

Picomag Magnetic-Inductive Liquid Flow Meters

Part No. [DMA25-AAACA1](#)

Features

- Small size is ideal for limited space and hard to reach installations
- No minimum inlet or outlet pipe run requirements
- 1/2" to 2" NPT female process connections
- Measure up to 198 GPM
- Measure process medium temperature and conductivity in addition to flow and total volume
- Large color display auto-rotates based on installation orientation
- Bluetooth wireless configuration and monitoring with the free SmartBlue for Android and iOS devices
- 4-pin M12 quick disconnect
- Two outputs selectable for switch, pulse, or analog signals
- IO-Link connectivity
- NSF/ANSI 61 drinking water certification and cULus Listed

The Endress+Hauser Picomag series magnetic-inductive flowmeter is designed for in-line flow measurement of conductive liquids such as drinking and industrial water with a minimum conductivity of 10 $\mu\text{S/cm}$. The small size of the Picomag series makes it ideal for use on process skids where space is often limited, or in difficult to reach locations. Because it requires no minimum inlet and outlet pipe runs, Picomag flowmeters can be mounted directly before or after a pipe bend.

Available with process connection sizes ranging from 1/2" to 2" female NPT, the Picomag series can measure flows up to 198 GPM with $\pm 0.1\%$ full scale accuracy. In addition to flow, Picomag can also measure the process liquid temperature from 14 to 158°F (-10 to 70°C) with $\pm 4.5^\circ\text{F}$ ($\pm 2.5^\circ\text{C}$) accuracy and conductivity up to 30,000 $\mu\text{S/cm}$ with $\pm 5 \mu\text{S/cm}$ accuracy. Available outputs include analog 4-20mA and 2-10VDC configurable for volumetric flow, rate, temperature, or conductivity; switching outputs configurable as NPN or PNP for limit or window switching based on flow temperature, conductivity, flow totalizer, or empty pipe detection; and pulse output for total flow volume. Additionally, one of the outputs can be configured for IO-Link connectivity providing flexible integration into automation systems. The Picomag also accepts a digital input used to reset the flow totalizer or set a flow override.

Picomag's large, user-friendly color display allows for quick reading of flow, temperature, conductivity, and totalizer values, as well as warning and alarm messages. For optimal readability, the screen rotates automatically depending on the installation orientation. Configuration parameters can be called up and monitored by simply knocking on the device.

The Picomag is configured and monitored with its Bluetooth wireless interface on Android and iOS devices via the free SmartBlue App. With a wireless connection distance of up to 32 ft Picomag is ideal for installation sites which are difficult to access.

The robust stainless steel Picomag flowmeter has high shock and vibration resistance, IP65/67 protection, a PEEK measuring tube, and is suitable for process medium temperature from 14 to 158°F with a maximum pressure of 232 psi. It fulfills EMC requirements according to IEC/EN 61326, is NSF/ANSI 61 certified for drinking water applications and is cULus Listed.

Download the free Endress+Hauser SmartBlue Mobile App for phone or tablet:



Scan or click the QR code for the Picomag IO-Link Quick Start Guide



For a variety of cable options see our website www.AutomationDirect.com



Picomag Magnetic-Inductive Liquid Flow Meter Selection

Part No.	Price	Connection	Flow Range	Temperature Range	Totalizer Range	Conductivity Range	Output 1	Output 2	Weight (lbs)	Drawing Link	Vendor Operating Instructions
DMA15-AAACA1	\$572.00	1/2" FNPT	0 to 9.2 GPM	14 to 158°F [-10 to 70°C]	+/-3.436E10 liters	20 to 30,000 $\mu\text{S/cm}$	• Flow rate, analog or switch • Temperature, analog or switch • Conductivity, analog or switch • Volumetric flow totalizer pulse • Empty pipe detection switch • Flow totalizer reset digital input • Flow override digital input • IO-Link	• Flow rate, analog or switch • Temperature, analog or switch • Conductivity, analog or switch • Empty pipe detection switch • Flow totalizer reset digital input • Flow override digital input	1.1	PDF	PDF
DMA20-AAACA1	\$688.00	3/4" FNPT	0 to 19.8 GPM						1.2	PDF	PDF
DMA25-AAACA1	\$824.00	1" FNPT	0 to 39.6 GPM						1.3	PDF	PDF
DMA50-AAACA1	\$1,106.00	2" FNPT	0 to 198.1 GPM			20 to 10,000 $\mu\text{S/cm}$			4.0	PDF	PDF

Picomag Magnetic-Inductive Liquid Flow Meters

Picomag Magnetic-Inductive Liquid Flow Meter Specifications	
Input	
Measured Variables	Volume flow, temperature, conductivity
Measuring Range (volume flow measurement)	DN 15 (½"): 0.05 to 35 l/min (0.013 to 9.2 gal/min) DN 20 (¾"): 0.1 to 75 l/min (0.026 to 19.8 gal/min) DN 25 (1"): 0.2 to 150 l/min (0.052 to 39.6 gal/min) DN 50 (2"): 1.5 to 750 l/min (0.4 to 198.1 gal/min)
Measuring Range (medium temperature measurement)	-10 to +70°C (+14 to +158°F)
Measuring Range (conductivity measurement)	DN 15 (½"): 20 to 30,000 µS/cm DN 20 (¾"): 20 to 30,000 µS/cm DN 25 (1"): 20 to 30,000 µS/cm DN 50 (2"): 20 to 10,000 µS/cm
Digital Input	High or low active Switch-on level 15V Switch-off level 5V Internal resistance 7.5 kΩ
Output	
Current Output	≤ 500Ω
Voltage Output	≥ 600Ω
Pulse Output	Max. pulse rate: 10,000 Pulse/s
Signal On Alarm	Status signal (as per NAMUR Recommendation NE 107) Plain text display with remedial action
Switch Output	Switching behavior: PNP or NPN Max. load 250mA
Power Supply	
Electrical Connection	4-pin M12 x 1 A-coded
Supply Voltage Range	18 to 30 VDC (SELV, PELV, Class 2)
Power Consumption	Maximum 3 W Without outputs IO1 and IO2: 120mA With outputs IO1 and IO2: 120mA plus the effective load currents
Performance Characteristics	
Volume Flow Measurement	
Flow Rate Units	GPM, fl oz/min, l/min, l/sec, l/hr, m³/hr, selectable
Flow Totalizer Units	Gal, kgal, fl oz, l, kl, Ml, m³, selectable
Reference Operating Conditions	Water, +15 to +45 °C, 2 to 6 bar
Maximum Measured Error	± 0.8 % o.r. ± 0.1 % o.f.s.
Repeatability	± 0.2 % o.r.
Medium Temperature Measurement	
Temperature Units	°F, °C, selectable
Maximum Measured Error	± 2.5°C
Repeatability	± 0.5°C
Conductivity Measurement	
Conductivity Units	µS/cm, S/m, mS/cm, selectable
Repeatability	± 5 % o.r. ± 5 µS/cm
Maximum Measured Error, Current Output	
Additional Error	± 20µA @ device temperature of 25°C
Repeatability	± 10 µA
Response Time T90*	Typically 200ms
Maximum Measured Error, Voltage Output	
Additional error	± 60mV @ device temperature of 25°C
Repeatability	± 10mV
Response Time T90*	Typically 200ms

* The response time T90 is the time a measuring system needs to display 90% of the change of the measured value.

Picomag Magnetic-Inductive Liquid Flow Meters

Picomag Magnetic-Inductive Liquid Flow Meter Specifications Cont.

Environment	
Ambient Temperature Range	-10 to +60°C (+14 to +140°F)
Storage Temperature	-25 to +85°C (-13 to +185°F)
Degree Of Protection	IP65/67, pollution degree 3
Humidity And Moisture	Suitable for indoor environments with up to 100% rh (wet and damp locations)
Operating Altitude	up to 2,000 M
Shock Resistance	20g (11ms) in accordance with IEC/EN60068-2-27
Vibration Resistance	Acceleration up to 5 g (10 to 2,000 Hz) in accordance with IEC/EN60068-2-6
Electromagnetic Compatibility (EMC)	According to IEC/EN61326 and/or IEC/EN55011 (Class A)
Process	
Medium Temperature Range	-10 to +70°C (+14 to +158°F) Permissible short-term temperature: maximum one hour 85°C (185°F) every 4 hours. Permissible short-term temperature with electronics switched off: maximum one hour 100°C (212°F) every 4 hours.
Medium Properties	Liquid, conductivity $\geq 10 \mu\text{S/cm}$ for flow measurement ($\geq 20 \mu\text{S/cm}$ for conductivity measurement)
Pressure	Max. 16 BAR _{rel}
Materials	
Wetted Parts	
Measuring Tube	PEEK (Polyether ether ketone)
Electrodes, Temperature Sensor	1.4435/316L
Process Connection	1.4404/316L
Seal	FKM (fluorine rubber)
Housing Material	
Housing	1.4404/316L, 1.4409/CF ³ M
Display Window	Polycarbonate
Operability	
Display	4 measured variables can be displayed (volume flow, temperature, conductivity, totalizer)
Operation	Via Bluetooth® wireless technology Via IO-Link PDF
Digital Communication	Via IO-Link PDF
SmartBlue App	The device has a Bluetooth® wireless technology interface and can be operated and configured using the SmartBlue app. • The range under reference conditions is 10m (33ft) • Unauthorized access is prevented by means of encrypted communication and password encryption • The Bluetooth® wireless technology interface can be disabled



Note: Check the chemical compatibility of the sensor's wetted parts with the medium to be measured.

Accessories



Part No. [71345225](#)

Picomag Accessory			
Part No.	Description	Price	Weight (lbs)
71345225	Endress+Hauser grounding clamp, 316 stainless steel. For use with Endress+Hauser Picomag series flow meters.	\$23.00	0.01

The Grounding Clamp is used when a Picomag series Magnetic-Inductive Flow Meter is installed in an ungrounded pipe system (e.g. PVC pipe). Simply place the Grounding Clamp around the base of the M12 connector and attach a grounded wire to the Grounding Clamp with the supplied machine screw and nut. Torque screw and nut assembly to 2.5 Nm.

Note: Improper grounding may cause inaccurate readings.

Magnetic-Inductive Flow Meters



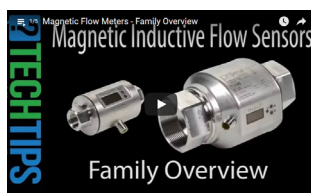
ProSense FMM Series



Endress+Hauser Picomag Series

Magnetic-Inductive Flow Meter Application

Magnetic-inductive flow meters (Magmeters) are one of the most widely used technologies for liquid flow monitoring in industrial process markets such as wastewater, mining and minerals, utilities, food and beverage, and pharmaceuticals. To ensure reliable and accurate operation, some important application requirements should be considered. Meeting the minimum conductivity of the liquid and properly installing with a full pipe are required in order to avoid significant error or the meter not functioning at all. Additionally, the presences of air bubbles should be avoided as they will affect the accuracy of the meter's measurements. Installation location in the piping is important because disturbances in the flow caused by bends in the pipe, valves, reductions, etc. can cause inaccuracies. The Endress+Hauser Picomag series has no minimum inlet or outlet pipe run requirements making it ideal for small confined spaces. Refer to the magmeter's specifications and operating instruction documents for specific information regarding application and installation requirements.



Click on the thumbnail or go to <https://www.automationdirect.com/VID-FL-0002> for a short overview video of the FMM Series Magnetic-Inductive Flow Meters

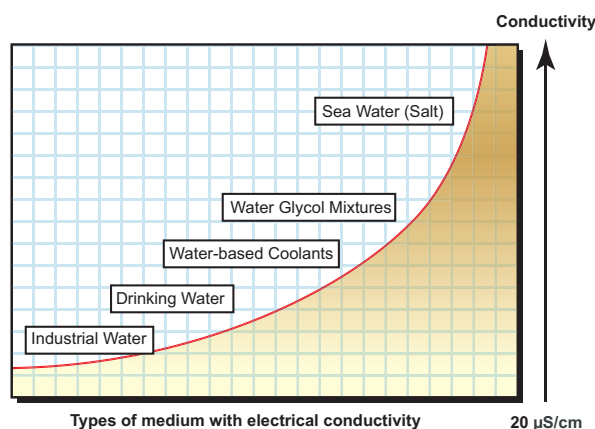
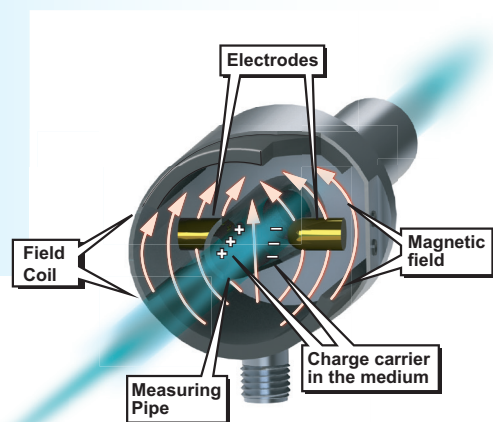


Click on the thumbnail or go to <https://www.automationdirect.com/VID-PS-0024> for a short overview video of the Endress+Hauser Picomag Series Flow Meters

Magnetic-Inductive Flow Meter Measuring Principle

Magmeters operate by using the magnetic-inductive measuring principle in which a magnetic field is generated in the specified measuring pipe by current-carrying coils. When the media flows through the pipe, the ions of the conductive media are diverted perpendicularly to the magnetic field with the positive and negative charge carriers flowing in opposite directions. The two electrodes that are in contact with the medium then measure the voltage that is induced.

The measured signal voltage is proportional to the average flow velocity. By knowing the inside pipe diameter of the unit, the volumetric flow rate is determined. Magmeters are suitable for use with a variety of conductive liquids in industrial process applications such as those in the following graph:



Click on the thumbnail or go to <https://www.automationdirect.com/VID-FL-0006> for a short video to learn how Magnetic Inductive Flow Meters works

Magnetic-Inductive Flow Meters

ProSense FMM Series Magnetic Flow Meter Selection Guide

Model	Price	Process Connection	Flow Range	Temperature Range	Display Units	Output 1	Output 2	Empty Pipe Detection	
<u>FMM50-1001</u>	\$556.00	1/2" FNPT	0 to 6.6 GPM	-4 to 176°F [-20 to 80°C]	GPM, GPH, GAL, or °F	Switch or pulse (flow)	Switch, analog or reset input (flow or temperature)	No	
<u>FMM75-1001</u>	\$602.00	3/4" FNPT	0 to 13.2 GPM						
<u>FMM100-1001</u>	\$666.00	1" FNPT	0 to 26.4 GPM			Switch, pulse or frequency (flow)		Yes	
<u>FMM150-1001</u>	\$997.00	1-1/2" FNPT	0 to 80 GPM						
<u>FMM200-1001</u>	\$1,075.00	2" FNPT	0 to 160 GPM		GPM, GPH, LPM, m³/h, °F, °C	Analog 4-20 mA (temperature)	Analog 4-20 mA (flow)	No	
<u>FMM50-1002</u>	\$556.00	1/2" FNPT	0 to 6.6 GPM						
<u>FMM75-1002</u>	\$602.00	3/4" FNPT	0 to 13.2 GPM						
<u>FMM100-1002</u>	\$666.00	1" FNPT	0 to 26.4 GPM						
<u>FMM150-1002</u>	\$997.00	1-1/2" FNPT	0 to 79.3 GPM					Yes	
<u>FMM200-1002</u>	\$1,075.00	2" FNPT	0 to 158.5 GPM						

Endress + Hauser Picomag Magnetic-Inductive Liquid Flow Meter Selection

Part No.	Price	Process Connection	Flow Range	Temperature Range	Totalizer Range	Conductivity Range	Output 1	Output 2	Empty Pipe Detection
<u>DMA15-AAACA1</u>	\$572.00	1/2" FNPT	0 to 9.2 GPM	14 to 158°F [10 to 70°C]	+/-3.436E10 liters	20 to 30,000 µS/cm	- Flow rate, analog or switch - Temperature, analog or switch - Conductivity, analog or switch - Volumetric flow totalizer pulse - Empty pipe detection switch - Flow totalizer reset digital input	- Flow rate, analog or switch - Temperature, analog or switch - Conductivity, analog or switch - Empty pipe detection switch - Flow totalizer reset digital input	Yes
<u>DMA20-AAACA1</u>	\$688.00	3/4" FNPT	0 to 19.8 GPM						Yes
<u>DMA25-AAACA1</u>	\$824.00	1" FNPT	0 to 39.6 GPM						Yes
<u>DMA50-AAACA1</u>	\$1,106.00	2" FNPT	0 to 198.1 GPM			20 to 10,000 µS/cm	- Flow override digital input - IO-Link	Flow override digital input	Yes