

Magnetic Inductive Flowmeter

All-Metal Design



measuring
•
monitoring
•
analyzing

dPde palma
thermofluid

MIM



IO-Link

- For Measurement and Monitoring of Conductive Liquids
- Flow and Temperature Measurement
- Switching, Transmitting, and Batching Functions
- Bi-directional Flow Measurement
- Rugged Stainless Steel Construction
- p_{max} : 230 PSI; t_{max} : 284 °F
- Accuracy: $< \pm (0.8\% \text{ of Reading} + 0.5\% \text{ of Full Scale})$



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Magnetic Inductive Flowmeter, All-Metal Design Model MIM

Description

The new MIM electromagnetic flowmeter measures and monitors small to medium sized flow of conductive liquids in pipes. According to Faraday's Law of magnetic induction, a voltage is induced in a conductor moving through a magnetic field. The electrically conductive measured media acts as the conductor. The voltage induced in the measured media is proportional to the flow velocity and is therefore a value for the volumetric flow. The induced voltage is detected by two sensing electrodes which are in contact with the measuring media and sent to an integrated amplifier. The flow rate will be calculated based on the cross sectional area of the pipe. The measurement does not depend on the process liquid and its properties such as density, viscosity and temperature. The two outputs can be independently set to switch, or provide an analog or frequency output. A batching function can also be selected, where output 1 is set to switch as NPN/PNP/PP and output 2 is set as the control input.

Features

- Rugged Stainless Steel Construction
- Flow and Temperature Measurement
- Switching, Transmitting, and Batching Functions
- Batching Function with External Control Input
- Bi-directional Flow Measurement
- Colored, Multi-parameter, Configurable TFT Display, Rotatable in 90° Increments
- Intuitive Setup Menu via 4 Optical Touch Keys
- 2 Configurable Outputs (Pulse/Frequency/Alarm/Analog Output)
- Grand and Resettable Totalizer
- Drinking Water Approval

Technical Details

Measurement Principle: Electromagnetic

Ranges: 0.16...16 GPH to 0.8...170 GPM

Media: Conductive Liquids

Min. Conductivity: $\geq 20 \mu\text{S/cm}$ ($\geq 35 \mu\text{S/cm}$ for Measuring Ranges 01G/01H)

Native Fittings: G 1/4...G 2, or 1/2" NPT...2" NPT

Optional Fitting Kits: 1/4"...1" NPT (Male or Female), 1" or 2" Tri-Clamp® (All Kits Include 2x Fittings and 2x Klinger SIL Gaskets except Kit ZUB-AD2G50T50 that Includes 2x Fittings and 2x FKM O-rings)

Max. Pressure: 230 PSI

Accuracy¹⁾: $< \pm (0.8\% \text{ of Reading} + 0.5\% \text{ of Full Scale})$

Repeatability: $\pm 0.2\% \text{ of Full Scale}$

Response Time Flow t_{90}

Alarm/Pulse/Frequency Output: $< 100 \text{ ms}$

Analog Output: $< 1 \text{ s}$

Temperature Measurement

Sensor: PT1000

Accuracy: $< \pm 3.6 \text{ }^\circ\text{F}$ (Flow $> 0.2 \text{ m/s}$)

Measuring Range: Temperature Range of the Media

Response Time Temp. t_{90} (Signal Output): $< 20 \text{ s}$

¹⁾ Reference Cond.: Media: 60...85 °F, 1 cSt, 500 $\mu\text{S/cm}$, 15 PSI, Ambient: 60...85°F

²⁾ Limited functionality with black rubber gloves



Programming²⁾: Via 4 Optical Touch Fields, Can be used with Gloves

Mounting Position: Universal

Inlet/Outlet: 3x Upstream, 2x Downstream

Pressure Drop: See Pressure Loss Diagram

Housing: 316L Stainless Steel, PMMA Display Screen

Wetted Parts

The wetted parts of MIM-13 (except measuring range code "35") are in conformance with DVGW 270 and WRAS guidelines for drinking water approval.

Fitting/Housing: 316L Stainless Steel

Insulation Parts: PEEK

Electrodes: 316L Stainless Steel

Seals: FKM or EPDM

Fitting Adapter: 316L Stainless Steel

Temperature Ranges

Design	Electronics	Model	Seal	Media Temperature	Ambient Temperature
Compact Version	C3T	MIM-12	FKM	-4...158 °F ¹⁾	-4...140 °F
		MIM-13	EPDM		
Remote Version (PVC Cable)	P02	MIM-12	FKM	-4...185 °F	-4...140 °F (Display Electronics)
		MIM-13	EPDM		-4...185 °F (Sensor)
Remote Version (ETFE Cable)	E02	MIM-12	FKM	-4...284 °F	-4...140 °F (Display Electronics)
					-4...284 °F (Sensor)
		MIM-13	EPDM	-40...284 °F	-4...140 °F (Display Electronics)
					-40...284 °F (Sensor)

¹⁾ Continuous -4...158 °F, short-term up to max. 185 °F (for max. 60 minutes at max. 104 °F ambient temperature and repetition earliest after 4 hours). Use of the electrical output remains limited to temperature range -4...158 °F.

Electrical Data

Supply Voltage: 19-30 V_{DC}, Internal Power Consumption max. 200 mA

Display: TFT Display, 128x128 Pixels, 1.4" Display, Orientation Adjustable in 90° Increments

Display Repetition Rate: 0.5...10 s, Adjustable

Pulse Output: Push-Pull, Freely Scalable, Configurable for Partial and Accumulated Totalizer



Technical Details (continued)

Electrical Data (continued)

Frequency Output: Push-Pull, Fully Scalable, 2 kHz @ Overflow
50...1000 Hz at Full Scale, User Programmable

Alarm Output: NPN, PNP, Push-Pull, Configurable Max. 30 V_{DC}, Max. 200 mA Short-Circuit Proof

Analog Output: Active, 3-wire, 4-20 mA, Max. Load 500 Ω or 0-10 V_{DC}, (R_i = 500 Ω)
(Factory Calibrated with R_L = 1 M Ω)

Control Input: Active Signal U_{high} Max. 30 V_{DC}, 0 < Low < 10 V_{DC}, 15 V_{DC} < High < V_S

Batching Function: Batching Output OUT2: Push-Pull, High Active
Control Input OUT1: START/STOP 0.5s < t_{high} < 4s
RESET t_{high} > 5s

Shock Resistance

DIN EN 60068-2-27:2010: 20 g (11 ms)

Vibration Resistance

DIN EN 60068-2-6:2008: 5 g (10 ... 2000 Hz)

Environmental Testing

DIN EN 60068-2-30:2006: Severity Level b

IO-Link Specification

Manufacturer ID: 1105 (Decimal), 0 x 0451 (Hex)
Manufacturer Name: Kobold Messring GmbH
IO-Link Specification: V1.1
Bitrate: COM3
Minimal Cycle Time: 1.1 ms
SIO-Mode: Yes (OUT1 in Configuration IO-Link)
Block Parameterisation: Yes
Operational Readiness: 10 s
Max. Cable Length: 20 m
Protection: IP67

Order Details (Example: MIM-12 05G N4 C3T 0)

Model	Measuring Range ¹⁾	Native Connection	Electronics	Options		
MIM-12.. = SS Housing SS Electrodes FKM Seals	..01G.. = 0.16...16 GPH ..01H.. = 0.01...1 LPM	..G2.. = G 1/4 Male	..C3T.. = Compact TFT Display 2x Configurable Outputs (Current/Voltage/Pulse/ Frequency/Alarm) M12x1 Electrical Connection ..P02 ²⁾ .. = Remote Display Version, TFT Display, 2m PVC Cable, Max. 185 °F ..E02 ²⁾ .. = Remote Display Version, TFT Display, 2m ETFE Cable, Max. 284 °F	0 = without K ³⁾ = Including Calibration Report		
	..03G.. = 0.48...48 GPH ..05G.. = 0.01...2.6 GPM	..N4 ³⁾ .. = 1/2" NPT Female				
	..03H.. = 0.03...3 LPM ..05H.. = 0.04...10 LPM	..G4 ³⁾ .. = G 1/2 Male				
	..10G.. = 0.025...6.6 GPM ..15G.. = 0.05...13 GPM	..N5 ³⁾ .. = 3/4" NPT Female				
MIM-13 ⁴⁾ .. = SS Housing SS Electrodes EPDM Seals	..10H.. = 0.1...25 LPM ..15H.. = 0.2...50 LPM	..G5 ³⁾ .. = G 3/4 Male				
	..15G.. = 0.05...13 GPM ..20G.. = 0.1...26 GPM	..N6 ³⁾ .. = 1" NPT Female				
	..15H.. = 0.2...50 LPM ..20H.. = 0.4...100 LPM	..G6 ³⁾ .. = G 1 Male				
	..35G.. = 0.4...90 GPM ..40G.. = 0.8...170 GPM	..N9.. = 2" NPT Female				
	..35H.. = 1.5...350 LPM ..40H.. = 2.6...650 LPM	..G9.. = G 2 Male				
	Accessories: P/N 807.037 = 4-Pin Micro-DC Connector with 6-foot Cable P/N 807.037/5M = 4-Pin Micro-DC Connector with 16-foot Cable P/N 807.037/10M = 4-Pin Micro-DC Connector with 32-foot Cable					

¹⁾ Units of measure factory programmed: °F and PSI for GPM/GPH models, °C and bar for LPM models

²⁾ Order code substitution for longer cables: 02 = 2 m (6 ft), 05 = 5 m (16 ft), 10 = 10 m (32 ft), 15 = 15 m (49 ft), 20 = 20 m (65 ft).
Wall mounting brackets (brackets incl. accessories) are included in the scope of delivery.

³⁾ Regulation (EC) No. 1935/2004 for materials and articles intended to come in contact with food. Not for connection code G9/N9.

⁴⁾ Measuring range code 35 is not in conformance with DVGW 270 and WRAS guidelines.

⁵⁾ Number of measuring points (standard): 5.



Order Details MIM Fitting Accessory Kits

Accessory Kit Number	Native Connection / Process Connection	Fitting Kit Type ¹⁾²⁾	Dimensions	Image
ZUB-AD2G08P08	G 1/4 Female / 1/4" NPT Male	Adapter		
ZUB-AD2U15P08	G 1/2 Cap Nut / 1/4" NPT Male	Cap Nut and Union		
ZUB-AD2G15P15	G 1/2 Female / 1/2" NPT Male	Adapter		
ZUB-AD2G15N08	G 1/2 Female / 1/4" NPT Female	Adapter		
ZUB-AD2G15N15	G 1/2 Female / 1/2" NPT Female	Adapter		
ZUB-AD2U20P15	G 3/4 Cap Nut / 1/2" NPT Male	Cap Nut and Union		
ZUB-AD2G20P20	G 3/4 Female / 3/4" NPT Male	Adapter		
ZUB-AD2G20N15	G 3/4 Female / 1/2" NPT Female	Adapter		

¹⁾ All Fitting Kits Include 2x Fittings and 2x Klinger SIL® Flat Sealing Gaskets

²⁾ Adapters and Unions are 316L SS, Cap Nuts are 304 SS

Order Details MIM Fitting Accessory Kits (Continued)



Accessory Kit Number	Native Connection/ Process Connection	Fitting Kit Type ¹⁾²⁾	Dimensions	Image
ZUB-AD2G20N20	G 3/4 Female/ 3/4" NPT Female	Adapter		
ZUB-AD2U25P15	G 1 Cap Nut/ 1/2" NPT Male	Cap Nut and Union		
ZUB-AD2U25P20	G 1 Cap Nut/ 3/4" NPT Male	Cap Nut and Union		
ZUB-AD2G25N15	G 1 Female/ 1/2" NPT Female	Adapter		
ZUB-AD2G25N20	G 1 Female/ 3/4" NPT Female	Adapter		
ZUB-AD2G25N25	G 1 Female/ 1" NPT Female	Adapter		
ZUB-AD2G25T25	G 1 Female/ 1" Tri-Clamp®	Adapter		
ZUB-AD2G50T50	G 2 Female/ 2" Tri-Clamp®	Adapter		

¹⁾ All Kits Include 2x Fittings and 2x Klinger SIL Gaskets except Kit Number ZUB-AD2G50T50 that Includes 2x Fittings and 2x FKM O-rings

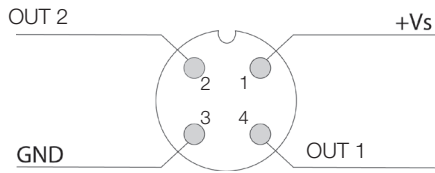
²⁾ Adapters and Unions are 316L SS, Cap Nuts are 304 SS



Accessories (Spare Part)

Model	Description	Image
ERS-ZOK-023618	Stainless Steel Wall Mounting Kit for Remote Version (2 Brackets, without Nuts/Washers)	
ZUB-MIM225128	Clamping Bracket Set for Wall Mounting (Stainless Steel with Partial Polyolefin Sleeve)	

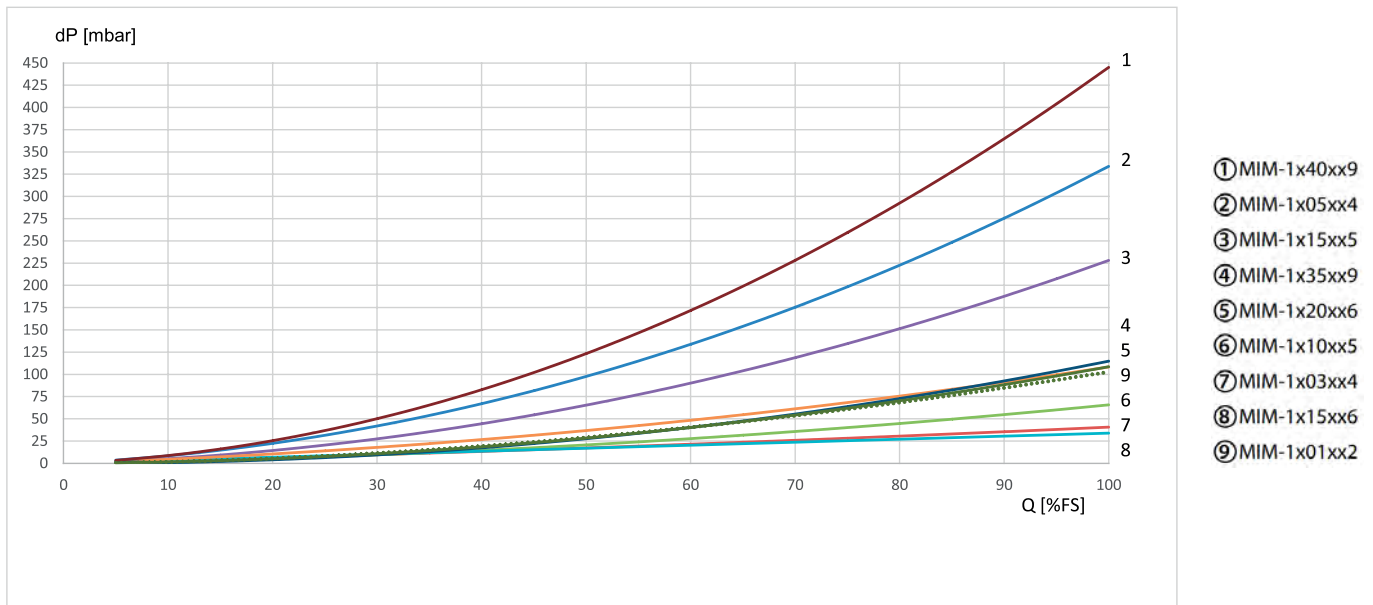
Electrical Connection MIM-..C3T



Configuration of Outputs

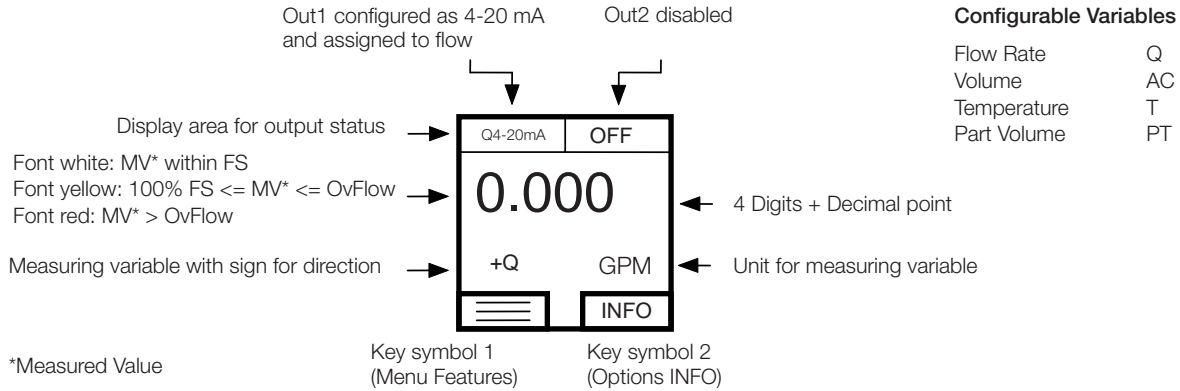
Output 1 (OUT1, PIN 4)	Output 2 (OUT2, PIN 2)
Analog Output 0-10 V _{DC}	Analog Output 0-10 V _{DC}
Analog Output 4-20 mA	Analog Output 4-20 mA
Switching Output NPN/PNP/PP	Switching Output NPN/PNP/PP
Pulse Output PP	Pulse Output PP
Frequency Output PP	Frequency Output PP
Communication Mode KofiCom	
Communication Mode IO-Link	
Control Input	
Control Input Start/Stop/Reset Batching Function	Batching Function Switch/PP

Pressure Loss Diagram

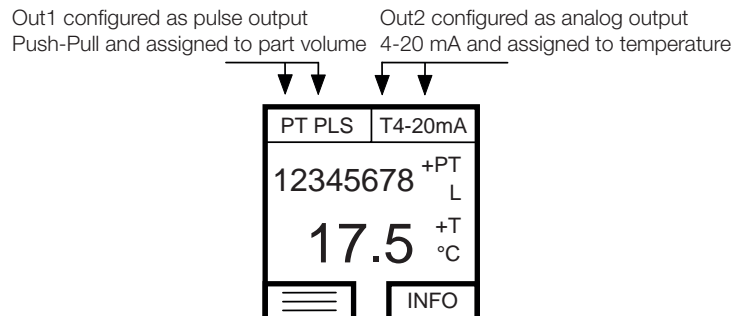
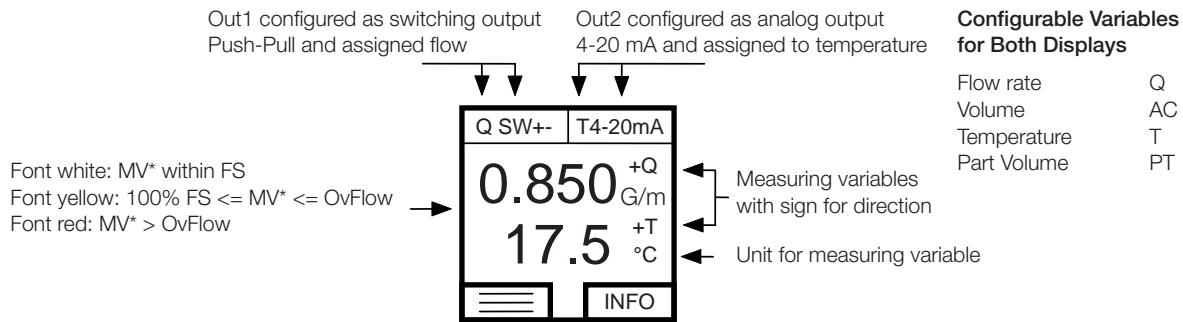




Measuring Mode: Display Layout "Single" Configurable



Measuring Mode: Display Layout "Dual" Configurable



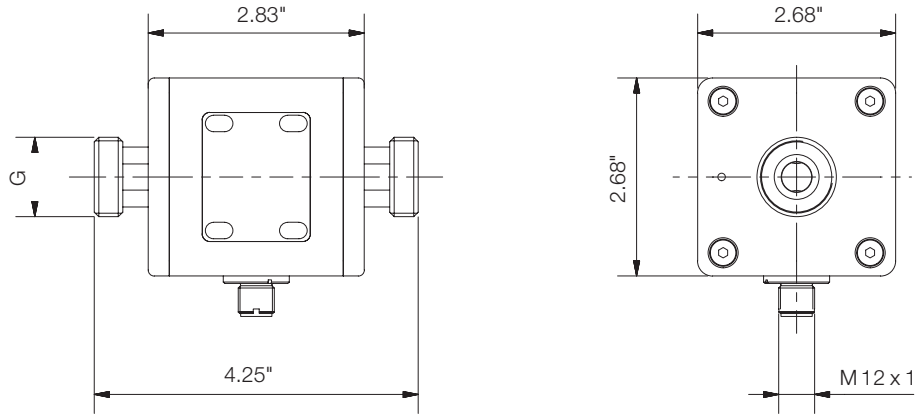


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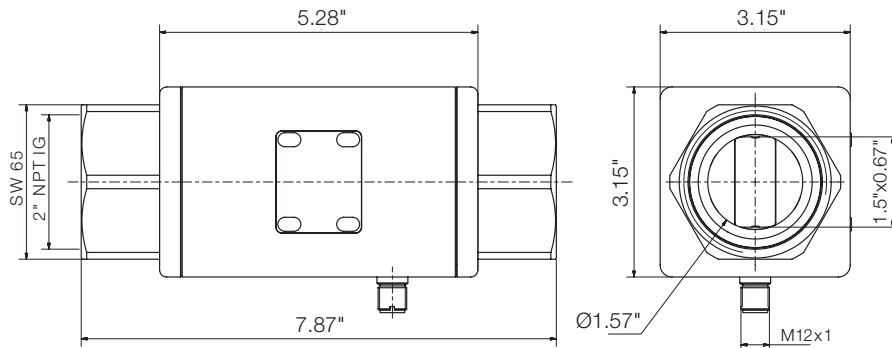
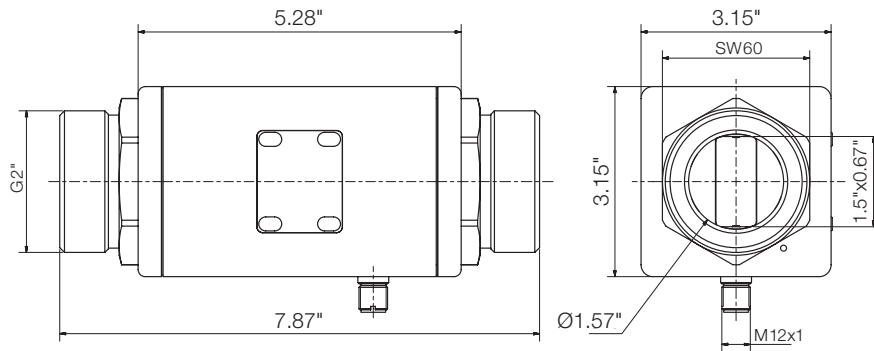
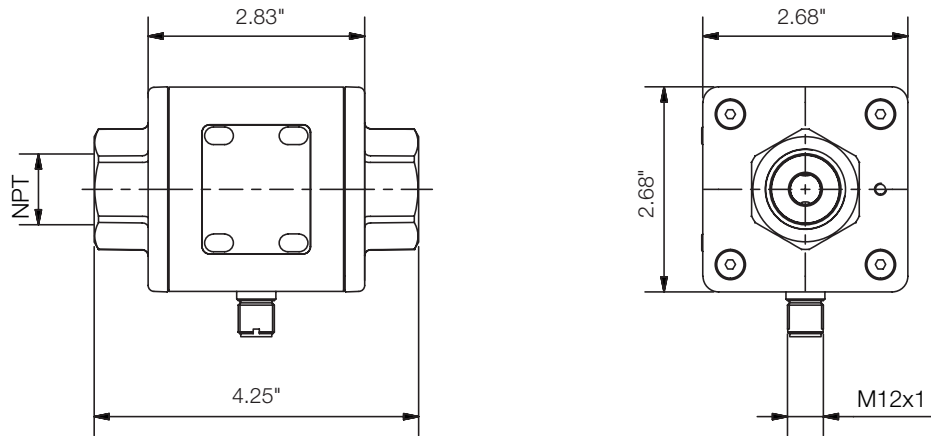
Dimensions

Compact Version

G
1/4
1/2
3/4
1

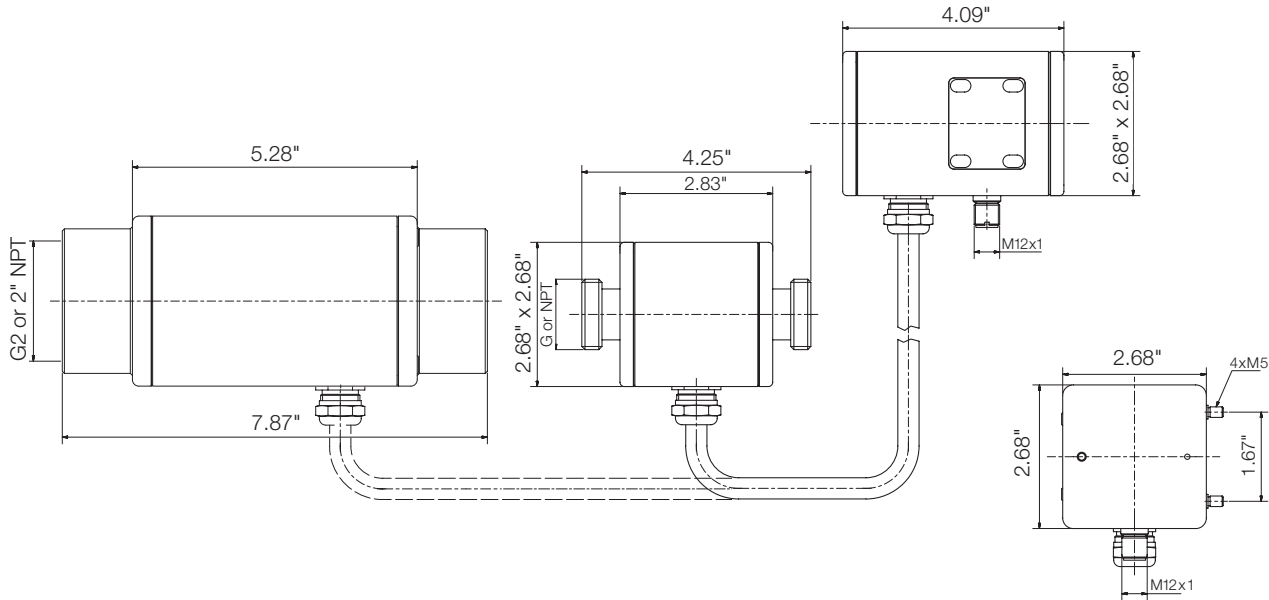


NPT
1/2
3/4
1



Dimensions (Continued)

Remote Version without Wall Mounting Brackets



Remote Version with Wall Mounting Brackets

