User's Manual

YTA Series Temperature Transmitters

Manual Change No. 16-047

Please use this manual change with the user's manuals listed below.

1. Applicable Users' Manual and Page

IM 01C50G01-01EN (2nd)

Item	Page	Applicable part and revised contents
2.7.1 (1) b)	2-5	ATEX Flameproof Type and Dust Ignition Proof Type See 2.1 Change applicable standards and Type of Protection and Marking Code See 2.2 Add Supply Voltage and Output Signal specifications
2.7.1 (6)	2-6, 2-7	Name Plate See 2.3 Change Name Plate
2.7.2 (1) b)	2-8	IECEx Flameproof Type and Dust Ignition Proof Type See 2.1 Change applicable standards and Type of Protection and Marking Code See 2.2 Add Supply Voltage and Output Signal specifications

2. Changed contents

2.1 Change applicable standards and Type of Protection and Marking Code

Before Change	After Change
ATEX Flameproof Type and Dust Ignition Proof Type 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**	ATEX Flameproof Type and Dust Ignition Proof Type Applicable Standard: EN 60079-0:2012+A11:2013, **EN 60079-1:2014**, **EN 60079-31:2014** Type of Protection and Marking Code: **II 2 G Ex db IIC T6/T5 Gb,** **II 2 D Ex tb IIIC T70°C / T90°C Db**
IECEx Flameproof Type and Dust Ignition Proof Type 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**	IECEx Flameproof Type and Dust Ignition Proof Type Applicable Standard: IEC 60079-0:2011, **IEC 60079-1:2014-06**, **IEC 60079-31:2013** Type of Protection and Marking Code: **Ex db IIC T6/T5 Gb,** **Ex tb IIIC T70°C / T90°C Db**

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Yokogawa Electric Corporation

Jan. 1, 2017

2.2 Add Supply Voltage and Output Signal specifications

Supply Voltage : 42 V dc max. (4 to 20 mA type)

: 32 V dc max. (Fieldbus type)

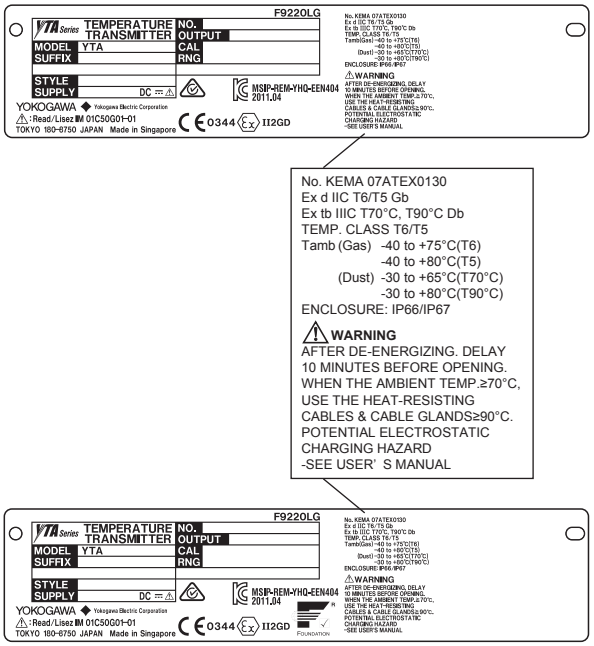
Output Signal : 4 to 20 mA

: 24 mA dc max. (Fieldbus type)

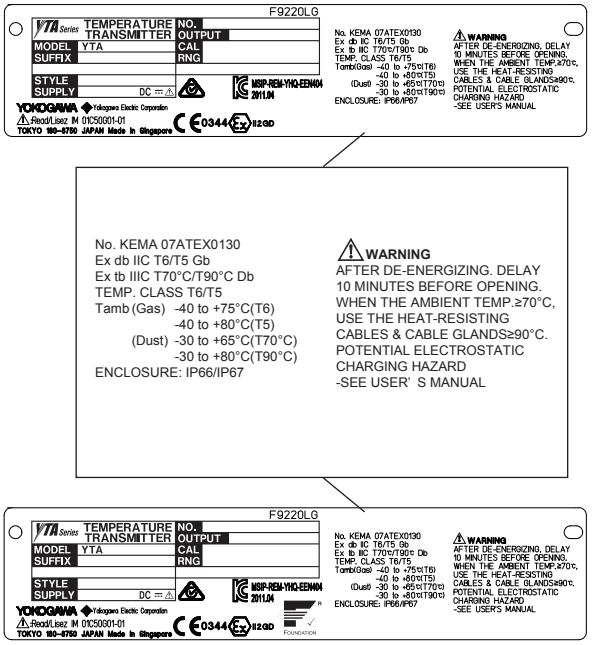
2.3 Change Name Plate

YTA710 /KF2 Flameproof and Dust ignition proof type

Before Change



After Change



User's Manual

YTA610 and YTA710 Temperature Transmitter (Hardware)

Manual Change No. 17-003

Please use this manual change with the user's manuals listed below.

1. Applicable User's Manual and Page

IM 01C50G01-01EN (2nd)

Item	Page	Applicable part and revised contents
2.7.2 (1) a)	2-7	IECEx intrinsically safe approval Items to be changed • Type of protection and marking code: • Ambient temperature: • Overvoltage category: • FISCO field device • Entity Parameters: • Sensor circuit:
2.7.5	2-14-1 2-14-2	Control Drawing Add (Ex ia) Add (Ex ic)
2.8	2-25	Add Immunity influence during the test
3.4.1	3-4	Delete *1 Applicable only for YTA610
7.1.1	7-2 7-4	Add Immunity influence during the test Add Ni120
7.1.2	7-6 7-8	Add Immunity influence during the test Add SIL Certification Change Note 1
7.3	7-12	Optional Specifications (YTA610 and YTA710) Items to be changed • Ambient temperature: • Overvoltage category: • Entity Parameters: • Sensor circuit:

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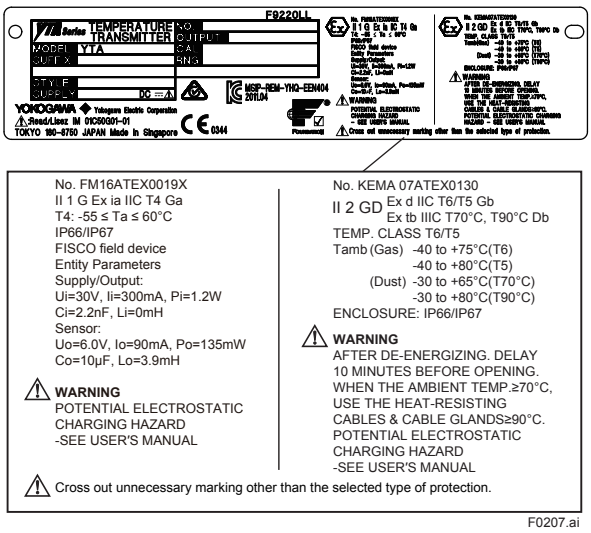
Yokogawa Electric Corporation

Mar. 7, 2017

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



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.

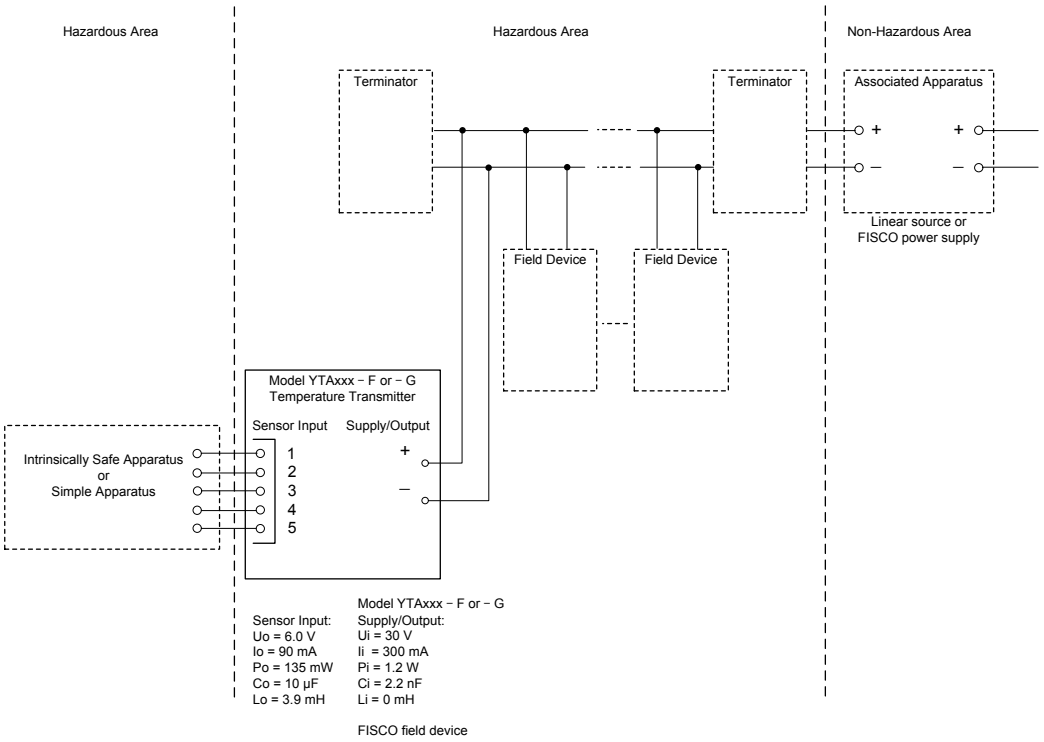
Note 1. Certification information

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
- Supply/Output circuit: Entity parameters:
  Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH
- Sensor circuit: Entity parameters:
  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
  Ex ic IIC T4 Gc
- Ambient Temperature (Ex ia): –55 to 60°C
- Ambient Temperature (Ex ic): –30 to 70°C
- Enclosure: IP66/IP67
- Overvoltage category: I
- Supply/Output circuit: Entity Parameters:
  Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH
- FISCO field device
- Sensor circuit: Entity Parameters:
  Uo=6V, Io=90mA, Po=135mW, Co=10μF, Lo=3.9mH
- Supply/Output circuit: Entity Parameters:
  Ui=32V, Ci=2.2nF, Li=0mH
- FISCO field device
- Sensor circuit: Entity Parameters:
  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]

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

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



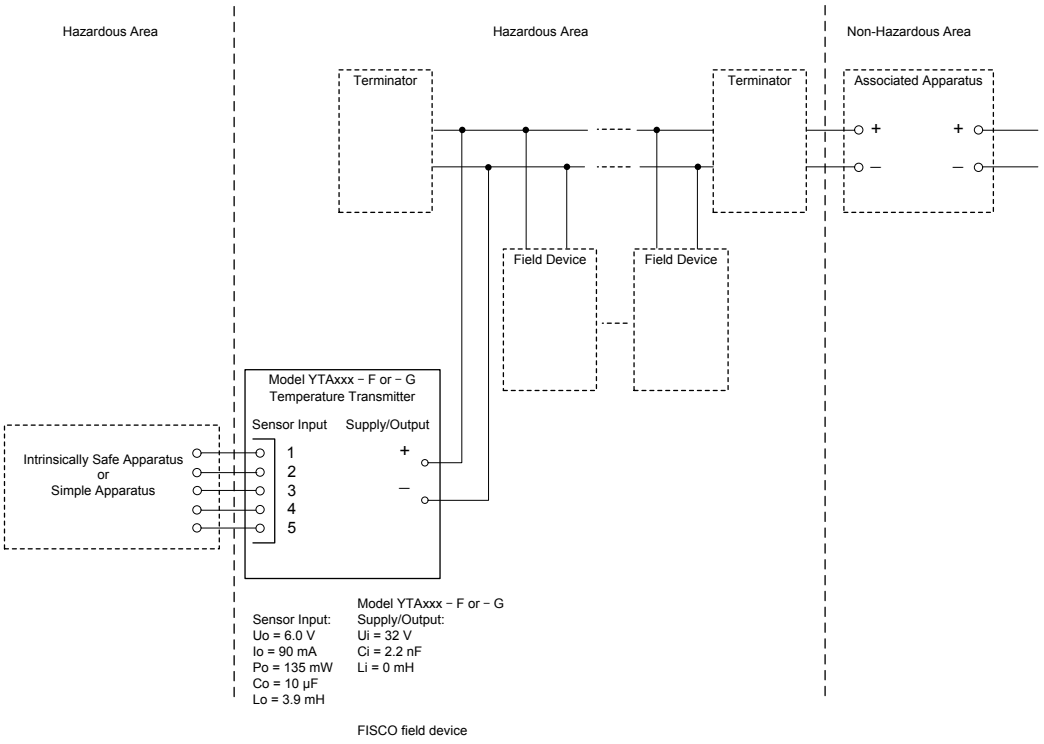
Specific Condition of Use:

– 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–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.

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



Specific Condition of Use:
– Precautions shall be taken to minimize the risk from electrostatic discharge of painted parts.
– The dielectric strength of 500 V r.m.s. between the intrinsically safe circuit and the enclosure of the Temperature Transmitter is limited, only by the removable surge absorber F9220AR.

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

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

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

2.8 EMC Conformity Standards

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

CAUTION

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

NOTE

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

2.9 Safety Requirement Standards

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

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

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

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

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, 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	—	

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	—	

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)
Immunity influence during the test:
Output shift is specified within ±1% of full span.

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)

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	
	Ni120	—	-70 to 320	-94 to 608		±0.08	±0.15	
mV		—	-10 to 120 [mV]		3 mV	±0.012 [mV]		
ohm		—	0 to 2000 [Ω]		20 Ω	±0.35 [Ω]		

Note 1: Total Accuracy = (A/D Accuracy / Span + D/A Accuracy) 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).

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)
Immunity influence during the test:
Output shift is specified within ±1% of full span.

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

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 400 °C
0.14°C / 400°C×100% of span +0.03% of span = 0.065% of span
Since the value is smaller than ±0.1% of span, the total accuracy is ±0.1%.

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

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 Supply/Output circuit: Entity Parameters: Ui=30V, Ii=200mA, Pi=1.0W, Ci=22nF, Li=0mH Sensor circuit: Entity Parameters: 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] [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 (Ex ia): –55 to 60°C Ex ic IIC T4 Gc, Ambient Temperature (Ex ic): –30 to 70°C Enclosure: IP66/IP67 Overvoltage category: I Supply/Output circuit: Entity Parameters: Ui=30V, Ii=300mA, Pi=1.2W, Ci=2.2nF, Li=0mH FISCO field device Sensor circuit: Entity Parameters: Uo=6V, Io=90mA, Po=135mW, Co=10µF, Lo=3.9mH Supply/Output circuit: Entity Parameters: Ui=32V, Ci=2.2nF, Li=0mH FISCO field device Sensor circuit: Entity Parameters: 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] [Flameproof and Dust Ignition Proof Approval] Same as SF2	**SU25**