HACH® ULTRA MAG

Ultra Mag 5000 Electromagnetic Flow Meter

Installation, Operation and Maintenance Manual









Standard Model
For use in non-hazardous locations

HL Model
For use in hazardous locations:
- Class I, Division 2, Groups A B C D, T4
- Class I, Zone 2 IIC T4

NSF/ANSI/CAN 61
NSF/ANSI/CAN 372

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Hach's Flow Solutions by McCROMETER

Contents

SAFETY 1
Safety Symbols And Warnings 1
Safety Warnings 1

1.0 DESCRIPTION OF THE FLOW METER. 2

2.0 UNPACKING THE CRATE AND VERIFYING SERIAL NUMBERS 2
2.1 Uncrating 2
2.2 Finding the Serial Numbers 2

3.0 PREPARING FOR A NEW INSTALLATION 3
3.1 Meter Mounted Sensor Location 3
3.2 Remote Mount Transmitter Location 3
3.3 Pipe Run Requirements 3
3.4 Positioning and Orienting the Sensor 4

4.0 FLOW METER INSTALLATION 5
4.1 Flanged Meter Installation. 5
4.2 Remote Mount Installation 5

5.0 REMOTE MOUNT TRANSMITTER INSTALLATION 6
5.1 Mounting the ProComm Max Transmitter 6
5.2 Installing Cables through Cable Glands and Conduit 6
5.3 Cable Gland Assignment for Wiring Harnesses 7
5.4 Pulling Sensor Cable Through Electrical Conduit 8

6.0 CABLING AND CONNECTING WIRING 9
6.1 Remote Mount Cable Connection to Sensor 9
6.2 Quick Connect Cable Ends (optional) 9
6.3 Terminal Block Diagram 10
6.4 Wiring Diagrams 11
6.5 Installing Expansion Cards. 11
6.6 Transmitter Power Wiring Diagram 12
6.7 4-20mA Hook-Up 13
6.8 Opto-Isolated Pulse Output Hook Up 13
6.9 Optional Smart Output Hook Up 14
6.10 Connecting the SmartTrax Remote Transmitting Unit. 14
6.11 Pin-out of Male and Female Connectors 15
6.12 Installing the SmartTrax Optional Solar Panel. 15

7.0 SENSOR GROUNDING 16

8.0 REPLACEMENT PARTS 17

9.0 SPECIFICATIONS, WEIGHTS, AND DIMENSIONS 18
9.1 Flow Meter Specifications 18
9.2 Flow Meter Dimensions and Weights 20
9.3 ProComm Max Transmitter Specifications. 23
9.4 ProComm Max Transmitter Dimensions. 25

10.0 RETURNING A UNIT FOR REPAIR 27

WARRANTY 28

SAFETY

Safety Symbols And Warnings

Throughout this manual are safety warning and caution information boxes. Each warning and caution box will be identified by a large symbol indicating the type of information contained in the box. The symbols are explained below:



This symbol indicates important safety information. Failure to follow the instructions can result in serious injury or death.



This symbol indicates important information. Failure to follow the instructions can result in permanent damage to the meter or installation site.

Safety Warnings

When installing, operating, and maintaining McCrometer equipment where hazards may be present, you must protect yourself by wearing Personal Protective Equipment (PPE) and be trained to enter confined spaces. Examples of confined spaces are manholes, pumping stations, pipelines, pits, septic tanks, sewage digesters, vaults, degreasers, storage tanks, boilers, and furnaces.

You must follow all state and local laws, as well as Occupational Safety and Health Administration (OSHA) regulations concerning Personal Protective Equipment and confined-space entry. Specific requirements can be found in the OSHA section of the Code of Federal Regulations: *29 CFR, 1910.132 - 1910.140, Personal Protective Equipment; and CFR Title 29, Part 1910.146, Permit-Required Confined-Spaces.*



WARNING!
Incorrect installation or removal of meters can result in serious injury or death. Read the instructions in this manual on the proper procedures carefully.



WARNING!
Never enter a confined space without testing the air at the top, middle, and bottom of the space. The air may be toxic, oxygen deficient, or explosive. Do not trust your senses to determine if the air is safe. You cannot see or smell many toxic gases.



WARNING!
Never enter a confined space without the proper safety equipment. You may need a respirator, gas detector, tripod, lifeline, and other safety equipment.



WARNING!
Never enter a confined space without standby/rescue personnel within earshot. Standby/rescue personnel must know what action to take in case of an emergency.

1.0 DESCRIPTION OF THE FLOW METER

Ultra Mag meters are available with integral or remote mount transmitters. Standard display features include forward, reverse and net flow totalizers, flow rate, alarm monitoring, and automatic self diagnostics to ensure integrity. All data and values are in selectable units of measurement. System compatibility is assured with a choice of current, pulse and serial data. Please refer to the transmitter manual provided with your meter.

Ultra Mag operating parameters are set via the electronics keypad. The software features multilevel password protection capability to prevent inadvertent program or setting changes. Data is stored in nonvolatile memory.

The flanged end tube design permits use in a wide range of applications. The fabricated tube is stainless steel with steel or stainless steel flanges and incorporates the UltraLiner, an NSF approved fusion-bonded epoxy liner.

2.0 UNPACKING THE CRATE AND VERIFYING SERIAL NUMBERS

2.1 Uncrating

The shipping crate contains the following items:

- Electromagnetic meter assembly with grounding wire attached
- Cable to transmitter (attached to meter)
- ProComm Max transmitter
- Grounding rings
- Ground wires (2)
- User manuals for both the sensor and transmitter

When uncrating the Ultra Mag, any damage due to rough or improper handling should be reported to the transportation firm and McCrometer. If for any reason it is determined that the unit or parts of the unit should be returned to the factory, please contact McCrometer for clearance prior to shipment. Each unit must be properly crated to prevent any further damage. The factory assumes no responsibility for equipment damaged in return shipment due to improper packaging.

2.2 Finding the Serial Numbers

The meter serial number is located on the side of the sensor body on a silver label. (Figure 1)

The transmitter serial number is located on the side of the side of the transmitter. (Figure 2)



Figure 1. Flow meter serial number tag

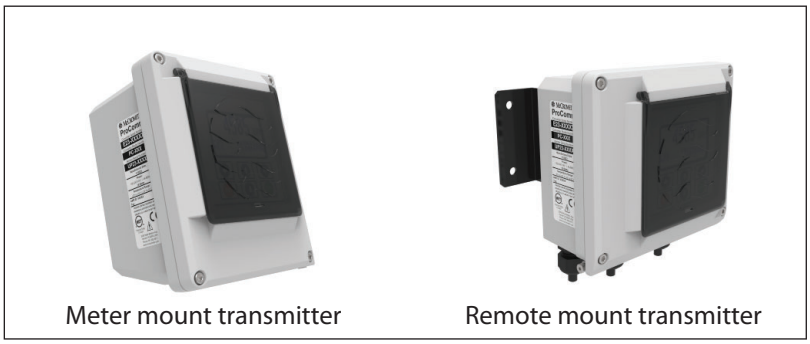


Figure 2. Transmitter serial number tag

3.0 PREPARING FOR A NEW INSTALLATION

3.1 Meter Mounted Sensor Location

Adjoining pipe must be adequately supported, and the area around the sensor should provide sufficient drainage to prevent flooding the transmitter or conduits. The location chosen should provide room to read the display and be free from harsh electrical noise from adjacent equipment, cables, R.F.I., or E.M.I. The transmitter should not be subjected to intense, prolonged sunlight and/or vibrations. Unit should also be protected from heat.

3.2 Remote Mount Transmitter Location

The transmitter may be installed in a desired location provided that free access is available to allow the display to be viewed as required. The unit can be either wall mounted or panel mounted with masonry fixings or nuts and bolts respectively via the fixing holes provided.

3.3 Pipe Run Requirements

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 shown at right.

Meter size	Upstream/ Downstream
Flanged 1½" to 3"	0 / 0
Wafer 2" & 3"	3 / 1
Flanged 4" to 48"	1 / 0

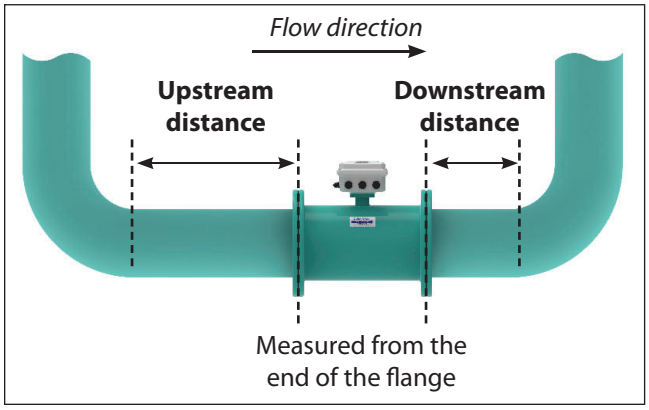


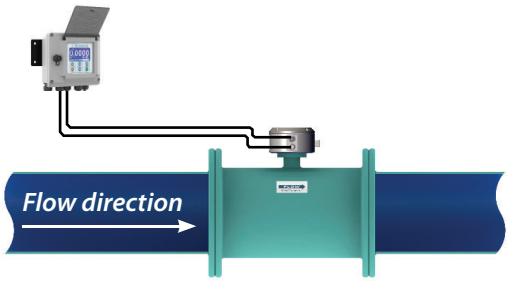
Figure 3. Upstream and downstream requirements

3.4 Positioning and Orienting the Sensor

The following installation recommendations should be followed (see Figure 2 for installation diagrams):

Horizontal installation

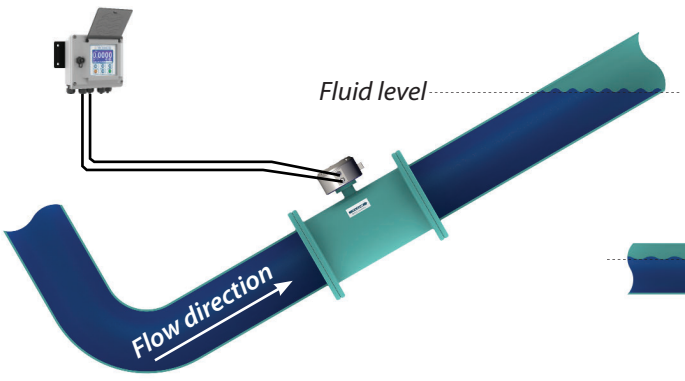
In horizontal pipe runs, the meter should be installed so that the junction box is vertical insuring the electrodes are positioned to prevent coating by sediments or loss of electrode contact due to air bubbles.





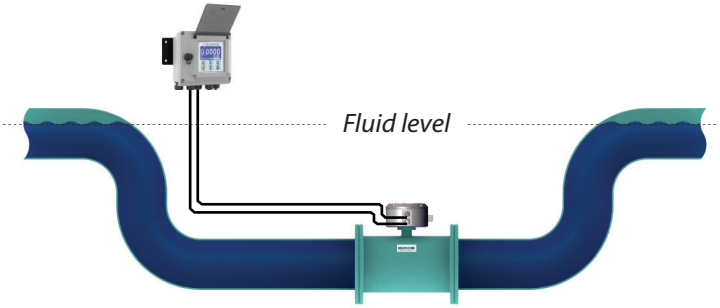
Vertical installation

In vertical pipe runs, the flow should be upward. In slurry application, a vertical position ensures optimal distribution of solids under all flow conditions.



Less than full pipes

In pipes which may encounter less than a full pipe of fluid, the meter must be positioned in a trap to ensure that the sensor is always completely filled with liquid.



4.0 FLOW METER INSTALLATION

NOTE Nothing in this manual supersedes local codes.

NOTE The flow of the medium should correspond to the direction shown by the arrow on the sensor.

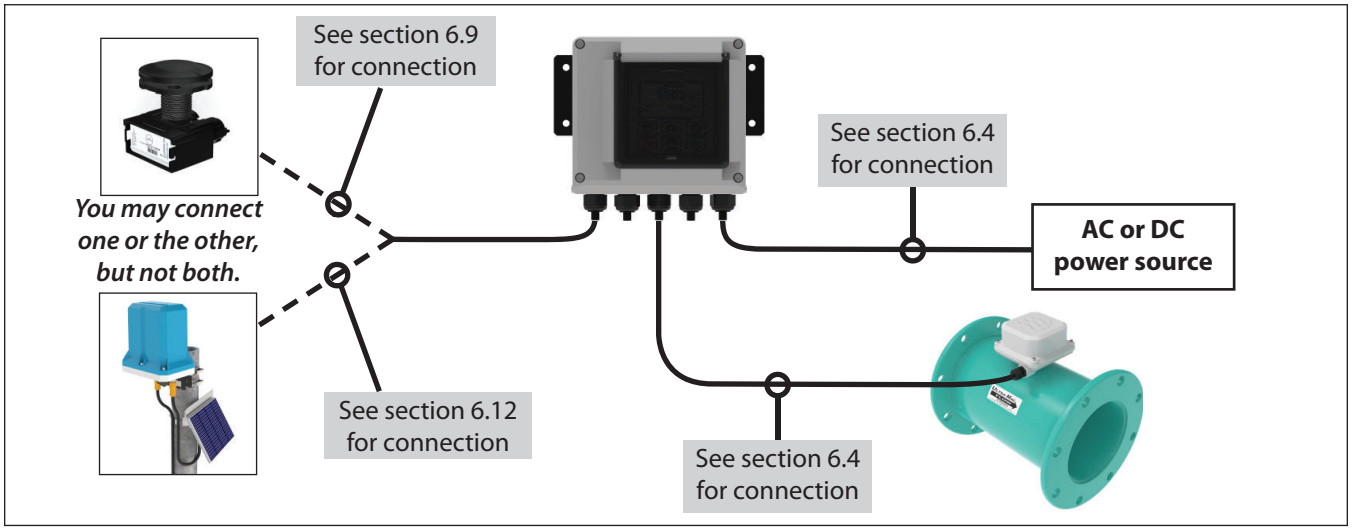
3.6 Flanged Meter Installation

Install the Ultra Mag flow meter inline between two flanged end pipes. The flow meter may require grounding, depending on the environment they are being installed in. Refer to section 7.0 for a full description of grounding.

3.5 Remote Mount Installation

You will need to prepare the location where you will install the remote transmitter. The location cannot be further from the flow meter than the length of the 25' cable. This must be planned in advance because ***the cable cannot be lengthened.*** Doing so will alter the calibration accuracy between the meter and the transmitter and void the warranty.

Install the flow meter as described in section 4.1. Mount the transmitter and connect the cable to the meter's junction box and the transmitter's external connection. Figure 3 below shows an example of a remote mount installation with an optional Smart Output connection.



IMPORTANT: The example shown above does not include grounding installation. Depending on your requirements, the meter will need to be grounded according to section 7.0.

Figure 4. Example remote mount configuration

5.0 REMOTE MOUNT TRANSMITTER INSTALLATION

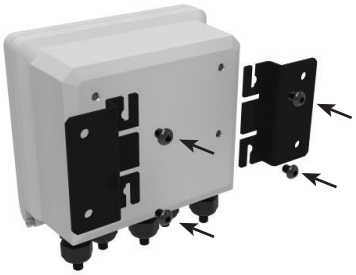
5.1 Mounting the ProComm Max Transmitter

Note: This applies to the remote mount transmitter only.

If possible, mount the transmitter in an electronics shed or environmental enclosure. The sun shield should be oriented in a direction to reduce sun damage and ensure readability.

Mount the transmitter to a solid surface using four bolts (Figure 4) or to a vertical or horizontal post using two clamps (Figure 5). This electronic unit is rated IP67 for temporary flooding.

If the brackets are not attached, attach them with the four screws.



Mount the transmitter to a solid surface with four bolts through the holes in the left and right brackets.



Figure 5. Mounting transmitter to solid surface

This applies to both vertical and horizontal mounting.

1. If the brackets are not attached, attach them with the four screws.
2. Open clamps and attach around post. (Not shown below)
3. Slide bracket tabs onto clamps and tighten them.

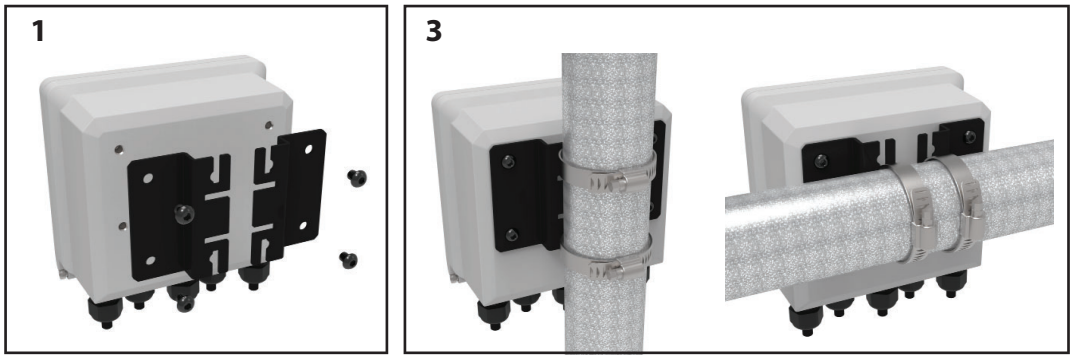


Figure 6. Mounting transmitter to vertical or horizontal post

4.1 Installing Cables through Cable Glands and Conduit

All electrical cables enter the transmitter through compression fittings or optional customer-supplied conduit located on the side or bottom of the transmitter (Figure 6, Figure 7, Figure 8) . Ensure that all compression glands are properly tightened and all unused fittings are plugged so the case remains sealed.

The power cable and wiring harnesses are each assigned specific cable glands where they will pass through into the transmitter. See section 5.3 for cable gland assignment for wiring harnesses and section 6.4 for wiring diagrams.

All cable compression glands must be properly tightened to prevent moisture intrusion and maintain the IP67 rating. To insure IP67 rating, use only round cable 0.24" to 0.47" in diameter.

Attaching conduit directly to the enclosure may introduce dangerous gasses and moisture into the enclosure creating a dangerous condition, and will remove the enclosure's IP67 rating.



Figure 7. Remote mount transmitter with five cable gland pass-throughs

The remote mount transmitter is shipped with five 1/2" NPT cable glands. Up to three cable glands may be removed and replaced with 1/2" conduits.



Figure 8. Remote mount transmitter with three conduit pass-throughs



Figure 9. Meter mount transmitter with three cable gland pass-throughs

Attaching conduit directly to the enclosure may introduce dangerous gasses and moisture into the enclosure creating a dangerous condition, and will remove the enclosure's IP67 rating. **Damage caused by attaching conduit to the enclosure or altering the enclosure in any way is not covered by the warranty.**

5.2 Cable Gland Assignment for Wiring Harnesses

To prevent signal interference and to keep the wiring organized, each cable gland is assigned for a specific wiring harness. Refer to the assignment diagrams (Figure 9, Figure 10) below when you route your cable run.

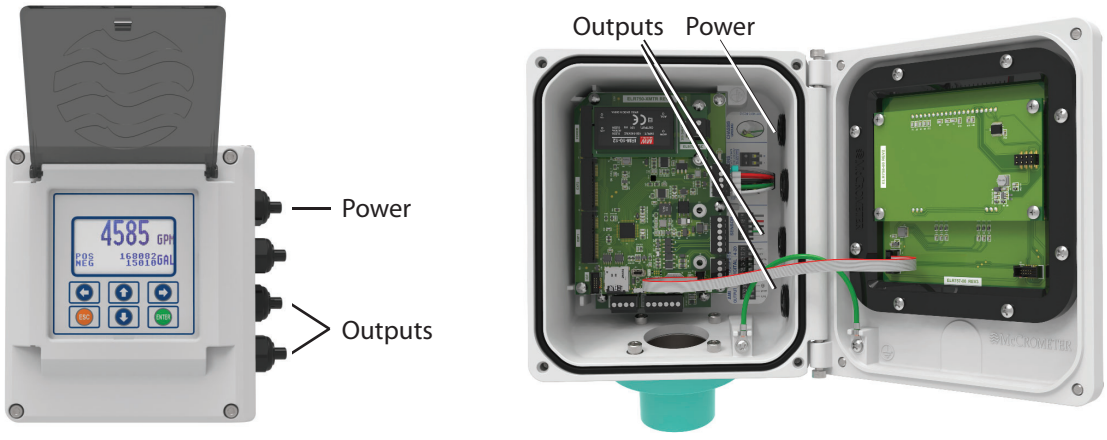
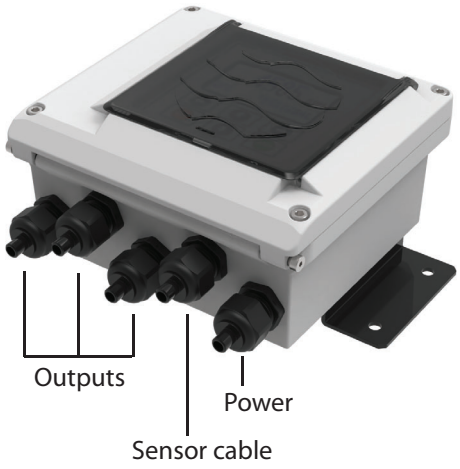


Figure 10. Meter mount transmitter cable assignments



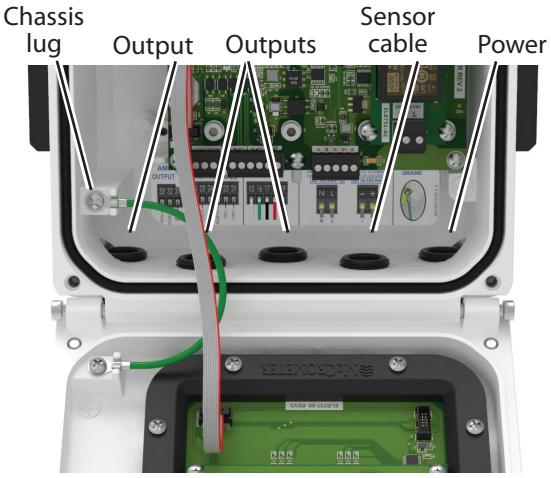


Figure 11. Remote mount transmitter cable assignments

5.3 Pulling Sensor Cable Through Electrical Conduit

It is very important to protect the end of the sensor cable when pulling it through a conduit. Water can accumulate in low portions of conduit. Always use a cable cover, or similar method, to seal the end of the cable against water when pulling the cable through conduit (see Figure 11). This will ensure proper operation of the meter.

NOTE Cable cover is not provided.

1. Tie a rope or cable-snake securely around the middle of the cable cover.
2. Carefully pull the rope or snake until the sensor cable end clears the conduit.
3. Bring the cable end to the transmitter location. If necessary, secure the cable so that it does not fall back through the conduit.
4. Remove the cable cover by pulling the rip wire. The cable cover will tear off (discard the cover).

CAUTION: Do not cut the cable cover off. Doing so may damage the sensor cable and adversely effect the calibration of the meter.

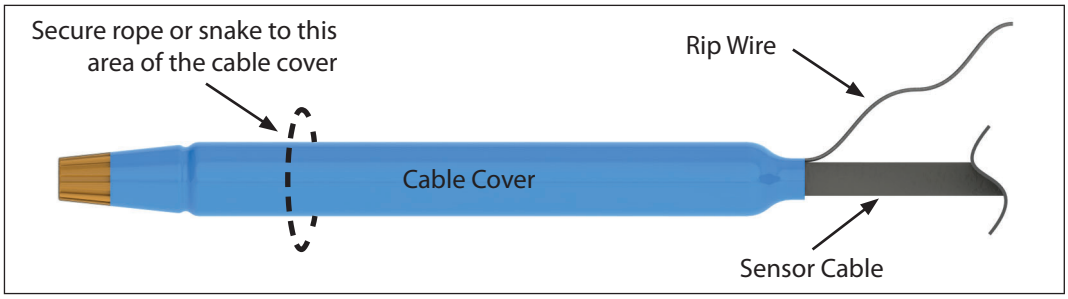


Figure 12. Cable Cover

6.0 CABLING AND CONNECTING WIRING

5.5 Remote Mount Cable Connection to Sensor

The ProComm Max transmitter is designed to connect to a single-port converter box mounted on meter. Figure 12 shows the location of the connection port. This design converts flow data and sends it to the ProComm Max transmitter. The length of the cable between the converter and the transmitter is not important because the two devices do not need to be calibrated. This will allow users to swap transmitters in the field if needed, requiring only the SD card in the transmitter to be moved to the replacement unit.

The port on the converter is available as either a cable gland fitting or a quick connect fitting.



Figure 13. Transmitter box mounted on a meter

5.4 Quick Connect Cable Ends (optional)

IMPORTANT
Connections to the sensor must be made with cable supplied by McCrometer specifically for that purpose. Do not substitute the supplied cable with other types of cable, even for short runs.

Quick Connect cable end fittings are optional. If selected at the time of order, follow the instructions below. (Figure 13)

1. Remove the protective caps from both the receiving ports and the cable ends.
2. Insert the cable end into the port until fully seated, then turn the knurled collar on the cable to the right until the cable is tight.
3. With both cables properly attached to the meter, connect the meter-end protective cap to the cable-end protective cap. This insures that the protective caps remain free from dirt.

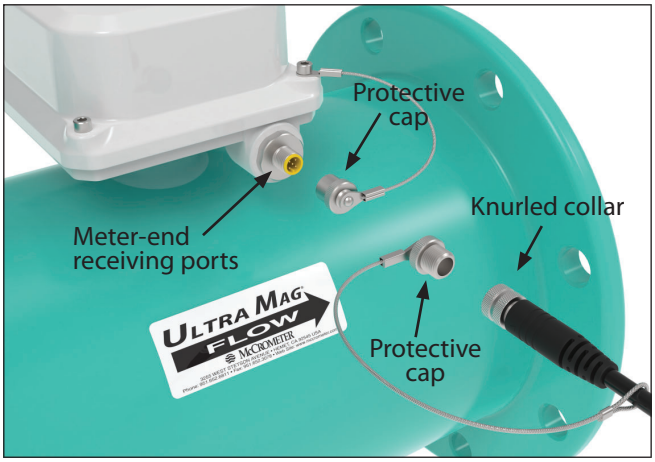


Figure 14. Optional quick connect cable ends

IMPORTANT NOTE: When the cables are not attached to the meter insure that the protective caps are properly secured to cable ends and the receiving ports to insure all connections remain free from dirt.

IMPORTANT
When not in use, always keep the attached cap firmly screwed into the connector to insure a water-tight seal. Also, keep the contacts in the cable connector clean and dry during assembly.

WARNING
EXPLOSION HAZARD. DO NOT CONNECT/ DISCONNECT CONNECTORS OR WIRING OR REMOVE ENCLOSURE LID WHILE WITHIN AN ELECTRICALLY CLASSIFIED HAZARDOUS AREA.

IMPORTANT
To connect sensor and transmitter via quick connect plugs and sockets, only use the supplied cable assemblies from McCrometer.

6.1 Terminal Block Diagram

> ***WARNING!***
> Ensure device is disconnected or circuit breaker is open per the requirements of IEC 60947-1 and IEC 60947-3 before opening the opening the transmitter.

All connections are made on the terminal blocks. To access the terminal blocks, loosen the four screws on the front of the transmitter and open the front panel. The example shown below (Figure 14) does not necessarily represent all transmitter models, however, it shows the placement for all terminal blocks used in all models.

NOTE: The terminal blocks unplug from the circuit board for easy connection.

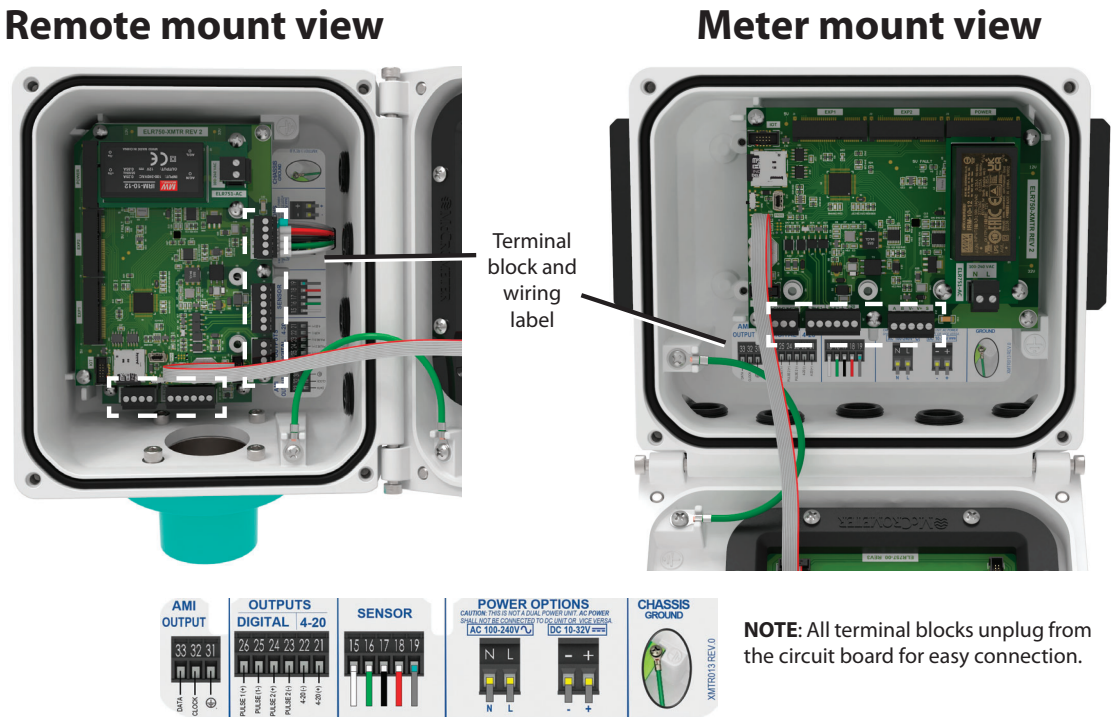
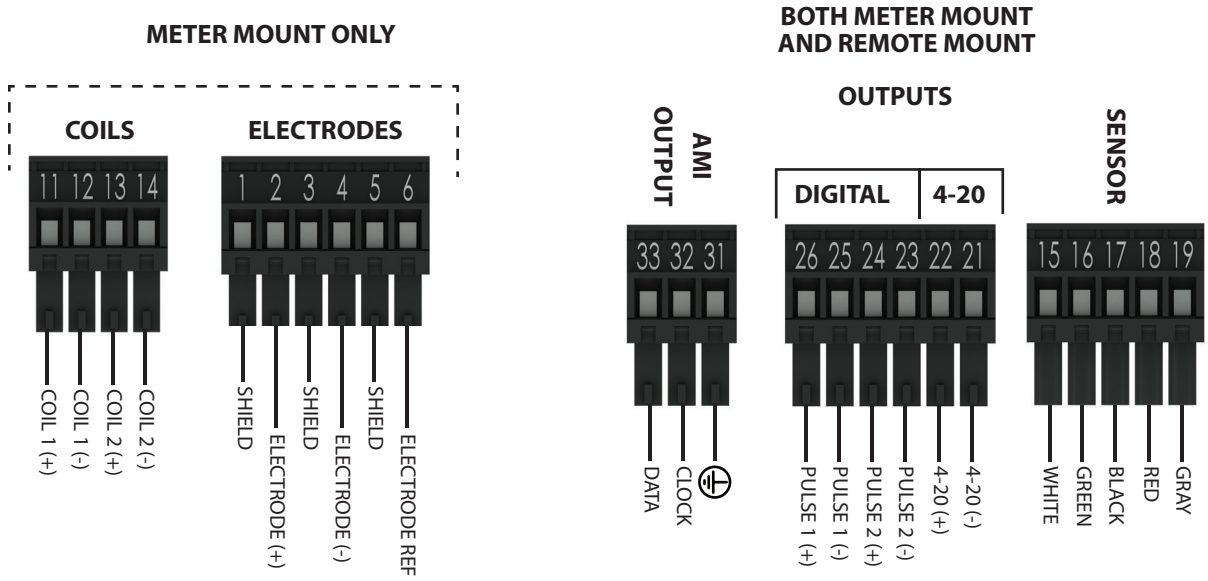


Figure 15. Terminal Block Diagram

6.3 Wiring Diagrams

CAUTION - Always disconnect the power cord before attempting any electrical connections.



Terminal Block Assignments

Terminal	Cable	Wire Color
COILS		
11	COIL 1 (+)	
12	COIL 1 (-)	
13	COIL 2 (+)	
14	COIL 2 (-)	

Terminal	Cable	Wire Color
ELECTRODES		
1	SHIELD	
2	ELECTRODE (+)	
3	SHIELD	
4	ELECTRODE (-)	
5	SHIELD	
6	ELECTRODE REF	

Terminal	Cable	Wire Color
OUTPUTS		
26	PULSE 1 (+)	
25	PULSE 1 (-)	
24	PULSE 2 (+)	
23	PULSE 2 (-)	
22	4-20 (+)	
21	4-20 (-)	

Terminal	Cable	Wire Color
SENSOR		
15	A	White
16	B	Green
17	(-) DC	Black

Terminal	Cable	Wire Color
AMI		
33	DATA	Varies. See section 3.8
32	CLOCK	
31	GROUND	

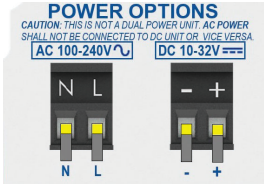
6.2 Installing Expansion Cards

See the ProComm Max IOM manual.

6.4 Transmitter Power Wiring Diagram

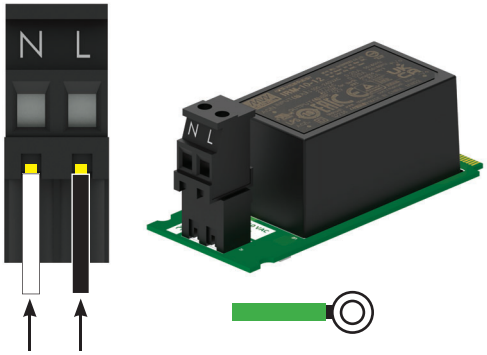
WARNING!
Hazardous supply voltage can shock, burn, or cause death.

These instructions are for connecting either the AC or DC power option. The connections are shown below above the appropriate power card.



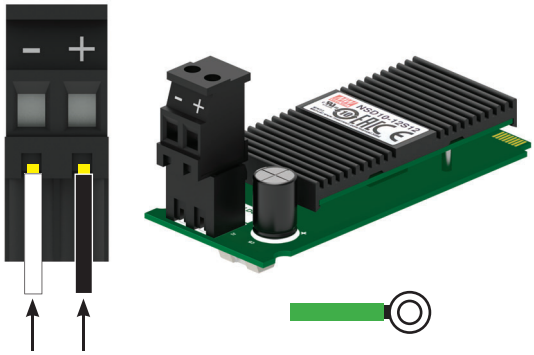
Install the power card as described in section 3.4. Connect power as shown below in Figure 15 and Figure 16.

The power supply line must be equipped with external surge protection for current overload (fuse or circuit breaker with limiting capacity not greater than 10A). It must be easily accessible for the operator and clearly identified.



Neutral Wire (typically a white wire)
Line Wire (typically a black wire)
Ground Wire (typically a green wire)

Figure 16. AC Power Supply Terminal Block

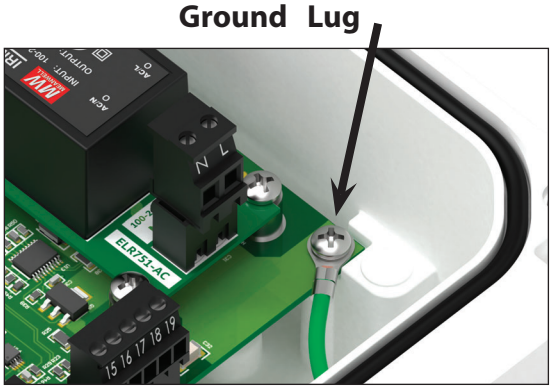


Power Supply (typically a white wire)
Power Supply + (typically a red wire)
Ground Wire (typically a green wire)

Figure 17. Optional DC Power Supply Terminal Block

Chassis Ground Connection

Location of Chassis Ground Lug

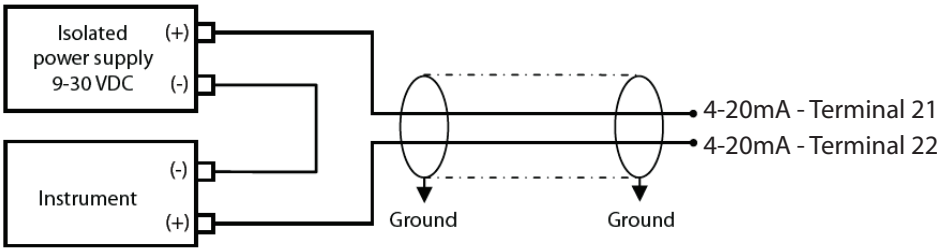


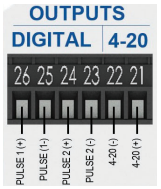


AC power card at left as an example of the ground connection.

6.6 4-20mA Hook-Up

Output type: 4-20mA current loop, sink powered (passive)





Output type: 4-20mA current loop, source powered (active)

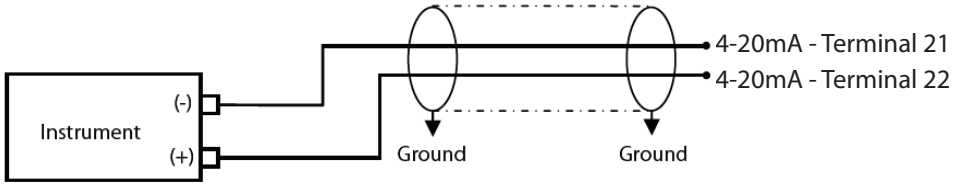


Figure 18. 4-20mA Hook-Up

If the external device requires a voltage input, a precision resistor placed across the input terminals of the external device will change the current to voltage. Calculate the required resistor using Ohm's law (V = I x R). For example, a 250Ω resistor will provide an input voltage of one to five volts with the transmitter range being set from 4mA to 20mA. An additional 4-20mA loop output is available.

Meter source power is 12V for loop power. Max resistance with source power is 300 ohms. Sink power supplied for loop from external device range is 12 – 30 V DC. Max resistance with external sink power is Rmax = 50 * (V in – 5)

IMPORTANT
The 4-20mA output can be sink or source powered which is selectable in the menus. Default setting is source powered to avoid damage to the circuit. Do not select source powered if the 4-20 loop has sink power from the 4-20 instrument.

6.5 Opto-Isolated Pulse Output Hook Up

The outputs are open collector solid state relay outputs used to communicate with or activate external devices.

- Opto-isolated solid state relay open collector
- Maximum switching voltage: 80 VDC
- Maximum switching current: 8 ohms
- Isolation from other secondary circuits: 500 V
- Pulse width range 5ms – 1 second

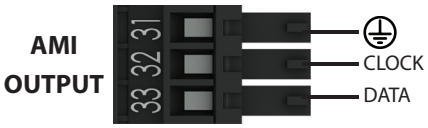
6.8 Optional Smart Output Hook Up

The transmitter comes pre-wired with an interconnection that should readily connect to most AMI transceivers. Where interconnective devices are not mechanically compatible or where non-standard wiring is encountered, the installer can opt to remove the connector from the end of the transmitter's interface cable and make direct connection via the wiring table shown at right.

- Signals and associated wire colors in the McCrometer SmartOutput™ interface cable are identified together in the top row of the table at right.
- Corresponding wire colors for transceivers from each compatible AMI vendor are identified in the columns under the top row.

McCrometer AMR Interface Pinout

	33 Data	32 Power/Clock	31 Ground
Badger	Red	Green	Black
Elster	Green	Red	Black
Itron	Black	Red	Green
Neptune	Black	Red	Green
Sensus	Red	Green	Black
SmartTrax	Brown	Black	Gray



6.7 Connecting the SmartTrax Remote Transmitting Unit

The SmartTrax remote telemetry unit must be installed separately from the transmitter, regardless of whether the transmitter is remote or integral.

The example configuration in section 2.2 shows the SmartTrax with an optional solar panel. If you use a solar panel or an external AC or DC power source, you will need to use the female connection shown in Figure 18 and Figure 19.

For specific wiring diagrams to connect the transmitter to the transmitter, see Figure 20 and Figure 21.

For more detail on the SmartTrax transmitter, including specifications, installation requirements, location, and remote data access, see the SmartTrax Installation, Operation, and Maintenance manual, 30125-82.

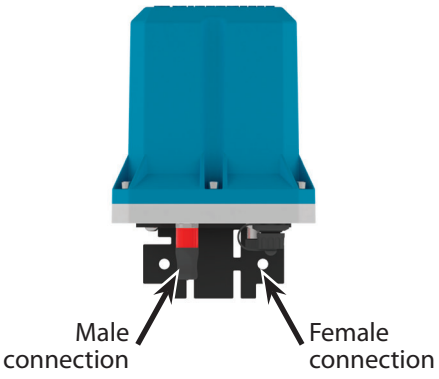


Figure 19. Connections, front view

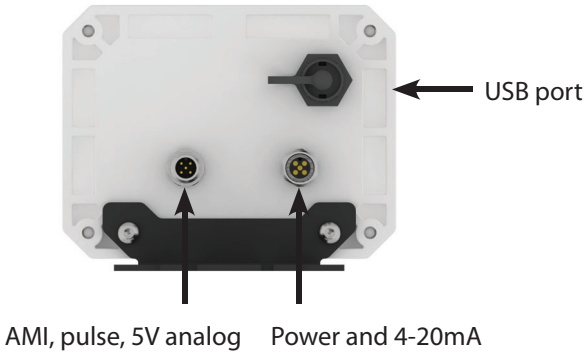


Figure 20. Connections, bottom view

6.10 Pin-out of Male and Female Connectors

FEMALE CABLE

4-20mA & Power Connector



Figure 21. Pin-out of Female Connector

PULSE 1 & 2		
FUNCTION	**COLOR**	**TERMINAL***
PULSE 1	BLUE	26
PULSE 2	WHITE	24
GROUND	BLACK	23, 25

AMI		
FUNCTION	**COLOR**	**TERMINAL***
DATA	BLUE	33
CLOCK	WHITE	32
GROUND	BLACK	31

5V ANALOG	
5V OUTPUT	BROWN
ANALOG IN	GRAY
GROUND	BLACK

* Indicates terminal on PCB (page 7).

MALE CABLE

Pulse / AMI / 5V Analog Connector

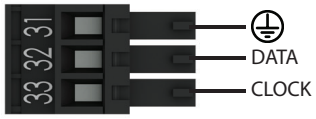


Figure 22. Pin-out of Male Connector

4-20mA	
4-20mA -	WHITE
4-20mA +	BROWN

DC POWER / SOLAR	
9-30 VDC+	BLUE
GROUND / V-	BLACK

AMI OUTPUT



6.9 Installing the SmartTrax Optional Solar Panel

The optional solar panel can be installed as shown in Figure 21. The solar panel has a nominal power rating of 5.1W.

Install the solar panel adjacent to the SmartTrax unit so that the two can be connected with the 6' cable. Connect the cable from the solar panel to the female connection (Figure 18).

If the cable is not connected to the solar panel, refer to the wiring diagram shown in Figure 19 and Figure 20.

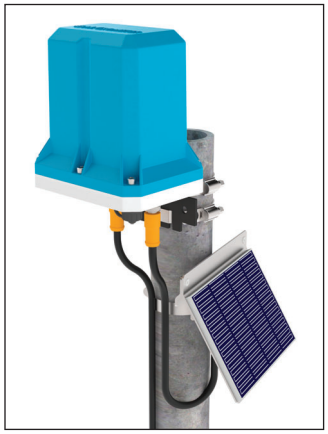


Figure 23. SmartTrax with attached solar panel

7.0 SENSOR GROUNDING

Meter Grounding Recommendations

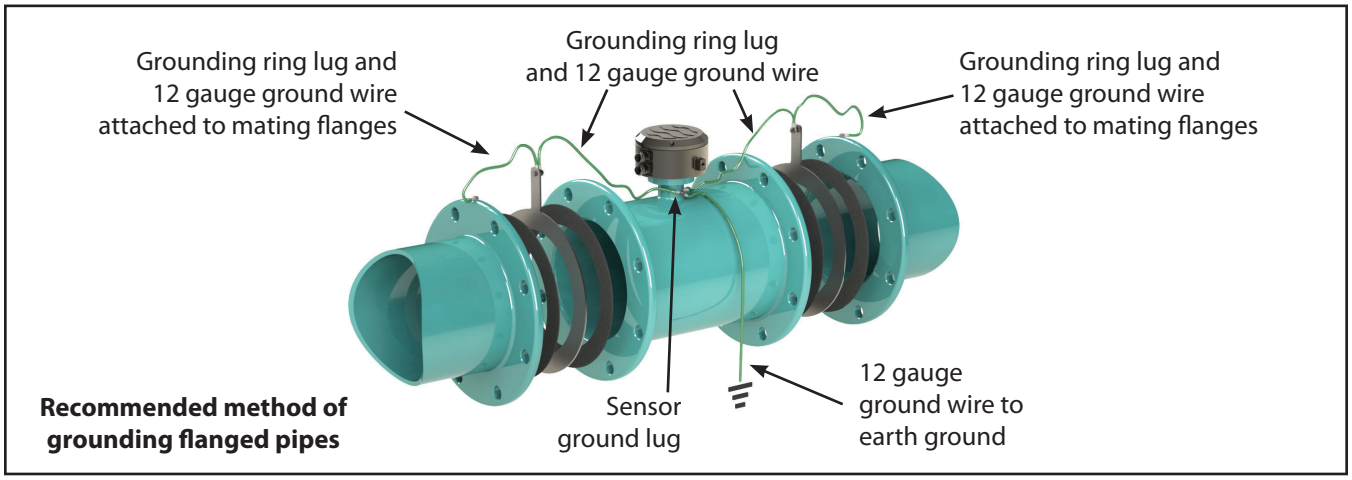
Grounding the meter body for safety according to national (NEC) or local electrical codes is recommended on ALL meter installations.

All Ultra Mag flow meter installations require minimum grounding with a 12-gauge ground wire to an earth ground.

Flanged end meters

When installing into a PVC or plastic pipe system, grounding rings for flanged meters are recommended for all sizes. Flanges on the Ultra Mag sensor have a non-conductive coating and may not require grounding rings. For best performance, McCrometer provides grounding rings for all sizes.

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.



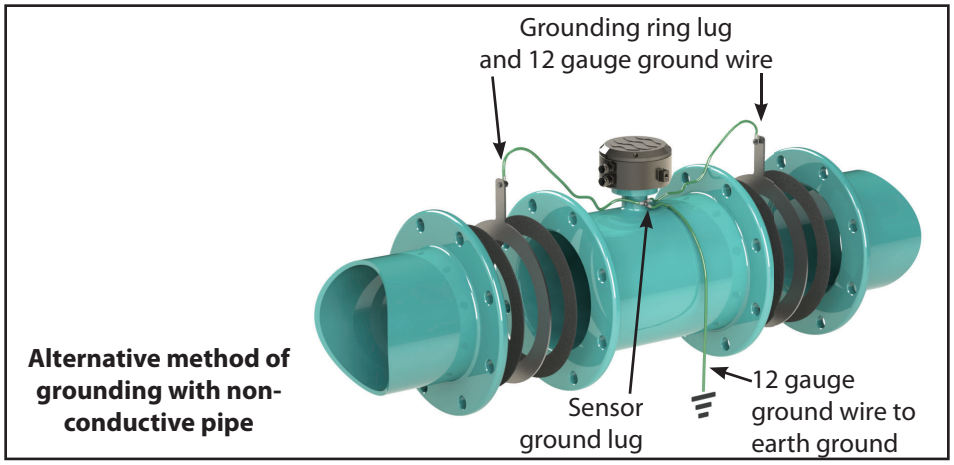
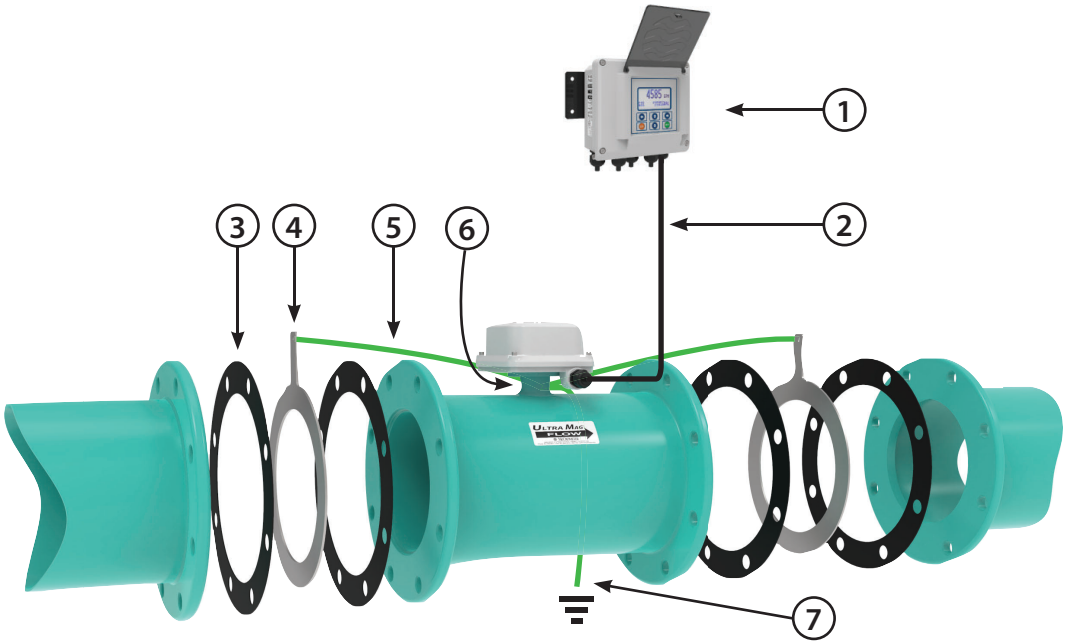


Figure 24. Sensor grounding

8.0 REPLACEMENT PARTS



The image above is representative for all Ultra Mag meter models and sizes.

NO.	PART NUMBER	DESCRIPTION
1	PH5-RA1	AC Transmitter 4-20mA Output
1	PH5-RD1	DC Transmitter 4-20mA Output
1	PH5-RA1MOD-R	AC Transmitter w/ Modbus RS485 Communications Protocol
1	PH5-RD1MOD-R	DC Transmitter w/ Modbus RS485 Communications Protocol
2	15050-XX	Cable - Submersible
3	1-1557-*	Gaskets (Optional)
4	3-2781-*	Grounding Rings, Stainless Steel (Optional on 4"-12")
5	3-2757-‡‡	Grounding Wire Assembly (opposite side of meter)
6	1-1201-10	Nut, Hex, Brass (opposite side of meter)
7	15029	Earth Ground Wire (opposite side of meter)

*** INSERT METER SIZE TO COMPLETE PART NUMBER - INSERT -02 FOR 2", -04 FOR 4", -06 FOR 6", ETC.**
‡‡ -W = 2" - 16" -14 = 14" - 20" -24 = 24" - 30" -36 = 36" - 48"

When ordering replacement parts, please specify: Meter Size • Meter Model • Meter Serial Number

9.0 SPECIFICATIONS, WEIGHTS, AND DIMENSIONS

9.1 Flow Meter Specifications

8.1 Physical Specifications

Measurement Method	Electromagnetic flow based on Faraday's Law
Directionality	Forward and reverse flow indication and forward, reverse, net totalization are standard with all meters
Pipe Sizes	Ultra Mag 3000: 1½, 2", 2½, 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24" Ultra Mag 5000: 1½, 2", 2½, 3", 4" 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36", 42", 48"
Body Style	Flanged tube
Liner	206N
Electrodes	Type 316 stainless steel, Hastelloy optional
Electrode Shape	Standard shape
Electrical Connections	• Compression gland seals • Quick-Connect
Signal Transmitter	• Ultra Mag 3000: ProComm GO transmitter • Ultra Mag 5000: ProComm Max transmitter
Transmitter Mount	Either meter mount or remote mount
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 ProComm GO • **Custom 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 quick connect cables at additional cost.

8.2 Performance and Operational Specifications

Process Fluid Temperature	-10 to 60 °C (14 to 140 °F)
Ambient Temperature	-10 to 60 °C (14 to 140 ° F)
IP Rating	• Quick Connect (NEMA 6P/IP68 with remote transmitter) • Compression gland seals (NEMA 6P/IP68 with remote transmitter)
Sensor Submersibility Depth	**With standard strain relief cable:** 1.8 m (6 ft.) **With optional quick connect cable:** 9 m (30 ft.)
Pressure Rating	• AWWA CL D, 150 PSI maximum working pressure • ANSI #150, 285 PSI maximum • ANSI #300, 500 PSI maximum
Velocity Range	0.2 to 32 FPS

Flow Meter Specifications (cont.)

9.2 Performance and Operational Specifications (cont.)

Accuracy	• Ultra Mag 3000: Battery powered: 1% of measured value ±0.006 ft/s (±0.0018 m/s) • Ultra Mag 5000: Standard: +/- 0.5% of measured value ±0.006 ft/s (±0.0018 m/s) Optional: +/- 0.2% of measured value ±0.006 ft/s (±0.0018 m/s) **IMPORTANT NOTICE ON FLOW METER ACCURACY:** The Ultra Mag 3000 flow meter with remote display's cable and electronics are factory calibrated for accuracy as a single unit. Changing the cable length, even with the splice kit, changes the accuracy of the meter and invalidates the calibration certificate. The Ultra Mag 5000 flow meter does not have this restriction. Multiple point wet flow calibrations are conducted on every complete flow tube with its signal transmitter. 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 ±0.15%.
Repeatability	±0.05% or ±.0008ft/s (±0.25mm/s), whichever is greater
Head Loss	None. No obstruction in line and no moving parts
Conductivity	5 µs/cm
Pipe Run Requirements	**3000:** 1½" to 3" Flanged style meters — 0D upstream / 0D downstream 4" - 24" Steel flanged meters — 2D upstream / 1D downstream **5000:** 1½" to 3" Flanged style meters — 0D upstream / 0D downstream 4" - 48" Steel flanged meters — 1D upstream / 0D downstream

9.3 Other Specifications

Certifications and Approvals	**Standard model:**
	• ISO 9001:2015 certified quality management system
	• Certified by MET to UL 61010-1
	• Certified to NSF / ANSI Standards*
	HL Model:
	• ISO 9001:2015 certified quality management system
	• Certified by MET to UL 61010-1 and MET C22.2 No. 61010-1-04
	  • Class I, Division 2, Groups A B C D, T4
	  • Class I, Zone 2, IIC T4
	• Certified to NSF / ANSI Standards*

System Options	Stainless steel ID tag
Meter Options and Accessories	• Extended warranty • Hastelloy® electrodes • ANSI flanges • Special lay lengths, including ISO standard lay lengths • Additional sensor cable up to 475' • Quick connect cable fittings • Transmitter sun shield • Smart Output™ (Sensus or Itron compatible) • Battery or battery-solar powered transmitter (ProComm GO only)
Warranty	**Meter:** 2 year warranty **Liner:** Lifetime guarantee

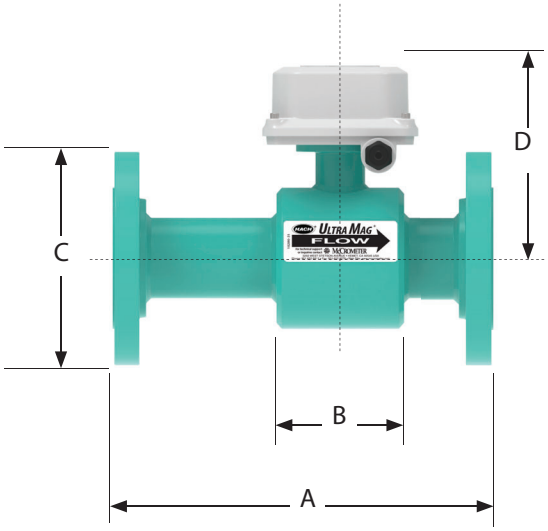
* Certified by IAPMO R&T to NSF/ANSI 61 for material safety and NSF/ANSI 372 for low lead content.

9.4 Flow Meter Dimensions and Weights

1½" to 3" Models

Pipe Size (Nominal)	Flow Ranges (0.2 to 32 FPS) Min-Max GPM	DIMENSIONS (Lay Lengths)							Est. Shipping Weight (lbs.)*	
		A		B	C		D			
		CL150 ANSI 150#	CL300 ANSI 300#		CL150 ANSI 150#	CL300 ANSI 300#	CL150 ANSI 150#	CL300 ANSI 300#	CL150 ANSI 150#	CL300 ANSI 300#
1 ½"	1.29-200	11	14	4.5	5.0	6.1	6.5	7.25	93	not offered
2"	1.29-200	11	14	4.5	6.0	6.5	6.5	7.25	93	70
2 ½"	3.25-510	13.4	15.5	4.5	7.0	7.5	7.0	7.75	94	not offered
3"	3.25-510	13.4	15.5	4.5	7.5	8.25	7.0	7.75	94	80

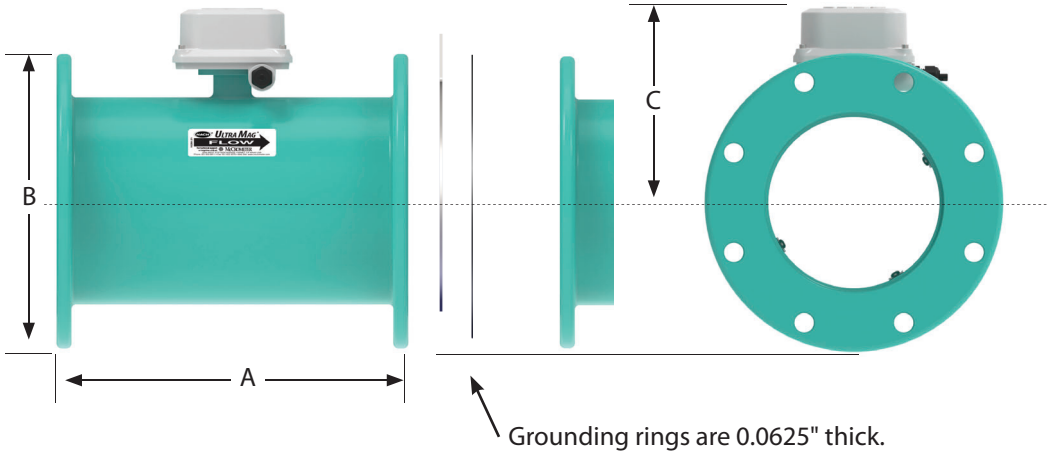
* For remote mount meters, add 4 lbs for ProComm Max transmitter.



4" to 12" Flanged End Body Style

Pipe Size (Nominal)	Flow Ranges (0.2 to 32 FPS) Min-Max GPM	DIMENSIONS (Lay Lengths)									Est. Shipping Weight (lbs.)*		
		A			B			C					
		AWWA	ANSI		AWWA	ANSI		AWWA	ANSI		AWWA	ANSI	
		150# Class D	150# CL150	300# CL300	150# Class D	150# CL150	300# CL300	150# Class D	150# CL150	300# CL300	150# Class D	150# CL150	300# CL300
4"	6.97-1110	13.4	13.4	13.4	9.0	9.0	10.0	9.25	9.25	9.25	86	167	167
6"	16.1-2560	14.6	14.6	14.6	11.0	11.0	12.5	10.25	10.25	10.25	98	186	186
8″	29.2-4670	16.1	17.25	17.25	13.5	13.5	15.0	11.25	11.25	11.25	118	250	250
10″	46.3-7400	18.5	18.5	18.5	16.0	16.0	17.5	12.5	12.5	12.5	168	290	290
12″	67.3-10760	19.7	19.7	19.7	19.0	19.0	20.5	13.5	13.5	13.5	210	350	350

*Shipping weights are estimated and may change due to specific order packaging

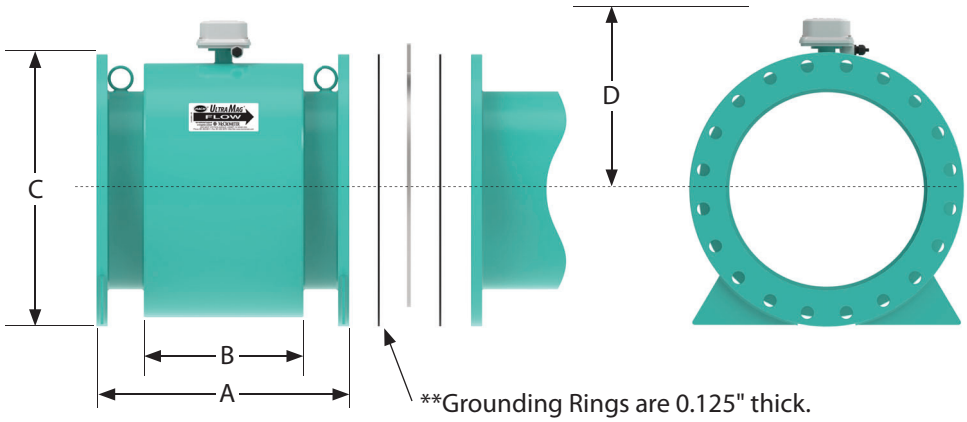


Flow Meter Dimensions and Weights (cont.)

14+" Flanged End Body Style

Pipe Size (nom.)	Flow Ranges (0.2 to 32 FPS) Min-Max GPM	DIMENSIONS										Est. Shipping Weight (lbs.)*			
		A				B	C				D**				
		AWWA		ANSI			AWWA		ANSI			AWWA		ANSI	
		150# Class D	300# Class F	150# CL150	300# CL300		150# Class D	300# Class F	150# CL150	300# CL300		150# Class D	300# Class F	150# CL150	300# CL300
14"	90.1-14410	21.70	22.75	22.75	22.75	10.38	21.00	23.00	21.00	23.00	13.56	290	370	370	550
16"	117-18670	23.60	25.25	25.25	25.25	12.38	23.50	25.50	23.50	25.50	14.31	352	443	443	639
18"	149-23820	23.60	25.25	25.25	25.25	12.38	25.00	28.00	25.00	28.00	15.31	400	492	492	801
20"	186-29600	25.60	28.25	28.25	28.25	14.38	27.50	30.50	27.50	30.50	16.25	465	603	603	973
24"	269-43040	30.70	35.75	35.75	35.75	18.88	32.00	36.00	32.00	36.00	18.25	658	864	864	1373
30"	418-66740	35.80	41.75	41.75	41.75	22.38	38.75	43.00	38.75	43.00	21.87	1067	1463	1463	2150
36"	607-97000	46.10	46.10	46.10	46.10	21.38	46.00	50.00	46.00	50.00	24.87	1529	2083	2083	3125
42"	831-132900	48.05	not offered	48.05	not offered	21.38	52.75	not offered	52.75	not offered	27.56	2113	2852	contact factory	
48"	1091-174440	50.00		50.00		21.38	59.50		59.50		30.56	2445	3139		

*Shipping weights are estimated and may change due to specific order packaging
** DIM D represents the remote transmitter height in relation to the meter centerline.



9.5 ProComm Max Transmitter Specifications

Physical Specifications

Electronic Housing	Diecast aluminum, powder coated enclosure w/ tamper resistant seal
Transmitter 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)
Power	AC Power: 100-240 VAC / 47-66 Hz (10 W) DC Power: 10-35 VDC (10 W) Note: AC or DC must be specified at time of ordering.
Connection Options	Conduit option: 1/2" NPT threaded connections
Galvanic Isolation	All outputs are galvanically isolated from power supply up to 500 V
Conductivity	Minimum conductivity of 5µS/cm

Performance and Operational Specifications

Location	Indoor or outdoor use
Operating and Storage Temperature	-4° to 140° F (-20° to 60° C)
IP Rating	IP67 Die cast aluminum transmitter
Standard Outputs	Single 4-20mA (standard). Galvanically isolated and fully programmable for zero and full scale. A second 4-20mA is available. Two separate digital programmable outputs: open collector transistor usable for pulse, frequency, or alarm settings. • Volumetric Pulse • Range Indication • Maximum switching voltage: 35 VDC • Maximum switching current: 100mA • Insulation from other secondary circuits: 500V
Optional Outputs	• Modbus • HART • Ethernet IP • Datalogger • Smart Output™ (Sensus, Itron 6, Itron 9)

Display and Measurement

Keyboard and Display	Can be used to access and change set-up parameters using six membrane keys and an LCD display
Units	GAL Gallons; CUF Cubic Feet; AFT Acre Feet; CUM Cubic Meters; LIT Liters; MML Megaliter; MTT Metric Ton (KL); B31 Barrel (31G); B42 Barrel (42G); B46 Barrel (46G); B55 Barrel (55G); IMG Imperial Gallon; AIN Acre Inch; TON Ton (Short); MM1 Miners Inch Minute (11.22G); MM9 Miners Inch Minute (9G); MH1 Miners Inch Hour (11.22G); MD1 Miners Inch Day (11.22G); MH9 Miners Inch Hour (9G); MD9 Miners Inch Day (9G); KGL Kilo Gallons; MGL Mega Gallons; IN3 Cubic Inch

Other Specifications

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

HL Model	• ISO 9001:2015 certified quality management system
	• Certified by MET to UL 61010-1 and MET C22.2 No. 61010-1-04
	  • Class I, Division 2, Groups A B C D, T4
	  • Class I, Zone 2, IIC T4	

IMPORTANT
Refer to certification requirements. Do not substitute components.

9.6 ProComm Max Transmitter Dimensions

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

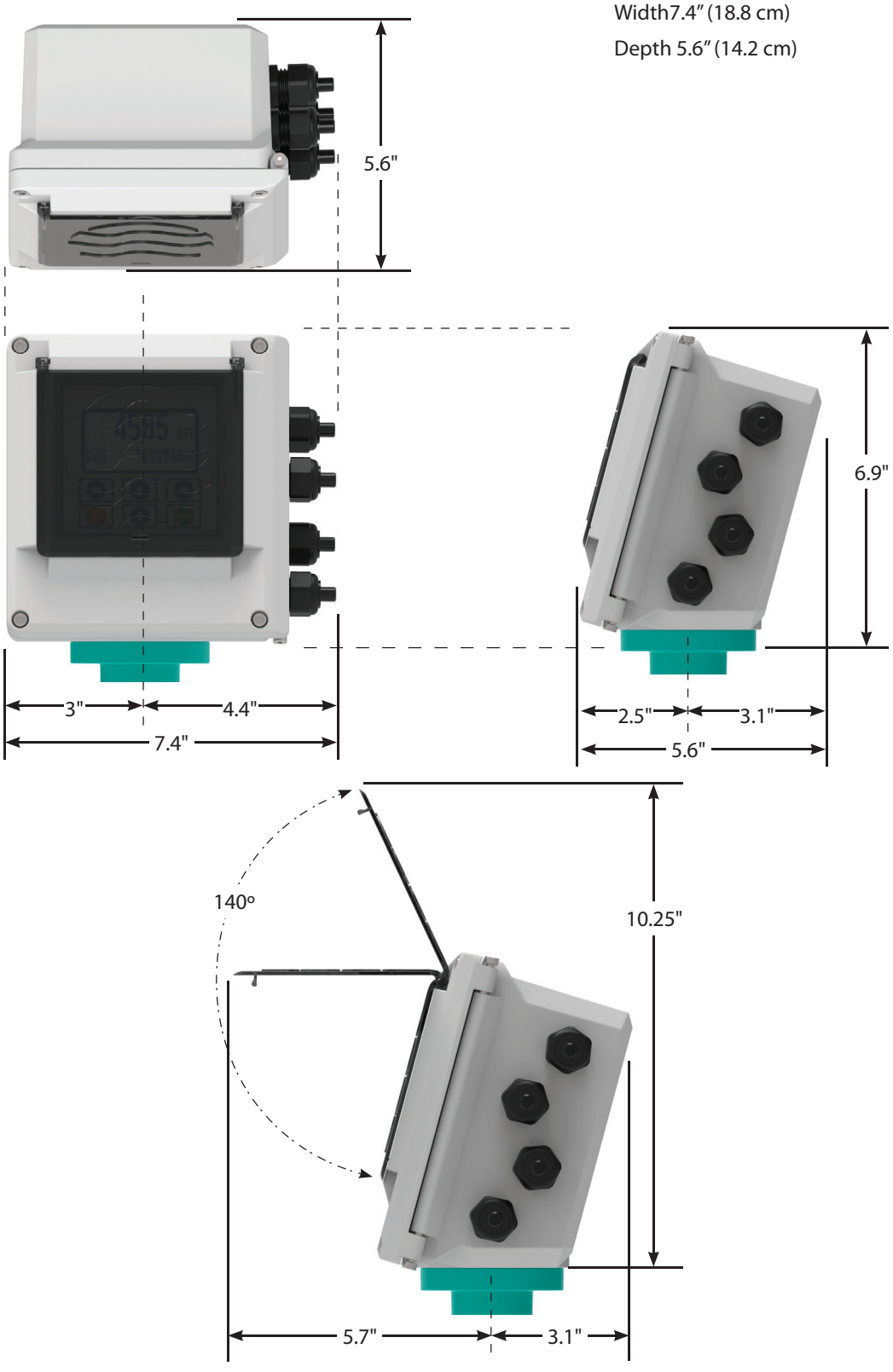
HL Model	• ISO 9001:2015 certified quality management system
	• Certified by MET to UL 61010-1 and MET C22.2 No. 61010-1-04
	  • Class I, Division 2, Groups A B C D, T4
	  • Class I, Zone 2, IIC T4	

IMPORTANT
Refer to certification requirements. Do not substitute components.

11.0 DIMENSIONS

Meter Mount Transmitter Dimensions

Height 6.9" (17.6 cm)
Width7.4" (18.8 cm)
Depth 5.6" (14.2 cm)



10.0 RETURNING A UNIT FOR REPAIR

If the unit needs to be returned to the factory for repair, please do the following:

- Prior to calling for a return authorization number, determine the model number, serial number, and reason for return.
- Contact McCrometer Customer Service Department and ask for a Return Authorization (RA) number.
  - Telephone: 1-800-220-2279
  - Email: customerservice@mccrometer.com
- Please make sure the meter is clean and free from foreign debris prior to shipping. McCrometer may charge a cleaning fee if the meter is sent without being cleaned.
- Ship the meter in the original packaging, if possible. Do not ship manuals, power cords, or other parts with your unit unless required for repair.
- Write the RA number on the outside of the shipping box. All return shipments should be insured.
- Address all shipments to:

  McCrometer, Inc.
  RMA #
  3255 W. Stetson Avenue
  Hemet, CA 92545

WARRANTY

This Warranty shall apply to and be limited to the original purchaser consumer of any McCrometer product. Meters or instruments defective because of faulty material or workmanship will be repaired or replaced, at the option of McCrometer, free of charge, FOB the factory in Hemet, California, within a period of two (2) years from the date of delivery.

Repairs or modifications by others than McCrometer or their authorized representatives shall render this Warranty null and void in the event that factory examination reveals that such repair or modification was detrimental to the meter or instrument. Any deviations from the factory calibration require notification in writing to McCrometer of such recalibrations or this Warranty shall be voided.

In case of a claim under this Warranty, the claimant is instructed to contact McCrometer Inc., Attn: Technical Support, 3255 W. Stetson Ave., Hemet, California 92545, and to provide an identification or description of the meter or instrument, the date of delivery, and the nature of the problem.

The Warranty provided above is the only Warranty made by McCrometer with respect to its products or any parts thereof and is made expressly in lieu of any other warranties, by course of dealing, usages of trade or otherwise, expressed or implied, including but not limited to any implied warranties of fitness for any particular purpose or of merchantability under the uniform commercial code. It is agreed this Warranty is in lieu of and buyer hereby waives all other warranties, guarantees or liabilities arising by law or otherwise. Seller shall not incur any other obligations or liabilities or be liable to buyer, or any customer of buyer for any anticipated or lost profits, incidental or consequential damages, or any other losses or expenses incurred by reason of the purchase, installation, repair, use or misuse by buyer or third parties of its products (including any parts repaired or replaced); and seller does not authorize any person to assume for seller any other liability in connection with the products or parts thereof. This Warranty cannot be extended, altered or varied except by a written instrument signed by seller and buyer.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

McCrometer reserves the right to make improvements and repairs on product components which are beyond the Warranty period at the manufacturer's option and expense, without obligation to renew the expired Warranty on the components or on the entire unit. Due to the rapid advancement of meter design technology, McCrometer reserves the right to make improvements in design and material without prior notice to the trade.

All sales and all agreements in relation to sales shall be deemed made at the manufacturer's place of business in Hemet, California and any dispute arising from any sale or agreement shall be interpreted under the laws of the State of California.



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