

**YTA610 and YTA710
Temperature Transmitters
(Hardware)**

IM 01C50G01-01EN

YTA610 and YTA710

Temperature Transmitters (Hardware)

IM 01C50G01-01EN 5th Edition

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Revision Information

1. Preface

The YTA temperature transmitter is fully factory-tested according to the specifications indicated on the order.

In order for the YTA temperature transmitter to be fully functional and to operate in an efficient manner, the manual must be carefully read to become familiar with the functions, operation, and handling of the YTA.

This manual gives instructions on handling, wiring, installation, maintenance, and general specifications.

To ensure correct use, please read this manual and following user's manuals.

Document No.	Explanation
IM 01C50G01-01EN	Hardware (This manual)
IM 01C50G01-02EN*1	For NEPSI Certification (Option code: /NS2, /NS25 and /NF2)
IM 01C50G01-01P *2	For Transmissor de Temperaturas YTA610 e YTA710 (Hardware) (Option code: /UF1, /US1 and /US15)
IM 01C50G01-01K *3	YTA610 and YTA710 Temperature Transmitters (Hardware) (Option code: /PF2, /PS2 and /PS25)
IM 01C50T01-02EN	For HART protocol type
IM 01C50T02-02EN	For FOUNDATION Fieldbus communication type
IM 01C50T03-02EN	For BRAIN protocol type
GS 01C50G01-01EN	YTA710 Temperature Transmitter
GS 01C50H01-01EN	YTA610 Temperature Transmitter



WARNING

When using the transmitter in a Safety Instrumented System (SIS) application, refer to Appendix 1 in either IM 01C50T01-02EN for the HART protocol.

The instructions and procedures in this section must be strictly followed in order to maintain the transmitter for this safety level.

These manuals can be downloaded from the website of Yokogawa or purchased from the Yokogawa representatives.

Website address: <http://www.yokogawa.com/fld/>

- *1: It is a manual when there is /NS2, /NS25 and /NF2 in the additional specifications.
- *2: It is a manual when there is /UF1, /US1 and /US15 in the additional specifications. This IM 01C50G01-01P is only in Portuguese.
- *3: It is a manual when there is /PF2, /PS2 and /PS25 in the additional specifications. This IM 01C50G01-01K is only in Korean.

■ Notes on the User's Manual

- This manual should be delivered to the end user.
- This manual and the identification tag attached on packing box are essential parts of the product; keep them in a safe place for future reference.
- The information contained in this manual is subject to change without prior notice.
- The information contained in this manual, in whole or part, shall not be transcribed or copied without notice.
- In no case does this manual guarantee the merchant ability of the transmitter or its adaptability to a specific client need.
- Should any doubt or error be found in this manual, submit inquiries to your local dealer.
- No special specifications are contained in this manual. When products whose suffix code or optional codes contain code "Z" and an exclusive document is attached, please read it along with this manual.
- Changes to specifications, structure, and components used may not lead to the revision of this manual unless such changes affect the function and performance of the transmitter.

■ Notes on Safety and Modifications

- This product is designed to be used by a person with specialized knowledge.
- Before handling the YTA, it is absolutely imperative that users of this equipment read and observe the safety instructions mentioned in each section of the manual in order to ensure the protection and safety of operators, the YTA itself and the system containing the transmitter. We are not liable for any accidents arising out of handling that does not adhere to the guidelines established in the safety instructions.
- No maintenance should be performed on explosionproof type temperature transmitters while the equipment is energized. If maintenance is required with the cover open, always first use a gas detector to check that no explosive gases are present.
- If the user attempts to repair or modify an explosionproof type transmitter and is unable to restore it to its original condition, damage to the explosionproof features result, leading to dangerous conditions. Contact your authorized Yokogawa Electric Corporation representative for repairs or modifications of an explosionproof type transmitter.

■ For Safe Use of Product

Please give your attention to the followings.

(a) Installation

- The instrument must be installed by an expert engineer or a skilled personnel. The procedures described about INSTALLATION are not permitted for operators.
- In case of high process temperature, care should be taken not to burn yourself because the surface of the case reaches a high temperature.
- All installation shall comply with local installation requirement and local electrical code.

(b) Wiring

- The instrument must be installed by an expert engineer or a skilled personnel. The procedures described about WIRING are not permitted for operators.
- Please confirm that voltages between the power supply and the instrument before connecting the power cables and that the cables are not powered before connecting.

(c) Maintenance

- Please do not carry out except being written to a maintenance descriptions. When these procedures are needed, please contact nearest YOKOGAWA office.
- Care should be taken to prevent the build up of drift, dust or other material on the display glass and name plate. In case of its maintenance, soft and dry cloth is used.

(d) Modification

Yokogawa will not be liable for malfunctions or damage resulting from any modification made to this instrument by the customer.

(e) Product Disposal

The instrument should be disposed of in accordance with local and national legislation/regulations.

(f) Authorized Representative in EEA

In relation to the CE Marking, The authorized representative for this product in the EEA (European Economic Area) is:
Yokogawa Europe B.V.
Euroweg 2, 3825 HD Amersfoort, The Netherlands

(g) **Morocco conformity mark** 

This conformity mark indicates that the product complies with Moroccan safety and EMC requirements.

● **Symbols used in this manual**

The YTA temperature transmitter and this manual use the following safety related symbols and signals.

 **WARNING**

Contains precautions to protect against the chance of explosion or electric shock which, if not observed, could lead to death or serious injury.

 **CAUTION**

Contains precautions to protect against danger, which, if not observed, could lead to personal injury or damage to the instrument.

 **IMPORTANT**

Contains precautions to be observed to protect against adverse conditions that may lead to damage to the instrument or a system failure.

 **NOTE**

Contains precautions to be observed with regard to understanding operation and functions.

Some of the diagrams in this manual are partially omitted, described in writing, or simplified for ease of explanation. The screen drawings contained in the instruction manual may have a display position or characters (upper/lower case) that differ slightly from the full-scale screen to an extent that does not hinder the understanding of functions or monitoring of operation.

■ **Warranty**

- The warranty period of the instrument is written on the estimate sheet that is included with your purchase. Any trouble arising during the warranty period shall be repaired free of charge.
- Inquiries with regard to problems with the instrument shall be accepted by the sales outlet or our local dealer representative.
- Should the instrument be found to be defective, inform us of the model name and the serial number of the instrument together with a detailed description of nonconformance and a progress report. Outline drawings or related data will also be helpful for repair.
- Whether or not the defective instrument is repaired free of charge depends on the result of our inspection.

● **Conditions not eligible for charge-exempt repair.**

- Problems caused by improper or insufficient maintenance on the part of the customer.
- Trouble or damage caused by mishandling, misuse, or storage that exceeds the design or specification requirements.
- Problems caused by improper installation location or by maintenance conducted in a non-conforming location.
- Trouble or damage was caused by modification or repair that was handled by a party or parties other than our consigned agent.
- Trouble or damage was caused by inappropriate relocation following delivery.
- Trouble or damage was caused by fire, earthquake, wind or flood damage, lightning strikes or other acts of God that are not directly a result of problems with this instrument.

■ **Trademarks**

- HART is a trademark of the FieldComm Group.
- Registered trademarks or trademarks appearing in this manual are not designated by a TM or ® symbol.
- Other company names and product names used in this manual are the registered trademarks or trademarks of their respective owners.

■ Control of Pollution Caused by the Product

This is an explanation for the product based on “Control of Pollution caused by Electronic Information Products” in the People’s Republic of China.

電子情報製品汚染制御管理弁法（中国版RoHS）

产品中有害物质或元素的名称及含量

型号	部件名称	有害物质					
		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
YTA610 and YTA710 温度变送器	壳体	×	○	○	○	○	○
	基板组件	×	○	○	○	○	○
	电源连接线	×	○	○	○	○	○

○：表示该部件的所有均质材料中的有害物质的含量均在 GB/T26572 标准中所规定的限量以下。
 ×：表示至少该部件的某些均质材料中的有害物质的含量均在 GB/T26572 标准中所规定的限量以上。



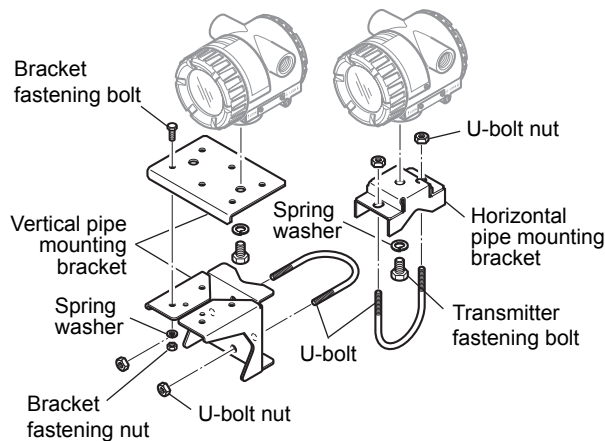
环保使用期限：

该标识适用于 SJ /T11364 中所述，在中华人民共和国销售的电子电气产品的环保使用期限。

注）该年数为“环保使用期限”，并非产品的质量保证期。

2. Notes on Handling

The YTA temperature transmitter is fully factorytested upon shipment. When the YTA is delivered, check the appearance for damage, and also check that the transmitter mounting parts shown in Figure 2.1 are included with your shipment. If “No Mounting Bracket” is indicated, no transmitter mounting bracket is included.

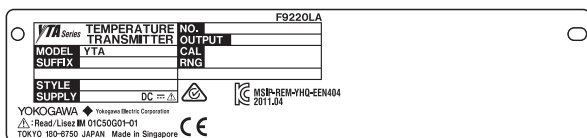


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Figure 2.1 Transmitter mounting parts

2.1 Nameplate

The model name and configuration are indicated on the nameplate. Verify that the configuration indicated in the “Model and Suffix Code” in Chapter 7 is in compliance with the specifications written on the order sheet.



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Figure 2.2 Name plate

2.2 Transport

To prevent damage while in transit, leave the transmitter in the original shipping container until it reaches the installation site.

2.3 Storage

When an extended storage period is expected, observe the following precautions:

1. If at all possible, store the transmitter in factoryshipped condition, that is, in the original shipping container.
2. Choose a storage location that satisfies the following requirements.
 - A location that is not exposed to rain or water.
 - A location subject to a minimum of vibration or impact.
 - The following temperature and humidity range is recommended. Ordinary temperature and humidity (25°C, 65%) are preferable.

Temperature:

No Integral indicator –40 to 85°C

With Integral indicator –30 to 80°C

Humidity: 0 to 100% RH (at 40°C)

3. The performance of the transmitter may be impaired if stored in an area exposed to direct rain and water. To avoid damage to the transmitter, install it immediately after removal from shipping container. Follow wiring instructions in Chapter 5.

2.4 Choosing the Installation Location

Although the temperature transmitter is designed to operate in a vigorous environment, to maintain stability and accuracy, the following is recommended:

(1) Ambient Temperature

It is preferable to not to expose the instrument to extreme temperatures or temperature fluctuations. If the instrument is exposed to radiation heat a thermal protection system and appropriate ventilation is recommended.

(2) Environmental Requirements

Do not allow the instrument to be installed in a location that is exposed to corrosive atmospheric conditions. When using the instrument in a corrosive environment, ensure the location is well ventilated.

The unit and its wiring should be protected from exposure to rainwater.

(3) Impact and Vibration

It is recommended that the instrument be installed in a location that is subject to a minimum amount of impact and vibration.

2.5 Use of a Transceiver



IMPORTANT

Although the temperature transmitter is designed to resist influence from high frequency noise; use of a transceiver in the vicinity of installation may cause problems. Installing the transmitter in an area free from high frequency noise (RFI) is recommended.

2.6 Insulation Resistance Test and Withstand Voltage Test



CAUTION

- (1) Overvoltage of the test voltage that is so small that it does not cause an dielectric breakdown may in fact deteriorate insulation and lower the safety performance; to prevent this it is recommended that the amount of testing be kept to a minimum.
- (2) The voltage for the insulation resistance test must be 500 V DC or lower, and the voltage for the withstand voltage test must be 500 V AC or lower. Failure to heed these guidelines may cause faulty operation.
- (3) For with a lightning protector (option code:/A), please remove the lightning protector from terminal at the test. In case of testing with the lightning protector, the voltage for the insulation resistance test must be 100V DC or lower, and the voltage for the withstand voltage test must be 100V AC or lower. Failure to heed these guidelines may cause faulty operation.

Follow the steps below to perform the test, the wiring of the transmission line must be removed before initiating testing.

2.6.1 Insulation resistance test procedure

■ Testing between the output terminal and input terminal

1. Lay transition wiring between the + terminal, the – terminal, and the check terminal of the terminal box.
2. Lay wiring across terminals 1, 2, 3, 4, and 5 of the terminal box.
3. Connect the insulation resistance meter (with the power turned OFF) between the transition wiring of Steps 1 and 2 above. The polarity of the input terminals must be positive and that of the output terminals must be negative.
4. Turn the power of the insulation resistance meter ON and measure the insulation resistance. The duration of the applied voltage must be the period during which 100MΩ or more is confirmed (or 20MΩ if the unit is equipped with a lightning protector).
5. Upon completion of the test, remove the insulation resistance meter, connect a 100KΩ resistor between the transition wiring, and allow the electricity to discharge. Do not touch the terminal with your bare hands while the electricity is discharging for more than 1 second.

■ Testing between the output terminal and grounding terminal

1. Lay transition wiring between the + terminal, the - terminal, and the check terminal of the terminal box, then connect an insulation resistance meter (with the power turned OFF) between the transition wiring and the grounding terminal. The polarity of the transition wiring must be positive and that of the grounding terminal must be negative.
2. Turn the power of the insulation resistance meter ON and measure the insulation resistance. The duration of the applied voltage must be the period during which 100MΩ or more is confirmed (or 20MΩ if the unit is equipped with a lightning protector).
3. Upon completion of the test, remove the insulation resistance meter, connect a 100KΩ resistor between the transition wiring and the grounding terminal, and allow the electricity to discharge. Do not touch the terminal with your bare hands while the electricity is discharging for more than 1 second.

■ Testing between the input terminal and grounding terminal

1. Lay transition wiring between terminals 1, 2, 3, 4 and 5 of the terminal box, and connect the insulation resistor (with the power turned OFF) between the transition wiring and the grounding terminal. The polarity of the transition wiring must be positive and that of the grounding terminal must be negative.
2. Turn the power of the insulation resistance meter ON and measure the insulation resistance. The duration of the applied voltage must be the period during which 100M Ω or more is confirmed (or 20M Ω if the unit is equipped with a lightning protector).
3. Upon completion of the test, remove the insulation resistance meter, connect a 100K Ω resistor between the transition wiring and the grounding terminal, and allow the electricity to discharge. Do not touch the terminal with your bare hands while the electricity is discharging for more than 1 second.

2.6.2 Withstand voltage test procedure**■ Testing between the output terminal and the input terminal**

1. Lay transition wiring between the + terminal, the – terminal, and the check terminal of the terminal box.
2. Lay transition wiring between terminals 1, 2, 3, 4 and 5 of the terminal box.
3. Connect the withstand voltage tester (with the power turned OFF) between the transition wiring shown in Steps 1 and 2 above.
4. After setting the current limit value of the withstand voltage tester to 10mA, turn the power ON, and carefully increase the impressed voltage from 0V to the specified value.
5. The voltage at the specified value must remain for a duration of one minute.
6. Upon completion of the test, carefully reduce the voltage so that no voltage surge occurs.

■ Testing between the output terminal and the grounding terminal

1. Lay the transition wiring between the + terminal, the - terminal and the check terminal of the terminal box, and connect the withstand voltage tester (with the power turned OFF) between the transition wiring and the grounding terminal. Connect the grounding side of the withstand voltage tester to the grounding terminal.
2. After setting the current limit value of the withstand voltage tester to 10mA, turn the power ON, and gradually increase the impressed voltage from 0V to the specified value.
3. The voltage at the specified value must remain for a duration of one minute.
4. Upon completion of the test, carefully reduce the voltage so that no voltage surge occurs.

■ Testing between the input terminal and the grounding terminal

1. Lay the transition wiring across terminals 1, 2, 3, 4, and 5 of the terminal box and connect the withstand voltage tester (with the power turned OFF) between the transition wiring and the grounding terminal. Connect the grounding side of the withstand voltage tester to the grounding terminal.
2. After setting the current limit value of the withstand voltage tester to 10mA, turn the power ON, and gradually increase the impressed voltage from 0V to the specified value.
3. The voltage at the specified value must remain for a duration of one minute.
4. Upon completion of the test, carefully reduce the voltage so that no voltage surge occurs.

2.7 Installation of Explosion Protected Type Transmitters

In this section, further requirements and differences and for explosionproof type instrument are described. For explosionproof type instrument, the description in this chapter is prior to other description in this users manual.



CAUTION

To preserve the safety of explosionproof equipment requires great care during mounting, wiring, and piping. Safety requirements also place restrictions on maintenance and repair activities. Please read the following sections very carefully.

2.7.1 ATEX Certification

(1) Technical Data

a) ATEX intrinsically safe approval

Caution for ATEX intrinsically safe approval.

Note 1. Certification information

① 4 - 20mA type

- YTA610 and YTA710 with /KU2 temperature transmitter (4 - 20mA type) is applicable for use in hazardous locations.

[Intrinsically safe ia]

- Applicable Standard:
EN 60079-0: 2012+A11:2013,
EN 60079-11: 2012
- Certificate No. FM16ATEX0019X
- Type of protection and marking code:
II 1 G Ex ia IIC T5...T4 Ga
- Ambient Temperature:
-40 to 70°C for T4, -40 to 50°C for T5
- Enclosure: IP66/IP67
- Electrical parameters:
Supply/Output circuit: Terminals: +, -
U_i=30V, I_i=200mA, P_i=1.0W, C_i=22nF,
L_i=0mH
Sensor circuit: Terminals: 1,2,3,4,5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF,
L_o=3.9mH
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)

[Intrinsically safe ic]

- Applicable Standard:
EN 60079-0: 2012+A11:2013,
EN 60079-11: 2012
- Certificate Not Applicable as per Annex VIII to ATEX 2014/34/EU
- Type of protection and marking code:
II 3 G Ex ic IIC T5...T4 Gc
- Ambient Temperature:
-30 to 70°C for T4, -30 to 50°C for T5
- Enclosure: IP66/IP67
- Overvoltage category: I
- Electrical parameters:
Supply/Output circuit: Terminals: +, -
U_i=30V, C_i=22nF, L_i=0mH
Sensor circuit: Terminals: 1,2,3,4,5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF,
L_o=3.9mH
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)

② Fieldbus type

- YTA610 and YTA710 with /KU25 temperature transmitter (Fieldbus type) is applicable for use in hazardous locations.

[Intrinsically safe ia]

- Applicable Standard:
EN 60079-0: 2012+A11:2013,
EN 60079-11: 2012
- Certificate No. FM16ATEX0019X
- Type of protection and marking code:
II 1 G Ex ia IIC T4 Ga
- Ambient Temperature: -55 to 60°C
- Enclosure: IP66/IP67
- Electrical parameters:
Supply/Output circuit: Terminals: +, -
FISCO field device or
U_i=30V, I_i=300mA, P_i=1.2W, C_i=2.2nF,
L_i=0mH
Sensor circuit: Terminals: 1,2,3,4,5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF,
L_o=3.9mH
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)

[Intrinsically safe ic]

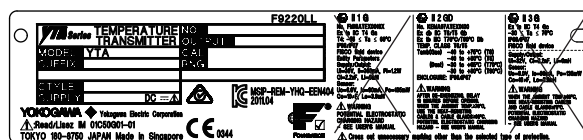
- Applicable Standard:
EN 60079-0:2012+A11:2013,
EN 60079-11:2012
- Certificate Not Applicable as per Annex VIII to ATEX 2014/34/EU

- Type of protection and marking code: II 3 G Ex ic IIC T4 Gc
- Ambient Temperature: -30 to 70°C
- Enclosure: IP66/IP67
- Overvoltage category: I
- Electrical parameters:
Supply/Output circuit: Terminals: +, -
FISCO field device or
U_i=32V, C_i=2.2nF, L_i=0mH
Sensor circuit: Terminals: 1,2,3,4,5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF,
L_o=3.9mH
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)

e.g. In case of selecting “ia” and crossing out “db” and “tb” and “ic”



e.g. In case of selecting “db” and “tb” and crossing out “ia” and “ic”



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! WARNING

Specification conditions of use

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- When the enclosure of the Temperature Transmitter is made of aluminum alloy, if it is mounted in an area where the use of Category 1G equipment is required, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- The dielectric strength of 500V r.m.s between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

Note 2. Note for multiple types of protection (KU2 and KU25)

- For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this instruction manual. Cross out the unnecessary type of protection on the name plate in the following ways.

Note 3. Installation

Installation should be in accordance with Control Drawing IIE029-A63.

b) ATEX Flameproof Type and Dust Ignition Proof Type

Caution for ATEX Flameproof Type and Dust Ignition Proof Type

Note 1. Certificate information

- YTA710 with /KF2, YTA610 and YTA710 with /KU2 and /KU25 temperature transmitters are applicable for use in hazardous locations.
- No. KEMA 07ATEX0130
- Applicable Standard:
EN 60079-0:2012+A11:2013,
EN 60079-1:2014, EN 60079-31:2014
- Type of Protection and Marking Code:
II 2 G Ex db IIC T6/T5 Gb,
II 2 D Ex tb IIIC T70°C / T90°C Db
- Ambient Temperature for Gas Atmospheres:
-40 to 75°C (T6), -40 to 80°C (T5)
- Ambient Temperature for Dust Atmospheres:
-30 to 65°C (T70°C), -30 to 80°C (T90°C)
- Degree of protection of enclosure: IP66/IP67
- Supply Voltage : 42 V dc max. (4 to 20 mA type)
: 32 V dc max. (Fieldbus type)
- Output Signal : 4 to 20 mA
: 24 mA dc max. (Fieldbus type)

Note 2. Installation

- Cable glands, adapters and/or blanking elements with a suitable IP rating shall be of Ex d IIC/Ex tb IIIC certified by ATEX and shall be installed so as to maintain the specific degree of protection (IP Code) of the equipment.
- All wiring shall comply with local installation requirement.

Note 3. Operation

- Keep “WARNING” on the equipment as follows.
WARNING: AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING. WHEN THE AMBIENT TEMP. ≥ 70°C, USE THE HEAT-RESISTING CABLES & CABLE GLANDS ≥ 90°C. POTENTIAL ELECTROSTATIC CHARGING HAZARD -SEE USER’S MANUAL
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous location.

Note 4. Special Conditions for Safe Use

 **WARNING**

- Electrostatic charge may cause an explosion hazard. Avoid any actions that cause the generation of electrostatic charge, such as rubbing with a dry cloth on coating face of the product.
- If the YTA is mounted in an area where the use of Category 2D equipment is required, it shall be installed in such a way that the risk from electrostatic discharges and propagating brush discharges caused by rapid flow of dust is avoided.
- To satisfy IP66 or IP67, apply waterproof glands to the electrical connection port.
- If the equipment is affected by external sources of heating or cooling from plant facilities, make sure that the parts in contact with the equipment or in the near vicinity of the equipment do not exceed the ambient temperature range of the equipment.

Note 5. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void ATEX Flameproof Certification.

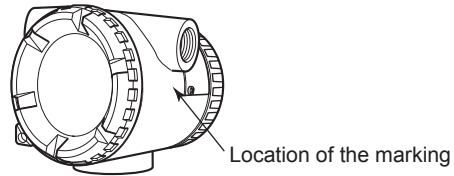
Note 6. Surge absorber

- The surge absorber can be removed from, or added to the equipment.

(2) Electrical Connection

The type of electrical connection is stamped near the electrical connection port according to the following marking.

Screw Size	Marking
ISO M20×1.5 female	△ M
ANSI 1/2 NPT female	△ N



F0204.ai

(3) Installation

 **WARNING**

All wiring shall comply with local installation requirement and local electrical code.

(4) Operation

 **WARNING**

- OPEN CIRCUIT BEFORE REMOVING COVER. INSTALL IN ACCORDANCE WITH THIS USER’S MANUAL
- Take care not to generate mechanical sparking when access to the instrument and peripheral devices in hazardous locations.

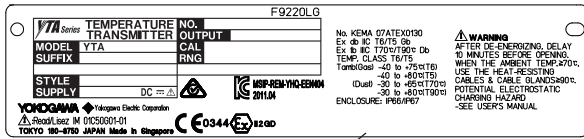
(5) Maintenance and Repair

 **WARNING**

The instrument modification or parts replacement by other than authorized Representative of Yokogawa Electric Corporation is prohibited and will void the certification.

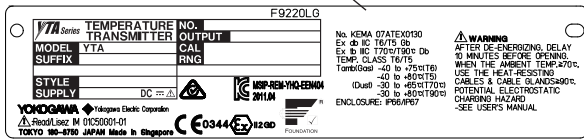
(6) Name Plate

YTA710 /KF2 Flameproof and Dust ignition proof type



No. KEMA 07ATEX0130
 Ex db IIC T6/T5 Gb
 Ex tb IIIC T70°C/T90°C Db
 TEMP. CLASS T6/T5
 Tamb (Gas) -40 to +75°C(T6)
 -40 to +80°C(T5)
 (Dust) -30 to +65°C(T70°C)
 -30 to +80°C(T90°C)
 ENCLOSURE: IP66/IP67

WARNING
 AFTER DE-ENERGIZING, DELAY
 10 MINUTES BEFORE OPENING.
 WHEN THE AMBIENT TEMP.≥70°C,
 USE THE HEAT-RESISTING
 CABLES & CABLE GLANDS≥90°C.
 POTENTIAL ELECTROSTATIC
 CHARGING HAZARD
 -SEE USER' S MANUAL



F2025.ai

Intrinsically safe approval and Flameproof and Dust ignition approval (4 - 20 mA type)

II 3 G
 Ex ic IIC T5...T4 Gc
 T4: -30 ≤ Ta ≤ 70°C
 T5: -30 ≤ Ta ≤ 50°C
 IP66/IP67
 Supply/Output:
 Ui=30V, Ci=22nF, Li=0mH
 Sensor:
 Uo=6.0V, Io=90mA, Po=135mW
 Co=10μF, Lo=3.9mH

WARNING
 WHEN THE AMBIENT TEMP.≥68°C,
 USE HEAT-RESISTING CABLES
 AND CABLE GLANDS≥75°C.
 POTENTIAL ELECTROSTATIC
 CHARGING HAZARD
 -SEE USER'S MANUAL



No. FM16ATEX0019X
II 1 G
 Ex ia IIC T5...T4 Ga
 T4: -40 ≤ Ta ≤ 70°C
 T5: -40 ≤ Ta ≤ 50°C
 IP66/IP67
 Supply/Output:
 Ui=30V, Ii=200mA, Pi=1.0W
 Ci=22nF, Li=0mH
 Sensor:
 Uo=6.0V, Io=90mA, Po=135mW
 Co=10μF, Lo=3.9mH

No. KEMA 07ATEX0130
II 2 GD
 Ex db IIC T6/T5 Gb
 Ex tb IIIC T70°C/T90°C Db
 TEMP. CLASS T6/T5
 Tamb (Gas) -40 to +75°C(T6)
 -40 to +80°C(T5)
 (Dust) -30 to +65°C(T70°C)
 -30 to +80°C(T90°C)
 ENCLOSURE: IP66/IP67

WARNING
 AFTER DE-ENERGIZING, DELAY
 10 MINUTES BEFORE OPENING.
 WHEN THE AMBIENT TEMP.≥70°C,
 USE THE HEAT-RESISTING
 CABLES & CABLE GLANDS≥90°C.
 POTENTIAL ELECTROSTATIC CHARGING
 HAZARD -SEE USER'S MANUAL

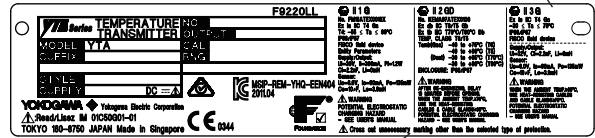
⚠ Cross out unnecessary marking other than the selected type of protection.

F2026.ai

Intrinsically safe approval and Flameproof and Dust ignition approval (Fieldbus type)

II 3 G
 Ex ic IIC T4 Gc
 -30 ≤ Ta ≤ 70°C
 IP66/IP67
 FISCO field device
 Supply/Output:
 Ui=32V, Ci=2.2nF, Li=0mH
 Sensor:
 Uo=6.0V, Io=90mA, Po=135mW
 Co=10μF, Lo=3.9mH

WARNING
 WHEN THE AMBIENT TEMP.≥68°C,
 USE HEAT-RESISTING CABLES
 AND CABLE GLANDS≥75°C.
 POTENTIAL ELECTROSTATIC
 CHARGING HAZARD
 -SEE USER'S MANUAL



II 1 G
 No. FM16ATEX0019X
 Ex ia IIC T4 Ga
 T4: -55 ≤ Ta ≤ 60°C
 IP66/IP67
 FISCO field device
 Entity Parameters
 Supply/Output:
 Ui=30V, Ii=300mA, Pi=1.2W
 Ci=2.2nF, Li=0mH
 Sensor:
 Uo=6.0V, Io=90mA, Po=135mW
 Co=10μF, Lo=3.9mH

II 2 GD
 No. KEMA 07ATEX0130
 Ex db IIC T6/T5 Gb
 Ex tb IIIC T70°C/T90°C Db
 TEMP. CLASS T6/T5
 Tamb (Gas) -40 to +75°C(T6)
 -40 to +80°C(T5)
 (Dust) -30 to +65°C(T70°C)
 -30 to +80°C(T90°C)
 ENCLOSURE: IP66/IP67

WARNING
 AFTER DE-ENERGIZING, DELAY
 10 MINUTES BEFORE OPENING.
 WHEN THE AMBIENT TEMP.≥70°C,
 USE THE HEAT-RESISTING
 CABLES & CABLE GLANDS≥90°C.
 POTENTIAL ELECTROSTATIC CHARGING
 HAZARD -SEE USER'S MANUAL

⚠ Cross out unnecessary marking other than the selected type of protection.

F2027.ai

MODEL: Specified model code.

SUFFIX: Specified suffix code.

STYLE: Style code.

SUPPLY: Supply voltage.

NO.: Serial number and year of production*1.

OUTPUT: Output signal.

FACTORY CAL: Specified calibration range.

YOKOGAWA ♦ TOKYO 180-8750 JAPAN:

The manufacturer name and the address*2.

*1: The third figure from the left shows the production year.

The relationship between the production year and the third figure is shown below.

The third figure	S	T	U	V	W	X	Y
The year of Production	2016	2017	2018	2019	2020	2021	2022

For example, the production year of the product engraved in "NO." column on the name plate as follows is 2016.

C2S616294

The year 2016

*2: "180-8750" is a postal code which represents the following address.

2-9-32 Nakacho, Musashino-shi, Tokyo Japan

*3: The identification number of Notified Body.

2.7.2 IECEx Certification

(1) Technical Data

a) IECEx intrinsically safe approval

Caution for IECEx intrinsically safe approval.

Note 1. Certification information

- ① 4 - 20mA type
 - YTA610 and YTA710 with /SU2 temperature transmitter (4 - 20mA type) is applicable for use in hazardous locations.
 - Applicable Standard: IEC 60079-0: 2011, IEC 60079-11: 2011
 - Certificate No. IECEx FMG 16.0014X
 - Type of protection and marking code: Ex ia IIC T5...T4 Ga
Ex ic IIC T5...T4 Gc
 - Ambient Temperature: -40 to 70°C for T4, -40 to 50°C for T5 (Ex ia)
-30 to 70°C for T4, -30 to 50°C for T5 (Ex ic)
 - Enclosure: IP66/IP67
 - Overvoltage category: I
 - Electrical parameters (Ex ia):
Supply/Output circuit: Terminals: +, -
U_i=30V, I_i=200mA, P_i=1.0W, C_i=22nF, L_i=0mH
Sensor circuit: Terminals: 1, 2, 3, 4, 5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF, L_o=3.9mH
 - Electrical parameters (Ex ic):
Supply/Output circuit: Terminals: +, -
U_i=30V, C_i=22nF, L_i=0mH
Sensor circuit: Terminals: 1, 2, 3, 4, 5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF, L_o=3.9mH
 - Dielectric strength: 500 V a.c.r.m.s., 1 min (See specific conditions of use)
- ② Fieldbus type
 - YTA610 and YTA710 with /SU25 temperature transmitter (Fieldbus type) is applicable for use in hazardous locations.
 - Applicable Standard: IEC 60079-0: 2011, IEC 60079-11: 2011
 - Certificate No. IECEx FMG 16.0014X
 - Type of protection and marking code: Ex ia IIC T4 Ga
Ex ic IIC T4 Gc
 - Ambient Temperature(Ex ia): -55 to 60°C
 - Ambient Temperature(Ex ic): -30 to 60°C
 - Enclosure: IP66/IP67
 - Overvoltage category: I

- Electrical parameters (Ex ia):
Supply/Output circuit: Terminals: +, -
FISCO field device or
U_i=30V, I_i=300mA, P_i=1.2W, C_i=2.2nF, L_i=0mH
Sensor circuit: Terminals: 1, 2, 3, 4, 5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF, L_o=3.9mH
- Electrical parameters (Ex ic):
Supply/Output circuit: Terminals: +, -
FISCO field device or
U_i=30V, C_i=2.2nF, L_i=0mH
Sensor circuit: Terminals: 1, 2, 3, 4, 5
U_o=6V, I_o=90mA, P_o=135mW, C_o=10μF, L_o=3.9mH
- Dielectric strength: 500 V a.c.r.m.s., 1 min (See specific conditions of use)



WARNING

Specific conditions of use

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- When the enclosure of the Temperature Transmitter is made of aluminum alloy, if it is mounted in an area where the use of EPL Ga equipment is required, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

Note 2. Note for multiple types of protection (SU2 and SU25)

- For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this instruction manual. Cross out the unnecessary type of protection on the name plate in the same ways of ATEX.

Note 3. Installation

Installation should be in accordance with Control Drawing IIE029-A63.

b) IECEx Flameproof Type and Dust Ignition Proof Type

Caution for IECEx flameproof type and Dust Ignition Proof Type

Note 1. Certification information

- YTA710 with /SF2, YTA610 and YTA710 with /SU2 and /SU25 temperature transmitters are applicable for use in hazardous locations.
- No. IECEx KEM 07.0044
- Applicable Standard: IEC 60079-0:2011, IEC 60079-1:2014-06, IEC 60079-31:2013
- Type of Protection and Marking Code:
Ex db IIC T6/T5 Gb,
Ex tb IIIC T70°C / T90°C Db
- Ambient Temperature for Gas Atmospheres:
-40 to 75°C (T6), -40 to 80°C (T5)
- Ambient Temperature for Dust Atmospheres:
-30 to 65°C (T70°C), -30 to 80°C (T90°C)
- Enclosure: IP66/IP67
- Supply Voltage : 42 V dc max. (4 to 20 mA type)
: 32 V dc max. (Fieldbus type)
- Output Signal : 4 to 20 mA
: 24 mA dc max. (Fieldbus type)

Note 2. Installation

- Cable glands, adapters and/or blanking elements with a suitable IP rating shall be of Ex d IIC/Ex tb IIIC certified by IECEx and shall be installed so as to maintain the specific degree of protection (IP Code) of the equipment.
- All wiring shall comply with local installation requirement.

Note 3. Operation

- Keep strictly the "WARNING" on the label on the transmitter.
WARNING: AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING. WHEN THE AMBIENT TEMP. ≥ 70°C, USE THE HEAT-RESISTING CABLES & CABLE GLANDS ≥ 90°C. POTENTIAL ELECTROSTATIC CHARGING HAZARD -SEE USER'S MANUAL
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous location.

Note 4. Special Conditions for Safe Use



- Electrostatic charge may cause an explosion hazard. Avoid any actions that cause the generation of electrostatic charge, such as rubbing with a dry cloth on coating face of the product.
- If the YTA is mounted in an area where the use of EPL Db equipment is required, it shall be installed in such a way that the risk from electrostatic discharges and propagating brush discharges caused by rapid flow of dust is avoided.
- To satisfy IP66 or IP67, apply waterproof glands to the electrical connection port.
- If the equipment is affected by external sources of heating or cooling from plant facilities, make sure that the parts in contact with the equipment or in the near vicinity of the equipment do not exceed the ambient temperature range of the equipment.

Note 5. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void IECEx Flameproof Certification.

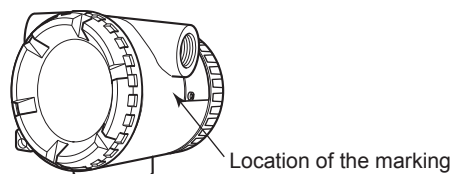
Note 6. Surge absorber

- The surge absorber can be removed from, or added to the equipment.

(2) Electrical Connection

The type of electrical connection is stamped near the electrical connection port according to the following marking.

Screw Size	Marking
ISO M20×1.5 female	△ M
ANSI 1/2 NPT female	△ N



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2.7.3 FM Certification

(1) Technical Data

a) FM (US) intrinsically safe approval/non-incendive approval

Caution for FM (US) intrinsically safe approval/non-incendive approval.

Note 1. Certification information

① 4 - 20mA type

- YTA610 and YTA710 with /FU1 temperature transmitter (4 - 20mA type) is applicable for use in hazardous locations.
- Applicable standard:
FM Class 3600:2011, FM Class 3610:2015, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA-60079-0:2013, ANSI/ISA-60079-11:2014, ANSI/IEC 60529:2004, NEMA 250:2003
- Marking/Rating
Intrinsically safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, G, T5...T4
Class I, Zone 0 AEx ia IIC T5...T4
Non-incendive for Class I, II, Division 2, Groups A, B, C, D, F, G, T5...T4
Class III, Division 1 T5...T4
Class I, Zone 2 Group IIC T5...T4
- Ambient Temperature:
-40 to 70°C for T4, -40 to 50°C for T5
- Enclosure Type 4X, IP66/IP67
- Electrical parameters:
Intrinsically safe for
Supply/Output circuit:
Terminals: +, -
 $U_i=30V$, $I_i=200mA$, $P_i=1.0W$, $C_i=22nF$, $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$, $L_o=3.9mH$
Non-incendive for
Supply/Output circuit:
Terminals: +, -
 $U_i=30V$, $C_i=22nF$, $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$, $L_o=3.9mH$
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)

② Fieldbus type

- YTA610 and YTA710 with /FU15 temperature transmitter (Fieldbus type) is applicable for use in hazardous locations.
- Applicable standard:
FM Class 3600:2011, FM Class 3610:2015, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA-60079-0:2013, ANSI/ISA-60079-11:2014, ANSI/IEC 60529:2004, NEMA 250:2003
- Marking/Rating
Intrinsically safe for
Class I, II, III Division 1 Groups A, B, C, D, E, F, G T4
Class I, Zone 0 AEx ia IIC T4
Non-incendive for
Class I, II, Division 2, Groups A, B, C, D, F, G T4
Class III Division 1 T4
Class I Zone 2 Group IIC T4
- Ambient Temperature: -55 to 60°C
- Enclosure Type 4X, IP66/IP67
- Electrical parameters:
Intrinsically safe for
Supply/Output circuit:
Terminals: +, -
FISCO field device or
 $U_i=30V$, $I_i=300mA$, $P_i=1.2W$, $C_i=2.2nF$, $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$, $L_o=3.9mH$
Non-incendive for
Supply/Output circuit:
Terminals: +, -
 $U_i=32V$, $C_i=2.2nF$, $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$, $L_o=3.9mH$
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)

**WARNING**

Specific conditions of use

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- When the enclosure of the Temperature Transmitter is made of aluminum alloy, if it is mounted in Zone 0, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

Note 2. Note for multiple types of protection (FU1 and FU15)

- For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this instruction manual. Cross out the unnecessary type of protection on the name plate in the same ways of ATEX.

Note 3. Installation

Installation should be in accordance with Control Drawing IIE029-A61.

b) FM Explosionproof Type

Caution for FM Explosionproof type

Note 1. Certification information

- YTA710 with /FF1, YTA610 and YTA710 with /FU1 and /FU15 temperature transmitter are applicable for use in hazardous locations.
- Applicable Standard: FM Class 3600: 2011, FM Class 3615: 2006, FM Class 3810: 2005, NEMA250: 2014
- Explosionproof for Class I, Division 1, Groups A, B, C, and D.
- Dust-ignitionproof for Class II/III, Division 1, Groups E, F and G.
- Enclosure rating: TYPE 4X.
- Temperature Class: T6
- Ambient Temperature: -40 to 60°C
- Supply Voltage: 42 V dc max. (4 to 20 mA type)
: 32 V dc max. (Fieldbus type)

- Output Signal: 4 to 20 mA
: 24 mA dc max. (Fieldbus type)

Note 2. Wiring

- All wiring shall comply with National Electrical Code ANSI/NEPA70 and Local Electrical Codes.
- "FACTORY SEALED, CONDUIT SEAL NOT REQUIRED".

Note 3. Operation

- Keep strictly the "WARNING" on the nameplate attached on the transmitter.

WARNING: OPEN CIRCUIT BEFORE REMOVING COVER. "FACTORY SEALED, CONDUIT SEAL NOT REQUIRED". AFTER DE-ENERGIZING, DELAY 2 MINUTES BEFORE OPENING. INSTALL IN ACCORDANCE WITH THE INSTRUCTION MANUAL IM 1C50G01-01EN.

- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous location.

Note 4. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void Factory Mutual Explosionproof Approval.

2.7.4 CSA Certification**(1) Technical Data****a) FM (Canada) intrinsically safe approval/non-incendive approval**

Caution for FM (Canada) intrinsically safe approval/non-incendive approval.

Note 1. Certification information

- ① 4 - 20mA type
- YTA610 and YTA710 with /CU1 temperature transmitter (4 - 20mA type) is applicable for use in hazardous locations.
- Applicable standard:
CAN/CSA-C22.2 No. 94.2-07,
C22.2 No.213:1987,
CAN /CSA-C22.2 No. 60079-0:11,
CAN/CSA-C22.2 No. 60079-11:14,
CAN/CSA-C22.2 No. 60529:05,
CAN/CSA-C22.2 No. 61010-1-12,
CAN/CSA-C22.2 No. 61010-2-030-12

- Marking/Rating
Intrinsically safe for
Class I, II, III Division 1, Groups A, B, C, D, E,
F, G, T5...T4
Ex ia IIC T5...T4 Ga
Non-incendive for
Class I, II, Division 2, Groups A, B, C, D, F, G,
T5...T4
Class III, Division 1 T5...T4
- Ambient Temperature:
–40 to 70°C for T4, –40 to 50°C for T5
- Enclosure Type 4X, IP66/IP67
- Electrical parameters:
Intrinsically safe for
Supply/Output circuit:
Terminals: +, -
 $U_i=30V$, $I_i=200mA$, $P_i=1.0W$, $C_i=22nF$,
 $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$,
 $L_o=3.9mH$
Non-incendive for
Supply/Output circuit:
Terminals: +, -
 $U_i=30V$, $C_i=22nF$, $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$,
 $L_o=3.9mH$
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)
- ② Fieldbus type
- YTA610 and YTA710 with /CU15 temperature transmitter (Fieldbus type) is applicable for use in hazardous locations.
- Applicable standard:
CAN/CSA-C22.2 No. 94.2-07,
C22.2 No.213:1987,
CAN /CSA-C22.2 No. 60079-0:11,
CAN/CSA-C22.2 No. 60079-11:14,
CAN/CSA-C22.2 No. 60529:05,
CAN/CSA-C22.2 No. 61010-1-12,
CAN/CSA-C22.2 No. 61010-2-030-12
- Marking/Rating
Intrinsically safe for
Class I, II, III Division 1, Groups A, B, C, D, E,
F, G T4
Ex ia IIC T4 Ga
Non-incendive for
Class I, II, Division 2, Groups A, B, C, D, F,
G T4
Class III, Division 1 T4

- Ambient Temperature: –55 to 60°C
- Enclosure Type 4X, IP66/IP67
- Electrical parameters:
Intrinsically safe for
Supply/Output circuit:
Terminals: +, -
FISCO field device or
 $U_i=30V$, $I_i=300mA$, $P_i=1.2W$, $C_i=2.2nF$,
 $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$,
 $L_o=3.9mH$
Non-incendive for
Supply/Output circuit:
Terminals: +/-
 $U_i=32V$, $C_i=2.2nF$, $L_i=0mH$
Sensor circuit:
Terminals: 1, 2, 3, 4, 5
 $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$,
 $L_o=3.9mH$
- Dielectric strength: 500 V a.c.r.m.s., 1 min
(See specific conditions of use)



WARNING

Specific conditions of use

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- When the enclosure of the Temperature Transmitter is made of aluminum alloy, if it is mounted in Zone 0, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

Note 2. Note for multiple types of protection (CU1 and CU15)

- For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this instruction manual. Cross out the unnecessary type of protection on the name plate in the same ways of ATEX.

Note 3. Installation

Installation should be in accordance with Control Drawing IIE029-A62.

b) CSA Explosionproof Type

Caution for CSA Explosionproof type

Note 1. Certification information

- YTA710 with /CF1, YTA610 and YTA710 with /CU1 and /CU15 temperature transmitters are applicable for use in hazardous locations.
- Certificate 1089576
- Applicable Standard:
C22.2 No. 0-10, C22.2 No. 0.4-04,
C22.2 No. 25-M1966, C22.2 No. 30-M1986,
C22.2 No. 94-M1991, C22.2 No. 142-M1987,
C22.2 No. 157-92, C22.2 No. 213-M1987,
C22.2 No.61010-1-12,
C22.2 No. 61010-2-030-12
- Class I, Groups B, C and D;
- Class II, Groups E, F and G;
- Class III.
- Enclosure: TYPE 4X
- Temperature Class: T6
- Ambient Temperature: -40 to 60°C
- Supply Voltage: 42 V dc max. (4 to 20 mA type)
: 32 V dc max. (Fieldbus type)
- Output Signal: 4 to 20 mA
: 24 mA dc max. (Fieldbus type)

Note 2. Wiring

- All wiring shall comply with Canadian Electrical Code Part I and Local Electrical Codes.
- In hazardous location, wiring shall be in conduit as shown in the figure.

WARNING: A SEAL SHALL BE INSTALLED WITHIN 50 cm OF THE ENCLOSURE. UN SCELLEMENT DOIT ÊTRE INSTALLÉ À MOINS DE 50 cm DU BOÎTIER.

- When installed in Division 2, "FACTORY SEALED, CONDUIT SEAL NOT REQUIRED".

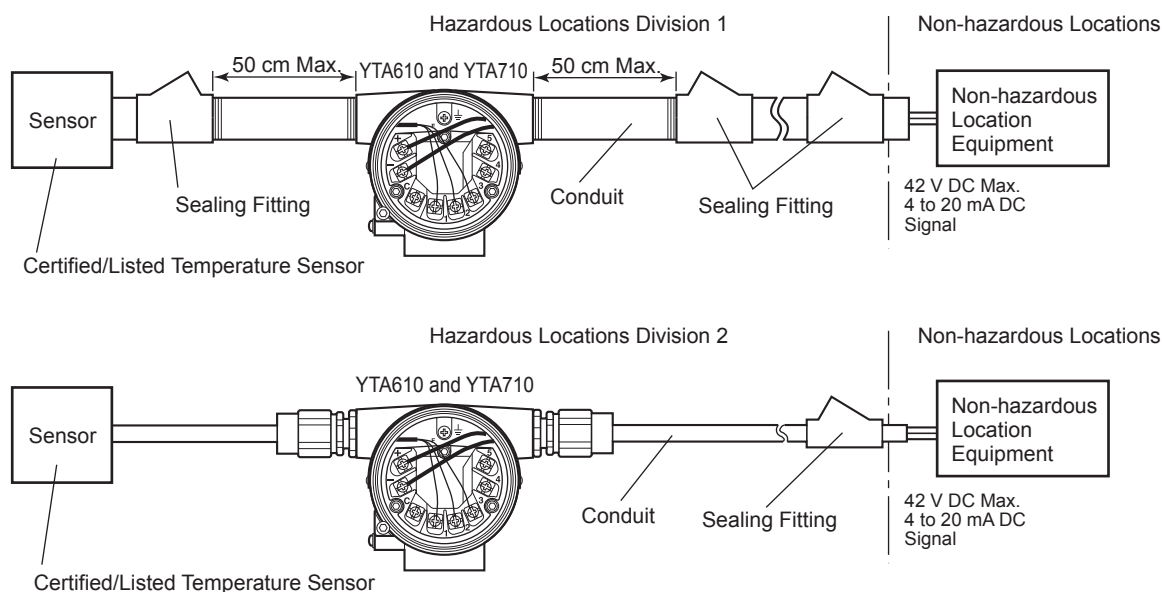
Note 3. Operation

- Keep strictly the "WARNING" on the label attached on the transmitter.
- WARNING: OPEN CIRCUIT BEFORE REMOVING COVER. AFTER DE-ENERGIZING, DELAY 2 MINUTES BEFORE OPENING. OUVRIR LE CIRCUIT AVANT D'ENLEVER LE COUVERCLE. APRÈS POWER-OFF, ATTENDRE 2 MINUTES AVANT D'OUVRIR.

- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous location.

Note 4. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void Canadian Standards Explosionproof Certification.



Note: Temperature sensor shall be certified in type of Hazardous Locations.

F0208.ai

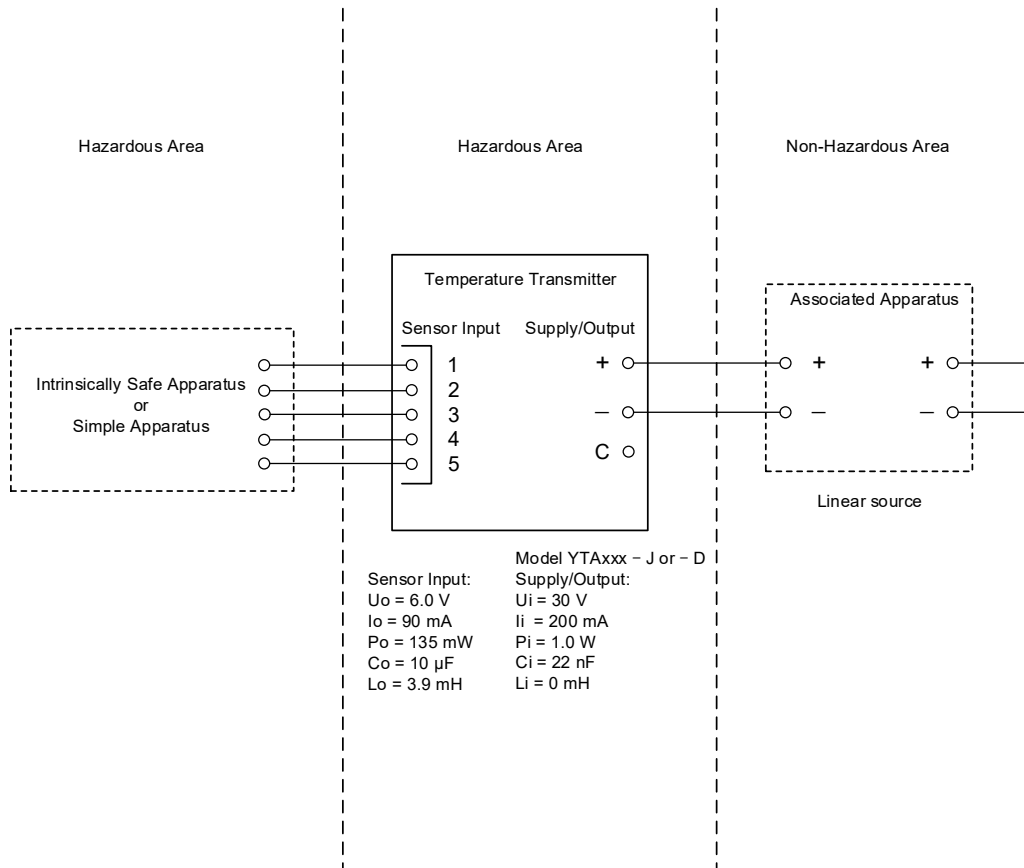
2.7.5 Control Drawing

Control Drawing for ATEX and IECEx Ex ia

Yokogawa Electric Corporation			Model		YTAxxx		
Title	Control Drawing						
No.	IIE029-A63	Page	01	Revision	1	Date	2017-08-18

Control Drawing (ATEX, IECEx)

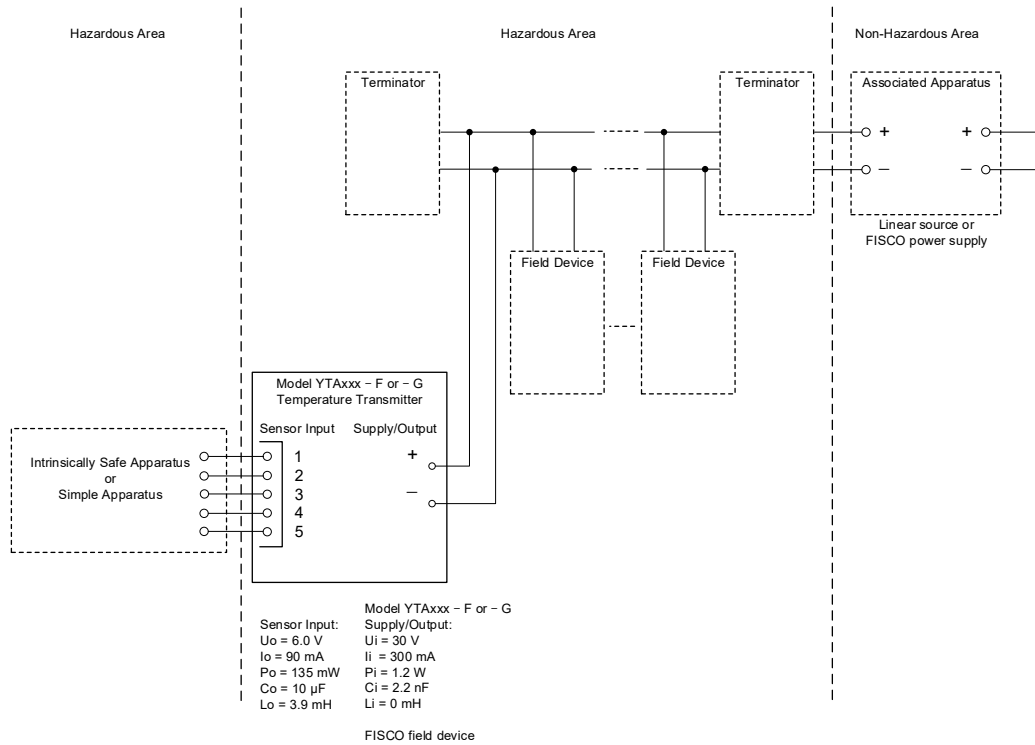
Intrinsically Safe Installation for YTAxxx – J or – D (Ex ia)



Control Drawing for ATEX and IECEx Ex ia

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A63	Page	02	Revision	3	Date	2017-08-18

Intrinsically Safe Installation for YTAxxx – F or – G (Ex ia)



Specific Condition of Use:

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- (ATEX) When the enclosure of the Temperature Transmitter is made of aluminium alloy, if it is mounted in a potentially explosive atmosphere requiring apparatus of equipment category 1 G is required, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- (IECEx) When the enclosure of the Temperature Transmitters is made of aluminium alloy, if it is mounted in a potentially explosive atmosphere requiring apparatus of equipment EPL Ga is required, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

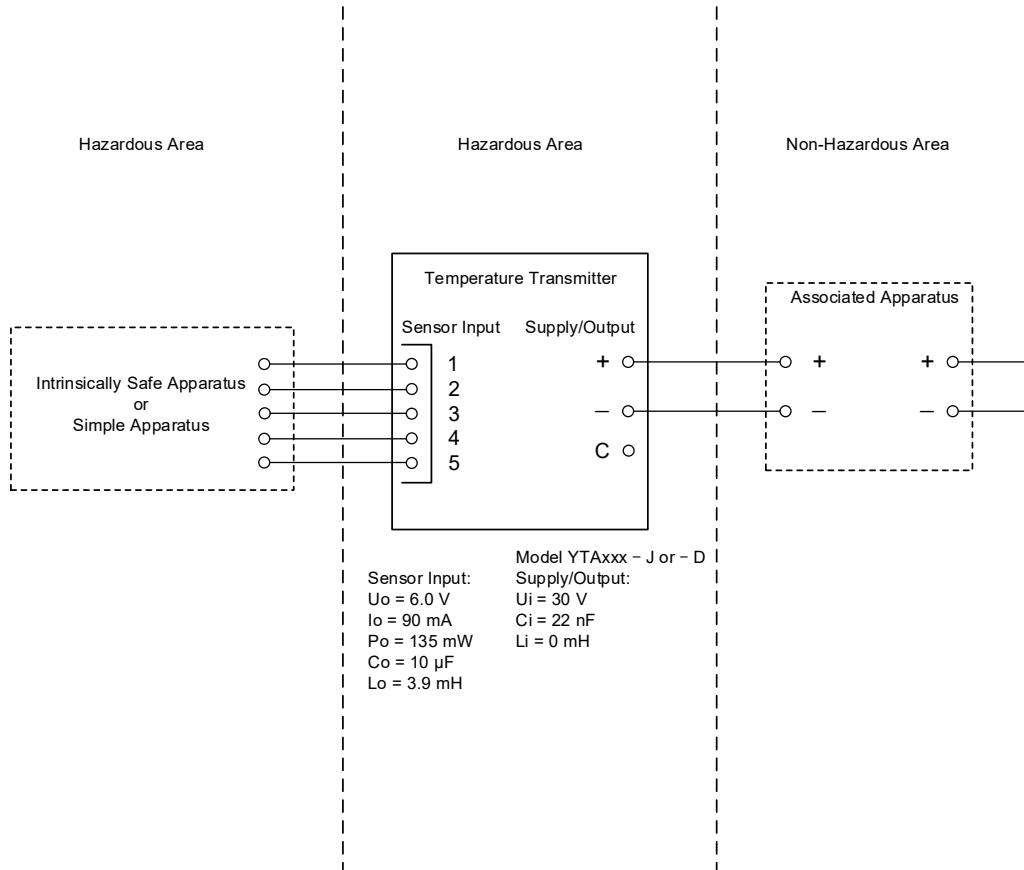
WARNING—ELECTROSTATIC CHARGE MAY CAUSE AN EXPLOSION HAZARD.
 AVOID ANY ACTIONS THAT CAUSE THE GENERATION OF ELECTROSTATIC CHARGE, SUCH AS RUBBING WITH A DRY CLOTH ON COATING FACE OF THE PRODUCT.

Note: The surge absorber F9220AR can be removed from, or added to the equipment.

Control Drawing ATEX Ex ic

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control drawing						
No.	IKE061-A07	Page	01	Revision	1	Date	2017-12-27

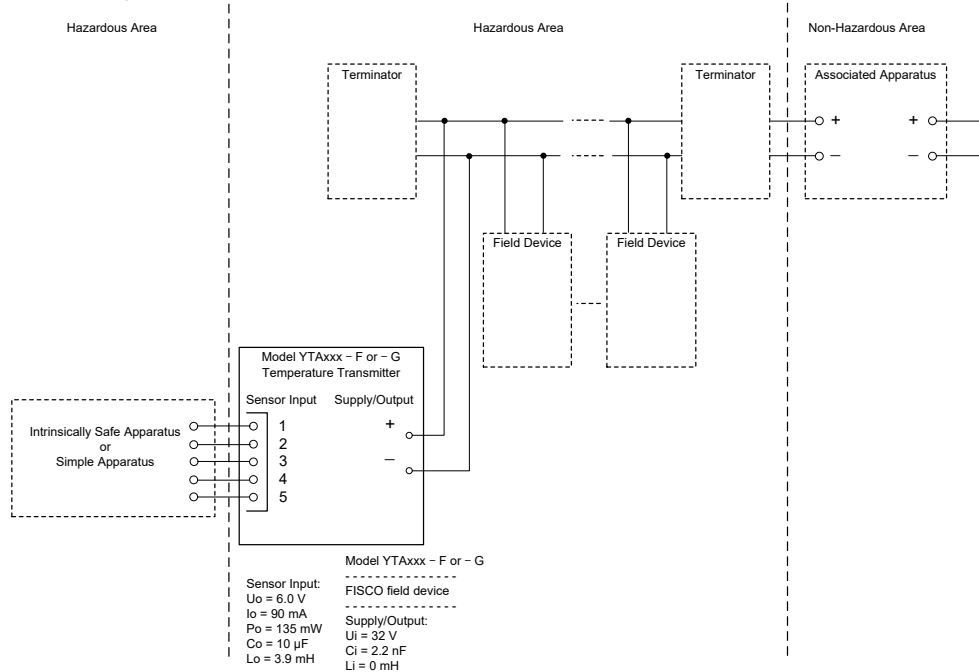
Intrinsically Safe Installation for YTAxxx – J or – D (Ex ic)



Control Drawing ATEX Ex ic

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control drawing						
No.	IKE061-A07	Page	02	Revision	0	Date	2017-12-27

Intrinsically Safe Installation for YTAxxx – F or – G (Ex ic)



Specific Condition of Use:

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

WARNING –WHEN THE AMBIENT TEMP. ≥68°C, USE HEAT-RESISTING CABLES AND CABLE GLANDS ≥75°C

WARNING –ELECTROSTATIC CHARGE MAY CAUSE AN EXPLOSION HAZARD. AVOID ANY ACTIONS THAT CAUSE THE GENERATION OF ELECTROSTATIC CHARGE, SUCH AS RUBBING WITH A DRY CLOTH ON COATING FACE OF THE PRODUCT.

Notes:

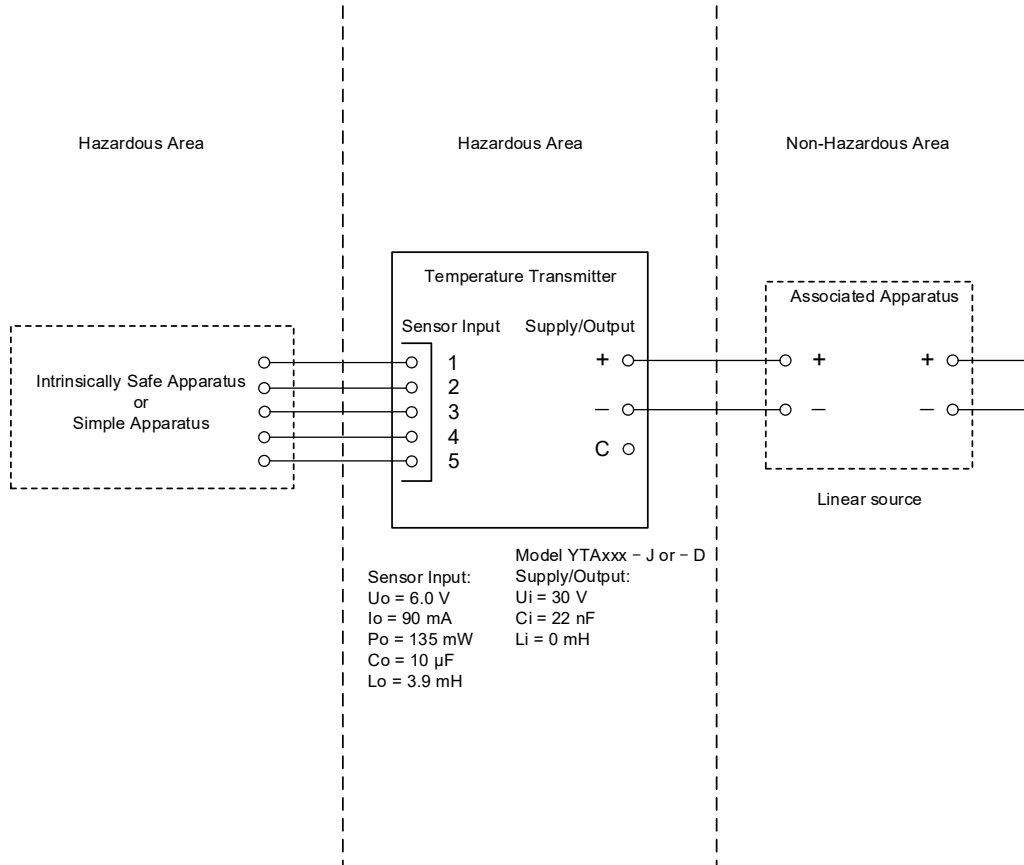
- The surge absorber F9220AR can be removed from, or added to the equipment.
- The equipment must be installed so that pollution degree 2 in accordance with EN 60664-1 is maintained inside the enclosure.
- Cable glands, adapters and/or blanking elements shall be of Ex “n”, Ex “e” or Ex “d” and shall be installed so as to maintain the specified degree of protection (IP Code) according to the environmental conditions. IP must be at least IP54.

Control Drawing IECEx Ex ic

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A63	Page	03	Revision	1	Date	2017-08-18

Control Drawing (IECEx)

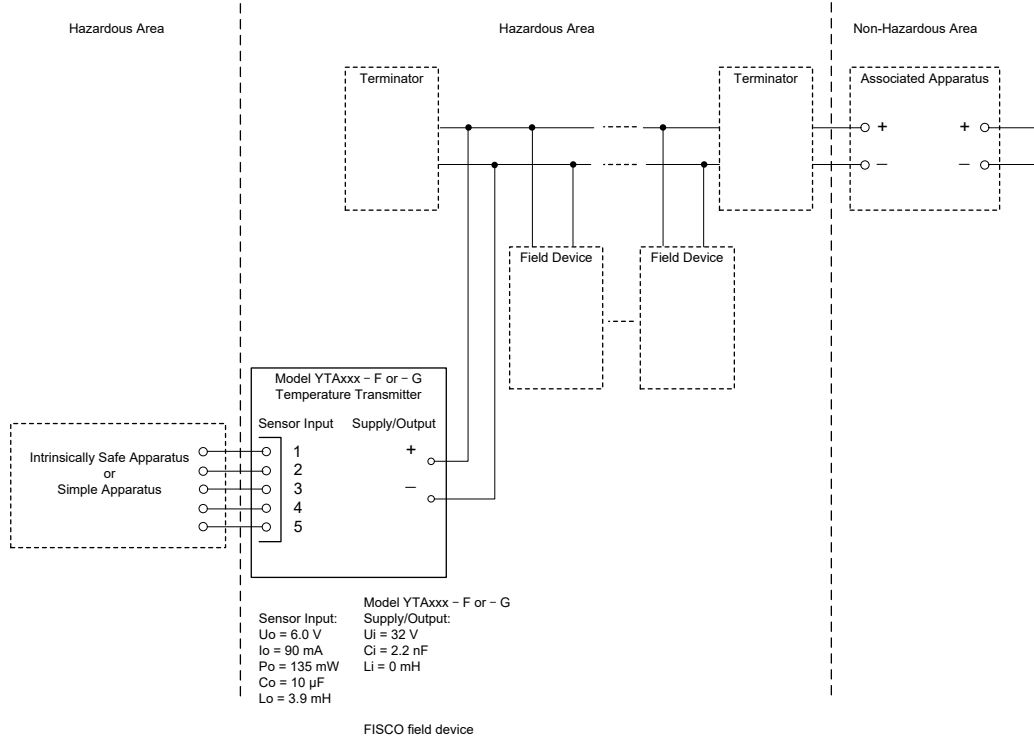
Intrinsically Safe Installation for YTAxxx – J or – D (Ex ic)



Control Drawing IECEx Ex ic

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A63	Page	04	Revision	0	Date	2017-08-18

Intrinsically Safe Installation for YTAxxx – F or – G (Ex ic)



Specific Condition of Use:

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

WARNING –WHEN THE AMBIENT TEMP. $\geq 68^\circ\text{C}$, USE HEAT-RESISTING CABLES AND CABLE GLANDS $\geq 75^\circ\text{C}$

WARNING –ELECTROSTATIC CHARGE MAY CAUSE AN EXPLOSION HAZARD.
 AVOID ANY ACTIONS THAT CAUSE THE GENERATION OF ELECTROSTATIC CHARGE, SUCH AS RUBBING WITH A DRY CLOTH ON COATING FACE OF THE PRODUCT.

Notes:

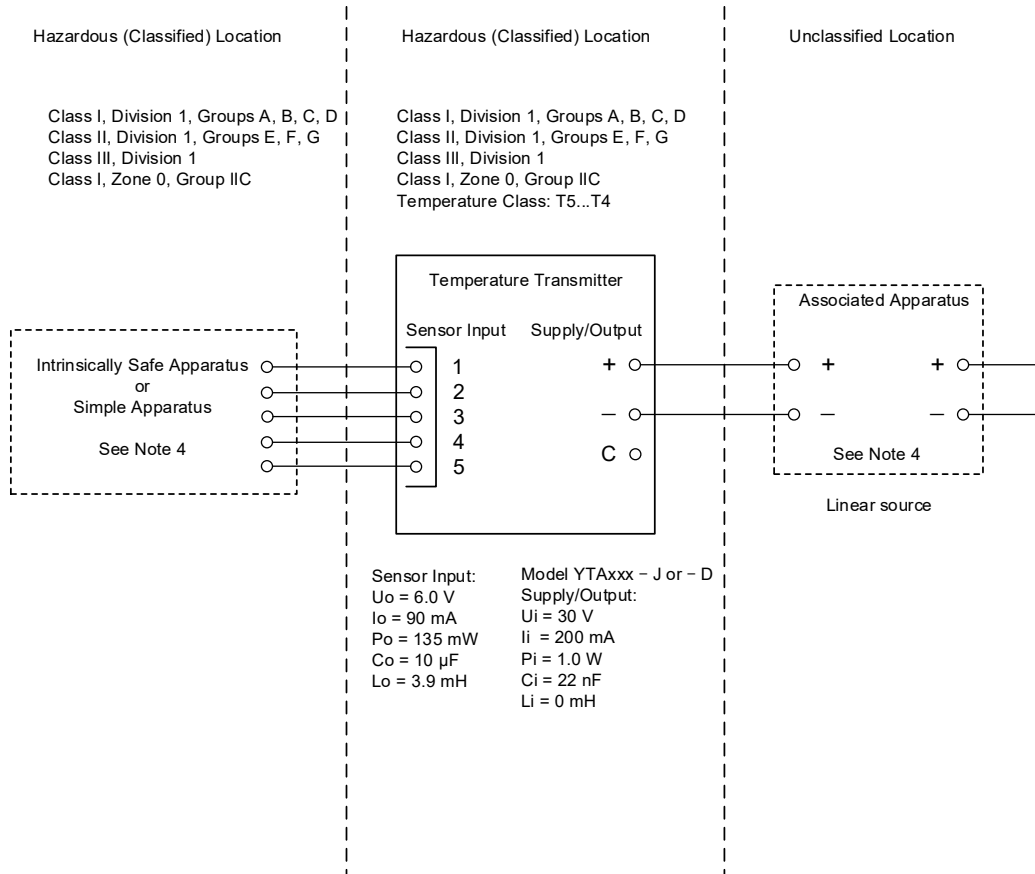
- The surge absorber F9220AR can be removed from, or added to the equipment.
- The equipment must be installed so that pollution degree 2 in accordance with IEC 60664-1 is maintained inside the enclosure.
- Cable glands, adapters and/or blanking elements shall be of Ex “n”, Ex “e” or Ex “d” and shall be installed so as to maintain the specified degree of protection (IP Code) according to the environmental conditions. IP must be at least IP54.

Control Drawing for FM (US) intrinsically safe approval (4 - 20 mA type)

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A61	Page	01	Revision	1	Date	2017-08-18

Control Drawing (US)

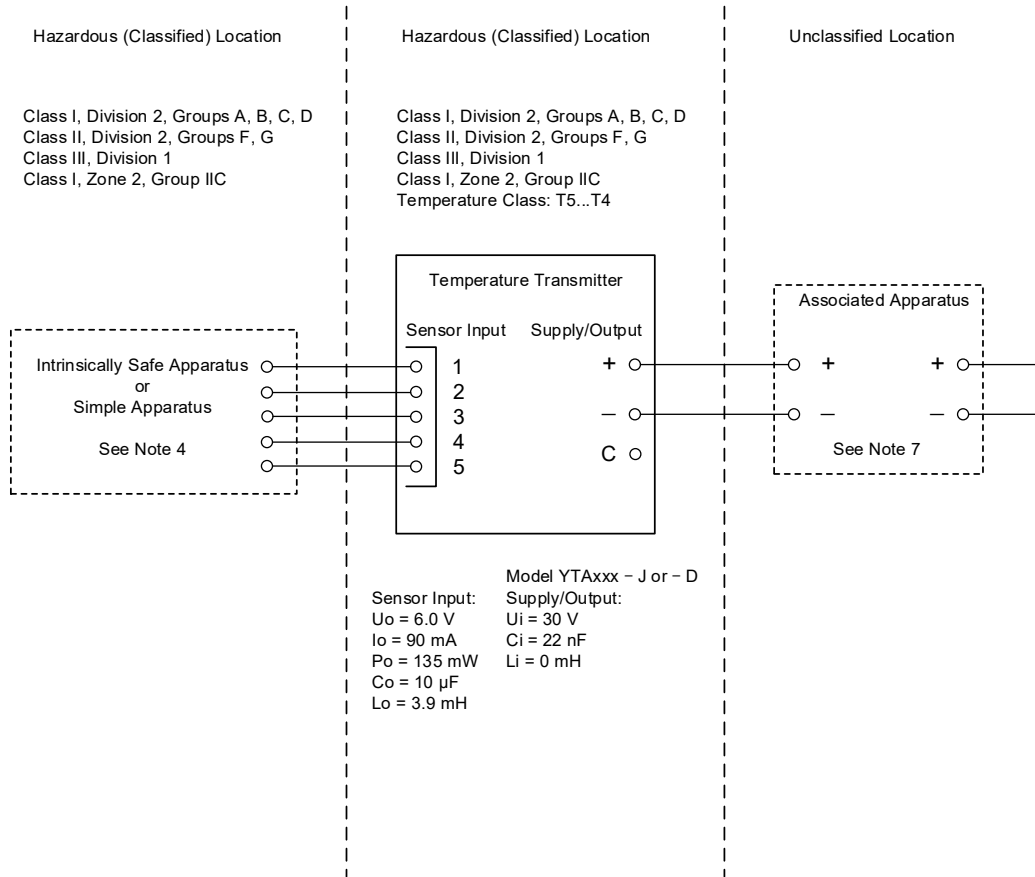
Intrinsically Safe Installation for YTAxxx – J or – D



Control Drawing for FM (US) Division 2 installation (4 - 20 mA type)

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A61	Page	02	Revision	1	Date	2017-08-18

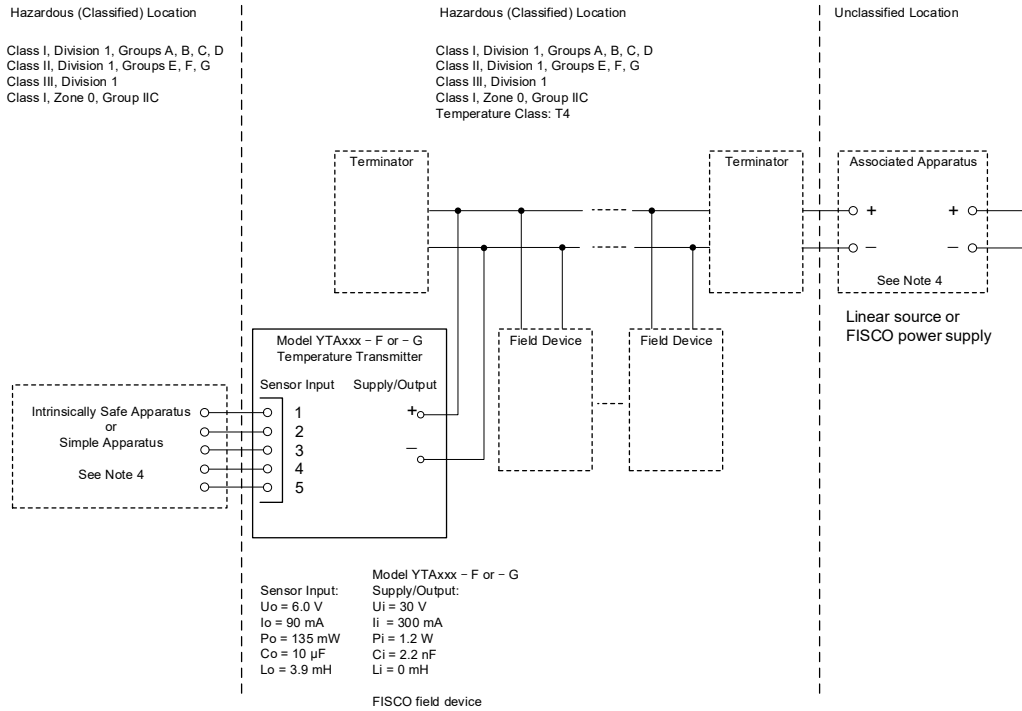
Division 2 Installation for YTAxxx – J or – D



Control Drawing for FM (US) intrinsically safe approval (Fieldbus type)

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A61	Page	03	Revision	1	Date	2017-08-18

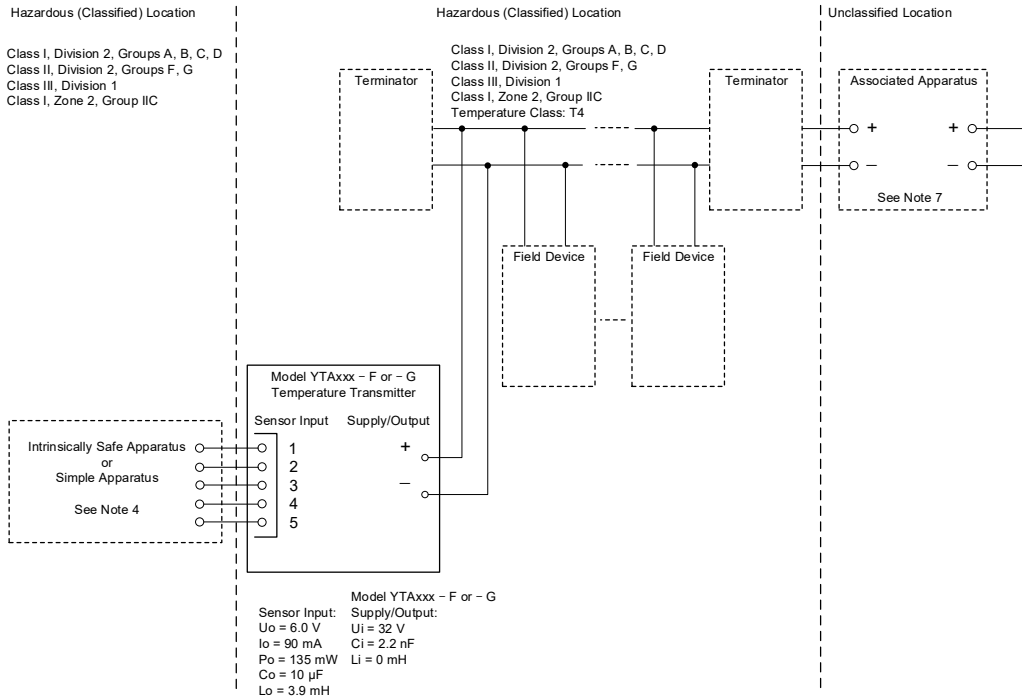
Intrinsically Safe Installation for YTAxxx – F or – G



Control Drawing for FM (US) Division 2 installation (Fieldbus type)

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A61	Page	04	Revision	2	Date	2017-08-18

Division 2 Installation for YTAxxx – F or – G



**Control Drowing for FM (US) intrinsically safe approval/non-incendive approval
(4 - 20 mA & Fieldbus type)**

Yokogawa Electric Corporation				Model	YTAxxx		
Title	Control Drawing						
No.	IIE029-A61	Page	05	Revision	1	Date	2017-08-18

Specific Conditions of Use:

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- When the enclosure of the Temperature Transmitter is made of aluminum alloy, if it is mounted in Zone 0, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

Notes:

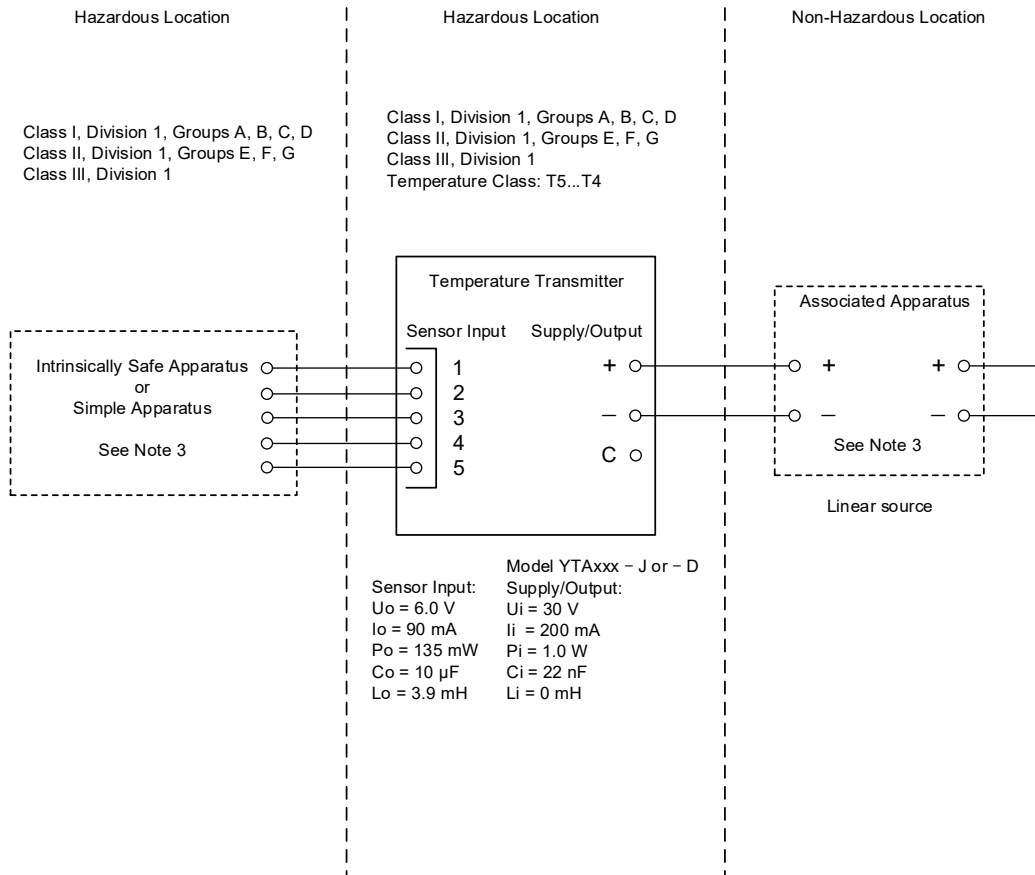
1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electric Code (NFPA70), ANSI/ISA-RP12.06.01, and relevant local codes.
3. The Associated Apparatus must be FM-approved.
4. The following conditions must be satisfied for each circuit.
 - $V_{oc} \text{ (or } U_o) \leq U_i$
 - $I_{sc} \text{ (or } I_o) \leq I_i$
 - $P_o \leq P_i$
 - $C_a \text{ (or } C_o) \geq C_i + C_{cable}$
 - $L_a \text{ (or } L_o) \geq L_i + L_{cable}$
5. Control equipment connected to the Associated Apparatus must not use or generate a voltage more than U_m of the Associated Apparatus.
6. The control drawing of the Associated Apparatus must be followed when installing the equipment.
7. In case Nonincendive Field Wiring Concept is used for the interconnection, FM-approved Associated Nonincendive Field Wiring Apparatus, which meets the following conditions, must be used as the Power Supply / Control Equipment.
 - $V_{oc} \text{ (or } U_o) \leq U_i$
 - $C_a \text{ (or } C_o) \geq C_i + C_{cable}$
 - $L_a \text{ (or } L_o) \geq L_i + L_{cable}$
8. The surge absorber F9220AR can be removed from, or added to the equipment.
9. Dust-tight conduit seals must be used when installed in Class II or Class III environments.
10. FISCO/FNICO installation must be in accordance with ANSI/ISA-60079-25.
11. The terminator(s) must be FM approved.
12. WARNING –ELECTROSTATIC CHARGE MAY CAUSE AN EXPLOSION HAZARD. AVOID ANY ACTIONS THAT CAUSE THE GENERATION OF ELECTROSTATIC CHARGE, SUCH AS RUBBING WITH A DRY CLOTH ON COATING FACE OF THE PRODUCT.
13. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY AND SUITABILITY FOR HAZARDOUS LOCATIONS

Control Drawing for FM (Canada) intrinsically safe approval (4 - 20mA type)

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A62	Page	01	Revision	1	Date	2017-08-18

Control Drawing (Canada)

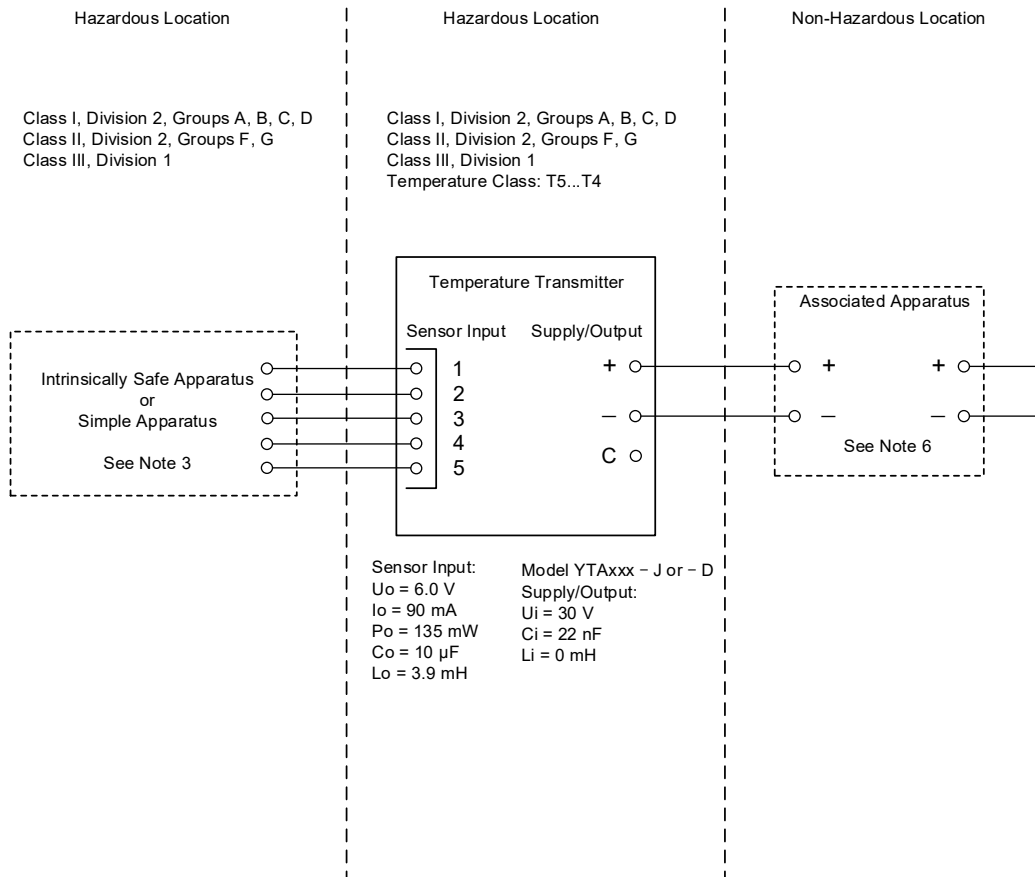
Intrinsically Safe Installation for YTAxxx – J or – D



Control Drawing for FM (Canada) Division 2 installation (4 - 20 mA type)

Yokogawa Electric Corporation			Model		YTAxxx		
Title	Control Drawing						
No.	IIE029-A62	Page	02	Revision	1	Date	2017-08-18

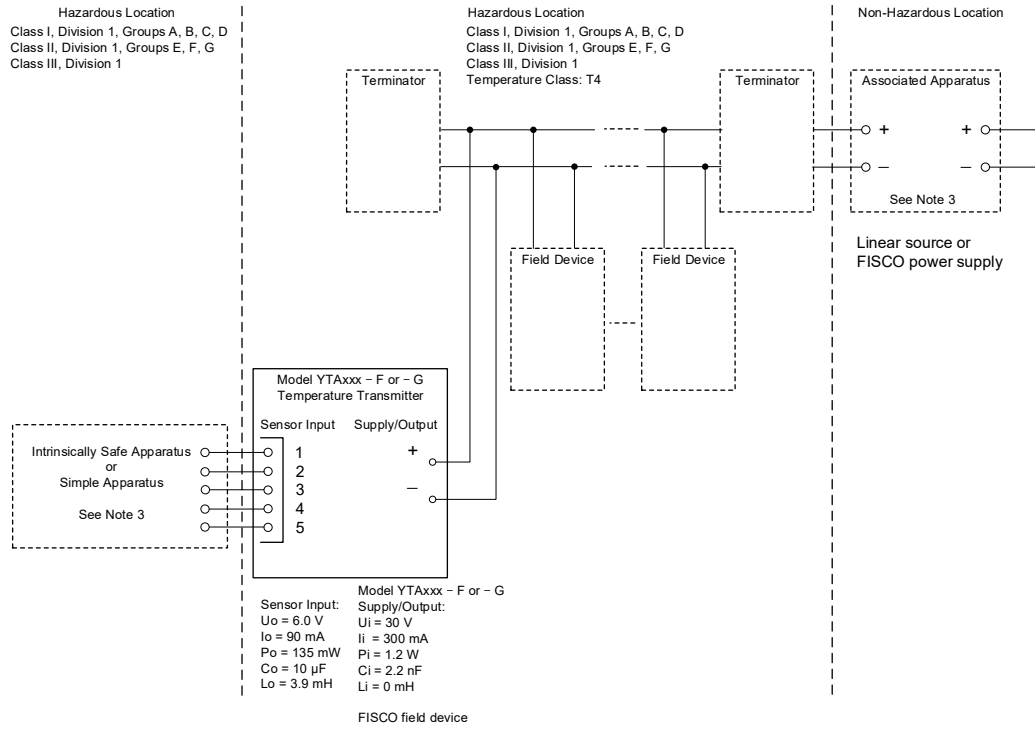
Division 2 Installation for YTAxxx – J or – D



Control Drawing for FM (Canada) intrinsically safe approval (Fieldbus type)

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A62	Page	03	Revision	1	Date	2017-08-18

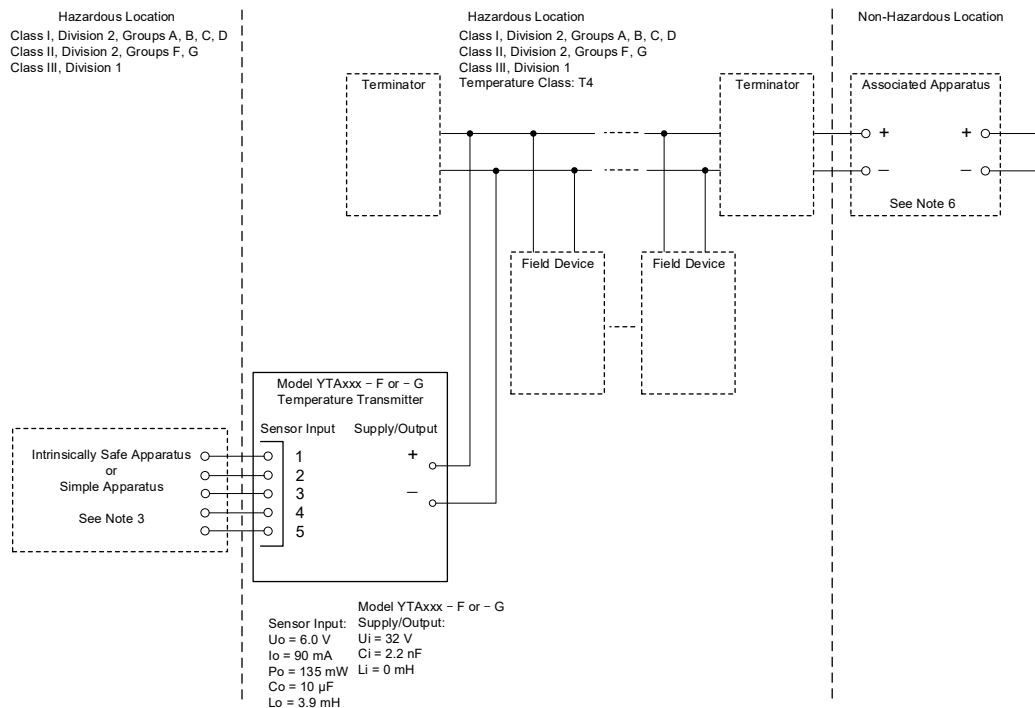
Intrinsically Safe Installation for YTAxxx – F or – G



Control Drawing for FM (Canada) Division 2 installation (Fieldbus type)

Yokogawa Electric Corporation		Model		YTAxxx			
Title	Control Drawing						
No.	IIE029-A62	Page	04	Revision	2	Date	2017-08-18

Division 2 Installation for YTAxxx – F or – G



**Control Drawings for FM (Canada) intrinsically safe approval/non-incendive approval
(4 - 20 mA & Fieldbus type)**

Yokogawa Electric Corporation			Model	YTAxxx			
Title	Control Drawing						
No.	IIE029-A62	Page	05	Revision	1	Date	2017-08-18

Specific Condition of Use:

- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the Temperature Transmitter shall be avoided.
- When the enclosure of the Temperature Transmitter is made of aluminum alloy, if it is mounted in Zone 0, it must be installed such that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.
- The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

Notes:

1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the Canadian Electrical Code Part I (C22.1), ANSI/ISA RP12.06.01, and relevant local codes.
3. The following conditions must be satisfied for each circuit.
 - $V_{oc} \text{ (or } U_o) \leq U_i$
 - $I_{sc} \text{ (or } I_o) \leq I_i$
 - $P_o \leq P_i$
 - $C_a \text{ (or } C_o) \geq C_i + C_{cable}$
 - $L_a \text{ (or } L_o) \geq L_i + L_{cable}$
4. Control equipment connected to the Associated Apparatus must not use or generate a voltage more than U_m of the Associated Apparatus.
5. The control drawing of the Associated Apparatus must be followed when installing the equipment.
6. In case Nonincendive Field Wiring Concept is used for the interconnection, Nonincendive Field Wiring Apparatus, which meets the following conditions, must be used as the Power Supply / Control Equipment.
 - $V_{oc} \text{ (or } U_o) \leq U_i$
 - $C_a \text{ (or } C_o) \geq C_i + C_{cable}$
 - $L_a \text{ (or } L_o) \geq L_i + L_{cable}$
7. The surge absorber F9220AR can be removed from, or added to the equipment.
8. Dust-tight conduit seal must be used when installed in Class II and Class III environments.
9. FISCO/FNICO installation must be in accordance with CAN/CSA-C22.2 No. 60079-25.
10. WARNING –ELECTROSTATIC CHARGE MAY CAUSE AN EXPLOSION HAZARD. AVOID ANY ACTIONS THAT CAUSE THE GENERATION OF ELECTROSTATIC CHARGE, SUCH AS RUBBING WITH A DRY CLOTH ON COATING FACE OF THE PRODUCT.
11. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY AND SUITABILITY FOR HAZARDOUS LOCATIONS

2.8 EMC Conformity Standards

EN61326-1 Class A, Table 2

EN61326-2-3

EN61326-2-5 (for Fieldbus)

Immunity influence during the test:

Output shift is specified within $\pm 1\%$ of full span.



CAUTION

This instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.



NOTE

YOKOGAWA recommends customer to apply the Metal Conduit Wiring or to use the twisted pair Shield Cable for signal wiring to conform the requirement of EMC Regulation, when customer installs the YTA Transmitter to the plant.

2.9 Safety Requirement Standards

EN61010-1, C22.2 No.61010-1

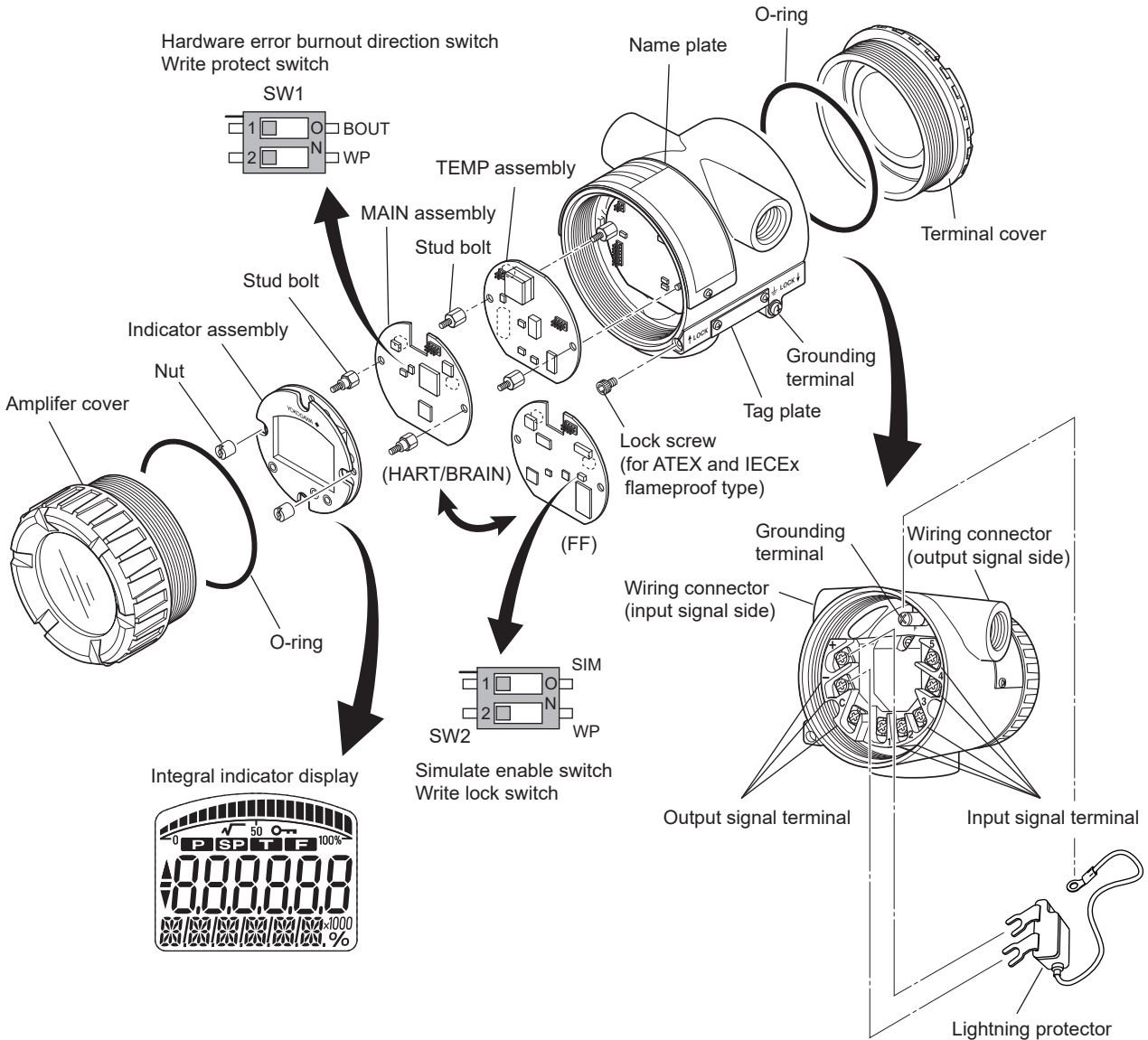
- Altitude of installation site: Max. 2,000 m above sea level
- Installation category: I
(Anticipated transient overvoltage 330 V)
- Pollution degree: 2
- Indoor/Outdoor use

EN61010-2-030, C22.2 No.61010-2-030

- Measurement category: O(Other)
(Measurement Input voltage: 150mVdc max)

3. Part Names and Functions

3.1 Part Names



F0301.ai

Figure 3.1 Part Names

3.2 Hardware Error Burnout and Hardware Write Protect Switch (HART/BRAIN)

There are two slide switches on the MAIN assembly board. One sets the hardware error burnout direction, and the other sets a hardware write protection function which disables parameter changes through the use of a handheld terminal or some other communication method.

The temperature transmitter is equipped with a hardware error burnout function used to set the output direction upon hardware error, and a sensor burnout function that sets the direction of the output in the event of burnout of the temperature sensor. When factory-shipped under standard specification or suffix code /C3, the output of both hardware error burnout and sensor burnout are set to HIGH, but if suffix code /C1 or /C2 is specified, the hardware error burnout is set to LOW (-5%) output, and sensor burnout is set to LOW (-2.5%) output, respectively. The setting of the direction of output from burnout can be changed.

To change the direction of output arising from burnout, set the switch on the MAIN assembly (see Figure 3.1 and Table 3.1). To change the direction of output arising out of sensor burnout, a dedicated hand-held terminal is required to rewrite the parameters within the transmitter.

For details, refer to the separate instruction manual, IM 01C50T01-02EN “HART Protocol” or IM 01C50T03-02EN “BRAIn Protocol”.



NOTE

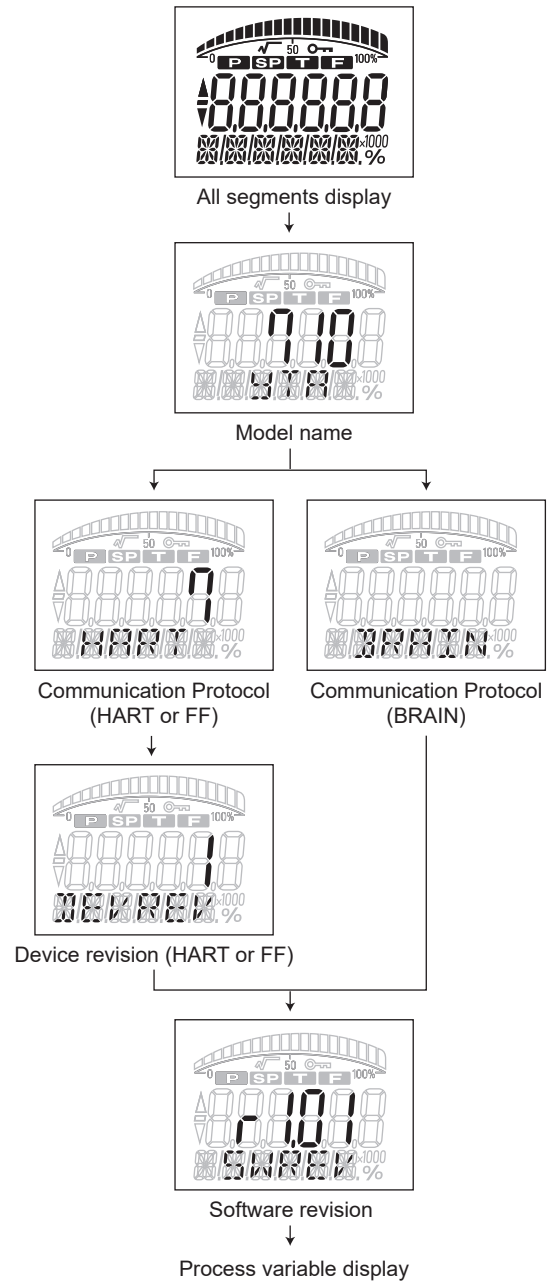
1. Turn off the power supply before changing the switches
2. To change the switches, it is necessary to remove the integral indicator assembly. Refer to “ 6.3.1 Replacement of Integral Indicator” about the procedures.

Table 3.1 Burnout Direction and Hardware Write Protect Switch

Burnout direction (BOUT) and hardware write protect (WP) switch position	SW1	SW1
Hardware error burnout direction	HIGH	LOW
Hardware error burnout output	110% or more (21.6 mA DC)	-5% or less (3.2 mA DC)
Remark	Set to HIGH when standard specification or suffix code /C3 is provided	Set to LOW when suffix code /C1 or /C2 is provided
Hardware write protect switch	OFF Write enabled	ON Write disabled

3.3 Integral Indicator Display Function

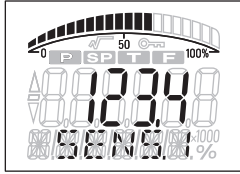
(1) Integral Indicator Display When Powering On



F0302.ai

(2) Process Variable Display

Process variables that can be displayed in YTA are shown in the Table 3.2. A cycle of up to four displays can be shown by assigning variables to the parameters. Indicates values of process variables with the indication limits -99999 to 99999.



F0303.ai

Table 3.2 Process Variable Display

Process variable	HART	BRAIN	FF
Sensor1	✓	—	✓
Sensor1 - Terminal	✓	—	✓
Terminal	✓	—	✓
Sensor2	✓	—	✓
Sensor2 - Terminal	✓	—	✓
Sensor1 - Sensor2	✓	—	✓
Sensor2 - Sensor1	✓	—	✓
Sensor Average	✓	—	✓
Sensor Backup	✓	—	✓
PV	✓	✓	—
SV	✓	✓	—
TV	✓	✓	—
QV	✓	✓	—
% of RANG	✓	✓	—
mA of RANGE	✓	✓	—
AI1	—	—	✓
AI2	—	—	✓
AI3	—	—	✓
AI4	—	—	✓

3.4 Local Parameter Setting



WARNING

The local push button on the integral indicator must not be used in a hazardous area. When it is necessary to use the push button, operate it in a non-hazardous location.



IMPORTANT

- Do not turn off the power to the temperature transmitter immediately after performing parameter setting. Powering off within 30 seconds of performing this procedure will return the parameter to its previous setting.
- LCD update will be slower at low ambient temperature, and it is recommended to use LPS function at temperatures above -10 degrees C.
- To implement local parameter settings, it is necessary to turn off the software Write protect and the hardware write protect switch on the MAIN assembly.

3.4.1 Local Parameter Setting (LPS) Overview

Parameter configuration by the 3 push button on the integral indicator offers easy and quick setup for parameters of Tag number, Unit, PV Damping, Display out 1, and etc. There is no effect on measurement signal (analog output or communication signal) when Local Parameter Setting is carried out.

Table 3.3 Action

Action	Operation
Activate	Push ▲ or ▼ button
Move	Push ▲ or ▼ button
Edit	Push SET button
Save	After parameter setting → Push SET button → "SAVE?" → Push SET button → "SAVED" If "FAILED" appear, retry or check the specifications.
Cancel	After parameter setting → Push SET button → "SAVE?" → Push ▲ or ▼ button → "CANCL?" → Push SET button → "CANCLD"
Abort	Hold down the SET button for over 2 seconds → "ABORT" and move to the process measurement display
Exit	Push ▲ button (When the first parameter is selected) or Push ▼ button (When the last parameter is selected)
Time out	no operation for 10 minutes

Table 3.4 Parameters List (HART)

Write Mode: RW=read/write, R=read only

Item	Indicator Display	Write Mode	Setting Type	Remarks
Tag number	TAG	RW	Character	up to 8 characters
Long tag number	LNG.TAG	RW	Character	up to 32 characters
PV unit	PV.UNIT	RW	Selection	K, °C, °F, °R, mV, ohm, mA, %, NOUNIT
PV damping time constant	PV.DAMP	RW	Numeric	0.00 to 100.00 seconds
Sensor 1 type	S1.TYPE	RW	Selection	mv, ohm, Pt100, JPt100, Pt200, Pt500, Pt1000, Cu10, Ni120, TYPE.B, TYPE.E, TYPE.J, TYPE.K, TYPE.N, TYPE.R, TYPE.S, TYPE.T, TYPE.L, TYPE.U, TYPE.W3, TYPE.C, USR. TBL, NO.CNCT, S.MATCH
Sensor 1 wire	S1.WIRE	RW	Selection	2, 3, 4
Sensor 2 type	S2.TYPE	RW	Selection	same as sensor1 type
Sensor 2 wire	S2.WIRE	RW	Selection	same as sensor1 wire
PV lower range	PV LRV	RW	Numeric	
PV upper range	PV URV	RW	Numeric	
Sensor burnout direction	BUN.DIR	RW	Selection	HIGH, LOW, USER, OFF
Sensor burnout value (mA)	BUN mA	RW	Numeric	3.6 to 21.6 mA
Sensor burnout value (%)	BUN %	RW	Numeric	-2.5 to 110%
Display out 1	DISP.1	RW	Selection	SENS.1, S.1-TER., TERM, SENS.2, S.2 - TER., S.1 - S.2, S2 - S.1, AVG, BACKUP, PV, SV, TV, QV, OUT %, OUT.mA
Write protect	WRT.PRT	RW	Selection, Character	ON, OFF, Up to 8 Characters
Model	MODEL	R	—	
HART revision	HART	R	—	
Device revision	DEV.REV	R	—	
Software revision	SW.REV	R	—	

Table 3.5 Parameters List (FF)

Write Mode: RW=read/write, R=read only

Item	Indicator Display	Write Mode	Setting Type	Remarks
PD TAG	PD.TAG	R	—	
Disp Out 1	DISP.1	RW	Selection	SENS.1, S.1-TER., TERM, SENS.2, S.2 - TER., S.1 - S.2, S2 - S.1, AVG, BACKUP, AI1.OUT, AI2.OUT, AI3.OUT, AI4.OUT
Local Write Lock	HW.LOCK	RW	Selection, Character	ON, OFF, Up to 8 Characters
Simulation	HW SIM	RW	Selection	ON, OFF
Model	MODEL	R	—	
Dev Rev	DEV.REV.	R	—	
Software Rev	SW.REV	R	—	

Table 3.6 Parameters List (BRAIN)

Write Mode: RW=read/write, R=read only

Item	Indicator Display	Write Mode	Setting Type	Remarks
Tag number	TAG	RW	Character	up to 16 characters
PV unit	PV.UNIT	RW	Selection	K, °C, °F, °R, mV, ohms, mA, %, NOUNIT
PV damping time constant	PV.DAMP	RW	Selection	0,1,2,....,100 seconds
Sensor 1 type	S1.TYPE	RW	Selection	TYPE.B, TYPE.E, TYPE.J, TYPE.K, TYPE.N, TYPE.R, TYPE.S, TYPE.T, TYPE.C, TYPE.W3, TYPE.L, TYPE.U, Pt100, Pt200, Pt500, Pt1000, JPt100, Ni120, Cu10, S.MATCH, ohms, mV, NO.CNCT
Sensor 1 wire	S1.WIRE	RW	Selection	2, 3, 4
Sensor 2 type	S2.TYPE	RW	Selection	same as sensor1 type
Sensor 2 wire	S2.WIRE	RW	Selection	same as sensor1 wire
PV lower range	PV LRV	RW	Numeric	
PV upper range	PV URV	RW	Numeric	
Sensor burnout direction	BUN.DIR	RW	Selection	HIGH, LOW, USER, OFF
Sensor burnout value (mA)	BUN mA	RW	Numeric	3.6 to 21.6 mA
Sensor burnout value (%)	BUN %	RW	Numeric	-2.5 to 110%
Display out 1	DISP.1	RW	Selection	PV, SV, TV, QV
Write protect	WRT.PRT	RW	Selection, Character	ON, OFF, Up to 8 Characters
Model	MODEL	R	—	
Software revision	SW.REV	R	—	

3.4.2 Parameters Configuration

(1) Activating Local Parameter Setting

Push the ▲ or ▼ button on the integral indicator to activate the local parameter setting mode. The transmitter will exit automatically from the local parameter setting mode if no operation is carried out for 10 minutes.

(2) Parameter Setting Review

▼ As you press the button, you will be shown in the order of the Parameter list in each communication table.

Press ▲ to back to previous Parameter.

Press ▲ on the first Parameter or ▼ on the last Parameter to back to the process value display screen.

(3) Character Configuration

Character parameter → Push SET button → Change the first character by pushing ▲/▼ button → Push SET button to go to the second character → Change the second character by pushing ▲/▼ button → Set all other characters in the same way → Hold down the SET button → “SAVE?” → Push SET button → “SAVED”

(4) Selection Configuration

Selection parameter → Push SET button → Use ▲/▼ button to select → Push SET button → “SAVE?” → Push SET button → “SAVED”

(5) Numeric Configuration

Numeric parameter → Push SET button → Change the first digit by pushing ▲/▼ button → Push SET button to go to the second digit → Change the second figure by pushing ▲/▼ button → Set all other digits in the same way → Hold down the SET button → “SAVE?” → Push SET button → “SAVED”

Available numbers

Number of digits	Selection	Remarks
1	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, -9, -8, -7, -6, -5, -4, -3, -2, -1, -0	Determine plus and minus in the first digit. Return cannot be selected. In case of integer a minus cannot be selected.
2 to 5	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, Dot(.), r*	A dot uses a one digit. Two dots cannot use. In case of integer a dot cannot be selected.
6	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, r*	

*: Press the SET button at the time of r display, one digit will return.

(6) Selection, Character Configuration

Select the Selection Character parameter to display the current status.

Press the SET button to enter the character configuration.

See 3. Character Configuration.

(7) Parameter Setting Lock

To disable parameter changes by the local parameter setting there are two different ways.

- Communication parameter write protect = On
- Hardware write protection switch on MAIN assembly = ON

Reviewing local parameter setting by push button on the integral indicator is available at any time even when the local parameter setting is locked.

4. Installation



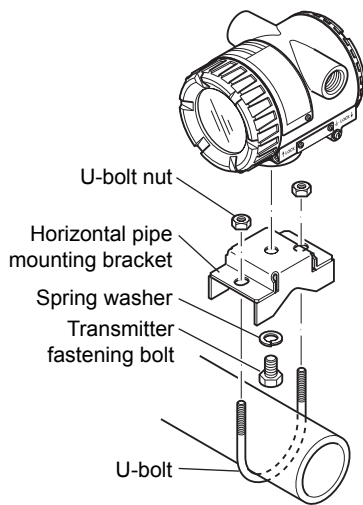
IMPORTANT

- When performing on-site pipe fitting work that involves welding, use care to prevent outflow of the welding current into the transmitter.
- Do not use the transmitter as a foothold for installation.

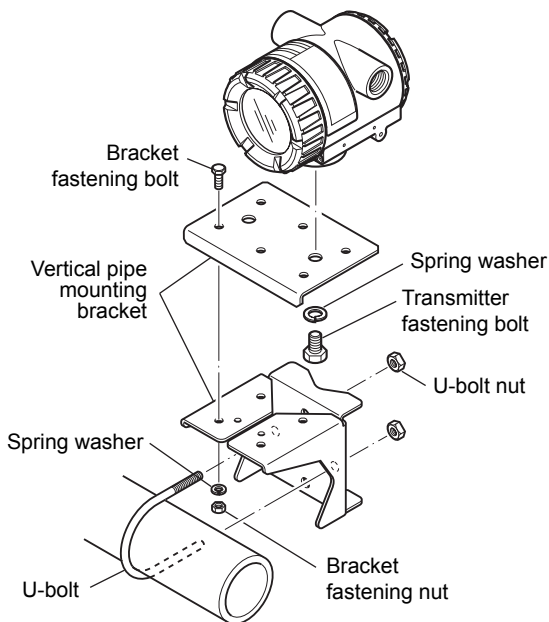
- For details of choosing the installation location, refer to the guidelines outlined in Section 2.4, "Choosing the installation location".
- The mounting bracket shown in Figure 4.1 is used for the transmitter and is installed on 50A (2B) pipe. It can be installed either on a horizontal pipe and a vertical pipe or on a wall.
- To install the mounting bracket on the transmitter, torque the transmitter lock screw to about 20 to 30N•m.

Horizontal Pipe Mounting

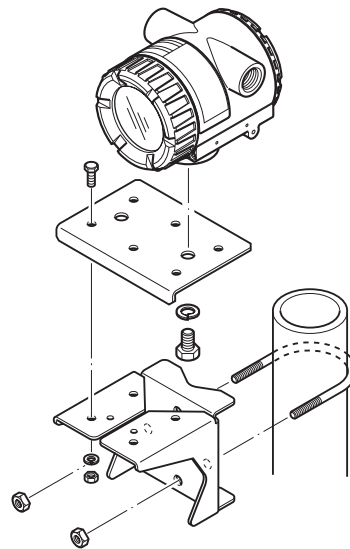
- When using a horizontal pipe mounting bracket



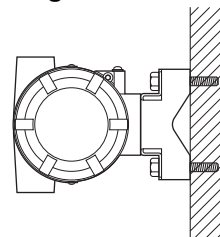
- When using a vertical pipe mounting bracket



Vertical Pipe Mounting



Wall Mounting



Note: Wall mounting bolts are user-supplied.

Figure 4.1 Mounting the Transmitter

F0401.ai

5. Wiring

5.1 Notes on Wiring



IMPORTANT

- Apply a waterproofing sealant to the threads of the connection port. (It is recommended that you use non-hardening sealant made of silicon resin for waterproofing.)
- Lay wiring as far away as possible from electrical noise sources such as large transformers, motors and power supplies.
- Remove the wiring connection dust-caps before wiring.
- To prevent electrical noise, the signal cable and the power cable must not be housed in the same conduit.
- The terminal box cover is locked by an Allen head bolt (a shrouding bolt) on ATEX and IECEx flameproof type transmitters. When the shrouding bolt is driven clockwise by an Allen wrench, it is going in and cover lock is released, and then the cove can be opened by hands. See Subsection 6.3 "Disassembly and Assembly" for details.

5.2 Loop Construction

The YTA temperature transmitter is a two-wire temperature transmitter that uses the output power supply wiring and signal wiring alternately.

The transmission loop requires DC power. Connect the transmitter with the distributor as shown in Figure 5.1.

For the transmission loop, the load resistance of the distributor or other instrument to be installed in the loop and the lead wire must be within the range shown in Figure 5.2.

For details of communication requirements, refer to the additional reference materials, IM 01C50T01-02EN "YTA610 and YTA710 Temperature Transmitter (HART Protocol)" and IM 01C50T03-02EN "YTA710 Temperature Transmitter Functions (BRAIN Protocol)".

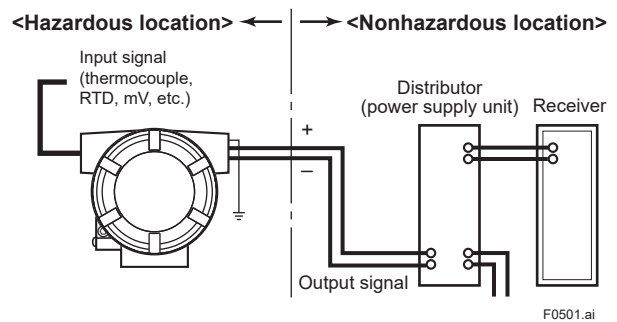


Figure 5.1 Loop Construction (for General-use Type and Flameproof Type)

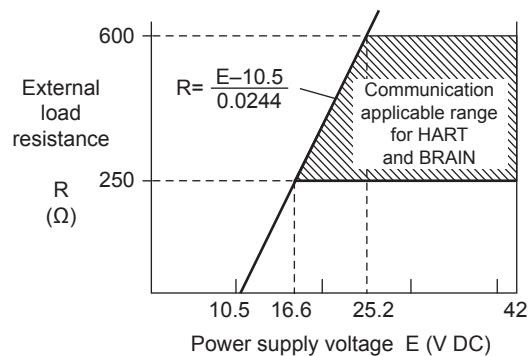


Figure 5.2 Relation Between Power Supply Voltage and External Load Resistance

Note: For intrinsic safe explosion-proof type units, the internal resistance of the safety barrier is also included in the load resistance.

5.3 Cable Selection

5.3.1 Input signal Cable Selection

A dedicated cable is used for connection between the temperature sensor and the temperature transmitter.

When a thermocouple is used as the temperature sensor, a compensation wire must be used that it appropriate for the type of thermocouple (refer to compensating cables for JIS C 1610/IEC60584-3 thermocouples). When a RTD is used as the temperature sensor, 2-core/3-core/4-core cable must be used (refer to JIS C 1604/IEC60751). The terminal of the dedicated cable is a 4 mm screw.

5.3.2 Output Signal Cable Selection

- With regard to the type of wire to be used for wiring, use twisted wires or cables with performance equivalent of 600V vinyl insulated cable (JIS C3307).
- For wiring in areas susceptible to electrical noise, use shielded wires.
- For wiring in high or low temperature areas, use wires or cables suitable for such temperatures.
- For use in an atmosphere where harmful gases or liquids, oil, or solvents are present, use wires or cables made of materials resistant to those substances.
- It is recommended that a self-sealing terminal with insulation sleeve (4-mm screw) be used for lead wire ends.

5.4 Cable and Terminal Connections

5.4.1 Input Terminal Connections



NOTE

Turn off the power when installing the sensor. Please make sure that the sensor will not affect the host system in case not turning off the power.



NOTE

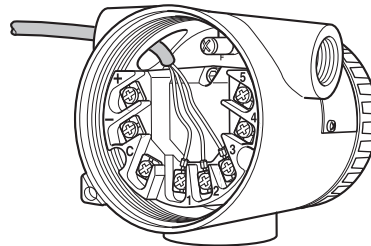
It is recommended that the terminals be connected in the order of STEP 1 and STEP 2.



CAUTION

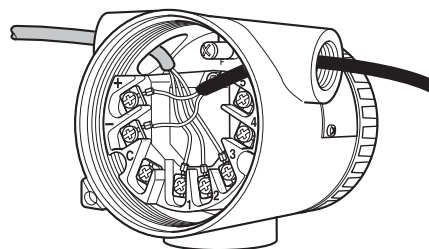
When wiring, pay attention not to damage the cable and cores. All the cores of the cable must have the sufficient insulation around them.

STEP 1
(1)



a. Cable connection to RTD 3-wire

STEP 2
(2)

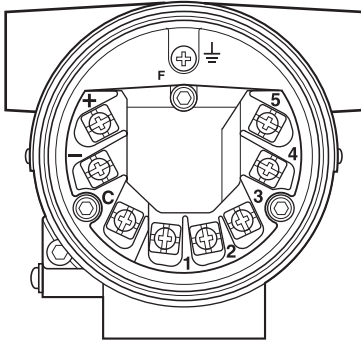


b. Output signal cable connection

F0503.ai

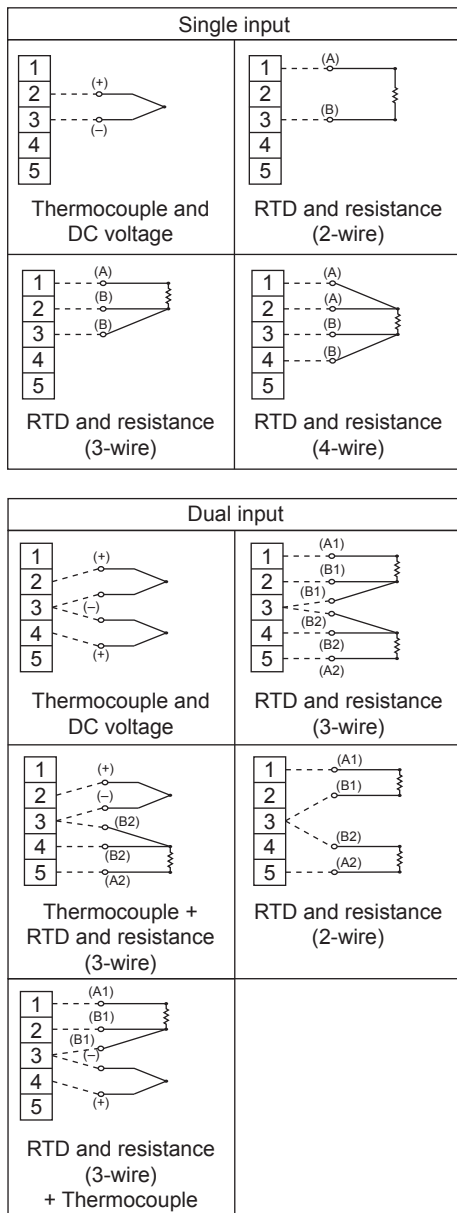
Figure 5.3 Terminal Connection Procedure

- The temperature sensor is to be connected as shown in Figures 5.5.



F0504.ai

Figure 5.4 Terminal Diagram



F0505.ai

Figure 5.5 Wiring Connection Diagram

5.4.2 Output Terminal Connection

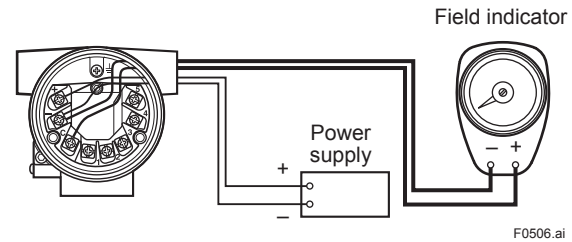
(1) Connection of output signal/power supply cable

Connect the output signal cable (shared with the power supply cable) to the – terminal and the + terminal. For details, refer to Figure 5.1, “Loop construction”.

(2) Connection of wiring for field indicator

Connect the lead wire for the field indicator with the – terminal and the C terminal.

Note: Use a field indicator with an internal resistance of 10Ω or less.



F0506.ai

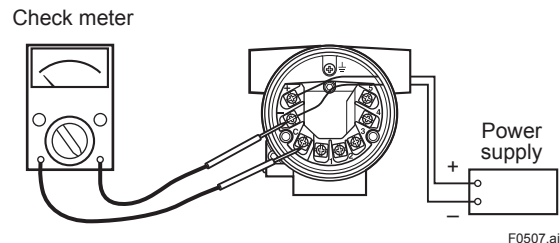
Figure 5.6 Connection to Field Indicator

(3) Connection of check meter

Connect the check meter with the – terminal and the C terminal.

The current signal of output signal 4 to 20 mA DC is output from the – terminal and the C terminal.

Note: Use a check meter with internal resistance of 10Ω or less.



F0507.ai

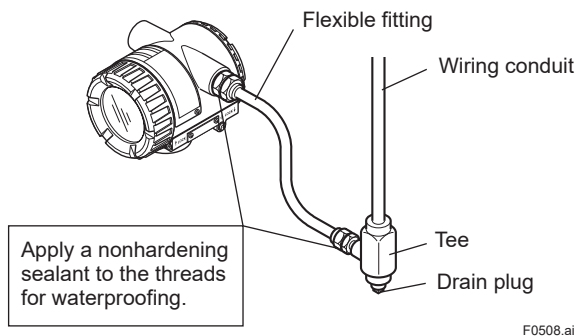
Figure 5.7 Check Meter Connection

5.5 Wiring Cautions

(1) General-use Type and Intrinsically Safe Type

Use metal conduit wiring or a waterproof gland (metal wiring conduit JIS F 8801) for cable wiring.

- Apply nonhardening sealant to the threads of the wiring tap and a flexible fitting for secure waterproofing. Figure 5.8 shows an example of wiring on the output side. This example also applies to the wiring on the input side.



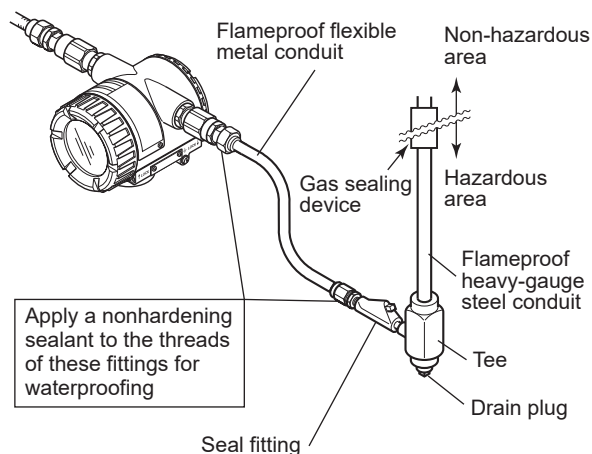
F0508.ai

Figure 5.8 Example of Wiring Using a Wiring Conduit

(2) Flameproof Type

Wire cables through a flameproof packing adapter, or using a flameproof metal conduit.

- A seal fitting must be installed near the terminal box connection port for a sealed construction.
- Apply a nonhardening sealant to the threads of the terminal box connection port, flexible metal conduit and seal fitting for waterproofing.



(After wiring, impregnate the fitting with a compound to seal tubing.)

F0509.ai

Figure 5.9 Typical Wiring Using Flameproof Metal Conduit

5.6 Grounding

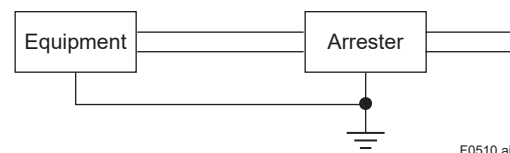
Grounding is always required for the proper operation of transmitters. Follow the domestic electrical requirements as regulated in each country. For a transmitter with a lightning protector, grounding should satisfy ground resistance of 10Ω or less.

Ground terminals are located on the inside and outside of the terminal box. Either of these terminals may be used.

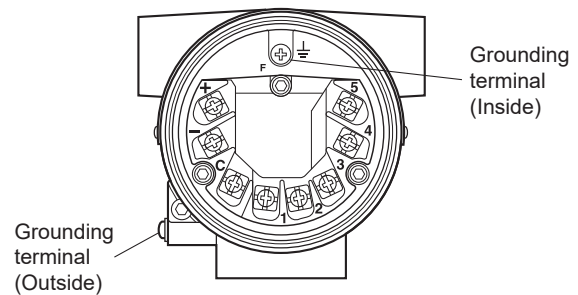


CAUTION

To use an external arrester, carry out the interlocked grounding as shown below, and perform grounding work (ground resistance: 10Ω or less) in the arrester side.



F0510.ai



F0511.ai

Figure 5.10 Grounding Terminal

6. Maintenance

6.1 General

Each component of this instrument is configured in units to make maintenance easier.

This chapter contains disassembly and assembly procedures associated with calibration, adjustment and part replacement required for maintenance of the affected instrument.



IMPORTANT

1. Maintenance of this instrument should be performed in a service shop where the necessary tools are provided.
2. Handling the MAIN and Indicator assembly
Some of the parts contained in the MAIN and Indicator assembly are susceptible to static electricity damage. Before performing maintenance, use a ground wrist band or other antistatic measures, and avoid touching the electronic components and circuits with bare hands.

6.2 Calibration

This instrument is fully factory-tested and is guaranteed for the intended accuracy, eliminating the need for calibration. When calibration needs to be verified, the following equipment and calibration procedure is recommended.

6.2.1 Selection of Equipment for Calibration

Table 6.1 lists the equipment required for calibration. The calibration equipment traceable to a verifying agency standard should be used.

Table 6.1 Calibration Equipment List

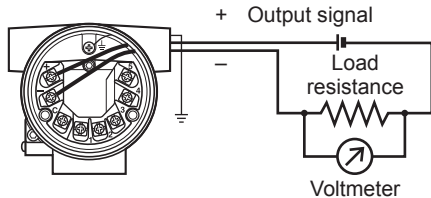
Name	Recommended	Remark
Power supply	SDBT, SDBS distributor	4 to 20mA DC (Output voltage: 26.5±1.5V DC, drop by internal 250Ω resistance included)
Load resistance	2792 standard resistor (250Ω ±0.005%)	For 4 to 20mA DC
Voltmeter		For 4 to 20mA DC signal
Universal calibrator		For calibration of DC voltage and thermocouple
Variable resistor	279301 6-dial variable resistor (accuracy: ±(0.01% of rdg + 2mΩ))	For calibration of RTD input

6.2.2 Calibration Procedure

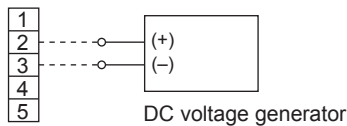
To conduct calibration required to evaluate the uncertainty while using the instrument, follow the steps below:

1. In accordance with the example wiring shown in Figure 6.1, connect each equipment, and warm up for 3 minutes or more. Lay wiring on the input side according to the sensor to be used.

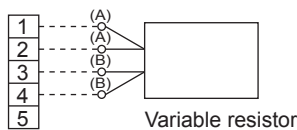
a. Wiring of power supply and output



b. Example of wiring for thermocouple or DC voltage input (when 1 input type is used)



c. Example of wiring for RTD 4-core type (when 1 input type is used)



F0601.ai

Figure 6.1 Example of Wiring for Calibration Equipment

2. For DC voltage input
With a voltage generator, deliver input signals corresponding to 0, 25, 75, or 100% of the input span to the temperature transmitter. Measure the resulting input signal with the voltmeter (digital multimeter) and check the output value relative to the input value.
3. For thermocouple input
Since this instrument is equipped with a reference junction compensating function, use a reference junction compensating function in universal calibrator in order to compensate for this function upon calibration. According to the reference millivolt table for thermocouple, obtain millivolt corresponding to 0, 25, 50, 75, or 100% of the span, and use that power as the input value, then deliver it from the universal calibrator to the temperature transmitter. Measure the resulting output signal with the voltage meter (digital multimeter) and check the output value relative to the input value.

4. RTD

Using a RTD as input, calibration of the temperature transmitter is carried out via a 4-core wire connection.

As defined the reference resistor value table of the RTD, obtain resistance values corresponding to 0, 25, 50, 75 or 100% of the span, and use the obtained resistance as the input value, then deliver it to the temperature transmitter by means of a variable resistor. Measure the resulting output signal with the voltmeter (digital multimeter) and check the output value relative to the input value.

5. In Steps 2 through 4, if the output signal deviates from the given range of accuracy when a given input signal is delivered, adjust the output using the handheld terminal. For details of how to adjust the output, refer to the additional reference, "HART Protocol" IM 01C50T01-02EN, or "BRAIN Protocol" IM 01C50T03-02EN and the instruction manual for each terminal.

6.3 Disassembly and Assembly

This section details the procedure for part replacement or disassembly and assembly of each component depending on the maintenance process.

Before starting disassembly and assembly work, turn off the power, and use a tool suited to the associated work.

Table 6.2 lists the tools required for disassembly and assembly of the instrument.

Table 6.2 Tools for Disassembly and Assembly

Tool name	Quantity	Remark
Phillips screwdriver	1	
Standard screwdriver	1	
Hexagonal wrench	1	
Crescent wrench	1	
Torque wrench	1	
Box wrench	1	For M10 screw
Box screwdriver	1	
Forceps	1	

CAUTION

Precautions for ATEX and IECEx Flameproof Type Transmitters

- For a withstand flameproof type transmitter, as a rule, move the transmitter to a non-hazardous location, then proceed with maintenance and restore the instrument to the original condition.
- For a withstand ATEX and IECEx flameproof type transmitter, turn the lock bolt (hexagon socket bolt) clockwise with a wrench for hexagon head, unlock and remove the cover. When installing the cover, it is the must to turn the lock bolt counterclockwise and lock the cover (locked to a torque of 0.7 Nm).
- For a withstand flameproof type transmitter, in no case should the user be allowed to modify the transmitter. Therefore, no user is allowed to add a integral indicator, or use the transmitter with the indicator removed. Contact us for any modification.

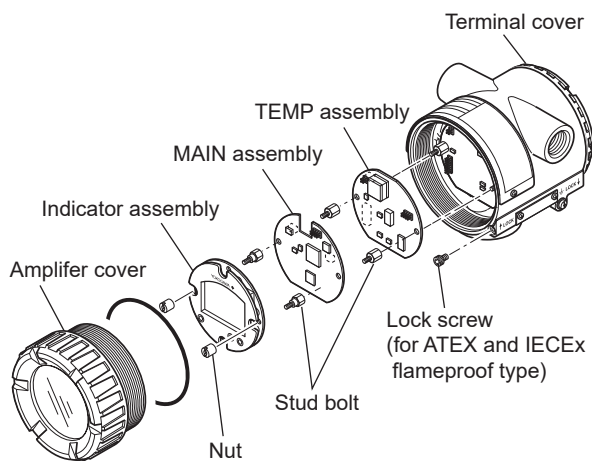


Figure 6.2 Mounting and Removal of Integral Indicator Assembly

F0602.ai

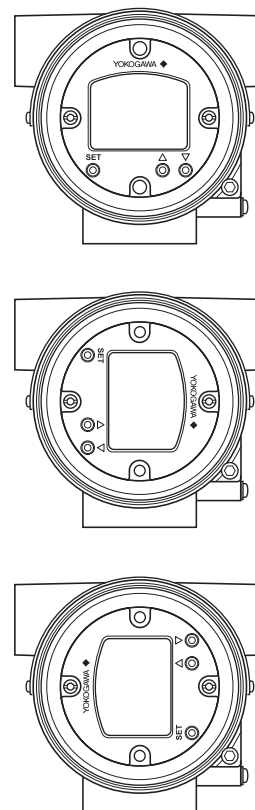
6.3.1 Replacement of Integral Indicator

■ Removal of integral indicator

1. Remove the cover.
2. Remove two nuts while using your hand to support the integral indicator.
3. Remove the indicator assembly from the MAIN assembly. At this time, straighten and pull the indicator assembly forward so that the connector connecting the MAIN assembly and the indicator assembly is not damaged.

■ Mounting the Integral indicator

Integral Indicator can be installed in the following three directions.



F0603.ai

Figure 6.3 Installation Direction of Indicator

1. Place the Indicator assembly in desired direction over the MAIN assembly.
2. Align the mounting hole of the Indicator assembly with the stud bolt hole, and carefully insert the indicator into the connector in a straight manner so that the connector is not damaged.
3. Tighten the two nuts that secure the indicator.
4. Mount the cover.

6.4 Troubleshooting

When the measured value is found abnormal, follow the troubleshooting flowchart below. If the complex nature of the trouble means that the cause cannot be identified using the following flowchart, refer the matter to our service personnel.

6.4.1 Basic Troubleshooting Flow

When the process measurement is found to be abnormal, it is necessary to determine whether the input temperature is out of range, the sensor has failed or being damaged, or the unit has been improperly wired. If it is suspected that the measurement system is the source of the problem, use the flowchart to identify the affected area and determine how to proceed.

In these troubleshooting steps, the self diagnostic function provides helpful solutions to the problem, refer to the instructions in Section 6.5 for details.

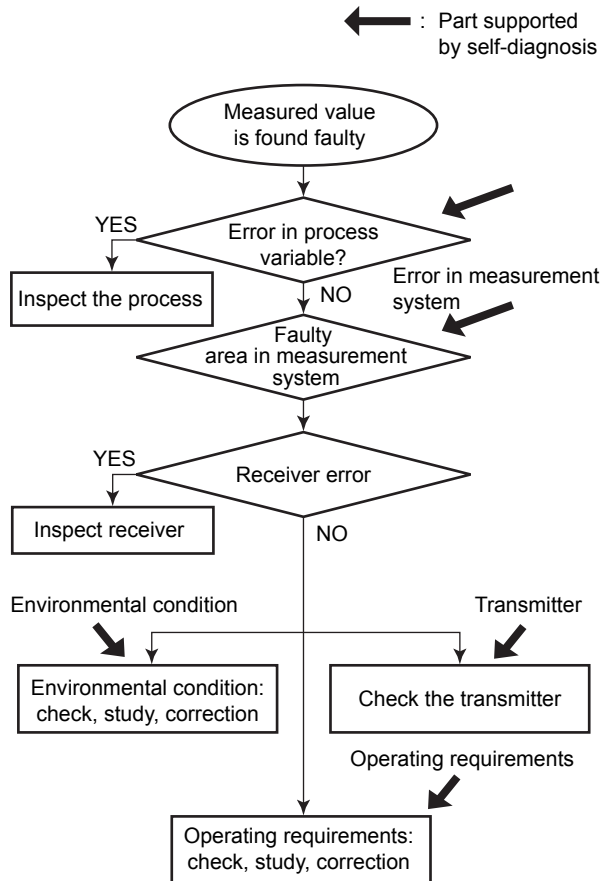


Figure 6.4 Basic Flow and Self-diagnosis

F0604.ai

6.4.2 Example of Troubleshooting Flow

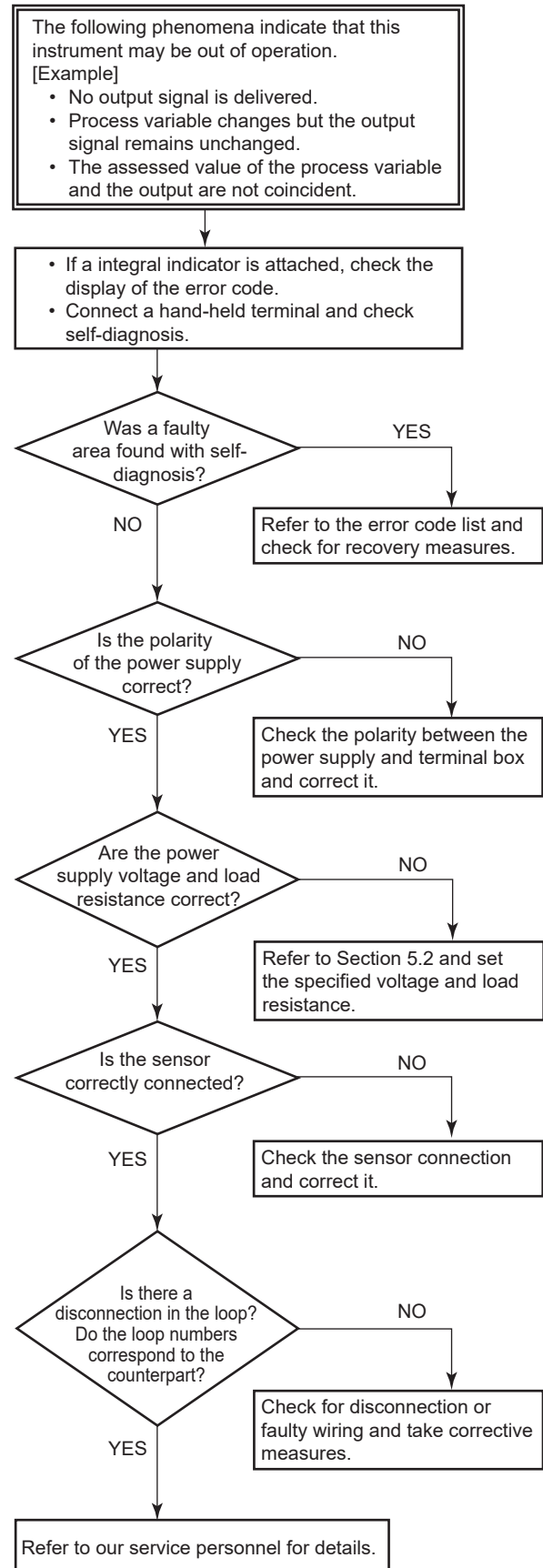


Figure 6.5 Example of Troubleshooting Flow

F0605.ai

Table 6.3 Problems and Causes

Observed Problems	Possible Cause	Related Parameter (HART)	Related Parameter (FF)	Related Parameter (BRAIN)
Output fluctuates greatly.	Span is too narrow.	PV LRV PV URV	—	E10:PV LRV E11:PV URV
	Input adjustment by user was not correctly done.	reset Sensor1(2) Trim	Sensor1 Trim Sensor2 Trim	I16:S1 ADJ CLR I26:S2 ADJ CLR
	Output adjustment by user was not correctly done.	reset AO Trim	—	I33:OUT ADJ CLR
Transmitter outputs fixed current.	The transmitter is in manual (test output) mode.	exec Loop Test enable Dev Var Sim	SIM_ENABLE_MSG	F10:OUTPUT MODE I30:OUTPUT
	Output adjustment by user was not correctly done.	reset AO Trim	—	I33:OUT ADJ CLR
Output is reversed. (See note 1)	LRV is greater than URV.	PV LRV PV URV	—	E10:PV LRV E11:PV URV
Parameters cannot be changed.	The transmitter is in write protect status.	Write Protect	WRITE_LOCK	G40:WRT PROTECT G41:WRT ENABLE
Sensor backup function doesn't work correctly.	Configuration of Sensor1 and Sensor2 is not correct.	Sns1(2) Probe Type Sns1(2) Wire Status group2 Mask Status group3 Mask	SENSOR_TYPE_1(2) SENSOR_CONNECTION_1(2) SENSOR_STATUS_MASK_3 SENSOR_STATUS_MASK_4	D10:SENSOR1 TYPE D11:SENSOR1 WIRE D30:SENSOR2 TYPE D31:SENSOR2 WIRE K10:S1 FAIL MASK K11:S2 FAIL MASK K12:S1 SHRT MASK K13:S2 SHRT MASK K23:BKUP S1 MASK K24:BKUP S2 MASK
	Sensor backup mode is not enabled.	PV is	BACKUP_VALUE	B10:PV is
Output damping doesn't work.	Damping time constant is set to "0 second."	AO Damping	PV_FTIME	E20:AO DAMP

Note 1: If the reversed output is desired and necessary setting was done by user, it is not considered as a problem.

Table 6.4 Problems and Countermeasures

Observed Problems	Possible Cause	Countermeasure
Output fluctuates greatly.	Span is too narrow.	Check the range, and change the settings to make the span larger.
	Input adjustment by user was not correctly done.	Clear the user adjustment (Sensor trim) value or set it to off.
	Output adjustment by user was not correctly done.	Clear the user adjustment (output trim) value or set it to off.
Transmitter outputs fixed current.	The transmitter is in manual (test output) mode.	Release manual mode. (Make the transmitter return to Automatic Mode)
	Output adjustment by user was not correctly done.	Clear the user adjustment (output trim) value or set it to off.
Output is reversed. (See note 1)	LRV is greater than URV.	Set the correct value to URV and LRV.
Parameters cannot be changed.	The transmitter is in write protect status.	Release write protect.
Sensor backup function doesn't work correctly.	Configuration of Sensor1 and Sensor2 is not correct.	<ul style="list-style-type: none"> • Check the type and wire settings for Sensor1 and Sensor2. • Check the connection of Sensor1 and Sensor2.
	Sensor backup mode is not enabled.	Change PV mapping "Sensor Backup."
Output damping doesn't work.	Damping time constant is set to "0 second."	Set correct value.

Note 1: If the reversed output is desired and necessary setting was done by user, it is not considered as a problem.

6.5 Integral Indicator and Error Display

For temperature transmitters equipped with an integral indicator, errors in the temperature sensor or the transmitter cause an integral indicator to call up the applicable error code. Table 6.5 lists the error codes for HART and BRAIN. Table 6.7 lists the error codes for Foundation fieldbus.

Table 6.5 List of Error Codes (HART and BRAIN)

Alarm Number	Indicator Message	Cause	Output operation during error
AL.00	CPU.ERR	MAIN CPU failed	According to the transmitter failure output (burnout) Communication disabled
AL.01	SENSOR	Sensor non-volatile memory verifies alarm	According to the transmitter failure output (burnout) Communication enabled
AL.02	TMP.MEM	Non-volatile memory of the TEMP ASSY verify alarm	
AL.03	AD.CONV	Input circuit hardware failed	
AL.04*3	CAL.ERR	MAIN ASSY memory failed	
AL.05	CAL.ERR	TEMP ASSY memory failed	
AL.06	TMP.ERR	TEMP ASSY voltage failed	
AL.07	COM.EEP	Communication non-volatile memory verifies alarm	
AL.08	TMP.MEM	Non-volatile memory of the TEMP ASSY verifies alarm	Continue to operate and output
AL.09	COM.ERR	Internal communication failed	According to the transmitter failure output (burnout) Communication enabled
AL.10	S.1.FAIL	Sensor 1 failed or disconnected from terminal block	Refer table 6.6
AL.11	S.2.FAIL	Sensor 2 failed or disconnected from terminal block	Refer table 6.6
AL.12*1	S.1.SHRT	Sensor 1 short-circuited	Refer table 6.6
AL.13*1	S.2.SHRT	Sensor 2 short-circuited	Refer table 6.6
AL.14*1	S.1.CORR	Sensor 1 corroded	Continue to operate and output
AL.15*1	S.2.CORR	Sensor 2 corroded	Continue to operate and output
AL.20	S.1.SGNL	Sensor 1 input is out of measurable range.	Continue to operate and output
AL.21	S.2.SGNL	Sensor 2 input is out of measurable range.	Continue to operate and output
AL.22*4	TERMNL	Terminal block temperature is abnormal. Or terminal block temperature sensor failed	Refer table 6.6
AL.23	S.1.FAIL	During sensor backup operation, Sensor1 fails, it has output Sensor2	Operating to the backup side. When the backup side also fails, output is according to burnout setting.
AL.24	S.2.FAIL	During sensor backup operation, Sensor2 fails	Continue to operate and output
AL.25	DRIFT	Sensor drift	Continue to operate and output
AL.26*1	S.1.CYCL	Temperature cycling times of Sensor1 exceeds the threshold	Continue to operate and output
AL.27*1	S.2.CYCL	Temperature cycling times of Sensor2 exceeds the threshold	Continue to operate and output
AL.30	PV LO	PV value is below the range limit setting	Lower limit 3.68mA (-2%)
AL.31	PV HI	PV value is above the range limit setting	Upper limit 20.8mA (105%)
AL.40	S.1 LO	Measured temperature of sensor 1 is too low	Continue to operate and output
AL.41	S.1 HI	Measured temperature of sensor 1 is too high	Continue to operate and output
AL.42	S.2 LO	Measured temperature of sensor 2 is too low	Continue to operate and output
AL.43	S.2 HI	Measured temperature of sensor 2 is too high	Continue to operate and output
AL.44	AMBNT.L	Ambient temperature is below -40 degree C	Continue to operate and output
AL.45	AMBNT.H	Ambient temperature is above 85 degree C	Continue to operate and output
AL.50	LRV LO	LRV setting is below the sensor operating temperature range	Continue to operate and output

Alarm Number	Indicator Message	Cause	Output operation during error
AL.51	LRV HI	LRV setting is above the sensor operating temperature range	Continue to operate and output
AL.52	URV LO	URV setting is below the sensor operating temperature range	Continue to operate and output
AL.53	URV HI	URV setting is above the sensor operating temperature range	Continue to operate and output
AL.54	SPAN.LO	It is set below recommended minimum span	Continue to operate and output
AL.60	PV.CFG	There is a setting error in the sensor that is mapped to the PV	Hold the output of the previous error When it occurs at startup, hold at 4mA
AL.61*2	S.1 CFG	There is a false set to sensor1	Continue to operate and output
AL.62*2	S.2 CFG	There is a false set to sensor2	Continue to operate and output

- *1: Applicable only for YTA710.
- *2: Applicable only for HART.
- *3: In software revision HART R1.03.01 or earlier or BRAIN R1.01.01, AL04 may be generated even when abnormality or disconnection of the terminal block temperature sensor occurs.
- *4: In software revision HART R1.03.01 or earlier or BRAIN R1.01.01, even if abnormality or disconnection of the terminal block temperature sensor occurs, AL22 may not be output and AL04 may be generated.

Table 6.6 Output operation (HART and BRAIN)

Current output mapping	S.1.FAIL	S.2.FAIL	S.1.SHRT*3	S.2.SHRT*3	TERMNL
SENS.1	Sensor Burnout	*1	Sensor Burnout	*1	*1*4
S.1-TER	Sensor Burnout	*1	Sensor Burnout	*1	Sensor Burnout*4
TERM	*1	*1	*1	*1	Sensor Burnout*4
SENS.2	*1	Sensor Burnout	*1	Sensor Burnout	*1*4
S.2-TER	*1	Sensor Burnout	*1	Sensor Burnout	Sensor Burnout*4
S.1-S.2	Sensor Burnout	Sensor Burnout	Sensor Burnout	Sensor Burnout	*1*4
S.2-S.1	Sensor Burnout	Sensor Burnout	Sensor Burnout	Sensor Burnout	*1*4
AVG	Sensor Burnout	Sensor Burnout	Sensor Burnout	Sensor Burnout	*1*4
BACKUP	*2	*2	*2	*2	*1*4

- *1: Continue to operate and output.
- *2: When both sensor1 and sensor2 occur error, output is burnout.
- *3: Applicable only for YTA710.
- *4: In software revision HART R1.03.01 or earlier or BRAIN R1.01.01, fixed output value just before the alarm occurred.

Table 6.7 List of Error Codes (FF)

Alarm Number	Indicator Message	Cause
AL.00	CPU.ERR	MAIN CPU failed
AL.01	SENSOR	Sensor non-volatile memory verifies alarm
AL.02	TMP.MEM	Non-volatile memory of the TEMP ASSY verifies alarm
AL.03	AD.CONV	Input circuit hardware failed
AL.04	CAL.ERR	MAIN ASSY memory failed
AL.05	CAL.ERR	TEMP ASSY memory failed
AL.06	TMP.ERR	TEMP ASSY voltage failed
AL.07	COM.EEP	Communication non-volatile memory verifies alarm
AL.08	TMP.MEM	Non-volatile memory of the TEMP ASSY verifies alarm
AL.09	COM.ERR	Internal communication failed
AL.10	S.1.FAIL	Sensor 1 failed or disconnected from terminal block
AL.11	S.2.FAIL	Sensor 2 failed or disconnected from terminal block
AL.12*1	S.1.SHRT	Sensor 1 short-circuited
AL.13*1	S.2.SHRT	Sensor 2 short-circuited
AL.14*1	S.1.CORR	Sensor 1 corroded
AL.15*1	S.2.CORR	Sensor 2 corroded
AL.20	S.1.SGNL	Sensor 1 input is out of measurable range.
AL.21	S.2.SGNL	Sensor 2 input is out of measurable range.
AL.22	TERMNL	Terminal block temperature is abnormal. Such as abnormal or disconnection of the terminal block temperature sensor
AL.23	S.1.FAIL	During sensor backup operation, Sensor1 fails, it has output Sensor2
AL.24	S.2.FAIL	During sensor backup operation, Sensor2 fails
AL.25	DRIFT	Sensor drift
AL.26*1	S.1.CYCL	Temperature cycling times of Sensor1 exceeds the threshold
AL.27*1	S.2.CYCL	Temperature cycling times of Sensor2 exceeds the threshold
AL.40	S.1 LO	Measured temperature of sensor 1 is to low
AL.41	S.1 HI	Measured temperature of sensor 1 is to high
AL.42	S.2 LO	Measured temperature of sensor 2 is to low
AL.43	S.2 HI	Measured temperature of sensor 2 is to high
AL.44	AMBNT.L	Ambient temperature is below -40 degree C
AL.45	AMBNT.H	Ambient temperature is above 85 degree C
AL.61	S.1 CFG	There is a false set to sensor1
AL.62	S.2 CFG	There is a false set to sensor2
AL.100	NOT.RDY	Any function block is not scheduled
AL.101	AI1 HH	HI HI alarm occurs in AI1 block
AL.101	AI1 LL	LO LO alarm occurs in AI1 block
AL.102	AI2 HH	HI HI alarm occurs in AI2 block
AL.102	AI2 LL	LO LO alarm occurs in AI2 block
AL.103	AI3 HH	HI HI alarm occurs in AI3 block
AL.103	AI3 LL	LO LO alarm occurs in AI3 block
AL.104	AI4 HH	HI HI alarm occurs in AI4 block
AL.104	AI4 LL	LO LO alarm occurs in AI4 block
AL.105	PID1.HH	HI HI alarm occurs in PID1 block
AL.105	PID1.LL	LO LO alarm occurs in PID1 block
AL.106	PID2.HH	HI HI alarm occurs in PID2 block
AL.106	PID2.LL	LO LO alarm occurs in PID2 block
AL.110	RS O/S	The actual mode of the RS block is O/S.
AL.111	STB O/S	The actual mode of the STB block is O/S.
AL.112	LTB O/S	The actual mode of the LTB block is O/S.
AL.113	MTB O/S	The actual mode of the MTB block is O/S.
AL.114	AI1 O/S	The actual mode of the AI1 block is O/S.
AL.115	AI2 O/S	The actual mode of the AI2 block is O/S.
AL.116	AI3 O/S	The actual mode of the AI3 block is O/S.

Alarm Number	Indicator Message	Cause
AL.117	AI4 O/S	The actual mode of the AI4 block is O/S.
AL.118	SCHEDL	Execution of AI1 is not scheduled.
AL.119	SCHEDL	Execution of AI2 is not scheduled.
AL.120	SCHEDL	Execution of AI3 is not scheduled.
AL.121	SCHEDL	Execution of AI4 is not scheduled.
AL.122	STB.MAN	The actual mode of the STB block is Man.
AL.130	DI1 O/S	The actual mode of the DI1 block is O/S.
AL.130	DI1.MAN	The actual mode of the DI1 block is Man.
AL.130	SCHEDL	Execution of DI1 is not scheduled.
AL.130	DI1.SIM	Simulate of the DI1 block is active.
AL.131	DI2 O/S	The actual mode of the DI2 block is O/S.
AL.131	DI2.MAN	The actual mode of the DI2 block is Man.
AL.131	SCHEDL	Execution of DI2 is not scheduled.
AL.131	DI2.SIM	Simulate of the DI2 block is active.
AL.132	DI3 O/S	The actual mode of the DI3 block is O/S.
AL.132	DI3.MAN	The actual mode of the DI3 block is Man.
AL.132	SCHEDL	Execution of DI3 is not scheduled.
AL.132	DI3.SIM	Simulate of the DI3 block is active.
AL.133	DI4 O/S	The actual mode of the DI4 block is O/S.
AL.133	DI4.MAN	The actual mode of the DI4 block is Man.
AL.133	SCHEDL	Execution of DI4 is not scheduled.
AL.133	DI4.SIM	Simulate of the DI4 block is active.
AL.134	PID1.O/S	The actual mode of the PID1 block is O/S.
AL.134	PID1.MAN	The actual mode of the PID1 block is Man.
AL.134	SCHEDL	Execution of PID1 is not scheduled.
AL.134	PID1.BYP	The bypass action for PID1 is active.
AL.135	PID2.O/S	The actual mode of the PID2 block is O/S.
AL.135	PID2.MAN	The actual mode of the PID2 block is Man.
AL.135	SCHEDL	Execution of PID2 is not scheduled.
AL.135	PID2.BYP	The bypass action for PID2 is active.
AL.136	SC O/S	The actual mode of the SC block is O/S.
AL.136	SC MAN	The actual mode of the SC block is Man.
AL.136	SCHEDL	Execution of SC is not scheduled.
AL.137	IS O/S	The actual mode of the IS block is O/S.
AL.137	IS MAN	The actual mode of the IS block is Man.
AL.137	SCHEDL	Execution of IS is not scheduled.
AL.138	AR O/S	The actual mode of the AR block is O/S.
AL.138	AR MAN	The actual mode of the AR block is Man.
AL.138	SCHEDL	Execution of AR is not scheduled.
AL.150	AI1.SIM	Simulate of the AI1 block is active.
AL.151	AI2.SIM	Simulate of the AI2 block is active.
AL.152	AI3.SIM	Simulate of the AI3 block is active.
AL.153	AI4.SIM	Simulate of the AI4 block is active.
AL.154	AI1.MAN	The actual mode of the AI1 block is Man.
AL.155	AI2.MAN	The actual mode of the AI2 block is Man.
AL.156	AI3.MAN	The actual mode of the AI3 block is Man.
AL.157	AI4.MAN	The actual mode of the AI4 block is Man.

*1: Applicable only for YTA710.

7. General Specifications

7.1 Standard Specifications

7.1.1 YTA710

■ Performance Specifications

Accuracy

HART and BRAIN communication type:
A/D accuracy/span + D/A accuracy
(See Table 7.1.)

Fieldbus communication type:
A/D accuracy (See Table 7.1.)

Cold Junction Compensation Accuracy (T/C)

$\pm(0.32^{\circ}\text{C} + 0.003 \times |\text{Tterm} - 23^{\circ}\text{C}|)$
Tterm means the terminal temperature
($-40^{\circ}\text{C} \leq \text{Tterm} \leq 85^{\circ}\text{C}$).

Ambient Temperature Effect (per 10°C change)

See Table 7.2. for Standard type
See Table 7.5. for /R1 option type

Stability (at 23±2°C)

RTD: $\pm 0.1\%$ of reading or $\pm 0.1^{\circ}\text{C}$ per 2 years,
whichever is greater.
T/C: $\pm 0.1\%$ of reading or $\pm 0.1^{\circ}\text{C}$ per year,
whichever is greater.

5 Year Stability (at 23±2°C)

RTD: $\pm 0.2\%$ of reading or $\pm 0.2^{\circ}\text{C}$, whichever is
greater.
T/C: $\pm 0.4\%$ of reading or $\pm 0.4^{\circ}\text{C}$, whichever is
greater.

Vibration Effect

The YTA710 is tested to the following
specifications with no effect on performance per
IEC 60770-1
10 to 60 Hz : 0.21 mm peak displacement
60 to 2000 Hz : 3g

Power Supply Effect (HART and BRAIN Type)

$\pm 0.005\%$ of calibrated span per volt

■ Functional Specifications

Input signals

Input number: single and dual input
Input type is selectable: Thermocouples, 2-, 3-,
and 4-wire RTDs, ohms and DC millivolts.
See Table 7.1.

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

1 k Ω or lower

Input lead wire resistance (for RTD, ohm)

10 Ω per wire or lower

Span & Range Limits

See Table 7.1.

Output signals

Two wire 4 to 20 mA DC Type

Output range: 3.68 to 20.8 mA DC
HART® or BRAIN protocol is superimposed
on the 4 to 20 mA signal.

Fieldbus communication Type

Output signal based on FOUNDATION
fieldbus™ communication protocol.

Isolation

Input/Output/GND isolated to 500V DC
Except lightning protector option.

Manual Test Output Function

The output value can be set manually.

Sensor Burnout (HART and BRAIN Type)

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

Output in Transmitter Failure (HART and BRAIN Type)

Down-scale: -5% , 3.2 mA DC or less (Optional
code C1 or C2)

Up-scale: 110%, 21.6 mA DC or more
(Standard or Optional code C3)

Update Time (HART and BRAIN Type)

Approximately 0.5 seconds for a single sensor
(0.8 second for dual sensors)

Turn-on Time (HART and BRAIN Type)

Approximately 6 seconds for a single sensor
(7 seconds for dual sensors)

Damping Time Constant

Selectable from 0 to 100 seconds

Self-Diagnostics

Self-diagnostic function based on the NAMUR
NE107 standard detects failures.

Hardware-Diagnostics

Hardware failure: Detect failures in CPU, ADC,
Memory, etc.

Sensor-Diagnostics

- Sensor failure: Detect the disconnection of sensor.
- Sensor short: Detect the short circuit of the sensor.
- Sensor Corrosion: Measure the loop resistance.
- Sensor line information: Measure the line resistance.
- Sensor drift: Detect the difference between sensor1 and sensor2.
- Temperature Cycle Diagnostics: Count the number of temperature fluctuations.

Fieldbus functions (Fieldbus Type)

Functional specifications for Fieldbus communication conform to the standard specifications (H1) of FOUNDATION Fieldbus.

Function Block (Fieldbus Type)

Resource block

The resource block contains physical transmitter information.

Transducer block

The transducer block contains the actual measurement data and information about sensor type and configuration and diagnostics.

LCD display block

The LCD display block is used to configure the local display, if an LCD display is being used.

Analog input (AI)

Four independent AI blocks can be selected.

Digital input (DI)

Four DI function blocks can be used as a limit switch for those temperature.

Other Function block

As other Function blocks, Arithmetic (AR), Signal Characterizer (SC), Input Selector (IS), and two PID function blocks are available.

Function block	Execution time (ms)
AI	30
DI	30
SC	30
IS	30
AR	30
PID	45

Link master function

This function enables backup of network manager and local control only by field devices.

Alarm function

Fieldbus models securely support various alarm functions, such as High/Low alarm, notice of block error, etc. based on FOUNDATION fieldbus specifications.

Software download function

This function permits to update YTA software via a FOUNDATION fieldbus. Based on Foundation fieldbus specifications (FF883)
Download class: Class 1

EMC Conformity Standards

- EN61326-1 Class A, Table2
- EN61326-2-3
- EN61326-2-5 (for fieldbus type)
- Immunity influence during the test:
- Output shift is specified within $\pm 1\%$ of full span.

Functional Safety (HART Type)

HART type is certified in compliance with IEC 61508: 2010.
Functional Safety of Electrical/electronic/programmable electronic related systems;
SIL 2 capability for single transmitter use
SIL 3 capability for dual transmitter use

Safety Requirement Standards

- EN61010-1, C22.2 No.61010-1
 - Altitude of installation site:
 - Max. 2,000 m above sea level
 - Installation category: I
 - (Anticipated transient overvoltage 330 V)
 - Pollution degree: 2
 - Indoor/Outdoor use
- EN61010-2-030, C22.2 No.61010-2-030
 - Measurement category: O (Other)
 - (Measurement Input voltage: 150mVdc max)

EU RoHS Directive

Applicable standard: EN 50581
 Applicable production sites is shown below.
 The production sites of the RoHS compliant product are confirmed by the serial number shown in the frame of "NO." in the name plate of the product.
 Serial numbers (9 letters): NNYMnnnnn
 NN: Identification code of production site.
 Use "C2, U1, BH, Y3 or S5"
 Y: Year of production
 2015: Use "R" 2016: Use "S"
 2017: Use "T" 2018: Use "U"
 2019: Use "V"
 M: Month of production
 January to September: Use "1" to "9"
 (January: 1, September: 9).
 October: Use "A". November: Use "B".
 December: Use "C".
 nnnn: 5-digit number assigned sequentially in each production date by the production site.

Normal Operating Condition

(Optional features or approval codes may affect limits.)

Ambient Temperature Limits

- 40 to 85°C (-40 to 185°F)
- 30 to 80°C (-22 to 176°F) (with indicator model)

Ambient Humidity Limits

0 to 100% RH at 40°C (104°F)

Supply Voltage Requirements

HART and BRAIN Type

10.5 to 42 V DC for general use and flameproof type
 10.5 to 32 V DC for lightning protector (option code /A)
 10.5 to 30 V DC for intrinsically safe and non-incendive
 Minimum voltage limited at 16.6 V DC for digital communications HART and BRAIN
 With 24 V DC supply, up to a 550Ω load can be used. See graph below.

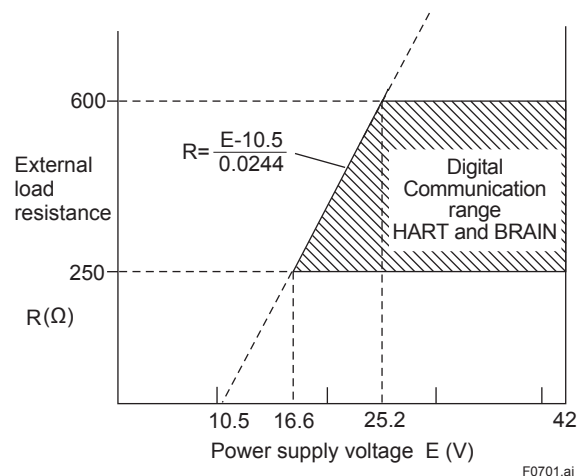


Figure 7.1 Relationship Between Power Supply Voltage and External Load Resistance

Fieldbus Type

- 9 to 32V DC for general use, flameproof type, and non-incendive type
- 9 to 30 V DC for intrinsically safe type
- 9 to 17.5 V DC for FISCO field device
- Communication Requirements
- Supply Voltage: 9 to 32 V DC
- Current Draw:
- Steady state: 15 mA (max)
- Software download state: 24 mA (max)

Communication Requirements (BRAIN Type)**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 μ F or less

Load Inductance

3.3 mH or less

Input Impedance of communicating device

10k Ω or more at 2.4 kHz

Load Requirements (HART and BRAIN Type)

- 0 to 1290 Ω for operation
- 250 to 600 Ω for digital communication

Physical Specifications**Enclosure****Material & Coating**

- Low copper cast aluminum alloy [for aluminum housing]
 - Polyester powder coating
 - Mint-green paint (Munsell 5.6BG 3.3/2.9 or its equivalent)
 - [for option code /P□ or /X2]
 - Epoxy and polyurethane resin solvent coating
- ASTM CF-8M Stainless steel

Degrees of Protection

IP66/IP67, TYPE 4X

Name plate and tag

316 SST

Mounting

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

Terminal Screws

M4 screws

Integral Indicator (with indicator model)

5-digit numerical display, 6-digit unit display and bar graph.

Local Parameter Setting (with indicator model)

Parameter configuration by the push button offers easy and quick setup for parameters. Accessible parameters are different with each output signal cord.

Weight

- Aluminum housing:
 - 1.3 kg (2.9 lb) without integral indicator and mounting
 - Integral indicator: 0.2 kg (0.4 lb)
 - Bracket for horizontal pipe: 0.3 kg (0.7 lb)
 - Bracket for vertical pipe: 1.0 kg (2.2 lb)
- Stainless housing:
 - 3.1 kg (6.8 lb) without integral indicator and mounting
 - Integral indicator: 0.3 kg (0.7 lb)

Connections

Refer to "Model and Suffix Codes."

Table 7.1 Sensor type, measurement range, and accuracy.

Sensor Type		Standard	Measurement Range		Minimum Span	A/D Accuracy		D/A Accuracy
			°C	°F		°C	°F	
T/C	B	IEC60584	100 to 300	212 to 572	25°C (45°F)	±3.0	±5.4	±0.02% of span
			300 to 1820	572 to 3308		±0.75	±1.35	
	E		-200 to -50	-328 to -58		±0.35	±0.63	
			-50 to 1000	-58 to 1832		±0.16	±0.29	
	J		-200 to -50	-328 to -58		±0.25	±0.45	
			-50 to 1200	-58 to 2192		±0.20	±0.36	
	K		-200 to -50	-328 to -58		±0.5	±0.9	
			-50 to 1372	-58 to 2501		±0.25	±0.45	
	N		-200 to -50	-328 to -58		±0.4	±0.72	
			-50 to 1300	-58 to 2372		±0.35	±0.63	
	R		-50 to 0	-58 to 32		±1.0	±1.8	
			0 to 600	32 to 1112		±0.6	±1.08	
S	600 to 1768	1112 to 3214	±0.4	±0.72				
	-50 to 0	-58 to 32	±1.0	±1.8				
T	0 to 600	32 to 1112	±0.5	±0.9				
	600 to 1768	1112 to 3214	±0.4	±0.72				
C	-200 to -50	-328 to -58	±0.25	±0.45				
	-50 to 400	-58 to 752	±0.14	±0.25				
W3	ASTM E988	0 to 400	32 to 752	±0.7	±1.26			
		400 to 1400	752 to 2552	±0.5	±0.9			
L	DIN43710	1400 to 2000	2552 to 3632	±0.7	±1.26			
		2000 to 2300	3632 to 4172	±0.9	±1.62			
U	DIN43710	0 to 400	32 to 752	±0.8	±1.44			
		400 to 1400	752 to 2552	±0.5	±0.9			
C	ASTM E988	1400 to 2000	2552 to 3632	±0.6	±1.08			
		2000 to 2300	3632 to 4172	±0.9	±1.62			
RTD	Pt100	IEC60751	-200 to 850	-328 to 1562	±0.1	±0.18		
			Pt200	-200 to 850	-328 to 1562	±0.22	±0.396	
	Pt500		-200 to 850	-328 to 1562	±0.14	±0.25		
	Pt1000		-200 to 300	-328 to 572	±0.1	±0.18		
	JPt100		-200 to 500	-328 to 932	±0.1	±0.18		
	Cu10		SAMA RC21-4	-70 to 150	-94 to 302	±1.0	±1.8	
	Ni120		—	-70 to 320	-94 to 608	±0.08	±0.15	
mV	—	-10 to 120 [mV]		3 mV	±0.012 [mV]			
ohm	—	0 to 2000 [Ω]		20 Ω	±0.35 [Ω]			

Note 1: Total Accuracy = (A/D Accuracy / Span + D/A Accuracy).
 For Fieldbus type, accuracy = A/D Accuracy.
 For T/C input, add Cold Junction Compensation Error to the total accuracy.
 Example: when selecting Pt100 with measurement range of 0 to 200 °C
 $0.1°C / 200°C \times 100\% \text{ of span} + 0.02\% \text{ of span} = 0.07\% \text{ of span}$

Note 2: T/C C type is same as W5 (ASTM E988).

Table 7.2 Temperature coefficient

Sensor Type		Temperature Coefficient
Thermocouples E, J, K, N, T, L, U		0.08°C + 0.02% of abs.reading
Thermocouples R, S, W3, C		0.25°C + 0.02% of abs.reading
Thermocouple B	100°C ≤ Reading < 300°C	1°C + 0.02% of abs.reading
	300°C ≤ Reading	0.5°C + 0.02% of abs.reading
RTD		0.08°C + 0.02% of abs.reading
mV		0.002 mV + 0.02% of abs.reading
ohm		0.1Ω + 0.02% of reading

Note 1: The "abs.reading" for thermocouples and RTD means the absolute value of the reading in °C.

Example of "abs.reading"

When the temperature value is 250 Kelvin, "abs.reading" is 23.15.

$|250 - 273.15| = 23.15$

Note 2: Ambient Temperature Effect per 10 °C change is ±0.1% or ±(temperature coefficient/span), whichever is greater.

Example of Ambient Temperature Effect

Conditions:

1) Input Sensor: Pt100

2) Calibration Range: -100 to 100°C

3) Reading value: -50°C

Ambient Temperature Effect per 10°C

Temperature Coefficient/Span = $(0.08°C + 0.02/100 × |-50°C|) / \{100°C - (-100°C)\} = 0.00045 \rightarrow 0.045\%$

Therefore, Ambient Temperature Effect is ±0.1%/10°C

Note 3: See Table 7.5 for R1 option type.

7.1.2 YTA610

■ Performance Specifications

Accuracy

HART communication type:
A/D accuracy/span + D/A accuracy
(See Table 7.3.)

Fieldbus communication type:
A/D accuracy (See Table 7.3.)

Cold Junction Compensation Accuracy

$\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$) for T/C only

Ambient Temperature Effect (per 10°C change)

See Table 7.4.

Stability (at $23\pm 2^{\circ}\text{C}$)

RTD: $\pm 0.1\%$ of reading or $\pm 0.1^{\circ}\text{C}$ per 2 years,
whichever is greater.

T/C: $\pm 0.1\%$ of reading or $\pm 0.1^{\circ}\text{C}$ per year,
whichever is greater.

5 Year Stability (at $23\pm 2^{\circ}\text{C}$)

RTD: $\pm 0.25\%$ of reading or $\pm 0.25^{\circ}\text{C}$,
whichever is greater.

T/C: $\pm 0.5\%$ of reading or $\pm 0.5^{\circ}\text{C}$,
whichever is greater.

Vibration Effect

The YTA610 is tested to the following specifications with no effect on performance per IEC 60770-1

10 to 60 Hz : 0.21 mm peak displacement

60 to 2000 Hz : 3g

Power Supply Effect (HART Type)

$\pm 0.005\%$ of calibrated span per volt

■ Functional Specifications

Input signals

Input number: single and dual input
Input type is selectable: Thermocouples, 2-, 3-,
and 4-wire RTDs, ohms and DC millivolts.

See Table 7.3.

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

1 k Ω or lower

Input lead wire resistance (for RTD, ohm)

10 Ω per wire or lower

Span & Range Limits

See Table 7.3.

Output signals

Two wire 4 to 20 mA DC Type

Output range: 3.68 to 20.8 mA DC

HART[®] protocol is superimposed on the 4 to 20 mA signal.

Fieldbus communication Type

Output signal based on FOUNDATION fieldbus[™] communication protocol.

Isolation

Input/Output/GND isolated to 500V DC

Except lightning protector option.

Manual Test Output Function

The output value can be set manually.

Sensor Burnout (HART Type)

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

Output in Transmitter Failure (HART Type)

Down-scale: -5% , 3.2 mA DC or less (Optional code C1 or C2)

Up-scale: 110%, 21.6 mA DC or more (Standard or Optional code C3)

Update Time (HART Type)

Approximately 0.5 seconds for a single sensor (0.8 second for dual sensors)

Turn-on Time (HART Type)

Approximately 6 seconds for a single sensor (7 seconds for dual sensors)

Damping Time Constant

Selectable from 0 to 100 seconds

Self-Diagnostics

Self-diagnostic function based on the NAMUR NE107 standard detects failures.

Hardware-Diagnostics

Hardware failure: Detect in CPU, ADC, Memory, etc.

Sensor-Diagnostics

Sensor failure: Detect the disconnection of sensor.

Sensor line information: Measure the line resistance.

Sensor drift: Detect the difference between sensor1 and sensor2.

Fieldbus functions (Fieldbus Type)

Functional specifications for Fieldbus communication conform to the standard specifications (H1) of FOUNDATION Fieldbus.

Function Block (Fieldbus Type)

Resource block

The resource block contains physical transmitter information.

Transducer block

The transducer block contains the actual measurement data and information about sensor type and configuration and diagnostics.

LCD display block

The LCD display block is used to configure the local display, if an LCD display is being used.

Analog input (AI)

Four independent AI blocks can be selected.

Digital input (DI)

Four DI function blocks can be used as a limit switch for those temperature.

Other Function block

As other Function blocks, Arithmetic (AR), Signal Characterizer (SC), Input Selector (IS), and two PID function blocks are available.

Function block	Execution time (ms)
AI	30
DI	30
SC	30
IS	30
AR	30
PID	45

Link master function

This function enables backup of network manager and local control only by field devices.

Alarm function

Fieldbus models securely support various alarm functions, such as High/Low alarm, notice of block error, etc. based on FOUNDATION fieldbus specifications.

Software download function

This function permits to update YTA software via a FOUNDATION fieldbus. Based on Foundation fieldbus specifications (FF883)
Download class: Class 1

EMC Conformity Standards

EN61326-1 Class A, Table2
EN61326-2-3
EN61326-2-5 (for fieldbus)
Immunity influence during the test:
Output shift is specified within ±1% of full span.

Functional Safety

Hart communication type is certified in compliance with IEC 61508: 2010.
Functional Safety of Electrical/electronic/programmable electronic related systems;
SIL 2 capability for single transmitter use
SIL 3 capability for dual transmitter use

Safety Requirement Standards

EN61010-1, C22.2 No.61010-1
• Altitude of installation site:
Max. 2,000 m above sea level
• Installation category: I
(Anticipated transient overvoltage 330 V)
• Pollution degree: 2
• Indoor/Outdoor use
EN61010-2-030, C22.2 No.61010-2-030
• Measurement category: O (Other)
(Measurement Input voltage: 150mVdc max)

EU RoHS Directive

Applicable standard: EN 50581
Applicable production sites is shown below. The production sites of the RoHS compliant product are confirmed by the serial number shown in the frame of "NO." in the name plate of the product.
Serial numbers (9 letters): NNYMnnnnn
NN: Identification code of production site.
Use "C2, U1, BH, Y3 or S5"
Y: Year of production
2015: Use "R" 2016: Use "S"
2017: Use "T" 2018: Use "U"
2019: Use "V"
M: Month of production
January to September: Use "1" to "9"
(January: 1, September: 9).
October: Use "A". November: Use "B".
December: Use "C".
nnnnn: 5-digit number assigned sequentially in each production date by the production site.

■ **Normal Operating Condition**

(Optional features or approval codes may affect limits.)

Ambient Temperature Limits

–40 to 85°C (–40 to 185°F)
 –30 to 80°C (–22 to 176°F) (with indicator model)

Ambient Humidity Limits

0 to 100% RH at 40°C (104°F)

Supply Voltage Requirements

HART Type

10.5 to 42 V DC for general use and flameproof type
 10.5 to 32 V DC for lightning protector (option code /A)
 10.5 to 30 V DC for intrinsically safe and non-incendive
 Minimum voltage limited at 16.6 V DC for digital communications HART
 With 24 V DC supply, up to a 550Ω load can be used. See graph below.

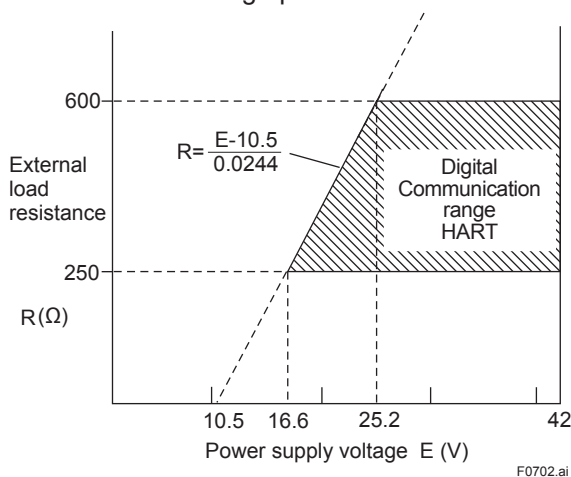


Figure 7.2 Relationship Between Power Supply Voltage and External Load Resistance

Fieldbus Type

9 to 32V DC for general use, flameproof type, and non-incendive type
 9 to 30 V DC for intrinsically safe type
 9 to 17.5 V DC for FISCO field device
Communication Requirements
 Supply Voltage: 9 to 32 V DC
 Current Draw:
 Steady state: 15 mA (max)
 Software download state: 24 mA (max)

Load Requirements (HART Type)

0 to 1290Ω for operation
 250 to 600Ω for digital communication

■ **Physical Specifications**

Enclosure

Material & Coating

- Low copper cast aluminum alloy [for aluminum housing]
 Polyester powder coating
 Mint-green paint (Munsell 5.6BG 3.3/2.9 or its equivalent)
 [for option code /P□ or /X2]
 Epoxy and polyurethane resin solvent coating
- ASTM CF-8M Stainless steel

Degrees of Protection

IP66/IP67, TYPE 4X

Name plate and tag

316 SST

Mounting

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

Terminal Screws

M4 screws

Integral Indicator (with indicator model)

5-digit numerical display, 6-digit unit display and bar graph.

Local Parameter Setting (with indicator model)

Parameter configuration by the push button offers easy and quick setup for parameters. Accessible parameters are different with each output signal cord.

Weight

- Aluminum housing:
 1.3 kg (2.9 lb) without integral indicator and mounting
 Integral indicator: 0.2 kg (0.4 lb)
 Bracket for horizontal pipe: 0.3 kg (0.7 lb)
 Bracket for vertical pipe: 1.0 kg (2.2 lb)
- Stainless housing:
 3.1 kg (6.8 lb) without integral indicator and mounting
 Integral indicator: 0.3 kg (0.7 lb)

Connections

Refer to “Model and Suffix Codes.”

Table 7.3 Sensor type, measurement range, and accuracy

Sensor Type		Standard	Measurement Range		Minimum Span	A/D Accuracy		D/A Accuracy
			°C	°F		°C	°F	
T/C	B E J K N R S T C	IEC60584	100 to 300	212 to 572	25°C (45°F)	±3.0	±5.4	±0.03% of span
			300 to 1820	572 to 3308		±0.77	±1.39	
			-200 to -50	-328 to -58		±0.4	±0.72	
			-50 to 1000	-58 to 1832		±0.2	±0.36	
			-200 to -50	-328 to -58		±0.35	±0.63	
			-50 to 1200	-58 to 2192		±0.25	±0.45	
			-200 to -50	-328 to -58		±0.5	±0.9	
			-50 to 1372	-58 to 2501		±0.3	±0.54	
			-200 to -50	-328 to -58		±0.5	±0.9	
	-50 to 1300	-58 to 2372	±0.4	±0.72				
	W3	ASTM E988	-50 to 0	-58 to 32		±1.0	±1.8	
			0 to 600	32 to 1112		±0.7	±1.26	
		600 to 1768	1112 to 3214	±0.5	±0.9			
		-50 to 0	-58 to 32	±1.0	±1.8			
		0 to 1768	32 to 3214	±0.6	±1.08			
		-200 to -50	-328 to -58	±0.35	±0.63			
		-50 to 400	-58 to 752	±0.2	±0.36			
		0 to 2000	32 to 3632	±0.7	±1.26			
		2000 to 2300	3632 to 4172	±1.0	±1.8			
	W3	ASTM E988	0 to 400	32 to 752	±0.9	±1.62		
			400 to 1400	752 to 2552	±0.6	±1.08		
			1400 to 2000	2552 to 3632	±0.7	±1.26		
			2000 to 2300	3632 to 4172	±1.0	±1.8		
	L	DIN43710	-200 to -50	-328 to -58	±0.35	±0.63		
			-50 to 900	-58 to 1652	±0.3	±0.54		
	U		-200 to 600	-328 to 1112	±0.35	±0.63		
RTD	Pt100	IEC60751	-200 to 850	-328 to 1562	10°C (18°F)	±0.14	±0.25	
	Pt200		-200 to 850	-328 to 1562		±0.25	±0.45	
	Pt500		-200 to 850	-328 to 1562		±0.18	±0.324	
	Pt1000		-200 to 300	-328 to 1562		±0.18	±0.324	
	JPt100	—	-200 to 500	-328 to 932		±0.16	±0.29	
	Cu10	SAMA RC21-4	-70 to 150	-94 to 302		±1.3	±2.23	
	Ni120	—	-70 to 320	-94 to 608		±0.14	±0.25	
mV	—	-10 to 120 [mV]		3 mV	±0.015[mV]			
ohm	—	0 to 2000 [Ω]		20 Ω	±0.45 [Ω]			

- Note 1: Total Accuracy = (A/D Accuracy / Span + D/A Accuracy) or (± 0.1% of calibrated span), whichever is greater.
 Accuracy of Fieldbus type: A/D Accuracy.
 For T/C input, add Cold Junction Compensation Error (± 0.5°C) to the total accuracy.
 Example: when selecting Pt100 with measurement range of 0 to 400 °C
 0.14°C / 400°C×100% of span +0.03% of span = 0.065% of span
 Since the value is smaller than ±0.1% of span, the total accuracy is ±0.1%.
- Note 2: T/C C type is same as W5 (ASTM E988).

Table 7.4 Temperature coefficient

Sensor Type		Temperature Coefficient
Thermocouples E, J, K, N, T, L, U		0.08°C + 0.02% of abs.reading
Thermocouples R, S, W3, C		0.25°C + 0.02% of abs.reading
Thermocouple B	100°C ≤ Reading < 300°C	1°C + 0.02% of abs.reading
	300°C ≤ Reading	0.5°C + 0.02% of abs.reading
RTD		0.08°C + 0.02% of abs.reading
mV		0.002 mV + 0.02% of abs.reading
ohm		0.1Ω + 0.02% of reading

Note 1: The "abs.reading" for thermocouples and RTD means the absolute value of the reading in °C.

Example of "abs.reading"

When the temperature value is 250 Kelvin, "abs.reading" is 23.15.

$|250 - 273.15| = 23.15$

Note 2: Ambient Temperature Effect per 10 °C change is ±0.1% or ±(temperature coefficient/span), whichever is greater.

Example of Ambient Temperature Effect

Conditions:

1) Input Sensor: Pt100

2) Calibration Range: -100 to 100°C

3) Reading value: -50°C

Ambient Temperature Effect per 10°C

Temperature Coefficient/Span = $(0.08°C + 0.02/100 × |-50°C|) / \{100°C - (-100°C)\} = 0.00045 \rightarrow 0.045\%$

Therefore, Ambient Temperature Effect is ±0.1%/10°C

7.2 Model and Suffix Codes

Model	Codes	Description
YTA610 YTA710	Temperature Transmitter
Output Signal	-D*2 -J -F	4 to 20 mA DC with digital communication BRAIN protocol 4 to 20 mA DC with digital communication HART protocol Digital communication (FOUNDATION Fieldbus protocol)
—	A	Always A (Global)
Sensor input	1 2	Single Double
Housing code	A C	Aluminum Stainless
Electrical Connection	0 2 4	G 1/2 female 1/2 NPT female M20 female
Integral Indicator	D N	Digital indicator with Local Operating Switch None
Mounting Bracket	B D J K N	SUS304 stainless steel 2-inch horizontal pipe mounting bracket *1 SUS304 stainless steel 2-inch vertical pipe mounting bracket SUS316 stainless steel 2-inch horizontal pipe mounting bracket *1 SUS316 stainless steel 2-inch vertical pipe mounting bracket None
Option codes	/□	Optional specification

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

*2: Applicable only for YTA710.

7.3 Optional Specifications (YTA610 and YTA710)

Item	Description		Code
Lightning protector *4	Allowable current: Max. 6000A (8×20μs), repeating 1000A (8×20μs), 100 times		A
Painting *1*6*13	Color and coating change Amplifier cover only *3	Color: Munsell code N1.5 Black Coating: High anti-corrosion coating	P1
		Color: Munsell code 7.5BG4/1.5, Jade green Coating: High anti-corrosion coating	P2
		Color: Metallic silver Coating: High anti-corrosion coating	P7
	Color and coating change Amplifier and terminal covers *3	Color: Munsell code 7.5 R4/14, Red Coating: High anti-corrosion coating	PR
	Coating change	High anti-corrosion coating	X2
Output signal Low-side in Transmitter failure *10	Output signal Low-side: -5%, 3.2 mA DC or less. Sensor burnout is also set to 'Low': -2.5%, 3.6 mA DC.		C1
NAMUR NE43 Compliant *10	Output signal limits: 3.8 mA to 20.5 mA	Failure alarm down-scale: output status at CPU failure and hardware error is -5%, 3.2 mA or less. Sensor burnout is also set to Low: -2.5%, 3.6 mA DC.	C2
		Failure alarm up-scale: output status at CPU failure and hardware error is 110%, 21.6 mA or more. In this case Sensor burnout is High: 110%, 21.6 mA DC	C3
Data Configuration *2	Description into "Descriptor" parameter of HART protocol (max. 16 characters)		CA
Wired tag plate	SUS316 stainless steel tag plate wired onto transmitter		N4
Sensor matching	RTD sensor matching function		CM1
Attached flameproof packing adapter*5*7	Electrical connection G1/2 female Applicable cable: O.D.8.0 to 12 mm	2pc.	V52
EAC approval and Russian pattern approval marking*9*11*13	EAC approval and Russian pattern approval marking		VR
EAC approval marking without Russian pattern approval marking*9*11*13	EAC approval marking without Russian pattern approval marking		VE
High ambient-temp characteristic type*8*13	Refer to Table 7.5 Temperature coefficient		R1
Manufacturing*12*14	Optional code to specify the manufacturing factory		SG

Note: The indication of the nameplate shows an initial shipment state.

- *1: Not applicable for Stainless housing.
- *2: Applicable for only HART type.
- *3: Except for Amplifier and terminal cover, color and coating are general specification.
- *4: Lightning protector (surge absorber) can be removed from, or added to the equipment.
- *5: Combination with other Explosion protected other than TIIS flameproof is not possible.
- *6: The combination of X2 and P□ is not possible.
- *7: Applicable for Electrical Connection code 4. (The thread of connection between YTA and CABLE GLAND is M20, and the thread of connection between CABLE GLAND and CABLE is G1/2.)
- *8: Applicable for only YTA710.
- *9: Not applicable for BRAIN type.
- *10: Not applicable for Fieldbus type.
- *11: Combination with other Explosion protected other than EAC Explosion-proof type is not applicable.
- *12: If SG is not attached, it is made in China. (It includes English name plate and English IM.)
- *13: Selection of SG is required.
- *14: In principle when this code is specified, the product made in Singapore will be delivered.

Table 7.5 Temperature coefficient (R1)

Sensor Type		Input Range °C	A/D Coefficient	D/A Coefficient
T/C	B	100 to 300 300 to 1000 1000 to 1820	±(0.586°C - 0.1433% of reading) ±(0.187°C - 0.0103% of reading) ±(0.038°C + 0.0046% of reading)	±{0.0088% of span + 0.007% of(reading - LRV)}
	E	-200 to 0 0 to 1000	±(0.007°C + 0.0158% of abs.reading) ±(0.007°C + 0.0065% of reading)	
	J	-200 to 0 0 to 1200	±(0.009°C + 0.0172% of abs.reading) ±(0.009°C + 0.0065% of reading)	
	K	-200 to 0 0 to 1372	±(0.011°C + 0.0218% of abs.reading) ±(0.011°C + 0.0078% of reading)	
	N	-200 to 0 0 to 1300	±(0.017°C + 0.0265% of abs.reading) ±(0.017°C + 0.0063% of reading)	
	R	-50 to 0 0 to 200 200 to 1768	±(0.088°C + 0.1273% of abs.reading) ±(0.088°C - 0.0142% of reading) ±(0.048°C + 0.0058% of reading)	
	S	-50 to 0 0 to 200 200 to 1768	±(0.088°C + 0.0517% of abs.reading) ±(0.088°C - 0.0106% of reading) ±(0.054°C + 0.0063% of reading)	
	T	-200 to 0 0 to 400	±(0.011°C + 0.0195% of abs.reading) ±(0.011°C + 0.0044% of reading)	
	C	0 to 1400 1400 to 2300	±(0.034°C + 0.0069% of reading) ±(-0.157°C + 0.0205% of reading)	
	W3	0 to 1400 1400 to 2300	±(0.044°C + 0.0053% of reading) ±(-0.214°C + 0.0237% of reading)	
	L	-200 to 0 0 to 900	±(0.009°C + 0.0117% of abs.reading) ±(0.009°C + 0.0052% of reading)	
	U	-200 to 0 0 to 600	±(0.011°C + 0.0148% of abs.reading) ±(0.011°C + 0.0046% of reading)	
RTD	Pt100	-200 to 850	±(0.015°C + 0.005% of reading)	
	Pt200	-200 to 850	±(0.023°C + 0.012% of reading)	
	Pt500	-200 to 850	±(0.015°C + 0.005% of reading)	
	Pt1000	-200 to 300	±(0.015°C + 0.005% of reading)	
	JPt100	-200 to 500	±(0.015°C + 0.005% of reading)	
	Cu10	-70 to 150	±(0.320°C + 0.120% of reading)	
	Ni120	-70 to 320	±(0.010°C + 0.005% of reading)	
	mV	-10 to 120 [mV]	±(0.441uV + 0.0065% of abs.reading)	
	ohm	0 to 2000 [Ω]	±(0.040Ω + 0.0088% of reading)	

Note: HART and BRAIN Temperature Effect = A/D coefficient + D/A coefficient

Fieldbus Temperature Effect = A/D 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

$$(0.015^{\circ}\text{C} + 50^{\circ}\text{C} \times 0.005\%) + [200^{\circ}\text{C} \times 0.0088\% + (50 - 0) \times 0.007\%]$$

$$= (0.015^{\circ}\text{C} + 0.0025^{\circ}\text{C}) + (0.0176^{\circ}\text{C} + 0.0035^{\circ}\text{C})$$

$$= \pm 0.0386^{\circ}\text{C} \text{ [per } 10^{\circ}\text{C change]}$$

Example 2; T T/C, -100 to 100°C calibration range, -50°C reading

$$(0.011^{\circ}\text{C} + |-50^{\circ}\text{C}| \times 0.0195\%) + \{200^{\circ}\text{C} \times 0.0088\% + [-50 - (-100)] \times 0.007\%$$

$$= (0.011^{\circ}\text{C} + 0.00975^{\circ}\text{C}) + (0.0176^{\circ}\text{C} + 0.0035^{\circ}\text{C})$$

$$= \pm 0.04185^{\circ}\text{C} \text{ [per } 10^{\circ}\text{C change]}$$

[For Explosion Protected Type]

Item	Description	Code
ATEX	<p>[4-20mA & Fieldbus: Flameproof and dust ignition proof approval] Applicable Standard: EN 60079-0:2012+A11:2013, EN 60079-1:2014, EN 60079-31:2014 Certificate: KEMA 07ATEX0130 II 2 G Ex db IIC T6/T5 Gb, II 2 D Ex tb IIIC T70°C, T90°C Db Ambient Temperature for Gas Atmospheres: -40 to 75°C for T6, -40 to 80°C for T5 Ambient Temperature for Dust Atmospheres: -30 to 65°C for T70°C, -30 to 80°C for T90°C Enclosure: IP66/IP67 Electrical Connection: 1/2 NPT female and M20 female*1</p>	<p>KF2*5</p>
	<p>4-20mA: [Intrinsically safe ia approval] Applicable Standard: EN 60079-0:2012+A11:2013, EN 60079-11:2012 Certificate No. FM16ATEX0019X II 1 G Ex ia IIC T5...T4 Ga Ambient Temperature: -40 to 70°C for T4, -40 to 50°C for T5 Enclosure: IP66/IP67 Electrical parameters: Supply/Output circuit: Terminals: +, - Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min(Without /A)</p> <p>[Intrinsically safe ic] Applicable Standard: EN 60079-0:2012+A11:2013, EN 60079-11:2012 Certificate Not Applicable as per Annex VIII to ATEX 2014/34/EU II 3 G Ex ic IIC T5...T4 Gc Ambient Temperature: -30 to 70°C for T4, -30 to 50°C for T5 Enclosure: IP66/IP67 Overvoltage category: I Electrical parameters: Supply/Output circuit: Terminals: +, - Ui=32V, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min(Without /A)</p> <p>[Flameproof and Dust Ignition Proof Approval] Same as KF2</p>	<p>KU2</p>
	<p>Fieldbus: [Intrinsically safe ia approval] Applicable Standard: EN 60079-0:2012+A11:2013, EN 60079-11:2012 Certificate No. FM16ATEX0019X II 1 G Ex ia IIC T4 Ga Ambient Temperature: -55 to 60°C Enclosure: IP66/IP67 Electrical parameters: Supply/Output circuit: Terminals: +, - FISCO field device or Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min(Without /A)</p> <p>[Intrinsically safe ic] Applicable Standard: EN 60079-0:2012+A11:2013, EN 60079-11:2012 Certificate: Not Applicable as per Annex VIII to ATEX 2014/34/EU II 3 G Ex ic IIC T4 Gc Ambient Temperature: -30 to 70°C Enclosure: IP66/IP67 Overvoltage category: I Electrical parameters: Supply/Output circuit: Terminals: +, - FISCO field device or Ui=32V, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A)</p> <p>[Flameproof and Dust Ignition Proof Approval] Same as KF2</p>	<p>KU25</p>

Item	Description	Code
IECEX*8	<p>[4-20mA & Fieldbus: Flameproof and dust ignition proof approval] Applicable standard: IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-31:2013 Certificate: IECEX KEM 07.0044 Ex db IIC T6/T5 Gb, Ex tb IIC T70°C / T90°C Db Ambient Temperature for Gas Atmospheres: -40 to 75°C (-40 to 167°F) for T6, -40 to 80°C (-40 to 176°F) for T5 Ambient Temperature for Dust Atmospheres: -30 to 65°C (-22 to 149°F) for T70°C, -30 to 80°C (-22 to 176°F) for T90°C Enclosure: IP66/IP67 Electrical Connection: 1/2 NPT female and M20 female*1</p>	SF2*5
	<p>4-20mA: [Intrinsically safe ia, ic pproval] Applicable Standard: IEC 60079-0:2011, IEC 60079-11:2011 Certificate No. IECEX FMG 16.0014X Ex ia IIC T5...T4 Ga Ex ic IIC T5...T4 Gc Ambient Temperature: -40 to 70°C for T4, -40 to 50°C for T5(Ex ia) Ambient Temperature: -30 to 70°C for T4, -30 to 50°C for T5(Ex ic) Enclosure: IP66/IP67 Overvoltage category: I Electrical parameters(Ex ia) Supply/Output circuit: Terminal: +, - Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Electrical parameters(Ex ic) Supply/Output circuit: Terminal: +, - Ui=30V, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s.,1 min (Without /A) [Flameproof and Dust Ignition Proof Approval] Same as SF2</p>	SU2
	<p>Fieldbus: [Intrinsically safe ia approval] Applicable Standard: IEC 60079-0: 2011, IEC 60079-11: 2011 Certificate No. IECEX FMG 16.0014X Ex ia IIC T4 Ga Ex ic IIC T4 Gc Ambient Temperature: -55 to 60°C (Ex ia) Ambient Temperature: -30 to 70°C (Ex ic) Enclosure: IP66/IP67 Overvoltage category: I Electrical parameters (Ex ia) Supply/Output circuit: Terminals: +, - FISCO field device or Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Electrical parameters (Ex ic) Supply/Output circuit: Terminals: +, - FISCO field device or Ui=32V, Ci=2.2nF, Li=0mH Sensor circuit:Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s.,1 min (Without /A) [Flameproof and Dust Ignition Proof Approval] Same as SF2</p>	SU25

Item	Description	Code
FM (US)	<p>[4-20mA & Fieldbus: Explosionproof approval] Applicable standard: FM Class 3600: 2011, FM Class 3615: 2006, FM Class 3810: 2005, NEMA250: 2014 Class I, Division 1, Groups A, B, C and D.; Class II/III, Division 1, Groups E, F and G. "FACTORY SEALD, CONDUIT SEAL NOT REQUIRED." Enclosure Ratings: TYPE 4X Temperature Class: T6 Ambient Temperature: -40 to 60°C (-40 to 140°F) Electrical Connection: 1/2NPT female²</p>	FF1*5
	<p>4-20mA: [Intrinsically safe approval/non-incendive approval] Applicable standard: FM Class 3600:2011, FM Class 3610:2015, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA-60079-0:2013, ANSI/ISA-60079-11:2014, NEMA 250:2003, ANSI/IEC 60529:2004 Intrinsically safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, G, T5...T4 Class I Zone 0 AEx ia IIC T5...T4 Non-incendive for Class I, II, Division 2, Groups A, B, C, D, F, G, T5...T4 Class III, Division 1 T5...T4 Class I Zone 2 Group IIC T5...T4 Ambient Temperature: -40 to 70°C for T4, -40 to 50°C for T5 Enclosure Type 4X, IP66/IP67 Electrical parameters: Intrinsically safe for Supply/Output circuit: Terminals: +, - Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Non-incendive for Supply/Output circuit: Terminals: +, - Ui=30V, Ci=22nF, Li=0mH Sensor circuit:Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s.,1 min (Without /A) [Explosionproof approval] Same as FF1</p>	FU1
	<p>Fieldbus: [Intrinsically safe approval/non-incendive approval] Applicable standard: FM Class 3600:2011, FM Class 3610:2015, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA-60079-0:2013, ANSI/ISA-60079-11:2014, NEMA 250:2003, ANSI/IEC 60529:2004 Intrinsically safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, G T4 Class I Zone 0 AEx ia IIC T4 Non-incendive for Class I, II, Division 2, Groups A, B, C, D, F, G T4 Class III, Division 1 T4 Class I Zone 2 Group IIC T4 Ambient Temperature: -55 to 60°C Enclosure Type 4X, IP66/IP67 Electrical parameters: Intrinsically safe for Supply/Output circuit: Terminals: +, - FISCO field device or Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Non-incendive for Supply/Output circuit: Terminals: +, - Ui=32V, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s.,1 min (Without /A) [Explosionproof approval] Same as FF1</p>	FU15

Item	Description	Code
CSA ^{3*7} FM (Canada) ^{4*7}	[4-20mA & Fieldbus: Explosionproof approval] Applicable standard: C22.2 No. 0-10, C22.2 No. 0.4-04, C22.2 No. 25-M1966, C22.2 No. 30-M1986, C22.2 No. 94-M1991, C22.2 No. 142-M1987, C22.2 No. 157-92, C22.2 No. 213-M1987, C22.2 No.61010-1-12, C22.2 No. 61010-2-030-12 Class I, Groups B, C and D, Class II, Groups E, F and G, Class III. For Class I, Division2 Groups ABCD Locations "FACTORY SEALED, CONDUIT SEAL NOT REQUIRED" Enclosure TYPE 4X Temperature Class: T6 Ambient Temperature: -40 to 60°C Electrical Connection: 1/2 NPT female*2	CF1 ⁵
	4-20mA: [Intrinsically safe approval/non-incendive approval] Applicable standard: CAN/CSA-C22.2 No. 94.2-07, C22.2 No.213:1987, CAN /CSA-C22.2 No. 60079-0:11, CAN/CSA-C22.2 No. 60079-11:14, CAN/CSA-C22.2 No. 60529:05, CAN/CSA-C22.2 No. 61010-1-12, CAN/CSA-C22.2 No. 61010-2-030-12 Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G, T5...T4 Ex ia IIC T5...T4 Ga Non-incendive for Class I, II, Division 2, Groups A, B, C, D, F, G T5...T4 Class III Division 1 T5...T4 Ambient Temperature: -40 to 70°C for T4, -40 to 50°C for T5 Enclosure Type: 4X, IP66/IP67 Electrical parameters: Intrinsically safe for Supply/Output circuit: Terminals: +, - Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Non-incendive for Supply/Output circuit: Terminals: +, - Ui=30V, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A) [Explosionproof approval] Same as CF1	CU1

Item	Description	Code
CSA ^{3*7} FM (Canada) ^{4*7}	Fieldbus: [Intrinsically safe approval/non-incendive approval] Applicable standard: CAN/CSA-C22.2 No. 94.2-07, C22.2 No.213:1987, CAN /CSA-C22.2 No. 60079-0:11, CAN/CSA-C22.2 No. 60079-11:14, CAN/CSA-C22.2 No. 60529:05, CAN/CSA-C22.2 No. 61010-1-12, CAN/CSA-C22.2 No. 61010-2-030-12 Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G T4 Ex ia IIC T4 Ga Non-incendive for Class I, II, Division 2, Groups A, B, C, D, F, G T4 Class III Division 1 T4 Ambient Temperature : -55 to 60°C Enclosure Type: 4X, IP66/IP67 Electrical parameters: Intrinsically safe for Supply/Output circuit: Terminals: +, - FISCO field device or Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Non-incendive for Supply/Output circuit: Terminals: +, - Ui=32V, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A) [Explosionproof approval] Same as CF1	CU15

Item	Description	Code
NEPSI*8	4-20mA and Fieldbus: [Flameproof and Dust Ignition Proof Approval] Applicable Standard: GB3836.1-2010, GB3836.2-2010, GB12476.1-2013, GB12476.5-2013 Certificate No. GYJ16.1396X Ex d IIC T6/T5 Gb, Ex tD A21 IP66/IP67 T70°C/T90°C Ambient Temperature for Gas Atmospheres: -40 to 75°C for T6, -40 to 80°C for T5 Ambient Temperature for Dust Atmospheres: -30 to 65°C for T70°C, -30 to 80°C for T90°C Enclosure: IP66/IP67 Electrical Connection: 1/2 NPT female and M20 female*1	<p style="text-align: center;">NF2</p>
	4-20mA: [Intrinsically safe approval] Applicable Standard: GB 3836.1-2010, GB 3836.4-2010 GB 3836.20-2010 Certificate No. GYJ16.1423X Ex ia IIC T4/T5 Ga Ambient Temperature: -40 to 70°C for T4, -40 to 50°C for T5 Enclosure: IP66/IP67 in accordance with only IEC 60529 Entity Parameters: Supply/Output circuit: $U_i=30V$, $I_i=200mA$, $P_i=1.0W$, $C_i=22nF$, $L_i=0mH$ Sensor circuit: $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$, $L_o=3.9mH$ Dielectric strength: 500 V a.c.r.m.s., 1 min [+ , - , C , 1 , 2 , 3 , 4 , 5] to Earth terminal [+ , - , C] to [1 , 2 , 3 , 4 , 5]	<p style="text-align: center;">NS2</p>
	Fieldbus: [Intrinsically safe approval] Applicable Standard: GB 3836.1-2010, GB 3836.4-2010, GB3836.20-2010 Certificate No. GYJ16.1423X Ex ia IIC T4 Ga Ambient Temperature: -55 to 60°C for T4 Enclosure: IP66/IP67 in accordance with only IEC 60529 FISCO field device Entity Parameters: Supply/Output circuit: $U_i=30V$, $I_i=300mA$, $P_i=1.2W$, $C_i=2.2nF$, $L_i=0mH$ Sensor circuit: $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$, $L_o=3.9mH$ Dielectric strength: 500 V a.c.r.m.s., 1 min [+ , - , 1 , 2 , 3 , 4 , 5] to Earth terminal [+ , -] to [1 , 2 , 3 , 4 , 5]	<p style="text-align: center;">NS25</p>

Item	Description	Code
INMETRO ^{7*8}	<p>[4-20mA & Fieldbus: Flameproof and dust ignition proof approval] Applicable Standard: ABNT NBR IEC 60079-0:2013 Versão Corrigida 2: 2016, ABNT NBR IEC60079-1:2016, ABNT NBR IEC 60079-31:2014 Certificate: DEKRA 16.0009 Ex db IIC T6/T5 Gb, Ex tb IIIC T70°C/ 90°C Db Ambient Temperature for Gas: -40 to +75°C for T6, -40 to +80°C for T5 Ambient Temperature for Dust: -30 to +65°C for T70°C, -30 to +80°C for T90°C Enclosure: IP66/IP67 Electrical Connection: 1/2 NPT female and M20 female*1</p>	<p>UF1</p>
	<p>4-20mA: [Intrinsically safe approval] Applicable Standard: ABNT NBR IEC 60079-0:2013 Versão Corrigida 2:2016, ABNT NBR IEC 60079-11:2013 Certificate: ABNT 17.0001X Ex ia IIC T5...T4 Ga Ambient Temperature: -40 to 70 °C for T4, -40 to 50 °C for T5 Enclosure: IP66/IP67 Supply/Output circuit: Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A)</p>	<p>US1</p>
	<p>Fieldbus: [Intrinsically safe approval "ia"] Applicable Standard: ABNT NBR IEC 60079-0:2013 Versão Corrigida 2:2016, ABNT NBR IEC 60079-11:2013 Certificate: ABNT 17.0001X Ex ia IIC T4 Ga Ambient Temperature: -55 to 60 °C Enclosure: IP66/IP67 Supply/Output circuit: FISCO field device and Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH Sensor circuit: Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A) [Intrinsically safe approval "ic"] Applicable Standard: ABNT NBR IEC 60079-0:2013 Versão Corrigida 2:2016, ABNT NBR IEC 60079-11:2013 Certificate: ABNT 17.0001X Ex ic IIC T4 Gc Ambient Temperature: -30 to 70 °C Enclosure: IP66/IP67 Overvoltage category: I Supply/Output circuit: FISCO field device and Ui=32V, Ci=2.2nF, Li=0mH Sensor circuit: Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A)</p>	<p>US15</p>

Item	Description	Code
KOSHA*8	<p>[4-20mA & Fieldbus: Flameproof and dust ignition proof approval] Applicable Standard: Notice of Ministry of Labor No. 2016-54, harmonized with IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-31:2013 Certificate: 17-AV4BO-0457 (Flameproof) 17-AV4BO-0458 (Dust Ignition Proof) Ex d IIC T6/ T5, Ex tD A21 IP66/IP67 T70°C/ T90°C Ambient Temperature for Gas Atmospheres: -40 to 75°C for T6, -40 to 80°C for T5 Ambient Temperature for Dust Atmospheres: -30 to 65°C for T70°C, -30 to 80°C for T90°C Enclosure: IP66/IP67 Electrical Connection: 1/2 NPT female and M20 female*1</p>	PF2
	<p>4-20mA: [Intrinsically safe approval] Applicable Standard: Notice of Ministry of Labor No. 2016-54, harmonized with IEC 60079-0: 2011, IEC 60079-11: 2011 Certificate: 17-AV4BO-0459X Ex ia IIC T5...T4 Ambient Temperature: -40 to 70 °C for T4, -40 to 50 °C for T5 Enclosure: IP66/IP67 Supply/Output circuit: Terminals: +, -, c Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A) Electrical Connection: 1/2 NPT female and M20 female *1</p>	PS2
	<p>Fieldbus: [Intrinsically safe approval] Applicable Standard: Notice of Ministry of Labor No. 2016-54, harmonized with IEC 60079-0: 2011, IEC 60079-11: 2011 Certificate: 17-AV4BO-0459X Ex ia IIC T4 Ambient Temperature: -55 to 60°C Enclosure: IP66/IP67 Supply/Output circuit: Terminals: +, - FISCO field device and Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A) Electrical Connection: 1/2 NPT female and M20 female *1</p>	PS25

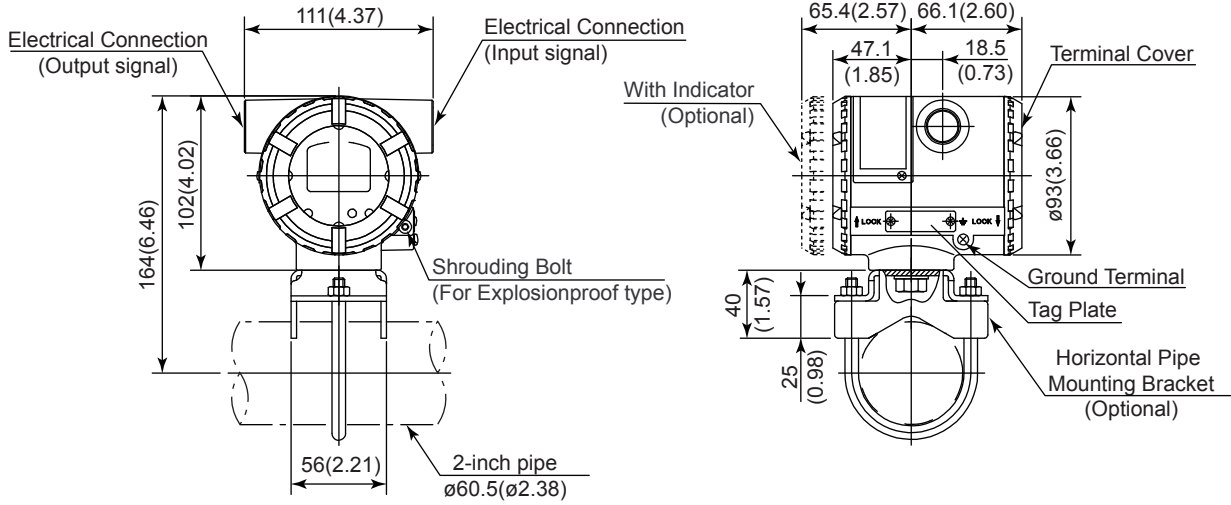
Item	Description	Code
EAC*7*8	[4-20mA & Fieldbus: Flameproof and dust ignition proof approval] Applicable Standard: GOST 31610.0-2014 GOST IEC 60079-1-2013 GOST IEC 60079-31-2013 Certificate: TC RU C-JP.ПБ98.В.00040 1Ex db IIC T6...T5 Gb, Ex tb IIIC T70°C...T90°C Db Ambient Temperature for Gas Atmospheres: -40 to 75°C for T6, -40 to 80°C for T5 Ambient Temperature for Dust Atmospheres: -30 to 65°C for T70°C, -30 to 80°C for T90°C Enclosure: IP66/IP67 Electrical Connection: 1/2 NPT female and M20 female*1	GF1*6
	4-20mA: [Intrinsically safe approval] Applicable Standard: GOST 31610.0-2014 GOST 31610.11-2014 Certificate: TC RU C-JP.ПБ98.В.00040 0Ex ia IIC T4...T5 Ga X Ambient Temperature: -40 to 70 °C for T4, -40 to 50 °C for T5 Enclosure: IP66/IP67 Supply/Output circuit: Terminals: +, - Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A) Electrical Connection: 1/2 NPT female and M20 female*1	GS1*6
	Fieldbus: [Intrinsically safe approval] Applicable Standard: GOST 31610.0-2014 GOST 31610.11-2014 Certificate: TC RU C-JP.ПБ98.В.00040 0Ex ia IIC T4 Ga X Ambient Temperature: -55 to 60°C Enclosure: IP66/IP67 Supply/Output circuit: Terminals: +, - FISCO field device and Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH Sensor circuit: Terminals: 1, 2, 3, 4, 5 Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Dielectric strength: 500 V a.c.r.m.s., 1 min (Without /A) Electrical Connection: 1/2 NPT female and M20 female*1	GS15*6

- *1: Applicable for Electrical Connection Code 2 and 4.
- *2: Applicable for Electrical Connection Code 2.
- *3: For Explosionproof approval.
- *4: For Intrinsically safe approval/non-incendive approval.
- *5: Not applicable for YTA610.
- *6: GF1, /GS1 and /GS15 shall be combined with either /VE or /VR.
- *7: Not applicable for BRAIN type.
- *8: Selection of SG is required.

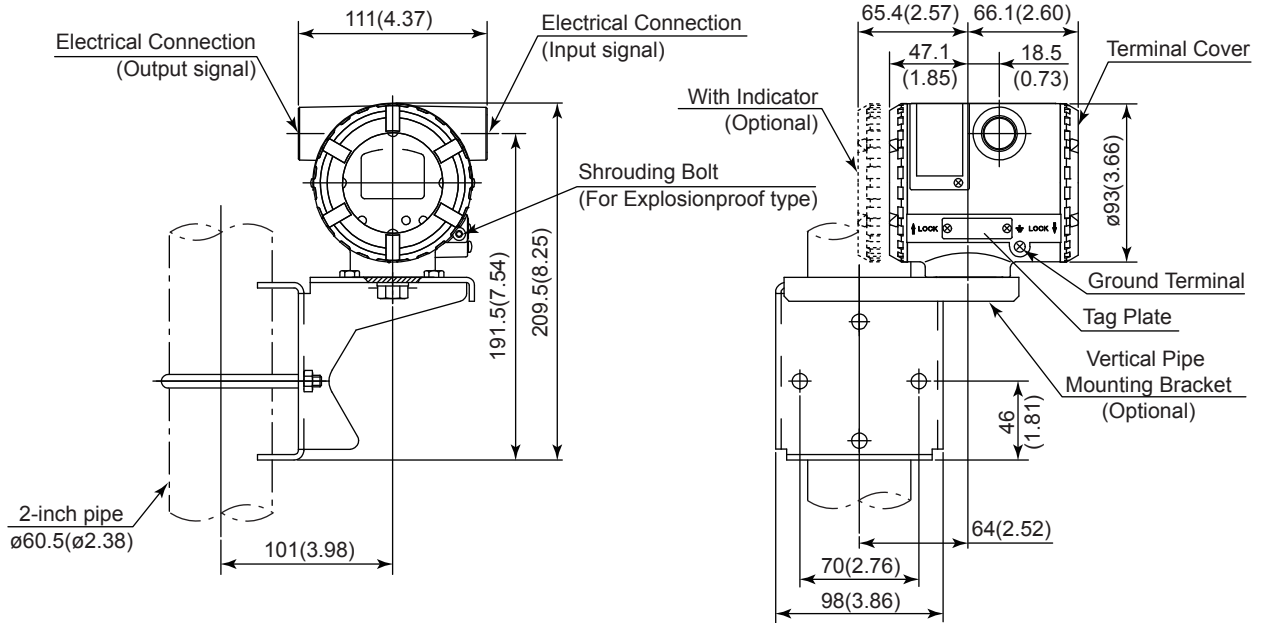
7.4 Dimensions (YTA610 and YTA710)

Unit: mm (Approx. inch)

● 2-inch horizontal pipe mounting

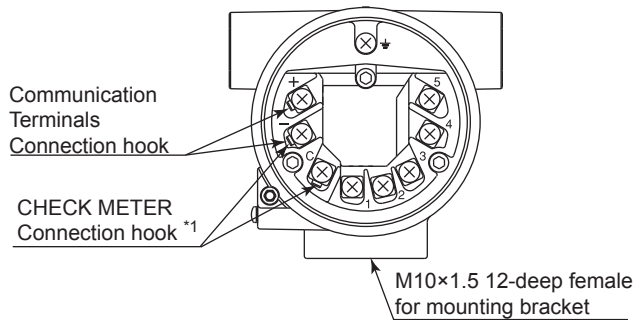


● 2-inch vertical pipe mounting



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Terminals



Terminal Configuration

+	Power supply and output terminal
-	External indicator (ammeter) terminal *1
⏚	Ground terminal

*1 : When using an external indicator or a check meter, the internal resistance must be 10Ω or less. The hook is not available for Fieldbus communication type.

F0704.ai

Revision Information

- Title : YTA610 and YTA710 Temperature Transmitters (Hardware)
- Manual No. : IM 01C50G01-01EN

Edition	Date	Page	Revised Item
1st	June 2016	—	New publication.
2nd	Oct. 2016	—	Add YTA610. Incorporate manual change 16-028 and 16-045.
		1-1	Add document No. of GS 01C50H01-01EN.
		1-5	Add YTA610 to the table.
		2-4	Add ATEX Intrinsically safe approval.
		2-5	Revise the name plate.
		2-6 & 2-7	Add name plate (intrinsically safe approval and Flameproof and Dust ignition approval).
		2-7	Add IECEx intrinsically safe approval.
		2-9	Add FM (US) intrinsically safe approval/non-incendive approval.
		2-10	Add FM (Canada) intrinsically safe approval/non-incendive approval.
		2-13 to 2-24	Add "2.7.5 Control Drawing".
		3-4	Add note for Ni120.
		6-1	Revise the description of IMPORTANT.
		6-3	Delete "6.3.2 Replacement of MAIN and TEMP Assembly".
		6-6 & 6-7	Add *1 to the Table 6.4.
		6-7	Add *3 to the Table 6.5.
		6-8 & 6-9	Add *1 to the Table 6.6.
		7-1	Revise 5 year stability.
		7-2	Revise Sensor-Diagnostics. Add software download class. Add SIL certification.
		7-3	Revise supply voltage requirements.
7-4	Revise accuracy of type N. Delete Ni120.		
7-5 to 7-9	Add YTA610 specifications.		
7-10	Add YTA610. Add *3 to the optional specifications table.		
7-11 to 7-15	Add intrinsically safe and non-incendive type (KU2, KU25, SU2, SU25, FU1, FU15, CU1, and CU15).		
7-16	Add YTA610.		
3rd	Dec. 2017	1-1	Add document No. of IM 01C50G01-02EN, IM 01C50G01-01P and IM 01C50G01-01K.
		2-4	Add Fieldbus Type.
		2-5 & 2-8	Change applicable standards and Type of Protection and Marking Code, Add Supply Voltage and Output Signal specifications.
		2-6 & 2-7	Change Name Plate.
		2-7	IECEx intrinsically safe approval Items to be changed.
		2-15 & 2-16	Add Control Drawing.
		2-27	Add Immunity influence during the test.
		3-4	Delete *1 Applicable only for YTA610.
		7-2	Add Immunity influence during the test, Add EU RoHS Directive.
		7-4	Add Ni120.
		7-7	Add Immunity influence during the test, Add EU RoHS Directive and add SIL Certification.
		7-9	Change Note1.
		7-12	Revise ATEX Intrinsically safe.
		7-13	Revise IECEx.
		7-16	Add NEPSI (NF2, NS2, NS25).
7-17	Add INMETRO (UF1, US1, US15).		
7-18	Add KOSHA (PF2, PS2, PS25).		

Edition	Date	Page	Revised Item
4th	Mar. 2018	2-5 2-8 2-10 2-11 2-14 to 2-29 6-5 7-1 to 7-4 7-13 7-14 7-15 7-16 7-17 7-18 7-23	Revise ATEX intrinsically safe approval Add "Ex ic" of ATEX intrinsically safe approval 4-20mA type Add "Ex ic" of IECEx intrinsically safe approval Revise IECEx intrinsically safe approval Revise FM (US) intrinsically safe approval/nonincendive Revise FM (Canada) intrinsically safe approval/nonincendive approval Revise Control Drawing Add Table 6.4 Add BRAIN Type. Add R1 Option and VE, VR Option. Add Table 7.5 Revise ATEX Add Ex ic Revise IECEx Add Ex ic Revise FM (US) Revise CSA, FM (Canada) Add EAC (GF1, GS1, GS15)
5th	June 2019	1-1 3-1 3-2 3-4, 3-5 3-6 5-2 6-5 6-6,6-7 7-1 to 7-13	Add reference for functional safety Add Nut to 3.PART Delete (HART/BRAIN) Add FF Add Character and Selection. Change Parameters Configuration Add Note Delete (HART/FF) Correction of errors Change Standard specification contents