People for Process Automation

Endress + Hauser 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 guick disconnect
- Two outputs selectable for switch, pulse, or analog signals
- IO-Link connectivity
- NSF/ANSI 61 drinking water certification and cULus Listed







by simply knocking on the device.

applications and is cULus Listed.

override.

access.

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



website www.AutomationDirect.com

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

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 μ S/cm with ±5 μ 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

Picomag's large, user-friendly color display allows for guick 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

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

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

flowmeters can be mounted directly before or after a pipe bend.



Picomag Magnetic-Inductive Liquid Flow Meter Selection Vendor Flow Temperature Totalizer Conductivity Weight Drawing Price Operating Part No. Connection Output 1 Output 2 (lbs) Range Range Range Range Link Instructions Flow rate, analog or 0 to 9.2 DMA15-AAACA1 \$-05#jd: 1/2" FNPT 1.1 PDF PDF switch GPM Flow rate, analog Temperature, analog or switch or switch Temperature, Conductivity, analog 20 to 30.000 0 to 19.8 analog or switch <u>PD</u>F DMA20-AAACA1 \$-05#je: 3/4" FNPT or switch 1.2 PDF GPM µS/cm Conductivity, Volumetric flow 14 to 158°F +/-3.436E10 analog or switch totalizer pulse [-10 to 70°C] liters Empty pipe Empty pipe detection 0 to 39.6 detection switch 1" FNPT switch DMA25-AAACA1 \$;-05#jf: 1.3 PDF PDF GPM Flow totalizer Flow totalizer reset reset digital input digital input Flow override Flow override digital digital input 20 to 10,000 0 to 198.1 \$;-005#jg: input DMA50-AAACA1 2" FNPT 4.0 PDF PDF GPM µS/cm IO-Link

www.automationdirect.com

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Picomag Magnetic-Inductive Liquid Flow Meters

Picomag Ma	agnetic-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, m ³ , 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 Measuremen	t					
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.

1-800-633-0405

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Picomag Magnetic-Inductive Liquid Flow Meters

Picomag Magne	tic-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 \ge 10 µS/cm for flow measurement (\ge 20 µS/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 <u>PDF</u>					
Digital Communication	Via IO-Link <u>PDF</u>					
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 passw • The Bluetooth® wireless technology interface can be disabled						
00000						

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

Accessories



Picomag Accessory							
Part No.	Description	Price	Weight (lbs)				
<u>71345225</u>	Endress+Hauser grounding clamp, 316 stainless steel. For use with Endress+Hauser Picomag series flow meters.	\$-5#jh:	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.

Part No. 71345225

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 <u>https://www.automationdirect.com/VID-FL-0002</u> for a short overview video of the FMM Series Magnetic-Inductive Flow Meters



Click on the thumbnail or go to <u>https://www.automationdirect.com/VID-PS-0024</u> 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:



w do they work

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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		
FMM50-1001	\$00?vx:	1/2" FNPT	0 to 6.6 GPM				Switch, analog or reset input (flow or temperature)	No		
FMM75-1001	\$00?vy:	3/4" FNPT	0 to 13.2 GPM		GPM, GPH, GAL, or °F	Switch or pulse (flow)				
FMM100-1001	\$00?vz:	1" FNPT	0 to 26.4 GPM	-						
FMM150-1001	\$;;000?v]:	1-1/2" FNPT	0 to 80 GPM			Switch, pulse or frequency (flow)		Yes		
FMM200-1001	\$;;000?v[:	2" FNPT	0 to 160 GPM	-4 to 176°F						
FMM50-1002	\$00?vq:	1/2" FNPT	0 to 6.6 GPM	[-20 to 80°C]	[-20 to 80°C]	[-20 to 80°C]				
FMM75-1002	\$00?vs:	3/4" FNPT	0 to 13.2 GPM			GPM, GPH, LPM, m³/h, °F °C	Analog 4-20 mA (temperature)	Analog 4-20 mA	No	
FMM100-1002	\$;00?vt:	1" FNPT	0 to 26.4 GPM							
FMM150-1002	\$;000?vu:	1-1/2" FNPT	0 to 79.3 GPM		1, 0	(temperature)	(iiuw) -	Yes		
FMM200-1002	\$;000?vv:	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>	\$-05#jd:	1/2" FNPT	0 to 9.2 GPM	14 to 158°F [10 to 70°C]	14 to 158°F +/- [10 to 70°C]			 Flow rate, analog or switch Temperature, analog or gwitch 	Flow rate, analog or switch	Yes				
<u>DMA20-AAACA1</u>	\$-05#je:	3/4" FNPT	IPT 0 to 19.8 GPM 14 to 158°F +			14 to 158°F	14 to 158°F	€PM 14 to 158°F	o 19.8 GPM 14 to 158°F	+/-3.436E10	20 to 30,000 µS/cm	 Conductivity, analog or switch Volumetric flow totalizer pulse 	Conductivity, analog or switch Conductivity, analog or switch Empty pipe	Yes
<u>DMA25-AAACA1</u>	\$;-05#jf:	1" FNPT	0 to 39.6 GPM			liters	liters	 Empty pipe detection switch Flow totalizer reset digital input 	 Empty pipe detection switch Flow totalizer reset digital input 	Yes				
<u>DMA50-AAACA1</u>	\$;-005#jg:	2" FNPT	0 to 198.1 GPM					20 to 10,000 µS/cm	 Flow override digital input IO-Link 	Flow override digital input	Yes			