

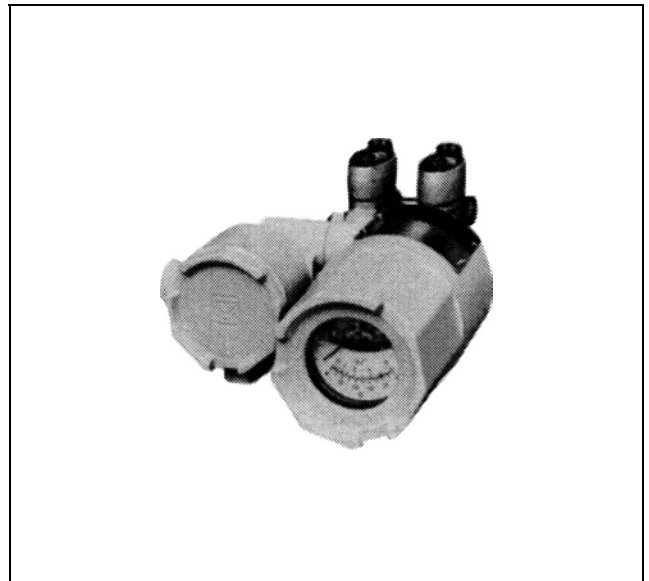
ST3000 Smart Transmitter Model JTD520

Differential Pressure Transmitter with Pressure Compensation

OVERVIEW

The ST3000 differential pressure transmitter with pressure compensation is a microprocessor-based transmitter.

The transmitter detects a differential pressure and a static pressure of a process fluid simultaneously to compensate the density change due to the static pressure change, and converts the differential pressure into an analog output signal of 4 to 20mA, which is proportional to the mass flow (volumetric flow at a reference condition).



Standard Specifications

Item	Specifications
Measuring Span (Continuously adjustable)	250 to 10000mmH ₂ O {2.45 to 98.1 kPa}
Setting Range	-10000 ≤ URV ⁽¹⁾ ≤ 10000mmH ₂ O {-98.1 ≤ URV ≤ 98.1 kPa}. -10000 ≤ LRV ⁽²⁾ ≤ 10000mmH ₂ O {-98.1 ≤ LRV ≤ 98.1 kPa}.
Output (After pressure compensation)	4 to 20mA DC
Designed Pressure Setting Range	1.7 to 35kgf/cm ² abs. {0.17 to 3.43 MPa abs.}
Accuracy (Output after compensation)	<p>Percentage with respect to x (mmH₂O) that represents the URV or LRV of the calibrated range, or the span-whichever is greatest.</p> <p>PPref. : Designed pressure (kgf/cm² abs.) PPmax. : Maximum process pressure (kgf/cm² abs.)</p> <p>±0.18% (at differential pressure 2500mmH₂O {24.5 kPa}, designed pressure 5kgf/cm² abs. {0.49 MPa abs.}, maximum process pressure 6kgf/cm² abs. {0.59 MPa abs.}).</p> <p>Accuracy % = ± (0.05 + A + B + C + D)</p> <p>A: $0.05\% \dots x \times \frac{PP_{ref.}}{PP_{max.}}$ is 1250mmH₂O {11.9 kPa} or greater</p> <p>$0.05\% \times \frac{1250}{x} \times \frac{PP_{max.}}{PP_{ref.}} \dots x \times \frac{PP_{ref.}}{PP_{max.}}$ is 1250mmH₂O {11.9 kPa} or less</p> <p>B: $0.1 \times \frac{PP_{max.}}{35} \dots x \times \frac{PP_{ref.}}{PP_{max.}}$ is 2500mmH₂O {23.8 kPa} or greater</p> <p>$0.1 \times \frac{2500}{x} \times \frac{PP_{max.}}{PP_{ref.}} \times \frac{PP_{max.}}{35} \dots x \times \frac{PP_{ref.}}{PP_{max.}}$ is 2500mmH₂O {23.8 kPa} or less</p> <p>C: $0.05\% \dots PP_{ref.}$ is 3.5kgf / cm² abs. {0.34 MPa abs.} or greater</p> <p>$0.05 \times \frac{3.5}{PP_{ref.}} \dots PP_{ref.}$ is 3.5kgf / cm² abs. {0.34 MPa abs.} or less</p> <p>D: $0.15 \times \frac{x}{PP_{ref.} \times 10000} \%$</p>
Supply Voltage	10.8 TO 45V DC (See Figure 1.)
Working Pressure Rating	35 kgf/cm ² abs. max. {3.43 MPa abs.} (For vacuum pressure, see Figure 2.)
Operating Temperature Range	<p>Ambient and meter body (process fluid) temperature:</p> <p>Normal operating conditions; -15 to 65°</p> <p>Operative limits; -40 to 70°C</p> <p>Transportation and storage conditions; -50 to +85°C</p>
Operating Humidity Range	Normal Operating conditions:10 to 90% RH
Temperature Effect (After compensation)	<p>Percentage with respect to x (mmH₂O) that represents the URV or the LRV of the setting range, or the span-whichever is greatest.</p> <p>PPref. : designed pressure (kgf/cm² abs.) PPmax. : maximum process pressure (kgf/cm² abs.)</p> <p>Zero shift:</p> <p>±0.20%/30°C (at differential pressure 2500mmH₂O {24.5 kPa abs.}, designed pressure 5kgf/cm² abs. {0.49 MPa abs.}) and maximum process pressure 6kgf/cm² abs. {0.59MPa abs.})</p> <p>Zero shifts under various conditions are obtained by the following equations:</p> <p>Zero shift%/30°C ±(0.15+A+B)</p> <p>A: $0.06 \times \frac{1250}{x} \times \frac{PP_{max.}}{PP_{ref.}}$</p> <p>B: $0.08 \times \frac{2500}{x} \times \frac{PP_{max.}}{35} \times \frac{PP_{max.}}{PP_{ref.}}$</p> <p>Combined shift (including zero and span shifts):</p> <p>±0.42%/30°C (at differential pressure 2500mmH₂O {24.5 kPa abs.}, designed pressure 5kgf/cm² abs. {0.49 MPa abs.}, and maximum process pressure 6kgf/cm² abs. {0.59MPa abs.})</p> <p>Combined shifts under various conditions are obtained by the following equations:</p> <p>Combined shift%/30°C = ±(0.2+A+B+C)</p> <p>A: $0.1\% \dots x \times \frac{PP_{ref.}}{PP_{max.}}$ is 1250mmH₂O abs. {11.9 kPa abs.} or greater</p> <p>$0.1 \times \frac{1250}{x} \times \frac{PP_{max.}}{35} \dots x$ is 1250mmH₂O abs. {11.9 kPa abs.} or less</p> <p>B: $0.08 \times \frac{PP_{max.}}{35} \dots x \times \frac{PP_{ref.}}{PP_{max.}}$ is 1250mmH₂O abs. {24.5 kPa abs.} or greater</p> <p>$0.08 \times \frac{2500}{x} \times \frac{PP_{max.}}{PP_{ref.}} \times \frac{PP_{max.}}{35} \dots x \times \frac{PP_{ref.}}{PP_{max.}}$ is 2500mmH₂O {24.5 kPa abs.} or less</p> <p>C: $0.1\% \dots PP_{ref.}$ is 3.5kgf / cm² abs. {0.34MPa abs.} or greater</p> <p>$0.1 \times \frac{3.5}{PP_{ref.}} \dots PP_{ref.}$ is 3.5kgf / cm² abs. {0.34MPa abs.} or less</p>
Accuracy and Calibration Accuracy for Differential Pressure Transmitter	<p>Percentage with respect to x (mmH₂O) that represents the URV or the LRV of the setting range or the span-whichever is greatest.</p> <p>Linear Output: ±0.1% ... x is 1250mmH₂O {11.9 kPa abs.} or greater.</p> <p>± (0.05 + 0.05 × $\frac{1250}{x}$)% ... x is 1250mmH₂O {11.9 kPa abs.} or less</p> <p>Square root output: When output is 50 to 100% ... Same as that of linear output</p> <p>When output is 7.1 to 50% ... Value of linear output × $\frac{50}{\text{Square-root output \%}}$</p>

Item	Specifications
	When output is less than 7.1% . . . Dropout
Calibration Accuracy for Pressure Transmitter	Percentage with respect to x (mmH ₂ O) that represents the URV or the LRV of the setting range or the span-whichever is greatest. $\pm 0.1\%$. . . x is 3.5kgf/cm ² abs. {0.34 MPa abs.} or greater. $\pm (0.05 + 0.05 \times \frac{3.5}{x})\%$. . . x is 3.5kgf / cm ² abs. {0.34 MPa abs.} or less
Stability Against Supply Voltage Change	0.005%FS/V
Dead Time	Approx. 0.6 sec.
Damping Time Constant	Adjustable within a range of 0.6 to 32 sec. (at 25°C)
Process Connection	Rc $\frac{1}{2}$, $\frac{1}{2}$ NPT, Rc $\frac{1}{4}$, $\frac{1}{4}$ NPT internal thread
Electrical Conduit Connection	G $\frac{1}{2}$ internal thread
Structure	Waterproof and dustproof structure: JIS C0920 Watertight, JIS F8001 Class 2 Watertight, NEMA 3 and 4X, IEC IP67
Materials	Centerbody: SUS316 Wetted parts of center body: SUS316 (SUS316L for diaphragm only) Meter body cover (Differential pressure chambers): Carbon steel (SF45A), SUSF316 Bolts: SNB7 Nuts: S45C Gasket: Teflon Transmitter case: Aluminum alloy
Finish	Basket acrylic paint, light beige (Munsell 4Y7.2/1.3)
Installation	Can be installed on a 2-inch horizontal or vertical pipe. (Can be directly mounted on a process pipe.)
Weight	Approx. 7.5 kg

(*1): URV denotes the value for 100% (20mA DC) output.

(*2): LRV denotes the value for 0% (4mA DC) output.

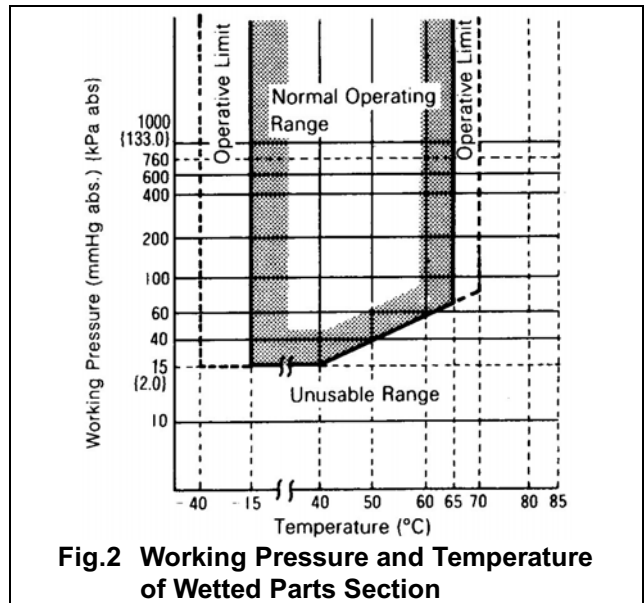
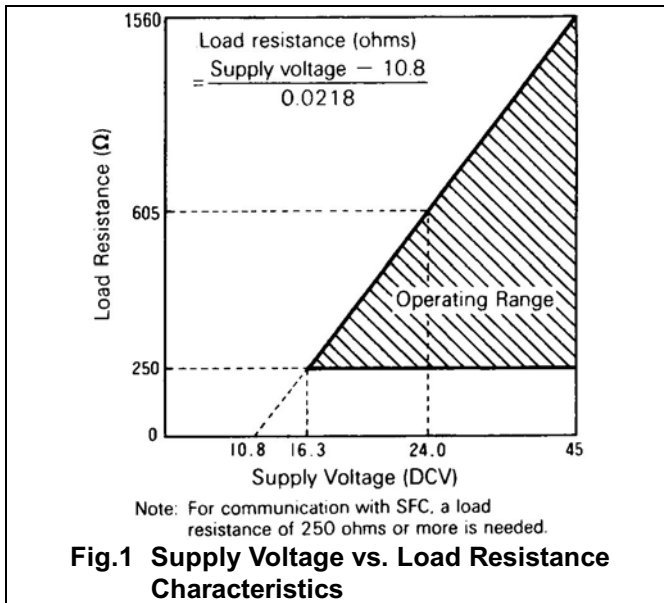
Optional Specifications

(The items other than the following are identical with those of the Standard Specifications.)

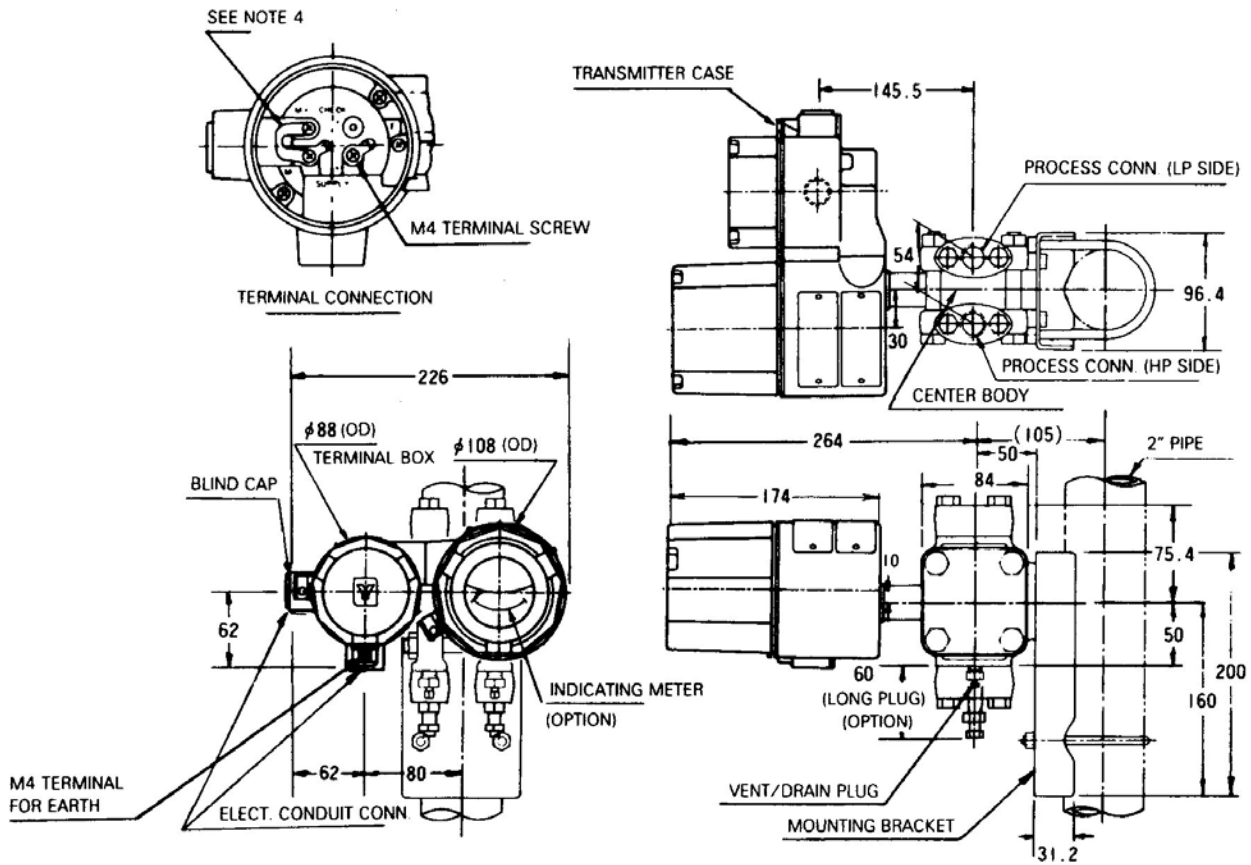
Item	Specifications
Built-in Indicating Meter (Class 2.5)	Ambient temperature: Normal operating conditions - 10 to + 60°C Operative limits (For short period) and Transportation and storage conditions: -40 to +85°C
Corrosion-resistant Finish	Corrosion-resistant paint (Baked acrylic paint), fungus-proof finish. (Silver paint when meter body cover, adapter flanges, bolts, nuts, and manifold valves are made of carbon steel)
Corrosion-proof Finish	Corrosion-proof paint (Baked epoxy paint), fungus-proof finish. (silver paint when meter body cover, adapter flanges, bolts, nuts, and manifold valves are made of carbon steel)
Corrosive-resistant Finish (Silver Paint)	Transmitter case is silver-painted in addition to the above corrosion-resistant finish.
Flameproof-packing type Cable Connecting Adapter	For electrical connection by the leading-in method of flameproof-packing type for special flameproof structure (Option-2)
Explosion-proof Structure	JIS C0903 ds2G4 special flameproof structure (Ambient temperature: -10 to +65°C Meter body (Process fluid) temperature: -10 to +65°C)
SFC for pressure compensation:	SFC 160 (Standard type) SFC 260 (with printer) For details, refer to Specification Sheet (No. SS2-SFC100-0100)

MODEL SELECTION

Basic Model No.	Selection I			Selection II	Options	Description
	Material	Fill Fluid	Process Connection			
JTD520						Measuring span: 250 ~ 10000mmH ₂ O {24.5 to 98.1 kPa}
	-A					Meter body cover: Carbon Steel Vent/drain plugs: SUS316 Wetted parts of center body: Diaphragm : SUS316L Others : SUS316
	-E					SUS316 SUS316 Diaphragm : SUS316L Others : SUS316
		1				Regular type (Silicone oil)
		2				For oxygen (Fluorine oil) service
			Q			Rc½
			R			½NPT internal thread
			S			Rc¼
			T			¼NPT internal thread
				-00000		No selection
					-X	No option
					-L	Built-in lightning arrester
					-M	Built-in indicating meter (0 to 100% linear and 0 to 10 √ double scales)
					-W	SUS304 bolts and nuts material
					-A	Corrosion-resistant finish
					-B	Corrosion-proof finish
					-D	Corrosion-resistant finish, silver paint
					-N	½NPT internal thread electrical conduit connection (Unavailable combination with "1" of options)
					-K	Oil free treatment
					-P	One cable adapter with flameproof packing
					-Q	Two cable adapters with flameproof packing
					-J	Long vent/drain plug
					-1	JIS Special flameproof structure (unavailable combination with "N" of options)



DIMENSIONS



- Notes:
- 1) The process connection can be made in any of two positions of top or bottom.
When connection is changed, replace the vent/drain plug.
 - 2) This transmitter can be mounted in various ways using the holes of the mounting bracket.
(The above drawing shows an example of typical mounting.)
 - 3) Mount the transmitter vertically.
 - 4) To use an external indicating meter, disconnect the jumper bar from the M terminals and connect in its place the lead-wires of the external indicating meter.

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: Taiwan 886-2-2501-1066
: Thailand 66-2-210-0900 to 7
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