

Technical Information

Capillary Fill Fluid Density Compensation
for EJA & EJX Pressure Transmitters

DPharp

For transmitters fitted with diaphragm seals the capillary fill fluid density compensates the zero shift caused by ambient temperature changes (auto zero).

$$\text{Compensated Output} = \text{Normal Output} + (\text{Temp (ambient)} \times K)$$

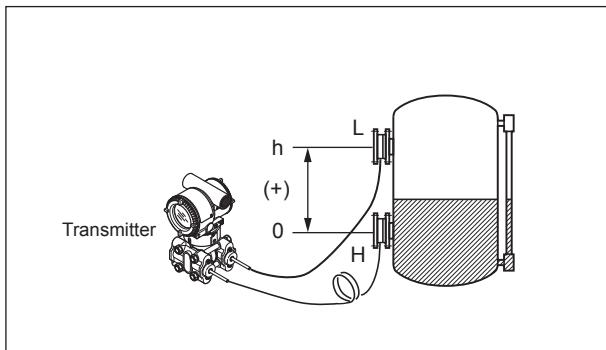
Temp (ambient) is the measured value from the built-in temperature sensor in the transmitter housing and K (expressed as %/°C) must be calculated using the equation below: -

$$K = - \frac{(h \times B \times 100)}{\text{Span}}$$

Where

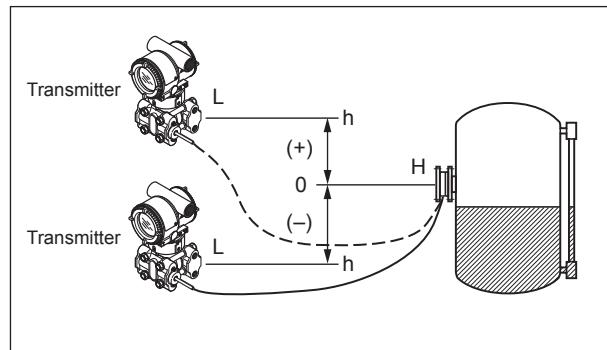
h = Distance (expressed in meters)

DP Transmitters



Distance from high side of diaphragm seal to low side of diaphragm seal

GP Transmitters



Distance from diaphragm seal (high side) to position of transmitter (low side)^{*1}

B = Constant value of fill fluid

Pressure Unit ^{*2}	Fill Fluid Code			
	A or C	B	D	E
mmH2O	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	0.7453	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

Note 1. When the transmitter is positioned below the diaphragm seal the value of h must be negative.

Note 2. The selection of the pressure unit must be the same as the transmitters.

Span = Upper Range Value (URV) – Lower Range Value (LRV) *2

<p>Example:</p> <p>H = +3</p> <p>B = 0.00745 (fill fluid code A & kPa)</p> <p>Span = 15 kPa</p>	
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$$K = - (+3 \times 0.00745 \times 100) \div 15 = - 0.149$$

Configure Transmitter

1. Enable Temperature Zero (T.Z.) Mode

Factory setting is “Off” (disable) and to set to “On” (enable) follow the procedure below.

DD and DTM (excluding EJX_HART 5[1.2])	[Root Menu] → Detailed setup → Signal condition → T.Z. Comp menu → T.Z. Comp mode →	Select “On”
EJX_HART 5[1.2] DTM	Configuration → Pressure Sensor → T.Z. Comp mode →	

2. Enter T.Z. Parameter

DD and DTM (excluding EJX_HART 5[1.2])	[Root Menu] → Detailed setup → Signal condition → T.Z. Comp menu → Temp Zero →	Enter calculated K value (- 0.149 from example above)
EJX_HART 5[1.2] DTM	Configuration → Pressure Sensor → Temp Zero →	

Note 2. The selection of the pressure unit must be the same as the transmitter

YOKOGAWA HEADQUARTERS 9-32, Nakacho 2-chome, Musashinohashi Tokyo 180 Japan Tel. (81)-422-52-5535 Fax (81)-422-55-1202 www.yokogawa.com	YOKOGAWA CORPORATION OF AMERICA 2 Dart Road Newnan GA 30265 United States Tel. (1)-770-253-7000 Fax (1)-770-251-2088 www.yokogawa.com/us	Yokogawa has an extensive sales and distribution network. Please refer to the European website (www.yokogawa.com/eu) to contact your nearest representative.
YOKOGAWA EUROPE B.V. Euroweg 2 3825 HD AMERSFOORT The Netherlands Tel. +31-88-4641 000 Fax +31-88-4641 111 www.yokogawa.com/eu	YOKOGAWA ELECTRIC ASIA Pte. Ltd. 5 Bedok South Road Singapore 469270 Singapore Tel. (65)-241-9933 Fax (65)-241-2606 www.yokogawa.com.sg	YOKOGAWA ♦