

# General Specifications

## YTA70 Temperature Transmitter



GS 01C50C03-00EN

The YTA70 is a head mount type of temperature transmitter that accepts thermocouple, RTD, ohms or DC millivolts input and converts it to a 4 to 20 mA DC signal for transmission. The YTA70 conforms to the standard DIN form B head mounting. The YTA70 supports HART® communication protocol.

HART protocol revision is selectable from HART 5 or HART 7, and HART 7 features long tag number up to 32 characters, enhanced burst mode and event notification, and command aggregation function.



### STANDARD SPECIFICATIONS

#### Accuracy

See Table 1. on page 3.

#### Cold Junction Compensation Accuracy (For T/C only)

±1°C (±1.8°F)

#### Ambient Temperature Effects

See Table 1. on page 3.

#### Power Supply Effects

±0.005% of FS per Volt

#### EMC Conformity

EN61326-1 Class A, Table 2

EN61326-2-3

#### EU RoHS Directive

Applicable standard: EN IEC 63000

#### Input Type, Span and Range

Selection from thermocouples (T/Cs), 2-, 3-, and 4-wire RTDs, ohms and DC millivolts.

See Table 1 on page 3.

#### Maximum Zero offset

±50% of selected maximum value

#### Input Resistance (for thermocouples, mV)

10 MΩ, or 3 kΩ at power-off

#### Input Lead Wire Resistance (for RTD, ohm)

5 Ω per wire or lower

(up to 50 Ω per wire is configurable with reduced measurement accuracy)

#### Sensor Burnout

High (NAMUR NE43 upscale), Low (NAMUR NE43 downscale), or value within 3.5 to 23 mA

#### Output

Two wire 4 to 20 mA DC

#### Response Time

1 to 60 seconds programmable

#### Ambient Temperature Limits

(Option code may affect limit)

-40 to 85°C (-40 to 185°F)

#### Ambient humidity limits

0% to 95% RH (non-condensation)

#### Isolation

Input/output isolated to 1500 V AC.

#### Supply & Load Requirements:

##### Voltage

8 to 35 V DC for operation

(8 to 30 V DC for Intrinsically safe type)

13.8 to 35 V DC for digital communication

##### Load Resistance

0 to  $(E-8)/0.0236$  [Ω]

where E is power supply voltage.

250 to 600 Ω for digital communication

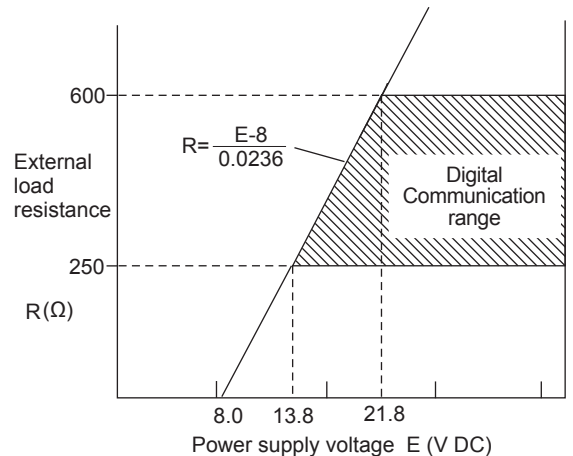


Figure 1. Relationship Between Power Supply Voltage and External Load Resistance

#### Material

Polycarbonate

#### Color of the case

Red

#### Mounting

DIN form B head mounting

#### Terminals

M3 screws

#### Weight

50 g (0.11 lb)

## MODEL AND SUFFIX CODES

Model	Suffix Codes	Descriptions														
<b>YTA70</b>	.....	Temperature Transmitter (Head Mount Type)														
Output Signal	<b>-J</b> .....	4 to 20 mA DC with digital communication (HART 5/HART 7 protocol)*1														
Optional Specifications	<b>/KS2</b> *2	<p>ATEX Intrinsicly safe approval                      Applicable standard: EN IEC 60079-0, EN 60079-11                      Certificate: KEMA 10 ATEX0027 X                      II 1 G Ex ia IIC T6...T4 Ga                      II 2 D Ex ia IIIC Db                      Amb. temp.:                      For EPL Ga:                      The relation between ambient temperature range and temperature class:</p> <table border="1"> <thead> <tr> <th rowspan="2">Temperature Class</th> <th>Pi= 0.84W</th> <th>Pi= 0.75W</th> </tr> <tr> <th>Ambient temperature range</th> <th>Ambient temperature range</th> </tr> </thead> <tbody> <tr> <td>T6</td> <td>-40°C to +47°C</td> <td>-40°C to +50°C</td> </tr> <tr> <td>T5</td> <td>-40°C to +62°C</td> <td>-40°C to +65°C</td> </tr> <tr> <td>T4</td> <td>-40°C to +85°C</td> <td>-40°C to +85°C</td> </tr> </tbody> </table> <p>For EPL Db:                      The surface temperature of the outer enclosure is + 20 K above the ambient temperature, determined without a dust layer.                      Ambient temperature range: -40 to 85°C                      Supply/output circuit: Ui=30V, Ii=120mA, Pi=0.84W or 0.75W, Ci=1nF, Li=0μH                      Sensor circuit: Uo=9.6V, Io=28mA, Po=67.2mW, Co=3.5μF, Lo=35mH</p>	Temperature Class	Pi= 0.84W	Pi= 0.75W	Ambient temperature range	Ambient temperature range	T6	-40°C to +47°C	-40°C to +50°C	T5	-40°C to +62°C	-40°C to +65°C	T4	-40°C to +85°C	-40°C to +85°C
	Temperature Class	Pi= 0.84W		Pi= 0.75W												
Ambient temperature range		Ambient temperature range														
T6	-40°C to +47°C	-40°C to +50°C														
T5	-40°C to +62°C	-40°C to +65°C														
T4	-40°C to +85°C	-40°C to +85°C														
	<b>/SS2</b> *2	<p>IECEx intrinsically safe, FM intrinsically safe/Nonincendive, and ATEX intrinsically safe approval combination (For ATEX intrinsically safe approval, see /KS2.)                      [FM Intrinsically safe/Nonincendive approval]                      Applicable standard: Class 3600, Class 3610, Class 3611, Class 3810, ANSI/ISA-60079-0, and ANSI/ISA-60079-11                      Intrinsically safe for Class I, Division 1, Groups A, B, C, and D                      Supply: Vmax=30V, Imax=120mA, Pmax=0.84W, Ci=0μF, Li=10μH                      Nonincendive for Class I, Division 2, Groups A, B, C, D                      Hazardous (Classified) indoor/outdoor (TYPE 4) Locations                      Supply: Vmax=35V, Ci=0μF, Li=10μH                      Amb. temp.: T6 Ta=60°C, T4 Ta=85°C                      [IECEx intrinsically safe approval]                      Applicable standard: IEC 60079-0, IEC 60079-11                      Certificate: IECEx KEM 10.0086X                      Ex ia IIC T6...T4 Ga                      Ex ia IIIC Db                      Amb. temp.:                      For EPL Ga:                      The relation between ambient temperature range and temperature class:</p> <table border="1"> <thead> <tr> <th rowspan="2">Temperature Class</th> <th>Pi= 0.84W</th> <th>Pi= 0.75W</th> </tr> <tr> <th>Ambient temperature range</th> <th>Ambient temperature range</th> </tr> </thead> <tbody> <tr> <td>T6</td> <td>-40°C to +47°C</td> <td>-40°C to +50°C</td> </tr> <tr> <td>T5</td> <td>-40°C to +62°C</td> <td>-40°C to +65°C</td> </tr> <tr> <td>T4</td> <td>-40°C to +85°C</td> <td>-40°C to +85°C</td> </tr> </tbody> </table> <p>For EPL Db:                      The surface temperature of the outer enclosure is + 20 K above the ambient temperature, determined without a dust layer.                      Ambient temperature range: -40 to 85°C                      Supply/output circuit: Ui=30V, Ii=120mA, Pi=0.84W or 0.75W, Ci=1nF, Li=0μH                      Sensor circuit: Uo=9.6V, Io=28mA, Po=67.2mW, Co=3.5μF, Lo=35mH</p>	Temperature Class	Pi= 0.84W	Pi= 0.75W	Ambient temperature range	Ambient temperature range	T6	-40°C to +47°C	-40°C to +50°C	T5	-40°C to +62°C	-40°C to +65°C	T4	-40°C to +85°C	-40°C to +85°C
Temperature Class	Pi= 0.84W	Pi= 0.75W														
	Ambient temperature range	Ambient temperature range														
T6	-40°C to +47°C	-40°C to +50°C														
T5	-40°C to +62°C	-40°C to +65°C														
T4	-40°C to +85°C	-40°C to +85°C														

\*1: Output signal code J is HART 5 or HART 7 selectable model. Specify HART 5 or HART 7 when ordering.

\*2: Even if the option code is the same, the explosion-proof specifications (Ex marking, Amb.temp., etc.) are different, so please check the specifications when ordering.

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

Sensor Type	Standard	Input range		Minimum Span		Accuracy (value whichever is greater)	Temp. effects/10°C (value whichever is greater)	
		°C	°F	°C	°F			
<T/Cs>								
B	IEC60584	400 to 1820	752 to 3308	200	360	±0.1% of span or ±1.0°C	±0.05% of span or ±1.0°C	
E		-100 to 1000	-148 to 1832	50	90			
J		-100 to 1200	-148 to 2192	50	90	±0.1% of span or ±0.5°C	±0.05% of span or ±0.25°C	
K		-180 to 1372	-292 to 2502	50	90			
N		-180 to 1300	-292 to 2372	100	180	±0.1% of span or ±1.0°C	±0.05% of span or ±1.0°C	
R		-50 to 1760	-58 to 3200	200	360			
S		-50 to 1760	-58 to 3200	200	360	±0.1% of span or ±0.5°C	±0.05% of span or ±0.25°C	
T		-200 to 400	-328 to 752	50	90			
L		DIN43710	-100 to 900	-148 to 1652	50	90	±0.1% of span or ±1.0°C	±0.05% of span or ±1.0°C
U			-200 to 600	-328 to 1112	75	135		
Lr	GOST 3044-84	-200 to 800	-328 to 1472	50	90	±0.1% of span or ±1.0°C	±0.05% of span or ±1.0°C	
W3	ASTM	0 to 2300	32 to 4172	200	360			
W5	E988-90	0 to 2300	32 to 4172	200	360			
<RTDs>								
Pt100	IEC60751	-200 to 850	-328 to 1562	10	18	±0.1% of span or ±0.1°C	±0.05% of span or ±0.05°C	
Ni100	DIN43760	-60 to 250	-76 to 482	10	18			
DC Voltage [mV]		-800 to 800 [mV]		2.5 [mV]		±0.1% of span or ±0.01mV	±0.05% of span or ±5µV	
Resistance [Ω]		0 to 7000 [Ω]		25 [Ω]		±0.1% of span or ±0.1Ω	±0.05% of span or ±0.05Ω	

Note: In T/C type B, the minimum range value can be set from 0°C. However, the accuracy between 0 to 400°C is not specified.

**□ Selection guide for HART 5 and HART 7**

Select HART 5 or HART 7 according to Table 2.

**Table 2. Selection guide for HART 5 and HART 7**

Specified item when ordering "HART protocol revision"	HART protocol revision	Selection guide		Note
		Requirement for HART 7 function	Other conditions	
Specify '5'	HART 5	NO	Available to switch to HART 7 protocol after delivery by user-configuration.	*
Specify '7'	HART 7	YES In this case, be sure to confirm that HART configuration tool supports HART 7 by Table 3.	Available to switch to HART 5 protocol after delivery by user-configuration.	

\*: Indicate the most typical selection for HART communication. Select this when HART 7 functionality is not required. In case of selecting HART 7 without conforming to Table 3, communication will not be available.

**□ HART protocol revision and communication**

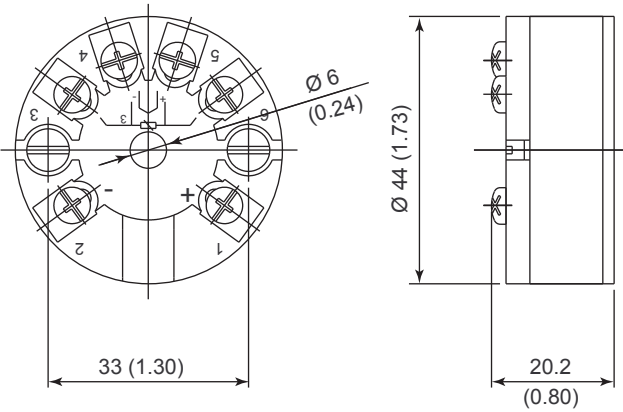
Protocol revision supported by HART configuration tool must be the same or higher than that of the device.  
HART 7 communication is supported by FieldMate R2.02 or later.

**Table 3. HART protocol revision and communication**

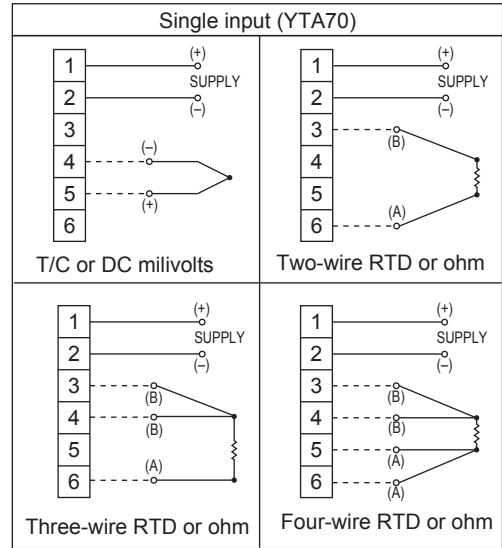
		Protocol revision supported by HART configuration tool	
		HART 5	HART 7
Protocol revision of YTA70	HART 5	Communication Available	Communication Available
	HART 7	Communication Not Available	Communication Available

**■ DIMENSIONS**

Unit : mm (approx. inch)



● Sensor Connections



F02E.ai

**< Ordering Information >**

Specify Model, suffix, and optional specification codes when ordering. If necessary, also specify the followings;

1. Sensor type. For RTD and ohm input, specify the number of wire together.
2. Calibration range and unit.
3. Sensor Burnout: High or Low
4. Response time: An integral number from 1 to 60.
5. HART protocol: When output signal code is "J", specify the HART protocol revision "5" or "7".

Model YTA70 will be shipped with the following settings from the factory if not specified upon ordering;

Sensor type: Pt100, 3-wire  
 Range: 0 to 100 °C  
 Sensor Burnout: High  
 Response time: 1 s

**< Reference >**

HART; Trademark of the HART Communication Foundation.