

# User's Manual

Magnetic Flowmeter  
AY6410  
Read Me First

**RMF-AY6410-00-R00**

This manual contains important information for safe operation of this product 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 and Adept make 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 or Adept 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.

To ensure correct use this product, read the manuals. Read the general specifications for its specification.

Enable to download the following YOKOGAWA's web page.

<https://www.yokogawa.com/solutions/products-and-services/measurement/field-instruments-products/flow-meters/magnetic-flowmeters/>

## ■ 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 earthing connection point



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 and Adept do 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.

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

## ■ 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 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 and Adept 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 IP67/IP68.
- This product is designed for indoor and outdoor use.



### 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 earthing connection point

Ensure to connect the protective earthing to prevent electric shock before turning on the power.

#### • Do Not Impair the Protective Earthing

Never cut off the internal or external protective earthing wire or disconnect the wiring of the protective earthing terminal. Doing so invalidates the protective functions of the product and poses a potential shock hazard.

#### • Do Not Operate with Defective Protective Earthing

Do not operate the product if the protective earthing might be defective. Also, ensure to check them before operation.

#### • Do Not Operate in an Explosive and Corrosive Atmosphere

Do not operate the product in the presence of flammable gas, vapors, or combustible dust. Prolonged use in a highly dense corrosive gas (H<sub>2</sub>S, SO<sub>x</sub>, etc.) will cause a malfunction. There are some areas inside the product have high voltages. Before carrying out wiring or other work, confirm the power is turned off.

#### • Do Not Remove the facing plate

The plate should be removed by YOKOGAWA's qualified personnel only. Opening the plate is dangerous, because some areas inside the product have high voltages

#### • Ground the Product before Making External Connections

Connect the protective earthing 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.



## WARNING

- **Installation, Wiring, and Maintenance**
  - 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 earthing 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.
  - 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).
  - All procedures relating to installation must comply with the electrical code of the country where it is used.

## IMPORTANT

- **Power supply**  
24 V DC, 100 to 240 V AC, 50/60 Hz  
100 to 240 V DC
- **Ambient Temperature:**  
0 to 55 °C
- **Ambient Humidity:**  
0 to 95 %

## ■ Warranty and Disclaimer

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

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## ■ Revision Information

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