

# MagneW 3000

## Electromagnetic Flowmeters (Integral Type)

### Model KID20A/KIC20A (Sanitary Type)

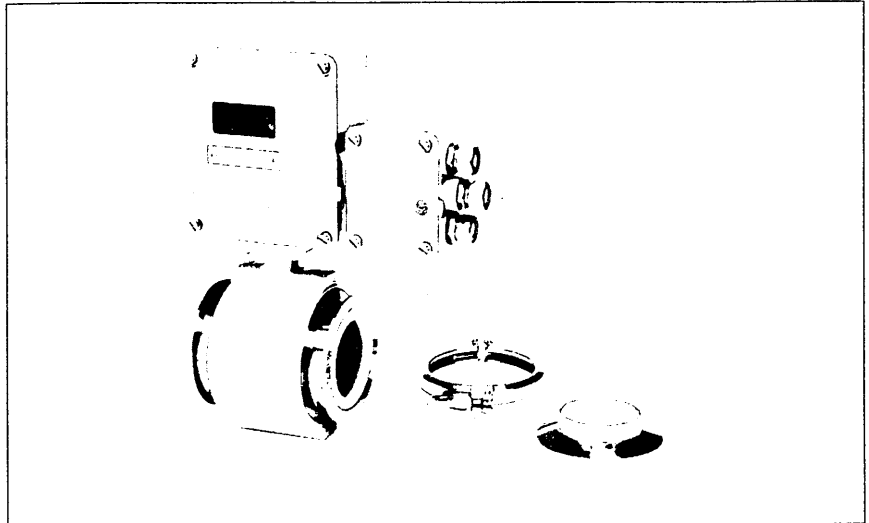
#### Introduction

The MagneW3000 Electromagnetic Flowmeters are extremely compact and light, and can lay claim to being a new generation instrument. They render high measuring accuracy and stability. Model KID20A/KIC20A sanitary-type, a key component of the flowmeter, is designed to fully satisfy applications requiring high-level sanitary standards in dairy, fermentation, and other industries.

#### Features of Electromagnetic Flowmeters

The features of electromagnetic flowmeters in general (quoted from JIS Z8764) are as follows:

- 1) Volumetric measurement of a liquid flow can be done without being influenced by changes in temperature, pressure, density, or viscosity of the liquid being measured.
- 2) Measurement is not affected by conductivity change, provided that conductivity is above a minimum level. Therefore, irrespective of the type of liquid measured, calibration can be done with the actual flow of water at normal temperature.
- 3) Liquids which contain solid suspensions can also be measured.
- 4) Pressure loss caused by measurement is practically zero.
- 5) The output signal is linearly proportional to the actual flow, starting from zero flow.
- 6) Only a short length of straight pipe is required at the upstream side of the detector as compared with those required by other types of flowmeters.
- 7) Structure without moving parts assures fast response.



#### Features of the MagneW3000 Sanitary Type Flowmeter

The outstanding features of the MagneW3000 Sanitary-type Flowmeters are as follows:

- 1) The MagneW3000 employs a square wave excitation system, thereby providing excellent zero-point stability and eliminating zero-point shift that could be caused by stain of electrodes.
- 2) The practical measuring range accuracy is  $\pm 0.5\%$  of rate.
- 3) No adjustments are required. Can be operated at the instant its power is turned on.
- 4) Adopted for piping connection are IDF clamps highly facile for mounting or demounting.
- 5) Pipe interior structure is completely free from moving mechanical parts or other items that obstruct liquid flow, thus being ideal for CIP washing applications.
- 6) The detectors are extremely compact and light, and provide a very high magnetizing efficiency—all products of their design which employs a Finite Element Method magnetic field analysis (concentrated magnetic field system).

- 7) The converters employ hybrid IC's, and they are compact, light, and reliable.
- 8) The compact and light detectors and converters are very convenient for installation and maintenance.
- 9) The flange-pincer installation-type flowmeters can be installed regardless of the flange types.
- 10) The MagneW3000 is available either in an integral type or remote type. Conversion between the two is possible.
- 11) The lining is made of Teflon PFA and embedded with an integral punched plate structure (patent No. 129514), making the MagneW3000 highly resistant to sharp changes in heat, steam, and vacuum pressures.

#### Measurable Liquids

Any liquids, provided that their electrical conductivity is  $3\mu\text{S}/\text{cm}$  or higher, can be measured irrespective of their properties or states (viscosity, temperature, pressure, or slurry).

Water: Tap water, mineral water

Foods: Beer, milk, juice, sauce, wine

Viscous liquids: Jam, yogurt

## Instrument Specifications

Item	Specifications	
Size (Diameter)	15 (0.5"S), 25 (1"S), 40 (1.5"S), 50 (2"S), 80 (3"S), 100 (4"S) mm	
Power requirement	100, 110, 120, 200, 220, 240V AC $\pm 10\%$ , 50/60Hz $\pm 2\text{Hz}$ , 24V DC $\pm 10\%$	
Power consumption	14W (22VA) (Including detector and converter)	
Outputs	Current output: 4 to 20mA DC (Load: 0 to 600 ohms) Pulse output: <ul style="list-style-type: none"> <li>• Mercury relay contact pulse output; 0 to 17Hz (Ext. power supply 30V DC max., 300mA, pulse width 30ms)</li> <li>• Counter drive pulse output; 0 to 17Hz (24V DC, external coil load 210 ohms, pulse width 30ms)</li> <li>• Open-collector pulse output; 0 to 1,700Hz (Ext. power supply 30V DC max., 100mA, pulse width selectable for 0.3ms or 30ms)</li> <li>• High-speed voltage pulse output; 0 to 1,700Hz, external load 5 k ohms or over (15V DC, pulse width selectable for 0.3ms or 30ms)</li> </ul> Flowrate indicator: 3.5 digits, 7-segment LED	
Damping time constant	1 to 10 sec. (continuously variable)	
Low flow cut-off (Drop out)	0 to 10% FS (continuously variable)	
Materials	1) Detector Case: Aluminium alloy Lining (Noncolored): Teflon PFA Electrodes (Internal insertion type): SUS316L 2) Converter Case: Aluminium alloy	
Case	Structure	NEMA4, IEC IP66, JIS C0920 Water-proof type
	Finish	Detector: Acryl baked finish (Corrosion-resistant finish) Converter: Acryl paint
	Finish color	Light beige (Munsell 4Y7.2/1.3)
Pipe connection parts	Welded type ferrule: SUS304 (#400 mirror surface finish for wet-part) Clamp band: IDF standard Gasket: Silicone rubber (Product that satisfactorily passed foods sanitation tests)	

## Installation Specifications

Ambient temperature	-10 to +50°C
Ambient humidity	10 to 90% RH
Pipe connection	IDF clamp
Cable connection	G <sup>1</sup> / <sub>2</sub> , CM20, <sup>1</sup> / <sub>2</sub> NPT internal thread
Mounting angle	The two electrodes to be in mutually horizontal position.
Ground	JIS Class 3 ground (Ground resistance not greater than 100 ohms)

## Fluid Specifications

Fluid temperature	-40 to +120°C (Up to +120°C for steam disinfection)
Fluid pressure	-1 to +10kgf/cm <sup>2</sup> G
Flow velocity ranges	0 - 0.3m/s to 0 - 9.999m/s (Can be set with 4-digit digital switch)
Electrical conductivity of fluid	3 $\mu\text{S/cm}$ or over

### Performance Specification

Item	Specifications		
	Span (Vs)	Flow rate $\geq 25\%$	Flow rate $\leq 25\%$
General accuracy	Vs = 1.0 to 10m/s	$\pm 0.5\%$ of rate	$\pm 0.125\%$ FS
	Vs = 0.3 to less than 1.0m/s	$\pm \left( \frac{0.25}{Vs} + 0.25 \right) \%$ of rate	$\pm \frac{1}{4} \left( \frac{0.25}{Vs} + 0.25 \right) \%$ FS

### Semi-standard Specification

Corrosion-resistant finish (Y138B)	Corrosion-proof finish (Y138B): Baked epoxy finish
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### Flow Conversion Table

$$V = K \times Q$$

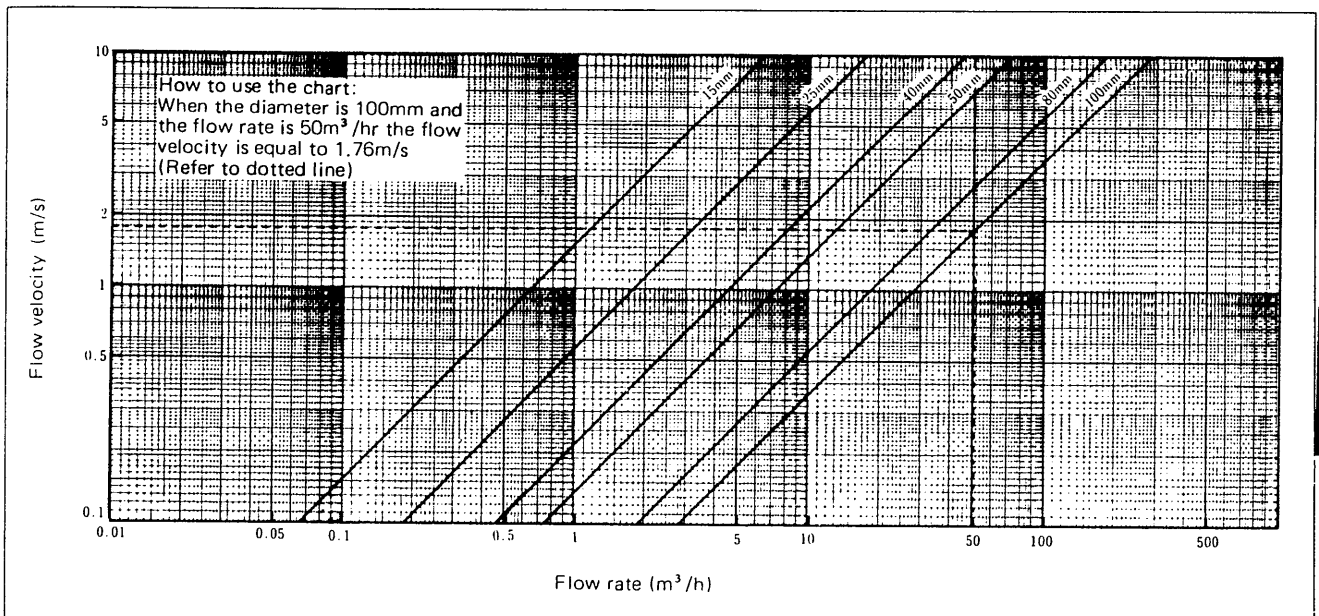
[V: Flow velocity (m/s); Q: Flow rate (m<sup>3</sup>/h);

$$K: \text{Flow conversion factor } \frac{1}{3600} \times \frac{4}{\pi D^2}]$$

Example: When size is 50mm and flow rate is 20m<sup>3</sup>/h  
 $V = 0.1415 \times 20 = 2.830$  [m/s]

Size (mm)	Flow conversion factor K	Flow span (m <sup>3</sup> /h) Q	Flow velocity (m/s) V
15 (0.5"S)	1.572	0.19 to 6.36	0.3 to 10
25 (1"S)	0.5659	0.53 to 17.7	
40 (1.5"S)	0.2210	1.36 to 45.2	
50 (2"S)	0.1415	2.12 to 70.7	
80 (3"S)	0.05526	5.43 to 181	
100 (4"S)	0.03537	8.48 to 283	

### Maximum Flow Velocity Conversion Chart



Model Number Table

(1) Detector

Ex: KID20A-0050PL51XX-X

Basic Model No.	Selections							Description
	Flowmeter Size	Lining Material	Electrode Material	Process Pipe Connection	Ground Ring	Conduit Connection	Additional Specifications	
	I	II	III	IV	V	VI	VII	
KID 20A								Integral type detector
	- 0015							15mm (0.5"S)
	- 0025							25mm (1"S)
	- 0040							40mm (1.5"S)
	- 0050							50mm (2"S)
	- 0080							80mm (3"S)
	- 0100							100mm (4"S)
		P						Teflon PFA
			L					SUS316L
				51				IDF clamp
					X			None
						X		None
							-X	None

(2) Converter

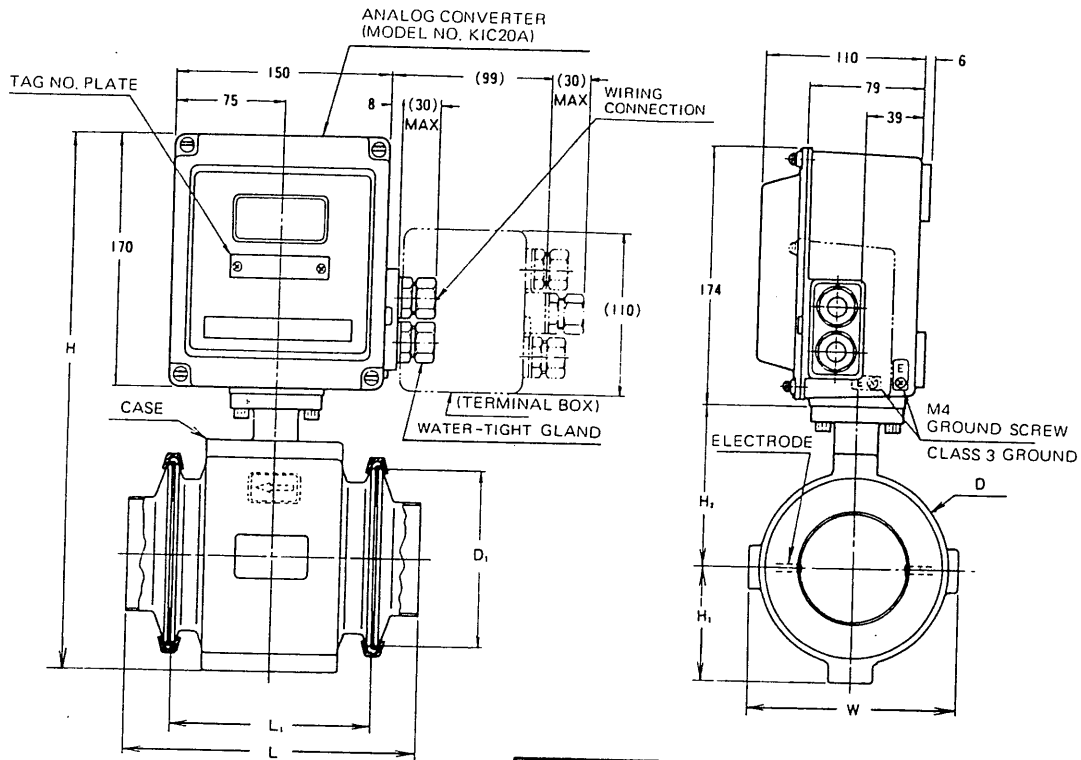
Ex: KIC20A-A1DP1XV-1

Basic Model No.	Selections								Description
	Power Supply	Output Signal			Terminal Box/ Lightning Arrester	Installation	Conduit Connection	Options	
		Analog	Indicator	Pulse					
I	II	III	IV	V	VI	VII	VIII		
KIC 20A									Integral type converter
	- A								100V AC, 50/60Hz
	- C								110V AC, 50/60Hz
	- E								120V AC, 50/60Hz
	- G								200V AC, 50/60Hz
	- I								220V AC, 50/60Hz
	- K								240V AC, 50/60Hz
	- M								24V DC
	X								None
	1								4 to 20mA DC
		X							None
		D							Flowrate indicator (%)
			X						None
			O						Open collector pulse output
			P						Totalizer drive pulse output
			Q						Mercury relay contact pulse output (Note 1)
			R						High speed voltage pulse output
				X					Without terminal box
				1					With terminal box, without lightning arrester
				2					With terminal box, with lightning arrester (Note 2)
					X				Integral type
						V			G <sup>1</sup> / <sub>2</sub> internal thread
						W			CM20 internal thread
						Y			<sup>1</sup> / <sub>2</sub> NPT Internal thread
									Water-tight gland is not available
								- X	Without water-tight gland
								- 1	With SUS304 water-tight gland
								- 2	With plastic water-tight gland

Notes 1) Not selectable for integral type instrument installed on a vertical pipe.  
 2) Specify no arrester for instrument used on liquid whose electrical conductivity is less than 100µS/cm.

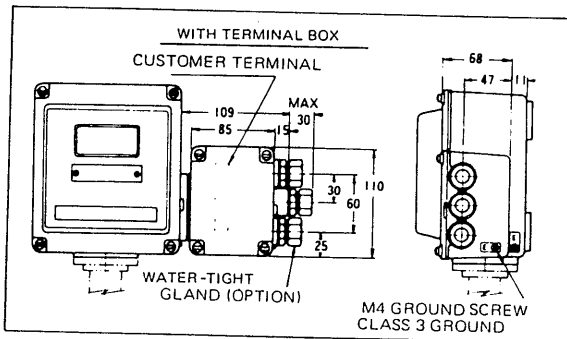
# Dimension Drawings

(Unit: mm)



Size (Diameter)		15 (0.5S)	25 (1S)	40 (1.5S)	50 (2S)	80 (3S)	100 (4 S)
Face-to-face	L	193	169	169	175	197	211
	L <sub>1</sub>	110	110	110	116	138	197
Height	H	317	317	317	333	361	385
	H <sub>1</sub>	55	55	55	64	78	90
	H <sub>2</sub>	88	88	88	95	109	121
Case width	W	104	104	104	144	144	168
	D	86	86	86	102	132	156
Case OD	D <sub>1</sub>	50.5	77.5	77.5	91	119	130
	Weight (kg)	4.8	5.6	5.5	6.3	9.5	10.3

\* With terminal box ... +0.8kg



MARK	DESCRIPTION
I+	CURRENT OUTPUT +
I-	CURRENT OUTPUT -
P+	PULSE OUTPUT +
P-	PULSE OUTPUT -
NC	—
E	CASE EARTH
N (-)	POWER SUPPLY
H (+)	

## Ordering Information

When ordering, please specify:

- 1) Model number
- 2) Condition of fluid to be measured.
  - Name of fluid
  - Temperature range
  - Pressure range
  - Conductivity
- 3) Flow span
  - Flow velocity m/s or Flow rate m<sup>3</sup>/h
- 4) For pulse output
  - Pulse width and weight

Specifications are subject to change without notice.