

User's Manual

ADMAG TI Series AXG###, AXW###, AXG4A, AXW4A, AXG1A Magnetic Flowmeter Read Me First (Optional Code EC)



IM 01E21A11-01EN

This manual contains important information for safe operation of this product with CE marking and common information among user's manuals on this product. Should thoroughly read this manual prior to other manuals before using this product.

■ Regarding This User's Manual

- This manual should be provided to the end user.
- The contents of this manual are subject to change without prior notice.
- All rights reserved. No part of this manual may be reproduced in any form without YOKOGAWA's written permission.
- YOKOGAWA makes no warranty of any kind with regard to this manual, including, but not limited to, implied warranty of merchantability and fitness for a particular purpose.
- If any question arises or errors are found, or if any information is missing from this manual, inform the nearest YOKOGAWA sales office.
- The specifications covered by this manual are limited to those for the standard type under the specified model number break-down and do not cover custom-made products.
- Note that changes in the specifications, construction, or component parts of the product may not immediately be reflected in this manual at the time of change, provided that postponement of revisions will not cause difficulty to the user from a functional or performance standpoint.
- This manual is intended for the following personnel; Engineers responsible for installation and wiring of the product.
Personnel responsible for normal daily operation and maintenance of the product.
- This manual is part of the product. Keep on safe place for future reference.



NOTE

When describing the model name like AXG### in this manual, "###" means any of the following.

For AXG###:

002, 005, 010, 015, 025, 032, 040, 050, 065,
080, 100, 125, 150, 200, 250, 300, 350, 400

For AXW###:

025, 032, 040, 050, 065, 080, 100, 125, 150,
200, 250, 300, 350, 400

To ensure to use this product correctly, read the applicable manuals and general specifications in the following table.

The documents are available to be downloaded from the following YOKOGAWA's web page.

<http://www.yokogawa.com/fld/>

Document No.	Document Title
IM 01E21A11-01EN	ADMAG TI Series AXG###, AXW###, AXG4A, AXW4A, AXG1A Magnetic Flowmeter Read Me First (Optional Code EC)
IM 01E21A21-02EN	ADMAG TI Series AXG/AXW Magnetic Flowmeter Safety Manual
IM 01E21A03-02EN	ADMAG TI Series AXG and AXW Magnetic Flowmeter ATEX Explosion Protection Type
IM 01E22A01-01EN	ADMAG TI Series AXG Magnetic Flowmeter Installation Manual
IM 01E22A01-02EN	ADMAG TI Series AXG Magnetic Flowmeter Maintenance Manual
IM 01E22A02-01EN	ADMAG TI Series AXG Magnetic Flowmeter BRAIN Communication Type
IM 01E22A02-02EN	ADMAG TI Series AXG Magnetic Flowmeter HART Communication Type
IM 01E21A02-05EN	ADMAG TI Series AXG, AXW Magnetic Flowmeter Modbus Communication Type
IM 01E21A02-03EN	ADMAG TI Series AXG, AXW Magnetic Flowmeter FOUNDATION fieldbus Communication Type
IM 01E22C02-01EN	ADMAG TI Series AXG1A Magnetic Flowmeter Remote Transmitter BRAIN Communication Type
IM 01E22C02-02EN	ADMAG TI Series AXG1A Magnetic Flowmeter Remote Transmitter HART Communication Type
IM 01E24A01-01EN	ADMAG TI Series AXW Magnetic Flowmeter [Size: 25 to 400 mm (1 to 16 in.)] Installation Manual
IM 01E24A01-02EN	ADMAG TI Series AXW Magnetic Flowmeter [Size: 25 to 1800 mm (1 to 72 in.)] Maintenance Manual
IM 01E24A02-01EN	ADMAG TI Series AXW Magnetic Flowmeter BRAIN Communication Type
IM 01E24A02-02EN	ADMAG TI Series AXW Magnetic Flowmeter HART Communication Type
GS 01E22A01-01EN	ADMAG TI Series AXG Magnetic Flowmeter
GS 01E24A01-01EN	ADMAG TI Series AXW Magnetic Flowmeter [Size: 25 to 400 mm (1 to 16 in.)]
GS 01E22C01-01EN	ADMAG TI Series AXG1A Magnetic Flowmeter Remote Transmitter
GS 01E21F02-01EN	ADMAG TI Series AXG/AXW Magnetic Flowmeter FOUNDATION Fieldbus communication Type

Note: The last 2 digits at the document number express a described language.

■ Precautions Related to the Protection, Safety, and Alteration of the Product

The following safety symbol marks are used in this manual and product.

WARNING

A WARNING sign denotes a hazard. It calls attention to procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.

CAUTION

A CAUTION sign denotes a hazard. It calls attention to procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or the entire product.

IMPORTANT

An IMPORTANT sign denotes that attention is required to avoid damage to the product or system failure.

NOTE

A NOTE sign denotes information necessary for essential understanding of operation and features.

The following symbols are used in the product and the manual to indicate the accompanying safety precautions:

-  Protective grounding terminal
-  Functional grounding terminal (This terminal should not be used as a protective grounding terminal.)
-  Alternating current
-  Direct current
-  Caution
This symbol indicates that the operator must refer to an explanation in the user's manual in order to avoid the risk of injury or death of personnel or damage to the product.

- For the protection and safe use of the product and the system in which this product is incorporated, be sure to follow the instructions and precautions on safety that is stated in this manual whenever you handle the product. Take special note that if you handle the product in a manner that violated these instructions, the protection functionality of the product may be damaged or impaired. In such cases, YOKOGAWA does not guarantee the quality, performance, function, and safety of product.

- When installing protection and/or safety as lightning protection devices and equipment for the product and control system or designing or installing separate protection and/or safety circuits for fool-proof design and fail-safe design of the processes and lines that use the product and the control system, the user should implement these using additional devices and equipment.
- Should use the parts specified by YOKOGAWA when replacing. Contact YOKOGAWA's service office for fuse replacement.
- This product is not designed or manufactured to be used in critical applications that directly affect or threaten human lives. Such applications include nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, air navigation facilities, aviation facilities, and medical equipment. If so used, it is the user's responsibility to include in the system additional equipment and devices that ensure personnel safety.
- Do not modify this product.

■ Notes for the Identification Tag

An exclusive user's manual might be attached to products whose suffix code or optional codes contain code "Z". Read it along with their standard manual.

The Identification Tag which is attached on packing box. Keep the Identification Tag with this document.

Identification Tag <Sample>

Identification Tag	
Serial No.	
Material	
MS Code	
Comp. No.	
Qty	
Order Instruction	
Customer PO	
Linkage No.	
1/2	YOKOGAWA ◆

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■ For Safe Use of Product

- For the protection and safe use of the product and the system in which this product is incorporated, be sure to follow the instructions and precautions on safety that are stated in this manual whenever you handle the product. Take special note that if you handle the product in a manner that violated these instructions, the protection functionality of the product may be damaged or impaired. In such cases, YOKOGAWA shall not be liable for any indirect or consequential loss incurred by either using or not being able to use the product.
- This product conforms to IP66/67 (EN60529) and NEMA Type 4X.
- This product is designed for indoor and outdoor use.
- Some parts of this product include the restricted substances of RoHS Directive, but their applications are under the exemption of the directive.

- morocco conformity mark  This conformity mark indicates that the product complies with Moroccan safety and EMC requirements (except AXG500, AXW500-1800).

WARNING

- **Purpose of Use**
This product is the Magnetic Flowmeter for use of measuring the liquid flow. Do not use this product for other purposes.
- **Connect the Protective Grounding Terminal**
Ensure to connect the protective grounding to prevent electric shock before turning on the power.
- **Do Not Impair the Protective Grounding**
Never cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Doing so invalidates the protective functions of the product and poses a potential shock hazard.
- **Connect the Functional Grounding Terminal**
Connect the functional grounding to stabilize the flow rate indication.
- **Do Not Operate with Defective Protective Grounding**
Do not operate the product if the protective grounding might be defective. Also, ensure to check them before operation.
- **Do Not Operate in an Explosive Atmosphere**
Do not operate the product in the presence of flammable gas, vapors, or combustible dust. Operation in such an environment constitutes a safety hazard. Prolonged use in a highly dense corrosive gas (H₂S, SO_x, etc.) will cause a malfunction.
- **Do Not Remove the Transmitter Cover**
The cover should be removed by YOKOGAWA's qualified personnel only. Opening the cover is dangerous, because some areas inside the product have high voltages.
- **Ground the Product before Making External Connections**
Connect the protective grounding before connecting to the item under measurement or control unit.

WARNING

- **Damage to the Protection**
Operating the product in a manner neither described in this manual nor the applicable manuals listed in the front page may damage the product's protection.
- **Installation, Wiring, and Maintenance**
 - The magnetic flowmeter is a heavy product. Be careful that no damage is caused personnel through accidentally dropping it, or by exerting excessive force on the magnetic flowmeter. When moving the magnetic flowmeter, always use a trolley and have at least two people carry it.
 - When the magnetic flowmeter is processing hot fluids, the product itself may become extremely hot. Take sufficient care not to get burnt.
 - Where the fluid being processed is a toxic substance, avoid contact with the fluid and avoid inhaling any residual gas, even after the product has been taken off the piping line for maintenance and so forth.
 - Do not apply excessive weight, for example, a person stepping on the magnetic flowmeter.
 - Installation, wiring and maintenance of the magnetic flowmeter must be performed by expert engineer or skilled personnel. No operator shall be permitted to perform procedures relating to installation, wiring and maintenance.
 - The magnetic flowmeter must be installed within the specification conditions.
 - The magnetic flowmeter should be installed away from electrical motors, transformers, and other power sources in order to avoid interference with measurement.
 - In cases where the ambient temperature exceeds 50°C, use external heat resistant wiring with a maximum allowable temperature of 70°C or more.
 - When wiring the conduits, pass the conduit through the cable entry, and utilize the waterproof gland to prevent water from flowing in. Install a drain valve at the low end of the vertical pipe, and open the valve regularly.
 - When opening and closing the cover, be sure to handle the cover carefully so that there are no damage and foreign matter adhesion at its threads and O-ring.
 - Do not open the cover in wet weather or humid environment. When the cover is open, stated enclosure protection is not applicable.
 - Do not connect cables outdoors in wet weather in order to prevent condensation and to protect the insulation, e.g. inside the terminal box of the flowmeter.
 - Ensure that the power supply is off in order to prevent electric shocks.
 - When opening the terminal box, wait for more than 20 minutes after turning off the power.
 - Install an external switch or circuit breaker as a means to turn the power off (capacitance: 15 A, conforming to EN60947-1 and EN60947-3). Locate this switch either near the product or in other places facilitating easy operation. Affix a "Power Off Equipment" label to this external switch or circuit breaker.



WARNING

- **Installation, Wiring, and Maintenance**
 - For AXG1A, impact resistance rating of glass on the display cover is IK06, metal housing is IK08. In the test method, the steel ball is dropped from a height of 200 mm after pre-cooling the housing to -40 degree C. (Impact on horizontal surface)
 - If any damages, such as cracks, breakage or destruction on the glass of the display occurs, stop using it and replace the cover. If it is used with damaged glass, it may cause injury, electric shock, malfunction, and specified protection performance of the housing is not provided.
 - Wiring work should be done adequate wire, sleeve crimp and torque force. Use terminal with insulating cover for the power supply wiring and protective grounding wiring. Do not pull the wires too much strongly in order to prevent electric shocks caused by their damage.
 - This product employs the parts which are affected by a function damage caused by static electricity. Thus, you should do the anti-static work using an anti-static wrist band for it and be careful to avoid touching each electrical parts and circuitry directly.
 - When connecting the wiring, check that the supply voltage is within the range of the voltage specified for this product before connecting the power cable. In addition, check that no voltage is applied to the power cable before connecting the wiring.
 - To prevent electric shocks, ensure the electrical wiring cover is completely attached after the wiring work.
 - To prevent electric shocks, do not impress over rated voltage to each input/output terminals.
 - If there is any unused cable entry, use the blanking plug to cover which comes with this product or which is supplied by YOKOGAWA. The blanking plug should be fastened into the unused cable entry without any mistake. If not, stated enclosure protection is not applicable. Explosion protection type must be wired in accordance with specific requirement (local legal regulations) in order to preserve the effectiveness of their explosion protected features.
 - Maintenance of this product should be implemented in a maintenance service shop where the necessity tools and environment condition are provided. The necessity of this environmental condition is that ambient temperature is 5 to 40°C (the maximum relative humidity is 80 % for temperature 5 to 31°C, and decreasing linearly to 50 % relative humidity at 40°C). For Explosion Protection type, maintenance shall be implemented only when there is no explosive atmosphere present.
 - All procedures relating to installation must comply with the electrical code of the country where it is used.



IMPORTANT

- **Power supply**

Ensure that the source voltage matches the voltage of the power supply before turning on the power.

Power Supply Code 1:

 - AC Type:
Rated Power Supply: 100 to 240 V AC, 50/60 Hz
 - DC Type:
Rated Power Supply: 100 to 120 V DC

Power Supply Code 2:

 - AC Type:
Rated Power Supply: 24 V AC, 50/60 Hz
 - DC Type:
Rated Power Supply: 24 V DC

Power Consumption:
AXG4A, AXW4A: 13 W
AXG1A: 32 W

EMC

- This product conforms to EN61326-1, EN61326-2-3, EN61000-3-2, and EN61000-3-3 (EMC standard).
- Performance Specification during immunity test Flow rate output: Output fluctuation within $\pm 5\%$ of default (1 m/s) span



CAUTION

This product is a Class A product in the EN61326-1(EMC standard). Operation of this product in a residential area may cause radio interference, in which case the user is required to take appropriate measures to correct the interference.

Safety Requirements

This product conforms to EN safety class I (with Protective grounding terminal), Installation Category (Overvoltage Category) II, No Measurement Category ("O"(Other)), Micro Pollution degree 2, Macro Pollution degree 4.

The following models are conformed to EN61010-1:2010 and EN61010-2-030:2010.

Product	Model	Size
Integral Flowmeter	AXG###	2.5 to 400 mm
	AXW###	25 to 400 mm
Remote Sensor	AXG###	2.5 to 400 mm
	AXW###	25 to 400 mm
Remote Transmitter	AXG4A	-
	AXG1A	-
	AXW4A	-

■ PED (Pressure Equipment Directive)

Note: Applicable only when CE marking (optional code EC) is selected.

(1) Technical Data

- Module: H
- Type of Equipment: Piping
- Type of Fluid: Liquid and Gas
- Group of Fluid*4: 1 and 2

• Use: General-purpose, Submersible, and Explosion Protection

MODEL	PROCESS CONNECTION	DN*1 (mm)	PS*1 (MPa)	PS-DN (MPa·mm)	CATEGORY*2, *4
AXG002	Wafer, Flange	2.5	4	10	Sound Engineering Practice (SEP)*3
AXG005	Wafer, Flange	5	4	20	Sound Engineering Practice (SEP)*3
AXG010	Wafer, Flange	10	4	40	Sound Engineering Practice (SEP)*3
AXG015	Wafer, Flange	15	4	60	Sound Engineering Practice (SEP)*3
AXG025 AXW025	Wafer, Flange	25	4	100	Sound Engineering Practice (SEP)*3
AXG032 AXW032	Wafer, Flange	32	4	128	II
AXG040 AXW040	Wafer, Flange	40	4	160	II
AXG050 AXW050	Wafer, Flange	50	4	200	II
AXG065 AXW065	Wafer, Flange	65	4	260	II
AXG080 AXW080	Wafer, Flange	80	4	320	II
AXG100 AXW100	Wafer, Flange	100	4	400	III
AXG125 AXW125	Wafer	125	2	250	II
	Flange	125	4	500	III
AXG150 AXW150	Wafer	150	2	300	II
	Flange	150	4	600	III
AXG200 AXW200	Wafer	200	2	400	III
	Flange	200	4	800	III
AXG250 AXW250	Flange	250	2	500	III
AXG300 AXW300	Flange	300	2	600	III
AXG350 AXW350	Flange	350	1.8	630	III
AXG400 AXW400	Flange	400	1.6	640	III

*1: PS: Maximum allowable pressure for the pipe
DN: Nominal size

*2: For details, see Table 6 covered by ANNEX II of Directive 2014/68/EU.

*3: Article 4, paragraph 3 of Directive 2014/68/EU

*4: Models classified in categories I or II shall not be used for unstable gases of Group 1.

• Use: Hygienic, and Hygienic Explosion Protection

MODEL	DN*1 (mm)	PS*1 (MPa)	PS-DN (MPa·mm)	CATEGORY*2, *4
AXG015	15	1	15	Sound Engineering Practice (SEP)*3
AXG025	25	1	25	Sound Engineering Practice (SEP)*3
AXG032	32	1	32	I
AXG040	40	1	40	I
AXG050	50	1	50	I
AXG065	65	1	65	I
AXG080	80	1	80	I
AXG100	100	1	100	I
AXG125	125	1	125	II

*1: PS: Maximum allowable pressure for the pipe
DN: Nominal size

*2: For details, see Table 6 covered by ANNEX II of Directive 2014/68/EU.

*3: Article 4, paragraph 3 of Directive 2014/68/EU

*4: Models classified in categories I or II shall not be used for unstable gases of Group 1.

(2) Installation



WARNING

- Tighten the bolts of the piping joints according to the prescribed torque values.
- Take measures to protect the flowmeters from forces caused by vibration channeled through the piping.

(3) Operation



WARNING

- The product should be operated with the temperature and pressure of the fluid under normal operating conditions.
- The ambient temperature should be that of normal operating conditions.
- Take measures to prevent excessive pressure such as water hammer, etc. To avoid water hammer prevent the pressure from exceeding the PS (maximum allowable pressure) by setting the system's safety valves, etc. appropriately.
- Should external fire occur, take safety measures at the device itself or system-wide prevent it having an effect on the flowmeters.
- Avoid using fluids exceeding the corrosion proof limitations of the lining and electrodes.
- Take measures not to abrade the metal pipe, and avoid abrading the lining by using fluids such as slurry and sand are contained.

■ Explosion Protection Type



NOTE

For explosion protection type, be sure to read the applicable user's manual.

■ Information on EU WEEE Directive

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

This product 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 product should be disposed of in accordance with local and national legislation/ regulations.

■ Authorized Representative in EEA

In relation to the CE Marking, the authorized representative for this product in the EEA (European Economic Area) is: Yokogawa Europe B.V. Euroweg 2, 3825 HD Amersfoort, The Netherlands

■ Warranty and Disclaimer

- Except as specified in the warranty terms, YOKOGAWA shall not provide any warranty for the product.
- YOKOGAWA shall not be liable for any indirect or consequential loss incurred by either using or not being able to use the product.

■ Trademarks:

- All the brands or names of Yokogawa Electric's products used in this manual are either trademarks or registered trademarks of Yokogawa Electric Corporation.
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■ Revision Information

Title: ADMAG TI Series
AXG###, AXW###, AXG4A, AXW4A,
AXG1A
Magnetic Flowmeter
Read Me First (Optional Code EC)

Manual No.: IM 01E21A11-01EN

Edition	Date	Page	Revised Item
1st	Oct. 2018	–	New Publication
2nd	Oct. 2018	–	Added Modbus spec.
3rd	Mar. 2019	–	Deleted Modbus spec.
4th	July 2019	–	Added Modbus spec., AXG1A and FOUNDATION fieldbus

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