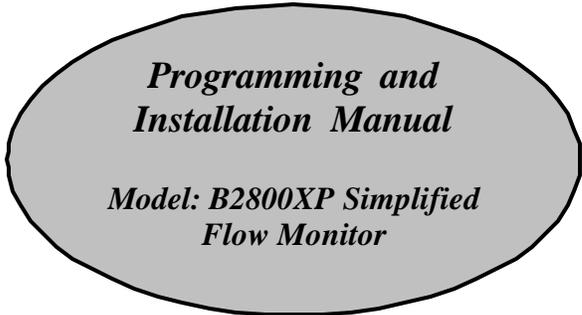




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## Specifications

- ▼ **Power Supply:**
  - 1 D” size 1.5 Volt Alkaline Battery
  - 4-20mA Loop Powered (optional)
- ▼ **Alpha-Numeric Rate and Totalization Display:**
  - Fixed or toggle modes of operation for Flow Rate and Totalizer display
  - 8 digit, .50” high numeric display
  - 8 digit, .25” high alpha display
- ▼ **Accuracy**
  - $\pm 0.1\%$
  - Temperature Drift = 50ppm / °C (Max)
- ▼ **Mounting Style**
  - NEMA/UL/CSA Type 4 (IP66)
- ▼ **Environmental:**
  - OPERATING TEMPERATURE
  - -22° F (-30° C) to 158° F (70° C)
  - HUMIDITY: 0-90% Noncondensing
- ▼ **INPUTS:**
  - MAGNETIC PICKUP INPUT:  
Frequency Range: 0 to 3500 Hz  
Trigger Sensitivity: 30 mV p-p  
Over Voltage Protected:  $\pm 30$  VDC
- ▼ **OUTPUTS:**
  - Opto-Isolated Open Collector Transistor
  - Max. Voltage: 30VDC
  - Pulse Width: 20ms/ Max rate 25Hz
  - Current (ON State): 0.9V drop @ 5.0mA or 0.7V drop @ 0.1mA
  - Optional 4-20mA Output
- ▼ **B2800 Certification:**
  - CSA Ordinary Locations: C22.2 No. 1010-1 for Canada  
ISA S82.02 for US – Class I, Div 1, Groups B,C, D:  
Class II, Groups E,F,G: Class III; Type 4X; T6 @ 70° C
  - CSA Hazardous Locations: C22.2 No. 30 for Canada  
FM3615 for US

## Operating the B2800 Simplified

The Blancett B2800 flow monitor utilizes two modes of operation. These are referred to as the **Run** mode and the **Program** mode. Both the Run mode and the Program mode display screen enunciators confirming the state of the monitor. A quick glance at the lower left hand corner of the LCD screen will confirm operating status. Normal operation will be in the **RUN** mode. To access the programming level, press the **MENU** key once. The programming indicator will appear signaling that the display is ready to accept programming inputs. After programming the display with the necessary information, a lock out feature can be turned on to prevent unauthorized access or changing the meter’s setup parameters.

### Basic Programming Mode

Keys:

**MENU** – Switches to Programming mode.  
**UP Arrow** – Scrolls forward through the parameter choices and increments numeric variables.  
**Right Arrow** – Scrolls backward through the parameter choices and moves the active digit to the right.  
**ENTER** – Used to save programming information, advance to the next programming parameter, and in the reset process.

Modes:

**RUN** – Normal operating mode.  
**PROGRAM** – Used to program variables into the display.

If your monitor was ordered with a flow meter, the two components ship from the factory, calibrated as a set. If the monitor is a replacement, the turbine's K-Factor has changed, or the monitor is being used with some other pulse-generating device, programming will be necessary.

**Programming Using Pulse Output Turbine Flow Meters**

Each turbine flow meter is shipped with either a K-Factor value or frequency data. If frequency data is provided, the data must be converted to a K-Factor before programming the monitor. K-Factor information, when supplied, can usually be found on the neck of the flow meter or stamped on the body. The K-Factor represents the number of pulses per unit of volume. The K-Factor will be needed to program the monitor readout.

**Enter Programming Mode** – Change to programming mode by pressing the MENU key once. The mode indicator will change from RUN to PROGRAM.

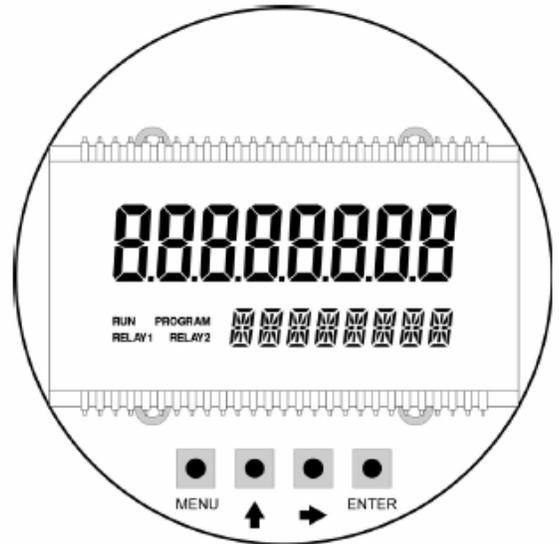
**Select The Meter Size** – At the METER prompt, press the - or Ⓢ arrow keys to select the bore size of your meter. Press ENTER once to save the meter size choice and advance to the K-Factor units selection.

**Note:** The meter connection size and the bore size are different. For example, many of the 1” NPT turbines have bore sizes that range from 3/8” up 1”. Be sure to use the correct bore size or the meter will report incorrect flows and totals.

**Enter The Meter's K-Factor Unit** – Directly after the METER size is selected the display's K-Factor unit must be chosen. Use the - arrow key to select your K-Factor unit. For meters calibrated in gallons, use PUL/GAL (pulses per gallon), for meters calibrated in cubic meters, use PUL/M3 (pulses per cubic meter). **Note: Unless otherwise specified, Blancett turbine flow meters are supplied with K-Factors measured in pulses per gallon (PUL/GAL) which will automatically convert to your desired units of measure.** Press ENTER to save the K-Factor unit and advance to the next parameter.

**Note:** The K-Factor supplied with the meter or calculated from calibration data will be needed to complete the next step.

**Enter The Meter's K-Factor** – To change the K-Factor value use the Ⓢ arrow key, select the position of the number that you wish to change. Using the - arrow key, increment the display digit until it matches the meter's K-Factor digit. Repeat this process until all K-Factor digits have been entered. Press ENTER once to save the K-Factor and advance to the RATE/TOTAL Units selection.



**FIGURE 1 - FRONT PANEL**

**Select The Rate/Total Units of Measure** – The monitor allows the choice of four common rate/total units.

SELECTION	RATE	TOTAL
GPM/GAL	Gallons per Minute	Gallons
LPM/LIT	Liters per Minute	Liters
M3PD/M	Cubic Meters per Day	Cubic Meters
BPD/BBL	Barrels per Day	Barrels

The monitor now shows the rate/total unit that the display is currently set for. If the current selection is current, press the ENTER key once to advance to the next parameter. To change to an alternate unit, use the arrow keys to scroll to the desired rate unit and press ENTER to save the choice. **Note: The total unit's output multiplier cannot be modified in the Simplified program level. This option is reserved in the Advanced program level.**

**Select The Display Function** – The monitor can display RATE or TOTAL or alternate between BOTH rate and total. If the current selection is correct, press the ENTER key to advance to the next parameter. To change to an alternate display mode, use the arrow keys to scroll to the desired display mode and press ENTER to save the choice.

A TEST function is also available in the Display Function sub-menu. With the test function selected the display acts like a frequency counter and displays the raw input frequency being supplied to the frequency input terminals. This is very useful when troubleshooting flow problems.

## ADDITIONAL SCALING PARAMETERS

**Note:** Some of the following scaling parameters are model dependent and may not be displayed.

**Totalizer Pulse Output** – The pulse output parameter can be either enabled or disabled. When enabled this output generates a 20mS duration pulse for every time the least significant digit of the totalizer increments. The amplitude of the pulse is dependent on the voltage level of the supply connected to the pulse output and is limited to a maximum 30VDC.

**Password** – Password protection prevents unauthorized users from changing programming information. Initially, the password is set to all zeros. To change the password press ENTER once at the password prompt. The first digit of the password value will begin to flash. Using the arrow keys as previously described, enter the password value. Pressing ENTER will store the password and exit to run mode.

**Reset Total** – To reset the monitor total display, in run mode press MENU and ENTER simultaneously until TOTAL RST starts to flash. The TOTAL RST will stop flashing and the display will return to run mode at the conclusion of the reset procedure.

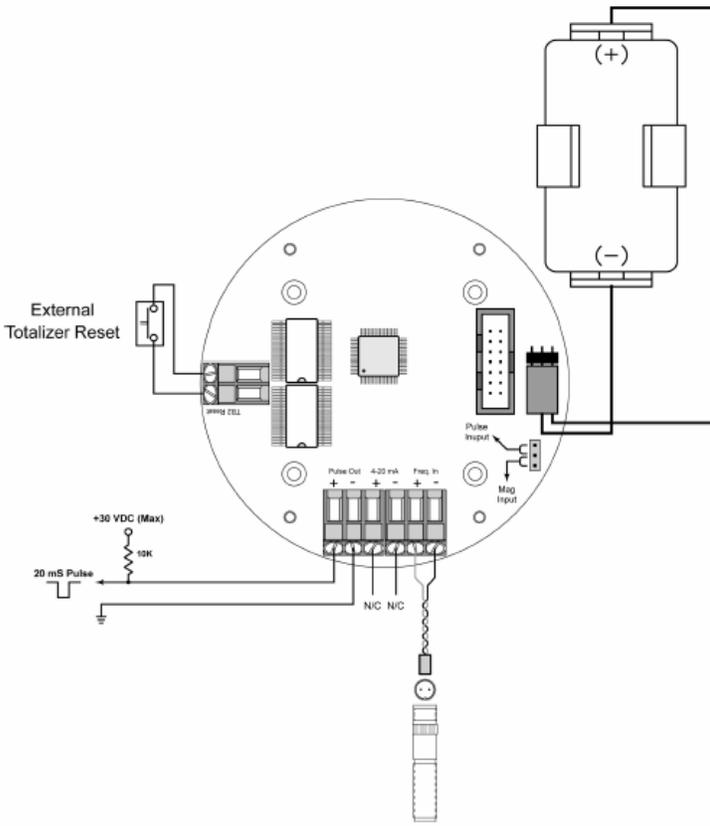
**Store Total** – The current total can be manually stored in the monitor's flash memory. This procedure may be desirable prior to replacing the battery. Press and hold the ENTER key for 2 seconds. The display will respond with a flashing TOTALSVD and then return to the run mode.

**Automatic Store Total** – The monitor is equipped with a store total feature that works automatically, saving the current total to flash memory. The frequency of saves depends on the power supply option chosen.

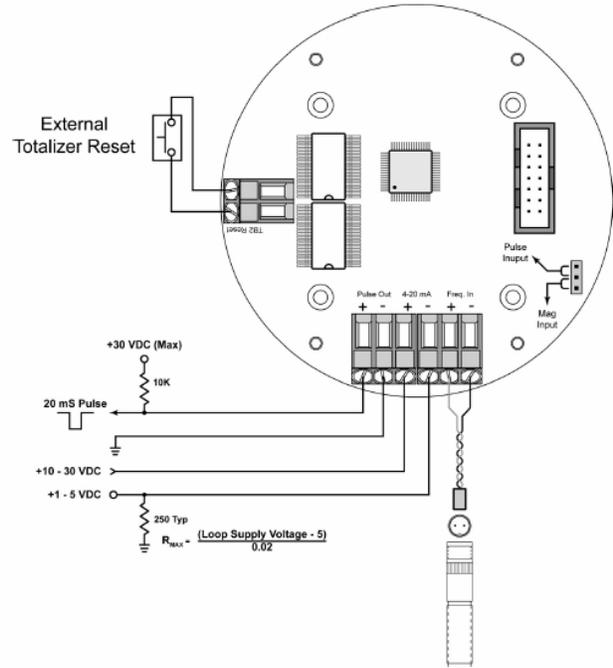
Battery Powered: Once per hour and just before a low battery condition turns the unit off.  
Loop Powered: Once every ten minutes.

## ADDITIONAL INPUT OPTIONS

The B2800 Flow Monitor is capable of receiving Magnetic Pickup input (small signal sine wave) or a Contact Closure input (pulse). Since most Blancett Turbine Flow Meters utilize a magnetic pickup, the B2800 Flow Monitor is shipped configured for magnetic pickup input. To change to a Contact Closure input, remove JP2 from the **bottom** two pins and jumper them to the **top** two pins. **See Figure 2**



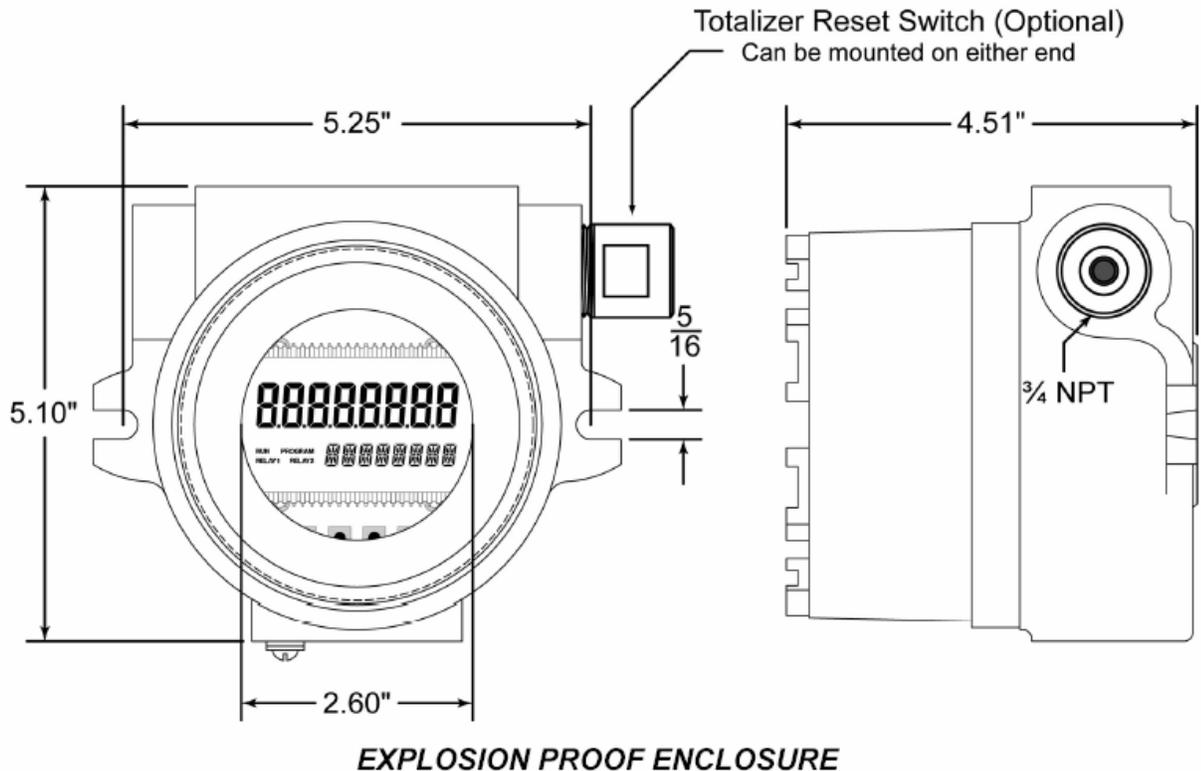
**EXPLOSION PROOF CIRCUIT BOARD LAYOUT  
(BATTERY POWERED)**



**EXPLOSION PROOF CIRCUIT BOARD LAYOUT  
(LOOP POWERED)**

**FIGURE 2 - CIRCUIT BOARD LAYOUT**

Notes:



## Battery Replacement

Battery powered monitors use a single 1.5V, D size, alkaline battery. When replacement is necessary, use a clean fresh battery to insure continued trouble free operation. It is recommended that the total be saved to memory before the battery is removed. (See “Store Total” in the programming section of this manual.)

### Explosion Proof Version



**Danger:** Do not open explosion proof enclosure unless the area is known to be free of hazards. Failure to make the area safe before opening the enclosure can result in a hazardous situation with a potential for injury.

Carefully unscrew the enclosure cover to access the circuit board. Remove the four screws securing the circuit board to the enclosure. Lay the circuit board to the side being careful not to pull any wires from their connections. Clip the battery retaining wire/strap and remove the battery. Replace the battery being sure to observe the proper polarity and install a new retaining strap or wire. Reassemble the monitor reversing the disassembly process.

# Explosion Proof Enclosure Installation

The EIH Instrument Enclosure is designed to house instrumentation and control equipment as well as act as a conduit outlet body in hazardous, abusive, and wet locations.

The EIH enclosure is approved by Underwriters Laboratories Inc., Canadian Standards Association, Factory Mutual and CENELEC for use in Class I, Groups B\*, C\*\*, and D, Class II, Groups E, F, and G and Class II hazardous (classified) locations as defined by the National Electrical Code® and Canadian Electrical Code. It is also NEMA/UL/CSA Type 4 and IP66 rated for watertight applications.

*\*With conduit seals installed within 18 inches of enclosure*

*\*\*For CSA group C applications, unsealed conduit lengths must not exceed 5 ft (152 cm).*

## Installation



**WARNING** Electrical power must be “OFF” before and during installation and maintenance.

1. EIH Instrument Enclosures are furnished with ¾” NPT offset through-feed cast hubs for conduit entries. EIH Instrument Enclosures are supplied with ¾” NPT offset through-feed cast hubs on the power side and one ¾” NPT hub on the instrument side for conduit entries. (Use Crouse-Hinds RE21-SA to reduce to ½” hubs.)
2. Secure the enclosure to the conduit system. If the enclosure has mounting feet, select a mounting location that will provide sufficient strength and rigidity to support the enclosure as well as the enclosed device and wiring.



**CAUTION** Select a mounting location so that the enclosure will not be subjected to impact by heavy objects. Impacts can damage enclosed devices or glass lens.



**CAUTION** The hazardous location information specifying class and group listing of each instrument enclosure is marked on the nameplate of each enclosure.



**CAUTION** All unused conduit openings must be plugged. Plug unused conduit openings with Crouse-Hinds PLG2. Plugs must be a minimum of 1/8” thick and engage a minimum of 5 full threads.

3. Install Crouse-Hinds EYS Sealing Fittings required by Section 501-5 and/or 502-5 of the National Electrical Code® and Section 18 of the Canadian Electrical Code as well as any other applicable local codes and when enclosure is installed in Class I Group B hazardous locations. (For CSA Group C applications, unsealed conduit lengths must not exceed 5 ft. or 152 cm).
4. Un-thread instrument (and power side) covers and carefully set aside to prevent damage to the cover threads and glass lens (when glass lens cover is used).

5. Pull wires into enclosure making certain they are long enough to make the required connections and to remove the instrument or power supply if servicing is required. Install instrument and power supply, if applicable and make all electrical connections.

**NOTE:** *When installing device be sure to check instrument dimensions to avoid interference with clamping ring on glass lens and the cover on standard units.*

6. Test wiring for correctness by checking continuity and also check for unwanted grounds with insulator resistance tester. Make sure test equipment being used will not damage instrument to be housed in the EIH or EIH instrument enclosure.
7. Carefully re-thread cover to enclosure housing. Tighten cover until cover flange contacts body face.



**CAUTION** Use care to prevent dirt, grit or other foreign material from lodging on threads. If any such material settles on these threads, clean them with Kerosene or Stoddard solvent\*\*\*, then re-lubricate with Crouse-Hinds Type STL thread lubricant.

\*\*\*To avoid the possibility of an explosion, oxidation and corrosion, do not use gasoline or similar solvent.

8. Tighten cover set screws to prevent cover from loosening under vibration.



**WARNING** To maintain the explosion proof integrity of the enclosure with a screw in a tapped mounting pad hole, there must be a minimum of 1/16" of material between the drill point and the back wall. If for any reason a screw will not be threaded into the drilled hole a minimum of 1/8" of material must remain between the drill point and the back wall.

## Maintenance



**WARNING** Always disconnect primary power source before opening enclosure for inspection or service.

1. Frequent inspection should be made. A schedule for maintenance checks should be determined by the environment and frequency of use. It is recommended that it should be at least once a year.
2. Perform visual, electrical and mechanical checks on all components on a regular basis.
  - A) Visually check for undue heating evidenced by discoloration of wires or other components, damaged or worn parts, or leakage evidenced by water or corrosion in the interior.
  - B) Electrically check to make sure that all connections are clean and tight and that the device is operating correctly.

# TROUBLESHOOTING

## 1) No LCD Display

- Check Battery Voltage. Should be 1.5 VDC. Replace if low or bad.

## 2) No rate or total displayed

- Check connection from meter pickup to display input terminals.
- Check turbine meter rotor for debris. Rotor should spin freely.
- Check programming of monitor.

## 3) Flow rate display reads a constant reading all the time

- This is usually an indication of external noise. Keep all AC wires separate from DC wires.
- Check for large motors close to meter pickup.
- Check for radio antenna in close proximity.
- Try disconnecting the pickup from the monitor pig tail. This should stop the noise. If so, then try re-orienting the meter to a new location.

## 4) Flow rate indicator bounces

- This usually indicates a weak signal. Replace pickup and/or check all connections.
- Examine K-Factor.

Default K-Factor Values			
Meter Size	Default K-Factor	Lower Limit	Upper Limit
0.375	20,000	16,000	24,000
0.500	13,000	10,400	15,600
0.750	2,750	2,200	3,300
0.875	2,686	2,148	3,223
1.000	870.0	696.0	1,044
1.500	330.0	264.0	396.0
2.000	52.0	41.6	62.0
3.000	57.0	45.6	68.0
4.000	29.0	23.2	35.0
6.000	7.0	5.6	8.0
8.000	3.0	2.4	4.0
10.000	1.6	1.3	2.0

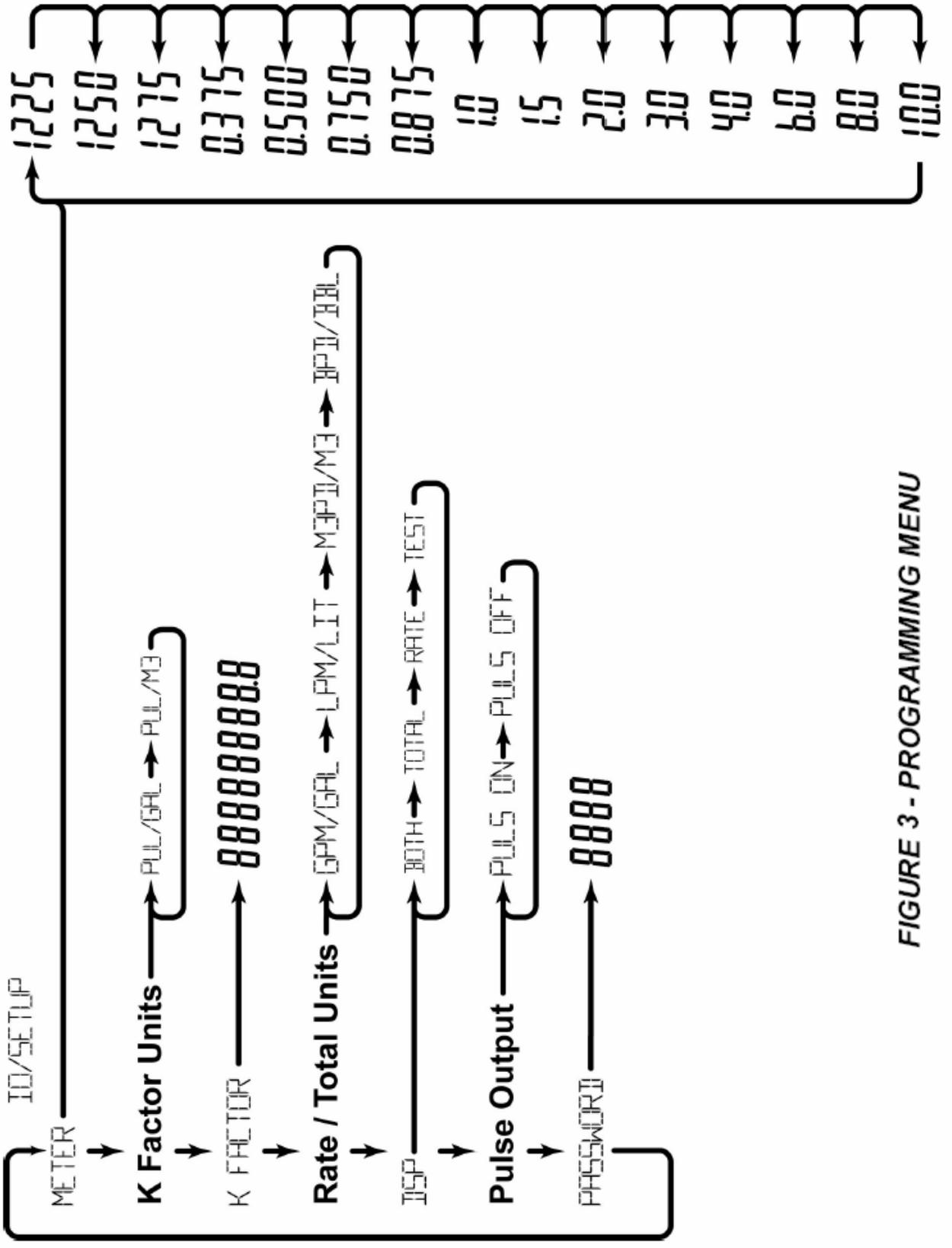
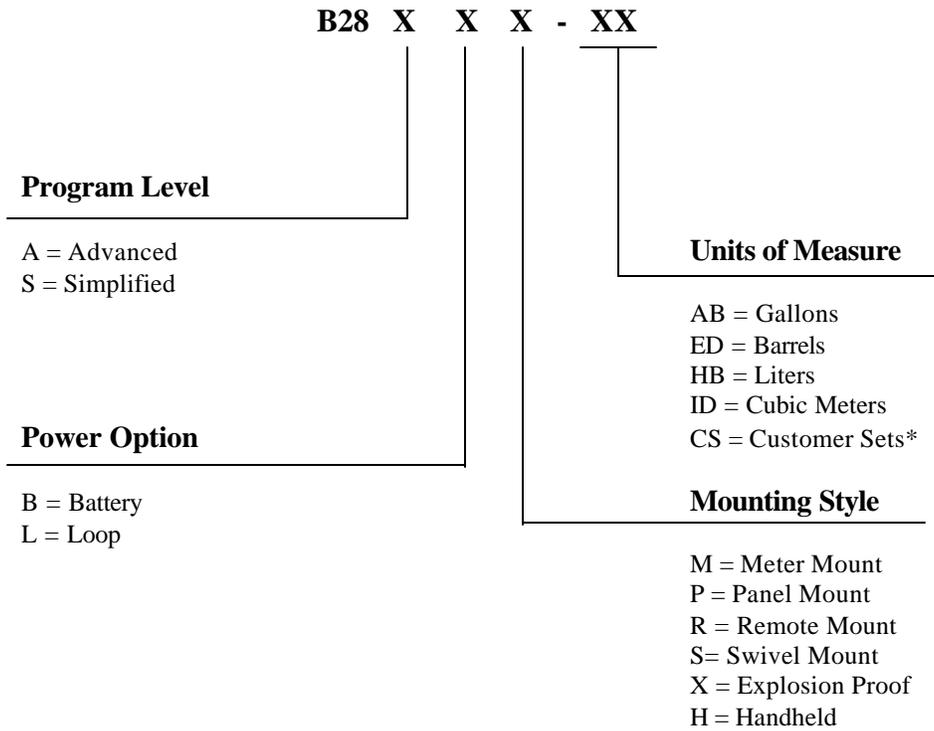


FIGURE 3 - PROGRAMMING MENU

**Blancett B2800 Flow Monitor Part Numbering Information**



\*Note: Advanced B2800 Monitors only. The default is gallons per minute.

**Explosion Proof - Accessories**

<b>Component</b>	<b>Part Number</b>
<b>Enclosure</b>	<b>B280635</b>
<b>Battery</b>	<b>B280601</b>
<b>Battery Holder</b>	<b>B280634</b>
<b>Battery Tie Wrap</b>	<b>B228036</b>
<b>Cap Plug – 3/4"</b>	<b>B118236</b>
<b>Desiccant Pouch</b>	<b>B220141</b>
<b>Pickup Cable</b>	<b>B222-121</b>
<b>Bell Reducer</b>	<b>B240657</b>
<b>Battery Mount Plate</b>	<b>B280618</b>
<b>Adaptor Bridge Plate</b>	<b>B280677</b>
<b>Hex Standoffs</b>	<b>B280667</b>