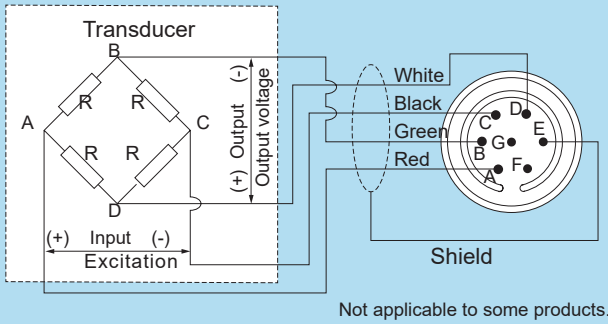
PRESSURE TRANSDUCERS

TML Pressure Transducers electrically detect the gauge pressure of fluids like oil and water or gases like air. Our pressure transducers have sensing elements that use TML strain gauges made exclusively for transducers, and they can be used for consistent, highly reliable measurements over long periods of time. Our PW-PA, PWH and PW-PAH models are cavity type pressure transducers ideal for high precision static measurements, and PWF, PWFA, PWFC, PWFD and PWFE models have flush diaphragm structures best suited for dynamic measurements. PWFA model is with built-in amplifier, capable of high temperature use up to 120 deg. C. and the output voltage is 0.5~5V. PW-PAH model is designed for high temperature use up to 170 deg. C with smaller size. And PDA/PDB models are Miniature Pressure gauges. Their sensing part is 7.6mm-dia. and 2mm-thick.

OUTPUT POLARITY WITH A LOAD

The measured value changes in positive(+) direction with increase of pressure..



Not applicable to some products.

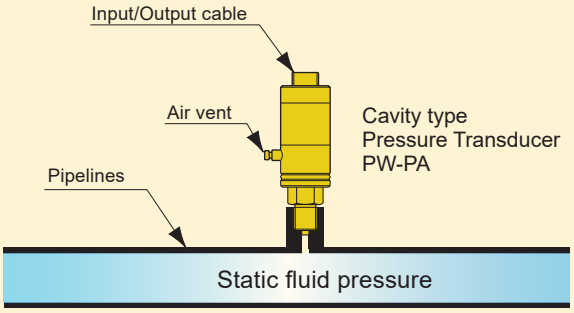
Pressure transducer selection

Utility	Type	Capacity (kPa)				Capacity (MPa)											Page
		50	100	200	500	1	2	3	5	10	20	30	50	70	100	150	200	
High precision	**PW-PA**		●	●	●	●	●		●	●	●	●	●					62
High capacity, High sensitivity	**PWH-PA**													●	●	●	●	62
High temperature use upto 170 deg C	**PW-PAH**						●		●	●	●		●					63
Built-in amplifier, High temperature use	**PWFA-PA**						●		●	●	●							63
Flush diaphragm	**PWF-PB**					●	●		●	●	●		●					64
Flush diaphragm, Small G1/8 screw	**PWFC-PB**						●		●	●	●		●					64
Flush diaphragm, M8 bolt shape	**PWFD-PB**						●		●	●	●							65
Flush diaphragm, M6 bolt shape	**PWFE-PA**						●		●	●	●							65
Miniature, 7.6mm-dia. 2mm-thick	**PDA-PB**	●	●	●	●	●	●	●										66
Miniature, 7.6mm-dia. 2mm-thick	**PDB-PB**	●	●	●	●	●	●	●										66

EXAMPLE OF PRESSURE TRANSDUCER USE

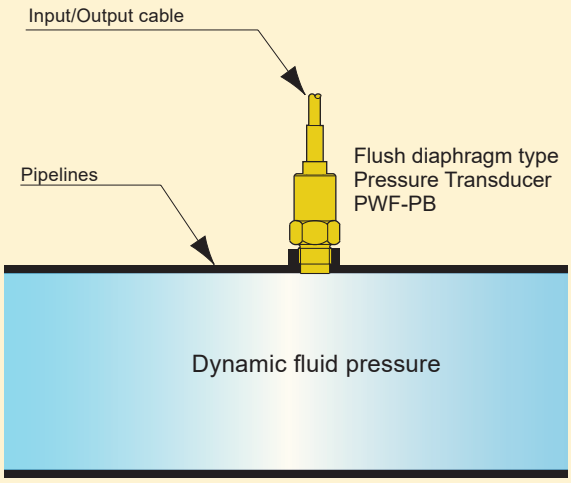
Static measurement

Measuring static water (oil) pressure in pressure vessels

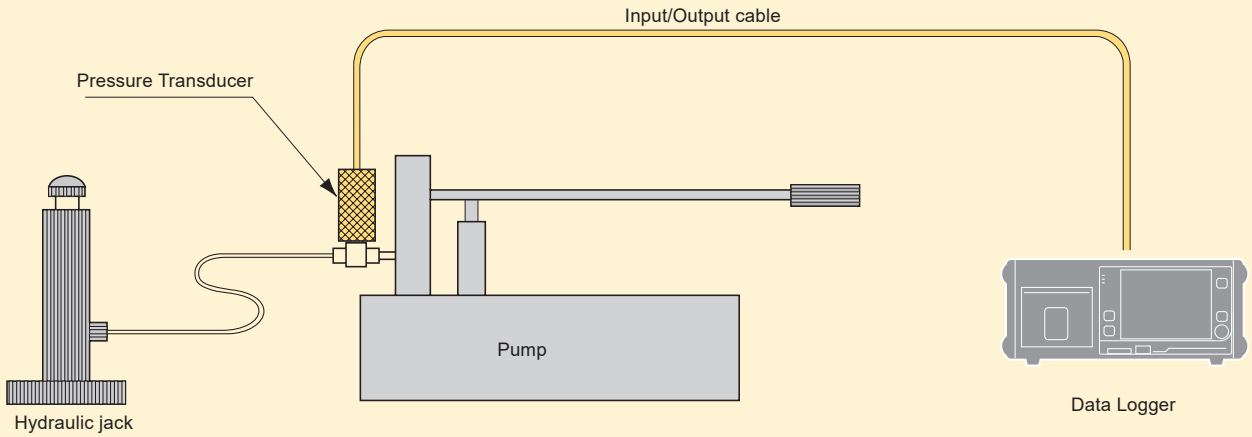


Dynamic measurement

Measuring pressure variation in pipe lines



Measuring hydraulic jack loads



Method used to calculate the conversion coefficient when measuring hydraulic jack load (kN or MN) with a pressure transducer

Correction coefficient (K) = C × A

K: Correction coefficient
C: Calibration coefficient for the transducer
A: Jack cylinder surface area exposed to pressure
F: Maximum jack load
P: Maximum jack pressure

Example

Determine the correction coefficient when a pressure transducer is mounted to a jack with a maximum load of 3MN and a cylinder surface area exposed to pressure of 500cm^2.

$$\text{Maxium jack pressure } P = \frac{F}{A} = \frac{3 \times 10^{6}}{5 \times 10^{-2}} = 60\text{MPa}$$

Select a pressure transducer with a capacity higher than 60MPa because maximum jack pressure here is 60MPa. In this case, use the PWH-70MPA because it has a capacity of 70MPa.

If the calibration coefficient for the PWH-70MPA is
C= 0.035MPa/1 × 10^{-6} strain,

then the correction coefficient (K) is
C × A = 0.035 × 10^{6} × 5 × 10^{-2}
and equals 1.75 × 10^{3}N.

Converted to MN, we get the following:

$$K = \frac{1.75 \times 10^{3}\ \text{N}}{1 \times 10^{-6}\ \text{strain}} = 0.00175\text{MN}/1 \times 10^{-6}\ \text{strain}$$

Therefore Data Logger TDS-540 settings are as follows:

Sensor Mode : 4 GAGE
Coefficient : +0.00175 E+0
Unit : MN
Point : ###.###

Settings are entered, screen displays the reflected functions.

Coefficient : 1.75000 E-3
Unit : MN
Point : ###.###