

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 required.

With the utilization of a replaceable electrode type flowtube, in case of severe adhesion, the electrodes can 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

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LM Function:

LM function is supported.

Displayed Language:

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

Lightning Protector:

The lightning protector is built into the Fieldbus communication signal and for remote converter also built into the excitation current output and the signal common. When optional code A is selected, the lightning protector is built into the power terminals.

■ STANDARD PERFORMANCE

Reference Conditions:

- Similar to BS EN 29104 (1993); ISO9104 (1991)
- Fluid temperature: 20°C ± 10°C (+68°F ± 18°F)
 - Ambient temperature: 25°C ± 5°C (+77°F ± 9°F)
 - Warm-up time: 30 min
 - Straight runs:
 - Upstream > 10 × DN
 - Downstream > 5 × DN
 - Properly grounded
 - Properly centered

Accuracy (at reference conditions)

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 ≤ V ≤ 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 ≤ V ≤ 10 (0.5) (33)	±0.35% of Rate	0.15 ≤ 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	1 ≤ V ≤ 10 (3.3) (33)	±0.2% of Rate
	0.15 ≤ V ≤ 10 (0.5) (33)	±0.35% of Rate	—	—

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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 ≤ V ≤ 10 (1.0) (33)	±0.35% of Rate

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

Repeatability:

- ± 0.1% of Rate (V ≥ 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
CENELEC ATEX Certification (KEMA Approval)	ATEX Explosion proof *1		KF2
IECEX Certification *3	IECEX Explosion proof *1		SF2
FM Approval	FM Explosion proof *1		FF1
CSA Certification	CSA Explosion proof *1		CF1
TIIS Certification *2	TIIS Flameproof *1		JF3
Flameproof packing adapter for TIIS Flameproof Type	Integral Flowmeter AXF	Two flameproof packing adapters.	G12
	Remote Converter AXFA14	Four flameproof packing adapters.	G14

*1: Refer to "HAZARDOUS AREA CLASSIFICATION" in GS 01E20D01-01E and GS 01E20C02-01E.

*2: Select optional code G12 or G14 when TIIS Flameproof type with wiring using a flameproof packing adapter. Available only for JIS G1/2 electrical connections.

*3: Applicable only for Australia and New Zealand area.

T02.eps

<Ordering Information>

Specify the following when ordering:

- 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	'0 × F4' 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'.

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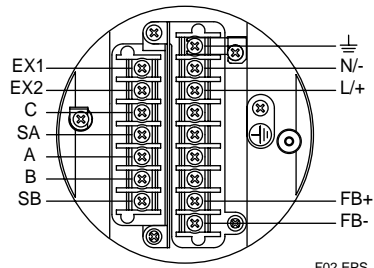
<Calibration Range Unit>

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, kbbbl(US Beer)/min, kbbbl(US Beer)/s, bbl(US Beer)/d, bbl(US Beer)/h, bbl(US Beer)/min, bbl(US Beer)/s, mbbbl(US Beer)/d, mbbbl(US Beer)/h, mbbbl(US Beer)/min, mbbbl(US Beer)/s, μbbbl(US Beer)/d, μbbbl(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

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Remote Type Converter AXFA14

Terminal configuration



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Terminal wiring

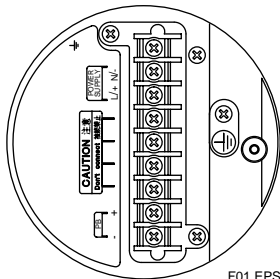
Terminal Symbols	Description	Terminal Symbols	Description
EX1 EX2	Excitation current Output	⏏	Functional grounding
C		N/- L/+	Power supply
SA A B SB	Flow signal input	FB+	
		FB-	
		⏏	Protective grounding (Outside of the terminal)

T08.EPS

■ TERMINAL CONNECTION

Integral Flowmeter AXF

Terminal configuration



F01.EPS

Terminal wiring

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

T07.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