

Ultra Mag® Sensor



ProComm Converter

Ultra Mag models UM06 and UM08 flanged tube flow meters are manufactured to the highest standard available for mag meters.

The flanged end tube design permits use in a wide range of applications with up to 300 PSI working pressure.

The fabricated tube is stainless steel with steel or stainless steel flanges and is lined with UltraLiner™, an NSF approved, fusion bonded epoxy material.

INSTALLATION

Ultra Mag flow meter installation is similar to placing a short length of flanged end pipe in the line. The meter can be installed vertically, horizontally, or inclined on suction or discharge lines. The meter must have a full pipe of liquid for proper operation. Fluid must be grounded to the downstream flange of the sensor either via internal grounding electrodes (2 - 12") or using McCrometer 316 SS grounding rings. For best performance, grounding rings are recommended for all sizes.

The meter needs to be located a minimum distance before and after flow disturbances, such as elbows, pumps, partially opened valves, and changes in pipe diameter. The uneven flow created by these obstructions can vary with each system.

The minimum distance is measured in pipe diameters (D). To ensure accuracy locate the sensor upstream and downstream of flow disturbances as follows:

2" & 3" Wafer style meters	3D upstream / 1D downstream
4" - 48" Steel flanged meters	1D upstream / 0D downstream

All blending and chemical injection should be done early enough so the flow media is thoroughly mixed prior to entering the measurement area.

AVAILABLE ULTRA MAG FLANGED MODELS

UM06 - 150 psi

- 2" & 3": Steel wafer style
- 4" - 12": Steel AWWA Class "D" flat face flanges (150 PSI)

UM08 - 300 psi

- 2" & 3": Steel wafer style
- 4" - 12": Steel ANSI 300 lb. Raised Face Flanges
- 14" & larger: Steel AWWA Class "F" raised face flanges

PERFORMANCE ADVANTAGES

- Flanged models need only 1 pipe diameter upstream of most flow disturbers
- No obstruction to the flow
- No moving parts to wear or break
- Maintenance free
- Worry-free accurate measurement
- Debris or solids will not clog the meter
- No head loss
- Bi-directional flow
- Empty pipe detection
- Unaffected by changes in density and viscosity
- No risk of liner delamination or separation
- Wide flow range
- Separated power and signal cables

TYPICAL APPLICATIONS

Industrial

Raw Water	Process Control
Chilled Water	Effluent Wastewater
Cooling Water	

Clean Water

Well Water	Rate-of-Flow Control
Potable Water	Raw Water Transmission
Pump Stations	

Wastewater

Influent	Waste Activated
Effluent	Sludge
Reclaimed	Return Activated
Lift Stations	Sludge



PROCOMM CONVERTER

The signal converter is the reporting, input and output control device for the sensor. The converter allows the measurements, functional programming, control of the sensor and data recording to be communicated through the display and inputs/outputs.

The microprocessor-based signal converter has a curve-fitting algorithm to improve accuracy, dual 4-20mA analog outputs, an optional RS485 communication port, an 8 line graphical backlit LCD display with 6-key touch programming, and a rugged enclosure that meets IP67.

In addition to a menu-driven self-diagnostic test mode, the converter continually monitors the microprocessor's functionality. The converter will output rate of flow and total volume. The converter also comes standard with password protection and many more features.

ISOLATED POWER AND SIGNAL

The power and signal between the converter and sensor are isolated and placed in separate cables giving superior resistance to electrical signal noise compared to single cable designs. An added benefit from the dual cable design is a maximum cable length of up to 500ft.



Ultra Mag Part Number Matrix

UM		-	-	-	-	-	-	-	-	-	-	-
SINGLE DIRECTION/ BIDIRECTIONAL												
150 PSI Service Pressure		06										
300 PSI Service Pressure		08										
NOMINAL LINE SIZE												
	2 in	02										
	3 in	03										
	4 in	04										
	6 in	06										
	8 in	08										
	10 in	10										
	12 in	12										
	14 in	14										
	16 in	16										
	18 in	18										
	20 in	20										
	24 in	24										
	30 in	30										
	36 in	36										
	42 in	42										
	48 in	48										
END CONNECTION OPTIONS												
AWWA Flat Face Flanges (Class D or F)		W										
ANSI Raised Face Flanges (150# or 300#)		A										
Wafer style (2" & 3" only)		F										
ELECTRODE MATERIAL OPTIONS												
S316 Stainless Steel (Standard)		S										
Hastelloy		H										
CONVERTER MOUNTING AND CABLE CONNECTOR OPTIONS												
Strain Relief [Remote Mount (Standard)]		R										
Quick Connect [Remote Mount]		Q										
Meter Mount Converter		M										
Strain Relief [Remote Mount] (Potted)		P										
Quick Connect [Remote Mount] (Potted)		C										
REMOTE CABLE LENGTH OPTIONS												
	25 feet (Standard)	025										
	50 feet	050										
	75 feet	075										
	100 feet	100										
	125 feet	125										
	150 feet	150										
	175 feet	175										
	200 feet	200										
	500 feet	500										
Custom Length Cable [User Specified]		CST										
Meter Mount Converter [No Remote Cable]		000										



Ultra Mag Part Number Matrix (cont.)

CONVERTER POWER OPTIONS						
	AC Power	A				
	DC Power	D				
	Battery Power [25ft remote cable max]	B				
	Solar Power, Battery Backup [25ft remote cable max]	S				
CONVERTER OUTPUT OPTIONS						
	Dual 4-20mA Analog, Dual Digital (Standard)	1				
	Modbus + STD (Two 4-20, two Dig)	2				
	Hart + STD (Two 4-20, two Dig)	3				
	Datalogger/BIV + STD (Two 4-20, two Dig)	4				
	Datalogger/BIV + Modbus + STD (Two 4-20, two Dig)	5				
	Datalogger/BIV + Hart + STD (Two 4-20, two Dig)	6				
	AMI Smart Output + STD (Two 4-20, two Dig)	7				
	Datalogger/BIV + AMI Smart Output + STD (Two 4-20, two Dig)	8				
	AMI Smart Output + Dig Out + Datalogger (Battery power only)	9				
	Digital Out + Datalogger (Standard Battery Power only)	0				
SMART OUTPUT PROTOCOL OPTIONS *						
	No AMI Outputs	-				
	Sensus Protocol (6ft cable, Nicor Connector hardwired only)	SEN				
	Itron 6 digit Protocol (6ft cable, Nicor Connector hardwired only)	IT6				
	Itron 9 digit Protocol (6ft cable, Nicor Connector hardwired only)	IT9				
	Battery Power / ATT Wireless Telemetry System (RTU, Solar Panel, 7 pin cable)	ATT				
	Battery Power / Verizon Wireless Telemetry System (RTU, Solar Panel, 7 pin cable)	VZW				
NON STANDARD LENGTH OPTIONS						
	McCrometer Length (Standard)	--				
	Competitor Meter Replacement Length	S				
	Special Length [Customer Specified]	XL				
HAZARDOUS LOCATION						
	Class I, Division 2, Groups A-D, T5	HL				

Smart Output protocol options require selection of converter option 7, 8, or 9.



FLOW METER SPECIFICATIONS

Pipe Sizes	
2", 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36", 42", 48"	
Flow Direction Measurement	
Forward and reverse flow indication and forward, reverse, net totalization are standard with all meters	
Accuracy	
Plus or minus 0.5% of actual flow (battery powered is $\pm 1\%$ of flow) IMPORTANT NOTICE ON FLOW METER ACCURACY: The flow meter, the cable and the electronics are factory calibrated for accuracy as a single unit. Changing the cable length with the Splice Kit changes the accuracy of the meter and invalidates the calibration certificate.	
Accuracy Tests	
5-point wet flow calibration of every complete flow tube with its signal converter. If desired, the tests can be witnessed by the customer. The McCrometer test facilities are traceable to the National Institute of Standards & Technology. Uncertainty relative to flow is $\pm 0.15\%$	
Pipe Run Requirements	
2" & 3" wafer style	3D upstream / 1D downstream
4" and larger flanged	1D upstream / 0D downstream
Repeatability	
$\pm 0.05\%$ or $\pm 0.0008\text{ft/s}$ ($\pm 0.25\text{mm/s}$), whichever is greater	
Conductivity	
5 $\mu\text{s/cm}$	
Liner	
UltraLiner NSF approved, fusion bonded epoxy	
Electrodes	
Type 316 stainless steel, others optional	
Electrical Connections	
<ul style="list-style-type: none"> • Compression gland seals • Quick-Connect 	
Sensor Cable Lengths	
Standard	25'/7.6 m McCrometer supplied submersible cable with each remote mount unit.
Optional	Up to 500'/152.4 m, or 25'/7.6 m max for battery powered.
Quick Connect	Available in standard cable lengths: Feet: 25, 50, 75, 100, 125, 150, 175, 200, 500 Meters: 7.6, 15.25, 22.5, 30.5, 38.1, 45.75, 53.3, 61, 152.4 Custom cable lengths at additional cost.



FLOW METER SPECIFICATIONS (CONT.)

IP Rating

Standard model	<ul style="list-style-type: none"> • Quick Connect (NEMA 6P/IP68 with remote converter) • Compression gland seals (NEMA 6P/IP68 with remote converter)
HL model	<ul style="list-style-type: none"> • Quick Connect (IP67) • Compression gland seals (IP67)

Sensor Submersibility Depth

With standard strain relief cable	9 m (30 ft.)
With optional quick connect cable	1.8 m (6 ft.)

Head Loss

None. No obstruction in line and no moving parts

Warranty

Meter	2 year warranty
Liner	Lifetime guarantee

Pressure Range

150 PSI maximum working pressure (UM06); 300 PSI maximum working pressure (UM08)

Velocity Range

.2 to 32 FPS

Temperature Range

Sensor Operating: -10 to 60°C (14 to 140°F)
Sensor Storage: -15 to 60°C (5 to 140° F)

Certifications and Approvals

Standard Model	<ul style="list-style-type: none"> • ISO 9001:2015 certified quality management system • Certified by MET to UL 61010-1
HL Model	<ul style="list-style-type: none"> • ISO 9001:2015 certified quality management system • Certified by MET to UL 61010-1 and MET C22.2 No. 61010-1-04 <ul style="list-style-type: none"> • Class I, Division 2, Groups A-D, T5 • Class I, Zone 2, IIC T5



System Options

- Hastelloy® electrodes
- Additional sensor cable up to 475'
- Annual verification / calibration
- Stainless steel ID tag

Meter Options

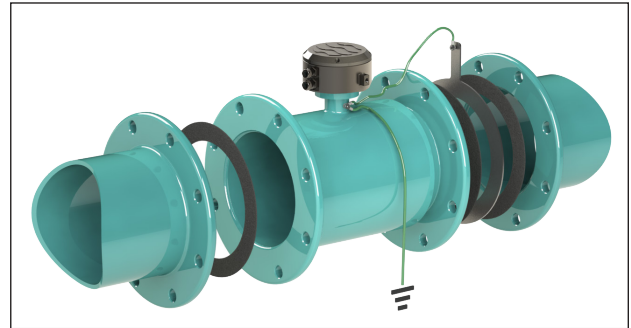
- | | |
|---|---|
| <ul style="list-style-type: none"> • DC powered converter (10-35 VDC, 21 W) • Meter mounted converter • Extended warranty • Hastelloy® electrodes • ANSI or DIN flanges • Special lay lengths, including ISO standard lay lengths | <ul style="list-style-type: none"> • Quick Connect cable fittings • Converter sun shield • HART® Converter • Smart Output™ (Sensus or Itron compatible) • Battery or battery-solar powered converter |
|---|---|

METER GROUNDING RECOMMENDATIONS

Grounding the meter body for safety according to national (NEC) or local electrical codes is recommended on ALL meter installations.

For best performance, grounding the fluid column is recommended when the meter is installed in an electrically noisy environment, such as with VFD pumps or nearby electrical systems with insufficient grounding.

Conductive or uncoated pipe - The uncoated pipe flange can be used to establish a connection to earth ground.



Plastic or internally coated pipe - Grounding rings can be installed to establish a connection to earth ground. See the Ultra Mag IOM Manual, Lit. # 30119-03, for more information on grounding configurations using grounding rods and grounding rings.

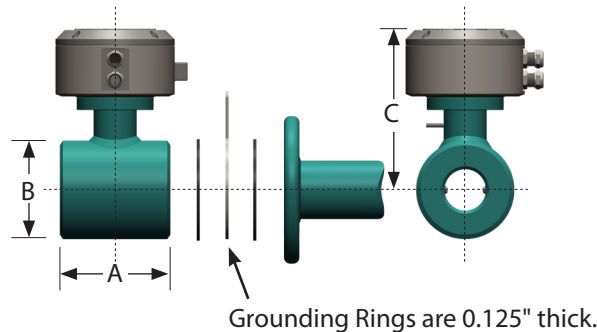
DIMENSIONS AND WEIGHTS

2" and 3" Models Body Style

Meter Type	Pipe Size (Nominal)	Meter Pipe ID	Flow Ranges GPM Standard .2 to 32 FPS Min - Max	DIMENSIONS (Lay Lengths)								Est. Shipping Weight (lbs.)**		
				A*		B	C		D	E	UM06	UM08		
				UM06	UM08		UM06	UM08						
Use model shown below for dimensions														
Wafer style	2"	1.625	2 - 310	4.5	4.5	4.0	6.5	7.25	n/a	n/a	9.6	10.1		
	3"	2.625	5 - 700	4.5	4.5	4.0	7.0	7.75	n/a	n/a	11.3	11.8		

* Laying lengths for meters with ANSI Class 150 Flanges are equal to UM08 laying lengths

** For remote mount meters, add 4 lbs for ProComm converter.



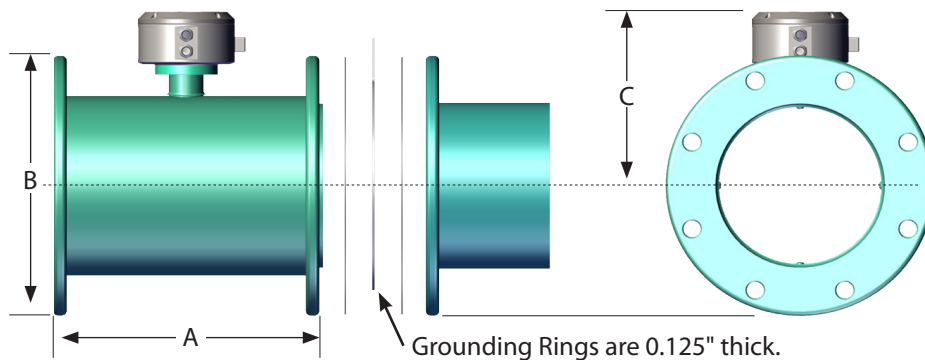
DIMENSIONS AND WEIGHTS (CONT.)

4" to 12" Models Body Style

Pipe Size (Nominal)	Meter Pipe ID	Flow Ranges GPM Standard .2 to 32 FPS Min - Max	DIMENSIONS (Lay Lengths)					Est. Shipping Weight (lbs.)**	
			A*		B		C	UM06	UM08
			UM06	UM08	UM06	UM08			
4"	3.720	8 - 1,140	13.40	13.40	9.00	10.00	8.06	78	108
6"	5.692	19 - 2,660	14.60	14.60	11.00	12.50	9.06	82	138
8"	7.692	33 - 4,870	16.10	17.25	13.50	15.00	10.06	115	195
10"	9.682	52 - 7,670	18.50	18.50	16.00	17.50	10.46	144	247
12"	11.682	74 - 11,180	19.70	19.70	19.00	20.50	12.31	193	342

* Laying lengths for meters with ANSI Class 150 Flanges are equal to UM08 laying lengths

** For remote mount meters, add 4 lbs for ProComm converter.



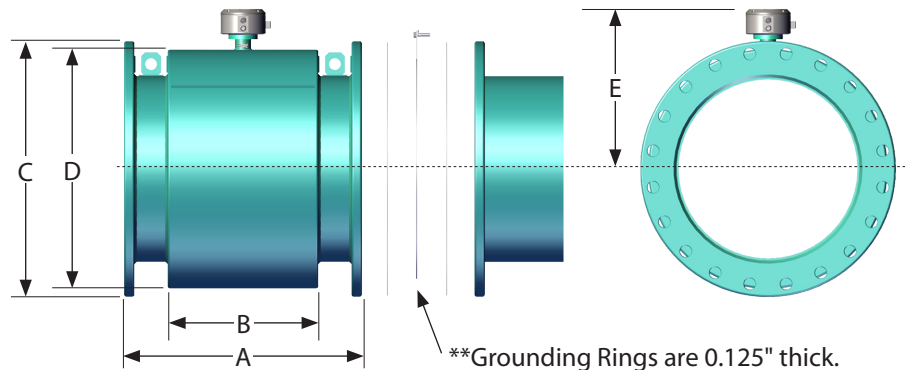
14+\" Models Body Style

Pipe Size (Nominal)	Meter Pipe ID	Flow Ranges GPM Standard .2 to 32 FPS Min - Max	DIMENSIONS (Lay Lengths)						Est. Shipping Weight (lbs.)**		
			A*		B	C		D	E	UM06	UM08
			UM06	UM08		UM06	UM08				
14"	13.440	90 - 16,070	21.70	22.75	12.00	21.00	23.00	20.30	15.46	321	476
16"	15.440	118 - 20,900	23.60	25.25	14.20	23.50	25.50	21.10	16.21	390	645
18"	17.440	150 - 26,480	23.60	25.25	14.20	25.00	28.00	21.10	17.21	446	750
20"	19.440	185 - 32,720	25.60	28.25	16.20	27.50	30.50	24.80	18.26	588	874
24"	23.440	270 - 47,180	30.70	35.75	21.70	32.00	36.00	29.60	20.11	769	1,568
30"	29.190	420 - 73,620	35.80	41.75	26.50	38.75	43.00	35.90	23.26	1,261	2,317
36"	35.190	610 - 105,930	46.10	46.10	28.20	46.00	50.00	42.70	26.66	1,696	2,915
42"	41.190	830 - 144,370	48.05	***	32.10	52.75	***	48.35	29.99	***	***
48"	47.190	1,080 - 188,430	50.00	***	36.00	59.50	***	54.00	33.31	***	***

* Laying lengths for meters with ANSI Class 150 Flanges are equal to UM08 laying lengths

** For remote mount meters, add 4 lbs for ProComm converter.

*** Consult factory





PROCOMM CONVERTER PART NUMBER MATRIX

PC -		-	-	-	-	-
CONVERTER MOUNTING OPTIONS						
Remote Mount	R					
Meter Mount	M					
Remote Mount, Lid Only	L					
Meter Mount, Lid Only	E					
CONVERTER POWER OPTIONS						
AC Power	A					
DC Power	D					
Battery Power [25ft/762 cm remote cable max]	B					
Solar Power, Battery Backup [25ft/762 cm remote cable max]	S					
CONVERTER OUTPUT OPTIONS						
Dual 4-20mA Analog, Dual Digital (Standard)	1					
Modbus + STD (Two 4-20, two Dig)	2					
Hart + STD (Two 4-20, two Dig)	3					
Datalogger/BIV + STD (Two 4-20, two Dig)	4					
Datalogger/BIV + Modbus + STD (Two 4-20, two Dig)	5					
Datalogger/BIV + Hart + STD (Two 4-20, two Dig)	6					
AMI Smart Output + STD (Two 4-20, two Dig)	7					
Datalogger/BIV + AMI Smart Output + STD (Two 4-20, two Dig)	8					
AMI Smart Output + Dig Out + Datalogger (Battery power only)	9					
Digital Out + Datalogger (Standard Battery Power only)	0					
SMART OUTPUT PROTOCOL OPTIONS *						
No AMI Outputs	-					
Sensus Protocol (6ft/183 cm), Nicor Connector hardwired only)	SEN					
Itron 6 digit Protocol (6ft/183 cm) cable, Nicor Connector hardwired only)	IT6					
Itron 9 digit Protocol (6ft/183 cm) cable, Nicor Connector hardwired only)	IT9					
Battery Power / ATT Wireless Telemetry System (RTU, Solar Panel, 7 pin cable)	ATT					
Battery Power / Verizon Wireless Telemetry System (RTU, Solar Panel, 7 pin cable)	VZW					
HAZARDOUS LOCATION						
Class I, Division 2, Groups A-D, T5						HL

* Smart Output protocol options require selection of converter output option 7, 8, or 9.



PROCOMM CONVERTER SPECIFICATIONS

Power Source

AC	100-240 VAC / 45-66 Hz (10 W)	Note: AC or DC must be specified at time of ordering.
DC	10-35 VDC (10 W)	

Standard Outputs

Dual 4-20mA Outputs: Galvanically isolated and fully programmable for zero and full scale (0-21mA rangeability)

Two separate digital programmable outputs: open collector transistor usable for pulse, frequency, or alarm settings.

- | | | |
|--------------------------|-------------------------------------|--|
| • Volumetric Pulse | • Range Indication | • Maximum switching frequency: 1250 Hz |
| • Flow Rate (Frequency) | • Maximum switching voltage: 40 VDC | • Insulation from other secondary circuits: 500V |
| • Hardware Alarm | • Maximum switching current: 100mA | |
| • High/Low Flow Alarms | | |
| • Empty Pipe | | |
| • Directional Indication | | |

Optional Outputs

- | | | |
|----------|--|-------------------------|
| • Modbus | • Smart Output™ (Sensus, Itron 6, Itron 9) | • Datalogger |
| • HART | | • Built-in verification |

Galvanic Isolation

All inputs / outputs are galvanically isolated from power supply up to 500 V

Engineering Units

- | | | |
|--------------------|----------------------------|-----------------------|
| • Cubic Meter | • US Gallons | • Imperial Kilogallon |
| • Cubic Centimeter | • Imperial Gallons | • Acre Feet |
| • Milliliter | • Cubic Feet | • Megagallon |
| • Liter | • Kilo Cubic Feet | • Imperial Megagallon |
| • Cubic Decimeter | • Standard Barrel | • Hundred Cubic Feet |
| • Decaliter | • Oil Barrel | • Megaliters |
| • Hectoliter | • US Kilogallon | |
| • Cubic Inches | • Ten Thousands of Gallons | |

Conductivity

Minimum conductivity of 5µS/cm

Electrical Connections

- Connection options**
- Compression gland seals for 0.24" to 0.47" diameter round cable
 - Conduit option: 1/2" NPT threaded connections

IP Rating

IP67 Die cast aluminum converter (only when connected using compression gland seals)

PROCOMM CONVERTER SPECIFICATIONS (CONT.)

Certifications and Approvals

Standard Model

- ISO 9001:2015 certified quality management system
- CE
- Certified by MET to UL 61010-1



HL Model

- ISO 9001:2015 certified quality management system
- CE
- Certified by MET to UL 61010-1 and MET C22.2 No. 61010-1-04
 - Class I, Division 2, Groups A-D, T5
 - Class I, Zone 2 IIC T5



IMPORTANT

Electrical safety certifications above do not apply to model 282L Single Point Insertion (SPI Mag) Electromagnetic Flow Meter.



IMPORTANT

Refer to certification requirements. Do not substitute components.



IMPORTANT

The ProComm converter, models PC-RA1-HL series and PC-MA1-HL series have no user serviceable parts.

Temperature Range

Operating and storage

-4° to 140° F (-20° to 60° C)

Converter Dimensions

Remote mount

- Height: 7.3" (18.5 cm)
- Width: 8.5" (21.6 cm)
- Depth: 4.3" (10.9 cm)

Meter mount

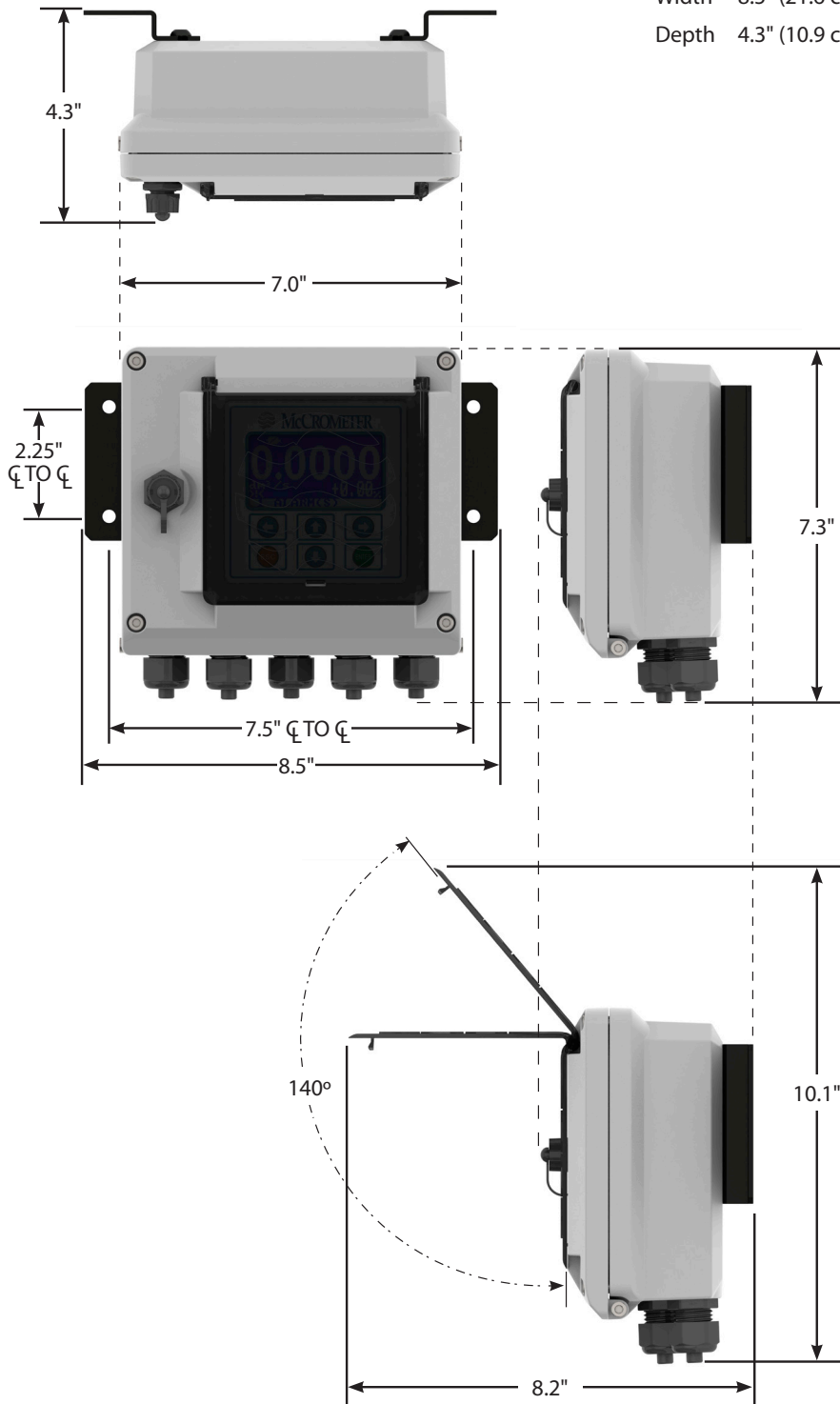
- Height: 6.9" (17.5 cm)
- Width: 7.2" (18.25 cm)
- Depth: 6.2" (15.7 cm)

Keypad and Display

Can be used to access and change set-up parameters using six membrane keys and an LCD display

METER MOUNT CONVERTER DIMENSIONS

Height 7.3" (18.5 cm)
Width 8.5" (21.6 cm)
Depth 4.3" (10.9 cm)



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