No.	Message	Description	Action
46	SFC FAULT	The SFC does not operate correctly.	Perform communications again. It the status does not change, replace the SFC.
47	SHIFT	The white characters on each key of the SFC will be selected.	
48	STATUS CHECK = OK	No error	
49	STATUS RECEIVED	Self-diagnosis of the transmitter has been completed.	
50	STATUS UNKNOWN #	The status is unknown.	
51	SQUARE ROOT	The output characteristic is given square-root processing.	
52	SUSPECT INPUT	The input data may be wrong. This trouble may be attributable to the process, the meter body of the transmitter, or the electronics. Also, this message is displayed when the connector from the meter body is not mounted correctly on the electronics.	Press the "STAT" key. If no message is displayed, the possibility that the trouble is related to the meter body of the transmitter is high. Check the meter body.
53	UP SCALE	The burnout for critical fault is upward.	
54	URV CORRECTED	100% range correction has been completed.	
55	WORKING ···	Operating status	
56	ZERO INPUT?	Is the sensor balanced (atmospheric pressure)?	Check to see if it is in the atmospheric state.
57	> RANGE	The result of computing exceeds the display length.	Press the "CLR" key and start again.
58	:	The SFC has a low battery level.	Charge the SFC.
59	#	Non-critical fault	Press the "STAT" key. Refer to the message table. After eliminating the cause of the problem, make sure that the "#" mark has disappeared by pressing the "STAT" key.

11. Troubleshooting

If the transmitter fails to operate normally, locate the source of trouble according to the following procedure.

(1) Check the following items by using the self-diagnosis function.
   1) Configuration data
   2) Transmitter operation
   3) Loop

(2) If the trouble was located in step (1), take the necessary action by referring to Section 10 "Self-diagnosis".

12. External Zero Point Adjustment (optional)

12.1 External zero point adjustment

Introduction:

Since this transmitter has an external zero point adjusting function, the zero point can be adjusted externally without using the S-SFC.

A transmitter with a digital meter will display "ZERO" in the display area.

Adjustment range:

An output corresponding to the current input can be set to any value within the range of -1.25% (3.8 mA) to +105% (20.8 mA).

Procedure:

Adjust the zero point externally using the following procedure:

(1) Make sure that the required differential pressure is applied to the transmitter.

(2) • Holding down the zero point adjust button using a regular screw driver, turn it in the desired direction (+ or -) until the output reaches the target value.

• Output increase: Holding down the button, turn it in the plus (+) direction. A transmitter with a digital meter will display "^UP ZERO" during adjustment.

• Output decrease: Holding down the button, turn it is the minus (-) direction. A transmitter with a digital meter will display "ZERO DOWN^" during adjustment.

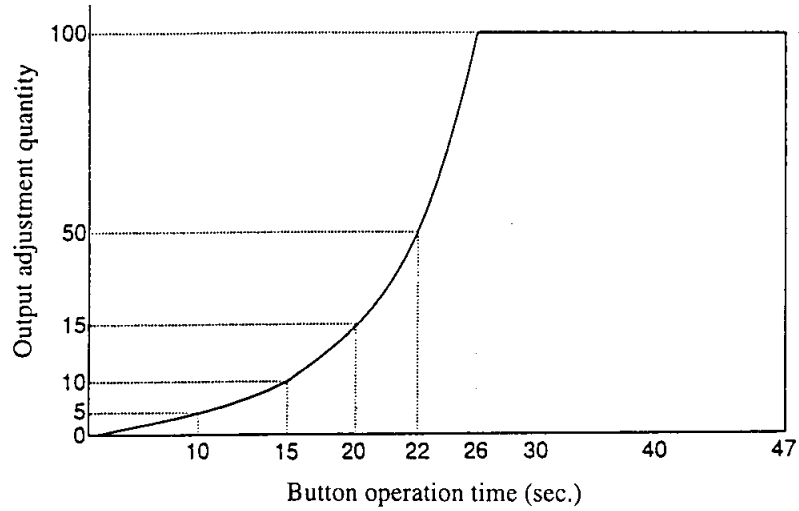
Caution
Do not turn the adjust button excessively, as it may break.

• Zero point adjustment will be interrupted by communications from the S-SFC.

• The S-SFC can read set values and set states only when communicating during zero point adjustment.

Output adjustment quantity:

The output adjustment quantity changes according to how long the button is pressed down and turned, as shown below.



Relationship between output adjustment quantity and button operation time

- The adjustment quantity increases with turning time (refer to the above graph.)
- The speed of adjustment (increase/decrease) increases with turning time (refer to the above graph.)

Error diagnosis:

The transmitter will determine if the external zero point adjustment function is operating normally, and "ZERO" will blink on the indicator.

If adjustment continues for about 50 seconds, the transmitter will determine an error, and the value will be reset to the pre-adjustment value.

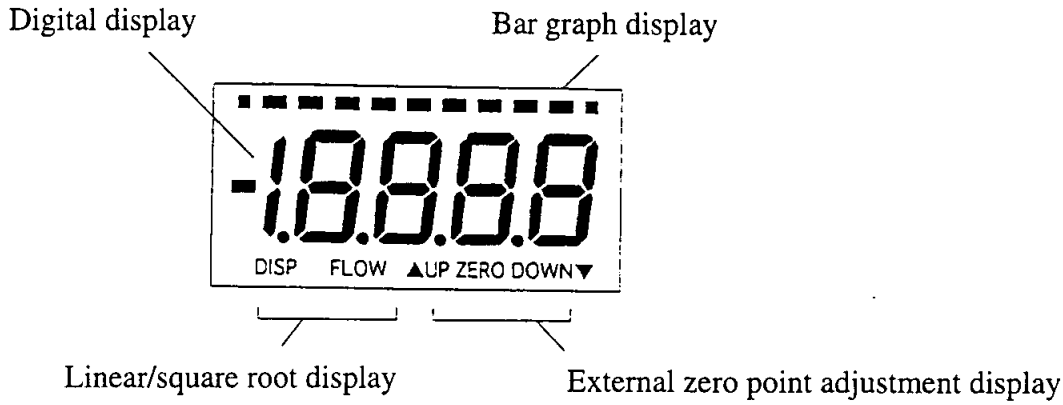
12.2 Influence due to Magnetic Fields

1. When a transmitter is installed in a strong magnetic field, the magnetic field will some have an effect and change the zero point, as with the magnet rod.
2. A magnetic field over 10 gauss may be generated near a motor or a pump. In such cases, install the transmitter at a distance of at least 1 to 2 m from the motor or pump.
   The magnetic field will fall to 2 to 3 gauss at a distance of 1 to 2 m.
3. If it is suspected that a magnetic field exceeding 10 gauss is present, measure this with a gauss meter and move the transmitter further away, to a place where the field is below 10 gauss.

13. Indicator (optional)

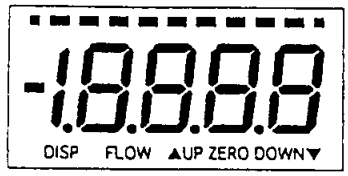
13.1 Identification of indicator parts

The names of the indicator parts are shown below.

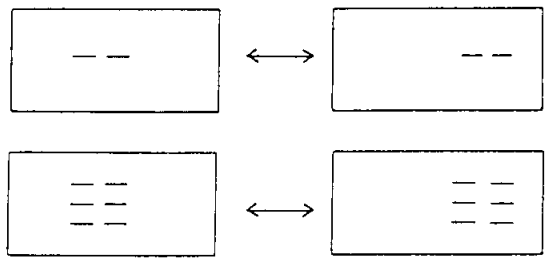


13.2 Digital display

The indicator digitally displays the transmitter output as a % value or in any engineering unit. The digital display is a 4.5 digit 7-segment LCD. Please note the following.

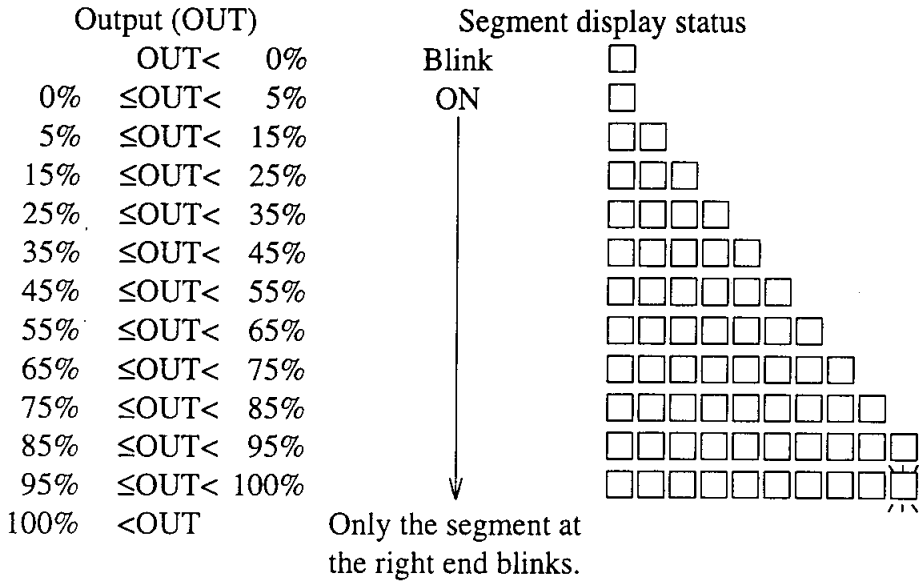


- If the current value exceeds the following range, the display limit value will blink.
  Current value < -19999
  Current value > 19999
- The indicator sometimes displays the following in the event of transmitter malfunction. In such cases, take the necessary action by referring to Item 13.7.



13.3 Analog bar graph display

The transmitter output is displayed in an 11-segment analog bar graph. The correspondence between the bar segment on/off states and the output values is shown below.



- In the constant current mode, the whole bar graph blinks.
- The bar graph and the digital display blink alternately.

13.4 Linear/square root extraction display

This function is used to determine whether the transmitter output value and the indicator display value are linear (differential pressure) or the result of square root extraction operation (flow rate).

The deciding criteria based on the display state are shown below.

Display	Output	Segment display status		Display	Name
		DISP	FLOW		
Linear (Differential pressure)	Linear (Differential pressure)	OFF	OFF	None	Linear
Square root extraction (Flow rate)	Linear (Differential pressure)	ON	ON	Disp flow	Display Flow Rate (Display Square Root Extraction)
Square root extraction (Flow rate)	Square root extraction (Flow rate)	OFF	ON	Flow	Flow Rate (Square Root Extraction)

13.5 External zero point adjustment display

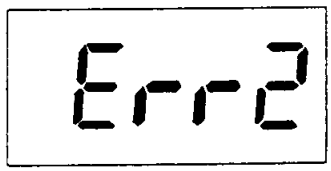
A transmitter with the external zero point adjustment function displays the operational status.
The deciding criteria based on the display status are shown below.
A transmitter with this function maintains a "ZERO" display.

Adjustment status	Segment display			Display
	△UP	ZERO	▽DOWN	
Output increasing	ON	ON	OFF	△UP ZERO
Output decreasing	OFF	ON	ON	ZERO ▽DOWN
Error	OFF	Blink	OFF	ZERO

• In the event of an error, take the necessary action by referring to Item 6.6. For the adjustment procedure, refer to Item 3.11.

13.6 Self-diagnosis display on indicator

Turn on the power and check to see if the indicator is normal.
• The indicator will not light up if there is a wiring error.
• When the indicator has an abnormality, an "Error No." corresponding to the abnormality will be displayed in the display unit.



Self-diagnosis error (ROM error)

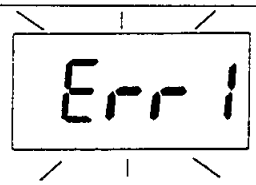
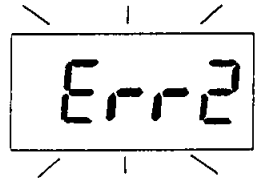
• If the transmitter itself has an abnormality, the messages explained in Item 3.10.2 will be displayed.

13.7 Self-diagnosis by indicator

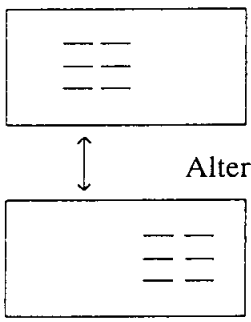
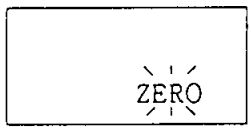
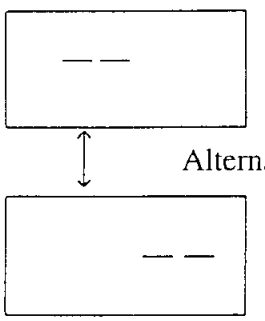
Introduction:

If the indicator or the transmitter has an abnormality, the details will be displayed in the digital display unit of the indicator.

Self-diagnosis following power on

Message	Meaning	Action
 (Blink)	Digital indicator RAM failure	Contact the location shown on the reverse side.
 (Blink)	Digital indicator ROM failure	Contact the location shown on the reverse side.

<b> Self-diagnosis during regular operation

Message	Meaning	Action
 Alternating display	Serious failure of transmitter	Contact the location shown on the reverse side.
 (Blink)	External zero point adjustment	Contact the location shown on the reverse side.
 Alternating display	Transmitter or indicator failure	Contact the location shown on the reverse side.

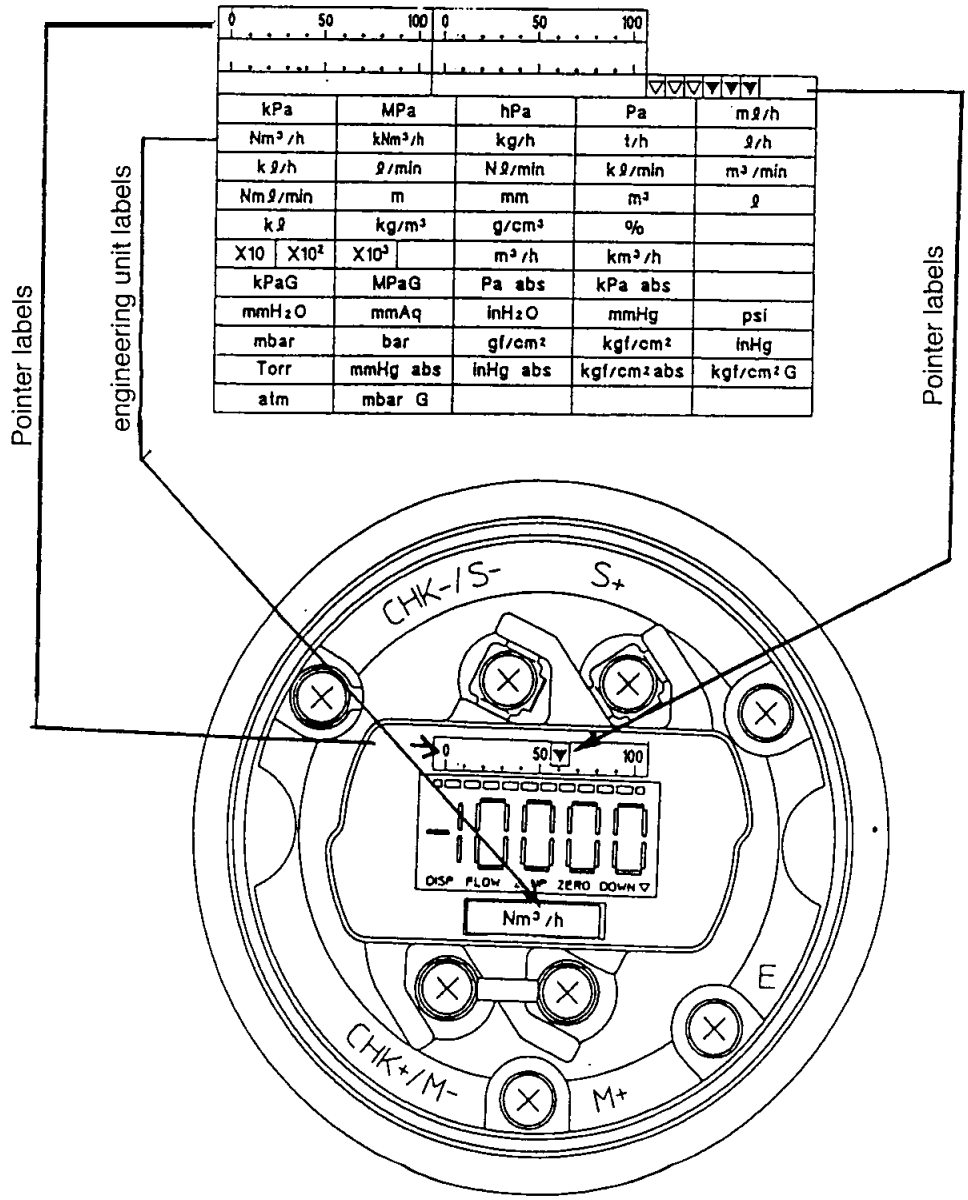
13.8 Engineering Unit Label

Use the engineering unit label sheet (included) to indicate the display area on the engineering unit.

* If you specify an engineering unit at the time of ordering, the equipment will be shipped with the specified label already attached. Change the engineering unit label by the following procedure when necessary.

* Pointer labels for analogue bar graphs are provided on the engineering unit label sheet. Use them for monitoring in the field.

1. Select a unit label or a pointer label and remove it from the sheet.
2. Attach the label to the designated position as illustrated below.



14. Direct Mounting (Patent pending)

14.1 Overview

Direct mounting is a simple kit (adaptor, tube clamp) designed to make it easy to install a remote seal transmitter on a tank for tank level measurements.

Direct mounting eliminates the need for a stanchion when installing the transmitter main unit. Achieving outstanding temperature characteristics is possible by selecting Yamatake Corporation's unique, fill-fluid temperature compensation function, which is standard for remote seal transmitters, and by careful positioning of the capillary tube.

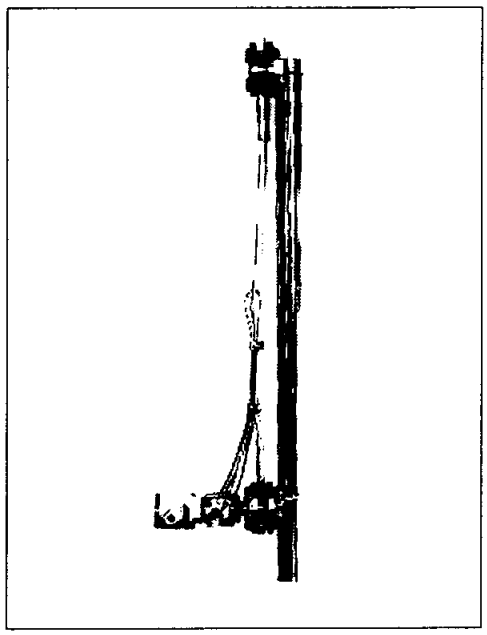


Figure 14.1 Example of Direct mounting Installation

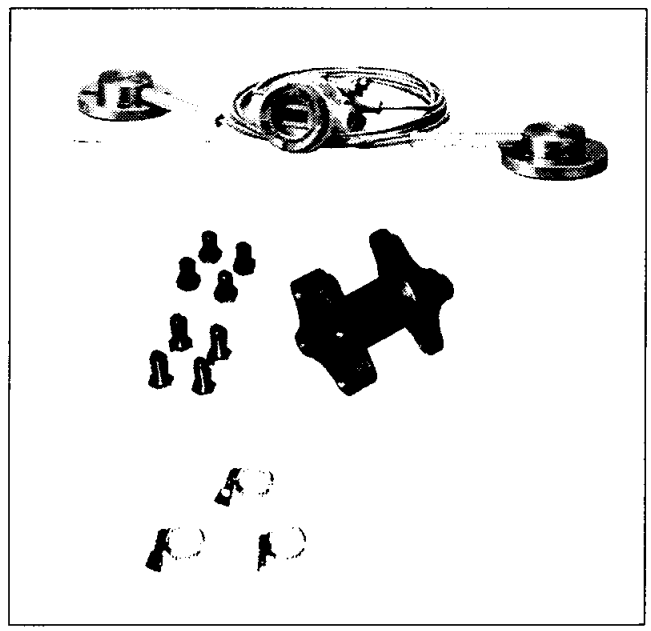


Figure 14.2 Remote Seal Transmitter and Direct mounting Installation Kit

14.2 Characteristics

(1) Simple, easy-to-install

• The adaptor lets you install the transmitter directly onto the exterior of any tank, eliminating the need for a 2B stanchion pipe. Direct mounting saves installation space and effort.

• The capillary tube can be firmly fastened with tube clamps. Optimum capillary tube length can be obtained simply by measuring the distance between tank flanges.

(2) Outstanding ambient temperature characteristics

• Yamatake Corporation's fill-fluid temperature compensation function (patented) minimizes the influence of ambient temperature changes, and greatly improves zero shift. It reduces the effect of seasonal temperature changes by 1/5 to 1/10 over previous models.

• Careful positioning of the capillary tube using the dedicated tube clamps can decrease zero shift due to differences in capillary temperature to half the previous level.

14.3 Specifications

Direct mounting installation kit specifications—remote seal transmitter accessory
For the remote seal transmitter specifications, refer to Appendix A.
— Direct mounting Installation Kit Specifications —
Material:
Adaptor: SCS13 (equivalent to SUS304)
Adaptor lock bolt: SUS304 (M8)
Tube clamp: Brass/nickel plated
Adaptor mounting:
Instrument side: Mounting with 4 adaptor lock bolts
Flange side: Mounting with 4 adaptor lock bolts
Tube clamp: Used for positioning and clamping the folded capillary tube.
Weight: About 600 g

14.4 Direct Mounting Transmitters

JTR926, JTR930, JTE929
JTR226, JTR229, JTR235

- A Direct mounting kit can be combined with the above remote seal differential pressure transmitters for general use only. It cannot be combined with high temperature, high temperature/vacuum, or high temperature/high vacuum models.

14.5 Installation procedure

14.5.1 Installation dimensions

Figure 14.3 is a view of an adaptor assembly mounted on a process, and Figure 14.4 is an external view of the adaptor. Figure 14.5 shows the installation kit adaptor length. For the other dimensions, refer to the external dimensions in "1. Overview."

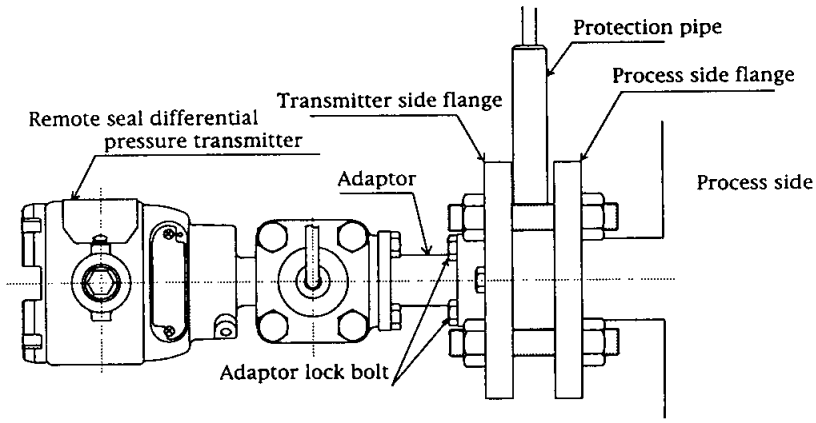


Figure 14.3 Adaptor Assembly (JTE)

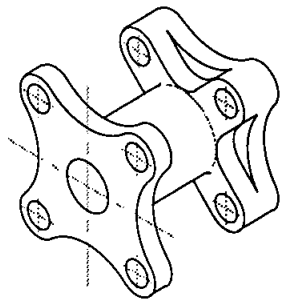


Figure 14.4 External View of Adaptor

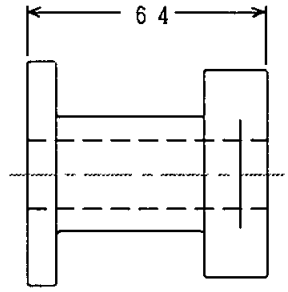


Figure 14.5 Adaptor Length

14.5.2 Installation location

Refer to A.5 Remarks about installation location.

14.5.3 Installation procedure

(1) Fixing the adaptor to a transmitter
Make sure that the adaptor is fixed firmly to the transmitter main unit with four bolts. (Refer to Figure 14.6.)

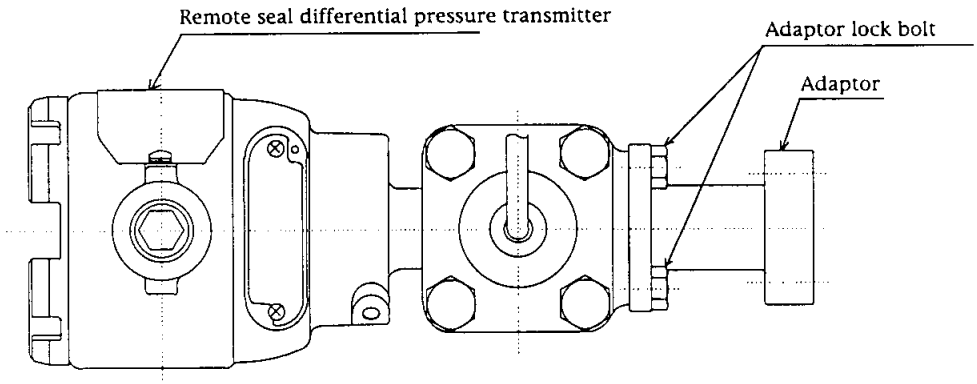


Figure 14.6 Mounting the adaptor on a transmitter

(2) Mounting the transmitter flange on the process side flange
Mount the transmitter flange *1 on the process side flange before fastening it to the end of the adaptor that was fixed to the transmitter in step (1). (Refer to Figure 14.7.)
*1) The transmitter can be fixed to either high or low pressure side flange.

> ⚠ Caution
> • When using a transmitter other than the JT□□29 model on an enclosed tank, be sure to mount the high pressure side connection flange (HP) on the upper side of the process.

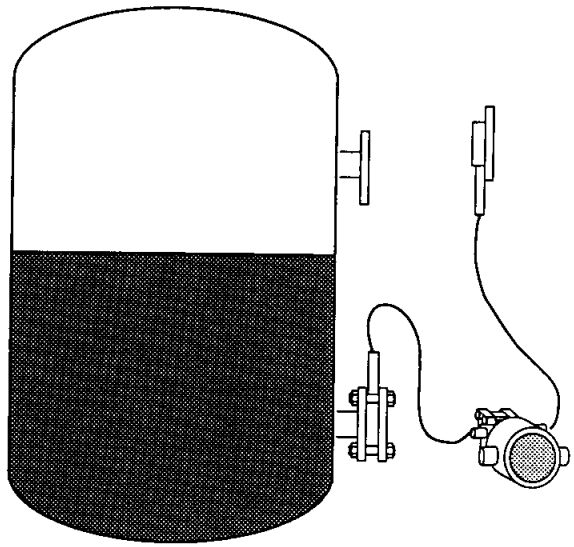


Figure 14.7 Installation on Process Side Flange No.1

① Installation on process flange
Install the transmitter flange on the process side flange using bolts and a gasket.

> ⚠ Caution
> • When installing on a flange, tighten the bolts evenly and firmly to prevent leakage.

② Gasket selection for flange
The process user should obtain the flange gasket. Select a gasket with an appropriate shape that will not contact the diaphragm with the pressure receiving unit. Select a gasket made from a material appropriate for the fluid, operating pressure and temperature. The inner diameter is an important factor.

> ⚠ Caution
> • Do not use a commercially available 3B gasket (inner diameter: 80 - 90 mm) for a 3B flush mount flange because the diaphragm diameter is 95 mm.
> • Select a gasket that will not contact the diaphragm even in the event of collapse or deformation. A gasket made of a soft material may be inappropriate since such materials are prone to deformation by tightening.
> • Align the gasket accurately. A gasket on a transmitter that is mounted in the vertical position may sometimes shift downward.
> • When using a gasket with protective FEP film, mount the film in accordance with Item 5, and do not tighten excessively, as this may damage the protective film.

⚠ Caution

• When the transmitter main unit is flange-mounted on the upper side of a process, the inner pressure in the tank must be at atmospheric pressures or higher. If this condition cannot be met, install the transmitter on the lower side of the process.

(3) Mounting a transmitter main unit with adaptor on the transmitter side flange
Ensure that the adaptor is firmly fitted to the transmitter: fasten the combination firmly to the transmitter side flange using 4 lock bolts (Refer to Figure 14.8.).

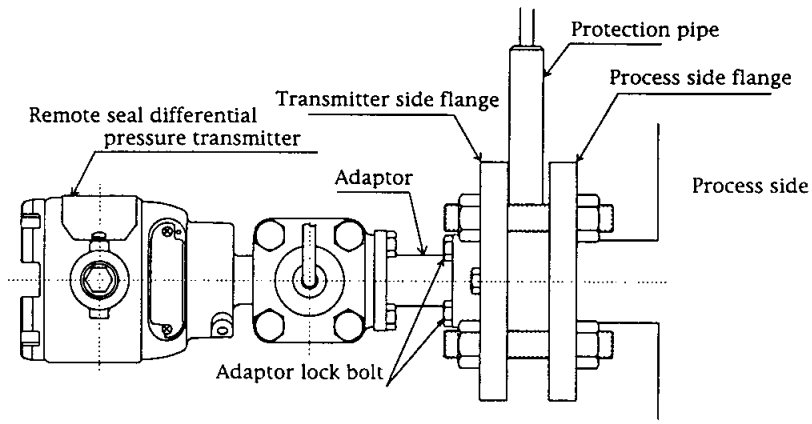


Figure 14.8 Installation on Transmitter Flange

(4) Mounting the other transmitter side flange on the process flange
Mount the other transmitter side flange on the process side flange. (Refer to Figure 14.9 and (2) ① and ② .)

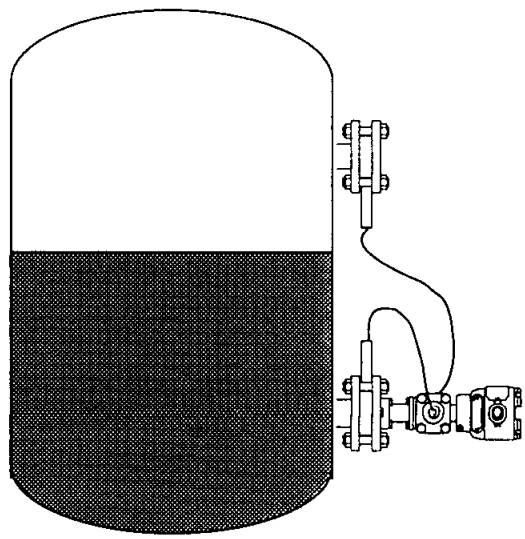


Figure 14.9 Installation on Process Side Flange No. 2

(5) Positioning the capillary tube using tube clamps
Carefully position the capillary tube using tube clamps (accessory). Clamp tightly, but do not squeeze the capillary tube (Refer to Figure 14.10.).

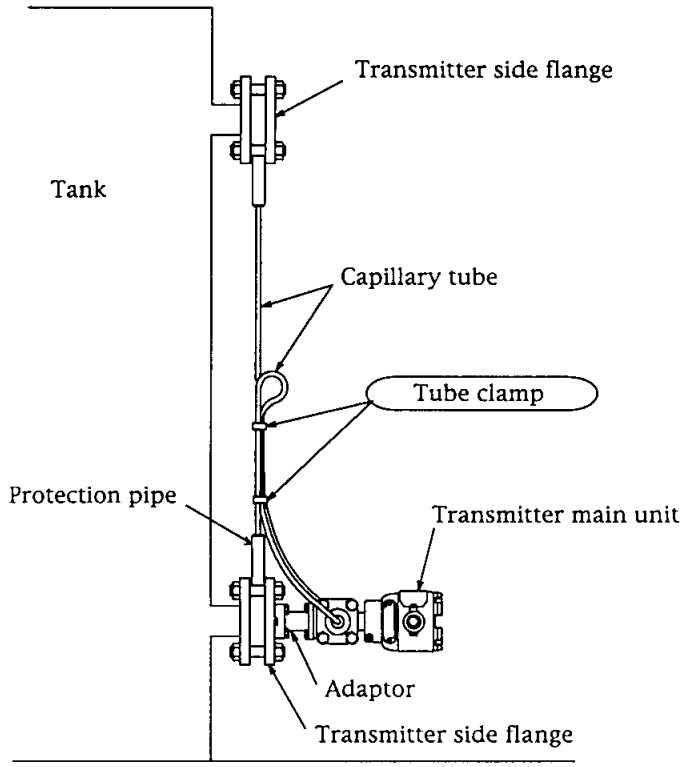


Figure 14.10 Capillary Tube Clamping

① Remarks about the capillary tube
(1) Do not twist the capillary tube.
(2) When positioning the capillary tube, hold the flange part and turn it to form a large ring.
(3) Fold the capillary tube without applying more force than necessary.
The minimum bending diameter is about 5 cm. Do not bend and straighten the capillary tube repeatedly.
(4) Do not turn the capillary tube so that it twists at the flange connection.
(5) Space the capillary tube clamps equally to prevent vibration.

⚠ Caution

• To maintain the capillary tube in a position higher than the lower process side flange, the pressure in the tank must be at atmospheric pressure or higher. If this condition is not met, ensure that the capillary tube is lower than the lower process side flange.
• If the capillary tube is to lead out of the transmitter at a positive angle, specify an olefin-coated tube.
• If the capillary tube has no olefin coating, make sure that it leads out of the transmitter at a negative angle, so that its drain position is below the horizontal. If not, rain water may accumulate in the protection pipe at the drain position.

(6) Zero adjustment
After installing a transmitter on a tank, adjust the zero point.
For the zero point adjustment procedure, refer to Item 6.3 or Item 6.5.3(8).

(7) Setting the fill fluid temperature compensation function
Set the distance between the flanges using the S-SFC.
For the setting procedure, refer to item 6.5.3(9).
For information about the sealed liquid temperature compensation function, refer to Item 6.2.4.
The influence of ambient temperature changes can be minimized and the zero point shift can be greatly improved by setting this function.

(8) Miscellaneous
① Open tank

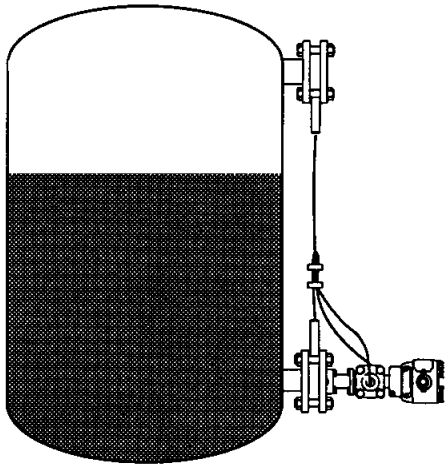
⚠ Caution

• The low pressure side flange of a transmitter that is not connected to the process should be fixed firmly in a location that is not exposed to large temperature changes or vibration. Damage to the seal diaphragm, drainage or dust will cause errors.

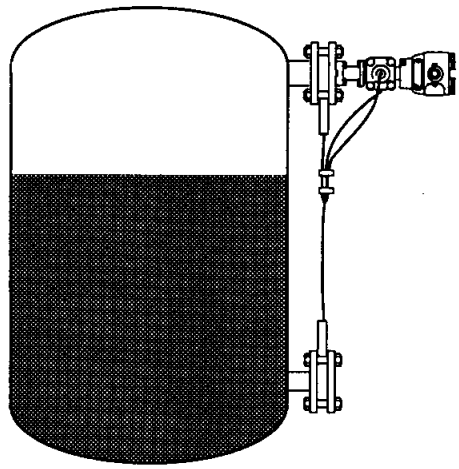
② Examples of installation under various conditions

Refer to Figure 14.11.

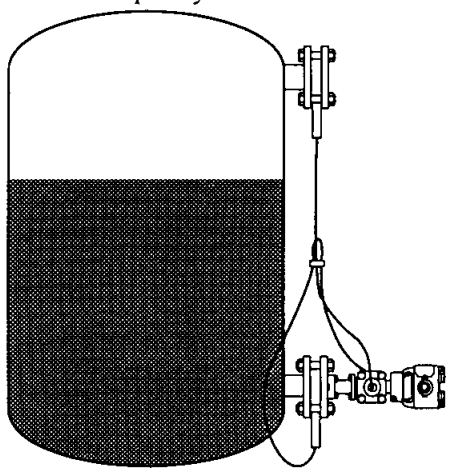
② Examples of installation under various conditions



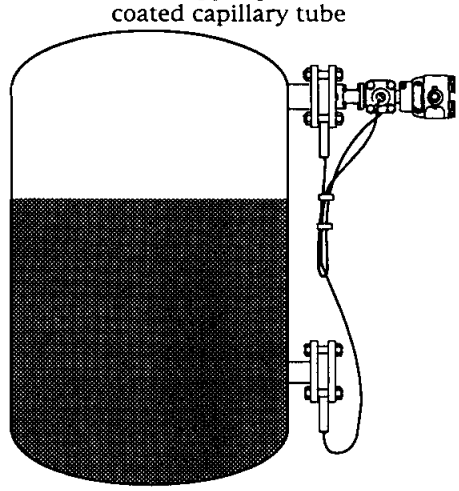
Pressure in tank : Atmospheric pressure, installation at the lower part of tank, olefin coated capillary tube



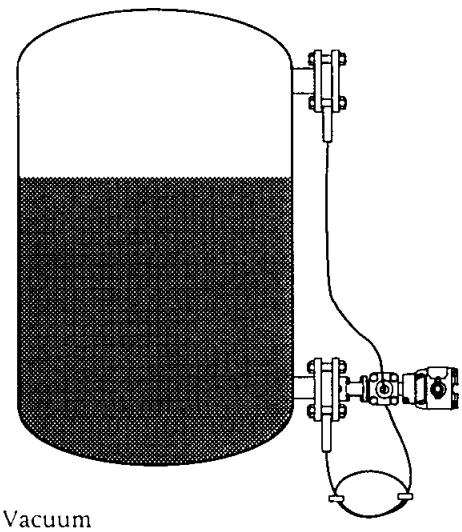
Pressure in tank : Atmospheric pressure, installation at the upper part of tank, olefin coated capillary tube



Pressure in tank : Atmospheric pressure, installation at the lower part of tank, non-olefin coated capillary tube



Pressure in tank : Atmospheric pressure, installation at the upper part of tank, non-olefin coated capillary tube



Pressure in tank : Vacuum
(below atmospheric pressure)

Figure 14.11 Installation under Various Conditions

YAMATAKE **Specification**

ST3000 Ace Smart Transmitter JTR Series of Remote-Sealed Type Differential Pressure Transmitters

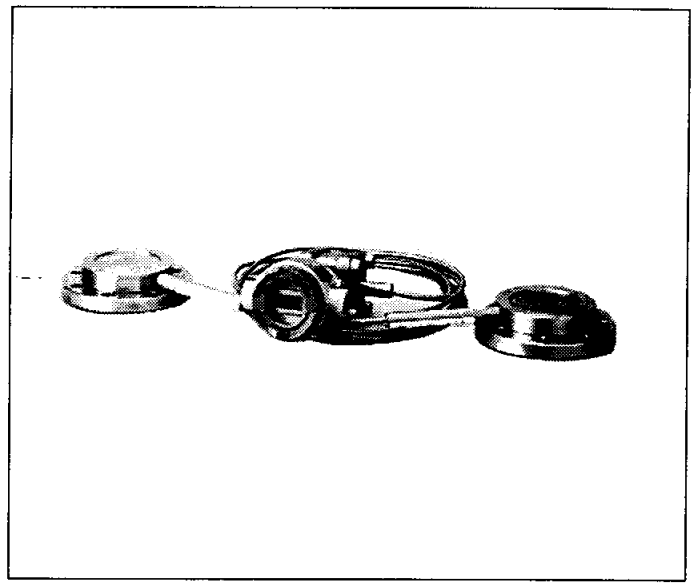
JTR929A/JTR930A

General

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, 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 SFC (Smart Field Communicator), and, via DE protocol, with the TDCS3000 or 3000^X and a database, thus facilitating self-diagnosis, range resetting, and automatic zero adjustment.

Remote-sealed differential pressure transmitters are suitable for the measurement of differential pressures (flow rates, liquid levels, etc.) of process fluids that are highly corrosive, tend to condense, precipitate metal, etc.



Features

(1) Excellent stability and high performance
- Long-term stability is proven in 500,000 installations worldwide.
- Unique characterization and composite semiconductor sensors realize excellent temperature and static pressure characteristics.

(2) A diverse lineup
- A wide range of models is available to meet user requirements. They include general purpose, high-temperature service, high-temperature vacuum service, and high-temperature high-vacuum service. In addition, the working temperature range of general purpose models has been expanded to 180°C maximum to allow you greater freedom in instrumentation.
- A wide variety of corrosion-resistant materials for wetted parts is also available.
- These differential pressure transmitters can be mounted in various ways, including direct mounting on tanks without using 2B stanchion pipes.

(3) Function to correct the temperature of the capillary section fill fluid:
- Changes in the density of the fill fluid caused by temperature fluctuations are calculated, and the output is corrected accordingly. This function substantially reduces (to 1/5—1/10) the effect of seasonal fluctuations in temperature.

(4) Multiprotocol communication
- Either analog output (4 to 20 mA dc), analog FSK output (4 to 20 mA dc) or digital output (DE protocol) is possible.
- Two-way communication using digital output facilitates self-diagnosis, range resetting, automatic zero adjustment, and other operations.

(5) Full after-sales service program
- From product delivery to replacement, we service all your needs. Our nationwide service network provides all the backup you require, including trial operation support and regular maintenance.

Applications

Petroleum/Petrochemical/Chemical
- For the measurement of liquid levels including corrosive fluids at high temperatures, and high temperatures under vacuum
- For the control of flow rates as used with tapless venturi tubes

Electric Power/City Gas/Other Utilities
- For measurement applications that require high degrees of stability and accuracy

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

Iron and Steel/Nonferrous Metal/Ceramics
- 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, vibration, etc.) conditions

Specifications

Measuring span/setting range/working pressure range:

See Table 1.

Output/communication:

Analog output (4 to 20 mA dc)

Analog FSK output (4 to 20 mA dc)

(Frequency shift keying signal transmission system)

Digital output (DE protocol)

Supply voltage and load resistance:

10.8 to 45 V dc. A load resistance of 250 Ω or more is necessary between loops. (See Figure 1)

Sealing liquid: Silicone oil for general purpose, high-temperature, high-temperature vacuum, and high-temperature high-vacuum models

Fluorine oil for oxygen and chlorine models

For specific gravity, see Table 2.

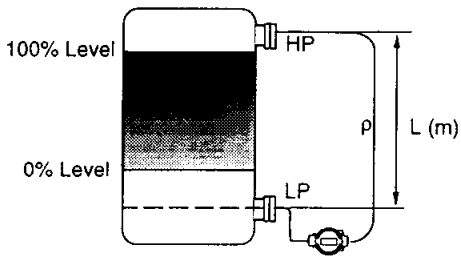
Function to correct the temperature of the capillary section fill fluid: (Patent No.1978534)

Changes in the density of the fill fluid (ρ) caused by temperature fluctuations are calculated, and the output is corrected accordingly. This function substantially reduces the effect of seasonal fluctuations in temperature.

<How to set this function>

Set the inter-flange height L (m) according to the SFC. If the height L (m) is already known, let us know, so, this function can be set before shipment.

If the high pressure side (HP) of your transmitter is located under the tank, place a minus (-) sign before the height L setting.



Temperature ranges of wetted parts:

See Table 2.

Ambient temperature ranges:

See Table 2, except for explosion-proof models with digital indicators, which have to be used within the following ranges:

Models with digital indicators:

Normal operating conditions: -20 to 70°C

Operative limits: -30 to 80°C

JIS pressure-resistant special explosion-proof models: -20 to 60°C

JIS intrinsically safe explosion-proof models: -10 to 60°C

Ambient humidity range:

5 to 100% RH

Stability against supply voltage change:

±0.005% FS/V

Lightning protection:

Peak value of voltage surge: 100 kV

Peak value of current surge: 1000 A

Dead time: Approx. 0.4 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:

JIS special explosion-proof models: (Exds II CT4)

JIS intrinsically safe models: (i3aG4)

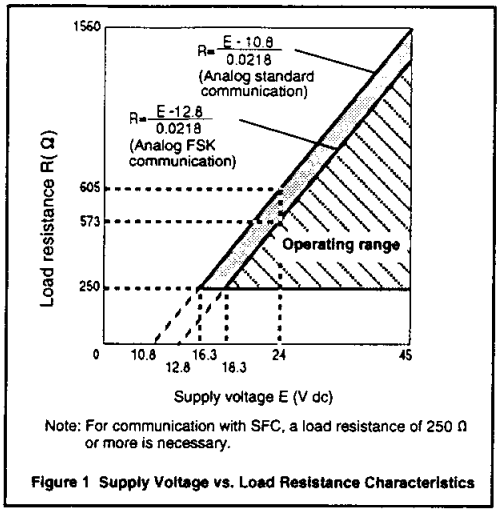
	Measuring Span	Setting Range	Working Pressure Range
JTR929A	2.5~100kPa (250~10160mmH₂O)	-100~100kPa (-10160~10160mmH₂O)	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2 and 3.) (For flange rating, see "Max Working Pressure")
JTR930A	35~700kPa (0.35~7kgf/cm²)	-100~700kPa (-1~7kgf/cm²)	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2 and 3.) (For flange rating, see "Max Working Pressure")

Table 1 Measuring Span, Setting Range, and Working Pressure Range

		Temperature Range (°C) Note 1), Note 4)			
		General-purpose models	High-temp./high-temp. vacuum models	High-temp. high-vacuum models	Oxygen and chlorine models
Wetted parts section	Normal operating range	-40~180	-5~280 Note 5)	10~280 Note 5)	-10~120
	Operative limit range	-50~185	-10~310 Note 6)	-10~310 Note 6)	-40~125
Ambient temperature Note 2)	Normal operating range	-30~75	-5~55	10~55	-10~75
	Operative limit range	-50~80	-10~60	-10~60	-40~80
Specific gravity of fill liquid Note 3)		0.935	1.07	1.09	1.87

Table 2 Temperature Range of Wetted Parts Section and Ambient Temperature Range

Note 1) See the working pressures and temperatures of the wetted parts section in Figure 2, Figure 3, and Figure 4.
Note 2) Ambient temperatures of the transmitter itself
Note 3) Approximate values at the temperature of 25°C
Note 4) Note that if the operating temperature falls below the lower limit of the normal operating range, the response of the transmitter becomes slower.
Note 5) When the wetted parts material is tantalum, the upper limit is 180°C.
Note 6) When the wetted parts material is tantalum, the upper limit is 200°C.



Note: For communication with SFC, a load resistance of 250 Ω or more is necessary.

Figure 1 Supply Voltage vs. Load Resistance Characteristics

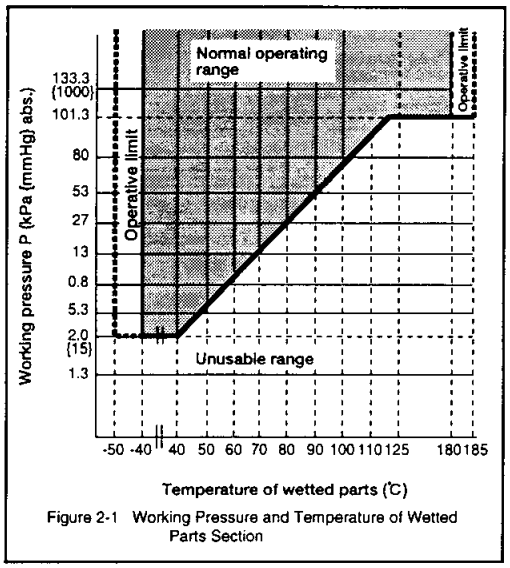


Figure 2-1 Working Pressure and Temperature of Wetted Parts Section

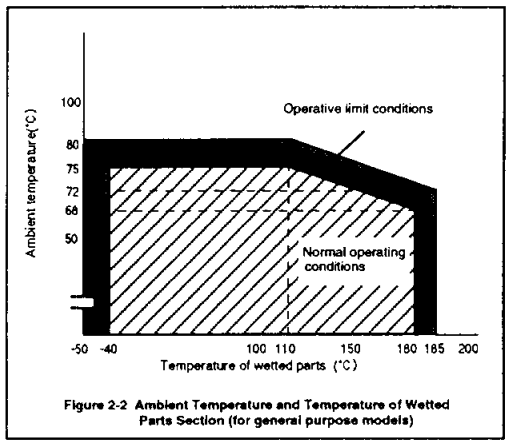


Figure 2-2 Ambient Temperature and Temperature of Wetted Parts Section (for general purpose models)

Note) When the fill liquid is for general purposes, makesure before using your transmitter that the conditions in both Figure 2-1 and Figure 2-2 are met.

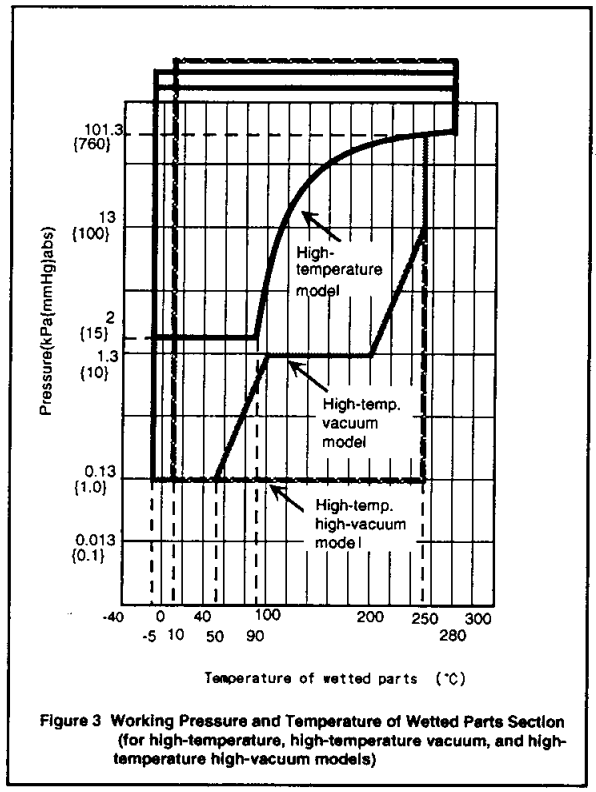


Figure 3 Working Pressure and Temperature of Wetted Parts Section (for high-temperature, high-temperature vacuum, and high-temperature high-vacuum models)

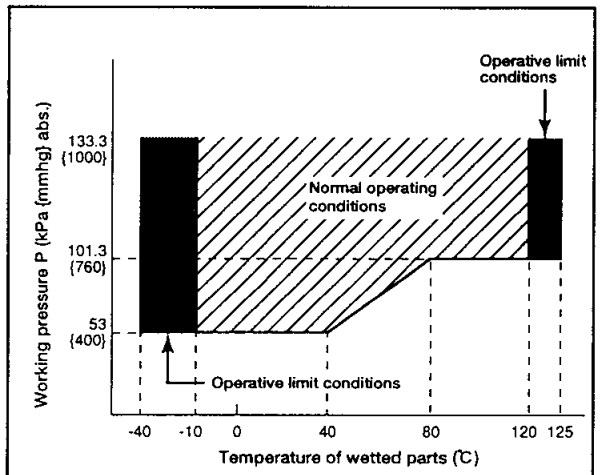
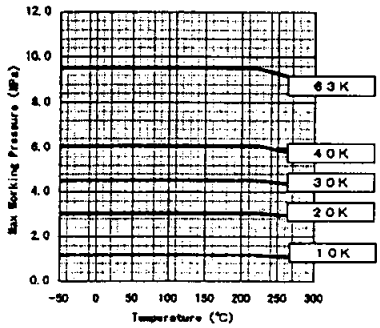
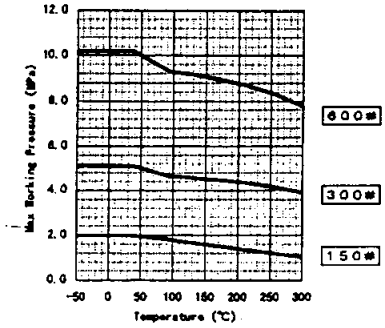
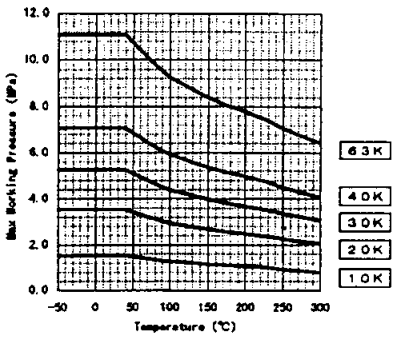
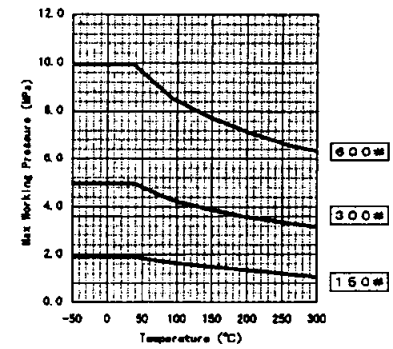
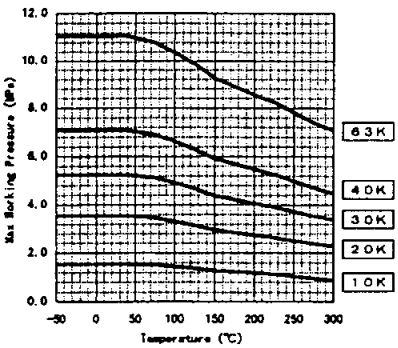
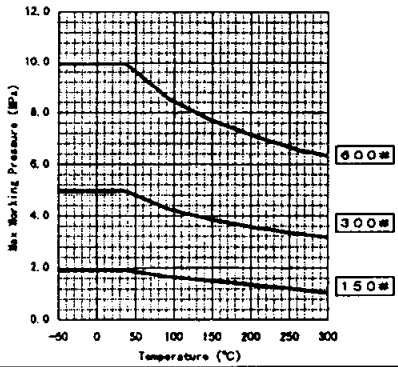
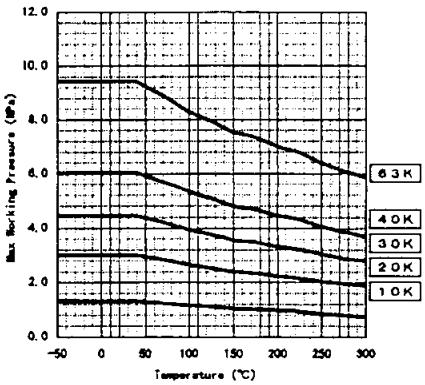
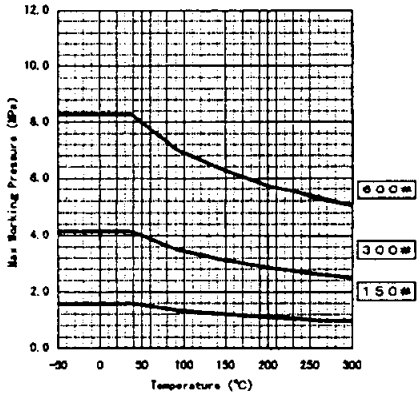


Figure 4 Working Pressure and Temperature of Wetted Parts Section (for oxygen and chlorine models)

Max Working Pressure

<*For Newloe*>

Note1. Max Working Pressure depends on flange rating , flange materials and operating temperature. Please refer to the following data.
Operating range of temperature depends on specification of transmitters
Note2. In case of flange type (JTF940□、JTC940□)and remote sealed type (JTU940□、JTH940□),
Max Working Pressure depends on the smaller value of either 1.5MPa or following data .
Note3. In case of absolute remote sealed type (JTS940□),
Max Working Pressure depends on the smaller value of either 3.5MPa abs or following data .
As for the following data , the vertical axis represent gage pressure.
Please exchange of units from gage pressure to absolute pressure, when you use.
Note4. In case of remote sealed type (JTH960□), Max Working Pressure depends on the smaller value of either 10MPa or following data .
Note5. In case of 1/2B remote sealed type (JTE929□,JTE930□,JTH960□),
Max Working Pressure depends on the smaller value of either 5.1MPa or the following data as for adoptor flange (HF) .

	JIS	JPI/ANSI
Carbon steal		
SUS304		
SUS316		
SUS316L		

Process pipe connection:

Flanges (both higher and lower pressure sides)

Flush diaphragm:

JIS10K, 20K, 30K, 63K, and 80A (RF) equivalents

ANSI150, 300, and 600-3B (RF) equivalents

JPI150, 300, and 600-3B (RF) equivalents

Extended diaphragm:

JIS10K, 20K, 30K, and 100A (RF) equivalents

ANSI150 and 300-4B (RF) equivalents

JPI150 and 300-4B (RF) equivalents

Electrical conduit connection:

G1/2 internal thread

1/2NPT internal thread (Not usable with JIS explosion-proof models)

Materials:

Center body: SUS316

Transmitter case: Aluminum alloy

Meter body cover: SUSF304

Wetted parts materials:

SUS316 (SUS316L for diaphragm only)

Hastelloy C, tantalum, etc.

Flange materials:

Carbon steel (SF440A), SUS304, SUS316, SUS316L

Bolts and nuts materials (for fastening meter body cover):

Carbon steel (SNB7), SUS630

Capillary section:

Capillary tube length: 2, 3, 4, 5, 6, 7, 8, 9, and 10 m

Capillary tube material: SUS316

Armored tube material: SUS304

Coating (optional): Olefin coating to improve corrosion resistance (Not usable with high-temperature vacuum or high-temperature high-vacuum models)

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-painted 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

lower limit

Grounding: Class 3 grounding (grounding resistance 100 Ω max.)

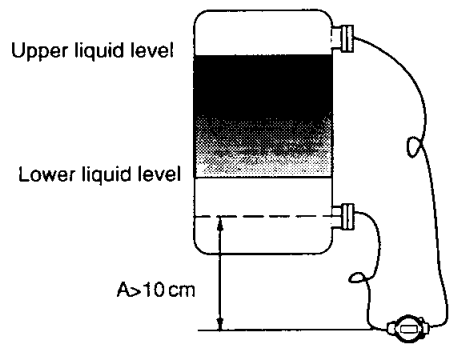
Mounting: Direct mounting on the process side

For mounting the transmitter body, choose between the following two methods:

(1) Using 2-inch pipe mounting brackets: Mount the transmitter on a horizontal or vertical 2-inch pipe, then use the brackets.

Materials: Brackets: carbon steel
U bolts and nuts: SUS304

Mounting Notes



1) If the fluid to be measured contains hydrogen, please consult us.

2) When mounting the transmitter, leave a space of at least 10 cm under the lower nozzle of the tank. If no space is available, please consult us.

Mounting (continued):

(2) Direct mounting (for general purpose model only)

Mount the transmitter directly on the tank using the direct mounting kit supplied.

<Features>

- Direct mounting saves space.
- Capillary tubes can be neatly arranged using tube clamps. This also improves temperature characteristics.

Direct mounting kit (weight: about 600 g)

Component	Material
Adaptor	SUS13 (SUS304 equivalent)
Adaptor fastening bolt	SUS304 (M8)
Tube clamp	Brass + nickel plating

Weight: Approx. 19.8 kg

(including JIS10K-80A flange and capillary 5 m long)

Tank Level Setting by Direct Mounting Method

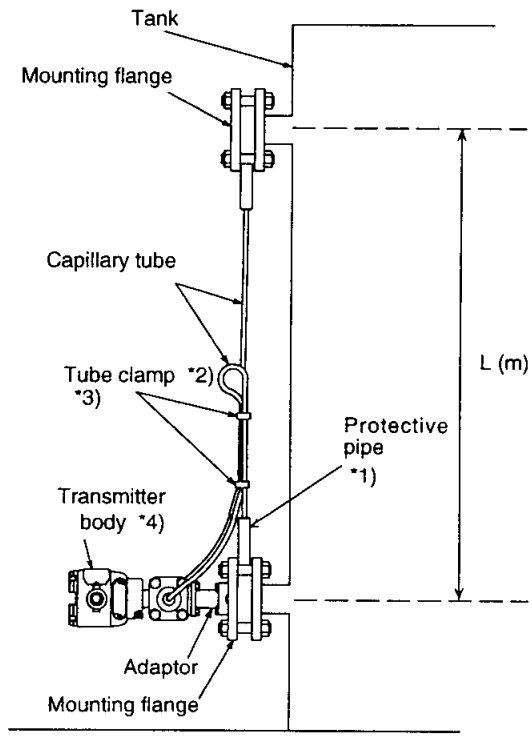
Notes)

*1) When fitting a protective pipe upward as shown in the figure, be sure to specify a capillary tube with olefin coating. If a capillary tube without olefin coating is to be used, set the capillary withdrawal direction downward a little.

*2) When bending a capillary tube, as shown in the figure, do not twist it. Also note that the minimum bending diameter is about 5 cm. Do not apply excessive force.

*3) Three tube clamps are supplied as an option. Referring to the figure, fix the tube at appropriate places. Do not tighten the clamps to the extent of deforming the tube.

*4) Before zero adjusting using the SFC, be sure to set the inter-flange height L (m) and use the capillary fill fluid temperature correction function.



Optional Specifications

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 and wherever high-performance lightning protection is required.

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 inhibiting treatment (including oil inhibiting treatment):

The transmitter is shipped with dry and oil-free wetted parts.

Oil inhibiting treatment:

The transmitter is shipped with oil-free wetted parts. (The vent drain plug is coated with a small amount of fluorine oil to prevent galling.)

FEP protective film:

Use FEP protective films when corrosive fluids are used or to inhibit ion migration from metal diaphragms.

Working temperature range:

0 to 110°C

Working pressure range:

atmospheric pressure to flange rating

(up to JIS10K, ANSI/JPI150)

(Not usable under negative pressure)

Electric power specification:

This specification applies where stringent quality control is required, such as in the electric 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.

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

Mill sheet: The mill sheet shows the chemical composition, heat-treatment conditions, and mechanical properties of the materials used for the wetted parts.

Documents of conformance to the High Pressure Gas Control Law (for general purposes):

This specification applies when documents verifying conformance to the High Pressure Gas Control Law are required. The documents consist of a strength calculation sheet, the mill sheet, and a pressure resistance and gas-tightness test result sheet.

Strength calculation sheet:

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

Pressure resistance and gas-tightness tests (for general purposes):

The pressure resistance and gas-tightness test result sheet shows the results of a pressure resistance test (under water pressure 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 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 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). Gasket protrusion may cause 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 explosion-proof product is a pull-in pressure-resistant packing-cable, be sure to use a pressure-resistant packing-cable adapter certified by Yamatake-Honeywell.**
- **When conduits are used for connection, be sure to use conduit fittings certified by Yamatake-Honeywell.**

⚠ Caution

- **After installing the transmitter, do not step on it. Using it as a foothold or the like could make it collapse and cause injury.**
- **Be careful not to hit the glass indicator with tools etc. This could break the glass and cause injury.**
- **This 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 breakdown.**
- **Use a power supply that conforms to the specifications. Use of an improper power supply may result in breakdown.**

Performance

Shown for each item are the upper limit (URV) [*1] and the lower limit (LRV) [*2] of the calibration range or the percentage ratio of the maximum value of the span to χ (kPa).

JTR929A (for general purpose and high-temperature models) Material for Wetted Parts: SUS316

Accuracy	Linear output:	$\pm$ 0.3%	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm$ $(0.3 \times \frac{12.5}{\chi})$ %	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	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 55°C**	Zero shift:	$\pm 0.75\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 0.75 \times \frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 1.6\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 1.6 \times \frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) **Change of 7MPa {70kgf/cm^2}**	Zero shift:	$\pm 0.75\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm (0.75 \times \frac{25}{\chi})\%$	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 1.00\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm (1.00 \times \frac{25}{\chi})\%$	($\chi < 25$kPa {2500mmH$_2$O})

JTR930A (for general purpose and high-temperature models) Material for Wetted Parts: SUS316

Accuracy [*3]	Linear output:	$\pm 0.2\%$	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm (0.05+0.15 \times \frac{210}{\chi})\%$	($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	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) [*3] **Change of 55°C**	Zero shift:	$\pm (0.25+0.5 \times \frac{210}{\chi})\%$	
	Combined shift: (including zero and span shifts)	$\pm 1.6\%$	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm (1.0+0.6 \times \frac{210}{\chi})\%$	($\chi < 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) [*3] **Change of 7MPa {70kgf/cm^2}**	Zero shift:	$\pm (0.75 \times \frac{700}{\chi})\%$	
	Combined shift:	$\pm (1.00 \times \frac{700}{\chi})\%$	

JTR929A (for general purpose and high-temperature models) Material for Wetted Parts: Hastelloy C, Tantalum

Accuracy	Linear output:	$\pm 0.4\%$ ($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm(0.4\times\frac{12.5}{\chi})\%$ ($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	When output is 50 to 100%: same as the 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 (Range from -5 to 55°C)	Zero shift:	$\pm 2.15\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O}) $\pm 2.15\times\frac{25}{\chi}\%$ ($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 3.0\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O}) $\pm 3.0\times\frac{25}{\chi}\%$ ($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm 6.00\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O}) $\pm(6.00\times\frac{25}{\chi})\%$ ($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 7.00\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O}) $\pm(7.00\times\frac{25}{\chi})\%$ ($\chi < 25$kPa {2500mmH$_2$O})

JTR930A (for general purpose and high-temperature models) Material for Wetted Parts: Hastelloy C, Tantalum

Accuracy (*3)	Linear output:	$\pm 0.2\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2}) $\pm(0.05+0.15\times\frac{2.1}{\chi})\%$ ($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	When output is 50 to 100%: same as the 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 (*3) (Range from -5 to 55°C)	Zero shift:	$\pm(0.15+0.7\times\frac{210}{\chi})\%$
	Combined shift: (including zero and span shifts)	$\pm 1.75\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2}) $\pm(1.00+0.75\times\frac{210}{\chi})\%$ ($\chi < 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) (*3) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm(0.75\times\frac{700}{\chi})\%$
	Combined shift: (including zero and span shifts)	$\pm(1.00\times\frac{700}{\chi})\%$

JTR929A (for high-temperature vacuum and high-temperature high-vacuum models)
Material for Wetted Parts: SUS316

Accuracy	Linear output:	$\pm$ 0.3% ($\chi \geqq$ 12.5kPa {1250mmH$_2$O})
		$\pm$ ($0.3 \times \frac{12.5}{\chi}$) % ($\chi <$ 12.5kPa {1250mmH$_2$O})
	Square-root output:	When output is 50 to 100%: same as the 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 (Range from -5 to 55°C)	Zero shift:	$\pm$1.5% ($\chi \geqq$ 25kPa {2500mmH$_2$O})
		$\pm 1.5 \times \frac{25}{\chi}$ % ($\chi <$ 25kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$2.5% ($\chi \geqq$ 25kPa {2500mmH$_2$O})
		$\pm 2.5 \times \frac{25}{\chi}$ % ($\chi <$ 25kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) 7MPa {70kgf/cm^2}	Zero shift:	$\pm$6.00% ($\chi \geqq$ 25kPa {2500mmH$_2$O})
		$\pm (6.00 \times \frac{25}{\chi})$% ($\chi <$ 25kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$7.00% ($\chi \geqq$ 25kPa {2500mmH$_2$O})
		$\pm (7.00 \times \frac{25}{\chi})$% ($\chi <$ 25kPa {2500mmH$_2$O})

JTR930A (for high-temperature vacuum and high-temperature high-vacuum models)
Material for Wetted Parts: SUS316

Accuracy (*3)	Linear output:	$\pm$0.2% ($\chi \geqq$ 210kPa {2.1kgf/cm^2})
		$\pm (0.05+0.15 \times \frac{210}{\chi})$% ($\chi <$ 210kPa {2.1kgf/cm^2})
	Square-root output:	When output is 50 to 100%: same as the 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 (*3) (Range from -5 to 55°C)	Zero shift:	$\pm (0.15+0.70 \times \frac{210}{\chi})$%
	Combined shift: (including zero and span shifts)	$\pm$1.75% ($\chi \geqq$ 210kPa {2.1kgf/cm^2})
		$\pm (1.00+0.75 \times \frac{210}{\chi})$% ($\chi <$ 210kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) (*3) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm (0.75 \times \frac{700}{\chi})$%
	Combined shift:	$\pm (1.00 \times \frac{700}{\chi})$%

JTR929A (for high-temperature vacuum and high-temperature high-vacuum models)
Material for Wetted Parts: Hastelloy C, Tantalum

Accuracy	Linear output:	$\pm 0.4\%$	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm(0.4\times\frac{12.5}{\chi})\%$	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	When output is 50 to 100%: same as the 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 (Range from -5 to 55°C)	Zero shift:	$\pm 2.15\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 2.15\times\frac{25}{\chi}\%$	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 3.0\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 3.0\times\frac{25}{\chi}\%$	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm 6.00\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(6.00\times\frac{25}{\chi})\%$	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 7.00\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(7.00\times\frac{25}{\chi})\%$	($\chi < 25$kPa {2500mmH$_2$O})

JTR930A (for high-temperature vacuum and high-temperature high-vacuum models)
Material for Wetted Parts: Hastelloy C, Tantalum

Accuracy (*3)	Linear output:	$\pm 0.2\%$	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(0.05+0.15\times\frac{2.1}{\chi})\%$	($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	When output is 50 to 100%: same as the 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 (*3) (Range from -5 to 55°C)	Zero shift:	$\pm(0.15+0.7\times\frac{210}{\chi})\%$	
	Combined shift: (including zero and span shifts)	$\pm 1.75\%$	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(1.00+0.75\times\frac{210}{\chi})\%$	($\chi < 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) (*3) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm(0.75\times\frac{700}{\chi})\%$	
	Combined shift: (including zero and span shifts)	$\pm(1.00\times\frac{700}{\chi})\%$	

Notes) (*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 $\geqq$ 0 and LRV $\geqq$ 0

Model Number Configuration Table

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTR) with Flush Diaphragm Flange for General Purpose and High-Temperature Models

Basic model number | Selections | Optional selections | Options

		Basic model number
Measuring span	2.5~100kPa	JTR929A
	35~700kPa	JTR930A

Forms of output/ communication	4 to 20mA dc (analog standard communication)	1
	4 to 20 mA dc (analog FSK communication)	2
	DE output	3
Wetted parts material	SUS316 (diaphragm: SUS316L)	2
	Tantalum	4
	Hastelloy C	H
	SUS316L	8
Sealing liquid	For general purposes: silicone oil	1
	For oxygen service: fluorine oil	2
	High-temperature model: silicone oil Note 1)	3
	For chlorine service: fluorine oil	5
Flange standard	JIS10K	A
	JIS20K	C
	JIS30K	D
	JIS63K	F
	ANSI150	G
	ANSI300	H
	ANSI600	J
	JPI150	N
	JPI300	P
	JPI600	Q
Flange diameter	3 B/80A	2
Flange shape	Standard	1
Flange material/ Bolt/nut material	Carbon steel/Carbon steel	A
	Carbon steel/SUS630	C
	SUS304/Carbon steel	D
	SUS304/SUS630	F
	SUS316/Carbon steel	G
	SUS316/SUS630	J
	SUS316L/Carbon steel	K
	SUS316L/SUS630	M
Capillary length	2 m	2
	3 m	3
	4 m	4
	5 m	5
	6 m	6
	7 m	7
	8 m	8
	9 m	9
	10 m	A
	2 m (Olefin covering)	B
	3 m (Olefin covering)	C
	4 m (Olefin covering)	H
	5 m (Olefin covering)	D
	6 m (Olefin covering)	J
	7 m (Olefin covering)	E
	8 m (Olefin covering)	F
	9 m (Olefin covering)	K
	10m (Olefin covering)	G

X	Electrical conduit and explosion-proof status								G1/2, not explosion-proof
1									G1/2, JIS explosion-proof, with single standard conduit fittings
H									G1/2, JIS explosion-proof, with double standard conduit fittings
2									G1/2, JIS explosion-proof, with single standard packing
3									G1/2, JIS explosion-proof, with double standard packing
6									G1/2, JIS intrinsically safe
A									1/2 NPT, not explosion-proof
□									Other
	X	Indicator							No meter
	1								Digital meter with standard reading (0 to 100%)
	2								Digital meter with actual reading
		X	Anticorrosion treatment						Standard coating
		A							Anticorrosion treatment
		B							Heavy-duty anticorrosion treatment
		D							Silver anticorrosion treatment
			X	Flange processing					None (Standard: JISRa3.2 (12.5 S))
			□						Other
				X	Burnout feature				None
				U					Upper limit of output at abnormal condition
				D					Lower limit of output at abnormal condition
					X	Mounting bracket			None
					1				Carbon steel (mounted on 2B pipe)
					P				Direct mounting (general purpose model only)
					□				Other

X X	No optional specifications
A 2	External zero adjustment
A 4	Additional lightning protection
B 7	For special local field meter
G 1	One elbow (left)
G 2	One elbow (right)
G 3	Two elbows
D 1	Water inhibiting treatment (including oil inhibition)
D 2	Oil inhibition
D 3	FEP protective film
J 2	Power specifications
J 8	Special burnout (3.2 mA)
T 1	Test report
T 2	Mill sheet
T 3	Document conforming to High Pressure Gas Control Law (for general purposes)
T 5	Strength calculation sheet
T 6	Pressure resistance/gas-tightness test (for general purposes)
T 8	Traceability certificate
U 2	Non-SI unit conformance
□□	Other

Note 1) The temperature range of tantalum wetted parts is -10 to 180°C.

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTR) with Extended Diaphragm Flange for General Purpose and High-Temperature Models

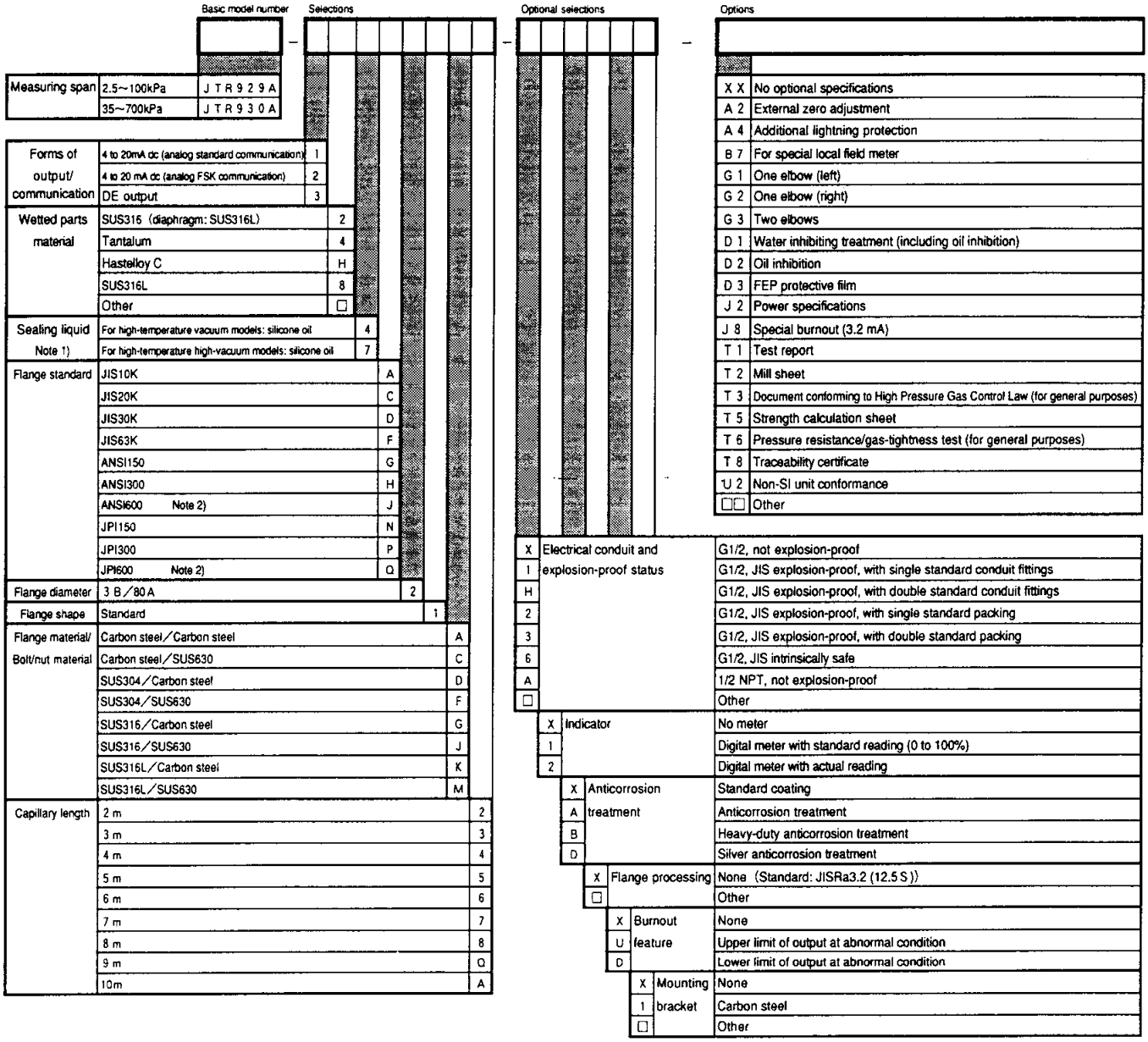
Basic model number | Selections | Optional selections | Options

Measuring span	2.5~100kPa	JTR929A	
	35~700kPa	JTR930A	
Forms of output/communication	4 to 20mA dc (analog standard communication)		1
	4 to 20 mA dc (analog FSK communication)		2
	DE output		3
Wetted parts material	SUS316 (diaphragm: SUS316L)		2
	SUS316L		8
Sealing liquid	For general purposes: silicone oil		1
	For oxygen service: fluorine oil		2
	High-temperature model: silicone oil		3
Flange standard	JIS10K		A
	JIS20K		C
	JIS30K		D
	ANSI150		G
	ANSI300		H
	JPI150		N
	JPI300		P
Flange diameter	4 B/100A		1
Flange shape	Length of extension 50mm		2
	Length of extension 100mm		3
	Length of extension 150mm		4
	Length of extension 200mm		5
	Length of extension 250mm		6
	Length of extension 300mm		7
Flange material/ Bolt/nut material	Carbon steel/Carbon steel		A
	Carbon steel/SUS630		C
	SUS304/Carbon steel		D
	SUS304/SUS630		F
	SUS316/Carbon steel		G
	SUS316/SUS630		J
	SUS316L/Carbon steel		K
	SUS316L/SUS630		M
Capillary length	2 m		2
	3 m		3
	4 m		4
	5 m		5
	6 m		6
	7 m		7
	8 m		8
	9 m		9
	10m		A
	2 m (Olefin covering)		B
	3 m (Olefin covering)		C
	4 m (Olefin covering)		H
	5 m (Olefin covering)		D
	6 m (Olefin covering)		J
	7 m (Olefin covering)		E
	8 m (Olefin covering)		F
	9 m (Olefin covering)		K
	10m (Olefin covering)		G

X	Electrical conduit and explosion-proof status	G1/2, not explosion-proof
1		G1/2, JIS explosion-proof, with single standard conduit fittings
H		G1/2, JIS explosion-proof, with double standard conduit fittings
2		G1/2, JIS explosion-proof, with single standard packing
3		G1/2, JIS explosion-proof, with double standard packing
6		G1/2, JIS intrinsically safe
A		1/2 NPT, not explosion-proof
□		Other
X	Indicator	No meter
1		Digital meter with standard reading (0 to 100%)
2		Digital meter with actual reading
X	Anticorrosion treatment	Standard coating
A		Anticorrosion treatment
B		Heavy-duty anticorrosion treatment
D		Silver anticorrosion treatment
X	Flange processing	None (Standard: JISRa3.2 (12.5S))
□		Other
X	Burnout feature	None
U		Upper limit of output at abnormal condition
D		Lower limit of output at abnormal condition
X	Mounting bracket	None
1		Carbon steel (mounted on 2B pipe)
P		Direct mounting (general purpose model only)
□		Other

XX	No optional specifications
A2	External zero adjustment
A4	Additional lightning protection
B7	For special local field meter
G1	One elbow (left)
G2	One elbow (right)
G3	Two elbows
D1	Water inhibiting treatment (including oil inhibition)
D2	Oil inhibition
J2	Power specifications
J8	Special burnout (3.2 mA)
T1	Test report
T2	Mill sheet
T3	Document conforming to High Pressure Gas Control Law (for general purposes)
T5	Strength calculation sheet
T6	Pressure resistance/gas-tightness test (for general purposes)
T8	Traceability certificate
U2	Non-SI unit conformance
□□	Other

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTR) with Flush Diaphragm Flange for High-Temperature Vacuum and High-Temperature High-Vacuum Models



Basic model number			Selections
Measuring span	2.5~100kPa	JTR929A	
	35~700kPa	JTR930A	
Forms of output/communication	4 to 20mA dc (analog standard communication)		1
	4 to 20 mA dc (analog FSK communication)		2
	DE output		3
Wetted parts material	SUS316 (diaphragm: SUS316L)		2
	Tantalum		4
	Hastelloy C		H
	SUS316L		8
	Other		□
Sealing liquid Note 1)	For high-temperature vacuum models: silicone oil		4
	For high-temperature high-vacuum models: silicone oil		7
Flange standard	JIS10K		A
	JIS20K		C
	JIS30K		D
	JIS63K		F
	ANSI150		G
	ANSI300		H
	ANSI600 Note 2)		J
	JPI150		N
	JPI300		P
	JPI600 Note 2)		Q
Flange diameter	3 B/80 A		2
Flange shape	Standard		1
Flange material/ Bolt/nut material	Carbon steel/Carbon steel		A
	Carbon steel/SUS630		C
	SUS304/Carbon steel		D
	SUS304/SUS630		F
	SUS316/Carbon steel		G
	SUS316/SUS630		J
	SUS316L/Carbon steel		K
	SUS316L/SUS630		M
Capillary length	2 m		2
	3 m		3
	4 m		4
	5 m		5
	6 m		6
	7 m		7
	8 m		8
	9 m		9
	10m		A

Optional selections			Options
			XX No optional specifications
			A2 External zero adjustment
			A4 Additional lightning protection
			B7 For special local field meter
			G1 One elbow (left)
			G2 One elbow (right)
			G3 Two elbows
			D1 Water inhibiting treatment (including oil inhibition)
			D2 Oil inhibition
			D3 FEP protective film
			J2 Power specifications
			J8 Special burnout (3.2 mA)
			T1 Test report
			T2 Mill sheet
			T3 Document conforming to High Pressure Gas Control Law (for general purposes)
			T5 Strength calculation sheet
			T6 Pressure resistance/gas-tightness test (for general purposes)
			T8 Traceability certificate
			U2 Non-SI unit conformance
			□□ Other
X	Electrical conduit and explosion-proof status		G1/2, not explosion-proof
1			G1/2, JIS explosion-proof, with single standard conduit fittings
H			G1/2, JIS explosion-proof, with double standard conduit fittings
2			G1/2, JIS explosion-proof, with single standard packing
3			G1/2, JIS explosion-proof, with double standard packing
6			G1/2, JIS intrinsically safe
A			1/2 NPT, not explosion-proof
□			Other
X	Indicator		No meter
1			Digital meter with standard reading (0 to 100%)
2			Digital meter with actual reading
X	Anticorrosion treatment		Standard coating
A			Anticorrosion treatment
B			Heavy-duty anticorrosion treatment
D			Silver anticorrosion treatment
X	Flange processing		None (Standard: JISRa3.2 (12.5 S))
□			Other
X	Burnout feature		None
U			Upper limit of output at abnormal condition
D			Lower limit of output at abnormal condition
X	Mounting bracket		None
1			Carbon steel
□			Other

Note 1) The temperature range of tantalum wetted parts section is -10 to 180°C.

Note 2) ANSI600 and JPI600 are not usable with high-temperature high-vacuum models at the flange standard.

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTR) with Extended Diaphragm Flange for High-Temperature Vacuum and High-Temperature High-Vacuum Models

Basic model number | Selections | Optional selections | Options

Measuring span	2.5~100kPa	JTR929A	
	35~700kPa	JTR930A	
Forms of output/communication	4 to 20mA dc (analog standard communication)		1
	4 to 20 mA dc (analog FSK communication)		2
	DE output		3
Wetted parts material	SUS316 (diaphragm: SUS316L)		2
	SUS316L		8
Sealing liquid	For high-temperature vacuum models: silicone oil		4
	For high-temperature high-vacuum models: silicone oil		7
Flange standard	JIS10K		A
	JIS20K		C
	JIS30K		D
	ANSI150		G
	ANSI300		H
	JPI150		N
	JPI300		P
Flange diameter	4B/100A		1
Flange shape	Length of extension 50mm		2
	Length of extension 100mm		3
	Length of extension 150mm		4
	Length of extension 200mm		5
	Length of extension 250mm		6
	Length of extension 300mm		7
Flange material/ Bolt/nut material	Carbon steel/Carbon steel		A
	Carbon steel/SUS630		C
	SUS304/Carbon steel		D
	SUS304/SUS630		F
	SUS316/Carbon steel		G
	SUS316/SUS630		J
	SUS316L/Carbon steel		K
	SUS316L/SUS630		M
Capillary length	2 m		2
	3 m		3
	4 m		4
	5 m		5
	6 m		6
	7 m		7
	8 m		8
	9 m		9
	10m		A

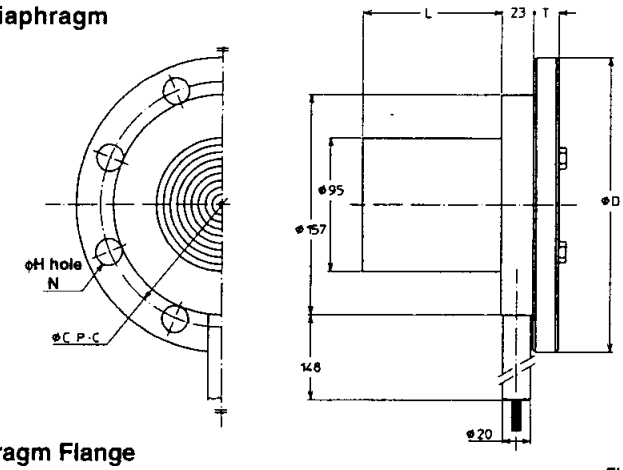
			XX No optional specifications
			A2 External zero adjustment
			A4 Additional lightning protection
			B7 For special local field meter
			G1 One elbow (left)
			G2 One elbow (right)
			G3 Two elbows
			D1 Water inhibiting treatment (including oil inhibition)
			D2 Oil inhibition
			J2 Power specifications
			J8 Special burnout (3.2 mA)
			T1 Test report
			T2 Mill sheet
			T3 Document conforming to High Pressure Gas Control Law (for general purposes)
			T5 Strength calculation sheet
			T6 Pressure resistance/gas-tightness test (for general purposes)
			T8 Traceability certificate
			U2 Non-SI unit conformance
			□□ Other
		X	Electrical conduit and explosion-proof status: G1/2, not explosion-proof
		1	Electrical conduit and explosion-proof status: G1/2, JIS explosion-proof, with single standard conduit fittings
		H	Electrical conduit and explosion-proof status: G1/2, JIS explosion-proof, with double standard conduit fittings
		2	Electrical conduit and explosion-proof status: G1/2, JIS explosion-proof, with single standard packing
		3	Electrical conduit and explosion-proof status: G1/2, JIS explosion-proof, with double standard packing
		5	Electrical conduit and explosion-proof status: G1/2, JIS intrinsically safe
		A	Electrical conduit and explosion-proof status: 1/2 NPT, not explosion-proof
		□	Electrical conduit and explosion-proof status: Other
	X		Indicator: No meter
	1		Indicator: Digital meter with standard reading (0 to 100%)
	2		Indicator: Digital meter with actual reading
X			Anticorrosion treatment: Standard coating
A			Anticorrosion treatment: Anticorrosion treatment
B			Anticorrosion treatment: Heavy-duty anticorrosion treatment
D			Anticorrosion treatment: Silver anticorrosion treatment
X			Flange processing: None (Standard: JISRa3.2 (12.5S))
□			Flange processing: Other
X			Burnout feature: None
U			Burnout feature: Upper limit of output at abnormal condition
D			Burnout feature: Lower limit of output at abnormal condition
X			Mounting bracket: None
1			Mounting bracket: Carbon steel
□			Mounting bracket: Other

Dimensions

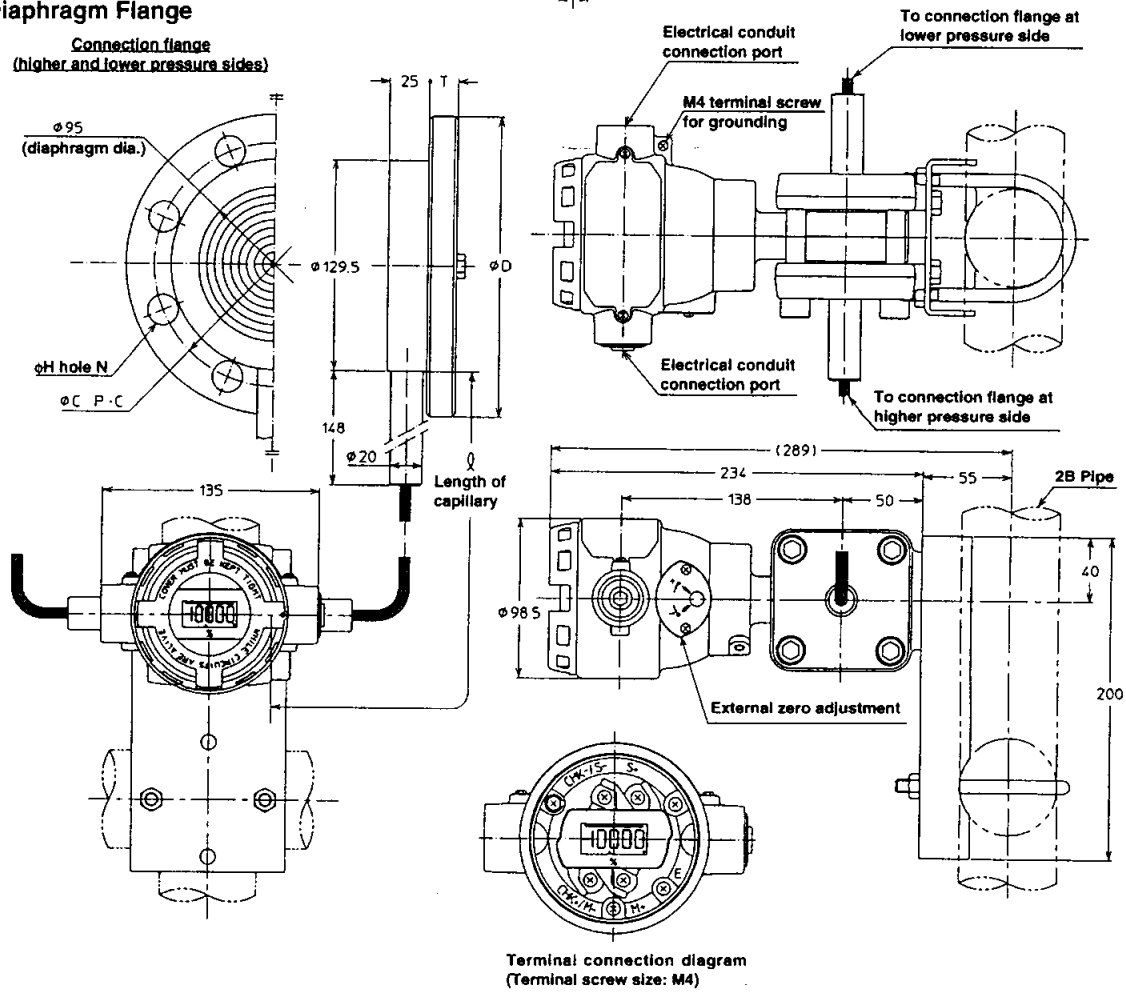
(Unit: mm)

JTR929A/930A General Purpose and High-Temperature Models

Extended Diaphragm Flange



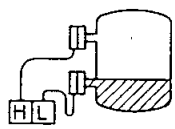
Flush Diaphragm Flange



Terminal connection diagram (Terminal screw size: M4)

Notes)

1. The transmitter can be mounted in various ways by changing the position of the mounting bracket. (A typical example is shown in the figure.)
2. To prevent vibration, you are recommended to fasten the capillary tube mid-length.
3. Select a gasket that will not contact the diaphragm after it is tightened.
4. When the volume of suppression is larger than one half of the adjustment span, the higher pressure side and the lower pressure side of the process connection end flange are opposite to those shown in the figure. When using the transmitter to measure liquid levels, connect at H and L marks on the meter body as shown in the figure below.

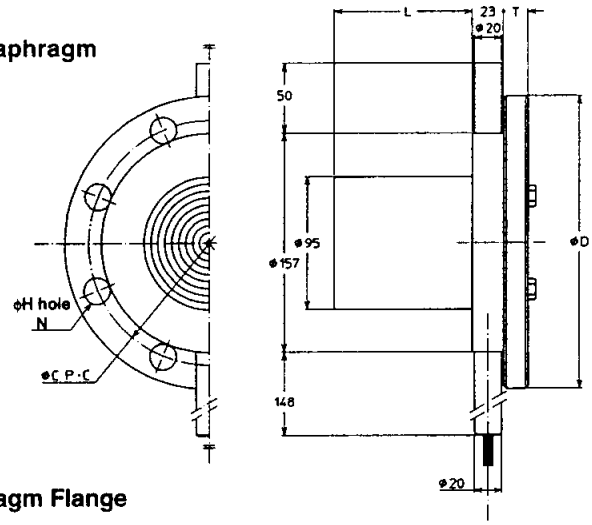


Meter body

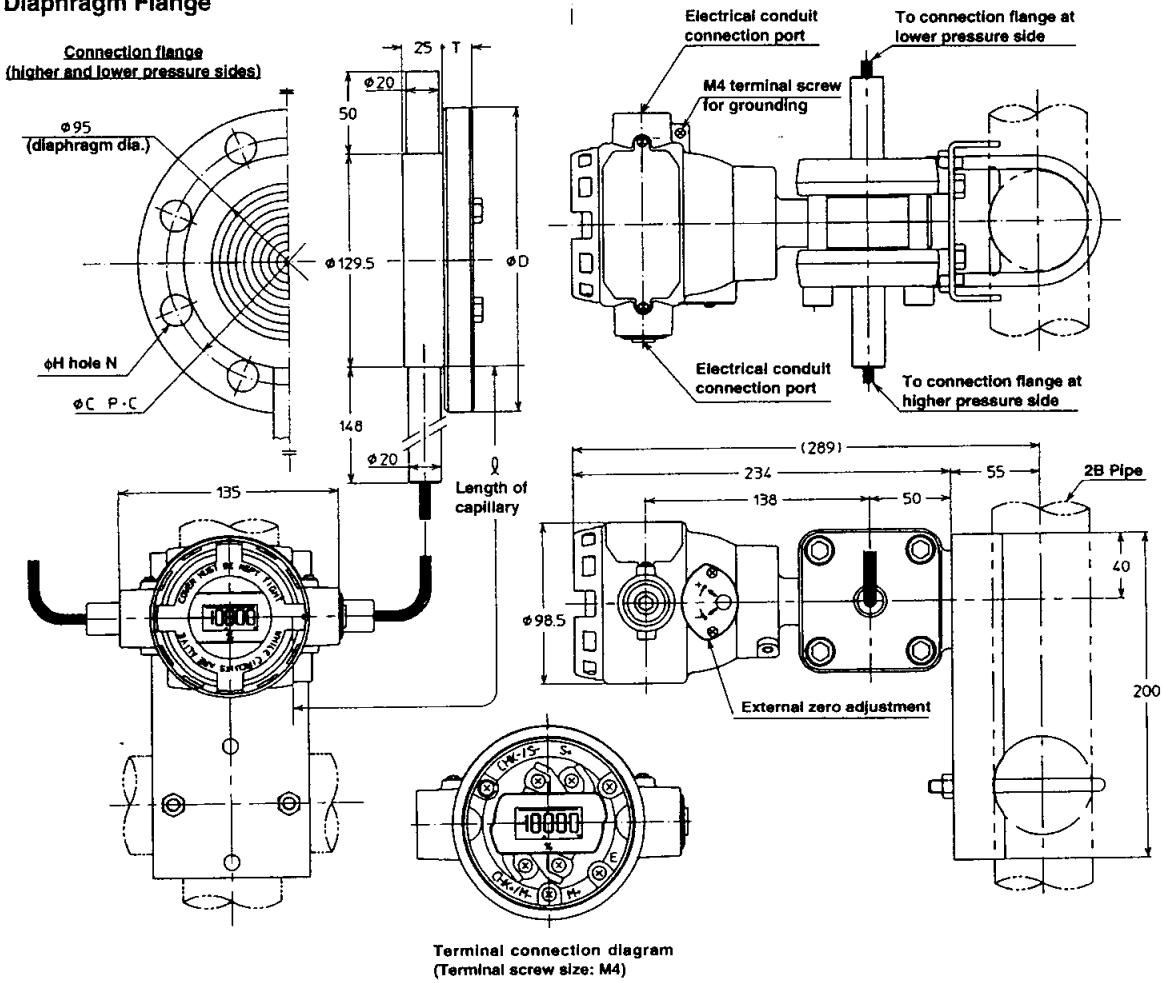
JTR929A/930A High-Temperature Vacuum and High-Temperature High-Vacuum Models

(Unit: mm)

Extended Diaphragm Flange



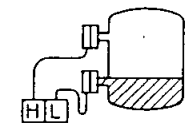
Flush Diaphragm Flange



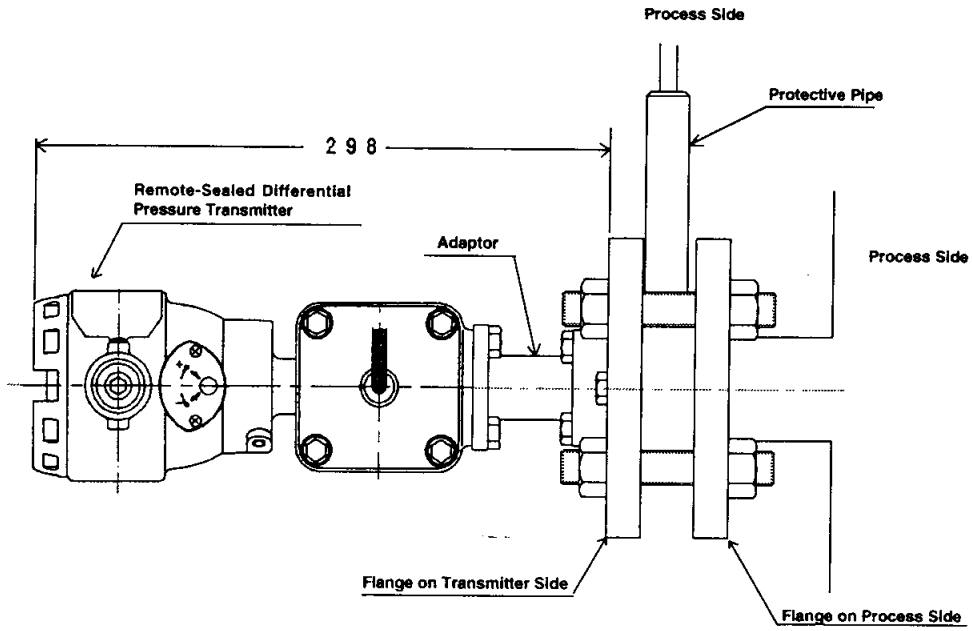
Terminal connection diagram
(Terminal screw size: M4)

Notes)

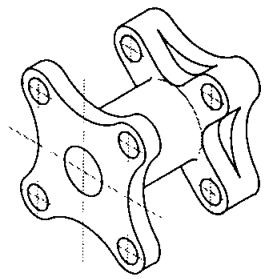
1. The transmitter can be mounted in various ways by changing the position of the mounting bracket. (A typical example is shown in the figure.)
2. To prevent vibration, you are recommended to fasten the capillary tube mid-length.
3. Select a gasket that will not contact the diaphragm after it is tightened.
4. When the volume of suppression is larger than one half of the adjustment span, the higher pressure side and the lower pressure side of the process connection end flange are opposite to those shown in the figure. When using the transmitter to measure liquid levels, connect at H and L marks on the meter body as shown in the figure below.



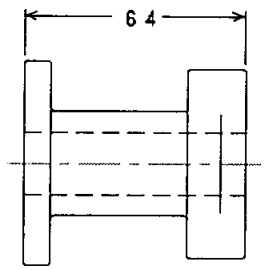
Meter body



Adaptor Assembly Drawing (JTR Type + Adaptor)



Adaptor Outline Drawing



Adaptor Dimension Drawing

Table of Flange Dimensions
(Flush Diaphragm Flange)

(Unit: mm)

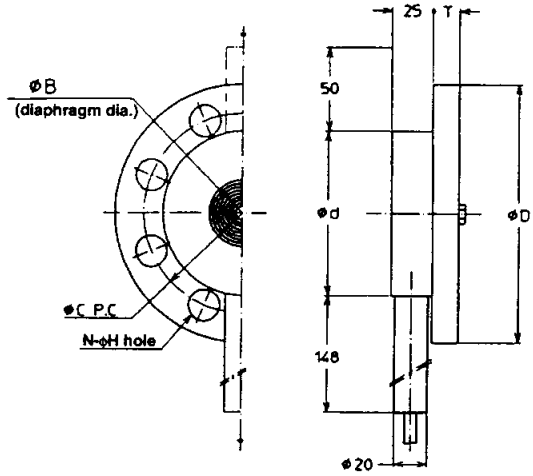


Table of Flange Dimensions

Flange standard	ϕD	T	ϕC	N	ϕH	ϕd	ϕB
JIS 10K-80A	185	18	150	8	19	129.5	95
JIS 20K-80A	200	22	160	8	23		
JIS 30K-80A	210	28	170	8	23		
JIS 63K-80A	230	40	185	8	25		
ANSI 150-3B	190	24	152.4	4	19		
ANSI 300-3B	210	28.5	168.1	8	22		
ANSI 600-3B	210	32	168.1	8	22		
JPI 150-3B	190	24	152.4	4	19		
JPI 300-3B	210	28.5	168.1	8	22		
JPI 600-3B	210	32	168.1	8	22		

(Extended Diaphragm Flange)

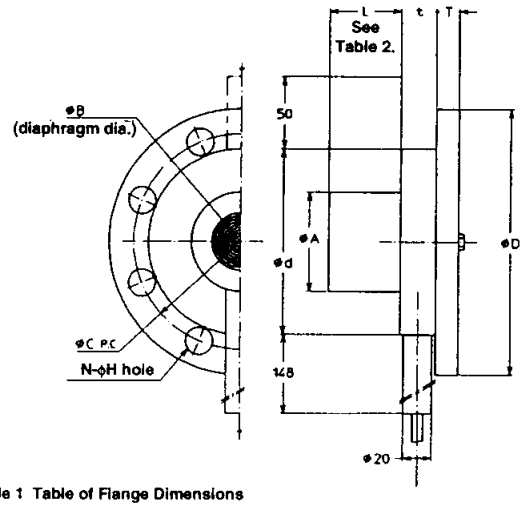


Table 1 Table of Flange Dimensions

Flange standard	ϕD	T	t	ϕC	N	ϕH	ϕd	ϕA	ϕB
JIS 10K-100A	210	18	23	175	8	19	95	95*1	90
JIS 20K-100A	225	24		185	8	23			
JIS 30K-100A	240	32		195	8	25			
ANSI 150-4B	229	24		190.5	8	19			
ANSI 300-4B	254	32		200.2	8	22			
JPI 150-4B	229	24		190.5	8	19			
JPI 300-4B	254	32		200.2	8	22			

Table 2 Length of Extension

L
50
100
150
200
250
300

YAMATAKE Specification

ST3000 Ace Smart Transmitter JTE Series of Remote-sealed Type Differential Pressure Transmitters

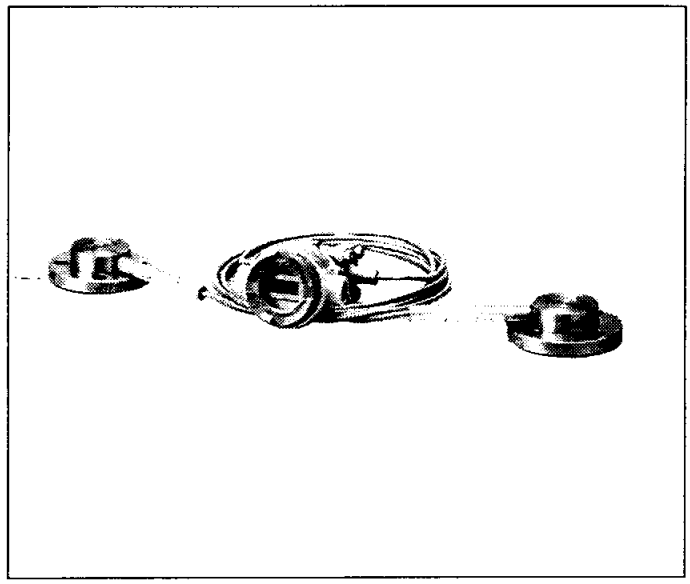
JTE929A/JTE930A

General

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, 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 SFC (Smart Field Communicator), and, via DE protocol, with the TDCS3000 or 3000^X and a database, thus facilitating self-diagnosis, range resetting, and automatic zero adjustment.

Remote-sealed differential pressure transmitters are suitable for the measurement of differential pressures (flow rates, liquid levels, etc.) of process fluids that are highly corrosive, tend to condense, precipitate metal, etc.



Features

(1) Excellent stability and high performance
- Long-term stability is proven in 500,000 installations worldwide.
- Unique characterization and composite semiconductor sensors realize excellent temperature and static pressure characteristics.

(2) A diverse lineup
- A diverse flange lineup, ranging from small diameter 1.5B (40A) and 2B (50A) to 3B (80A), is available to meet user requirements.
- A wide range of models, including those for general purposes and high-temperature service, is available to meet user requirements. In addition, the working temperature range of general purpose models has been expanded to 180°C maximum to allow you greater freedom in instrumentation.
- A wide variety of corrosion-resistant materials for wetted parts is also available.
- These differential pressure transmitters can be mounted in various ways, including direct mounting on tanks without using 2B stanchion pipes.

(3) Function to correct the temperature of the fill fluid of the capillary section:
- Changes in the density of the fill fluid caused by temperature fluctuations are calculated, and output is corrected accordingly. This function substantially reduces (to 1/5—1/10) the effect of seasonal fluctuations in temperature.

(4) Multiprotocol communication
- Either analog output (4 to 20 mA dc), analog FSK output (4 to 20 mA dc) or digital output (DE protocol) is possible.
- Two-way communication using digital output facilitates self-diagnosis, range resetting, automatic zero adjustment, and other operations.

(5) Full after-sales service program
- From product delivery to replacement, we service all your needs. Our nationwide service network provides all the backup you require, including trial operation support and regular maintenance.

Applications

Petroleum/Petrochemical/Chemical
- For the measurement of liquid levels including corrosive fluids at high temperatures, and high temperatures under vacuum
- For the control of flow rates as used with tapless venturi tubes
- For replacement of displacement type level gauges
- For materialization of instrumentation without connecting tubes

Electric Power/City Gas/Other Utilities
- For measurement applications that require high degrees of stability and accuracy

Pulp and Paper
- For lines that need transmitters resistant to chemical liquids, corrosive fluids and the like
- For the measurement of liquid levels in small tanks

Iron and Steel/Nonferrous Metal/Ceramics
- 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, vibration, etc.) conditions

Specifications

Measuring span/setting range/working pressure range:

See Table 1.

Output/communication:

Analog output (4 to 20 mA dc)

Analog FSK output (4 to 20 mA dc)

(Frequency shift keying signal transmission system)

Digital output (DE protocol)

Supply voltage and load resistance:

10.8 to 45 V dc. A load resistance of 250 Ω or more is necessary between loops. (See Figure 1)

Sealing liquid: Silicone oil for general purpose and high-temperature models

Fluorine oil for oxygen and chlorine models

For specific gravity, see Table 2.

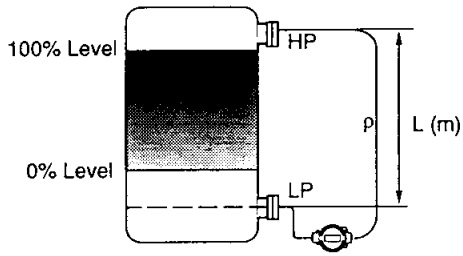
Function to correct the temperature of the capillary section fill fluid : (Patent No.1978534)

Changes in the density of the fill fluid (ρ) caused by temperature fluctuations are calculated, and the output is corrected accordingly. This function substantially reduces the effect of seasonal fluctuations in temperature.

<How to set this function>

Set the inter-flange height L (m) according to the SFC. If the height L (m) is already known, let us know, so, this function can be set before shipment.

If the high pressure side (HP) of your transmitter is located under the tank, place a minus (-) sign before the height L setting.



Temperature ranges of wetted parts:

See Table 2.

Ambient temperature ranges:

See Table 2, except for explosion-proof models with digital indicators, which have to be used within the following ranges:

Models with digital indicators:

Normal operating conditions: -20 to 70°C

Operative limits: -30 to 80°C

JIS pressure-resistant special explosion-proof models: -20 to 60°C

JIS intrinsically safe explosion-proof models: -10 to 60°C

Ambient humidity range:

5 to 100% RH

Stability against supply voltage change:

±0.005% FS/V

Lightning protection:

Peak value of voltage surge: 100 kV

Peak value of current surge: 1000 A

Dead time: Approx. 0.4 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:

JIS special explosion-proof models: (Exds II CT4)

JIS intrinsically safe models: (i3aG4)

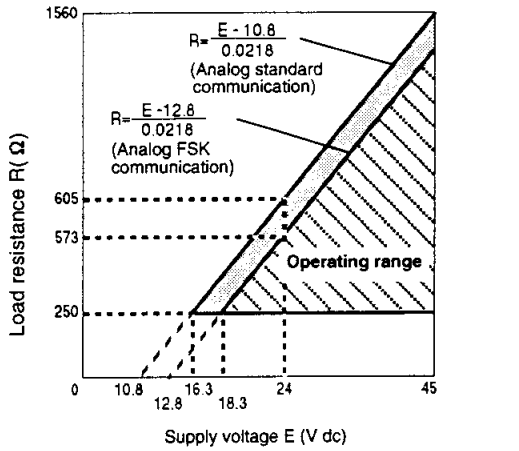
	Measuring Span	Setting Range	Working Pressure Range
JTE929A	2.5~100kPa (250~10160mmH$_2$O)	-100~100kPa (-10160~10160mmH$_2$O)	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2, 3, and 4.) (For flange rating, see "Max Working Pressure")
JTE930A	35~700kPa (0.35~7kgf/cm^2)	-100~700kPa (-1~7kgf/cm^2)	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2, 3, and 4.) (For flange rating, see "Max Working Pressure")

Table 1 Measuring Span, Setting Range, and Working Pressure Range

		Temperature Range (℃) Note 1), Note 4)		
		General-purpose models	High-temperature models	Oxygen and chlorine models
Wetted parts section	Normal operating range	-40~180	-5~280 Note 5)	-10~120
	Operative limit range	-50~185	-10~310 Note 6)	-40~125
Ambient temperature Note 2) Flange diameter: Flush diaphragm type 3B (80A) Extended diaphragm type 4B (100A)	Normal operating range	-30~75	-5~55	-10~75
	Operative limit range	-50~80	-10~60	-40~80
Ambient temperature Note 2) Flange diameter: Flush diaphragm type 2B (50A) /1.5B (40A) Extended diaphragm type 3B (80A) /2B (50A)	Normal operating range	-15~65	-5~45	-10~75
	Operative limit range	-30~80	-10~55	-40~80
Specific gravity of fill liquid Note 3)		0.935	1.07	1.87

Table 2 Temperature Range of Wetted Parts Section and Ambient Temperature Range

Note 1) See the working pressures and temperatures of the wetted parts section in Figure 2, Figure 3, and Figure 4.
Note 2) Ambient temperatures of the transmitter itself
Note 3) Approximate values at the temperature of 25°C
Note 4) Note that if the operating temperature falls below the lower limit of the normal operating range, the response of the transmitter becomes slower.
Note 5) When the wetted parts material is tantalum, the upper limit is 180°C.
Note 6) When the wetted parts material is tantalum, the upper limit is 200°C.



Note: For communication with SFC, a load resistance of 250 Ω or more is necessary.

Figure 1 Supply Voltage vs. Load Resistance Characteristics

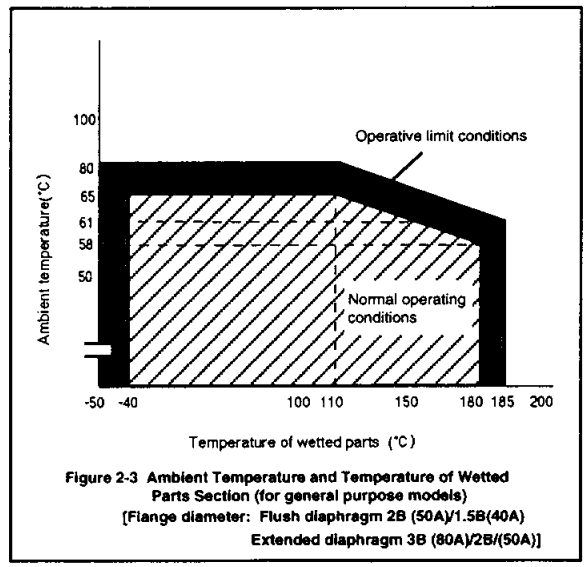


Figure 2-3 Ambient Temperature and Temperature of Wetted Parts Section (for general purpose models)
[Flange diameter: Flush diaphragm 2B (50A)/1.5B(40A)
Extended diaphragm 3B (80A)/2B/(50A)]

Note) When the fill liquid is for general purposes, makesure before using your transmitter that the conditions in both Figure 2-1,2-2 and Figure 2-3 are met.

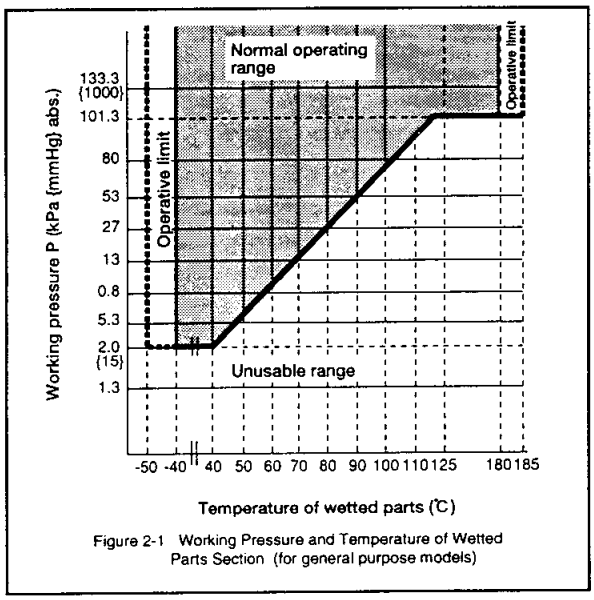


Figure 2-1 Working Pressure and Temperature of Wetted Parts Section (for general purpose models)

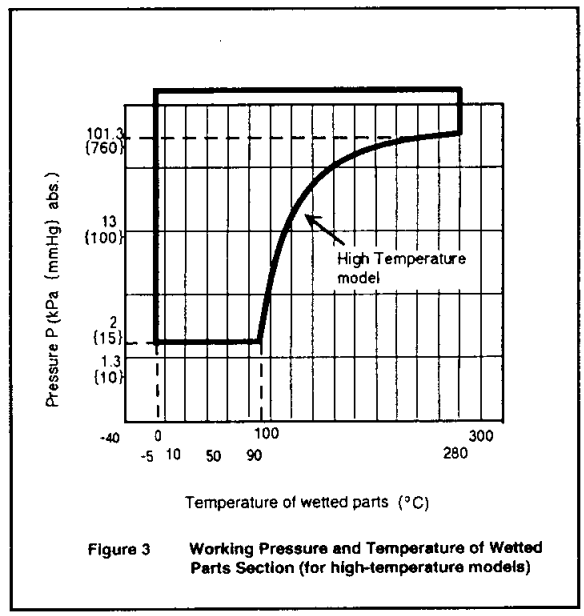


Figure 3 Working Pressure and Temperature of Wetted Parts Section (for high-temperature models)

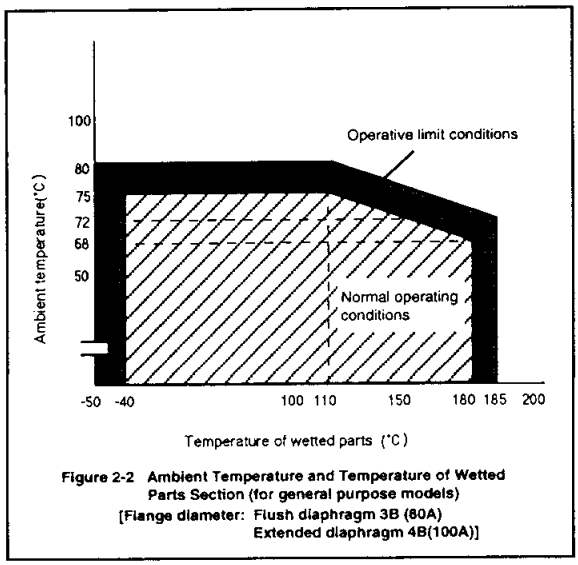


Figure 2-2 Ambient Temperature and Temperature of Wetted Parts Section (for general purpose models)
[Flange diameter: Flush diaphragm 3B (80A)
Extended diaphragm 4B(100A)]

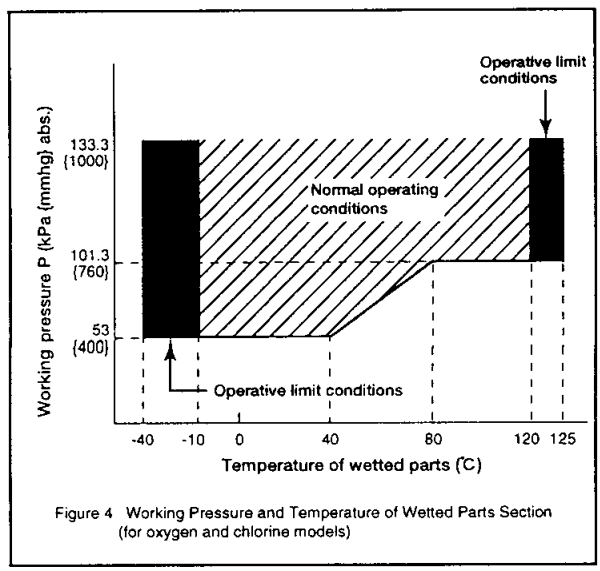
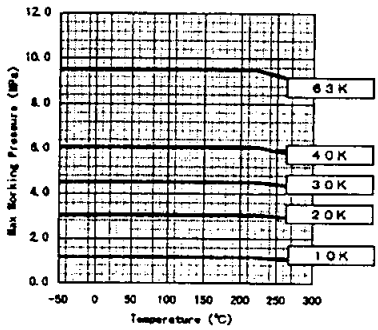
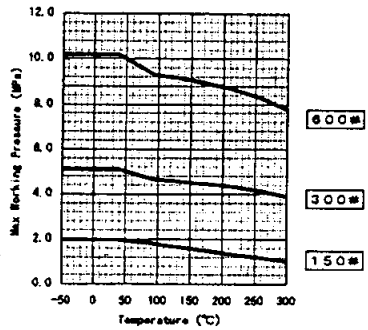
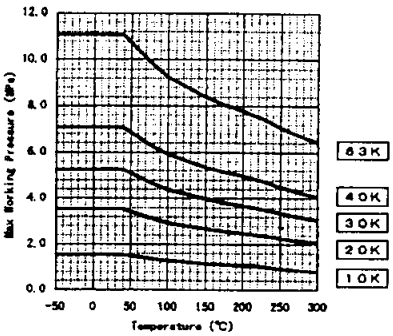
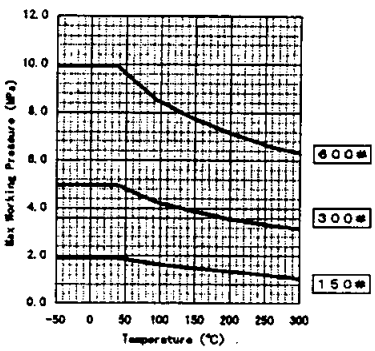
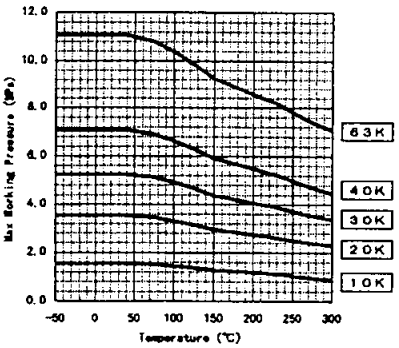
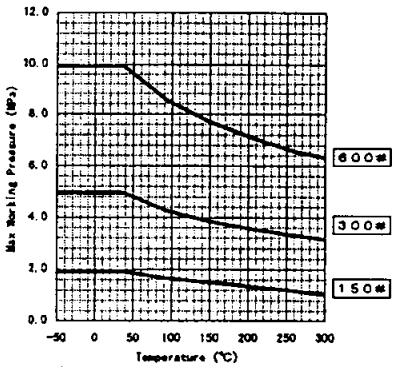
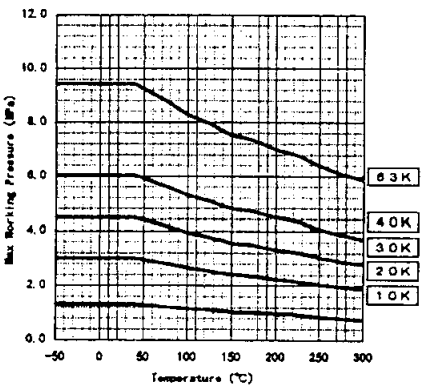
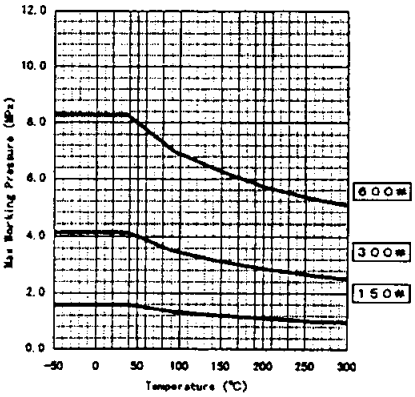


Figure 4 Working Pressure and Temperature of Wetted Parts Section (for oxygen and chlorine models)

Max Working Pressure

<*ForNewAge*>

Note1. Max Working Pressure depends on flange rating , flange materials and operating temperature. Please refer to the following data.
Operating range of temperature depends on specification of transmitters
Note2. In case of flange type (JTF940□、JTC940□) and remote sealed type (JTU940□、JTH940□),
Max Working Pressure depends on the smaller value of either 1.5MPa or following data .
Note3. In case of absolute remote sealed type (JTS940□),
Max Working Pressure depends on the smaller value of either 3.5MPa abs or following data .
As for the following data , the vertical axis represent gage pressure.
Please exchange of units from gage pressure to absolute pressure, when you use.
Note4. In case of remote sealed type (JTH960□), Max Working Pressure depends on the smaller value of either 10MPa or following data .
Note5. In case of 1/2B remote sealed type (JTE929□,JTE930□,JTH960□),
Max Working Pressure depends on the smaller value of either 5.1MPa or the following data as for adoptor flange (HF) .

	JIS	JPI/ANSI
Carbon steal		
SUS304		
SUS316		
SUS316L		

Process pipe connection:

Flanges (both higher and lower pressure sides)

Flush diaphragm:

JIS10K, 20K, 30K, and 63K-80A/50A/40A (RF) equivalents

ANSI150, 300, and 600-3B/2B/1.5B (RF) equivalents

JPI150, 300, and 600-3B/2B/1.5B (RF) equivalents

Extended diaphragm:

JIS10K, 20K, and 30K-100A/80A/50A (RF) equivalents

ANSI150 and 300-4B/3B/2B (RF) equivalents

JPI150 and 300-4B/3B/2B (RF) equivalents

Electrical conduit connection:

G1/2 internal thread

1/2NPT internal thread (Not usable with JIS explosion-proof models)

Materials:

Center body: SUS316

Transmitter case: Aluminum alloy

Meter body cover: SUSF304

Wetted parts materials:

SUS316 (SUS316L for diaphragm only)
SUS316L
Hastelloy C, tantalum, etc.

Flange materials:

Carbon steel (SF440A), SUS304, SUS316, SUS316L

Bolts and nuts materials (for fastening meter body cover):

Carbon steel (SNB7), SUS630

Capillary section:

Capillary tube length: 2, 3, 4, 5, 6, 7, 8, 9, and 10 m

2, 3, 4, and 5 m when

flange diameters:

flush diaphragm 2B (50A)/1.5B (40A)
extended diaphragm 3B (80A)/2B (50A)

Capillary tube material: SUS316

Armored tube material: SUS304

Coating (optional): Olefin coating to improve corrosion resistance

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-painted 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
lower limit

Grounding: Class 3 grounding (grounding resistance 100 Ω max.)

Mounting: Direct mounting on the process side

For mounting the transmitter body, choose between the following two methods:

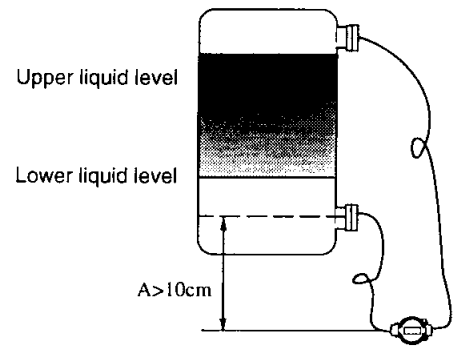
(1) Using 2-inch pipe mounting brackets: Mount the transmitter on a horizontal or vertical 2-inch pipe, then use the brackets.

Materials: Brackets: carbon steel
U bolts and nuts: SUS304

Mounting (continued):

(2) Direct mounting (for general purpose model only)

Mounting Notes



1) If the fluid to be measured contains hydrogen, please consult us.

2) When mounting the transmitter, leave a space of at least 10 cm under the lower nozzle of the tank. If no space is available, please consult us.

Mount the transmitter directly on the tank using the direct mounting kit supplied.

<Features>

- Direct mounting saves space.
- Capillary tubes can be neatly arranged using tube clamps. This also improves temperature characteristics.

Direct mounting kit (weight: approx. 600 g)

Component	Material
Adaptor	SUS13 (SUS304 equivalent)
Adaptor fastening bolt	SUS304 (M8)
Tube clamp	Brass + nickel plating

Weight: Approx. 19.8 kg
(including JIS10K-80A flange and capillary 5 m long)

Tank Level Setting by Direct Mounting Method

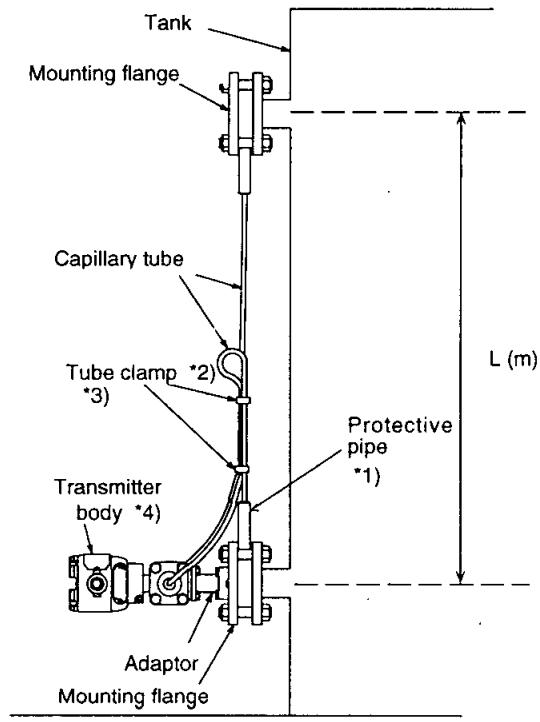
Notes)

*1) When fitting a protective pipe upward as shown in the figure, be sure to specify a capillary tube with olefin coating. If a capillary tube without olefin coating is to be used, set the capillary withdrawal direction downward a little.

*2) When bending a capillary tube, as shown in the figure, do not twist it. Also note that the minimum bending diameter is about 5 cm. Do not bend it more by applying excessive force.

*3) Three tube clamps are supplied as an option. Referring to the figure, fix the tube at appropriate places. Do not tighten the clamps to the extent of deforming the tube.

*4) Before zero adjusting using the SFC, be sure to set the inter-flange height L (m) and use the capillary fill fluid temperature correction function.



Optional Specifications

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 and wherever high-performance lightning protection is required.

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 inhibiting treatment (including oil inhibiting treatment):

The transmitter is shipped with dry and oil-free wetted parts.

Oil inhibiting treatment:

The transmitter is shipped with oil-free wetted parts. (The vent drain plug is coated with a small amount of fluorine oil to prevent galling.)

FEP protective film:

Use FEP protective films when corrosive fluids are used or to inhibit ion migration from metal diaphragms.

Working temperature range:

0 to 110°C

Working pressure range:

atmospheric pressure to flange rating

(up to JIS10K, ANSI/JPI150)

(Not usable under negative pressure)

Electric power specification:

This specification applies where stringent quality control is required, such as in the electric 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.

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

Mill sheet: The mill sheet shows the chemical composition, heat-treatment conditions, and mechanical properties of the materials used for the wetted parts.

Documents of conformance to the High Pressure Gas Control Law (for general purposes):

This specification applies when documents verifying conformance to the High Pressure Gas Control Law are required. The documents consist of a strength calculation sheet, the mill sheet, and a pressure resistance and gas-tightness test result sheet.

Strength calculation sheet:

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

Pressure resistance and gas-tightness tests (for general purposes):

The pressure resistance and gas-tightness test result sheet shows the results of a pressure resistance test (under water pressure 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 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 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). Gasket protrusion may cause 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 explosion-proof product is a pull-in pressure-resistant packing-cable, be sure to use a pressure-resistant packing-cable adapter certified by Yamatake-Honeywell.**
- **When conduits are used for connection, be sure to use conduit fittings certified by Yamatake-Honeywell.**

⚠ Caution

- **After installing the transmitter, do not step on it. Using it as a foothold or the like could make it collapse and cause injury.**
- **Be careful not to hit the glass indicator with tools etc. This could break the glass and cause injury.**
- **This 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 breakdown.**
- **Use a power supply that conforms to the specifications. Use of an improper power supply may result in breakdown.**

Performance

Shown for each item are the upper limit (URV) [*1] and the lower limit (LRV) [*2] of the calibration range or the percentage ratio of the maximum value of the span to χ (kPa).

JTE929A (for general purpose and high-temperature models)
Material for Wetted Parts: SUS316
Flange diameter: Flush diaphragm 3B (80A) Extended diaphragm 4B (100A)

Accuracy	Linear output:	$\pm$ 0.3%	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm$ $(0.3 \times \frac{12.5}{\chi})$ %	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	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 55°C**	Zero shift:	$\pm$0.75%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 0.75 \times \frac{25}{\chi}$%	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$1.6%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 1.6 \times \frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) **Change of 7MPa {70kgf/cm^2}**	Zero shift:	$\pm$0.75%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(0.75 \times \frac{25}{\chi})$%	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$1.00%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(1.00 \times \frac{25}{\chi})$%	($\chi < 25$kPa {2500mmH$_2$O})

JTE930A (for general purpose and high-temperature models)
Material for Wetted Parts: SUS316
Flange diameter: Flush diaphragm 3B (80A) Extended diaphragm 4B (100A)

Accuracy [*3]	Linear output:	$\pm$0.2%	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(0.05+0.15 \times \frac{210}{\chi})$%	($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	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) [*3] **Change of 55°C**	Zero shift:	$\pm(0.25+0.5 \times \frac{210}{\chi})$%	
	Combined shift: (including zero and span shifts)	$\pm$1.6%	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(1.0+0.6 \times \frac{210}{\chi})$%	($\chi < 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) [*3] **Change of 7MPa {70kgf/cm^2}**	Zero shift:	$\pm(0.75 \times \frac{700}{\chi})$%	
	Combined shift:	$\pm(1.00 \times \frac{700}{\chi})$%	

Notes) [*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 $\geqq$ 0 and LRV $\geqq$ 0

JTE929A (for general purpose and high-temperature models)
Material for Wetted Parts: Hastelloy C, Tantalum
Flange Diameter: Flush diaphragm 3B (80A)

Accuracy	Linear output:	$\pm 0.4\%$	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm(0.4\times\frac{12.5}{\chi})\%$	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	When output is 50 to 100%: same as the 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 (Range from -5 to 55°C)	Zero shift:	$\pm 2.15\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 2.15\times\frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 3.0\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 3.0\times\frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm 6.00\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(6.00\times\frac{25}{\chi})\%$	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 7.00\%$	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(7.00\times\frac{25}{\chi})\%$	($\chi < 25$kPa {2500mmH$_2$O})

JTE930A (for general purpose and high-temperature models)
Material for Wetted Parts: Hastelloy C, Tantalum
Flange Diameter: Flush diaphragm 3B (80A)

Accuracy (*3)	Linear output:	$\pm 0.2\%$	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(0.05+0.15\times\frac{2.1}{\chi})\%$	($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	When output is 50 to 100%: same as the 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 (*3) (Range from -5 to 55°C)	Zero shift:	$\pm(0.15+0.7\times\frac{210}{\chi})\%$	
	Combined shift: (including zero and span shifts)	$\pm 1.75\%$	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(1.00+0.75\times\frac{210}{\chi})\%$	($\chi \geqq 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) (*3) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm(0.75\times\frac{700}{\chi})\%$	
	Combined shift: (including zero and span shifts)	$\pm(1.00\times\frac{700}{\chi})\%$	

Notes) (*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 $\geqq$ 0 and LRV $\geqq$ 0

JTE929A (for general purpose models)

Material for Wetted Parts: SUS316

Flange Diameter: Flush diaphragm 2B (50A)/1.5B (40A) Extended diaphragm 3B (80A)/2B (50A)

Accuracy	Linear output:	± 0.3%	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		± $(0.3 \times \frac{12.5}{\chi})$ %	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	When output is 50 to 100%: same as the linear output When output is 7.1 to 50%: linear output × $\frac{50}{\text{square-root output \%}}$ When output is less than 7.1%: dropout	
Temperature characteristics (Shift from the set range) **Change of 55°C**	Zero shift:	±0.75%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±0.75 × $\frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	±1.6%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±1.6 × $\frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) **Change of 7MPa {70kgf/cm^2}**	Zero shift:	±1.47%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±(1.47 × $\frac{25}{\chi}$)%	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	±1.97%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±(1.97 × $\frac{25}{\chi}$)%	($\chi < 25$kPa {2500mmH$_2$O})

JTE929A (for high-temperature models)

Material for Wetted Parts: SUS316

Flange Diameter: Flush diaphragm 2B (50A)/1.5B (40A) Extended diaphragm 3B (80A)/2B (50A)

Accuracy	Linear output:	± 0.3%	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		± $(0.3 \times \frac{12.5}{\chi})$ %	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	When output is 50 to 100%: same as the linear output When output is 7.1 to 50%: linear output × $\frac{50}{\text{square-root output \%}}$ When output is less than 7.1%: dropout	
Temperature characteristics (Shift from the set range) **Change of 10°C**	Zero shift:	±0.36%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±0.36 × $\frac{25}{\chi}$%	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	±2.18%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±2.18 × $\frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) **Change of 7MPa {70kgf/cm^2}**	Zero shift:	±2.7%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±(2.7 × $\frac{25}{\chi}$)%	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	±3.5%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		±(3.5 × $\frac{25}{\chi}$)%	($\chi < 25$kPa {2500mmH$_2$O})

JTE930A (for general purpose and high-temperature models)

Material for Wetted Parts: SUS316

Flange Diameter: Flush diaphragm 2B (50A)/1.5B (40A) Extended diaphragm 3B (80A)/2B (50A)

Accuracy (*3)	Linear output:	±0.2%	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		±(0.05+0.5 × $\frac{210}{\chi}$)%	($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	When output is 50 to 100%: same as the linear output When output is 7.1 to 50%: linear output × $\frac{50}{\text{square-root output \%}}$ When output is less than 7.1%: dropout	
Temperature characteristics (Shift from the set range) (*3) **Change of 55°C**	Zero shift:	±(0.25+0.15 × $\frac{210}{\chi}$)%	
	Combined shift: (including zero and span shifts)	±2.8%	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		±(2.2+0.6 × $\frac{210}{\chi}$)%	($\chi < 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) (*3) **Change of 7MPa {70kgf/cm^2}**	Zero shift:	± {($\frac{T-25}{200}$ +0.47) × $\frac{700}{\chi}$ + 0.03}%	
	Combined shift:	± {($\frac{T-25}{200}$ +0.72) × $\frac{1400}{\chi}$ + 0.03}%	
		T: ambient temperature (°C)	

JTE929A (for general purpose and high-temperature models)
Material for Wetted Parts: Hastelloy C, Tantalum
Flange Diameter: Flush diaphragm 2B (50A)/1.5B (40A)

Accuracy	Linear output:	$\pm 0.4\%$ ($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm(0.4\times\frac{12.5}{\chi})\%$ ($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	When output is 50 to 100%: same as the 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 (Range from -5 to 55°C)	Zero shift:	$\pm 2.15\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 2.15\times\frac{25}{\chi}\%$ ($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 6.55\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 6.55\times\frac{25}{\chi}\%$ ($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm 6.00\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(6.00\times\frac{25}{\chi})\%$ ($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 7.00\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(7.00\times\frac{25}{\chi})\%$ ($\chi < 25$kPa {2500mmH$_2$O})

JTE930A (for general purpose and high-temperature models)
Material for Wetted Parts: Hastelloy C, Tantalum
Flange Diameter: Flush diaphragm 2B (50A)/1.5B (40A)

Accuracy (*3)	Linear output:	$\pm 0.2\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(0.05+0.15\times\frac{2.1}{\chi})\%$ ($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	When output is 50 to 100%: same as the 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 (*3) (Range from -5 to 55°C)	Zero shift:	$\pm(0.15+0.7\times\frac{210}{\chi})\%$
	Combined shift: (including zero and span shifts)	$\pm 3.0\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(2.2+0.8\times\frac{210}{\chi})\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) (*3) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm \{(\frac{T-25}{200}+0.47)\times\frac{700}{\chi}+0.03\}\%$
	Combined shift: (including zero and span shifts)	$\pm \{(\frac{T-25}{200}+0.72)\times\frac{1400}{\chi}+0.03\}\%$ T: ambient temperature (°C)

Notes) (*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 ≧ 0 and LRV ≧ 0

Model Number Configuration Table

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTE) with Flush Diaphragm Flange 3B (80A) for General Purpose and High-Temperature Models

Basic model number | Selections | Optional selections | Options

Measuring span	2.5~100kPa	JTE929A	
	35~700kPa	JTE930A	
Forms of output/ communication	4 to 20 mA dc (analog standard communication)		1
	4 to 20 mA dc (analog FSK communication)		2
	DE output		3
Wetted parts material	SUS316 (diaphragm: SUS316L)		2
	Tantalum		4
	Hastelloy C		H
	SUS316L		8
Sealing liquid	For general purposes: silicone oil		1
	For oxygen service: fluorine oil		2
	For high-temperature model: silicone oil Note 1)		3
	For chlorine service: fluorine oil		5
Flange standard	JIS10K		A
	JIS20K		C
	JIS30K		D
	JIS63K		F
	ANSI150		G
	ANSI300		H
	ANSI600		J
	JPI150		N
	JPI300		P
	JPI600		Q
Flange diameter	3B/80A		2
Flange shape	Standard		1
Flange material/ Bolt/nut material	Carbon steel/Carbon steel		A
	Carbon steel/SUS304		B
	Carbon steel/SUS630		C
	SUS304/Carbon steel		D
	SUS304/SUS304		E
	SUS304/SUS630		F
	SUS316/Carbon steel		G
	SUS316/SUS304		H
	SUS316/SUS630		J
	SUS316L/Carbon steel		K
	SUS316/SUS304		L
	SUS316L/SUS630		M
Capillary length	2 m		2
	3 m		3
	4 m		4
	5 m		5
	6 m		6
	7 m		7
	8 m		8
	9 m		Q
	10m		A
	2 m (Olefin covering)		B
	3 m (Olefin covering)		C
	4 m (Olefin covering)		H
	5 m (Olefin covering)		D
	6 m (Olefin covering)		J
	7 m (Olefin covering)		E
	8 m (Olefin covering)		F
	9 m (Olefin covering)		K
	10m (Olefin covering)		G

		XX No optional specifications
		A2 External zero adjustment
		A4 Additional lightning protection
		B7 For special local field meter
		G1 One elbow (left)
		G2 One elbow (right)
		G3 Two elbows
		D1 Water inhibiting treatment (including oil inhibition)
		D2 Oil inhibition
		D3 FEP protective film
		J2 Power specifications
		J8 Special burnout (3.2 mA)
		T1 Test report
		T2 Mill sheet
		T3 Document conforming to High Pressure Gas Control Law (for general purposes)
		T5 Strength calculation sheet
		T6 Pressure resistance/gas-tightness test (for general purposes)
		T8 Traceability certificate
		U2 Non-SI unit conformance
		□□ Other
X	Electrical conduit and explosion-proof status	G1/2, not explosion-proof
1		G1/2, JIS explosion-proof, with single standard conduit fittings
H		G1/2, JIS explosion-proof, with double standard conduit fittings
2		G1/2, JIS explosion-proof, with single standard packing
3		G1/2, JIS explosion-proof, with double standard packing
6		G1/2, JIS intrinsically safe
A		1/2 NPT, not explosion-proof
□		Other
X	Indicator	No meter
1		Digital meter with standard reading (0 to 100%)
2		Digital meter with actual reading
X	Anticorrosion treatment	Standard coating
A		Anticorrosion treatment
B		Heavy-duty anticorrosion treatment
D		Silver anticorrosion treatment
X	Flange processing	None (Standard: JISRa3.2 (12.5S))
X	Burnout feature	None
U		Upper limit of output at abnormal condition
D		Lower limit of output at abnormal condition
X	Mounting bracket	None
1		Carbon steel (mounted on 2B pipe)
P		Direct mounting (general purpose model only)
□		Other

Note) The temperature range of tantalum wetted parts is -10 to 180°C.

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTE) with Flush Diaphragm Flange 2B (50A)/ 1.5B (40A) for General Purpose and High-Temperature Models

Basic model number			Selections									Optional selections							Options	
Measuring span	2.5~100kPa	J T E 9 2 9 A																	X X	No optional specifications
	35~700kPa	J T E 9 3 0 A																	A 2	External zero adjustment
Forms of output/ communication	4 to 20 mA dc (analog standard communication)		1																A 4	Additional lightning protection
	4 to 20mA dc (analog FSK communication)		2																B 7	For special local field meter
	DE output		3																G 1	One elbow (left)
Wetted parts material	SUS316 (diaphragm: SUS316L)			2															G 2	One elbow (right)
	Tantalum Note 1)			4															G 3	Two elbows
	Hastelloy C			H															D 1	Water inhibiting treatment (including oil inhibition)
	SUS316L			8															D 2	Oil inhibition
Sealing liquid	For general purposes: silicone oil				1														D 3	FEP protective film
	For oxygen service: fluorine oil				2														J 2	Power specifications
	For high-temperature model: silicone oil				3														J 8	Special burnout (3.2 mA)
	For chlorine service: fluorine oil				5														T 1	Test report
Flange standard	JIS10K					A													T 2	Mill sheet
	JIS20K					C													T 3	Document conforming to High Pressure Gas Control Law (for general purposes)
	JIS30K					D													T 5	Strength calculation sheet
	JIS63K					F													T 6	Pressure resistance/gas-tightness test (for general purposes)
	ANSI150					G													T 8	Traceability certificate
	ANSI300					H													Ù 2	Non-SI unit conformance
	ANSI600					J													□□	Other
	JPI150					N														
	JPI300					P														
	JPI600					Q														
Flange diameter	2 B/50 A						3													
	1.5 B/40 A						4													
Flange shape	Standard							1												
Flange material/ Bolt/nut material	Carbon steel/Carbon steel								A											
	Carbon steel/SUS304								B											
	Carbon steel/SUS630								C											
	SUS304/Carbon steel								D											
	SUS304/SUS304								E											
	SUS304/SUS630								F											
	SUS316/Carbon steel								G											
	SUS316/SUS304								H											
	SUS316/SUS630								J											
	SUS316L/Carbon steel								K											
	SUS316L/SUS304								L											
	SUS316L/SUS630								M											
Capillary length	2 m									2										
	3 m									3										
	4 m									4										
	5 m									5										
	2 m (Olefin covering)									B										
	3 m (Olefin covering)									C										
	4 m (Olefin covering)									H										
	5 m (Olefin covering)									D										

X	Electrical conduit and explosion-proof status		G1/2, not explosion-proof
1			G1/2, JIS explosion-proof, with single standard conduit fittings
H			G1/2, JIS explosion-proof, with double standard conduit fittings
2			G1/2, JIS explosion-proof, with single standard packing
3			G1/2, JIS explosion-proof, with double standard packing
6			G1/2, JIS intrinsically safe
A			1/2 NPT, not explosion-proof
□			Other
	X	Indicator	No meter
	1		Digital meter with standard reading (0 to 100%)
	2		Digital meter with actual reading
		X Anticorrosion	Standard coating
		A treatment	Anticorrosion treatment
		B	Heavy-duty anticorrosion treatment
		D	Silver anticorrosion treatment
		X Flange processing	None (Standard: JISRa3.2 (12.5 S))
			X Burnout None
			U feature Upper limit of output at abnormal condition
			D Lower limit of output at abnormal condition
			X Mounting None
			1 bracket Carbon steel (mounted on 2B pipe)
			P Direct mounting (general purpose model only)
			□ Other

Note) When the wetted parts material is tantalum, the flange diameter is 2B (50A).

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTE) with Extended Diaphragm Flange 4B (100A) for General Purpose and High-Temperature Models

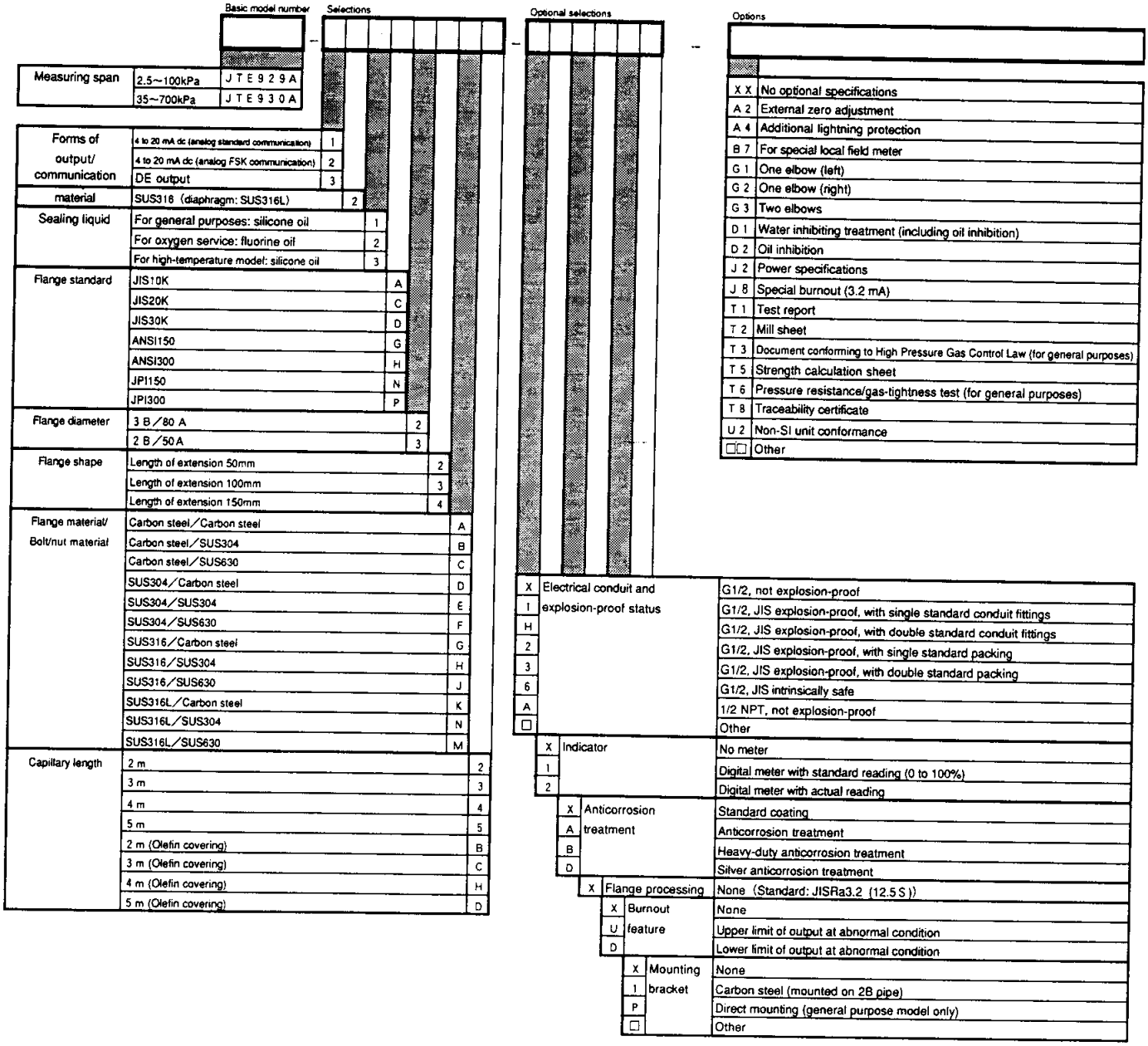
Basic model number – Selections – Optional selections – Options

Measuring span	2.5~100kPa	JTE929A	
	35~700kPa	JTE930A	
Forms of output/ communication	4 to 20 mA dc (analog standard communication)		1
	4 to 20 mA dc (analog FSK communication)		2
	DE output		3
Wetted parts material	SUS316 (diaphragm: SUS316L)		2
	SUS316L		8
Sealing liquid	For general purposes: silicone oil		1
	For oxygen service: fluorine oil		2
	For high-temperature model: silicone oil		3
Flange standard	JIS10K		A
	JIS20K		C
	JIS30K		D
	ANSI150		G
	ANSI300		H
	JPI150		N
	JPI300		P
Flange diameter	4B/100A		1
Flange shape	Length of extension 50mm		2
	Length of extension 100mm		3
	Length of extension 150mm		4
	Length of extension 200mm		5
	Length of extension 250mm		6
	Length of extension 300mm		7
Flange material/ Bolt/nut material	Carbon steel/Carbon steel		A
	Carbon steel/SUS304		B
	Carbon steel/SUS630		C
	SUS304/Carbon steel		D
	SUS304/SUS304		E
	SUS304/SUS630		F
	SUS316/Carbon steel		G
	SUS316/SUS304		H
	SUS316/SUS630		J
	SUS316L/Carbon steel		K
	SUS316L/SUS304		L
	SUS316L/SUS630		M
Capillary length	2 m		2
	3 m		3
	4 m		4
	5 m		5
	6 m		6
	7 m		7
	8 m		8
	9 m		Q
	10m		A
	2 m (Olefin covering)		B
	3 m (Olefin covering)		C
	4 m (Olefin covering)		H
	5 m (Olefin covering)		D
	6 m (Olefin covering)		J
	7 m (Olefin covering)		E
	8 m (Olefin covering)		F
	9 m (Olefin covering)		K
	10m (Olefin covering)		G

X	Electrical conduit and explosion-proof status	G1/2, not explosion-proof
1		G1/2, JIS explosion-proof, with single standard conduit fittings
H		G1/2, JIS explosion-proof, with double standard conduit fittings
2		G1/2, JIS explosion-proof, with single standard packing
3		G1/2, JIS explosion-proof, with double standard packing
6		G1/2, JIS intrinsically safe
A		1/2 NPT, not explosion-proof
□		Other
X	Indicator	No meter
1		Digital meter with standard reading (0 to 100%)
2		Digital meter with actual reading
X	Anticorrosion treatment	Standard coating
A		Anticorrosion treatment
B		Heavy-duty anticorrosion treatment
D		Silver anticorrosion treatment
X	Flange processing	None (Standard: JISRa3.2 (12.5S))
X	Burnout feature	None
U		Upper limit of output at abnormal condition
O		Lower limit of output at abnormal condition
X	Mounting bracket	None
1		Carbon steel (mounted on 2B pipe)
P		Direct mounting (general purpose model only)
□		Other

XX	No optional specifications
A2	External zero adjustment
A4	Additional lightning protection
B7	For special local field meter
G1	One elbow (left)
G2	One elbow (right)
G3	Two elbows
D1	Water inhibiting treatment (including oil inhibition)
D2	Oil inhibition
J2	Power specifications
J8	Special burnout (3.2 mA)
T1	Test report
T2	Mill sheet
T3	Document conforming to High Pressure Gas Control Law (for general purposes)
T5	Strength calculation sheet
T6	Pressure resistance/gas-tightness test (for general purposes)
T8	Traceability certificate
U2	Non-SI unit conformance
□□	Other

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTE) with Extended Diaphragm Flange 3B (80A)/2B (50A) for General Purpose and High-Temperature Models



Basic model number | Selections | Optional selections | Options

Measuring span	2.5~100kPa	JTE929A	
	35~700kPa	JTE930A	
Forms of output/communication	4 to 20 mA dc (analog standard communication)		1
	4 to 20 mA dc (analog FSK communication)		2
	DE output		3
material	SUS316 (diaphragm: SUS316L)		2
Sealing liquid	For general purposes: silicone oil		1
	For oxygen service: fluorine oil		2
	For high-temperature model: silicone oil		3
Flange standard	JIS10K		A
	JIS20K		C
	JIS30K		D
	ANSI150		G
	ANSI300		H
	JPI150		N
	JPI300		P
Flange diameter	3 B/80 A		2
	2 B/50 A		3
Flange shape	Length of extension 50mm		2
	Length of extension 100mm		3
	Length of extension 150mm		4
Flange material/ Bolt/nut material	Carbon steel/Carbon steel		A
	Carbon steel/SUS304		B
	Carbon steel/SUS630		C
	SUS304/Carbon steel		D
	SUS304/SUS304		E
	SUS304/SUS630		F
	SUS316/Carbon steel		G
	SUS316/SUS304		H
	SUS316/SUS630		J
	SUS316L/Carbon steel		K
	SUS316L/SUS304		N
	SUS316L/SUS630		M
Capillary length	2 m		2
	3 m		3
	4 m		4
	5 m		5
	2 m (Olefin covering)		B
	3 m (Olefin covering)		C
	4 m (Olefin covering)		H
	5 m (Olefin covering)		D

X	Electrical conduit and explosion-proof status	G1/2, not explosion-proof
1		G1/2, JIS explosion-proof, with single standard conduit fittings
H		G1/2, JIS explosion-proof, with double standard conduit fittings
2		G1/2, JIS explosion-proof, with single standard packing
3		G1/2, JIS explosion-proof, with double standard packing
6		G1/2, JIS intrinsically safe
A		1/2 NPT, not explosion-proof
□		Other
X	Indicator	No meter
1		Digital meter with standard reading (0 to 100%)
2		Digital meter with actual reading
X	Anticorrosion treatment	Standard coating
A		Anticorrosion treatment
B		Heavy-duty anticorrosion treatment
D		Silver anticorrosion treatment
X	Flange processing	None (Standard: JISRa3.2 (12.5S))
X	Burnout feature	None
U		Upper limit of output at abnormal condition
D		Lower limit of output at abnormal condition
X	Mounting bracket	None
1		Carbon steel (mounted on 2B pipe)
P		Direct mounting (general purpose model only)
□		Other

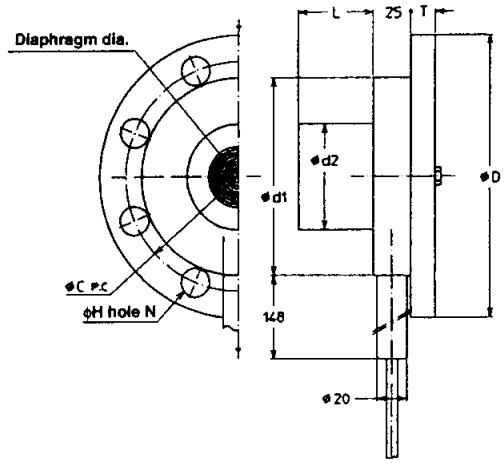
XX	No optional specifications
A2	External zero adjustment
A4	Additional lightning protection
B7	For special local field meter
G1	One elbow (left)
G2	One elbow (right)
G3	Two elbows
D1	Water inhibiting treatment (including oil inhibition)
D2	Oil inhibition
J2	Power specifications
J8	Special burnout (3.2 mA)
T1	Test report
T2	Mill sheet
T3	Document conforming to High Pressure Gas Control Law (for general purposes)
T5	Strength calculation sheet
T6	Pressure resistance/gas-tightness test (for general purposes)
T8	Traceability certificate
U2	Non-SI unit conformance
□□	Other

Dimensions

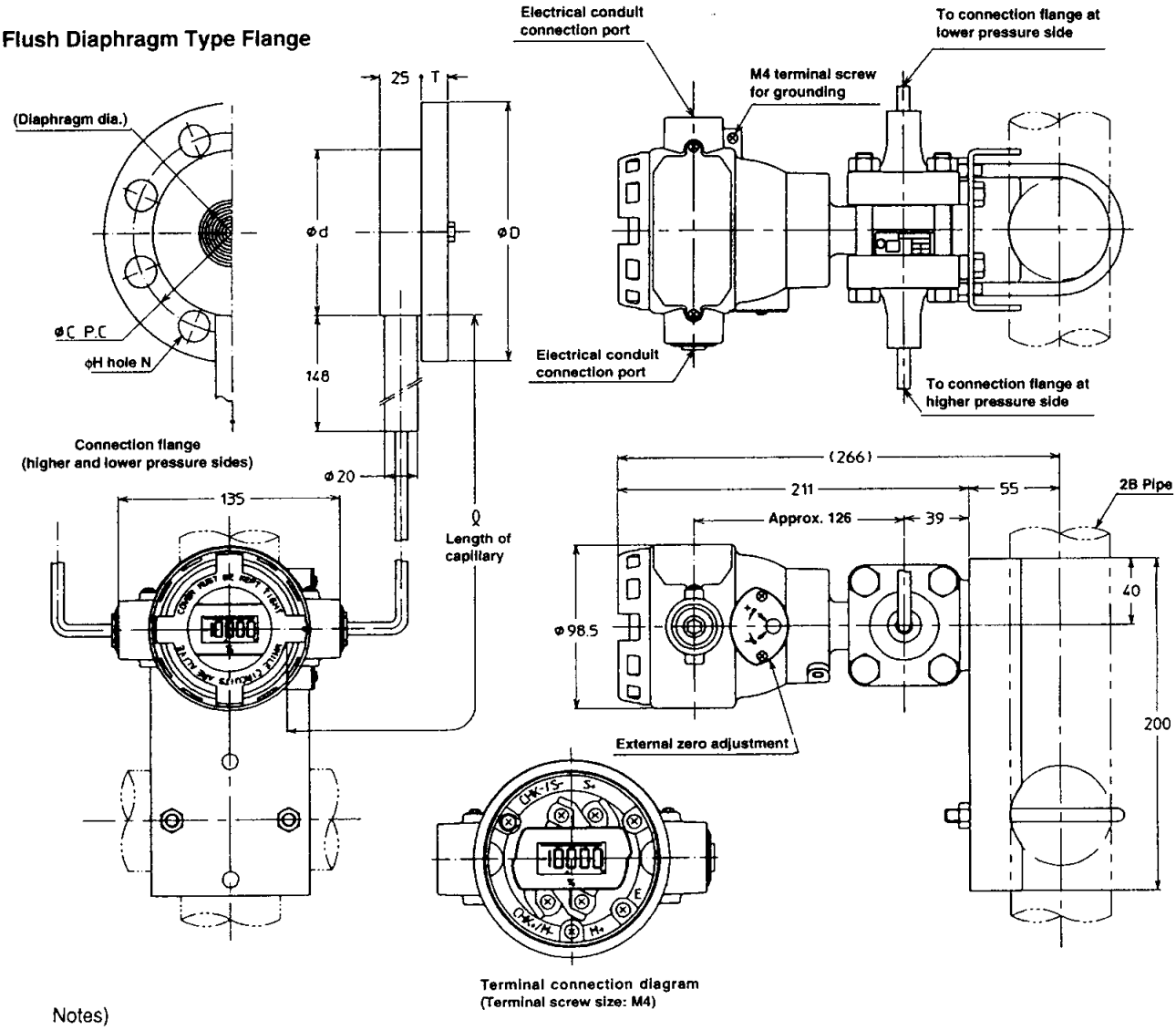
(Unit: mm)

JTE929A/930A General Purpose and High-Temperature Models

Extended Diaphragm Flange

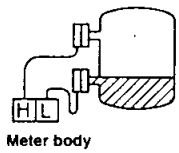


Flush Diaphragm Type Flange



Notes)

1. The transmitter can be mounted in various ways by changing the position of the mounting bracket. (A typical example is shown in the figure.)
2. To prevent vibration, you are recommended to fasten the capillary tube mid-length.
3. Select a gasket that will not contact the diaphragm after it is tightened.
4. When the volume of suppression is larger than one half of the adjustment span, the higher pressure side and the lower pressure side of the process connection end flange are opposite to those shown in the figure. When using the transmitter to measure liquid levels, connect at H and L marks on the meter body as shown in the figure.



Meter body

JTE929A/930A Table of Flush Diaphragm Flange Dimensions

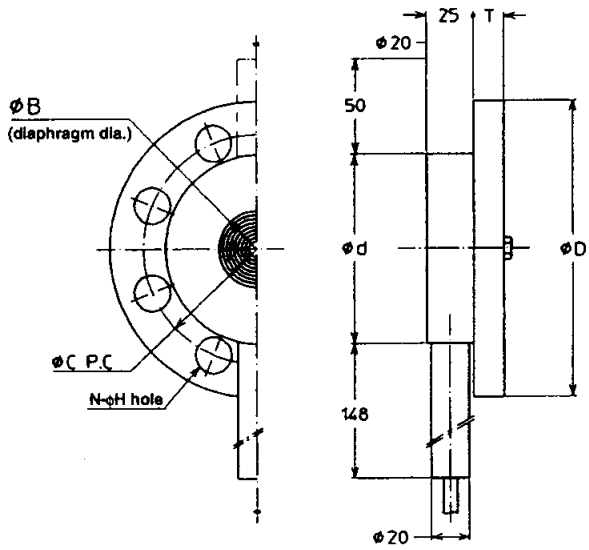


Table of Flange Dimension

Flange standard	φD	T	φC	N	φH	φd	φB
JIS 10K-40A	140	16	105	4	19	81	43
JIS 20K-40A	140	18	105	4	19		
JIS 30K-40A	160	22	120	4	23		
JIS 63K-40A	175	32	130	4	25		
ANSI 150 1-½B	127	18	98.6	4	16		
ANSI 300 1-½B	155	21	114.3	4	22		
ANSI 600 1-½B	155	22.5	114.3	4	22		
JPI 150 1-½B	127	18	98.6	4	16		
JPI 300 1-½B	155	21	114.3	4	22		
JPI 600 1-½B	155	22.5	114.3	4	22		
JIS 10K-50A	155	16	120	4	19	99	62 Note)
JIS 20K-50A	155	18	120	8	19		
JIS 30K-50A	165	22	130	8	19		
JIS 63K-50A	185	34	145	8	23		
ANSI 150-2B	152	19.5	120.6	4	19		
ANSI 300-2B	165	22.5	127	8	19		
ANSI 600-2B	165	25.5	127	8	19		
JPI 150-2B	152	19.5	120.6	4	19		
JPI 300-2B	165	22.5	127	8	19		
JPI 600-2B	165	25.5	127	8	19		
JIS 10K-80A	185	18	150	8	19	129.5	95
JIS 20K-80A	200	22	160	8	23		
JIS 30K-80A	210	28	170	8	23		
JIS 63K-80A	230	40	185	8	25		
ANSI 150-3B	190	24	152.4	4	19		
ANSI 300-3B	210	28.5	168.1	8	22		
ANSI 600-3B	210	32	168.1	8	22		
JPI 150-3B	190	24	152.4	4	19		
JPI 300-3B	210	28.5	168.1	8	22		
JPI 600-3B	210	32	168.1	8	22		

Note) Material for hastelloy C wetted parts: φB=43

JTE929A/930A Table of Extended Diaphragm Flange Dimensions

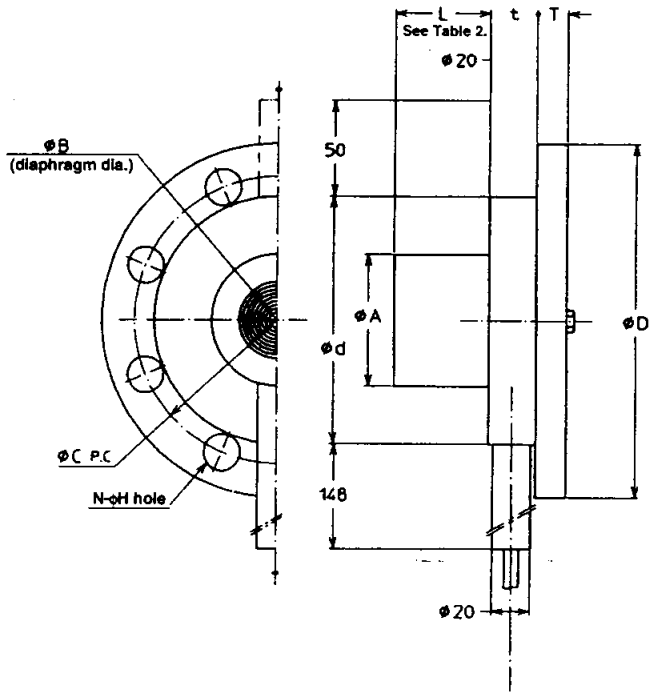


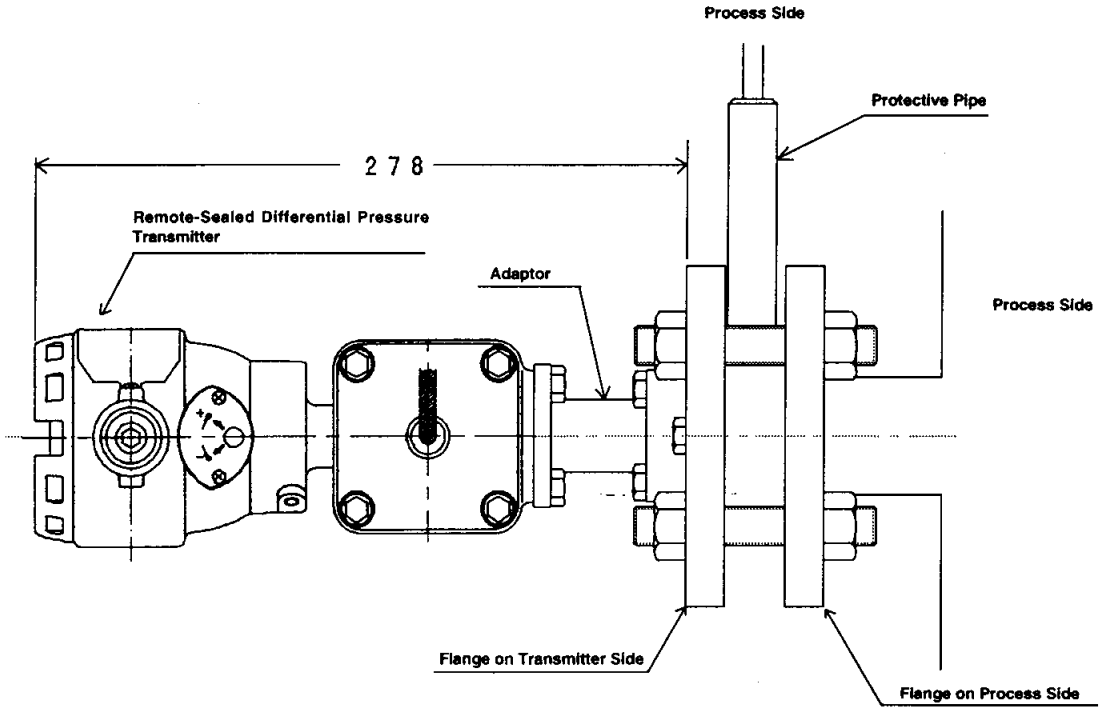
Table 1 Table of Flange Dimension

Flange standard	ØD	T	t	ØC	N	ØH	Ød	ØA	ØB
JIS 10K-100A	210	18	23	175	8	19	157	95±1	90
JIS 20K-100A	225	24		185	8	23			
JIS 30K-100A	240	32		195	8	25			
ANSI 150-4B	229	24		190.5	8	19			
ANSI 300-4B	254	32		200.2	8	22			
JPI 150-4B	229	24		190.5	8	19			
JPI 300-4B	254	32		200.2	8	22			
JIS 10K-80A	185	18	25	150	8	19	129.5	69±1	62
JIS 20K-80A	200	22		160	8	23			
JIS 30K-80A	210	28		170	8	23			
JIS 63K-80A	230	40		185	8	25			
ANSI 150-3B	190	24		152.4	4	19			
ANSI 300-3B	210	28.5		168.1	8	22			
ANSI 600-3B	210	32		168.1	8	22			
JPI 150-3B	190	24		152.4	4	19			
JPI 300-3B	210	28.5		168.1	8	22			
JPI 600-3B	210	32		168.1	8	22			
JIS 10K-50A	155	16	25	120	4	19	99	47±1	43
JIS 20K-50A	155	18		120	8	19			
JIS 30K-50A	165	22		130	8	19			
JIS 63K-50A	185	34		145	8	23			
ANSI 150-2B	152	19.5		120.6	4	19			
ANSI 300-2B	165	22.5		127	8	19			
ANSI 600-2B	165	25.5		127	8	19			
JPI 150-2B	152	19.5		120.6	4	19			
JPI 300-2B	165	22.5		127	8	19			
JPI 600-2B	165	25.5		127	8	19			

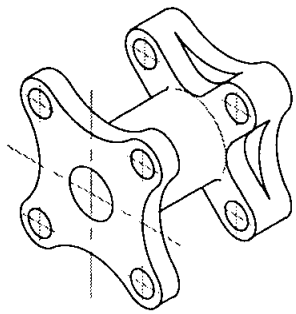
Table 2 Length of Extension

L
50
100
150
200
250
300

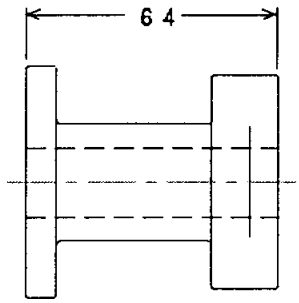
Dimension Drawing for Direct Mounting (Unit: mm)



Adaptor Assembly Drawing (JTE Type + Adaptor)



Adaptor Outline Drawing



Adaptor Dimension Drawing

YAMATAKE **Specification**

ST3000 Ace Smart Transmitter
1/2B Remote-Sealed Transmitters
JTE929A/JTE930A
JTH940A/JTH960A

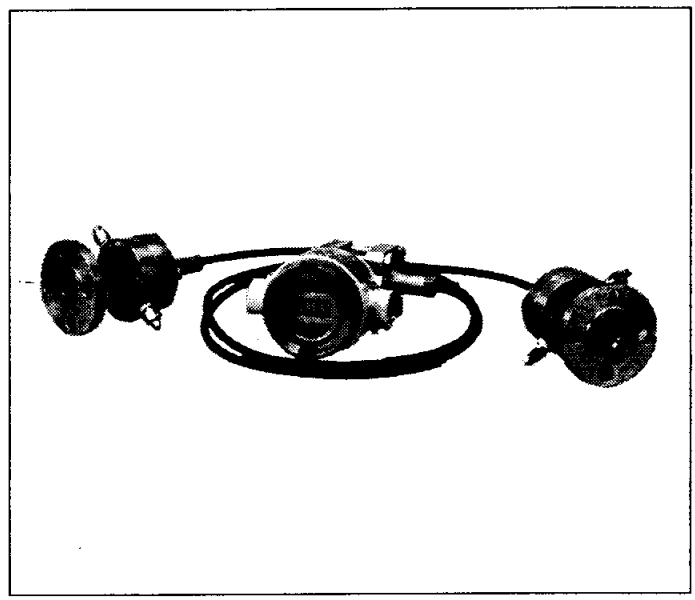
General

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, 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 SFC (Smart Field Communicator), and, via DE protocol, with the TDCS3000 or 3000^X and a database, thus facilitating self-diagnosis, range resetting, and automatic zero adjustment.

Remote-sealed transmitters are suitable for the measurement of differential pressures (flow rates, liquid levels, etc.) of process fluids that are highly corrosive, tend to condense, precipitate metal, etc.

In addition, connecting tubes are made unnecessary by connecting a 1/2B or 3/4B flange directly to the pressure tap. It prevents troubles that could otherwise be caused by clogging or staining and reduces costs associated with steam tracing, tube connecting, and other work.



Features

(1) Tubeless instrumentation
- Connecting tubes are made unnecessary by connecting a 1/2B or 3/4B flange directly to the pressure tap. This prevents troubles that could be caused by clogging, stains, leaks, aging, etc.

(2) Substantial labor cost reductions
- Substantial cost and labor reductions compared to using connecting tubes and steam tracing.

(3) Considerable maintenance cost reductions
- No need to change or replenish the sealing liquid.
- No need to remove connecting tube clogging.
- No need to zero point adjust.

(4) Substantial reductions in dangerous work
- No need to do the dangerous work of checking connecting tubes for leaks.
- No need to do the dangerous work of removing clogging from connecting tubes.
- No need to do the dangerous work of changing or replenishing the sealing liquid.

(5) A diverse lineup
- A diverse lineup, ranging from the small diameter flanges of 1/2B (15A) and 3/4B (20A) to screw-in flanges, is available to meet user requirements.
- A wide range of models, including those for general purposes and high-temperature service, is available to meet user requirements. In addition, the working temperature range of general purpose models has been expanded to 180°C maximum to allow you greater freedom in instrumentation.

(6) Excellent stability and high performance
- Long-term stability is proven in 500,000 installations worldwide.
- Unique characterization and composite semiconductor sensors realize excellent temperature and static pressure characteristics.

(7) Function to correct the temperature of the capillary section fill fluid (JTE type only):
- Changes in the density of the fill fluid caused by temperature fluctuations are calculated, and the output is corrected accordingly. This function substantially reduces (to 1/5—1/10) the effect of seasonal fluctuations in temperature.

Applications

- For the measurement of fluids that tend to clog up connecting tubes
- For the measurement of liquid levels and pressures in small tanks
- For the measurement of liquids that otherwise demands laborious heat insulation work
- For the measurement of differential pressure flow rates (Consult us separately)
- For applications where laborious work such as replenishing the sealing liquid would otherwise be required.
- For the replacement of displacement level gages

Specifications

Measuring span/setting range/working pressure range:

See Table 1.

Output/communication:

Analog output (4 to 20 mA dc)

Analog FSK output (4 to 20 mA dc)

(Frequency shift keying signal transmission system)

Digital output (DE protocol)

Supply voltage and load resistance:

10.8 to 45 V dc. A load resistance of 250 Ω or more is necessary between loops. (See Figure 1)

Sealing liquid: Silicone oil for general purpose and high-temperature models

Fluorine oil for oxygen models

For specific gravity, see Table 2.

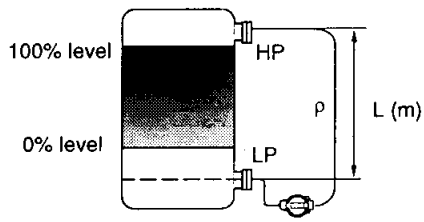
Function to correct the temperature of the capillary section fill fluid (JTE type only): (Patent No.1973584)

Changes in the density of the fill fluid (ρ) caused by temperature fluctuations are calculated, and the output is corrected accordingly. This function substantially reduces the effect of seasonal fluctuations in temperature.

<How to set this function>

Set the inter-flange height L (m) according to the SFC. If the height L (m) is already known, let us know, so, this function can be set before shipment.

If the high pressure side (HP) of your transmitter is to be located under the tank, place a minus (-) sign before the height L setting.



Temperature ranges of wetted parts:

See Table 2.

Ambient temperature ranges:

See Table 2, except for explosion-proof models with digital indicators, which have to be used within the following ranges:

Models with digital indicators:

Normal operating conditions: -20 to 70°C

Operative limits: -30 to 80°C

JIS pressure-resistant special explosion-proof models: -20 to 60°C

JIS intrinsically safe explosion-proof models: -10 to 60°C

Ambient humidity range:

5 to 100% RH

Stability against supply voltage change:

±0.005% FS/V

Lightning protection:

Peak value of voltage surge: 100 kV

Peak value of current surge: 1000 A

Dead time: Approx. 0.4 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:

JIS special explosion-proof models: (Exds II CT4)

JIS intrinsically safe models: (i3aG4)

	Measuring Span	Setting Range	Working Pressure Range
JTE929A	2.5~100kPa {250~10160mmH$_2$O}	-100~100kPa {-10160~10160mmH$_2$O}	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2, 3, and 4.) (For flange rating, see "Max Working Pressure")
JTE930A	35~700kPa {0.35~7kgf/cm^2}	-100~700kPa {-1~7kgf/cm^2}	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2, 3, and 4.) (For flange rating, see "Max Working Pressure")
JTH940A	35~3500kPa {0.35~35kgf/cm^2}	-100~3500kPa {-1~35kgf/cm^2}	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2, 3, and 4.) (For flange rating, see "Max Working Pressure")
JTH960A	0.7~10MPa {7~102kgf/cm^2}	-0.1~10kPa {-1~102kgf/cm^2}	Up to the smaller value of either setting range or flange rating (For negative pressures, see Figures 2, 3, and 4.) (For flange rating, see "Max Working Pressure")

Table 1 Measuring Span, Setting Range, and Working Pressure Range

		Temperature Range (°C) Note 1), Note 4)		
		General-purpose models	High-temp. models	Oxygen models
Wetted parts section	Normal operating range	-40~180	-5~280	-10~120
	Operative limit range	-50~185	-10~310	-40~125
Ambient temperature Note 2)	Normal operating range	-15~65	-5~45	-10~75
	Operative limit range	-30~80	-10~55	-40~80
Specific gravity of fill liquid Note 3)		0.935	1.07	1.87

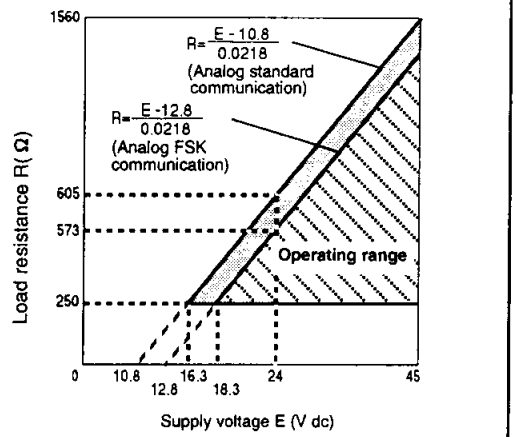
Note 1) See the working pressures and temperatures of the wetted parts section in Figure 2, Figure 3, and Figure 4.

Note 2) Ambient temperatures of the transmitter itself

Note 3) Approximate values at the temperature of 25°C

Note 4) Note that if the operating temperature falls below the lower limit of the normal operating range, the response of the transmitter becomes slower.

Table 2 Temperature Range of Wetted Parts Section and Ambient Temperature Range



Note: For communication with SFC, a load resistance of 250 Ω or more is necessary.

Figure 1 Supply Voltage vs. Load Resistance Characteristics

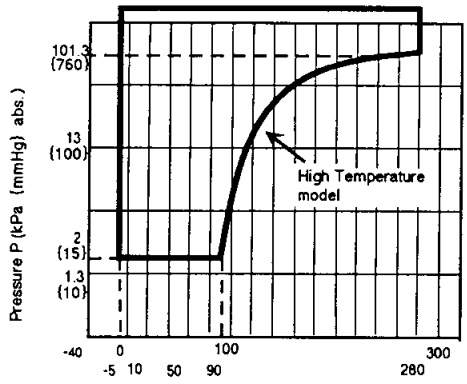


Figure 3 Working Pressure and Temperature of Wetted Parts Section (for high-temperature models)

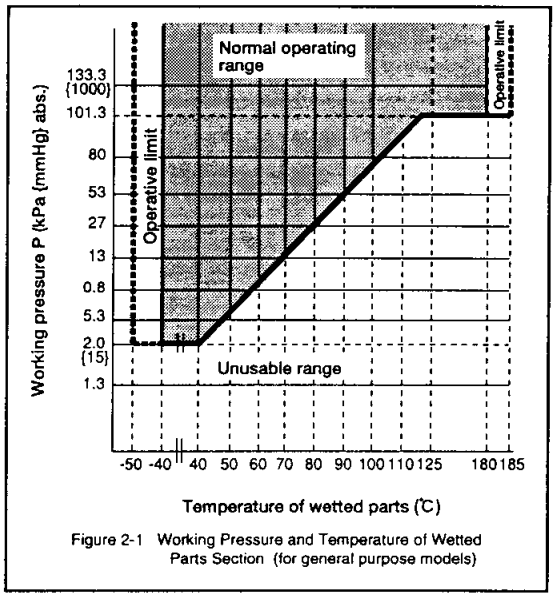


Figure 2-1 Working Pressure and Temperature of Wetted Parts Section (for general purpose models)

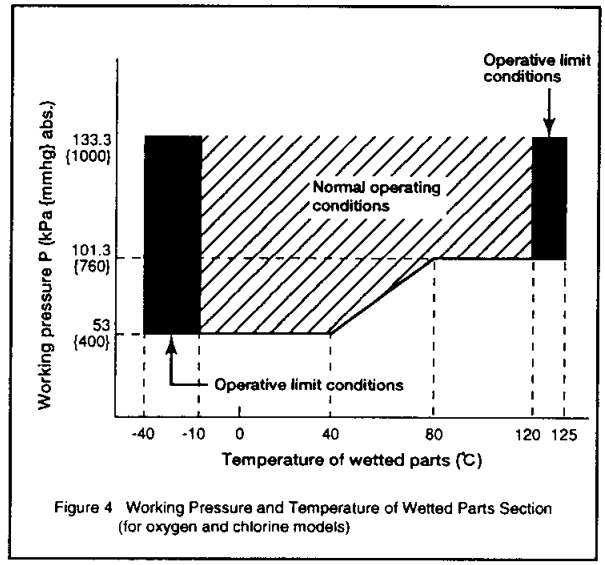


Figure 4 Working Pressure and Temperature of Wetted Parts Section (for oxygen and chlorine models)

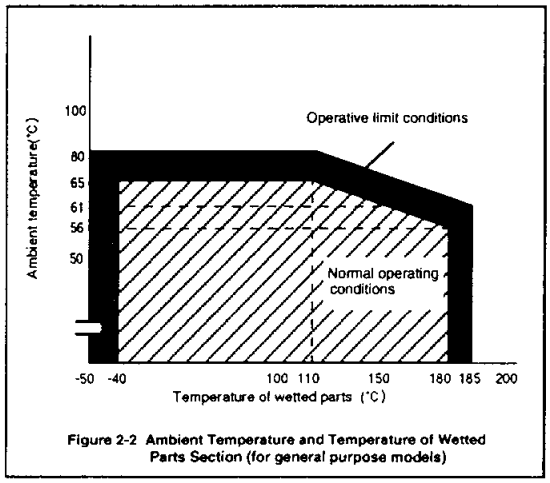


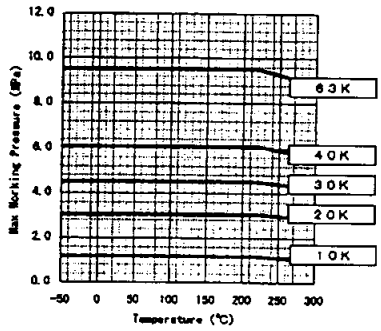
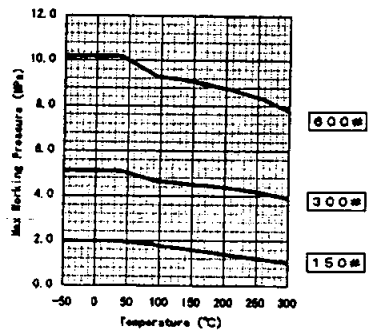
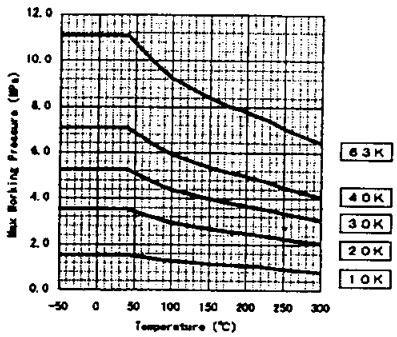
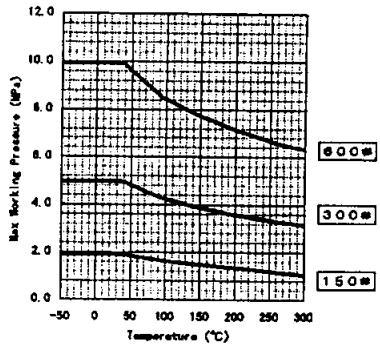
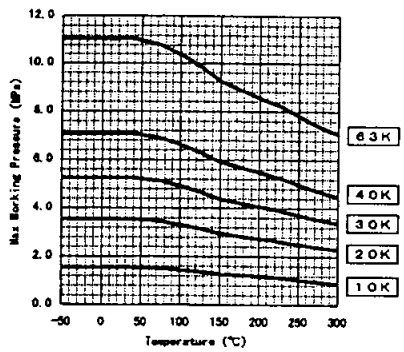
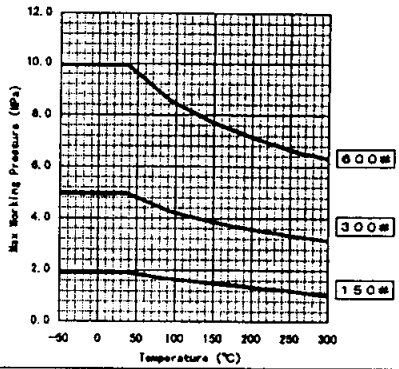
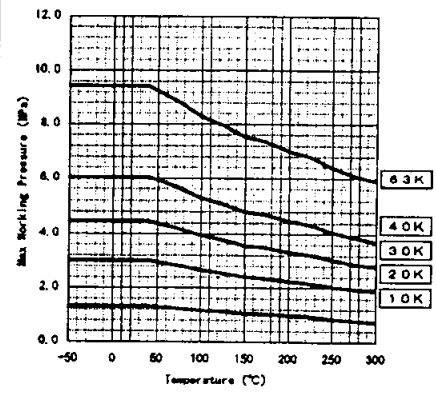
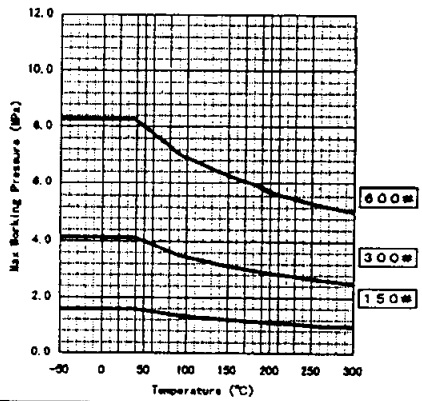
Figure 2-2 Ambient Temperature and Temperature of Wetted Parts Section (for general purpose models)

Note) If sealing liquid is for general purposes, please confirm the conditions listed in Figures 2-1 and 2-2.

Max Working Pressure

<ForNewJoe>

Note1. Max Working Pressure depends on flange rating , flange materials and operating temperature. Please refer to the following data.
Operating range of temperature depends on specification of transmitters
Note2. In cace of flange type (JTF940□、JTC940□)and remote sealed type (JTU940□、JTH940□),
Max Working Pressure depends on the smaller value of either 1.5MPa or following data .
Note3. In cace of absolute remote sealed type (JTS940□),
Max Working Pressure depends on the smaller value of either 3.5MPa abs or following data .
As for the following data , the vertical axis represent gage pressure.
Please exchange of units from gage pressure to absolute pressure, when you use.
Note4. In cace of remote sealed type (JTH960□), Max Working Pressure depends on the smaller value of either 10MPa or following data .
Note5. In cace of 1/2B remote sealed type (JTE929□,JTE930□,JTH960□),
Max Working Pressure depends on the smaller value of either 5.1MPa or the following data as for adoptor flange (HF) .

	JIS	JPI/ANSI
Carbon steal		
SUS304		
SUS316		
SUS316L		

Process pipe connection:

Flange adapters:

JIS10K, 20K, 30K-15A/20A (RF) equivalents

ANSI150, 300-1/2B, 3/4B (RF) equivalents

JPI150, 300-1/2B, 3/4B (RF) equivalents

Screw connection:

Rc 1/2

Electrical conduit connection:

G1/2 internal thread

1/2NPT internal thread (Not usable with JIS explosion-proof models)

Materials:

Center body: SUS316

Transmitter case: Aluminum alloy

Meter body cover: SUSF304

Wetted parts materials:

SUS316 (SUS316L for diaphragm only)
SUS316L
Hastelloy C (Consult us separately.)

Flange materials:

None

Bolts and nuts materials (for fastening meter body cover):

Carbon steel (SNB7), SUS630

Capillary section:

Capillary tube length: 1, 2, 3, 4 and 5 m

Capillary tube material: SUS316

Armored tube material: SUS304

Coating (optional): Olefin coating to improve corrosion resistance

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-painted 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
lower limit

Grounding: Class 3 grounding (grounding resistance 100 Ω max.)

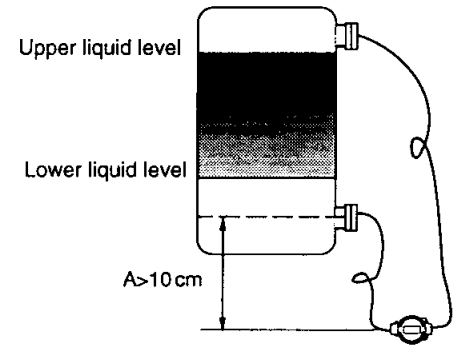
Mounting: Direct mounting on the process side

Using 2-inch pipe mounting brackets:
Mount the transmitter on a horizontal or vertical 2-inch pipe, then use the brackets.

Materials: Brackets: carbon steel
U bolts and nuts: SUS304

Mounting Notes

<For JTE>



1) If the fluid to be measured contains hydrogen, please consult us.
2) When mounting the transmitter, leave a space of at least 10 cm under the lower nozzle of the tank. If no space is available, please consult us.

Weight: Approx. 6.9 kg

(including JTE929 capillary 1 m long)

Optional Specifications

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 and wherever high-performance lightning protection is required.

1/2B remote mounting kit:

This is an adaptor with a vent drain for connecting the remote-sealed section (pressure diaphragm) to the process pipe.

For 1/2B, 3/4B flanges and screw connection Rc 1/2 are available for process pipes.

This adapter is packed without being mounted to the transmitter unless specified.

Materials of gaskets:

SUS316 (hoop)
PTFE (filler)

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 inhibiting treatment (including oil inhibiting treatment):

The transmitter is shipped with dry and oil-free wetted parts.

Oil inhibiting treatment:

The transmitter is shipped with oil-free wetted parts. (The vent drain plug is coated with a small amount of fluorine oil to prevent galling.)

Electric power specification:

This specification applies where stringent quality control is required, such as in the electric 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.

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

Mill sheet: The mill sheet shows the chemical composition, heat-treatment conditions, and mechanical properties of the materials used for the wetted parts.

Documents of conformance to the High Pressure Gas Control Law (for general purposes):

This specification applies when documents verifying conformance to the High Pressure Gas Control Law are required. The documents consist of a strength calculation sheet, the mill sheet, and a pressure resistance and gas-tightness test result sheet.

Strength calculation sheet:

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

Pressure resistance and gas-tightness tests (for general purposes):

The pressure resistance and gas-tightness test result sheet shows the results of a pressure resistance test (under water pressure 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 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 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). Gasket protrusion may cause 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 explosion-proof product is a pull-in pressure-resistant packing-cable, be sure to use a pressure-resistant packing-cable adapter certified by Yamatake-Honeywell.**
- **When conduits are used for connection, be sure to use conduit fittings certified by Yamatake-Honeywell.**

⚠ Caution

- **After installing the transmitter, do not step on it. Using it as a foothold or the like could make it collapse and cause injury.**
- **Be careful not to hit the glass indicator with tools etc. This could break the glass and cause injury.**
- **This 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 breakdown.**
- **Use a power supply that conforms to the specifications. Use of an improper power supply may result in breakdown.**

Performance

Shown for each item are the upper limit (URV) [*1] and the lower limit (LRV) [*2] of the calibration range or the percentage ratio of the maximum value of the span to χ (kPa).

JTE929A (for general purpose models) Material for Wetted Parts: SUS316/SUS316L

Accuracy	Linear output:	$\pm$ 0.3%	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm (0.3 \times \frac{12.5}{\chi})$ %	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	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 55°C** [*4]	Zero shift:	$\pm$0.75%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 0.75 \times \frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$1.6%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 1.6 \times \frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) [*4] **Change of 7MPa {70kgf/cm^2}**	Zero shift:	$\pm$1.47%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm (1.47 \times \frac{25}{\chi})$%	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$1.97%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm (1.97 \times \frac{25}{\chi})$%	($\chi < 25$kPa {2500mmH$_2$O})

JTE929A (for high-temperature models) Material for Wetted Parts: SUS316/SUS316L

Accuracy	Linear output:	$\pm$ 0.3%	($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm (0.3 \times \frac{12.5}{\chi})$ %	($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	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) [*4] **Change of 10°C**	Zero shift:	$\pm$0.36%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 0.36 \times \frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$2.18%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 2.18 \times \frac{25}{\chi}$ %	($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) [*4] **Change of 7MPa {70kgf/cm^2}**	Zero shift:	$\pm$2.7%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm (2.7 \times \frac{25}{\chi})$%	($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm$3.5%	($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm (3.5 \times \frac{25}{\chi})$%	($\chi < 25$kPa {2500mmH$_2$O})

JTE930A (for general purpose and high-temperature models) Material for Wetted Parts: SUS316/SUS316L

Accuracy [*3]	Linear output:	$\pm$0.2%	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm (0.05+0.15 \times \frac{210}{\chi})$%	($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	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) [*3, *4] **Change of 55°C**	Zero shift:	$\pm (0.25+0.15 \times \frac{210}{\chi})$%	
	Combined shift: (including zero and span shifts)	$\pm$2.8%	($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm (2.2+0.6 \times \frac{210}{\chi})$%	($\chi < 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) [*3, *4] **Change of 7MPa {70kgf/cm^2}**	Zero shift:	$\pm \{(\frac{T-25}{200} + 0.47) \times \frac{700}{\chi} + 0.03\}$%	
	Combined shift:	$\pm \{(\frac{T-25}{200} + 0.72) \times \frac{1400}{\chi} + 0.03\}$%	
		T: ambient temperature (°C)	

Notes) [*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 $\geqq$ 0 and LRV $\geqq$ 0
[*4]: Condition: the capillary length is up to 3 m. If exceeding 3 m, please consult us separately.

JTE929A (for general purpose and high-temperature models) **Material for Wetted Parts: Hastelloy C [*5]**

Accuracy	Linear output:	$\pm 0.4\%$ ($\chi \geqq 12.5$kPa {1250mmH$_2$O})
		$\pm(0.4\times\frac{12.5}{\chi})\%$ ($\chi < 12.5$kPa {1250mmH$_2$O})
	Square-root output:	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 (Range from -5 to 55°C)	Zero shift:	$\pm 2.15\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 2.15\times\frac{25}{\chi}\%$ ($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 6.55\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm 6.55\times\frac{25}{\chi}\%$ ($\chi < 25$kPa {2500mmH$_2$O})
Static pressure effect (Shift with respect to setting range) Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm 6.00\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(6.00\times\frac{25}{\chi})\%$ ($\chi < 25$kPa {2500mmH$_2$O})
	Combined shift: (including zero and span shifts)	$\pm 7.00\%$ ($\chi \geqq 25$kPa {2500mmH$_2$O})
		$\pm(7.00\times\frac{25}{\chi})\%$ ($\chi < 25$kPa {2500mmH$_2$O})

JTE930A (for general purpose and high-temperature models) **Material for Wetted Parts: Hastelloy C [*5]**

Accuracy [*3]	Linear output:	$\pm 0.2\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(0.05+0.15\times\frac{2.1}{\chi})\%$ ($\chi < 210$kPa {2.1kgf/cm^2})
	Square-root output:	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 [*3] (Range from -5 to 55°C)	Zero shift:	$\pm(0.15+0.7\times\frac{210}{\chi})\%$
	Combined shift: (including zero and span shifts)	$\pm 3.0\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2})
		$\pm(2.2+0.8\times\frac{210}{\chi})\%$ ($\chi \geqq 210$kPa {2.1kgf/cm^2})
Static pressure effect (Shift with respect to setting range) [*3] Change of 7MPa {70kgf/cm^2}	Zero shift:	$\pm\{(\frac{T-25}{200}+0.47)\times\frac{700}{\chi}+0.03\}\%$
	Combined shift: (including zero and span shifts)	$\pm\{(\frac{T-25}{200}+0.72)\times\frac{1400}{\chi}+0.03\}\%$
		T: ambient temperature (°C)

Notes) [*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 $\geqq$ 0 and LRV $\geqq$ 0
[*5]: Please consult us separately.

JTH940A (for general purpose and high-temperature models) **Material for Wetted Parts: SUS316/SUS316L**

Accuracy	Linear output:	± 0.3%	($\chi \geqq$ 350kPa {3.5kgf/cm²})
		± $(0.3 \times \frac{350}{\chi})$ %	($\chi <$ 350kPa {3.5kgf/cm²})
Temperature characteristics (Shift from the set range)	Zero shift:	± $(0.25 + 0.5 \times \frac{350}{\chi})$ %	
Change of 55°C	Combined shift:	± 1.05%	($\chi \geqq$ 350kPa {3.5kgf/cm²})
		± $(0.35 + 0.7 \times \frac{350}{\chi})$ %	($\chi <$ 350kPa {3.5kgf/cm²})

JTH940A (for general purpose and high-temperature models) **Material for Wetted Parts: Hastelloy C (*5)**

Accuracy	Linear output:	± 0.3%	($\chi \geqq$ 350kPa {3.5kgf/cm²})
		± $(0.3 \times \frac{350}{\chi})$ %	($\chi <$ 350kPa {3.5kgf/cm²})
Temperature characteristics (Shift from the set range)	Zero shift:	± 0.68%	($\chi \geqq$ 350kPa {3.5kgf/cm²})
Change of 30°C		$(0.68 \times \frac{350}{\chi})$ %	($\chi <$ 350kPa {3.5kgf/cm²})
(Range from -5 to 55°C)	Combined shift:	± 1.75%	($\chi \geqq$ 350kPa {3.5kgf/cm²})
		± $(1.75 \times \frac{350}{\chi})$ %	($\chi <$ 350kPa {3.5kgf/cm²})

JTH960A (for general purpose and high-temperature models) **Material for Wetted Parts: SUS316/SUS316L**

Accuracy	Linear output:	± 0.4%	($\chi \geqq$ 3.5MPa {35kgf/cm²})
		± $(0.4 \times \frac{3.5}{\chi})$ %	($\chi <$ 3.5MPa {35kgf/cm²})
Temperature characteristics (Shift from the set range)	Zero shift:	± $(0.25 + 0.5 \times \frac{3.5}{\chi})$ %	
Change of 55°C	Combined shift:	± 1.5%	($\chi \geqq$ 3.5MPa {3.5kgf/cm²})
		± $(0.35 + 0.7 \times \frac{3.5}{\chi})$ %	($\chi <$ 3.5MPa {3.5kgf/cm²})

JTH960A (for general purpose and high-temperature models) **Material for Wetted Parts: Hastelloy C (*5)**

Accuracy	Linear output:	± 0.4%	($\chi \geqq$ 3.5MPa {3.5kgf/cm²})
		± $(0.4 \times \frac{3.5}{\chi})$ %	($\chi <$ 3.5MPa {3.5kgf/cm²})
Temperature characteristics (Shift from the set range)	Zero shift:	± 0.68%	($\chi \geqq$ 3.5MPa {3.5kgf/cm²})
Change of 30°C		$(0.68 \times \frac{3.5}{\chi})$ %	($\chi <$ 3.5MPa {3.5kgf/cm²})
(Range from -5 to 55°C)	Combined shift:	± 1.75%	($\chi \geqq$ 3.5MPa {3.5kgf/cm²})
		± $(1.75 \times \frac{3.5}{\chi})$ %	($\chi <$ 3.5MPa {3.5kgf/cm²})

Notes) (*5): Please consult us separately.

Model Number Configuration Table

ST3000 Ace Remote-Sealed Differential Pressure Transmitter (JTE) with 1/2B Remote Model for General Purpose and High-Temperature Models

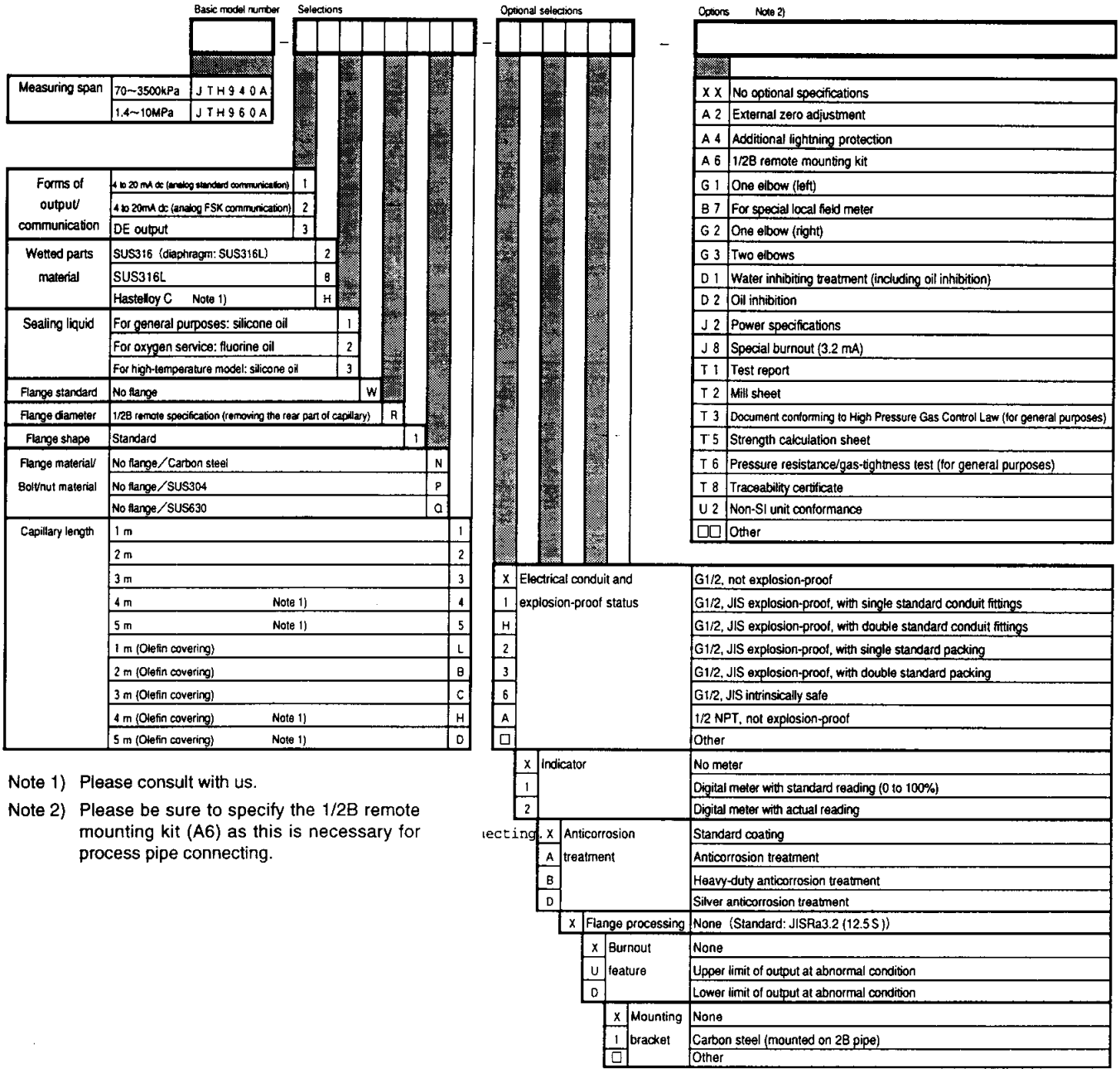
Basic model number		Selections									Optional selections						Options Note 2)	
Measuring span	2.5~100kPa	J T E 9 2 9 A																
	35~700kPa	J T E 9 3 0 A																
Forms of output/ communication	4 to 20 mA dc (analog standard communication)		1															
	4 to 20mA dc (analog FSK communication)		2															
	DE output		3															
Wetted parts material	SUS316 (diaphragm: SUS316L)			2														
	SUS316L			8														
	Hastelloy C Note 1)			H														
Sealing liquid	For general purposes: silicone oil				1													
	For oxygen service: fluorine oil				2													
	For high-temperature model: silicone oil				3													
Flange standard	No flange					W												
Flange diameter	1/2B remote specification (removing the rear part of capillary)					R												
Flange shape	Standard						1											
Flange material/ Bolt/nut material	No flange/Carbon steel							N										
	No flange/SUS304							P										
	No flange/SUS630							Q										
Capillary length	1 m								1									
	2 m								2									
	3 m								3									
	4 m	Note 1)							4									
	5 m	Note 1)							5									
	1 m (Olefin covering)								L									
	2 m (Olefin covering)								8									
	3 m (Olefin covering)								C									
	4 m (Olefin covering)	Note 1)							H									
	5 m (Olefin covering)	Note 1)							D									

			X X No optional specifications
			A 2 External zero adjustment
			A 4 Additional lightning protection
			A 6 1/2B remote mounting kit
			B 7 For special local field meter
			G 1 One elbow (left)
			G 2 One elbow (right)
			G 3 Two elbows
			D 1 Water inhibiting treatment (including oil inhibition)
			D 2 Oil inhibition
			J 2 Power specifications
			J 8 Special burnout (3.2 mA)
			T 1 Test report
			T 2 Mill sheet
			T 3 Document conforming to High Pressure Gas Control Law (for general purposes)
			T 5 Strength calculation sheet
			T 6 Pressure resistance/gas-tightness test (for general purposes)
			T 8 Traceability certificate
			U 2 Non-SI unit conformance
			□□ Other
X	Electrical conduit and explosion-proof status		G1/2, not explosion-proof
1			G1/2, JIS explosion-proof, with single standard conduit fittings
H			G1/2, JIS explosion-proof, with double standard conduit fittings
2			G1/2, JIS explosion-proof, with single standard packing
3			G1/2, JIS explosion-proof, with double standard packing
6			G1/2, JIS intrinsically safe
A			1/2 NPT, not explosion-proof
□			Other
	X	Indicator	No meter
	1		Digital meter with standard reading (0 to 100%)
	2		Digital meter with actual reading
		X Anticorrosion treatment	Standard coating
		A	Anticorrosion treatment
		B	Heavy-duty anticorrosion treatment
		D	Silver anticorrosion treatment
			X Flange processing None (Standard: JISRa3.2 (12.5 S))
			X Burnout feature None
			U Upper limit of output at abnormal condition
			D Lower limit of output at abnormal condition
			X Mounting bracket None
			1 Carbon steel (mounted on 2B pipe)
			□ Other

Note 1) Please consult us separately.

Note 2) Please be sure to specify the 1/2B remote mounting kit (A6) as this is necessary for process pipe connecting.

ST3000 Ace Remote-Sealed Pressure Transmitter (JTH) with 1/2B Remote Model for General Purpose and High-Temperature Models



Basic model number			Selections								Optional selections							Options Note 2)	
Measuring span	70~3500kPa	JTH940A																XX	No optional specifications
	1.4~10MPa	JTH960A																A2	External zero adjustment
																		A4	Additional lightning protection
																		A6	1/2B remote mounting kit
																		G1	One elbow (left)
																		B7	For special local field meter
																		G2	One elbow (right)
																		G3	Two elbows
																		D1	Water inhibiting treatment (including oil inhibition)
																		D2	Oil inhibition
																		J2	Power specifications
																		J8	Special burnout (3.2 mA)
																		T1	Test report
																		T2	Mill sheet
																		T3	Document conforming to High Pressure Gas Control Law (for general purposes)
																		T5	Strength calculation sheet
																		T6	Pressure resistance/gas-tightness test (for general purposes)
																		T8	Traceability certificate
																		U2	Non-SI unit conformance
																		□□	Other
Forms of output/ communication	4 to 20 mA dc (analog standard communication)		1																
	4 to 20mA dc (analog FSK communication)		2																
	DE output		3																
Wetted parts material	SUS316 (diaphragm: SUS316L)			2															
	SUS316L			8															
	Hastelloy C Note 1)			H															
Sealing liquid	For general purposes: silicone oil				1														
	For oxygen service: fluorine oil				2														
	For high-temperature model: silicone oil				3														
Flange standard	No flange					W													
Flange diameter	1/2B remote specification (removing the rear part of capillary)						R												
Flange shape	Standard							1											
Flange material/ Bolt/nut material	No flange/Carbon steel								N										
	No flange/SUS304								P										
	No flange/SUS630								Q										
Capillary length	1 m									1									
	2 m									2									
	3 m									3									
	4 m	Note 1)								4									
	5 m	Note 1)								5									
	1 m (Olefin covering)									L									
	2 m (Olefin covering)									B									
	3 m (Olefin covering)									C									
	4 m (Olefin covering)	Note 1)								H									
	5 m (Olefin covering)	Note 1)								D									
											X	Electrical conduit and explosion-proof status							G1/2, not explosion-proof
											1								G1/2, JIS explosion-proof, with single standard conduit fittings
											H								G1/2, JIS explosion-proof, with double standard conduit fittings
											2								G1/2, JIS explosion-proof, with single standard packing
											3								G1/2, JIS explosion-proof, with double standard packing
											6								G1/2, JIS intrinsically safe
											A								1/2 NPT, not explosion-proof
											□								Other
												X	Indicator						No meter
												1							Digital meter with standard reading (0 to 100%)
												2							Digital meter with actual reading
													X	Anticorrosion treatment					Standard coating
													A						Anticorrosion treatment
													B						Heavy-duty anticorrosion treatment
													D						Silver anticorrosion treatment
														X	Flange processing				None (Standard: JISRa3.2 (12.5S))
															X	Burnout feature			None
															U				Upper limit of output at abnormal condition
															D				Lower limit of output at abnormal condition
																X	Mounting bracket		None
																1			Carbon steel (mounted on 2B pipe)
																□			Other

Note 1) Please consult with us.

Note 2) Please be sure to specify the 1/2B remote mounting kit (A6) as this is necessary for process pipe connecting.

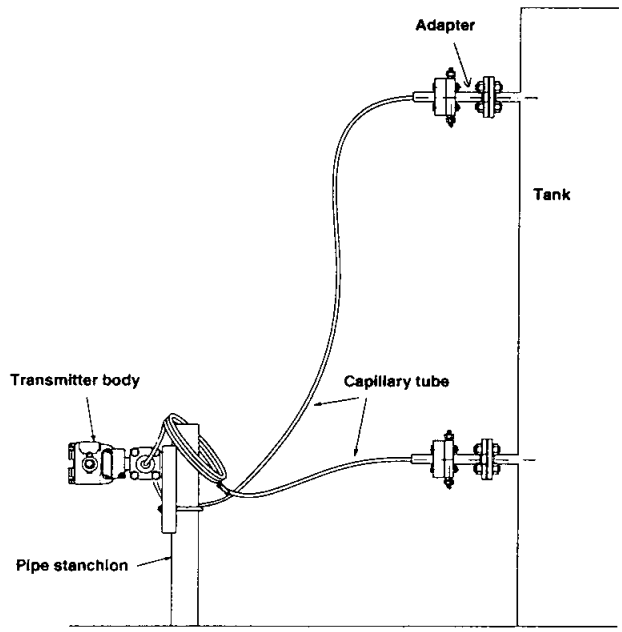
1/2B Remote Mounting Kit (Accessory)

Model Number Example: HF-E1A23-X

		Basic model number	Selections					Options
Product category	1/2B remote mounting kit	H F						

Models	For JTE (2 adaptor bodies)		E			
	For JTH (1 adaptor body)		H			
Adapter	Flange diameter	1/2B flange		1		
		3/4B flange		2		
		Screw-in Rc 1/2 (internal thread)		A		
	Flange standard/ rating	JIS10K			A	
		JIS20K			C	
		JIS30K			D	
		ANSI150			G	
		ANSI300			H	
		JPI150			N	
		JPI300			P	
		No flange (Selectable in the case of "screw-in" for flange diameter)			X	
	Adaptor body material	SUS316				2
		Carbon steel with Zn				B
	Material of bolts/nuts to fasten adaptor body	Carbon steel				1
		SUS630				3

X	None
1	Water inhibiting treatment (including oil inhibition)
2	Oil inhibition
3	Long vent drain
4	Mounting transmitter



⚠ Caution

(1) When bending a capillary tube, do not twist it.

(2) Note that the minimum bending diameter is about 5 cm. Do not bend it more by applying excessive force.

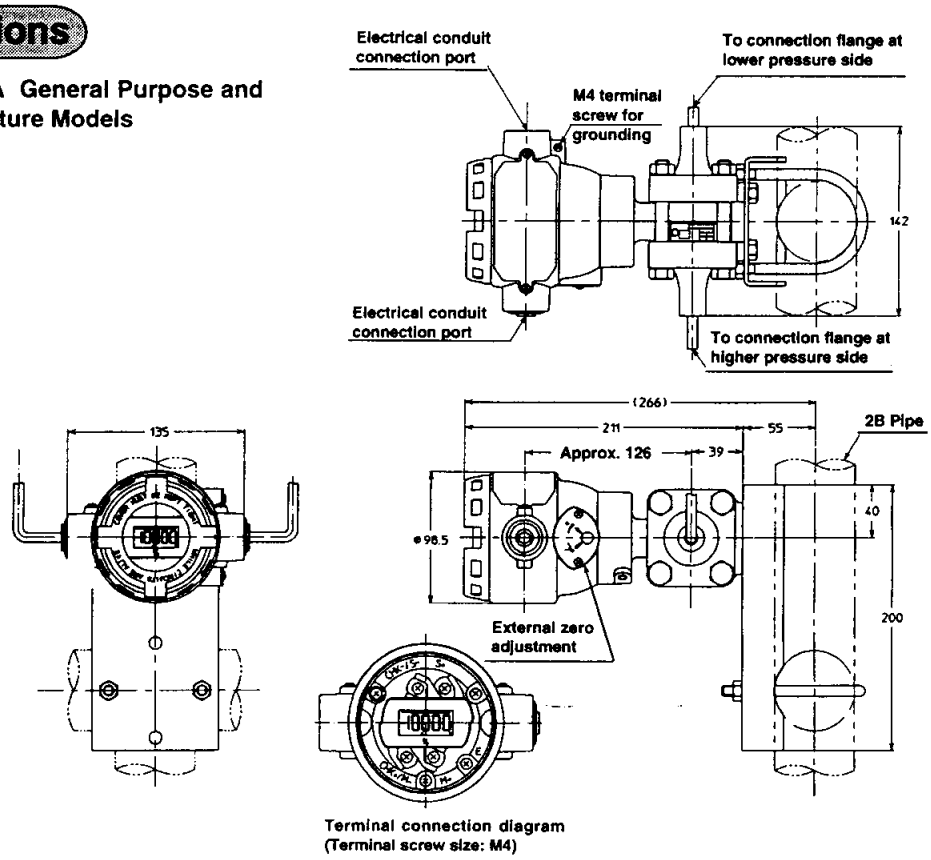
(3) Depending on their properties, fluids to be measured may solidify inside the adaptor, causing measurement difficulties. Keep sufficient heat around the adaptor to prevent the fluid solidifying.

Figure 5 Example of Instrumentation at Tank Level

Dimensions

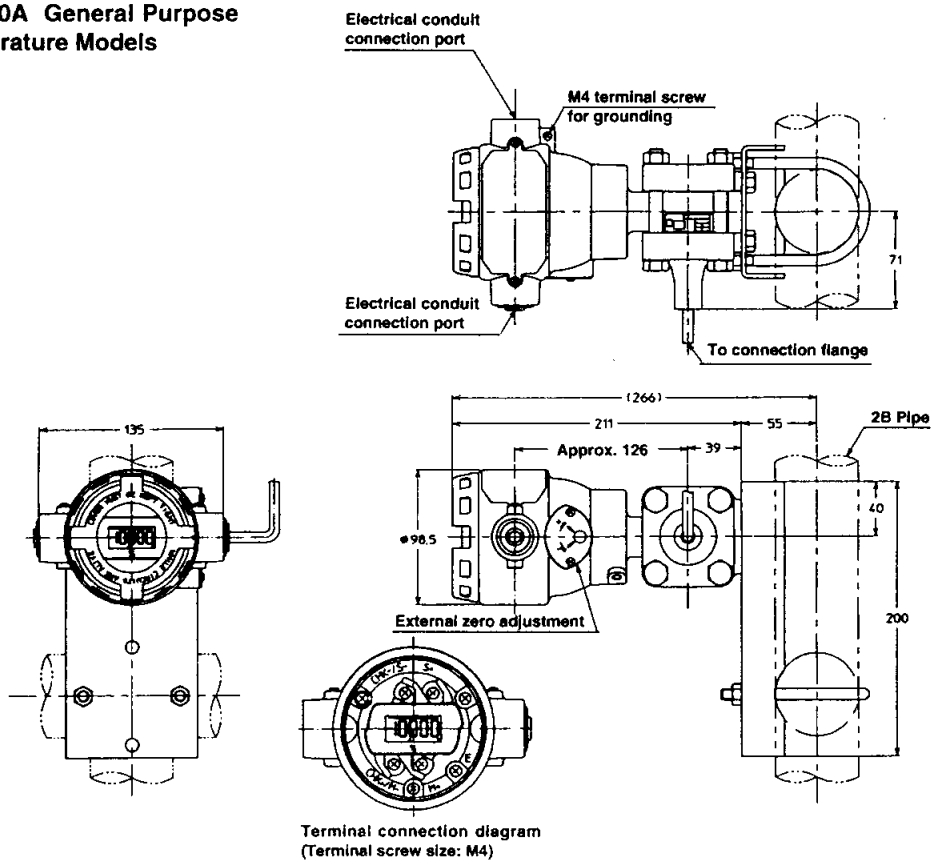
(Unit: mm)

JTE929A/930A General Purpose and High-Temperature Models



Terminal connection diagram
(Terminal screw size: M4)

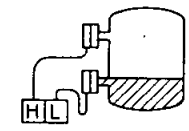
JTH940A/JTH960A General Purpose and High-Temperature Models



Terminal connection diagram
(Terminal screw size: M4)

Notes)

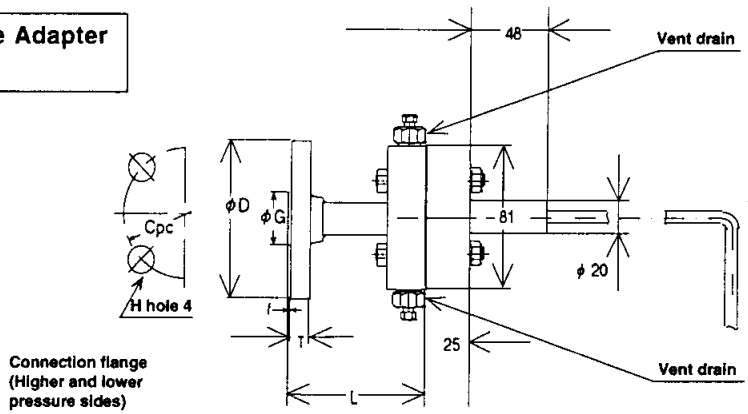
1. The transmitter can be mounted in various ways by changing the position of the mounting bracket. (A typical example is shown in the figure.)
2. To prevent vibration, you are recommended to fasten the capillary tube mid-length.
3. Select a gasket that will not contact the diaphragm after it is tightened.
4. When the volume of suppression is larger than one half of the adjustment span, the higher pressure side and the lower pressure side of the process connection end flange are opposite to those shown in the figure. When using the transmitter to measure liquid levels, connect at H and L marks on the meter body as shown in the figure.



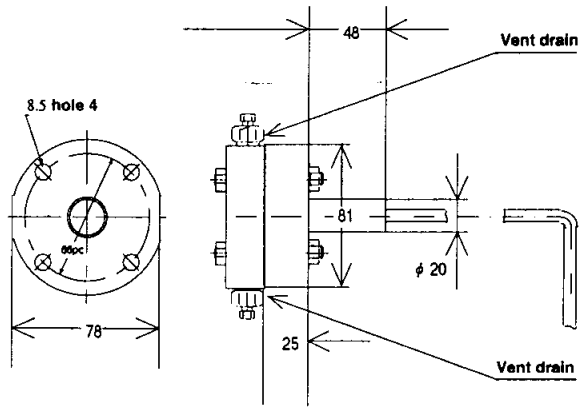
Meter body

JTE929A/930A Table of Flush Diaphragm Flange Dimensions

1/2B or 3/4B Flange Adapter Assembly Drawing



Screw-in Rc 1/2B Adapter Assembly Drawing



Flange standard	φ D	φ G	T	f	φ C	φ H	φ L
JIS 10K-15A・1/2	95	51	12	1	70	15	84
JIS 20K-15A・1/2	95	51	14	1	70	15	84
JIS 30K-15A・1/2	115	55	18	1	80	19	79
ANSI150-15A・1/2	89	35.1	11.5	1.6	60.5	16	86
ANSI300-15A・1/2	95	35.1	14.5	1.6	66.5	19	92
JPI150-15A・1/2	89	35.1	11.5	1.6	60.5	16	86
JPI300-15A・1/2	95	35.1	14.5	1.6	66.5	19	92
JIS 10K-20A・3/4	100	56	14	1	75	15	90
JIS 20K-20A・3/4	100	56	16	1	75	15	90
JIS 30K-20A・3/4	120	60	18	1	85	19	84
ANSI150-20A・3/4	99	42.9	13	1.6	69.8	16	90
ANSI300-20A・3/4	117	42.9	16	1.6	82.6	19	99
JPI150-20A・3/4	99	42.9	13	1.6	69.8	16	90
JPI300-20A・3/4	117	42.9	16	1.6	82.6	19	99

MEMO

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