FC101 FlowCom Register

Installation, Operation and Maintenance Manual

30119-50 Rev. 2.5
August 5, 2021

McCROMETER

Contents

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 Health and Safety Administration (OSHA) regulations concerning Personal Protective Equipment, confined-space entry, and exposure to bloodborne pathogens. Specific requirements can be found in the OSHA section of the Code of Federal Regulations: *29 CFR, 1910.132 - 1910.140, Personal Protective Equipment; CFR Title 29, Part 1910.146, Permit-Required Confined-Spaces; and 29 CFR, 1910.1030, Bloodborne Pathogens.*

WARNING!
Never enter a confined space without first 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.

WARNING!
Pressurized pipes should only be tapped, cut, or drilled by qualified personnel. If possible, depressurize and drain the pipe before attempting any installation.

1.0 INTRODUCTION

1.1 Description

The FlowCom Register displays a flowmeter's flowrate and volumetric total. Available are optional outputs: scaled pulse and/or industry standard 4-20mA signal. The FlowCom can be fitted to any new or existing Water Specialties propeller flowmeter.

1.2 Features

- Retrofits to any existing McCrometer Mc Propeller Flowmeter
- Four output options: Contact Closure, Open Collector, Optically Isolated, and 4-20mA Loop
- Unique Units of Measurement for Rate, Total, 4-20mA and Pulse Outputs
- 6–10 Year Battery Life
- NEMA 4X Enclosure with Non-intrusive Register Programming
- Remote and Meter-Mounted Models
- Factory sealed enclosure protects electronics

1.3 Model Number Identification

Mc Propeller FC101 - XX - X - _____ - _____

Required: XX - X

Options: _____ - _____

Output

No Output	**00**
Open Collector	**01**
4-20mA, Optically Isolated Pulse *	**02**
4-20mA, Contact Closure *	**03**
Open Collector (Quick Connect)	**05**
Sensus	**06**
Sensus Open Collector	**07**
4-20mA, Optically Isolated Pulse Sensus *	**08**
4-20mA, Relay Sensus *	**09**
Sensus RM	**16**

*These output options require 420mA/DC power.

Mounting Style

Sold with Meter	**M**
Retrofit (Register only)	**R**
Kit (Register, sensor, cable)	**K**
Retro for W.S. trans. mount	**RT**

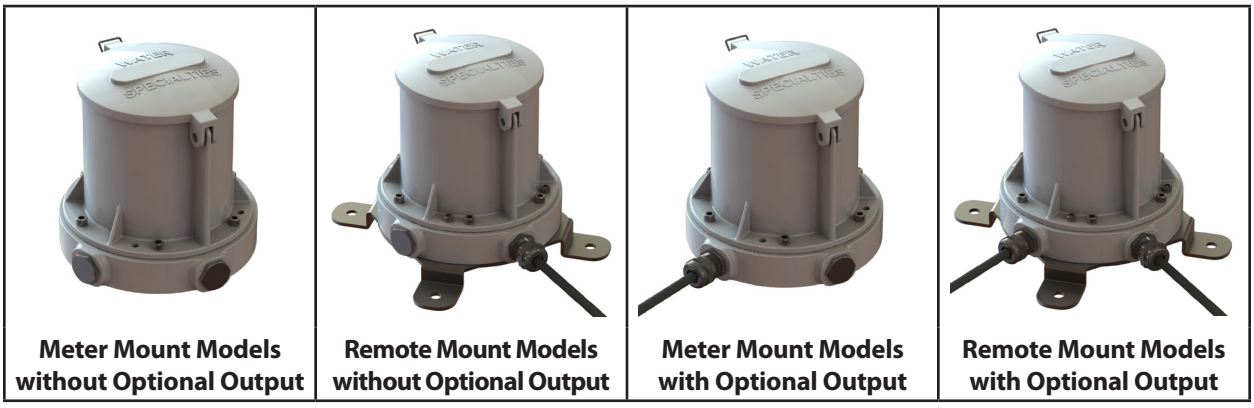
Remote

6'	**RM06**
25'	**RM25**
50'	**RM50**

***Output Cable**

6'	**OC06**
25'	**OC25**
50'	**OC50**
75'	**OC75**
100'	**OC100**
125'	**OC125**
150'	**OC150**

*Output Cable Option is ONLY available with Outputs of 01, 02 or 03.



Meter Mount Models without Optional Output | **Remote Mount Models without Optional Output** | **Meter Mount Models with Optional Output** | **Remote Mount Models with Optional Output**

2.0 INSTALLATION

After unpacking the register assembly, verify that the meter serial number engraved on the enclosure lid is correct. Then confirm the information on a white label located on the bottom of the base plate (Figure 1.)

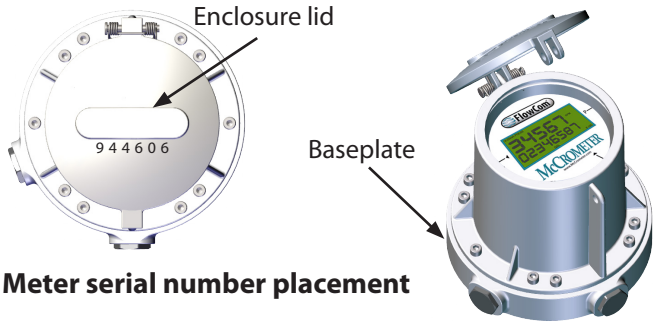


Figure 1. Meter serial number placement

2.1 Mechanical-to-FlowCom Conversion Kit Installation - Meter Mount

Note: For remote mount retrofit, see section 2.2.

Check the parts received against the parts list and Figure 2 and Figure 3 below. Contact the factory to report any discrepancies.

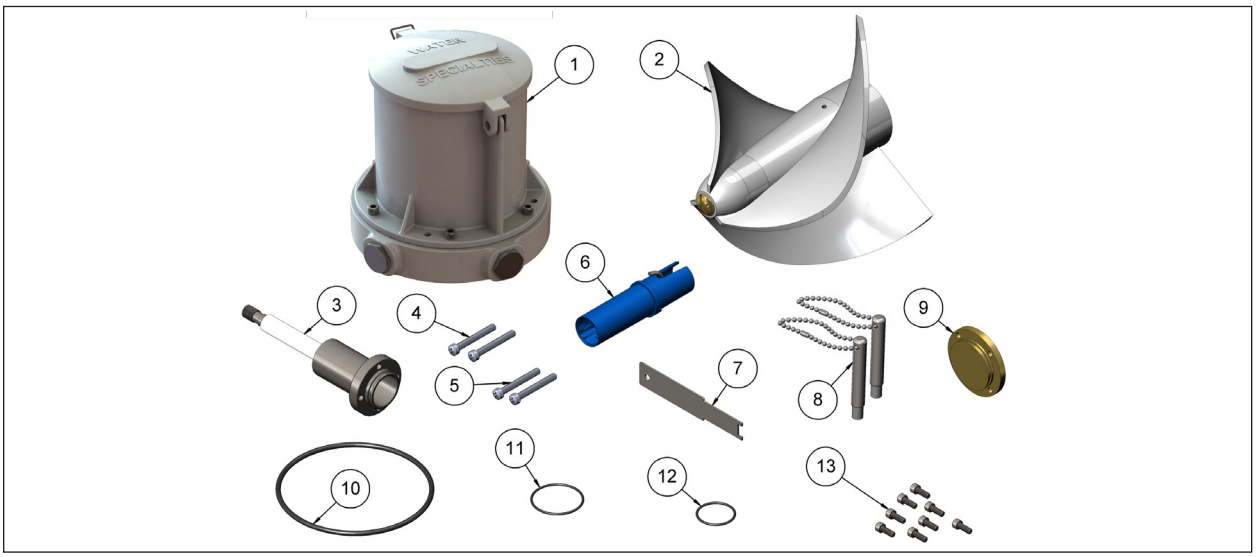


Figure 2. Conversion kit - FC101-00-K, meter mount

Parts Diagram	Description	Quantity	Part Number
1	FlowCom Unit	1	FC101-01
2	Propeller Assembly	1	
	Bagged parts:		
3	Separator	1	4-2455-2-D
4	Screw 10-32 x 1.25" Long	2	10730
5	Screw 10-32 x 1.25" Long w/hole	2	10830
6	Sensor	1	4-2745-2
7	Reverse Thrust Brg Tool	1	T-2402X-1
8	Magnet Wand	2	FC100-M
9	Back Plate	1	2-2731-SS
10	O-Ring (243 Buna)	1	1-1551-38
11	O-Ring (028 Buna)	1	1-1551-2
12	O-Ring (022 Buna)	1	1-1551-24
13	Screw 8-32 x 7/16 SOC HD	8	1-1103-8-7

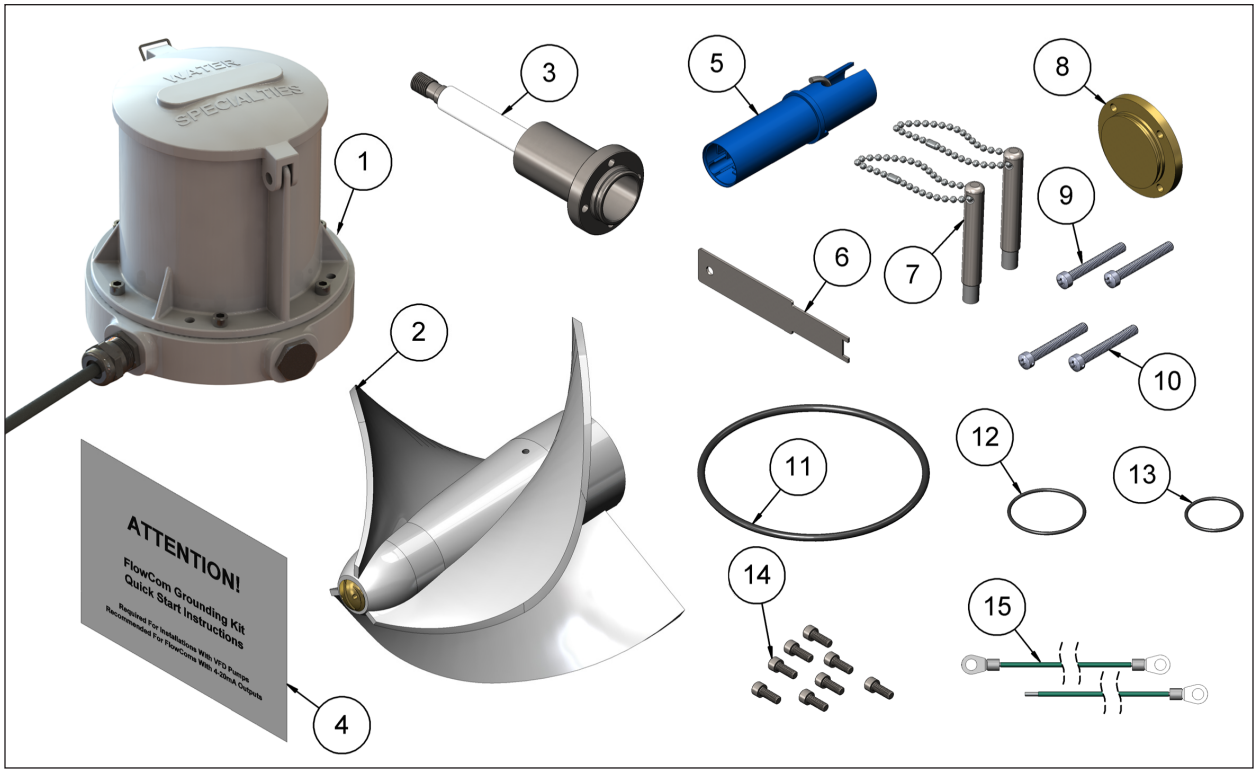


Figure 3. Conversion kit - FC101-01-K, FC101-02-K, FC101-03-K, meter mount

Parts Diagram	Description	Quantity	Part Number
1	FlowCom Unit	1	FC101-01
2	Propeller Assembly	1	
	Bagged parts:		
3	Separator	1	4-2455-2-D
4	Grounding Kit Instructions	1	30110-18
5	Sensor	1	4-2745-2
6	Reverse Thrust Brg Tool	1	T2402X-1
7	Magnet Wand	2	FC100-M
8	Back Plate	1	2-2731-SS
9	Screw 10-32 x 1.25″ Long	2	10730
10	Screw 10-32 x 1.25″ Long w/hole	2	10830
11	O-Ring (243 Buna)	1	1-1551-38
12	O-Ring (028 Buna)	1	1-1551-2
13	O-Ring (022 Buna)	1	1-1551-24
14	Screw 8-32 x 7/16 SOC HD	8	1-1103-8-7
15	Green Wire	1	3-2757-FCW

STEP 1: Remove the flowmeter.

Remove pressure from the pipeline.

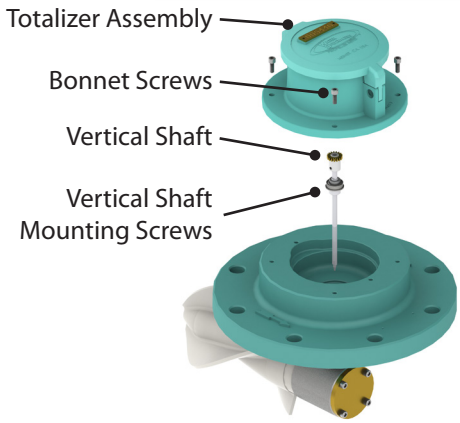
Remove the entire flowmeter from the pipeline.

CAUTION!
Never remove a meter or top plate assembly while the line is under pressure!

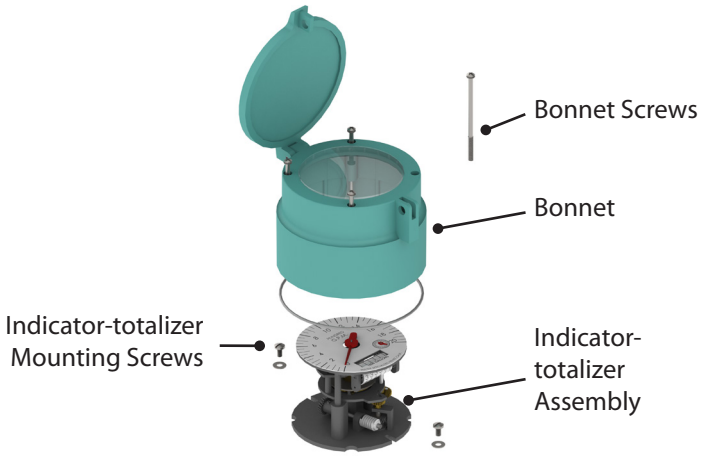
STEP 2: Remove the totalizer assembly.

Remove the entire totalizer or indicator-totalizer register assembly. Register models with totalizers have four bonnet screws and models with both the indicators and totalizers have four bonnet screws and two register screws. Remove the shaft.

For ML and LP meters: Remove the V-shaft by loosening the two screws holding the V-shaft from the inside of the meter head.



For ML and LP meters with extensions and for OF and VF meters: Pull vertical shaft out only enough (approximately 1") for removal of miter gear frame assembly so that the vertical shaft can be used later for pulling the sensor input cable out of the drop pipe.



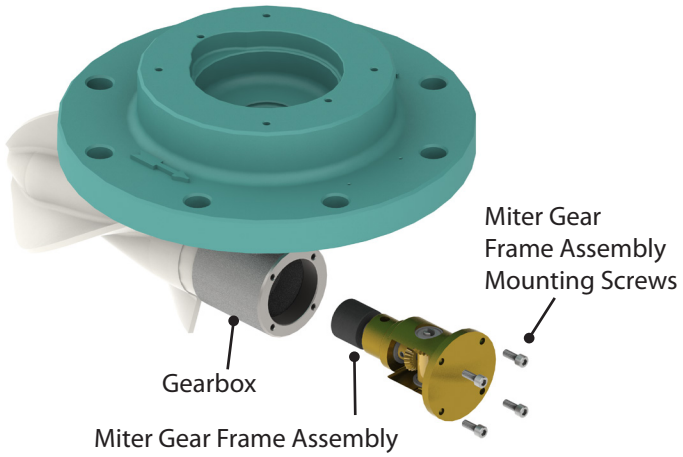
STEP 3: Remove the gearbox assembly.

For ML, LP, and OF meters:

Remove the miter gear frame assembly by releasing the four screws out of the back of the gearbox.

Caution: The gearbox oil will begin draining as soon as the seal is broken.

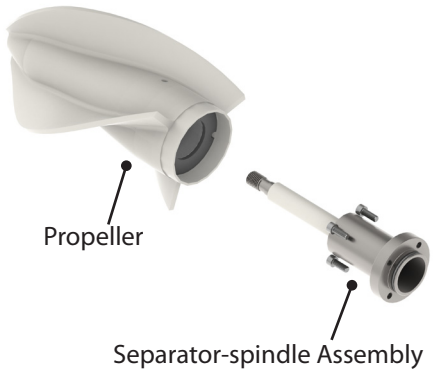
Note: See your flow meter's IOM manual for instructions on removing the propeller.



For VF meters:

Remove the propeller and the separator-spindle assembly.

Note: See your flow meter's IOM manual for instructions on removing the propeller.

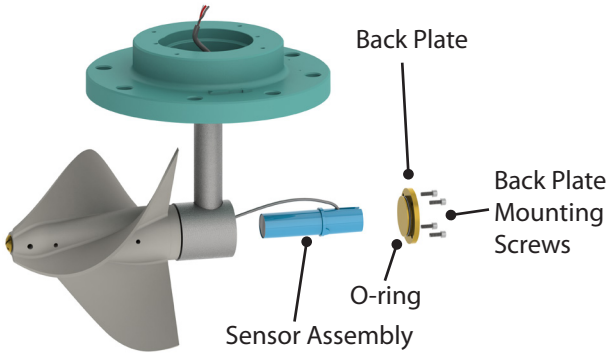


STEP 4: Reassemble the gearbox assembly.

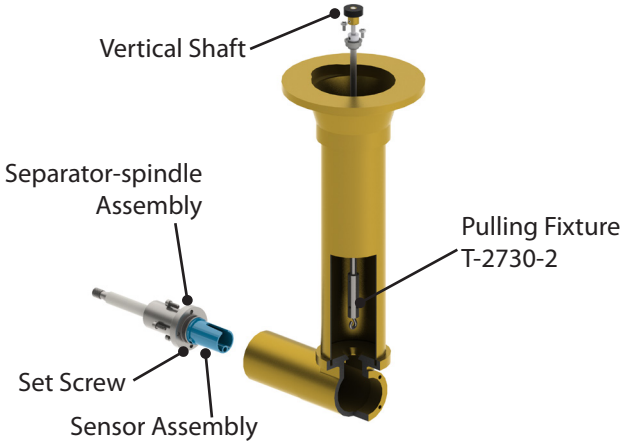
Before you begin, make sure the gearbox or drop pipe and separator/spindle assembly are dry and free of oil.

For ML and LP meters: Push the sensor assembly through the back of the gearbox all the way into the separator/spindle assembly. Rotate the sensor assembly so that the sensor cable can be fed through gearbox up over the meter head. Put a thin film of silicon grease on the O-ring and secure the back plate of the gearbox with four screws.

Note: Do not twist the back plate. This can cause the O-ring to be pinched and the meter to leak.

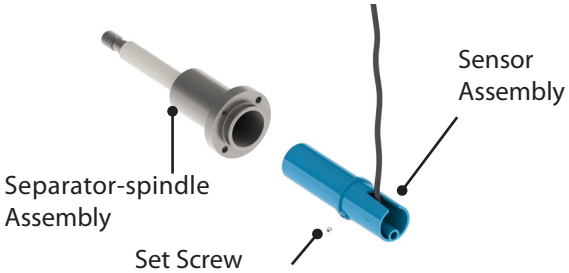


For OF and 24" to 54" ML meters: Attach pulling fixture T-2730-2 to bottom tip of existing vertical shaft assembly. Tighten both set screws on the fixture with a 0.062 Allen wrench for a secure connection to the vertical shaft tip. Loop sensor cable through hook on fixture and secure with a small piece of tape. Keep the sensor cable tight to allow passage through drop pipe bushings.



For VF meters: Push the sensor assembly all the way into separator/spindle assembly and then tighten the set screw to secure the position of the sensor assembly.

Note: The sensor cable must be positioned as shown.

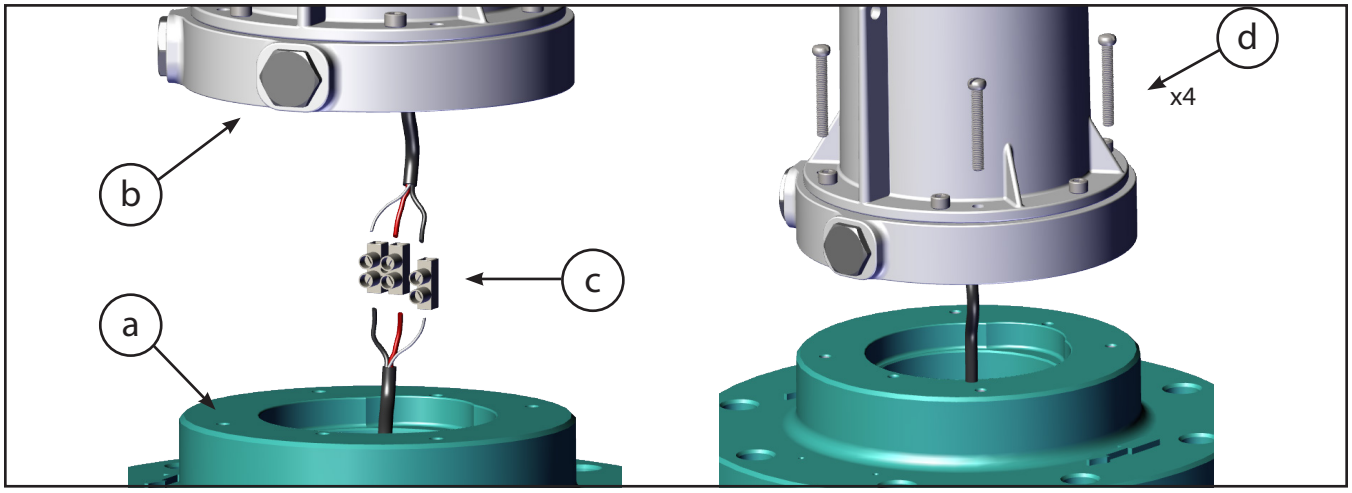


Then tie the sensor cable to the magnet end of the vertical shaft to assist in pulling the cable through. Leave approximately a 4" tale from the knot to the end connector so that magnet and cables can pass through the drop pipe end. At last, reinstall the propeller and separator/spindle assembly.

STEP 5: Connecting the sensor wires

The connection shown below is typical of all Water Specialties Electronic Propeller Flow Meters.

a. Clean the meter head surface of all dirt, glue, gaskets, etc.
b. Verify that an O-ring is installed at the bottom of the electronic register base plate.
c. Connect the sensor cable to the in-line terminal blocks.
d. Secure the electronic register to the meter head with the four 1-1/4" long screws provided (Figure18).
e. Spin the propeller and verify that the rate display responds.



NOTE: When the FlowCom is attached to the base plate, it can be oriented in four possible ways. This affects how the register is read when the flowmeter is installed in the pipe. Select the orientation you prefer as shown below in Figure 4.

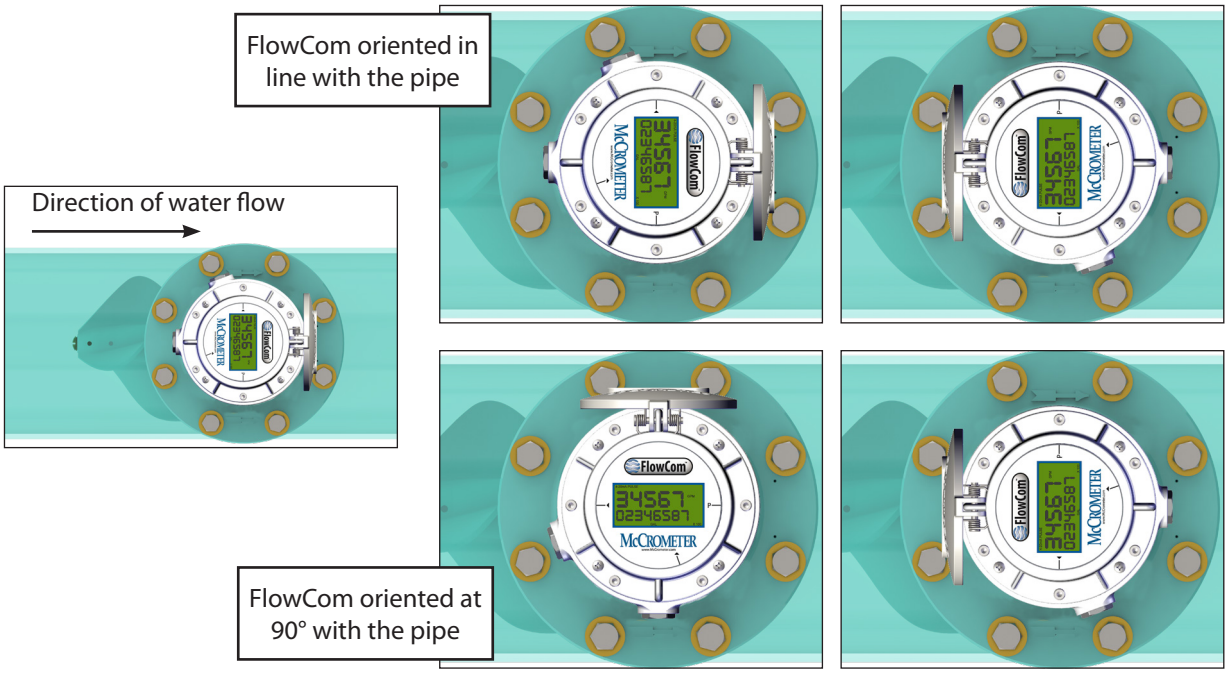


Figure 4. FlowCom mounting orientation

2.2 Mechanical-to-FlowCom Conversion Kit Installation - Remote Mount

Check the parts received against the parts list and Figure 5 and Figure 6 below. Contact the factory to report any discrepancies.

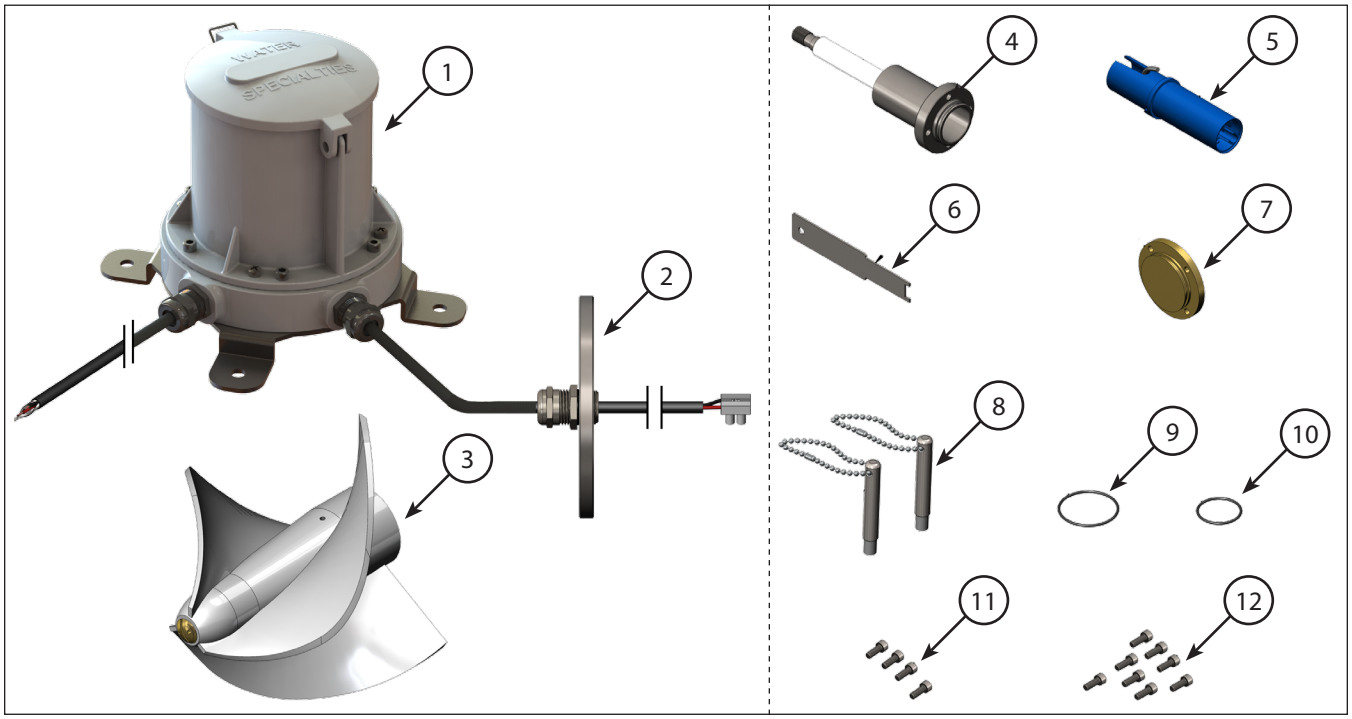


Figure 5. Conversion kit for table shown below

For FlowCom models with remote: FC101-00-K, FC101-01-K, FC101-02-K, FC101-03-K with remote mount. Refer to Figure 5 above.

# in Diagram	Description	Quantity	Part Number
1	FlowCom Unit	1	FC101-01
2	Cover plate	1	3-4391-4
3	Propeller Assembly	1	
Bagged parts:			
4	Separator	1	4-2455-2-D
5	Sensor	1	4-2745-2
6	Reverse Thrust Brg Tool	1	T2402X-1
7	Back Plate	1	2-2731-SS
8	Magnet Wand	2	FC100-M
9	O-Ring (028 Buna)	1	1-1551-2
10	O-Ring (022 Buna)	1	1-1551-24
11	Screws, 10-32 x 5/8 FIL HD	4	1-1115-10-10B
12	Screw 8-32 x 7/16 SOC HD	8	1-1103-8-7

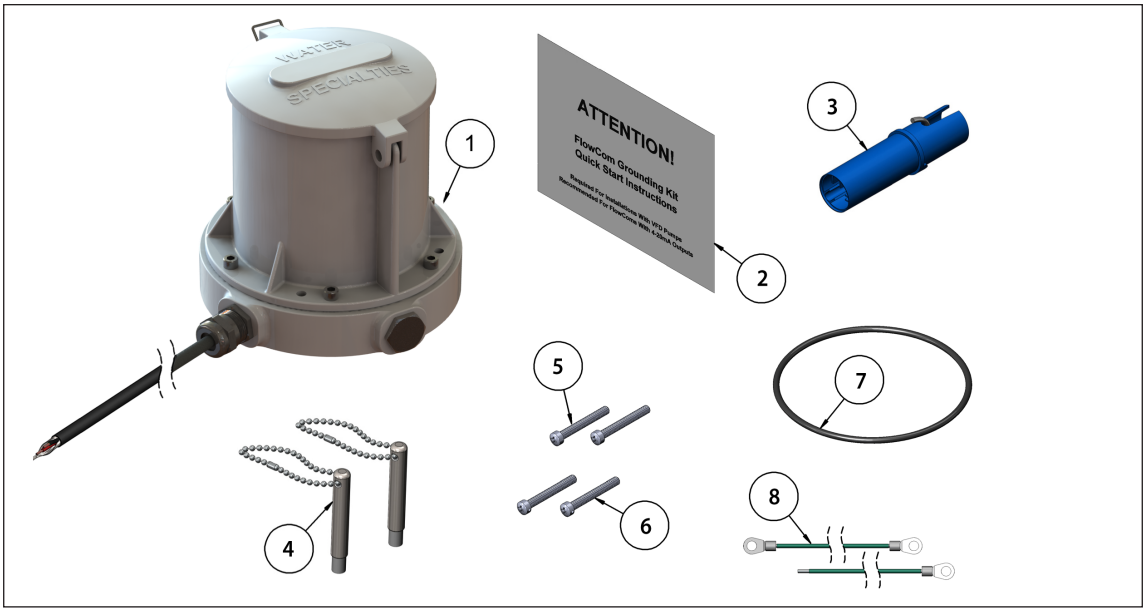


Figure 6. Conversion kit for tables shown below

For FlowCom models FC101-01-R, FC101-02-R, FC101-03-R. Refer to Figure 6 above.

Parts Diagram	Description	Quantity	Part Number
1	FlowCom Unit	1	FC101-01
	Bagged parts:		
2	Grounding Kit Instructions	1	30110-18
3	Sensor	1	4-2745-2
4	Magnet Wand	2	FC100-M
5	Screw 10-32 x 1.25" Long	2	10730
6	Screw 10-32 x 1.25" Long w/hole	2	10830
7	O-Ring (243 Buna)	1	1-1551-38
8	Green Wire	1	1-1706-18-1

For FlowCom model FC101-00-R.
Refer to Figure 6 above.

Parts Diagram	Description	Quantity	Part Number
1	FlowCom Unit	1	FC101-01
	Bagged parts:		
3	Sensor	1	4-2745-2
4	Magnet Wand	2	FC100-M
5	Screw 10-32 x 1.25" Long	2	10730
6	Screw 10-32 x 1.25" Long w/hole	2	10830
7	O-Ring (243 Buna)	1	1-1551-38

For FlowCom models with remote: FC101-00-R, FC101-01-R, FC101-02-R, FC101-03-R.
Refer to Figure 6 above.

Parts Diagram	Description	Quantity	Part Number
1	FlowCom Unit	1	FC101-01
	Bagged parts:		
2	Grounding Kit Instructions	1	30110-18
3	Sensor	1	4-2745-2
4	Magnet Wand	2	FC100-M
8	Green Wire	1	1-1706-18-1

STEP 1: Install submergible remote mount kit in the meter head plate

If the submergible remote mount assembly has not already been installed in the meter head plate, you need to assemble it. Use Figure 7 at right as a guide for this step.

a. Follow steps 1 through 4 from section 2.1.
b. Pull the FlowCom remote cable through the assembled submergible remote mount kit and out through the bottom.
c. Using the inline terminal, connect the FlowCom remote cable to the sensor cable wires, matching the red wires and the black wires.
d. Guide the inline terminal block into the neck of the drive shaft column and screw the submergible remote mount kit assembly into the neck of the drive shaft column while holding the remote mount cable. Holding the remote mount cable will prevent the twisting of the sensor cable inside the drive shaft column which can cause the cable termination of the inline terminal block to be pulled apart.

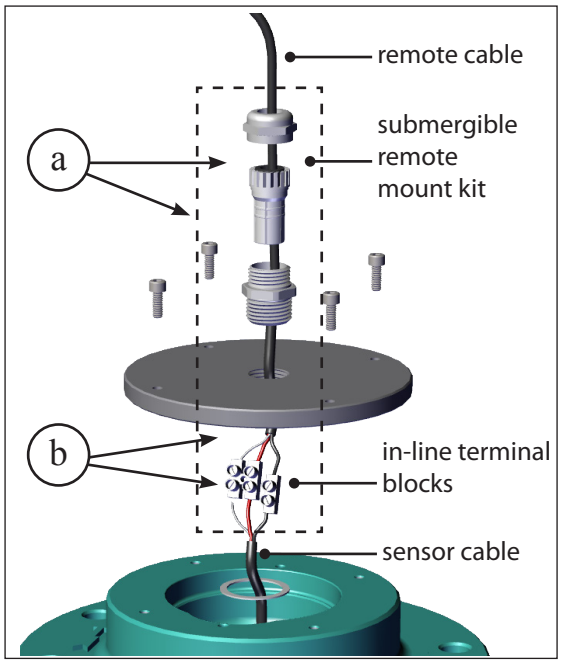


Figure 7. Submergible remote mount assembly

WARNING!
Over tightening the cable compression seal will damage the internal conductors, causing them to be crushed and shorted together, preventing proper operation.

e. Tighten down the compression on the submergible assembly kit. Tighten only hand tight plus one half turn.

STEP 2: Test the FlowCom.

Test the conversion by spinning the propeller by hand and ensuring the display changes. Install the meter into the line and mount the remote FlowCom in a convenient location.

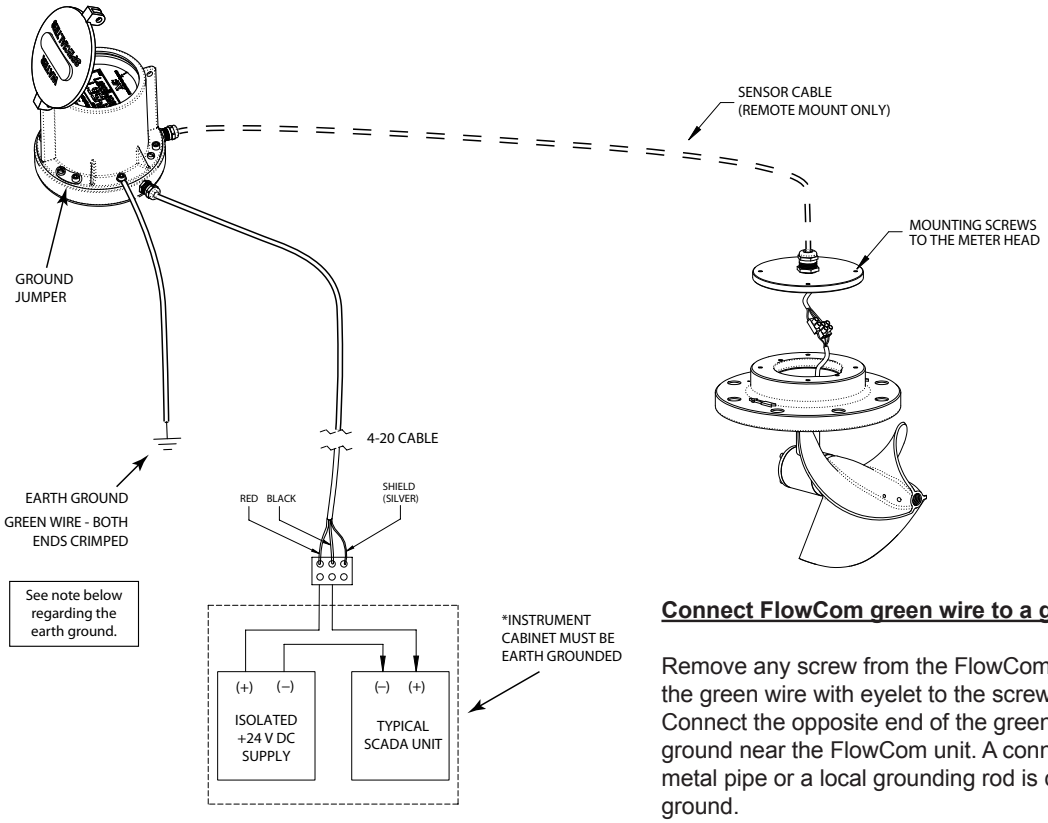
STEP 3: Ground the Flowcom.

Following the Grounding Kit Instructions, connect the ground wire to the Flowcom and other systems that may be attached.

> **NOTE** Figure 8 shows grounding requirements for FlowCom registers that are remote mount, equipped with 4-20mA, pulse, and/or used with VFD pumps.

Grounding connections for both meter-mount and remote-mount FlowCom registers.

Includes FlowCom registers that are equipped with 4-20mA, pulse output, and/or used with VFD pumps.



Connect FlowCom green wire to a good earth ground.

Remove any screw from the FlowCom bonnet and attach the green wire with eyelet to the screw. Re-insert the screw. Connect the opposite end of the green wire to an earth ground near the FlowCom unit. A connection to a buried metal pipe or a local grounding rod is considered an earth ground.

Figure 8. Grounding the FlowCom remote mount

3.0 OUTPUT WIRING CONNECTION DIAGRAMS

3.1 4-20mA Current Loop (Meter Mount Version)

Output type: 4-20mA current loop (meter mount version)

Housing label: 1 (see Figure 10)

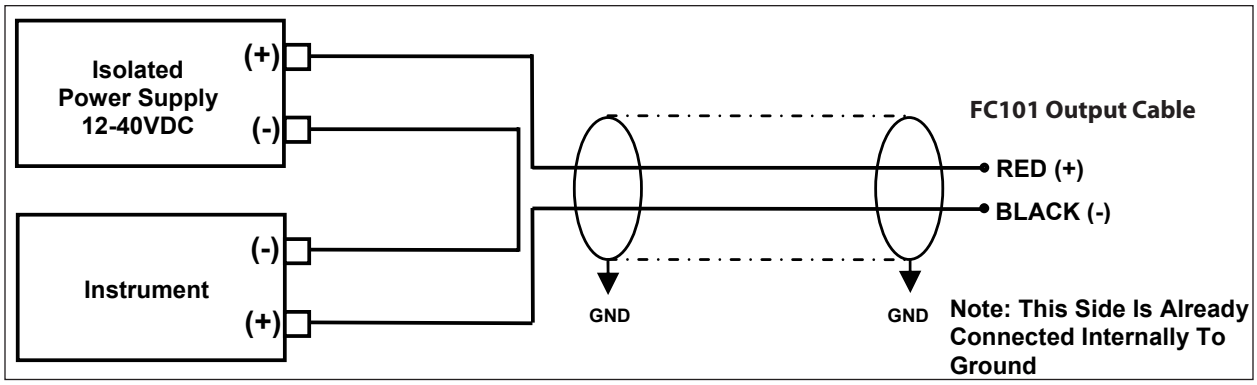


Figure 9. 4-20mA current loop (meter mounted)

3.2 Optically Isolated Connection

Output type: Optically isolated connection

Housing label: 1 (see Figure 10)

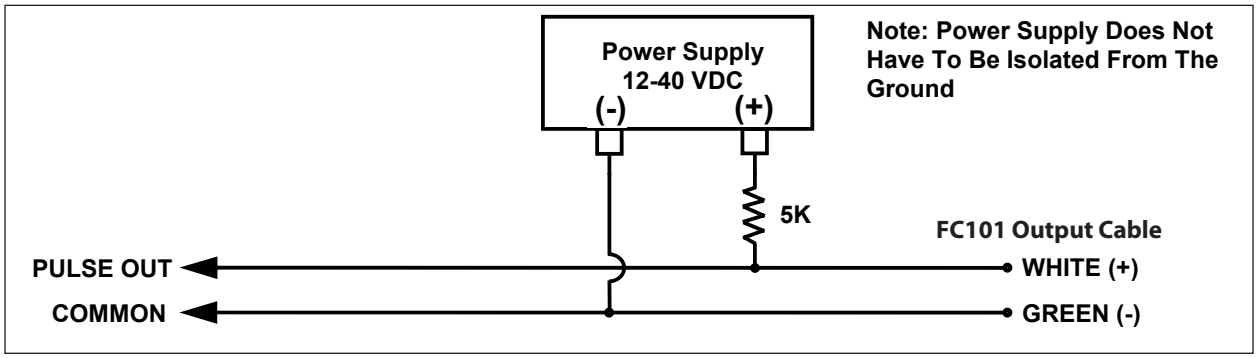


Figure 10. Optically isolated connection

3.3 Housing Label 1

4-20 mA / OC

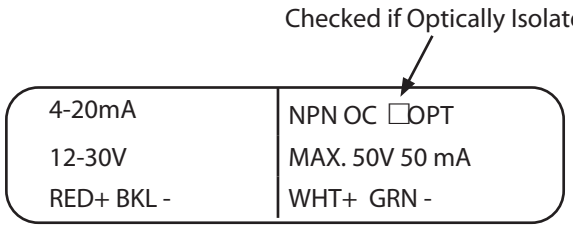


Figure 11. Enclosure label 1

~~3.4 Open Collector~~

~~Output type: Open collector powered by instrument with internal resistor~~

~~Housing label: 2 (see Figure 14)~~

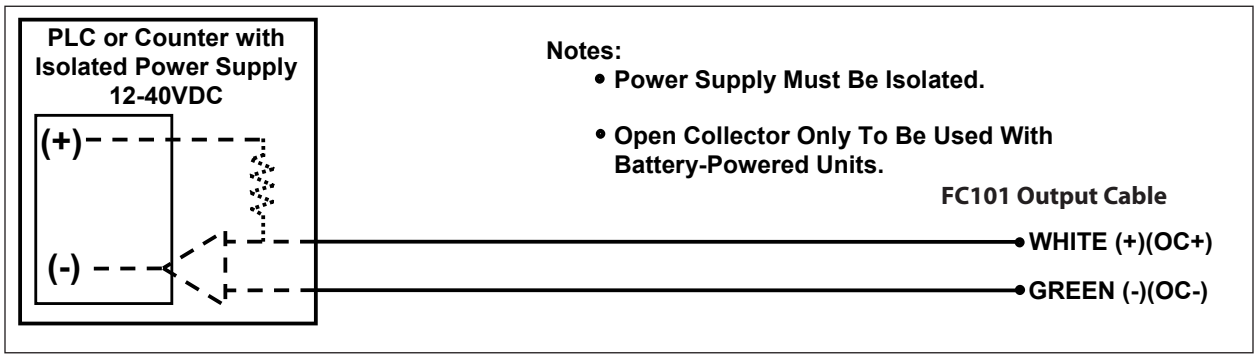


Figure 12. Open collector powered by instrument with internal resistor

~~3.5 Dry Contact Switch Closure~~

~~Output type: Dry contact switch closer~~

~~Housing label: 2 (see Figure 14)~~

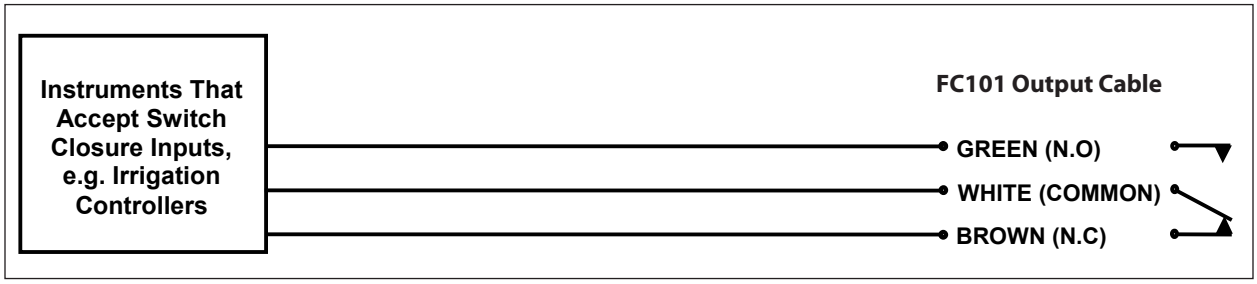


Figure 13. Dry contact switch closure

3.6 Housing Label 2

4-20 mA / switch closure

4-20mA	RELAY MAX. 30V 1A
12-30V	WHT - COMMON
RED+ BKL -	GRN - NO BRN - NC

Figure 14. Enclosure label 2

3.7 4-20 mA Current Loop (Remote Mount Version)

Output type: 4-20mA current loop (Remote mount version) in the presence of environmental noise (VFDs, RF Transmitters, etc.)

Housing label: 1 (see Figure 10)

IMPORTANT NOTES:

- The +24VDC Power supply must be isolated by ensuring that the -24VDC is NOT tied to earth ground
- To ensure that the power supply for 4-20mA output loop is properly isolated from the earth ground, check voltage between earth ground and negative power supply terminal. You should see floating values, in approximate range of 4V to 8V.
- The shield for the Wiegand sensor must be connected to earth ground. Ensure the shield for the sensor is not connected to VSS.
- To locate good earth ground, measure impedance between any of the non-powered 4-20mA terminals and the chosen ground spot. The ohmmeter should show a very low reading, lower than 1Ω.

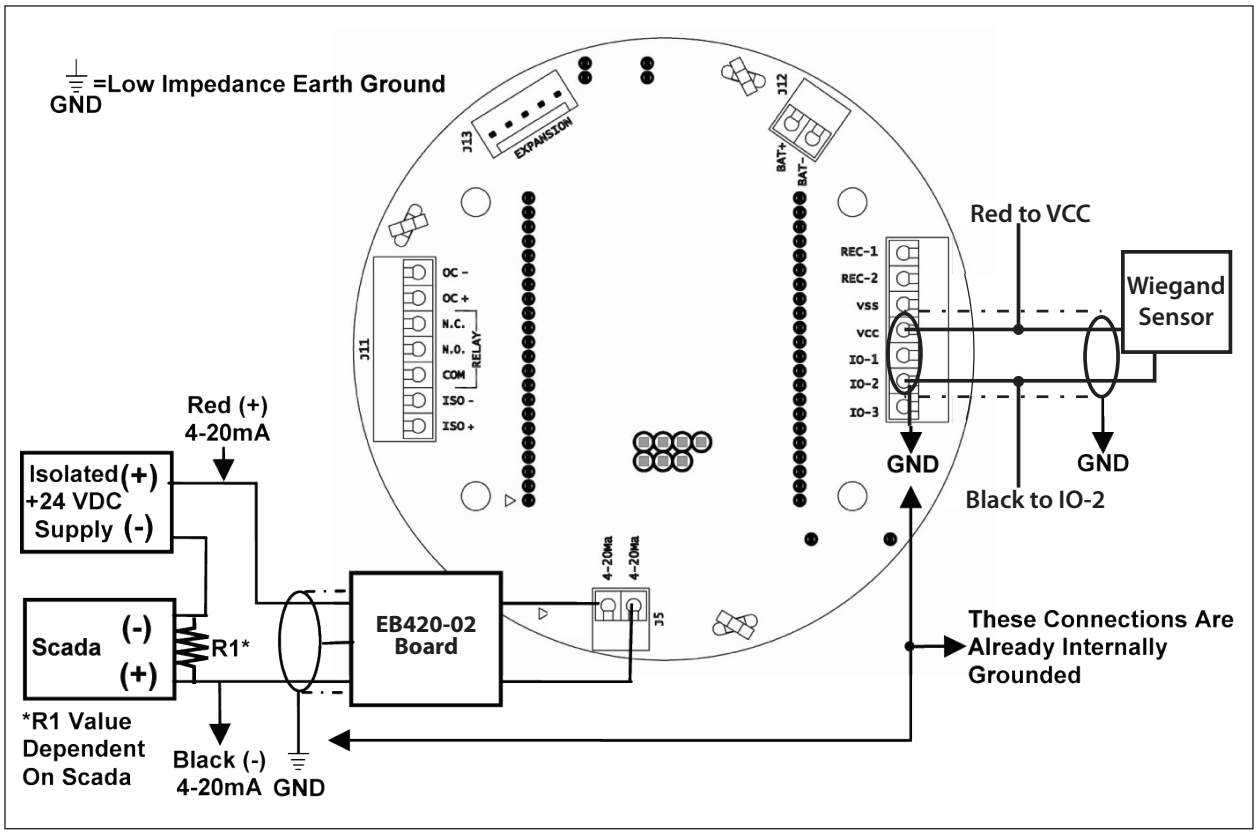


Figure 15. Output type 4-20mA current loop (remote mounted)

3.8 4-20mA Connection To Water Specialties Instrumentation

IN60 – Flow Computer

Connection	To	Connection
IN60 Term. Strip Pin 16 (Iso. +12 VDC)		FC101 Output Cable Red (+)
IN60 Term. Strip Pin 4 (input)		FC101 Output Cable Blk (-)

IN41 – 10" Chart Recorder

Connection	To	Connection
IN41 TB-2 (-)		FC101 Output Cable Red (+)
IN 41 TB-2 (+)		Separate 24 VDC Supply (+)
Separate 24 VDC Supply (-)		FC101 Output Cable Blk (-)

IN48 – 12" Chart Recorder (Sold After 05/1993)

Connection	To	Connection
IN48 J11 (+)		FC101 Output Cable Red (+)
IN48 J11 (-)		IN48 J2 (-)
IN48 J2 (+)		FC101 Output Cable Blk (-)

IN48 – 12" Chart Recorder (Sold Before 05/1993)

Connection	To	Connection
IN48 J6 (+)		FC101 Output Cable Red (+)
IN48 J6 (-)		IN48 J10 (-)
IN48 J10 (+)		FC101 Output Cable Blk (-)
250 Ohm resister from IN48 J6 (+) and IN48 J6 (-)		

3.9 Wiring for Sensus Output

Wiring diagrams for automated meter reading using Sensus are available in a separate document. It can be found on the McCrometer Web site.

30122-77 Wiring Diagram for AMI Compatible Flow Meters

3.10 LCD Output Symbol Clarifications

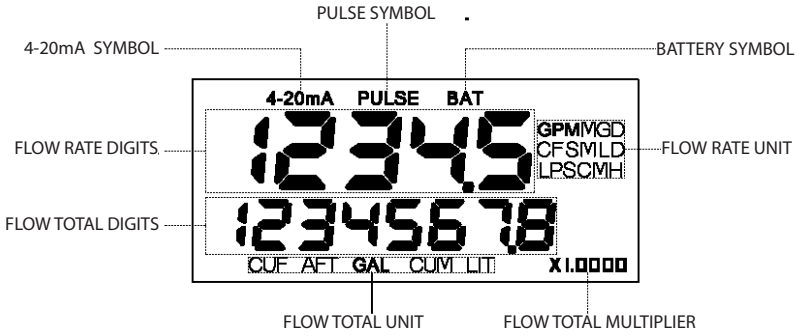


Figure 16. FC101 Screen symbols

SCENARIO	RESULT
The 4-20mA full scale is not defined and the 4-20mA loop is either powered or not powered.	There is no 4-20mA output and the "**4-20mA**" symbol is *off*.
The 4-20mA full scale is defined and the 4-20mA loop is powered.	There is a 4-20mA output and the "**4-20mA**" symbol is *on*.
The 4-20mA full scale is defined and the 4-20mA loop is powered, but the output value is over 21.5mA.	There is a 4-20mA output and the "**4-20mA**" symbol is *flashing*.
The pulse increment value is not defined.	There is no pulse output and the "**PULSE**" symbol is *off*.
The 4-20mA loop is not powered, the pulse increment value is defined and the pulse type is set as an optically-isolated open collector or a relay switch.	There is no pulse output and the "**PULSE**" symbol is *flashing*.
The 4-20mA loop is not powered, the pulse increment value is defined and the pulse type is set as an open collector.	There is a pulse output and the "**PULSE**" symbol is *on*.
The 4-20mA loop is powered, the pulse increment value is defined and the pulse type is set as an optically-isolated open collector or a relay switch.	There is a pulse output and the "**PULSE**" symbol is *on*.
The 4-20mA loop is powered, the pulse increment value is defined and the pulse type is set as an optically-isolated open collector or a relay switch, but the output frequency is greater than the limit of the selected pulse type.	There is a pulse output and the "**PULSE**" symbol is *flashing*.
The battery level is ok.	The "**BAT**" symbol is *off*.
The 4-20mA loop is either powered or not powered, and battery level meets low battery criteria.	The "**BAT**" symbol is *on*.

4.0 PROGRAMMING

4.1 Accessing The Configuration Menu

Hold the magnetic wand as noted in *Figure 27* below. After five seconds the register will display "Loc-Code". **A lock code of 01000 is required to enter the configuration menu.** Use the magnetic wand to input the lock code and then pass the wand over the "P" symbol to submit the lock code and the configuration menu will appear. The register will switch back to run mode by either selecting the run mode from the configuration menu or by not activating the configuration menu for sixty seconds.

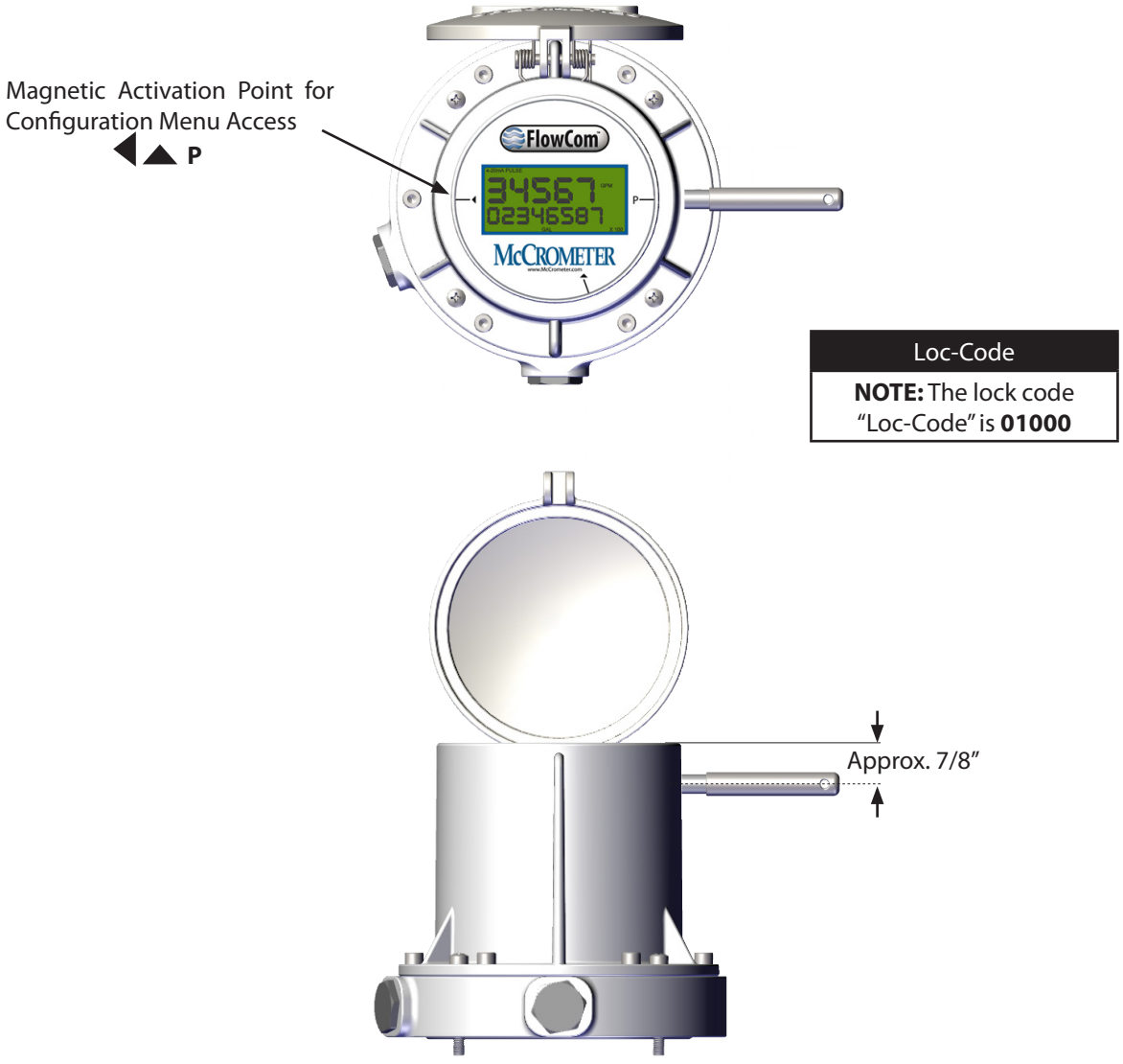


Figure 17. Magnetic wand activation points for configuration menu

4.2 Document Changes

Each register ships with two silver identification labels. The label contains basic setting information for the register. If changes are made to the register settings the labels should be marked as required. Forward the changes to the factory so the records can be updated.

4.3 Menu Table Of Contents

First Menu Level			
	Display	**Menu Title**	**Description**
0	**Loc-CodE**	Program Lock Out	Enter w/preset code
1	**rAtE-Un**	Rate Unit/Time	Sets Unit/Time
2	**rAtE-dP**	Rate Format	Sets Rate Decimal Place
3	**tot-Un**	Totalizer Unit	Sets Unit
4	**tot-dP-E** *	Totalizer Decimal Point Enable	Enables/Disables Totalizer Decimal Point
5	**tot-dP** *	Totalizer Decimal Place	Sets Decimal Place
	Tot-FAct *	Totalizer Multiplier	Sets Multiplier
6	**20mA-Un**	20mA Unit	Sets 20mA Unit
7	**20mA-dP**	20mA DP	Sets 20mA Decimal Place
8	**20mA-FS**	20mA FS	20mA Full Scale
9	**PLS-Un**	Pulse Unit	Sets Pulse Unit
10	**PLS-dP**	Pulse Decimal Place	Sets Pulse Decimal Place
11	**PLS-Inc**	Pulse Increment	Sets Pulse Value
12	**CAL-Pct**	Calibration Percent	Adjusts Meter Accuracy
13	**-Go to**	Go to Menu or Run	

Second Menu Level			
	Display	**Menu Title**	**Description**
1	Par-S	**Parent Meter Serial #**	Sets Meter Serial No.
2	SErno	**Register Serial #**	Sets Register Serial No.
3	Set-CodE	**Set Lock Code**	Sets new Lock Code
4	GPr-dP	**GPR Decimal Place**	Sets GPR Decimal Place
5	GPr	**Gallons Per Revolution**	Sets GRR Digits
6	Smooth	**Smoothing**	Turns Smoothing on/off
7	4mA-AdJ	**Trim 4mA**	Adjusts 4mA Zero
8	20mA-AdJ	**Trim 20mA**	Adjusts 20mA FS
9	PLS-tYPE	**Pulse Type**	Sets Pulse Type
10	PLSwidth **	**Pulse Width**	Sets Pulse Width in ms
11	RESEttot	**Reset Total**	Zeroes Total
12	DIS-rSt	**Disable Reset Total**	Permanent Reset Disable
13	tot-S	**Set Total**	Sets Total
14	Au-InP	**Auxiliary Input**	Sets operation of input
15	cutoff	**Low Flow Cutoff**	Sets Min. Flowrate
16	PLS-Pr	**Pulses per Revolution**	Sensor Pulses per rev.
17	-Go to	**Go to Menu or Run**	

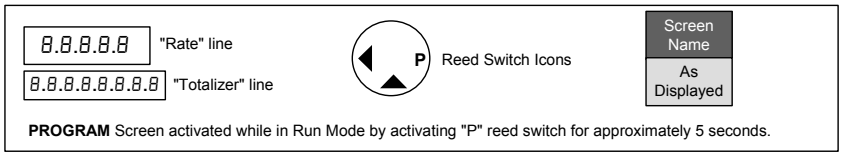
* If **tot-dP-E** (Totalizer Decimal Point Enable) is disabled (turned off), **tot-dP** (Totalizer Decimal Place) will not be accessible.

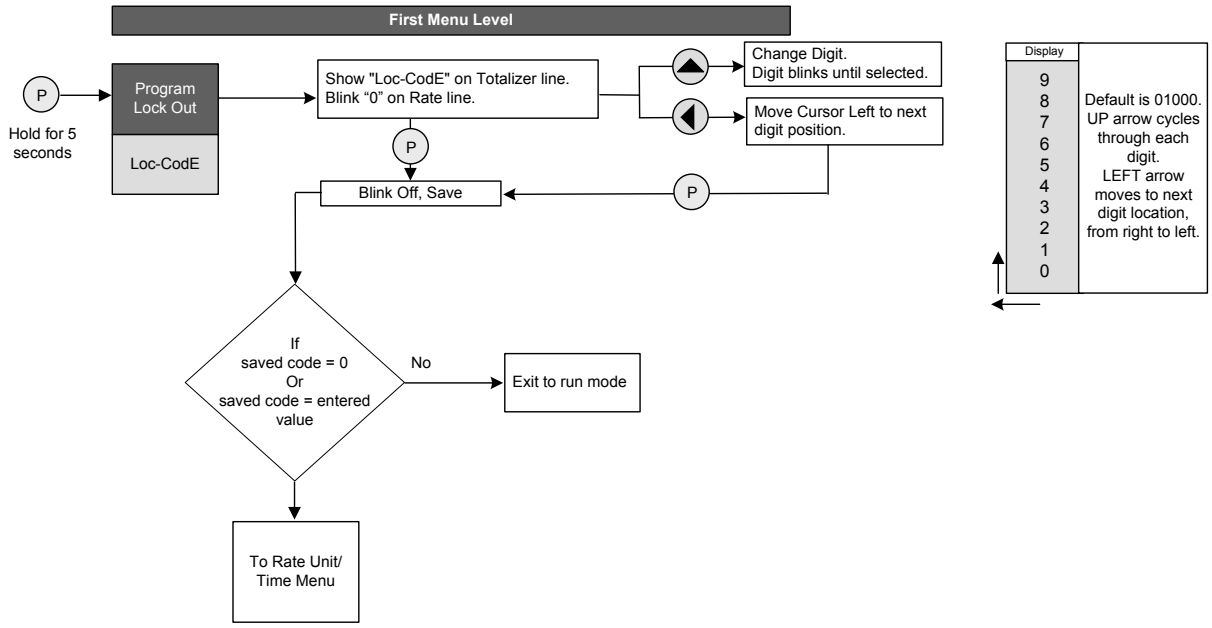
* If **tot-dP-E** (Totalizer Decimal Point Enable) is enabled (turned on), **Tot-FAct** (Totalizer Multiplier) will not be accessible.

** **PLSwidth** (Pulse Width) is only accessible when OC is selected in the **PLS-tYPE** menu (Pulse Type).

4.4 Menu Navigation

First Menu Level	
0	Loc-CodE

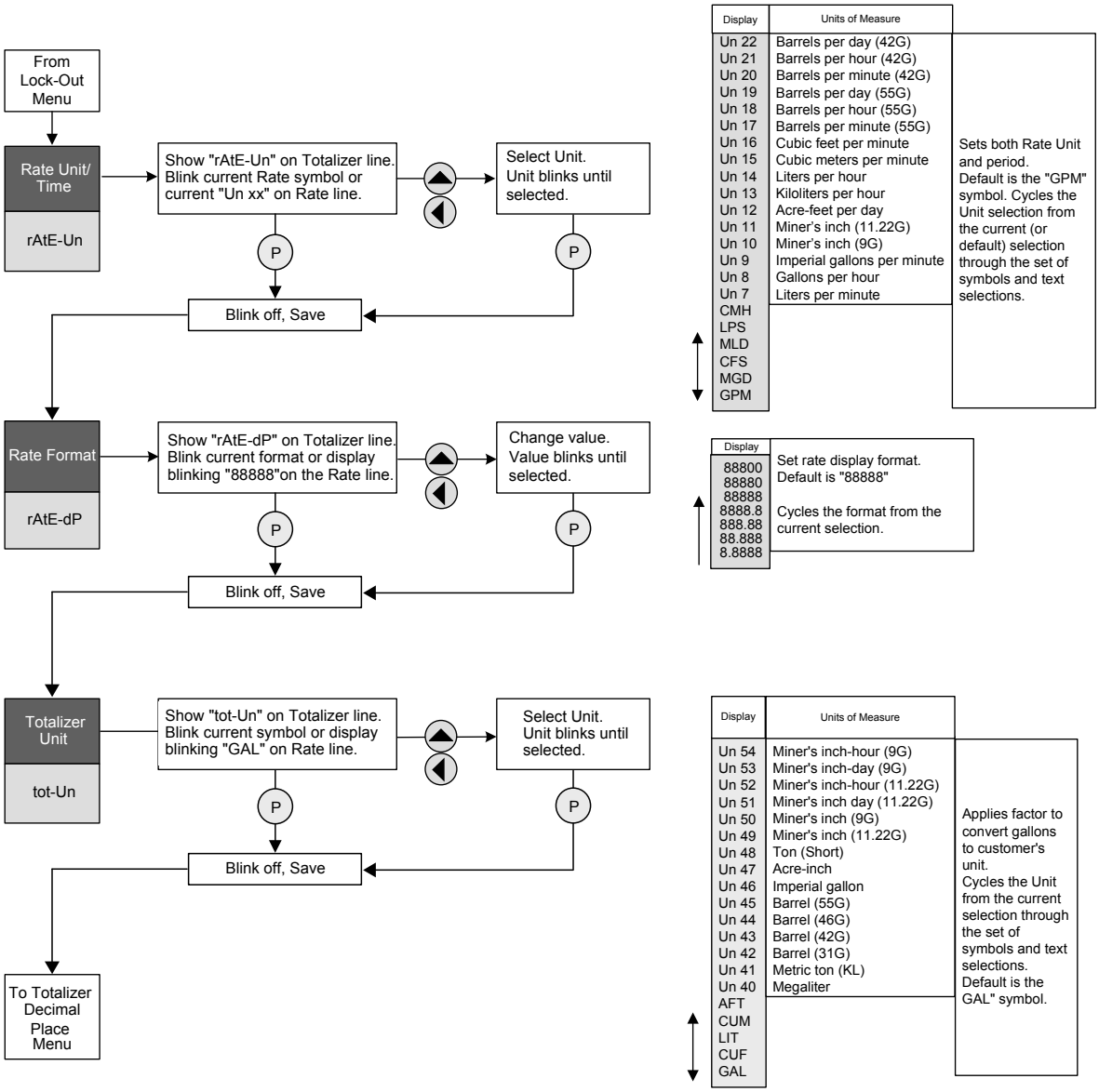




NOTE:

1. If a lock code has been programmed then the user will be asked for the code upon entering into programming mode. **The factory default lock code is 01000.**

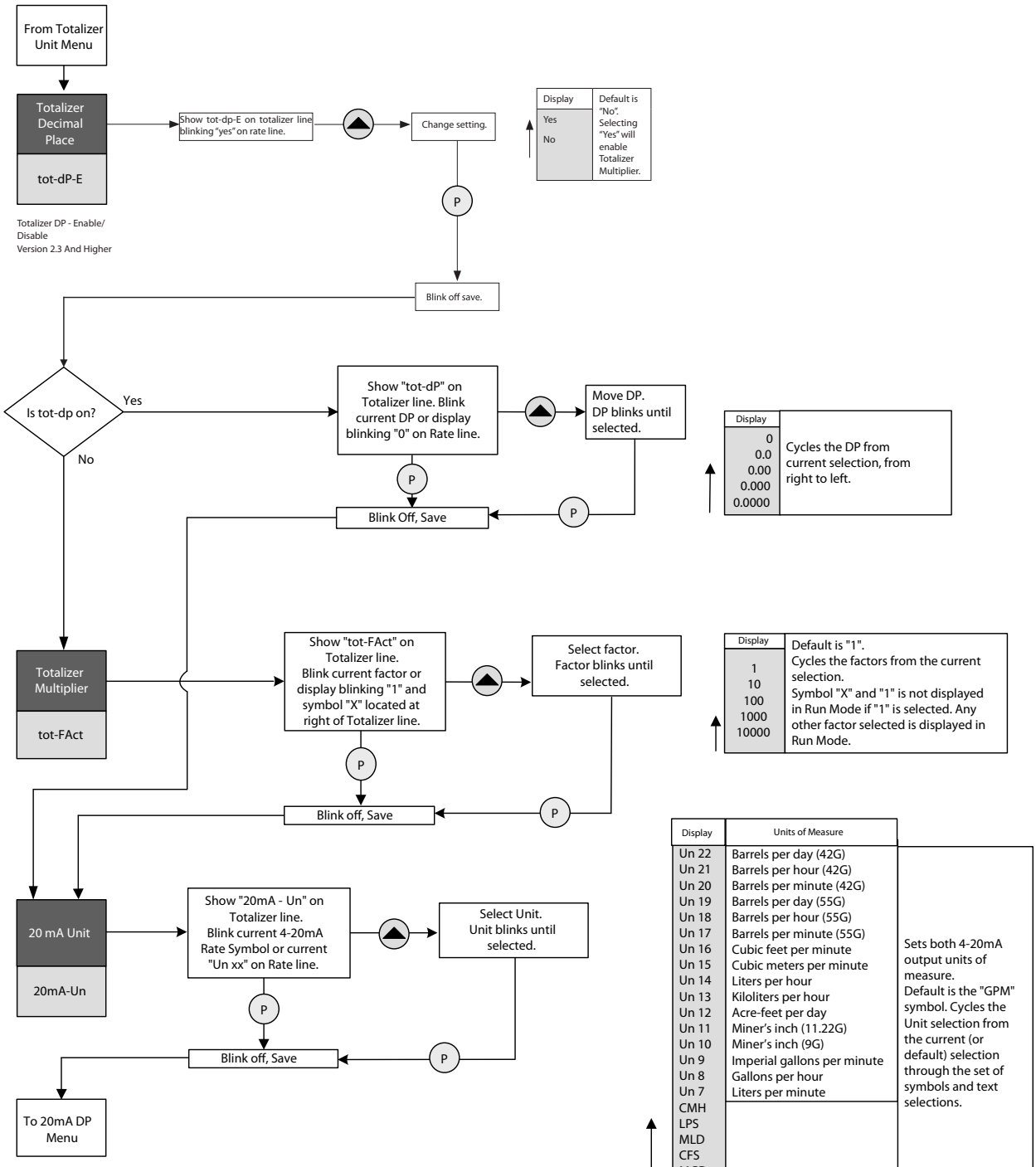
First Menu Level	
1	rAtE-Un
2	rAtE-dP
3	tot-Un



NOTES:

1. "Un XX" are units of measures that do not have an abbreviated symbol directly on the display.
2. The rate unit selection for the flow rate and 4-20mA full scale is chosen from the same menu table.
3. The total unit selection for the total and pulse output increment is chosen from the same menu table.

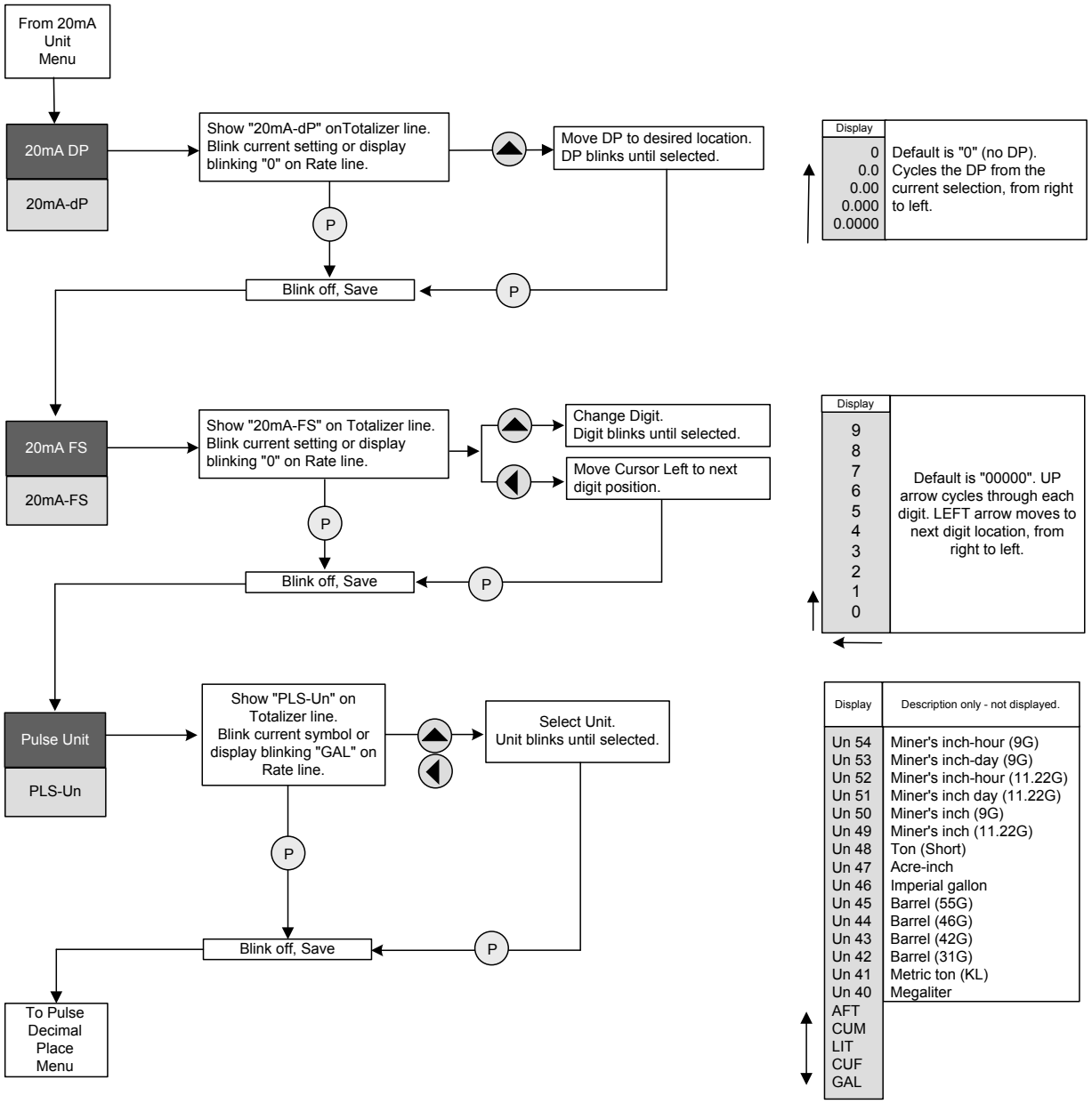
First Menu Level	
4	tot-dP-E
5	tot-dP
	Tot-FAct
6	20mA-Un



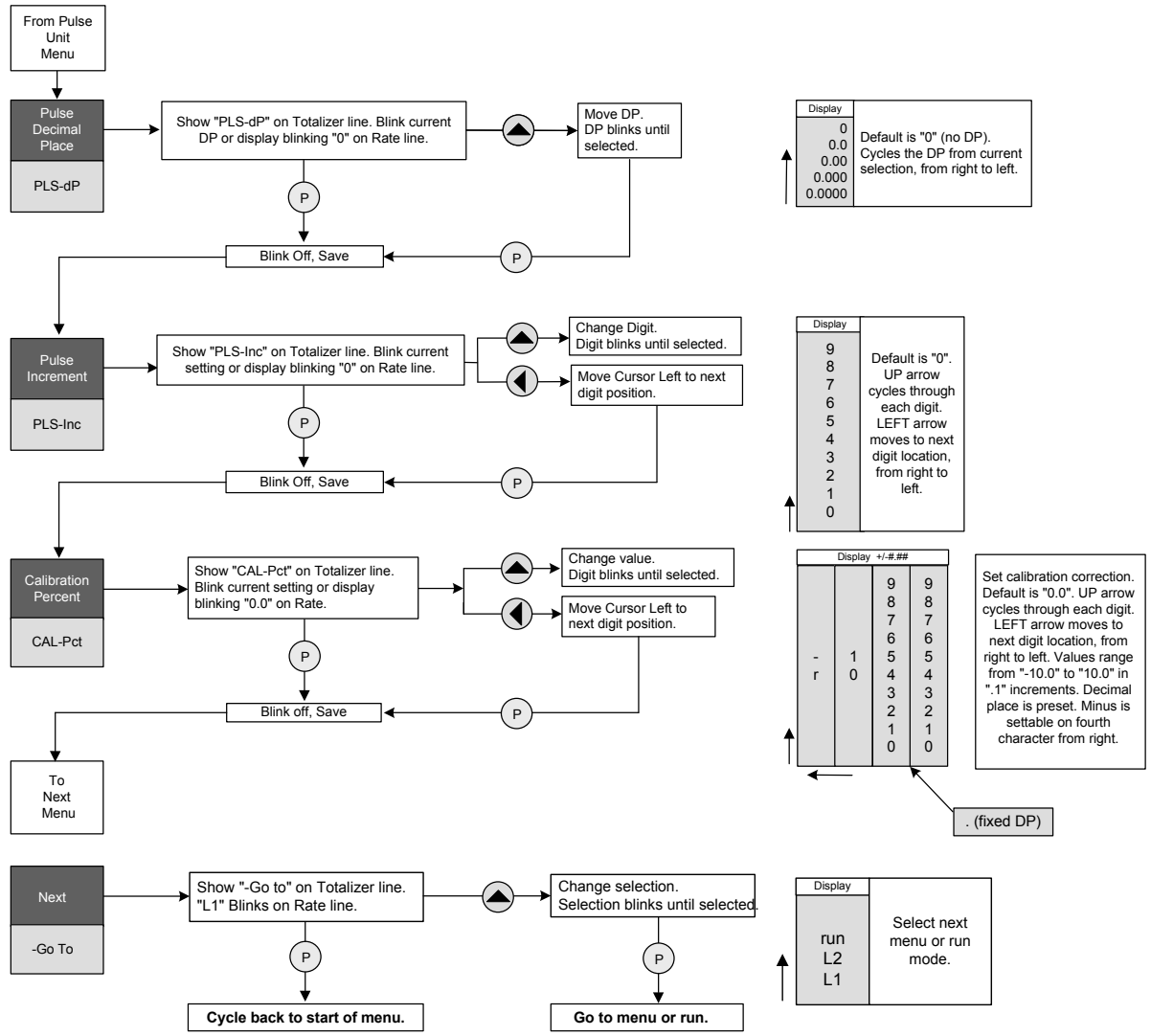
NOTE:

1. The cumulative total can either have a decimal point or a multiplier setting but not both simultaneously.

First Menu Level	
7	20mA-dP
8	20mA-FS
9	PLS-Un



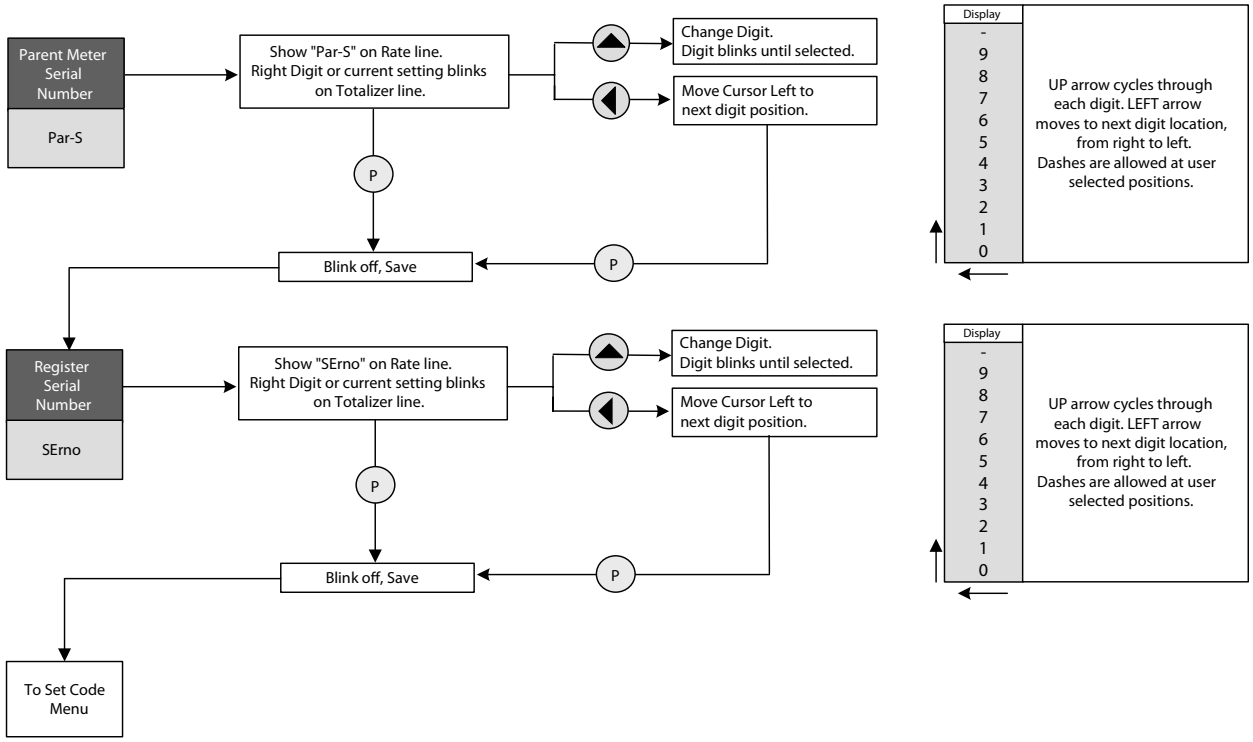
First Menu Level	
10	PLS-dP
11	PLS-Inc
12	CAL-Pct
13	-Go to



NOTES:

1. Pulse increment is used to set the amount of volume that initiates one pulse output. For example, as the pulse unit of measure is set to "Gallon" and the Pulse Increment is set to "1000", then one pulse will be generated for every 1000 gallons of fluid flowing through the system.
2. The type of pulse output is set by the pulse type in menu L2. The type of pulse output is set by the pulse type in menu L2.

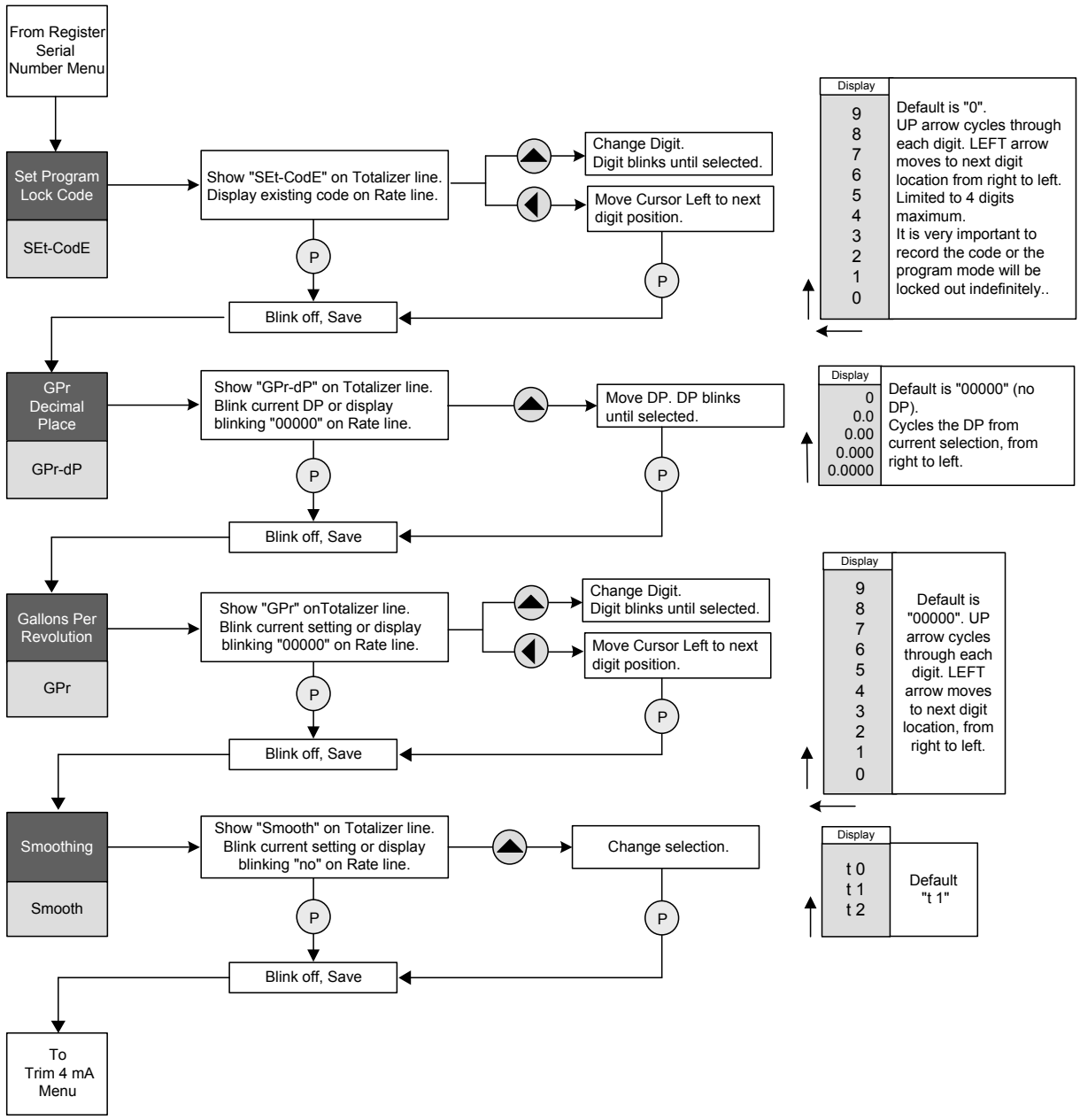
Second Menu Level	
1	Par-S
2	SErno



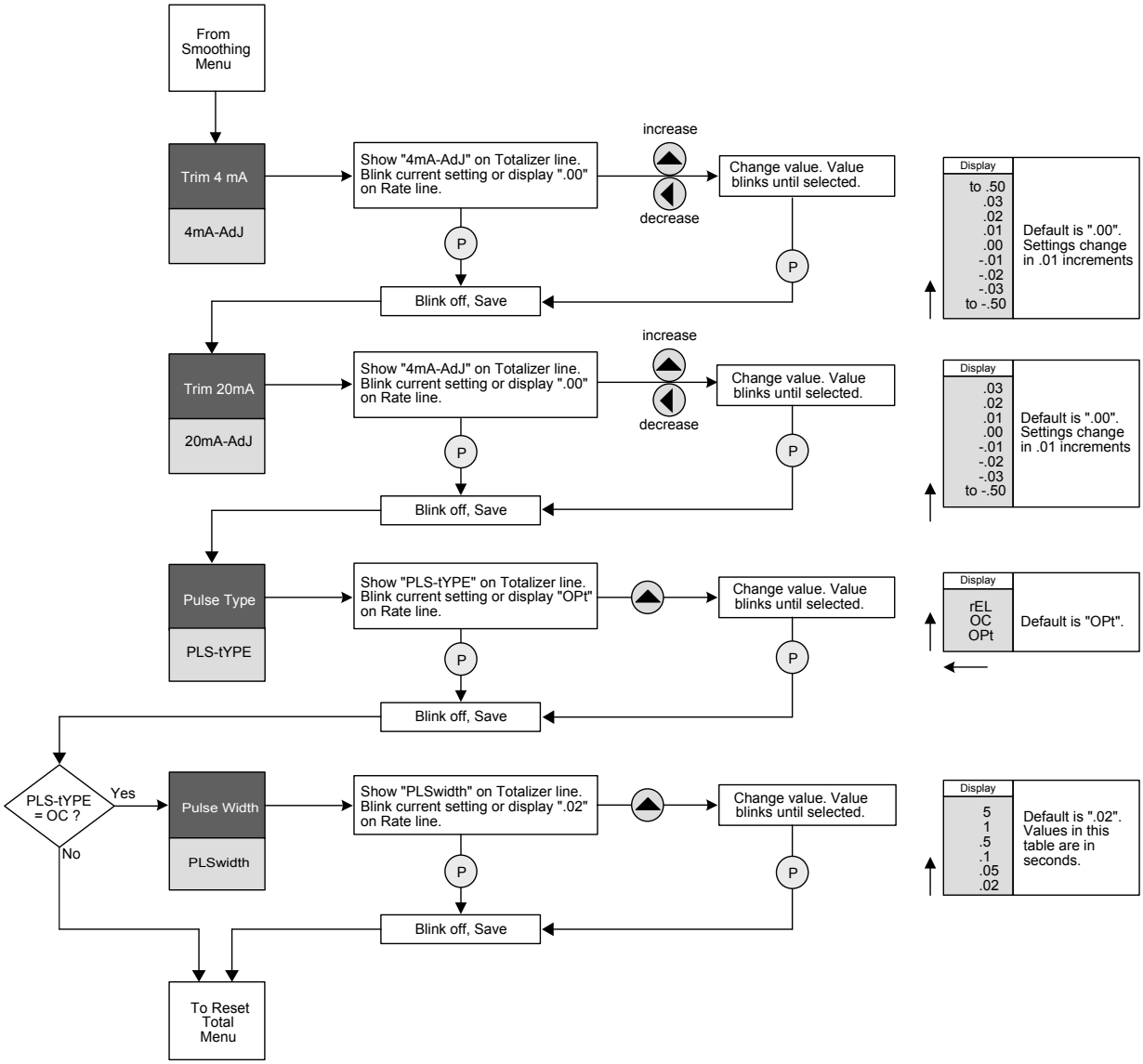
NOTE:

1. Each electronic register has a unique serial number separate from the meter (parent) serial number.

Second Menu Level	
3	Set-CodE
4	GPr-dP
5	GPr
6	Smooth



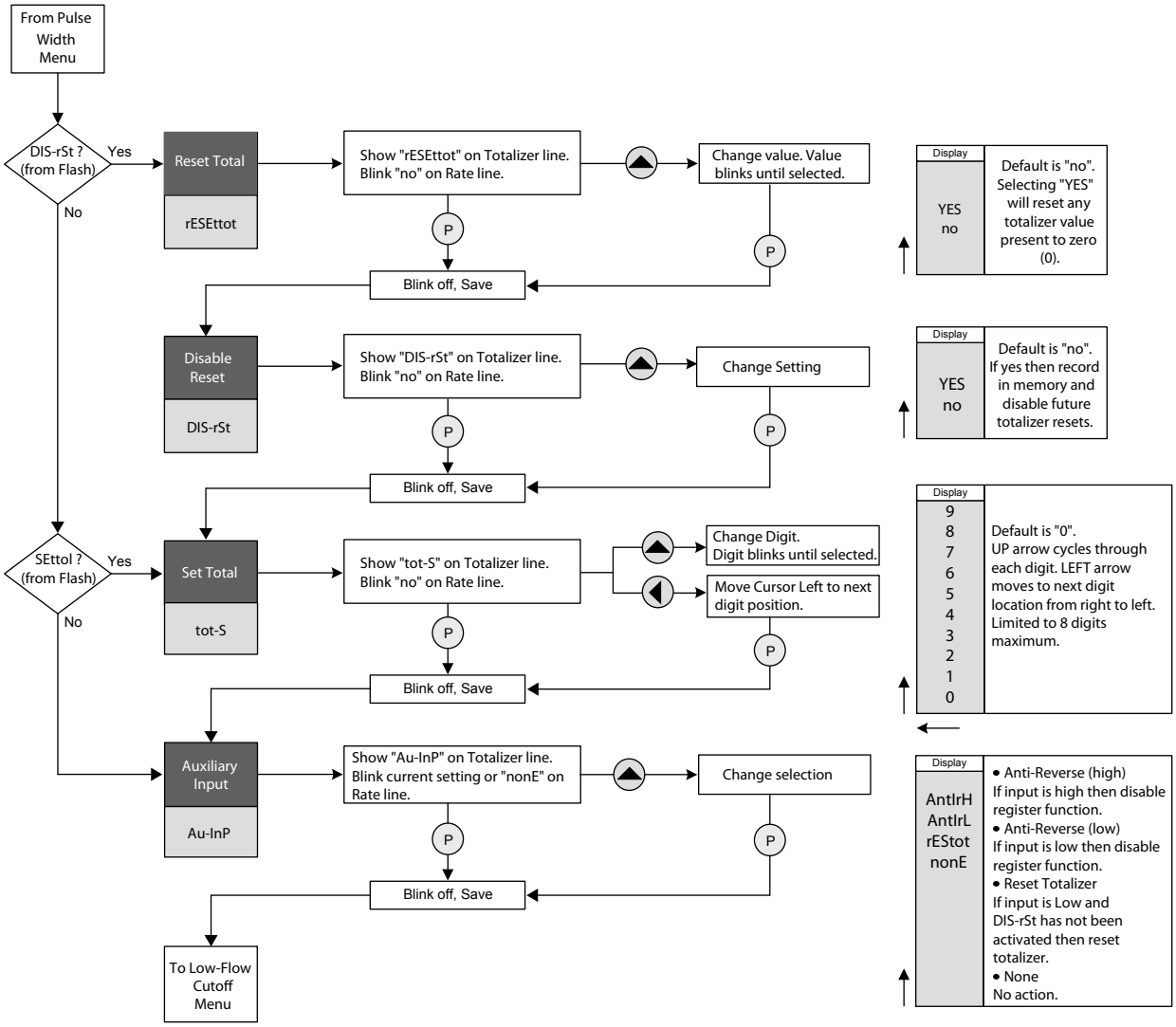
Second Menu Level	
7	4mA-AdJ
8	20mA-AdJ
9	PLS-tYPE
10	PLSwidth **



NOTES:

1. The pulse width setting is only available for a standard open collector output.
2. 4-20mA can be calibrated by adjusting the 4mA and 20mA trim values.

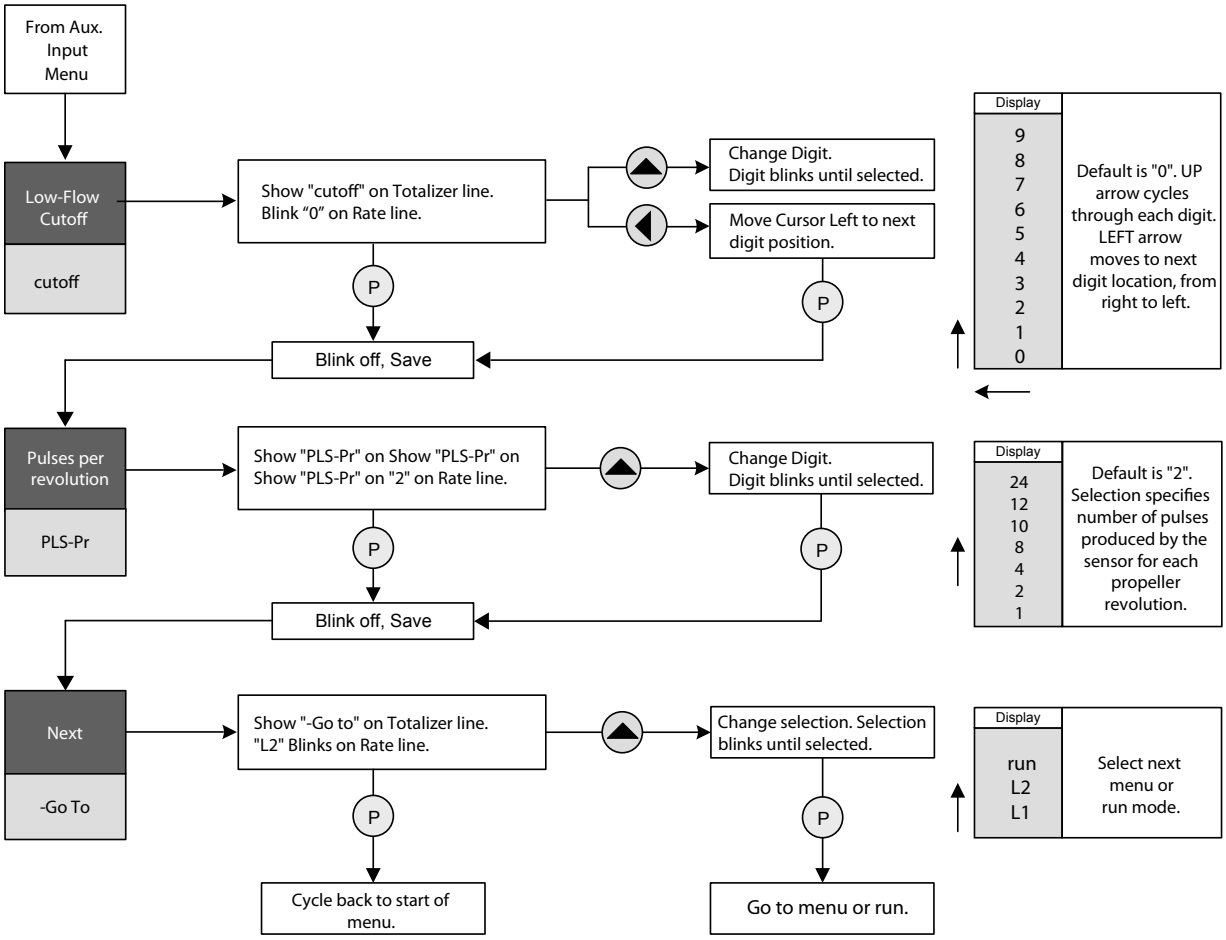
Second Menu Level	
11	RESEttot
12	DIS-rSt
13	tot-S
14	Au-InP



NOTES:

1. The ability to reset the cumulative total can be *permanently* disabled. Once the reset is disabled, the Reset Total function will no longer appear in the menu.
2. The Auxiliary Input function is available for usage to stop the register from totalizing and transmitting. The factory should be consulted if this feature is required.

Second Menu Level	
15	**cutoff**
16	**PLS-Pr**
17	**-Go to**



NOTE:

1. Entering the correct pulses per revolution is very important. Contact the factory regarding the pulses per revolution if unknown.

4.5 Configuration Examples

Example 1: Register With DC-powered Optically-isolated O.C. Pulse Output

Meter Size : 6″
Gallons Per Revolution: 1.4815
Rate Units: Cubic Feet per Second
Totalizer Units: Acre Feet x 0.001
4-20mA Full Scale: 2.5 CFS
Switch Closure Output: 1 Switch for Every 1000 Gallons
Sensor Type: 2 PPR

Configuration Settings:

Menu Item Display	Menu Item Description	Item Selection
rAtE-Un	Rate Unit	CFS
rAtE-dP	Rate Format	888.88
tot-Un	Totalizer Unit	AFT
tot-dP	Totalizer Decimal Place	0.000
tot-Fact	Totalizer Multiplier	(Not applicable with a tot-dP setting)
20mA-Un	20 mA Unit	CFS
20mA-dP	20 mA dp	0.0
20mA-FS	20 mA FS	2.5
PLS-Un	Pulse Units	GAL
PLS-dP	Pulse Decimal Place	0
PLS-Inc	Pulse Increment	1000
SErno	Reg. Serial Number	(Serial number is set at the factory)
GPr-dP	GPR Decimal Place	0.0000
GPr	Gallons Per Rev	1.4815
Smooth	Smoothing	t1
4mA-AdJ	Trim 4mA	.00 (Adjusted during 4-20mA calibration)
20mA-AdJ	Trim 20mA	.00 (Adjusted during 4-20mA calibration)
PLS-tYPE	Pulse Type	rEL
PLSwidth	Pulse Width	(Not applicable for the dry contact switch output)
Au-InP	Auxiliary Input	nonE
Cut-dP	Low-Flow Cutoff DP	0
CutoFF	Low-Flow Cutoff	0
PLS-Pr	Pulse Per Rev	2

Note:

1. The dry contact switch pulse output commonly used on Scada and irrigation systems. The dry contact switch pulse length is not adjustable.

Example 2: Register With Battery-powered O.C. Pulse Output

Meter Size :	24"
Gallons Per Revolution:	37.0
Rate Units:	MGD
Totalizer Units:	Gallons x 10000
Open Collector Pulse Output:	1 Pulse for Every 0.01 Acre Foot
Pulse Width:	0.1 milliseconds
Sensor Type:	2 PPR

Configuration Settings:

Menu Item Display	Menu Item Description	Item Selection
rAtE-Un	Rate Unit	MGD
rAtE-dP	Rate Format	8888.8
tot-Un	Totalizer Unit	GAL
tot-dP	Totalizer Decimal Place	(Not applicable with a tot-Fact setting)
tot-Fact	Totalizer Multiplier	X 10000
20mA-Un	20 mA Unit	GAL
20mA-dP	20 mA dp	0
20mA-FS	20 mA FS	0 (4-20mA full scale not defined)
PLS-Un	Pulse Units	AFT
PLS-dP	Pulse Decimal Place	0.00
PLS-Inc	Pulse Increment	0.01
Par-Ser	Parent Serial Number	(Serial number is set at the factory)
SErno	Reg. Serial Number	(Serial number is set at the factory)
GPr-dP	GPR Decimal Place	00000
GPr	Gallons Per Rev	37
Smooth	Smoothing	t1
4mA-AdJ	Trim 4mA	.00 (Adjusted during 4-20mA calibration)
20mA-AdJ	Trim 20mA	.00 (Adjusted during 4-20mA calibration)
PLS-tYPE	Pulse Type	OC
PLSwidth	Pulse Width	0.1
Au-InP	Auxiliary Input	nonE
Cut-dP	Low-Flow Cutoff DP	0
CutoFF	Low-Flow Cutoff	0
PLS-Pr	Pulse Per Rev	2

Note:

1. Optically-isolated open collector and dry contact switch closure outputs are not applicable because they both require DC power. The pulse width length is an option only for the standard open collector pulse output.

Example 3: Register With 4-20mA Transmitter Output

Meter Size :	4"
Gallons Per Revolution:	0.5
Rate Units:	Liters Per Hour
Totalizer Units:	Metric Ton x 1
4-20mA FS:	100 LPM
Sensor type:	2 PPR

Configuration Settings:

Menu Item Display	Menu Item Description	Item Selection
rAtE-Un	Rate Unit	Un 14 (No symbol on display)
rAtE-dP	Rate Format	88888
tot-Un	Totalizer Unit	Un 7 (No symbol on display)
tot-dP	Totalizer Decimal Place	0
tot-Fact	Totalizer Multiplier	X 1
20mA-Un	20 mA Unit	Un 7 (Un 7 is an reference to a rate unit)
20mA-dP	20 mA dp	0
20mA-FS	20 mA FS	100
PLS-Un	Pulse Units	GAL
PLS-dP	Pulse Decimal Place	0
PLS-Inc	Pulse Increment	0 (No pulse output defined)
Par-Ser	Parent Serial Number	(Serial number is set at the factory)
SErno	Reg. Serial Number	(Serial number is set at the factory)
GPr-dP	GPR Decimal Place	0000.0
GPr	Gallons Per Rev	0.5
Smooth	Smoothing	t1
4mA-AdJ	Trim 4mA	.00 (Adjusted during 4-20mA calibration)
20mA-AdJ	Trim 20mA	.00 (Adjusted during 4-20mA calibration)
PLS-tYPE	Pulse Type	Opt (Type is irrelevant since there the pulse increment is not defined)
PLSwidth	Pulse Width	(Not applicable for the optically-isolate open collector pulse output)
Au-InP	Auxiliary Input	nonE
Cut-dP	Low-Flow Cutoff DP	0
CutoFF	Low-Flow Cutoff	0
PLS-Pr	Pulse Per Rev	2

Note:

1. In this example, units of measures "Un XX" are used at three different settings. There will not be any unit of measure symbol on the display. The cumulative total is using "Un 7" from the set of total units, and the 4-20mA is using "Un 7" from the set of rate units.

5.0 PRODUCT SPECIFICATIONS

5.1 Specifications

Environmental	
Operating Temp.:	-4°F to 158°F (-20°C to 70°C)
Storage Temperature:	-40°F to 158°F (-40°C to 70°C)
Housing Rating:	NEMA 4X
Meter Rating (with Remote Mount):	IP67
Input Signal	
Input Compatibility:	McCrometer Flowmeters
Remote Distance:	50 feet max.
Rate Functions	
Display:	5-digit
Rate Units:	22 different units
Totalizer Functions	
Display:	8-Digit
Totalizer Units:	20 different units
Accuracy:	0.25%
Non-Volatile Storage:	Updated hourly
Scaling Factor:	.0001 to 10000
Programming	
Program Access:	Magnetic wand (included)
Programming:	Menu driven
Access Lockout:	5-digit code
Test Modes:	4 mA and 20 mA test modes
Totalizer Reset:	Programming
Total Reset Disable:	Programming (permanent)
Calibration Adjustment:	± .01% to 10%

4-20mA Analog	
Power Requirements:	12 to 30 VDC
Transmission:	5,000 feet max.
4mA/20mA Trim:	.01 mA to .50 mA
Engineering/Time Units:	22 different units
Pulse Outputs	
Engineering Units:	20 different units
Optically Isolated Pulse	
Collector to emitter voltage:	50V @ 50 mA max.
Pulse Width:	80 ms
Max Pulses Per Minute:	30
Signal Distance:	500 feet max.
Open Collector Pulse	
Collector to emitter voltage:	50V @ 50 mA max.
Pulse Width:	adjustable
Max Pulses Per Minute:	150
Signal Distance:	500 feet max.
Contact Closure	
Contact Rating:	30V @ 1 Amp Max.
Pulse Width:	80 ms
Max Counts Per Minute:	30
Signal Distance:	500 feet
Power Requirement	
Battery Type:	Lithium 3.6 V
Battery Life:	6 - 10 Years
Optional 4-20mA:	Loop powered

5.2 Dimensions

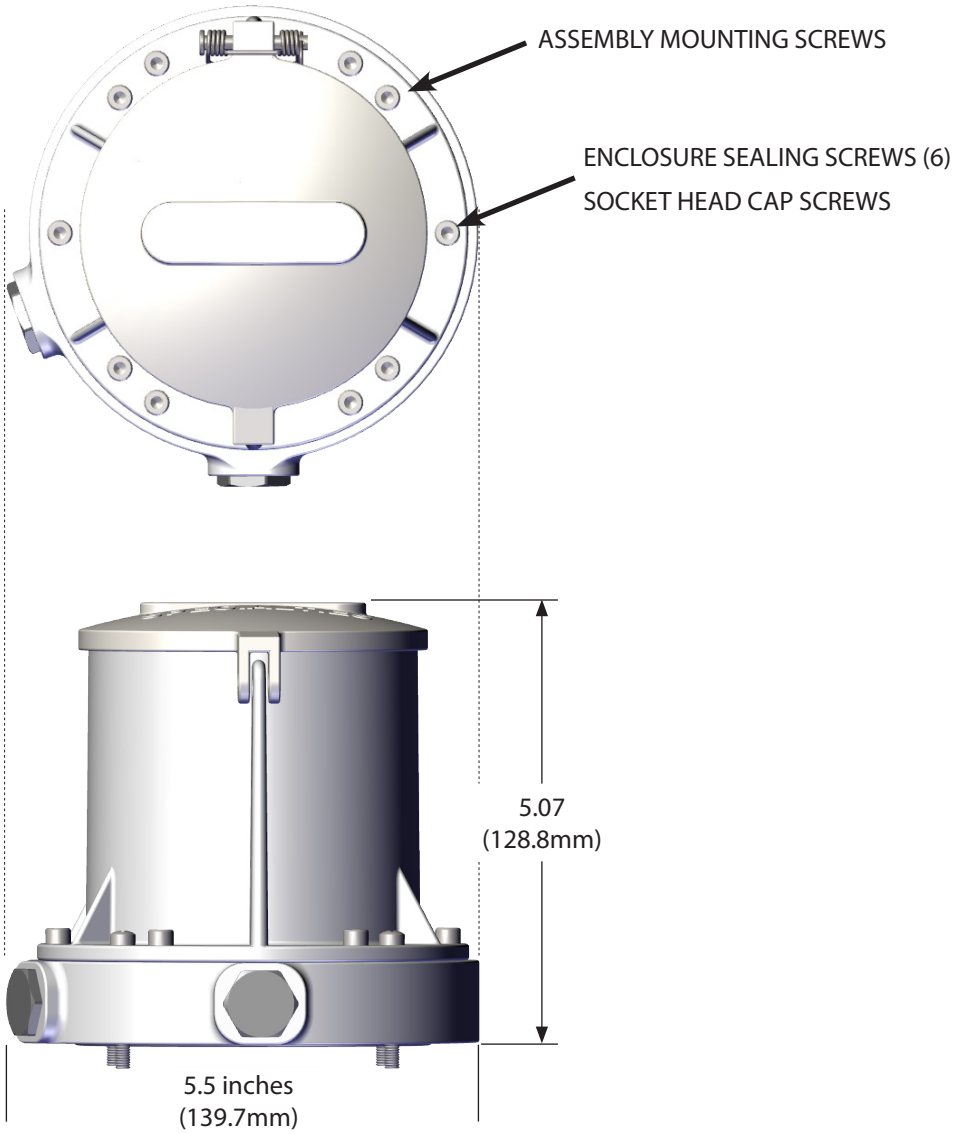


Figure 18. FlowCom housing

5.3 Housing

The enclosure assembly is sealed by six socket head cap screws. The enclosure cover and base are made of aluminum and coated for all weather use.

5.4 Parts List

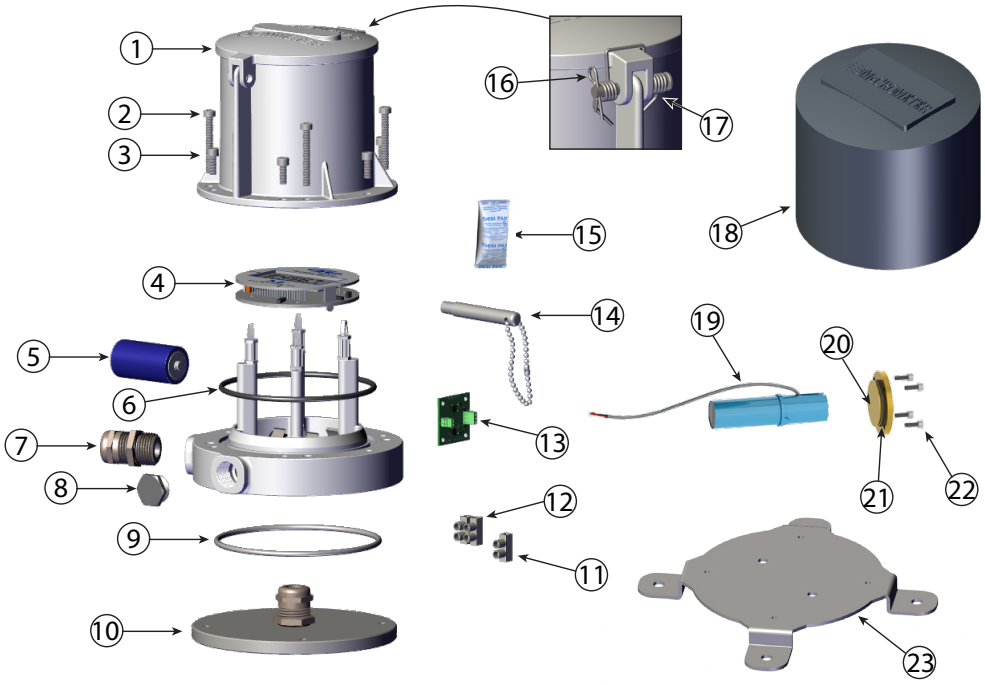


Figure 19. FlowCom replacement parts

Ref.	Part Number	Description	Qty
1	R0710-60	Canopy Enclosure Water Specialties	1
2	10730	Screw 10-32 x 1.25" Long Fillister Head	4
3	10602	Screw 10-32 x 0.5" Long Socket Head Cap	6
4	ELR500-01	Electronic Register, FlowCom	1
5	EZ100-00	Battery C 3.6V Lithium	1
6	10285	O-Ring (237 Buna)	1
7	EJ539-00 / EJ543-00	Fitting Cable Compression PG7 (Inside) / Fitting Cable PG11 Brass Plate (Outside)	Note 1
8	EJ544-00-K	Plug PG7 Slotted w/O-ring	Note 1
9	1-1551-38	O-Ring (243 Buna)	1
10	3-4397-4	Meter Head Cover with O-Ring & Cable Out (Remote Only)	1
11	1-1707-18	Inline Terminal 1 Wire	1
12	1-1707-19	Inline Terminal 2 Wire	1
13	EB420-02	4-20mA Protection Board	1
14	FC100-M	Magnet Wand	2
15	10015-00	Dry Pack	2
16	RP100-00	Retaining Pin SS F/Canopy	1
17	SP100-00	Spring Double Torsion F/Canopy	1
18	CB100-10	Canopy Boot	1
19	4-2745-2 / 4-2748-8	Sensor Pulse Transmitter 2 Pulse / Sensor Pulse Transmitter 8 Pulse	1
20	2-2731-SS	Gear Box Cover with O-Ring	1
21	1-1551-2	O-Ring (028 Buna)	1
22	1-1103-8-7	Screw 8-32 x 7/16" Long	4
23	1-2802	Remote Wall Bracket	1

Notes:

1. Quantity is based on the model selected.

Recommended parts for technicians: FC100-M (2 each), EZ100-00 (quantity as required), 10015-00 (quantity as required).

6.0 PRODUCT MAINTENANCE

6.1 Battery Replacement

To replace the battery the canopy enclosure must be removed. The time period which the enclosure is opened should be minimized to reduce moisture and contamination. The battery holder may have a zip tie or other locking mechanism in place which can be removed.

1. Make a note of the enclosure to base orientation prior to disassembly.
2. Remove the enclosure retaining screws and then the cover.
3. Inspect the inside environment of the enclosure and look for damage of any type.
4. Remove the existing battery and discard it following the local government standards.
5. Install the new battery.
6. Verify that the register turns on.
7. Replace the existing dry packs with new dry packs if available.
8. Apply O-ring lube to the cover O-ring (Figure 21).
9. Install the cover and screws.
10. If required re-install tamper evident components.

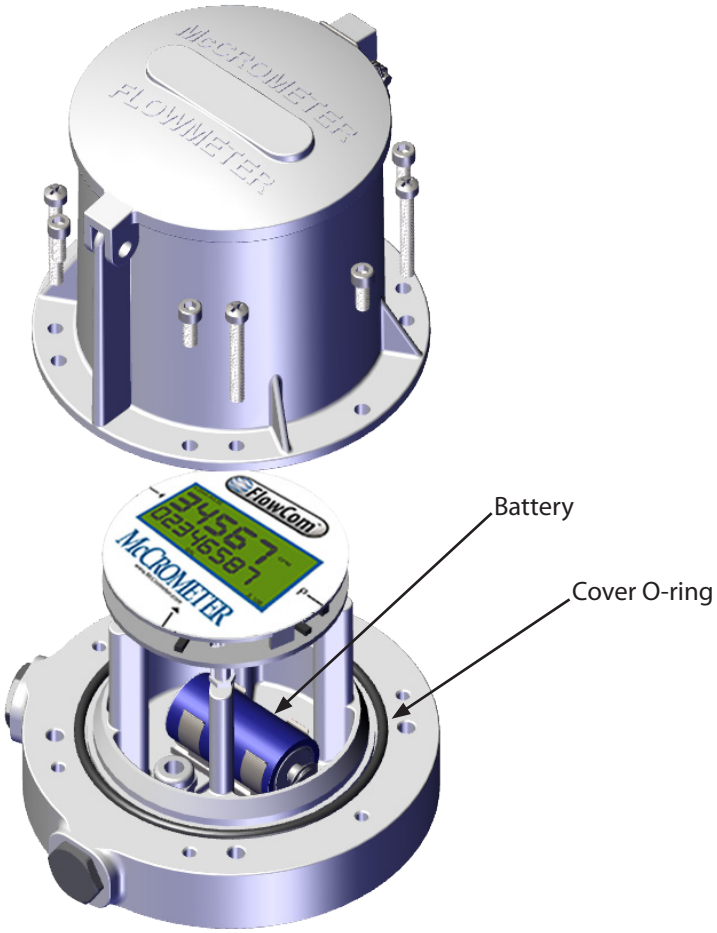


Figure 20. Canopy enclosure removed for battery replacement

7.0 TROUBLESHOOTING

Inaccurate Rate And Total Readings.

A. Check the gallons per revolution (GPR) and pulses per revolution (PPR) settings. The electronic register could be programmed with incorrect GPR and PPR values.

B. Check that the input sensor cable's shield wire is connected to the earth ground, per instructions on tag. Also, check the connection of the shield wire on the outside instrumentation side of the output cable, per instructions on tag.

C. If there is known noisy process instrumentation close to the installation, such as variable frequency drives, use the crimped green wire to connect any of the screws on the FlowCom's canopy to a known good earth ground, such as a copper rod inserted 4' (four feet) into the ground.

No Optically-isolated Pulse Or Dry Contact Switch Output.

A. Verify that both the 4-20mA loop power and DC power to the optically-isolated pulse/dry contact switch are present and connected to the correct output wires.

B. Check if the power source has the correct pulse voltage and current.

C. Make sure the ground wire inside the output cable is grounded on the instrument side.

D. Check whether a pull-up resistor is required to produce a signal.

No 4-20mA Transmitter Output.

A. Check that the negative side of the 24VDC (-24VDC) loop power supply is not connected to earth ground. To do this, turn off the 24VDC power supply and use a standard ohm meter to verify that the -24VDC connection is not shorted to the earth ground.

B. Check whether the 4-20mA loop is connected properly and powered.

C. Verify that the 20mA unit and full scale are set up in the program configurations.

Non-responsive Rate And Total Readings.

Check the connection between the sensor cable and the pulse input cable.

Blank LCD Display.

Check whether the 4-20mA loop is powered and/or the battery inside the canopy enclosure is installed properly.

7.1 Circuit Board Connections

The circuit board does not have any serviceable components. Each register is shipped with the cables connected to the appropriate input and output connections per the customer requirements. The circuit board layout is contained in this manual as a technical support reference manual as a technical support reference.

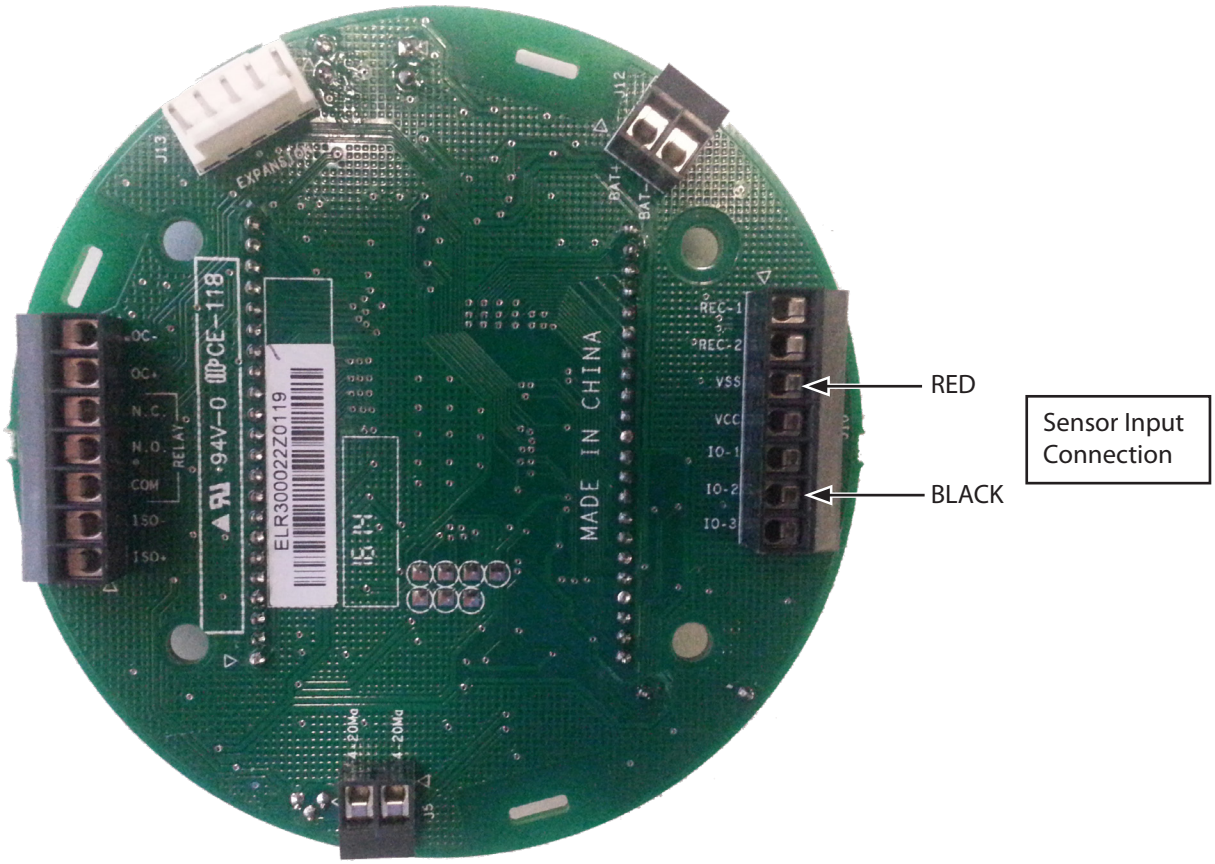


Figure 21. FlowCom circuit board

WARRANTY STATEMENT

McCrometer garantit que ce produit est exempt de tout défaut de matériau et de fabrication pendant une période de 12 mois à compter de la date d'installation de l'appareil, et pendant une période de 18 mois à compter de la date de livraison de l'appareil par McCrometer. Les réparations sont assurées pendant 12 mois ou, si la réparation est réalisée dans le cadre de la présente garantie, jusqu'à la fin de la période de garantie initiale, la période la plus courte étant à retenir.

L'acheteur signalera tout défaut par écrit à McCrometer dès la découverte de ce dernier et, dans tous les cas, au cours de la période de garantie. McCrometer se réserve le droit de réparer l'appareil, ou de fournir un appareil ou des pièces de rechange, au point de livraison initial.

McCrometer ne saura être tenu responsable de frais d'enlèvement, de réinstallation ou d'accès. La réparation, le remplacement ou la modification de l'appareil ou des pièces par l'acheteur ou un tiers sans l'accord écrit préalable de McCrometer libère McCrometer de toute obligation ultérieure envers l'acheteur en vertu du présent article concernant cet appareil.

Aucun appareil fourni par McCrometer ne saurait être jugé défectueux en raison d'une usure normale, de la non-résistance à l'action corrosive et érosive de fluides ou de gaz (sauf indication contraire mentionnée dans les spécifications de devis et de bon de commande), de l'incapacité directe ou indirecte de l'acheteur (ou l'incapacité de ses agents ou mandataires) à stocker, installer, faire fonctionner ou entretenir correctement l'appareil selon les bonnes pratiques de l'industrie ou les recommandations spécifiques de McCrometer, ou l'incapacité de l'acheteur à fournir des informations complètes et précises à McCrometer concernant l'utilisation opérationnelle de l'appareil.

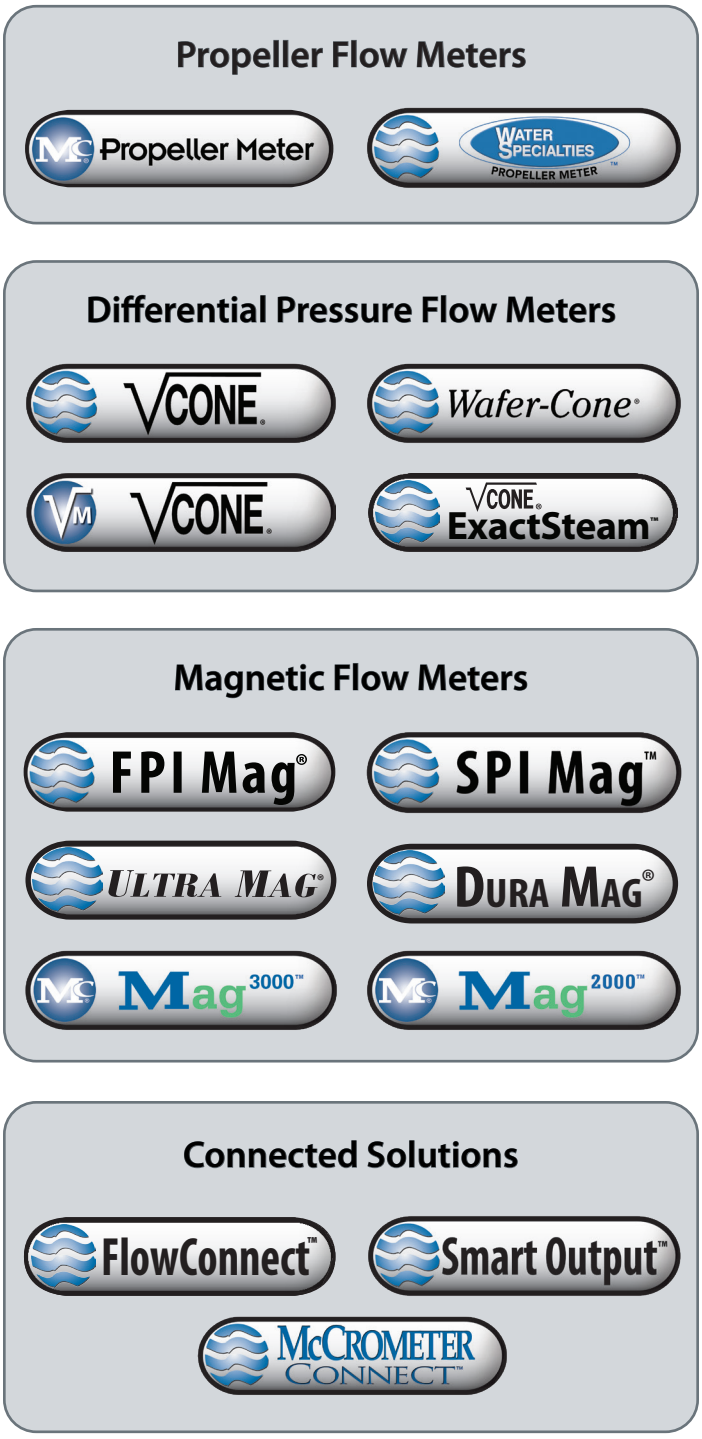
LES GARANTIES LIMITÉES QUI PRÉCÈDENT CONCERNANT L'APPAREIL ET LES PRODUITS SONT EXCLUSIVES ET REMPLACENT TOUTES LES AUTRES GARANTIES DE QUALITÉ OU DE PERFORMANCE, EXPRESSES, TACITES OU STATUTAIRES, Y COMPRIS ET SANS LIMITATION, TOUTE GARANTIE DE COMMERCIALISATION OU D'ADAPTATION DE L'APPAREIL ET DES PRODUITS À DES FINS PARTICULIÈRES.

MCCROMETER REJETTE TOUTE GARANTIE, EXPRESSE OU IMPLICITE, QUANT À L'APTITUDE DES PRODUITS ET DE L'APPAREIL FOURNIS RÉSULTANT D'UN BON DE COMMANDE POUR L'INSTALLATION AU SEIN D'UN SYSTÈME PARTICULIER. MCCROMETER N'OFFRE AUCUNE GARANTIE QUANT AUX SERVICES FOURNIS PAR MCCROMETER OU SES AGENTS ET RÉSULTANT D'UN DEVIS.

Le seul recours de l'acheteur et la seule obligation du fabricant pour le prétendu manquement, qu'il s'agisse de réclamation de garantie ou pas, sont pour le fabricant de devoir réparer ou remplacer les produits renvoyés dans les vingt-quatre mois après la date de l'expédition d'origine. Le fabricant ne peut être tenu pour responsable des pertes et dégâts pouvant survenir suite à l'utilisation par l'acheteur des produits du fabricant, et l'acheteur accepte d'indemniser et de garder le fabricant non responsable.

McCrometer n'autorise aucune personne ou entité (y compris et sans limitation, les agents et employés de McCrometer) à effectuer des représentations (verbales ou écrites) contraires aux termes de cette garantie limitée ou ses exclusions. Lesdits termes de cette garantie limitée et ses exclusions peuvent être uniquement et effectivement modifiés par écrit et exclusivement par le président de McCrometer.

OTHER McCROMETER PRODUCTS INCLUDE:



3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078
www.mccrometer.com

McCROMETER