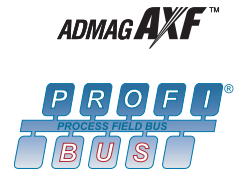


General Specifications

AXF
PROFIBUS PA Communication Type
Magnetic Flowmeter



GS 01E20F12-01E

PROFIBUS is a vendor-independent and open fieldbus based on the international standard IEC61158 and IEC61784. It covers a wide range of applications in manufacturing and process automation fields.

Vendor-independence and openness allow communication between devices of different manufactures with no special interface adjustment.

Thus, based on PROFIBUS PA specifications, AXF PROFIBUS PA 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

PROFIBUS 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 PROFIBUS communication line contributes to the reduction of wiring cost.

● Function blocks

All function block, Totalizer function blocks and DI function blocks are available. (Profibus Profile 3.01 Compliant)

● 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.

● 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 $1\mu\text{S}/\text{cm}$.

● Supported tools

DTM for FieldMate R1.03
EDDL for SIEMENS SIMATIC PDM V6.0

PROFIBUS: Registered trademark of Profibus
Nutzerorganisation e.v., Karlsruhe, Germany.

■ 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 Signal:

Digital communication signal based on PROFIBUS PA protocol.

Output data

Volumetric flow, Totalized value, Status output (Adhesion alarm, HH/H/L/LL alarm)

Input data

Totalized value reset

Function Blocks:

One AI function block, Three Totalizer function blocks and Two DI function blocks are available (Profibus Profile 3.0 Compliant)

Conditions of Communication Line:

Supply voltage from the Bus: 9 to 32 V DC
Current Draw: 15mA (maximum)

Bus Address Switch:

via Hardware Address Switch or via Software

FDE (Fault Disconnection Electronic):

0 mA

Alarm Selection Function:

These informations are indicated in DIAGNOSTICS parameter, which can be handled during normal operation.

(Note 1) The following functions are not supported in the Profibus model.

- Pulse Output
- Multi-range Function
- Totalization Switch
- Alarm Output

Power 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

Displayed Language:

In the case of PROFIBUS PA 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	$1 \leq V \leq 10$ (3.3) (33)	±0.2% of Rate
	$0.15 \leq V \leq 10$ (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□□□□-G□□□□□-□□□□-□□□□/□

Remote Converter AXFA14

AXFA14□-G□-□□□/□

(Note1) "G" following the first dash indicates that the output is digital communication compliant with the PROFIBUS PA 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).

<Ordering Information>

Specify the following when ordering:

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

1. Model, suffix codes, and optional codes
2. Flow rate span and unit (PV SCALE).
 - 1) Flow rate span can be specified up to 5 digits (excluding any decimal point) within the range of 0.0001 to 32000.
 - 2) The flowtube ordering information "FLOW RATE SPAN" be used and set in converter's PV SCALE.
 - 3) Low range always be set 0 and shipped.
 - 4) Specify only one unit from the "Calibration Range Unit" table.
3. Output mode (Characterization Type)
Characterization Type is always set as Direct and shipped.
4. Output scale and unit (OUT SCALE)
OUT SCALE is always set the same as PV 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. Bus Address

Specify the address between hexadecimal 0x03 and 0x7E.

Explanation of PROFIBUS PA parameters:

- (1) PV 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.
- (3) Output Mode (Characterization Type): Always set as 'No Linearization'

<Factory Setting>

Tag Number (Name Plate and/or stainless steel tag plate)	As specified in order
Software Tag (TAG NO)	In case of different Software Tag (TAG NO) is required from Tag Number above in the amplifier memory, specify at Software Tag. Default (FT2001) be set for TAG NO unless otherwise both Tag Number and Software Tag specified in order.
Node Address (Bus Address)	'0x7E' unless otherwise specified in order
Output Mode (Characterization Type)	Always set as 'No Linearization'
Calibration Range (PV SCALE) Lower/Higher Range Value	FROWRATE SPAN of flowtube order information be set in PV 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 'PV SCALE'.

T03.EPS

<Calibration Range Unit>

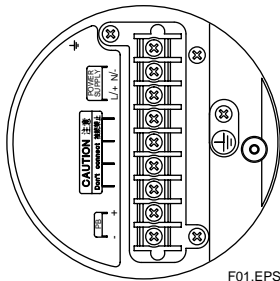
Volume/ Mass unit	Allowable units
L	ml/d, ml/h, ml/min, kl/d, kl/h, kl/min, kl/s, L/d, L/h, L/min, L/s
m ³	m ³ /d, m ³ /h, m ³ /min, m ³ /s
cm ³	cm ³ /d, cm ³ /h, cm ³ /min, cm ³ /s
m	m/s
t	t/d, t/h, t/min, t/s
kg	kg/d, kg/h, kg/min, kg/s
g	g/d, g/h, g/min, g/s
CFH	ft ³ /d, CFH, CFM, CFS
gal(US)	Mgal(US)/d, 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)	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, bbbl(US Beer)/min, bbbl(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

T04.EPS

■ TERMINAL CONNECTION

Integral Flowmeter AXF

Terminal configuration



F01.EPS

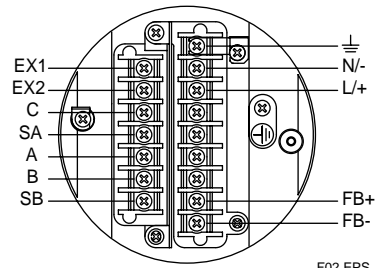
Terminal wiring

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 Flowmeter: GS 01E20D01-01E
- FieldMate: GS 01R01A01-01E

<Reference>

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