User's Manual

YTA610 and YTA710 Temperature Transmitter (Hardware)

YTA Series

IM 01C50G01-01EN

vigilantplant.®

YOKOGAWA ◆

Yokogawa Electric Corporation

YTA610 and YTA710
Temperature Transmitter (Hardware)

IM 01C50G01-01EN   2nd Edition

CONTENTS

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 01C50T01-02EN	For HART protocol type
IM 01C50T02-02EN	For FOUNDATION Fieldbus communication type
GS 01C50G01-01EN	YTA710 Temperature Transmitter
GS 01C50H01-01EN	YTA610 Temperature Transmitter

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

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

■ Notes on the User's Manual

- This manual should be delivered to the end user.
- 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.
- 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

- 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

● **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, misusage, 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 HART Communication Foundation.
- 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.

■ ATEX Documentation

This procedure is only applicable to the countries in European Union.

GB All instruction manuals for ATEX Ex related products are available in English, German and French. Should you require Ex related instructions in your local language, you are to contact your nearest Yokogawa office or representative.

DK Alle brugervejledninger for produkter relateret til ATEX Ex er tilgængelige på engelsk, tysk og fransk. Skulle De ønske yderligere oplysninger om håndtering af Ex produkter på eget sprog, kan De rette henvendelse herom til den nærmeste Yokogawa afdeling eller forhandler.

I Tutti i manuali operativi di prodotti ATEX contrassegnati con Ex sono disponibili in inglese, tedesco e francese. Se si desidera ricevere i manuali operativi di prodotti Ex in lingua locale, mettersi in contatto con l'ufficio Yokogawa più vicino o con un rappresentante.

E Todos los manuales de instrucciones para los productos antiexplosivos de ATEX están disponibles en inglés, alemán y francés. Si desea solicitar las instrucciones de estos artículos antiexplosivos en su idioma local, deberá ponerse en contacto con la oficina o el representante de Yokogawa más cercano.

NL Alle handleidingen voor producten die te maken hebben met ATEX explosiebeveiliging (Ex) zijn verkrijgbaar in het Engels, Duits en Frans. Neem, indien u aanwijzingen op het gebied van explosiebeveiliging nodig hebt in uw eigen taal, contact op met de dichtstbijzijnde vestiging van Yokogawa of met een vertegenwoordiger.

SF Kaikkien ATEX Ex -tyyppisten tuotteiden käyttöhjeet ovat saatavilla englannin-, saksan- ja ranskankielisinä. Mikäli tarvitsette Ex -tyyppisten tuotteiden ohjeita omalla paikallisella kielellännne, ottakaa yhteyttä lähimpään Yokogawa-toimistoon tai -edustajaan.

P Todos os manuais de instruções referentes aos produtos Ex da ATEX estão disponíveis em Inglês, Alemão e Francês. Se necessitar de instruções na sua língua relacionadas com produtos Ex, deverá entrar em contacto com a delegação mais próxima ou com um representante da Yokogawa.

F Tous les manuels d'instruction des produits ATEX Ex sont disponibles en langue anglaise, allemande et française. Si vous nécessitez des instructions relatives aux produits Ex dans votre langue, veuillez bien contacter votre représentant Yokogawa le plus proche.

D Alle Betriebsanleitungen für ATEX Ex bezogene Produkte stehen in den Sprachen Englisch, Deutsch und Französisch zur Verfügung. Sollten Sie die Betriebsanleitungen für Ex-Produkte in Ihrer Landessprache benötigen, setzen Sie sich bitte mit Ihrem örtlichen Yokogawa-Vertreter in Verbindung.

S Alla instruktionsböcker för ATEX Ex (explosionssäkra) produkter är tillgängliga på engelska, tyska och franska. Om Ni behöver instruktioner för dessa explosionssäkra produkter på annat språk, skall Ni kontakta närmaste Yokogawakontor eller representant.

GR Όλα τα εγχειρίδια λειτουργίας των προϊόντων με ATEX Ex διατίθενται στα Αγγλικά, Γερμανικά και Γαλλικά. Σε περίπτωση που χρειάζεστε οδηγίες σχετικά με Εx στην τοπική γλώσσα παρακαλούμε επικοινωνήστε με το πλησιέστερο γραφείο της Yokogawa ή αντιπρόσωπο της.

SK Všetky návody na obsluhu pre prístroje s ATEX Ex sú k dispozícii v jazyku anglickom, nemeckom a francúzskom. V prípade potreby návodu pre Ex-prístroje vo Vašom národnom jazyku, skontaktujte prosím miestnu kanceláriu firmy Yokogawa.

CZ Všechny uživatelské příručky pro výrobky, na něž se vztahuje nevýbušné schválení ATEX Ex, jsou dostupné v angličtině, němčině a francouzštině. Požadujete-li pokyny týkající se výrobků s nevýbušným schválením ve vašem lokálním jazyku, kontaktujte prosím vaši nejbližší reprezentační kancelář Yokogawa.

LT Visos gaminiø ATEX Ex kategorijos Eksploatavimo instrukcijos teikiami anglø, vokieèiø ir prancûzø kalbomis. Norëdami gauti prietaisø Ex dokumentacijà kitomis kalbomis susisiekite su artimiausiu bendrovës "Yokogawa" biuru arba atstovu.

LV Visas ATEX Ex kategorijas izstrâdâjumu Lietoðanas instrukcijas tiek piegâdâtas angïu, vâcu un franèu valodâs. Ja vçlaties saòemt Ex ierîèu dokumentâciju citâ valodâ, Jums ir jâsazinâs ar firmas Jokogava (Yokogawa) tuvâko ofisu vai pârstâvi.

EST Kõik ATEX Ex toodete kasutamisjuhendid on esitatud inglise, saksa ja prantsuse keeles. Ex seadmete muukeelse dokumentatsiooni saamiseks pöörduge lähima lokagava (Yokogawa) kontori või esindaja poole.

PL Wszystkie instrukcje obsługi dla urządzeń w wykonaniu przeciwwybuchowym Ex, zgodnych z wymaganiami ATEX, dostępne są w języku angielskim, niemieckim i francuskim. Jeżeli wymagana jest instrukcja obsługi w Państwa lokalnym języku, prosimy o kontakt z najbliższym biurem Yokogawy.

SLO Vsi predpisi in navodila za ATEX Ex sorodni pridelki so pri roki v anglišèini, nemšèini ter francošèini. Èe so Ex sorodna navodila potrebna v vašem tukejnjem jeziku, kontaktirajte vaš najbliši Yokogawa office ili predstaunika.

H Az ATEX Ex mûszerek gépkönyveit angol, német és francia nyelven adjuk ki. Amennyiben helyi nyelven kérik az Ex eszközök leírásait, kérjük keressék fel a legközelebbi Yokogawa irodát, vagy képviseletet.

BG Всички упътвания за продукти от серията ATEX Ex се предлагат на английски, немски и френски език. Ако се нуждаете от упътвания за продукти от серията Ex на родния ви език, се свържете с най-близкия офис или представителство на фирма Yokogawa.

RO Toate manualele de instructiuni pentru produsele ATEX Ex sunt in limba engleza, germana si franceza. In cazul in care doriti instructiunile in limba locala, trebuie sa contactati cel mai apropiat birou sau reprezentant Yokogawa.

M Il-manwali kollha ta' l-istruzzjonijiet għal prodotti marbuta ma' ATEX Ex huma disponibbli bl-Ingliż, bil-Ġermaniż u bil-Franċiż. Jekk tkun teħtieġ struzzjonijiet marbuta ma' Ex fil-lingwa lokali tiegħek, għandek tikkuntattja lill-eqreb rappreżentan jew uffiċċju ta' Yokogawa.

■ 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.
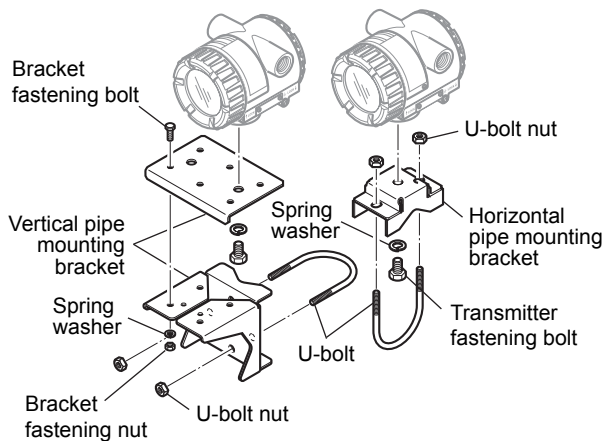
Figure 2.1   Transmitter mounting parts

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.
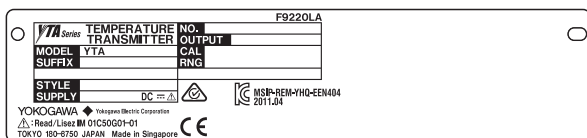
Figure 2.2   Name plate

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 lighting 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 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.

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.
- 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
- 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=10µF, 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]

② Fieldbus type
- YTA610 and YTA710 with /KU25 temperature transmitter (Fieldbus type) is applicable for use in hazardous locations.
- 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
- 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=10µF, 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]

Note 2. Specific conditions of use

⚠ WARNING

- Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.
- When the enclosure of the Temperature Transmitter is made of aluminum alloy, if it is mounted in an area where the use of category 1 G 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 3. 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.

e.g. In case of selecting "ia" and crossing out "d" and "tb"
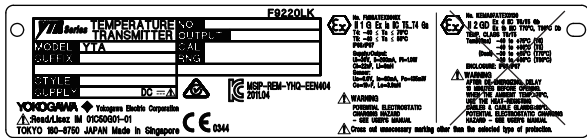
e.g. In case of selecting "d" and "tb" and crossing out "ia"
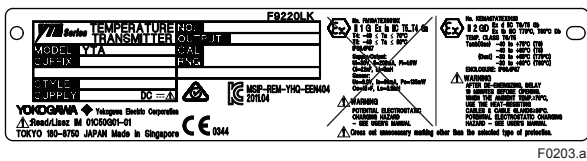
F0203.ai

Note 4. Installation

Installation should be in accordance with Control Drawing IIE019-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 60079-1:2007, EN 60079-31:2009
*   Type of Protection and Marking Code: II 2 G Ex d 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

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 strictly the "WARNING" on the label on the transmitter.
    WARNING: AFTER DE-ENERGING, DELAY 10 MINUTES BEFORE OPENING. WHEN THE AMBIENT TEMP.≥70°C, USE THE HEATRESISTING CABLES AND CABLE GLANDS OF HIGHER THAN 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.

(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
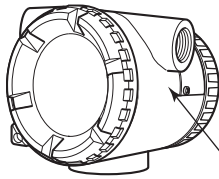
Location of the marking

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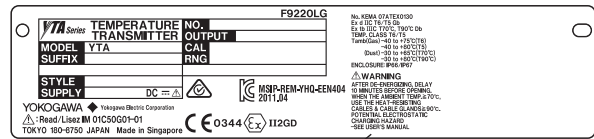
No. KEMA 07ATEX0130
Ex d IIC T6/T5 Gb
Ex tb IIIC T70°C, T90°C Db
TEMP. CLASS T6/T5
Tamb (Gas) -40 to +75°C(T6)
                   -40 to +80°C(T5)
      (Dust) -30 to +65°C(T70°C)
                   -30 to +80°C(T90°C)
ENCLOSURE: IP66/IP67

⚠ **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
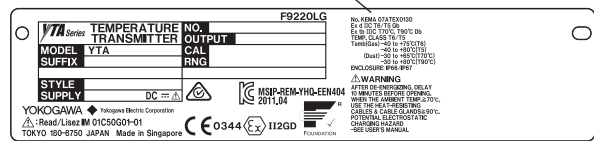
F0205.ai

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

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

⚠ **WARNING**
POTENTIAL ELECTROSTATIC
CHARGING HAZARD
-SEE USER'S MANUAL

No. KEMA 07ATEX0130
II 2 GD Ex d 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.

F0206.ai

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

No. FM16ATEX0019X
II 1 G 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

⚠ **WARNING**
POTENTIAL ELECTROSTATIC
CHARGING HAZARD
-SEE USER'S MANUAL

No. KEMA 07ATEX0130
II 2 GD Ex d 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.

F0207.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
- Ambient Temperature:
  –40 to 70°C for T4, –40 to 50°C for T5
- Enclosure: IP66/IP67
- Entity parameters:
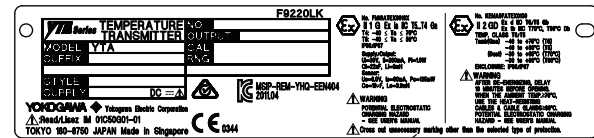 Supply/Output circuit: Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH
  Sensor circuit: Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH
- Dielectric strength: 500 V a.c.r.m.s.,1 min
  [+, -, C, 1, 2, 3, 4, 5] to Earth terminal
  [+, -, C] to [1, 2, 3, 4, 5]

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
- Ambient Temperature: –55 to 60°C
- Enclosure: IP66/IP67
- FISCO field device
- Entity Parameters:
  Supply/Output circuit: 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
  [+, -, 1, 2, 3, 4, 5] to Earth terminal
  [+, -] to [1, 2, 3, 4, 5]

Note 2. Specific conditions of use

⚠ WARNING

- Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.
- 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 3. 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 4. Installation

Installation should be in accordance with Control Drawing IIE019-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 60079-1:2007, IEC 60079-31:2008
- Type of Protection and Marking Code: Ex d 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

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-ENERGING, DELAY 10 MINUTES BEFORE OPENING. WHEN THE AMBIENT TEMP.≥70°C, USE THE HEATRESISTING CABLES AND CABLE GLANDS OF HIGHER THAN 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 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.

(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

Location of the marking
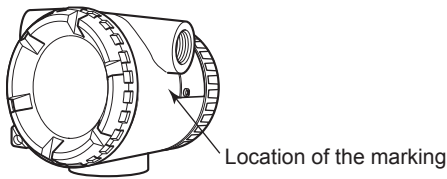
F0204.ai

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:
  Class 3600:2011, Class 3610:2015,
  Class 3611:2004, Class 3810:2005,
  ANSI/ISA-60079-0:2013,
  ANSI/ISA-60079-11:2014,
  ANSI/IEC 60529:2004 (R2011),
  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

- Entity parameters:
  Intrinsically safe for
  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=10µF, L_o=3.9mH
  Non-incendive for
  Supply/Output circuit: U_i=30V, C_i=22nF, L_i=0mH
  Sensor circuit: 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
  [+, -, C, 1, 2, 3, 4, 5] to Earth terminal
  [+, -, C] to [1, 2, 3, 4, 5]
② Fieldbus type
- YTA610 and YTA710 with /FU15 temperature transmitter (Fieldbus type) is applicable for use in hazardous locations.
- Applicable standard:
  Class 3600:2011, Class 3610:2015,
  Class 3611:2004, Class 3810:2005,
  ANSI/ISA-60079-0:2013,
  ANSI/ISA-60079-11:2014,
  ANSI/IEC 60529:2004 (R2011),
  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
- FISCO field device
- Entity parameters:
  Intrinsically safe for
  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=10µF, L_o=3.9mH
  Non-incendive for
  Supply/Output circuit: U_i=32V, C_i=2.2nF, L_i=0mH
  Sensor circuit: 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
  [+, -, 1, 2, 3, 4, 5] to Earth terminal
  [+, -] to [1, 2, 3, 4, 5]

Note 2. Specific conditions of use

⚠ WARNING

- Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.
- 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 3. 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 4. 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 3600, FM 3615, FM 3810, ANSI/NEMA 250
- 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. 0:2010 (R2015),
  CAN/CSA-C22.2 No. 94.1:2007 (R2012),
  CAN/CSA-C22.2 No. 94.2:2007 (R2012),
  C22.2 No.213:1987 (R2013),
  CAN /CSA-C22.2 No. 60079-0:2011,
  CAN/CSA-C22.2 No. 60079-11:2014,
  CAN/CSA-C22.2 No. 60529:2005 (R2010),
  CAN/CSA-C22.2 No. 61010-1:2012,
  CAN/CSA-C22.2 No. 61010-2-030:2012

- 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
- Entity parameters:
  Intrinsically safe for
  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
  Non-incendive for
  Supply/Output circuit: Ui=30V, 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
  [+, -, C, 1, 2, 3, 4, 5] to Earth terminal
  [+, -, C] to [1, 2, 3, 4, 5]

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. 0:2010 (R2015),
  CAN/CSA-C22.2 No. 94.1:2007 (R2012),
  CAN/CSA-C22.2 No. 94.2:2007 (R2012),
  C22.2 No.213:1987 (R2013),
  CAN /CSA-C22.2 No. 60079-0:2011,
  CAN/CSA-C22.2 No. 60079-11:2014,
  CAN/CSA-C22.2 No. 60529:2005 (R2010),
  CAN/CSA-C22.2 No. 61010-1:2012,
  CAN/CSA-C22.2 No. 61010-2-030:2012
- 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
- FISCO field device
- Entity parameters:
  Intrinsically safe for
  Supply/Output circuit: 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
  Non-incendive for
  Supply/Output circuit: 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
  [+, -, 1, 2, 3, 4, 5] to Earth terminal
  [+, -] to [1, 2, 3, 4, 5]

Note 2. Specific conditions of use

⚠️ **WARNING**

- Precautions shall be taken to minimize the
  risk from electrostatic discharge of painted
  parts.
- 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 3. 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 4. 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, C22.2 No.0.4, C22.2 No.25, C22.2 No.30, C22.2 No.94, C22.2 No.142, C22.2 No.157, C22.2 No.213, C22.2 No.61010-1, C22.2 No.61010-2-30
*   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.
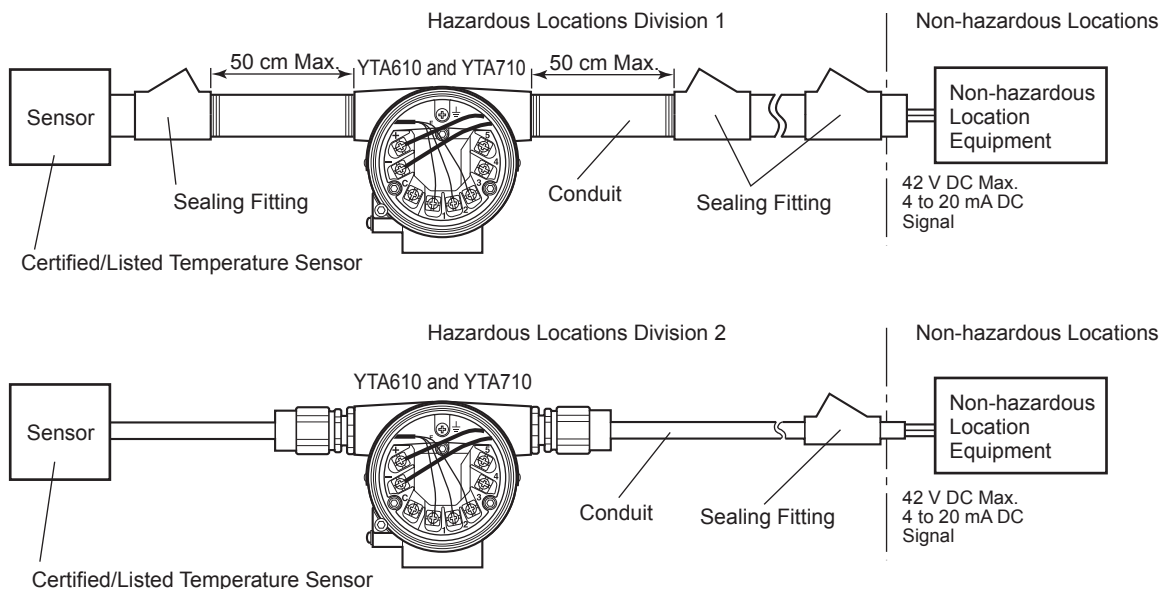
Note: Temperature sensor shall be certified in type of Hazardous Locations.

F0208.ai

2.7.5 Control Drawing

Control Drawing for ATEX and IECEx intrinsically safe approval (4 - 20 mA type)

Model: YTA series   Date: September 24, 2015

Control Drawing (ATEX, IECEx)

Intrinsically Safe Installation for YTAxxx – J or – D

Hazardous Area	Hazardous Area	Non-Hazardous Area

Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

1
2
3
4
5

+

–

C

Associated Apparatus
(linear source)

+

–

+

–

Sensor Input:
$U_o = 6.0$ V
$I_o = 90$ mA
$P_i = 135$ mW
$C_i = 10$ μF
$L_i = 3.9$ mH

Model YTAxxx – J or – D
Supply /Output:
$U_i = 30$ V
$I_i = 200$ mA
$P_i = 1.0$ W
$C_i = 22$ nF
$L_i = 0$ mH
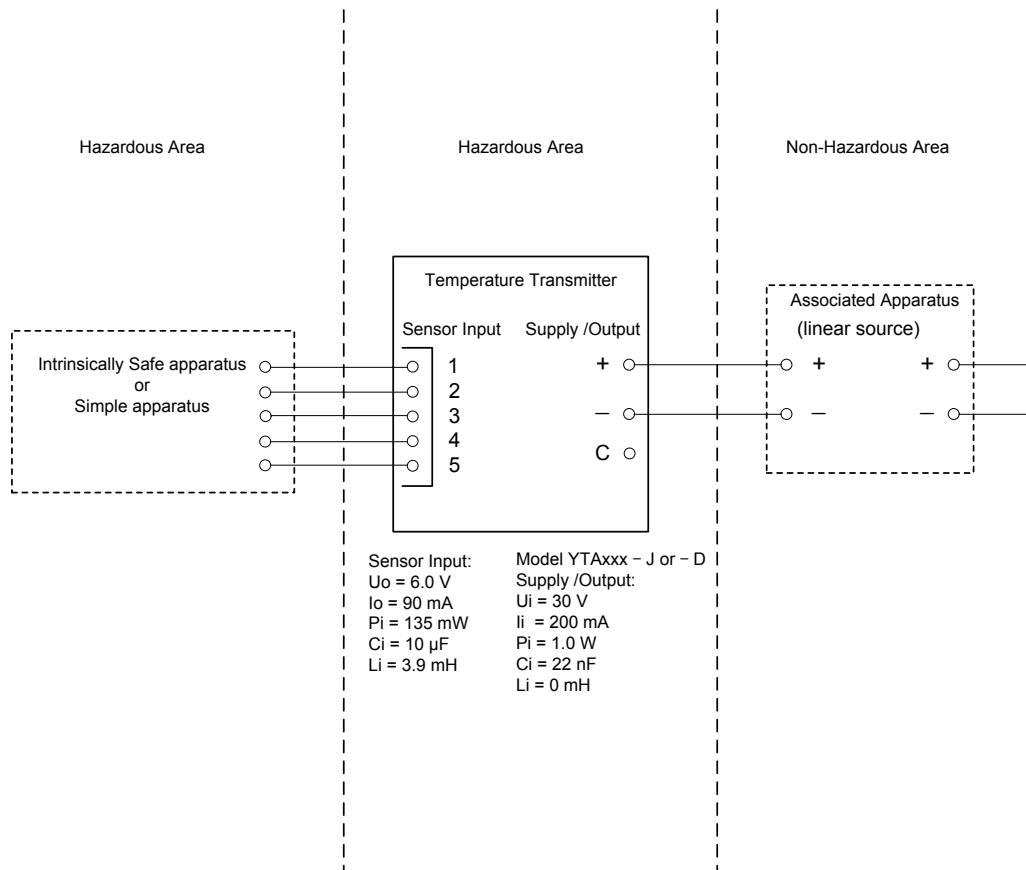
Rev.   Doc. No.:   IIE029-A63 P.1

Yokogawa Electric Corporation

Control Drawing for ATEX and IECEx intrinsically safe approval (Fieldbus type)

Model: YTA series   Date: September 24, 2015

Intrinsically Safe Installation for YTAxxx – F or – G

Hazardous Area | Hazardous Area | Non-Hazardous Area

Terminator

Terminator

Associated Apparatus

Field Device   Field Device

Linear source or
FISCO power supply

Model YTAxxx – F or – G
Temperature Transmitter

Intrinsically Safe apparatus
or
Simple apparatus

Sensor Input	Supply /Output
	+
1	
2	
3	
4	−
5	

Sensor Input:
$U_o = 6.0\,V$
$I_o = 90\,mA$
$P_i = 135\,mW$
$C_i = 10\,\mu F$
$L_i = 3.9\,mH$

Model YTAxxx – F or – G
Supply /Output:
$U_i = 30\,V$
$I_i = 300\,mA$
$P_i = 1.2\,W$
$C_i = 2.2\,nF$
$L_i = 0\,mH$

FISCO field device

Specific Condition of Use:
– Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.
– (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 – 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.

Rev.1: July 4, 2016   Doc. No.:   IIE029-A63 P.2

Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Control Drawing (US)

Intrinsically Safe Installation for YTAxxx – J or – D

Hazardous (Classified) Location	Hazardous (Classified) Location	Unclassified Location

Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1
Class I, Zone 0, Group IIC

Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1
Class I, Zone 0, Group IIC
Temperature Class: T5...T4

Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 4

1
2
3
4
5

+

−

C

Associated Apparatus

+   +

−   −

See Note 4

Linear source

Sensor Input:
U_o = 6.0 V
I_o = 90 mA
P_i = 135 mW
C_i = 10 µF
L_i = 3.9 mH

Model YTAxxx – J or – D
Supply /Output:
U_i = 30 V
I_i = 200 mA
P_i = 1.0 W
C_i = 22 nF
L_i = 0 mH

Rev.   Doc. No.:   IIE029-A61 P.1

Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Division 2 Installation for YTAxxx – J or – D

Hazardous (Classified) Location	Hazardous (Classified) Location	Unclassified Location

Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III, Division 1
Class I, Zone 2, Group IIC

Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III, Division 1
Class I, Zone 2, Group IIC
Temperature Class: T5...T4

Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 4

1
2
3
4
5

+

—

C

Associated Apparatus

+   +

—   —

See Note 7

Sensor Input:
Uo = 6.0 V
Io = 90 mA
Pi = 135 mW
Ci = 10 μF
Li = 3.9 mH

Model YTAxxx – J or – D
Supply /Output:
Ui = 30 V
Ci = 22 nF
Li = 0 mH

Rev.   Doc. No.:   IIE029-A61 P.2
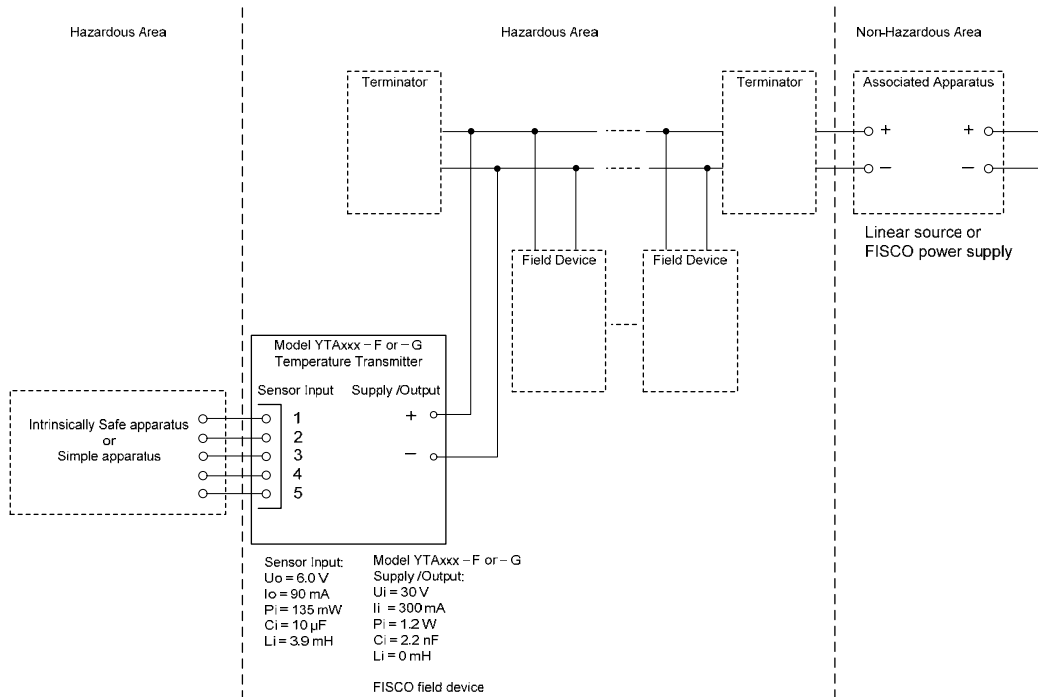
Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Intrinsically Safe Installation for YTAxxx – F or – G

Hazardous (Classified) Location

Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1
Class I, Zone 0, Group IIC

Hazardous (Classified) Location

Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1
Class I, Zone 0, Group IIC
Temperature Class: T4

Unclassified Location

Terminator

Terminator

Associated Apparatus

+

−

See Note 4

Linear source or
FISCO power supply

Model YTAxxx – F or – G
Temperature Transmitter

Field Device

Field Device

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 4

1
2
3
4
5

+

−

Sensor Input:
U_o = 6.0 V
I_o = 90 mA
P_i = 135 mW
C_i = 10 µF
L_i = 3.9 mH

Model YTAxxx – F or – G
Supply /Output:
U_i = 30 V
I_i = 300 mA
P_i = 1.2 W
C_i = 2.2 nF
L_i = 0 mH

FISCO field device

Rev.   Doc. No.:   IIE029-A61 P.3

Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Division 2 Installation for YTAxxx – F or – G

Hazardous (Classified) Location

Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III, Division 1
Class I, Zone 2, Group IIC

Hazardous (Classified) Location

Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III, Division 1
Class I, Zone 2, Group IIC
Temperature Class: T4

Unclassified Location

Terminator

Terminator

Associated Apparatus

See Note 7

Field Device   Field Device

Model YTAxxx – F or – G
Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 4

1
2
3
4
5

+

–

Sensor Input:
$U_o = 6.0$ V
$I_o = 90$ mA
$P_i = 135$ mW
$C_i = 10$ µF
$L_i = 3.9$ mH

Model YTAxxx – F or – G
Supply /Output:
$U_i = 32$ V
$C_i = 2.2$ nF
$L_i = 0$ mH

Rev.1: July 4, 2016   Doc. No.:   IIE029-A61 P.4

Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Specific Conditions of Use:
– Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.
– 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.
$$Voc \ (or \ Uo) \leq Ui$$
$$Isc \ (or \ Io) \leq Ii$$
$$Po \leq Pi$$
$$Ca \ (or \ Co) \geq Ci + Ccable$$
$$La \ (or \ Lo) \geq Li + Lcable$$

5. Control equipment connected to the Associated Apparatus must not use or generate a voltage more than Um 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.
$$Voc \ (or \ Uo) \leq Ui$$
$$Ca \ (or \ Co) \geq Ci + Ccable$$
$$La \ (or \ Lo) \geq Li + Lcable$$

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

Rev.   Doc. No.:   IIE029-A61 P.5

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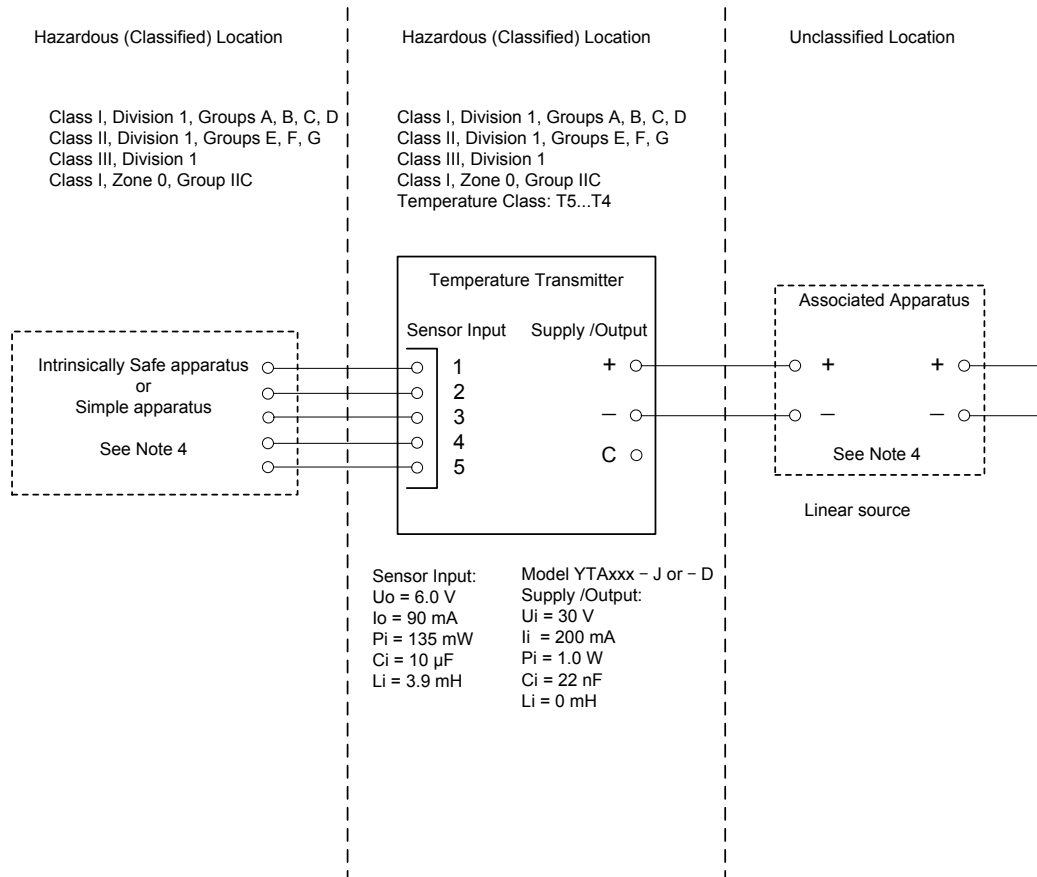
Control Drawing for FM (Canada) intrinsically safe approval (4 - 20mA type)

Model: YTA series   Date: September 24, 2015

Control Drawing (Canada)

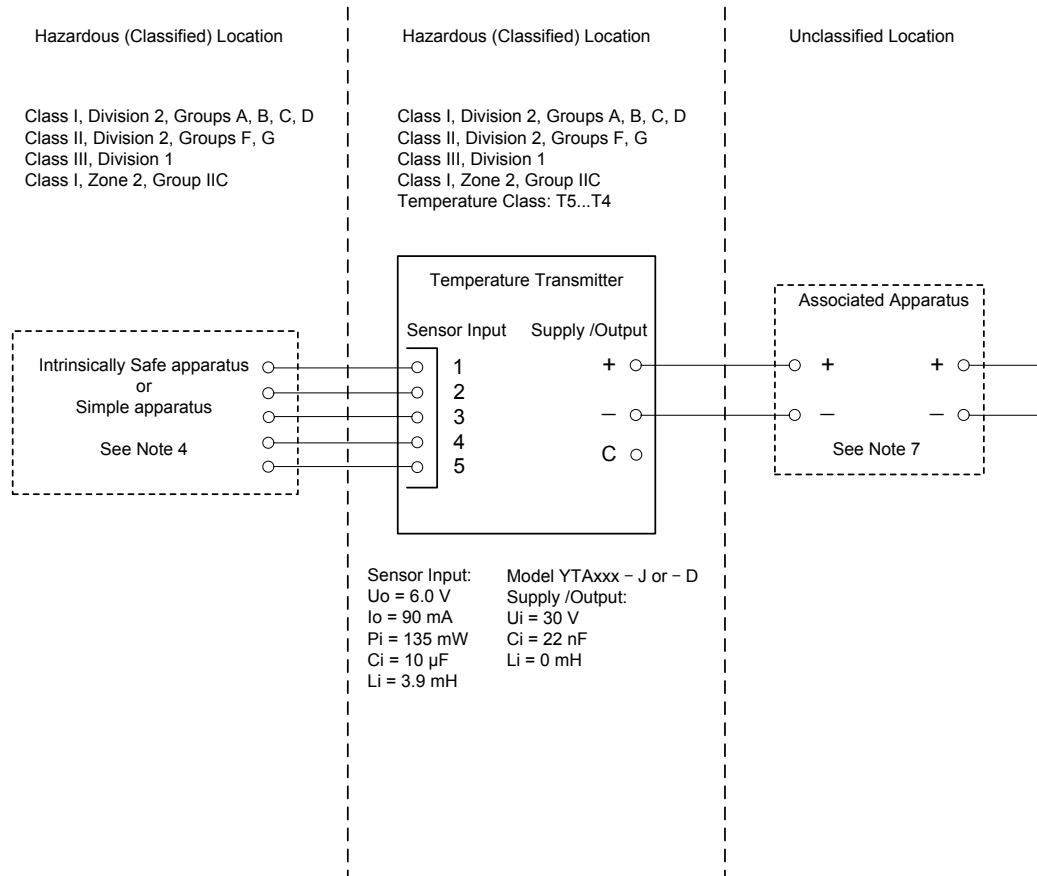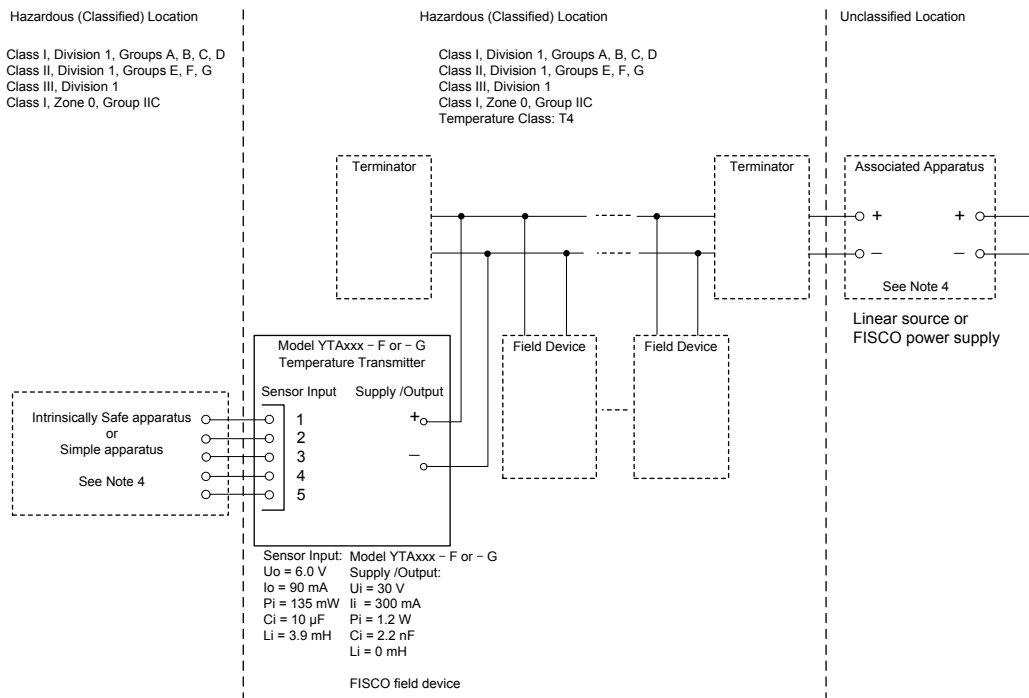Intrinsically Safe Installation for YTAxxx − J or − D

Hazardous Location | Hazardous Location | Non-Hazardous Location

Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1

Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1
Temperature Class: T5...T4

Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 3

1
2
3
4
5

+

−

C

Associated Apparatus

+   +

−   −

See Note 3

Linear source

Sensor Input:
$U_o = 6.0$ V
$I_o = 90$ mA
$P_i = 135$ mW
$C_i = 10$ μF
$L_i = 3.9$ mH

Model YTAxxx − J or − D
Supply /Output:
$U_i = 30$ V
$I_i = 200$ mA
$P_i = 1.0$ W
$C_i = 22$ nF
$L_i = 0$ mH

Rev.   Doc. No.:   IIE029-A62 P.1

Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Division 2 Installation for YTAxxx – J or – D

Hazardous Location	Hazardous Location	Non-Hazardous Location
Class I, Division 2, Groups A, B, C, D Class II, Division 2, Groups F, G Class III, Division 1	Class I, Division 2, Groups A, B, C, D Class II, Division 2, Groups F, G Class III, Division 1 Temperature Class: T5...T4	

Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 3

1
2
3
4
5

+
−
C

Associated Apparatus

+   +
−   −

See Note 6

Sensor Input:
U_o = 6.0 V
I_o = 90 mA
P_i = 135 mW
C_i = 10 µF
L_i = 3.9 mH

Model YTAxxx – J or – D
Supply /Output:
U_i = 30 V
C_i = 22 nF
L_i = 0 mH

Rev.   Doc. No.:   IIE029-A62 P.2
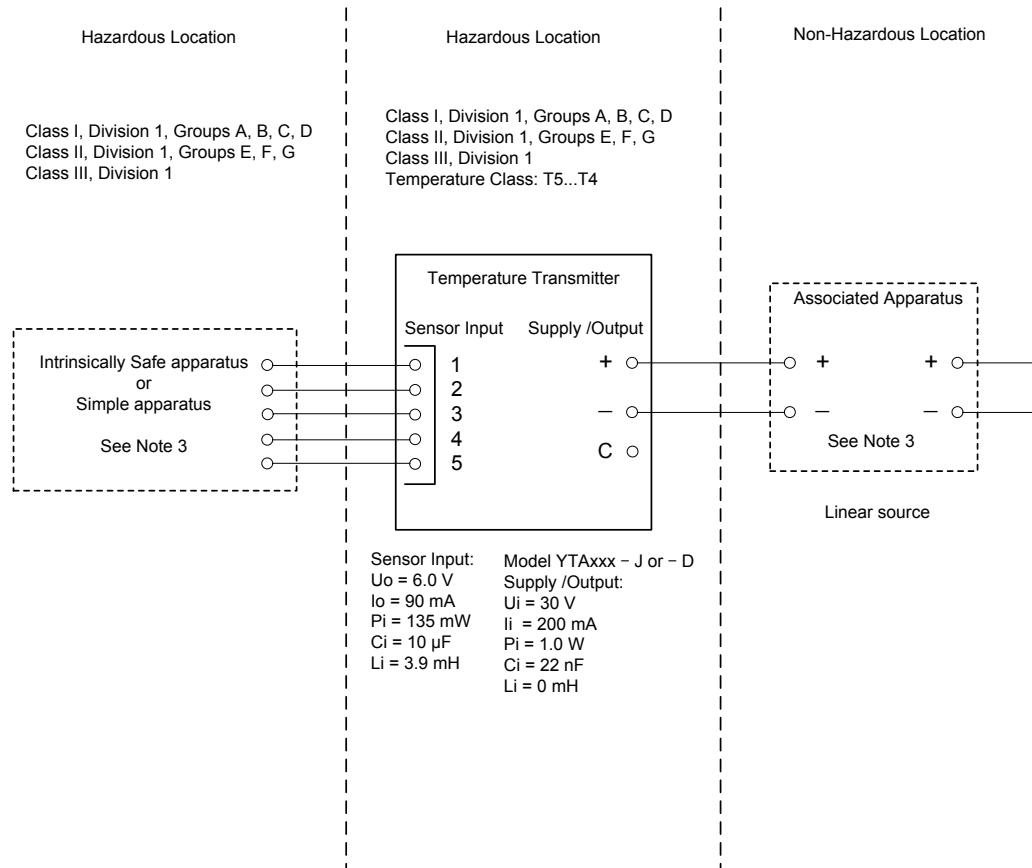
Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Intrinsically Safe Installation for YTAxxx – F or – G

Hazardous Location	Hazardous Location	Non-Hazardous Location
Class I, Division 1, Groups A, B, C, D	Class I, Division 1, Groups A, B, C, D	
Class II, Division 1, Groups E, F, G	Class II, Division 1, Groups E, F, G	
Class III, Division 1	Class III, Division 1	
	Temperature Class: T4	

Terminator

Terminator

Associated Apparatus

+
−

See Note 3

Linear source or
FISCO power supply

Field Device

Field Device

Model YTAxxx – F or – G
Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 3

1	+
2	
3	−
4	
5	

Sensor Input:
Uo = 6.0 V
Io = 90 mA
Pi = 135 mW
Ci = 10 µF
Li = 3.9 mH

Model YTAxxx – F or – G
Supply /Output:
Ui = 30 V
Ii = 300 mA
Pi = 1.2 W
Ci = 2.2 nF
Li = 0 mH

FISCO field device

Rev.   Doc. No.:   IIE029-A62 P.3

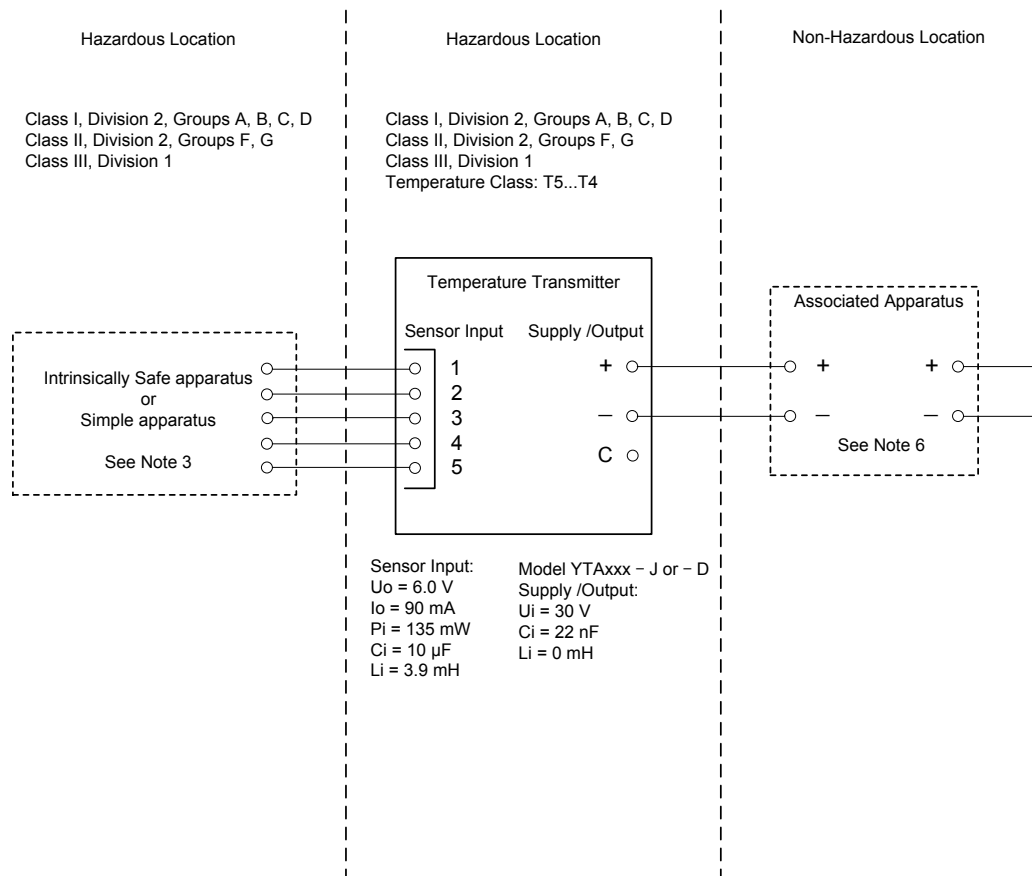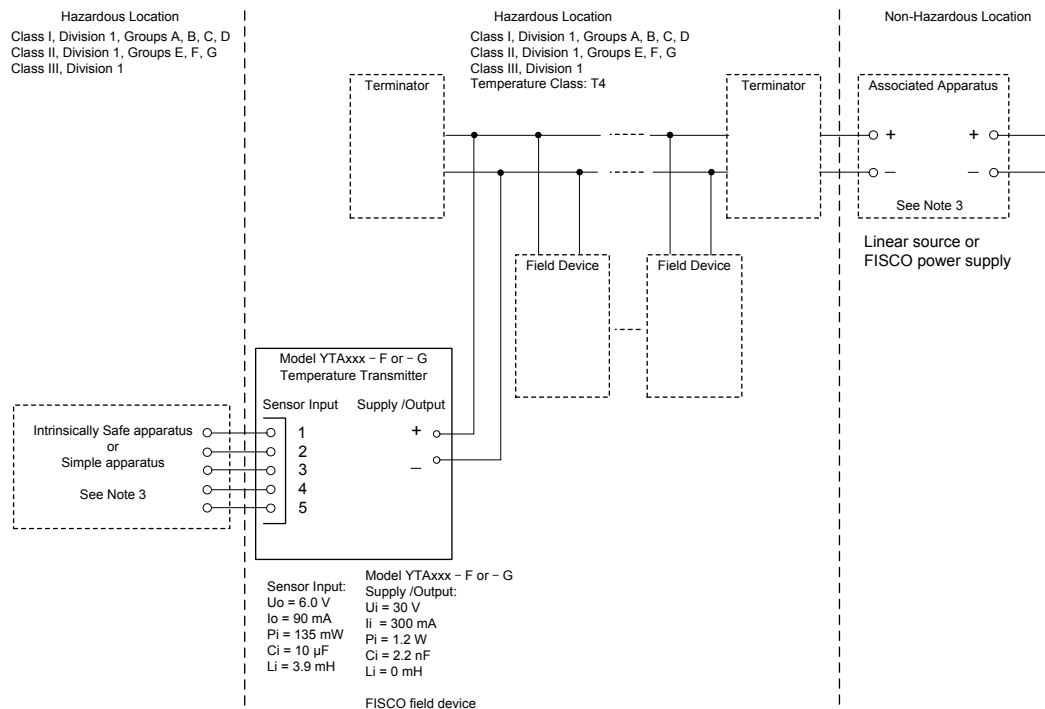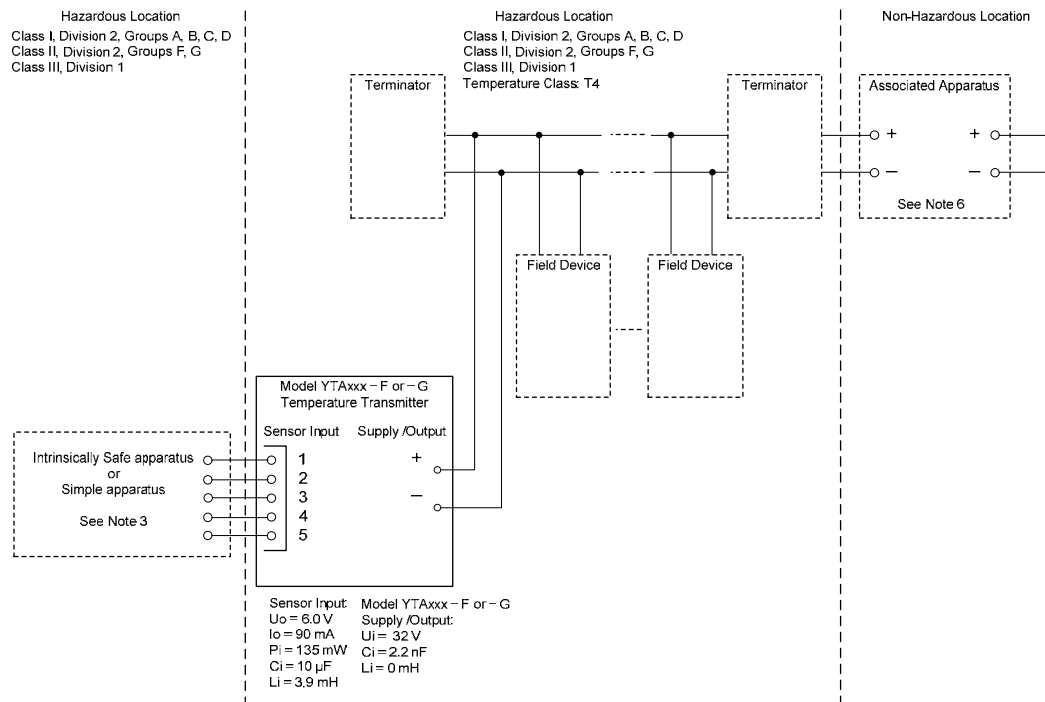Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Division 2 Installation for YTAxxx – F or – G

Hazardous Location
Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III, Division 1

Hazardous Location
Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III, Division 1
Temperature Class: T4

Non-Hazardous Location

Terminator

Terminator

Associated Apparatus

+

+

−

−

See Note 6

Field Device

Field Device

Model YTAxxx – F or – G
Temperature Transmitter

Sensor Input   Supply /Output

Intrinsically Safe apparatus
or
Simple apparatus

See Note 3

1
2
3
4
5

+

−

Sensor Input:
$U_o = 6.0$ V
$I_o = 90$ mA
$P_i = 135$ mW
$C_i = 10$ μF
$L_i = 3.9$ mH

Model YTAxxx – F or – G
Supply /Output:
$U_i = 32$ V
$C_i = 2.2$ nF
$L_i = 0$ mH

Rev.1: July 4, 2016   Doc. No.:   IIE029-A62 P.4

Yokogawa Electric Corporation

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

Model: YTA series   Date: September 24, 2015

Specific Condition of Use:
– Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.
– 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.
   Voc (or Uo) $\leq Ui$
   Isc (or Io) $\leq Ii$
   $Po \leq Pi$
   Ca (or Co) $\geq Ci + Ccable$
   La (or Lo) $\geq Li + Lcable$

4. Control equipment connected to the Associated Apparatus must not use or generate a voltage more than Um 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.
   Voc (or Uo) $\leq Ui$
   Ca (or Co) $\geq Ci + Ccable$
   La (or Lo) $\geq Li + Lcable$

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

Rev.   Doc. No.:   IIE029-A62 P.5

Yokogawa Electric Corporation

2.8 EMC Conformity Standards

EN61326-1 Class A, Table 2
EN61326-2-3
EN61326-2-5 (for Fieldbus)

⚠ 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
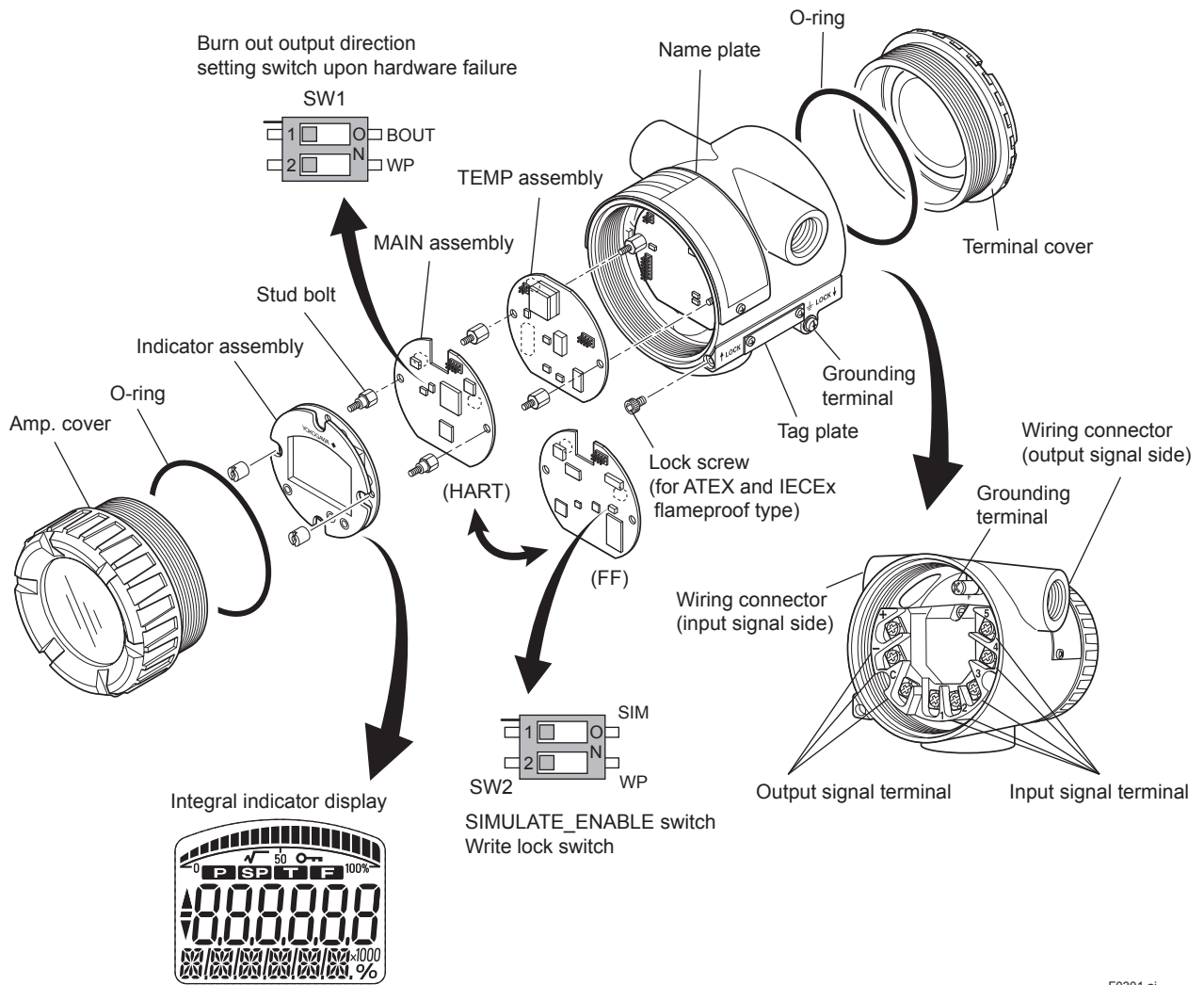
EN61010-1, C22.2 No.61010-1
- Altitude of installation site: Max. 2,000 m above sea level
- Installation category: I
  (Anticipated transient overvoltage 330 V)
- Pollution degree: 2
- Indoor/Outdoor use

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

Burn out output direction
setting switch upon hardware failure
SW1

BOUT
WP

Name plate

O-ring

Terminal cover

TEMP assembly

MAIN assembly

Stud bolt

Indicator assembly

O-ring

Amp. cover

(HART)

(FF)

Lock screw
(for ATEX and IECEx
flameproof type)

Grounding
terminal

Tag plate

Wiring connector
(output signal side)

Grounding
terminal

Wiring connector
(input signal side)

Integral indicator display

SIM

SW2   WP

SIMULATE_ENABLE switch
Write lock switch

Output signal terminal   Input signal terminal

F0301.ai

Figure 3.1   Part Names

3.2 Hardware Error Burnout and Hardware Write Protect Switch

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.
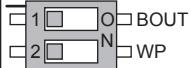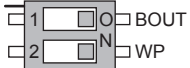
The temperature transmitter is equipped with a hardware error burnout function used to set the output direction upon hardware error, and a sensor burnout function that sets the direction of the output in the event of burnout of the temperature sensor. When factory-shipped under normal conditions, the output of both hardware error burnout and sensor burnout are set to HIGH, but if suffix code /C1 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 swich 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.

⚠️ **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 Swich**

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 upon shipment	Set to LOW when suffix code /C1 is provided
Hardware write protect swich	OFF Write enabled	ON Write disabled

3.3 Integral Indicator Display Function
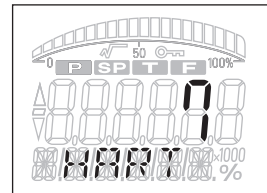
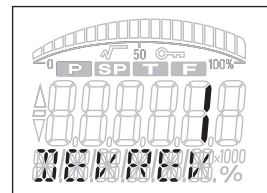**(1) Integral Indicator Display When Powering On (HART)**
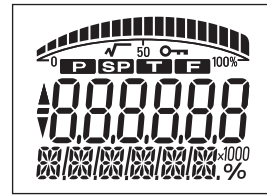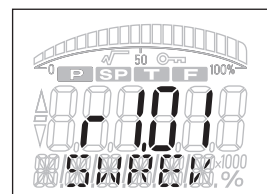

All segments display

↓
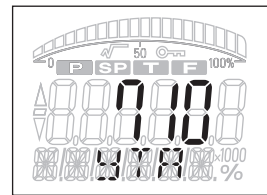
Model name

↓

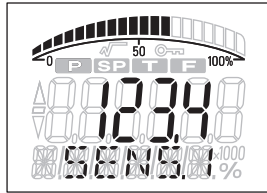Communication Protocol

↓

Device revision

↓

Software revision

↓

Process variable display

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	DISP.1
Sensor1	✓
Sensor1 – Terminal	✓
Terminal	✓
Sensor2	✓
Sensor2 – Terminal	✓
Sensor1 – Sensor2	✓
Sensor2 – Sensor1	✓
Sensor Average	✓
Sensor Backup	✓
PV	✓
SV	✓
TV	✓
QV	✓

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.

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 specificasions.
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	Digit	0.00 to 100.00 seconds
Sensor 1 type	S1.TYPE	RW	Selection	mv, ohm, Pt100, JPt100, Pt200, Pt500, Pt1000, Cu10, Ni120*1, 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, SMATCH
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	Digit	
PV upper range	PV URV	RW	Digit	
Sensor burnout direction	BUN.DIR	RW	Selection	HIGH, LOW, USER, OFF
Sensor burnout value (mA)	BUN mA	RW	Digit	3.6 to 21.6 mA
Sensor burnout value (%)	BUN %	RW	Digit	-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	ON, OFF
Model	MODEL	R	—	
HART revision	HART	R	—	
Device revision	DEV.REV	R	—	
Software revision	SW.REV	R	—	

*1:   Applicable only for YTA610.

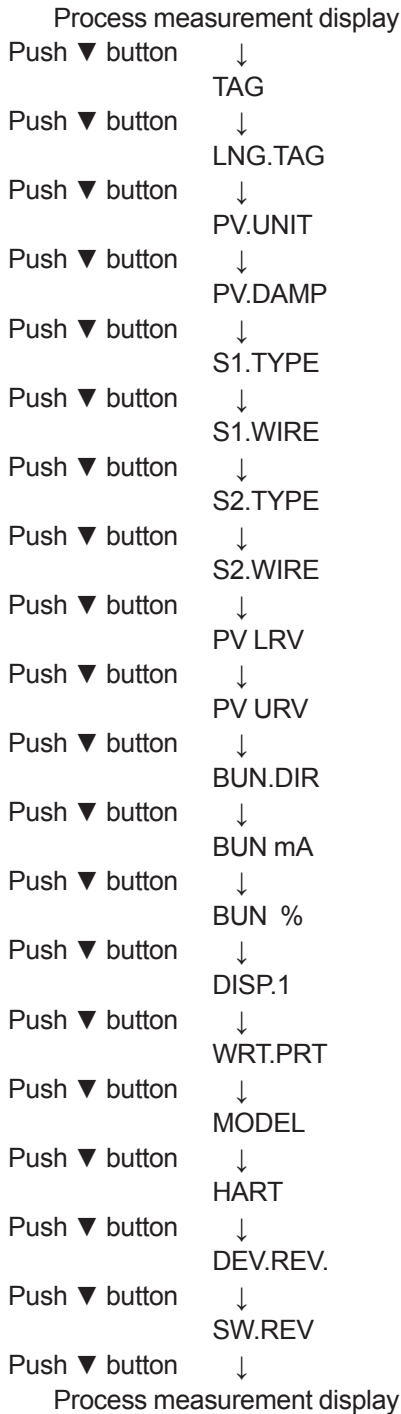**Table 3.5** **Parameters List (FF)**

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	Character	Up to 8 Character, OFF
Simulation	HW SIM	RW	Selection	ON, OFF
Model	MODEL	R	—	
Dev Rev	DEV.REV.	R	—	
Software Rev	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 (HART)

	Process measurement display
Push ▼ button	↓
	TAG
Push ▼ button	↓
	LNG.TAG
Push ▼ button	↓
	PV.UNIT
Push ▼ button	↓
	PV.DAMP
Push ▼ button	↓
	S1.TYPE
Push ▼ button	↓
	S1.WIRE
Push ▼ button	↓
	S2.TYPE
Push ▼ button	↓
	S2.WIRE
Push ▼ button	↓
	PV LRV
Push ▼ button	↓
	PV URV
Push ▼ button	↓
	BUN.DIR
Push ▼ button	↓
	BUN mA
Push ▼ button	↓
	BUN %
Push ▼ button	↓
	DISP.1
Push ▼ button	↓
	WRT.PRT
Push ▼ button	↓
	MODEL
Push ▼ button	↓
	HART
Push ▼ button	↓
	DEV.REV.
Push ▼ button	↓
	SW.REV
Push ▼ button	↓
	Process measurement display

(3) Tag Number (TAG) Configuration

Up to 8 alphanumeric characters for HART can be set.
TAG → 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"
Push ▲/▼ to return to the process measurement display.
See "(2) Parameter Setting Review (HART)".

(4) PV Unit (PV.UNIT) Configuration

PV unit (unit of sensor mapping in PV) for the Table3.4 can be changed as below
PV.UNIT → Push SET button → Select the temperature unit by pushing ▲/▼ button → Push SET button → "SAVE?" → Push SET button → "SAVED"
Push ▲/▼ to return to the process measurement display.
See "(2) Parameter Setting Review (HART)".

(5) Damping Time Constant (PV.DAMP) Configuration

The damping time constant for the amplifier assembly can be set from 0 to 100 seconds. Damping time constant is rounded off to two decimal places.
PV.DAMP → 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"
Push ▲/▼ to return to the process measurement display.
See "(2) Parameter Setting Review (HART)".

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, Dot(.), r*	A dot cannot use in 6th digits.

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

(6) Other Parameters Configuration

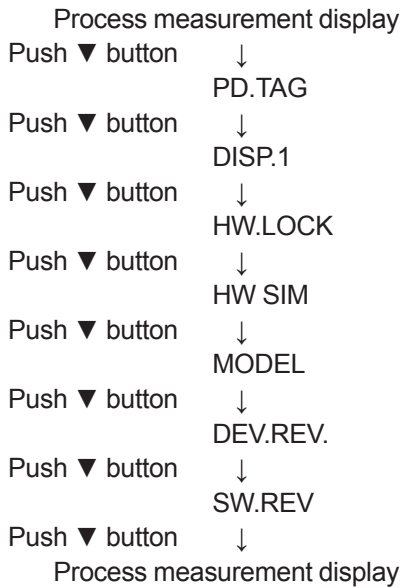| Parameter	Indicator display	Configuration
Long tag number	LNG.TAG	Please refer to "Tag Number Configuration" for how to set.
Sensor 1 type	S1.TYPE	Please refer to "PV Unit Configuration" for how to set.
Sensor 1 wire	S1.WIRE	Please refer to "PV Unit Configuration" for how to set.
Sensor 2 type	S2.TYPE	Please refer to "PV Unit Configuration" for how to set.
Sensor 2 wire	S2.WIRE	Please refer to "PV Unit Configuration" for how to set.
PV lower range	PV LRV	Please refer to "Damping Time Constant Configuration" for how to set.
PV upper range	PV URV	Please refer to "Damping Time Constant Configuration" for how to set.
Sensor burnout direction	BUN.DIR	Please refer to "PV Unit Configuration" for how to set.
Sensor burnout value (mA)	BUN mA	Please refer to "Damping Time Constant Configuration" for how to set.
Sensor burnout value (%)	BUN %	Please refer to "Damping Time Constant Configuration" for how to set.
Display	DISP.1	Please refer to "PV Unit Configuration" for how to set.
Write protect	WRT.PRT	Please refer to "PV Unit Configuration" for how to set.

(7) Local 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.

(8) Parameter Setting Review (FF)

    Process measurement display
Push ▼ button   ↓
        PD.TAG
Push ▼ button   ↓
        DISP.1
Push ▼ button   ↓
        HW.LOCK
Push ▼ button   ↓
        HW SIM
Push ▼ button   ↓
        MODEL
Push ▼ button   ↓
        DEV.REV.
Push ▼ button   ↓
        SW.REV
Push ▼ button   ↓
    Process measurement display

(9) FF Parameter Configuration

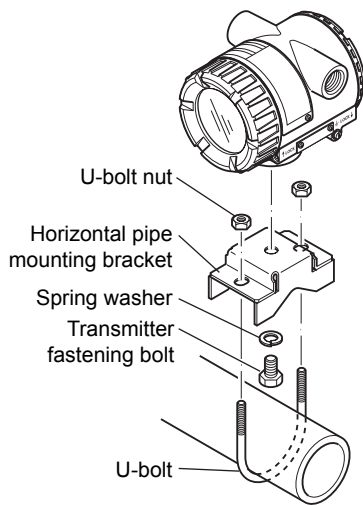| Parameter	Indicator display	Configuration
Disp Out 1	DISP.1	Please refer to "PV Unit Configuration" for how to set.
Local Write Lock	HW.LOCK	Please refer to "Tag Number Configuration" for how to set.
Simulation	HW SIM	Please refer to "PV Unit Configuration" for how to set.

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.
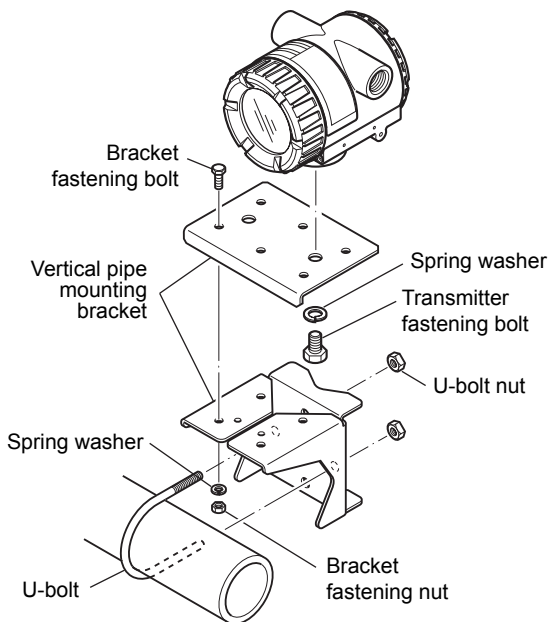- Do not use the transmitter as a foothold for installation.

- 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.
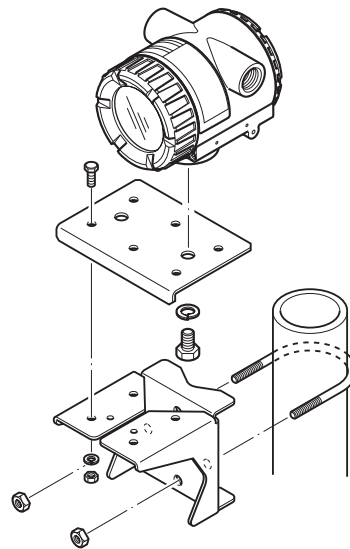
Horizontal Pipe Mounting

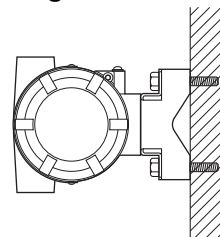• When using a horizontal pipe mounting bracket

U-bolt nut

Horizontal pipe mounting bracket

Spring washer

Transmitter fastening bolt

U-bolt

• When using a vertical pipe mounting bracket

Bracket fastening bolt

Vertical pipe mounting bracket

Spring washer

Transmitter fastening bolt

U-bolt nut

Spring washer

U-bolt

Bracket fastening nut

Vertical Pipe Mounting

Wall Mounting

Note: Wall mounting bolts are user-supplied.

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Figure 4.1   Mounting the Transmitter

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 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.
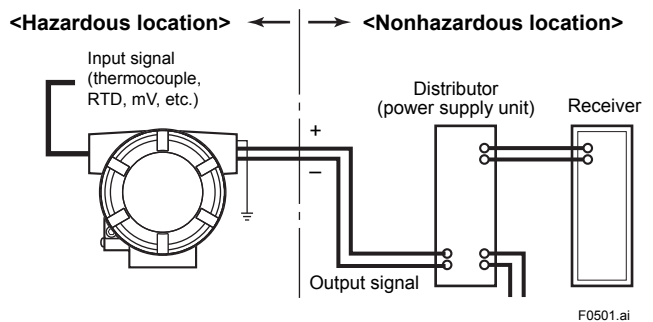

Figure 5.1 Loop Construction (for General-use Type and Flameproof Type)
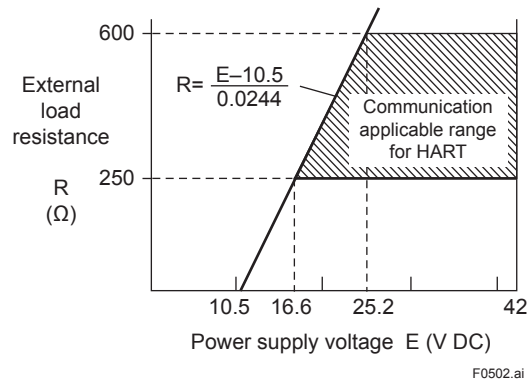

$$R= \frac{E-10.5}{0.0244}$$

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
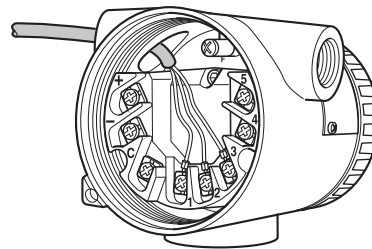
✋ NOTE

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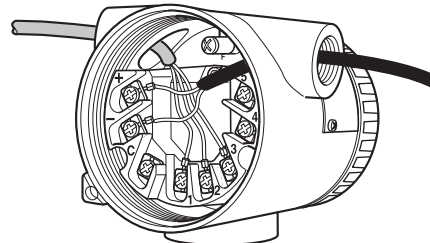
⚠ CAUTION

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
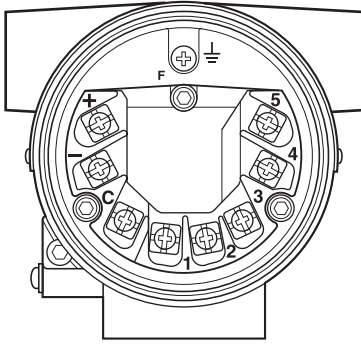(1)

a. Cable connection to RTD 3-wire

STEP 2
(2)

b. Power supply cable connection
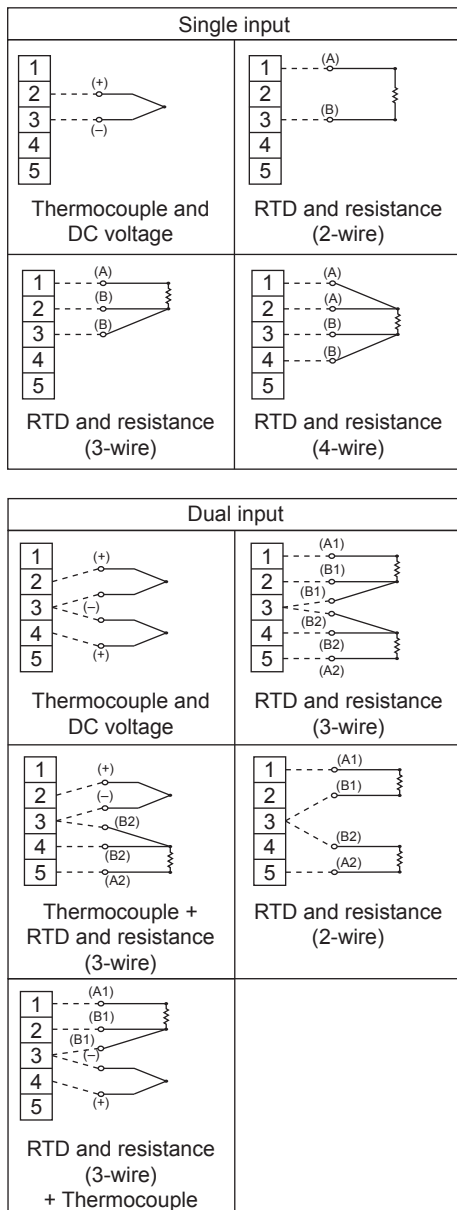
F0503.ai

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.
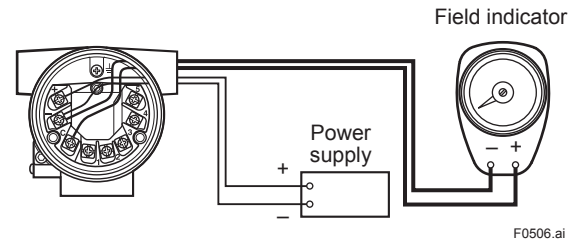
F0506.ai

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

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

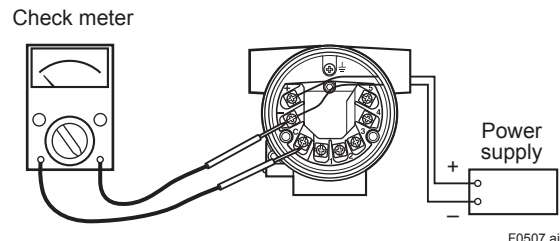- Apply nonhardening sealant to the threads of the wiring tap and a flexible fitting for secure waterproofing. Figure 5.8 shows an example of wiring on the output side. This example also applies to the wiring on the input side.
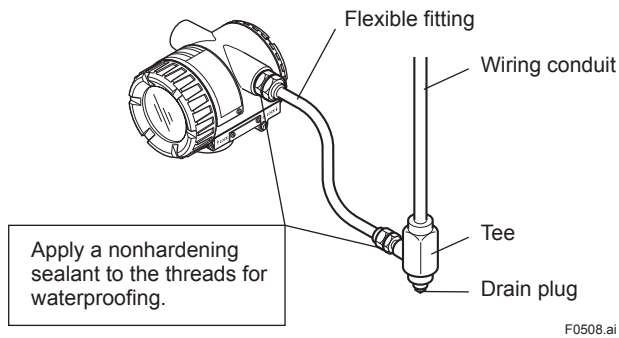
Figure 5.8   Example of Wiring Using a Wiring Conduit

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.
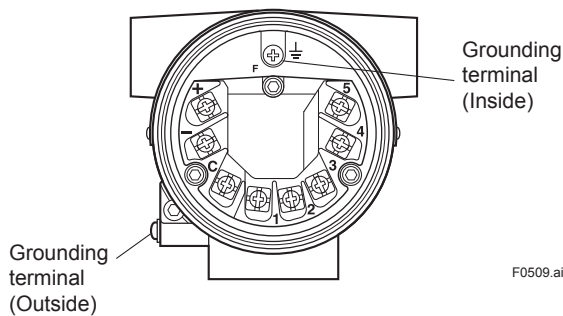
Figure 5.9   Grounding Terminal

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 varified, 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.

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 initiate warm up. Lay wiring on the input side according to the sensor to 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, 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% ±2mΩ)	For calibration of RTD input

a. Wiring of power supply and output
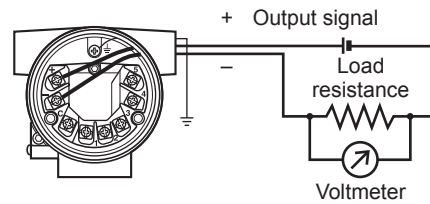
b. Example of wiring for thermocouple or DC voltage input (when 1 input type is used)
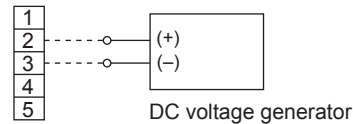
c. Example of wiring for RTD 4-core type (when 1 input type is used)

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 obta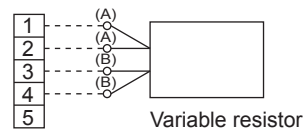ined resistance as the input value, then deliver it to the temperature transmitter by means of a variable resistor. Measure the resulting output signal with the voltmeter (digital multimeter) and check the output value relative to the input value.

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 subsection 3.5.6 "Sensor Trim" 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.
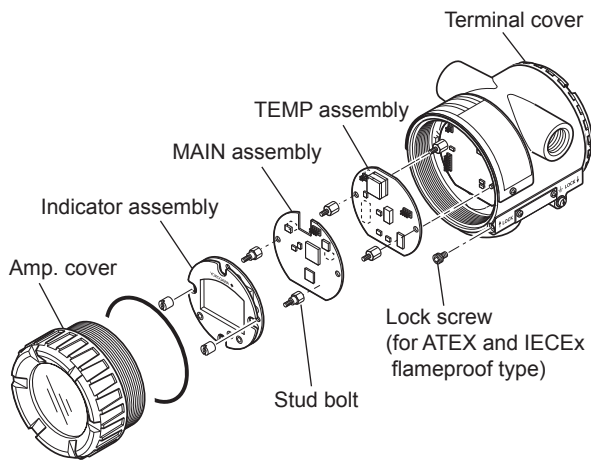
Figure 6.2 **Mounting and Removal of Integral Indicator Assembly**

6.3.1 Replacement of Integral Indicator

■ Removal of integral indicator

1. Remove the cover.
2. Remove two mounting screws 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.
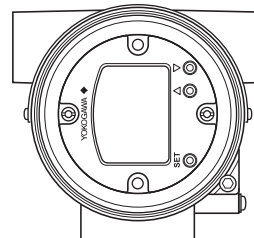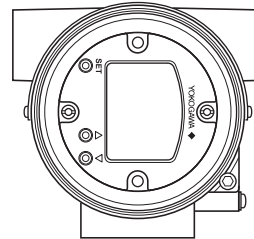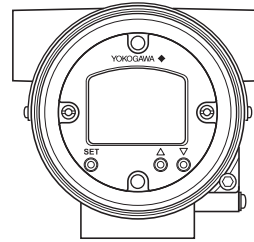
Figure 6.3 **Installation Direction of Indicator**

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 mounting screws 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.
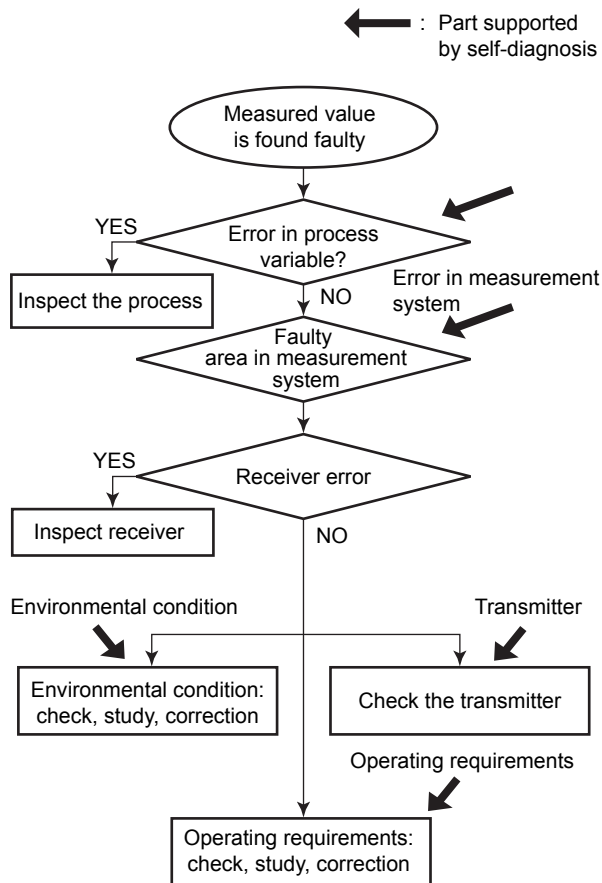
F0604.ai

Figure 6.4   Basic Flow and Self-diagnosis

6.4.2 Example of Troubleshooting Flow
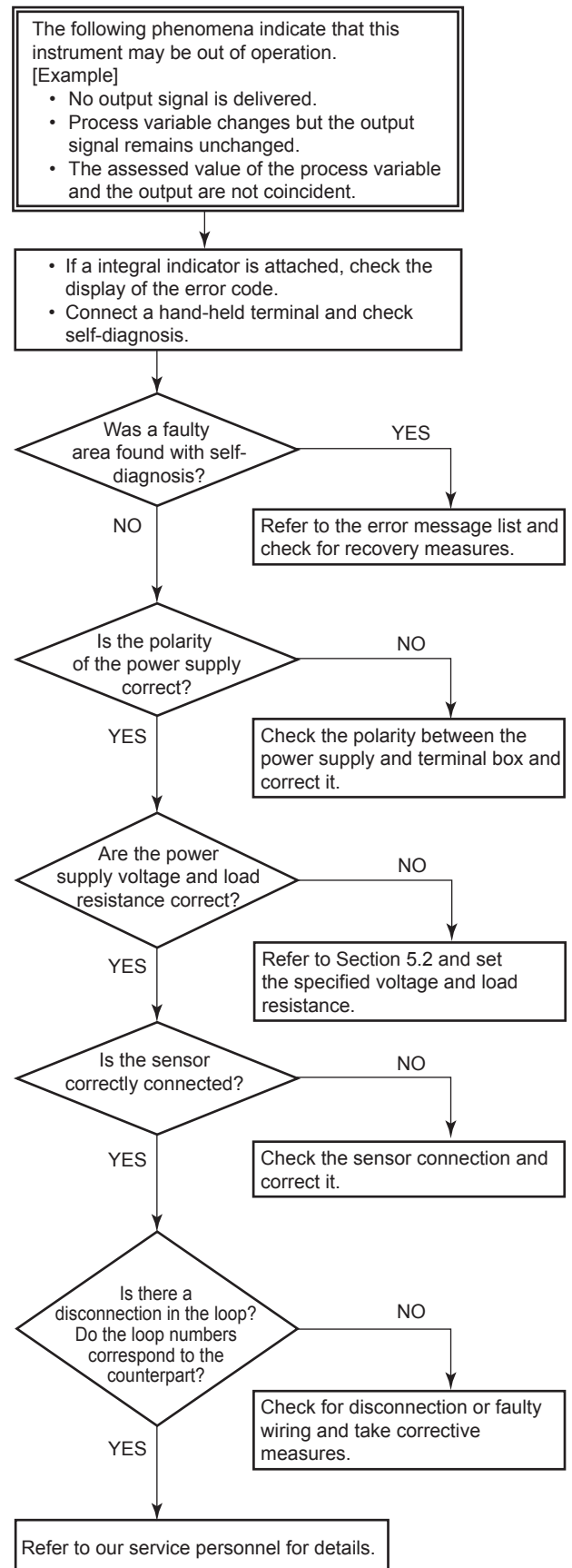
F0605.ai

Figure 6.5   Example of Troubleshooting Flow

IM 01C50G01-01EN

Table 6.3   Problems, Causes and Countermeasures

Observed Problems	Possible Cause	Countermeasure	Related Parameter (HART)	Related Parameter (FF)
Output fluctuates greatly.	Span is too narrow.	Check the range, and change the settings to make the span larger.	PV LRV PV URV	—
	Input adjustment by user was not corrctly done.	Clear the user adjustment (Sensor trim) value or set it to off.	reset Sensor1(2) Trim	Sensor1 Trim Sensor2 Trim
	Output adjustment by user was not correctly done.	Clear the user adjustment (output trim) value or set it to off.	reset AO Trim	—
Transmitter outputs fixed current.	The transmitter is in manual (test output) mode.	Release manual mode. (Make the transmitter return to Automatic Mode)	exec Loop Test enable Dev Var Sim	SIM_ENABLE_MSG
	Output adjustment by user was not correctly done.	Clear the user adjustment (output trim) value or set it to off.	reset AO Trim	—
Output is reversed. (See note 1)	LRV is greater than URV.	Set the correct value to URV and LRV.	PV LRV PV URV	—
Parameters cannot be changed.	The transmitter is in write protect status.	Release write protect.	Write Protect	WRITE_LOCK
Sensor backup function doesn't work correctly.	Configuration of Sensor1 and Sensor2 is not correct.	• Check the type and wire settings for Sensor1 and Sensor2. • Check the connection of Sensor1 and Sensor2.	Sns1(2) Probe Type Sns1(2) Wire	SENSOR_TYPE_1(2) SENSOR_ CONNECTION_1(2)
	Sensor backup mode is not enabled.	Change PV mapping "Sensor Backup."	PV is	BACKUP_VALUE
Output damping doesn't work.	Damping time constant is set to "0 second."	Set correct value.	AO Damping	PV_FTIME

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 6.4 lists the error codes for HART and the associated corrective actions. Table 6.6 lists the error codes for Foundation fieldbus.

Table 6.4   List of Error Codes (HART)

Alarm Number	Indicator Message	Cause	Output operation during error
AL.00	CPU.ERR	MAIN CPU failed	According to the transmitter failure output (burnout) Communacation 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	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	Refar table 6.5
AL.11	S.2.FAIL	Sensor 2 failed or disconnected from terminal block	Refar table 6.5
AL.12[*1]	S.1.SHRT	Sensor 1 short-circuited	Refar table 6.5
AL.13[*1]	S.2.SHRT	Sensor 2 short-circuited	Refar table 6.5
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	TERMNL	Terminal block temperature is abnormal. Or terminal block temperature sensor failed	Refar table 6.5
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	S.1 CFG	There is a false set to sensor1	Continue to operate and output
AL.62	S.2 CFG	There is a false set to sensor2	Continue to operate and output

*1:   Applicable only for YTA710.

Table 6.5   Output operation (HART)

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
S.1-TER	Sensor Burnout	*1	Sensor Burnout	*1	Sensor Burnout
TERM	*1	*1	*1	*1	Sensor Burnout
SENS.2	*1	Sensor Burnout	*1	Sensor Burnout	*1
S.2-TER	*1	Sensor Burnout	*1	Sensor Burnout	Sensor Burnout
S.1-S.2	Sensor Burnout	Sensor Burnout	Sensor Burnout	Sensor Burnout	*1
S.2-S.1	Sensor Burnout	Sensor Burnout	Sensor Burnout	Sensor Burnout	*1
AVG	Sensor Burnout	Sensor Burnout	Sensor Burnout	Sensor Burnout	*1
BACKUP	*2	*2	*2	*2	*1

*1:   Continue to operate and output.
*2:   When both sensor1 and sensor2 occur error, output is burnout.
*3:   Applicable only for YTA710.

Table 6.6 **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 PID1block
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 AI2 is not scheduled.
AL.121	SCHEDL	Execution of AI1 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	PID.MAN	The actual mode of the PID1 block is Man.
AL.134	SCHEDL	Execution of PID1 is not scheduled.
AL.134	PID.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	PID.MAN	The actual mode of the PID2 block is Man.
AL.135	SCHEDL	Execution of PID2 is not scheduled.
AL.135	PID.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 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
± 0.5°C (± 0.9 °F) for T/C only
Include influence of the ambient temperature.

Ambient Temperature Effect (per 10°C change)
±0.1% or ±(Temperature coefficient/span),
whichever is greater. (See Table 7.2.)

Stability
RTD: ±0.1% of reading or ±0.1°C per 2 years,
whichever is greater at 23±2°C.
T/C: ±0.1% of reading or ±0.1°C per year,
whichever is greater at 23±2°C.

5 Year Stability
RTD: ±0.2% of reading or ±0.2°C, whichever is
greater at 23±2°C.
T/C: ±0.4% of reading or ±0.4°C, whichever is
greater at 23±2°C.

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
±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 kΩ 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
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 , sensor
burnout –2.5%, 3.6 mA (Optional code C1)
Down-scale: –5%, 3.2 mA DC or less (Optional
code 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) at damping time 0

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 in the hardware, configuration and communications.

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 Fundation fieldbus specifications (FF883)
Download class: Class 1

EMC Conformity Standards

EN61326-1 Class A, Table2
EN61326-2-3
EN61326-2-5 (for fieldbus)

SIL Certification

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)

■ 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 type
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 7.1   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)

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 with polyurethane, mint-green paint. (Munsell 5.6BG 3.3/2.9 or its equivalent), or 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 cord.

Weight

Alminum 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
    Bracket for vertical pipe: 1.0 kg
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 300 300 to 1820	212 to 572 572 to 3308	25°C (45°F)	±3.0 ±0.75	±5.4 ±1.35	±0.02% of span
	E		-200 to -50 -50 to 1000	-328 to -58 -58 to 1832		±0.35 ±0.16	±0.63 ±0.29	
	J		-200 to -50 -50 to 1200	-328 to -58 -58 to 2192		±0.25 ±0.20	±0.45 ±0.36	
	K		-200 to -50 -50 to 1372	-328 to -58 -58 to 2502		±0.5 ±0.25	±0.9 ±0.45	
	N		-200 to -50 -50 to 1300	-328 to -58 -58 to 2372		±0.4 ±0.35	±0.72 ±0.63	
	R		-50 to 0 0 to 600 600 to 1768	-58 to 32 32 to 1112 1112 to 3214		±1.0 ±0.6 ±0.4	±1.8 ±1.08 ±0.72	
	S		-50 to 0 0 to 600 600 to 1768	-58 to 32 32 to 1112 1112 to 3214		±1.0 ±0.5 ±0.4	±1.8 ±0.9 ±0.72	
	T		-200 to -50 -50 to 400	-328 to -58 -58 to 752		±0.25 ±0.14	±0.45 ±0.25	
	C		0 to 400 400 to 1400 1400 to 2000 2000 to 2300	32 to 752 752 to 2552 2552 to 3632 3632 to 4172		±0.7 ±0.5 ±0.7 ±0.9	±1.26 ±0.9 ±1.26 ±1.62	
	W3	ASTM E988	0 to 400 400 to 1400 1400 to 2000 2000 to 2300	32 to 752 752 to 2552 2552 to 3632 3632 to 4172		±0.8 ±0.5 ±0.6 ±0.9	±1.44 ±0.9 ±1.08 ±1.62	
	L	DIN43710	-200 to -50 -50 to 900	-328 to -58 -58 to 1652		±0.3 ±0.2	±0.54 ±0.36	
	U		-200 to -50 -50 to 600	-328 to -58 -58 to 1112		±0.35 ±0.25	±0.63 ±0.45	
RTD	Pt100	IEC60751	-200 to 850	-328 to 1562	10°C (18°F)	±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	
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) 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 200 °C
0.1°C / 200°C×100% of span +0.02% of span = 0.07% 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 7.2   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 → 0.045%
  Therefore, Ambient Temperature Effect is ±0.1%/10°C

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
± 0.5°C (± 0.9 °F) for T/C only

Ambient Temperature Effect (per 10°C change)
±0.1% or ±(Temperature coefficient/span), whichever is greater. (See Table 7.4.)

Stability
RTD: ±0.1% of reading or ±0.1°C per 2 years, whichever is greater at 23±2°C.
T/C: ±0.1% of reading or ±0.1°C per year, whichever is greater at 23±2°C.

5 Year Stability
RTD: ±0.25% of reading or ±0.25°C, whichever is greater at 23±2°C.
T/C: ±0.5% of reading or ±0.5°C, whichever is greater at 23±2°C.

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
±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 kΩ 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
HART® protocol is superimposed on the 4 to 20 mA signal. Any single value among followings can be selected as the analog output signal.
Sensor 1, Terminal Temperature.
Dual input type, same as above plus;
Sensor 2, Average, and Differential Temperature.
Also, up to three of the above values can be displayed on LCD display or read via communication.

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 , sensor burnout –2.5%, 3.6 mA (Optional code C1)
Down-scale: –5%, 3.2 mA DC or less (Optional code 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) at damping time 0

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 in the hardware, configuration and communications.

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 Fundation fieldbus specifications (FF883)
Download class: Class 1

EMC Conformity Standards

EN61326-1 Class A, Table2
EN61326-2-3
EN61326-2-5 (for fieldbus)

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)

■ 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 type
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.

$$R = \frac{E-10.5}{0.0244}$$

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 with polyurethane, mint-green paint. (Munsell 5.6BG 3.3/2.9 or its equivalent), or 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 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
Bracket for vertical pipe: 1.0 kg
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	IEC60584	100 to 300 300 to 1820	212 to 572 572 to 3308	25°C (45°F)	±3.0 ±0.77	±5.4 ±1.39	±0.03% of span
	E		-200 to -50 -50 to 1000	-328 to -58 -58 to 1832		±0.4 ±0.2	±0.72 ±0.36	
	J		-200 to -50 -50 to 1200	-328 to -58 -58 to 2192		±0.35 ±0.25	±0.63 ±0.45	
	K		-200 to -50 -50 to 1372	-328 to -58 -58 to 2502		±0.5 ±0.3	±0.9 ±0.54	
	N		-200 to -50 -50 to 1300	-328 to -58 -58 to 2372		±0.5 ±0.4	±0.9 ±0.72	
	R		-50 to 0 0 to 600 600 to 1768	-58 to 32 32 to 1112 1112 to 3214		±1.0 ±0.7 ±0.5	±1.8 ±1.26 ±0.9	
	S		-50 to 0 0 to 1768	-58 to 32 32 to 3214		±1.0 ±0.6	±1.8 ±1.08	
	T		-200 to -50 -50 to 400	-328 to -58 -58 to 752		±0.35 ±0.2	±0.63 ±0.36	
	C		0 to 2000 2000 to 2300	32 to 3632 3632 to 4172		±0.7 ±1.0	±1.26 ±1.8	
	W3	ASTM E988	0 to 400 400 to 1400 1400 to 2000 2000 to 2300	32 to 752 752 to 2552 2552 to 3632 3632 to 4172		±0.9 ±0.6 ±0.7 ±1.0	±1.62 ±1.08 ±1.26 ±1.8	
	L	DIN43710	-200 to -50 -50 to 900	-328 to -58 -58 to 1652		±0.35 ±0.3	±0.63 ±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 200 °C
0.1°C / 200°C×100% of span +0.02% of span = 0.07% 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 → 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	**-J** · · · · · · · · · · · · · ·			4 to 20 mA DC with digital communication HART 7protocol
	-F · · · · · · · · · · · · · ·			Digital communication (FOUNDATION Fieldbus protocol)
—		**A** · · · · · · · · · · · · ·		Always A
Sensor input		**1** · · · · · · · · · · · ·		Single
		2 · · · · · · · · · · · ·		Double
Housing code		**A** · · · · · · · · · ·		Aluminum
		C · · · · · · · · · ·		Stainless
Electrical Connection		**0** · · · · · · · ·		G 1/2 female
		2 · · · · · · · ·		1/2 NPT female
		4 · · · · · · · ·		M20 female
Integral Indicator		**D** · · · · · · ·		Digital indicator with Local Operating Switch
		N · · · · · · ·		None
Mounting Bracket		**B** · · · · ·		SUS304 stainless steel 2-inch horizontal pipe mounting bracket [*1]
		D · · · · ·		SUS304 stainless steel 2-inch vertical pipe mounting bracket
		J · · · · ·		SUS316 stainless steel 2-inch horizontal pipe mounting bracket [*1]
		K · · · · ·		SUS316 stainless steel 2-inch vertical pipe mounting bracket
		N · · · · ·		None
Option codes			**/□**	Optional specification

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

7.3 Optional Specifications (YTA610 and YTA710)

Item	Description		Code
Lightning protector	Allowable current: Max. 6000A (8×20µs), repeating 1000A (8×20µs), 100 times		**A**
Painting [*1]	Color change Amplifier cover only	Munsell code: N1.5, black	**P1**
		Munsell code: 7.5BG4/1.5,Jade green	**P2**
		Metallic silver	**P7**
	Color change Amplifier and terminal covers	Munsell code: 7.5R4/14,Red	**PR**
	Coating change [*3]	High anti-corrosion coating	**X2**
Output signal Low-side in Transmitter failure [*2]	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 [*2]	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**

*1: Not applicable for Stainless housing.
*2: Not applicable for Fieldbus type.
*3: Not applicable for color change.

[For Explosion Protected Type]

Item	Description	Code
ATEX	[4-20mA & Fieldbus: Flameproof and dust ignition proof approval] 　Applicable Standard: EN 60079-0:2012+A11:2013, EN 60079-1:2007, EN 60079-31:2009 　Certificate: KEMA 07ATEX0130 　II 2 G Ex d 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]	**KF2**[*5]
	4-20mA: [Intrinsically safe 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 　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=10µF, 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] [Flameproof and Dust Ignition Proof Approval] 　Same as KF2	**KU2**
	Fieldbus: [Intrinsically safe 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 　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=10µF, 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] [Flameproof and Dust Ignition Proof Approval] 　Same as KF2	**KU25**

Item	Description	Code
IECEx	[4-20mA & Fieldbus: Flameproof and dust ignition proof approval] Applicable standard: IEC 60079-0:2011, IEC 60079-1:2007-04, IEC 60079-31:2008 Certificate: IECEx KEM 07.0044 Ex d IIC T6/T5 Gb, Ex tb IIIC 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]	**SF2**[*5]
	4-20mA: [Intrinsically safe approval] Applicable Standard: IEC 60079-0:2011, IEC 60079-11:2011 Certificate No. IECEx FMG 16.0014X Ex ia IIC T5…T4 Ga Ambient Temperature: –40 to 70°C for T4, –40 to 50°C for T5 Enclosure: IP66/IP67 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=10µF, 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] [Flameproof and Dust Ignition Proof Approval] Same as SF2	**SU2**
	Fieldbus: [Intrinsically safe approval] Applicable Standard: IEC 60079-0:2011, IEC 60079-11:2011, Certificate No. IECEx FMG 16.0014X Ex ia IIC T4 Ga, Ambient Temperature: –55 to 60°C Enclosure: IP66/IP67 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=10µF, 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] [Flameproof and Dust Ignition Proof Approval] Same as SF2	**SU25**

Item	Description	Code
FM (US)	[4-20mA & Fieldbus: Explosionproof approval] Applicable standard: Class 3600, Class 3615, Class 3810, ANSI/NEMA250 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 female[*2]	**FF1**[*5]
	4-20mA: [Intrinsically safe approval/non-incendive approval] Applicable standard: Class 3600:2011, Class 3610:2015, Class 3611:2004, Class 3810:2005, ANSI/ISA-60079-0:2013, ANSI/ISA-60079-11:2014, NEMA 250:2003, ANSI/IEC 60529:2004 (R2011) 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 Entity Parameters: Intrinsically safe for Supply/Output circuit: $Ui=30V$, $Ii=200mA$, $Pi=1.0W$, $Ci=22nF$, $Li=0mH$ Sensor circuit: $Uo=6V$, $Io=90mA$, $Po=135mW$, $Co=10\mu F$, $Lo=3.9mH$ Non-incendive for Supply/Output circuit: $Ui=30V$, $Ci=22nF$, $Li=0mH$ Sensor circuit: $Uo=6V$, $Io=90mA$, $Po=135mW$, $Co=10\mu F$, $Lo=3.9mH$ 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] [Explosionproof approval] Same as FF1	**FU1**
	Fieldbus: [Intrinsically safe approval/non-incendive approval] Applicable standard: Class 3600:2011, Class 3610:2015, Class 3611:2004, Class 3810:2005, ANSI/ISA-60079-0:2013, ANSI/ISA-60079-11:2014, NEMA 250:2003, ANSI/IEC 60529:2004 (R2011) 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 FISCO field device Entity Parameters: Intrinsically safe for Supply/Output circuit: $Ui=30V$, $Ii=300mA$, $Pi=1.2W$, $Ci=2.2nF$, $Li=0mH$ Sensor circuit: $Uo=6V$, $Io=90mA$, $Po=135mW$, $Co=10\mu F$, $Lo=3.9mH$ Non-incendive for Supply/Output circuit: $Ui=32V$, $Ci=2.2nF$, $Li=0mH$ Sensor circuit: $Uo=6V$, $Io=90mA$, $Po=135mW$, $Co=10\mu F$, $Lo=3.9mH$ 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] [Explosionproof approval] Same as FF1	**FU15**

Item	Description	Code
CSA[*3] FM (Canada)[*4]	**[4-20mA & Fieldbus: Explosionproof approval]** 　Applicable standard: C22.2 No.0, C22.2 No.0.4, C22.2 No.25, C22.2 No.30, C22.2 No.94, C22.2 No.142, C22.2 No.157, C22.2 No.213, C22.2 No.61010-1, C22.2 No.61010-2-030 　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. 0:2010 (R2015), 　CAN/CSA-C22.2 No. 94.1:2007 (R2012), CAN/CSA-C22.2 No. 94.2:2007 (R2012), 　C22.2 No.213:1987 (R2013), CAN /CSA-C22.2 No. 60079-0:2011, 　CAN/CSA-C22.2 No. 60079-11:2014, CAN/CSA-C22.2 No. 60529:2005 (R2010), 　CAN/CSA-C22.2 No. 61010-1:2012, CAN/CSA-C22.2 No. 61010-2-030:2012 　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 　Entity Parameters: 　Intrinsically safe for 　　Supply/Output circuit: $U_i=30V$, $I_i=200mA$, $P_i=1.0W$, $C_i=22nF$, $L_i=0mH$ 　　Sensor circuit: $U_o=6V$, $I_o=90mA$, $P_o=135mW$, $C_o=10\mu F$, $L_o=3.9mH$ 　Non-incendive for 　　Supply/Output circuit: $U_i=30V$, $C_i=22nF$, $L_i=0mH$ 　　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] **[Explosionproof approval]** 　Same as CF1	**CU1**

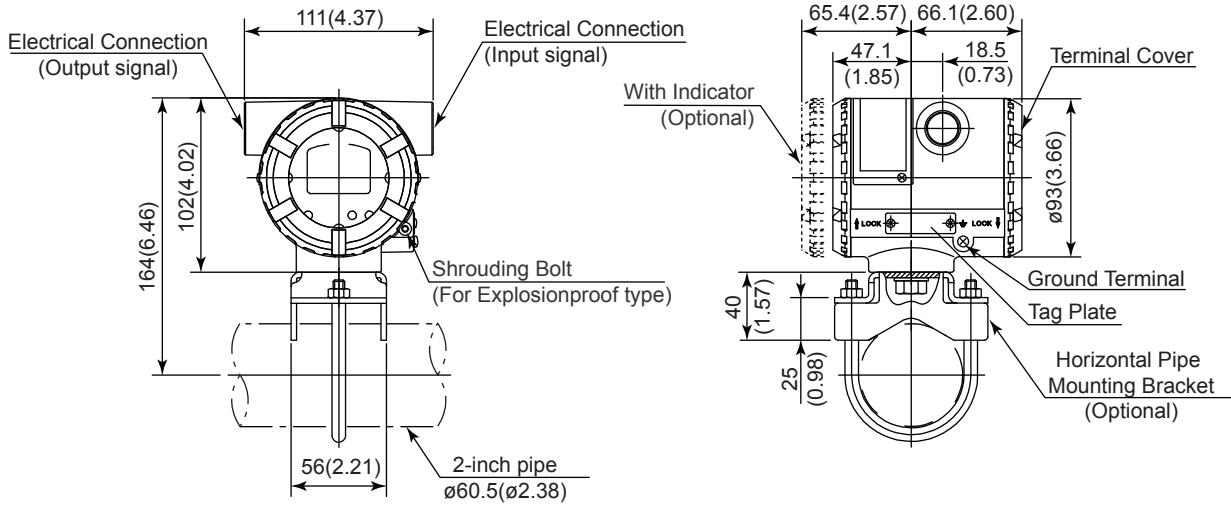| Item	Description	Code

CSA*3
 	
FM (Canada)*4
	Fieldbus:
	[Intrinsically safe approval/non-incendive approval]
	    Applicable standard: CAN/CSA-C22.2 No. 0:2010 (R2015),
	    CAN/CSA-C22.2 No. 94.1:2007 (R2012), CAN/CSA-C22.2 No. 94.2:2007 (R2012),
	    C22.2 No.213:1987 (R2013), CAN /CSA-C22.2 No. 60079-0:2011,
	    CAN/CSA-C22.2 No. 60079-11:2014, CAN/CSA-C22.2 No. 60529:2005 (R2010),
	    CAN/CSA-C22.2 No. 61010-1:2012, CAN/CSA-C22.2 No. 61010-2-030:2012
	    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
	    FISCO field device
	    Entity Parameters:
	    Intrinsically safe for
	        Supply/Output circuit: 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
	    Non-incendive for
	        Supply/Output circuit: 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
	    [+, -, 1, 2, 3, 4, 5] to Earth terminal
	    [+, -] to [1, 2, 3, 4, 5]
	[Explosionproof approval]
	    Same as CF1
		CU15

*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.
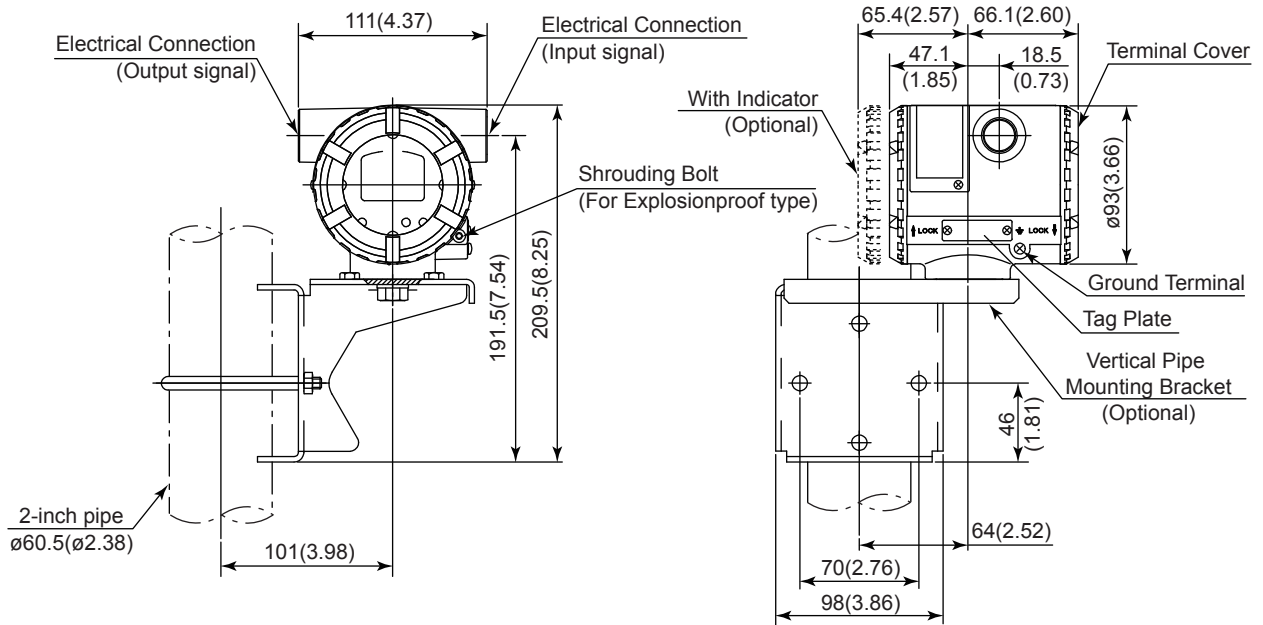
7.4 Dimensions (YTA610 and YTA710)

Unit: mm (Approx. inch)
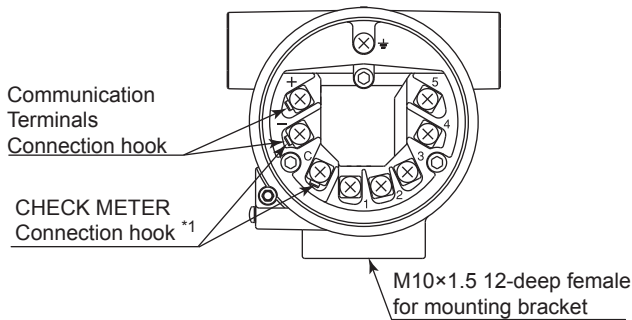
● **2-inch horizontal pipe mounting**

Electrical Connection (Output signal)
Electrical Connection (Input signal)
111(4.37)
102(4.02)
164(6.46)
65.4(2.57) 66.1(2.60)
47.1 (1.85) 18.5 (0.73)
Terminal Cover
With Indicator (Optional)
ø93(3.66)
Shrouding Bolt (For Explosionproof type)
Ground Terminal
Tag Plate
40 (1.57)
25 (0.98)
Horizontal Pipe Mounting Bracket (Optional)
56(2.21)
2-inch pipe ø60.5(ø2.38)

● **2-inch vertical pipe mounting**

Electrical Connection (Output signal)
111(4.37)
Electrical Connection (Input signal)
With Indicator (Optional)
Shrouding Bolt (For Explosionproof type)
191.5(7.54)
209.5(8.25)
65.4(2.57) 66.1(2.60)
47.1 (1.85) 18.5 (0.73)
Terminal Cover
ø93(3.66)
Ground Terminal
Tag Plate
Vertical Pipe Mounting Bracket (Optional)
46 (1.81)
2-inch pipe ø60.5(ø2.38)
101(3.98)
64(2.52)
70(2.76)
98(3.86)

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Terminals

Communication Terminals Connection hook
CHECK METER Connection hook [1]
M10×1.5 12-deep female for mounting bracket

Terminal Configuration

$\pm$	Power supply and output terminal
$\overline{C}$	External indicator (ammeter) termial [1]
$\perp$	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.

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Revision Information

- Title : YTA610 and YTA710 Temperature Transmitter (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