

# WaterMAG

## Electromagnetic Flowmeter for Water Applications

### Model MCB10A

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#### OVERVIEW

The WaterMAG is an electromagnetic flowmeter for water measurement applications based on field-proven Yamatake electromagnetic flowmeter technologies.

The WaterMAG offers functions required for water applications. It is compact in size and best meets water flow monitoring needs.

#### FEATURES

##### Lowest “cost of ownership”

##### Energy efficient

The obstruction-less design of the WaterMAG causes no pressure loss. As a result, less energy is required to maintain the desired flow rate.

##### Maintenance free

WaterMAG does not have any moving parts in the flowtube, eliminating periodic maintenance and calibration.

##### Easy operation

WaterMAG has all necessary functions for water flow monitoring, resulting in easy operation.

Local display and key switches make it easy to set up and provide % flow rate, actual flow rate and totalized value.

##### Compact in size and light in weight

Easy to handle and easy to install.



Nominal size: 1 to 4 inches (25 to 100 mm)

#### APPLICATIONS

- ✓ recirculating water
- ✓ chilled water
- ✓ hot water
- ✓ water filtration systems
- ✓ water supply

**For Converter****FUNCTIONAL SPECIFICATIONS****Type of protection**

IEC IP65

**Output signal****Analog output**

4 to 20mA DC

Load resistance: 0 to 400  $\Omega$ **Pulse Output****Pulse Output (totalized value output)**

Open collector

Contact capacitance: 30V DC max., 100mA max.

Pulse width: 1ms to 1s

Adjustable between 1ms to 1s or fixed at 50% of duty

Pulse frequency: 0.0001 to 500 Hz

**Contact output**

Open collector

Contact capacitance: 30V DC max., 100mA max.

**Flow unit**Volume flow: m<sup>3</sup>, L, cm<sup>3</sup>, G (gallon), mG, kG,  
B (barrel)

Mass flow: t, kg, g, lb

Time: d, h, m, s

**Display****Display: LCD**

Main display: 7-segment, 8 digits

Sub-display: 16 digits, 2 lines

Display contents: displays three values simultaneously – % flow rate, actual flow rate, totalized value

**Data setting**

Operation by four key switches

**Damping**

Adjustable between 0.5 and 199.9 seconds.

Default setting: 5 seconds.

**Low flow cutoff.**

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

Default setting: OFF (0%).

**Dropout**

Adjustable between 0 and 10% of setting range.

Below selected value, pulse output is cut.

Default setting: 2%.

**Empty pipe detection**

If the detector is empty, analog output and pulse output will be fixed at zero. The display will be latched to zero and “EMPTY” will be indicated.

**Failure diagnostics**

If the converter malfunctions, the analog output will be automatically fixed at 3.6mA.

**Power failure**

An EEPROM retains a data record of totalized flow volume when pulse output is used.

**Power supply**24V DC  $\pm$ 10%**Power consumption**

2.4W max.

**Ambient temperature limits**

32 to 122°F (0 to 50°C)

**Ambient humidity limits**

5 to 85% RH (no condensation)

**Optional specifications****Traceability certificate**

The following three documents are included:

- Traceability system chart
- Traceability certificate
- Test report

**PHYSICAL SPECIFICATIONS****Case material**Polycarbonate (*not recommended for installation in direct sunlight*)**Case cover material**Polycarbonate (*not recommended for installation in direct sunlight*)**INSTALLATION****Cable gland**

Plastic gland (3 pieces)

**Cable**

Applicable cable outer diameter: 0.24 to 0.47 inch (6 to 12mm)

Applicable cable conductor

Power supply: AWG14 to 22 (0.32 to 2.03mm<sup>2</sup>)Outputs: AWG16 to 26 (0.13 to 1.31mm<sup>2</sup>)**Mounting**

Integral type

**Grounding**Grounding resistance should be less than 100  $\Omega$ **Piping vibration**0.5 G (4.9m/s<sup>2</sup>) max.

**For Detector****FUNCTIONAL SPECIFICATIONS****Type of protection**

IEC IP65

**Temperature range of process fluid**

-4 to 194°F (-20 to 90°C) (process fluid must not freeze)

**Pressure range of process fluid**

290 PSI. (2.0 MPa) max.

**Measurable process fluid**

Water, hot water

(no corrosive fluid, no abrasive fluid)

**Measurable electrical conductivity**50 to 50,000  $\mu$ S/cm**Measurement flow range**

Size inches (mm)	Minimum Range GPM (m <sup>3</sup> /h)	Maximum Range GPM (m <sup>3</sup> /h)
1 (25)	0 to 7.8 (0 to 1.768)	0 to 38.9 (0 to 8.835)
1.5 (40)	0 to 19.9 (0 to 4.524)	0 to 99.6 (0 to 22.619)
2 (50)	0 to 31.1 (0 to 7.069)	0 to 155.6 (0 to 35.342)
2.5 (65)	0 to 52.6 (0 to 11.946)	0 to 262.7 (0 to 59.729)
3 (80)	0 to 79.7 (0 to 18.096)	0 to 398.4 (0 to 90.477)
4 (100)	0 to 124.5 (0 to 28.275)	0 to 622.4 (0 to 141.371)

**Size**

1, 1.5, 2, 2.5, 3, 4 inches (25, 40, 50, 65, 80, 100mm)

**Flange rating**

Wafer style – 1 to 4 inches (25 to 100mm), ANSI 150

**Ambient temperature limits**

32 to 122°F (0 to 50°C)

**Ambient humidity limits**

5 to 85% RH (no condensation)

**PERFORMANCE SPECIFICATIONS****Accuracy** $\pm$ 1% of rate (flow velocity: 0.5 to 5 m/s) $\pm$ 0.05 m/s (flow velocity: 0.1 to 0.5 m/s)**Magnetic field effect** $\pm$ 0.2% F.S. (400A/m)**PHYSICAL SPECIFICATIONS****Main body materials****Case material**

SS304 stainless steel

**Measuring pipe material**

SS304 stainless steel

**Process wetted materials****Lining**

Polypropylene

**Electrode**

SS316L stainless steel

**Grounding ring**

SS304 stainless steel

**INSTALLATION****Pipe connection**

Wafer style

**Grounding**Grounding resistance should be less than 100  $\Omega$ **Length of straight pipe****Upstream side**

A minimum of five straight pipe diameters.

A minimum of 10 straight pipe diameters is required if diffuser/valve/pump is installed on the upstream side.

**Downstream side**

Two straight pipe diameters are recommended.

**Mounting**

Integral style (installed on the piping)

**Optional specifications****Bolts and nuts**

SS304 stainless steel bolts and nuts for installing the detector on the piping are available.

## MODEL SELECTION

### WaterMAG Electromagnetic Flowmeter

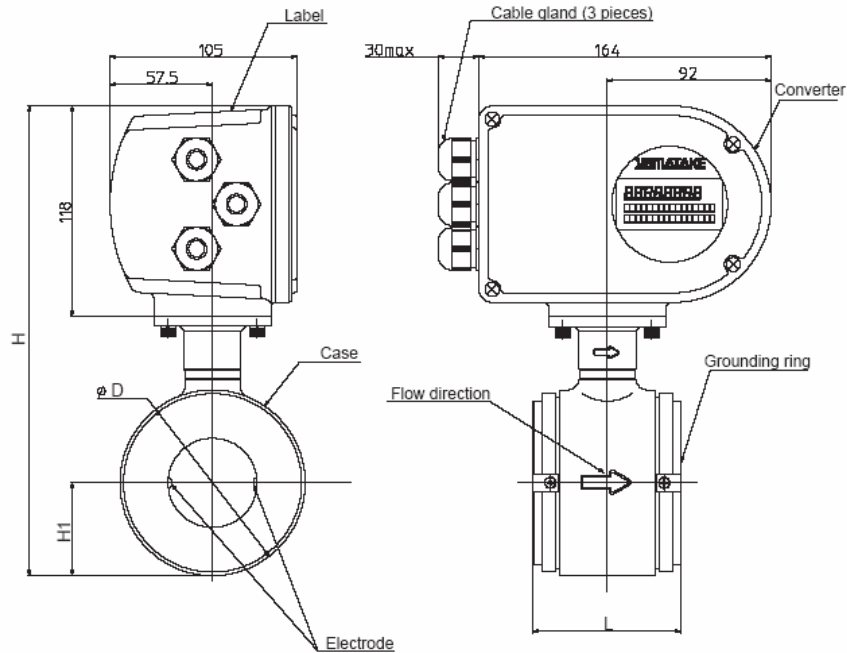
Basic model number		Selection	
MCB10A			
Size	1 inch (25 mm)	025	
	1.5 inches (40 mm)	040	
	2 inches (50 mm)	050	
	2.5 inches (65 mm)	065	
	3 inches (80 mm)	080	
	4 inches (100 mm)	100	
Style code	Global model	GLB	
Power supply	24V DC		G
Pipe connection	Wafer ANSI 150		21
Bolts and nuts	None		X
	SS304 stainless steel bolts and nuts		2
Options	None		H
	Setting customer's required range		K
	Traceability certificate		B

## DIMENSIONS

### Wafer style: 1 to 4 inches (25 to 100 mm)

Nominal size – inches (mm)		1 (25)	1.5 (40)	2 (50)	2.5 (65)	3 (80)	4 (100)
Face-to-face dimension – inches (mm)	L	2.2 (56)	3 (77)	3.2 (83)	3.6 (93)	4 (103)	4.6 (117)
	H	9 (229)	9.6 (245)	10.3 (263)	11 (280)	11.5 (293)	12.5 (318)
Height – inches (mm)	H1	1.3 (34)	1.7 (43.5)	2 (52)	2.4 (62)	2.6 (67)	3.1 (79.5)
	D	2.6 (68)	3.4 (87)	4 (104)	4.8 (124)	5.2 (134)	6.2 (159)
Case outer diameter – inches (mm)							
Weight – lbs (kg)		4 (1.9)	5 (2.3)	6.5 (2.9)	7 (3.3)	9 (4.2)	11.5 (5.3)

(unit: mm)



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