

# ST3000 Ace Smart Transmitter

## JTD Series of Differential Pressure Transmitters

### Model JTD910A/920A/930A/960A/921A/931A/961A

#### **OVERVIEW**

The ST3000 Ace Smart Transmitter is a microprocessor-based smart transmitter that features high performance and excellent stability. Capable of measuring gas, liquid, and vapor flow rates, pressures, and liquid levels, it transmits 4 to 20 mA DC analog and digital signals according to the measured differential pressure.

It can also execute two-way communications between the Smart communicator and via DE protocol with the TDCS3000 or 3000<sup>X</sup>, or Advanced-PS, and a database, thus facilitating self-diagnosis, range resetting, and automatic zero adjustment.

Refer to No. SS2-DST10F-0100 for FOUNDATION™ Fieldbus specification.

#### **FEATURES**

##### **Excellent stability and high performance**

- Long-term stability has been proven in 2,000,000 installations worldwide.
- Unique characterization and composite semiconductor sensors realize excellent temperature and static pressure characteristics.

##### **Wide measuring range (rangeability)**

- A wide measuring range is available from a single model. This feature is highly effective in taking measurements over a wide range and reducing the need for reserve units. The measuring range of the model JTD920A, for example, is 0.75 to 100 kPa (range ability = 1:135).

##### **A diverse lineup**

- A wide range of models is available to meet user requirements. They include micro-differential pressure, standard differential pressure, high differential pressure, standard differential pressure/high static pressure, and high differential pressure/high static pressure models.
- A wide variety of corrosion-resistant materials for wetted parts is also available.

##### **Multi protocol communication**

- Either analog output (4 to 20 mA DC, SFN protocol, HART® protocol) or digital output



(DE protocol, FOUNDATION™ Fieldbus protocol) is possible.

- Two-way communication using SFN, HART, or Foundation Fieldbus facilitates self-diagnosis, range resetting, automatic zero adjustment, and so on.

##### **Full after-sales service program**

- A wide variety of specialized replacement kits is provided to meet customers' needs when replacing Azbil Corporation's transmitters or transmitters from other companies.
- From product delivery to replacement, we will service all your needs. Our nationwide service network provides all the backup you require, including trial operation support and regular maintenance.

##### **China RoHS**

This device is used in the Oil & Gas, Petrochemical, Chemical, Pulp & Paper, Food & Beverage, Machinery, Steel/Metal & Mining, and Automobile industries and therefore does not fall under the China RoHS Legislation.

If this device is used in semiconductor manufacturing equipment, labeling on the device and documents for the China RoHS may be required. If such documents are required, consult an Azbil Corp. representative.

HART® is a registered trademark of the HART Communication Foundation.

**APPLICATION****Petroleum / Petrochemical / Chemical**

- For strict flow control in combination with orifice plates
- For measuring pressures and liquid levels in pipes and tanks

**Electric power / City gas / Other utilities**

- For measurement applications that require high degrees of stability and accuracy

**Draft range applications such as semiconductor equipment manufacturing / Clean rooms**

- For applications that require highly stable, accurate measurement

**Pulp and paper**

- For lines that need transmitters resistant to chemical liquids, corrosive fluids and the like

**Iron and steel / Nonferrous metal / Ceramics**

- For highly stable, accurate measurements such as furnace pressure measurement
- For lines that require stable measurement under strictly controlled (temperature, humidity, etc.) conditions

**Machinery / Shipbuilding**

- For lines that require stable measurement under strictly controlled (temperature, humidity, etc.) conditions

**SPECIFICATIONS****Measuring span / Setting range / Working pressure range**

See Table 1.

**Output**

Analog output (4 to 20 mA DC)

Digital output (DE protocol)

Digital output (FOUNDATION™ Fieldbus protocol)

**Communication**

SFN communication

HART® communication

FOUNDATION™ Fieldbus communication

**Supply voltage and load resistance**

10.8 to 45V DC.

9 to 32 VDC ( FOUNDATION™ Fieldbus communication).

A load resistance of 250 Ω or more is necessary between loops. (See Figure 1)

**Fill Fluid**

Silicone oil for general purpose models

Fluorine oil for oxygen and chlorine models

**Ambient temperature range****Normal operating range**

-40 to 85°C for general purpose models

-15 to 65°C for general purpose model (JTD910A)

-15 to 85°C for general purpose model (JTD921A / 931A / 961A)

-10 to 75°C for oxygen and chlorine models

-20 to 70°C for models with digital indicators

**Operative limits**

-50 to 93°C for general purpose models

-40 to 70°C for general purpose model (JTD910A)

-25 to 93°C for general purpose model (JTD921A / 931A / 961A)

-40 to 80°C for oxygen and chlorine models

-30 to 80°C for models with digital indicators

TIIS flameproof models: -20 to 60°C

TIIS intrinsically safe models: -10 to 60°C

KOSHA flameproof models: -20 to 60°C

**Temperature ranges of wetted parts****Normal operating range**

-40 to 110°C for general purpose models

-15 to 65°C for general purpose model (JTD910A)

-15 to 110°C for general purpose model (JTD921A / 931A / 961A)

-10 to 75°C for oxygen and chlorine models

-10 to 65°C for oxygen and chlorine models (JTD910A)

**Operative limits:**

-50 to 115°C for general purpose models

-40 to 70°C for general purpose model (JTD910A)

-15 to 115°C for general purpose model (JTD921A / 931A / 961A)

-40 to 80°C for oxygen and chlorine models

-40 to 70°C for oxygen and chlorine models (JTD910A)

TIIS flameproof models: -20 to 110°C

(JTD910A: -15 to 65°C)

(JTD921A / 931A / 961A: -15 to 110°C)

TIIS intrinsically safe models: -20 to 100°C

(JTD910A: -10 to 65°C)

(JTD921A / 931A / 961A: -15 to 100°C)

KOSHA flameproof models: -20 to 110°C

(JTD910A: -15 to 65°C)

(JTD921A / 931A / 961A: -15 to 110°C)

**Ambient humidity range**

5 to 100% RH

**Stability against supply voltage change**

± 0.005% F.S./V

**Lightning protection**

Peak value of voltage surge: 100 kV

Peak value of current surge: 1000A

**Dead time**

Approximately 250 m sec.

**Damping time constant**

Selectable from 0 to 32 sec. in ten stages

**Waterproof / Dustproof structure**

JIS C0920 watertight: NEMA3 and 4X

JIS F8001 class 2 watertight: IEC IP67

**Explosion-proof structure**

TIIS flameproof models: (Ex d II C T4X)

*Note) Please use the cable that can be used in the environment that maximum ambient temperature is beyond 65°C*

TIIS intrinsically safe models: (Ex ia II C T4)

Vi=30 V, Ii=100 mA

Pi=1W, Ci=10 nF

Li=0.5 mH

KOSHA flameproof models: (Ex d II C T4)

**Vibration effect**

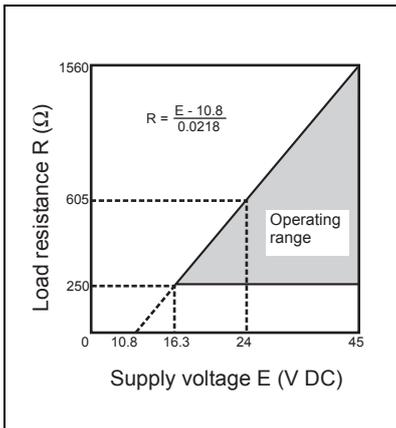
Amplitude 1.5mm / Frequency 0 to 9Hz

5m/s<sup>2</sup>(0.5G) / 9 to 60Hz**Impact effect**10m/s<sup>2</sup>(1G)**Table 1 Measuring span, setting range, and working pressure range**

(for negative pressure in the working pressure range, see Figure2, Figure 3, Figure 4 and Figure 5.)

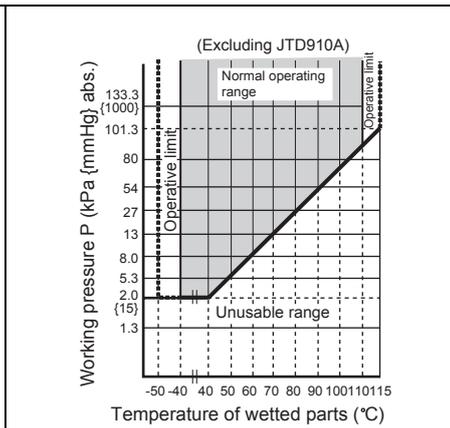
Model	Measuring span	Setting range	Working pressure range
JTD910A	0.1 to 2 kPa {10 to 200 mmH <sub>2</sub> O}	-1 to 1 kPa {-100 to 100 mmH <sub>2</sub> O}	-70 to 210 kPaG {-0.7 to 2.1 kgf/cm <sup>2</sup> }
JTD920A	0.75 to 100 kPa {75 to 10160 mm H <sub>2</sub> O}	-100 to 100 kPa {-10160 to 10160 mmH <sub>2</sub> O}	2.0 kPa abs. to 14 MPa *1 *2 {15 mmHg abs. to 140 kgf/cm <sup>2</sup> }
JTD930A	35 to 700 kPa {0.35 to 7 kgf/cm <sup>2</sup> }	-100 to 700 kPa {-1 to 7 kgf/cm <sup>2</sup> }	
JTD960A	0.25 to 14 MPa {2.5 to 140 kgf/cm <sup>2</sup> }	-0.1 to 14 MPa {-1 to 140 kgf/cm <sup>2</sup> }	2.0 kPa abs. to 14 MPa *2 {15 mmHg abs. to 140 kgf/cm <sup>2</sup> }
JTD921A	2.5 to 100 kPa {250 to 10160 mmH <sub>2</sub> O}	-100 to 100 kPa {-10160 to 10160 mmH <sub>2</sub> O}	2.0 kPa abs. to 42 Mpa *3 {15 mmHg abs. to 420 kg/cm <sup>2</sup> }
JTD931A	35 to 700 kPa {0.35 to 7 kgf/cm <sup>2</sup> }	-100 to 700 kPa {-1 to 7 kgf/cm <sup>2</sup> }	
JTD961A	0.25 to 14 MPa {2.5 to 140 kgf/cm <sup>2</sup> }	-0.1 to 14 MPa {-1 to 140 kgf/cm <sup>2</sup> }	

*Note) \*1: With PVC wetted parts, the maximum working pressure is 1.5 MPa {15 kgf/cm<sup>2</sup>}**\*2: With 304 SST bolts and nuts, the maximum working pressure is 10 MPa {100 kgf/cm<sup>2</sup>}**\*3: With 304 SST bolts and nuts, the maximum working pressure is 23 MPa {230 kgf/cm<sup>2</sup>}**\*4: JTD910A is high sensitivity. So that shall not be receiving the mounting position of the radiant heat of the wind effect.*

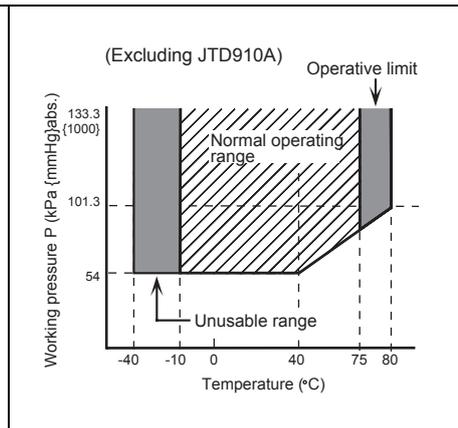


**Figure 1** Supply voltage vs. load resistance characteristics

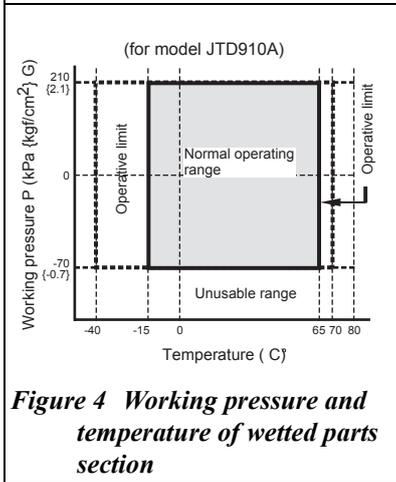
Note) For communication with Communicator, a load resistance of 250 Ω or more is necessary



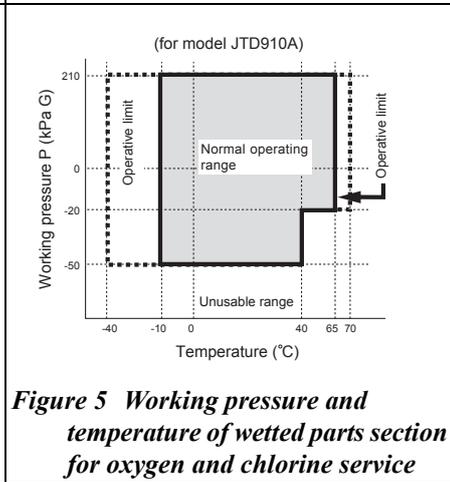
**Figure 2** Working pressure and temperature of wetted parts section



**Figure 3** Working pressure and temperature of wetted parts section for oxygen and chlorine service



**Figure 4** Working pressure and temperature of wetted parts section



**Figure 5** Working pressure and temperature of wetted parts section for oxygen and chlorine service

**Process pipe connection**

Rc1/2, 1/2NPT internal thread and Rc1/4, 1/4NPT internal thread

**Electrical conduit connection**

G1/2 internal thread and 1/2NPT internal thread

**Materials**

Center body: 316 SST  
Transmitter case: Aluminum alloy

**Wetted parts materials**

**Meter body cover**

SCS14A(316 SST),SUSF316, PVC

**Wetted parts of center body**

316 SST (Diaphragm: 316L SST),  
ASTM B575 (Hastelloy C-276 equivalent),  
tantalum, etc.

**Vents and plugs**

316 SST, PVC

**Gaskets for wetted parts**

FEP (Teflon)

**Bolts and nuts material (for fastening meter body cover)**

Carbon steel (SNB7), 304 SST, 630 SST

**Finish**

Housing: light beige (Munsell 4Y7.2/1.3)

Cap: dark beige (Munsell 10YR4.7/0.5)

**Corrosion-resistant finish**

**Standard**

Corrosion-resistant paint (Baked acrylic paint)

**Corrosion-resistant finish**

Corrosion-resistant paint (Baked acrylic paint),  
fungus-proof finish

**Corrosion-proof finish**

Corrosion-proof paint (Baked epoxy paint), fungus-  
proof finish

**Corrosion-resistant finish (silver paint)**

Transmitter case is silver-coated in addition to the  
above corrosion-resistant finish.

**Built-in indicating meter**

The digital LCD indicator (optional) indicates actual  
flow rates (in SI units) and can be set freely between  
-19999 and 19999 (4.5 digits). For actual calibration,  
specify the following items when placing your order:

- Actual calibration range
- Actual calibration unit

- Proportional representation and instructions about square-root extraction
- Various kinds of data can be set using the SFC smart communicator (Ver. 7.1 or later).

### Burnout feature

Choice of three states at abnormal condition:

- Burnout of output values: none
- upper limit: 20.8mA (105%) or more
- lower limit: 3.8mA (-1.25%) or less

### Grounding

Grounding resistance 100Ω max.

### Installation

Can be installed on a 2-inch horizontal or vertical pipe (can be directly mounted on a process pipe)

### Weight

Approx. 4.4 kg (Model JTD920A)

## OPTIONAL SPECIFICATIONS

### Adaptors for anticorrosion materials

These are adaptor flanges to connect 82 mm pipes made of anticorrosion materials (excluding ASTM B575 (Hastelloy C-276 equivalent)) to 54 mm general-purpose pipes.

### External zero adjustment function

The transmitter can be easily zero-adjusted in the field with a flat-blade screwdriver.

### Additional lightning protection

It is possible to achieve a lightning protection performance of 200 kV, 2000 A, twice the standard performance (100 kV, 1000 A). This is advisable when the transmitter is to be used in lightning-prone areas such as mountains, hills or wherever high-performance lightning protection is required.

### Long vent drain

A longer (58 mm) drain than the standard (24 mm) can be used for maintenance, process, and safety reasons.

### Elbow

This is an adaptor for changing the electrical conduit connection port from the horizontal to the vertical direction, if required by wiring conditions in the field. One or two elbows may be used as needed.

### Water free treatment (including oil free treatment)

The transmitter is shipped with dry and oil-free wetted parts. (The vents and plugs are coated with a small amount of fluorine oil to prevent galling)

### Water free treatment (including oil free treatment) High Grade

The transmitter is shipped with dry and oil-free wetted parts (including vents and plugs).

### Oil free treatment

The transmitter is shipped with oil-free wetted parts. (The vents and plugs are coated with a small amount of fluorine oil to prevent galling)

### Electric power specification

This specification applies to where stringent quality control is required, such as in the electrical power and city gas industries.

### Special burnout (3.2 mA)

The burnout output value (in the lower-limit direction) under abnormal conditions shall be 3.2 mA (-5%) or less.

### Output saturation

The output saturation point can be set within the following ranges.

12 mA(50%) ≤ output upper limit ≤ 20.8 mA(105%)  
3.2 mA(-5%) ≤ output lower limit ≤ 12 mA(50%)

*Note) As HART communication type,*

1. In case code J8 "Special burnout (3.2mA)" of Options 2 is selected, the lower limit of output saturation becomes 3.2 mA(-5%).
2. In case code J8 "Special burnout (3.2mA)" of Options 2 is not selected, the lower limit of output saturation becomes 3.8 mA(-1.25%).

### Test report

The test report indicates the results of appearance, I/O characteristics, insulation resistance, and breakdown voltage tests.

### Material certificate

The material certificate shows the chemical composition, heat-treatment conditions, and mechanical properties of the materials used for the wetted parts. The transmitter can be easily zero-adjusted in the field with a flat-blade screwdriver.

### Strength calculation sheet

The strength calculation sheet indicates the strength of the meter body cover, flanges, bolts, etc.

### Withstand pressure and air tight test (for general purposes)

The withstand pressure and air tight test result sheet shows the results of a pressure resistance test (under water pressure for 10 minutes) and a gas-tightness test (using N<sub>2</sub> gas for 10 minutes) performed on the wetted parts.

## Traceability certificate

This certificate consists of three parts: the transmitter's measurement control system configuration diagram, a calibration certificate, and a test report.

## Conformance to non-SI units

We deliver transmitters set to any non-SI unit you specify.

## Transmitter handling notes

To get the most from the performance this transmitter can offer, please use it properly noting the points mentioned below. Before using it, please read the Instruction Manual.

## Transmitter installation notes

### **⚠ WARNING**

- When installing the transmitter, ensure that gaskets do not protrude from connecting points into the process (such as adapter flange connection points and connecting pipes and flanges). Failure to do so may cause a leak of process fluid, resulting in harm from burns, etc. In addition, if the process fluid contains toxic substances, take safety measures such as wearing goggles and a mask to prevent contact with the skin and eyes and to prevent inhalation.
- Use the transmitter within the operating ranges stated in the specifications (for explosion-proofing, pressure rating, temperature, humidity, voltage, vibration, shock, mounting direction, atmosphere, etc.). Using the transmitter outside the operating conditions may cause device failure or fire, resulting in a harmful physical risk of burning or the like.
- Some models of the transmitter have a mass of 10 kg or more because of differences in specifications. For your safety when transporting or installing the transmitter, use a dolly or two or more people. Carelessly lifting the transmitter and accidentally dropping it can cause injury or damage.
- When performing wiring work in explosion-proof areas, follow the work method specified in the explosion-proof guidelines. In addition, when the wiring for an explosionproof product is a pull-in pressure-resistant packing cable, be sure to use a pressure-resistant packing-cable adapter certified by Azbil Corporation.
- Be sure to use the cable which allowable temperature is more than 65°C.

### **⚠ CAUTION**

- After installation, do not use the transmitter as a foothold or put your weight on it. Doing so may cause damage.
- Be careful not to hit the glass indicator with tools etc. This could break the glass and cause injury.
- Impact to transmitter can damage sensor module.

## Wiring notes

### **⚠ WARNING**

- To avoid shocks, do not perform electrical wiring work with wet hands or with live wires.

### **⚠ CAUTION**

- Do wiring work properly in conformance with the specifications. Wiring mistakes may result in malfunction or irreparable damage to the instrument.
- Use a power supply that conforms to the specifications. Use of an improper power supply may result in malfunction or irreparable damage to the instrument.
- Use a power supply with overcurrent protection for this instrument.

## Handling precautions for HART specification devices

- If you need to operate with a secondary host (HART communicator, etc.), set the communication interval of the primary host (DCS, device management system) to 8 seconds or more, or suspend communication from the primary host. If the primary host repeats HART communication within 8 seconds, the request from the secondary host may not be received (communication may not be possible).
- If electrical noise in the environment prevents HART-communications with the host, take countermeasures such as separating the signal cables from the source of the noise, improving the grounding, changing to shielded signal cables, etc. Even if noise interferes with HART communications, the 4-20 mA analog signal will be unaffected and can be used for control.
- If this product is being operated in multidrop mode, there is a limit to the number of devices that can be used. If you are using multidrop mode, please consult with us.

**PERFORMANCE**

Shown for each performance (accuracy/ temperature characteristics/ static pressure effect) are absolute value of the upper limit (URV)<sup>\*1</sup> and the lower limit (LRV)<sup>\*2</sup> of the calibration range or the percentage ratio of the maximum value of the span to  $\chi$ .

**Model JTD910A (material for wetted parts: 316 SST)**

Accuracy	<b>Linear output:</b>	$\pm\left(0.15 + 0.15 \times \frac{1.0}{\chi}\right) \%$ ( $\chi.kPa$ )
	<b>Square-root output:</b>	When output is 50 to 100%: same as linear output When output is 7.1 to 50%: linear output $\times \frac{50}{\text{square-root output}} \%$ When output is less than 7.1%: dropout
Temperature characteristics (Shift from the set range) Change of 30°C	<b>Zero shift:</b>	$\pm\left(0.15 + 0.35 \times \frac{1.0}{\chi}\right) \%$ ( $\chi.kPa$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm\left(0.2 + 0.6 \times \frac{1.0}{\chi}\right) \%$ ( $\chi.kPa$ )
Static pressure effect (Shift with respect to setting range) Change of 70 kPa {0.7 kgf/cm <sup>2</sup> }	<b>Zero shift:</b>	$\pm 0.45\%$ ( $\chi \geq 1.0 kPa \{100 mmH_2O\}$ ) $\pm\left(0.45 \times \frac{1.0}{\chi}\right) \%$ ( $\chi < 1.0 kPa \{100 mmH_2O\}$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm 0.5\%$ ( $\chi \geq 1.0 kPa \{100 mmH_2O\}$ ) $\pm\left(0.5 \times \frac{1.0}{\chi}\right) \%$ ( $\chi < 1.0 kPa \{100 mmH_2O\}$ )

**Model JTD920A / 921A (material for wetted parts: 316 SST)**

Accuracy <sup>*3</sup>	<b>Linear output:</b>	$\pm 0.1\%$ ( $\chi \geq 5.0 kPa \{500 mmH_2O\}$ ) $\pm\left(0.025 + 0.075 \times \frac{5.0}{\chi}\right) \%$ ( $\chi < 5.0 kPa \{500 mmH_2O\}$ )
	<b>Square-root output:</b>	When output is 50 to 100%: same as linear output When output is 7.1 to 50%: linear output $\times \frac{50}{\text{square-root output}} \%$ When output is less than 7.1%: dropout
Temperature characteristics (Shift from the set range) <sup>*3</sup> Change of 30°C	<b>Zero shift:</b>	$\pm\left(0.14 + 0.17 \times \frac{12.5}{\chi}\right) \%$ ( $\chi.kPa$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm 0.44\%$ ( $\chi \geq 12.5 kPa \{1250 mmH_2O\}$ ) $\pm\left(0.19 + 0.25 \times \frac{12.5}{\chi}\right) \%$ ( $\chi < 12.5 kPa \{1250 mmH_2O\}$ )
Static pressure effect (Shift with respect to setting range) <sup>*3</sup> Change of 7 MPa {70 kgf/cm <sup>2</sup> }	<b>Zero shift:</b>	$\pm 0.18 \%$ ( $\chi \geq 20.0 kPa \{2000 mmH_2O\}$ ) $\pm\left(0.18 \times \frac{20.0}{\chi}\right) \%$ ( $\chi < 20.0 kPa \{2000 mmH_2O\}$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm 0.33 \%$ ( $\chi \geq 20.0 kPa \{2000 mmH_2O\}$ ) $\pm\left(0.33 \times \frac{20.0}{\chi}\right) \%$ ( $\chi < 20.0 kPa \{2000 mmH_2O\}$ )

**Model JTD930A / 931A (material for wetted parts: 316 SST)**

Accuracy <sup>*3</sup>	<b>Linear output:</b>	$\pm 0.1\%$ ( $\chi \geq 140 kPa \{1.4 kgf/cm^2\}$ ) $\pm\left(0.025 + 0.075 \times \frac{140}{\chi}\right) \%$ ( $\chi < 140 kPa \{1.4 kgf/cm^2\}$ )
	<b>Square-root output:</b>	When output is 50 to 100%: same as linear output When output is 7.1 to 50%: linear output $\times \frac{50}{\text{square-root output}} \%$ When output is less than 7.1%: dropout
Temperature characteristics (Shift from the set range) <sup>*3</sup> Change of 30°C	<b>Zero shift:</b>	$\pm\left(0.14 + 0.17 \times \frac{12.5}{\chi}\right) \%$ ( $\chi.kPa$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm 0.44\%$ ( $\chi \geq 12.5 kPa \{1250 mmH_2O\}$ ) $\pm\left(0.19 + 0.25 \times \frac{12.5}{\chi}\right) \%$ ( $\chi < 12.5 kPa \{1250 mmH_2O\}$ )
Static pressure effect (Shift with respect to setting range) <sup>*3</sup> Change of 7 MPa {70 kgf/cm <sup>2</sup> }	<b>Zero shift:</b>	$\pm\left(0.18 \times \frac{700}{\chi}\right) \%$ ( $\chi.kPa$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm\left(0.33 \times \frac{700}{\chi}\right) \%$ ( $\chi.kPa$ )

**Model JTD960A / 961A**

Material for wetted parts: 316 SST

Accuracy *3	<b>Linear output:</b>	$\pm 0.15\%$	$(\chi \geq 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\})$
		$\pm \left(0.1 + 0.05 \times \frac{3.5}{\chi}\right) \%$	$(\chi < 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\})$
Temperature characteristics (Shift from the set range) *3 Change of 55°C	<b>Square-root output:</b>	When output is 50 to 100%: same as linear output	
		When output is 7.1 to 50%: linear output $\times \frac{50}{\text{square-root output}} \%$	
		When output is less than 7.1%: dropout	
Zero shift:		$\pm \left(0.14 + 0.16 \times \frac{3.5}{\chi}\right) \%$	$(\chi: \text{MPa})$
	<b>Combined shift:</b> (including zero and span shift)	$\pm 0.44\%$	$(\chi \geq 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\})$
		$\pm \left(0.19 + 0.25 \times \frac{3.5}{\chi}\right) \%$	$(\chi < 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\})$
Static pressure effect (Shift with respect to setting range) *3 Change of 7 MPa {70 kgf/cm <sup>2</sup> }	<b>Zero shift:</b>	$\pm \left(0.03 + 0.17 \times \frac{7}{\chi}\right) \%$	$(\chi > 7 \text{ MPa } \{70 \text{ kgf/cm}^2\})$
	<b>Combined shift:</b> (including zero and span shift)	$\pm 0.4\%$	$(\chi \leq 7 \text{ MPa } \{70 \text{ kgf/cm}^2\})$
		$\pm \left(0.03 + 0.37 \times \frac{7}{\chi}\right) \%$	$(\chi \leq 7 \text{ MPa } \{70 \text{ kgf/cm}^2\})$

T: Ambient temperature (°C)

**Model JTD920A**

Material for wetted parts: ASTM B575 (Hastelloy C-276 equivalent), Tantalum

Accuracy *3	<b>Linear output:</b>	$\pm 0.2\%$	$(\chi \geq 5.0 \text{ kPa } \{500 \text{ mmH}_2\text{O}\})$
		$\pm \left(0.125 + 0.075 \times \frac{5.0}{\chi}\right) \%$	$(\chi < 5.0 \text{ kPa } \{500 \text{ mmH}_2\text{O}\})$
Temperature characteristics (Shift from the set range) *3 Change of 30°C (Range from -5 to 55°C)	<b>Square-root output:</b>	When output is 50 to 100%: same as linear output	
		When output is 7.1 to 50%: linear output $\times \frac{50}{\text{square-root output}} \%$	
		When output is less than 7.1%: dropout	
Zero shift:		$\pm \left(0.15 + 0.6 \times \frac{20.0}{\chi}\right) \%$	$(\chi: \text{kPa})$
	<b>Combined shift:</b> (including zero and span shift)	$\pm \left(0.55 + 0.65 \times \frac{20.0}{\chi}\right) \%$	$(\chi: \text{kPa})$
Static pressure effect (Shift with respect to setting range) *3 Change of 7 MPa {70 kgf/cm <sup>2</sup> }	<b>Zero shift:</b>	$\pm 0.66\%$	$(\chi \geq 20.0 \text{ kPa } \{2000 \text{ mmH}_2\text{O}\})$
		$\pm \left(0.66 \times \frac{20.0}{\chi}\right) \%$	$(\chi < 20.0 \text{ kPa } \{2000 \text{ mmH}_2\text{O}\})$
<b>Combined shift:</b> (including zero and span shift)		$\pm 1.0\%$	$(\chi \geq 20.0 \text{ kPa } \{2000 \text{ mmH}_2\text{O}\})$
		$\pm \left(1.0 \times \frac{20.0}{\chi}\right) \%$	$(\chi < 20.0 \text{ kPa } \{2000 \text{ mmH}_2\text{O}\})$

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

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

\*3: Within a range of URV  $\geq 0$  and LRV  $\geq 0$

\*4: Hastelloy C-276 equivalent material.

**Model JTD930A**

Material for wetted parts: ASTM B575 (Hastelloy C-276 equivalent), Tantalum, 316L SST

Accuracy <sup>*3</sup>	<b>Linear output:</b>	$\pm 0.2\%$ (For $\chi \geq 140 \text{ kPa } \{1.4 \text{ kgf/cm}^2\}$ )
		$\pm \left(0.125 + 0.075 \times \frac{140}{\chi}\right) \%$ (For $\chi < 140 \text{ kPa } \{1.4 \text{ kgf/cm}^2\}$ )
	<b>Square-root output:</b>	When output is 50 to 100%: same as linear output
		When output is 7.1 to 50%: linear output $\times \frac{50}{\text{square-root output}} \%$
		When output is less than 7.1%: dropout
Temperature characteristics (Shift from the set range) <sup>*3</sup> Change of 30°C (Range from -5 to 55°C)	<b>Zero shift:</b>	$\pm \left(0.15 + 0.6 \times \frac{210}{\chi}\right) \%$ ( $\chi: \text{kPa}$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm 1.2\%$ (For $\chi \geq 210 \text{ kPa } \{2.1 \text{ kgf/cm}^2\}$ ) $\pm \left(0.55 + 0.65 \times \frac{210}{\chi}\right) \%$ (For $\chi < 210 \text{ kPa } \{2.1 \text{ kgf/cm}^2\}$ )
Static pressure effect (Shift with respect to setting range) <sup>*3</sup> Change of 7 MPa {70 kgf/cm <sup>2</sup> }	<b>Zero shift:</b>	$\pm \left(0.03 + 0.295 \times \frac{700}{\chi}\right) \%$ ( $\chi: \text{kPa}$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm \left(0.03 + 0.495 \times \frac{700}{\chi}\right) \%$ ( $\chi: \text{kPa}$ )

**Model JTD960A**

Material for wetted parts: ASTM B575 (Hastelloy C-276 equivalent), Tantalum, 316L SST

Accuracy <sup>*3</sup>	<b>Linear output:</b>	$\pm 0.3\%$ (For $\chi \geq 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\}$ )
		$\pm \left(0.25 + 0.05 \times \frac{3.5}{\chi}\right) \%$ (For $\chi < 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\}$ )
	<b>Square-root output:</b>	When output is 50 to 100%: same as linear output
		When output is 7.1 to 50%: linear output $\times \frac{50}{\text{square-root output}} \%$
		When output is less than 7.1%: dropout
Temperature characteristics (Shift from the set range) <sup>*3</sup> Change of 30°C (Range from -5 to 55°C)	<b>Zero shift:</b>	$\pm \left(0.15 + 0.6 \times \frac{3.5}{\chi}\right) \%$ ( $\chi: \text{kPa}$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm 1.2\%$ (For $\chi \geq 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\}$ ) $\pm \left(0.55 + 0.65 \times \frac{3.5}{\chi}\right) \%$ (For $\chi < 3.5 \text{ MPa } \{35 \text{ kgf/cm}^2\}$ )
Static pressure effect (Shift with respect to setting range) <sup>*3</sup> Change of 7 MPa {70 kgf/cm <sup>2</sup> }	<b>Zero shift:</b>	$\pm \left(0.03 + 0.295 \times \frac{7}{\chi}\right) \%$ ( $\chi: \text{kPa}$ )
	<b>Combined shift:</b> (including zero and span shift)	$\pm 0.525\%$ (For $\chi \geq 7 \text{ MPa } \{70 \text{ kgf/cm}^2\}$ ) $\pm \left(0.03 + 0.495 \times \frac{7}{\chi}\right) \%$ (For $\chi < 7 \text{ MPa } \{70 \text{ kgf/cm}^2\}$ )

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

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

\*3: Within a range of  $URV \geq 0$  and  $LRV \geq 0$ 

\*4: Hastelloy C-276 equivalent material.

**MODEL SELECTIONS**

**Model JTD910A - Lowest differential pressure - Regular service**

Basic model no.      Selections      Options 1      Options 2 (Options 2: Refer to page 17)  
 [ ] - [ I | II | III | IV | V ] - [ VI | VII | VIII | IX | X ] - [ ]

Model	Pressure range / style		Service (Fill fluid)	Process connection
JTD910A	0.1 to 2 kPa (10 to 200 mmH <sub>2</sub> O)	Lowest differential pressure	Regular service (Silicon oil)	Rc1/2, 1/2NPT, Rc1/4, NPT1/4

Measuring span		0.1 to 2.0 kPa (10 to 200 mmH <sub>2</sub> O)		JTD910A	Basic model no. Selections					Options 1										
<b>Selections</b>																				
I	Output	4 to 20 mA (SFN protocol)			1															
		Digital output (DE protocol) *1 *2			3															
		Digital output (FOUNDATION Fieldbus protocol) *3			4															
		4 to 20 mA (HART protocol)			5															
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body																
		SCS14A	316 SST	316 SST	E															
III	Fill fluid	Regular type (Silicon oil)			1															
IV	Process connection	Rc1/2, top connection			A															
		Rc1/2, bottom connection			B															
		1/2NPT internal thread, top connection			F															
		1/2NPT internal thread, bottom connection			G															
		Rc1/4, top connection			L															
		Rc1/4, bottom connection			M															
		1/4NPT internal thread, top connection			R															
		1/4NPT internal thread, bottom connection			S															
V	Bolt / nut	304 SST			2															
<b>Options 1</b>																				
VI	Electrical connection / explosion-proof	G1/2, watertight			X															
		G1/2, TIIS Flameproof with 1 pc. of cable gland attached			2															
		G1/2, TIIS Flameproof with 2 pcs. of cable gland attached			3															
		G1/2, TIIS Intrinsically safe *4			K															
		G1/2, KOSHA Flameproof			P															
		1/2NPT, watertight			A															
VII	Built-in indicating smart meter	None			X															
		0 to 100% linear scales			1															
		Engineering unit scales			2															
VIII	Finish	Standard			X															
		Corrosion-resistant			A															
		Corrosion-proof			B															
		Corrosion-resistant (Silver coating)			D															
IX	Burnout feature	None			X															
		Upper limit of output at abnormal condition *1 *4			U															
		Lower limit of output at abnormal condition *1 *4			D															
X	Mounting bracket	None			X															
		Carbon steel			1															
		304 SST			2															

Note 1: Digital output (DE protocol) should be selected with upper/lowe direction of burn feature.  
 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.  
 3: Code L1 must be selected for Options 2.  
 4: This can not be combined with FOUNDATION™ Fieldbus.

**Model JTD920A / JTD930A / JTD960A - Regular service**

Basic model no.      Selections      Options 1      Options 2 (Options 2: Refer to page 17)

\_\_\_\_\_ - [ I | II | III | IV | V ] - [ VI | VII | VIII | IX | X ] - \_\_\_\_\_

Model	Pressure range / style	Service (Fill fluid)	Process connection
JTD920A	0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O)	Medium differential pressure	Regular service (Silicon oil) Rc1/2, 1/2NPT, Rc1/4, NPT1/4
JTD930A	35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )	High differential pressure	
JTD960A	0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	Super high differential pressure	

		Basic model no.	Selections	Options-1	
	Measuring span	0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O) 35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> ) 0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	JTD920A JTD930A JTD960A		
I	Output	4 to 20 mA (SFN protocol)	1		
		Digital output (DE protocol) *1 *2	3		
		Digital output (FOUNDATION Fieldbus protocol) *3	4		
		4 to 20 mA (HART protocol)	5		
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body	
		SCS14A	316 SST	316 SST	E
		SCS14A	316 SST	ASTM B575 *5	F
		*6 SCS14A	316 SST	Tantalum	H
		*6 SCS14A	316 SST	316L SST	K
		*6, *7, *8, *9 PVC	PVC	Tantalum	P
III	Fill fluid	Regular type (Silicon oil)	1		
IV	Process connection	Rc1/2, top connection		A	
		Rc1/2, bottom connection		B	
		1/2NPT internal thread, top connection		F	
		1/2NPT internal thread, bottom connection		G	
		Rc1/4, top connection		L	
		Rc1/4, bottom connection		M	
		1/4NPT internal thread, top connection		R	
		1/4NPT internal thread, bottom connection		S	
V	Bolt / nut	Carbon steel		1	
		304 SST		2	
		630 SST		3	
<b>Options 1</b>					
VI	Electrical connection / explosion-proof	G1/2, watertight		X	
		G1/2, TIIS Flameproof with 1 pc. of cable gland attached		2	
		G1/2, TIIS Flameproof with 2 pcs. of cable gland attached		3	
		G1/2, TIIS Intrinsically safe *4		K	
		G1/2, KOSHA Flameproof		P	
		1/2NPT, watertight		A	
VII	Built-in indicating smart meter	None		X	
		0 to 100% linear scales		1	
		Engineering unit scales		2	
VIII	Finish	Standard		X	
		Corrosion-resistant		A	
		Corrosion-proof		B	
		Corrosion-resistant (Silver coating)		D	
IX	Burnout feature	None		X	
		Upper limit of output at abnormal condition *1 *4		U	
		Lower limit of output at abnormal condition *1 *4		D	
X	Mounting bracket	None		X	
		Carbon steel		1	
		304 SST		2	

- Note 1: Digital output (DE protocol) should be selected with upper/lowe direction of burn feature.  
 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.  
 3: Code L1 must be selected for Options 2.  
 4: This can not be combined with FOUNDATION™ Fieldbus.  
 5 ASTM B575: Hastelloy C-276 equivalent.  
 6: The pitch is 82mm. To change the pitch to 54mm (standard pitch), should be selected adapter flange ("A1" of Options 2).  
 7: JTD960A is not available for cover material PVC.  
 8: When meterbody cover material is PVC, Option 2 should be selected "V" as bolt/nut 304 SST.  
 9: When meterbody cover material is PVC, manifold valve (model MVG) and/or Integral orifice (model KEE) can not be combined with.

**Model JTD921A / JTD931A / JTD961A - Regular service**

Basic model no.      Selections      Options 1      Options 2 (Options 2: Refer to page 17)

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I	II	III	IV	V
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VI	VII	VIII	IX	X
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Model	Pressure range / style	Service (Fill fluid)	Process connection
JTD921A	2.5 to 100 kPa (250 to 10160 mmH <sub>2</sub> O)	Regular service (Silicon oil)	Rc1/2, 1/2NPT, Rc1/4, NPT1/4
JTD931A	35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )		
JTD961A	0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )		

		Basic model no.	Selections	Options 1
Measuring span	0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O)	JTD921A		
	35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )	JTD931A		
	0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	JTD961A		
I Output	4 to 20 mA (SFN protocol)	1		
	Digital output (DE protocol) *1 *2	3		
	Digital output (FOUNDATION Fieldbus protocol) *3	4		
	4 to 20 mA (HART protocol)	5		
II Material	Meterbody cover	E		
	SCS14A			
III Fill fluid	Vent / drain plugs	1		
	316 SST			
IV Process connection	Wetted parts of center body			
	316 SST			
V Bolt / nut	Regular type (Silicon oil)			
	Rc1/2 *10	1		
	1/2NPT *10	2		
	Rc1/4 *10	3		
V Bolt / nut	1/4NPT *10	4		
	Carbon steel		1	
	304 SST		2	
V Bolt / nut	630 SST		3	
	<b>Options 1</b>			
VI Electrical connection / explosion-proof	G1/2, watertight			X
	G1/2, TIIS Flameproof with 1 pc. of cable gland attached			2
	G1/2, TIIS Flameproof with 2 pcs. of cable gland attached			3
	G1/2, TIIS Intrinsically safe *4			K
	G1/2, KOSHA Flameproof			P
	1/2NPT, watertight			A
VII Built-in indicating smart meter	None			X
	0 to 100% linear scales			1
	Engineering unit scales			2
VIII Finish	Standard			X
	Corrosion-resistant			A
	Corrosion-proof			B
	Corrosion-resistant (Silver coating)			D
IX Burnout feature	None			X
	Upper limit of output at abnormal condition *1 *4			U
	Lower limit of output at abnormal condition *1 *4			D
X Mounting bracket	None			X
	Carbon steel			1
	304 SST			2

- Note 1: Digital output (DE protocol) should be selected with upper/lowe direction of burn feature.
- 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.
- 3: Code L1 must be selected for Options 2.
- 4: This can not be combined with FOUNDATION™ Fieldbus.
- 10: Code P1 or P2 must be selected for Options 2.

**Model JTD910A - Oxygen service**

Basic model no.      Selections      Options 1      Options 2 (Options 2: Refer to page 17)  
 [ ] - [ I | II | III | IV | V ] - [ VI | VII | VIII | IX | X ] - [ ]

Model	Pressure range / style	Service (Fill fluid)	Process connection
JTD910A	0.1 to 2.0 kPa (10 to 200 mmH <sub>2</sub> O) Lowest differential pressure	Oxygen service (Fluorine oil)	Rc1/2, 1/2NPT, Rc1/4, NPT1/4

		Basic model no.	Selections	Options-1
	Measuring span	0.1 to 2.0 kPa (10 to 200 mmH <sub>2</sub> O) JTD910A		
I	Output	4 to 20 mA (SFN protocol)	1	
		Digital output (DE protocol) *1 *2	3	
		Digital output (FOUNDATION Fieldbus protocol) *3	4	
		4 to 20 mA (HART protocol)	5	
II	Material	Meterbody cover		
		SCS14A	E	
		Vent/drain plugs		
		Wetted parts of centerbody		
		316 SST		
		316 SST		
III	Fill fluid	For oxygen service (Fluorine oil)	2	
IV	Process connection	Rc1/2, top connection	A	
		Rc1/2, bottom connection	B	
		1/2NPT internal thread, top connection	F	
		1/2NPT internal thread, bottom connection	G	
		Rc1/4, top connection	L	
		Rc1/4, bottom connection	M	
		1/4NPT internal thread, top connection	R	
		1/4NPT internal thread, bottom connection	S	
V	Bolt / nut	304 SST	2	
<b>Options 1</b>				
VI	Electrical connection / explosion-proof	G1/2, watertight		X
		G1/2, THIS Flameproof with 1 pc. of cable gland attached		2
		G1/2, THIS Flameproof with 2 pcs. of cable gland attached		3
		G1/2, THIS Intrinsically safe *4		K
		G1/2, KOSHA Flameproof		P
		1/2NPT, watertight		A
VII	Built-in indicating smart meter	None		X
		0 to 100% linear scales		1
		Engineering unit scales		2
VIII	Finish	Standard		X
		Corrosion-resistant		A
		Corrosion-proof		B
		Corrosion-resistant (Silver coating)		D
IX	Burnout feature	None		X
		Upper limit of output at abnormal condition *1 *4		U
		Lower limit of output at abnormal condition *1*4		D
X	Mounting bracket	None		X
		Carbon steel		1
		304 SST		2

Note1: Digital output (DE protocol) should be selected with upper/lowe direction of burn feature.  
 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.  
 3: Code L1 must be selected for Options 2.  
 4: This can not be combined with FOUNDATION<sup>TM</sup> Fieldbus.

**Model JTD920A / JTD930A / JTD960A - Oxygen service**

Basic model no.      Selections      Options 1      Options 2 (Options 2: Refer to page 17)

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I	II	III	IV	V
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VI	VII	VIII	IX	X
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Model	Pressure range / style	Service (Fill fluid)	Process connection
JTD920A	0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O)	Medium differential pressure	Rc1/2, 1/2NPT, Rc1/4, NPT1/4
JTD930A	35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )	High differential pressure	
JTD960A	0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	Super high differential pressure	

		Basic model no.	Selections	Options-1	
Measuring span		0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O)	JTD920A		
		35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )	JTD930A		
		0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	JTD960A		
I Output	4 to 20 mA (SFN protocol)		1		
	Digital output (DE protocol) *1 *2		3		
	Digital output (FOUNDATION Fieldbus protocol) *3		4		
	4 to 20 mA (HART protocol)		5		
	Material	Meterbody cover	Vent/drain plugs	Wetted parts of centerbody	
*6		SCS14A	316 SST	316 SST	E
		SCS14A	316 SST	ASTM B575 *5	F
		SCS14A	316 SST	Tantalum	H
		SCS14A	316 SST	316L SST	K
	*6, *7, *8, *9	PVC	PVC	Tantalum	P
III Fill fluid	For oxygen service (Fluorine oil)			2	
IV Process connection	Rc1/2, top connection			A	
	Rc1/2, bottom connection			B	
	1/2NPT internal thread, top connection			F	
	1/2NPT internal thread, bottom connection			G	
	Rc1/4, top connection			L	
	Rc1/4, bottom connection			M	
	1/4NPT internal thread, top connection			R	
	1/4NPT internal thread, bottom connection			S	
	Δ Probe bottom connection			W	
V Bolt / nut	Carbon steel			1	
	304 SST			2	
	630 SST			3	
<b>Options 1</b>					
VI Electrical connection / explosion-proof	G1/2, watertight			X	
	G1/2, TIIS Flameproof with 1 pc. of cable gland attached			2	
	G1/2, TIIS Flameproof with 2 pcs. of cable gland attached			3	
	G1/2, TIIS Intrinsically safe *4			K	
	G1/2, KOSHA Flameproof			P	
	1/2NPT, watertight			A	
VII Built-in indicating smart meter	None			X	
	0 to 100% linear scales			1	
	Engineering unit scales			2	
VIII Finish	Standard			X	
	Corrosion-resistant			A	
	Corrosion-proof			B	
	Corrosion-resistant (Silver coating)			D	
IX Burnout feature	None			X	
	Upper limit of output at abnormal condition *1 *4			U	
	Lower limit of output at abnormal condition *1 *4			D	
X Mounting bracket	None			X	
	Carbon steel			1	
	304 SST			2	

- Note 1: Digital output (DE protocol) should be selected with upper/lowe direction of burn feature.  
 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.  
 3: Code L1 must be selected for Options 2.  
 4: This can not be combined with FOUNDATION™ Fieldbus.  
 5: ASTM B575: Hastelloy C-276 equivalent  
 6: The pitch is 82 mm. To change the pitch to 54 mm (standard pitch), should be selected adapter flange ("A1" of Option 2).  
 7: Model JTD960A is not available for meterbody cover material PVC.  
 8: When meterbody cover material is PVC, Option 2 should be selected "V" as bolt/nut 304 SST.  
 9: When meterbody cover material is PVC, manifold valve (model MVG) and/or integral orifice (model KEE) can not be combined with.

**Model JTD921A / JTD931A / JTD961A - Oxygen service**

Basic model no.      Selections      Options 1      Options 2 (Options 2: Refer to page 17)

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I	II	III	IV	V
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VI	VII	VIII	IX	X
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Model	Pressure range / style	Service (Fill fluid)	Process connection
JTD921A	2.5 to 100 kPa (250 to 10160 mmH <sub>2</sub> O)	Oxygen service (Fluorine oil)	Rc1/2, 1/2NPT, Rc1/4, NPT1/4
JTD931A	35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )		
JTD961A	0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )		

		Basic model no.	Selections	Options-1	
	Measuring span	0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O) 35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> ) 0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	JTD921A JTD931A JTD961A		
I	Output	4 to 20 mA (SFN protocol)	1		
		Digital output (DE protocol) *1 *2	3		
		Digital output (FOUNDATION Fieldbus protocol) *3	4		
		4 to 20 mA (HART protocol)	5		
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body	E
		SCS14	316 SST	316 SST	
III	Fill fluid	For oxygen service (Fluorine oil)			2
IV	Process connection	Rc1/2 *10			1
		1/2NPT *10			2
		Rc1/4 *10			3
		1/4NPT *10			4
V	Bolt / nut	Carbon steel			1
		304 SST			2
		630 SST			3
<b>Options 1</b>					-
VI	Electrical connection / explosion-proof	G1/2, watertight			X
		G1/2, TIIS Flameproof with 1 pc. of cable gland attached			2
		G1/2, TIIS Flameproof with 2 pcs. of cable gland attached			3
		G1/2, TIIS Intrinsically safe *4			K
		G1/2, KOSHA Flameproof			P
		1/2NPT, watertight			A
VII	Built-in indicating smart meter	None			X
		0 to 100% linear scales			1
		Engineering unit scales			2
VIII	Finish	Standard			X
		Corrosion-resistant			A
		Corrosion-proof			B
		Corrosion-resistant (Silver coating)			D
IX	Burnout feature	None			X
		Upper limit of output at abnormal condition *1 *4			U
		Lower limit of output at abnormal condition *1 *4			D
X	Mounting bracket	None			X
		Carbon steel			1
		304 SST			2

- Note1: Digital output (DE protocol) should be selected with upper/lowe direction of burn feature.  
 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.  
 3: Code L1 must be selected for Options 2.  
 4: This can not be combined with FOUNDATION<sup>TM</sup> Fieldbus.  
 10: Code P1 or P2 must be selected for Options 2.

**Model JTD920A / JTD930A / JTD960A - Chlorine service**

Basic model no.      Selections      Options 1      Options 2 (Options 2: Refer to page 17)

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I	II	III	IV	V
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VI	VII	VIII	IX	X
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Model	Pressure range / style	Service (Fill fluid)	Process connection
JTD920A	0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O)	Medium differential pressure	Rc1/2, 1/2NPT, Rc1/4, NPT1/4
JTD930A	35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )	High differential pressure	
JTD960A	0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	Super high differential pressure	

	Basic model no.	Selections	Options 1
Measuring span	0.75 to 100 kPa (75 to 10160 mmH <sub>2</sub> O)	JTD920A	
	35 to 700 kPa (0.35 to 7 kgf/cm <sup>2</sup> )	JTD930A	
	0.25 to 14 MPa (2.5 to 140 kgf/cm <sup>2</sup> )	JTD960A	

I	Output	4 to 20 mA (SFN protocol)	1					
		Digital output (DE protocol) *1 *2	3					
		Digital output (FOUNDATION Fieldbus protocol) *3	4					
		4 to 20 mA (HART protocol)	5					
II	Material	Meterbody cover	Vent/drain plugs	Wetted parts of centerbody				
		*6 SCS14A	316 SST	Tantalum	H			
		*6, 7, 8, 9 PVC *3	PVC	Tantalum	P			
III	Fill fluid	For chlorine service (Fluorine oil)			5			
IV	Process connection	Rc1/2, top connection			A			
		Rc1/2, bottom connection			B			
		1/2NPT internal thread, top connection			F			
		1/2NPT internal thread, bottom connection			G			
		Rc1/4, top connection			L			
		Rc1/4, bottom connection			M			
		1/4NPT internal thread, top connection			R			
		1/4NPT internal thread, bottom connection			S			
		Δ Probe bottom connection			W			
V	Bolt / nut	Carbon steel			1			
		304 SST			2			
		630 SST			3			

**Options 1**

VI	Electrical connection / explosion-proof	G1/2, watertight		X	
		G1/2, TIS Flameproof with 1 pc. of cable gland attached		2	
		G1/2, TIS Flameproof with 2 pcs. of cable gland attached		3	
		G1/2, TIS Intrinsically safe *4		K	
		G1/2, KOSHA Flameproof		P	
		1/2NPT, watertight		A	
VII	Built-in indicating smart meter	None		X	
		0 to 100% linear scales		1	
		Engineering unit scales		2	
VIII	Finish	Standard			X
		Corrosion-resistant			A
		Corrosion-proof			B
		Corrosion-resistant (Silver coating)			D
IX	Burnout feature	None			X
		Upper limit of output at abnormal condition *1 *4			U
		Lower limit of output at abnormal condition *1 *4			D
X	Mounting bracket	None			X
		Carbon steel			1
		304 SST			2

- Note1: Digital output (DE protocol) should be selected with upper/lower direction of burn feature.  
 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.  
 3: Code L1 must be selected for Options 2.  
 4: This can not be combined with FOUNDATION<sup>TM</sup> Fieldbus.  
 6: The pitch is 82 mm. To change the pitch to 54 mm (standard pitch), should be selected adapter flange ("A1" of Option 2).  
 7: Model JTD960A is not available for meterbody cover material PVC.  
 8: When meterbody cover material is PVC, Option 2 should be selected "V" as bolt/nut 304 SST.  
 9: When meterbody cover material is PVC, manifold valve (model MVG) and/or integral orifice (model KEE) can not be combined with.

## Options 2

XX	No options
A1	Adapter flange for corrosion-resistant application (316L SST or Tantalum for the wetted parts of centerbody)
A2	External Zero adjustment *2 *4
A4	Lightning arrestor *4
A5	Long vent/drain plugs
B7	For mounting a high load resistance smart meter *4 *11
C1	Color: Red (Munsell 5R4/13)
C2	Color: Yellow (Munsell 2.5Y8/16))
C3	Color: Blue (Munsell 7.5BG7/2)
C7	Process connection; reverse
D1	Water free finish (including oil free finish)
E6	Water free finish (including oil free finish) High Grade
D2	Oil free finish *12
G1	One elbow (left)
G2	One elbow (right)
G3	2 elbows
J8	Special burn-out feature (3.2 mA) *4 *13
K9	Output saturation point changeable
L1	Fieldbus communication stack BASIC class
P1	Process connection: Top
P2	Process connection: Bottom
T1	Test report
T2	Material certificate *14
T5	Strength calculation sheet *15
T6	Withstand pressure and Airtight test *16
T8	Traceability certificate
U2	Non-SI unit conformance

Note 2: Digital output (DE protocol) can not be combined with an External zero adjustment function.

4: This can not be combined with FOUNDATION<sup>TM</sup> Fieldbus.

11: This can not be combined with TIIS intrinsically safe, code K in Options 1.

12: When the fill fluid is for oxygen or chlorine service, there is no need to select.

13: "Lower limit of output at abnormal condition" - code D must be selected for Options 1 "V", Burnout feature.

14: Available only for material of wetted part.

15: Specify design pressure and design temperature.

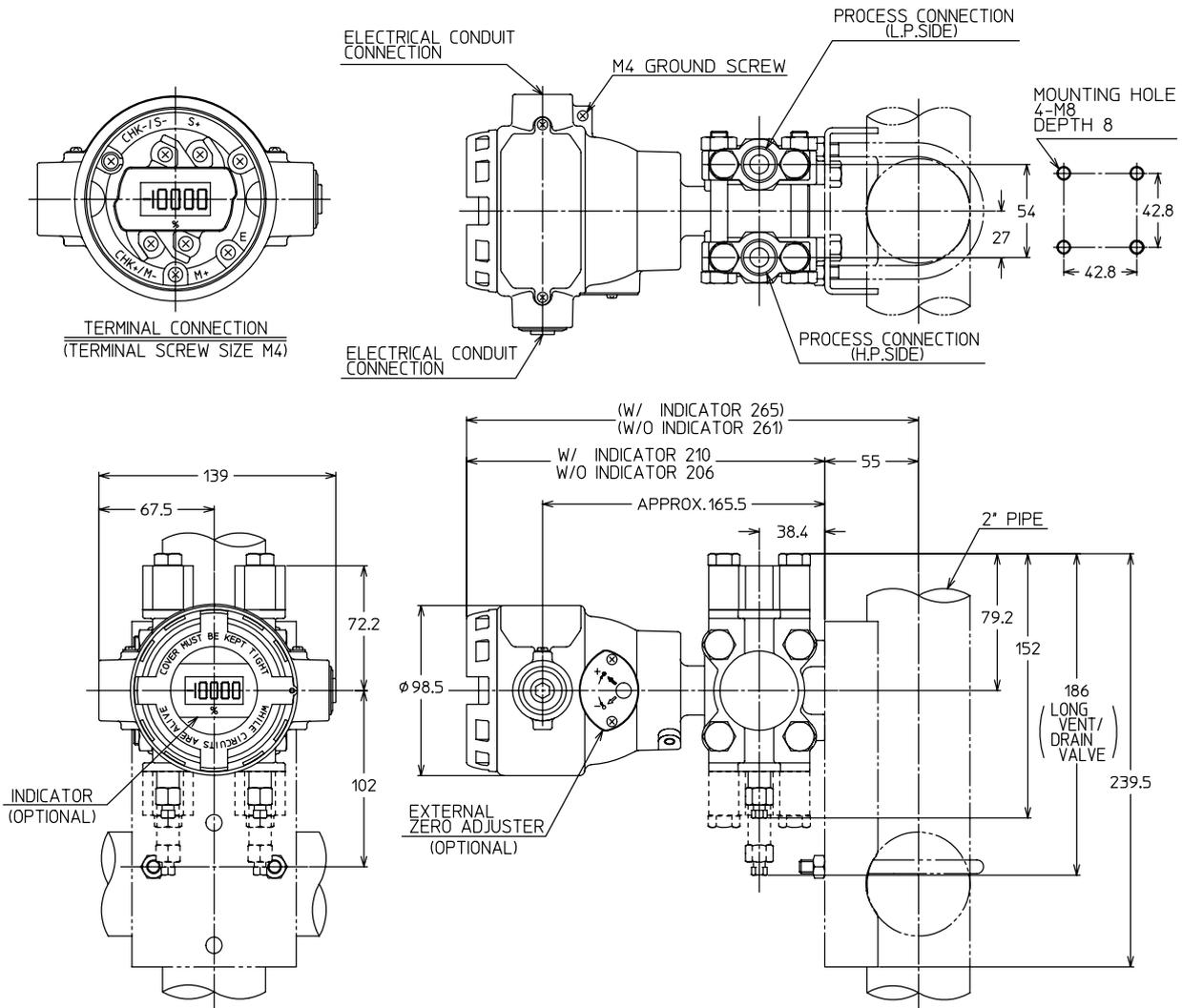
16: Specify required test pressures (up to the max. working pressure).

**DIMENSIONS**

[Unit: mm]

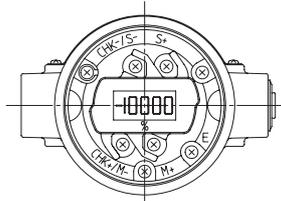
**Model JTD910A /JTD920A /JTD930A (316 SST, ASTM B575 (Hastelloy C-276 equivalent))**

**Model JTD960A (316 SST)**



Model JTD921A / JTD931A / JTD961A

[Unit: mm]



TERMINAL CONNECTIONS  
(TERMINAL SCREW SIZE :M4)  
SEE TABLE 1

ELECTRICAL CONDUIT CONNECTION  
SEE SPEC. LIST

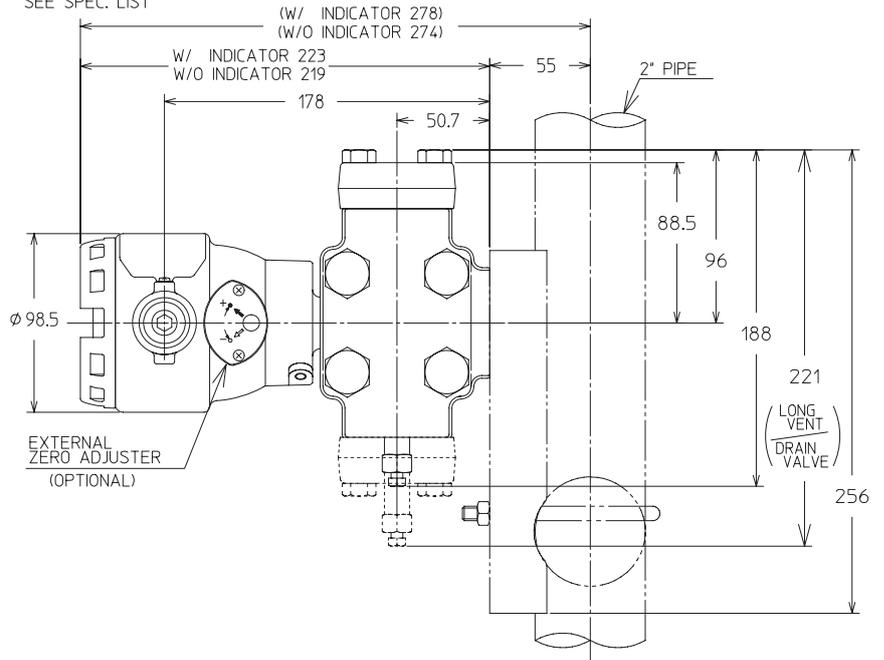
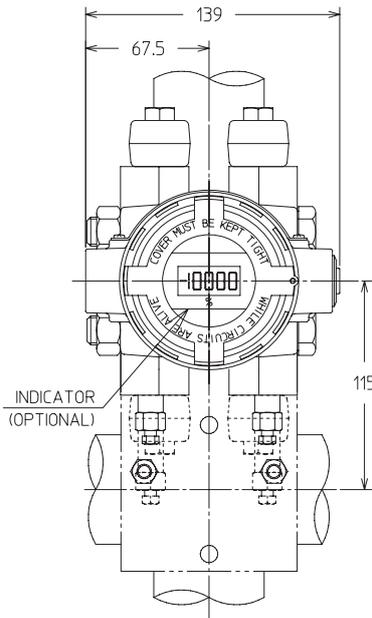
M4 GROUND SCREW

PROCESS CONNECTION (L.P.SIDE)  
SEE SPEC. LIST

MOUNTING HOLE  
4xM8  
DEPTH 8

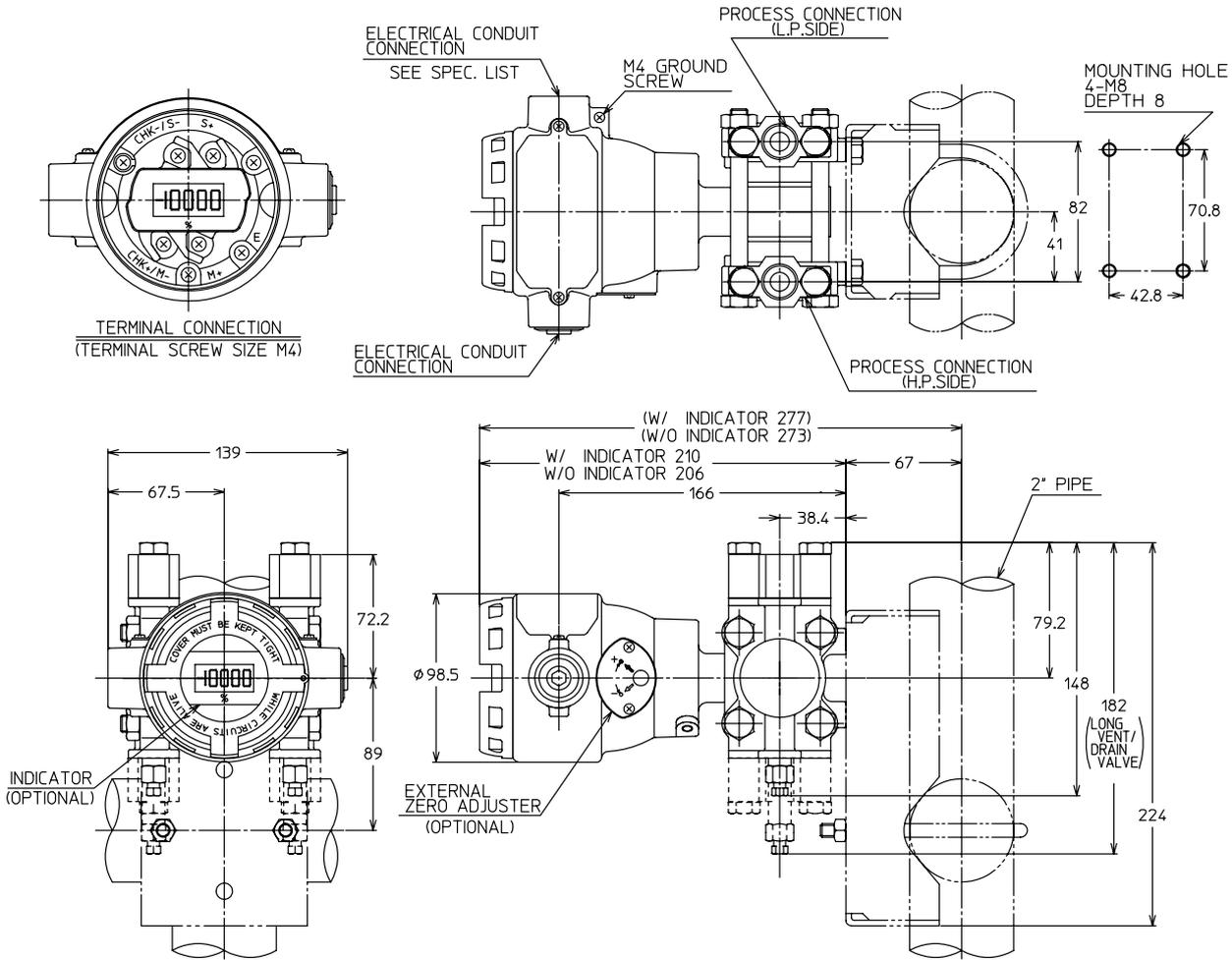
ELECTRICAL CONDUIT CONNECTION  
SEE SPEC. LIST

PROCESS CONNECTION (H.P.SIDE)  
SEE SPEC. LIST

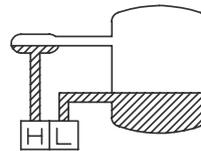


**Model JTD920A/930A (Tantalum, 316L SST)**

**Model JTD960A (ASTM B575 (Hastelloy C-276 equivalent), Tantalum, 316L SST)** [Unit mm]



Note) The suppression > adjustment Span/2  
 A high pressure and a low pressure side of the process piping connection become it contrary to figure.  
 Please follow the figure, if measuring the level with liquid seal.



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