

ST 3000 Smart Transmitter

Electronic Differential Pressure Transmitter

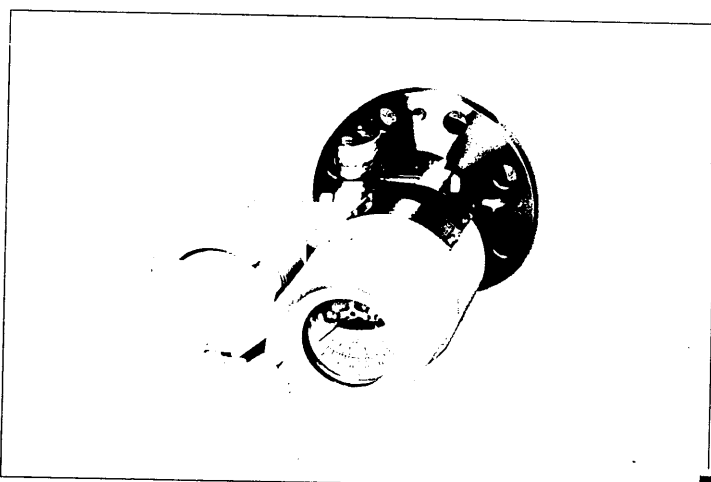
Model JTF226 (Flange Type for Open and Closed Tank Lead Pipe Gas Sealing)

Model JTF228 (Flange Type for Closed Tank Lead Pipe Liquid Sealing)

Measuring Span: 250 to 10000mmH₂O

Introduction

The ST 3000 Differential Pressure Transmitter measures a differential pressure and transmits an analog 4 to 20mA DC output or digital output proportional to the measured variable. The transmitter is a microprocessor-based instrument, whose parameters and settings (range, damping time constant, linear or square-root output, constant current output and others) can be remote-controlled from the instrument room via the SFC (Smart Communicator). The Flange Type Differential Pressure Transmitter is installed on the side of an open or closed tank to detect the top level, boundary level, or the specific-gravity of the liquid in the tank.



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Standard Specifications

Item	Specifications
Measuring span (Continuously adjustable)	250 to 10000mmH ₂ O
Setting range	$-10000 \leq \text{URV}^{(*1)} \leq 10000 \text{mmH}_2\text{O}$, $-10000 \leq \text{URV}^{(*2)} \leq 10000 \text{mmH}_2\text{O}$
Output	Analog output (4 to 20mA DC) / Digital output
Accuracy ^(*3)	Percentage with respect to x (mmH ₂ O) that represents the URV or LRV of the calibrated range, or the span – whichever is greatest. Linear output: $\pm 0.1\%$ When x is 1250mmH ₂ O or greater. $\pm [0.05 + (0.05 \times \frac{1250}{x})]\%$ When x is less than 1250mmH ₂ O. (with damping effected)
Supply voltage and load resistance	10.8 to 45V DC (See Figure 1.)
Working pressure rating	Up to flange pressure rating (For vacuum pressures, see Figure 2.)
Operating temperature range	Ambient temperature: Normal operating conditions; -30 to $+75^\circ\text{C}$ Operative limits (for short period); -50 to $+80^\circ\text{C}$ Transportation and storage conditions; -50 to $+85^\circ\text{C}$ Meter body (Process fluid) temperature: Normal operation conditions; -40 to $+110^\circ\text{C}$ Operative limits (for short period); -50 to $+125^\circ\text{C}$
Operating humidity range	Normal operating conditions: 10 to 90% RH
Temperature effect ^(*3,*4) (Shift with respect to setting range)	Percentage with respect to x (mmH ₂ O) that represents the URV or LRV of the setting range, or the span – whichever is greatest. Zero shift: $\pm [0.25 + (0.1 \times \frac{1250}{x})]\%/55^\circ\text{C}$ change Combined shift (Including zero and span shifts): $\pm 0.5\%/55^\circ\text{C}$ change When x is 1250mmH ₂ O or greater. $\pm [0.35 + (0.15 \times \frac{1250}{x})]\%/55^\circ\text{C}$ change When x is less than 1250mmH ₂ O.

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

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

(*3): Within a range of $\text{URV} \geq 0$ and $\text{LRV} \geq 0$ for JTF226.

Within a range of $\text{URV} \leq 0$ and $\text{LRV} \leq 0$ for JTF228.

(*4): Refer to the temperature effect diagram (Figure 3).

(*5): For the performance and external dimensions of corrosion-resistant type, refer to the specification sheet for corrosion-resistant application.

Item	Specifications
Static pressure effect^(*) (at 25° C) (Shift with respect to setting range)	Percentage with respect to x (mmH ₂ O) that represents the URV or LRV of the setting range, or the span – whichever is greatest (P: Static pressure value) Zero shift: $\pm [0.03 + (0.07 \times \frac{P}{70}) \times \frac{2500}{x}] \%$ Combined shift (Including zero and span shifts) $\pm [0.03 + (0.2 \times \frac{P}{70})] \%$ When x is 2500mmH ₂ O or greater. $\pm [0.03 + (0.2 \times \frac{P}{70}) \times \frac{2500}{x}] \%$ When x is less than 2500mmH ₂ O.
Stability against supply voltage change	0.005% FS/V
Dead time	Approx. 0.4 sec.
Damping time constant	Adjustable within a range of 0.4 to 32 sec. by 10 steps. (at 25° C)
Process connection	Measured pressure (Liquid level) side: Flange { Flush diaphragm type JIS 10K, 30K – 80mm (RF) equivalent ANSI 150, 300 – 3" (RF) equivalent JPI 150, 300 – 3" (RF) equivalent Extended Diaphragm type JIS 10K, 30K – 100mm (RF) equivalent ANSI 150, 300 – 4" (RF) equivalent JPI 150, 300 – 4" (RF) equivalent } Reference pressure side: Rc 1/2, 1/2 NPT internal thread, Rc 1/4, 1/4 NPT internal thread
Electric conduit connection	G 1/2 internal thread
Structure	Water-proof and dust-proof structure JIS C0920 water-tight, JIS F8001 Class2 water-tight, NEMA 3 and 4X, IEC IP67
Materials	Center body: SUS316 Wetted parts of flange side and those of center body: SUS316 (Diaphragm: SUS316L) Meter body cover: Reference (Low pressure) side; Carbon steel (SF45A), SUSF316 Measuring (High pressure) side; Carbon steel (SF45A), SUSF304 Flange: Carbon steel (SF45A), SUS304 Gasket: Teflon Transmitter case: Aluminium alloy
Finish	Baked acryl paint, light beige (Munsell 4Y7.2/1.3)
Burnout feature	Lower limit of output value at abnormal condition.
Installation	Direct mount on process flange.
Weight	Approx. 12.5kg (with JIS 10K – 80mm flange)

Selectable Standard Specifications

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

Item	Specifications
Material	When model number of meter body material is B or F. Flush diaphragm
Fill fluid	For oxygen or chlorine service { Meter body cover: Other than carbon steel. For chlorine service, H and P only are available as model numbers for meter body material. (Including no oil finish of wetted parts) } Ambient temperature: Normal operating conditions; - 10 to +75° C Operative limits (for short period); - 40 to +80° C Transportation and storage conditions; - 50 to +85° C Meter body (Process fluid) temperature: Normal operating conditions; - 10 to +75° C Operative limits (for short period); - 40 to +80° C (Note) For use on vacuum pressures, please consult us.

Optional Specifications

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

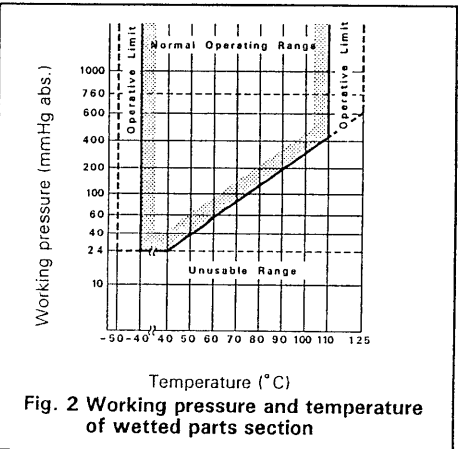
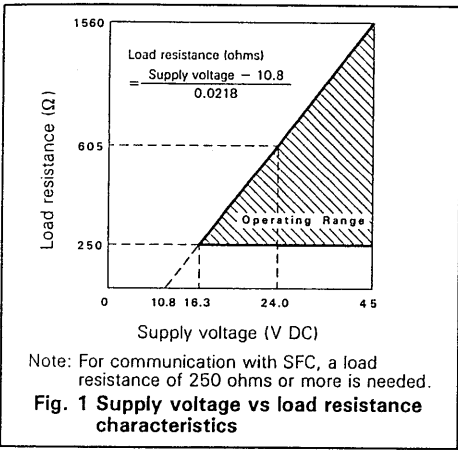
Item	Specifications
Built-in indicating meter (Class 2.5)	Ambient temperature: Normal operating conditions; - 10 to +60° C Operative limits (for short period); - 40 to +80° C Transportation and storage conditions; - 40 to +85° C
SUS304 bolts and nuts	Pressure rating: 70kgf/cm ² max.
Corrosion-resistant finish	Corrosion-resistant paint (Baked acryl paint), fungus-proof finish. (Silver paint when meter body cover, adaptor flanges, bolts, nuts, and flange are made of carbon steel)
Corrosion-proof finish	Corrosion-proof paint (Baked epoxy paint), fungus-proof finish. (Silver paint when meter body cover, adaptor flanges, bolts, nuts, and flange are made of carbon steel)
Corrosion-resistant finish (Silver paint)	Transmitter case is silver-painted in addition to the above corrosion-resistant finish.
Flame-proof packing type cable connecting adaptor	For electrical connection by the leading-in method of flame-proof packing type for special flame-proof structure.
Teflon covered diaphragm	For flange rating model [A] Meterbody (Pressure fluid) temperature: - 15 to +110° C
Explosion-proof structure	JIS C0903 ds2G4 special flame-proof structure (Ambient temperature: - 10 to +70° C, Meter body (Process fluid) temperature: - 10 to +100° C) JIS C0903 i3aG4 intrinsic-safety explosion-proof structure, using Zener barrier 8907/51 – 24/45 (Approval No. 29911) (Ambient temperature: - 10 to +60° C, Meter body (Process fluid) temperature: - 10 to +100° C) FM flame-proof structure Explosion-proof Class I (Gas, steam), Division 1, Group B, C, D Dust-ignition Class II (Inflammable dust), Division 1, Group E, F, G Suitable Class III (Inflammable fiber), Division 1 FM intrinsic-safety explosion-proof structure Intrinsically safe Class I, II, III, Division 1, Group A, B, C, D, E, F, G Nonincendive (for Class 2 location) Class I, Division 2, Group A, B, C, D
No oil finish	Excluding meter body cover made of carbon steel

Model Number Table

Basic Model Number	Meter body			Flange					Options I	Options II	Description
	Material	Fill Fluid	Process Connection	Standard	Type and Rating	Flange Material	Finish of Gasket Face	Length of Extended Parts			
JTF226											Measuring span: 250 to 10000 mmH ₂ O
JTF228											Measuring span: 250 to 10000 mmH ₂ O
	-A										Reference pressure side meter body cover
											Vent drain plugs
											Wetted parts of flange side and those of center body
											SUS316 (Diaphragm: SUS316L)
	-B										SF45A
											SUS316
											Hastelloy C
	-D										SF45A
											SUS316
											Tantalum
	-E										SUSF316
											SUS316
											SUS316 (Diaphragm: SUS316L)
	-F										SUSF316
											SUS316
											Hastelloy C
	-H										SUSF316
											SUS316
											Tantalum
		1									Regular type (Silicon oil)
		2									For oxygen (Fluorine oil) service
		5									For chlorine (Fluorine oil) service
			Q								Rc1/2 Top or bottom connection
			R								1/2NPT internal thread Top or bottom connection
			S								Rc1/4 Top or bottom connection
			T								1/4NPT internal thread Top or bottom connection
			J								JIS Flange
			A								ANSI Flange
			P								JPI Flange
				A							Flush diaphragm type 10K-80 mm/150-3" (RF) equivalent
				B							Flush diaphragm type 30K-80 mm/300-3" (RF) equivalent
				C							Extended diaphragm type 10K-100 mm/150-4" (RF) equivalent
				D							Extended diaphragm type 30K-100 mm/300-4" (RF) equivalent
					1						Carbon steel
					7						SUS304
						J					Standard
									00		Flush diaphragm
									05		L = 50 mm (Extended diaphragm)
									10		L = 100 mm (Extended diaphragm)
									15		L = 150 mm (Extended diaphragm)
									-X		No option
									-L		Built-in lightning arrester
									-M		Built-in indicating meter (0 to 100% linear scale)
									-W		SUS304 bolts and nuts
									-A		Corrosion-resistant finish
									-B		Corrosion-proof finish
									-D		Corrosion-resistant finish, silver paint
									-N		1/2NPT internal-thread electrical conduit connection
									-T		Teflon covered diaphragm
									-K		No oil finish
									-P		One cable adaptor with flame-proof packing
									-Q		Two cable adaptors with flame-proof packing
									-R		Specifications for power plant application
									-1		JIS special flame-proof structure
									-2		JIS intrinsic-safety explosion-proof structure
									-3		FM flame-proof structure
									-4		FM intrinsic-safety explosion-proof structure
									-9		Vertical pressure-conduit connection, right-side electrical-conduit connection type
									-XX		No options
									-A1		Adaptor flange for corrosion-resistant application
									-A2		With external zero adjustment (Unavailable combination with FM explosion-proof structure)
									-A5		Burnout feature (Upper limit of output value at abnormal condition)
									-D1		With DE meter

Notes:

- The items enclosed in the bold-line boxes are for Standard Specifications.
- Material of meter body cover of high pressure side depends on model number of flange material as follows:
 Flange "1" Cover... Carbon steel (SF45A) Flange "7" Cover ... SUSF304
 For JTF226, make lower the pressure of the reference pressure side than that of the measured pressure side (flange side).
 For JTF228, make higher the pressure of the reference pressure side than that of the measured pressure side (flange side).



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