






Tek-Bar 3110A



Quick Start Guide

1. Before You Begin

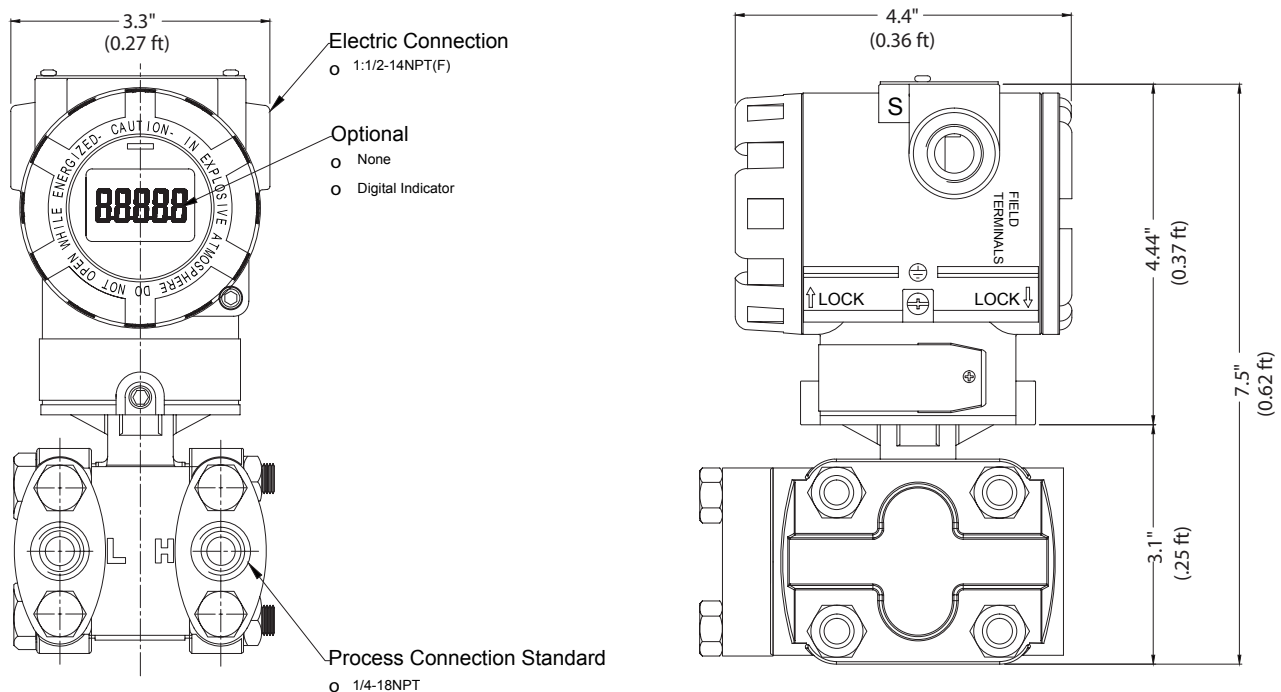
Before installation check the model, specifications, and installation location for the transmitter. Follow the Operating Instruction Manual for detailed installation instructions and other information.

-  Do not remove the transmitter cover in explosive atmospheres when the circuit is live.
-  Before connecting a HART-based communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe field wiring practices.
-  Only trained and qualified specialists must carry out installation of the device. The specialist must have read and understood these Operating Instructions and must follow the instructions they contain.
-  Do not clean or touch the diaphragm seals with a hard or pointed object.
-  When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the Safety Instructions or Installation, or Control Drawings.

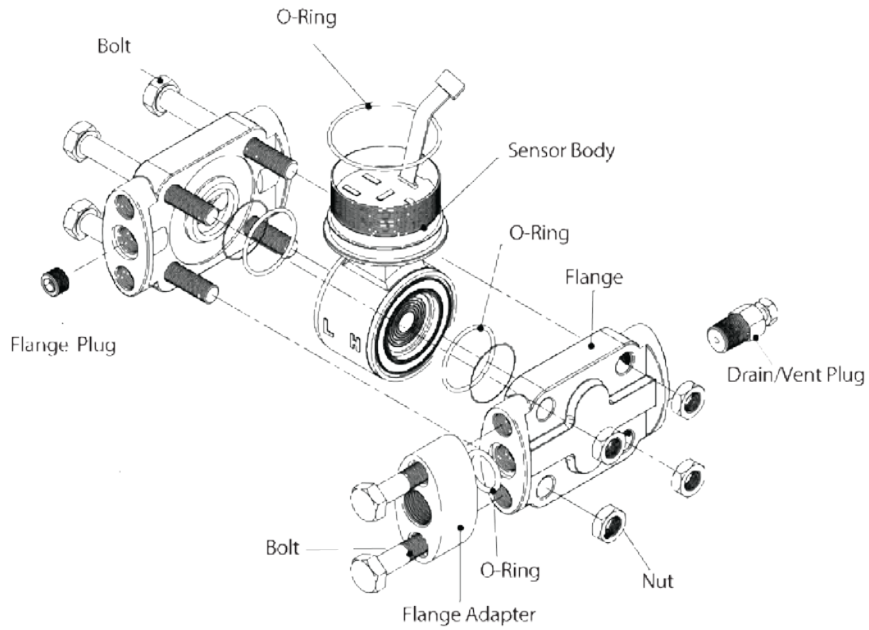
2. Unpack

Tek-Bar 3110A Explosion-Proof Differential Pressure Transmitter

3. Dimensional Drawings

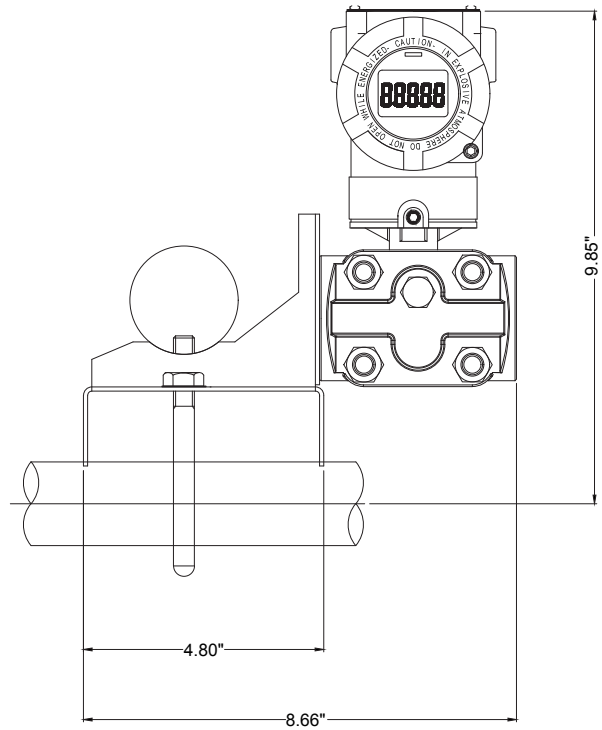
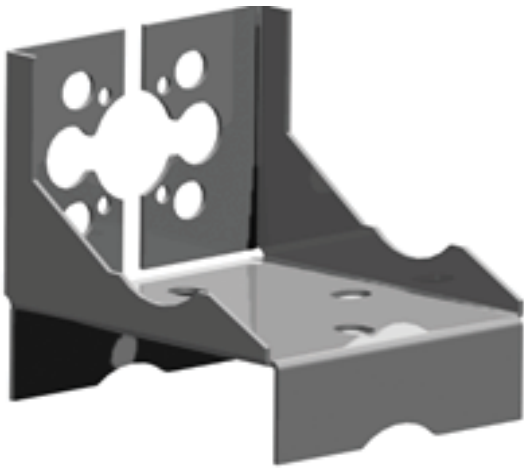


Exploded View



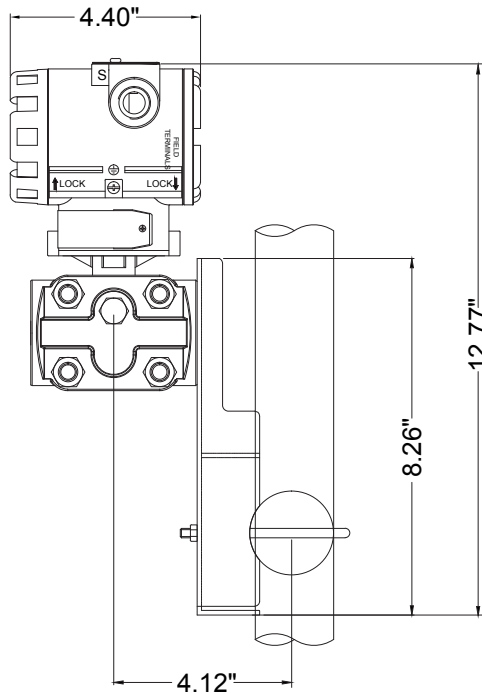
4. Mounting

Vertical Mount Type



Quick Start Guide

Horizontal Mount Type

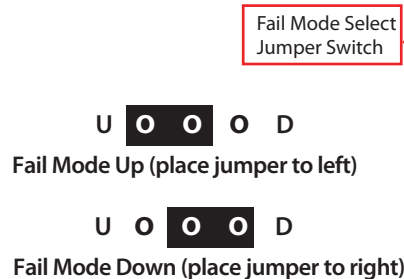


5. Failure Mode Alarm

Fail Mode Selection (Fail High/Up or Fail Low/Down) can be configured using the appropriate jumper switch provided on the LCD Module or the DIP switches included on the main CPU module. For units provided with a LCD module the desired fail-safe mode can be selected directly from the jumper switch included in the front display; this setting overrides the DIP settings on the back-end main CPU module. However, in cases of blind units select the required DIP switch settings from the DIP switch labeled (2) marked on the Main CPU board.

1. Fail Mode Selection Jumper Switch on LCD Module

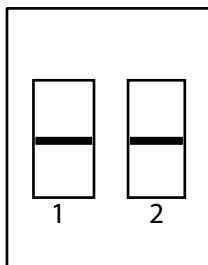
Level	4-20 mA Saturation	4-20 mA Alarm
Low/Down	3.9 mA	≤ 3.75 mA
High/Up	20.8 mA	≥ 21.75 mA



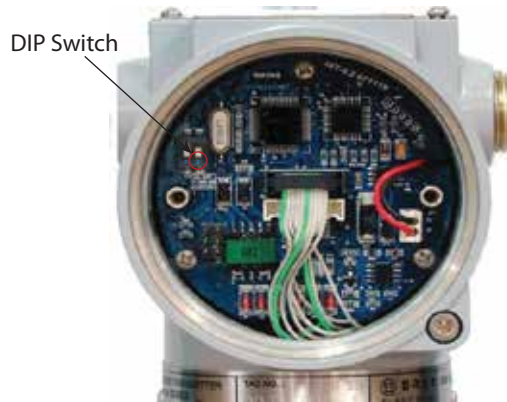
2. Fail Mode Selection DIP Switch on CPU Module

Selected Fail Mode	Jumper Status on LCD and Switch (2) on CPU Module		DIP Switch (2) Setting on CPU Module
	CPU Module	LCD Module	CPU Module
Fail Down	Down	D	Down
Fail Up	Down	U	Up
	Up	U or D	

DIP Switch Setting

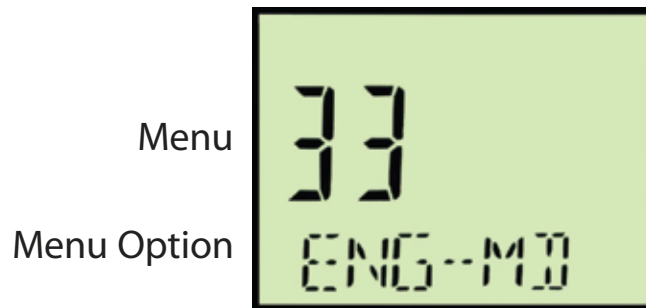


DIP (2): Fail Mode (Alarm)
 Down: Fail Low
 Up: Fail High



6. Display

The local display enables you to read all important parameters directly at the measuring point and configure the device using the function matrix. The LCD display indicates output and diagnostic messages on display. The LCD display features a two-line display with 5-digits. The first line displays measured value and second line displays the engineering units.



LCD Display Rotation

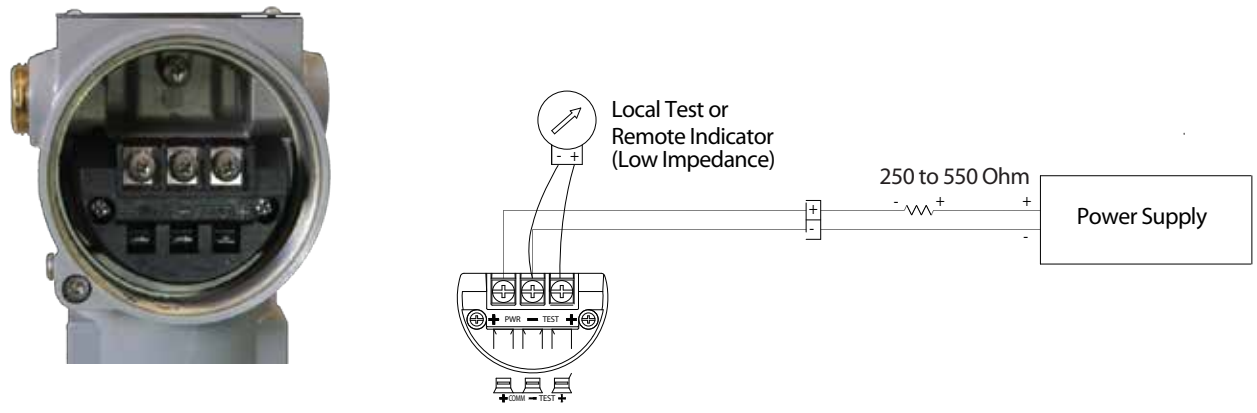
If the device cannot be operated in a vertical position, the digital display can be turned to make it easier to read. To do this, proceed is as follows:
 Unscrew the two screws on either side of the LCD screen; this allows the screen to be rotated 90 ° clockwise or counter-clockwise. An integral indicator can be installed in the following three directions.

Quick Start Guide



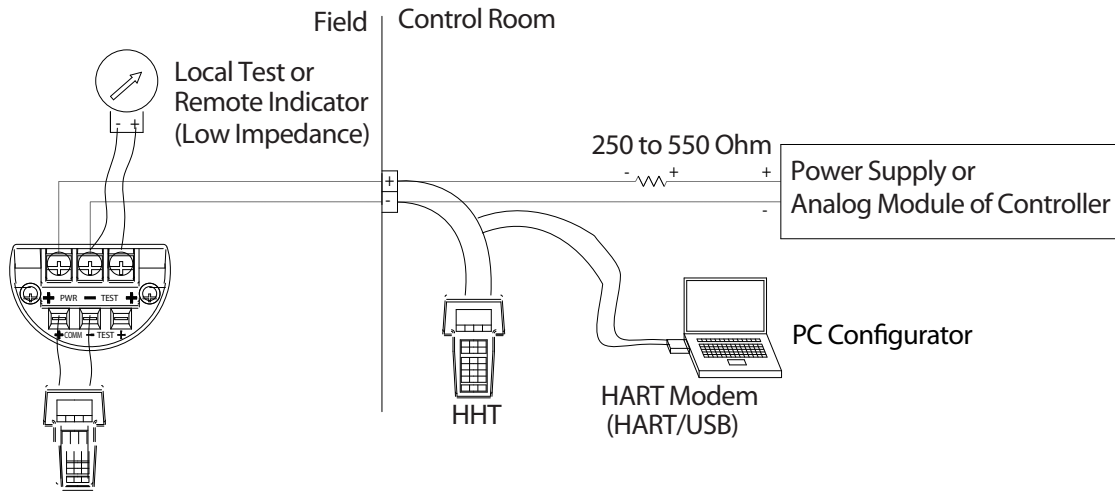
7. Power Supply

Connect the positive lead to the terminal marked (+) and the negative lead to the terminal marked (pwr/comm-). Do not connect powered signal wiring to the test terminals as this could damage the test diode.



Connection to the HART Handheld Communicator

The HART Communicator requires a loop resistance between 250 Ω and 550 Ω .
The transmitter operates on 11.9 to 45 VDC.

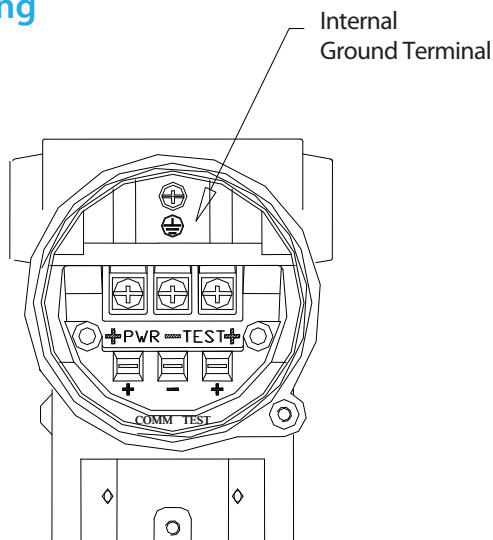


- Note:**
- If a LCD display is not available, the HART is used for communication and configuration.
 - Use shielded twisted pairs to yield best results. To ensure proper communication, use a wire that is 24 AWG or larger, and do not exceed 1500 m.

8. Grounding

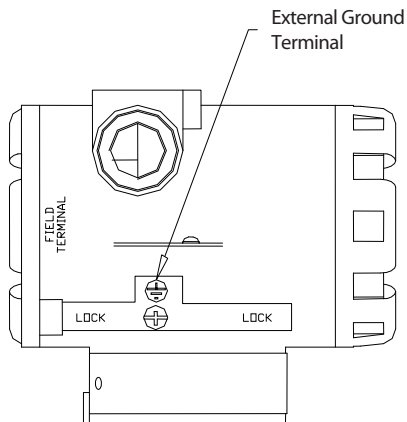
Please provide proper grounding (earth ground) at designated points (external or internal). A ground terminal is provided on the inside and outside of the terminal box. Either one of these terminals may be used for grounding the transmitter.

Internal Grounding



Quick Start Guide

External Grounding



9. Configuration

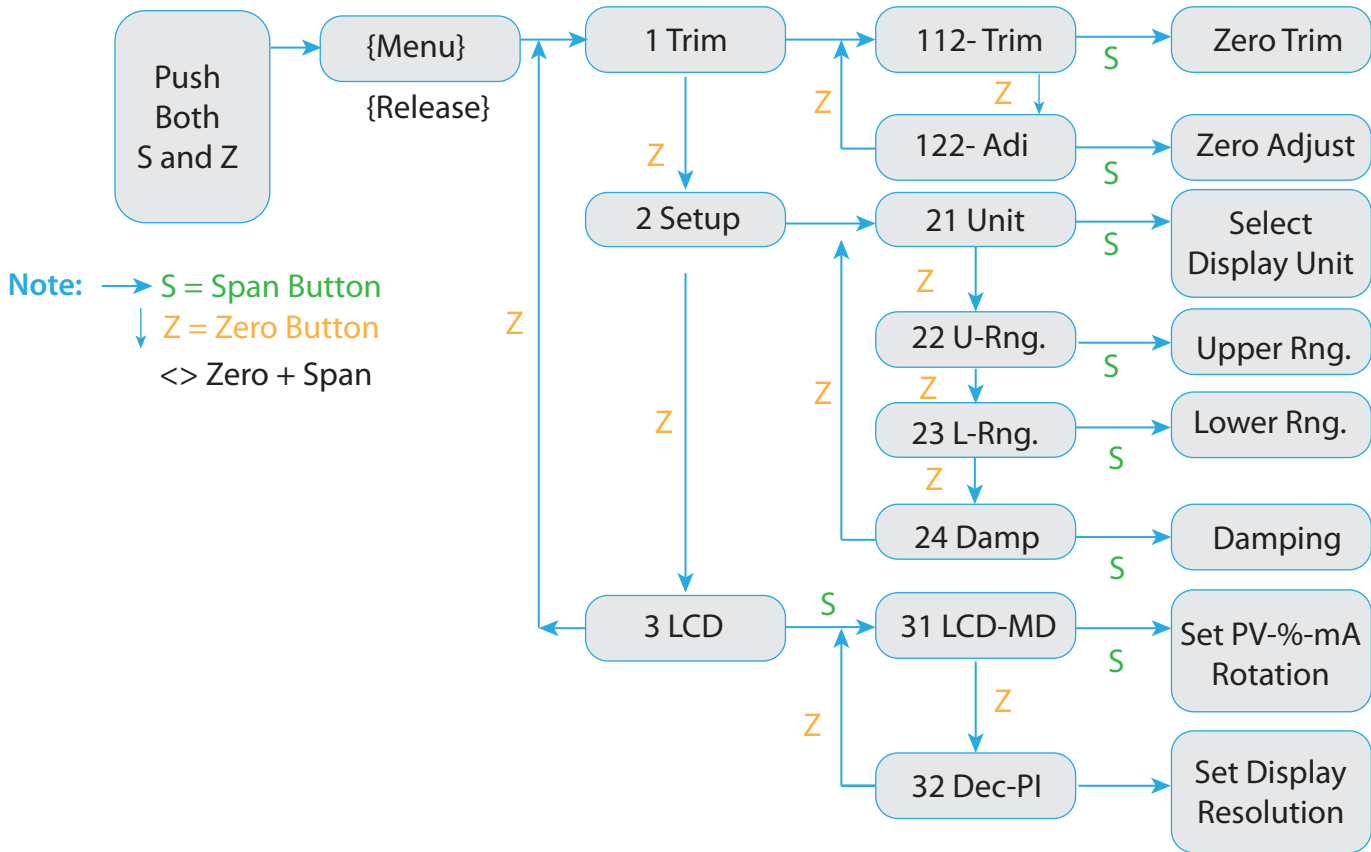
The top nameplate (right side only) is located in the upper part of the transmitter. Slide the name plate anti-clockwise (slightly until the Zero/Span button is visible and fully accessible.).

A single operation of individual buttons (labeled Zero/Span respectively) will initiate a zero/span configuration process as found in conventional transmitters requiring an external pressure source. However as these are smart transmitters most configuration functions such as Zero Trim, Zero Adjustment, selecting units, re-ranging (or setting URL/LRL), Damping Time, display resolution, LCD preference etc. can be done without any external pressure source or HHT.

To access advanced configuration settings and enter the programming menu press Zero + Span buttons simultaneously for 5 seconds. When display reads "Menu" release both push buttons immediately. This will take the user top of main programming menu indicated by message "1-TRIM" on display. To navigate through Main Menus and /or Sub-Menus:

- Use the Zero button to scroll down a menu (or sub-menu if active).
For example pressing/release Zero to scroll down from main menu 1-Trim > 2-Setup > 3-LCD > 1-Trim > 2-Setup etc.
or from an active sub-menu press/release Zero to scroll down within a sub-menu For example 21-Units > 22-URL > 23-LRL > 24-Damping > 21-Units > 22-URL etc.
- Use the Span button to enter into a specific sub menu or data input function.
- For example pressing Span the from main menu <1-Trim> will take user into Sub-menu.
- "11>Zero Trim". Releasing and pressing Span again will initiate the Zero Trim configuration; Release and pres Zero instead to increment all move the user down to sub-menu "12>Zero ADJ".
- Within an active sub-menu, use of Span also acts as a key to allow changes to be saved and then exit the programming mode.
- For moving back to the previous menu press Zero + Span together. During the numeric value entry mode use Zero + Span together to save the numeric data and to exit from programming menu.

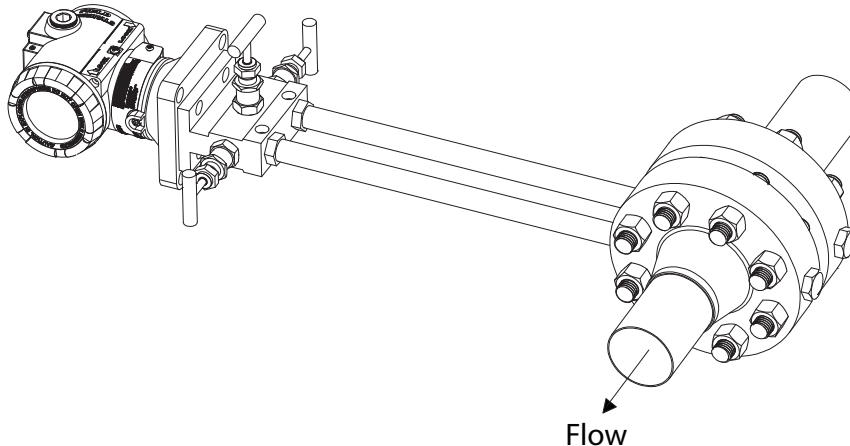




10. Installation

Liquid Flow Measurement

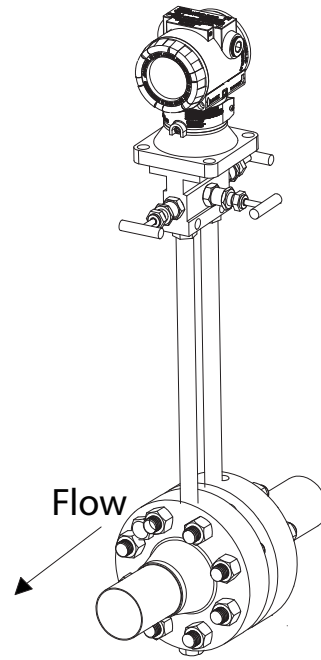
- Place the taps to the side of the line to prevent sediment deposits on the transmitters process isolators.
- Mount the transmitter beside or below the taps so gases can vent into the process line.
- Mount drain/vent the valve upward to allow gases to vent.



Quick Start Guide

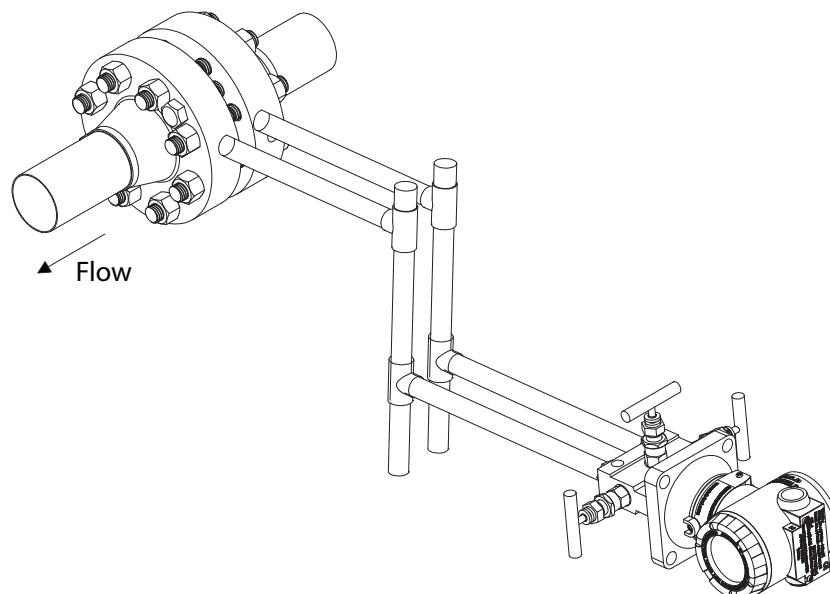
Gas Flow Measurement

- Place taps in the top or to the side of the line.
- Mount the transmitter beside or above the taps so liquid will drain into the process line.



Steam Flow Measurement

- Place taps to the side of the line.
- Mount the transmitter below the taps to ensure that the impulse piping will stay filled with condensation.
- In steam service above 250 °F (121 °C), fill impulse lines with water to prevent the steam from contacting the transmitter directly and to ensure accurate measurement at start-up.



Note: For steam or other elevated temperature services, it is important that temperatures at the process connection do not exceed the transmitters process temperature limits.

11. LCD Screen Display Error Codes

Message	Description	Remarks
ADJ-U	Set value outside of upper limits during Zero Adj. function.	Check limits
ADJ-L	Set value outside of upper limits during Zero Adj. function.	Check limits
ZERO	Initial message when activating Zero push button	Apply Zero input
SPAN	Initial message when activating Span push button	Apply Span input
BT-ERR	Button Input Sequence Error.	Check key seq.
P-LOCK	Write Protect Lock on	Check Jumper
ZT-ERR	Setting Limit (10%) Error when Zero Trim	Redo Zero Trim
-TR-	Zero Trim Done	Successful Trim
ZR-ERR	Set value outside of upper limits during Zero Trim	Check limits
SP-ERR	Set value outside of upper limits during Span Trim	Check limits
-ZR-	Zero/LRL configuration with external PV initiated	LRL set up initiated
-SP-	SpanURL configuration with external PV initiated	URL setup initiated
-ZA-	Zero Adj. done	Z-Adj accepted
-DONE-	Setting done using button	Changes accepted
RNGOVR	Over Range	Check limits
LCD_OV	Over Range for LCD display	Check limits
SCD-ER	Sensor Code Error	Check Sensor
F-RST	Flash Setting Data Reset	Reboot
F-LOCK	While Flash Setting Data Reset, Protect Locked	Write Protect on
F-FAIL	Flash Setting Data Reset Failure	Initialize failed
-FR-	Flash Reset Done	Initialize completed
A-RST	Analog EEPROM Initializing Start	Initialize initiated
A-STOR	Analog EEPROM Whole Write	Write initiated
A-FAIL	Analog EEPROM Whole Write Failure	Write fail
-AC-	Analog EEPROM Whole Write Done	Write completed
S-FL	Sensor Failure	Check sensor input
S-OP	Sensor PV exceed MWP	Check limits
AEP-RF	Check sum error in EEPROM during read sequence	Reboot
AEP-WF	Check sum error in EEPROM during write sequence	Reboot
TS-FL	Temperature Sensor Failure	Replace
EOSC	Sensor Element Defective	Replace
FAVE	Flash Access Violation	Reboot



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