

General Specifications

AXFA11G Magnetic Flowmeter Remote Converter



GS 01E20C01-01E

The AXFA11 magnetic flowmeter high grade remote converter is a sophisticated product with outstanding reliability and ease of operation, developed on the basis of decades of field-proven experience.

The AXFA11 employs an LCD indicator, infra-red switches, and "Easy Setup" parameters to ensure substantially improved its operability. Its diagnostic function to detect the adhesion level on the electrodes combining with a flowtube such as AXG, AXW and AXF dramatically improves maintainability at the customer.

The AXFA11 also employs the "Dual Frequency Excitation Method" which is for fluid noise free for more difficult application to ensure greater stability and quicker response.

Note: The "Dual Frequency Excitation Method" is Yokogawa's unique technology.



The specifications marked with "◇" on this General Specifications are different from each remote flowtube such as AXG and AXW.

This General Specifications is described the AXFA11 converter. Read each General specifications written in the last page for confirmation of each instrument which is combined with the AXFA11 converter.

■ FEATURES

● User-oriented Functionality

Fluid Adhesion Level Diagnosis

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

Clear and Versatile Indications

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

"Easy Setup" Parameters

The most frequently used parameters are arranged in a group at the top.

The infra-red switches enable the users to set parameters without opening the cover.

Operation Immediately after Installation

The AXFA11 is shipped with the main parameters completely set. Therefore, the AXFA11 can be operated immediately after installation and wiring.

Compact and Light-weight Converter

The AXFA11 is equipped with a compact and light-weight amplifier.

● Enhanced Performance and Specifications

Enhanced Dual Frequency Excitation Method: for AXF Remote Flowtube

The "Enhanced Dual Frequency Excitation Method" can be optionally selected for Size 25 mm (1.0 in.) to 200 mm (8.0 in.) in the AXF series remote flowtube.

Improved Minimum Conductivity

The AXFA11 converter permits the measurement of fluids with conductivity as low as 1 μS/cm.

High-Speed Pulse Output

The pulse rate now goes up to 10,000 pps (pulse/second) for use with high speed applications such as in short time batch processes.

Versatile Input/output Function

The functions of one current output, one pulse output, one alarm output, two status inputs, and two status outputs are available.

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■ STANDARD SPECIFICATIONS

Excitation Method:

- Dual frequency excitation:
 - AXG: Size 2.5 to 400 mm (0.1 to 16 in.)
 - AXW: Size 25 to 400 mm (1.0 to 16 in.)
 - AXF: Size 2.5 to 400 mm (0.1 to 16 in.)
- Enhanced dual frequency excitation
 - AXF: Size 25 to 200 mm (1.0 to 8.0 in.)
 - (Optional code HF1 or HF2)
- Pulsed DC excitation:
 - AXG: Size 500 mm (20 in.)
 - AXW: Size 500 to 1800 mm (20 to 72 in.)

Input Signal:

Two Status Inputs: Dry contact
 Load resistance: 200 Ω or less (ON), 100 kΩ or more (OFF)

Output Signals:

- One Current Output: 4 to 20 mA DC (load resistance: 1 kΩ maximum, including cable resistance)
- One Pulse Output:
 - Transistor contact output (open collector)
 - Contact capacity: 30 V DC (OFF), 200 mA (ON)
 - Output rate: 0.0001 to 10,000 pps (pulse/second)
- One Alarm Output:
 - Transistor contact output (open collector)
 - Contact capacity: 30 V DC (OFF), 200 mA (ON)
- Two Status Outputs:
 - Transistor contact output (open collector)
 - Contact capacity: 30 V DC (OFF), 200 mA (ON)

Communication Signals:

BRAIN or HART communication signal
 (Superimposed on the 4 to 20 mA DC signal)
 Distance from Power Line: 15 cm (6 in.) or more
 (Parallel wiring should be avoided.)

BRAIN:

Communication Distance:

Up to 1.5 km (0.93 miles), when polyethylene insulated PVC-sheathed cables (CEV cables) are used.
 Communication distance varies depending on the type of cable and wiring used.

Load Resistance:

250 to 450 Ω (including cable resistance)

Load Capacitance:

0.22 μF or less

Load Inductance:

3.3 mH or less

Input Impedance of Communicating Device:

10 kΩ or more (at 2.4 kHz)

HART:

Load Resistance:

250 to 600 Ω (including cable resistance)

Note: HART is a registered trademark of the FieldComm Group.

Data Security During Power Failure:

Data (parameters, totalizer value, etc.) storage by EEPROM. No back-up battery required.

Indicator:

Full dot-matrix LCD (32×132 pixels)

Lightning Protector:

The lightning protector is built into the excitation current output, the current output, the signal common, and the pulse/alarm/status input and output terminals. When optional code A is selected, the lightning protector is built into the power terminals.

Protection:

IP66/IP67

Coating:

Case and Cover: Corrosion-resistant coating
 Coating Color: Silver gray (Munsell 3.2PB 7.4/1.2 or its equivalent)
 Cover Mounting Screws: Polyurethane corrosion-resistant
 Coating Color: Mint green (Munsell 5.6BG 3.3/2.9 or its equivalent)

Converter Material:

Case and Cover: Aluminum alloy

Mounting/Shapes:

- Mounting: 2-inch pipe, panel or surface mounting
- Electrical Connection: ANSI 1/2 NPT female
 ISO M20 ×1.5 female
 JIS G1/2 female
- Terminal Connection: M4 size screw terminal

Grounding:

Grounding resistance 100 Ω or less
 When optional code A is selected, grounding resistance 10 Ω or less shall be applied.

Combined Remote Flowtube:

- AXFA11 Converter can combine with the following remote flowtubes.

Model	Meter sizes
AXG	2.5 to 500 mm (0.1 to 20 in.)
AXW	25 to 400 mm (1.0 to 16 in.)
	500 to 1800 mm (20 to 72 in.)
AXF	2.5 to 400 mm (0.1 to 16 in.)

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Read each General Specifications written in the last page for detail.



NOTE

- ATEX, IECEx or TIIS certified AXF Remote Flowtube cannot be combined with AXFA11 Converter (In this case, use AXFA14 converter).
- If a combined converter is changed from AXFA11 to other converters or vice versa, a new meter factor must be adjusted by flow calibration.

Functions

How to Set Parameters:

The indicator's LCD and three infra-red switches enable users to set parameters without opening the case cover. Parameters can also be set with the configuration tool (Such as HHT (handheld terminal) or FieldMate™, etc.). The language for the HHT is English only.

Displayed Languages:

Users can choose a language from among English, Japanese, German, French, Italian, Spanish.

Instantaneous Flow Rate/Totalized Value Display Functions:

The full dot-matrix LCD enables user selections of displays from one line to three lines for:

- Instantaneous flow rate
- Instantaneous flow rate (%)
- Instantaneous flow rate (bar graph)
- Current output value (mA)
- Totalized forward-direction flow rate
- Totalized reverse-direction flow rate
- Totalized differential flow rate
- Tag No.
- Results of electrode adhesion diagnostics
- Communication type

Totalizer Display Function:

The flow rate is counted one pulse at a time according to the setting of totalization pulse weights. For forward and reverse flow measurement functions, the totalized values of the flow direction (forward or reverse) and the flow direction are displayed on the indicator together with the units. The difference of totalized values between the forward and reverse flow rate can be displayed. Totalization for the reverse flow rate is carried out only when "Forward and reverse flow measurement functions" is selected.

Damping Time Constant:

Time constant can be set from 0.1 second to 200.0 seconds (63% response). The default is 3 seconds.

Span Setting Function:

Span flows can be set in units such as volume flow rate, mass flow rate, time, or flow rate value. The velocity unit can also be set.

Volume Flow Rate Unit: kcf, cf, mcf, Mgal (US), kgal (US), gal (US), mgal (US), kbbbl (US)*, bbl (US)*, mbbbl (US)*, μbbbl (US)*, MI (megaliter), m³, kl (kiloliter), l (liter), cm³

Mass Flow Rate Unit (Density must be set.): klb (US), lb (US), t (ton), kg, g

Velocity Unit: ft, m (meter)

Time Unit: s (sec), min, h (hour), d (day)

* "US Oil" or "US Beer" can be selected.

Pulse Output:

Scaled pulse can be output by setting a pulse weight.

Pulse Width: Duty 50% or fixed pulse width (0.05, 0.1, 0.5, 1, 20, 33, 50, 100 ms) can be selected.

Output Rate: 0.0001 to 10,000 pps (pulse/second)

Multi-range Function:

- Range switching via status input
Status input enables the switching of up to four ranges.
- Automatic range switching
When the flow rate exceeds 100 % of the range, transition to the next range (up to four ranges) is carried out automatically. Range switching can be confirmed by status outputs and indicator.

Forward and Reverse Flow Measurement Functions:

Flows in both forward and reverse directions can be measured. The reverse flow measurement can be confirmed by status output and indicator.

Totalization Switch:

The status output is carried out when a totalized value becomes equal to or greater than the set value.

Preset Totalization:

The parameter setting or status input enables a totalized value to be preset to a setting value or zero.

0% Signal Lock:

Status input forcibly fixes the instantaneous flow rate display, current output, pulse output, and flow rate totalization to 0%.

Alarm Selection Function:

Alarms are classified into System Alarms (hard failures), Process Alarms (such as 'Empty Pipe', 'Signal Overflow' and 'Adhesion Alarm'), Setting Alarms, and Warnings. Whether alarms should be generated or not can be selected for each item.

The current output generated for an alarm can be selected from among 2.4 mA or less, fixed to 4 mA, 21.6 mA or more, or HOLD.

Alarm Output:

Alarms are generated only for the items selected via the 'Alarm Selection Function' if relevant failures occur.

Self Diagnostics Functions:

If alarms are generated, details of the System Alarms, Process Alarms, Setting Alarms and Warnings are displayed together with concrete descriptions of countermeasures.

Flow Upper/Lower Limit Alarms:

If a flow rate becomes greater or smaller than the set value, this alarm is generated. In addition, two upper limits (H, HH) and two lower limits (L, LL) can be set.

If a flow rate becomes greater or smaller than any of the set values, the status is output.

Electrode Adhesion Diagnostics Function:

This function enables monitoring of the adhesion level of insulating substances to the electrodes. Depending on the status of adhesion, users are notified by a warning or an alarm via status outputs.

■ CONFORMITY STANDARDS (◇)

● Combined with AXG Remote Flowtube

For AXG Remote Flowtube (up to 400 mm (16 in.))

Safety Requirement Standards:

- EN61010-1
- EN61010-2-030
- CAN/CSA-C22.2 No.61010-1-12
- CAN/CSA-C22.2 No.61010-2-30-12
- CAN/CSA-C22.2 No.94.02-07
- UL 61010-1 (3rd Edition)
- UL 61010-2-030 (1st Edition)
- UL 50E
- IEC 60529
- Altitude at Installation Site: Max. 2000 m Above sea level
- Installation Category (Overvoltage category): II
- Micro Pollution Degree: 2
- Macro Pollution Degree: 4
- Protection Degree: IP66/67, Type 4X (CSA)

EMC:

- EN61326-1 Class A, Table 2 (For use in industrial locations)
- EN61326-2-3
- EN61000-3-2 Class A
- EN61000-3-3

For AXFA11 Remote Converter

Safety Requirement Standards:

- EN61010-1
- EN61010-2-030
- Altitude at installation site: Max. 2000 m above sea level
- Installation category based on IEC1010: Overvoltage category II ("II" applies to electrical equipment which is supplied from a fixed installation-like distribution board.)
- Pollution degree based on IEC1010: Pollution degree 2 ("Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to a normal indoor atmosphere.)

EMC:

- EN61326-1 Class A, Table 2 (For use in industrial locations)
- EN61326-2-3
- EN61000-3-2 Class A
- EN61000-3-3



NOTE

This instrument is an EN61326-1 (EMC standard), Class A (for use in commercial, industrial, or business environments).

● Combined with AXW Remote Flowtube

For AXW Remote Flowtube (up to 400 mm (16 in.))

Safety Requirement Standards:

- EN61010-1
- EN61010-2-030
- CAN/CSA-C22.2 No.61010-1-12
- CAN/CSA-C22.2 No.61010-2-30-12
- CAN/CSA-C22.2 No.94.02-07
- UL 61010-1 (3rd Edition)
- UL 61010-2-030 (1st Edition)
- UL 50E
- IEC 60529
- Altitude at Installation Site: Max. 2000 m Above sea level
- Installation Category (Overvoltage category): II
- Micro Pollution Degree: 2
- Macro Pollution Degree: 4
- Protection Degree: IP66/67, Type 4X (CSA)

EMC:

- EN61326-1 Class A, Table 2 (For use in industrial locations)
- EN61326-2-3
- EN61000-3-2 Class A
- EN61000-3-3

For AXFA11 Remote Converter

Safety Requirement Standards:

- EN61010-1
- EN61010-2-030
- Altitude at installation site: Max. 2000 m above sea level
- Installation category based on IEC1010: Overvoltage category II ("II" applies to electrical equipment which is supplied from a fixed installation-like distribution board.)
- Pollution degree based on IEC1010: Pollution degree 2 ("Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to a normal indoor atmosphere.)

EMC:

- EN61326-1 Class A, Table 2 (For use in industrial locations)
- EN61326-2-3
- EN61000-3-2 Class A
- EN61000-3-3



NOTE

This instrument is an EN61326-1 (EMC standard), Class A (for use in commercial, industrial, or business environments).

● Combined with AXF Remote Flowtube

Safety Requirement Standards:

- EN61010-1
- EN61010-2-030
- Altitude at installation site: Max. 2000 m above sea level
- Installation category based on IEC1010:
 - Overvoltage category II ("II" applies to electrical equipment which is supplied from a fixed installation-like distribution board.)
- Pollution degree based on IEC1010
 - Pollution degree 2 ("Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to a normal indoor atmosphere.)
- Protection Degree:
 - IP66/67 (General-Purpose Use, Sanitary type)
 - For Sanitary type:
 - Attached with a set of sanitary type adaptors
 - IP68 (Submersible type (Only for Remote Flowtube)) (Conforms to continuous immersion under the following test condition)
 - Test Condition:
 - 50 m below the surface of the water, equivalent to 0.5 MPa hydraulic pressure, for one month.
 - Adverse condition such as waste water and sea water are out of scope.
 - Cables should be protected at customer site.
 - For Submersible type:
 - Available for temporary submersion under water
 - Note: A set of 30m length signal cable and excitation cable are attached as standard upon shipment from the manufacturing plant. And they are dispensed as wired and fixed with equipped waterproof glands with polyurethane potting.

EMC:

- EN61326-1 Class A, Table 2 (For use in industrial locations)
- EN61326-2-3
- EN61000-3-2 Class A
- EN61000-3-3



NOTE

This instrument is an EN61326-1 (EMC standard), Class A (for use in commercial, industrial, or business environments).

■ STANDARD PERFORMANCE (◇)

● Combined with AXG Remote Flowtube

Accuracy:

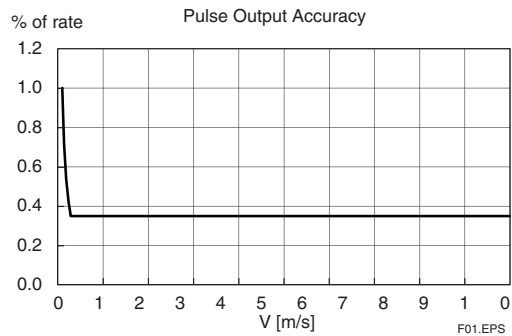
Size mm (in.)	Flow Velocity V m/s (ft/s)	Standard Accuracy (Code B)
2.5 (0.1) to 15 (0.5)	$V < 0.3$ (1)	± 1.0 mm/s
	$0.3 \leq V \leq 10$ (1) (33)	$\pm 0.35\%$ of rate
25 (1) to 400 (16)	$V < 0.15$ (0.5)	± 0.5 mm/s
	$0.15 \leq V \leq 10$ (0.5) (33)	$\pm 0.35\%$ of rate
500 (20)	$V < 0.3$ (1)	± 2.0 mm/s
	$0.3 \leq V \leq 10$ (1) (33)	$\pm 0.35\%$ of rate ± 1.0 mm/s

Size mm (in.)	Flow Velocity V m/s (ft/s)	High Grade Accuracy (Code C)
25 (1) to 200 (8)	$V < 0.15$	± 0.5 mm/s
	$0.15 \leq V < 1$	$\pm 0.18\%$ of rate ± 0.2 mm/s
	$1 \leq V \leq 10$	$\pm 0.2\%$ of rate

T02.EPS

Sizes 2.5 to 15 mm (0.1 to 0.5 in.)

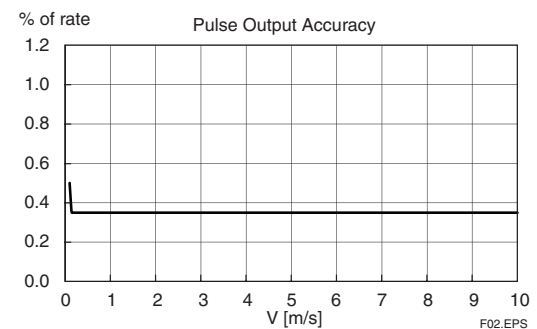
Standard Accuracy (Code B)



F01.EPS

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

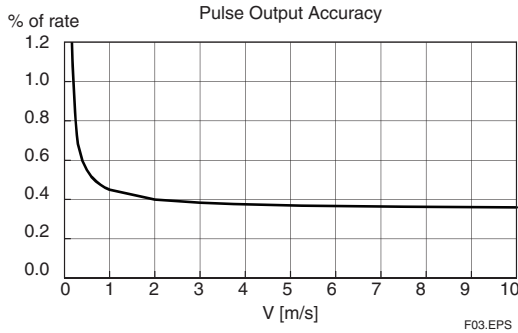
Standard Accuracy (Code B)



F02.EPS

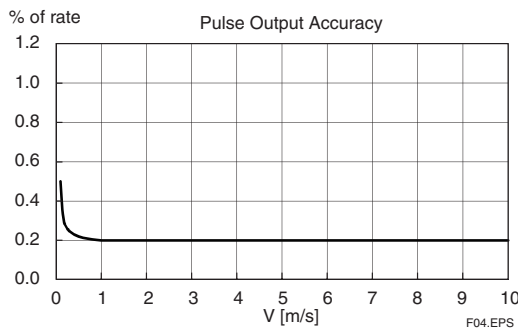
Size 500 mm (20 in.)

Standard Accuracy (Code B)



Sizes 25 to 200 mm (1 to 8 in.)

High Grade Accuracy (Code C)



Note: - The accuracy above is the result of calibration test at our water flow facility before shipment. It is defined by the integrated value of the pulse output. As for the current output accuracy, add $\pm 8 \mu A$ ($\pm 0.05\%$ of span) to the accuracy above.

- Calibration takes place at reference conditions as below.
 - Medium: Water, Density: 0.9 to 1.1 kg/l
 - Medium temperature: 10 to 35°C (50 to 95°F)
 - (Average temperature 22.5°C (72.5°F))
 - Ambient temperature: 10 to 35°C (50 to 95°F)
 - Process pressure (absolute): 0.1 to 0.2 MPa (15 to 29 psi)
- Reference Standards: JIS B 7554, ISO 4185, ISO 5168, ISO 9104, BS EN 29104

Repeatability:

- $\pm 0.1\%$ of rate (V equals or above 1 m/s (3.3 ft/s))
- $\pm 0.05\%$ of rate ± 0.5 mm/s (V below 1 m/s (3.3 ft/s))

Power Consumption:

20 W

Note: The power consumption is the same as above regardless of the communication type.

Insulation Resistance:

AXG Remote Flowtube:

- Between signal terminals: 100 M Ω /500 V DC
- Between signal terminals and common terminal: 100 M Ω /500 V DC
- Between excitation current terminal and signal / common terminals: 100 M Ω /500 V DC

AXFA11 Remote Converter:

- Between power supply terminals and ground terminal: 10 M Ω at 500 V DC
- Between power supply terminals and input/output/excitation current terminals : 100 M Ω at 500 V DC
- Between ground terminal and input/output/excitation current terminals: 20 M Ω at 100 V DC
- Between input/output/excitation current terminal: 20 M Ω at 100 V DC

Withstand Voltage: (Up to 400 mm (16 in.) only)

AXG Remote Flowtube (Option WT1):

- Between excitation current terminal and ground terminal: 1000 V AC for 1 minute

AXG Remote Flowtube (Option WT2):

- Between excitation current terminal and ground terminal: 1500 V AC for 1 minute
- Between signal terminals and excitation current terminal: 1500 V AC for 1 minute

AXFA11 Remote Converter:

- Between power supply terminals and ground terminal: 1400 V AC for 2 seconds
- Between power supply terminals and input/output terminals: 1400 V AC for 2 seconds
- Between excitation current terminal and ground terminal: 160 V AC for 2 seconds
- Between excitation current terminal and input /output terminals: 350 V AC for 2 seconds



CAUTION

- *1: When performing the Insulation Resistance Test or the Withstand Voltage Test, please obey the following caution.
- Following the relevant test, wait for more than 10 minutes after the power supply has been turned off before removing the cover.
 - Remove all wires from terminals before testing.
 - When the power terminal has a lightning protector (optional code A) in the AXFA11G, remove the short bar at the ground terminal.
 - After testing, be sure to discharge by using a resistance and return all wires and the short bar to its correct position.
 - Screws must be tightened to a torque of 1.18 N-m or more.
 - After closing the cover, the power supply can be restored.

● Combined with AXW Remote Flowtube

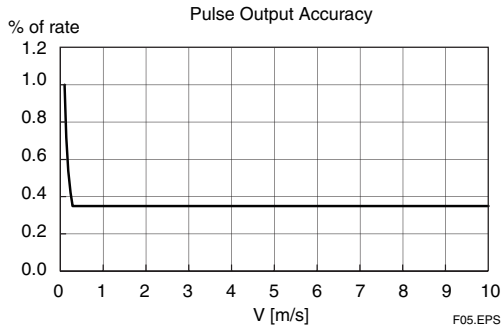
Accuracy:

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

Size mm (in.)	Flow Velocity V m/s (ft/s)	Standard Accuracy
500 (20) to 1000 (40)	$V < 0.3$ (1.0)	± 2.0 mm/s
	$0.3 \leq V \leq 10$ (1.0) (33)	$\pm 0.35\%$ of rate ± 1.0 mm/s
1100 (44) to 1800 (72)	$V < 0.3$ (1.0)	± 3.0 mm/s
	$0.3 \leq V < 1.0$	$\pm 0.4\%$ of rate ± 1.8 mm/s
	$1.0 \leq V \leq 10$	$\pm 0.5\%$ of rate ± 1.0 mm/s

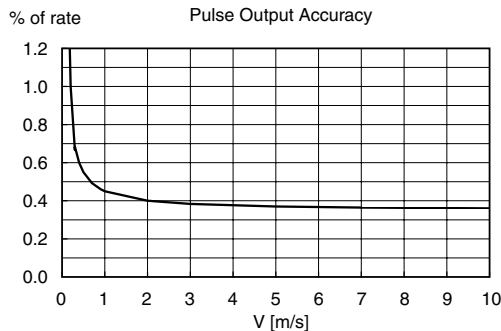
T03.EPS

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



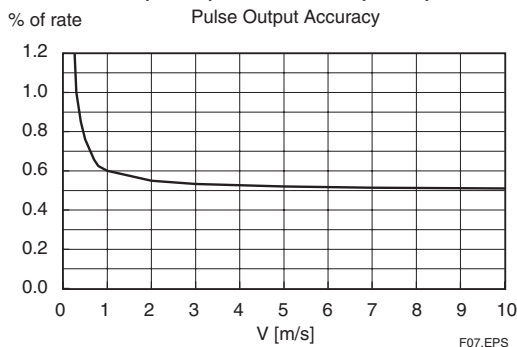
F05.EPS

Sizes 500 mm (20 in.) to 1000 mm (40 in.)



F06.EPS

Sizes 1100 mm (44 in.) to 1800 mm (72 in.)



F07.EPS

Note: - The accuracy above is the result of calibration test at our water flow facility before shipment. It is defined by the integrated value of the pulse output. As for the current output accuracy, add $\pm 8 \mu A$ ($\pm 0.05\%$ of span) to the accuracy above.
 - Calibration takes place at reference conditions as below.
 Medium: Water, Density: 0.9 to 1.1 kg/l
 Medium temperature: 10 to 35°C (50 to 95°F)
 (Average temperature 22.5°C (72.5°F))
 Ambient temperature: 10 to 35°C (50 to 95°F)
 Process pressure (absolute): 0.1 to 0.2 MPa (15 to 29 psi)
 - Reference Standards: JIS B 7554, ISO 4185, ISO 5168, ISO 9104, BS EN 29104

Repeatability:

Up to 400 mm (16 in.):
 $\pm 0.1\%$ of rate ($V \geq 1$ m/s (3.3 ft/s))
 $\pm 0.05\%$ of rate ± 0.5 mm/s ($V < 1$ m/s (3.3 ft/s))
 500 mm (20 in.) or larger:
 $\pm 0.2\%$ of rate ($V \geq 1$ m/s (3.3 ft/s))
 $\pm 0.1\%$ of rate ± 1 mm/s ($V < 1$ m/s (3.3 ft/s))

Power Consumption:

20 W

Note: The power consumption is the same as above regardless of the communication type.

Insulation Resistance:

AXW Remote Flowtube:

Between signal terminals: 100 MΩ/500 V DC
 Between signal terminals and common terminal: 100 MΩ/500 V DC

Between excitation current terminal and signal / common terminals: 100 MΩ/500 V DC

AXFA11 Remote Converter:

Between power supply terminals and ground terminal: 100 MΩ at 500 V DC

Between power supply terminals and input/output/excitation current terminals : 100 MΩ at 500 V DC
 Between ground terminal and input/output/excitation current terminals: 20 MΩ at 100 V DC

Between input/output/excitation current terminal: 20 MΩ at 100 V DC

Withstand Voltage: (Up to 400 mm (16 in.) only)

AXW Remote Flowtube (Option WT1):

Between excitation current terminal and ground terminal: 1000 V AC for 1 minute

AXW Remote Flowtube (Option WT2):

Between excitation current terminal and ground terminal: 1500 V AC for 1 minute

Between signal terminals and excitation current terminal: 1500 V AC for 1 minute

AXFA11 Remote Converter:

Between power supply terminals and ground terminal: 1400 V AC for 2 seconds

Between power supply terminals and input/output terminals: 1400 V AC for 2 seconds

Between excitation current terminal and ground terminal: 160 V AC for 2 seconds

Between excitation current terminal and input /output terminals: 350 V AC for 2 seconds



CAUTION

*1: When performing the Insulation Resistance Test or the Withstand Voltage Test, please obey the following caution.

- Following the relevant test, wait for more than 10 minutes after the power supply has been turned off before removing the cover.
- Remove all wires from terminals before testing.
- When the power terminal has a lightning protector (optional code A) in the AXFA11G, remove the short bar at the ground terminal.
- After testing, be sure to discharge by using a resistance and return all wires and the short bar to its correct position.
- Screws must be tightened to a torque of 1.18 N·m or more.
- After closing the cover, the power supply can be restored.

● **Combined with AXF Remote Flowtube**

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)

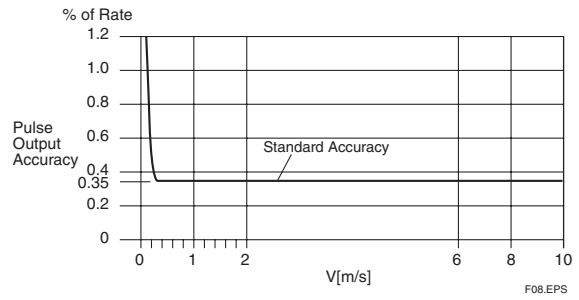
Pulse Output:

PFA/Ceramics Lining:

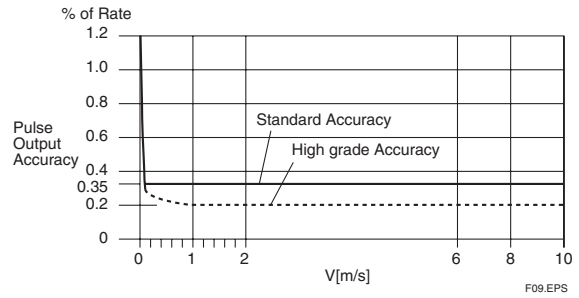
Size mm (in.)	Flow Velocity V m/s (ft/s)	Standard Accuracy ^(*) (Calibration code B)	Flow Velocity V m/s (ft/s)	High grade Accuracy (Calibration code C)
2.5 (0.1) to 15 (0.5)	V < 0.3 (1.0)	±1.0 mm/s	—	—
	0.3 ≤ V ≤ 10 (1.0)	±0.35% of Rate		
25 (1.0) to 200 (8.0)	V < 0.15 (0.5)	±0.5 mm/s	V < 0.15 (0.5)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

*: For enhanced dual frequency excitation (Option code HF2) add ± 1 mm/s to the standard accuracy.

Sizes 2.5 mm (0.1 in.) to 15 mm (0.5 in.)



Sizes 25 mm (1.0 in.) to 400 mm (16 in.)

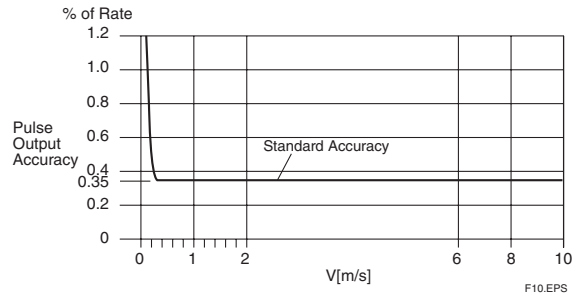


Polyurethane Rubber/Natural Soft Rubber/EPDM Rubber Lining

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

*: For enhanced dual frequency excitation (Option code HF2) add ± 1 mm/s to the standard accuracy.

Size 25 mm (1.0 in.) to 400 mm (16 in.)



Current Output:

Pulse output accuracy plus 0.05% of Span

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))

Maximum Power Consumption:

20 W

Note: The power consumption is the same as above regardless of the communication type.

Insulation Resistance(*1) :

- Between power supply terminals and ground terminal: 100 MΩ at 500 V DC
- Between power supply terminals and input/output/excitation current terminals : 100 MΩ at 500 V DC
- Between ground terminal and input/output/excitation current terminals: 20 MΩ at 100 V DC
- Between input/output/excitation current terminal: 20 MΩ at 100 V DC

Withstand Voltage(*1) :

- Between power supply terminals and ground terminal: 1400 V AC for 2 seconds
- Between power supply terminals and input/output terminals: 1400 V AC for 2 seconds
- Between excitation current terminal and ground terminal: 160 V AC for 2 seconds
- Between excitation current terminal and input /output terminals: 350 V AC for 2 seconds



CAUTION

*1: When performing the Insulation Resistance Test or the Withstand Voltage Test, please obey the following caution.

- Following the relevant test, wait for more than 10 minutes after the power supply has been turned off before removing the cover.
- Remove all wires from terminals before testing.
- When the power terminal has a lightning protector (optional code A) in the AXFA11G, remove the short bar at the ground terminal.
- After testing, be sure to discharge by using a resistance and return all wires and the short bar to its correct position.
- Screws must be tightened to a torque of 1.18 N·m or more.
- After closing the cover, the power supply can be restored.

■ NORMAL OPERATING CONDITIONS

Ambient Temperature: -40°C to +60°C (-40°F to +140°F)
Indicator's operating range: -20°C to +60°C (-4°F to +140°F)

Ambient Humidity: 0 to 100%
Lengthy continuous operation at 95% or more is not recommended.

Power Supply:

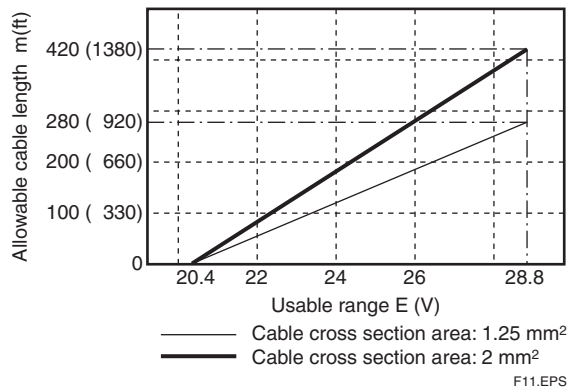
Power supply code 1:

- AC specifications
Rated power supply: 100 to 240 V AC, 50/60 Hz
(Operating voltage range: 80 to 264 V AC)
- DC specifications
Rated power supply: 100 to 120 V DC
(Operating voltage range: 90 to 130 V DC)

Power supply code 2:

- AC specifications
Rated power supply: 24 V AC, 50/60 Hz
(Operating voltage range: 20.4 to 28.8 V AC)
- DC specifications
Rated power supply: 24 V DC
(Operating voltage range: 20.4 to 28.8 V DC)

Supplied Power and Cable Length for Power Supply Code 2



Vibration Conditions:

Level of vibration in conformity with IEC 60068-2-6 (SAMA31. 1-1980)
4.9 m/s² or less (frequency of 500 Hz or less)

Note: Avoid locations with much vibration (with a vibration frequency of 500 Hz or more), which may cause damage to the equipment.

■ ACCESSORIES

Mounting bracket: 1 set

MODEL AND SUFFIX CODE (◇)

Magnetic Flowmeter Remote Converter:

Model	Suffix Code	Description
AXFA11	Magnetic Flowmeter Remote Converter
Use	G	General-Purpose Use For Remote tube of AXG: Size 2.5 to 500 mm (0.1 to 20 in.), AXW: Size 25 to 1800 mm (1.0 to 72 in.), or AXF: Size 2.5 to 400 mm (0.1 to 16 in.)
	-D	4 to 20 mA DC, BRAIN Communication
Output Signal and Communication	-E	4 to 20 mA DC, HART Communication
	1	100 V to 240 V AC or 100 to 120 V DC
Power Supply	2	24 V AC/DC (*1)
	-0	JIS G1/2 female
Electrical Connections	-2	ANSI 1/2 NPT female
	-4	ISO M20 × 1.5 female
Indicator	1	With Indicator
Option	/□	Optional code (See the Table of Optional Specifications)

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*1: In case of power supply code 2 (24 V AC/DC), optional code A (lightning protector) is mandatory.

Signal Cable:



NOTE

For excitation cable, prepare a two-core cable at the customer side.

Combined with AXG Remote Flowtube, or with AXW Remote Flowtube (up to 400 mm (16 in.))

Model	Suffix Code	Optional Code	Description
AX01C			Magnetic Flowmeter Signal Cable
Cable Finish and Length	-A □□□ (*1)		Unfinished, Cable length □□□ m, Set of Finishing Parts for M4 Screws
	-D □□□ (*1)		Finished for AXFA11, Cable Length □□□ m
Finishing Parts		/C □ (*2)	Finishing Parts (□ sets)

*1: Specify the cable length in three digits as multiple of 1 meter (e.g., 001, 002, or 005) for a length up to 5 m, as multiple of 5 meters up to 100 m (e.g. 010, 020, or 100), or as multiple of 10 meters up to 200 m (e.g. 110, 120, or 200).
The maximum cable length:
-A □□□: 200 m

*2: Specify the quantity of in of sets in one digit from 1 to 9.

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Combined with AXW Remote Flowtube (500 mm (20 in.) or larger), or AXF Remote Flowtube (400 mm (16 in.) or smaller)

Model	Suffix Code	Description
AXFC	Magnetic Flowmeter Dedicated Signal cable for AXW (500 mm (20 in.) or larger) or AXF series
Termination	-0 -4	No Termination. A set of termination parts for M4 screws is attached. Terminated for the AXFA11 Converter.
Cable Length	-L□□□	Designate the cable length, unit: m Following "L", specify the cable in three digits as multiple of 1 meter (e.g., 001, 002, or 005) for a length up to 5 m, or as a multiple of 5 meters (i.e., 005, 010, 015, or the like). The maximum cable length: 200 m for combined use with AXFA11
Option	/C□	With termination parts sets. Following "C", specify the qty of sets of termination parts in one digits.

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- Note:
- The cable is constructed with double shielding over the two conductors, and uses heat-resistant vinyl as the outer covering material.
Finished diameter: 10.5 mm (0.413 in.)
Maximum temperature: +80°C (+176°F)
 - Unnecessary to order the above cable for submersible type flowtube or for the optional code DHC flowtube because the flowtube is wired with 30 m (98 ft) cable.
 - For excitation cable, prepare a two-core cable at the customer side.

Recommended Excitation, Power and Output Cable:

JIS C 3401 control cable equivalent

JIS C 3312 power cable equivalent

14 AWG Belden 8720 equivalent

Outer Diameter:

With no gland option;

6.5 to 12 mm (0.26 to 0.47 in.)

With gland options EG,EU and EW;

• Excitation cable;

10.5 or 11.5 mm (0.41 or 0.45 in.)

• Power and output cable;

7.5 to 12 mm (0.3 to 0.47 in.)

With gland options EP;

6 to 12 mm (0.24 to 0.47 in.)

Nominal Cross Section:

Single wire: 0.5 to 2.5 mm²

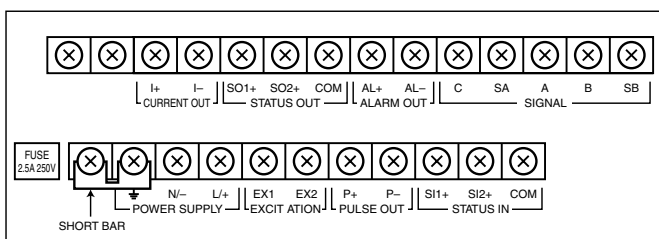
Stranded wire: 0.5 to 1.5 mm²

OPTIONAL SPECIFICATIONS FOR AXFA11 REMOTE CONVERTER

Item	Specification	Code
Lightning Protector	A lightning protector is built into the power terminals. In case of power supply code 2 (24 V AC/DC), this optional code is mandatory.	A
DC Noise Cut Circuit	The DC Noise Cut Circuit is built in. Available for 15 mm (0.5 in.) and larger sizes, and for fluids with the conductivity of 50 μS/cm or higher. Nullifies the empty check and electrode adhesion diagnostics function.	ELC
Burn Out Down	The output level is set to 0 mA during a CPU failure and is set 2.4 mA (-10%) or less during an alarm. Standard products are delivered with a setting 25 mA during a CPU failure and 21.6 mA (110%) or more during an alarm.	C1
NAMUR NE43 Compliance	Output signal limits: 3.8 to 20.5 mA	C2
	Failure alarm down-scale: The output level is set to 0 mA during a CPU failure and is set 2.4 mA (-10%) or less during an alarm. Failure alarm up-scale: The output level is set to 25 mA during a CPU failure and is set 21.6 mA (110%) or more during an alarm.	C3
Active Pulse Output	Active pulses are output in order to drive an external electromagnetic or electronic counter directly using the converter's internal power supply. (Nullifies the standard transistor contact pulse output.) Output voltage: 24 V DC ±20% Pulse specifications: • The drive current of 150 mA or less • Pulse rate: 0.0001 to 2 pps (pulse/second); Pulse width: 20, 33, 50, or 100 ms	EM
G3/4 Female Waterproof Glands	Waterproof glands for G3/4 conduits or flexible tubes are attached to the electrical connections. Available only for JIS G1/2 female electric connections.	EW
Waterproof Glands	Waterproof glands are attached to the electrical connections. Available only for JIS G1/2 female electric connections.	EG
Waterproof Glands with Union Joints	Waterproof glands with union joints are attached to the electrical connections. Available only for JIS G1/2 female electric connections.	EU
Plastic Glands	Plastic glands are attached to the electrical connections. Available only for JIS G1/2 female electric connections.	EP
Air Purge Fitting	Provided with an air purge fitting (1.5 L/min air consumption) with purge air pressure at 0.14 MPa or less. 1/4 NPT female (when electrical conn. code is 2 or 4) or Rc1/4 female (when electrical conn. code is 0).	APC
Stainless Steel Mounting Bracket	Provided with a JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent) stainless steel mounting bracket in lieu of the standard carbon steel bracket.	SB
AM11 Replacement Bracket	Provided with a special mounting bracket for replacing an AM11 converter with an AXFA11.	RK
Stainless Steel Tag Plate	Screwed JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent) stainless steel tag plate. Choose this option when an SS tag plate is required in addition to the standard nameplate with the tag number inscribed on it. Dimension (Height × Width): Appr. 12.5 (4.92) × 40 (15.7) mm (inch)	SCT
Painting Color Change	Coated in black (Munsell N1.5 or its equivalent.)	P1
	Coated in jade green (Munsell 7.5BG4/1.5 or its equivalent.)	P2
	Coated in metallic silver.	P7
Epoxy Resin Coating	Epoxy resin coating which has alkali-resistance instead of standard polyurethane resin coating. The color is same as standard type.	X1
High Anti-corrosion Coating	Three-layer coating (polyurethane coating on two-layer epoxy resin coating) in the same range as that for the standard coating. The color is same as standard type. Salt/alkali/acid/weather-resistance.	X2
Calibration Certificate	Level 2: The Declaration and the Calibration Equipment List are issued.	L2
	Level 3: The Declaration and the Primary Standard List are issued.	L3
	Level 4: The Declaration and the Yokogawa Measuring Instruments Control System are issued.	L4

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Terminal Configuration



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Terminal Wiring

Terminal Symbols	Description	Terminal Symbols	Description
SIGNAL [C, SA, A, B, SB]	Flow signal input	STATUS IN [SH1+, SH2+, COM]	Status input (Two input)
ALARM OUT [AL+, AL-]	Alarm output	PULSE OUT [P+, P-]	Pulse output
STATUS OUT [SO1+, SO2+, COM]	Status output (Two output)	EXCITATION [EX1, EX2]	Excitation current output
CURRENT OUT [I+, I-]	Current output 4 to 20 mA DC	POWER SUPPLY [L+, N-,]	Power supply
		[Grounding symbol]	Functional grounding
		[Protective Grounding symbol]	Protective grounding (Outside of the terminal)

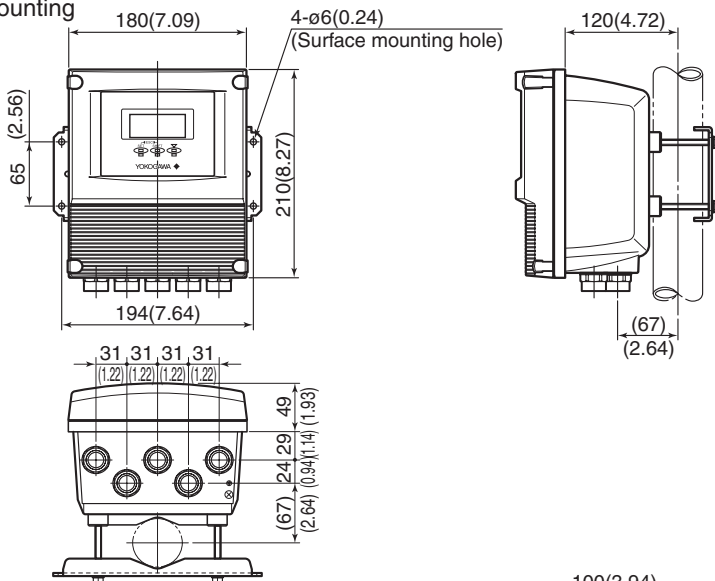
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EXTERNAL DIMENSIONS

Remote Converter AXFA11G

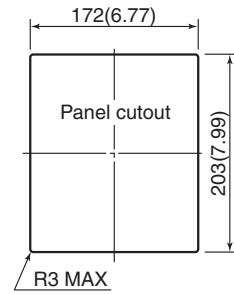
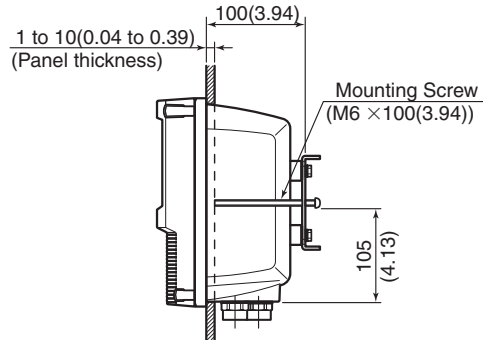
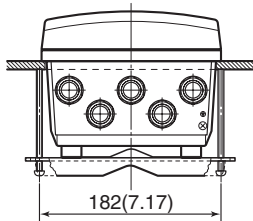
Unit: mm
(approx. inch)

Pipe mounting

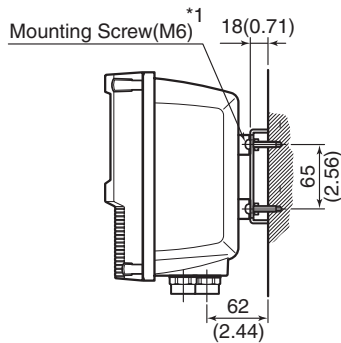
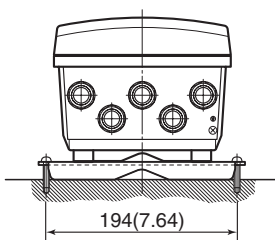


Weight 3.3 kg (7.3 lb)

Panel mounting



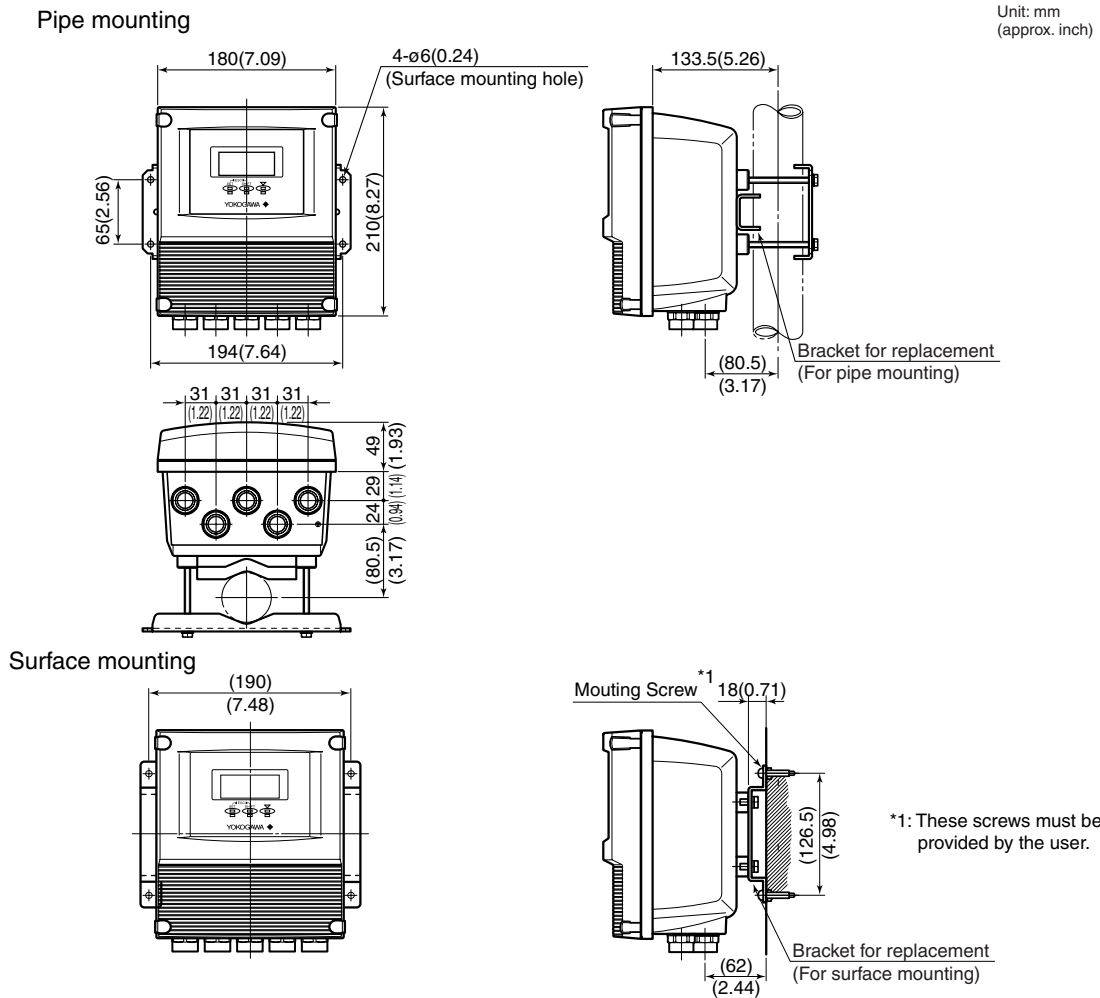
Surface mounting



*1: These screws must be provided by the user.

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● Remote Converter AXFA11G /RK (AM11 Replacement Bracket)



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● Unless otherwise specified, difference in the dimensions are refer to the following table.

General tolerance in the dimensional outline drawing.

Unit : mm (approx.inch)

Category of basic dimension		Tolerance	Category of basic dimension		Tolerance
Above	Equal or below		Above	Equal or below	
	3 (0.12)	±0.7 (±0.03)	500 (19.69)	630 (24.80)	±5.5 (±0.22)
3 (0.12)	6 (0.24)	±0.9 (±0.04)	630 (24.80)	800 (31.50)	±6.25 (±0.25)
6 (0.24)	10 (0.39)	±1.1 (±0.04)	800 (31.50)	1000 (39.37)	±7.0 (±0.28)
10 (0.39)	18 (0.71)	±1.35 (±0.05)	1000 (39.37)	1250 (49.21)	±8.25 (±0.32)
18 (0.71)	30 (1.18)	±1.65 (±0.06)	1250 (49.21)	1600 (62.99)	±9.75 (±0.38)
30 (1.18)	50 (1.97)	±1.95 (±0.08)	1600 (62.99)	2000 (78.74)	±11.5 (±0.45)
50 (1.97)	80 (3.15)	±2.3 (±0.09)	2000 (78.74)	2500 (98.43)	±14.0 (±0.55)
80 (3.15)	120 (4.72)	±2.7 (±0.11)	2500 (98.43)	3150 (124.02)	±16.5 (±0.65)
120 (4.72)	180 (7.09)	±3.15 (±0.12)			
180 (7.09)	250 (9.84)	±3.6 (±0.14)			
250 (9.84)	315 (12.40)	±4.05 (±0.16)			
315 (12.40)	400 (15.75)	±4.45 (±0.18)			
400 (15.75)	500 (19.69)	±4.85 (±0.19)			

Remarks: The numeric is based on criteria of tolerance class IT18 in JIS B 0401.

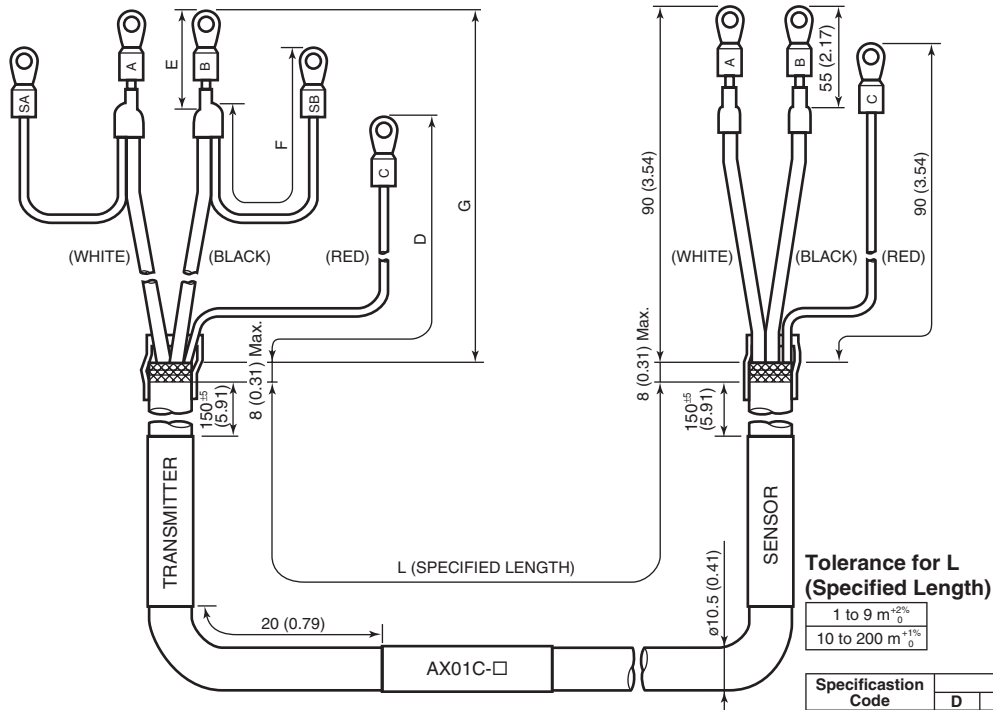
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● Dedicated Signal Cable

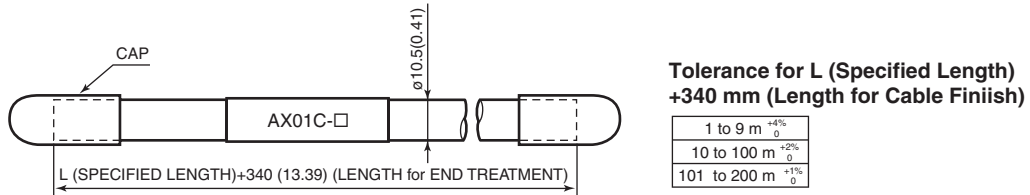
For AXG Remote Flowtube or AXW Remote Flowtube (up to 400 mm (16 in.))

Unit: mm (approx. in.)

AX01C-■□□□
 ■=D



AX01C-■□□□
 ■=A

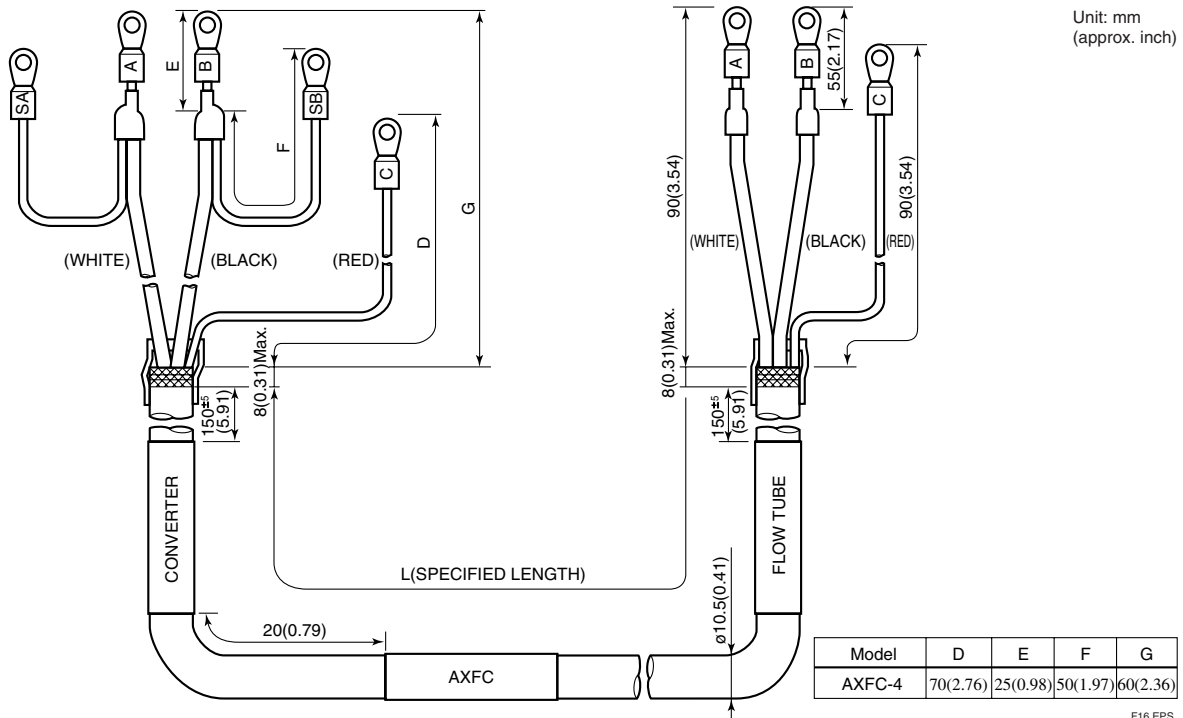


Note: The terms “transmitter” and “sensor” in this document are used in the same manner as “converter” and “flowtube” respectively which have been used for our and previously released magnetic flowmeter models.

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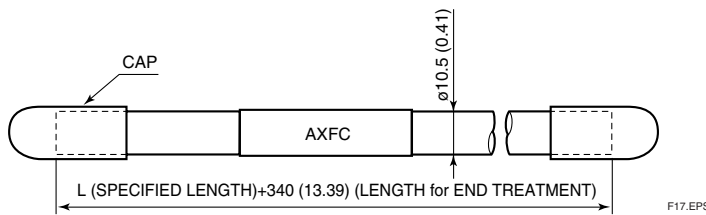
For AXW Remote Flowtube (500 mm or larger) or AXF Remote Flowtube (up to 400 mm (16 in.))

AXFC-4-L□□□



Unit: mm
(approx. inch)

AXFC-0-L□□□



ORDERING INFORMATION

Note 1: When ordering in combination a remote flowtube and a remote converter, specify the span flow rate, unit, pulse weight, and totalizer display pulse weight can be specified. These parameters will then be set in the combined converter before shipment. When ordering of a converter alone, these parameters cannot specify. Please refer to "ORDERING INFORMATION" or GS 01E25D11-01EN "ORDERING INFORMATION".

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

1. Model, specification and option codes.
2. Tag number

Each tag number can be specified in up to 16 characters in a combination of letters (capital or small letters), numbers, "-" and ".". For HART protocol, up to 8 characters can be specified. If specified, the tag number is inscribed on the product's name plate and tag plate (if optional code SCT is selected). The tag number is also set into the memory of converter. If the user wishes to change only the tag number to be set into a converter's memory, specify the software tag. If a tag number is not specified, the tag number is set as a blank.

RELATED INSTRUMENTS

- ADMAG TI Series AXG Magnetic Flowmeter: GS 01E22A01-01EN
- ADMAG TI Series AXW Magnetic Flowmeter [25-400mm]: GS 01E24A01-01EN
- ADMAG TI Series AXW Magnetic Flowmeter [500-1800mm]: GS 01E25D11-01EN
- AXF Magnetic Flowmeter Integral Flowmeter/ Remote Flowtube: GS 01E20D01-01E
- AXFA14G/C Magnetic Flowmeter Remote Converter: GS 01E20C02-01E
- FieldMate Versatile Device Management Wizard: GS 01R01A01-01E
- BT200 BRAIN TERMINAL: GS 01C00A11-00EN
- AM012 Calibrator for Magnetic Flowmeter: GS 01E06K02-00E

REFERENCE

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