

General Specifications

GS 01E21F02-01EN

ADMAG Total Insight Series
FOUNDATION™ Fieldbus
Communication Type
AXG/AXW Magnetic Flowmeter



■ GENERAL DESCRIPTION

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

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.

Thus, based on FOUNDATION Fieldbus specifications, ADMAG Total Insight Fieldbus models offer more flexible instrumentation through a higher level communication capability and propose the cost reduction by multi-drop wirings with less cables.



Integral Flowmeter



Remote Transmitter

■ FEATURES

● Interoperability

FOUNDATION Fieldbus specifications grant the interoperability of the field instruments without preparing designated softwares for the instrument.

● Improved Operation and Monitoring Function

Operation authority level setting for ensuring safety, process data trend display, display backlight flashing (Squawk) function, and data store / restore function with display unit internal memory or microSD card are available.

● Function Blocks

Discrete Input (DI), Integrator (IT), Arithmetic (AR) function blocks are available as standard function besides Analog Input (AI) function block. Proportional/Integral/Derivative (PID) function block and MAO (Multiple Analog Output) are also supported.

● Fluid Adhesion Level Diagnosis

By constantly monitoring the level of insulating substance on the electrodes, it is possible to determine when maintenance is required.

● Stable Measurement

Our own dual frequency excitation method realizes stable flow measurement even under high flow noise in the fluid with highly concentrated slurry.

● Improved Maintainability

Diagnostic functions that contribute to preventive maintenance of the plant are installed. Diagnosis of the device (verification function) that can be executed without demounting from piping, detection of the process condition by monitoring the flow noise and electric conductivity of the fluid, electrode insulation deterioration diagnosis, electrode adhesion diagnosis, and wiring connection diagnosis are available.

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■ FUNCTIONS

For items other than those described below, refer to GS 01E22A01-01E, GS 01E24A01-01E or GS 01E25D11-01E.

Output:

Digital communication signal based on FOUNDATION Fieldbus protocol.

Communication Requirements:

Supply Voltage: 9 to 32 V DC

Current Draw: 15 mA (maximum)

Functional Specifications:

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

Note: I/O2 (Pulse/Status Output) terminal is only used when calibration.

Function Block:

AXG4A

| Block | Number of block | Execution time | Note |
|-------|-----------------|----------------|--|
| AI | 4 | 10 ms | For flow rate |
| DI | 3 | | For flow limit switches |
| IT | 2 | | Integrator block integrate variables of forward and reverse flow |
| AR | 1 | | Arithmetic block permits simple use of popular measurement math function |
| PID | 1 | | For PID control |
| MAO | 1 | | Multiple signal input from other devices |

AXW4A

| Block | Number of block | Execution time | Note |
|-------|-----------------|----------------|--|
| AI | 3 | 10 ms | For flow rate |
| DI | 3 | | For flow limit switches |
| IT | 2 | | Integrator block integrate variables of forward and reverse flow |
| AR | 1 | | Arithmetic block permits simple use of popular measurement math function |
| PID | 1 | | For PID control |
| | | | |

Link Master Function:

Link Master function is supported.

Displayed Language:

English.

MODEL AND SUFFIX CODE

For items other than those described below, refer to GS 01E22A01-01E, GS 01E24A01-01E or GS 01E25D11-01E.

AXG series Integral Flowmeter

AXG###-A#####-#F0##/#

AXG4A Remote Transmitter

AXG4A-#####F0##/#

AXW series Integral Flowmeter

Size 25 mm to 400 mm (1 in. to 16 in.)

AXW###-A#####-#F0##/#

Size 500 mm (20 in.) or larger

AXW####-F#####-###/#

AXW4A Remote Transmitter

AXW4A-#####F0##/#

(Note1) "F0" or "F" indicates that the output is digital communication compliant with the FOUNDATION Fieldbus protocol.

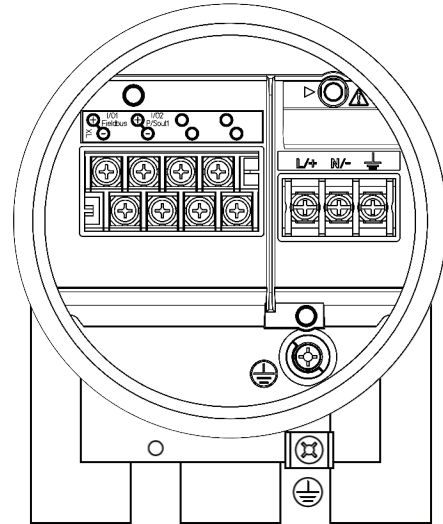
ACCESSORIES

- Mounting Bracket (Remote transmitter only): 1 set
Note: Accessories differ depending on specifications to be selected.

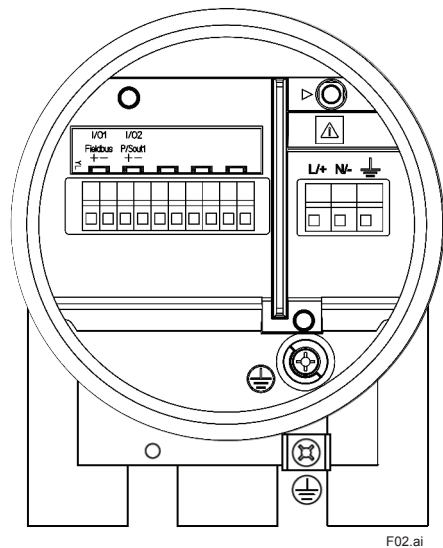
TERMINAL CONFIGURATION

<To be wired to Power Supply and I/Os>

M4 Screw Type



Clamp Type



| Terminal Symbol | Description |
|-----------------|---|
| ▶ | Shorting Screw (Need to be fixed for normal operation) |
| ⏏ | Functional Grounding |
| N/- L/+ | Power Supply |
| I/O1- I/O1+ | Fieldbus (Passive) |
| I/O2- I/O2+ | Pulse/Status Output (Passive) *It is only used when calibration. |

Recommended Cable for Excitation, Power and Input / Output (except I/O1):

- JIS C 3401 control cable equivalent
- JIS C 3312 power cable equivalent
- 14 AWG Belden 8720 equivalent
- Outer Diameter:
 - Without gland:
 - 6.5 to 12 mm (0.26 to 0.47 in.)
 - Nominal Cross Section:
 - Single wire: 0.5 to 2.5 mm²
 - Stranded wire: 0.5 to 1.5 mm²

Recommended Cable for Input / Output (I/O1):
Fieldbus Type-A specification

■ ORDERING INFORMATION

Note 1: In the case of FOUNDATION Fieldbus remote type, please order flowtube and converter.

Note 2: Some options, if ordered, require the relevant specifications to be input when ordering.

Note 3: Please refer GS 01E22A01-01EN or GS 01E25D11-01EN for following order information.

- Measurable Flow Rate Range
- Specified Span Five-point Calibration (optional code SC)
- Direction of Cable Entry (optional code RH)
- Direction of Display

1. Model, Suffix Code and Optional Code
2. Flow rate span and unit (XD_SCALE).
 - 1) Flow rate span can be specified within the range of 0.0001 to 999999000000.0000 if combined sensor is AXG of size 2.5 mm to 500 mm (0.1 in. to 20 in.) or AXW of size 25 mm to 400 mm (1 in. to 16 in.), 0.0001 to 32000 if combined sensor is AXW of size 500 mm to 1800 mm (2 in. to 72 in.), in increments of 0.0001. Number of significant digits for mathematical calculation is upper 6 digits.
 - 2) The sensor ordering information "FLOW RATE SPAN" be used and set in transmitter's XD_SCALE.
 - 3) Low range always be set 0 and shipped.
 - 4) Specify only one unit from the "Calibration Range Unit" table.
 - 5) Be sure to specify the span flow rate and unit when selecting the Mass Unit Setting (optional code MU), or Specified Span Fivepoint Calibration (optional code SC).
3. Output scale and unit (OUT_SCALE)
OUT_SCALE is always set the same as XD_SCALE and shipped.
4. Tag Number
Tag number (up to 30 letters) to be engraved on the tag plate.
5. Software Tag (PD_TAG)
Software tag (up to 32 letters) to be written on the amplifier memory. If neither of Tag number and Software Tag are not specified, "FT1002" is written on PD_TAG as default.

6. Node Address
Specify 2 digits of hex number, between 0x14 and 0xF7. Specify small value in range of 0x14 or larger if the device is Link Master. If nothing is specified, 0xF4 is written.
7. Operation Function Class
Specify "BASIC" if the device becomes Basic device, or "LINK MASTER" if the device becomes Link Master. If nothing is specified, "BASIC" is set.
8. Mass Unit (optional code MU)
The flow rate calculation is performed in mass unit. In addition to fluid density, specify span flow rate, output pulse weight, and totalizer display pulse weight in mass unit. The specifiable numerical digit and range is the same as that for "2. Span Flow Rate and Unit".

(1) Density
Numerical Value:
Specify within six digits (up to three digits below the decimal point) in the range of 500 to 2000 kg/m³ (4.2 to 16.7 lb/gal, 31.2 to 124.8 lb/cf).
Unit: kg/m³, lb/gal, lb/cf
The density of water is about 1000 kg/m³. Then specify "1000 kg/m³" in this case. However, as the density varies with temperature, specify the density at the time of flow measurement.

(2) Span Flow Rate
Numerical Value:
When setting the mass span flow rate, calculate the volume span flow rate from the "density" and it must be within the measurable flow rate range. The settable numerical range for the mass span flow rate is the same as that for the volume span flow rate.
Unit:
Mass Unit: t, kg, g, klb, lb
Time Unit: /d, /h, /min, /s

<Factory Setting>

| Tag Number (Name Plate and/or stainless steel tag plate) | As specified in order |
|---|---|
| Software Tag (PD_TAG) | In case of different Software Tag (PD_TAG) is required from Tag Number above in the amplifier memory, specify at Software Tag. Default (FT1002) be set for PD_TAG unless otherwise both Tag Number and Software Tag specified in order. |
| Node Address | '0xF4' unless otherwise specified in order |
| Operation Function Class | 'BASIC' or as specified |
| Calibration Range (XD_SCALE) Lower/Higher Range Value | FROWRATE SPAN of sensor order information be set in XD_SCALE. Lower Range Value be always zero. |
| Calibration Range Unit | Specified unit. Refer to Table below. |
| Output Scale (OUT_SCALE) Lower/Higher Range Value | 'OUT_SCALE' always be the same as 'XD_SCALE'. |
| Output Scale Unit | Same as Calibration Range Unit |

<Calibration Range Unit>

| Volume/ Mass unit | Allowable units |
|----------------------|--|
| L | ml/d, ml/h, ml/min, kL/d, kL/h, kL/min, kL/s, L/d, L/h, L/min, L/s |
| m ³ | m ³ /d, m ³ /h, m ³ /min, m ³ /s |
| cm ³ | cm ³ /d, cm ³ /h, cm ³ /min, cm ³ /s |
| m | m/s |
| t | t/d, t/h, t/min, t/s |
| kg | kg/d, kg/h, kg/min, kg/s |
| g | g/d, g/h, g/min, g/s |
| CFH | ft ³ /d, CFH, CFM, CFS |
| gal(US) | Mgal(US)/d, Mgal(US)/h, Mgal(US)/min, Mgal(US)/s, kgal(US)/d, kgal(US)/h, kgal(US)/min, kgal(US)/s, gal(US)/d, gal(US)/h, GPM, gal(US)/s, mgal(US)/d, mgal(US)/h, mgal(US)/min, mgal(US)/s |
| bbl (US Oil) | kbbbl(US Oil)/d, kbbbl(US Oil)/h, kbbbl(US Oil)/min, kbbbl(US Oil)/s, bbl(US Oil)/d, bbl(US Oil)/h, bbl(US Oil)/min, bbl(US Oil)/s, mbbbl(US Oil)/d, mbbbl(US Oil)/h, mbbbl(US Oil)/min, mbbbl(US Oil)/s, μbbbl(US Oil)/d, μbbbl(US Oil)/h, μbbbl(US Oil)/min, μbbbl(US Oil)/s |
| bbl (US Beer) | kbbbl(US Beer)/d, kbbbl(US Beer)/h, bbl(US Beer)/min, bbl(US Beer)/s, bbl(US Beer)/d, bbl(US Beer)/h, mbbbl(US Beer)/min, mbbbl(US Beer)/s, mbbbl(US Beer)/d, mbbbl(US Beer)/h, μbbbl(US Beer)/min, μbbbl(US Beer)/s |
| lb | lb(US)/d, lb(US)/h, lb(US)/min, lb(US)/s |
| ft | ft/s |

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.
- (2) OUT_SCALE: Output scaling parameter. Set the output value which corresponds to 0% value and 100% value of the AI function block.

■ RELATED INSTRUMENTS

| Product | Document Number |
|--|------------------|
| AM012 Calibrator for Magnetic Flowmeter | GS 1E6K2-E |
| FieldMate Versatile Device Management Wizard | GS 01R01A01-01E |
| ADMAG TI Series AXG Magnetic Flowmeter | GS 01E22A01-01EN |
| ADMAG TI Series AXW Magnetic Flowmeter [Size: 25 to 400 mm (1 to 16 in.)] | GS 01E24A01-01EN |
| ADMAG TI Series AXW Magnetic Flowmeter [Size: 500 to 1800 mm (20 to 72 in.)] | GS 01E25D11-01EN |

■ TRADEMARKS

"FOUNDATION" in "FOUNDATION fieldbus" is a registered trademark of FieldComm Group.

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Note: The terms "transmitter" and "sensor" in this document are used in the same manner as "converter" and "flowtube" respectively which are used for our previous magnetic flowmeter models.

<Information on EU WEEE Directive>

EU WEEE (Waste Electrical and Electronic Equipment) Directive is only valid in the EU.

This instrument is intended to be sold and used only as a part of equipment which is excluded from WEEE Directive, such as large-scale stationary industrial tools, a large-scale fixed installation and so on, and, therefore, subjected to the exclusion from the scope of the WEEE Directive. The instrument should be disposed of in accordance with local and national legislation/regulations.