

Smart Multivariable Flow Transmitter

Model JTD720A

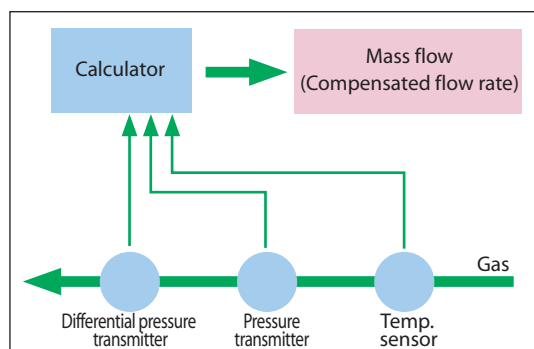
OVERVIEW

Smart Multivariable Flow transmitter Model JTD720A is a differential pressure transmitter for mass flow measurement for gas. It measures process DP, SP, and temperature simultaneously and outputs analog 4 to 20 mA signal or digital signal proportional to the mass flow (volume flow at the standard condition).

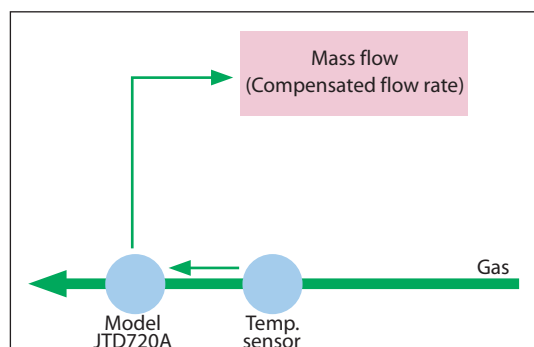
FEATURES

- Three process variable measurements and a mass flow calculation with one transmitter.
- High accuracy and high range ability

■ Past instrumentation



■ Instrumentation of model JTD720



APPLICATIONS

Measurement fluid

N₂, O₂, H₂, Ar, Steam, Natural gas, Air, etc.

Applications

- Custody transfer of gas at chemical/steal market.
- Flow control of fluid gas for an incinerator or a boiler.
- Management of utility such as steam and air.
- Flow rate measurement of H₂ or other flammable gases at hazardous area.

FUNCTIONAL SPECIFICATIONS

Type of protection

JIS C 0920 watertight: NEMA 3 and 4X
JIS F 8001 class 2 watertight IEC IP67

TIIS Flameproof approval

Exd IIB+H2 T4

KCs Flameproof model

Ex d IIB+H2 T4

NEPSI Explosion-proof

Certificate No. GYJ19.1301X

Ex d IIB+H2 T4 Gb -30 °C T_{amb} ≤ +60 °C T_{process} = 60 °C

Measuring span/Setting range/Working pressure range

See Table 1.

Temperature input

RTD (Pt 100Ω or JPt 100Ω)

Output / Communication

Analog output (4 to 20 mA)

Digital output (DE protocol)

Power supply and load resistance

17 to 45V DC. A load resistance of 250Ω or more is necessary between loops. (See Figure 2.)

Ambient temperature

Unit: °C	Ambient temperature limit (Operative limits)	Temperature ranges of wetted parts (Operative limits)	Transportation and storage conditions
For general purpose model	-15 to +65 (-40 to +70)	-15 to +65 (-40 to +70)	-50 to +85
For oxygen model	-10 to +65 (-40 to +70)	-10 to +65 (-40 to +80)	-50 to +85
With digital indicators	-15 to +65 (-30 to +70)	-15 to +65 (-30 to +70)	-30 to +80
For explosion-proof type *	-15 to +60	-15 to +60	-50 to +85

*The explosion-proof types are TIIS Flameproof model, KCs Flameproof model, NEPSI Explosion-proof.

Ambient humidity

10 to 90% RH

Stability against supply voltage change

±0.005% F.S./V

Lightning protection

Peak value of voltage: 100 kV

Peak value of current: 1000 A

Dead time

Approx. 0.4 sec.

Damping time

Selectable from 0 to 32 sec. in ten stages

Output saturation point

Upper limit: 20.8 mA

lower limit: 3.8 mA

Vibration characteristics

Amplitude 1.5 mm / Frequency 0 to 9 Hz

Acceleration 5 m/S² (0.5 G) / 9 to 60 Hz

Shock characteristics

Acceleration 10 m/s² (at 1 g)

Built-in indicator

The digital LCD indicator (optional) shows the output in percentage or in engineering units, and indicates temperature and pressure.

Any value from -19999 to +19999 can be specified.

Specify the following when placing an order involving engineering units.

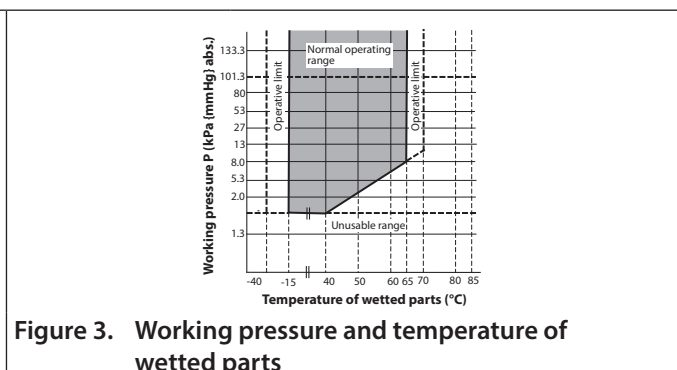
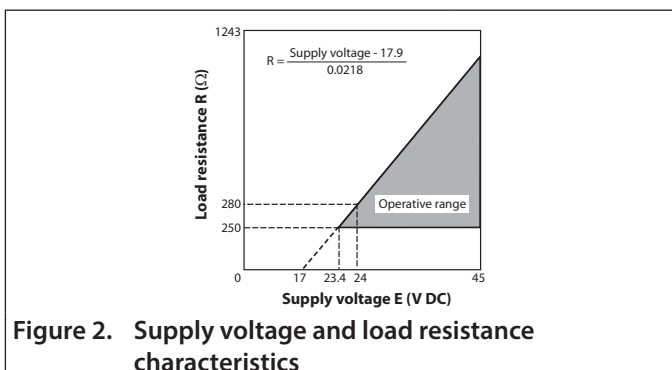
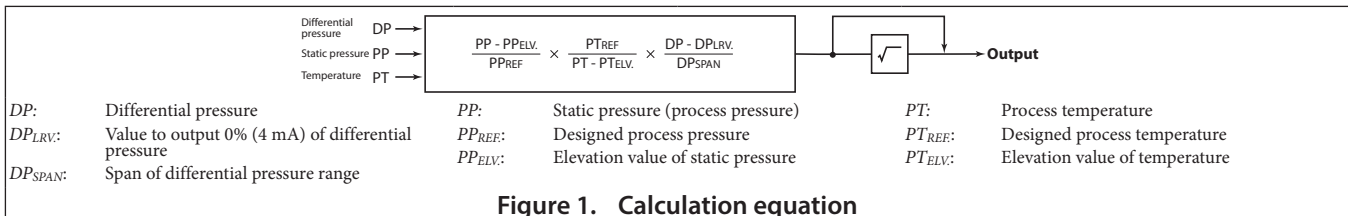
- Pressure range
- Unit of pressure

Various settings can be changed using the communicator.

Compensation method

Pressure compensation only, temperature and pressure compensation, or saturated steam compensation can be selected by model number.

If temperature compensation only is desired, specify when ordering. For the formula used in calculation, see figure 1.



PHYSICAL SPECIFICATIONS

Materials

Fill fluid

For general purpose (Silicone oil)
For oxygen service (Fluorine oil)

Center body

SUS316

Transmitter case

Aluminum alloy

For wetted parts

Meter body cover

SCS14A (SUS316 equivalent)

Centerbody

SUS316 (Diaphragm SUS316L)

Vent plugs

SUS316

Gaskets

FEP

Bolts and nuts (for meterbody covers)

Carbon steel (SNB7), SUS304

Finish

Baked acrylic

Housing

Light beige (Munsell 4Y7.2/1.3)

Cap

Dark beige (Munsell 10YR4.7/0.5)

Weight

Approx. 4.4 kg

INSTALLATION

Electrical connection

G1/2 internal thread, 1/2NPT internal thread

Grounding

Resistance 100Ω max.

Mounting

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

Process connection

Rc1/2, Rc1/4

OPTIONAL SPECIFICATIONS

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.

Oil free treatment

The transmitter is shipped with oil-free wetted parts.

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.

Strength calculation sheet

The strength calculation sheet indicates the strength of the meter body cover, flanges, bolts and 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 (10 minutes) and a gas-tightness test (10 minutes) performed on the wetted parts.

Reversed process connection:

High-pressure process pipe is on the left and low-pressure pipe is on the right. (Normal connection: high pressure on the right, low pressure on the left)

Transmitter handling notes

To make the most of the performance this transmitter can offer, please use it properly noting the points mentioned below. Before using it, please read the user's 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). Gasket protrusion may result in leaks and output errors.
- Do not use the transmitter outside its defined pressure, temperature, and connection specifications. A serious accident may otherwise occur due to damage and leaks.
- 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 installing the transmitter, do not stand on it. Using it as a foothold could cause it to collapse and cause physical injury.
- Be careful not to hit the glass indicator with tools etc. This could break the glass and cause injury.
- The transmitter is heavy. Wear safety shoes and take care when installing it.

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.

PERFORMANCE SPECIFICATIONS

Table 1. Performance specifications

DP Measuring span	0.75 to 100 kPa
DP setting range	$-100 \leq URV \leq +100$ kPa (*1) $-100 \leq LRV \leq +100$ kPa (*2) <i>Note</i> *1. URV denotes the value for 100% (20 mA) output. *2. LRV denotes the value for 0% (4 mA) output.
Design pressure setting range	0.17 to 3.5 MPa abs.
Design temperature setting range	-100 to +650 °C
Calculation equation	See Figure 1.
Accuracy (output after compensation)	<p>Shown are the upper limit (URV) and lower limit (LRV) of the calibration range or the percentage ratio of the maximum value of the span to χ (kPa.)</p> <p>PP_{REF}: designed pressure PP_{MAX}: max. pressure of process</p> <p>Accuracy% = $\pm (0.025 + A + B + C + D + E)$ (* E: only when the temperature is input.)</p> <p>A: $0.075\% \dots \dots \dots \left(x \times \frac{PP_{REF}}{PP_{MAX}}\right) \geq 12.5 \text{ kPa}$</p> <p>$0.075\% \times \frac{12.5}{x} \times \frac{PP_{MAX}}{PP_{REF}} \dots \dots \dots \left(x \times \frac{PP_{REF}}{PP_{MAX}}\right) \leq 12.5 \text{ kPa}$</p> <p>B: $0.1 \times \frac{PP_{MAX}}{3.5} \dots \dots \dots \left(x \times \frac{PP_{MAX}}{PP_{REF}}\right) \geq 25 \text{ kPa}$</p> <p>$0.1 \times \frac{2.5}{x} \times \frac{PP_{MAX}}{PP_{REF}} \times \frac{PP_{MAX}}{3.5} \dots \dots \dots \left(x \times \frac{PP_{MAX}}{PP_{REF}}\right) \leq 25 \text{ kPa}$</p> <p>C: $0.075\% \dots \dots \dots PP_{REF} \geq 0.35 \text{ MPa abs.}$</p> <p>$0.075 \times \frac{0.35}{PP_{REF}} \dots \dots \dots PP_{REF} \leq 0.35 \text{ MPa abs.}$</p> <p>D: $0.15 \times \frac{x}{PP_{REF} \times 1000} \%$</p> <p>E: 0.1% (Only when the temperature is input.)</p> <p>Square root output:</p> <p>When output is 50 to 100%; same as that of linear output.</p> <p>When output is 7.1 to 50%; value of linear output $\times \frac{50}{Output} \%$</p> <p>(Not specified for dropout area)</p> <p>When output is 7.1% or below; Not specified</p>
Working pressure rating	3.5 MPa max. (For vacuum pressure, see Figure 3).
Low flow cut-off	Value of cut-off: The output is changeable from 0 to 20%. $-100 \leq URV \leq +100$ kPa Drop-out type: Zero or linear output
Working pressure range	3.5 MPa abs. max. (refer to Figure 3 for negative pressure.)
Temperature effect (after compensation)	<p>Shown are the upper limit (URV) and lower limit (LRV) of the setting range or the percentage ratio of the maximum value of the span to χ (kPa.)</p> <p>PP_{REF}: designed pressure PP_{MAX}: max. pressure of process</p> <p>Zero shifts: $\pm 0.47\%$ / 30°C change (differential pressure 25 kPa, design pressure 0.5 MPa, process pressure 0.6 MPa abs. max.) Zero shift% / 30°C = $\pm (0.15 + A + B + D)$ (* D: only when the temperature is input.)</p> <p>A: $0.16\% \times \frac{12.5}{x} \times \frac{PP_{MAX}}{PP_{REF}}$</p> <p>B: $0.1 \times \frac{2.5}{x} \times \frac{PP_{MAX}}{3.5} \times \frac{PP_{MAX}}{PP_{REF}}$</p> <p>D: 0.2% (Only when the temperature is input.)</p> <p>Total shifts: $\pm 0.76\%$ / 30°C change (included zero span shifts) (differential pressure 25 kPa, design pressure 0.5 MPa, process pressure 0.6 MPa abs. max.) Zero shift% / 30°C change = $\pm (0.2 + A + B + D)$ (* D: only when the temperature is input.)</p> <p>A: $0.24\% \dots \dots \dots \left(x \times \frac{PP_{REF}}{PP_{MAX}}\right) \geq 12.5 \text{ kPa}$</p> <p>$0.24 \times \frac{12.5}{x} \times \frac{PP_{MAX}}{PP_{REF}} \dots \dots \dots \left(x \times \frac{PP_{REF}}{PP_{MAX}}\right) \leq 12.5 \text{ kPa}$</p> <p>B: $0.1 \times \frac{PP_{MAX}}{3.5} \dots \dots \dots \left(x \times \frac{PP_{REF}}{PP_{MAX}}\right) \geq 25 \text{ kPa}$</p> <p>$0.1 \times \frac{2.5}{x} \times \frac{PP_{MAX}}{PP_{REF}} \times \frac{PP_{MAX}}{3.5} \dots \dots \dots \left(x \times \frac{PP_{REF}}{PP_{MAX}}\right) \leq 25 \text{ kPa}$</p> <p>C: $0.1\% \dots \dots \dots PP_{REF} \geq 0.35 \text{ MPa abs.}$</p> <p>$0.1 \times \frac{0.35}{PP_{REF}} \dots \dots \dots PP_{REF} \leq 0.35 \text{ MPa abs.}$</p> <p>D: 0.2% (Only when the temperature is input.)</p>
Calibration accuracy for differential pressure transmitter	<p>Shown are the upper limit (URV) and lower limit (LRV) of the calibration range or the percentage ratio of the maximum value of the span to χ (kPa.)</p> <p>Linear output: $\pm 0.1\% \dots \dots \dots \chi \geq 5 \text{ kPa}$</p> <p>$\pm \left(0.025 + 0.075 \times \frac{5}{\chi}\right) \dots \dots \dots \chi \leq 5 \text{ kPa}$</p>
Calibration accuracy for pressure transmitter	<p>Shown are the upper limit (URV) and lower limit (LRV) of the calibration range or the percentage ratio of the maximum value of the span to χ (kPa.)</p> <p>Linear output: $\pm 0.1\% \dots \dots \dots \chi \geq 0.35 \text{ kPa abs.}$</p> <p>$\pm \left(0.025 + 0.075 \times \frac{0.35}{\chi}\right) \dots \dots \dots \chi \leq 0.35 \text{ kPa abs.}$</p>
Calibration accuracy for temperature transmitter	$-100^\circ\text{C} \leq LRV, URV \leq +650^\circ\text{C}$ and span 50°C or more. $\pm \left(0.3 \times \frac{50}{span} + 0.05\right) \% \text{ F.S.}$
Temperature input type	Resistance thermobulb Pt100Ω or JPt100Ω

MODEL SELECTIONS

JTD720A - I II III IV V - VI VII VIII IX X - Options

Basic model no. Selections					Optional specifications					Options			
	Measuring span	0.75 to 100 kPa		JTD720A	-								
Selections													
I	Output / Communications	4 to 20 mA			1							XX	No options
		Digital output (DE protocol) *4			3							A5	Long vent/drain plugs
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body								F1	Without temperature compensation *2
		SCS14A	SUS316	SUS316	E							G1	With one elbow
III	Fill fluid	Regular type (Silicon oil)				1						D1	Water free finish (with oil free finish)
		For oxygen service (Fluorine oil) *1				2						E6	Water-free finish (with oil-free finish), high grade
IV	Process connection	Rc1/2, top connection				A						D2	Oil free finish
		Rc1/2, bottom connection *3				B						T1	Test report
		Rc1/2, front connection				D						T2	Material certificate (Mill sheet)
		Rc1/4, top connection				L						T3	Document for high pressure gas regulation
		Rc1/4, bottom connection *3				M						T5	Strength calculation sheet
		Rc1/4, front connection				P						T6	Withstand pressure and air tight test
V	Bolts / nuts material	Carbon steel (SNB7)				1						C7	Process connection; reverse
		SUS304				2							
Option 1					-								
VI	Electrical connection / explosion-proof	G1/2, watertight				X							
		G1/2, TIIS Flameproof with 1 pc. of cable gland attached *3				2							
		G1/2, TIIS Flameproof with 2 pcs. of cable gland attached *3				3							
		G1/2, KCs Flameproof				P							
		1/2NPT, Watertight				A							
		1/2NPT, NEPSI Flameproof				E							
VII	Built-in indicating smart meter	None				X							
		0 to 100% linear scales				1							
		Engineering unit scales				2							
VIII	Finish	Standard						X					
IX	Fail safe	None *4							X				
		Upper limit of output at abnormal condition							U				
		Lower limit of output at abnormal condition							D				
X	Mounting bracket	None								X			
		SUS304									2		
		For replacement										F	

Note) *1. Included oil-free finish.

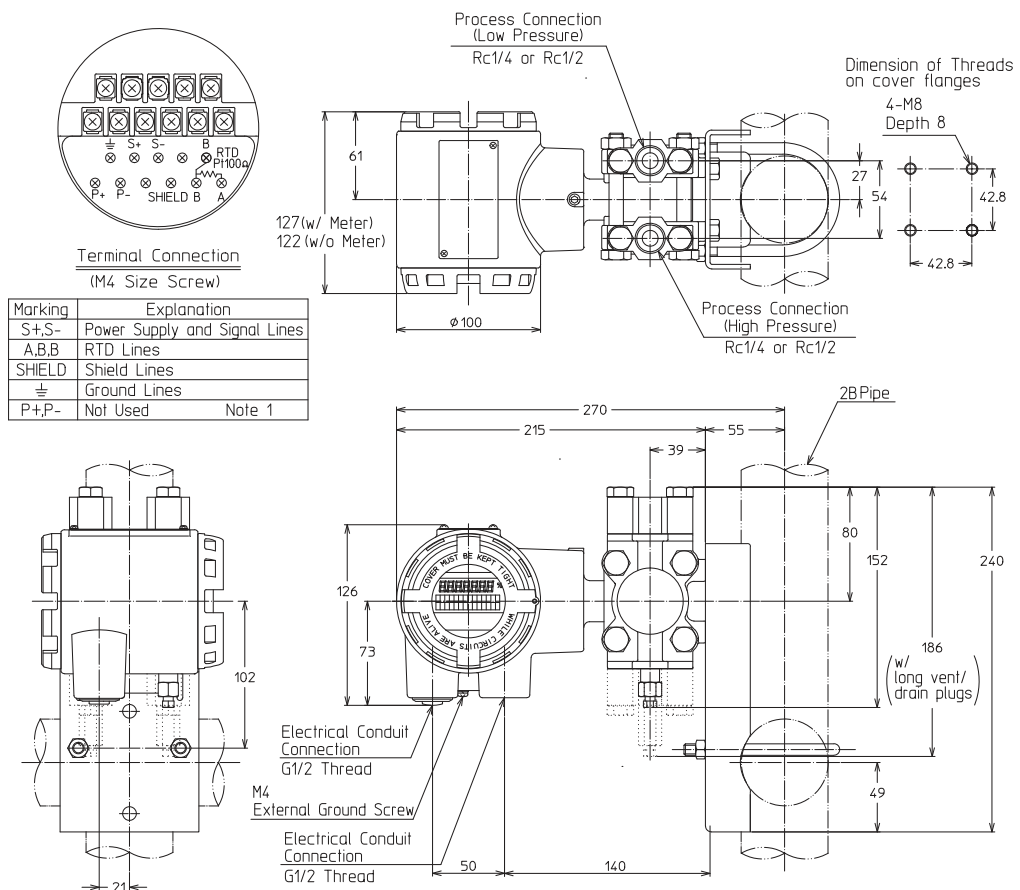
*2. Code "F1" option must be selected when the temperature compensation is not needed.

*3. In case of combination with "process bottom connection" and "Explosion-proof", please select a manifold valve with "extension pipe". (Model No.: MVG_ _ _ _S- _)

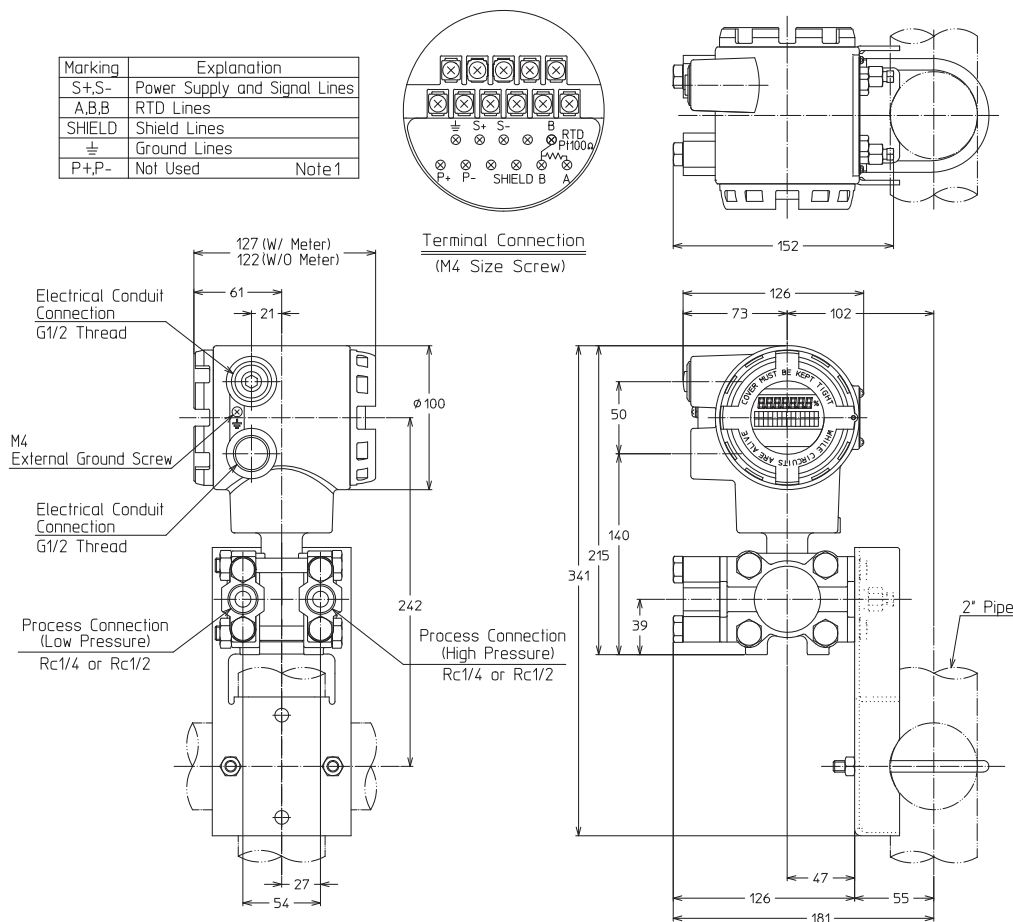
*4. Digital output (DE protocol) should be selected with upper/lower direction of burn out feature.

DIMENSIONS

Unit: mm



Vertical installation



Horizontal installation

Note 1) Do not connect P+, P- terminal

Please read "Terms and Conditions" from the following URL
before ordering and use.
<https://www.azbil.com/products/factory/order.html>

Specifications are subject to change without notice.

azbil

Azbil Corporation
Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL: <https://www.azbil.com/>

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