

General Specifications

YTA series Fieldbus Communication



GS 01C50T02-00EN

Fieldbus is the digital communication line for the field instruments, whose signal is internationally standardized by Fieldbus Foundation.

The Fieldbus bi-directional digital communication performance makes possible for the field instruments and the control devices to be a complete on-line system, superseding the existing analog transmission lines. Also, the precise transmission of various process data including the PV and MV of the field instruments is well established by the Fieldbus multisensing function. Thus, based on FOUNDATION Fieldbus specifications, YTA320 Fieldbus model offers more flexible instrumentation through a higher level communication capability and proposes the cost reduction by multi-drop wirings with less cables.



■ FEATURES

- **Interoperability**
FOUNDATION Fieldbus specifications grant the interoperability of the field instruments without preparing designated softwares for the instrument.
- **Reduction of instrumentation cost**
The multi-drop wiring on the Fieldbus communication line contributes to the reduction of wiring cost.
- **Four AI and DI function blocks**
YTA320 Fieldbus model has four independent AI function blocks whose input can be selected from Sensor1 input, Sensor2 input, terminal temperature, differential temperature, average temperature, and back-uped input. Four DI function blocks can be used as a limit switch for those temperature.
- **Alarm function**
YTA Fieldbus models securely support various alarm functions, such as high/low alarm, notice of block error, etc. based on FOUNDATION Fieldbus specifications.
- **Self-diagnostic function**
The reliable self-diagnostic function detects such failure as measuring range failure and abnormal ambient temperature, as well as the hardware failure.
- **PID function block (option)**
PID function block enables field devices to control processes. Up to two blocks can be specified.

■ STANDARD SPECIFICATIONS

For items other than those described below, refer to GS 01C50B02-00EN.

Applicable Model:
YTA320

Output Signal:
Digital communication signal based on FOUNDATION Fieldbus protocol.

Supply Voltage:
9 to 32 V DC for general use, flameproof type,
Type n, or nonincendive
9 to 24 V DC for intrinsically safe type Entity model
9 to 17.5 V DC for intrinsically safe type FISCO model

Conditions of Communication Line:
Supply Voltage: 9 to 32 V DC
Supply Current: 16.6 mA (max)

Functional Specifications:
Functional specifications for Fieldbus communication conform to the standard specifications (H1) of FOUNDATION Fieldbus.
Function Block:
Four AI function blocks
Four DI function blocks
One/Two PID function blocks (option)
Link Master function

YOKOGAWA ◆

Yokogawa Electric Corporation
2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 Japan
Tel.: 81-422-52-5690 Fax.: 81-422-52-2018

GS 01C50T02-00EN
©Copyright Sep. 2000
17th Edition Apr. 2016

MODEL AND SUFFIX CODE

YTA320-F□□□□/□

└─ Output signal . . . Digital communication (FOUNDATION Fieldbus protocol)

OPTIONAL SPECIFICATIONS

Item	Description	Code
TIIS certification	TIIS Flameproof Approval, Ex ds IIC T6 X Amb. Temp.: -20 to 60°C	JF3
Attached flameproof packing adapter ¹	Electrical connection: G1/2 female Applicable cable: O.D. 8.5 to 11 mm	2pc. G12
ATEX	ATEX 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 ³	KF2
	ATEX Intrinsically Safe Ia Approval Applicable Standard: EN 50014: 1997, EN 50020: 2002, EN 50284: 1999, EN 60529: 1999 Certificate: KEMA 02ATEX1324 X [Entity model] II 1G EEx ia IIC T4, Ambient Temperature: -40 to 60°C (-40 to 140°F) Supply Circuit: Ui=24 V DC, Ii=250 mA, Pi=1.2 W, Ci=1.5 nF, Li=8 µH [FISCO model] II 1G EEx ia IIC T4, Ambient Temperature: -40 to 60°C (-40 to 140°F) Supply Circuit: Ui=17.5 V DC, Ii=360 mA, Pi=2.52 W, Ci=1.5 nF, Li=8 µH II 1G EEx ia IIB T4, Ambient Temperature: -40 to 60°C (-40 to 140°F) Supply Circuit: Ui=17.5 V DC, Ii=380 mA, Pi=5.32 W, Ci=1.5 nF, Li=8 µH Sensor Circuit: Uo=7.7 V, Io=70 mA, Po=140 mW, Co=1.6 µF, Lo=7.2 mH Electrical Connection: 1/2 NPT female and M20 female ³	KS25 ⁴
	ATEX Intrinsically safe Ic Applicable standard: EN 60079-0:2012, EN 60079-11:2012 II 3 G Ex ic IIC T4 Gc Ambient Temperature: -30 to 70°C Enclosure: IP66/IP67 Supply/Output circuit: Ui=32 V, Ci=2.4 nF, Li=8 µH Input circuit: Uo=7.7 V, Io=70 mA, Po=140 mW, Co=1.6 µF, Lo=7.2 mH Electrical connection: 1/2 NPT female and M20 female ³	KN25
	FM Explosionproof Approval Applicable Standard: FM 3600, FM 3615, FM 3810, ANSI/NEMA 250 Explosionproof Class I, Div.1, Groups A, B, C and D; Dust-ignitionproof for Class II/III, Div. 1, Groups E, F and G. "FACTORY SEALED, CONDUIT SEAL NOT REQUIRED." Enclosure Rating: TYPE 4X Temperature Class : T6 Ambient Temperature: -40 to 60°C (-40 to 140°F) Electrical Connection: 1/2 NPT female ²	FF1
Factory Mutual (FM)	FM Intrinsically Safe Approval Applicable Standard: FM 3600, FM 3610, FM 3611, FM 3810, NEMA250, ANSI/ISA-60079-0, ANSI/ISA-60079-11 IS-AIS/I, II, III/1/ABCDEF/G/T4 Ta=60°C; Type 4X I/O/AEx ia IIC T4 Ta=60°C Nonincendive Approval NI-ANI/II/2/ABCD/T4 Ta=60°C; Type 4X I/2/IIC/T4 Ta=60°C; Type 4X S-ANI/II/2FG/T4 Ta=60°C; Type 4X Dust Approval DIP/III/1/T4 Ta=60°C; Type 4X Entity Parameters: Groups A, B, C, D, E, F and G and Group IIC : Vmax=24 V, Imax=250 mA, Pi=1.2 W, Ci=1.5 nF, Li=8 µH Nonincendive Field Wiring Parameters: Groups A, B, C, D, F and G and Group IIC : Vmax=32 V, Ci=1.5 nF, Li=8 µH FISCO Parameters: Groups A, B, C, D, E, F and G and Group IIC : Vmax=17.5 V, Imax=360 mA, Pi=2.52 W, Ci=1.5 nF, Li=8 µH Groups C, D, E, F and G and Group IIB : Vmax=17.5 V, Imax=360 mA, Pi=5.32 W, Ci=1.5 nF, Li=8 µH Maximum Entity and Nonincendive Field Wiring Parameters: Output Terminals Vt=6.7 V, It=60 mA, Ca=10 µF, La=10 mH, Po=100 mW Electrical Connection: 1/2 NPT female ²	FS15

Item	Description	Code
Canadian Standards Association (CSA)	CSA Explosionproof Approval Applicable Standard: C22.2 No0, C22.2 No0.4, C22.2 No25, C22.2 No30, C22.2 No94, C22.2 No142, C22.2 No157, C22.2 No213, C22.2 No1010.1 Certificate: 1089576 Explosionproof Class I, Div.1, Groups B, C and D, Class II, Groups E, F and G, Class III. Enclosure TYPE 4X Temperature Class: T4 Ambient Temperature: -40 to 60°C (-40 to 140°F) Electrical Connection: 1/2 NPT female ^{*2}	CF1
IECEX	IECEX 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 IIC T70°C, T90°C Db Ambient Temperature for Gas Atmospheres: -40 to 75°C (-40 to 167°F) for T6, -40 to 80°C (-40 to 176°F) for T5 Ambient Temperature for Dust Atmospheres: -30 to 65°C (-22 to 149°F) for T70°C, -30 to 80°C (-22 to 176°F) for T90°C Enclosure: IP66/IP67 Electrical Connection: 1/2 NPT female and M20 female	SF2
	IECEX Intrinsically safe and type n Applicable Standard: IEC 60079-0: 2000, IEC 60079-11: 1999, IEC 60079-15: 2001 Certificate: IECEX CSA 05.0014 Ex ia IIC T4, Ex ia IIB T4, Ex nL IIC T4 Enclosure: IP66, IP67 Amb. Temp.: -40 to 60°C (-40 to 140°F) Electrical Parameters: [Ex ia Entity model] Ui=24 V, Ii=250 mA, Pi=1.2 W, Ci=1.5 nF, Li=8 µH [Ex ia IIC FISCO model] Ui=17.5 V, Ii=380 mA, Pi=2.52 W, Ci=1.5 nF, Li=8 µH [Ex ia IIB FISCO model] Ui=17.5 V, Ii=380 mA, Pi=5.32 W, Ci=1.5 nF, Li=8 µH [Ex nL] Ui=32 V, Ci=1.5 nF, Li=8 µH [Sensor Output] Uo=7.7 V, Io=70 mA, Po=140 mW, Co=1.6 µF, Lo=7.2 mH Electrical Connection: 1/2 NPT female or M20 female ^{*3}	SS25
PID function	PID control function (one block)	LC1
	PID control function (2 blocks)	LC2

*1: If cable wiring is to be used to a TIS flameproof type transmitter, add the YOKOGAWA-assured flameproof packing adapter.

*2: Applicable for Electrical connection code 2.

*3: Applicable for Electrical connection code 2 and 4.

*4: Because the examination of conformity to the updated standards is under the way, intrinsically safe type EX ia (option: KS25 for Fieldbus communication type) is pending the sale to EEA market.

< Settings When Shipped >

Sensor type	Pt100, 3 wire system (for both inputs), or as specified in order.
Tag Number (PD tag)	'TT1001' unless otherwise specified in order. (Not engraved on tag plate in such case.) *1
Output Mode (L_TYPE)	'Direct' unless otherwise specified in order
Calibration Range (XD_SCALE) Lower/Higher Range Value	'0 to 100', or as specified in order
Unit of Calibration Range	Selected from °C and Kelvin. (Only one unit can be specified.) When optional code /D2 is specified, °F and °R can also be specified.
Output Scale (OUT_SCALE) Lower/Higher Range Value	'0 to 100%'
Node Address (in hexadecimal)	'0xF3' unless otherwise specified in order
Operation functional Class	'BASIC', or as specified
Sensor back up*2	'DISABLE', or as specified

- *1: Specified Tag Number is entered in the amplifier memory and also engraved on the stainless steel plate.
Restrictions: Up to 16 letters using any of alphanumeric and symbols of [-] and [.].
- *2: Channel settings of AI function blocks depend on sensor back up setting.

Sensor Back up	AI1 Channel	AI2 Channel
DISABLE	'Sensor1'	'Sensor2' (Terminal board temperature, when Sensor2 type is 'Non-connection')
ENABLE	Backup temperature (Sensor1 under normal condition, Sensor2 when Sensor1 is in burn out mode)	'Terminal board temperature.'

Explanation of Fieldbus parameters:

- (1)XD_SCALE: Set the input value from Transducer block (input range of sensor) which corresponds to 0% value and 100% value of the calculation in the AI function block. In the case of YTA320, the value set as calibration range should be entered to this parameter.
- (2)OUT_SCALE: Output scaling parameter. Set the output value which corresponds to 0% value and 100% value of the calculation in the AI function block. In the case of YTA320, the value set as output scale should be entered to this parameter and set as '0 to 100 %' upon shipment. When integral indicator is required, this output is shown on LCD.
- (3)L_TYPE: Determines if the values passed by the transducer block to the AI block may be used directly (Direct) or if the value is in different units and must be converted linearly (Indirect) or with square root (Indirect SQRT), using the input range defined by XD_SCALE and the associated output range (OUT_SCALE).

< Ordering Information >

Model, suffix codes, and optional codes Specify followings if necessary.

- Sensor type for both two inputs. For RTD and resistance input, specify the number of wire as well. (Example; Pt200 3-wire system)
- Calibration range (XD_SCALE)
- Units of calibration range:
Specify only one unit from the table, 'Settings when shipped.'
- Output mode (L_TYPE)
Select 'Direct' or 'Indirect Linear.'
- Tag Number (PD tag)
Specify software tag (up to 30 letters) to be written on the amplifier memory and Tag number (up to 16 letters) to be engraved on the tag plate separately.
- Node Address
- Operation Functional Class
Select 'BASIC' or 'LINK MASTER'.
- Sensor back up
Select 'DISABLE' or 'ENABLE'.

Example; When 0 to 200 °C for calibration range is required, specify the values as follows:

Calibration range: Lower value 0
Upper value 200
Calibration unit: °C

< Related Instruments >

The customer should prepare instrument maintenance tool, terminator, fieldbus power supply etc.

Supplier	Type	Model
P+F	Isolator	KLD2-PR-Ex1, IEC1 (FISCO)

< Reference >

FOUNDATION; Trademark of Fieldbus Foundation.