductivity of Product (5µS/cm minimum): \_\_\_\_\_

Batching: \_\_\_\_\_

Suspended Solids in Product? \_\_\_\_\_

Process Control: \_\_\_\_\_

Abrasive Fluid? \_\_\_\_\_

Other: \_\_\_\_\_

Rate of Flow (GPM):                      Min. \_\_\_\_\_                      Max. \_\_\_\_\_                      Normal: \_\_\_\_\_

Rate of Flow (L/min):                      Min. \_\_\_\_\_                      Max. \_\_\_\_\_                      Normal: \_\_\_\_\_

System Pressure Range (PSI):                      Min. \_\_\_\_\_                      Max. \_\_\_\_\_                      Normal: \_\_\_\_\_

System Temperature Range (°F)                      Min. \_\_\_\_\_                      Max. \_\_\_\_\_                      Normal: \_\_\_\_\_

Process Fittings (flanged, wafer, threaded, or sanitary): \_\_\_\_\_

Pulse Output per Unit: \_\_\_\_\_

(pulses per unit must not exceed 1.25KHz at max flow or 10KHz with Converter Option "D", High Frequency Output)

Desired Display (if specified on converter)                      Totalizer Units: \_\_\_\_\_                      Rate of Flow Units: \_\_\_\_\_

(full gal., 1/10 gal, etc.)

(full GPM, 1/10 GPM, etc.)

Analog Output Range:                      0-20 mA or 4-20 mA

0 or 4mA: min. scale \_\_\_\_\_

GPM

20mA: full scale \_\_\_\_\_

GPM

Supply Voltage: \_\_\_\_\_

Converter Location:                      Integral: \_\_\_\_\_

Remote: \_\_\_\_\_

Length of Cable Required: \_\_\_\_\_ ft



## A tradition of excellence that benefits you

Almost fifty years ago, Liquid Controls set a new standard of excellence in engineering and building the finest flow meter products possible, starting with metering aviation fuel for the United States Air Force.

Since that time, the industry base we serve has grown, broadened. Our product line has expanded to include a wide variety of flow meters, accessories and related items distributed worldwide. But our commitment to excellence will never change. The professionals at Liquid Controls are driven to bring you products that perform efficiently and accurately, with minimum maintenance for years to come. Delivering everything you'd expect from the very best—that's our goal.

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In 2001, Liquid Controls joined the IDEX team of companies. IDEX is a leader in the manufacture of a broad range of pump products, dispensing equipment and other engineered technologies. Maintaining a theme of leadership, IDEX delivers Innovation, Diversity and **EX**cellence to thousands of valued customers around the world.



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