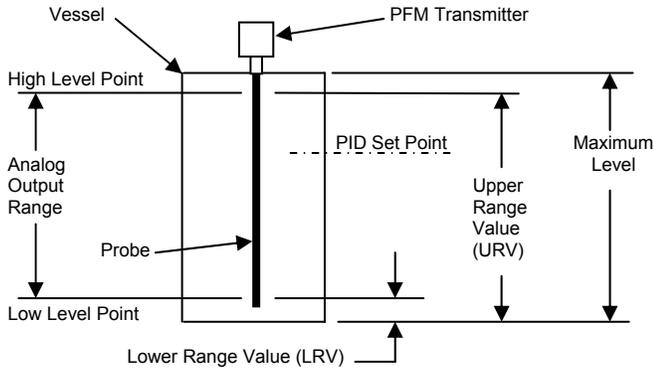


## MODEL 7000 QUICK CALIBRATION GUIDE

- This guide is not a replacement for the instruction manual. However, it is a simplified step by step instruction which may be used for most applications.
- This document should not be used until after the Probe, PFM Transmitter and control unit have been properly installed.



**FIGURE 1**

Refer to Figure 1 and fill in the required information below as applicable. For Volume or Flow measurement, also refer to the applicable figures in the instruction manual for interpretation of vessel, flume or weir dimensions.

### FOR LEVEL MEASUREMENT (ALL INSTRUMENTS):

**Maximum Level:** \_\_\_\_\_

This is the highest point that can be measured. This is usually, but not always, the same as the vessel height.

**Lower Range Value (LRV):** \_\_\_\_\_

This point is usually on the active portion of the probe as it is normally the lowest point that can be measured. For Level Only measurement it is the 4 ma point when the instrument has an analog output. If the instrument will also be used for Volume, Flow or PID Control this value should be 0.

**Upper Range Value (URV):** \_\_\_\_\_

This is the anticipated high level point. For Level Only measurement it is the 20 ma point when the instrument has an analog output. If the instrument will also be used for Volume, Flow or PID Control this value should be the same as the Maximum Level.

### FOR VOLUME MEASUREMENT:

**Lower Range Value (LRV) – Volume:** \_\_\_\_\_

This is the volume at the anticipated low point and is usually on the active portion of the probe as it is normally the lowest point that can be measured. It is the 4 ma point when the instrument has an analog output. If the instrument will be used as a PID Controller this value should be 0.

**Upper Range Value (URV) – Volume:** \_\_\_\_\_

This is the volume at the anticipated high level point. It is the 20 ma point when the instrument has an analog output. If the instrument will also be used as a PID controller this value should be the volume at the Maximum Level.

For Vertical Cylinder, Vertical Cylinder with Cone Bottom, Horizontal Cylinder, Horizontal Cylinder with Elliptical Ends, Horizontal Cylinder with Spherical ends and Spherical Vessel fill in the following as applicable:

**Tank Height:** \_\_\_\_\_ (Does not include Cone Height)

**Tank Length:** \_\_\_\_\_ (Does not include End Depth)

**Cone Height:** \_\_\_\_\_ **End Depth:** \_\_\_\_\_

**Tank Radius:** \_\_\_\_\_

For all other vessels or for User Defined Vessels a strapping table is required. See section on strapping tables.

### FOR FLOW MEASUREMENT:

**Lower Range Value (LRV) – Flow:** \_\_\_\_\_

This is the flow at the anticipated low point and is usually on the active portion of the probe as it is normally the lowest point that can be measured. It is the 4 ma point when the instrument has an analog output. If the instrument will be used as a PID Controller this value should be 0.

**Upper Range Value (URV) – Flow:** \_\_\_\_\_

This is the flow at the anticipated high level point. It is the 20 ma point when the instrument has an analog output. If the instrument will also be used as a PID controller this value should be the volume at the Maximum Level.

For V-Notch Weir, Parshall Flume, Rectangular Weir, Contracted Weir and Cipolletti Weir fill in the following as applicable:

**Notch Angle:** \_\_\_\_\_ **Throat Width:** \_\_\_\_\_

**Crest length:** \_\_\_\_\_

For all other weirs or flumes or for User Defined Weir or Flume a strapping table is required. See section on strapping tables.

### STRAPPING TABLE:

For User Defined Vessels, Flumes or Weirs a strapping table as shown below is required. The % of Volume or Flow in increments of 5% of the Level must be known.

ENTRY #	% OF LEVEL	LEVEL	VOLUME or FLOW	% OF VOLUME OR FLOW
1	5 %			
2	10 %			
3	15 %			
4	20 %			
5	25 %			
6	30 %			
7	35 %			
8	40 %			
9	45 %			
10	50 %			
11	55 %			
12	60 %			
13	65 %			
14	70 %			
15	75 %			
16	80 %			
17	85 %			
18	90 %			
19	95 %			
20	100 %			

### FOR ALARMS:

- Process Alarms are used to indicate when the Level, Volume or Flow rises or drops to predetermined values.
- Output Alarms are used to indicate when the 4-20 ma output rises or drops to predetermined ma values. It is highly recommended that Output Alarms be disabled when using PID Control.
- Setpoint Alarms are applicable only when using the instrument as a PID Controller. They set the minimum and maximum limits for the setpoint and indicate an alarm when an operator sets the setpoint outside of those parameters.
- All Alarms may be enabled or disabled.
- For enabled alarms fill in the appropriate information in the table(s) below.

	PROCESS ALARMS			
	ALARM #1	ALARM #2	ALARM #3	ALARM #4
STATUS Enable or Disabled				
MEASUREMENT Level, Volume or Flow				
FAILSAFE MODE LLFS or HLFS				
ALARM TYPE FXD or ADJ Differential				
LOW SETPOINT See note 1 on next page				
HIGH SETPOINT See note 2 on next page				
OFF DELAY In seconds				
ON DELAY In seconds				
OUTPUT RELAY None, #1, #2, #3 or #4				

	OUTPUT ALARMS		SETPOINT ALARMS	
	ALARM #1	ALARM #2	ALARM #1	ALARM #2
STATUS Enable or Disabled				
FAILSAFE MODE LLFS or HLFS				
ALARM TYPE FXD or ADJ Differential				
LOW SETPOINT See note 1 below				
HIGH SETPOINT See note 2 below				
OUTPUT RELAY None, #1, #2, #3 or #4				

NOTE 1: LOW SETPOINT is applicable only if the alarm FAILSAFE MODE is LLFS or if the ALARM TYPE is ADJ.

NOTE 2: HIGH SETPOINT is applicable only if the alarm FAILSAFE MODE is HLFS or if the ALARM TYPE is ADJ.

- Use only the settings and values called for in this document and in the order stated. After calibration has been completed they may be changed if desired.
- Do not be concerned with the ERROR LED or EXCESSIVE HEAD HEIGHT warning prior to completion of Calibration.
- Use CLEAR to back out of a mode and to erase numerical entries.
- This guide is written as though all of the settings are at the factory default settings. If any settings were changed it is recommended to proceed to INITIALIZATION PROCEDURE, otherwise proceed to INITIAL SETUP.

### INITIALIZATION PROCEDURE

KEYPAD ENTRY	REMARKS
SETUP	<b>Access Level</b> appears in VFD line 2.
ENTER	<b>Limited</b> appears in VFD line 2.
△ ▽	Scroll until <b>Full</b> appears in VFD line 2.
ENTER	<b>Password?</b> appears in VFD line 1.
	*-*-*-*-> appears in VFD line 2.
	Enter password. (12345 is factory default password)
NUMERIC	<b>Full</b> appears in VFD line 2.
ENTER	<b>Access Level</b> appears in VFD line 2.
CLEAR	Scroll until <b>Diagnostics</b> appears in VFD line 2.
△ ▽	<b>PFM Input Test</b> appears in VFD line 2.
ENTER	Scroll until <b>Initialize Database</b> appears in VFD line 2.
△ ▽	<b>All Except PFM Input</b> appears in VFD line 2.
ENTER	Scroll until <b>Full Initialization</b> appears in VFD line 2.
△ ▽	<b>Initialize Database</b> appears in VFD line 2 after a short wait.
ENTER	<b>Diagnostics</b> appears in VFD line 2.
CLEAR	<b>VFD lines 1 and 2 are blank.</b>
CLEAR	

Proceed to INITIAL SETUP.

### INITIAL SETUP:

KEYPAD ENTRY	REMARKS
SETUP	<b>Access Level</b> appears in VFD line 2.
ENTER	<b>Limited</b> appears in VFD line 2.
△ ▽	Scroll until <b>Full</b> appears in VFD line 2.
ENTER	<b>Password?</b> appears in VFD line 1.
	*-*-*-*-> appears in VFD line 2.
	Enter password. (12345 is factory default password)
NUMERIC	<b>Full</b> appears in VFD line 2.
ENTER	<b>Access Level</b> appears in VFD line 2.
CLEAR	Scroll until <b>Measurement Mode</b> appears in VFD line 2.
△ ▽	<b>Level Only</b> appears in VFD line 2.
ENTER	Scroll until desired measurement appears in VFD line 2.
△ ▽	<b>Measurement Mode</b> appears in VFD line 2.
ENTER	Scroll until <b>PV Display Variable</b> appears in VFD line 2.
△ ▽	<b>Level</b> appears in VFD line 2.
ENTER	Scroll to <b>Volume</b> or <b>Flow</b> if either of those will be used.
△ ▽	<b>PV Display Variable</b> appears in VFD line 2.
ENTER	Scroll until <b>SP Display Variable</b> appears in VFD line 2.
△ ▽	<b>Level</b> appears in VFD line 2.
ENTER	For Level Only measurement scroll to <b>NONE</b> .
△ ▽	If Volume or Flow measurement will be used scroll to <b>Level</b> .
ENTER	<b>SP Display Variable</b> appears in VFD line 2.
△ ▽	Scroll until <b>VFD Line 1 Variable</b> appears in VFD line 2.
ENTER	<b>Output %</b> appears in VFD line 2.
△ ▽	<b>VFD Line 1 Variable</b> appears in VFD line 2.
ENTER	Scroll until <b>VFD Line 2 Variable</b> appears in VFD line 2.
△ ▽	<b>Output %</b> appears in VFD line 2.
ENTER	Scroll until <b>PFM Input Counts</b> appears in VFD line 2.
△ ▽	<b>VFD Line 2 Variable</b> appears in VFD line 2.
ENTER	<b>XX.XX percent</b> appears in VFD line 1.
CLEAR	

Proceed to LEVEL CALIBRATION.

### LEVEL CALIBRATION (ALL INSTRUMENTS):

KEYPAD ENTRY	REMARKS
CALIBRATE	<b>Level</b> appears in VFD line 2.
ENTER	<b>Units</b> appears in VFD line 2.
ENTER	<b>Inches</b> appears in VFD line 2.
△ ▽	Scroll until desired units appears in VFD line 2.
ENTER	<b>Units</b> appears in VFD line 2.
△ ▽	Scroll until <b>Maximum Level</b> appears in VFD line 2.
ENTER	<b>Maximum Measurement</b> appears in VFD line 1.
	<b>XX.XX-&gt;</b> appears in VFD line 2.
	Enter Maximum Level.
NUMERIC	<b>Maximum Level</b> appears in VFD line 2.
ENTER	Scroll until <b>Upper Range Value</b> appears in VFD line 2.
△ ▽	<b>Upper Range Value</b> appears in VFD line 1.
ENTER	<b>XX.XX-&gt;</b> appears in VFD line 2.
	Enter Upper Range Value.
NUMERIC	<b>Upper Range Value</b> appears in VFD line 2.
ENTER	Scroll until <b>Lower Range Value</b> appears in VFD line 2.
△ ▽	<b>Lower Range Value</b> appears in VFD line 1.
ENTER	<b>XX.XX-&gt;</b> appears in VFD line 2.
	Enter Lower Range Value.
NUMERIC	<b>Lower Range Value</b> appears in VFD line 2.
ENTER	Scroll until <b>Damping Time</b> appears in VFD line 2.
△ ▽	<b>Level Damping Time</b> appears in VFD line 1.
ENTER	<b>X.X-&gt;</b> appears in VFD line 2.
	Enter 0.
NUMERIC	<b>Damping Time</b> appears in VFD line 2.
ENTER	<b>LEVEL</b> appears in VFD line 2.
CLEAR	

For Level Only measurement proceed to INPUT CALIBRATION.  
For Level and Volume Measurement proceed to VOLUME CALIBRATION.  
For Level and Flow measurement proceed to FLOW CALIBRATION.

### VOLUME CALIBRATION:

KEYPAD ENTRY	REMARKS
△ ▽	Scroll until <b>Volume</b> appears in VFD line 2.
ENTER	<b>Units</b> appears in VFD line 2.
ENTER	<b>Gallons</b> appears in VFD line 2.
△ ▽	Scroll until desired units appears in VFD line 2.
ENTER	<b>Units</b> appears in VFD line 2.
△ ▽	Scroll until <b>Vessel Type</b> appears in VFD line 2.
ENTER	<b>Vertical Cylinder</b> appears in VFD line 2.
△ ▽	Scroll until desired vessel type appears in VFD line 2.

Proceed to applicable VESSEL TYPE.

#### VERTICAL CYLINDER: HORIZONTAL CYLINDER: HORIZONTAL CYLINDER WITH SPHERICAL ENDS:

ENTER	<b>Tank Height</b> or <b>Tank Length</b> appears in VFD line 2.
ENTER	<b>XXX.XX-&gt;</b> appears in VFD line 2.
NUMERIC	Enter Tank Height or Tank Length.
ENTER	<b>Tank Height</b> or <b>Tank Length</b> appears in VFD line 2.
△ ▽	Scroll until <b>Tank Radius</b> appears in VFD line 2.
ENTER	<b>XX.X-&gt;</b> appears in VFD line 2.
NUMERIC	Enter Tank RADIUS.
ENTER	<b>Tank Radius</b> appears in VFD line 2.
CLEAR	<b>Vert, Horiz or Horiz w/Sphere ends</b> appears in VFD line 2.
CLEAR	<b>Vessel Type</b> appears in VFD line 2.

Proceed to RANGE VALUES.

#### VERTICAL CYLINDER WITH CONE BOTTOM: HORIZONTAL CYLINDER WITH ELLIPTICAL ENDS:

ENTER	<b>Tank Height</b> or <b>Tank Length</b> appears in VFD line 2.
ENTER	<b>XXX.XX-&gt;</b> appears in VFD line 2.
NUMERIC	Enter Tank Height or Tank Length.
ENTER	<b>Tank Height</b> or <b>Tank Length</b> appears in VFD line 2.
△ ▽	Scroll until <b>Tank Radius</b> appears in VFD line 2.
ENTER	<b>XX.X-&gt;</b> appears in VFD line 2.
NUMERIC	Enter Tank Radius.
ENTER	<b>Tank Radius</b> appears in VFD line 2.
△ ▽	Scroll until <b>Cone Height</b> or <b>End Depth</b> appears in VFD.
ENTER	<b>X.X-&gt;</b> appears in VFD line 2.
NUMERIC	Enter Cone Height or End Depth.
ENTER	<b>Cone Height</b> or <b>End Depth</b> appears in VFD line 2.
CLEAR	<b>Vert w/Cone Bot or Horiz w/Ellip Ends</b> appears in VFD line 2.
CLEAR	<b>Vessel Type</b> appears in VFD line 2.

Proceed to RANGE VALUES.

SPHERICAL VESSEL:

ENTER Tank Radius appears in VFD line 1.  
XXX.XX-> appears in VFD line 2.  
NUMERIC Enter Tank Radius.  
ENTER Sphere appears in VFD line 2.  
CLEAR Vessel Type appears in VFD line 2.

Proceed to RANGE VALUES.

USER DEFINED VESSEL:

ENTER Strapping Table appears in VFD line 1.  
ENTER Tank Capacity appears in VFD line 2.  
NUMERIC XXX.XX-> appears in VFD line 2.  
ENTER Enter Maximum Measurement (Volume).  
ENTER Tank Capacity appears in VFD line 2.  
ENTER Scroll until Table Values appears in VFD line 2.  
ENTER Edit Strapping Table appears in VFD line 1.  
ENTER Entry #1, 5% Level appears in VFD line 2.  
NUMERIC X.XX-> appears in VFD line 2.  
ENTER Enter % of Volume at 5% of the Max Level.  
ENTER Entry #1, 5% Level appears in VFD line 2.  
NUMERIC Scroll until Entry #2, 10% Level appears in VFD.  
ENTER X.XX-> appears in VFD line 2.  
NUMERIC Enter % of Volume at 10% of the Max Level.  
ENTER Entry #2, 10% Level appears in VFD line 2.  
ENTER Scroll to next entry and press ENTER.  
ENTER Enter value and press ENTER.  
ENTER Repeat until all 20 entries have been made.  
CLEAR Table Values appears in VFD line 2.  
CLEAR User Defined appears in VFD line 2.  
CLEAR Vessel Type appears in VFD line 2.

Proceed to RANGE VALUES.

FLOW CALIBRATION:

KEYPAD ENTRY REMARKS  
△▽ Scroll until Flow appears in VFD line 2.  
ENTER Units appears in VFD line 2.  
ENTER cubic feet/second appears in VFD line 2.  
△▽ Scroll until desired units appear in VFD line 2.  
ENTER Units appears in VFD line 2.  
△▽ Scroll until Element Type appears in VFD line 2.  
ENTER V-Notch Weir appears in VFD line 2.  
△▽ Scroll until desired element type appears in VFD line 2.

Proceed to applicable weir or flume type.

V-NOTCH WEIR:

PARSHALL FLUME:

ENTER 22.5 Degrees or 1 inch Throat appears in VFD line 2.  
△▽ Scroll until desired size appears in VFD line 2.  
ENTER V-Notch Weir or Parshall Flume appears in VFD line 2.  
CLEAR Element Type appears in VFD line 2.

Proceed to RANGE VALUES.

CIPOLLETTI WEIR:

CONTRACTED WEIR:

RECTANGULAR WEIR:

ENTER Weir Crest Length appears in VFD line 1.  
NUMERIC X.XXXX-> appears in VFD line 2.  
ENTER Enter Weir crest Length.  
ENTER Cipoll, Contract or Rectang Weir appears in VFD line 2.  
CLEAR Element Type appears in VFD line 2.

Proceed to RANGE VALUES.

USER DEFINED FLUME OR WEIR:

ENTER Strapping Table appears in VFD line 1.  
ENTER Maximum Flow Rate appears in VFD line 2.  
NUMERIC XXX.XX-> appears in VFD line 2.  
ENTER Enter Maximum Flow Rate.  
ENTER Maximum Flow Rate appears in VFD line 2.  
ENTER Scroll until Table Values appears in VFD line 2.  
ENTER Edit Strapping Table appears in VFD line 1.  
ENTER Entry #1, 5% Level appears in VFD line 2.  
NUMERIC X.XX-> appears in VFD line 2.  
ENTER Enter percentage of Flow at 5% of the Max Level.  
ENTER Entry #1, 5% Level appears in VFD line 2.  
NUMERIC Scroll until Entry #2, 10% Level appears in VFD.  
ENTER X.XX-> appears in VFD line 2.  
NUMERIC Enter percentage of Flow at 10% of the Max Level.  
ENTER Entry #2, 10% Level appears in VFD line 2.  
ENTER Scroll to next entry and press ENTER.  
ENTER Enter value and press ENTER.  
ENTER Repeat until all 20 entries have been made.  
CLEAR Table Values appears in VFD line 2.  
CLEAR User Defined appears in VFD line 2.

CLEAR Element Type appears in VFD line 2.

Proceed to RANGE VALUES.

RANGE VALUES:

KEYPAD ENTRY REMARKS  
△▽ Scroll until Upper Range Value appears in VFD line 2.  
ENTER XXX.XX-> appears in VFD line 2.  
NUMERIC Enter Upper Range Value (Volume or Flow).  
ENTER Upper Range Value appears in VFD line 2.  
△▽ Scroll until Lower Range Value appears in VFD line 2.  
ENTER X.XX-> appears in VFD line 2.  
NUMERIC Enter Lower Range Value (Volume or Flow).  
ENTER Lower Range Value appears in VFD line 2.  
CLEAR Volume or Flow appears in VFD line 2.

Proceed to INPUT CALIBRATION.

INPUT CALIBRATION:

KEYPAD ENTRY REMARKS  
△▽ Scroll until Input appears in VFD line 2.  
ENTER Two Point appears in VFD line 2.  
ENTER Lo Level Input Cal appears in VFD line 1.  
NUMERIC X.XX-> appears in VFD line 2.  
ENTER With the process at any known low level, enter that level.  
ENTER Hi Level Input Cal appears in VFD line 1.  
NUMERIC XX.XX-> appears in VFD line 2.  
ENTER With the process at a known higher level, enter that level.  
CLEAR Two Point appears in VFD line 2.  
CLEAR Input appears in VFD line 2.  
CLEAR XX.XX percent appears in VFD line 1.

If instrument is to be used as a PID Controller proceed to PID SETUP AND CALIBRATION.

If instrument is not to be used as a PID Controller proceed to SETTING THE ALARMS, or, if no alarms are to be enabled, proceed to FINISH.

PID SETUP AND CALIBRATION:

Set Point: \_\_\_\_\_  
This is the anticipated set point in terms of the variable to be controlled (Level, Volume or Flow).

4 ma Point: \_\_\_\_\_ 20 ma point: \_\_\_\_\_  
If the ma output is to decrease upon rising level the 4 ma point will be 0% and the 20 ma point 100%. If the ma output is to increase upon rising level the 4 ma point will be 100% and the 20 ma point 0%.

Gain: \_\_\_\_\_ Reset: \_\_\_\_\_ Rate: \_\_\_\_\_  
If these values are unknown use: Gain = 2; Reset = 1; Rate = 0

KEYPAD ENTRY REMARKS  
SETUP Access Level appears in VFD line 2.  
△▽ Scroll until PID Mode appears in VFD line 2.  
ENTER Off appears in VFD line 2.  
ENTER Scroll until On appears in VFD line 2.  
ENTER Setup Menu appears in VFD line 1.  
ENTER PID Mode appears in VFD line 2.  
See note → If VFD does not look like the above press CLEAR.  
△▽ Scroll until PV Display Variable appears in VFD line 2.  
ENTER Level appears in VFD line 2.  
△▽ Scroll until desired controlled variable appears in VFD line 2.  
ENTER PV Display Variable appears in VFD line 2.  
△▽ Scroll until SP Display Variable appears in VFD line 2.  
ENTER Setpoint appears in VFD line 2.  
ENTER SP Display Variable appears in VFD line 2.  
△▽ Scroll until VFD Line 2 Variable appears in VFD line 2.  
ENTER Output (%) appears in VFD line 2.  
△▽ Scroll until Level w/EU appears in VFD line 2.  
ENTER VFD Line 2 Variable appears in VFD line 2.  
CLEAR XX.XX percent appears in VFD line 1.  
XX.XX xxxxxx appears in VFD line 2.  
SETUP Access Level appears in VFD line 2.  
△▽ Scroll until PID Controller appears in VFD line 2.  
ENTER Controlled Variable appears in VFD line 2.  
ENTER Level appears in VFD line 2.  
△▽ Scroll until desired Controlled Variable appears in VFD line 2.  
ENTER Controlled Variable appears in VFD line 2.  
△▽ Scroll until PID Output appears in VFD line 2.  
ENTER 4 mA Point (%) appears in VFD line 2.  
ENTER 4 mA Point (%) appears in VFD line 1.  
NUMERIC X.XX-> appears in VFD line 2.  
ENTER Enter the 4 mA point.

**ENTER** 4 mA Point % appears in VFD line 2.  
 "Output Span Too Low" may appear for a short time.  
 Scroll until **20 mA Point (%)** appears in VFD line 2.  
**ENTER** **20 mA Point (%)** appears in VFD line 1.  
**XXX.XX->** appears in VFD line 2.  
 Enter the 20 mA point.  
**NUMERIC** **20 mA point (%)** appears in VFD line 2.  
**ENTER** **PID Output** appears in VFD line 2.  
**CLEAR** Scroll until **Gain** appears in VFD line 2.  
**ENTER** **PID Gain Constant** appears in VFD line 1.  
**△ ▽** **X.XXXX->** appears in VFD line 2.  
 Enter Gain.  
**NUMERIC** **Gain** appears in VFD line 2.  
**ENTER** Scroll until **Reset** appears in VFD line 2.  
**△ ▽** **PID Reset Constant** appears in VFD in line 1.  
**ENTER** **XXXX.XX->** appears in VFD line 2.  
 Enter Reset.  
**NUMERIC** **Reset** appears in VFD line 2.  
**ENTER** Scroll until **Rate** appears in VFD line 2.  
**△ ▽** **PID Rate Constant** appears in VFD line 1.  
**ENTER** **X.XX->** appears in VFD line 2.  
 Enter Rate.  
**NUMERIC** **Rate** appears in VFD line 2.  
**ENTER** **PID Controller** appears in VFD line 2.  
**CLEAR** **XX.XX percent** appears in VFD line 1.  
**CLEAR** **XX.XX xxxxxs** appears in VFD line 2.

MANUAL LED must be lit, if not, press MANUAL

Manually bring the process to a point that is close to the desired setpoint. Process (Level, Volume or Flow) must be close to stable.

**AUTO** MANUAL LED must not be lit.  
 The Setpoint in the SP Display should have changed to conform to the process.

**NUMERIC** Press any number. **PID Setpoint** appears in VFD line 1.  
**XX.XX->** appears in VFD line 2.

**NUMERIC** Enter the desired Setpoint (Level, Volume or Flow).  
**ENTER** **XX.XX percent** appears in VFD line 1.  
**XX.XX xxxxxs** appears in VFD line 2.

Monitor and evaluate the performance in controlling the process. If necessary, the Setpoint may be changed as often as required to accomplish this by repeating the last three steps (NUMERIC, NUMERIC, ENTER).

The instrument should now be tuned. Proceed to either AUTOTUNE or MANUAL TUNING.

**AUTOTUNE:**

KEYPAD ENTRY	REMARKS
<b>SETUP</b>	<b>Access Level</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>PID Controller</b> appears in VFD line 2.
<b>ENTER</b>	<b>Controlled Variable</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Autotune</b> appears in VFD line 2.
<b>ENTER</b>	<b>Off</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until the desired mode appears in VFD line 2.
<b>ENTER</b>	<b>Autotune</b> appears in VFD line 2.
<b>CLEAR</b>	<b>PID Controller</b> appears in VFD line 2.
<b>CLEAR</b>	<b>XX.XX percent</b> appears in VFD line 1.
<b>CLEAR</b>	<b>XX.XX xxxxxs</b> appears in VFD line 2.

Proceed to SETTING THE ALARMS, or, if no alarms are to be enabled, proceed to **FINISH**.

**MANUAL TUNING:**

KEYPAD ENTRY	REMARKS
<b>SETUP</b>	<b>Access Level</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>PID Controller</b> appears in VFD line 2.
<b>ENTER</b>	<b>Controlled Variable</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until desired constant (Gain, Reset or Rate) appears.
<b>ENTER</b>	<b>XX.XX-&gt;</b> appears in VFD line 2.
<b>NUMERIC</b>	Enter new value.
<b>ENTER</b>	Desired constant appears in VFD line 2.
	If changes to additional constants are required, scroll to the constant and repeat the previous 3 steps (ENTER, NUMERIC, ENTER) as required.
<b>CLEAR</b>	<b>PID Controller</b> appears in VFD line 2.
<b>CLEAR</b>	<b>XX.XX percent</b> appears in VFD line 1.
<b>CLEAR</b>	<b>XX.XX xxxxxs</b> appears in VFD line 2.

Repeat changing Setpoint and constants until optimum results are obtained.

Proceed to SETTING THE ALARMS, or, if no alarms are to be enabled, proceed to **FINISH**.

KEYPAD ENTRY	REMARKS
<b>CALIBRATE</b>	<b>Level</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Alarms</b> Appear in VFD line 2.
<b>ENTER</b>	<b>Process Alarm #1</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until desired Alarm appears in VFD line 2.
<b>ENTER</b>	<b>Status</b> appears in VFD line 2.
<b>ENTER</b>	<b>Disabled</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Enabled</b> appears in VFD line 2.
<b>ENTER</b>	<b>Status</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Measurement</b> appears in VFD line 2.
	This feature not applicable for Output and Setpoint Alarms.
<b>ENTER</b>	<b>Level</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until desired Measurement appears in VFD line 2.
<b>ENTER</b>	<b>Measurement</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Failsafe Mode</b> appears in VFD line 2.
<b>ENTER</b>	<b>LLFS</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until desired Failsafe Mode appears in VFD line 2.
<b>ENTER</b>	<b>Failsafe Mode</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Alarm Type</b> appears in VFD line 2.
<b>ENTER</b>	<b>Fixed Differential</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until desired Alarm Type appears in VFD line 2.
<b>ENTER</b>	<b>Alarm Type</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Low Setpoint</b> appears in VFD line 2.
<b>ENTER</b>	<b>X.XX-&gt;</b> appears in VFD line 2.
<b>NUMERIC</b>	Enter low setpoint if alarm is for LLFS and/or has an Adjustable Differential, otherwise enter 0.
<b>ENTER</b>	<b>Low Setpoint</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>High Setpoint</b> appears in VFD line 2.
<b>ENTER</b>	<b>X.XX-&gt;</b> appears in VFD line 2.
<b>NUMERIC</b>	Enter High setpoint if alarm is for HLFS and/or has an Adjustable Differential, otherwise enter 0.
<b>ENTER</b>	<b>High Setpoint</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Off Delay</b> appears in VFD line 2.
<b>ENTER</b>	This feature not applicable for Output and Setpoint Alarms.
<b>NUMERIC</b>	<b>X.X-&gt;</b> appears in VFD line 2.
<b>ENTER</b>	Enter 0 or desired Off Delay time in seconds.
<b>△ ▽</b>	<b>Off Delay</b> appears in VFD line 2.
<b>ENTER</b>	Scroll until <b>On Delay</b> appears in VFD line 2.
<b>NUMERIC</b>	This feature not applicable for Output and Setpoint Alarms.
<b>△ ▽</b>	<b>X.X-&gt;</b> appears in VFD line 2.
<b>ENTER</b>	Enter 0 or desired On Delay time in seconds.
<b>NUMERIC</b>	<b>On Delay</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Output Relay</b> appears in VFD line 2.
<b>ENTER</b>	<b>None</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until desired Relay or None appears in VFD line 2.
<b>ENTER</b>	<b>Output Relay</b> appears in VFD line 2.
<b>CLEAR</b>	<b>Xxxxxx Alarm #X</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll to next alarm which is to be enabled and repeat previous steps.
	After all desired alarms have been enabled proceed as follows:
<b>CLEAR</b>	<b>Alarms</b> appears in VFD line 2.
<b>CLEAR</b>	<b>XX.XX percent</b> appears in VFD line 1.

**SETTING THE DISABLED ALARMS:**

KEYPAD ENTRY	REMARKS
<b>CALIBRATE</b>	<b>Level</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until <b>Alarms</b> Appear in VFD line 2.
<b>ENTER</b>	<b>Process Alarm #1</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll until desired Alarm appears in VFD line 2.
<b>ENTER</b>	<b>Status</b> appears in VFD line 2.
<b>ENTER</b>	<b>Disabled</b> appears in VFD line 2.
<b>ENTER</b>	<b>Status</b> appears in VFD line 2.
<b>CLEAR</b>	<b>Xxxxxx Alarm #X</b> appears in VFD line 2.
<b>△ ▽</b>	Scroll to next alarm which is to be disabled and repeat previous steps.
	After all desired alarms have been disabled proceed as follows:
<b>CLEAR</b>	<b>Alarms</b> appears in VFD line 2.
<b>CLEAR</b>	<b>XX.XX percent</b> appears in VFD line 1.

**FINISH**

CALIBRATION is complete. Instrument should now be fully operational. If desired, displays and settings may now be changed to suit the application.

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