

# Advanced Transmitter

## Remote-sealed type of Absolute Pressure Transmitters

Model GTX30S/GTX60S

### OVERVIEW

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 pressure.

It can also execute two-way communications between the communicator, thus facilitating self-diagnosis, range resetting, and automatic zero/span adjustment.

SFN, HART and FOUNDATION Fieldbus are available.

\* Refer to SS2-GTX00Z-0100 for FOUNDATION Fieldbus type for the items marked with [★].



### 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.

#### Remote communication

- Two-way communication using digital output facilitates self-diagnosis, range resetting, automatic zero adjustment, and other operations.

**PRODUCT APPROVALS [☆]****FM Explosionproof for Division System/  
Flameproof for Zone System (Code F1)**

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

$T_5 -40\text{ °C} \leq T_{amb} \leq +85\text{ °C}$

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 Intrinsic Safety (Code F2)**

IS/I, II, III/1/ABCDEFGH/T4;  $-40\text{ °C} \leq T_{amb} \leq +60\text{ °C}$ ; 80395278, 80395279, 80395280; Entity; TYPE 4X; IP67

I/0/AEx ia/IIC/T4;  $-40\text{ °C} \leq T_{amb} \leq +60\text{ °C}$ ; 80395278, 80395279, 80395280; Entity; TYPE 4X; IP67

Entity Parameters:  $V_{max} (U_i)=30\text{ Volts}$ ,

$I_{max} (I_i)=100\text{ mA}$ ,

$P_i=1\text{ W}$ ,  $C_i=10\text{ nF}$ ,  $L_i=0.5\text{ mH}$

**FM Nonincendive (Code F5)**

NI/I/2/ABCD/T4;  $-40\text{ °C} \leq T_{amb} \leq +60\text{ °C}$ ; 80395494; NIFW; TYPE 4X; IP67

NI/I/2/IIC/T4;  $-40\text{ °C} \leq T_{amb} \leq +60\text{ °C}$ ; 80395494; NIFW; TYPE 4X; IP67

S/II, III/1/EFG/T4;  $-40\text{ °C} \leq T_{amb} \leq +60\text{ °C}$ ; 80395494; NIFW; TYPE 4X; P67

Nonincendive Field Wiring Parameters:

$V_{max} (U_i)=30\text{ Volts}$ ,  $C_i=10\text{ nF}$ ,  $L_i=0.5\text{ mH}$

**Combination of F1, F2 and F5 (Code F6)****ATEX Flameproof and Dust Certifications****(Code A1)**

KEMA 08ATEX0004 X

II 1/2 G Ex db IIC T6 Ga/Gb  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 85\text{ °C}$

II 1/2 G Ex db IIC T5 Ga/Gb  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$   $T_{process} \leq 100\text{ °C}$

II 1/2 G Ex db IIC T4 Ga/Gb  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$   $T_{process} \leq 110\text{ °C}$

II 2 D Ex tb IIIC T85 °C Db  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 85\text{ °C}$

II 2 D Ex tb IIIC T100 °C Db  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 100\text{ °C}$

II 2 D Ex tb IIIC T110 °C Db  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 110\text{ °C}$

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

**ATEX Intrinsic Safety and Dust Certifications****(Code A2)**

KEMA 07ATEX0200 X

II 1 G Ex ia IIC T4 Ga  $-30\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=105\text{ °C}$  IP66/IP67

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

II 1 D Ex ia IIIC T105 °C Da  $-30\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=105\text{ °C}$  IP66/IP67

II 3 G Ex ic IIC T4 Gc  $-30\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=110\text{ °C}$  IP66/IP67

ELECTRICAL PARAMETERS:  $U_i=30\text{V}$ ,  $C_i=5\text{nF}$ ,  $L_i=0.5\text{mH}$

**NEPSI Flameproof and Dust Certifications****(Code N1)**

Ex d IIC T6 Gb; Ex tD A21 IP66/IP67  $T_{85\text{ °C}}$   $T_{process}=80\text{ °C}$ ;  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$

Ex d IIC T5 Gb; Ex tD A21 IP66/IP67  $T_{100\text{ °C}}$   $T_{process}=95\text{ °C}$ ;  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$

Ex d IIC T4 Gb; Ex tD A21 IP66/IP67  $T_{115\text{ °C}}$   $T_{process}=110\text{ °C}$ ;  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$

**NEPSI Intrinsic Safety Certification (Code N2)**

Ex ia IIC T4 Ga  $-40\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=105\text{ °C}$  IP66/IP67

Ex ic IIC T4 Gc  $-40\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=110\text{ °C}$  IP66/IP67

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

Use cable suitable for 5 °C above ambient temperature

**IECEx Flameproof and Dust Certifications (Code E1)**

Certificate No. IECEx KEM 08.0001 X

Ex db IIC T6 Ga/Gb  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 85\text{ °C}$

Ex db IIC T5 Ga/Gb  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$   $T_{process} \leq 100\text{ °C}$

Ex db IIC T4 Ga/Gb  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$   $T_{process} \leq 110\text{ °C}$

Ex tb IIIC T85 °C Db  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 85\text{ °C}$

Ex tb IIIC T100 °C Db  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 100\text{ °C}$

Ex tb IIIC T110 °C Db  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process} \leq 110\text{ °C}$

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

**IECEx Intrinsic Safety and Dust Certifications (Code E2)**

Certificate No. IECEx KEM 07.0058 X

Ex ia IIC T4 Ga  $-30\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=105\text{ °C}$  IP66/IP67

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

Ex ia IIIC T105 °C Da  $-30\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=105\text{ °C}$  IP66/IP67

Ex ic IIC T4 Gc  $-30\text{ °C} \leq T_{amb} \leq +60\text{ °C}$   $T_{process}=110\text{ °C}$  IP66/IP67

ELECTRICAL PARAMETERS:  $U_i=30\text{V}$ ,  $C_i=5\text{nF}$ ,  $L_i=0.5\text{mH}$

**KCs Flameproof (Code K1)****11-AV4BO-0323**

Ex d IIC T6  $-30\text{ °C} \leq T_{amb} \leq +75\text{ °C}$   $T_{process}=85\text{ °C}$

Ex d IIC T5  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$   $T_{process}=100\text{ °C}$

Ex d IIC T4  $-30\text{ °C} \leq T_{amb} \leq +80\text{ °C}$   $T_{process}=110\text{ °C}$

**18-AV4BO-0254X**

Ex tD A21 T85 °C -30 °C ≤ T<sub>amb</sub> ≤ +75 °C  
 -30 °C ≤ T<sub>process</sub> ≤ 85 °C

Ex tD A21 T100 °C -30 °C ≤ T<sub>amb</sub> ≤ +75 °C  
 -30 °C ≤ T<sub>process</sub> ≤ 100 °C

Ex tD A21 T110 °C -30 °C ≤ T<sub>amb</sub> ≤ +75 °C  
 -30 °C ≤ T<sub>process</sub> ≤ 110 °C

**TIIS Flameproof (Code J1)**

Ex d IIC T4

Use cables with the maximum allowable temperature, 70° C in case ambient temperature excess 50° C

**TAIWAN Flameproof (Code T1)**

Certificate No.(2015)00113

Ex db IIC T6 Gb X -30° C ≤ T<sub>amb</sub> ≤ +75° C T<sub>process</sub> ≤ 85 °C

Ex db IIC T5 Gb X -30° C ≤ T<sub>amb</sub> ≤ +80° C T<sub>process</sub> ≤ 100 °C

Ex db IIC T4 Gb X -30° C ≤ T<sub>amb</sub> ≤ +80° C T<sub>process</sub> ≤ 110 °C

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

Please refer to specification, “SS2-GTX00Z-0100” for the Fieldbus code below.

**FM Intrinsic safety ia/ic FISCO and Fieldbus(Code F4)**

**FM Fieldbus Nonincendive(Code F7)**

**ATEX Intrinsic safety ia FISCO and Fieldbus(Code A4)**

**ATEX Intrinsic safety ic FISCO and Fieldbus(Code A7)**

**IECEx Intrinsic safety ia FISCO and Fieldbus(Code E4)**

**IECEx Intrinsic safety ic FISCO and Fieldbus(Code E7)**

**EMC Conformity [ ☆ ]**

EN 61326-1 (industrial electromagnetic environment)

EN 61326-2-3

**FUNCTIONAL SPECIFICATIONS**

**Type of protection**

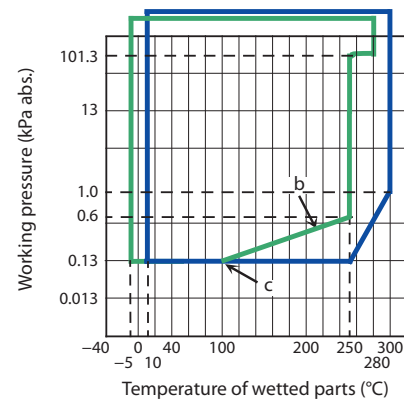
NEMA 3 and 4X  
 IEC IP66/67

**Measuring span/Setting range**

	Measuring span	Setting range
GTX30S	4 to 104 kPa abs. {30 to 780 mmHg abs.}	0 to 104 kPa abs. {0 to 780 mmHg abs.}
GTX60S	35 to 3500 kPa abs. {0.35 to 35 kgf/cm <sup>2</sup> abs.}	0 to 3500 kPa abs. {0 to 35 kgf/cm <sup>2</sup> abs.}

**Working pressure range/Overload resistant value**

	Working pressure range	Overload resistant value
GTX30S	0.13 to 104 kPa abs.	300 kPa abs. {3.0 kgf/cm <sup>2</sup> }
GTX60S	Up to flange rating of the setting range, which is lower.	5250 kPa abs. {52.5 kgf/cm <sup>2</sup> }



b. For high temperature and vacuum,  
 c. For high temperature and high vacuum

Figure 1. Working pressure temperature of wetted parts section (For high temperature and vacuum/high temperature and high vacuum)

**Power Supply [ ☆ ]**

12.5 to 42 V DC

Limited to 12.5 to 30 V DC for intrinsic safety, Nonincendive types

**Power Supply voltage and load resistance characteristics [ ☆ ]**

See Figure 2.

Limited to Load resistance: 250 to 1345 Ω for SFN or DE communication. 250 to 600 Ω for HART communication. Power supply voltage: 12.5 to 30 V DC for intrinsic safety, Nonincendive types

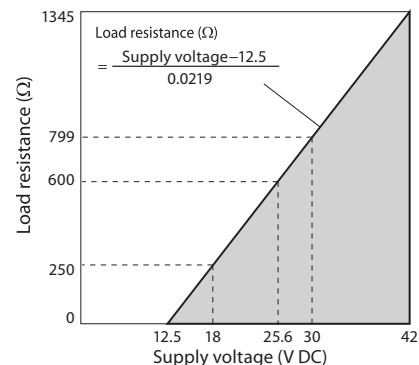


Figure 2. Supply voltage vs. load resistance characteristics

Note) For communication with a communicator, a load resistance of

250  $\Omega$  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/Temperature ranges of wetted parts

		Temperature Range (°C) *1 *4	
		High-temp. vacuum models	High-temp. high-vacuum models
Wetted parts section	Normal operating range	-5 to +280	+10 to +300
	Operative limit range	-10 to +310	-10 to +310
Ambient temperature *2	Normal operating range	-5 to +55	+10 to +55
	Operative limit range	-10 to +60	-10 to +60
Specific gravity of fill fluid *3		1.07	1.09

Note \*1. See the working pressures and temperatures of the wetted parts section in Figure 1.

\*2. Ambient temperatures of the transmitter itself

\*3. Approximate values at the temperature of 25 °C

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

### For Explosion proof models with digital indicators, which have to be used within the following ranges

Normal operating condition  
-20 to +70 °C

Operative limit  
-30 to +80 °C

TIIS explosion proof model  
-20 to +60 °C

### Transportation and storage conditions

Without indicators: -50 to + 85 °C

With indicators: -25 to 80 °C

### Ambient humidity limits

5 to 100 % RH

### Stability against supply voltage change

$\pm 0.005$  % FS/V

### Response time [★]

Approx. 400 ms (ref. value, with 5 m of ordinary capillaries, at room temp.)

### Damping time [★]

Selectable from 0 to 128 sec. (HART)  
Selectable from 0 to 32 sec. in ten stages (SFN)

### Zero Stability

$\pm 0.5$  % of URL per 10 year

### Lightning protection [★]

Applicable Standards; IEC 61000-4-5  
Peak value of current surge (80/20  $\mu$  sec.): 6000 A

### Vibration characteristics:

Amplitude: 0.42mm / Frequency: 5 to 60 Hz

Acceleration: 29.4 m/s<sup>2</sup> (3G)/60 to 200 Hz

### Shock characteristics:

Acceleration 9.8 m/s<sup>2</sup> (1G)

### Indicator

The digital LCD indicator (optional) shows the output in percentage or in engineering units. Range for engineering unit is from -99999 to 99999 when set at the factory, and from -19999 to 19999 when using the communicator. Specify the following items when placing order with engineering units,

- Pressure range
- Engineering unit of pressure
- Method of display, either linear or square-root.  
These data may be set or changed using the communicator.

## OPTIONAL SPECIFICATIONS

### Oil free finish

The transmitter is shipped with oil-free wetted parts.

### External zero/span adjustment function

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

Indicator must be selected to enable this option.

Fieldbus type does not have span adjustment.

### 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.

### Safety Transmitter

Select this option to be used as a component of Safety Instrument System (SIS).

Models GTX\_\_\_ is complied with IEC61508, certified according to Safety Integrity Level 2 (SIL-2)

This option is not applicable for FOUNDATION Fieldbus type, DE communication type, external zero/span adjustment (option A2), and Alarm output (option Q7).

### Alarm Output (contact output)

Contact output is prepared as alarm output when alarm (Output Alarm/Sensor Temp. Alarm) condition is detected. It can be set to or Normally Close.

Contact output type: One open collector (NPN)

Contact rating: 30 V DC max., 30 mA DC max.

Residual voltage at output ON: 3.0 V max.

Operating mode: Normally Open (default)

Normally Close is not recommended.

When this option is selected, CHECK terminals for current check cannot be used.

This option is not applicable for FOUNDATION Fieldbus type, and with intrinsic safety, Nonincendive types.

### Advanced diagnostics [★]

This option is applicable for FOUNDATION Fieldbus type. Refer to SS2-GTX00Z-0100.

### Custom calibration

Calibrate for the specified pressure range at the factory.

### Long vent drain:

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

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

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

### Test report:

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

### Mill sheet:

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

### Test report (with traceability certificate):

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

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

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

### Strength calculation sheet:

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

## PHYSICAL SPECIFICATIONS

### Materials

#### Fill fluid

Silicone oil for high-temperature vacuum, and high temperature high-vacuum models

For specific gravity, refer to “Ambient temperature limits/ Temperature ranges of wetted parts” on page 4.

#### Center body

316 SST

#### Transmitter case

Aluminum alloy, CF8M (Equivalent to 316 SST)

#### Meter body cover

304 SST

#### Bolts and nuts (for fastening meter body cover)

Carbon steel (SNB7), 304 SST, 630 SST

#### O-ring

NBR

#### For Wetted parts

316 SST (316L SST for diaphragm only)

316L SST

#### Flange materials

304 SST, 316 SST, 316L SST

#### Mounting Bracket

##### Bracket

304 SST

##### U-bolt and nuts

304 SST

#### Paint

Standard: Baked acrylic paint

Corrosion-proof: Baked urethane paint

#### Color

Housing: Silver N-8.2

Cap: azbil bordeaux 2.5R 2.25/5

### Weight

Approx. 13.5 kg (GTX30S) (Including ANSI 150# - 3 inches flange and capillary 5 m long)

## INSTALLATION

### Electrical connection

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

### Grounding

Resistance 100  $\Omega$  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

### Process connection

#### Measured pressure

Flanges

#### Flush diaphragm

JIS 10K, 20K, 30K and 63K: 80 mm (RF) equivalents

ANSI/JPI 150, 300 and 600: 3 inches (RF) equivalents

#### Extended diaphragm

JIS 10K, 20K and 30K: 100 mm (RF) equivalents

ANSI/JPI 150 and 300: 4 inches (RF) equivalents

#### Flange standards

JIS; JIS B 2220 (2004)

ANSI; ANSI B 16.5 (1988)

JPI; JPI-7S-15-93

## TRANSMITTER HANDLING NOTES

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

### Transmitter installation notes

#### WARNING

- When installing the transmitter, ensure that gaskets do not protrude from connecting points into the process (such as adapter flange connection points and connecting pipes and flanges). Failure to do so may cause a leak of process fluid, resulting in harm from burns, etc. In addition, if the process fluid contains toxic substances, take safety measures such as wearing goggles and a mask to prevent contact with the skin and eyes and to prevent inhalation.
- Use the transmitter within the operating ranges stated in the specifications (for explosion-proofing, pressure rating, temperature, humidity, voltage, vibration, shock, mounting direction, atmosphere, etc.). Using the transmitter outside the operating conditions may cause device failure or fire, resulting in a harmful physical risk of burning or the like.
- When performing wiring work in explosion-proof areas, follow the work method specified in the explosion-proof guidelines.

#### CAUTION

- After installation, do not use the transmitter as a foothold or put your weight on it. Doing so may cause damage.
- Be careful not to hit the glass indicator with tools etc. This could break the glass and cause injury.
- 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.
- Use a power supply with overcurrent protection for this instrument.

## Handling precautions for HART specification devices

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

If this product is being operated in multidrop mode, there is a limit to the number of devices that can be used. If you are using multidrop mode, please consult with us.

## To use the remote seal type transmitter correctly

A various accuracy regulation and notes of the remote seal type transmitter are as follows.

### A. Standard accuracy

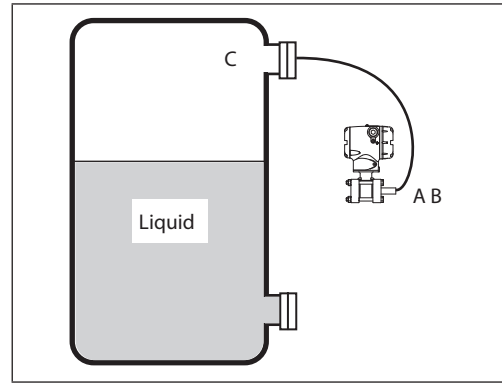
Linearity in constant ambient temperature and constant static pressure is shown. (Refer to “PERFORMANCE SPECIFICATIONS” on page 9)

### B. Ambient temperature characteristics

Accuracy by the ambient temperature change in the main body under constant static pressure is shown. (Refer to “PERFORMANCE SPECIFICATIONS” on page 9)

### C. Wetted parts temperature characteristics

Zero shift is shown, when the temperature fluctuate of process wetted parts of an upper flange and lower flange changes.



Flange type	3 inches flush diaphragm flange, 4 inches Extended diaphragm flange		
Fill fluid	Regular/High temp.	High-temp. and vacuum	High-temp. and high-vacuum
Wetted parts temperature characteristics (zero shift of setting ranges)	$\pm \left\{ \left( 600 + \frac{20L}{50} \right) \times \frac{1}{55} \times \frac{\Delta T}{1000x} \right\} \%$	$\pm \left\{ \left( 900 + \frac{20L}{50} \right) \times \frac{1}{55} \times \frac{\Delta T}{1000x} \right\} \%$	$\pm \left\{ \left( 1200 + \frac{30L}{50} \right) \times \frac{1}{55} \times \frac{\Delta T}{1000x} \right\} \%$

x: Shown for each item are the percentage ratio for x (kPa), which is the greatest value of either the upper range value (URV)\*<sup>1</sup>, the lower range value (LRV)\*<sup>2</sup> or the span.

L: Flange length (mm) (In case, standard flange; L=0 mm)

ΔT: Temperature difference between upper flange and ambient temperature.

### D. Installation position

Azbil Corporation is recommended to set up the main body of the transmitter from a flange downward when the transmitter is set up to the sealed tank. Please meet the following requirements when it is necessary to set up the transmitter by all means in the middle of the tank.

$$P_o + ((-\rho'h))/102 \geq P \quad (1 \text{ kpa} = 102 \text{ mmH}_2\text{O})$$

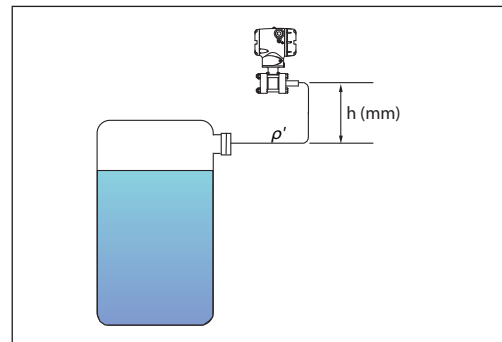
$$\therefore (h \leq (P_o - P) / (102 / \rho'))$$

P: Permissible pressure lower bound value of the transmitter (kPa abs.)

ρ': Fill fluid gravity of the transmitter

P<sub>o</sub>: Pressure in tank (kPa abs.)

h: Distance from a lower flange (mm)



	Fill fluid gravity ρ'	Permissible pressure lower bound value P (kPa abs.)	Temperature range of wetted parts (°C)
High-temp. and vacuum	1.07	0.1333	-5 to +100
High-temp and high-vacuum	1.09	0.1333	10 to 250

Note:

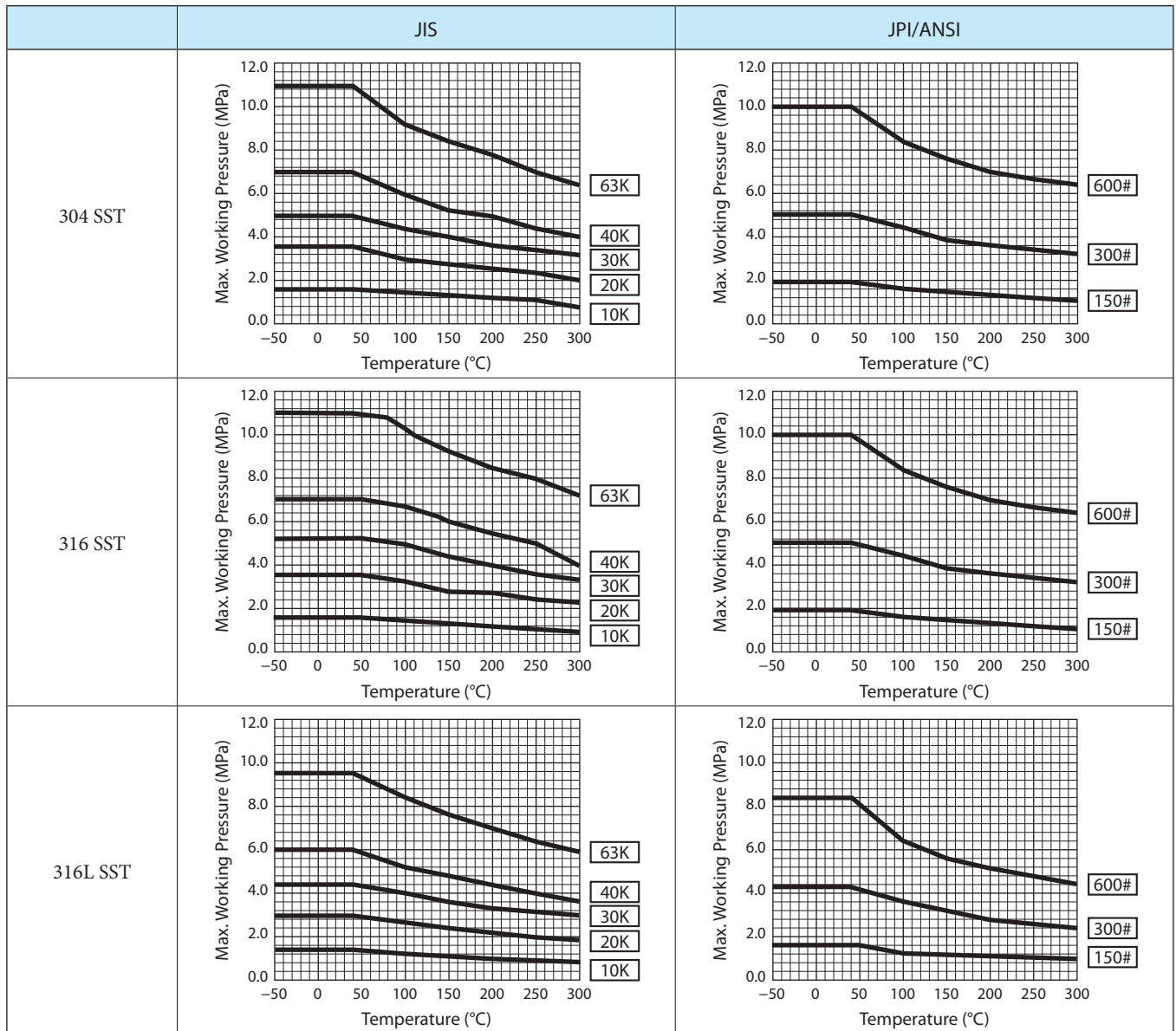
1. Special care is required for applications in which the pressure in the tank (P<sub>o</sub>) changes to vacuum pressure.
2. If the above conditions are violated, negative pressure exceeding the working pressure range will be applied to the surface of the diaphragm. Since the negative pressure also exceeds the saturated vapor pressure of the fill fluid, bubbles will develop in the fill fluid, causing a zero point shift. Also, if the diaphragm is pulled by the negative pressure, it may be deformed or broken.



## 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.
2. In case of model GTX\_ \_S max working pressure depends on the smaller value of either 1.5 MPa or following data.



**Reference accuracy**

Shown for each item are the percentage ratio for  $x$  (kPa), which is the greatest value of either the upper range value (URV)<sup>\*1</sup>, the lower range value (LRV)<sup>\*2</sup> or the span.

**Model GTX30S (for high-temperature vacuum, high-temperature high-vacuum service)**

Reference accuracy <sup>*3</sup>		$\pm 0.25$ %	(For $x \geq 12$ kPa abs. (90 mmHg abs.))
		$\pm \left( 0.1 + 0.15 \times \frac{12}{x} \right)$ %	(For $x < 12$ kPa abs. (90 mmHg abs.))
Ambient Temperature effect (Shift from the set range) Change of 30 °C (Range from -5 to 55 °C)	Combined shift	$\pm 0.79$ %	(For $x \geq 12$ kPa abs. (90 mmHg abs.))
		$\pm \left( 0.19 + 0.6 \times \frac{12}{x} \right)$ %	(For $x < 12$ kPa abs. (90 mmHg abs.))

**Model GTX60S (for high-temperature vacuum, high-temperature high-vacuum service)**

Reference accuracy <sup>*3</sup>		$\pm 0.25$ %	(For $x \geq 350$ kPa abs. (3.5 kgf/cm <sup>2</sup> abs.))
		$\pm \left( 0.1 + 0.15 \times \frac{350}{x} \right)$ %	(For $x < 350$ kPa abs. (3.5 kgf/cm <sup>2</sup> abs.))
Ambient Temperature effect (Shift from the set range) Change of 30 °C (Range from -5 to 55 °C)	Combined shift	$\pm 0.79$ %	(For $x \geq 350$ kPa abs. (3.5 kgf/cm <sup>2</sup> abs.))
		$\pm \left( 0.19 + 0.6 \times \frac{350}{x} \right)$ %	(For $x < 350$ kPa abs. (3.5 kgf/cm <sup>2</sup> abs.))

\*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. Reference accuracy at calibrated condition.

## MODEL SELECTION

**Model GTX30S (Remote-sealed type for standard absolute pressure)**

**Model GTX60S (Remote-sealed type for high absolute pressure)**

**Flush 3 inches flange type for high temperature vacuum, high temperature high vacuum service**

Model No.: GTX\_ \_S - Selection I (I II III IV V VI VII VIII IX) - Selection II (I II III IV V VI) - Option

### Basic Model No.

Measuring span	4.0 to 104 kPa abs. (30 to 780 mmHg abs.)	GTX30S	Flush flange type 3 inches (80mm)
	35 to 3500 kPa abs. (0.35 to 35 kgf/cm <sup>2</sup> abs.)	GTX60S	

### Selection I

I	Output	4 to 20 mA (SFN Communication)	A	
		4 to 20 mA (HART5 Communication)	B	
		FOUNDATION Fieldbus communication *2 *3 *4	C	
		Digital output (DE communication) *1	D	
		4 to 20 mA (HART7 Communication)	F	
II	Fill fluid	For high temperature vacuum service (Silicone oil)	C	
		For high temperature high vacuum service (Silicone oil)	D	
III	Wetted parts material	316L SST	D	
IV	Flange rating	ANSI150	A1	
		ANSI300	A2	
		ANSI600	A3	
		JIS10K	J1	
		JIS20K	J3	
		JIS30K	J4	
		JIS63K	J6	
		JPI150 *4	P1	
		JPI300 *4	P2	
		JPI600 *4	P3	
	Flange rating for China (refer to Table 1) *5	-		
V	Flange size	3 in./80 A	F	
VI	Flange type	Flush type	A	
VII	Flange material/bolt and nut material	Flange	Bolt and nut	
		304 SST	304 SST	A
		304 SST	630 SST	C
		304 SST	Carbon steel	D
		316 SST	304 SST	E
		316 SST	630 SST	G
		316 SST	Carbon steel	H
		316L SST	304 SST	J
		316L SST	630 SST	L
		316L SST	Carbon steel	M
VIII	Gasket face finish	None Standard JISRa3.2 (12.5S)	A	
IX	Capillary length	2 m	02	
		3 m	03	
		4 m	04	
		5 m	05	
		6 m	06	
		7 m	07	
		8 m	08	
		9 m	09	
		10 m	10	

\*1. Not applicable for the combination with code A2 "With external Zero/Span adjustment", Q1 "Safety Transmitter", and Q2 "NAMUR NE43 Compliant Output signal limits" of Option.

\*2. Not applicable for the combination with code Q1 "Safety Transmitter" and Q2 "NAMUR NE43 Compliant Output signal limits" of Option.

\*3. In case code A of indicator is selected, code A2 of Option code should be selected.

\*4. Not applicable for the combination with code YB "Manufactured by ACNP (for use in China)" and YD "Manufactured by ACNP (for use outside of China)" of Option.

Table 1. Flange rating for China

Flange rating	GB PN1.0	GB PN 1.6	GB PN2.5	GB PN 4.0	GB PN 6.3	HG PN1.0	HG PN1.6	HG PN2.5	HG PN4.0	HG PN6.3
Code	G1	G2	G4	G5	G6	H1	H2	H4	H5	H6

**Model GTX30S (Remote-sealed type for standard absolute pressure)  
Model GTX60S (Remote-sealed type for high absolute pressure)**

**Extended 4 inches flange type for high temperature vacuum, high temperature high vacuum service**

Model No.: GTX\_ \_S - Selection I (I II III IV V VI VII VIII IX) - Selection II (I II III IV V VI) - Option

**Basic Model No.**

Measuring span	4.0 to 104 kPa abs. (30 to 780 mmHg abs.)* <sup>1</sup>	GTX30S	Extended flange type 4 inches (100 mm)
	35 to 3500 kPa abs. (0.35 to 35 kgf/cm <sup>2</sup> abs.)* <sup>2</sup>	GTX60S	

**Selection I**

I	Output	4 to 20 mA (SFN Communication)	A	
		4 to 20 mA (HART5 Communication)	B	
		FOUNDATION Fieldbus communication * <sup>5</sup> * <sup>6</sup> * <sup>7</sup>	C	
		Digital output (DE communication) * <sup>4</sup>	D	
		4 to 20 mA (HART7 Communication)	F	
II	Fill fluid	For high temperature vacuum service (Silicone oil)	C	
		For high temperature high vacuum service (Silicone oil)	D	
III	Wetted parts material	316 SST (Diaphragm: 316L SST)	A	
		316L SST	D	
IV	Flange rating	ANSI150	A1	
		ANSI300 * <sup>3</sup>	A2	
		JIS10K	J1	
		JIS20K	J3	
		JIS30K	J4	
		JPI150 * <sup>7</sup>	P1	
		JPI300 * <sup>3</sup> * <sup>7</sup>	P2	
		Flange rating for China (refer to Table 2) * <sup>8</sup>	-	
V	Flange size	4 in./100 A	G	
VI	Flange type	Extended Length 50 mm	B	
		Extended Length 100 mm	C	
		Extended Length 150 mm	D	
		Extended Length 200 mm * <sup>3</sup>	E	
		Extended Length 250 mm * <sup>3</sup>	F	
		Extended Length 300 mm * <sup>3</sup>	G	
VII	Flange material/bolt and nut material	Flange	Bolt and nut	
		304 SST	304 SST	A
		304 SST	630 SST	C
		304 SST	Carbon steel	D
		316 SST	304 SST	E
		316 SST	630 SST	G
		316 SST	Carbon steel	H
		316L SST	304 SST	J
		316L SST	630 SST	L
316L SST	Carbon steel	M		
VIII	Gasket face finish	None Standard JISRa3.2 (12.5S)	A	
IX	Capillary length	2 m	02	
		3 m	03	
		4 m	04	
		5 m	05	
		6 m	06	
		7 m	07	
		8 m	08	
		9 m	09	
		10 m	10	

\*1. Specify range in abs. Pressure. Correct: 0 to 500 mmHg abs. Incorrect: -700 mmHg to 1 kgf/cm<sup>2</sup>.

\*2. Specify range in abs. Pressure. Correct: 0 to 3 kgf/cm<sup>2</sup> abs. Incorrect: -1 to 2 kgf/cm<sup>2</sup> abs.

\*3. In case "ANSI/JPI300" is used for Flange Type & Rating, Not available for Length of Extended Parts: 200/250/300 mm.

\*4. Not applicable for the combination with code A2 "With external Zero/Span adjustment", Q1 "Safety Transmitter", and Q2 "NAMUR NE43 Compliant Output signal limits" of Option.

\*5. Not applicable for the combination with code Q1 "Safety Transmitter" and Q2 "NAMUR NE43 Compliant Output signal limits" of Option.

\*6. In case code A of indicator is selected, code A2 of Option code should be selected.

\*7. Not applicable for the combination with code YB "Manufactured by ACNP (for use in China)" and YD "Manufactured by ACNP (for use outside of China)" of Option.

\*8. Code "YB" or "YD" of Option code should be selected.

Table 2. Flange rating for China

Flange rating	GB PN1.0	GB PN 1.6	GB PN2.5	GB PN 4.0	HG PN1.0	HG PN1.6	HG PN2.5	HG PN4.0
Code	G1	G2	G4	G5	H1	H2	H4	H5

Model No.: GTX\_ \_S - Selection I (I II III IV V VI VII VIII IX) - Selection II (I II III IV V VI) - Option

## Selection II

Selection II		—	
I	Electrical connection	G1/2 *2 *13	1
		G1/2 TIIS explosion proof with 1 cable gland attached *3 *13	3
		G1/2 TIIS explosion proof with 2 cable gland attached *3 *13	4
		1/2 NPT, Watertight	A
		M20, Watertight *1	B
II	Explosion proof [ ★ ] *14 *15	None	XX
		FM Explosionproof for Division system/Flameproof for Zone system	F1
		FM Intrinsic safety	F2
		FM Intrinsic safety ia/ic FISCO and Fieldbus *8	F4
		FM Nonincendive	F5
		Combination of code F1, F2, and F5	F6
		FM Fieldbus Nonincendive *8	F7
		ATEX Flameproof	A1
		ATEX Intrinsic safety	A2
		ATEX Intrinsic safety ia FISCO and Fieldbus *8	A4
		ATEX Intrinsic safety ic FISCO and Fieldbus *8	A7
		IECEX Flameproof	E1
		IECEX Intrinsic safety	E2
		IECEX Intrinsic safety ia FISCO and Fieldbus *8	E4
		IECEX Intrinsic safety ic FISCO and Fieldbus *8	E7
		NEPSI Flameproof	N1
		NEPSI Intrinsic safety	N2
TIIS Flameproof *5 *6	J1		
KCs Flameproof *6	K1		
TAIWAN Flameproof	T1		
III	Indicator	None	X
		With indicator *7	A
IV	Paint *12	Standard	X
		None (316 stainless steel housing) *4	E
		Corrosion-proof (Urethane)	H
V	Failure alarm	Upper limit of output at abnormal condition	A
		Lower limit of output at abnormal condition	B
		None (for FOUNDATION Fieldbus) *8	X
VI	Mounting bracket	None	X
		304 SST (Flat form)	6

\*1. Not applicable for the combination with code F1, F6 of Explosion proof.

\*2. Code XX of Explosion proof should be selected.

\*3. Code J1 of Explosion proof should be selected.

\*4. Not applicable for combination with code 1,3,4 of Electrical connection.

\*5. 3 or 4 of Electrical connection should be selected.

\*6. Not applicable for the combination with code E of Paint.

\*7. In case the code C "FOUNDATION Fieldbus communication" of output is selected, code A2 of Option code should be selected.

\*8. In case this code is selected, code C of Output should be selected.

\*12. In case code X or H is selected, the material of transmitter case is aluminum alloy.

\*13. Not applicable for the combination with code YB "Manufactured by ACNP (for use in China)" and YD "Manufactured by ACNP (for use outside of China)" of Option.

\*14. For FOUNDATION Fieldbus type. Refer to SS2-GTX00Z-0100.

\*15. For option code YB "Manufactured by ACNP (for use in China)" and YD "Manufactured by ACNP (for use outside of China)" selected, only the following codes can be selected.

YB: XX, N1, N2

YD: XX, F1, F2, F5, F6, A1, A2, E1, E2, T1

Model No.: GTX\_\_S - Selection I (I II III IV V VI VII VIII IX) - Selection II (I II III IV V VI) - Option

Option

		—
No options		XX
With external Zero/Span adjustment *8 *9		A2
Oil and water free finish		K1
Oil free finish *1		K3
Safety Transmitter *2 *9 *14 *16		Q1
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) *9 *14		Q2
Alarm Output (contact output) *10 *14		Q7
Advanced diagnostics *15		Q8
Custom calibration		R1
Test report		T1
Mill certificate		T2
Traceability certificate *17		T4
NACE certificate *6		T5
Non SI Unit		W1
Safety label for Taiwan		Y2
Manufactured by ACNP (for use in China)		YB
Manufactured by ACNP( for use outside of China)		YD

\*1. No need to select when Fill Fluid code H, or J is selected.

\*2. Not applicable for the combination with code A2, or Q7 of Option.

\*6. Applicable for “ASTM B575”, code B of Material (center body).

\*8. Not applicable for the combination with code X “None” of Indicator. Please select “With indicator”.

\*9. Not applicable for the combination with code D “Digital output (DE communication)” of output.

\*10. Not applicable for the combination with code F2, F5, F6, N2, C2, E2, E5, A2 and A5 of Explosion proof.

\*14. Not applicable for the combination with code C “Digital output (FOUNDATION Fieldbus communication)” of output.

\*15. Not applicable for the combination with code A “4 to 20 mA (SFN Communication)”, B “4 to 20 mA (HART Communication)”, and D “Digital output (DE communication)” of output.

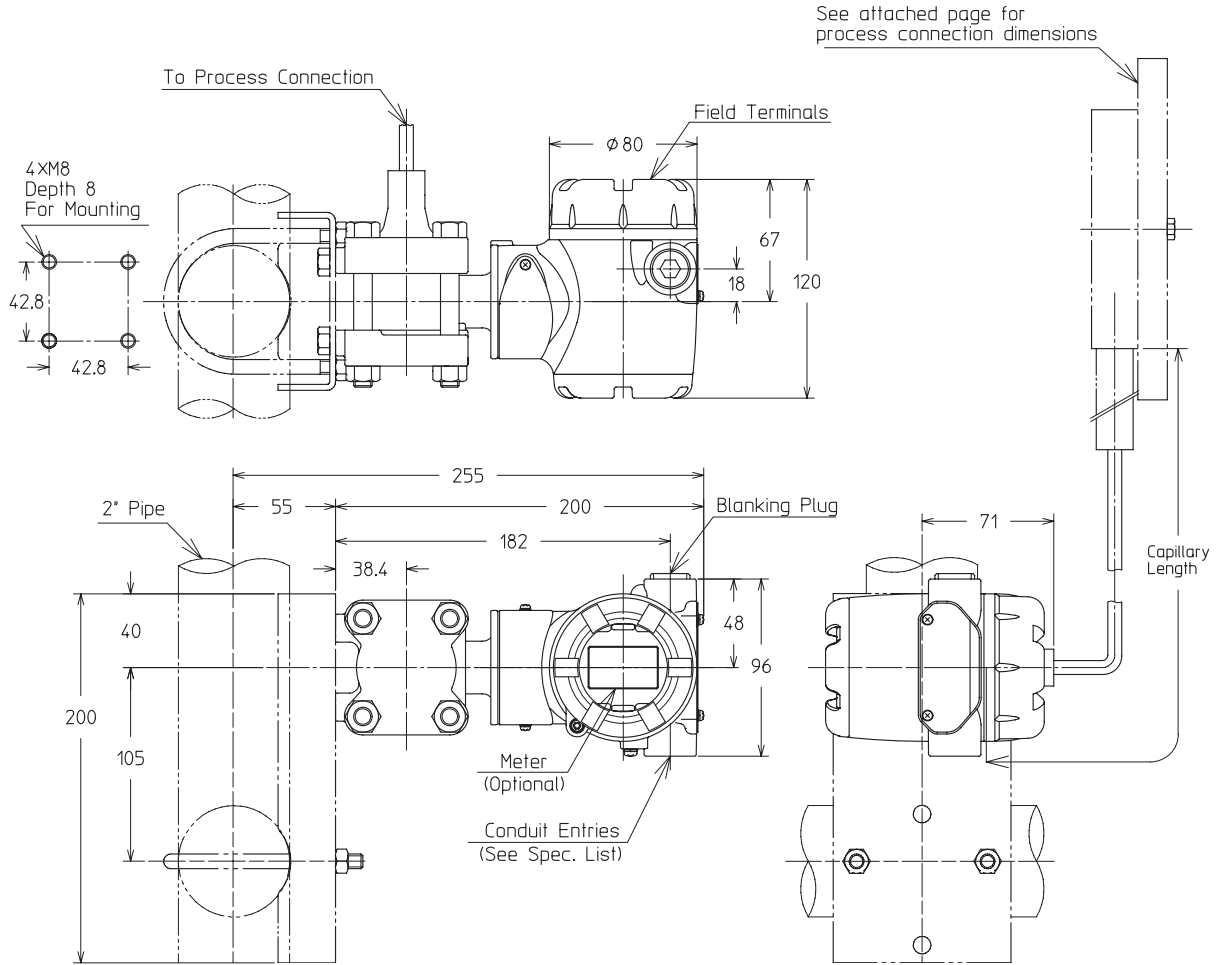
\*16. Not applicable for the combination with code F “4 to 20 mA (HART7 Communication)” of output.

\*17. Not applicable for the combination with code YB “Manufactured by ACNP (for use in China)” and YD “Manufactured by ACNP( for use outside of China)” of Option.

**DIMENSION**

**Model GTX30S/60S**

Unit: mm



**TERMINAL CONNECTION**

(Not applicable for Fieldbus. See SS2-GTX00Z-0100 for Fieldbus.)

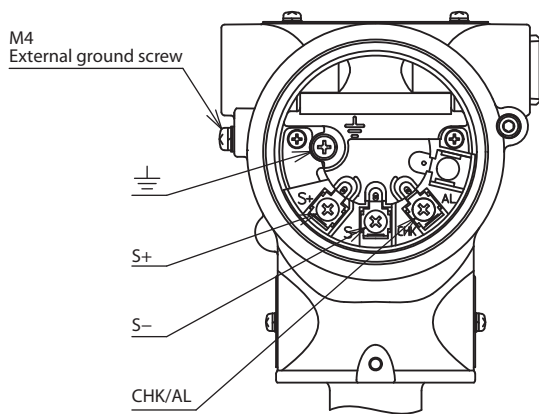


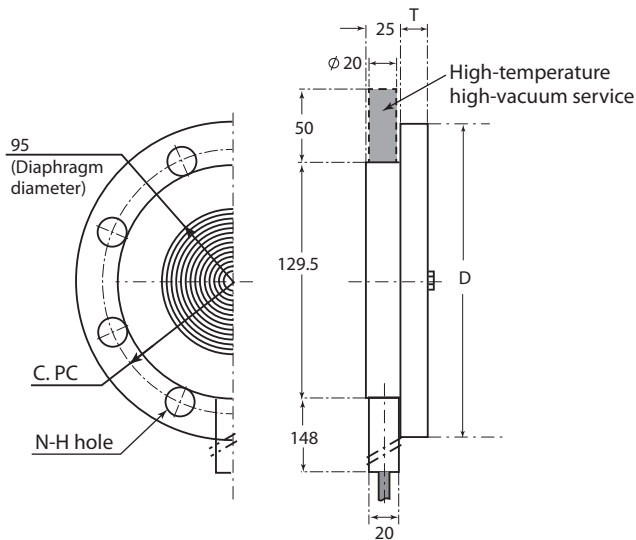
Table 3: Terminal connection

Symbol	Details
S+	Power supply and output signal +
S-	Power supply and output signal -/Check meter -
CHK/AL	Check meter +
⏏	Ground

Table 4: Terminal connection (option "07": Alarm output)

Symbol	Details
S+	Power supply and output signal +
S-	Power supply and output signal -
CHK/AL	Alarm +
⏏	Ground/Alarm -

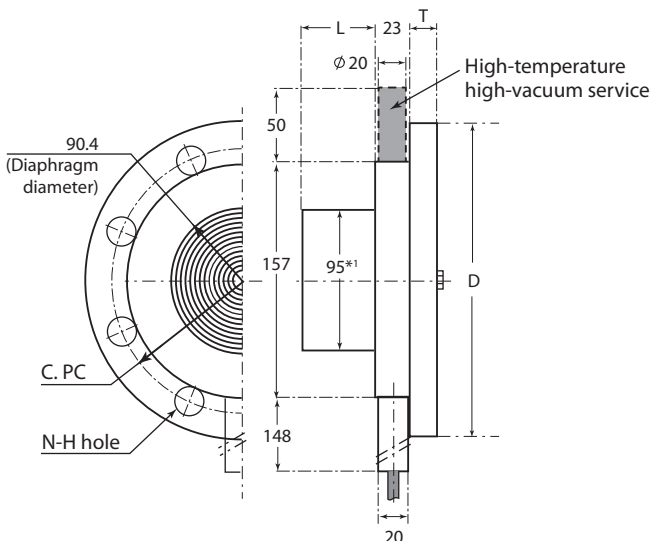
**Table of flush diaphragm flange dimensions**



Unit: mm

Rating	Flange rating	D	T	C	N	H
3 inches (80 mm)	JIS 10K-80 mm	185	18	150	8	19
	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

**Table of extended diaphragm flange dimensions**



Unit: mm

Rating	Flange rating	D	T	C	N	H	Extended length L
4 inches (100 mm)	JIS 10K - 100 mm	210	18	175	8	19	50
	JIS 20K - 100 mm	225	24	185	8	23	100
	JIS 30K - 100 mm	240	32	195	8	25	150
	ANSI 150 - 4 inches	229	24	191	8	19	200
	ANSI 300 - 4 inches	254	32	200	8	22	250
	JPI 150 - 4 inches	229	24	191	8	19	300
	JPI 300 - 4 inches	254	32	200	8	22	

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