

AT9000 Advanced Transmitter

Flange type of Differential Pressure Transmitter

OVERVIEW

AT9000 Advanced Transmitter is a microprocessor-based smart transmitter that features high performance and excellent stability. Capable of measuring gas, liquid, and vapor, and liquid levels, it transmits 4 to 20 mA DC analog and digital signals according to the measured differential pressure.

It can also execute two-way communications between the Smart Communicator or HART® 375 communicator, thus facilitating self-diagnosis, range resetting, and automatic zero adjustment.



FEATURES

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.

A diverse lineup

- A diverse flange lineup, ranging from small diameter 1.5 inch (40 mm) and 2 inches (50 mm) to 3 inches (80 mm), is available to meet user requirements.
- A wide variety of models, including those for standard differential pressure and high differential pressure, is available to meet user requirements.
- A wide variety of corrosion-resistant materials for wetted parts is also available.

Remote communication

- Two-way communication using digital output facilitates self-diagnosis, range resetting, automatic zero adjustment, and other operations.
- HART® protocol communication is available. (Option)

China RoHS

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

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

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

APPLICATION**Petroleum / Petrochemical / Chemical**

For measuring pressures, liquid levels, and ordinary surface levels in tanks of all sizes.

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 measuring pressures, liquid levels, and boundary surface levels in tanks
- For measuring pressure, liquid levels, and boundary surface levels in tanks of all sizes.

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, etc.) conditions.

FUNCTIONAL SPECIFICATIONS**Type of protection**

NEMA3 and 4X
IEC IP67

FM Explosionproof and Dust Approvals

Explosionproof for Class I, Division 1, Groups A, B, C and D; Class I, Zone 1, AEx d IIC
Dust-Ignitionproof for Class II, III, Division 1, Groups E, F and G

T5 $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +85^{\circ}\text{C}$

Hazardous locations

Indoor / Outdoor Type 4X, IP67

Factory sealed, conduit seal not required for Division applications

Caution - Use supply wires suitable for 5°C above surrounding ambient

FM Intrinsically safe Approval

IS/I,II,III/1/ABCDEFGH/T4; $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$;
80395278, 80395279, 80395280; Entity; TYPE 4X; IP67
I/O/ AEx ia/IIC/T4; $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$; 80395278,
80395279, 80395280; Entity; TYPE 4X; IP67
Entity Parameters: $V_{\text{max}}(U_i)=30$ Volts, $I_{\text{max}}(I_i)=100\text{mA}$,
 $P_i=1\text{W}$, $C_i=10\text{nF}$, $L_i=0.5\text{mH}$

FM Nonincendive Approval

NI/I/2/ABCD/T4; $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$; 80395494;
NIFW; TYPE 4X; IP67
NI/I/2/IIC/T4; $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$; 80395494; NIFW;
TYPE 4X; IP67
S/II,III/1/EFH/T4; $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$;
80395494; NIFW; TYPE 4X; P67
Nonincendive Field Wiring Parameters: $V_{\text{max}}(U_i)=30$
Volts, $C_i=10\text{nF}$, $L_i=0.5\text{mH}$

ATEX Flameproof and Dust Certifications

CE 0344  KEMA 08ATEX0004

II 1/2 G Ex d IIC T6 $T_{\text{process}}=85^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$ IP66/67

II 1/2 G Ex d IIC T5 $T_{\text{process}}=100^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +80^{\circ}\text{C}$ IP66/67

II 1/2 G Ex d IIC T4 $T_{\text{process}}=110^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +80^{\circ}\text{C}$ IP66/67

II 2 D Ex tD A21 IP66/67 T85 $T_{\text{process}}=85^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$

II 2 D Ex tD A21 IP66/67 T100 $T_{\text{process}}=100^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$

II 2 D Ex tD A21 IP66/67 T110 $T_{\text{process}}=110^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$

Caution - Use supply wires suitable for 5°C above surrounding ambient

ATEX Intrinsic safety and Dust Certifications

CE 0344  KEMA 07ATEX0200 X

II 1 G Ex ia IIC T4 $T_{\text{PROCESS}} = 105^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$ IP66 / 67

ELECTRICAL PARAMETERS: $U_i = 30$ V, $I_i = 93$ mA,
 $P_i = 1$ W, $C_i = 5$ nF, $L_i = 0.5$ mH

II 1 D Ex iaD 20 IP66 / 67 T105 $T_{\text{PROCESS}} = 105^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$

ATEX Type n and Dust Certifications

CE 0344  KEMA 07ATEX0200 X

II 3 G Ex nL IIC T4 $T_{\text{PROCESS}} = 105^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$ IP66 / 67

ELECTRICAL PARAMETERS: $U_i = 30$ V, $C_i = 5$ nF, $L_i = 0.5$ mH

II 2 D Ex tD A21 IP66 / 67 T85 $T_{\text{PROCESS}} = 85^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$

II 2 D Ex tD A21 IP66 / 67 T100 $T_{\text{PROCESS}} = 100^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +80^{\circ}\text{C}$

II 2 D Ex tD A21 IP66 / 67 T110 $T_{\text{PROCESS}} = 110^{\circ}\text{C}$

$-30^{\circ}\text{C} \leq T_{\text{amb}} \leq +80^{\circ}\text{C}$

NEPSI Flameproof and Dust Certifications

Ex d IIC T6 DIP A21 T_A 85°C $T_{\text{process}}=80^{\circ}\text{C}$ $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$

Ex d IIC T5 DIP A21 T_A 100°C $T_{\text{process}}=95^{\circ}\text{C}$ $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +80^{\circ}\text{C}$

Ex d IIC T4 DIP A21 T_A 115°C $T_{\text{process}}=110^{\circ}\text{C}$ $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +80^{\circ}\text{C}$

ENCLOSURE TYPE IP66/67

Certificate No. GYJ071268

NEPSI Intrinsic Safety Certification

Ex ia IIC T4 $T_{\text{process}}=105^{\circ}\text{C}$ $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$

Enclosure IP66 / 67

Electrical Parameters: $U_i=30\text{V}$, $I_i=100\text{mA}$, $P_i=1\text{W}$,
 $C_i=13\text{nF}$, $L_i=0.5\text{mH}$

Certificate No. GYJ071269

NEPSI Type n Certification

Ex nL IIC T4 $T_{\text{process}}=110^{\circ}\text{C}$ $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$

Enclosure IP66 / 67

Electrical Parameters: $U_i=30\text{V}$, $I_i=100\text{mA}$, $P_i=1\text{W}$,
 $C_i=13\text{nF}$, $L_i=0.5\text{mH}$

Certificate No. GYJ071269

IECEx Flameproof and Dust Certifications

Certificate No. IECEx KEM 08.0001

Ga/Gb Ex d IIC T6 Tprocess=85°C -30°C ≤ Tamb ≤ +75°C IP66/67

Ga/Gb Ex d IIC T5 Tprocess=100°C -30°C ≤ Tamb ≤ +80°C IP66/67

Ga/Gb Ex d IIC T4 Tprocess=110°C -30°C ≤ Tamb ≤ +80°C IP66/67

Ex tD A21 IP66/67 T85 Tprocess=85°C -30°C ≤ Tamb ≤ +75°C

Ex tD A21 IP66/67 T100 Tprocess=100°C -30°C ≤ Tamb ≤ +75°C

Ex tD A21 IP66/67 T110 Tprocess=110°C -30°C ≤ Tamb ≤ +75°C

Caution - Use supply wires suitable for 5°C above surrounding ambient

IECEx Intrinsic safety and Dust Certifications

IECEx KEM 07.0058X

Zone 0 Ex ia IIC T4 TPROCESS = 105 °C

-30 °C ≤ Tamb ≤ +60 °C IP66 / 67

ELECTRICAL PARAMETERS: Ui = 30 V, Li = 93

mA, Pi = 1 W, Ci = 5 nF, Li = 0.5 mH

Ex iaD 20 IP66 / 67 T105 TPROCESS = 105 °C

-30 °C ≤ Tamb ≤ +60 °C

IECEx Type n and Dust Certifications

IECEx KEM 07.0058X

Ex nL IIC T4 TPROCESS = 105 °C

-30 °C ≤ Tamb ≤ +60 °C IP66 / 67

ELECTRICAL PARAMETERS: Ui = 30 V, Ci = 5 nF, Li = 0.5 mH

Ex tD A21 IP66 / 67 T85 TPROCESS = 85 °C

-30 °C ≤ Tamb ≤ +75 °C

Ex tD A21 IP66 / 67 T100 TPROCESS = 100 °C

-30 °C ≤ Tamb ≤ +80 °C

Ex tD A21 IP66 / 67 T110 TPROCESS = 110 °C

-30 °C ≤ Tamb ≤ +80 °C

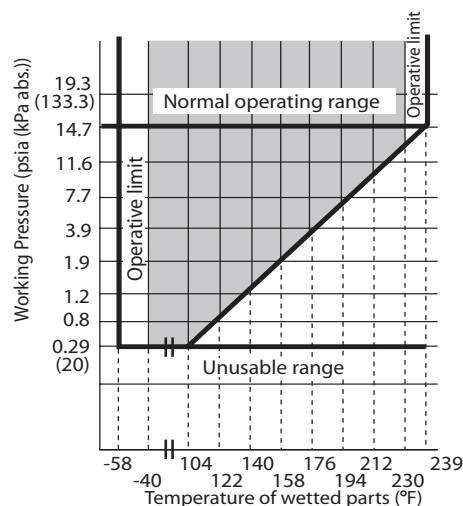
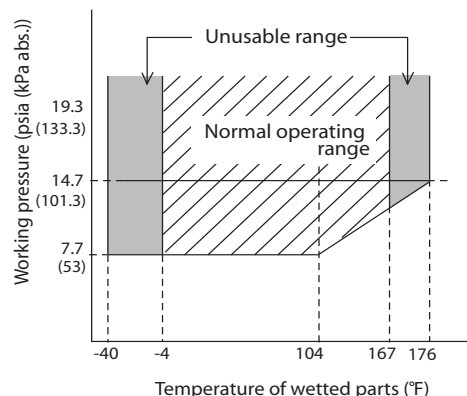
EMC Conformity

89/336/EEC, 92/31/EEC, 93/68/EEC Electromagnetic

Compatibility (EMC) Directive

Measuring span / Setting range / Working pressure range

	Measuring span	Setting range	Working pressure range
GTX 35F	0 to 400 inH ₂ O (2.5 to 100 kPa)	-400 to 400 inH ₂ O (-100 to 100 kPa)	Up to flange rating (for negative pressures, see Figure 1 and Figure 2)
GTX 60F	5.1 to 508 psi (35 to 3500 kPa)	-14.5 to 508 psi (-100 to 3500 kPa)	

**Figure 1 Working pressure and temperature of wetted parts section****Figure 2 Working pressure and temperature of wetted parts section (for oxygen and chlorine service)**

Supply voltage and load resistance

17.9 to 42V DC. Reverse polarity protection is standard. A load resistance of 250 Ω or more is necessary between loops. See Figure 3.

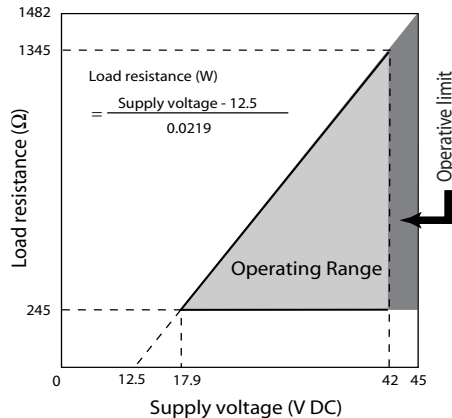


Figure 3 *Supply voltage vs. load resistance characteristics*

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

Output

Analog output (4 to 20 mA DC) with DE protocol
 Analog output (4 to 20 mA DC) with HART protocol
 Digital output (DE protocol)

Output signal

3.6 to 21.6 mA
 3.8 to 20.5 mA (NAMUR NE43 compliant)

Failure Alarm

Upper: 21.6 mA or more
 Lower: 3.6 mA or less

Ambient temperature limits**Normal operating range**

-22 to 167°F (-30 to 75°C) for general purpose models
 14 to 167°F (-10 to 75°C) for oxygen and chlorine models
 -13 to 167°F (-25 to 75°C) for models with digital indicators

Operative limits

-58 to 176°F (-50 to 80°C) for general purpose models
 -40 to 176°F (-40 to 80°C) for oxygen and chlorine models
 -22 to 176°F (-30 to 80°C) for models with digital indicators

Temperature ranges wetted parts**Normal operating range**

-40 to 230°F (-40 to 110°C) for general purpose models
 -4 to 164°F (-20 to 75°C) for oxygen and chlorine models

Operative limits

-58 to 239°F (-50 to 115°C) for general purpose models
 -40 to 176°F (-40 to 80°C) for oxygen and chlorine models

Ambient humidity limits

5 to 100% RH

Stability against supply voltage change

$\pm 0.005\%$ FS/V

Response time

Max: 0.3 sec.

Damping time

Selectable from 0 to 32 sec. in ten stages

Lightning protection

Applicable Standards; IEC 61000-4-5

Peak value of current surge(80/20 μ sec.): 6000A

Indicator

The digital LCD indicator (optional) indicates engineering units and can be set freely between -99999 and 99999 (5 digits). For meter calibration, specify the following items when placing your order.

- Meter calibration range
- Meter calibration unit
- Linear / Square-root for meter indication.

Various kinds of data can be set using the Smart Communicator or the HART[®]375 communicator.

Bolts and nuts materials (for fastening meter body cover)

Carbon steel (SNB7), 304 SST, 630 SST

Paint**Standard**

Corrosion-resistant paint (Baked acrylic paint)

Corrosion-proof finish

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

Corrosion-resistant finish (silver color)

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

OPTIONAL SPECIFICATIONS**FEP protective film**

Use FEP protective films when corrosive fluids are used or to avoid metal ions contact.

Working temperature range

0 to 110°C

Working pressure range

Atmospheric pressure to flange rating
 (up to JIS10K, ANSI / JPI 150)
 (Not usable under negative pressure)

Oil free finish

The transmitter is shipped with oil-free wetted parts.

External zero/span adjustment function

The transmitter can be easily zero/span adjusted in the field.

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.

Conformance to SI units

We deliver transmitters set to any SI units as specified.

PHYSICAL SPECIFICATIONS**Materials****Fill fluid**

Silicone oil for general purpose models
Fluorine oil for oxygen and chlorine models

Center body

316 SST

Transmitter case

Aluminum alloy

Meter body cover

SCS14A (equivalent to 316 SST) or 316 SST

For Wetted parts**Adapter flange (option)**

SCS14A (equivalent to 316 SST)

Center body

316 SST (316L SST for diaphragm only)
ASTM B575 (Hastelloy C-276 equivalent), Tantalum,
316L SST

Vents and plugs

316 SST

Gaskets

FEP

Flange materials

304 SST, 316 SST, 316L SST

Weight

Approx. 5.9 kg (in case of ANSI 150# - 1-1/2 inches flange)

INSTALLATION**Electrical connection**

1/2NPT internal thread, M20 internal thread.

Grounding

Resistance 100 Ω max

Mounting

Direct mounting on the process side

Process connection**Measured pressure (liquid side)****Flush diaphragm**

JIS 10K, 20K, 30K and 63K: 40, 50 and 80mm (RF) equivalents
ANSI/JPI 150, 300 and 600: 1.5, 2, 3 inches (RF) equivalents

Extended diaphragm

JIS 10K, 20K and 30K: 50, 80 and 100mm (RF) equivalents
ANSI/JPI 150, 300 and 600: 2, 3 inches (RF) equivalents
ANSI/JPI 150 and 300: 4 inches (RF) equivalents

Flange standard

JIS; JIS B 2220 (2004)
ANSI; ANSI B 16.5 (1988)

JPI; JPI-7S-15-93

Standard pressure side

Rc1/2, 1/2NPT internal thread, Rc1/4, 1/4NPT internal thread, atmospheric disconnection hole.

TRANSMITTER HANDLING NOTES

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

Transmitter installation notes**⚠ WARNING**

- When installing the transmitter, ensure that gaskets do not protrude from connecting points into the process (such as adapter flange connection points and connecting pipes and flanges). Gasket protrusion may result in leaks and output errors.
- Do not use the transmitter outside its defined pressure, temperature, and connection specifications. A serious accident may otherwise occur due to damage and leaks.
- When performing wiring work in explosion-proof areas, follow the work method specified in the explosion-proof guidelines.

⚠ CAUTION

- After installing the transmitter, do not stand on it. Using it as a foothold could cause it to collapse and cause physical injury.
- Be careful not to hit the glass indicator with tools etc. This could break the glass and cause injury.
- The transmitter is heavy. Wear safety shoes and take care when installing it.
- Impact to transmitter can damage sensor module.

Wiring notes**⚠ WARNING**

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

⚠ CAUTION

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

Handling precautions for HART specification devices

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

PERFORMANCE SPECIFICATIONS**Max working pressure**

- Note) 1. 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.
- Note) 2. In case of flange type (GTX60F) and remote sealed type (GTX60U), max working pressure depends on the smaller value of either 1.5 MPa or following data.
- Note) 3. In case of remote sealed type (GTX71U), max working pressure depends on the smaller value of either 10 MPa or following data.

	JIS	JPI/ANSI
304 SST		
316 SST		
316L SST		

Reference accuracy

Shown for each item are the percentage ratio for χ (inH₂O / psi), which is the greatest value of either the upper range value (URV)^{*1}, the lower range value (LRV)^{*2} or the span.

Model GTX35F

Material of Wetted Parts at Flange Side: 316 SST (Diaphragm; 316L SST), 316L SST,

Material of Wetted parts at reference side: 316 SST (Diaphragm; 316L SST)

Reference accuracy (*4)	Linear output:	$\pm 0.2\%$	(For $\chi \geq 50$ inH ₂ O (12.5 kPa))
		$\pm \left(0.05 + 0.15 \times \frac{50}{\chi} \right) \%$	(For $\chi < 50$ inH ₂ O (12.5 kPa))
Ambient Temperature effect (Shift from the set range) Change of 86°F (30°C) (Range from 23 to 131°F (-5 to 55°C))	Combined shift: (including zero and span shifts)	$\pm 1.45\%$	(For $\chi \geq 50$ inH ₂ O (12.5 kPa))
		$\pm \left(0.35 + 1.1 \times \frac{50}{\chi} \right) \%$	(For $\chi < 50$ inH ₂ O (12.5 kPa))
Static pressure effect (Shift in respect to setting range) Change of 1015 psi (7 MPa)	Zero shift:	$\pm \left(0.03 + 0.64 \times \frac{100}{\chi} \right) \%$	
	Combined shift: (including zero and span shifts)	$\pm 0.97\%$	(For $\chi \geq 100$ inH ₂ O (25 kPa))
		$\pm \left(0.03 + 0.94 \times \frac{100}{\chi} \right) \%$	(For $\chi < 100$ inH ₂ O (25 kPa))

Model GTX35F (For option “M5”, 0.1 mm thickness diaphragm)

Material of Wetted Parts at Flange Side: 316 SST (Diaphragm; 316L SST), 316L SST,

Material of Wetted parts at reference side: 316 SST (Diaphragm; 316L SST)

Reference accuracy (*4)	Linear output:	$\pm 0.8\%$	(For $\chi \geq 50$ inH ₂ O (12.5 kPa))
		$\pm \left(0.15 + 0.3 \times \frac{50}{\chi} \right) \%$	(For $\chi < 50$ inH ₂ O (12.5 kPa))
Ambient Temperature effect (Shift from the set range) Change of 86°F (30°C) (Range from 23 to 131°F (-5 to 55°C))	Combined shift: (including zero and span shifts)	$\pm \left(0.6 + 5.4 \times \frac{100}{\chi} \right) \%$	
Static pressure effect (Shift in respect to setting range) Change of 1015 psi (7 MPa)	Zero shift:	$\pm \left(0.64 + 2.64 \times \frac{100}{\chi} \right) \%$	
	Combined shift: (including zero and span shifts)	$\pm \left(1.17 + 2.0 \times \frac{100}{\chi} \right) \%$	(For $\chi \geq 100$ inH ₂ O (25 kPa))
		$\pm \left(0.23 + 2.94 \times \frac{100}{\chi} \right) \%$	(For $\chi < 100$ inH ₂ O (25 kPa))

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

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

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

*4) Reference accuracy at calibrated condition.

Model GTX35F

Material of Wetted Parts at Flange Side: ASTM B575 (Hastelloy C-276 equivalent), Tantalum,

Material of Wetted parts at reference side: 316 SST (Diaphragm; 316L SST)

Reference accuracy (*4)	Linear output:	$\pm 0.4\%$	(For $\chi \geq 50$ inH ₂ O (12.5 kPa))
		$\pm \left(0.25 + 0.15 \times \frac{50}{\chi}\right)\%$	(For $\chi < 50$ inH ₂ O (12.5 kPa))
Ambient Temperature effect (Shift from the set range) Change of 86°F (30°C) (Range from 23 to 131°F (-5 to 55°C))	Combined shift: (including zero and span shifts)	$\pm \left(0.6 + 2.4 \times \frac{100}{\chi}\right)\%$	
Static pressure effect (Shift in respect to setting range) Change of 1015 psi (7 MPa)	Zero shift:	$\pm \left(0.03 + 1.64 \times \frac{100}{\chi}\right)\%$	
	Combined shift: (including zero and span shifts)	$\pm \left(1.07 + 1.0 \times \frac{100}{\chi}\right)\%$	(For $\chi \geq 100$ inH ₂ O (25 kPa))
		$\pm \left(0.13 + 1.94 \times \frac{100}{\chi}\right)\%$	(For $\chi < 100$ inH ₂ O (25 kPa))

Model GTX60F

Material of Wetted Parts at Flange Side: 316 SST (Diaphragm; 316L SST), 316L SST,

Material of Wetted parts at reference side: 316 SST (Diaphragm; 316L SST)

Reference accuracy (*3)(*4)	Linear output:	$\pm 0.15\%$	(For $\chi \geq 50.8$ psi (350 kPa))
		$\pm \left(0.05 + 0.1 \times \frac{50.8}{\chi}\right)\%$	(For $\chi < 50.8$ psi (350 kPa))
Ambient Temperature effect (Shift from the set range) Change of 86°F (30°C) (*3) (Range from 23 to 131°F (-5 to 55°C))	Combined shift: (including zero and span shifts)	$\pm 0.75\%$	(For $\chi \geq 50.8$ psi (350 kPa))
		$\pm \left(0.35 + 0.4 \times \frac{50.8}{\chi}\right)\%$	(For $\chi < 50.8$ psi (350 kPa))
Static pressure effect (Shift in respect to setting range) (*3) Change of 1015 psi (7 MPa)	Zero shift:	$\pm \left(0.03 + 7.5 \times \frac{50.8}{\chi}\right)\%$	
	Combined shift: (including zero and span shifts)	$\pm 9.00\%$	(For $\chi \geq 50.8$ psi (350 kPa))
		$\pm \left(1.5 + 7.5 \times \frac{50.8}{\chi}\right)\%$	(For $\chi < 50.8$ psi (350 kPa))

Note) *3) Within a range of $URV \geq 0$ and $LRV \geq 0$.

*4) Reference accuracy at calibrated condition.

Model GTX60F (For option “M5”, 0.1mm thickness diaphragm)

Material of Wetted Parts at Flange Side: 316 SST (Diaphragm; 316L SST), 316L SST,

Material of Wetted parts at reference side: 316 SST (Diaphragm; 316L SST)

Reference accuracy (*3)(*4)	Linear output:	$\pm 0.6\%$	(For $\chi \geq 50.8$ psi (350 kPa))
		$\pm \left(0.3 + 0.3 \times \frac{50.8}{\chi} \right) \%$	(For $\chi < 50.8$ psi (350 kPa))
Ambient Temperature effect (Shift from the set range) Change of 86°F (30°C) (*3) (Range from 23 to 131°F (-5 to 55°C))	Combined shift: (including zero and span shifts)	$\pm \left(0.35 + 2.6 \times \frac{50.8}{\chi} \right) \%$	
Static pressure effect (Shift in respect to setting range) (*3)	Zero shift:	$\pm \left(0.03 + 9.5 \times \frac{50.8}{\chi} \right) \%$	
	Combined shift: (including zero and span shifts)	$\pm 9.0\%$ $\pm \left(1.5 + 7.5 \times \frac{50.8}{\chi} \right) \%$	(For $\chi \geq 50.8$ psi (350 kPa)) (For $\chi < 50.8$ psi (350 kPa))

Model GTX60F

Material of Wetted Parts at Flange Side: ASTM B575 (Hastelloy C-276 equivalent), Tantalum,

Material of Wetted parts at reference side: 316 SST (Diaphragm; 316L SST)

Reference accuracy (*3)(*4)	Linear output:	$\pm 0.3\%$	(For $\chi \geq 50.8$ psi (350 kPa))
		$\pm \left(0.15 + 0.15 \times \frac{50.8}{\chi} \right) \%$	(For $\chi < 50.8$ psi (350 kPa))
Ambient Temperature effect (Shift from the set range) Change of 86°F (30°C) (*3) (Range from 23 to 131°F (-5 to 55°C))	Combined shift: (including zero and span shifts)	$\pm \left(0.35 + 0.65 \times \frac{50.8}{\chi} \right) \%$	
Static pressure effect (Shift in respect to setting range) (*3)	Zero shift:	$\pm \left(0.03 + 8.5 \times \frac{50.8}{\chi} \right) \%$	
	Combined shift: (including zero and span shifts)	$\pm 9.0\%$ $\pm \left(1.5 + 7.5 \times \frac{50.8}{\chi} \right) \%$	(For $\chi \geq 50.8$ psi (350 kPa)) (For $\chi < 50.8$ psi (350 kPa))

Note) *3) Within a range of $URV \geq 0$ and $LRV \geq 0$.

*4) Reference accuracy at calibrated condition.

MODEL SELECTION**Model GTX35F (Flange type for standard differential pressure)****Model GTX60F (Flange type for high differential pressure)**

Model No.: GTX_ _ F-Selection I (I II III IV V VI VII) -Selection II (I II III IV V VI) -Option

Basic Model No.

	Measuring span	10 to 400 inH ₂ O (2.5 to 100 kPa)	GTX35F	Flush flange type 3 inches (80 mm)
		5.1 to 508 psi (35 to 3500 kPa)	GTX60F	

Selection I

I	Output	4 to 20 mA (SFN Communication)	A
		4 to 20 mA (HART Communication)	B
		4 to 20 mA (SFN/HART Bilingual Communication) *5	E
II	Fill fluid	Regular type (Silicone oil)	A
		For oxygen service (Fluorine oil)	H
		For chlorine service (Fluorine oil) *1	J
III	Material (Meterbody cover, Vent/Drain plugs)	Meterbody cover	A
		Vent / Drain plugs	
IV	Material (center-body)	Reference side	Wetted part of flange side
		316 SST	316 SST (Diaphragm: 316L SST)
		316 SST	ASTM B575
		316 SST	Tantalum *1
		316 SST	316L SST
V	Process connections of reference side	Rc 1/2, with adapter flange *4	A
		Rc 1/4, with adapter flange *4	B
		Rc 1/4, without adapter flange *4	C
		1/2 NPT internal thread, with adapter flange *4	D
		1/4 NPT internal thread, with adapter flange *4	E
		1/4 NPT internal thread, without adapter flange *4	F
VI	Process installation of reference side	Open to atmosphere *3	H
		No connection *3	X
		Vertical piping, top connection	A
VII	Flange rating	Vertical piping, bottom connection	B
		ANSI150	A1
		ANSI300	A2
		ANSI600	A3
		JIS10K	J1
		JIS20K	J3
		JIS30K	J4
		JIS63K	J6
		JPI150	P1
		JPI300	P2
VIII	Flange size	JPI600	P3
		3in./80A	F
IX	Flange type	Flush type	A
X	Flange material/bolt and nut material	Flange	Bolt and nut
		304 SST	304 SST
		304 SST	Carbon steel
		316 SST	304 SST
		316 SST	Carbon steel
		316L SST	304 SST
XI	Gasket face finish	316L SST	Carbon steel
		None Standard JISR3.2(12.5S)	A

Selection II

I	Electrical connection	1/2 NPT, Watertight	A
		M20, Watertight *2	B
II	Explosion proof	None	XX
		FM Explosion proof	F1
		FM Intrinsically safe	F2
		FM Nonincendive	F5
		ATEX Explosion proof	A1
		ATEX Intrinsically safe	A2
		ATEX Type n	A5
		IECEx Explosion proof	E1
		IECEx Intrinsically safe	E2
		IECEx Type n	E5
		NEPSI Explosionproof	N1
		NEPSI Intrinsically safe	N2
		NEPSI Type n	N5
III	Built-in indicating smart meter	None	X
		With indicator	A
IV	Paint	Standard	X
		Corrosion-proof (Urethane)	H
		Corrosion-resistant (Silver color)	D
V	Burnout feature	UP Scale	A
		DOWN scale	B
VI	Mounting Bracket	None	X

Note) *1 In case code J is selected, code C "Tantalum", wetted part material of flange side should be selected.

*2 Not applicable for the combination with code F1, F6 "FM Explosion proof" of Explosion proof.

*3 In case code H is selected, code X "No connection" of process installation of reference side should be selected.

*4 Not applicable for the combination with code X "No connection" of Process installation of reference side.

*5 Not applicable for the combination with code Q1 "Safety Transmitter" of Option.

Model GTX35F (Flange type for standard differential pressure)**Model GTX60F (Flange type for high differential pressure)**

Model No.: GTX__F-Selection I (I II III IV V VI VII) -Selection II (I II III IV V VI) -Option

Basic Model No.

	Measuring span	10 to 400 inH ₂ O (2.5 to 100 kPa)	GTX35F	Extended flange type 4 inches (100 mm)
		5.1 to 508 psi (35 to 3500 kPa)	GTX60F	

Selection I

I	Output	4 to 20 mA (SFN Communication)	A
		4 to 20 mA (HART Communication)	B
		4 to 20 mA (SFN/HART Bilingual Communication) *4	E
II	Fill fluid	Regular type (Silicone oil)	A
		For oxygen service (Fluorine oil)	H
III	Material (Meterbody cover, Vent/Drain plugs)	Meterbody cover	A
		Vent / Drain plugs	
IV	Material (center-body)	Reference side	Wetted part of flange side
		316 SST	316 SST (Diaphragm: 316L SST)
		316 SST	316L SST
V	Process connections of reference side	Rc 1/2, with adapter flange *3	A
		Rc 1/4, with adapter flange *3	B
		Rc 1/4, without adapter flange *3	C
		1/2 NPT internal thread, with adapter flange *3	D
		1/4 NPT internal thread, with adapter flange *3	E
		1/4 NPT internal thread, without adapter flange *3	F
		Open to atmosphere *2	H
VI	Process installation of reference side	No connection *2	X
		Vertical piping, top connection	A
		Vertical piping, bottom connection	B
VII	Flange rating	ANSI150	A1
		ANSI300	A2
		JIS10K	J1
		JIS20K	J3
		JIS30K *5	J4
		JPI150	P1
		JPI300	P2
VIII	Flange size	4in./100A	G
IX	Flange type	Extended Length 50mm	B
		Extended Length 100mm	C
		Extended Length 150mm	D
		Extended Length 200mm	E
		Extended Length 250mm	F
		Extended Length 300mm	G
X	Flange material/bolt and nut material	Flange	Bolt and nut
		304 SST	304 SST
		304 SST	Carbon steel
		316 SST	304 SST
		316 SST	Carbon steel
		316L SST	304 SST
		316L SST	Carbon steel
XI	Gasket face finish	None Standard JISRa3.2(12.5S)	A
Selection II			
I	Electrical connection	1/2 NPT, Watertight	A
		M20, Watertight *1	B
II	Explosion proof	None	XX
		FM Explosion proof	F1
		FM Intrinsically safe	F2
		FM Nonincendive	F5
		ATEX Explosion proof	A1
		ATEX Intrinsically safe	A2
		ATEX Type n	A5
		IECEx Explosion proof,	E1
		IECEx Intrinsically safe	E2
		IECEx Type n	E5
		NEPSI Explosionproof	N1
		NEPSI Intrinsically safe	N2
		NEPSI Type n	N5
III	Built-in indicating smart meter	None	X
		With indicator	A
IV	Paint	Standard	X
		Corrosion-proof (Urethane)	H
		Corrosion-resistant (Silver color)	D
V	Burnout feature	UP Scale	A
		DOWN scale	B
VI	Mounting Bracket	None	X

Note) *1 Not applicable for the combination with code F1, F6 "FM Explosion proof" of Explosion proof.

*2 In case code M is selected, code X "No connection" of process installation of reference side should be selected.

*3 Not applicable for the combination with code X "No connection" of Process installation of reference side.

*4 Not applicable for the combination with code Q1 "Safety Transmitter" of Option.

*5 In case flange rating "JIS30K" and wetted part of flange side "316L SST", not applicable for Extended Length: 300 mm.

Model GTX35F (Flange type for standard differential pressure)**Model GTX60F (Flange type for high differential pressure)**

Model No.: GTX_ _ F-Selection I (I II III IV V VI VII) -Selection II (I II III IV V VI) -Option

Basic Model No.

	Measuring span	10 to 400 inH ₂ O (2.5 to 100 kPa)	GTX35F	Flush flange type 2 inches (50 mm), 1.5inches (40 mm)
		5.1 to 508 psi (35 to 3500 kPa)	GTX60F	

Selection I

I	Output	4 to 20 mA (SFN Communication)	A
		4 to 20 mA (HART Communication)	B
		4 to 20 mA (SFN/HART Bilingual Communication) *7	E
II	Fill fluid	Regular type (Silicone oil)	A
		For oxygen service (Fluorine oil)	H
		For chlorine service (Fluorine oil) *1	J
III	Material (Meterbody cover, Vent/Drain plugs)	Meterbody cover Vent / Drain plugs	A
IV	Material (center-body)	Reference side	Wetted part of flange side
		316 SST	316 SST (Diaphragm: 316L SST)
		316 SST	ASTM B575 (Equivalent to Hastelloy C-276)
		316 SST	Tantalum *1
		316 SST	316L SST
V	Process connections of reference side	Rc 1/2, with adapter flange *6	A
		Rc 1/4, with adapter flange *6	B
		Rc 1/4, without adapter flange *6	C
		1/2 NPT internal thread, with adapter flange *6	D
		1/4 NPT internal thread, with adapter flange *6	E
		1/4 NPT internal thread, without adapter flange *6	F
		Open to atmosphere *5	H
VI	Process installation of reference side	No connection *6	X
		Vertical piping, top connection	A
		Vertical piping, bottom connection	B
VII	Flange rating	ANSI150	A1
		ANSI300	A2
		ANSI600	A3
		JIS10K	J1
		JIS20K	J3
		JIS30K	J4
		JIS63K	J6
		JPI150	P1
		JPI300	P2
		JPI600	P3
VIII	Flange size	1.5in./40A *2 *3	D
		2in./50A	E
IX	Flange type	Flash type	A
X	Flange material/bolt and nut material	Flange Bolt and nut	
		304 SST	304 SST
		304 SST	Carbon steel
		316 SST	304 SST
		316 SST	Carbon steel
		316L SST	304 SST
		316L SST	Carbon steel
XI	Gasket face finish	None Standard JISRa3.2(12.5S)	A
Selection II			
I	Electrical connection	1/2 NPT, Watertight	A
		M20, Watertight *4	B
II	Explosion proof	None	XX
		FM Explosion proof	F1
		FM Intrinsically safe	F2
		FM Nonincendive	F5
		ATEX Explosion proof	A1
		ATEX Intrinsically safe	A2
		ATEX Type n	A5
		IECEx Explosion proof,	E1
		IECEx Intrinsically safe	E2
		IECEx Type n	E5
		NEPSI Explosionproof	N1
		NEPSI Intrinsically safe	N2
		NEPSI Type n	N5
III	Built-in indicating smart meter	None	X
		With indicator	A
IV	Paint	Standard	X
		Corrosion-proof (Urethane)	H
		Corrosion-resistant (Silver color)	D
V	Burnout feature	UP Scale	A
		DOWN scale	B
VI	Mounting Bracket	None	X

- Note) *1 In case code J is selected, code C "Tantalum", wetted part material of flange side should be selected.
 *2 Not applicable for the combination with code J "For chlorine service" of Fill Fluid.
 *3 Not applicable for the combination with code C "Tantalum" of Material of wetted part of flange side.
 *4 Not applicable for the combination with code F1, F6 "FM Explosion proof" of Explosion proof.
 *5 In case code M is selected, code X "No connection" of process installation of reference side should be selected.
 *6 Not applicable for the combination with code X "No connection" of Process installation of reference side.
 *7 Not applicable for the combination with code Q1 "Safety Transmitter" of Option.

Model GTX35F (Flange type for standard differential pressure)**Model GTX60F (Flange type for high differential pressure)**

Model No.: GTX_ _F-Selection I (I II III IV V VI VII) -Selection II (I II III IV V VI) -Option

Basic Model No.

	Measuring span	10 to 400 inH ₂ O (2.5 to 100 kPa)	GTX35F	Extended flange type 3 inches (80 mm), 2 inches (50 mm)
		5.1 to 508 psi (35 to 3500 kPa)	GTX60F	

Selection I

I	Output	4 to 20 mA (SFN Communication)	A
		4 to 20 mA (HART Communication)	B
		4 to 20 mA (SFN/HART Bilingual Communication) *4	E
II	Fill fluid	Regular type (Silicone oil)	A
		For oxygen service (Fluorine oil)	H
III	Material (Meter-body cover, Vent/Drain plugs)	Meterbody cover	A
		Vent / Drain plugs	
IV	Material (center-body)	Reference side	Wetted part of flange side
		316 SST	
		316L SST	
V	Process connections of reference side	Rc 1/2, with adapter flange	A
		Rc 1/4, with adapter flange	B
		Rc 1/4, without adapter flange	C
		1/2 NPT internal thread, with adapter flange	D
		1/4 NPT internal thread, with adapter flange	E
		1/4 NPT internal thread, without adapter flange	F
		Open to atmosphere *2	H
VI	Process installation of reference side	No connection *2 *3	X
		Vertical piping, top connection	A
		Vertical piping, bottom connection	B
VII	Flange rating	ANSI150	A1
		ANSI300	A2
		JIS10K	J1
		JIS20K	J3
		JIS30K	J4
		JPI150	P1
		JPI300	P2
VIII	Flange size	2in./50A	E
		3in./80A	F
IX	Flange type	Extended Length 50mm	B
		Extended Length 100mm	C
		Extended Length 150mm	D
X	Flange material/bolt and nut material	Flange	Bolt and nut
		304 SST	
		304 SST	
		316 SST	
		316 SST	
		316L SST	
XI	Gasket face finish	None	A
		Standard JISRa3.2 (12.5S)	A

Selection II

I	Electrical connection	1/2 NPT, Watertight	A
		M20, Watertight *1	B
II	Explosion proof	None	XX
		FM Explosion proof	F1
		FM Intrinsically safe	F2
		FM Nonincendive	F5
		ATEX Explosion proof	A1
		ATEX Intrinsically safe	A2
		ATEX Type n	A5
		IECEx Explosion proof,	E1
		IECEx Intrinsically safe	E2
		IECEx Type n	E5
		NEPSI Explosionproof	N1
		NEPSI Intrinsically safe	N2
		NEPSI Type n	N5
III	Built-in indicating smart meter	None	X
		With indicator	A
IV	Paint	Standard	X
		Corrosion-proof (Urethane)	H
		Corrosion-resistant (Silver color)	D
V	Burnout feature	UP Scale	A
		DOWN scale	B
VI	Mounting Bracket	None	X

Note) *1 Not applicable for the combination with code F1, F6 "FM Explosion proof" of Explosion proof.

*2 In case code H is selected, code X "No connection" of process installation of reference side should be selected.

*3 Not applicable for the combination with code X "No connection" of Process installation of reference side.

*4 Not applicable for the combination with code Q1 "Safety Transmitter" of Option.

Model No.:GTX__F-Selection I (I II III IV V VI VII) -Selection II (I II III IV V VI) -Option

Options II	XX	No options
	A2	External Zero adjustment *11
	G4	Long vent/drain plugs
	K1	Oil and water free finish
	K3	Oil free finish *4
	L1	Au Plating Diaphragm *15
	M5	0.1mm thickness diaphragm *12 *13
	N1	FEP protective film *14
	Q1	Safety Transmitter *5
	Q2	NAMUR NE43 Compliant Output signal limits:3.8 to 20.5 mA (Output 21.6 mA/selected upper limit, 3.6 mA/selected lower limit)
	Q7	Alarm Output (contact output) *16
	R1	Custom calibration
	T1	Test report
	T2	Mill certificate
	T4	Traceability certificate
	T5	NACE certificate *9
	W1	Non SI Unit

Note) *4 No need to select when Fill Fluid code H, or J is selected.

*5 Not applicable for the combination with code A2, or Q7 of Option.

*9 Applicable for "ASTM B575", code B of Material (center body).

*11 Not applicable for the combination with code X "None" of Indicator. Please select "With indicator".

*12 0.1 mm thickness diaphragm option is only available for Material of Wetted parts: "316 SST" and "316L SST".

*13 0.1 mm thickness diaphragm option is only available for 4inches Extended Flange or 3inches Flush Flange.

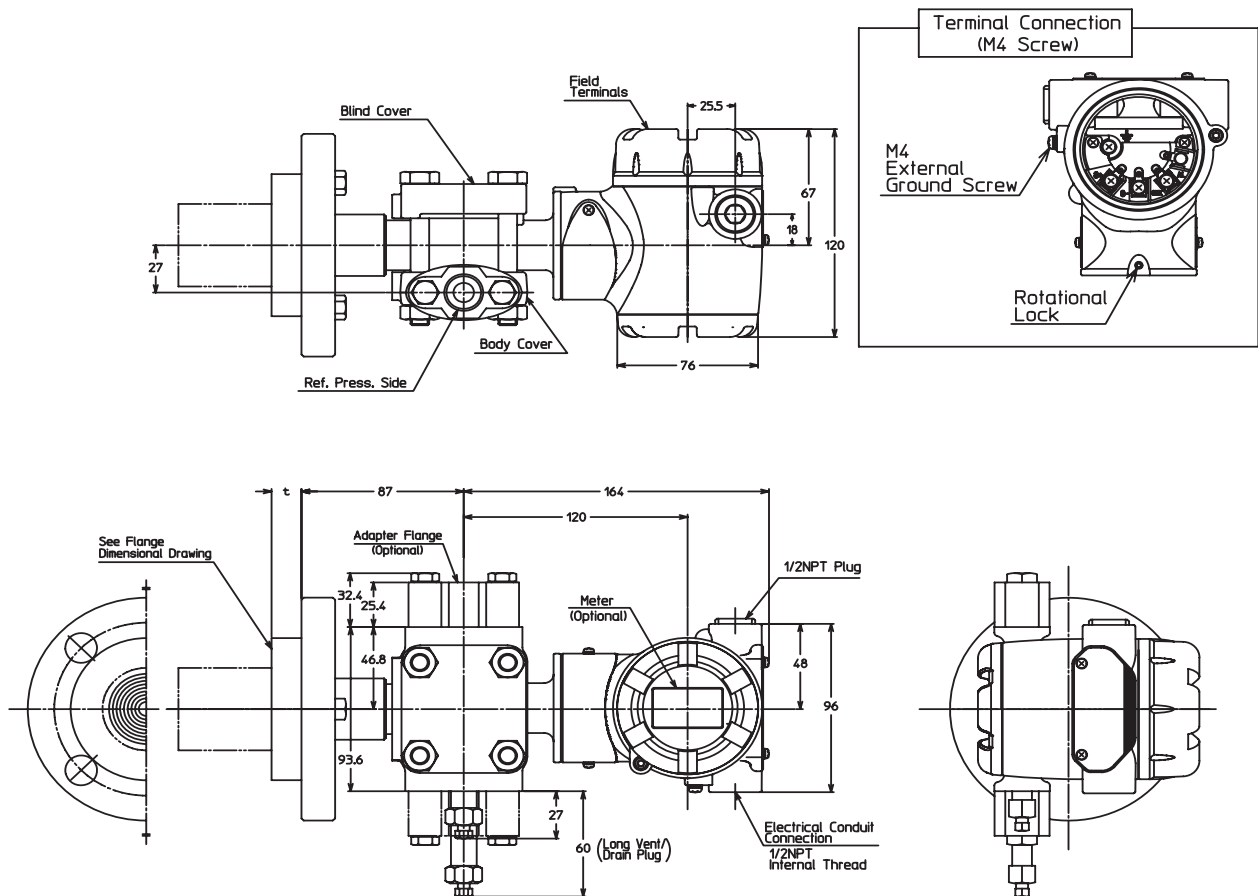
*14 Not applicable for the combination with Extended Flange Type.

*15 Not applicable for the combination with "Tantalum" of Material (center body).

*16 Not applicable for the combination with code F2, F5, F6, N2, N5, E2, E5, A2 and A5 of Explosion proof.

DIMENSIONS**Model GTX35F/60F**

(Unit : mm)



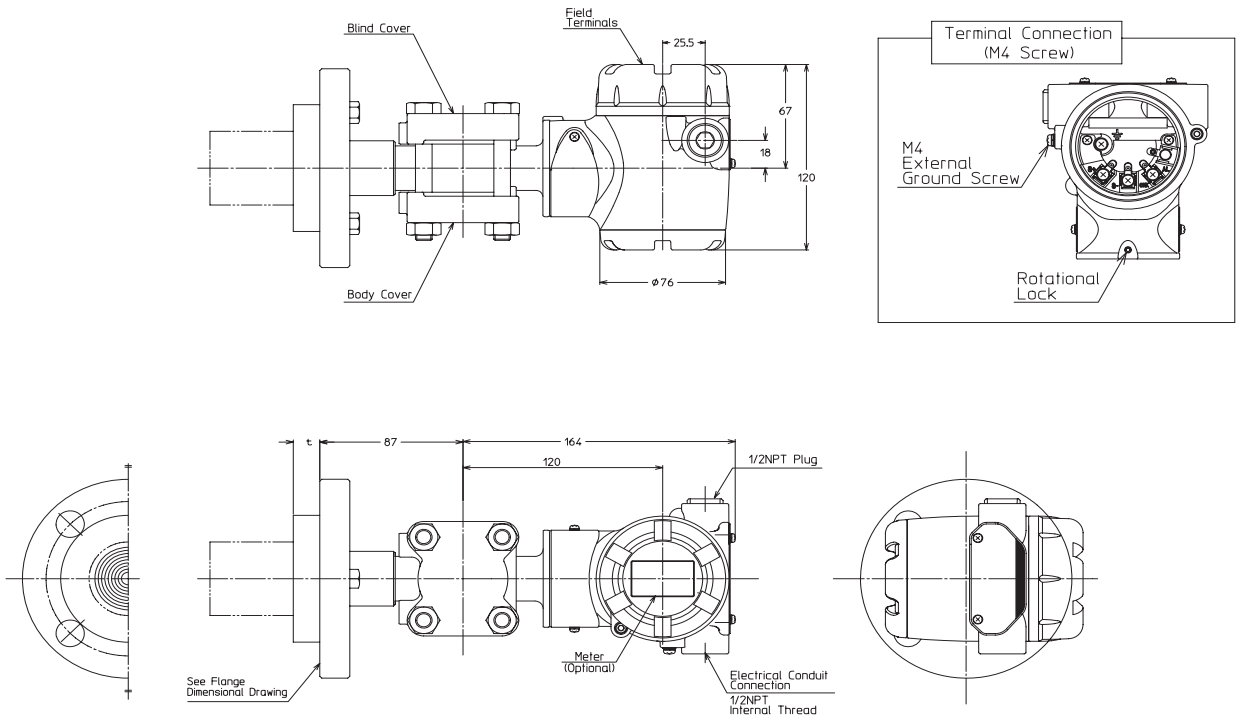
- Note) 1) For the process pipe connection on the standard pressure side, choose either the upward or downward directions. When changing the connection, replace the adapter flange and the vent/drain plugs.
- 2) Select a gasket that will not contact the diaphragm after it is tightened.

Model GTX35F/60F

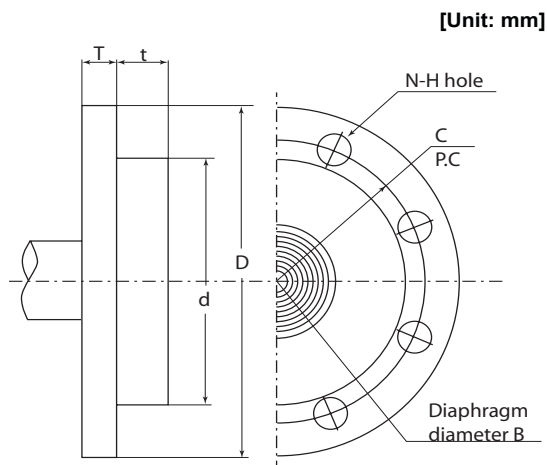
Process connection of reference side: open to atmosphere

Process Connection :

(Unit : mm)



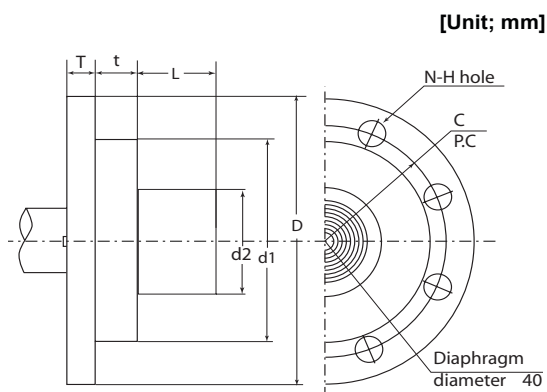
Flash diaphragm flange



Material of wetted parts	B
316 SST	40
316L SST	
ASTM B575 (Hastelloy C-276 equivalent)	43
Tantalum	62

Rating	Flange rating	D	T	C	N	H	d	t
1.5 inch/ 40 mm	JIS 10K - 40 mm	140	18	105	4	19	81	16
	JIS 20K - 40 mm	140	18	105	4	19		
	JIS 30K - 40 mm	160	25	120	4	23		
	ANSI 150 - 1.5 inch	127	18	98.6	4	16		
	ANSI 300 - 1.5 inch	155	25	114.3	4	22		
	ANSI 600 - 1.5 inch	155	32	114.3	4	22		
	JPI 150 - 1.5 inch	127	18	98.6	4	16		
	JPI 300 - 1.5 inch	155	25	114.3	4	22		
2 inches/ 50 mm	JIS 10K - 50 mm	155	16	120	4	19	99	19
	JIS 20K - 50 mm	155	18	120	8	19		
	JIS 30K - 50 mm	165	22	130	8	19		
	ANSI 150 - 2 inches	152	19.5	120.6	4	19		
	ANSI 300 - 2 inches	165	22.5	127	8	19		
	ANSI 600 - 2 inches	165	25.5	127	8	19		
	JPI 150 - 2 inches	152	19.5	120.6	4	19		
	JPI 300 - 2 inches	165	22.5	127	8	19		
3 inches/ 80 mm	JIS 10K - 80 mm	185	18	150	8	19	129.5	22
	JIS 20K - 80 mm	200	22	160	8	23		
	JIS 30K - 80 mm	210	28	170	8	23		
	ANSI 150 - 3 inches	190	24	152.4	4	19		
	ANSI 300 - 3 inches	210	28.5	168.1	8	22		
	ANSI 600 - 3 inches	210	32	168.1	8	22		
	JPI 150 - 3 inches	190	24	152.4	4	19		
	JPI 300 - 3 inches	210	28.5	168.1	8	22		
	JPI 600 - 3 inches	210	32	168.1	8	22		

External diaphragm flange



Rating	Flange rating	D	T	C	N	H	d1	d2	t	B	L
2 inches/ 50 mm	JIS 10K - 50 mm	155	16	120	4	19	99	47±1	19		50
	JIS 20K - 50 mm	155	18	120	8	19					100
	JIS 30K - 50 mm	165	22	130	8	19					150
	ANSI 150 - 2 inches	152	19.5	120.6	4	19					200
	ANSI 300 - 2 inches	165	22.5	127	8	19					250
	ANSI 600 - 2 inches	165	25.5	127	8	19					300
	JPI 150 - 2 inches	152	19.5	120.6	4	19					
	JPI 300 - 2 inches	165	22.5	127	8	19					
3 inches/ 80 mm	JIS 10K - 80 mm	185	18	150	8	19	129.5	69±1	22	40	
	JIS 20K - 80 mm	200	22	160	8	23					
	JIS 30K - 80 mm	210	28	170	8	23					
	ANSI 150 - 3 inches	190	24	152.4	4	19					
	ANSI 300 - 3 inches	210	28.5	168.1	8	22					
	ANSI 600 - 3 inches	210	32	168.1	8	22					
	JPI 150 - 3 inches	190	24	152.4	4	19					
	JPI 300 - 3 inches	210	28.5	168.1	8	22					
4 inches/ 100 mm	JIS 10K - 100 mm	210	18	175	8	19	157	95±1	23		
	JIS 20K - 100 mm	225	24	185	8	23					
	JIS 30K - 100 mm	240	32	195	8	25					
	ANSI 150 - 4 inches	229	24	190.5	8	19					
	ANSI 300 - 4 inches	254	32	200.2	8	22					
	JPI 150 - 4 inches	229	24	190.5	8	19					
	JPI 300 - 4 inches	254	32	200.2	8	22					

Note

Note

Specifications are subject to change without notice

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