

# 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 µS/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 ±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 ±4.5°F (±2.5°C) accuracy and conductivity up to 30,000 µS/cm with ±5 µS/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](http://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
<a href="#">DMA15-AAACA1</a>	\$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	• 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	1.1	<a href="#">PDF</a>	<a href="#">PDF</a>
<a href="#">DMA20-AAACA1</a>	\$688.00	3/4" FNPT	0 to 19.8 GPM				1.2		<a href="#">PDF</a>	<a href="#">PDF</a>	
<a href="#">DMA25-AAACA1</a>	\$824.00	1" FNPT	0 to 39.6 GPM				1.3		<a href="#">PDF</a>	<a href="#">PDF</a>	
<a href="#">DMA50-AAACA1</a>	\$1,106.00	2" FNPT	0 to 198.1 GPM			20 to 10,000 µS/cm	4.0	<a href="#">PDF</a>	<a href="#">PDF</a>		

# Picomag Magnetic-Inductive Liquid Flow Meters

<b>Picomag Magnetic-Inductive Liquid Flow Meter Specifications</b>	
<b>Input</b>	
<b>Measured Variables</b>	Volume flow, temperature, conductivity
<b>Measuring Range (volume flow measurement)</b>	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)
<b>Measuring Range (medium temperature measurement)</b>	-10 to +70°C (+14 to +158°F)
<b>Measuring Range (conductivity measurement)</b>	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
<b>Digital Input</b>	High or low active Switch-on level 15V Switch-off level 5V Internal resistance 7.5 kΩ
<b>Output</b>	
<b>Current Output</b>	≤ 500Ω
<b>Voltage Output</b>	≥ 600Ω
<b>Pulse Output</b>	Max. pulse rate: 10,000 Pulse/s
<b>Signal On Alarm</b>	Status signal (as per NAMUR Recommendation NE 107) Plain text display with remedial action
<b>Switch Output</b>	Switching behavior: PNP or NPN Max. load 250mA
<b>Power Supply</b>	
<b>Electrical Connection</b>	4-pin M12 x 1 A-coded
<b>Supply Voltage Range</b>	18 to 30 VDC (SELV, PELV, Class 2)
<b>Power Consumption</b>	Maximum 3 W Without outputs IO1 and IO2: 120mA With outputs IO1 and IO2: 120mA plus the effective load currents
<b>Performance Characteristics</b>	
<b>Volume Flow Measurement</b>	
<b>Flow Rate Units</b>	GPM, fl oz/min, l/min, l/sec, l/hr, m³/hr, selectable
<b>Flow Totalizer Units</b>	Gal, kgal, fl oz, l, kl, Ml, m³, selectable
<b>Reference Operating Conditions</b>	Water, +15 to +45 °C, 2 to 6 bar
<b>Maximum Measured Error</b>	± 0.8 % o.r. ± 0.1 % o.f.s.
<b>Repeatability</b>	± 0.2 % o.r.
<b>Medium Temperature Measurement</b>	
<b>Temperature Units</b>	°F, °C, selectable
<b>Maximum Measured Error</b>	± 2.5°C
<b>Repeatability</b>	± 0.5°C
<b>Conductivity Measurement</b>	
<b>Conductivity Units</b>	µS/cm, S/m, mS/cm, selectable
<b>Repeatability</b>	± 5 % o.r. ± 5 µS/cm
<b>Maximum Measured Error, Current Output</b>	
<b>Additional Error</b>	± 20µA @ device temperature of 25°C
<b>Repeatability</b>	± 10 µA
<b>Response Time T90*</b>	Typically 200ms
<b>Maximum Measured Error, Voltage Output</b>	
<b>Additional error</b>	± 60mV @ device temperature of 25°C
<b>Repeatability</b>	± 10mV
<b>Response Time T90*</b>	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.	
<b>Environment</b>	
<b>Ambient Temperature Range</b>	-10 to +60°C (+14 to +140°F)
<b>Storage Temperature</b>	-25 to +85°C (-13 to +185°F)
<b>Degree Of Protection</b>	IP65/67, pollution degree 3
<b>Humidity And Moisture</b>	Suitable for indoor environments with up to 100% rh (wet and damp locations)
<b>Operating Altitude</b>	up to 2,000 M
<b>Shock Resistance</b>	20g (11ms) in accordance with IEC/EN60068-2-27
<b>Vibration Resistance</b>	Acceleration up to 5 g (10 to 2,000 Hz) in accordance with IEC/EN60068-2-6
<b>Electromagnetic Compatibility (EMC)</b>	According to IEC/EN61326 and/or IEC/EN55011 (Class A)
<b>Process</b>	
<b>Medium Temperature Range</b>	-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.
<b>Medium Properties</b>	Liquid, conductivity ≥ 10 μS/cm for flow measurement (≥ 20 μS/cm for conductivity measurement)
<b>Pressure</b>	Max. 16 BAR <sub>rel</sub>
<b>Materials</b>	
<b>Wetted Parts</b>	
<b>Measuring Tube</b>	PEEK (Polyether ether ketone)
<b>Electrodes, Temperature Sensor</b>	1.4435/316L
<b>Process Connection</b>	1.4404/316L
<b>Seal</b>	FKM (fluorine rubber)
<b>Housing Material</b>	
<b>Housing</b>	1.4404/316L, 1.4409/CF <sup>3</sup> M
<b>Display Window</b>	Polycarbonate
<b>Operability</b>	
<b>Display</b>	4 measured variables can be displayed (volume flow, temperature, conductivity, totalizer)
<b>Operation</b>	Via Bluetooth® wireless technology Via IO-Link <a href="#">PDF</a>
<b>Digital Communication</b>	Via IO-Link <a href="#">PDF</a>
<b>SmartBlue App</b>	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)
<a href="#">71345225</a>	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

## Magnetic-Inductive Flow Meter Application

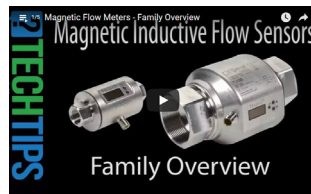
Magnetic-inductive flow meters (Magmeters) are one of the most widely used technologies for liquid flow monitoring in industrial process markets such as wastewater, mining and minerals, utilities, food and beverage, and pharmaceuticals. To ensure reliable and accurate operation, some important application 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.



### ProSense FMM Series



### Endress+Hauser Picomag Series



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

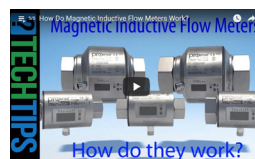
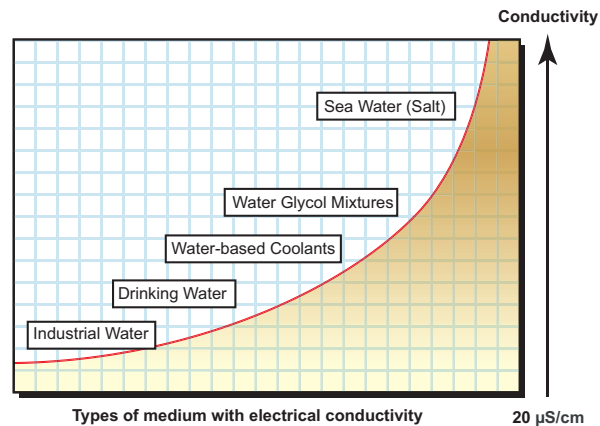
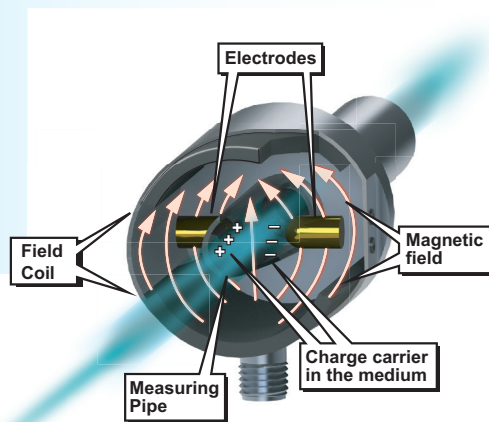


Click on the thumbnail or go to <https://www.automationdirect.com/VID-PS-0024> for a short overview video of the Endress+Hauser Picomag Series Flow Meters

## 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	
<a href="#"><u>FMM50-1001</u></a>	\$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	
<a href="#"><u>FMM75-1001</u></a>	\$602.00	3/4" FNPT	0 to 13.2 GPM						
<a href="#"><u>FMM100-1001</u></a>	\$666.00	1" FNPT	0 to 26.4 GPM						
<a href="#"><u>FMM150-1001</u></a>	\$997.00	1-1/2" FNPT	0 to 80 GPM						
<a href="#"><u>FMM200-1001</u></a>	\$1,075.00	2" FNPT	0 to 160 GPM						
<a href="#"><u>FMM50-1002</u></a>	\$556.00	1/2" FNPT	0 to 6.6 GPM		GPM, GPH, LPM, m³/h, °F, °C	Switch, pulse or frequency (flow)	Analog 4-20 mA (temperature)	Analog 4-20 mA (flow)	No
<a href="#"><u>FMM75-1002</u></a>	\$602.00	3/4" FNPT	0 to 13.2 GPM						
<a href="#"><u>FMM100-1002</u></a>	\$666.00	1" FNPT	0 to 26.4 GPM						
<a href="#"><u>FMM150-1002</u></a>	\$997.00	1-1/2" FNPT	0 to 79.3 GPM						
<a href="#"><u>FMM200-1002</u></a>	\$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
<a href="#"><u>DMA15-AAACA1</u></a>	\$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	<ul style="list-style-type: none"> <li>• Flow rate, analog or switch</li> <li>• Temperature, analog or switch</li> <li>• Conductivity, analog or switch</li> <li>• Volumetric flow totalizer pulse</li> <li>• Empty pipe detection switch</li> <li>• Flow totalizer reset digital input</li> </ul>	<ul style="list-style-type: none"> <li>• Flow rate, analog or switch</li> <li>• Temperature, analog or switch</li> <li>• Conductivity, analog or switch</li> <li>• Empty pipe detection switch</li> <li>• Flow totalizer reset digital input</li> <li>• Flow override digital input</li> </ul>	Yes
<a href="#"><u>DMA20-AAACA1</u></a>	\$688.00	3/4" FNPT	0 to 19.8 GPM						Yes
<a href="#"><u>DMA25-AAACA1</u></a>	\$824.00	1" FNPT	0 to 39.6 GPM						Yes
<a href="#"><u>DMA50-AAACA1</u></a>	\$1,106.00	2" FNPT	0 to 198.1 GPM			20 to 10,000 µS/cm			<ul style="list-style-type: none"> <li>• Flow override digital input</li> <li>• IO-Link</li> </ul>