

AT9000 Advanced Transmitter SuperAce JTD Series Differential Pressure Transmitter

JTD9□□S/W Models

Overview

The AT9000 Advanced Transmitter is a smart transmitter which features a built-in microprocessor and outstanding stability. It is capable of measuring the flow rate, pressure, liquid level, etc., of gases, liquids, and vapors, outputting a 4 to 20 mA DC analog signal corresponding to the measured differential pressure.



Features

- (1) Outstanding long-term stability
 - Achieves an extremely high level of stability: zero point drift of $\pm 0.1\%$ in 10 years.
- (2) Fast response
 - Response speed: 100 ms or less achieved. Can be utilized in applications that require fast response.
- (3) Outstanding usability
 - Zero adjustment can be performed without removing the cover.
- (4) A wide variety of functions
 - Using a communicator, historical information regarding excessive pressure, abnormal temperature, etc., can be checked.

Product Usage Precautions

- This product is intended for the general industrial market.
- This product is not subject to the regulations pursuant to the Chinese electronic information product pollution control laws. However, if the product is used with semiconductor manufacturing equipment, special-purpose equipment for electronic devices, etc., it may in some cases be necessary to include documents and to mark the product in accordance with Chinese electronic information product pollution control laws. If necessary, please indicate this in advance to our sales department.

Specifications

Measuring span/setting range/working pressure range:
See Table 1.

Output signal:

Analog output: 4 to 20 mA DC

Communication method: SFN, HART®

HART® Version: 5

Supply voltage/load resistance:

12.5 to 45 V DC: For communication with a communicator,
load resistance of at least 250 Ω is required
between loops. Regarding supply voltage
and load resistance, see Figure 1.

Sealed liquid:

Silicone oil (for regular use), fluorine oil (for oxygen or chlorine use)

Waterproof / dustproof structure: IP66/IP67

Ambient temperature range:

JTD910□

- Normal operating range:

For general-purpose use: -15 to +65 °C

For oxygen use: -10 to +65 °C

- Operative limit range:

For general-purpose or oxygen use: -40 to +70 °C

- TIIS special explosion-proof model:

-20 to +60 °C (without indicators)

-20 to +55 °C (with indicators)

JTD920□/930□/960□

- Normal operating range:

For general-purpose use: -40 to +85 °C

For general-purpose use (with indicators): -25 to +80 °C

For oxygen or chlorine use: -10 to +75 °C

- Operative limit range:

For general-purpose use: -50 to +93 °C

For general-purpose use (with indicators): -30 to +85 °C

For oxygen or chlorine use: -40 to +80 °C

For oxygen or chlorine use (with indicators): -30 to +80 °C

- TIIS special explosion-proof model:

-20 to +60 °C (without indicators)

-20 to +55 °C (with indicators)

JTD921□/931□/961□

- Normal operating range:

For general-purpose use: -15 to +85 °C

For general-purpose use (with indicators): -15 to +80 °C

For oxygen or chlorine use: -10 to +75 °C

- Operative limit range:

For general-purpose use: -25 to +93 °C

For general-purpose use (with indicators): -25 to +85 °C

For oxygen or chlorine use: -25 to +80 °C

- TIIS special explosion-proof model:

-20 to +60 °C (without indicators)

-20 to +55 °C (with indicators)

Wetted part temperature range:

JTD910□

- Normal operating range:

For general-purpose or oxygen use: -15 to +65 °C

- Operative limit range:

For general-purpose or oxygen use: -40 to +70 °C

JTD920□/930□/960□

- Normal operating range:

For general-purpose use: -40 to +110 °C

For oxygen or chlorine use: -20 to +75 °C

- Operative limit range:

For general-purpose use: -50 to +115 °C

For oxygen or chlorine use: -40 to +80 °C

- TIIS special explosion-proof model: -20 to +110 °C

JTD921□/931□/961□

- Normal operating range:

For general-purpose use: -15 to +110 °C

For oxygen or chlorine use: -15 to +75 °C

- Operative limit range:

For general-purpose use: -20 to +115 °C

For oxygen or chlorine use: -20 to +80 °C

- TIIS special explosion-proof model: -20 to +110 °C

Transport and storage temperature range:

JTD910□: -15 to +65 °C

JTD920□/930□/960□: -25 to +80 °C

Meter body cover material PVC: -10 to +60 °C

JTD921□/931□/961□: -15 to +80 °C

Ambient humidity limits: 5 to 100 % RH

Supply voltage/voltage characteristics: ±0.005 % FS/V

Table 1. Measuring Span/Setting Range/Working Pressure Range (for negative pressure in the working pressure range, see Figures 2, 3, 4, and 5)

Model No.	Measuring Span	Setting Range	Working Pressure Range
JTD910□	0.1 to 2 kPa	-1 to +1 kPa	-70 to +210 kPa
JTD920□	0.5 to 100 kPa	-100 to +100 kPa	2.0 kPa abs to 14 MPa (Notes 1, 2, 5)
JTD921□			2.0 kPa abs to 42 MPa (Note 3)
JTD930□	35 to 700 kPa	-100 to +700 kPa	2.0 kPa abs to 14 MPa (Notes 1, 2, 5)
JTD931□			2.0 kPa abs to 42 MPa (Note 3)
JTD960□	0.25 to 14 MPa	-0.1 to +14 MPa	2.0 kPa abs to 14 MPa (Note 2)
JTD961□			2.0 kPa abs to 42 MPa (Note 3)

Note 1: If meter body cover material is PVC (polyvinyl chloride), maximum working pressure is 1.5 MPa

Note 2: If bolt and nut material is SUS304, maximum working pressure is 10 MPa

Note 3: If bolt and nut material is SUS304, maximum working pressure is 20 MPa

Note 4: JTD910□ is extremely sensitive, so during installation be careful of its mounting orientation, and be careful not to subject it to direct wind, radiant heat, etc.

Note 5: When model number options S1 and T3 are selected, design strength on the strength calculation sheet will be up to 10 MPa.

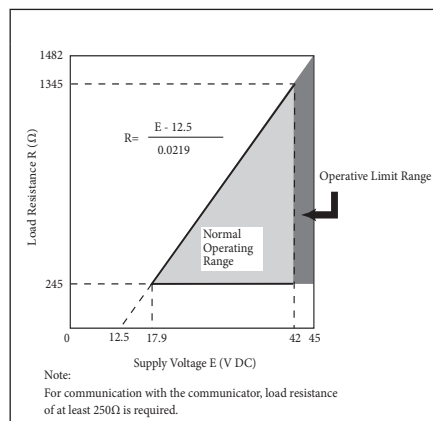


Figure 1. Supply Voltage and Load Resistance Characteristics

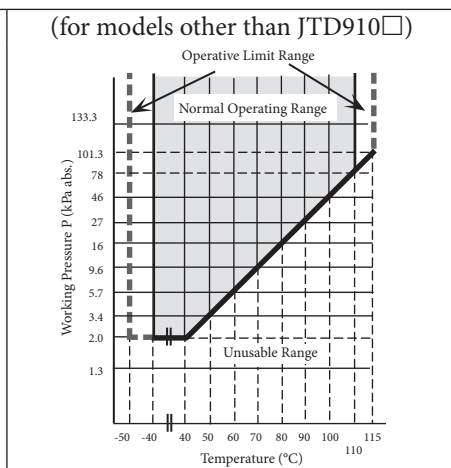


Figure 2. Wetted Parts Working Pressure and Temperature (General Purpose)

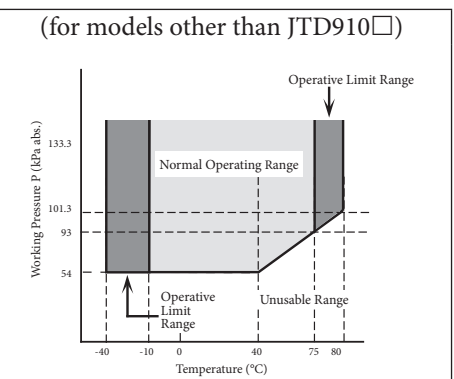


Figure 3. Wetted Parts Working Pressure and Temperature (for Oxygen/Chlorine)

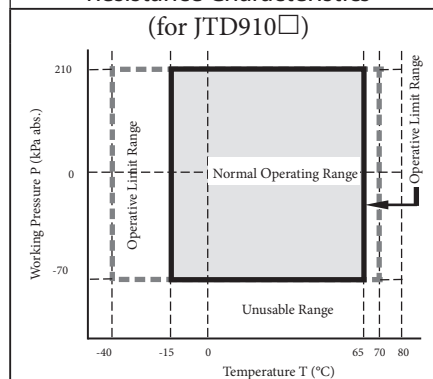


Figure 4. Wetted Parts Working Pressure and Temperature (General Purpose)

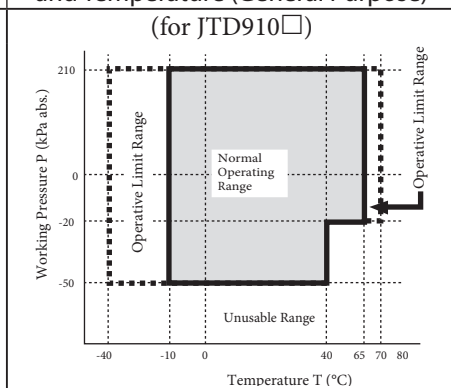


Figure 5. Wetted Parts Working Pressure and Temperature (for Oxygen/Chlorine)

EMC regulation compliance:

EN 61326-1:2013

IEC 61326-2-3

Lightning protection characteristics

(surge immunity test, IEC 61000-4-5)

Line-to-line (S+, S-): ±1 kV

Line-to-ground (S+, S-): ±2 kV

Waveform: 1.2/50 (8/20) μs

Response time:

100 ms or less

(JTD920□ models, ambient temperature 23±2 °C)

150 ms or less

(JTD920□ models, ambient temperature 23±2 °C)

Long-term stability (zero point):

±0.1 %/10 years (JTD920□/921□/930□/931□ models)

±0.2 %/10 years (JTD960□/961□ models)

±1.0 × $\frac{1}{X}$ %/10 years (JTD910□ models)

Drift under standard operating conditions
(23 ± 2 °C, atmospheric pressure)

Damping time constant:

Settable to 10 levels in range 0 to 32 s

(HART® communication protocol can be set in range 0 to 128 s)

Output saturation point:

High limit: 21.6 mA

Low limit: 3.6 mA

Vibration characteristics:

Amplitude: 1.5 mm / Frequency: 5 to 9 Hz

Acceleration: 4.9 m/s² (0.5 G) / 9 to 200 Hz

Shock characteristics: Acceleration 9.8 m/s² (1 G)

Process pipe connection:

Rc 1/2 internal thread, Rc 1/4 internal thread,
1/2 NPT internal thread, 1/4 NPT internal thread

Electrical conduit connection:

G 1/2 internal thread, 1/2 NPT internal thread,
M20 internal thread

Body material

Main unit: SUS316

Transmitter case: Aluminum alloy

Process wetted material:

Meter body cover: SCS14A (SUS316 equivalent) or
SUSF316, PVC

Adapter flange (optional): SCS14A (SUS316 equivalent),
PVC

Wetted part of main unit: SUS316 (diaphragm-only
SUS316L), alloy C-276,
tantalum, SUS316L

Vents and plugs: SUS316, PVC

Gaskets for wetted part: FEP

Bolt and nut material (for meter body cover fastening):

carbon steel (SNB7), SUS304, SUS630

Mounting bracket material:

Bracket: Carbon steel, SUS304, SF8 (SUS304 equivalent)

Bolts and nuts: SUS304

Finish:

Standard corrosion prevention: Baked acrylic resin coating

Corrosion-proof finish: Urethane baked finish

Standard color: Case cover: Azbil Bold 2.5R 2.25/5

Case: Silver N-8.2

Silver: Case cover: Silver N-8.2

Case: Silver N-8.2

Built-in indicators:

Digital LCD indicators (optional)

Engineering unit scale display compatible

Can be set to a value in the range -19999 to +19999 (4.5 digits).

Specify the following when issuing engineering unit scale commands.

- Meter calibration range

- Engineering unit scale

- Proportional or square root display

All data setting operations are performed from the communicator.

Failure mode: The following can be selected

Upscale: 21.6 mA (110 %) or higher

Downscale: 3.6 mA (-2.5 %) or lower

Grounding: D class grounding

(grounding resistance: lower than 100-ohms)

Installation: Mount to horizontal to vertical 2-inch pipe

(direct attachment to process pipe also possible)

Mass: Approx. 3.4 kg (for JTD910S)

Approx. 3.7 kg (for JTD920S/930S/960S)

Approx. 6.3 kg (for JTD921S/931S/961S)

for JTD9□□W, +1.0kg

Explosion-proof Structure

TIIS special explosion-proof model (Ex d IIC T4)

Note:

Use cables with the maximum allowable temperature shown below.

S specification: 65 °C (with indicators)

70 °C (without indicators)

W specification: 60 °C (with indicators)

65 °C (without indicators)

Options

Adapters for anticorrosion material:

Adapter flange to adapt the installation dimension of the general purpose lead pipe (54 mm) to the installation dimension of the anticorrosion material lead pipe (82 mm).

External zero adjustment function:

On-site zero adjustment of the transmitter can be performed using the included magnetic bar.

Note: Be sure to use this in conjunction with the indicators.

Long vent drain:

Maintenance, process conditions, and safety are addressed by using a drain whose length (60 mm) is longer than the standard length (27 mm).

Elbow:

An adapter for changing the orientation of the electrical conduit connection port from the horizontal direction to the vertical direction in order to fit the on-site wiring conditions. Either one or two can be selected as necessary.

Moisture-free finish (including oil-free finish):

Shipped with water content and oil content removed from the wetted part. (A small amount of fluorine oil is applied to vent/drain plugs in order to prevent sticking.)

High-grade moisture-free (incl. oil-free finish):

Shipped with water content and oil content removed from the wetted part (including the vent/drain plugs).

High performance type:

Has improved accuracy and ambient temperature performance.

Oil-free finish:

Shipped with oil content removed from the wetted part.

(A small amount of fluorine oil is applied to vent/drain plugs in order to prevent sticking.)

Electric power specification:

Applicable in cases in which particularly strict quality control is required, as in the electric power and gas industries.

Stability tests under high static pressure, confirmation tests of differential pressure gauge input output characteristics under high-speed static pressure variation, and the like are performed.

Special failure mode (3.2 mA):

Burnout output values (low limit) during abnormal conditions will be 3.2 mA (-5 %) or lower.

Variable output saturation point:

The output saturation point can be set within the following range:

12 mA (50 %) ≤ output high limit ≤ 21.6 mA (110 %)

3.6 mA (-2.5 %) ≤ output low limit ≤ 12 mA (50 %)

Notes: Regarding the HART® communication protocol

1. Option J8: When "Special burnout 3.2 mA" is selected:
3.2 mA (-5 %) ≤ output low limit < 12 mA (50 %)

2. Option J8: When "Special burnout 3.2 mA" is not selected:
3.8 mA (-1.25 %) ≤ output low limit < 12 mA (50 %).

Test report:

Shows the results of having tested the appearance, input output characteristics, insulation resistance, dielectric strength, etc., of the transmitter.

Mill sheet:

Shows data related to the chemical composition, heat treatment condition, and mechanical properties of the wetted part material.

Strength calculation sheet:

Shows the results of having calculated the strength of the meter body cover, flanges, and bolts.

Withstand pressure and air tight test (general-purpose use):

Shows the results of the wetted part withstand pressure test (water pressure: 10 minutes) and air tight test (N₂: 10 minutes).

Test report (with traceability certificate):

Comprised of three documents: a traceability diagram, a calibration certificate, and a test report.

Product Usage Precautions

Bear in mind the following points when using the product in order to take full advantage of its capabilities. Also be sure to read the operating instructions for the product before use.

Installation Precautions

Warning

- When installing the product, make sure that the gaskets do not stick out at the connections with the process (connections between adapter flanges and connecting pipes and flanges). There is a danger that the measured fluid will leak out and cause scalding and other harmful health effects. If the measured fluid is harmful to the human body, take safety measures such as wearing goggles or a mask so that it does not contact the skin or the eyes, become inhaled, etc.
- Use this product within the limits of the described usage conditions (explosion proofing, pressure rating, temperature, humidity, voltage, vibration, shock, installation orientation, ambient atmosphere, and the like). There is a danger of scalding and other harmful health effects as a result of instrument failure, fire, etc.
- When working in a hazardous area, perform installation and deployment according to the construction methods prescribed by the hazard guidelines.
- In addition, with the TIIS flameproof model, for flameproof packing cable wiring system, be sure to use flameproof cable glands certified by this company.

Caution

- After installing this product, do not use it as a scaffold, place your body weight on it, etc. Doing so may cause damage to the product.
- Be careful not to strike the glass portion of the display with tools, etc. The glass can become damaged, and injuries can occur.
- As this product is extremely heavy, when installing it exercise care regarding scaffolding, and be sure to wear safety shoes.
- This product is a precision instrument. Be sure to avoid subjecting it to shock. Shock may damage the product.

Wiring Precautions

Warning

- Do not perform wiring work, turn on the electricity, etc., when your hands are wet. There is a risk of electric shock.

Caution

- Be sure to thoroughly check the specifications to ensure that the wiring is carried out correctly. Incorrect wiring can cause instrument damage or malfunctions.
- Supply power correctly based on the specifications. Inputting an incorrect power supply can damage the instrument.
- Use a power supply for this product which has overcurrent protection capability.

Usage Precautions for HART® Devices

- If operation using a secondary host (HART® Communicator, etc.) is necessary, set the communication interval of the primary host (distributed control system, device management system, etc.) to 8 seconds or longer, or terminate communication from the primary host before using the secondary host. If the primary host repeats HART® communication before 8 seconds have elapsed, the secondary host may not receive the request (i.e., may not be able to communicate).
- If, as a result of the effects of electrical noise in the installation environment, HART® communication with the host is not possible, take countermeasures such as distancing the signal cable from the noise sources, re-evaluating the grounding conditions, and changing the signal cable to a shielded cable. However, even if HART® communication is not possible due to noise, control by the 4 to 20 mA analog signal will not be affected.
- When using this product in multidrop mode, there is a limit to the number of units which can be used. If using multidrop, please consult our representative for more details.

Performance Specifications

The performance specifications (accuracy/temperature characteristics/static pressure characteristics) show the absolute values of the lower range value (LRV)*1 and upper range value (URV)*2 of the calibration range, as well as the maximum value χ in the span. The value relative to the span is as follows.

(Span-related value) = (χ -related value) $\times$ (χ) / (span)

JTD910□ (Wetted Part Material: SUS316)

Accuracy	Linear output:	$\pm(0.15 + 0.15 \times \frac{1.0}{\chi})$ %	(χ : kPa)
	Square-root output:	When output is 50 to 100 %: same as linear output When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)	
Temperature characteristics (shift from set range) 30 °C change	Combined shift: (incl. zero/span shift)	$\pm(0.19 + 0.56 \times \frac{1.0}{\chi})$ %	(χ : kPa)
Static pressure characteristics (shift from set range) 70 kPa change	Zero shift:	$\pm(0.03 + 0.4 \times \frac{1.0}{\chi})$ %	(χ : kPa)
	Combined shift: (incl. zero/span shift)	$\pm(0.03 + 0.45 \times \frac{1.0}{\chi})$ %	(χ : kPa)

JTD920□ (Wetted Part Material: SUS316)

Accuracy *3	Linear output:	± 0.1 % ($\chi \geq 5$ kPa) $\pm(0.025 + 0.075 \times \frac{5.0}{\chi})$ % ($\chi < 5$ kPa)	
	Square-root output:	When output is 50 to 100 %: same as linear output When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)	
Temperature characteristics (shift from set range) *3 30 °C change	Combined shift: (incl. zero/span shift)	± 0.44 % ($\chi \geq 12.5$ kPa) $\pm(0.19 + 0.25 \times \frac{12.5}{\chi})$ % ($\chi < 12.5$ kPa)	
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 + 0.17 \times \frac{20.0}{\chi})$ %	(χ : kPa)
	Combined shift: (incl. zero/span shift)	± 0.4 % ($\chi \geq 20.0$ kPa) $\pm(0.03 + 0.37 \times \frac{20.0}{\chi})$ % ($\chi < 20.0$ kPa)	

JTD920□ (Option J1, Wetted Part Material: SUS316)

	Linear output:	± 0.04 % ($\chi \geq 10$ kPa) $\pm(0.008 + 0.032 \times \frac{10}{\chi})$ % ($\chi < 10$ kPa)	
	Square-root output:	When output is 50 to 100 %: same as linear output When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)	
Temperature characteristics (shift from set range) *3 30 °C change	Combined shift: (incl. zero/span shift)	± 0.15 % ($\chi \geq 12.5$ kPa) $\pm(0.075 + 0.075 \times \frac{12.5}{\chi})$ % ($\chi < 12.5$ kPa)	
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 \times \frac{12.5}{\chi})$ %	(χ : kPa)
	Combined shift: (incl. zero/span shift)	$\pm(0.03 + 0.37 \times \frac{12.5}{\chi})$ %	(χ : kPa)

Notes: *1: URV is the measured value when 100 % (20 mA DC) is output

*2: LRV is the measured value when 0 % (4 mA DC) is output

*3: Range is $\text{URV} \geq 0$, $\text{LRV} \geq 0$

JTD920□ (Wetted Part Material: Alloy C-276, Tantalum, SUS316L)

Accuracy *3	Linear output:	$\pm 0.15\%$ ($\chi \geq 5$ kPa) $\pm(0.075 + 0.075 \times \frac{5}{\chi})\%$ ($\chi < 5$ kPa)
	Square-root output:	When output is 50 to 100 %: same as linear output $\frac{50}{\text{Output \%}}$ When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)
Temperature characteristics (shift from set range) *3 30 °C change (-5 to +55 °C range)	Combined shift: (incl. zero/span shift)	$\pm(0.55 + 0.65 \times \frac{20.0}{\chi})\%$ (χ : kPa)
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 + 0.62 \times \frac{20.0}{\chi})\%$ (χ : kPa)
	Combined shift: (incl. zero/span shift)	$\pm(0.55 + 0.45 \times \frac{20.0}{\chi})\%$ ($\chi \geq 20.0$ kPa) $\pm(0.18 + 0.82 \times \frac{20.0}{\chi})\%$ ($\chi < 20.0$ kPa)

JTD921□ (Wetted Part Material: SUS316)

Accuracy *3	Linear output:	$\pm 0.1\%$ ($\chi \geq 5.0$ kPa) $\pm(0.025 + 0.075 \times \frac{5.0}{\chi})\%$ ($\chi < 5.0$ kPa)
	Square-root output:	When output is 50 to 100 %: same as linear output $\frac{50}{\text{Output \%}}$ When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)
Temperature characteristics (shift from set range) *3 30 °C change	Combined shift: (incl. zero/span shift)	$\pm 0.41\%$ ($\chi \geq 12.5$ kPa) $\pm(0.18 + 0.23 \times \frac{12.5}{\chi})\%$ ($\chi < 12.5$ kPa)
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 + 0.17 \times \frac{20.0}{\chi})\%$ (χ : kPa)
	Combined shift: (incl. zero/span shift)	$\pm 0.4\%$ ($\chi \geq 20.0$ kPa) $\pm(0.03 + 0.37 \times \frac{20.0}{\chi})\%$ ($\chi < 20.0$ kPa)

JTD930□/931□ (Wetted Part Material: SUS316)

Accuracy *3	Linear output:	$\pm 0.1\%$ ($\chi \geq 140$ kPa) $\pm(0.025 + 0.075 \times \frac{140}{\chi})\%$ ($\chi < 140$ kPa)
	Square-root output:	When output is 50 to 100 %: same as linear output $\frac{50}{\text{Output \%}}$ When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)
Temperature characteristics (shift from set range) *3 30 °C change	Combined shift: (incl. zero/span shift)	$\pm 0.41\%$ ($\chi \geq 210$ kPa) $\pm(0.18 + 0.23 \times \frac{210}{\chi})\%$ ($\chi < 210$ kPa)
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 + 0.17 \times \frac{700}{\chi})\%$ (χ : kPa)
	Combined shift: (incl. zero/span shift)	$\pm(0.03 + 0.37 \times \frac{700}{\chi})\%$ (χ : kPa)

Notes: *1: URV is the measured value when 100 % (20 mA DC) is output

*2: LRV is the measured value when 0 % (4 mA DC) is output

*3: Range is URV ≥ 0 , LRV ≥ 0

JTD930□ (Wetted Part Material: Alloy C-276, Tantalum, SUS316L)

Accuracy *3	Linear output:	$\pm 0.15 \%$ ($\chi \geq 140 \text{ kPa}$) $\pm(0.075 + 0.075 \times \frac{140}{\chi}) \%$ ($\chi < 140 \text{ kPa}$)
	Square-root output:	When output is 50 to 100 %: same as linear output When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)
Temperature characteristics (shift from set range) *3 30 °C change (-5 to +55 °C range)	Combined shift: (incl. zero/span shift)	$\pm 1.2 \%$ ($\chi \geq 210 \text{ kPa}$) $\pm(0.55 + 0.65 \times \frac{210}{\chi}) \%$ ($\chi < 210 \text{ kPa}$)
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 + 0.295 \times \frac{700}{\chi}) \%$ (χ : kPa)
	Combined shift: (incl. zero/span shift)	$\pm(0.08 + 0.495 \times \frac{700}{\chi}) \%$ (χ : kPa)

JTD960□/961□ (Wetted Part Material: SUS316)

Accuracy *3	Linear output:	$\pm 0.1 \%$ ($\chi \geq 3.5 \text{ MPa}$) $\pm(0.05 + 0.05 \times \frac{3.5}{\chi}) \%$ ($\chi < 3.5 \text{ MPa}$)
	Square-root output:	When output is 50 to 100 %: same as linear output When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1 %: dropout (undefined)
Temperature characteristics (shift from set range) *3 30 °C change	Combined shift: (incl. zero/span shift)	$\pm 0.41 \%$ ($\chi \geq 3.5 \text{ MPa}$) $\pm(0.18 + 0.23 \times \frac{3.5}{\chi}) \%$ ($\chi < 3.5 \text{ MPa}$)
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 + 0.17 \times \frac{7}{\chi}) \%$ (χ : kPa)
	Combined shift: (incl. zero/span shift)	$\pm 0.4 \%$ ($\chi \geq 7 \text{ MPa}$) $\pm(0.03 + 0.37 \times \frac{7}{\chi}) \%$ ($\chi < 7 \text{ MPa}$)

JTD960□/961□ (Wetted Part Material: Alloy C-276, Tantalum, SUS316L)

Accuracy *3	Linear output:	$\pm 0.15 \%$ ($\chi \geq 3.5 \text{ MPa}$) $\pm(0.075 + 0.075 \times \frac{3.5}{\chi}) \%$ ($\chi < 3.5 \text{ MPa}$)
	Square-root output:	When output is 50 to 100 %: same as linear output When output is 7.1 to 50 %: linear output value $\times \frac{50}{\text{Output \%}}$ When output is less than 7.1%: dropout (undefined)
Temperature characteristics (shift from set range) *3 30 °C change (-5 to 55 °C range)	Combined shift: (incl. zero/span shift)	$\pm 1.2 \%$ ($\chi \geq 3.5 \text{ MPa}$) $\pm(0.55 + 0.65 \times \frac{3.5}{\chi}) \%$ ($\chi < 3.5 \text{ MPa}$)
Static pressure characteristics (shift from set range) *3 7 MPa change	Zero shift:	$\pm(0.03 + 0.295 \times \frac{7}{\chi}) \%$ (χ : MPa)
	Combined shift: (incl. zero/span shift)	$\pm(0.45 + 0.125 \times \frac{7}{\chi}) \%$ ($\chi \geq 7 \text{ MPa}$) $\pm(0.08 + 0.495 \times \frac{7}{\chi}) \%$ ($\chi < 7 \text{ MPa}$)

Notes: *1: URV is the measured value when 100 % (20 mA DC) is output

*2: LRV is the measured value when 0 % (4 mA DC) is output

*3: Range is $\text{URV} \geq 0$, $\text{LRV} \geq 0$

Model Number Configuration Table

Micro-Differential Pressure Model

Basic Model No.				Additional Selections				Options	
Measuring span	0.1 to 2 kPa	JTD910S JTD910W (with external terminal box)							
Output / communication format	4 to 20 mA DC (standard)		1						
	Digital output (DE protocol) Note 1		3						
	4 to 20 mA DC (HART® communication)		5						
Process Wetted Material	Meter body cover	Wetted part of main unit	Vent/drain plugs						
	SCS14A	SUS316	SUS316 E						
Sealed liquid	Regular type (silicone oil)		1						
	For oxygen service (fluorine oil)		2						
Process connection	Rc 1/2, process upper portion		A						
	Rc 1/2, process lower portion		B						
	1/2 NPT internal thread, process upper portion		F						
	1/2 NPT internal thread, process lower portion		G						
	Rc 1/4, process upper portion		L						
	Rc 1/4, process lower portion		M						
	1/4 NPT internal thread, process upper portion		R						
	1/4 NPT internal thread, process lower portion		S						
Bolt and nut material	SUS304		2						
				X	Electrical connection / explosion-proof	G 1/2, water-tight			
				2		G 1/2, TIIS special explosion-proof model with 1 cable gland attached			
				3		G 1/2, TIIS special explosion-proof model with 2 cable glands attached			
				A		1/2 NPT, non-explosion-proof			
				X	Indicators	None			
				1		Digital meter linear scale (0 to 100 %)			
				2		Digital meter engineering unit scale			
				X	Corrosion-resistant finish	Standard corrosion-proofing			
				B		Heavy corrosion-proofing			
				C		Silver paint (standard corrosion-proofing)			
				D		Silver paint (heavy corrosion-proofing)			
				X	Fail safe	None			
				U		Fail safe high limit			
				D		Fail safe low limit			
				X	Mounting bracket	None			
				1		Carbon steel (square)			
				2		SUS304 (square)			
				7		CF8 (SUS304 equivalent, round)			

Note 1: Cannot be combined with Failure mode "None," variable output saturation point, or external zero adjustment.

Note 2: Be sure to select indicators.

Standard Differential Pressure Model / High Differential Pressure Model / Ultra-High Differential Pressure Model

		Basic Model No.	Selections				Additional Selections				Options		
Measuring span	0.5 to 100kPa	JTD920S											
		JTD920W (with external terminal box)											
	35 to 700kPa	JTD930S											
		JTD930W (with external terminal box)											
		0.25 to 14MPa											JTD960S
JTD960W (with external terminal box)													
Output/ communication format	4 to 20 mA DC (standard)	1											
	Digital output (DE protocol)	Note 1											3
	4 to 20 mA DC (HART® communication)												5
Process Wetted Material	Meter body cover	Vent/drain plugs	Wetted part of main unit										
	SCS14A	SUS316	SUS316										E
	SCS14A	SUS316	Alloy C-276										F
	SCS14A	SUS316	Tantalum										H
	SCS14A	SUS316	SUS316L										K
	Note 2	PVC	PVC										Tantalum
Sealed liquid	Regular type (silicone oil)			1									
	For oxygen service (fluorine oil)			2									
	For chlorine service (fluorine oil)			Note 3									5
Process connection	Rc 1/2, process upper portion			A									
	Rc 1/2, process lower portion			B									
	1/2 NPT internal thread, process upper portion			F									
	1/2 NPT internal thread, process lower portion			G									
	Rc 1/4, process upper portion			L									
	Rc 1/4, process lower portion			M									
Bolt and nut material	Carbon Steel			1									
	SUS304			2									
	SUS630			3									
X	Electrical connection / explosion-proof	G 1/2, water-tight											
2		G 1/2, TIS special explosion-proof model with 1 cable gland attached											
3		G 1/2, TIS special explosion-proof model with 2 cable glands attached											
A		1/2 NPT, non-explosion-proof											
X	Indicators	None											
1		Digital meter linear scale (0 to 100 %)											
2		Digital meter engineering unit scale											
X	Corrosion-resistant finish	Standard corrosion-proofing											
B		Heavy corrosion-proofing											
C		Silver paint (standard corrosion-proofing)											
D		Silver paint (heavy corrosion-proofing)											
X	Fail safe	None											
U		Fail safe high limit											
D		Fail safe low limit											
X	Mounting bracket	None											
1		Carbon steel (square)											
2		SUS304 (square)											
7		CF8 (SUS304 equivalent, round)											

Note 1: Cannot be combined with Failure mode "None," variable output saturation point, or external zero adjustment.

Note 2: Meter body material: PVC and JTD960□ cannot be used together.

Maximum working pressure is 1.5 MPa. Bolt and nut material is SUS304.

Note 3: For wetted part of main unit, only "tantalum" can be selected.

Note 4: Be sure to select indicators.

Note 5: Model JTD920S/W only.

Standard Differential Pressure / High Static Pressure Model / High Differential Pressure / High Static Pressure Model / Ultra-High Differential Pressure / High Static Pressure Model

Basic Model No.		Selections				Additional Selections				Options	
Measuring span	0.5 to 100kPa	JTD921S									
		JTD921W (with external terminal box)									
	35 to 700kPa	JTD931S									
		JTD931W (with external terminal box)									
		0.25 to 14MPa									
JTD961W (with external terminal box)											
Output/communication format	4 to 20 mA DC (standard)		1								
	Digital output (DE protocol) Note 1		3								
	4 to 20 mA DC (HART* communication)		5								
Process Wetted Material	Meter body cover	Vent/drain plugs	Wetted part of main unit	E							
	SUSF316	SUS316	SUS316								
Sealed liquid	Regular type (silicone oil)			1							
	For oxygen service (fluorine oil)			2							
Process connection	Rc 1/2, process upper portion			A							
	Rc 1/2, process lower portion			B							
	1/2 NPT internal thread, process upper portion			F							
	1/2 NPT internal thread, process lower portion			G							
	Rc 1/4, process upper portion			L							
	Rc 1/4, process lower portion			M							
	1/4 NPT internal thread, process lower portion			S							
Bolt and nut material	Carbon Steel			1							
	SUS304			2							
	SUS630			3							
X	Electrical connection / explosion-proof										
2											
3											
A											
X	Indicators										
1											
2											
X	Corrosion-resistant finish										
B											
C											
D											
X	Fail safe										
U											
D											
X	Mounting bracket										
1											
2											
7											

XX	No options	
A 2	External zero adjustment	Note 2
A 5	Long vent drain	
B 7	For mounting a high load resistance smart meter	
G 1	Elbow x 1 (left)	
G 2	Elbow x 1 (right)	
G 3	Elbow x 2	
D 1	Moisture-free (incl. oil-free) finish	
E 6	Moisture-free (incl. oil-free) finish, high-grade	
D 2	Oil-free finish	
J 2	Electric power specification	
J 8	Special failure mode (3.2 mA)	
K 9	Variable output saturation point	
T 1	Test report	
T 2	Mill sheet	
T 5	Strength calculation sheet	
T 6	Withstand pressure and air tight test (general-purpose use)	
T 8	Test report (with traceability certificate)	
☐	Other	

G 1/2, water-tight
G 1/2, TIS special explosion-proof model with 1 cable gland attached
G 1/2, TIS special explosion-proof model with 2 cable glands attached
1/2 NPT, non-explosion-proof

Note 1: Cannot be combined with Failure mode "None," variable output saturation point, or external zero adjustment.

Note 2: Be sure to select indicators.

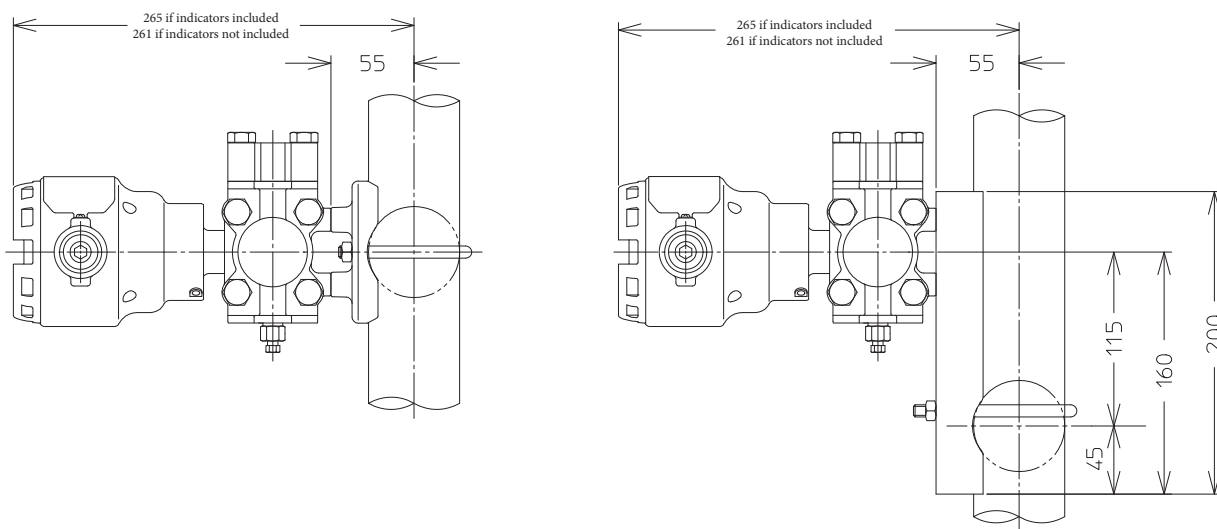
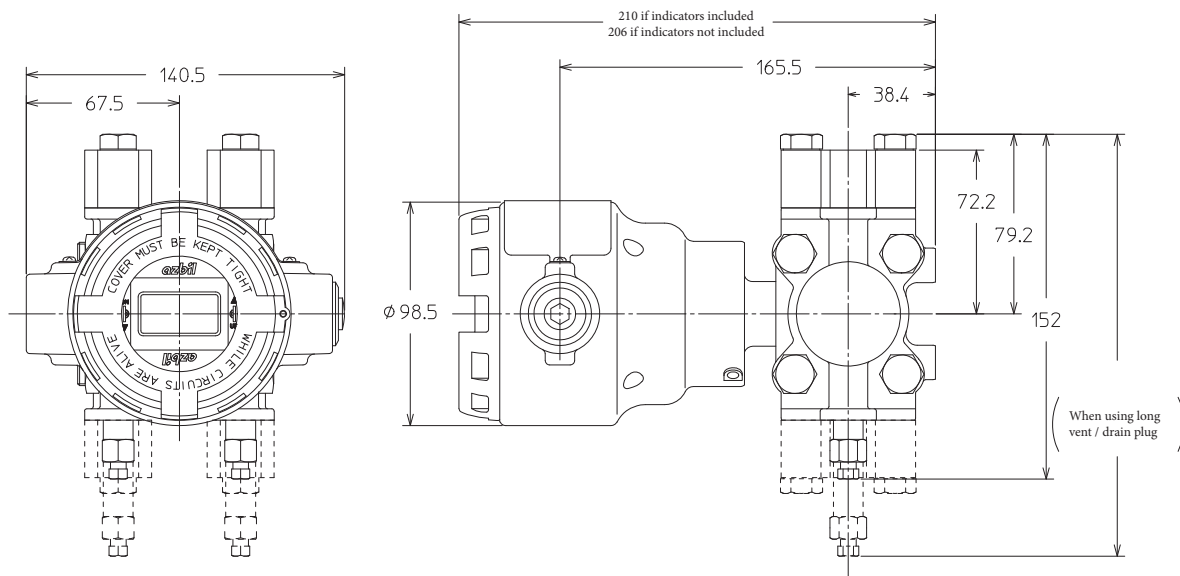
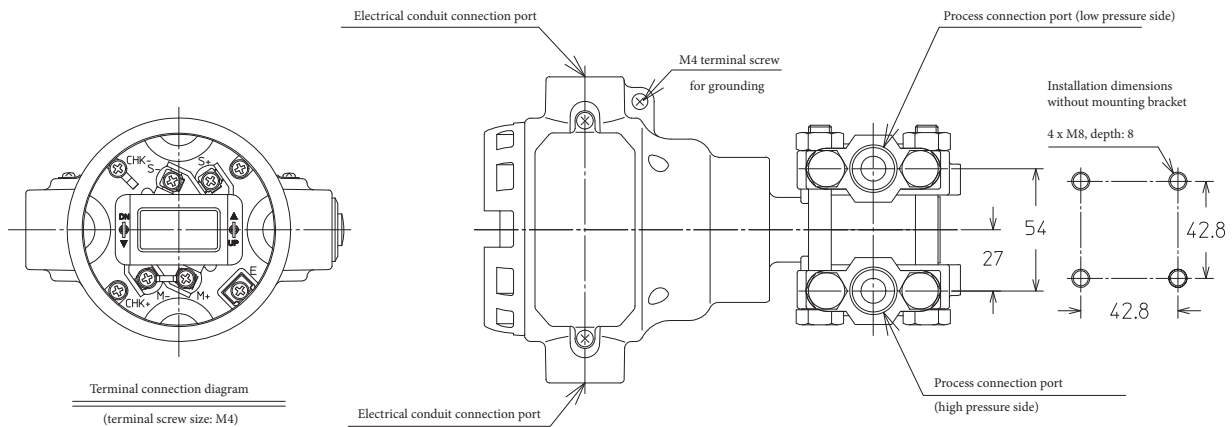
Dimensions

JTD910S

JTD920S/930S (SUS316, Alloy C-276)

JTD960S (SUS316)

(units: mm)

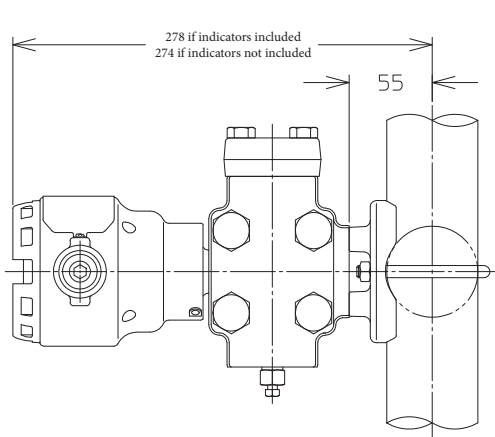
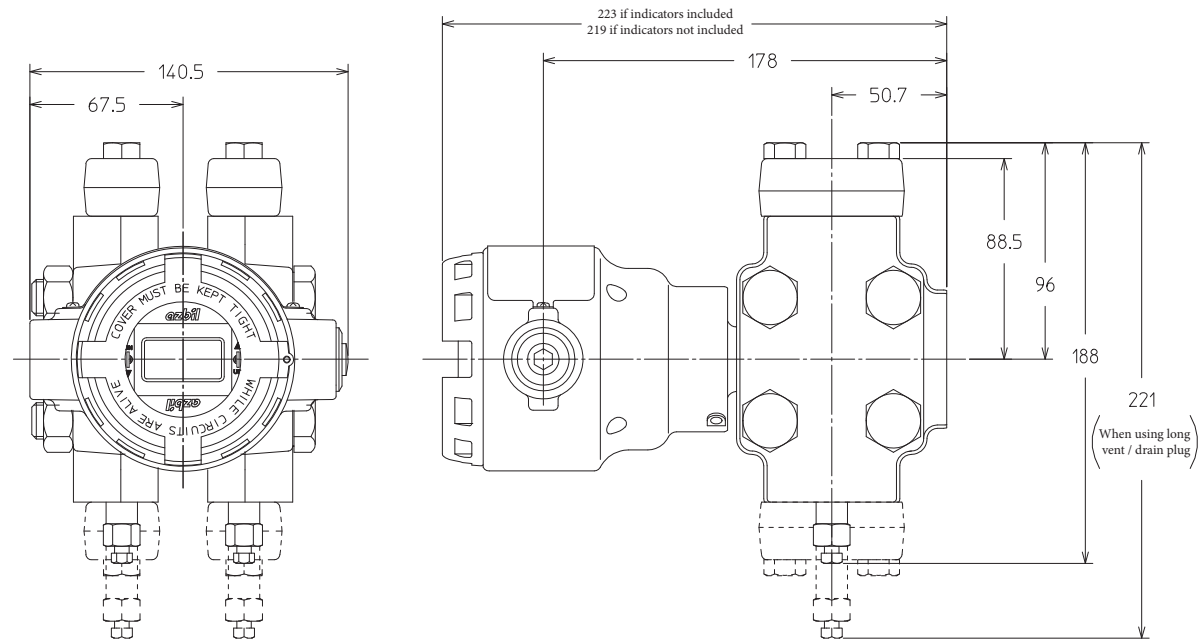
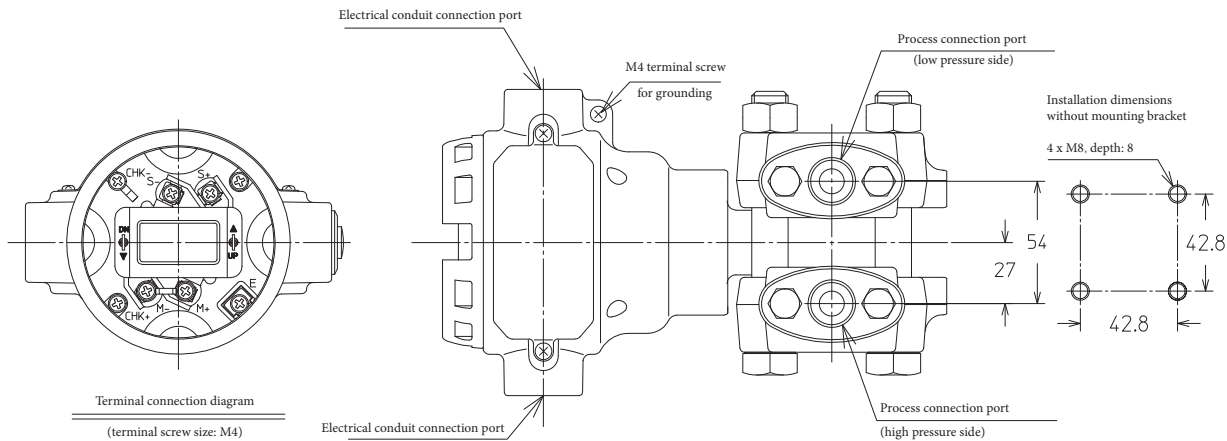


Round Bracket

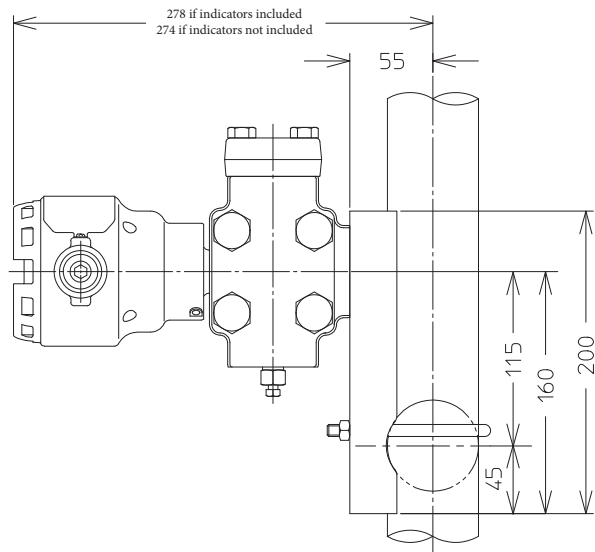
Square Bracket

JTD921S/931S/961S

(units: mm)



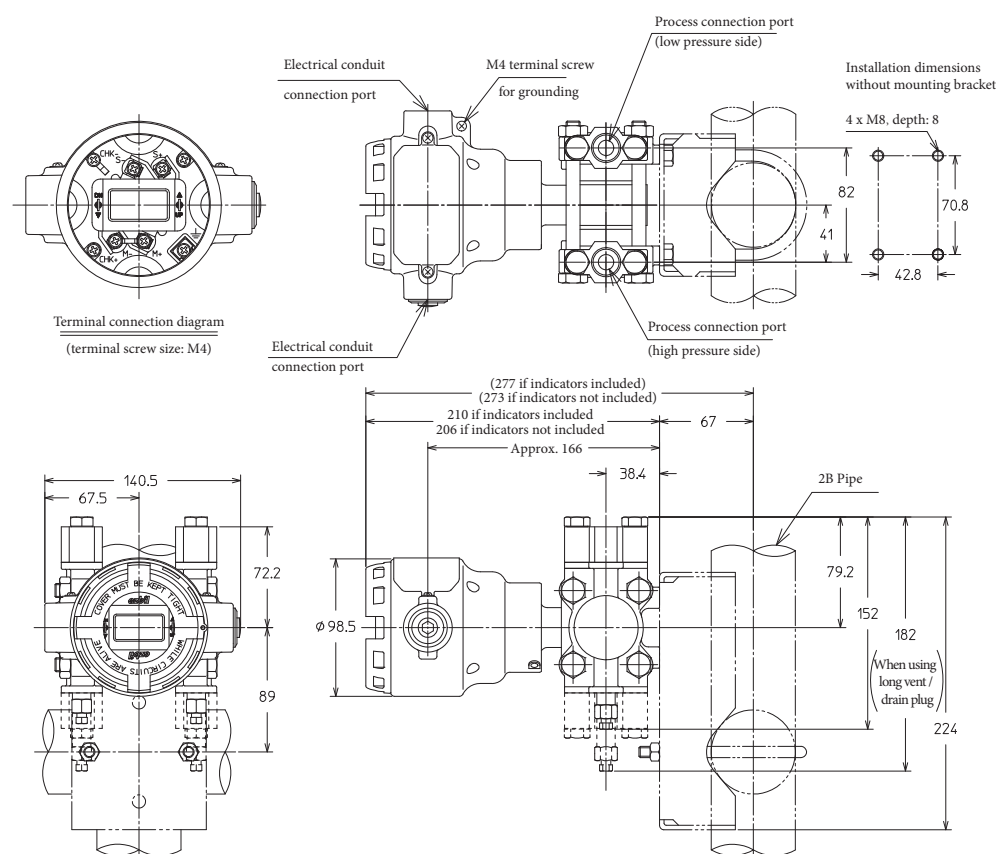
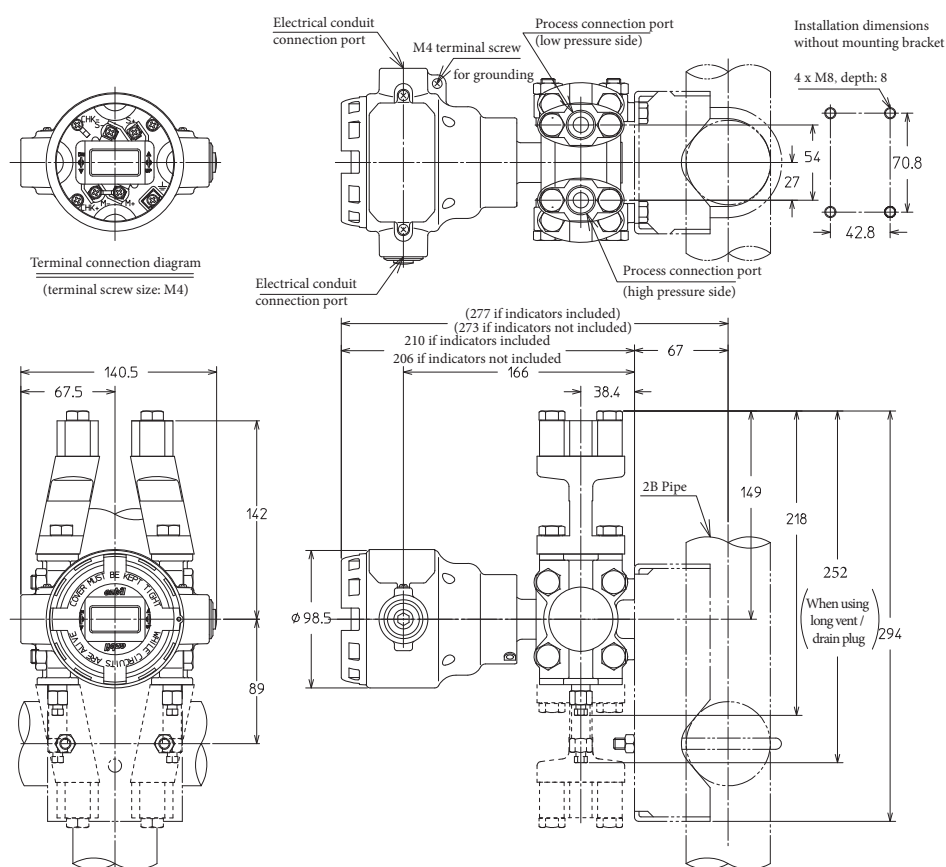
Round Bracket



Square Bracket

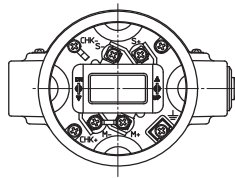
JTD920S/930S (tantalum, SUS316L)**JTD960S (Alloy C-276, tantalum, SUS316L)**

(units: mm)

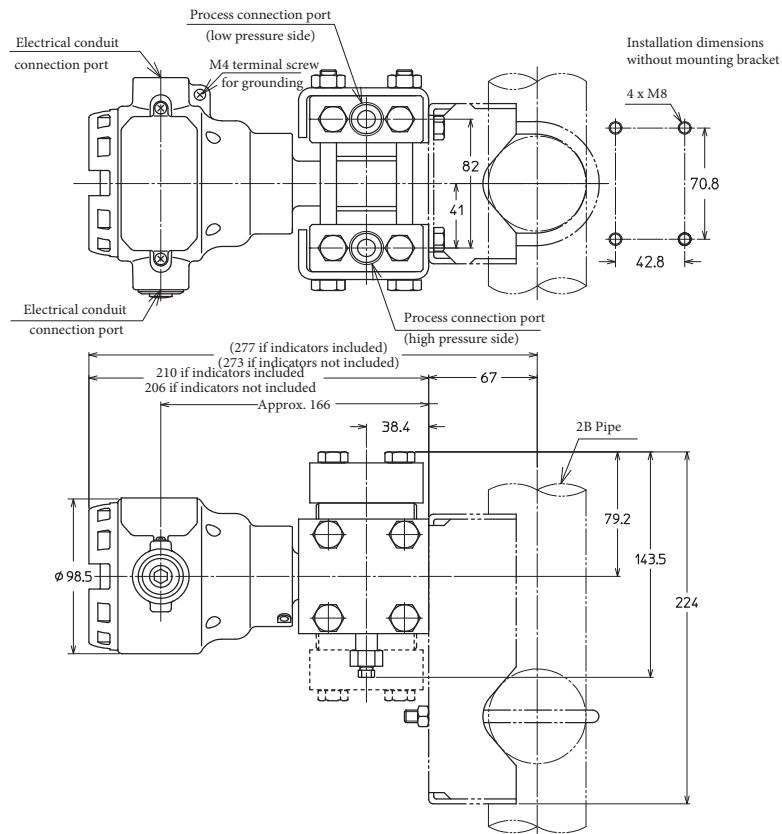
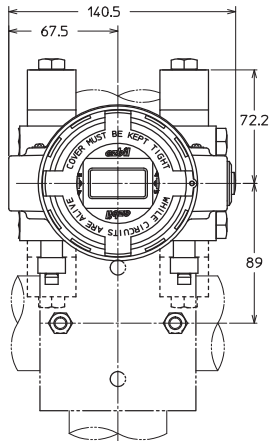
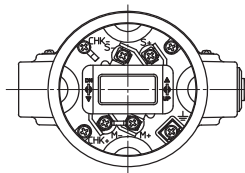
**With anticorrosion adapter**

JTD920S/930S/960S (cover material: PVC)

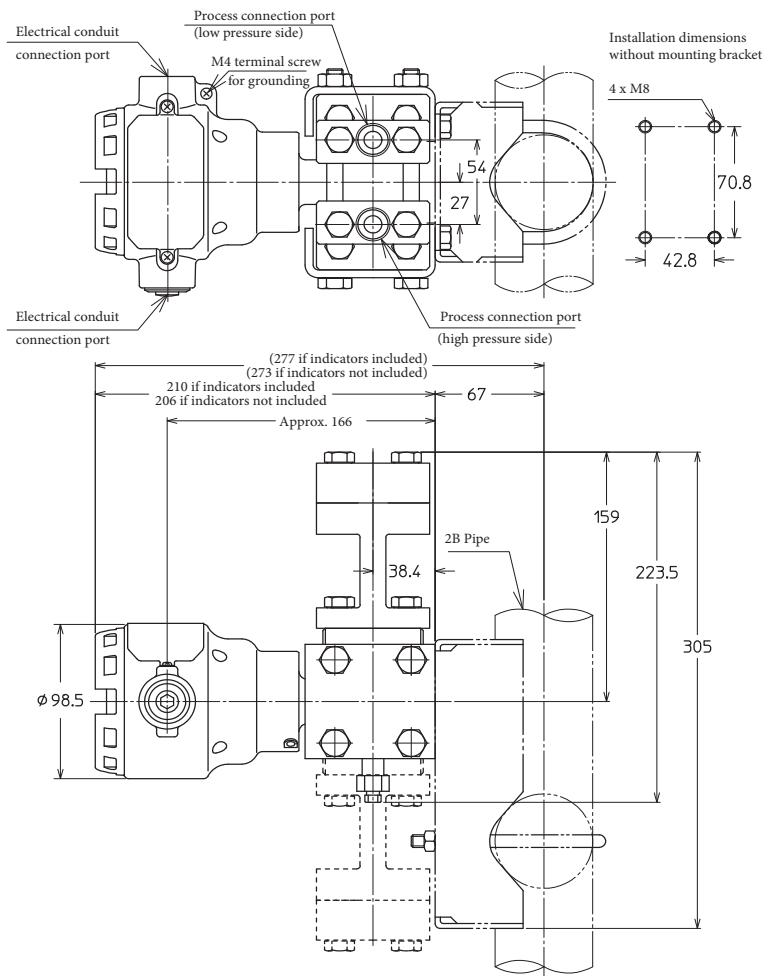
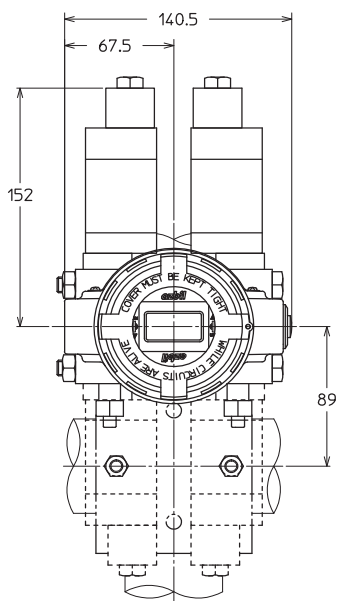
(units: mm)



Terminal connection diagram
(terminal screw size: M4)

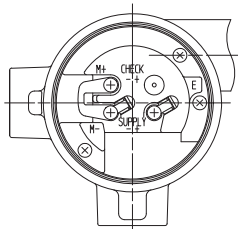
**With anticorrosion adapter**

Terminal connection diagram
(terminal screw size: M4)

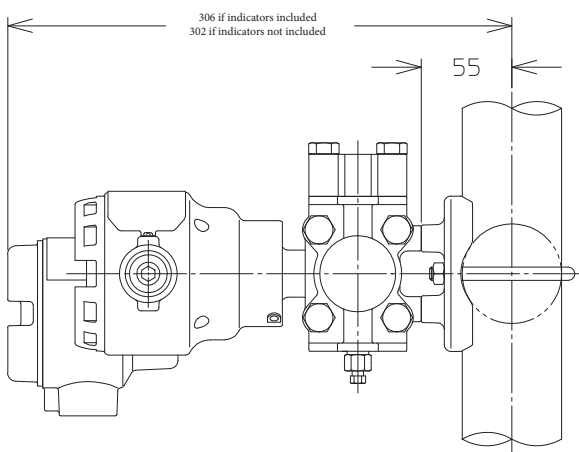
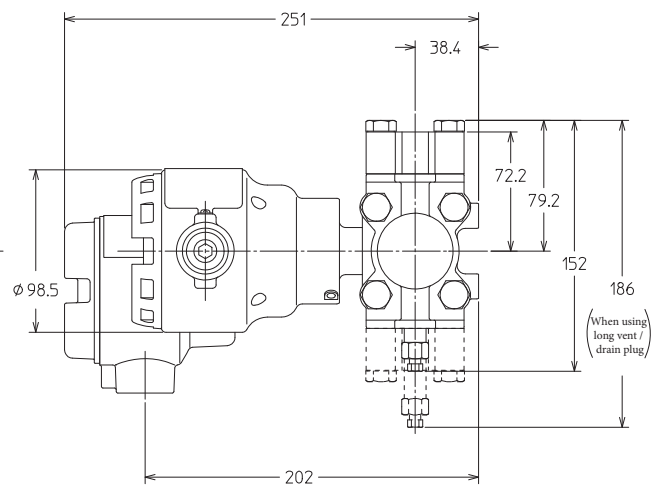
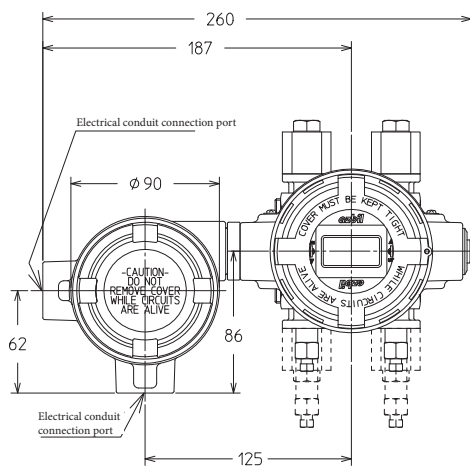
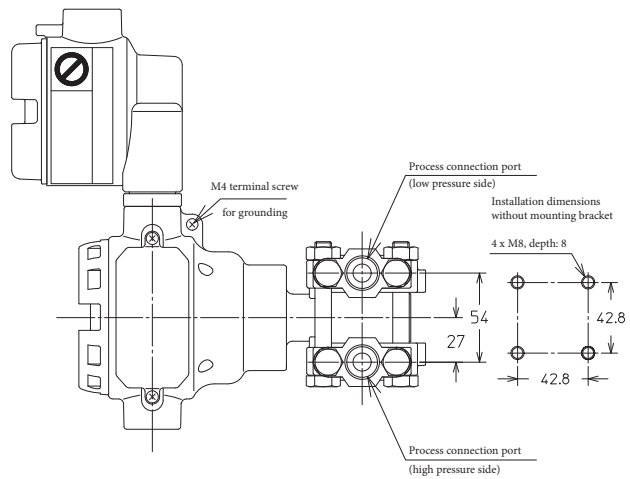


JTD910W**JTD920W/930W (SUS316, Alloy C-276)****JTD960W (SUS316)**

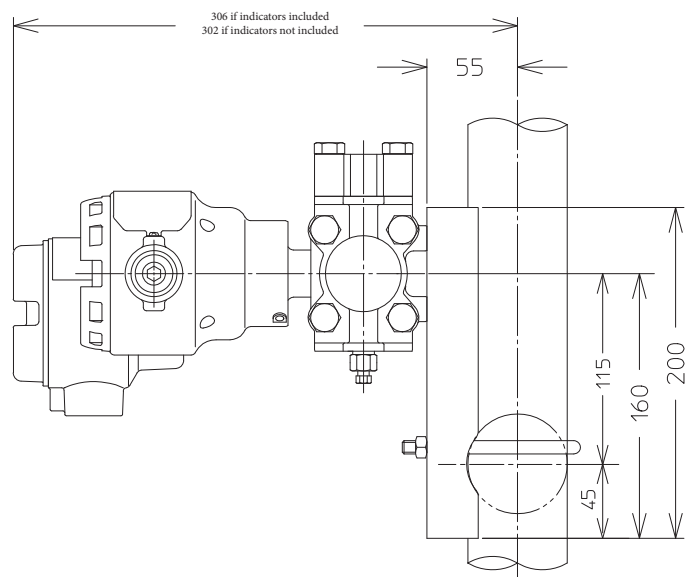
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Terminal connection diagram
(terminal screw size: M4)



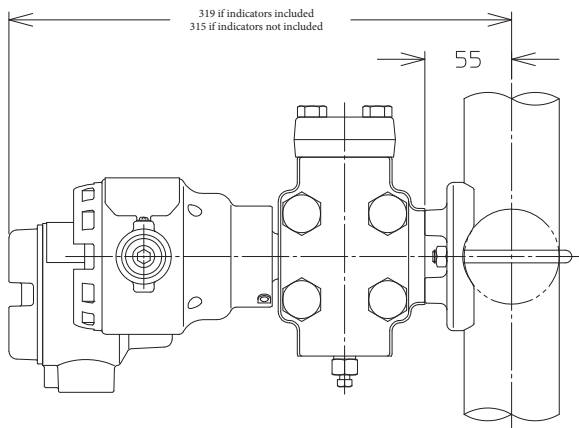
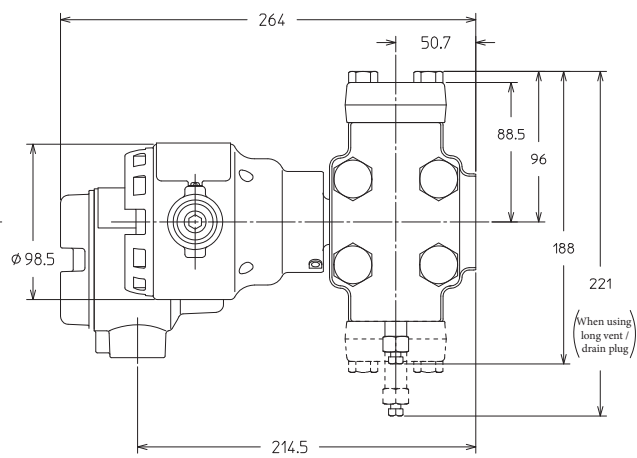
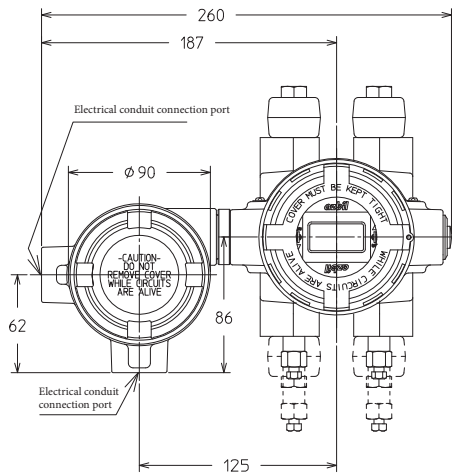
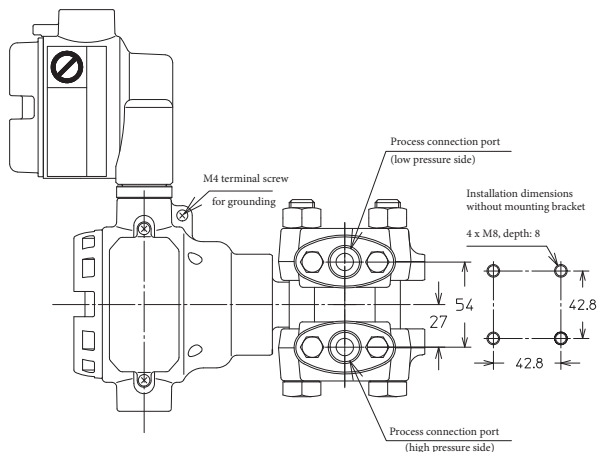
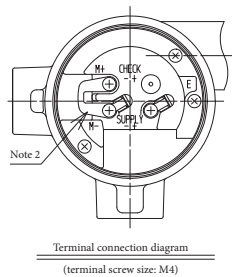
Round Bracket



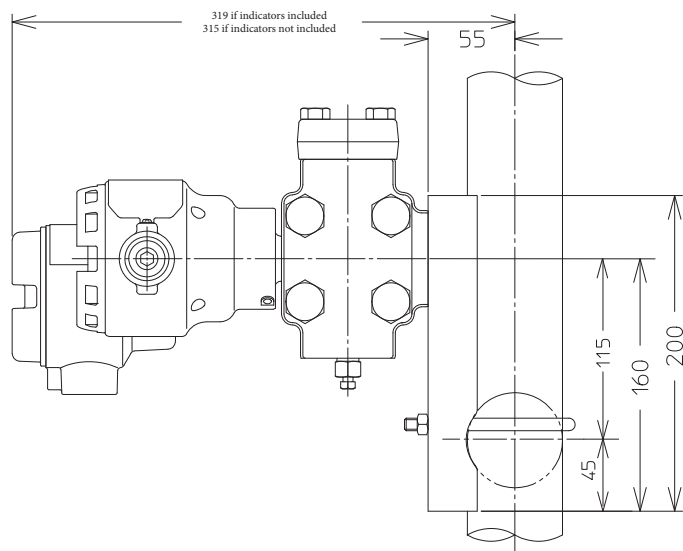
Square Bracket

JTD921W/931W/961W

(units: mm)



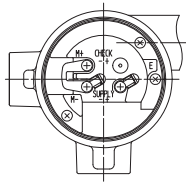
Round Bracket



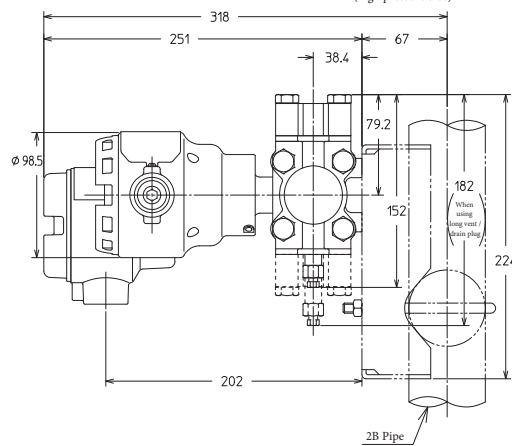
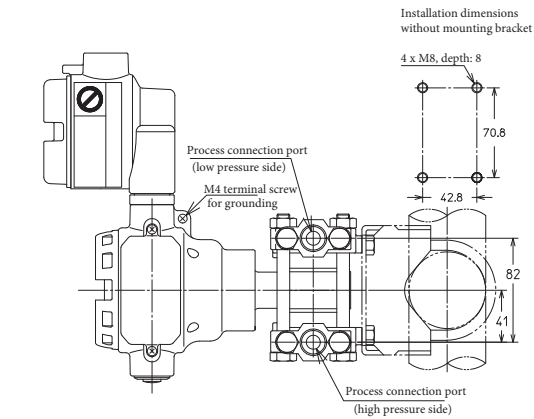
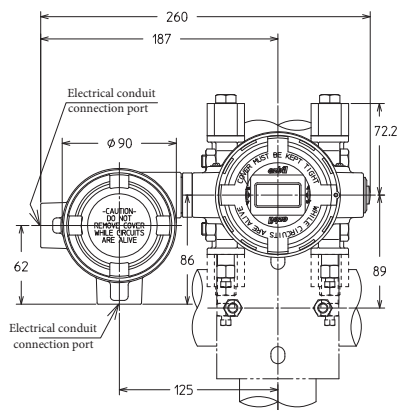
Square Bracket

JTD920W/930W (tantalum, SUS316L)
JTD960W (Alloy C-276, tantalum, SUS316L)

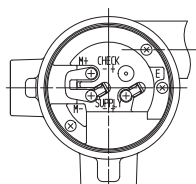
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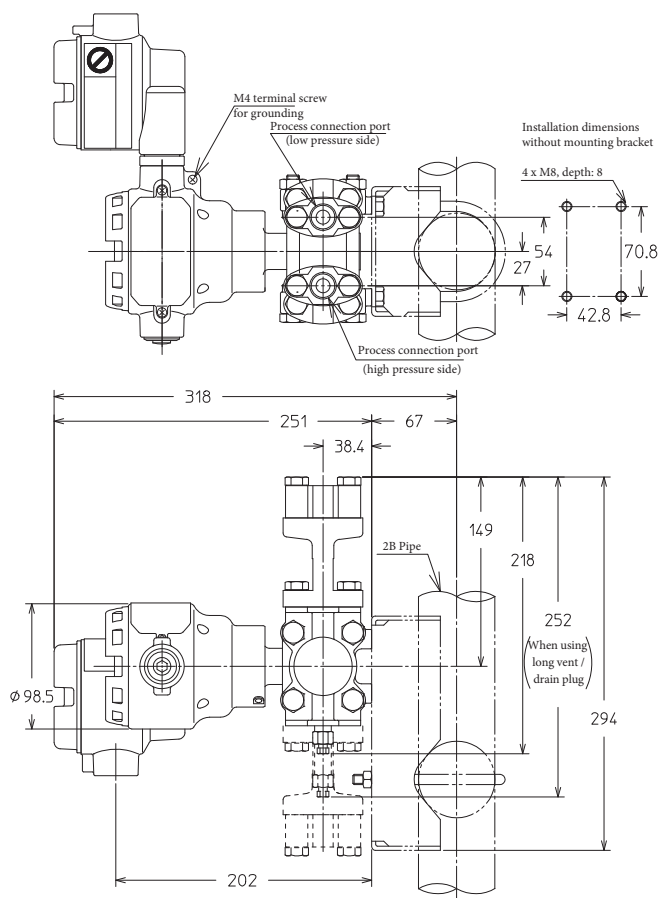
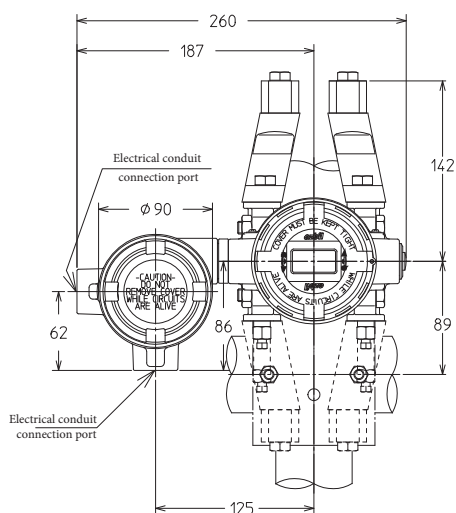
Terminal connection diagram
 (terminal screw size: M4)



With anticorrosion adapter

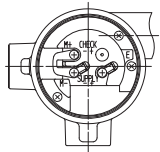
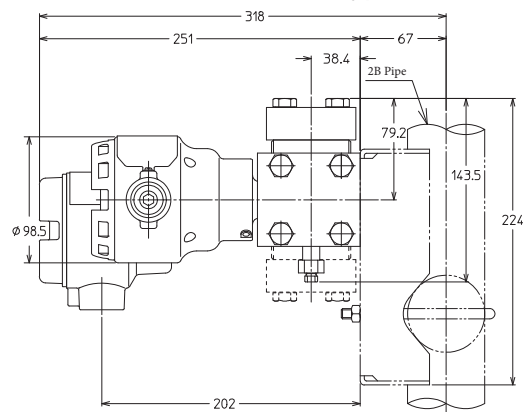
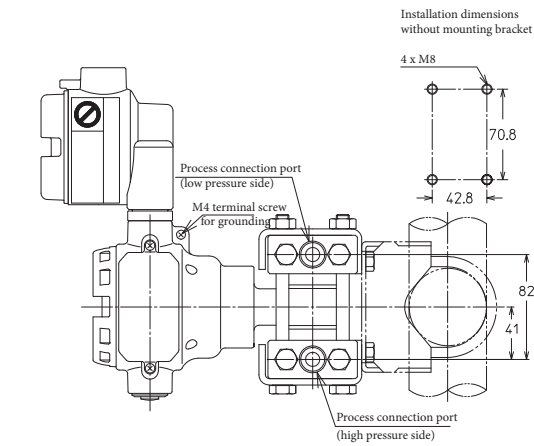
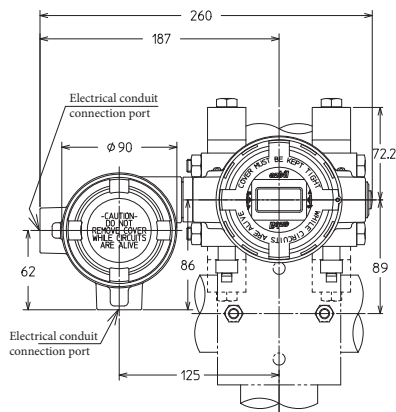
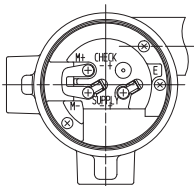
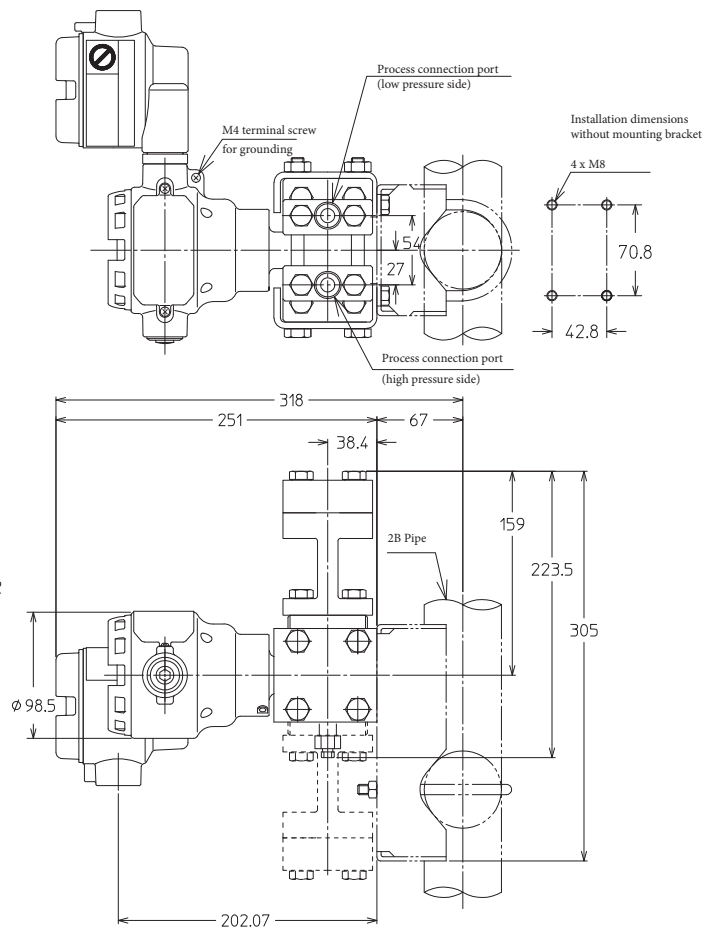
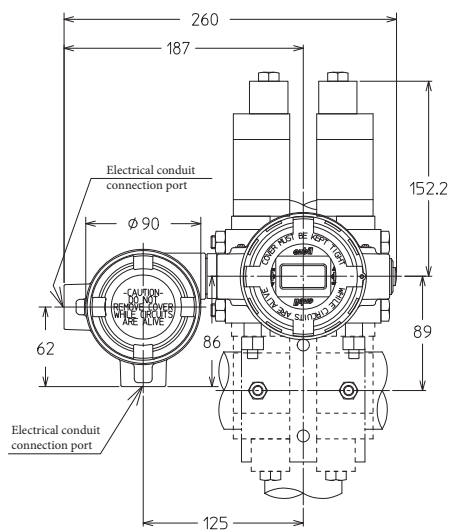


Terminal connection diagram
 (terminal screw size: M4)



JTD920W/930W/960W (cover material: PVC)

(units: mm)

Terminal connection diagram
(terminal screw size: M4)**With anticorrosion adapter**Terminal connection diagram
(terminal screw size: M4)

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