

Important

This *Field Guide* topic only applies to the EJX118A and the EJX438A.

For transmitters with diaphragm seals, *Capillary Fill Fluid Density Compensation* is used to compensate the zero shift caused by the ambient temperature effect on the capillary tubes. Unique among pressure transmitters, the EJX118A and EJX438A offer the customer the ability to do this compensation on site.

The following equation indicates the relationship between the calculated output value and the compensating constant K (expressed in %/DegC) with the measured ambient temperature at the capsule module.

$$\text{Compensated output} = \text{output} + K \times T(\text{amb})$$

Section 1.0 Setting the Compensation

Using a Hart Communicator, setting the Compensation requires two steps:

1. Temperature Compensation Mode Setup
2. Zero Shift Compensation Setup

Section 1.1 Temperature Compensation Mode Setup

The Temperature Compensation Mode needs to be set to *Enabled*.

(See *Figure 1*)

The Temperature Compensation function uses the built-in temperature sensor in the transmitter body to generate the T(amb)



needed in the Compensation equation. The temperature deviation between the transmitter body and capillaries should be minimized to achieve optimal performance of this function.

Example: Set the temperature compensation mode to **ON**.

1. Device setup
 ↓
4. Detailed setup
 ↓
2. Signal condition
 ↓
T.Z. Cmp menu
 ↓
1. T.Z. Cmp mode

1

EJX: T.Z. Cmp mode Off On	<input type="button" value="↓"/> <input type="button" value="F4"/>
<input type="button" value="HELP"/> <input type="button" value="DEL"/> <input type="button" value="ESC"/> <input type="button" value="ENTER"/>	<input type="button" value="(ENTER)"/>

Select **On**, and press **ENTER (F4)**.

2

EJX: T.Z. Cmp menu T.Z. Cmp mode ← On 2 Temp Zero	<input type="button" value="F2"/>
<input type="button" value="HELP"/> <input type="button" value="SEND"/> <input type="button" value="HOME"/>	<input type="button" value="(SEND)"/>

Press **SEND (F2)** to send the data to the transmitter, then check to confirm that disappears.

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Figure 1

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Section 1.2 Zero Shift Compensation Mode

The other unit needed by the compensation equation is K (the compensating constant expressed in % / DegC). K is dependant on the installation, fill fluid, and Span. It is expressed by the equation (a):

$$K = -((h \times B)/Span) \times 100$$

Where,

B = Constant value of fill fluid

(See *Figure 2*)

Span = URV – LRV

h = Distance from the high pressure side to low pressure side (expressed in meters)

EJX118A: Distance from high-side diaphragm seal to the low-side diaphragm seal.

EJX438A: Distance from the diaphragm seal (high-side) to the position of the transmitter (low-side)
(See *Figure 3*)

	Fill fluid code	A, C	B	D	E
Constant value [B]	mmH ₂ O	0.76	0.87	1.45	0.75
	kgf/cm ²	0.000076	0.000087	0.000145	0.000075
	kPa	0.00745	0.00853	0.01422	0.00736
	mBar	0.07453	0.08532	0.14220	0.07355
	atm	0.000074	0.000084	0.000140	0.000073
	inH ₂ O	0.02992	0.03425	0.05709	0.02953
	psi	0.00108	0.00124	0.00206	0.00167
	mmHg	0.05592	0.06401	0.10669	0.05518

Figure 2

Note

Select the unit of Constant Value (**B**) from the actual unit used for the transmitter in operation.

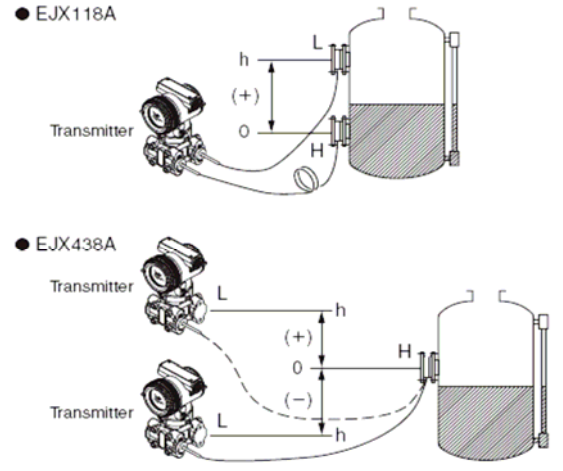


Figure 3

Note

EJX438A: When the transmitter is positioned lower than the diaphragm seal part, the value of 'h' must have a negative sign (-).

Obtain the K compensating value from the equation and enter the value in **Temp Zero**.

(See *Figure 4*)

Note

If the transmitter is re-spanned, a new K compensation value must be obtained and entered in **Temp Zero**.

Section 2.0 Setting when shipped

The compensation is *Disabled* when shipped.

Example: Enter K value obtained from the equation (a).
A value having up to 3 decimal places may be specified.
When $h = +3$ m, Fill fluid code A, span = 15 kPa,
 $K = -(+3) \times 0.00745 + 15 \times 100 = -0.149$

1. Device setup
4. Detailed setup
2. Signal condition
T.Z. Cmp menu
2. Temp Zero

1

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EJX:
Temp Zero      -0.149
 0.000 1/degC
-0.149
HELP DEL ESC ENTER

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F4
(ENTER)
Enter -0.149 and press ENTER (F4).

2

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EJX:
T.Z. Cmp menu  On
1 T.Z. Cmp mode
2 Temp Zero
HELP SEND HOME

```

F2
(SEND)
Press SEND (F2) to send the data to the transmitter, then check to confirm that SEND disappears.

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Figure 4