

Sensor Trim

Introduction

Yokogawa pressure transmitters are factory characterized. Factory characterization is the process of comparing a known pressure input with the output of the sensor capsule over the entire pressure and temperature operation range. During the characterization process, this comparison information is stored in the transmitter's memory. In operation, the transmitter uses this information to produce the Primary Variable (PV) output dependent on the pressure input. This output is in engineering units.

Yokogawa's pressure transmitter Sensor Trim function allows the customer to adjust for local conditions. The Sensor Trim function offers two different methods: a Zero Trim and a Full Sensor Trim.

> **Zero Trim:** A zero trim is a *one-point* adjustment typically used to compensate for mounting position effects.

> **Full Sensor Trim:** Full sensor trim is a *two-point* process in which two accurate end-point pressures are applied and all output between the points is linear.

Applicable Models

> **EJA-E Series:** All models available

> **EJX-A Series:** All models available

Zero Trim

> Zeroing

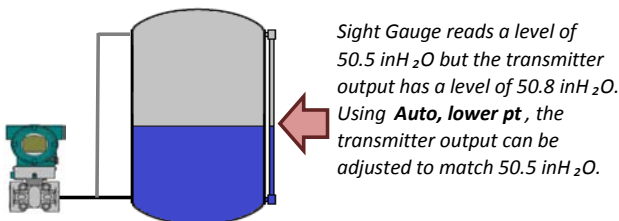
In HART Protocol, the function **Pres Zero Trim** automatically sets the output value to "0" when the input is at the zero.

> Level Adjustment

When a transmitter is being used to measure level in a tank, the HART function **Auto, lower pt** can be used to calibrate the output to the actual tank level. (**Auto, lower pt** is part of the Pres Trim menu - See FieldMate box to right).

To use this method, an alternate method to determine the level of the tank is needed. This could be a Sight Level Gauge or similar device.

See Figure 1.



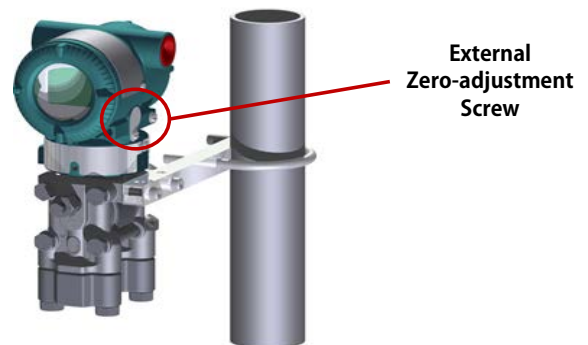
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Figure 1: Single point Level Adjustment.

> External Zero-adjustment Screw

All Yokogawa transmitters come standard with an External Zero-adjustment Screw. Unlike our competitors that use potentiometers, we use a digital encoder to avoid drift and other errors a potentiometer can introduce.

The External Zero-adjustment Screw allows for zero adjustments without the need of FieldMate or other Hart communication device. Simply use a slotted screw driver to adjust the reading on the integral indicator.



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Figure 2: External Zero-adjustment Screw (Digital Encoder)

FieldMate™ HART 7

HART 7	
DTM Works	▼
Menu	▼
Diagnostic	> Diag / Service
	> Calibration
	Pres sensor trim
	Pres Zero trim
	Pres trim

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Although FieldMate is highlighted here, any Hart Communicator has access to these functions. Refer to the User's Manual for the HART programming tree.

This function is available for HART 5 and HART 7.

- Full Sensor Trim

A full sensor trim is a two point adjustment. The lower point adjustment should always be performed before the upper point adjustment in order to maintain the pitch between the 0% and 100% points within the calibration range.

There are two modes available for the two-point trim: Auto and Manual.

> Auto Sensor Trim

In Auto Sensor Trim, reference pressures are applied at 0% and 100% of the measurement range. With the 0% applied, the **Auto, Lower Pt** function is activated and the transmitter automatically calculates the adjustment needed and applies it to the output. The same procedure is done at 100%.

Auto Sensor Trim calculates and applies the trim value.

> Manual Sensor Trim

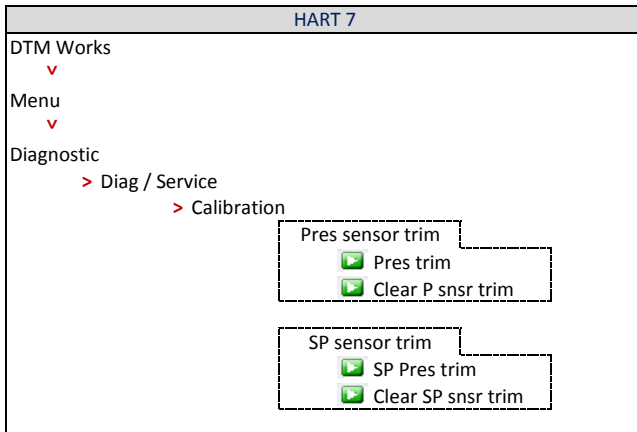
With Manual Sensor Trim, reference pressures are applied at 0% and 100% of the measurement range. With the 0% applied, compare the known pressure with the output. The difference between the known and the output is the value that is entered into **Manual, Lower Pt**. The same procedure is done at 100%.

Manual Sensor trim requires the technician to determine the trim value and input that value.

! Both the DP and the SP Pressure can be trimmed using the above procedure.
(See FieldMate box below)

- Reset Sensor Trim to Factory Settings

The **Clear P snsr trim** and **Clear SP snsr trim** commands can reset the trim adjustments to the initial calibrated values. The amount of adjustment performed with the External Zero-adjustment Screw is returned to the initial setting as well.



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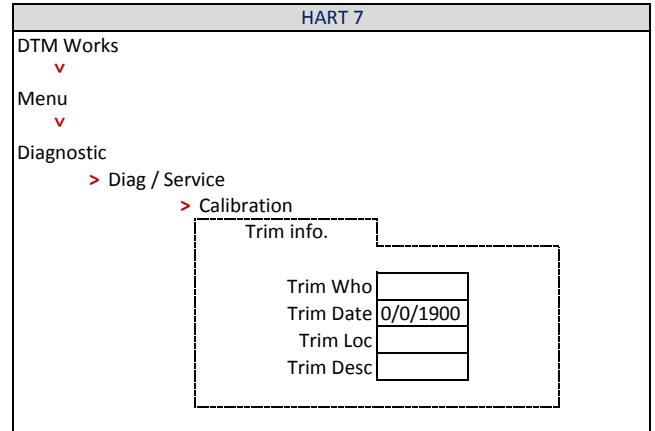
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This function is available for HART 5 and HART 7.

- Trim Info.

FieldMate has an information tab available for the Trim information.

- > **Trim Who:** The technician completing the trim can add his name.
- > **Trim Date:** This field is automatically populated by the transmitter when the trim is performed.
- > **Trim Loc:** Transmitter location information can be added.
- > **Trim Desc:** Description of the trim can be added.



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- BRAIN PROTOCOL

The features described in this FieldGuide are also available for EJA-E and EJX-A transmitters with BRAIN Protocol communication. Please refer to the User's Manual for details.

