

General Specifications

ADMAG AXF Series
FOUNDATION™ Fieldbus Communication Type
Magnetic Flowmeter



GS 01E20F02-01E

FOUNDATION 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.

Thus, based on FOUNDATION Fieldbus specifications, AXF Fieldbus models offer more flexible instrumentation through a higher level communication capability and propose 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.

● 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 is also supported as an option.

● User Friendly

Fluid Adhesion Level Diagnosis

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

With the utilization of a replaceable electrode type flowtube, in case of severe adhesion, the electrodes can be easily removed from the meter and cleaned.

Clear and Versatile Indications

The LCD indicator employs a large, backlit full dot-matrix, that can facilitate various displays. One to three lines of indications are possible. When there is an alarm condition, a full description of the countermeasures is indicated.

● Link master function

AXF Fieldbus models support the Link Maser function. This function enables backup of network manager and local control only by field devices.

● Self-diagnostic function

The reliable self-diagnostic function detects various system alarms, process alarms and setting alarms.

● Expansion of Product Lineup

Two Types of Accuracy

Standard accuracy is $\pm 0.35\%$ of Rate, and High grade accuracy type ($\pm 0.2\%$ of Rate) is also available.

● Enhanced Performance and Specifications

Enhanced Dual Frequency Excitation Method

The "Enhanced Dual Frequency Excitation Method" can be optionally selected.

For severe applications such as for high concentration slurry or low conductivity fluid, extremely stable measurements can be realized.

Improved Minimum Conductivity

The lower limit of conductivity is from $1\mu\text{S}/\text{cm}$.

FOUNDATION is a registered trademark of Fieldbus FOUNDATION.

STANDARD SPECIFICATIONS

For items other than those described below, refer to GS 01E20D01-01E, GS 01E20C02-01E.

Applicable Models:

Integral Flowmeter AXF
Remote Converter AXFA14

Output:

Digital communication signal based on FOUNDATION Fieldbus protocol.

Supply Voltage:

Power supply code 1:

- AC specifications
Rated power supply: 100 to 240 V AC, 50/60 Hz

- DC specifications

Rated power supply: 100 to 120 V DC

Power supply code 2:

- AC specifications
Rated power supply: 24 V AC, 50/60 Hz

- DC specifications

Rated power supply: 24 V DC

Communication Requirements:

Supply Voltage: 9 to 32 V DC
Current Draw: 15mA (maximum)

Functional Specifications:

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

Function Block:

Block name	Number	Execution time	Note
AI	1	30 ms	For flow rate
DI	2	25 ms	For flow limit switches
IT	2	30 ms	Integrator block integrate variables of forward and reverse flow
AR	1	30 ms	Arithmetic block permits simple use of popular measurement math functions
PID	1	50 ms	Applicable when LC1 option is specified

T01.EPS

LM Function:

LM function is supported.

Displayed Language:

In the case of FOUNDATION Fieldbus communication type, only English is provided.

STANDARD PERFORMANCE

Accuracy

Note: The accuracy of a product before shipment is defined as totalized value at the result of calibration test in our water actual flow test facility.

Calibrated conditions in our water actual test facility are as follows:

Fluid temperature; 20 ± 10°C
Ambient temperature; 20 ± 5°C
Length of straight runs; 10 D or more on the upstream side; 5 D or more on the downstream side

Reference conditions; Similar to BS EN29104 (1993); ISO 9104 (1991)

PFA/Ceramics Lining:

Size mm (in.)	Flow Velocity V m/s (ft/s)	Standard Accuracy (Calibration code B)	Flow Velocity V m/s (ft/s)	High Grade Accuracy (Calibration code C)
2.5 (0.1) to 15 (0.5)	$V < 0.3$ (1)	±1.0 mm/s	—	—
	$0.3 \leq V \leq 10$ (1) (33)	±0.35% of Rate		
25 (1.0) to 200 (8.0)	$V < 0.15$ (0.5)	±0.5 mm/s	$V < 0.15$ (0.5)	±0.5 mm/s
	$0.15 \leq V \leq 10$ (0.5) (33)	±0.35% of Rate	$0.15 \leq V < 1$ (0.5) (3.3)	±0.18% of Rate ±0.2mm/s
250 (10) to 400 (16)	$V < 0.15$ (0.5)	±0.5 mm/s	—	—
	$0.15 \leq V \leq 10$ (0.5) (33)	±0.35% of Rate		

T05.EPS

Polyurethane Rubber /Natural Soft Rubber /

EPDM Rubber Lining:

Size mm (in.)	Flow Velocity V m/s (ft/s)	Standard Accuracy (Calibration code B)
25 (1.0) to 400 (16)	$V < 0.3$ (1.0)	±1.0 mm/s
	$0.3 \leq V \leq 10$ (1.0) (33)	±0.35% of Rate

T06.EPS

Enhanced dual frequency excitation (Option code HF2):
Standard accuracy ±1 mm/s

Repeatability:

± 0.1% of Rate ($V \geq 1$ m/s (3.3 ft/s))
± 0.05% of Rate ± 0.5 mm/s ($V < 1$ m/s (3.3 ft/s))

MODEL AND SUFFIX CODE

Integral Flowmeter AXF

AXF□□□□-F□□□□□-□□□□-□□□□/□

Remote Converter AXFA14

AXFA14□-F□-□□□/□

(Note1) "F" following the first dash indicates that the output is digital communication compliant with the FOUNDATION Fieldbus protocol.

OPTIONAL SPECIFICATIONS

For options other than below, refer to GS 01E20D01-01E and GS 01E20C02-01E (Optional codes /C1, /C2, /C3, /EM, /G11 and /G13 are unable to select).

Item	Description	Code
PID Function	PID control Function	LC1
Software download function	Based on Fieldbus Foundation Specification (FF-883) Download class: Class1	EE

T02.eps

<Ordering Information>

Specify the following when ordering:

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

- Model, suffix codes, and optional codes
- Flow rate span and unit (XD_SCALE).
 - Flow rate span can be specified up to 5 digits (excluding any decimal point) within the range of 0.0001 to 32000.
 - The flowtube ordering information "FLOW RATE SPAN" be used and set in converter's XD_SCALE.
 - Low range always be set 0 and shipped.
 - Specify only one unit from the "Calibration Range Unit" table.
- Output mode (L_TYPE)

L_TYPE is always set as Direct and shipped.
- Output scale and unit (OUT_SCALE)

OUT_SCALE is always set the same as XD_SCALE and shipped.

5. Tag Number

Specify software tag (up to 32 letters) to be written on the amplifier memory and Tag number (up to 16 letters) to be engraved on the tag plate separately.

6. Node Address.

Explanation of Fieldbus parameters:

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

<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 (FT2001) 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
Output Mode (L_TYPE)	Always 'Direct'
Calibration Range (XD_SCALE) Lower/Higher Range Value	FROWRATE SPAN of flowtube order information be set in XD_SCALE. Lower Range Value be always zero.
Calibration Range Unit	Refer to Table below.
Output Scale (OUT_SCALE) Lower/Higher Range Value	'OUT_SCALE' always be the same as 'XD_SCALE'.

T03.EPS

<Calibration Range Unit>

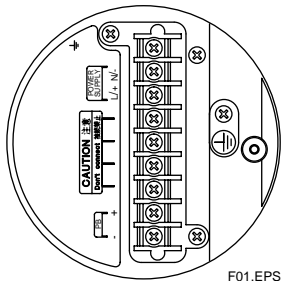
Volume/ Mass unit	Allowable units
L	ml/d, ml/h, ml/min, kl/d, kl/h, kl/min, kl/s, L/d, L/h, L/min, L/s
m ³	m ³ /d, m ³ /h, m ³ /min, m ³ /s
cm ³	cm ³ /d, cm ³ /h, cm ³ /min, cm ³ /s
m	m/s
t	t/d, t/h, t/min, t/s
kg	kg/d, kg/h, kg/min, kg/s
g	g/d, g/h, g/min, g/s
CFH	ft ³ /d, CFH, CFM, CFS
gal(US)	Mgal(US)/d, 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)	kbb(US Oil)/d, kbb(US Oil)/h, kbb(US Oil)/min, kbb(US Oil)/s, bbl(US Oil)/d, bbl(US Oil)/h, bbl(US Oil)/min, bbl(US Oil)/s, mbb(US Oil)/d, mbb(US Oil)/h, mbb(US Oil)/min, mbb(US Oil)/s, μbb(US Oil)/d, μbb(US Oil)/h, μbb(US Oil)/min, μbb(US Oil)/s
bbl (US Beer)	kbb(US Beer)/d, kbb(US Beer)/h, bb(US Beer)/min, bb(US Beer)/s, bbl(US Beer)/d, bbl(US Beer)/h, mbb(US Beer)/min, mbb(US Beer)/s, mbb(US Beer)/d, mbb(US Beer)/h, μbb(US Beer)/min, μbb(US Beer)/s
lb	lb(US)/d, lb(US)/h, lb(US)/min, lb(US)/s
ft	ft/s

T04.EPS

■ TERMINAL CONNECTION

Integral Flowmeter AXF

Terminal configuration



F01.EPS

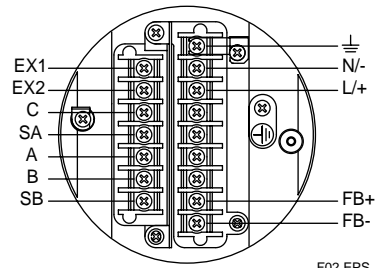
Terminal wiring

Terminal Symbols	Description
⏏	Functional grounding
N/- L/+	Power supply
FB+ FB-	Fieldbus communication signal
⏏	Protective grounding (Outside of the terminal)

T07.EPS

Remote Type Converter AXFA14

Terminal configuration



F02.EPS

Terminal wiring

Terminal Symbols	Description	Terminal Symbols	Description
EX1 EX2	Excitation current Output	⏏	Functional grounding
C		N/- L/+	Power supply
SA A B SB	Flow signal input	FB+ FB-	
		⏏	Protective grounding (Outside of the terminal)

T08.EPS

⚠ CAUTION

Do not connect to these terminals which are marked "CAUTION Don't connect".

<Related Instruments>

Maintenance tools for field devices, bus terminators, fieldbus power supply, and other fieldbus components need to be prepared by the customer

- Calibrator for Magnetic Flowmeter (AM012): GS 01E06K02-00E
- AXFA14G/C Magnetic Flowmeter Remote Converter: GS 01E20C02-01E
- AXF Magnetic Flowmeter Integral Flowmeter/Remote Flowtube: GS 01E20D01-01E
- FieldMate: GS 01R01A01-01E

<Reference>

Company names and product names used in this material are registered trademarks or trademarks of their respective owners.