ST3000 Ace Smart Transmitter
JTG Series of Pressure Transmitters
Model JTG929A / JTG960A / JTG980A

OVERVIEW

The ST3000 Ace* Smart Transmitter is a microprocessor-based smart transmitter that features high performance and excellent stability. Capable of measuring pressure of 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 the Comm-Pad (Smart communicator) , or the SFC (Smart Field Communicator), and via DE protocol, with the TDCS3000 or 3000X , or Advance-PS, and a database, thus facilitating self-diagnosis, range resetting, and automatic zero adjustment.

Refer to No. SS2-DST10F-0100 for FOUNDATION™ Fieldbus specification.

FEATURES

Excellent stability and high performance
- Long-term stability has been proven in 500,000 installations worldwide.
- Unique characterization and composite semiconductor sensors realize excellent temperature characteristics.

Wide measuring range (rangeability)
- A wide measuring range is available from a single model. This feature is highly effective in taking measurements over a wide range and reducing the need for reserve units. Model JTG940A: 35 to 3500 kPa (rangeability: 1 to 100)

A diverse lineup
- A wide range of models is available to meet user needs for low, standard, and high pressures.
- A wide variety of corrosion-resistant materials for wetted parts is also available.

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

Full after-sales service program
- A wide variety of specialized replacement kits is provided to meet customers' needs when replacing Yamatake transmitters or transmitters from other companies.
- From product delivery to replacement, we will service all your needs. Our nationwide service network provides all the backup you require, including trial operation support and regular maintenance.

APPLICATION

Petroleum / Petrochemical / Chemical
- For the measurement pressures and liquid levels in pipes and tanks.

Electric power / City gas / Other utilities
- For measurement applications that require a high degree 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, etc.) conditions.

SPECIFICATIONS

Measuring span / Setting range / Working pressure range / Overload resistance value
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)
Digital output (FOUNDATION™ Fieldbus protocol)

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

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

Ambient temperature range

Normal operating range
-40 to 85°C for general purpose models
-10 to 75°C for oxygen and chlorine models
-20 to 70°C for models with digital indicators

Operative limits
-50 to 93°C for general purpose models
-40 to 80°C for oxygen and chlorine models
-30 to 80°C for models with digital indicators

JIS special explosion-proof models
-20 to 60°C

JIS intrinsically safe models
-10 to 60°C

Temperature ranges of wetted parts

Normal operating range
-40 to 110°C for general purpose models
-10 to 75°C for oxygen and chlorine models

Operative limits
-50 to 115°C for general purpose models
-40 to 80°C for oxygen and chlorine models

JIS special explosion-proof models
-20 to 110°C

JIS intrinsically safe models
-10 to 100°C

Operating humidity range
5 to 100% RH

Stability against supply voltage change
± 0.005% F.S./V

Lightning protection
Peak value of voltage surge: 100 kV
Peak value of current surge: 1000A

Dead time
Approximately 0.4 sec.

Damping time constant
Selectable from 0 to 32 sec. in ten stages
(Hart protocol: selectable 0 to 128 sec.)

Waterproof / Dustproof structure
JIS C0920 watertight: NEMA3 and 4X
JIS F8001 class 2 watertight: IEC IP67

Explosion-proof structure
JIS explosion-proof models: (Exd II CT4X)
JIS intrinsically safe models: (i3aG4)

Note) Please use the cable that can be used in the environment that maximum ambient temperature is beyond 65°C

Vibraation effect
Amptitude 1.5mm / Frequency 0 to 9Hz
$5m/s^2$(0.5G) / 9 to 60Hz

Impact effect
$10m/s^2$(1G)

Process pipe connection
Rc1/2, 1/2NPT internal thread and Rc1/4, 1/4NPT internal thread

Electrical conduit connection
G1/2 internal thread and 1/2NPT internal thread

Materials
Center body: SUS316
Transmitter case: Aluminum alloy

Wetted parts materials

Meter body cover
SUSF316, PVC

Wetted parts of center body
SUS316 (diaphragm: SUS316L)
ASTM B575 (Hastelloy C-276 equivalent), Tantalum, etc.

Vents and plugs
SUS316, PVC

Gaskets for wetted parts
FEP

*Note) *: In the case of model JTG980A, SFVC2A*

Bolts and nuts material (for fastening meter body cover)
Carbon steel (SNB7), SUS304, SUS630

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-coated 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 newer).

Burnout feature
Choice of three states at abnormal condition:
Burnout of output values: none
upper limit: 20.8mA (105%) or more
lower limit: 3.8mA (-1.25%) of less

Grounding
Grounding resistance 100 Ω max.

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

Weight
Approx. 4.4 kg (Model JTG940A / 960A)

Table 1 Measuring span, setting range, and working pressure range (for negative pressure in the working pressure range, see Figure 2, Figure 3) / Overload resistant value

Model	Measuring span	Setting range	Working pressure range	Overload resistant value
JTG940A	35 to 3500 kPa {0.35 to 35 kgf/cm²}	-100 to 3500 kPa {-1 to 35 kgf/cm²}	2.0 kPa abs. to 3500 kPa {15 mmHg abs. to 35 kgf/cm²}	5250 kPa {52.5 kgf/cm²}
JTG960A	0.7 to 14 MPa {7 to 140 kgf/cm²}	-0.1 to 14 MPa {-1 to 140 kgf/cm²}	2.0 kPa abs. to 14 MPa *1 *2 {15 mmHg abs. to 140 kgf/cm²}	21 MPa {210 kgf/cm²}
JTG980A	0.7 to 42 MPa {7 to 420 kgf/cm²}	-100 to 42 MPa {-1 to 420 kgf/cm²}	2.0 kPa abs. to 42 MPa *3 {15 mmHg abs. to 420 kgf/cm²}	63 MPa {630 kgf/cm²}

*Note) *1.With PVC wetted parts, the maximum working pressure is 1.5 MPa {15 kgf/cm²}*
**2. With SUS304 bolts and nuts, the maximum working pressure is 7 MPa {70 kgf/cm²}*
**3. WIth SUS304 bolts and nuts, the maximum working pressure is 23 MPa {230 kgf/cm²}*

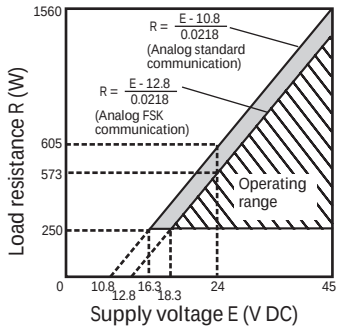


Figure 1 Supply voltage vs. load resistance characteristics

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

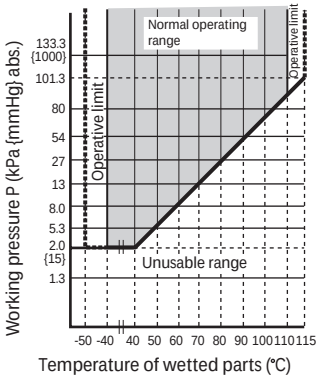


Figure 2 Working pressure and temperature of wetted parts section

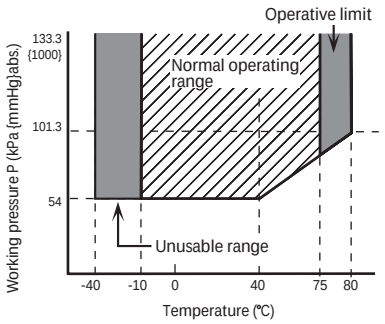


Figure 3 Working pressure and temperature of wetted parts section for oxygen and chlorine service

OPTIONAL SPECIFICATIONS

External zero adjustment function
The transmitter can be easily zero-adjusted in the field with a flat-head screwdriver.

Additional lightning protection
It is possible to achieve a lightning protection performance of 200 kV, 2000A, twice the standard performance (100 kV, 1000A). This is advisable when the transmitter is to be used in lightning-prone areas such as mountains, hills or wherever high-performance lightning protection is required.

Log vent drain
A longer (58 mm) drain than the standard (24 mm) can be used for maintenance, process, and safety reasons.

Steam block
A block with steam piping can be attached to the initial process section of the transmitter to deal with process fluids or steam that tend to coagulate or condense at low temperatures.

Working pressure (steam block)
5 MPa {50 kgf/cm²} max.
(Must not exceed the working pressure range)

Working temperature (steam block)
250°C max.
(The temperature of the wetted parts of the transmitter must not exceed the temperature range of the wetted parts.)

Elbow
This is an adaptor for changing the electrical conduit connection port from the horizontal to the vertical direction, if required by wiring conditions in the field. One or two elbows may be used as needed.

Water free treatment (including oil free treatment)
The transmitter is shipped with dry and oil-free wetted parts.

Oil free treatment
The transmitter is shipped with oil-free wetted parts.

Electric power specification
This specification applies to where stringent quality control is required, such as in the electrical 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.

Output saturation
The output saturation point can be set within the following ranges.
12mA(50%) ≤ output upper limit ≤ 20.8mA(105%)
3.2mA(-5%) ≤ output lower limit ≤ 12mA(50%)

Note) As HART communication type, the lower limit of output satuation becomes 3.8mA(-1.25%).

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

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

Pressure resistance and gas-tightness tests (for general purpose)
The test result sheet shows the results of a pressure resistance test (under water pressure for 10 minutes) and a gas-tightness test (using N_2 gas 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 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. In addition, when the wiring for an explosionproof product is a pull-in pressure-resistant packing cable, be sure to use a pressure-resistant packing-cable adapter certified by Yamatake Corporation.
- Be sure to use the cable which allowable temperature is more than 65°C.

⚠ CAUTION

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

Wiring notes

⚠ WARNING

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

⚠ CAUTION

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

PERFORMANCE

Shown for each performance (accuracy/ temperature characteristics/ static pressure effect) are absolute value of 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.

Model JTG940A - Material for wetted parts: SUS316

Accuracy [*3]		± 0.1%	($\chi \geq 0.14$ MPa {1.4 kgf/cm^2})
		$\pm\left(0.025 + 0.75 \times \frac{0.14}{\chi}\right)$ %	($\chi < 0.14$ MPa {1.4 kgf/cm^2})
Temperature characteristics (Shift from the set range) Change of 30°C	**Zero shift:**	$\pm\left(0.14 + 0.17 \times \frac{0.35}{\chi}\right)$ %	(χ:*MPa*)
	Combined shift: (including zero and span shift)	± 0.44%	($\chi \geq 0.35$ MPa {3.5 kgf/cm^2})
		$\pm\left(0.19 + 0.25 \times \frac{0.35}{\chi}\right)$ %	($\chi < 0.35$ MPa {3.5 kgf/cm^2})

Model JTG960A - Material for wetted parts: SUS316

Accuracy [*3]		± 0.15%	($\chi \geq 2.1$ MPa {21 kgf/cm^2})
		$\pm\left(0.05 + 0.1 \times \frac{2.1}{\chi}\right)$ %	($\chi < 2.1$ MPa {21 kgf/cm^2})
Temperature characteristics (Shift from the set range) [*3] **Change of 30°C**	**Zero shift:**	$\pm\left(0.14 + 0.17 \times \frac{3.5}{\chi}\right)$ %	(χ:*MPa*)
	Combined shift: (including zero and span shift)	± 0.44%	($\chi \geq 3.5$ MPa {35 kgf/cm^2})
		$\pm\left(0.19 + 0.25 \times \frac{3.5}{\chi}\right)$ %	($\chi < 3.5$ MPa {35 kgf/cm^2})

Model JTG980A - Material for wetted parts: SUS316

Accuracy [*3]		± 0.15%	($\chi \geq 7$ MPa {70 kgf/cm^2})
		$\pm\left(0.05 + 0.1 \times \frac{7}{\chi}\right)$ %	($\chi < 7$ MPa {70 kgf/cm^2})
Temperature characteristics (Shift from the set range) [*3] **Change of 30°C**	**Zero shift:**	$\pm\left(0.14 + 0.17 \times \frac{7}{\chi}\right)$ %	(χ:*MPa*)
	Combined shift: (including zero and span shift)	± 0.44%	($\chi \geq 7$ MPa {70 kgf/cm^2})
		$\pm\left(0.19 + 0.25 \times \frac{7}{\chi}\right)$ %	($\chi < 7$ MPa {70 kgf/cm^2})

Model JTG940A - Material for wetted parts: ASTM B575 (Hastelloy C-276 equivalent), Tantalum

Accuracy [*3]		± 0.2%	($\chi \geq 0.14$ MPa {1.4 kgf/cm^2})
		$\pm\left(0.05 + 0.15 \times \frac{0.14}{\chi}\right)$ %	($\chi < 0.14$ MPa {70 kgf/cm^2})
Temperature characteristics (Shift from the set range) [*3] **Change of 30°C (Range from -5 to 55°C)**	**Zero shift:**	$\pm\left(0.15 + 0.45 \times \frac{0.35}{\chi}\right)$ %	(χ:*MPa*)
	Combined shift: (including zero and span shift)	± 0.85%	($\chi \geq 0.35$ MPa {3.5 kgf/cm^2})
		$\pm\left(0.35 + 0.5 \times \frac{0.35}{\chi}\right)$ %	($\chi < 0.35$ MPa {3.5 kgf/cm^2})

Model JTG960A - Material for wetted parts: ASTM B575 (Hastelloy C-276 equivalent), Tantalum

Accuracy [*3]		± 0.15%	($\chi \geq 2.1$ MPa {21 kgf/cm^2})
		$\pm\left(0.05 + 0.1 \times \frac{2.1}{\chi}\right)$ %	($\chi < 2.1$ MPa {21 kgf/cm^2})
Temperature characteristics (Shift from the set range) [*3] **Change of 30°C (Range from -5 to 55°C)**	**Zero shift:**	$\pm\left(0.15 + 0.45 \times \frac{3.5}{\chi}\right)$ %	(χ:*MPa*)
	Combined shift: (including zero and span shift)	± 0.85%	($\chi \geq 3.5$ MPa {35 kgf/cm^2})
		$\pm\left(0.35 + 0.5 \times \frac{(3.5)}{\chi}\right)$ %	($\chi < 3.5$ MPa {35 kgf/cm^2})

Model JTG980A - Material for wetted parts: ASTM B575 (Hastelloy C-276 equivalent), Tantalum

Accuracy *3		± 0.15%	($\chi \geq 7$ MPa {70 kgf/cm^2})
		$\pm\left(0.05 + 0.1 \times \frac{7}{\chi}\right)$ %	($\chi < 7$ MPa {70 kgf/cm^2})
Temperature characteristics (Shift from the set range) *3 **Change of 30°C (Range from -5 to 55°C)**	**Zero shift:**	$\pm\left(0.15 + 0.45 \times \frac{7}{\chi}\right)$ %	(χ:*MPa*)
	Combined shift: (including zero and span shift)	± 0.85%	($\chi \geq 3.5$ MPa {35 kgf/cm^2})
		$\pm\left(0.35 + 0.5 \times \frac{7}{\chi}\right)$ %	($\chi < 3.5$ MPa {35 kgf/cm^2})

*Note) *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 $\geq$ 0 and LRV $\geq$ 0*

MODEL SELECTIONS

Model JTG940A/JTG960A - Regular service (Fill fluid: Silicon oil)

Basic model no.		Selections						Options 1						Options 2 (Refer to page 13)
	-	I	II	III	IV	V	-	VI	VII	VIII	IX	X	-	

Basic model no.

	Measuring span	35 to 3500 kPa (0.35 to 35 kgf/cm²)	Low pressure	**JTG940A**
		0.7 to 14 MPa (7 to 140 kgf/cm²)	Medium pressure	**JTG960A**

Selections

												-				
I	Output	4 to 20 mA			1											
		4 to 20 mA (Analog FSK communication) *3			2											
		Digital output (DE protocol) *2			3											
		Digital output (FOUNDATION Fieldbus protocol) *41			4											
		4 to 20 mA (HART protocol) *43			5											
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body												
	*10	SUSF316	SUS316	SUS316	E											
	*10	SUSF316	SUS316	ASTM B575 **	F											
	*10	SUSF316	SUS316	Tantalum	H											
		SUSF316	SUS316	SUS316L	K											
	*6 *26	PVC	PVC	Tantalum	P											
III	Fill fluid	Regular type (Silicon oil)				1										
IV	Process connection	Rc1/2, top connection					A									
		Rc1/2, bottom connection					B									
	*27	Rc 1/2, side connection					C									
		1/2NPT internal thread, top connection					F									
		1/2NPT internal thread, bottom connection					G									
	*27	1/2 NPT internal thread, side connection					H									
		Rc1/4, top connection					L									
		Rc1/4, bottom connection					M									
	*27	Rc1/4, side connection					N									
		1/4NPT internal thread, top connection					R									
		1/4NPT internal thread, bottom connection					S									
	*27	1/4 NPT internal thread, side connection					T									
V	Bolts and nuts	Carbon steel						1								
		SUS304						2								
		SUS630						3								
Options 1									-							
VI	Electrical connection / explosion-proof	G1/2, Watertight								X						
		G1/2, JIS Flameproof with 1 pc. of cable gland attached								2						
		G1/2, JIS Flameproof with 2 pcs. of cable gland attached.								3						
		G1/2, Intrinsically safe *1								6						
		1/2NPT, Watertight								A						
VII	Builting indicating smart meter	Carbon steel									X					
		Carbon steel / SUS304									1					
		Carbon steel / SUS630									2					
VIII	Finish	Standard										X				
		Corrosion-resistant										A				
		Corrosion-proof										B				
		Corrosion-resistant (Silver coating)										D				
IX	Burnout feature *1	None											X			
		Upper limit of output at abnormal condition											U			
		Lower limit of output at abnormal condition											D			
X	Mounting bracket	None												X		
		Carbon steel												1		
		SUS304												2		

Note) 1: Digital output (DE protocol) should be selected with upper/lower direction of burn out feature.
2: Digital output (DE protocol) can not be combined with an external zero adjustment function.
3: Analog FSK Communication can not be combined with intrinsically safe.
6: When meterbody material is PVC, bolts and nuts material of selection "V" should be SUS304.
8: This can be selected for the meterbody cover if the process fluid contains hydro-carbon or H2S which used for refinery / petrochemical. In other cases, select carbon steel Ni plating for meterbody cover.
26: Not available for model JTG960A.
27: Not available for material selection "P".
41: Code L1 must be selected for OPTION2.
42: Burnout function can not be combined with Fieldbus.
43: HART communication can not be combined with special burnout (3.2mA) it JIS Intrinsically safe.

***: ASTM B575 is equivalent to Hastelloy C-276.*

JTG980A - Regular service (Fill fluid: Silicon oil)

Basic model no.		Selections						Options 1						Options 2 (Refer to page 13)
	-	I	II	III	IV	V	-	VI	VII	VIII	IX	X	-	

Basic model no.

	Measuring span	0.7 to 42 MPa (7 to 420 kgf/cm²)	High pressure	**JTG980A**

Selections

												-						
I	Output	4 to 20 mA				1												
		4 to 20 mA (Analog FSK communication) *3				2												
		Digital output (DE protocol) *2				3												
		Digital output (FOUNDATION Fieldbus protocol) *41				4												
		4 to 20 mA (HART protocol) *43				5												
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body														
		SUSF316	SUS316	SUS316		E												
		SUSF316	SUS316	ASTM B575 **		F												
III	Fill fluid	Regular type (Silicon oil)					1											
IV	Process connection	Rc1/2, top connection						A										
		Rc1/2, bottom connection						B										
		Rc 1/2, side connection						C										
		1/2NPT internal thread, top connection						F										
		1/2NPT internal thread, bottom connection						G										
		1/2 NPT internal thread, side connection						H										
		Rc1/4, top connection						L										
		Rc1/4, bottom connection						M										
		Rc1/4, side connection						N										
		1/4NPT internal thread, top connection						R										
		1/4NPT internal thread, bottom connection						S										
		1/4 NPT internal thread, side connection						T										
V	Bolts and nuts	Carbon steel							1									
		SUS304							2									
		SUS630							3									
Options 1										-								
VI	Electrical connection / explosion-proof	G1/2, Watertight									X							
		G1/2, JIS Flameproof with 1 pc. of cable gland attached									2							
		G1/2, JIS Flameproof with 2 pcs. of cable gland attached.									3							
		G1/2, Intrinsically safe *1									6							
		1/2NPT, Watertight									A							
VII	Builting indicating smart meter	Carbon steel										X						
		Carbon steel / SUS304										1						
		Carbon steel / SUS630										2						
VIII	Finish	Standard											X					
		Corrosion-resistant											A					
		Corrosion-proof											B					
		Corrosion-resistant (Silver coating)											D					
IX	Burnout feature *1	None												X				
		Upper limit of output at abnormal condition												U				
		Lower limit of output at abnormal condition												D				
X	Mounting bracket	None													X			
		Carbon steel													1			
		SUS304													2			

Note) 1: Digital output (DE protocol) should be selected with upper/lower direction of burn out feature.
2: Digital output (DE protocol) can not be combined with an external zero adjustment function.
3: Analog FSK Communication can not be combined with intrinsically safe.
8: This can be selected for the meterbody cover if the process fluid contains hydro-carbon or H2S which used for refinery / petrochemical. In other cases, select carbon steel Ni plating for meterbody cover.
41: Code L1 must be selected for OPTION2.
42: Burnout function can not be combined with Fieldbus.
43: HART communication can not be combined with special burnout (3.2mA) it JIS Intrinsically safe.

***: ASTM B575 is equivalent to Hastelloy C-276.*

Model JTG940A/JTG960A - Oxygen service (Fill fluid: Fluorine oil)

Basic model no.		Selections						Options 1						Options 2 (Refer to page 13)
	-	I	II	III	IV	V	-	VI	VII	VIII	IX	X	-	

Basic model no.

	Measuring span	35 to 3500 kPa (0.35 to 35 kgf/cm²)	Low pressure	**JTG940A**
		0.7 to 14 MPa (7 to 140 kgf/cm²)	Medium pressure	**JTG960A**

Selections

												-				
I	Output	4 to 20 mA			1											
		4 to 20 mA (Analog FSK communication) *3			2											
		Digital output (DE protocol) *2			3											
		Digital output (FOUNDATION Fieldbus protocol) *41			4											
		4 to 20 mA (HART protocol) *43			5											
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body												
		SUSF316	SUS316	SUS316	E											
		SUSF316	SUS316	ASTM B575 **	F											
		SUSF316	SUS316	Tantalum	H											
		SUSF316	SUS316	SUS316L	K											
	*6 *26	PVC	PVC	Tantalum	P											
III	Fill fluid	For oxygen service (Fluorine oil)				2										
IV	Process connection	Rc1/2, top connection					A									
		Rc1/2, bottom connection					B									
	*27	Rc 1/2, side connection					C									
		1/2NPT internal thread, top connection					F									
		1/2NPT internal thread, bottom connection					G									
	*27	1/2 NPT internal thread, side connection					H									
		Rc1/4, top connection					L									
		Rc1/4, bottom connection					M									
	*27	Rc1/4, side connection					N									
		1/4NPT internal thread, top connection					R									
		1/4NPT internal thread, bottom connection					S									
	*27	1/4 NPT internal thread, side connection					T									
V	Bolts and nuts	Carbon steel						1								
		SUS304						2								
		SUS630						3								
Options 1									-							
VI	Electrical connection / explosion-proof	G1/2, Watertight								X						
		G1/2, JIS Flameproof with 1 pc. of cable gland attached								2						
		G1/2, JIS Flameproof with 2 pcs. of cable gland attached.								3						
		G1/2, Intrinsically safe *1								6						
		1/2NPT, Watertight								A						
VII	Builting indicating smart meter	Carbon steel									X					
		Carbon steel / SUS304									1					
		Carbon steel / SUS630									2					
VIII	Finish	Standard										X				
		Corrosion-resistant										A				
		Corrosion-proof										B				
		Corrosion-resistant (Silver coating)										D				
IX	Burnout feature *1	None											X			
		Upper limit of output at abnormal condition											U			
		Lower limit of output at abnormal condition											D			
X	Mounting bracket	None												X		
		Carbon steel												1		
		SUS304												2		

Note) 1: Digital output (DE protocol) should be selected with upper/lower direction of burn out feature.
2: Digital output (DE protocol) can not be combined with an external zero adjustment function.
3: Analog FSK Communication can not be combined with intrinsically safe.
6: When meterbody material is PVC, bolts and nuts material of selection "V" should be SUS304.
8: This can be selected for the meter body cover if the process fluid contains hydro-carbon or H2S which used for refinery / petrochemical. In other cases, select carbon steel Ni plating for meterbody cover.
26: Not available for model JTG960A.
27: Not available for material selection "P".
41: Code L1 must be selected for OPTION2.
42: Burnout function can not be combined with FOUNDATION™ Fieldbus.
43: HART communication can not be combined with special burnout (3.2mA) or JIS Intrinsically safe.

***: ASTM B575 is equivalent to Hastelloy C-276.*

JTG980A - Oxygen service (Fill fluid: Fluorine oil)

Basic model no.		Selections						Options 1						Options 2 (Refer topage 13)
	-	I	II	III	IV	V	-	VI	VII	VIII	IX	X	-	

Basic model no.

	Measuring span	0.7 to 42 MPa (7 to 420 kgf/cm²)	High pressure	**JTG980A**

Selections

							-						
I	Output	4 to 20 mA			1								
		4 to 20 mA (Analog FSK communication) *3			2								
		Digital output (DE protocol) *2			3								
		Digital output (FOUNDATION Fieldbus protocol) *41			4								
		4 to 20 mA (HART protocol) *43			5								
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body									
		SUSF316	SUS316	SUS316	E								
		SUSF316	SUS316	ASTM B575 **	F								
III	Fill fluid	For oxygen service (Fluorine oil)				2							
IV	Process connection	Rc1/2, top connection					A						
		Rc1/2, bottom connection					B						
	*5	Rc 1/2, side connection					C						
		1/2NPT internal thread, top connection					F						
		1/2NPT internal thread, bottom connection					G						
	*5	1/2 NPT internal thread, side connection					H						
		Rc1/4, top connection					L						
		Rc1/4, bottom connection					M						
	*5	Rc1/4, side connection					N						
		1/4NPT internal thread, top connection					R						
		1/4NPT internal thread, bottom connection					S						
	*5	1/4 NPT internal thread, side connection					T						
V	Bolts and nuts	Carbon steel						1					
		SUS304						2					
		SUS630						3					
Options 1									-				
VI	Electrical connection / explosion-proof	G1/2, Watertight								X			
		G1/2, JIS Flameproof with 1 pc. of cable gland attached								2			
		G1/2, JIS Flameproof with 2 pcs. of cable gland attached.								3			
		G1/2, Intrinsically safe *1								6			
		1/2NPT, Watertight								A			
VII	Builting indicating smart meter	Carbon steel									X		
		Carbon steel / SUS304									1		
		Carbon steel / SUS630									2		
VIII	Finish	Standard										X	
		Corrosion-resistant										A	
		Corrosion-proof										B	
		Corrosion-resistant (Silver coating)										D	
IX	Burnout feature *2	None											X
		Upper limit of output at abnormal condition											U
		Lower limit of output at abnormal condition											D
X	Mounting bracket	None											X
		Carbon steel											1
		SUS304											2

Note) 1: Digital output (DE protocol) should be selected with upper/lower direction of burn out feature.

2: Digital output (DE protocol) can not be combined with an external zero adjustment function.

5: The pitch of vent drains are 82 mm. To change the pitch of vent drains to 54 mm (standard pitch), use adapter flange. ("A1" of Option 2.)

41: Code L1 must be selected for OPTION2.

42: Burnout function can not be combined with FOUNDATION™ Fieldbus.

43: HART communication can not be combined with special burnout (3.2mA) or JIS Intrinsically safe.

***: ASTM B575 is equivalent to Hastelloy C-276.*

Model JTG940A/JTG960A - Chlorine service (Fill fluid: Fluorine oil)

Basic model no.		Selections						Options 1						Options 2 (Refer to page 13)
	-	I	II	III	IV	V	-	VI	VII	VIII	IX	X	-	

Basic model no.

	Measuring span	35 to 3500 kPa (0.35 to 35 kgf/cm²)	Low pressure	**JTG940A**
		0.7 to 14 MPa (7 to 140 kgf/cm²)	Medium pressure	**JTG960A**

Selections

												-				
I	Output	4 to 20 mA			1											
		4 to 20 mA (Analog FSK communication) *3			2											
		Digital output (DE protocol) *2			3											
		Digital output (FOUNDATION Fieldbus protocol) *41			4											
		4 to 20 mA (HART protocol) *43			5											
II	Material	Meterbody cover	Vent / drain plugs	Wetted parts of center body												
		SUSF316	SUS316	Tantalum	H											
	*6 *26	PVC	PVC	Tantalum	P											
III	Fill fluid	For chlorine service (Fluorine oil)				5										
IV	Process connection	Rc1/2, top connection					A									
		Rc1/2, bottom connection					B									
	*27	Rc 1/2, side connection					C									
		1/2NPT internal thread, top connection					F									
		1/2NPT internal thread, bottom connection					G									
	*27	1/2 NPT internal thread, side connection					H									
		Rc1/4, top connection					L									
		Rc1/4, bottom connection					M									
	*27	Rc1/4, side connection					N									
		1/4NPT internal thread, top connection					R									
		1/4NPT internal thread, bottom connection					S									
	*27	1/4 NPT internal thread, side connection					T									
V	Bolts and nuts	Carbon steel						1								
		SUS304						2								
		SUS630						3								
Options 1									-							
VI	Electrical connection / explosion-proof	G1/2, Watertight								X						
		G1/2, JIS Flameproof with 1 pc. of cable gland attached								2						
		G1/2, JIS Flameproof with 2 pcs. of cable gland attached.								3						
		G1/2, Intrinsically safe *1								6						
		1/2NPT, Watertight								A						
VII	Builting indicating smart meter	Carbon steel									X					
		Carbon steel / SUS304									1					
		Carbon steel / SUS630									2					
VIII	Finish	Standard										X				
		Corrosion-resistant										A				
		Corrosion-proof										B				
		Corrosion-resistant (Silver coating)										D				
IX	Burnout feature *1	None											X			
		Upper limit of output at abnormal condition											U			
		Lower limit of output at abnormal condition											D			
X	Mounting bracket	None														X
		Carbon steel														1
		SUS304														2

Note) 1: Digital output (DE protocol) should be selected with upper/lower direction of burn out feature.
2: Digital output (DE protocol) can not be combined with an external zero adjustment function.
3: Analog FSK Communication can not be combined with intrinsically safe.
6: When meterbody material is PVC, bolts and nuts material of selection "V" should be SUS304.
8: This can be selected for the meterbody cover if the process fluid contains hydro-carbon or H2S which used for refinery / petrochemical. In other cases, select carbon steel Ni plating for meterbody cover.
26: Not available for model JTG960A.
27: Not available for material selection "P".
41: Code L1 must be selected for OPTION2.
42: Burnout function can not be combined with FOUNDATION™ Fieldbus.
43: HART communication can not be combined with special burnout (3.2mA) or JIS Intrinsically safe.

***: ASTM B575 is equivalent to Hastelloy C-276.*

Basic model no.		Selections						Options 1						Options 2
	-	I	II	III	IV	V	-	VI	VII	VIII	IX	X	-	

Options 2

	No options	XX
	External zero adjustment *2	A2
	Lightening arrestor	A4
	Long vent/drain plugs	A5
	Steam block *22	B2
	For mounting a high load resistance smart meter *23	B7
	Color: Red (Munsell 5R4/13)	C1
	Color: Yellow (Munsell 2.5Y8/16)	C2
	Color: Blue (Munsell 7.5BG7/2)	C3
	Process connection; reverse	C7
	Water free finish (included oil free finish) *16 *17	D1
	Oil free finish *16 *17	D2
	One elbow (Left)	G1
	One elbow (Right)	G2
	Two elbows	G3
	Special burn-out feature (3.2 mA) *18	J8
	Output saturation point changeable	K9
	Fieldbus communication stack BASIC class	L1
	Test report	T1
	Material certificate *19	T2
	Strength calculation sheet *20	T5
	Pressure resistance and gas tightness test *21	T6
	Traceability certificate	T8
	Non-SI unit conformance	U2
	Others	❑❑

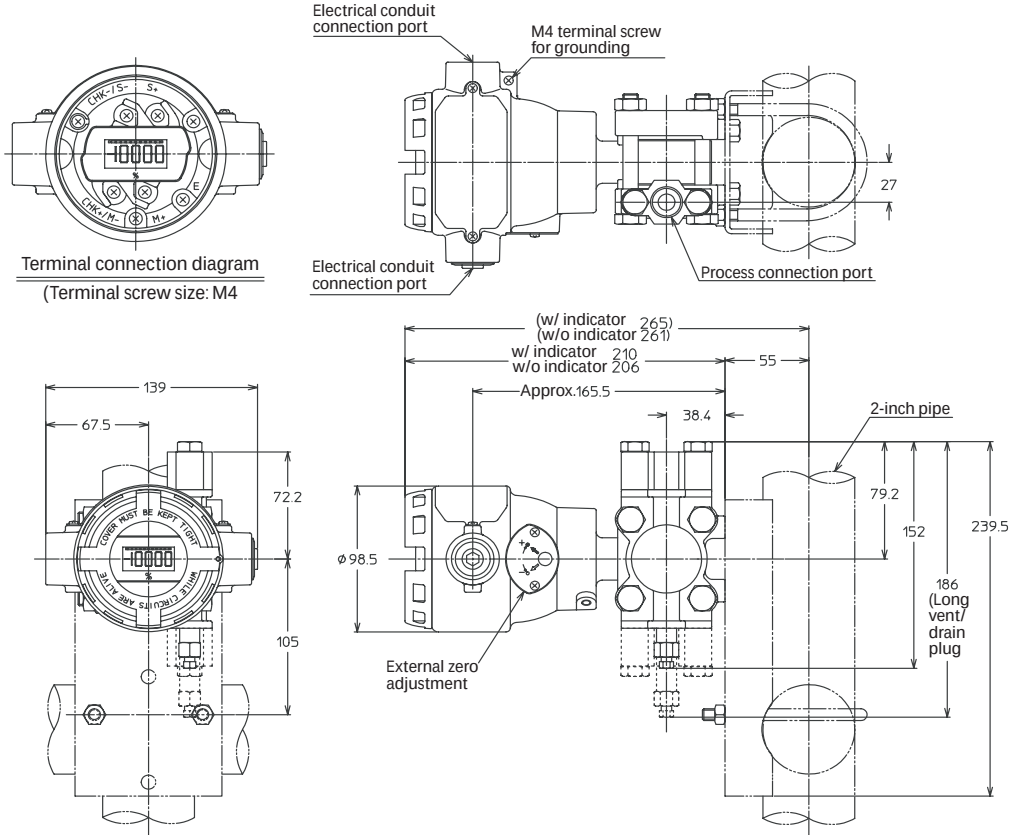
Note) 2: Digital output (DE protocol) can not be combined with an external zero adjustment function.
16: When the fill fluid is for oxygen or chlorine service, this is no needed to select.
17: The carbon steel for meterbody cover material is not available for this option.
18: This should be selected with upper/lower of burn out feature.
19: Available only for material of wetted part.
20: When order-entry, designed pressure and designed temperature are required.
21: When ordering, resistant pressure and gas-tightness test pressure are required.

DIMENSIONS

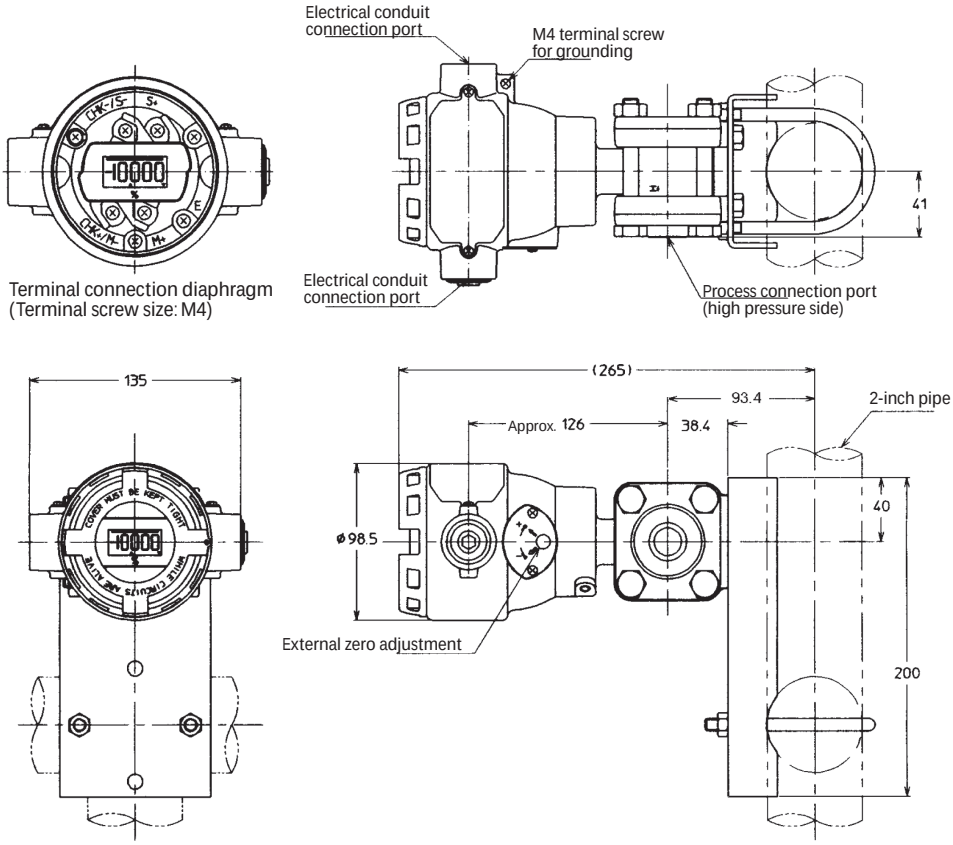
Model JTG940A / 960A

[Unit: mm]

Process pipe connection: Top or bottom connection



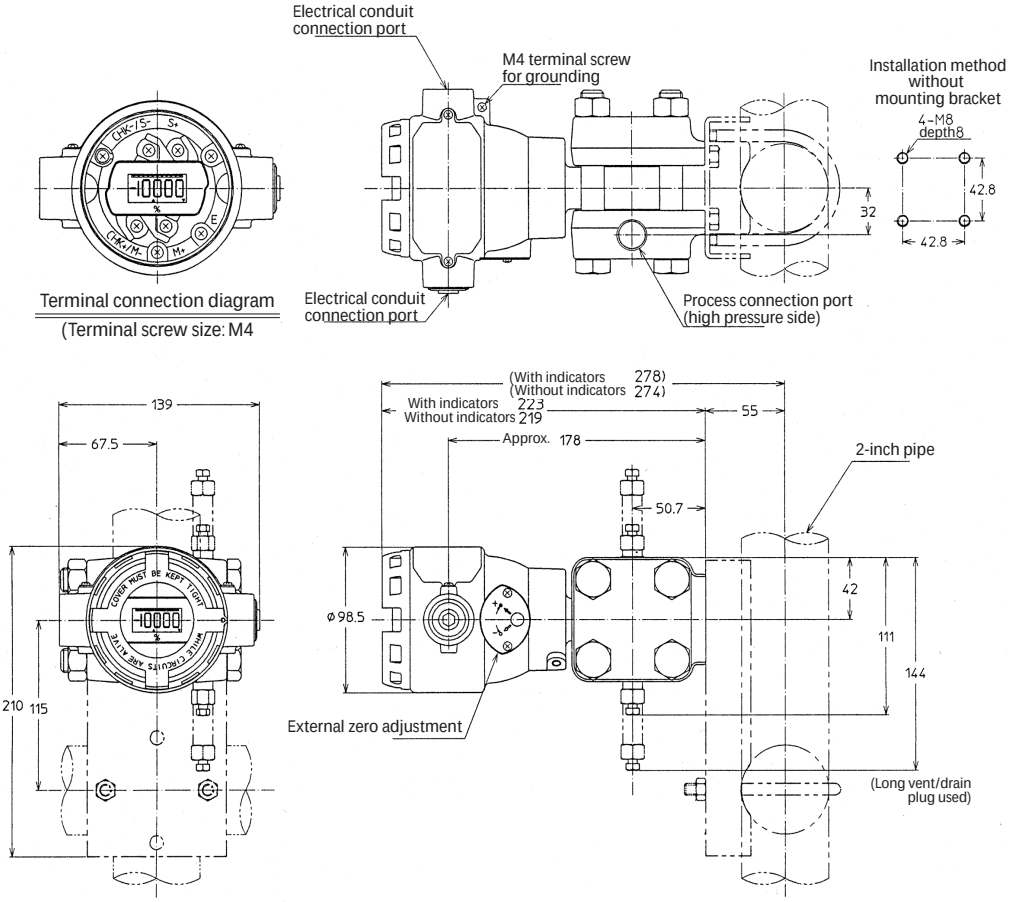
Process pipe connection: Side connection



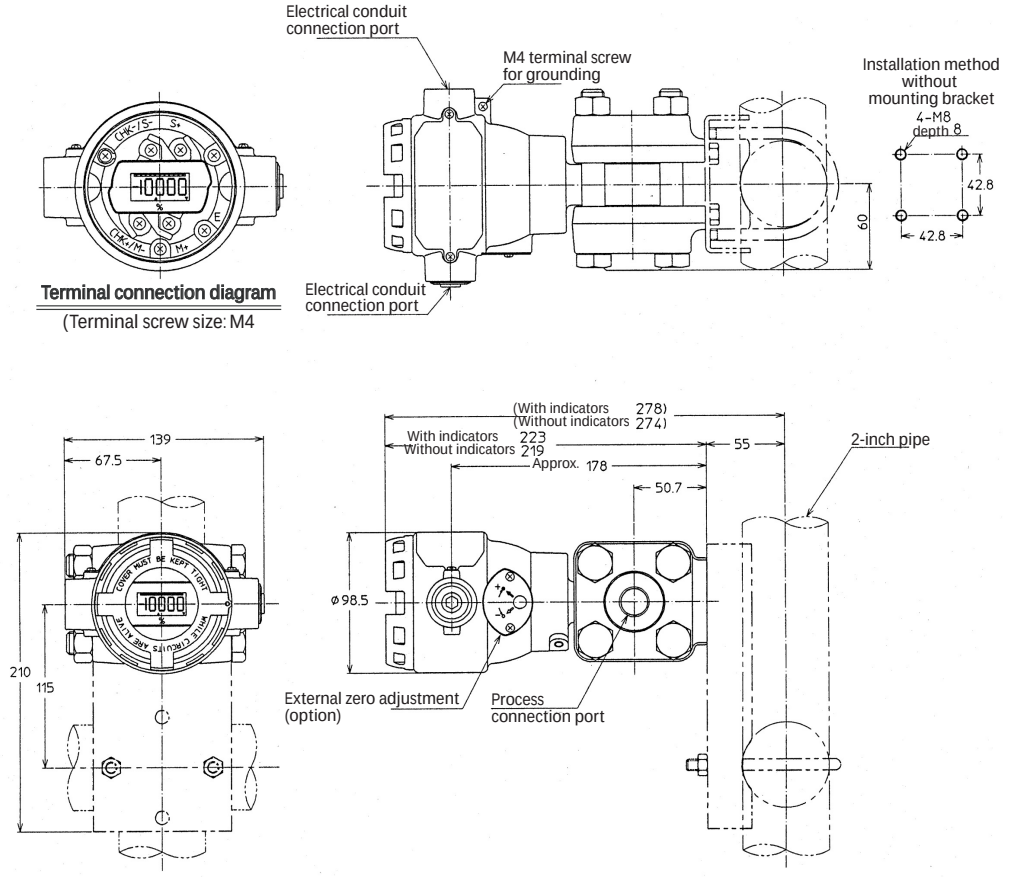
Model JTG980A

[Unit: mm]

Process pipe connection: Top or bottom connection



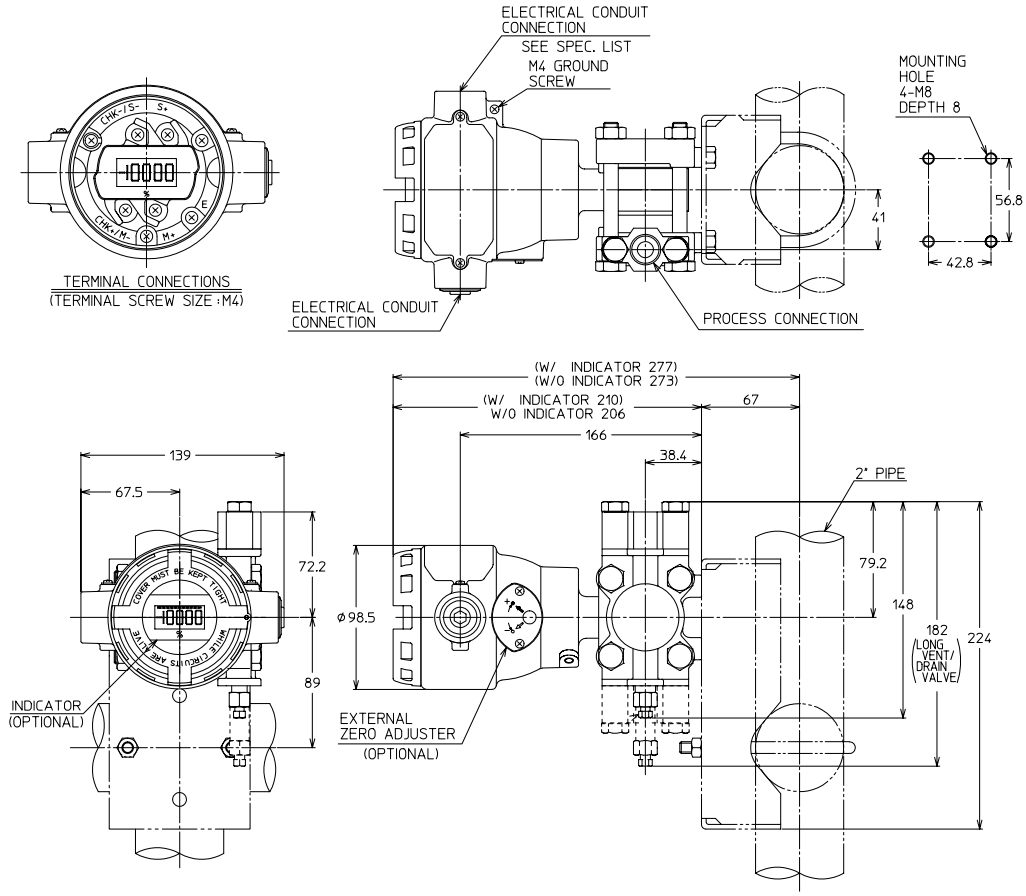
Process pipe connection: Side connection



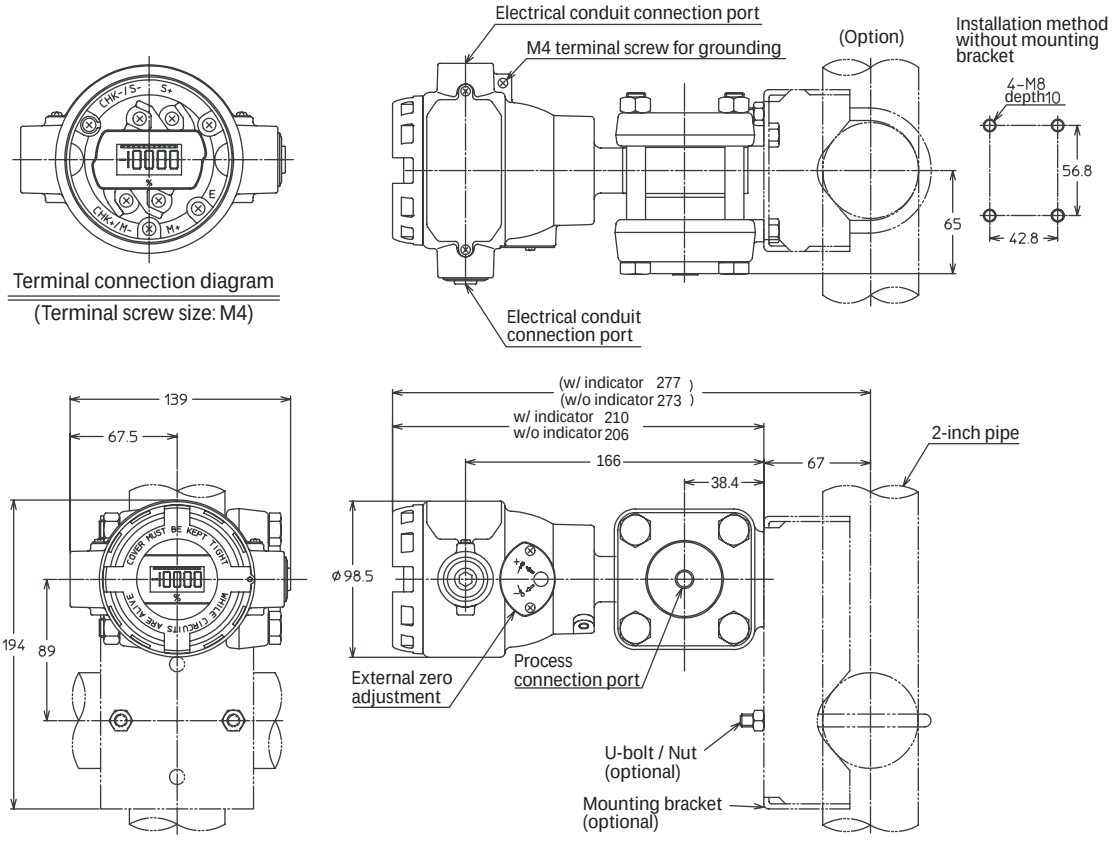
Model JTG940A / 960A (Wetted parts materials: Tantalum)

[Unit: mm]

Process pipe connection: Top or bottom connection



Process pipe connection: Side connection



Note

Note

Note

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