MagneW 3000 PLUS Smart Electromagnetic Flowmeter Converter **(General, FM/CSA Nonincendive Approval)** Model MGG14C

OVERVIEW

The MagneW 3000 PLUS electromagnetic flowmeter converter is a high-performance, and highly reliable flowmeter based on Yamatake's proven MagneW 3000 flow measurement technologies. The model MGG14C converter offers expanded flowrate and process measurement capabilities when used with the new range of MagneW 3000 PLUS detectors.
FM / CSA nonincendive model is suitable for use in Class I / II / III, Division 2, Groups A, B, C, D, F, and G or non - hazardous location only.
General model is suitable for use in non - hazardous location.

(Remote converter)

FEATURES

Liquid crystal display with backlighting (optional)

- Backlit display eases reading in direct sunlight or in a dark room.
- Simultaneously displays flow volume in percentage, actual flow volume and integrated flow volume.
- Rotating display improves visibility of integral models mounted on pipes up to 90 degrees from standard.

Setting parameters by optional infrared touch sensor (Optional)

- Allows safe setting, in severe environments, without opening the cover of the converter.
- Prevent malfunctioning of the infrared touch sensor via special security feature.

Easy changeover of integral and remote models

- One converter case is used for both models.

Broader range of pitch in cable connection port

- Allows incorporation of an all-purpose waterproofing gland the pitch of the cable connection port has been significantly increased.

Compatibility

- Enables combination of the remote electromagnetic flow converter with conventional detectors. Please talk to your Yamatake Corporation representative for details.

Type of protection

- Conforms CE marking and FM/CSA Nonincendive use in Class I / II / III, Division 2, Groups A, B, C, D, F, and G.

APPLICATIONS

Pulp and Paper
Pulp liquids, chemicals, corrosive liquids, industrial water, wastewater, etc.

Petroleum/petrochemical/chemicals
Corrosive liquids, dyestuffs, chemicals, industrial water, waste water, etc.

Public utilities
Portable water, sewage systems, community drainage, human waste, sludge, sediment slurry, regulation of total effluent, etc.

Food
Beer, milk, juice, wine, liquor, potable water, light, medium and high density fluids, industrial water, waste water, etc.

Steel / nonferrous metals / ceramics
Alumina slurry, cooling water, industrial water, sea water, corrosive liquids, wastewater, etc.

Machinery / electrical machinery
Corrosive liquids, cooling water, circulating water, industrial water, waste water, etc.

Construction
Building material slurry, sediment slurry, cement slurry, industrial water, etc.

Shipbuilding
Sediment slurry, etc.

Electric power
Corrosive liquids, cooling water, industrial water, wastewater, etc.

Gas
Circulating water for air conditioning, etc.

FUNCTIONAL SPECIFICATIONS

Type of protection

Enclosure rating
JIS C 0920 Waterproof model
NEMA ICS6-110 TYPE4X
IEC PUBL 529 IP66

Hazardous areas certifications
FM/CSA Nonincendive for Class I / II / III, Division 2, Groups A, B, C, D, F, and G.

Measurable electrical conductivity
(with detector size of 2.5 mm to 1100 mm (0.1 to 44 inches))
3 μS/cm or more

Input signal

Flow signal
Flow proportional voltage signal from the detector

Contact input (optional)
Solid-state contact or no-voltage contact

Output signal

Analog output
4 to 20mA DC

Digital output
DE
Analog or digital output is selectable

Contact output (optional)
Open collector

Contact capacity
30 V DC max.
200mA max.

Pulse output (optional)
Open collector

Contact capacity
30 V DC max.
200mA max.

Pulse frequency
2000 Hz max.

Pulse width
0.3 to 999.9 ms
Random setting or fixed at 50% of the duty

Analog output range/load resistance

Without SFC communication
0.8mA to 22.4mA (-20% to +115%)
Load resistance: 0 to 600 Ω

With SFC communication
3.2mA to 22.4mA (-5% to +115%)
External power source for SFC communication 16 to 45 V DC
Load resistance (Ω) =
(External power source for communication - 8.5 V) / 0.025

With HART communication
Load resistance: 250 Ω minimum

Digital output range/load resistance

With SFC communication

3.2mA to 22.4mA (-5% to +115%)
External power source for SFC communication/ digital communication 16 to 45 V DC
Load resistance (Ω) =
(External power source for communication - 8.5 V) / 0.025

Unit of flow indication

Indication of volume flow : m^3, L, cm^3, G, mG, kG, B
Indication of mass flow : t, kg, g, lb
Indication of time : d, h, min, s

Damping time

Adjustable between 0.5 and 199.9 seconds

Low flow cutoff

Adjustable between 0 to 10% of setting range.
Below selected value, output is driven to the zero flow rate signal level.

Drop out

Adjustable between 0 to 10% of setting range.
Below selected value, pulse output is cut.

Lightning protection

12 kV, 1000 A
Equipped with the lightning arrester in the power source and external input and output terminals.

Power failure

An EEPROM retains data record of totalized value when pulse output is used (retention period approximately 10 years).

Power supply

100 V AC	+10% / -15%
110 V AC	+10% / -15%
115 / 120 V AC	+10% / -15%
200 V AC	+10% / -15%
220 V AC	+10% / -15%
230 / 240 V AC	+10% / -15%
24 V DC	+15% / -20%

Frequency

50 / 60 Hz ±5%

Power consumption

Within 13 W (17VA)

Ambient temperature limits

-25 to +60°C (-13 to 140°F)

Ambient humidity limits

5 to 100% RH

Optional specifications

Display Indication by LCD with backlighting

Main display

7-segment, 6 digits

Sub display

16 digits, 2 lines

Display contents

Demonstrates three values simultaneously.
- Flow volume in percentage
- Actual flow volume
- Totalized flow volume (when pulse output selected)

Selection of main display and sub display

Main display is selectable from the three values.

Data setting device

Setting by infrared ray touch sensor
Infrared ray touch sensor: Four key switches

Contact input function

External 0% lock input

Forces outputs (analog, digital, pulse) to the zero flow rate signal level.
Activates by applying a contact input.

External automatic zero adjustment input

Adjusts zero-point.
Activates by applying a contact input.

External range switching input

Switches two flow measurement ranges.
Two measurement ranges
- Dual range for normal directions
- Normal / reverse range

Activates by applying a contact input.

Built-in counter reset input (for pulse output model)

Resets the totalized value of the built-in counter.
Activates by applying a contact input.

Contact output function

Alarm output

Outputs an alarm under the following conditions.
- Self-diagnostic result
- Empty detection
- High / low limit alarm

Range switching output

- Outputs the status of flow range.
- Large / small in dual range
- Normal / Reverse

Counter preset status output (for pulse output model)

Activates when the counter reaches the preset value.

Self-check result output
Activates only when a self-diagnostic abnormality occurs.

Empty detection output
Activates only when an empty status is detected.

High/low limit alarm output
Activates when a high / low limit alarm occurs.

Two-stage flow rate alarm output (with two contact outputs)
Activates when the first high / low limit alarm (H / L) occurs and the second high / low limit alarm (HH / LL) occurs.

Empty pipe detection
When the detector is empty, the analog output, digital output and pulse output are fixed at zero. Display is latched to zero.

Pulse output
Outputs the totalized value.
Must be selected in case of using totalizer.

Built-in counter function

Totalizer
According to the pulse scale setting, it totals one count at a time, for normal and reverse flows.

Totalizer with presetting function
A preset value (target totalized value) can be set between 0000000000 and 9999999999. The counting method is same as that of the standard totalizer.

Normal/reverse flow difference totalizer
The difference in flow volumes in the normal or reverse directions is calculated and counted.

Traceability certificate
The following three documents are provided.
- Traceability System Chart
- Traceability Certificate
- Test Report

Tropicalization treatment
Protects the electromagnetic flow meter in harsh environments during transportation and/or storage.
The following treatments are applied.
- Corrosion protection
- Moisture prevention
- Mildew proofing

Indication other than SI units
The following non-SI units are available.

Volume unit
B (barrel), kG (kilo-gallon), G (gallon), mG (milli-gallon)

Mass unit
lb (pound)

Tag number on terminal box
The designated tag numbers (maximum 16 characters) should be stamped on a plate, which is attached to the terminal box. One line can contain 8 characters, so if more characters must be written on two lines.
Characters can be upper-case English letters, numbers and hyphens (-).

For additional specifications, please contact your Yamatake representative.

PERFORMANCE SPECIFICATIONS

Accuracy
in combination with a detector
<Size 2.5 to 15 mm (0.1 to 1/2 inch)>
Vs = Velocity of setting range

Vs (m/s)	Velocity during measurement ≥ Vs × 40%	Velocity during measurement ≤ Vs × 40%
1.0 ≤ Vs ≤ 10	±0.5% of rate	±0.2% of Vs
0.1 ≤ Vs ≤ 1.0	±(0.1/Vs+0.4)% of rate	±0.4(0.1/Vs+0.4)% of Vs

<Size 25 to 600 mm (1 to 24 inches)>
Vs = Velocity of setting range

Vs (m/s)	Velocity during measurement ≥ Vs × 20%	Velocity during measurement ≤ Vs × 20%
1.0 ≤ Vs ≤ 10	±0.5% of rate	±0.1% of Vs
0.1 ≤ Vs ≤ 1.0	±(0.1/Vs+0.4)% of rate	±0.2(0.1/Vs+0.4)% of Vs

<Size 700 to 1100 mm (28 to 44 inches)>
Vs = Velocity of setting range

Vs (m/s)	Velocity during measurement ≥ Vs × 50%	Velocity during measurement ≤ Vs × 50%
1.0 ≤ Vs ≤ 10	±1.0% of rate	±0.5% of Vs
0.1 ≤ Vs ≤ 1.0	±(0.2/Vs+0.8)% of rate	(0.1/Vs+0.4)% of Vs

PHYSICAL SPECIFICATION

Housing material
Aluminum alloy

Finish

Standard
Baked acryl paint

Corrosion-resistant
Baked acryl paint

Corrosion-proof
Baked epoxy paint

Color
Light beige (Munsell 4Y7.2/1.3)

Display cover material
Tempered glass, 5 mm thick

Weight
3.7 kg (8.2 lb)

INSTALLATION

Electrical Connection

FM/CSA Nonincendive
1/2 NPT internal threads

General
G1/2 (PF1/2) internal threads CM20 internal threads, Pg 13.5 internal threads

Mounting

Remote type
Wall mounting, 2-inch pipe mounting

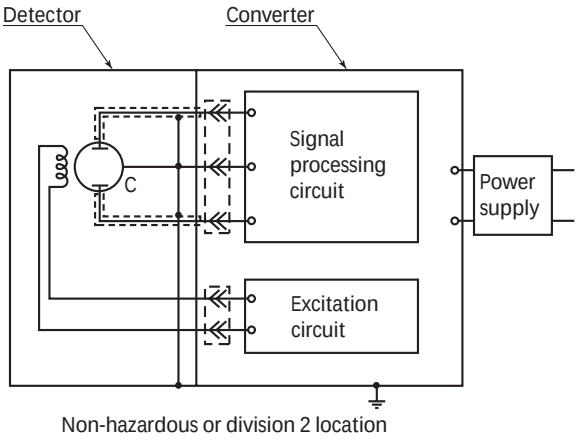
Grounding
Resistance less than 100 Ω

For FM/CSA Nonincendive model
This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D, Class II, Division 2, Groups F and G; Class III, Division 2.

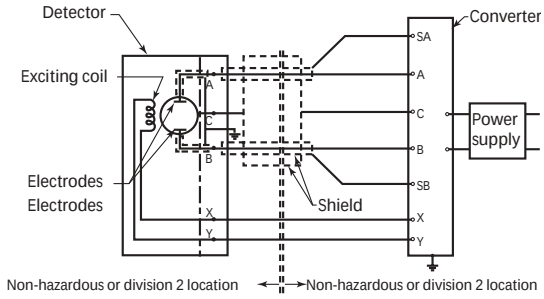
⚠ CAUTION

Power supply and internal voltage of ordinary equipment to the earth shall not exceed 250 V AC 50/60 Hz, 250 V DC in case of normal / fault conditions.

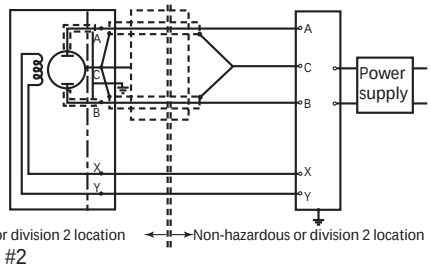
(Integral model)



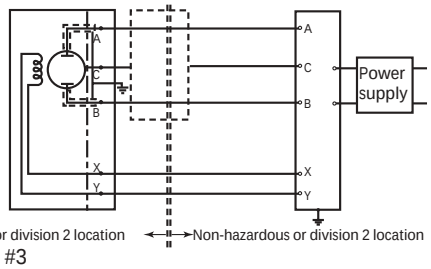
(Remote model)



Configuration #1
- Preferred for 2.5 mm to 10 mm detectors to minimize noise



Configuration #2



Configuration #3

MODEL SELECTION

Converter

Model MGG14C - I II III IV - V VI VII VIII - Y / Options (Some options can be selected per each model.)
Option "Y" must be specified for Yamatake version

Basic model no.				Selections				Optional selections			
	MGG14C			-							
I	Power supply	100 V AC, 50/60 Hz		A							
		110 V AC, 50/60 Hz		B							
		115/120 V AC, 50/60 Hz		C							
		200 V AC, 50/60 Hz		D							
		220 V AC, 50/60 Hz		E							
		230/240 V AC, 50/60 Hz		F							
		24 V DC, noise filter 50 Hz		G							
		24 V DC, noise filter 60 Hz		H							
II	Output signal / Communication	Volume flow 4 to 20mA DC output / without communication			A						
		Volume flow 4 to 20mA DC output / with communication (Note 1)			B						
		Volume flow DE output / with communication (Note 1)			C						
		Volume flow 4 to 20mADC output / with HART communication			H						
III	Electrical connection / Watertight gland	G1/2 internal thread / without watertight gland				1					
		G1/2 internal thread / with brass (Ni-plated) watertight gland				2					
		G1/2 internal thread / with plastic watertight gland				3					
		1/2NPT internal thread / without watertight gland (Note 2)				4					
		CM20 internal thread / without watertight gland				5					
		Pg13.5 internal thread / without watertight gland				6					
		G1/2 internal thread / with SUS304 watertight gland				7					
IV	Installation / Wiring direction	Integral type	Horizontal piping mounting / upstream side				A				
			Horizontal piping mounting / downstream side				B				
			Horizontal piping mounting / left side viewed from upstream				C				
			Horizontal piping mounting / right side viewed from upstream				D				
			Vertical piping mounting / downstream side (flow direction: downstream to upstream)				E				
		Remote type	Wall mounting with standard bracket				G				
			2-inch pipe mounting with standard bracket				H				
V	Finish	Standard finish						X			
		Corrosion-resistant finish						1			
		Corrosion-proof finish						2			
VI	Display with data setting device	None							X		
		Main display: instantaneous indication of flow volume in %							A		
		Main display: instantaneous indication of actual flow volume							B		
		Main display: indication of integrated flow volume (Note 3)							C		
VII	Contact inputs / outputs	None								X	
		1 input and 1 output (ranging function, warning for contact input/output, etc.)								1	
		2 inputs (ranging function, external automatic zero adjustment input, etc.)								2	
		2 outputs (ranging function, warning for contact outputs.)								3	
VIII	Style code	None									X

Options		
	Yamatake version (must be selected)	Y
	Empty pipe detection function	A
	Pulse output (open collector)	B
	Traceability certificate for converter	C
	Indication other than SI units	H
	Attachment of the TAG number to the terminal box for converter (Note 4)	J
	Tropical treatment	E

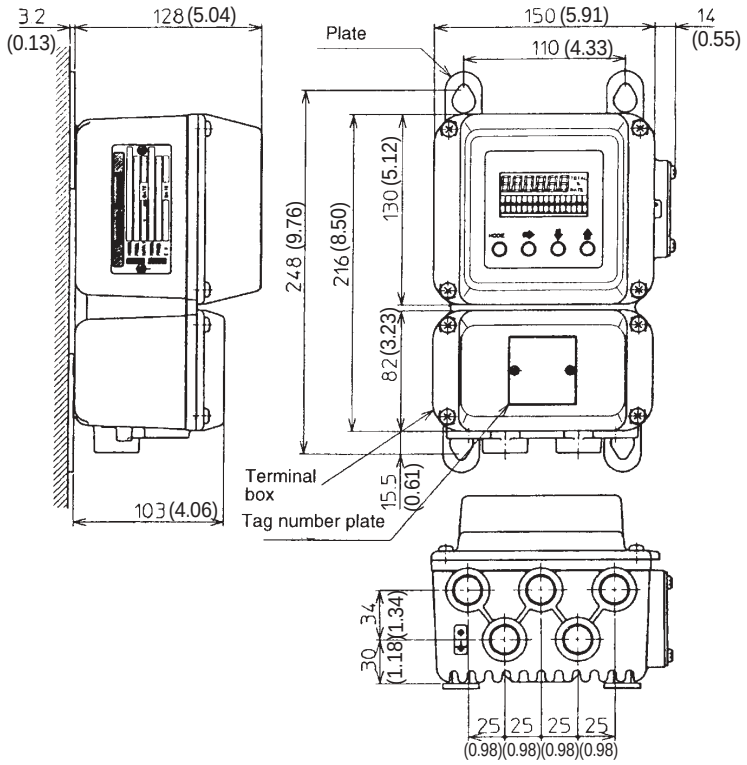
Note) 1. In case of this code, it is necessary to supply 16 to 45 V DC on 4 to 20mA DC signal line.
2. Must be selected for FM / CSA NI approval.
3. In case of this code, option "B" must be selected.
4. Must be selected for Tag no. requirement

DIMENSIONS

All dimensions are in millimeters, dimensions in brackets ( ) are in inches (inch).

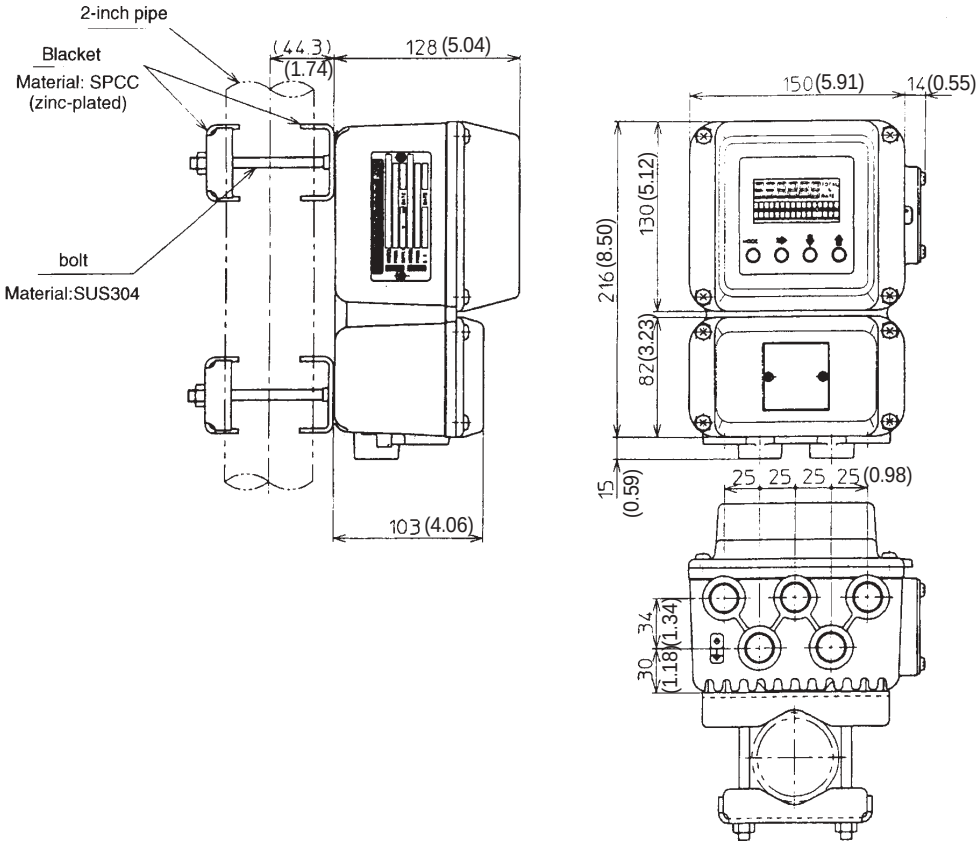
Wall mounting

[Unit: mm (inch)]



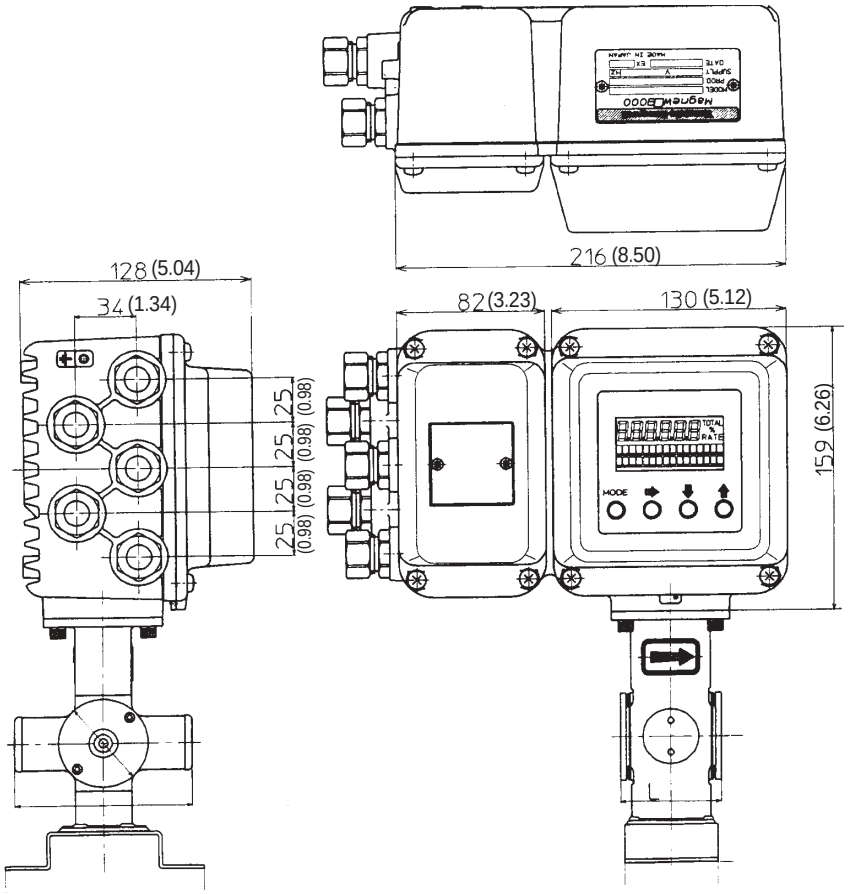
2-inch pipe mounting

[Unit: mm (inch)]



Integral type

[Unit: mm (inch)]



Note) The weight of an integral detector is 100 g less than the weight of remote detectors.

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