

The YTA310 and YTA320 are the highly accurate temperature transmitters that accept Thermocouple, RTD, ohms or DC millivolts inputs and converts it to a 4 to 20 mA DC signal for transmission. The YTA310 is a single sensor input model, and the YTA320 is a dual input model. Both models support either BRAIN or HART® 275 communication protocol, and YTA320 also supports FOUNDATION fieldbus.

For the specifications of Fieldbus communication type marked with "◇", refer to GS 1C50T2-E.



### ■ FEATURES

#### Outstanding performance, high reliability

Microprocessor-based sensing technology ensures high accuracy and reliability.

#### Variety of sensor inputs

The type of sensor input is user-selectable from thermocouples (T/C), RTDs, ohms, or DC millivolts.

#### Digital communication

BRAIN or HART® communication protocol is available. The instrument configuration can be changed by the user with using the BT200 or HART®275 communicator.

#### Self-diagnostics function

Continuous self-diagnostics capability ensures long-term performance and lower cost of ownership.

#### LCD display with bargraph

The LCD display provides both a digital readout and percent bargraph simultaneously.

#### Dual universal inputs (Model YTA320)

The YTA320 can accept two thermocouple, RTD, ohm or DC millivolt inputs. Differential or average temperature measurement is selectable. The sensor backup function for automatically switches-over from the primary to the backup upon sensor failure.

### ■ STANDARD SPECIFICATIONS

#### PERFORMANCE SPECIFICATIONS

##### Accuracy

BRAIN, HART communication type:  
A/D accuracy/span + D/A accuracy  
(See Table 1 on page 3.)  
Fieldbus communication type:  
A/D accuracy  
(See Table 1 on page 3.)

##### Cold Junction Compensation Accuracy

(For T/C only)  
± 0.5°C (± 0.9°F)

##### Ambient Temperature Effect

BRAIN, HART communication type:  
Sum of temperature coefficient of A/D conversion and D/A conversion. (See Table 2 on page 4.)  
Fieldbus communication type:  
Coefficient of A/D conversion. (See Table 2 on page 4.)

##### Vibration Effect

10 to 60 Hz 0.21 mm peak displacement  
60 to 2000 Hz 3G

##### RFI Effect

Tested per EN 50082-2, field intensity up to 10 V/m.

##### Power Supply Effect

± 0.005% of calibrated span per volt

##### Position Effect

None

### FUNCTIONAL SPECIFICATIONS

#### Input

YTA310: single input, YTA320: dual input  
Input type is selectable: Thermocouples, 2-, 3-, and 4-wire RTDs, ohms and DC millivolts. See table 1. on page 2.

#### Span & Range Limits

See Table 1. on page 3.

#### Input signal source resistance (for T/C, mV)

1 kΩ or lower

#### Input lead wire resistance (for RTD, ohm)

10 Ω per wire or lower

#### Output "◇"

Two wire 4 to 20 mA DC.  
Signal range: 3.68 to 20.8 mA  
BRAIN or HART® protocol is superimposed on the 4 to 20 mA signal.  
Any single value among followings can be selected as the analog output signal.  
Sensor 1, Terminal Temperature.

For YTA320, same as above plus;  
 Sensor 2, Average, and Differential Temperature.  
 Also, up to three of the above values can be displayed on LCD display or read via communication.

**Isolation**

Input/Output/GND isolated to 500V AC

**Manual Output Function**

The output value can be set manually.

**Sensor Burnout (Output signal code D & E)**

High (21.6 mA DC) or low (3.6 mA DC), user-selectable.

**Output in Transmitter Failure (Output signal code D & E)**

High (21.6 mA DC or more) or Low (3.2 mA DC or less)

**Update Time (Output signal code D & E)**

Approximately 0.5 seconds

**Turn-on Time (Output signal code D & E)**

Approximately 5 seconds

**Damping Time Constant**

Selectable from 0 to 99 seconds

**Ambient Temperature Limits**

Option Code may affect limits.  
 -40 to 85°C (-40 to 185°F)  
 -30 to 80°C (-22 to 176°F) with Integral Indicator

**Ambient Humidity Limits**

5 to 100% RH at 40°C (104°F)

**EMC Conformity** CE , N200

For EMI (Emission): EN55011, AS/NZS 2064 1/2  
 For EMS (Immunity): EN550082-2

**Self-diagnostics**

Loss of input error, ambient temperature error, EEPROM error, and CPU error.

**Sensor Back-up Function (Model YTA320)**

The YTA320 can be set to automatically switch to Sensor 2 when Sensor 1 fails, and not “bump” the output signal.

**Sensor Matching Function**

Callender-vanDusen coefficient of specific RTD can be programmed into a transmitter to improve total measurement accuracy.

**Supply & Load Requirements**

**Supply Voltage “◇”**

10.5 to 42 V DC for operation  
 16.4 to 42 V DC for digital communications, BRAIN and HART® protocols

**Load (Output signal code D & E)**

0 to 1335 Ω for operation  
 250 to 600 Ω for digital communication

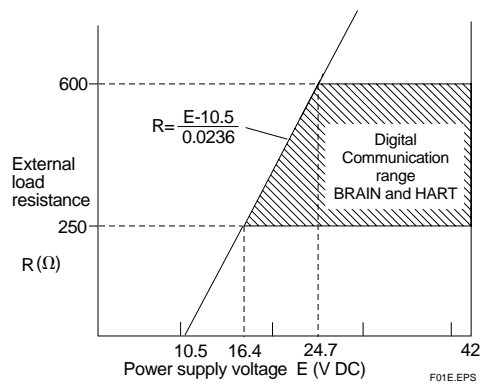


Figure 1. Relationship Between Power Supply Voltage and External Load Resistance.

**Communication Requirements “◇”**

**BRAIN**

**Communication Distance**

Up to 2 km (1.25 miles) when using CEV polyethylene-insulated PVC-sheathed cables. Communication distance varies depending on type of cable used.

**Load Capacitance**

0.22 μF or less

**Load Inductance**

3.3 mH or less

**Input Impedance of communicating device**

10 kΩ or more at 2.4 kHz.

**HART®**

**Communication Distance**

Up to 1.5 km (1 mile) when using multiple twisted pair cables. Communication distance varies depending on type of cable used.

Use the following formula to determine cable length for specific applications:

$$L = \frac{65 \times 10^6}{(R \times C)} - \frac{(C_f + 10,000)}{C}$$

Where:

L = length in meters or feet

R = resistance in Ω (including barrier resistance)

C = cable capacitance in pF/m or pF/ft

C<sub>f</sub> = maximum shunt capacitance of receiving devices in pF

**PHYSICAL SPECIFICATIONS**

**Enclosure**

**Material**

Low copper cast-aluminum alloy

**Coating**

Polyurethan resin baked finish

Color: Deep-sea moss green (Munsell 0.6GY3.1/2.0)

**Enclosure Classification**

JIS C0920 immersion proof

(equivalent to NEMA 4X and IEC IP67)

**Data and Tag Plate**

SUS304 Stainless steel

**Mounting**

Optional mounting bracket can be used either for two-inch pipe or flat panel mounting.

**Terminal Screws**

M4 screws

**Integral Indicator**

Optional LCD digital indicator includes 5-digit numerical display with °C, K, °F, °R, % and mV, 0 to 100% bargraph and dot-matrix display.

**Weight**

1.2 kg(2.6lbs.) without integral indicator and mounting bracket. Integral indicator weights 0.2 kg(0.4lbs.).

**Electrical Connections**

Refer to 'MODEL AND SUFFIX CODES.'

**Table 1. Sensor type, range, and accuracy.**

| Sensor Type | Reference Standard | Measurement Range |              | Minimum Span (Recommended) | Accuracy     |                     |                     |                     | D/A Accuracy        |
|-------------|--------------------|-------------------|--------------|----------------------------|--------------|---------------------|---------------------|---------------------|---------------------|
|             |                    | °C                | °F           |                            | Input range  |                     | A/D Accuracy        |                     |                     |
|             |                    |                   |              |                            | °C           | °F                  | °C                  | °F                  |                     |
| T/C         | IEC584             | 100 to 1820       | 212 to 3308  | 25 °C<br>(45 °F)           | 100 to 300   | 212 to 572          | ± 3.0               | ± 5.4               | ±0.02%<br>of span   |
|             |                    |                   |              |                            | 300 to 400   | 572 to 752          | ± 1.0               | ± 1.8               |                     |
|             |                    |                   |              |                            | 400 to 1820  | 752 to 3308         | ± 0.75              | ± 1.35              |                     |
|             |                    | -200 to 1000      | -328 to 1832 |                            | -200 to -50  | -328 to -58         | ± 0.35              | ± 0.63              |                     |
|             |                    |                   |              |                            | -50 to 1000  | -58 to 1832         | ± 0.16              | ± 0.29              |                     |
|             |                    | -200 to 1200      | -328 to 2192 |                            | -200 to -50  | -328 to -58         | ± 0.40              | ± 0.72              |                     |
|             |                    |                   |              |                            | -50 to 1200  | -58 to 2192         | ± 0.20              | ± 0.36              |                     |
|             | -200 to 1372       | -328 to 2502      | -200 to -50  |                            | -328 to -58  | ± 0.50              | ± 0.90              |                     |                     |
|             |                    |                   | -50 to 1372  |                            | -58 to 2502  | ± 0.25              | ± 0.45              |                     |                     |
|             | -200 to 1300       | -328 to 2372      | -200 to -50  |                            | -328 to -58  | ± 0.80              | ± 1.44              |                     |                     |
|             |                    |                   | -50 to 1300  |                            | -58 to 2372  | ± 0.35              | ± 0.63              |                     |                     |
|             | -50 to 1768        | -58 to 3214       | -50 to 0     |                            | -58 to 32    | ± 1.0               | ± 1.8               |                     |                     |
|             |                    |                   | 0 to 100     |                            | 32 to 212    | ± 0.80              | ± 1.44              |                     |                     |
|             | -50 to 1768        | -58 to 3214       | 100 to 600   |                            | 212 to 1112  | ± 0.60              | ± 1.08              |                     |                     |
| 600 to 1768 |                    |                   | 1112 to 3214 | ± 0.40                     | ± 0.72       |                     |                     |                     |                     |
| -50 to 1768 | -58 to 3214        | -50 to 0          | -58 to 32    | ± 1.0                      | ± 1.8        |                     |                     |                     |                     |
|             |                    | 0 to 100          | 32 to 212    | ± 0.80                     | ± 1.44       |                     |                     |                     |                     |
| -200 to 400 | -328 to 752        | 100 to 600        | 212 to 1112  | ± 0.60                     | ± 1.08       |                     |                     |                     |                     |
|             |                    | 600 to 1768       | 1112 to 3214 | ± 0.40                     | ± 0.72       |                     |                     |                     |                     |
| W3          | ASTM E988          | 0 to 2300         | 32 to 4172   | 0 to 400                   | 32 to 752    | ± 0.80              | ± 1.44              |                     |                     |
|             |                    |                   |              | 400 to 1400                | 752 to 2552  | ± 0.50              | ± 0.90              |                     |                     |
| W5          | ASTM E988          | 0 to 2300         | 32 to 4172   | 1400 to 2000               | 2552 to 3632 | ± 0.60              | ± 1.08              |                     |                     |
|             |                    |                   |              | 2000 to 2300               | 3632 to 4172 | ± 0.90              | ± 1.62              |                     |                     |
| L           | DIN43710           | -200 to 900       | -328 to 1652 | 0 to 400                   | 32 to 752    | ± 0.70              | ± 1.26              |                     |                     |
|             |                    |                   |              | 400 to 1400                | 752 to 2552  | ± 0.50              | ± 0.90              |                     |                     |
| U           | DIN43710           | -200 to 600       | -328 to 1112 | 1400 to 2000               | 2552 to 3632 | ± 0.70              | ± 1.26              |                     |                     |
|             |                    |                   |              | 2000 to 2300               | 3632 to 4172 | ± 0.90              | ± 1.62              |                     |                     |
| RTD         | Pt100              | -200 to 850       | -328 to 1562 | 10 °C<br>(18 °F)           | -200 to -50  | -328 to -58         | ± 0.30              | ± 0.54              |                     |
|             |                    |                   |              |                            | -50 to 900   | -58 to 1652         | ± 0.20              | ± 0.36              |                     |
|             | Pt200              | IEC751            | -200 to 850  |                            | -328 to 1562 | -200 to -50         | -328 to -58         | ± 0.50              | ± 0.90              |
|             |                    |                   |              |                            |              | -50 to 600          | -58 to 1112         | ± 0.25              | ± 0.45              |
|             | Pt500              | IEC751            | -200 to 850  |                            | -328 to 1562 | -200 to 850         | -328 to 1562        | ± 0.14<br>(± 0.10)* | ± 0.25<br>(± 0.18)* |
|             |                    |                   |              |                            |              | -200 to 850         | -328 to 1562        | ± 0.30<br>(± 0.22)* | ± 0.54<br>(± 0.40)* |
| JPT100      | JIS C1604          | -200 to 500       | -328 to 932  | -200 to 850                | -328 to 1562 | ± 0.20<br>(± 0.14)* | ± 0.36<br>(± 0.25)* |                     |                     |
|             |                    |                   |              | -200 to 500                | -328 to 932  | ± 0.16<br>(± 0.10)* | ± 0.29<br>(± 0.18)* |                     |                     |
| Cu          | SAMA RC21-4        | -70 to 150        | -94 to 302   | -70 to -40                 | -94 to -40   | ± 1.35              | ± 2.43              |                     |                     |
|             |                    |                   |              | -40 to 150                 | -40 to 302   | ± 1.0               | ± 1.8               |                     |                     |
| Ni120       | —                  | -70 to 320        | -94 to 608   | -70 to 320                 | -94 to 608   | ± 0.11<br>(± 0.08)* | ± 0.20<br>(± 0.14)* |                     |                     |
| mV          | —                  | -10 to 100 [mV]   |              | 3 [mV]                     | —            |                     | ± 12 [µV]           |                     |                     |
| ohm         | —                  | 0 to 2000 [Ω]     |              | 20 [Ω]                     | —            |                     | ± 0.35 [Ω]          |                     |                     |

Note 1: A/D accuracy marked with (\*) in the above table is an accuracy for Fieldbus communication type.

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Note 2: For BRAIN/HART communication type, Total Accuracy = (A/D Accuracy/Span + D/A Accuracy)

For T/C input, add Cold Junction Compensation Accuracy (± 0.5°C) to the total accuracy.

Example; when selecting Pt100 with measurement range of 0 to 200°C.

$$\frac{0.14^\circ\text{C}}{200^\circ\text{C}} \times 100\% \text{ of span} + 0.02\% \text{ of span} = \pm 0.09\% \text{ of span}$$

Note 3 : For differential or average measurement of YTA320, the digital accuracy is as followings ;

<When the types of the sensors are similar (for example, T/C & T/C, RTD & RTD )>

$$\text{A/D accuracy} = \text{A/D accuracy of either two input, whichever is worse} \times 1.5$$

<When the types of the sensors are dissimilar(for example, T/C & RTD )>

$$\text{A/D accuracy} = \text{Sensor 1 A/D accuracy} + \text{Sensor 2 A/D accuracy}$$

**Table 2. Temperature Coefficient.**

| Sensor Type | Input Range  |              | A/D Coefficient                    |  | D/A Coefficient                             |
|-------------|--------------|--------------|------------------------------------|--|---|
|             | °C           | °F           |                                    |  |   |
| T/C         | B            | 100 to 300   | 212 to 572                         | -(0.530 °C-0.080 % of reading)                                       |   |
|             |              | 300 to 1000  | 572 to 1832                        | -(0.350 °C-0.021 % of reading )                                      |   |
|             |              | 1000 to 1820 | 1832 to 3308                       | -(0.140 °C)  |   |
|             | E            | -200 to 1000 | -328 to 1832                       | -(0.035 °C+0.042 % of abs.reading)                                   |   |
|             |              | -200 to 0    | -328 to 32                         | -(0.039 °C+0.020 % of abs.reading)                                   |   |
|             | J            | 0 to 1200    | 32 to 2192                         | -(0.039 °C+0.0029 % of reading)                                      |   |
|             |              | -200 to 0    | -328 to 32                         | -(0.046 °C+0.020 % of abs.reading)                                   |   |
|             | K            | 0 to 1372    | 32 to 2502                         | -(0.046 °C+0.0054 % of reading)                                      |   |
|             |              | -200 to 0    | -328 to 32                         | -(0.054 °C+0.010 % of abs.reading)                                   |   |
|             | N            | 0 to 1300    | 32 to 2372                         | -(0.054 °C+0.0036 % of reading)                                      |   |
|             |              | -50 to 200   | -58 to 392                         | -(0.210 °C-0.032 % of abs.reading)                                   |   |
|             | R            | 200 to 1768  | 392 to 3214                        | -(0.150 °C)  |   |
|             |              | -50 to 200   | -58 to 392                         | -(0.210 °C-0.032 % of abs.reading)                                   |   |
|             | S            | 200 to 1768  | 392 to 3214                        | -(0.150 °C)  |   |
| -200 to 0   |              | -328 to 32   | -(0.046 °C-0.036 % of abs.reading) |  |   |
| T           | 0 to 400     | 32 to 752    | -(0.046 °C)                        |  |   |
|             | 0 to 1400    | 32 to 2552   | -(0.100 °C+0.0040 % of reading)    |  |   |
| W3          | 1400 to 2300 | 2552 to 4172 | -(0.130 °C+0.020 % of reading)     |  |   |
| W5          | 0 to 1400    | 32 to 2552   | -(0.100 °C+0.0040 % of reading)    |  |   |
|             | 1400 to 2300 | 2552 to 4172 | -(0.120 °C+0.020 % of reading)     |  |   |
| L           | -200 to 0    | -328 to 32   | -(0.039 °C+0.020 % of abs.reading) |  |   |
|             | 0 to 900     | 32 to 1652   | -(0.039 °C+0.0029 % of reading)    |  |   |
| U           | -200 to 0    | -328 to 32   | -(0.046 °C+0.036 % of abs.reading) |  |   |
|             | 0 to 600     | 32 to 1112   | -(0.046 °C)                        |  |   |
| RTD         | Pt100        | -200 to 850  | -328 to 1562                       | -(0.047 °C+0.009 % of reading)<br>[- (0.015 °C+0.005 % of reading)]* |   |
|             | Pt200        | -200 to 850  | -328 to 1562                       | -(0.065 °C+0.012 % of reading)<br>[- (0.023 °C+0.005 % of reading)]* |   |
|             | Pt500        | -200 to 850  | -328 to 1562                       | -(0.047 °C+0.009 % of reading)<br>[- (0.015 °C+0.005 % of reading)]* |   |
|             | JPt100       | -200 to 500  | -328 to 932                        | -(0.047 °C+0.009 % of reading)<br>[- (0.015 °C+0.005 % of reading)]* |   |
|             | Cu           | -70 to 150   | -94 to 302                         | -(0.320 °C+0.120 % of reading)                                       |   |
|             | Ni120        | -70 to 320   | -94 to 608                         | -(0.016 °C+0.007 % of reading)<br>[- (0.010 °C+0.005 % of reading)]* |   |
| mV          | ---          |              | -(0.001mV+0.0043 % of abs.reading) |  | - {0.0088% of span+0.007% of (reading-LRV)} |
| ohm         | ---          |              | -(0.040 Ω+0.0088 % of reading)     |  |   |

Note 1: A/D Coefficient marked with [ ]\* in the above table is an coefficient for Fieldbus communication type.

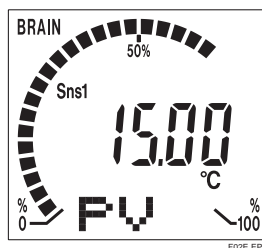
Note 2; For BRAIN/HART communication type;

Temperature Effect = A/D coefficient + D/A coefficient (The data in the table is the coefficient per 10 °C change.)

Example 1; Pt100Ω, 0 to 200 °C calibration range, 50 °C reading  
 $(0.047 \text{ °C} + 50 \text{ °C} \times 0.009\%) + [200 \text{ °C} \times 0.0088\% + (50 - 0) \times 0.007\%]$   
 $= (0.047 \text{ °C} + 0.0045 \text{ °C}) + (0.0176 \text{ °C} + 0.0035 \text{ °C})$   
 $= -0.0726 \text{ °C [ per } 10 \text{ °C change ]}$

Example 2; T T/C, -100 to 100 °C calibration range, -50 °C reading  
 $(0.046 \text{ °C} + | -50 \text{ °C} | \times 0.036\%) + [200 \text{ °C} \times 0.0088\% + [ -50 - (-100) ] \times 0.007\%]$   
 $= (0.046 \text{ °C} + 0.018 \text{ °C}) + (0.0176 \text{ °C} + 0.0035 \text{ °C})$   
 $= -0.0851 \text{ °C [ per } 10 \text{ °C change ]}$

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**Figure 2. Integral Indicator Display Example.**

**MODEL AND SUFFIX CODES**

| Model                 | Suffix Codes               | Descriptions  |
|-----------------------|----------------------------|---|
| YTA310                | .....                      | Temperature Transmitter   |
| YTA320                | .....                      | Temperature Transmitter with Dual Sensor Input                                |
| Output Signal         | -D .....                   | 4 to 20mA DC with digital communication (BRAIN protocol)                      |
|                       | -E .....                   | 4 to 20mA DC with digital communication (HART protocol, refer to GS 1C50T1-E) |
|                       | -F .....                   | Digital communication (FOUNDATION Fieldbus protocol, refer to GS 1C50T2-E)*1  |
| —                     | A .....                    | Always A  |
| Electrical Connection | 0 .....                    | G1/2 female   |
|                       | 2 .....                    | 1/2 NPT female  |
|                       | 3 .....                    | Pg 13.5 female  |
|                       | 4 .....                    | M20 female  |
| Integral Indicator    | D .....                    | with digital indicator  |
|                       | N .....                    | None  |
| Mounting Bracket      | B ....                     | SUS304 Stainless steel 2-inch pipe mounting *2                                |
|                       | N ....                     | None  |
| Optional Codes        | /□ Optional Specifications |   |

\*1: Applicable only for YTA320.

\*2: For flat-panel mounting, please prepare bolts and nuts.

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**OPTIONAL SPECIFICATIONS**

| Item   | Descriptions  | Code                 |   |    |
|--|---|----------------------|---|----|
| Lightning protector                              | Power supply voltage: 10.5 to 32 V DC (9 to 32 V DC for Fieldbus communication type.)<br>Allowable current: Max. 6000A(1×40μs), repeating 1000A(1×40μs) 100 times | A                    |   |    |
| Painting   | Coating change  | Epoxy resin coating  | X1  |    |
|  | Color change  | Amplifier cover only | Munsell renotation code: NI1.5 Black            | P1 |
|  |   |                      | Munsell renotation code: 7.5BG4/1.5, Jade green | P2 |
|  |   | Metallic silver      | P7  |    |
| Calibration Unit                                 | Degree F/Degree R unit  | D2                   |   |    |
| Output signal low-side in Transmitter failure *1 | Output signal low-side: -5 %, 3.2 mA DC or less.<br>Sensor burnout is also set to 'LOW': -2.5 %, 3.6 mA DC  | C1                   |   |    |
| Sensor matching function*2                       | RTD Sensor matching function  | CM1                  |   |    |
| Stainless steel housing *3                       | Housing Material: SCS14A stainless steel (equivalent to SUS316 cast stainless steel and ASTM CF-8M)   | E1                   |   |    |

\*1: Not applicable for output signal code F.

\*2: Not necessary to specify when ordering output signal code F, as this function is already included.

\*3: Available with optional code A, D2, C1, and CM1.

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**OPTIONAL SPECIFICATIONS (For Explosion Protected Types)**

| Item                                     | Descriptions  | Code  |
|--|---|-------|
| CENELEC (KEMA)                           | <p>CENELEC (KEMA) Intrinsically safe, Type N and Flameproof approval combination*5<br/>                     [Intrinsically safe approval]<br/>                     EEx ia IIC, T4, T5 Ambient Temperature : -40 to 70°C for T4, -40 to 50°C for T5<br/>                     Supply/Output circuit : Ui=30V, Ii=165mA, Pi=0.9W, Ci=20nF, Li=660μH<br/>                     Input circuit : Uo=8.6V, Io=30mA, Po=0.07W, Co=3μF, Lo=20mH<br/>                     Electrical Connection : 1/2 NPT female, Pg13.5 female and M20 female*1.</p> <p>[Type N approval (IEC) ]<br/>                     Ex nC IIC, T4/T5 Ambient Temperature : -40 to 70°C for T4, -40 to 50°C for T5<br/>                     Supply/output circuit : Ui=30V, Ii=150mA<br/>                     Input circuit : Uo=8.6V, Io=30mA, Po=70mW<br/>                     Electrical connection : 1/2 NPT female, Pg13.5 female and M20 female*1.</p> <p>[Flameproof approval]<br/>                     EEx d IIC T6, Ambient Temperature : -40 to 75°C<br/>                     Electrical Connection : 1/2 NPT female, Pg13.5 female and M20 female*1.</p>  | KU1   |
| Canadian Standards Association (CSA)     | <p>CSA Intrinsically safe, non-incendive and Explosionproof approval combination*5<br/>                     [Intrinsically safe/non-incendive approval]<br/>                     Intrinsically safe for Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III, Division 1:<br/>                     Non-incendive for Class I, Division 2, Groups A, B, C and D; Class II, Division 2, Groups E, F and G; Class III, Division 1:<br/>                     Enclosure Type 4X, Temperature Class : T4, Ambient Temperature : -40 to 60°C,<br/>                     Supply : Vmax=30V, Imax=165mA, Pmax=0.9W, Ci=18nF, Li=730μH<br/>                     Sensor input : Voc=9V, Isc=40mA, Po=0.09W, Ca=1μF, La=10mH<br/>                     Electrical Connection : 1/2 NPT female*2</p> <p>[Explosionproof approval]<br/>                     Explosionproof Class I, Div.1, Groups B, C and D, Class II, Groups E, F and G, Class III. For Class I, Div.2 Locations FACTORY SEALED, CONDUIT SEAL NOT REQUIRED<br/>                     Enclosure Type 4X Temperature Class : T4 Ambient Temperature : -40 to 60°C<br/>                     Electrical Connection : 1/2 NPT female*2</p> | CU1   |
| Factory Mutual (FM)                      | <p>FM Explosionproof approval<br/>                     Explosionproof Class I, Division 1, Groups A, B, C and D:<br/>                     Dust-ignitionproof for Class II/III, Division 1, Groups E, F and G.<br/>                     FACTORY SEALED, CONDUIT SEAL NOT REQUIRED. Enclosure Rating: NEMA 4X<br/>                     Temperature Class : T6 Ambient Temperature : -40 to 60°C (-40 to 140°F)<br/>                     Electrical Connection : 1/2 NPT female*2</p>  | FF1   |
|  | <p>FM Intrinsically safe, non-intrinsically and Explosionproof approval combination*5<br/>                     [Intrinsically safe/non-incendive approval]<br/>                     Intrinsically safe for Class I, II, III Division 1 Groups A, B, C, D, E, F and G.<br/>                     Non-incendive for Class I, II, Division 2 Groups A, B, C, D, E, F and G Class III, Division 1.<br/>                     Enclosure Type : 4X Temperature Class : T4 Ambient Temperature : -40 to 60°C (-40 to 140°F)<br/>                     Supply : Vmax=30V, Imax=165mA, Pmax=0.9W, Ci=18nF, Li=730μH<br/>                     Sensor : Voc=9V, Isc=40mA, Po=90mW, Ca=1μF, La=10mH</p> <p>[Explosionproof approval]<br/>                     Class I, Division 1, Groups A, B, C and D;<br/>                     Dust-ignitionproof for Class II/III, Division 1, Groups E, F and G.<br/>                     "FACTORY SEALED, CONDUIT SEAL NOT REQUIRED." Enclosure Ratings : NEMA4X<br/>                     Temperature Class : T6 Ambient Temperature : -40 to 60°C (-40 to 140°F)<br/>                     Electrical Connection : 1/2NPT female*2</p>   | FU1   |
| Standards Association of Australia (SAA) | <p>SAA Intrinsically safe, non-sparking and Flameproof approval combination*5<br/>                     Ex ia IIC T4 (Tamb=70°C) IP66/67, Ex n IIC T4(Tamb=70°C), IP66/67<br/>                     Input parameters : Ui=30V, Ii=165mA, Pi=0.9W<br/>                     Output parameters : Uo=8.6V, Io=30mA, Po=62mW, Co=1μF<br/>                     Ex d IIC T6 (Tamb=75°C) IP66/67<br/>                     Electrical connection : 1/2 NPT female, Pg13.5 female and M20 female*1.</p>   | SU1   |
| Japanese Industrial Standards (JIS)      | <p>JIS Flameproof approval<br/>                     Ex ds IIC T6 X *3<br/>                     Amb. Temp. : -20 to 60°C</p>   | JF3   |
| Attached flameproof packing adapter*4    | Electrical connection : G1/2 female<br>Applicable cable : O.D. 8 to 12 mm   | 1 pc. |
|  |   | 2 pc. |

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\*1 : Applicable for Electrical Connection Code 2, 3 and 4.

\*2 : Applicable for Electrical Connection Code 2.

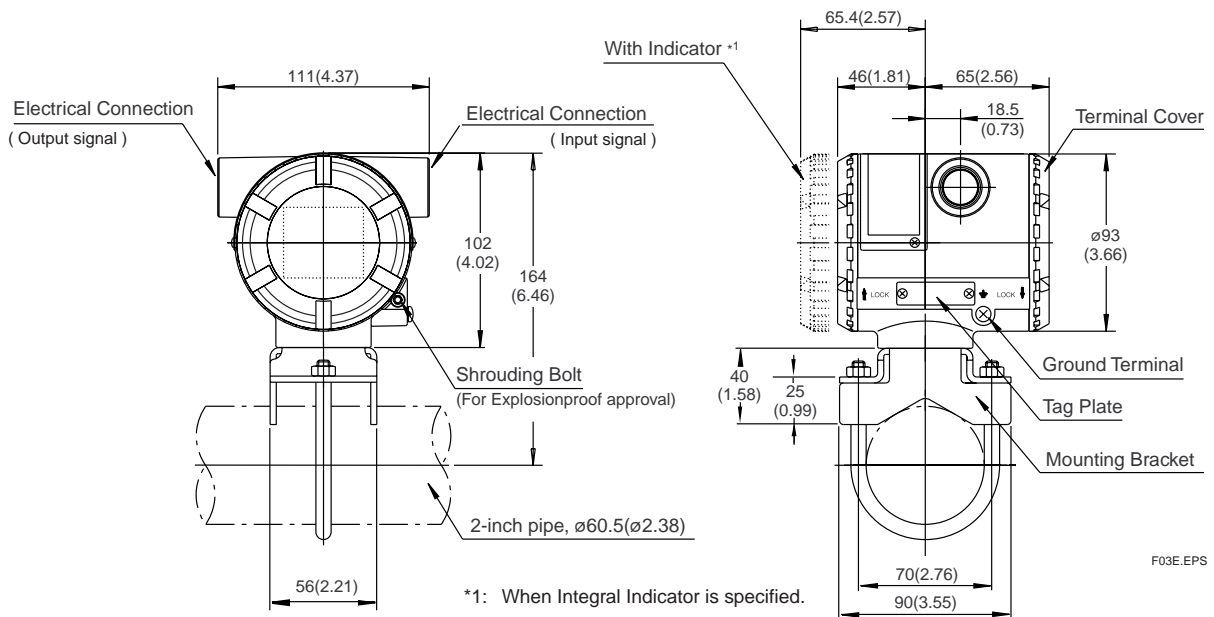
\*3 : In case the ambient temperature exceeds 50°C, use heat resistant cables with maximum allowable temperature of 70°C or above.

\*4 : If cable wiring is to be used to a JIS flameproof type transmitter, do not fail to add the YOKOGAWA-assured flameproof packing adapter.

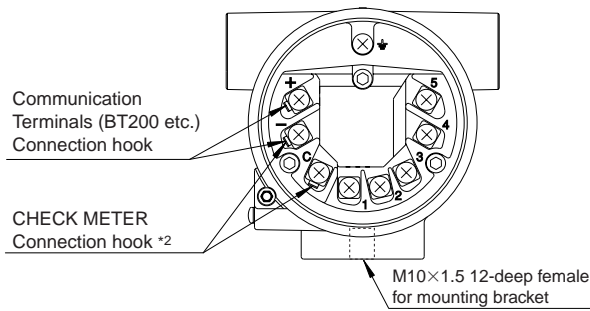
\*5 : Not applicable for Fieldbus communication type(output signal code F).

## DIMENSIONS

Unit: mm (Approx. inch)



## Terminals



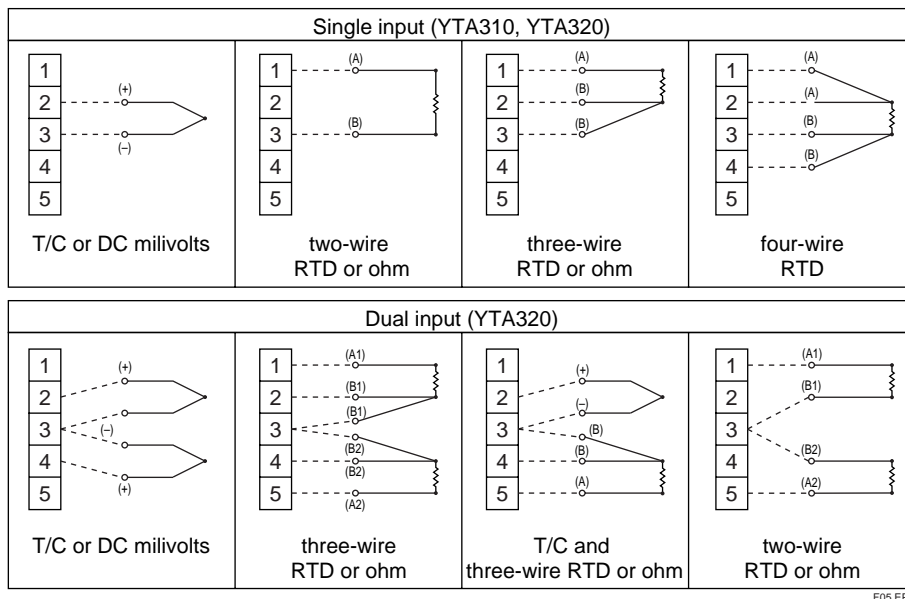
### Terminal Configuration

|   |  |
|---|--|
| + | Power Supply and output terminal         |
| - |  |
| C | External Indicator (ammeter) terminal *2 |
| ⏏ | Ground terminal                          |

\*2: When using an external indicator or check meter, the internal resistance must be 10Ω or less. This hook is not available for Fieldbus communication type(output signal code F).

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## Input Wiring



**< Ordering Information > “◇”**

Specify the following when ordering. For output signal code F, refer to GS 1C50T2-E.

Model, suffix codes, and optional codes

The instrument is shipped with the settings shown in Table A. Specify the followings when necessary.

1. Sensor type.  
For RTD and resistance input, specify the number of wire as well. For YTA320, specify the type for two inputs.\*1  
(Example; Pt200 3-wire system)
2. Calibration range and unit
  - 1) Calibration range can be specified within the measurement range shown in Table 1. on page 3.
  - 2) Specify one range from °C, K, °F or °R for temperature input. °F and °R are available when Optional code D2 is specified. It is not necessary to specify the unit of mV and ohm input, for these units automatically will be mV or Ω.
3. Tag Number

\*1 For YTA320 when 4-wire RTD is specified as Sensor1, Sensor2 cannot be used.

**Table A. Settings upon shipment.**

|                                  |  |
|----------------------------------|--|
| Input sensor type                | Pt100 three-wire system, or as specified |
| Calibration range lower limit    | "0" or as specified                      |
| Calibration range upper limit    | "100" or as specified                    |
| Calibration unit                 | "°C" or as specified                     |
| Damping time constant            | 2 seconds                                |
| Sensor burnout *1                | High (110%, 21.6 mA DC)                  |
| Output in Transmitter failure *1 | High (110%, 21.6 mA DC or more)          |
| Integral Indicator *2            | PV (°C)                                  |
| Output type                      | Sensor 1                                 |
| Tag number                       | As specified in order                    |

\*1: Except when Optional code C1 is specified.

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\*2: When Integral indicator is specified.

**< Related Instruments >**

Power Distributor: Refer to GS 1B4T1-E, 1B4T2-E.  
BRAIN TERMINAL: Refer to GS 1C0A11-E

**< Reference >**

HART; Trademark of The HART Communication Foundation. (USA)  
FOUNDATION Fieldbus ; Trademark of The Fieldbus Foundation. (USA)

**Material Cross Reference Table**

|        |          |
|--------|----------|
| SUS304 | AISI 304 |
|--------|----------|

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