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# User's Manual

## Magnetic Flowmeter CA Series FM (USA) Explosion Protection Type

IM 01E40A03-01EN

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# Magnetic Flowmeter CA Series

## FM (USA) Explosion Protection Type

IM 01E40A03-01EN 1st Edition

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## Revision Information

# 1. Introduction

This manual provides the basic guidelines for explosion protection type of Magnetic Flowmeter CA Series.

For the items which are not covered in this manual, read the applicable user's manuals and general specifications as listed in IM 01E21A21-01Z1 (Read Me First). These documents can be downloaded from the website of YOKOGAWA. To ensure correct use of the product, read these manuals thoroughly and fully understand how to operate the product before maintaining it. For method of checking the model and specifications, read the applicable general specifications in IM 01E21A21-01Z1 (Read Me First).

Website address: <http://www.yokogawa.com/fld/doc/>  
These manuals can be downloaded from the website of YOKOGAWA or purchased from the YOKOGAWA representatives.



## NOTE

When describing the model name like "CA####" in this manual, #### means any of the following.  
For CA####:  
0015, 0025, 0040, 0050, 0080, 0100, 0150, 0200

## ■ 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 user's manual as listed in IM 01E21A21-01Z1 (Read Me First) 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.
- Do not modify this product.
- The product should be disposed of in accordance with local and national legislation/regulations.

## ■ 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 instrument.
- To ensure correct use, read this manual and the applicable user's manuals as listed in IM 01E21A21-01Z1 (Read Me First) thoroughly before starting operation. Read the general specifications as listed in IM 01E21A21-01Z1 (Read Me First) for its specification.

## ■ Trademark

- All the brands or names of Yokogawa Electric's products used in this manual are either trademarks or registered trademarks of Yokogawa Electric Corporation.
- All other company and product names mentioned in this manual are trade names, trademarks or registered trademarks of their respective companies.
- In this manual, trademarks or registered trademarks are not marked with <sup>TM</sup> or <sup>®</sup>.

## ■ 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 user's manual as listed in IM 01E21A21-01Z1 (Read Me First) 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.

## 2. Explosion Protection Type



### WARNING

CA#### magnetic flowmeter is products which have been certified as explosion protection type products. Strict limitations are applied to the structures, installation locations, external wiring work, maintenance and repairs, etc. of these products. Sufficient care must be taken, as any violation of the limitations may cause dangerous situations.

Be sure to read this manual before handling the explosion protection type products.



### WARNING

The terminal box cover and display cover are locked by special screw. In the case of opening the cover, use the hexagonal wrench (nominal size 3).

The covers of explosion protection type products are locked. Use this hexagonal wrench to open and close the cover. Before opening the cover, be sure to check that the power of flowmeter has been turned off. Once the cover is closed, be sure to re-lock the product.

Be sure to lock the cover with the special screw using the hexagonal wrench after tightening the cover.

### 2.1 Technical Data

#### Applicable Standard:

FM 3600, FM3615, FM3616, FM3810,  
ANSI/UL UL 50E, NEMA 250, ANSI/UL 61010-1,  
ANSI/UL 61010-2-30

#### Certificate:

FM 17US0140X

#### Explosionproof

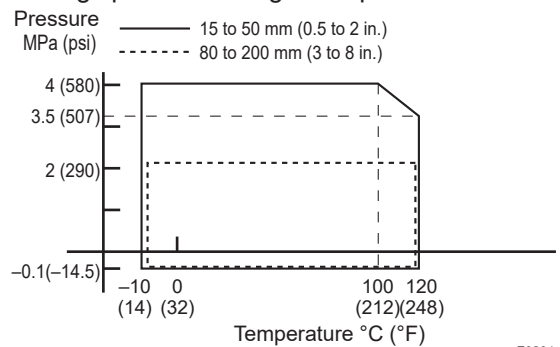
- Type of Protection  
CL I/II/III GP ABCDEFG  
T6...T4
- Enclosure: Type 4X
- Ambient Temperature: -20°C to 50°C
- Process Temperature:

Temperature Class	T6	T5	T4
Max. Surface Temp.	T70°C	T85°C	T120°C
Max. Process Temp.	70°C	85°C	120°C
Min. Process Temp.	-10°C	-10°C	-10°C

- Power Supply:  
100 to 240 Va.c. (50/60 Hz) / 100 to 120 Vd.c.  
24 Va.c. (50/60 Hz) / 24 Vd.c.
- Current I/O: 4 to 20 mA, 32 Vd.c. max.
- Digital I/O: 30 Vd.c. max., 200 mA max.
- Maximum Working Pressure:  
Read "Fluid Temperature and Pressure"

#### Fluid Temperature and Pressure:

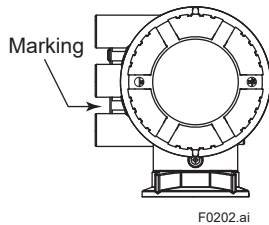
The figure shows the usable range of the sensor in each specification. It is also limited by the flange pressure rating of the process connection.



## 2.2 Cable Entry

The type of cable entry is stamped near the cable entry port according to the following codes.

Marking	Screw Size
N	ASME 1/2 NPT Female



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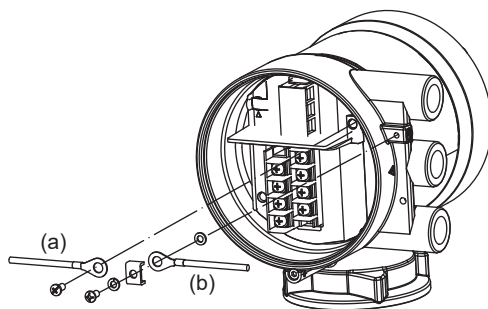
## 2.3 Installation

- All wiring shall comply with NFPA70 (US) and local electric codes and requirements.
- Unused apertures shall be closed with suitable certified blanking elements.  
(The plug attached is certified.)
- The sensor is not surrounded by pipe insulation material.
- In hazardous location, wiring shall be in conduit as follows.  
"SEAL ALL CONDUITS WITHIN 18 INCHES"
- In order to prevent the grounding conductor from loosening, the conductor must be secured to the terminal, tightening the screw with appropriate torque. Care must be taken not to twist the conductor.

The grounding terminals are located on the inside and outside of the terminal area.

Connect the cable to the grounding terminal in accordance with wiring procedure (a) or (b).

- (a) Internal grounding terminal
- (b) External grounding terminal



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## 2.4 Operation

- Take care not to generate mechanical spark when access to the product and peripheral devices in hazardous locations.
- Take care the following warning marking when the opening the cover.
- Take care the following warning marking "AFTER DE-ENERGIZING, DELAY 20 MINUTES BEFORE OPENING".

## 2.5 Maintenance and Repair

Only personnel authorized by Yokogawa Electric Corporation can repair the equipment

A modification of the equipment would no longer comply with the construction described in the certificate documentation.

## 2.6 Specific Condition of Use

- In the case the grounding rings are made of titanium, the sensor should be kept away from impacts and frictions in hazardous locations.
- Electrostatic charges on the non-metallic parts(excluding glass parts) or coated parts of the product shall be avoided.
- The applicable temperature class, maximum surface temperature, ambient temperature range and process temperature range of the product are shown in 2.1 Technical data.

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# Revision Information

- Title : Magnetic Flowmeter CA Series FM (USA) Explosion Protection Type
- Manual No. : IM 01E40A03-01EN

Edition	Date	Page	Revised Item
1st	May 2023	—	New Publication