

LIQUID CONTROLS



LCMag™ Electromagnetic Flowmeters



Applications

Agricultural

Food & Beverage

Chemical

Pulp & Paper

Water & Waste Water

Others

Premier Electromagnetic Flow Measuring

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 models of electromagnetic flow meters for specific applications, including microflow, wafer, sanitary, flanged, and insertion style meters. The units are offered in a wide variety of sizes and flow ranges for many industrial and OEM applications.

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 $\frac{1}{8}$ " 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 Information

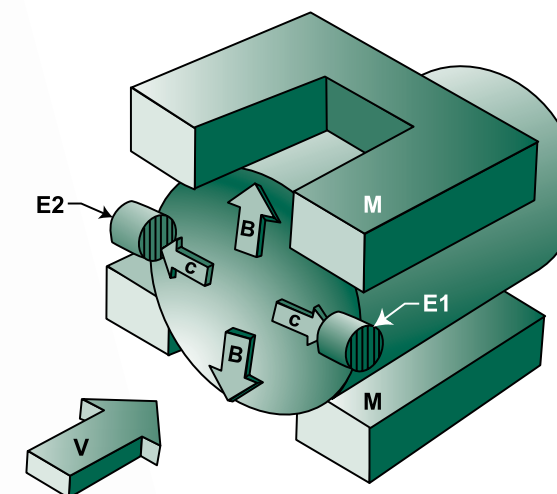
LCMag meters are available in a full selection of configurations and sizes. Models are available in flow ranges from 0.10 GPM to 400,000 GPM and in process fittings from $\frac{1}{8}$ " NPT to 72" for the flanged meters and up to 80" for the insertion meters. Connections include flanged, threaded, wafer, pipe clamp, and sanitary. Scaled, digital pulse output is standard. Analog outputs of 0–20mA or 4–20mA are 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 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

1/8" to 3/4"

Threaded, Sanitary Clamp, ANSI Flange, DIN Sanitary

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 Microflow Stainless Steel

The HMS501 microflow style LCMag meter is designed for low flow and small volume dosing applications. Perfect for OEM filling machine applications, the Microflow is available in nominal diameters from 1/8" to 3/4". Liquid temperature range is -4° to 212°F (-20° to 100°C).

The housing and external connections are manufactured in stainless steel with PTFE liners. HMS501 meters have a rating of IP67 or IP68, depending on the configuration.

Working pressure rating

85 PSI (5.9 BAR)

Connections

1/8" to 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 Microflow Polypropylene

The HMS600 microflow style LCMag meter is designed for low flow and small volume applications. Perfect for water applications, the Microflow is available with nominal diameters from 1/8" to 3/4". Liquid temperature range is 32° to 140°F (0° to 60°C). The housing, external connections, and liner are polypropylene. The HMS600 has 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 LCMag meter is designed for water and waste water applications. The wafer style installs quickly and easily between two existing flanges. It is available in nominal diameters from 1" to 16". The HMS1000 has a rating of IP67 or IP68, depending on the configuration. Electrodes are available in 316 Stainless Steel, Hastelloy C, Titanium, Tantalum, and Platinum. Liners are available in PTFE, Polypropylene, and Ebonite.

Liquid temperature range for liner materials:

- 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)

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

Body Material

304 stainless steel, polished

Electrode Material

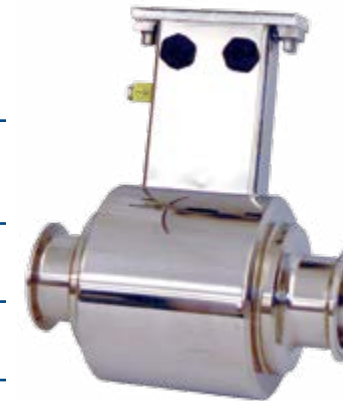
316 Stainless Steel

Liner Material

PTFE

O-Ring Material

FPM, EPDM



HMS2410 Sanitary

The HMS2410 is specifically designed for sanitary, food grade applications. They are available in nominal diameters from 1" to 4" with flow rates from 8 to 1,200 GPM. The meters are equipped with PTFE liners and sanitary connections. HMS2410 Sanitary 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

1,2, and 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 1,2 and 3" and flow rates from 8 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

HMS3770: 1" Threaded

Body Material

304 stainless steel

Electrode Material

316 stainless steel

Liner Material

PTFE



HMS3770 Insertion Flange

The HMS3770 models is designed for water and waste water applications. HMS3770 is for installations where the piping is NOT under pressure and is available in four sizes for piping from 4" to 80" in diameter. PTFE liner.

Electronics

The signal generated by the LCMag flow sensor must be amplified and processed by an electronic converter. The converter provides power to the coils in the flow sensor to generate the magnetic field and provide electrical output signals proportional to the fluid flow rate. Calibration features and other options are specific to each converter model. All converters are available with four programming languages (English, Italian, Spanish, and French). Complete technical information is available on pages 13 and 14.

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 compatible with the HMS1000, HMS2500 (less than 40"), HMS3700, and HMS3770 series flow sensors. It is a programmable, microprocessor-driven unit that provides 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 compatible with all HMS series flow sensors. It is available in a painted aluminum or stainless steel housing. It is a programmable, microprocessor-driven unit that provides 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.

Electronics

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



HML250

The HML250 Converter is a battery operated unit compatible with all HMS series flow sensors. It is a programmable, microprocessor-driven unit that provides 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. The HML250 Converter accepts power from a line source, lithium batteries, or 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 |

Accuracy

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

Repeatability

Capable of 0.5% or better

Features

- Programmable with IF21 or HMT200
- IP67 rating
- Sampling rate up to 400 Hz
- One digital output
- Two internal totalizers
- For use with HMS501 and HMS2410



HML4-F1

The HML4-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.

Accuracy

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

Repeatability

Capable of 0.01% or better

Accessories

Programming Options

IF2 Features

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



IF21

The IF21 is a PC interface for the HM4-F1, HML210, and HML250 blind converters. The IF21 program disk and interface cable allows you to read and program LCMag converters through a laptop or desktop.

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, made of 304 or 316 stainless steel, are available in sizes from 1" to 18". Consult the factory for grounding rings larger than 18".

Technical Data - Sensors

| SPECIFICATION | MODEL | | | | | |
|-----------------------------|--|---|--|---|--|---|
| | HMS501 | HMS600 | HMS1000 | HMS2410 | HMS2500 | HMS5000 |
| Size | 1/8" to 3/4" | 1/8" to 3/4" | 1" to 16" | 1" to 4" | 1" to 72" | 1, 2, and 3" |
| Flow Range | 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 | 80 to 800 GPM |
| Connections | Threaded Sanitary ANSI | NPT Threaded | Wafer style | Sanitary clamp | 150# or 300# ANSI Flanges AWWA Class D 8" to 40" | Pipe Clamp |
| Nominal Pressure | 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) |
| Body Material | 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 |
| Liner | PTFE | Polypropylene | PTFE (Teflon), Ebonite, or Polypropylene depending on size | PTFE | PTFE (Teflon), Ebonite, or Polypropylene depending on size | Polyurethane |
| Liquid Temperature | 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) |
| Electrode Material | 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 |
| Protection Rating | IP67/68 with integral converter Complete submersion up to 5 feet (IP68) with remote converter option B. | | | | | |
| Minimum Liquid Conductivity | 5µS/cm | | | | | |

Technical Data - Sensors

| SPECIFICATION | MODEL | HMS3770 | |
|------------------------------------|--|---------------|---------------|
| | OPTION | Pipe Diameter | Sensor Length |
| For Insertion Into Existing Piping | 1 | 3" to 20" | 7" |
| | 2 | 3" to 40" | 9.5" |
| | 3 | 3" to 80" | 18" |
| Connections | 1" Threaded | | |
| Nominal Pressure | 225 PSI (16 BAR) | | |
| Body Material | 304 Stainless steel | | |
| Liner | PTFE | | |
| Liquid Temperature | Nominal 212°F (100°C) 300°F (150°C) with remote converter option B | | |
| Electrode Material | 316 Stainless steel | | |
| Protection Rating | IP67/68 with integral converter Complete submersion up to 5 feet (IP68) with remote converter option B. | | |
| Minimum Liquid Conductivity | 5µS/cm | | |

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

Technical Data - Sensors

| METER MODEL & STYLE | | HMS501 Microflow | HMS600 | HMS1000 Wafer Style | HMS2410 Sanitary | HMS2500 Flange Style | HMS5000 | HMS3770 Insertion (1, 2, or 3) |
|------------------------|----------------------|---------------------|--------|---------------------------|---------------------|----------------------------|---------|--------------------------------------|
| METER SIZE (Inches) | FLOW RANGE1 (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 | | | • | • | • | | • |
| 64 | 31,700 to 317,000 | | | • | • | • | | • |
| 64 | 31,700 to 317,000 | | | • | • | • | | • |
| 72 | 40,000 to 400,000 | | | • | • | • | | • |

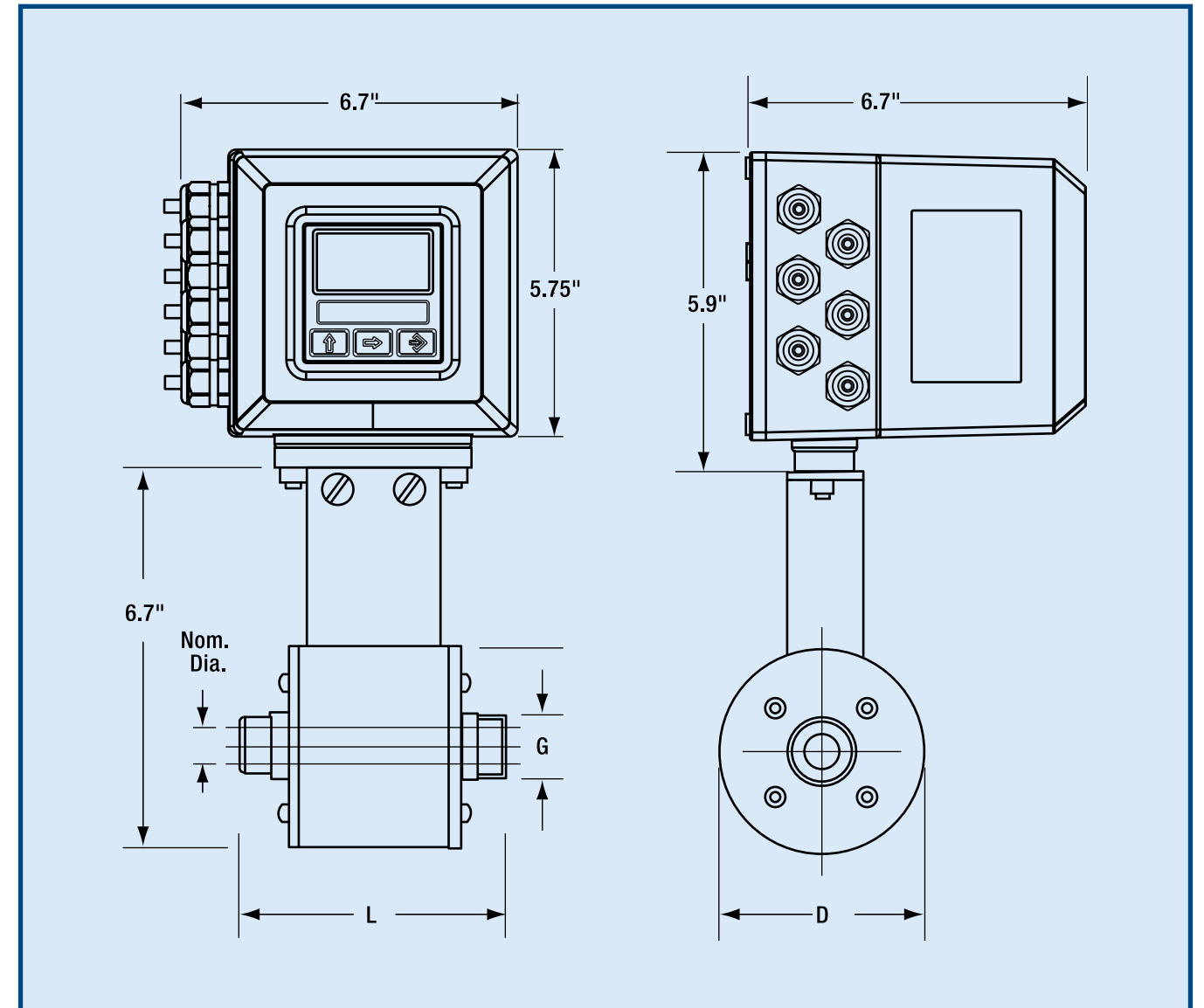
Technical Data - Converters

| SPECIFICATION | CONVERTER MODEL | | | |
|----------------------------|--|---|--|---|
| | HML110 | HML210 | HML250 | HML4-F1 |
| Housing Material | Nylon with glass fiber | Aluminum or Stainless | Aluminum | 304 stainless steel |
| Protection Rating | IP65 | IP67 | IP67 | IP67 |
| Panel Mount | N/A | Available | Available | N/A |
| Temperature Rating | 32° to 122°F | -4° to 140°F | -4° to 140°F | -4° to 140°F |
| Display | Optional 16 character 2 line | Optional 16 character 8 line | Optional 16 character 2 line | None |
| Backlit | No | Yes | No | N/A |
| Keyboard | 3 internal keys | 3 membrane keys | 3 membrane keys | N/A |
| Pulse/Frequency Output | 1,250 Hz max | 100mA, 40VDC 1,250Hz | Optional | 100mA, 40VDC 1,250Hz 12,500Hz optional |
| Current Output 0/4-20mA | Optional | Optional | Optional | Optional |
| Alarm Output | Programmable | Programmable | Optional | ON-OFF output |
| Digital Input | | Programmable | Optional | Programmable |
| Bi-Directional Flow | Yes | Yes | Yes | Yes |
| Dual Range | No | Yes | | No |
| Empty Pipe Detection | Yes | Yes | Yes | Yes |
| Data Storage | No | 32 values 64 alarm events | Yes | No |
| Programming Input | PC hand held terminal | PC hand held terminal | PC hand held terminal | PC hand held terminal |
| Batch Function | No | Yes | No | Yes, with auto preset |
| Serial Output | No | RS485, RS232 | Optional | No |
| Accuracy | ±0.8% (±0.4% Optional) | ±0.2% | ±1% | ±0.2% |
| Repeatability | 0.2% | 0.01% | 0.5% | 0.01% |
| Power Supply | 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 |
| Power Consumption | 5VA 4VA (AC) 3W (DC) | 25VA 23VA (AC) 21W (DC) | 0.1W with battery 0.3W | 10W max 5W typical |
| Sensor Compatibility | 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

| SPECIFICATION | CONVERTER MODEL | | | |
|--|---------------------------|---|---|---|
| | HML110 | HML210 | HML250 | HML4-F1 |
| Mounting Style | Meter Mount Wall Mount | Meter Mount Wall Mount Panel Mount | Meter Mount Wall Mount Panel Mount | Meter Mount |
| Optional Additional Output Modules Available | N/A | 2 ON/OFF outputs 2 ON/OFF outputs; 1 at 10 kHz 0/4-20 mA output and 2 ON/OFF outputs RS232 serial interface and 2 ON/OFF outputs RS232 serial interface, 0/4-20 mA and 2 ON/OFF outputs Profibus DP Data Logger Modules Data Logger, 2Mb Data Logger, 2 Mb with RS232 serial interface or RS232 & RS485 serial interface, and 0/4-20 mA input or 2 ON/OFF outputs or 2 ON/OFF outputs, 1 at 10 KHz or 0/4-20 mA output, 2 ON/OFF outputs or RS232 serial interface, 2 ON/OFF outputs, and 1 ON/OFF input or RS232 serial interface, 0/4-20 mA output, 2 ON/OFF outputs, 1 ON/OFF input or 2 relay outputs or 0/4-20 mA output, 1 ON/OFF output, and 1 ON/OFF input or RS232 serial interface and 2 ON/OFF outputs or RS232 serial interface and 2 ON/OFF outputs, 1 at 10 KHz 2 relay outputs | 0/4-20 mA output 2 ON/OFF outputs and 1 digital input RS232 serial interface 0/4-20 mA output, 2 ON/OFF outputs, 1 digital input, and RS232 serial interface | High frequency measuring range output; 12,500 kHz 4-20 mA output |
| Internal Totalizers | Four 10-digit totalizers | Four 10-digit totalizers | | Two 10-digit totalizers |

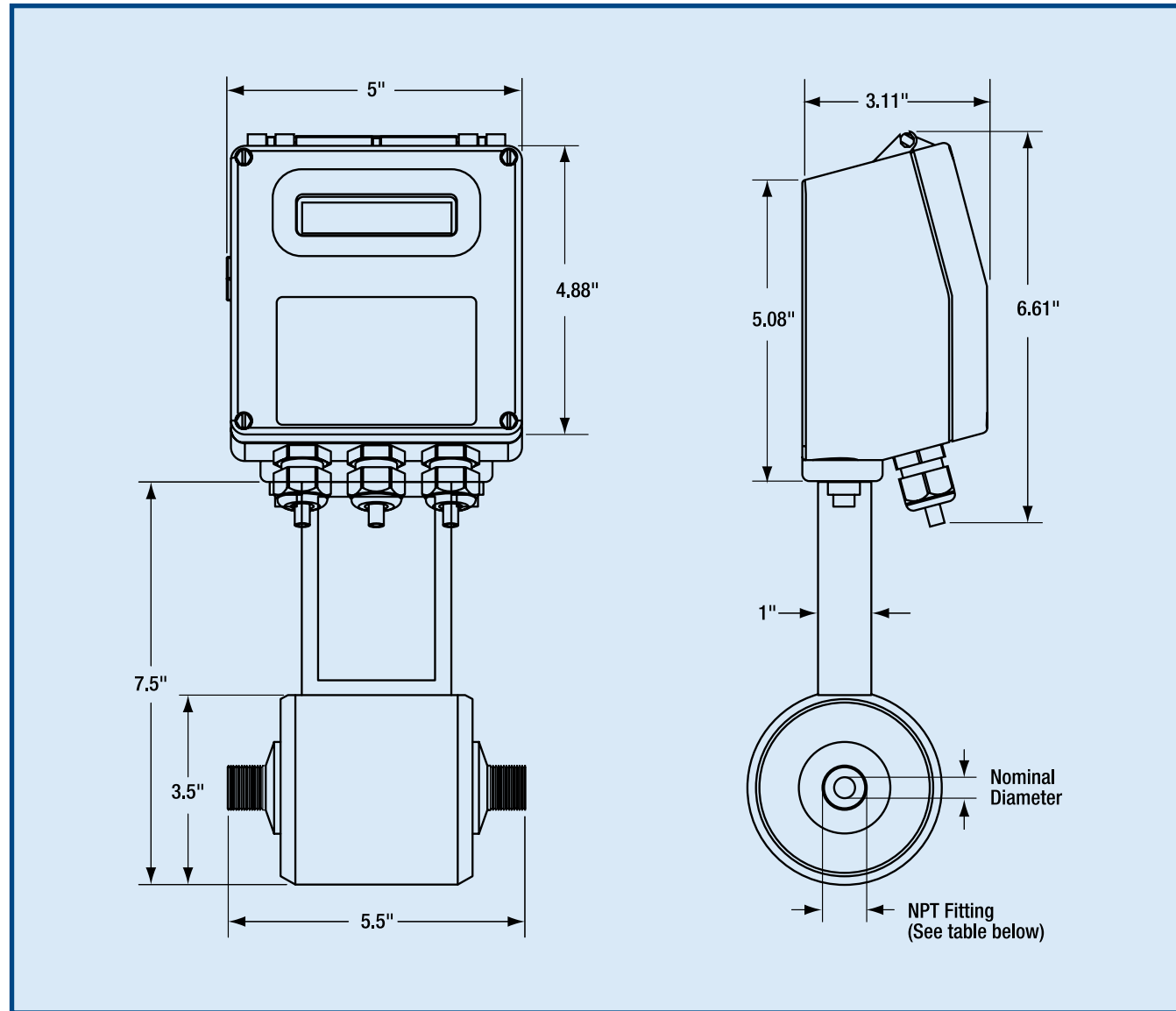
Dimensions - HMS501: Microflow Style



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

| HMS501 MICROFLOW STYLE SENSOR DIMENSIONS (Inches) | | | | | |
|---|-----|-----|-----|-----|-----|
| Nominal Diameter | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 |
| Dimension | L | 5 | 5 | 5 | 6 |
| | D | 3 | 3 | 3 | 3 |
| | G | 1/4 | 3/8 | 1/2 | 3/4 |
| Weight (lbs) | 7 | 7 | 7 | 7 | 7 |

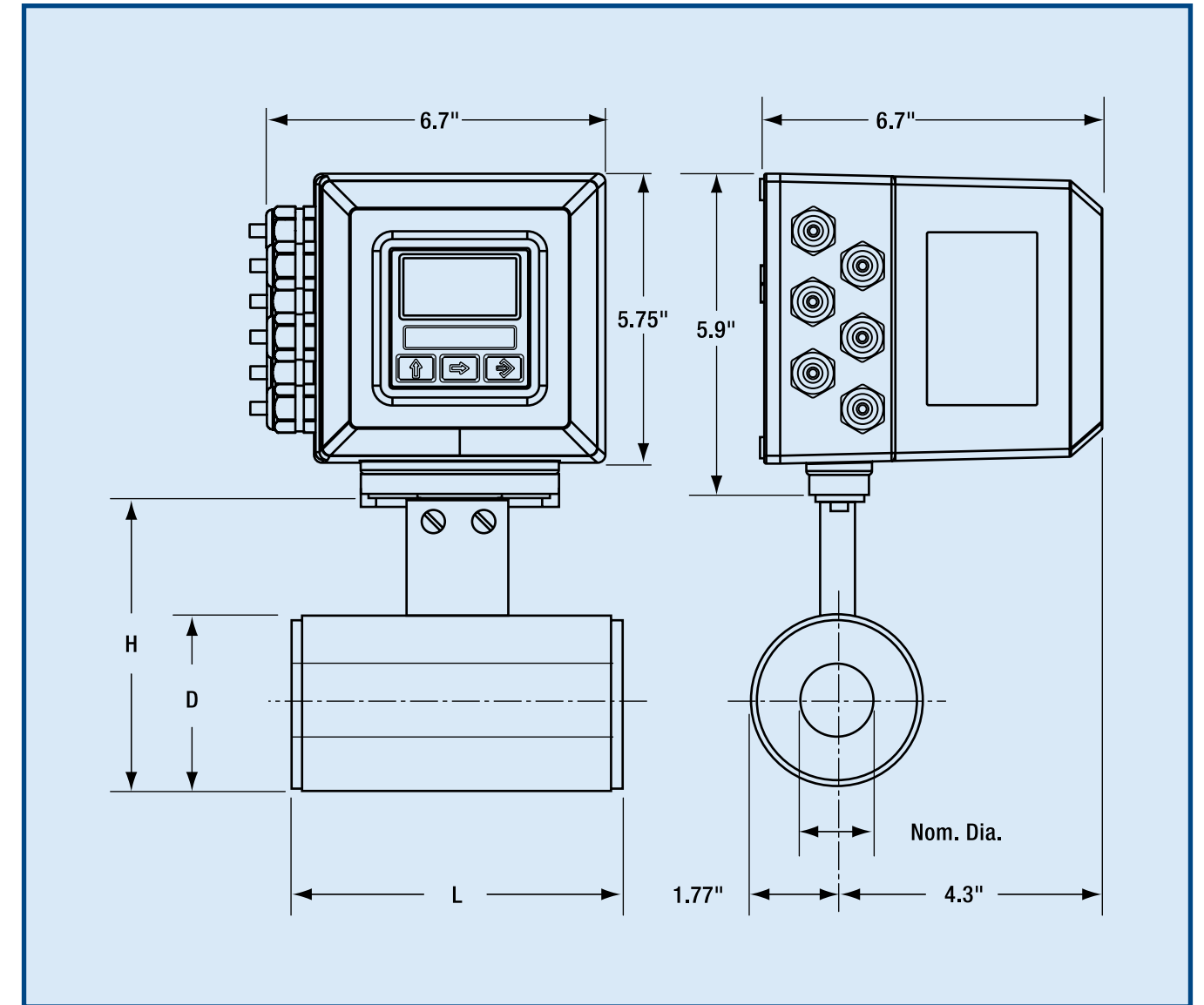
Dimensions - HMS600: Polypropylene Threaded Style



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

| HMS600 POLYPROPYLENE THREADED STYLE DIMENSIONS (Inches) | | | | | |
|---|-----|-----|-----|-----|-----|
| Nominal Diameter | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 |
| NPT Fitting | 1/4 | 3/8 | 1/2 | 3/4 | 1 |
| Weight (lbs) | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |

Dimensions - HMS1000: Wafer Style

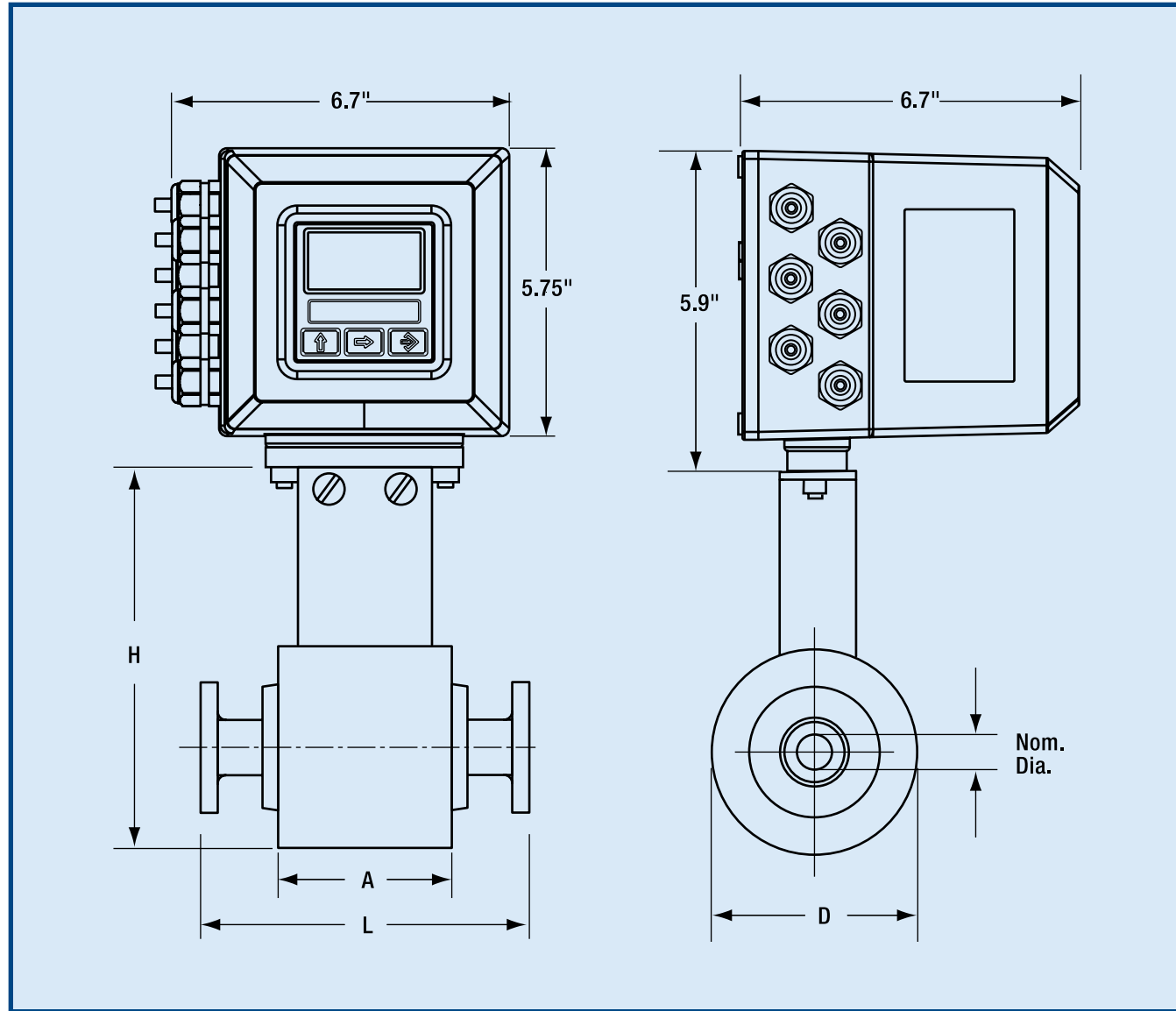


Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.

| HMS1000 WAFER STYLE SENSOR DIMENSIONS (Inches) | | | | | | | | | | |
|--|---|------|-------|-------|------|-------|------|------|------|----------------|
| Nominal Diameter | | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 5 | 6 ¹ |
| Dimension | L | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 7 | 7 |
| | D | 11.4 | 12.1 | 12.5 | 13.1 | 13.9 | 14.4 | 15.6 | 16.7 | 17.6 |
| | G | 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 |

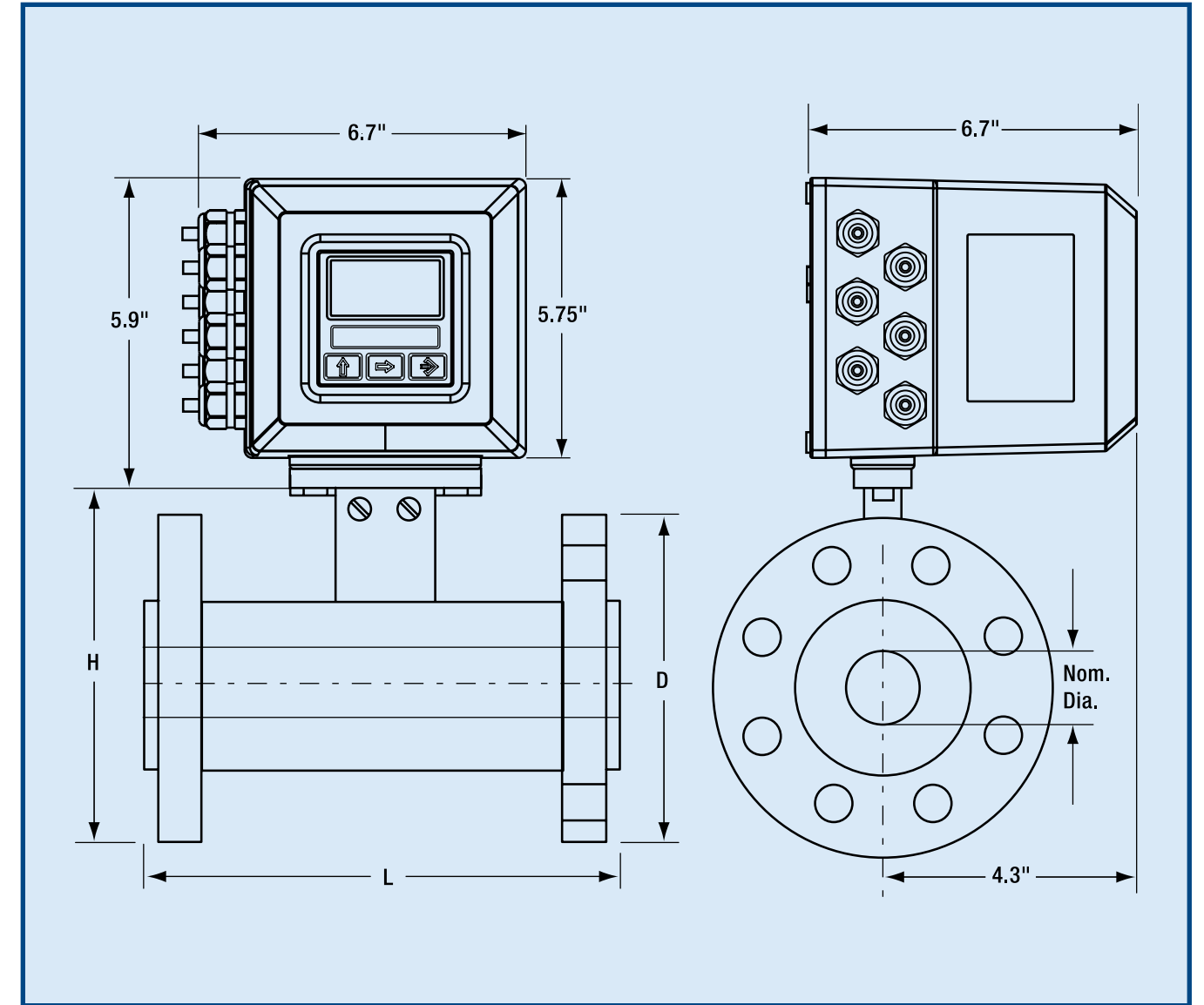
¹For models larger than 6" (up to 16") contact the factory.

Dimensions - HMS2410: Sanitary Style



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

Dimensions - HMS2500: Flange Style



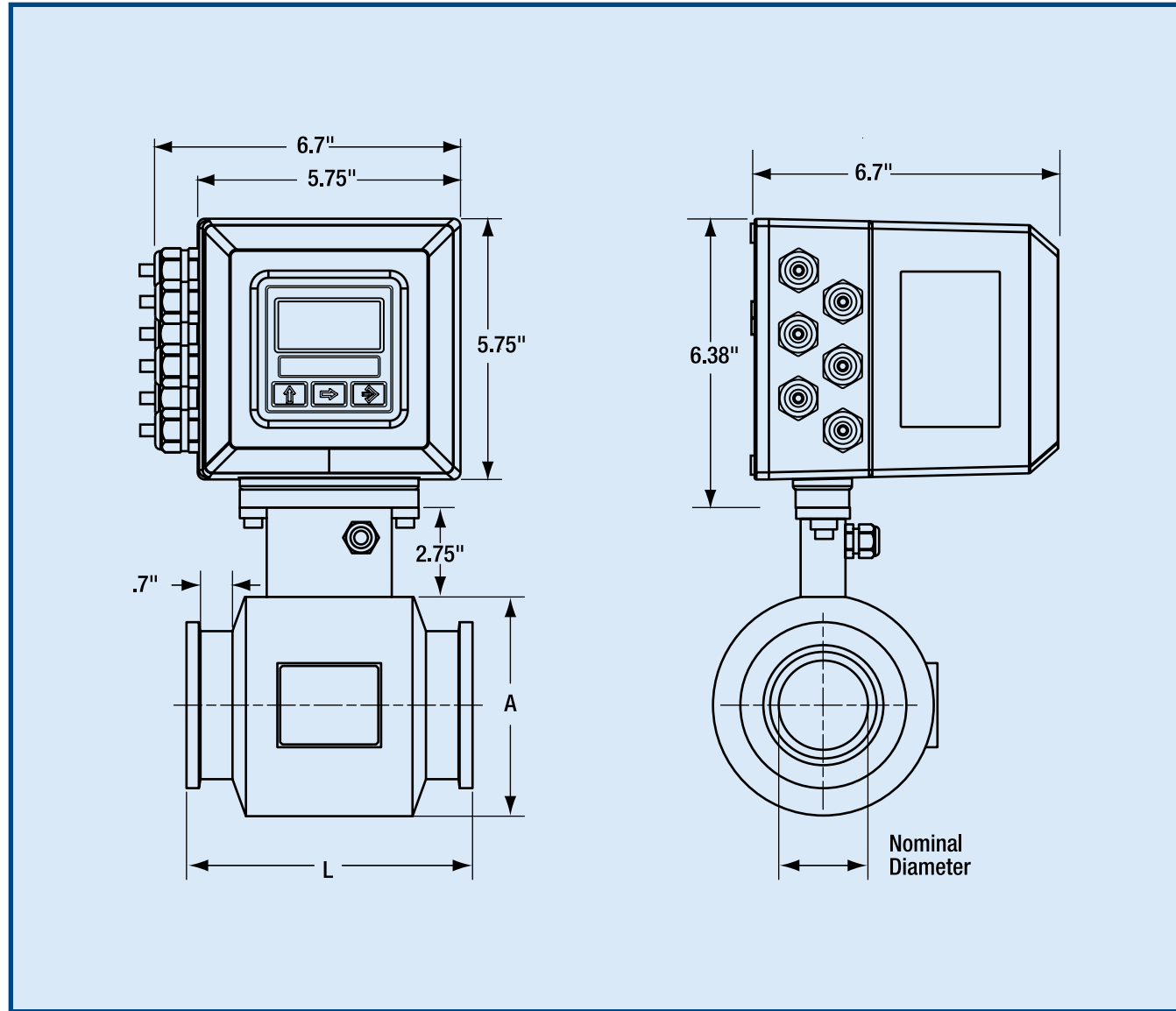
Dimensions and weights shown are not for construction use. Consult factory when certified engineering prints are required.

| HMS2410 SANITARY STYLE SENSOR DIMENSIONS (Inches) | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|------|------|
| Nominal Diameter | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | |
| Dimension | A | 4 | 4 | 4 | 4 | 7 | 4 | |
| | L | 7 | 7 | 7 | 7 | 7.9 | 7.9 | |
| | H | 6.7 | 7.2 | 7.2 | 8.2 | 9.2 | 10.2 | |
| | D | 3 | 3.5 | 3.5 | 4.5 | 5.5 | 6.5 | |
| Weight (lbs) | | 3.9 | 4.4 | 4.8 | 9.7 | 9.2 | 13.9 | 18.7 |

| HMS2500 FLANGE STYLE SENSOR DIMENSIONS (Inches) | | | | | | | | | | | | | | | | | | |
|---|---|-----|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Nominal Diameter | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | |
| 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 | |
| | 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 |

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

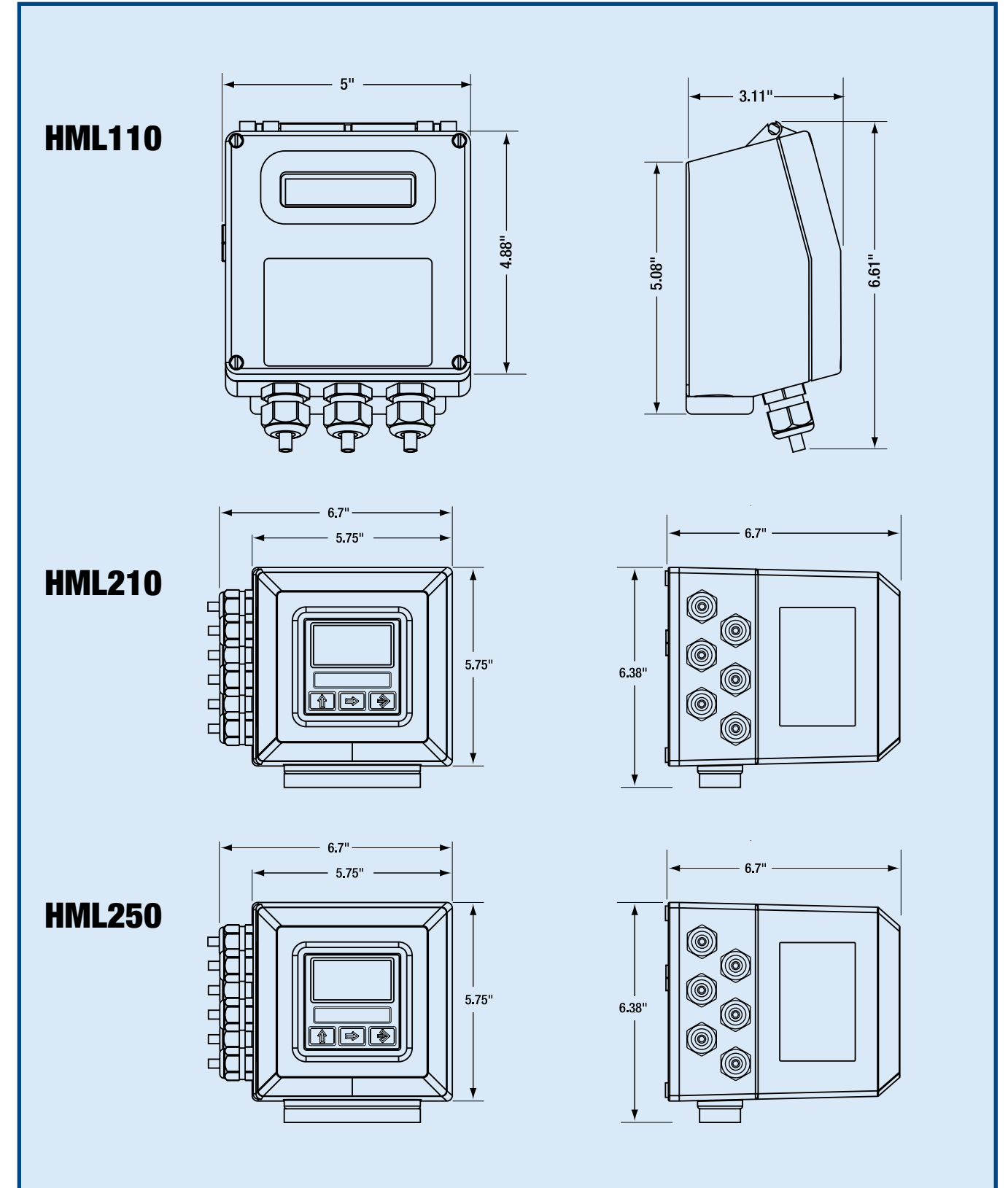
Dimensions - HMS5000: Pipe Clamp Polyurethane Style



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

| HMS5000 PIPE CLAMP POLYURETHANE STYLE DIMENSIONS (Inches) | | | | |
|--|---|-----|-----|-----|
| Nominal Diameter | | 1 | 2 | 3 |
| Dimension | A | 3.1 | 4.9 | 6.1 |
| | L | 5.3 | 6.3 | 7.5 |
| Weight (lbs) | | 2.4 | 4.9 | 7.5 |

Dimensions - HML110, HML210 and HML250



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

Dimensions - HML4-F1 and Panel Mount HML210 and HML250

LCMag Ordering Worksheet

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 $5\mu\text{S/cm}$ 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

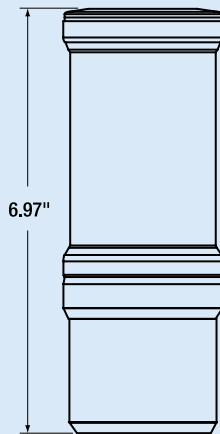
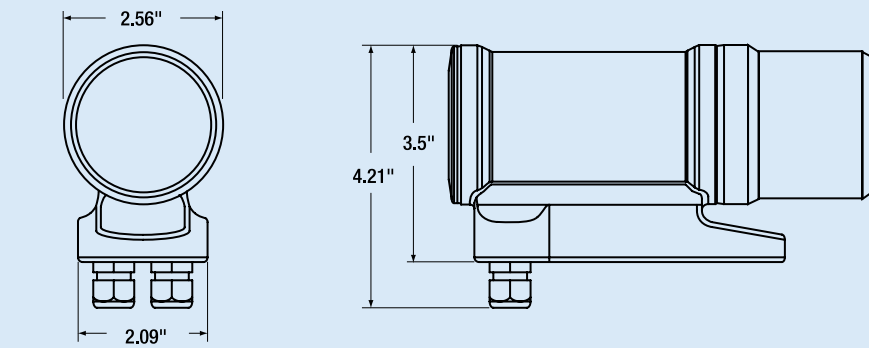
Desired Display *if specified on converter* Totalizer Units: _____ Rate of Flow Units: _____
(full GPM, 1/10 GPM, etc.) (full GPM, 1/10 GPM, etc.)

Analog Output Range: 0-20 mA *or* 4-20 mA
0 *or* 4mA: min. scale _____ GPM
20mA: full scale _____ GPM

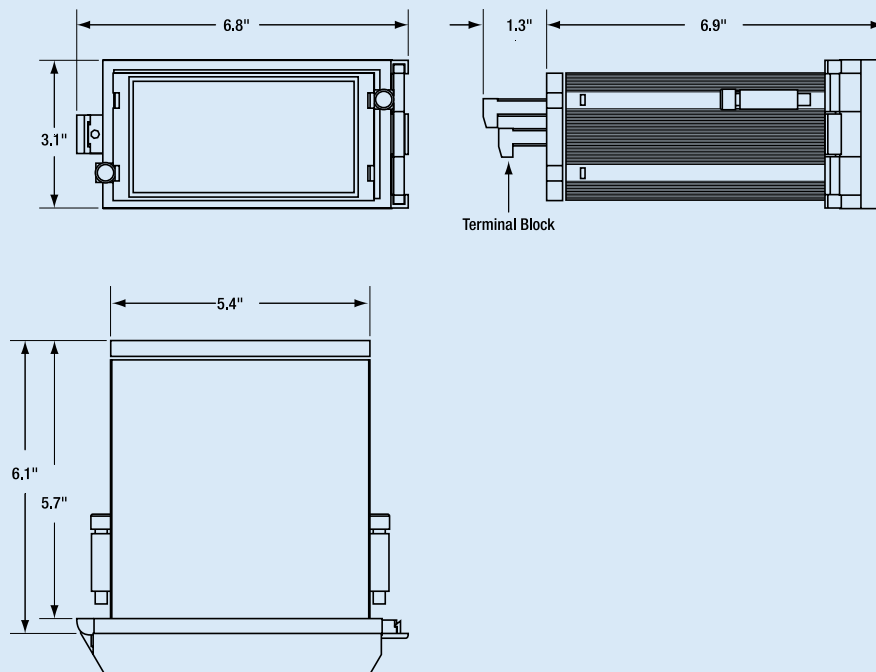
Supply Voltage: _____

Converter Location: Integral: _____ Remote: _____
Length of Cable Required: _____ ft.

HML4-F1



HML210 and HML250 Panel Mount



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



IDEX Energy & Fuels

IDEX Energy & Fuels provides custody transfer solutions for the control and management of high-value fluids and gases. In 2001, IDEX united Corken, Liquid Controls and Sampi to form IDEX Energy & Fuels. Together, they used their combined resources to design valuable new products and offer cost-effective pump and meter solutions. The three flagship business units laid the foundation for LCG's successful program of collaboration and innovation. With the additions of Liquid Controls Sponsler, Toptech Systems and Faure Herman, a total of six industry leading brands, LCG quickly became a dependable, single source provider, large enough to supply comprehensive solutions yet flexible enough to customize solutions for unique needs. Today, IDEX Energy & Fuels has a strong global presence with seven business units in five countries and over 500 distributors on six continents.



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LIQUID CONTROLS

105 Albrecht Drive
Lake Bluff, IL 60044
(847) 295-1050

LIQUID CONTROLS EUROPE/SAMPI

Via Amerigo Vespucci 1
55011 Altopascio (Lucca), Italy
+39 0583 24751

LIQUID CONTROLS INDIA

808 VCCI Complex
GIDC Makarpura
Vadodara-390 101
Gujarat, India
+91 265 2631855

LIQUID CONTROLS SPONSLER

105 Albrecht Drive
Lake Bluff, IL 60044
(847) 295-1050

TOPTECH SYSTEMS

1124 Florida Central Parkway
Longwood, FL 32750
(407) 332-1774

Nateus Business Park
Nieuwe Weg 1-Haven 1053
B-2070 Zwijndrecht (Antwerp), Belgium

FAURE HERMAN

Route de Bonnetable
B.P. 20154
72406 La Ferté-Bernard Cedex, France
+33 (0)2 43 60 28 60

6961 Brookhollow West Drive
Houston, TX 77040
(713) 623-0808

CORKEN

3805 Northwest 36th St.
Oklahoma City, OK 73112
(405) 946-5576

www.lcmeter.com

