MAG SERIES
MAGNETIC FLOW METERS

The Growco MAG Series is our Intelligent Electromagnetic Flow Meters which are designed based on Faraday Electromagnetic Induction Law and are typically used as standalone flow meters or used together with electronic controllers or PLC for flow measurement used in water treatment plants, waste water plants, food and beverage plants, pharmaceutical plants, chemical and Petroleum plants or related processing installations.

➢ TYPICAL FEATURES OF MAG SERIES:

- Stable and reliable operations.
- Straight through flow design.
- Simple structure and easy maintenance.
- Insensitivity to temperature, pressure, viscosity and density due to the changes of the measured fluid.
- Wide applications which can measure conductivity without reference to solid or suspended material contained in the liquid.
- Easy installation at any angle as long as liquid are completely filled in the pipe with straight pipe of 5D on the upstream of the flow meter and 3D on the downstream.
- Turndown Ratio can reach up to 1 : 100.
- No moving parts design.

Typical Photograph of Mag Series Flow Meters with Accessories

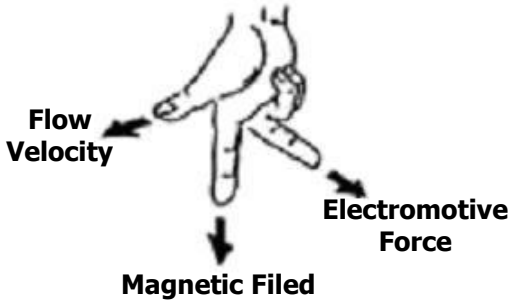
➢ PRINCIPLE OF OPERATIONS

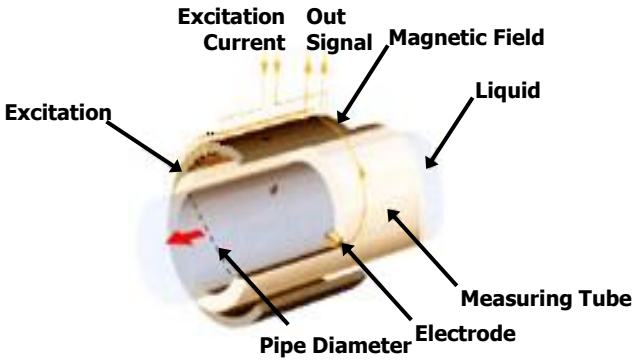
The Growco MAG Series is our Intelligent Electromagnetic Flow Meters which are designed based on Faraday Electromagnetic Induction Law:

The operation of a magnetic flow meter is based on Faraday's Law, which states that the voltage induced across any conductor as it moves at right angle through a magnetic field is proportional to the velocity of that conductor.
Faraday's Formula:

E = KBDV where:

E = The voltage generated in the conductor
K = Instrument constant.
B = Magnetic field strength.
D = Length of the conductor (The distance between the electrodes).
V = Average velocity in the cross section of the measured pipe.





To apply this principle to flow measurement with a magnetic flow meter, it is necessary first to state that the fluid being measured must be electrically conductive for the Faraday principle to apply.

When measuring flow rate, the conductive liquid flows at a velocity of V perpendicularly through a magnetic field, which inducts a voltage that is direct proportional to the average velocity. The inducted voltage signal is measured on two or more poles immediately contacted with the liquid, sent to a convertor through the cable, and then intelligently processed before it is sent to and displayed in a LCD display or converted into 4~20mA or 0~1kHz output.

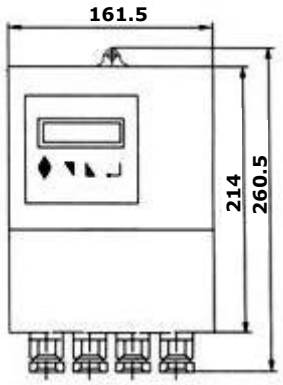
- **GENERAL FLOW METERS SPECIFICATIONS**

Typical photograph of Mag Series Flow Meter with Integrated Display

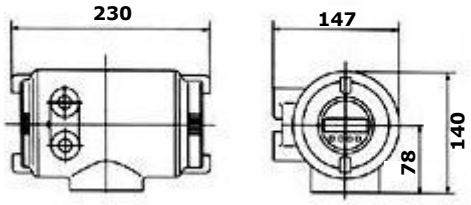
Nominal Diameter Range	: 15 ~ 3,000mm (Approx.120")
Accuracy Types	: +/-0.3%, +/-0.5% and +/-1.0%
Repeatability Types	: +/-0.15%, +/-0.25% and +/-0.5%
Ambient Temperature	: Sensor (Separate Type): -20°C~+70°C
Converter	: -20°C~+50°C
Integral type	: -10°C~+50°C
Humidity	: 5% ~ 95% RH (No Frost)
Vibration	: 55Hz (Frequency)
Ambient magnetic field	: $\leq$400A/m
Fluid Temperature	: Integral Type $\leq$+80°C Separate Type (Rubber Lining) $\leq$+80°C (PTFE Lining) $\leq$+120°C
Nominal Pressure	: 0.6 Mpa ~ 32.0 Mpa
Liquid Conductivity	: $\geq$5S/cm
Power Supply	: DC24V$\pm$5% or 100-240VAC/47~63Hz
Output Signal	: 4~20mA/0~10mA, Standard Pulse output
Communication	: RS485 computer Interface and HART Protocol.
Alarm output	: Available
Electrode Material Options	: Stainless Steel, Hastelloy, Titanium, Carbonized Tungsten (contact us for other materials)
Lining Material	: PTFE, Synthetic Rubber
Flange Material	: Cast Steel and Stainless Steel
Measuring Tube	: Stainless Steel
Flange Standard	: DN or contact us for others or custom-made types
Enclosure	: IP 65 (Option for IP 68)

- **GENERAL TRANSMITTERS SPECIFICATIONS:**
  - Back light LCD Display with three grades password protection and other functions.
  - Intelligent self-diagnostic features and alarms warnings.
  - Low power consumption and zero stability.
  - Standard Pulse Output (option: 4~20mA or 0~10mA current output).
  - Communication: RS485 computer interface with HART Protocol.

Various Types of Display Transmitters Options Shown Below:



a) Typical Square Type Transmitter



b) Typical Round Type Transmitter

➢ CAUTIONS FOR THE INSTALLATION:

- ❑ Welding slug, foreign sharp particles, etc. in the pipe must be cleared up before the Flow meter is installed.
- ❑ Install the Flow meter correctly (e.g. Horizontally or Vertically based on purchased requirement).
- ❑ Ensure that liquid are completely filled in the pipe with straight pipe of 5D on the upstream of the flow meter and 3D on the downstream of the flow meter.
- ❑ Do not install at close proximity to heat source or strong magnetic field.
- ❑ Please also follow any required local standard recommendations of pipeline installations to ensure compliance to local safety requirements.

➢ NOTES WHEN ORDERING:

- Describe its application and specify minimum & maximum flow rates.
- Specify accuracy type.
- Specify its model/series or size.
- Specify working & maximum pressures.
- Specify liquid name which must
- Be electrically conductive & it's acidity properties.
- Specify voltage.
- Specify horizontal or vertical installation.
- Other useful details or contact us.

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