FMAG550 Series

Electromagnetic Flowmeter

FMAG550 ▶▶▶

한국아토셀(주)
ATOZCELL KOREA CO.,LTD.

Electromagnetic Flowmeter

FMAG550 ▶▶▶

PART Ⅰ. DETECTOR

The FMAG550's flow detectors offer the strength and durability of steel with a choice of chemical or abrasive resistant liners.

.

Features

- The FMAG550 flow detector uses the well proven electromagnetic method of measurement, which applies Faraday's Law as the principle of operation.
- No moving parts
- High accuracy
- Wide operating range
- No obstruction to the flow
- Little to no pressure loss
- Liners to suit chemical or abrasive applications
- A choice of electrodes to suit the process
- Variety of flange types available
- Robust construction
- Steel welded construction
- Submersible to 10 metres (5 feet) of water
- Suitable for buried service
- Minimal straight pipe installation requirements
- FMAG550 transmitter which features multiple outputs and flexible programming

General Applications

- Water production and distribution.
- Waste water monitoring and treatment.
- Irrigation flow measurement.
- Mining slurries.
- Effluent discharge
- Pulp and paper applications

Technical Data and Specifications

Accuracy	
Display And Outputs	0.5% of rate or 1mm/sec whichever is greater(Option 0.2%)
Velocity Range:	0.1 to 10m/sec(0.01m/sec option)
Turndown from Full Scale:	> 1000:1
Pressure Effects:	Negligible effect
Repeatability:	< 0.05 %
Power Supply Variations:	Negligible

Note : Under reference conditions

Specifications	
Sizes	10mm-1200mm NB
Metering Tube	304 Stainless steel
Lining	Chloraprene Rubber, F.E.P PTFE, , Linatex, Polyurethane
Electrodes	316L S/S(STD) , Hastelloy 'C' Tantanum, Titanium, Tungsten , Carbide, Monel
Earthing	316SS(STD), Hastelloy “C” Tungsten Tipped 304SS Discs
Process Flange	KS 10K RF
Connections	ANSI Other available on request
Pressure Limits	Limited by flange rating
Temperature Limitations	Dependent on Linear selection, Hard Rubber=80℃, FEP=120℃ PTFE=160℃
Environmental Protection	IP65/IP67
Housing	All steel welded case with two part 304 Flange(option)

Installation Requirements

Detector

Mounts directly into the process pipeline and can be installed in horizontal, vertical or sloped pipelines. The preferred axis of the detector measuring electrodes is horizontal. Note:For accurate flow measurement the flow detector must always be full. Recommended installations requirements are 5 diameters of straight pipe section upstream and 3 diameters downstream.

Electromagnetic Flowmeter

FMAG550 ▶▶▶

PART Ⅱ. TRANSMITTER

A comprehensive range of electromagnetic flowmeters to suit applications from water to abrasive and corrosive process fluids.

Features

- The FMAG550 uses the well proven electro-magnetic method of measurement, which applies Faraday's Law as the principle of operation. This technique features a straight through section of pipe with no obstruction to restrict flow and no moving parts to wear or break.
- Highly accurate. 0.2 % of rate from 0.5 to 10 metres per second.
- Integral key pad standard. All configuration is performed via front keypad. No plug-in programmer required.
- 32 character display standard, displays rate, total and diagnostic messages.
- Display guides operator with menu prompts during configuration.
- Comprehensive output options, Include multiple analogue, relay, digital and serial outputs.
- Self calibrating system with in-field verification.
- Self monitoring and diagnostic functions. Constantly monitors system integrity and measurement validity. Diagnostics can be linked to outputs for diagnostic alarm.
- Combined type flow transmitter

General Applications

Electromagnetic flowmeters for the accurate flow measurement of any conductive fluid, Ideally suited to water and waste water treatment plants, mining and general industry.

Technical Data

Display: 32 character (2 line x 16 character) alpha-numeric backlit LCD. Displays rate of flow, total flow, alarms, analogue outputs and relay annunciators. Displays text prompts in programming mode.

Configuration: All functions are accessible via 4 button integral key pad. A logical 4 group menu system with display prompts ensures ease of configuration.

Outputs:

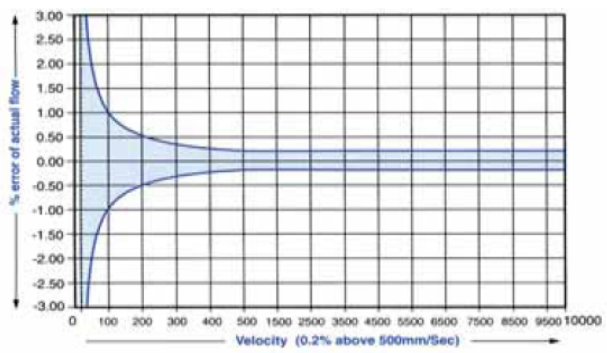
- 24VDC Power Output
- 1 x 4-20 mA Output Fully isolated. (max. load 750 ohms)
- 2 x relays with change over contacts. Hi / Low alarm
- 2 x Digital open collector output
- 1 x RS422/RS232 (Optional)

Power supply: 24VDC. 85-265 VAC 50/60Hz. (* 20%). Power consumption, 25 VA.

Enclosure: Rated IP65 Combined type

Accuracy: *0.2% of rate or *0.001 metres (*0.003 feet) per second, whichever is greater, from 0.5 to 1 0 metres (1 -65 to 33 feet) per second.

Velocity/Accuracy Graph



Resolution	18 bit.
Linearity	< 0.05%
Repeatability	< 0.05%
Temp, stability	< 0.05% range, minus 10-55°C (14-131°F)
Voltage effects	Negligible
Turndown from FS	> 1000:1
Separation	100 metres (328 feet).
Conductivity	5µS/cm.

Electromagnetic Flowmeter

FMAG550 ▶▶▶

Set-up and Operation

The operation and set-up of the system are broken into two main areas:

Commissioning Mode
Only accessible through a security code to avoid unauthorised access. This mode is used to set the Flow System to your application requirements, including Flow Range, Flow Units, Response Time, Simulations, Outputs etc. Settings may be made either direct via the four button keypad or remotely using the Comms Port. When information is provided, the FMAG 550 is supplied configured to customer requirements.

Operations Menu
Displays readings in normal run mode. The default display shows the Flowrate and Totaliser with an indication of Forward Flow.
The operator may also call up other displays, using the up/down arrow key, such as
• Total / Rate
• Accumulated Total
• Error Status
The display automatically reverts back to default display after ten seconds.

Diagnostics
The FMAG550 incorporates advanced diagnostics which monitor the integrity of the system, including:
• Detector Head Current
• Detector Head Cabling
• Internal Reference Voltages
• A to D Conversion

Configuration options
• Detector Head Size
• Low-flow Cut-off
• Detector Head Constant
• Failsafe Modes
• Flow range
• Relay functions
• Outputs

The LCD display and integral keypad allows the user complete control over all configurable functions.

Operator interface
The FMAG550 includes an integral 2 line alphanumeric display and keypad as standard. No plug in programmer is required. Password protection is included to prevent unauthorized tampering. All parameters are sequenced in a logical, easy to follow order. Configuration prompts on the display further simplifies set-up.

Automatic electrode cleaning
A high frequency applied to the Electrodes between each measurement cycle is used to continuously clean the electrodes. This feature removes the errors caused by coating which typically occurs in many applications.

Electromagnetic Flowmeter

FMAG550 ▶▶▶

PART III. ENERGY COMPUTE

FMAG550E (ElectroMagnetic Flowmeter With Energy Compute Function) is design ed to measure energy used in heating system or cooling system.

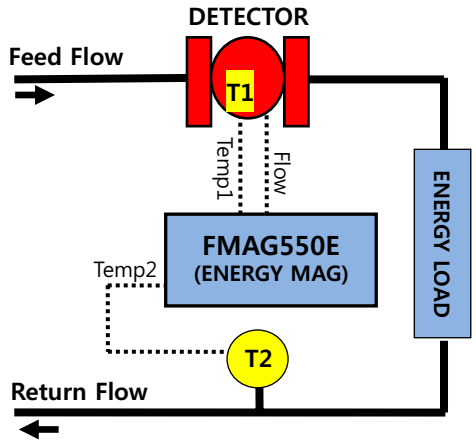
This two temperature input feature can be used to calculate energy consumption. Temperature input in both the feed and returns lines are measure via RTD(pt100).

FMAG550E (Energy MAG) has general func tion of FMAG550. In addition to Energy calculation function.

Features

- Designed to **OIML R75**, **KS B5304**, **EN1434**
- Energy Unit selected calorie or watt (BTU, KWh, MWh, MJ, GJ, Mcal, Gcal)
- Additional Information Display
  - Heating energy total
  - Cooling energy total
  - Accumulated energy total
  - Energy flow rate
  - Feed, Return temperature
  - Differential temperature (ΔT)
- Auto switching Heating and cooling mode
- Cooling energy pulse output
- Heating energy pulse output

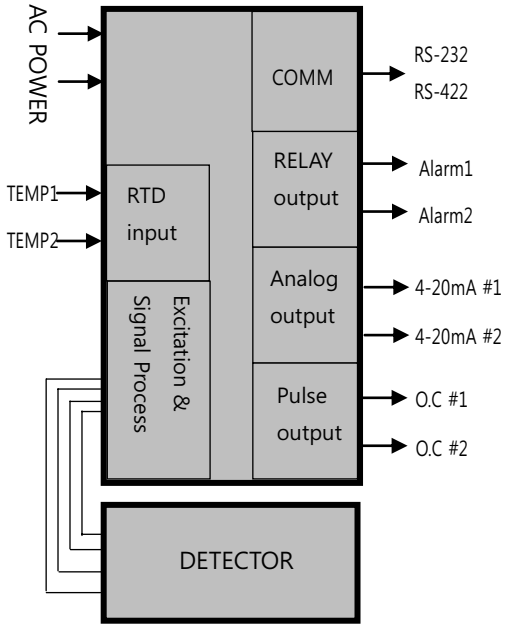
System diagram



Applications

- Chilled water, hot water and condenser water system for Commercial office tenant billing
- Central plant monitoring
- University campus monitoring
- Institutional energy cost allocation
- Performance/efficiency evaluations
- Performance contracting energy monitoring

Block Diagram



Installation Function

Temperature input

Type : Platinum PT100

Range : -100℃ to 100℃

Communication

BaudRate : 1200~19200bps

Type : RS-232/422/485 Modbus protocol

Analog Output

Function : Flow or Energy rate output

Accuracy : Isolated 12-bit 0.025% better than

Pulse & Relay output

Relay output : Alarm output 2 channel

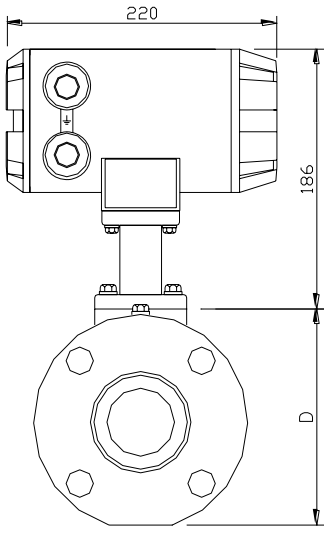
Pulse output : Energy or Flow total output

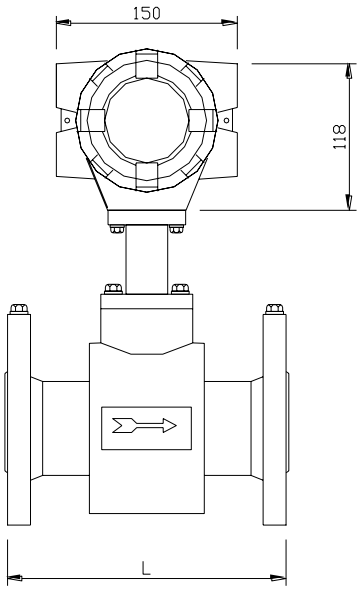
Electromagnetic Flowmeter

FMAG550 ▶▶▶

Dimensions

Meter Size		Drawing size		Standard Pressure Rating PN	Mini. Flow Range Flow Velocity 0 to 0.5 m/s				Max. Flow Range Flow Velocity 0 to 10 m/s			
DN	Inch	D	L									
10	3/8	90	160	40	0	to	2.0	l/min	0	to	40	l/min
15	1/2	95	160	40	0	to	5.0	l/min	0	to	100	l/min
20	3/4	100	200	40	0	to	7.5	l/min	0	to	150	l/min
25	1	115	200	40	0	to	10	l/min	0	to	200	l/min
32	1-1/4	140	200	40	0	to	20	l/min	0	to	400	l/min
40	1-1/2	140	200	40	0	to	30	l/min	0	to	600	l/min
50	2	165	200	40	0	to	3	m³/h	0	to	60	m³/h
65	2-1/2	185	200	40	0	to	6	m³/h	0	to	120	m³/h
80	3	200	250	40	0	to	9	m³/h	0	to	180	m³/h
100	4	220	250	16	0	to	12	m³/h	0	to	240	m³/h
125	5	285	250	16	0	to	21	m³/h	0	to	420	m³/h
150	6	280	300	16	0	to	30	m³/h	0	to	600	m³/h
200	8	340	350	10/16	0	to	54	m³/h	0	to	1080	m³/h
250	10	395	400	10/16	0	to	90	m³/h	0	to	1800	m³/h
300	12	445	400	10/16	0	to	120	m³/h	0	to	2400	m³/h
350	14	505	400	10/16	0	to	165	m³/h	0	to	3300	m³/h
400	16	565	450	10/16	0	to	225	m³/h	0	to	4500	m³/h
450	18	615	450	10/166	0	to	300	m³/h	0	to	6000	m³/h
500	20	670	450	10	0	to	330	m³/h	0	to	6600	m³/h
600	24	780	600	10	0	To	480	m³/h	0	to	9600	m³/h
700	28	895	700	10	0	To	660	m³/h	0	to	13200	m³/h
800	32	1015	800	10	0	To	900	m³/h	0	to	18000	m³/h
900	36	1140	1180	10	0	To	1200	m³/h	0	to	24000	m³/h
1000	40	1245	1310	10	0	to	1350	m³/h	0	to	27000	m³/h



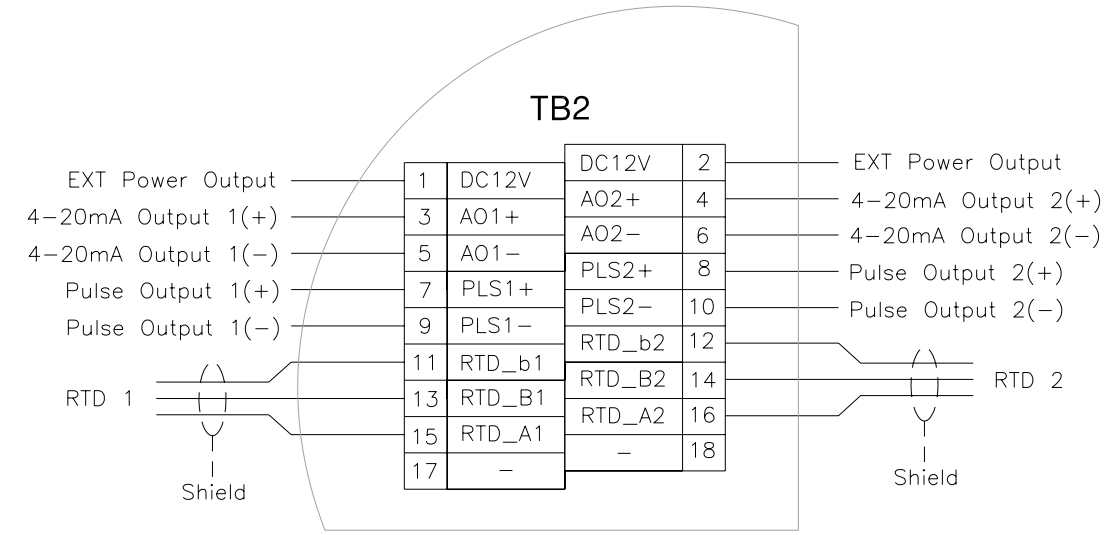


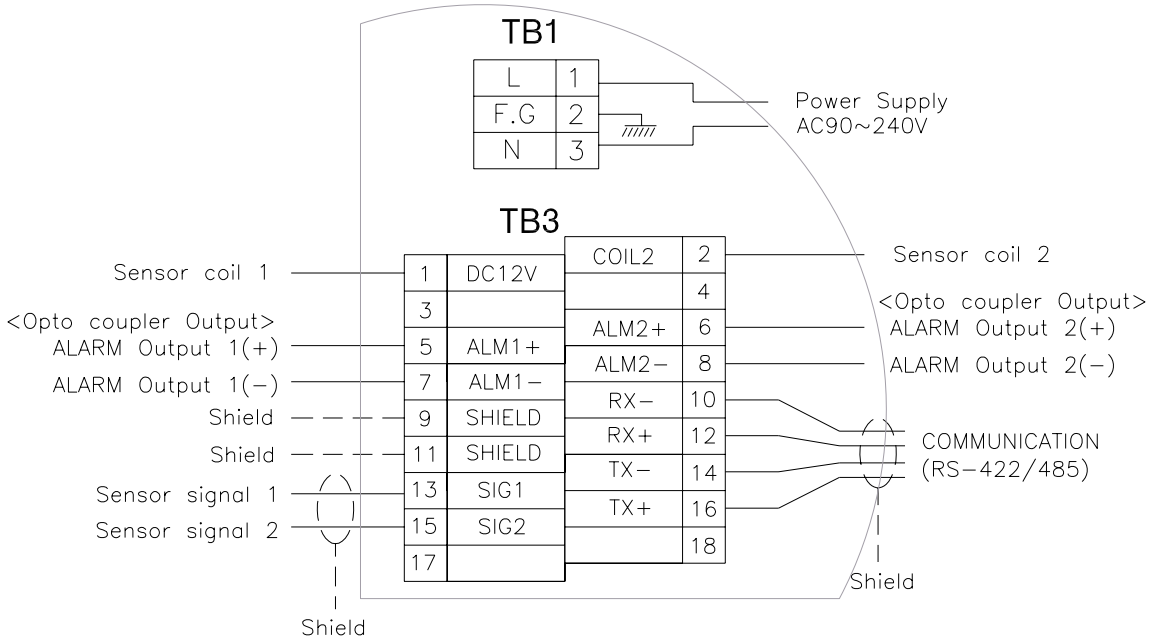
Electromagnetic Flowmeter

FMAG550 ▶▶▶

Wiring Diagram (#1)

Integrated Type



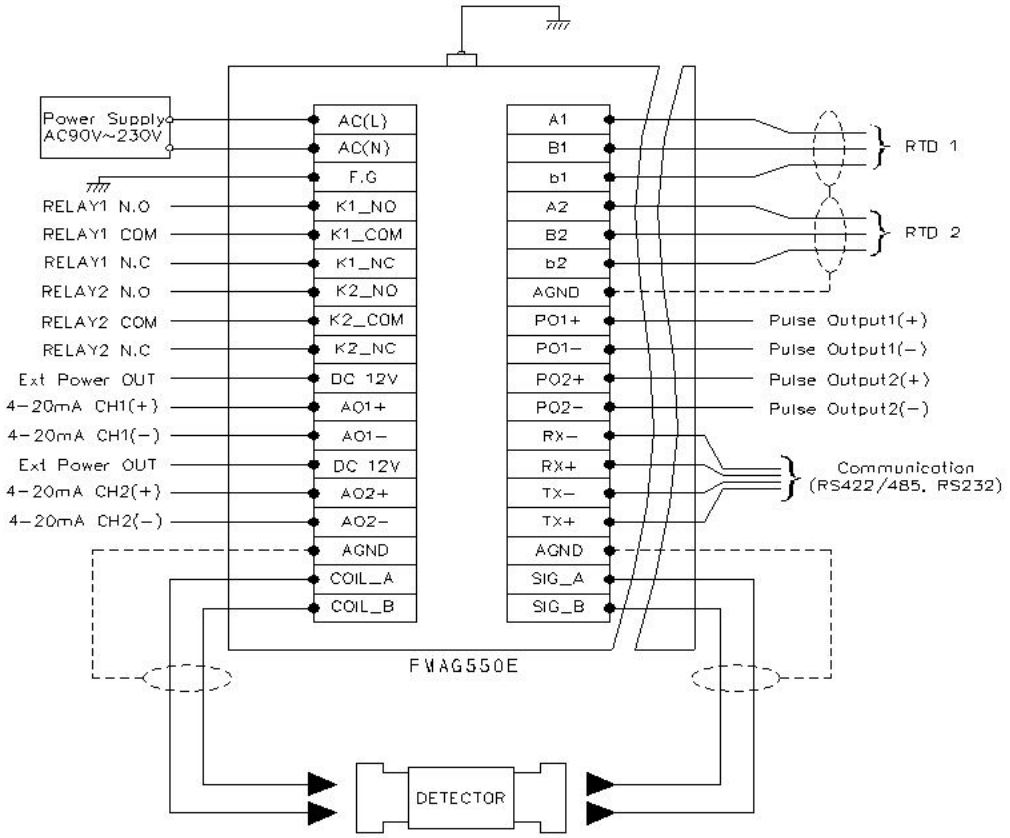


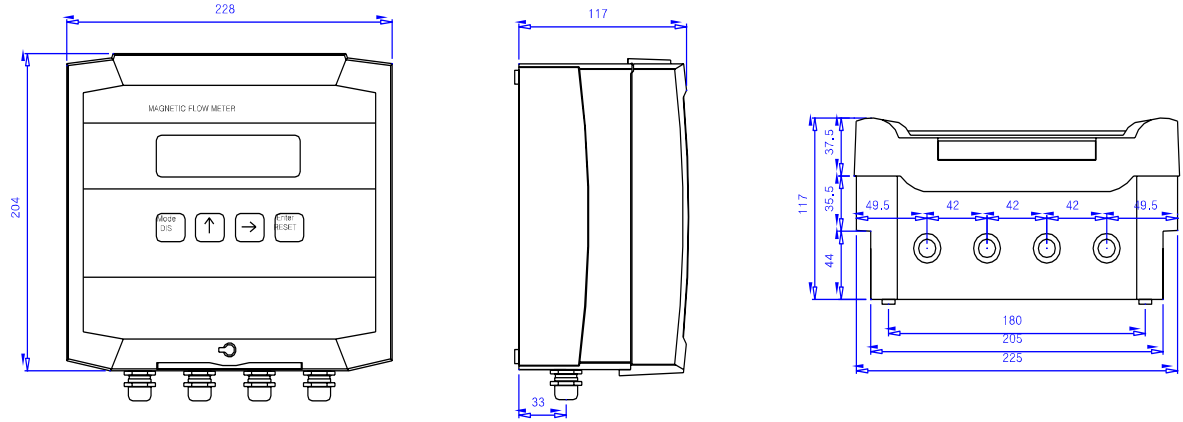
Electromagnetic Flowmeter

FMAG550 ▶▶▶

Separated Type

Wiring Diagram (#2)





Electromagnetic Flowmeter

FMAG550 ▶▶▶

Ordering Information

Example: FMAG550E-100K11-SXCID1A0

FMAG550	E	100	K1	1	S	X	C	I	D	1A	0
Function	**G** **E**							General MAG Energy MAG			
Detector	**SIZE**	**010** **015** **020** **032** **040** **050** **065** **080** **100** **125** **150** **~**						10 mm 15 mm 20 mm 32 mm 40 mm 50 mm 65 mm 80 mm 100 mm 125 mm 150 mm ~1000 mm			
	CONNECTION		**K1** **K2** **C1** **C2** **P0** **T0**					KS 10 Kg KS 20 Kg ANSI 150 ANSI 300 PT THRADED TRICLOVER(SANITARY)			
	LINING MATERIAL			**1** **2** **3** **4** **0**				Chloroprene Rubber F.E.P PTFE PFA Special			
	ELECTRODES				**S** **T** **U** **P** **H** **O**			316L SS(STD) Titanium Tantalum Platinum-Iridium Hastelloy-C Special			
	EARTH RING					**X** **S** **H** **T** **D** **O**		None (STD) Stainless-316 Hastelloy-C Tungsten Tipped Staonless-304 Special			
	SENSOR HOUSING MATERIAL						**C** **S**	Carbon Steel(STD) Stainless-304			
Transmitter	**TRANSMITTER LOCATION**							**I** Intergral Mount **R** Remote Mount			
	POWER								**D** **DC 24-36V** **E** **AC90-230V FREE**		
	ANALOG OUTPUT									**1A** **1Anlog,2-Relay(STD)** **2A** **2Anlog,2-Relay(OPT)**	
	COMMUNICATION										**0** **No Communication** **1** **RS232-C** **2** **RS422/485(MODBUS)**