

User's Manual

YTA SERIES
YTA50
Temperature Transmitter

vigilantplant.™

YOKOGAWA 

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YOKOGAWA 

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SAFETY INSTRUCTIONS

Ex installation:

For a safe installation of YTA50 in hazardous area the following must be observed. The module must only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Year of manufacture can be taken from the first two digits in the serial number.

The sensor circuit is not infallibly galvanically isolated from the input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500 Vac during 1 minute.

The transmitter must be mounted in an enclosure in order to provide a degree of ingress protection of at least IP20.

In explosive atmospheres caused by air / dust mixtures:

The transmitter may only be installed in a potentially explosive atmosphere caused by the presence of combustible dust when mounted in a metal enclosure form B according to DIN 43729 that is providing a degree of ingress protection of at least IP 6X in accordance with EN 60529, that is suitable for the application and is correctly installed.

Cable entries and blanking elements shall be used that are suitable for the application and correctly installed.

For an ambient temperature $\geq 60^{\circ}\text{C}$, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

Special Conditions for Safe Use:

If the enclosure in which the transmitter is mounted is made of aluminium and installed in Zone 0, 1 or Zone 20, 21 or 22 it shall not contain by weight more than 6% in total of magnesium and titanium.

The additional enclosure of the apparatus shall be designed and/or installed in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

The YTA50 is a head mount type of temperature transmitter that accepts thermocouple or RTD input and converts it to a 4 to 20 mA DC signal for transmission. The YTA50 conforms to the standard DIN form B head mounting.

It is imperative that users observe the instructions in this manual to ensure the protection and safety of operators.

1. MODEL AND SUFFIX CODES

Model	Suffix code	Descriptions	
YTA50	Temperature Transmitter (Head Mount Type)	
Output Signal	-A	4 to 20 mA DC	
Optional Specifications	/KS2	CENELEC ATEX intrinsically safe approval	EEx ia IIC T1-6 Amb. Temperature T1-4: -40 to 85°C T5-6: -40 to 60°C
	/DS2	CENELEC ATEX/FM intrinsically safe approval combination	CENELEC: EEx ia IIC T1-6 FM: IS Class I, Div.1, Groups A, B, C & D

T01E.EPS

2. WARRANTY

The warranty period of the instrument is as of condition shown when purchasing. Any trouble arising during the warranty period shall be replaced at free of charge.

The following problems or troubles shall not be eligible of charge-exempt repair.

- Caused by improper usage or storage of the customer which exceeds the specification requirements.
- Caused by mishandling or modification.
- Caused by fire, earthquake or other acts of God that are not directly a result of problems of the instrument.

4. STANDARD SPECIFICATIONS

Accuracy

See table in the right.

Cold Junction Compensation Accuracy(For T/C only)

±1°C(±1.8°F)

Ambient Temperature Effects (per 10°C Change)

See table in the right

Type	Standard	Input ranges °C	Minimum span °C	Accuracy *1	Temperature effect *1
T/C	IEC584	400 to 1820	200	±0.1% or ±2.0°C	±0.1% or ±2.0°C
		-100 to 1000	50		
		-100 to 1200	50		
		-180 to 1372	50		
		-180 to 1300	100		
	DIN43710	-50 to 1760	200	±0.1% or ±2.0°C	±0.1% or ±2.0°C
			200		
			50		
			50		
			75		
ASTM E988-90	0 to 2300	200	±0.1% or ±2.0°C	±0.1% or ±2.0°C	
		200			
		200			
RTD	IEC751	-200 to 850	25	±0.1% or ±0.2°C	±0.1% or ±0.1°C
		-60 to 250	25		
DC Voltage [mV]		-10 to 800 mV	5 mV	±0.1% or ±0.01mV	±0.1% or ±10µV
Resistance [Ω]		0 to 5000Ω	30Ω	±0.1% or ±0.1Ω	±0.1% or ±0.1Ω

T02E.EPS

*1 : The value whichever is greater. value in % indicates the % of span.

Power Supply Effects

±0.005% of FS per Volt

RFI Effects

Tested per EN 61326, field intensity up to 10 V/m.

EMC Conformity **CE**

EN 61326

Maximum Zero Offset

±50% of the maximum temperature

3. HANDLING PRECAUTIONS

- (1) Read this manual thoroughly and carefully before handling the instruments. Observe the instructions.
- (2) Store the product in location that meets the following requirements.
 - No exposure to rain or water
 - No major mechanical vibration or shock
 - Humidity and Temperature limitations
 - Ordinary conditions(25°C, 65%) is preferable. Otherwise, as of specified in "Standard Specifications."
- (3) Avoid corrosive atmosphere for storage and installation.
- (4) For safe installation of the transmitter in hazardous area, the following must be observed. The module must only be installed by qualified personnels who are familiar with the national and international laws, directives, and standards that apply to this area.
- (5) Yokogawa will not be liable for malfunctions or damage resulting from any modification made to this instrument by the customer.

Input Signal Source Resistance (for T/C input)

10 MΩ, or 3 kΩ at power-off

Input Lead Wire Resistance (for RTD input)

5 Ω per wire or lower

Burnout

High (21.6 mA or more) or Low (3.6 mA or less)

Output

Two wire 4 to 20 mA DC

Response Time

1 to 60 sec (as specified upon shipment)

Ambient Temperature Limits (Option code may affect limit.)

-40 to 85°C (-40 to 185°F)

Ambient Humidity Limits

5 to 90% RH at 40°C (104°F)

Supply Voltage

7 to 35 V DC

7 to 30 V DC for Intrinsically safe type

Load Resistance (Limitation)

0 to (E-7)/0.023 [Ω], where E is power supply voltage.

Ex. 739 Ω max. @ 24 V DC

Isolation

Input/output isolated to 1500 V AC.

Mounting

DIN form B head mounting

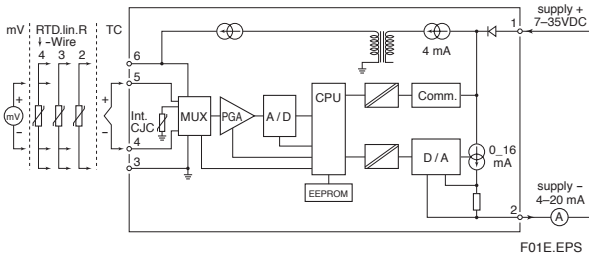
Terminals

M3 screws

Weight

50 g(0.11 lb)

5. BLOCK DIAGRAM



F01E.EPS

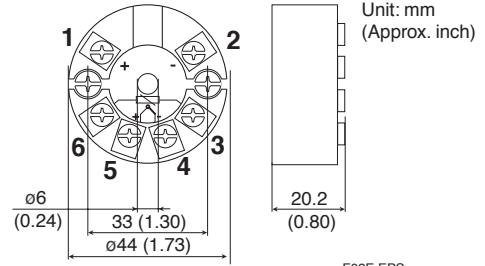
6. WIRING

See wiring diagram. For output signal, use twisted pair or cables with performance equivalent to 600V vinyl insulate cable. For wiring in high or low temperature, use a wire or cable suitable for such temperature. Use cables and wires which meet atmospheric conditions. Take necessary measure to avoid corrosion or damage of cables and wires.

Important

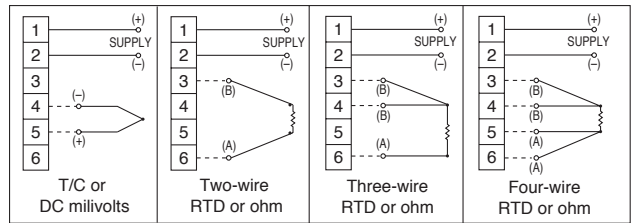
When mounting on a sensor head, do not overtighten the screws.

■ DIMENSIONS



F02E.EPS

■ WIRING DIAGRAM



F03E.EPS

7. APPROVAL OPTIONS

CENELEC ATEX Intrinsically safe model (/KS2, /DS2)

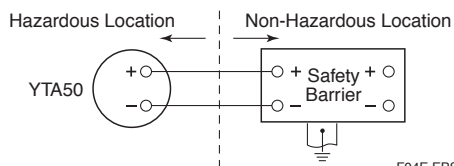
ATEX Certificate: KEMA 06 ATEX 0191 X

Applicable Standard: EN 50014, EN 50020, EN 50284

Ex II 1 GD, T80°C...T105°C

EEx ia IIC T6

[Installation diagram]



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Intrinsically safety rating(maximum value)

Output/Power supply :

$U_i=30\text{ V}$, $I_i=120\text{ mA}$, $P_i=0.84\text{ W}$, $C_i<1\text{ nF}$, $L_i<10\text{ }\mu\text{H}$

Sensor :

$U_o=9.6\text{ V}$, $I_o=25\text{ mA}$, $P_o=60\text{ mW}$, $C_o<2.4\text{ }\mu\text{F}$, $L_o<33\text{ mH}$

Applicable in Zone

0, 1, 2, 20, 21, or 22

Maximum Ambient Temperature for gas-proof

For T4: 85°C, For T5/T6: 60°C

Maximum Surface Temperature for dust-proof

For T4: T105°C (Ambient Temperature: -40 to 85°C)

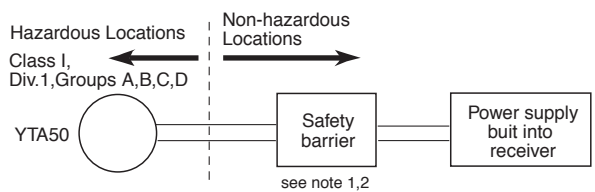
For T6: T85°C (Ambient Temperature: -40 to 60°C)

FM Intrinsically safe model (/DS2)

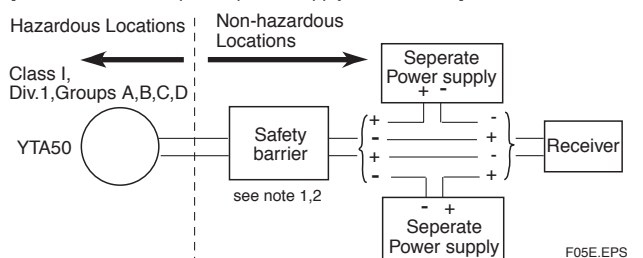
Applicable Standard: FM 3600, FM 3610, FM 3611, FM 3810

Installation diagram

[Connection with power supply built in receiver]



[Connection with separate power supply and receiver]



F05E.EPS

Output : standard 4 to 20 mA loop

Note

1. Maximum entity parameters ;

$V_{MAX}=30\text{ VDC}$, $I_{MAX}=120\text{ mA}$, $P_{MAX}=0.84\text{ W}$, $C_i=1\text{ nF}$, $L_i=10\text{ }\mu\text{H}$

2. Maximum power $P_{MAX}=0.84\text{ W}$ is limited by the resistor in the barrier.

If $V_{oc}=28\text{ V}$, the resistor shall be more than 233.3Ω.

If $V_{oc}=30\text{ V}$, the resistor shall be more than 250.0Ω.