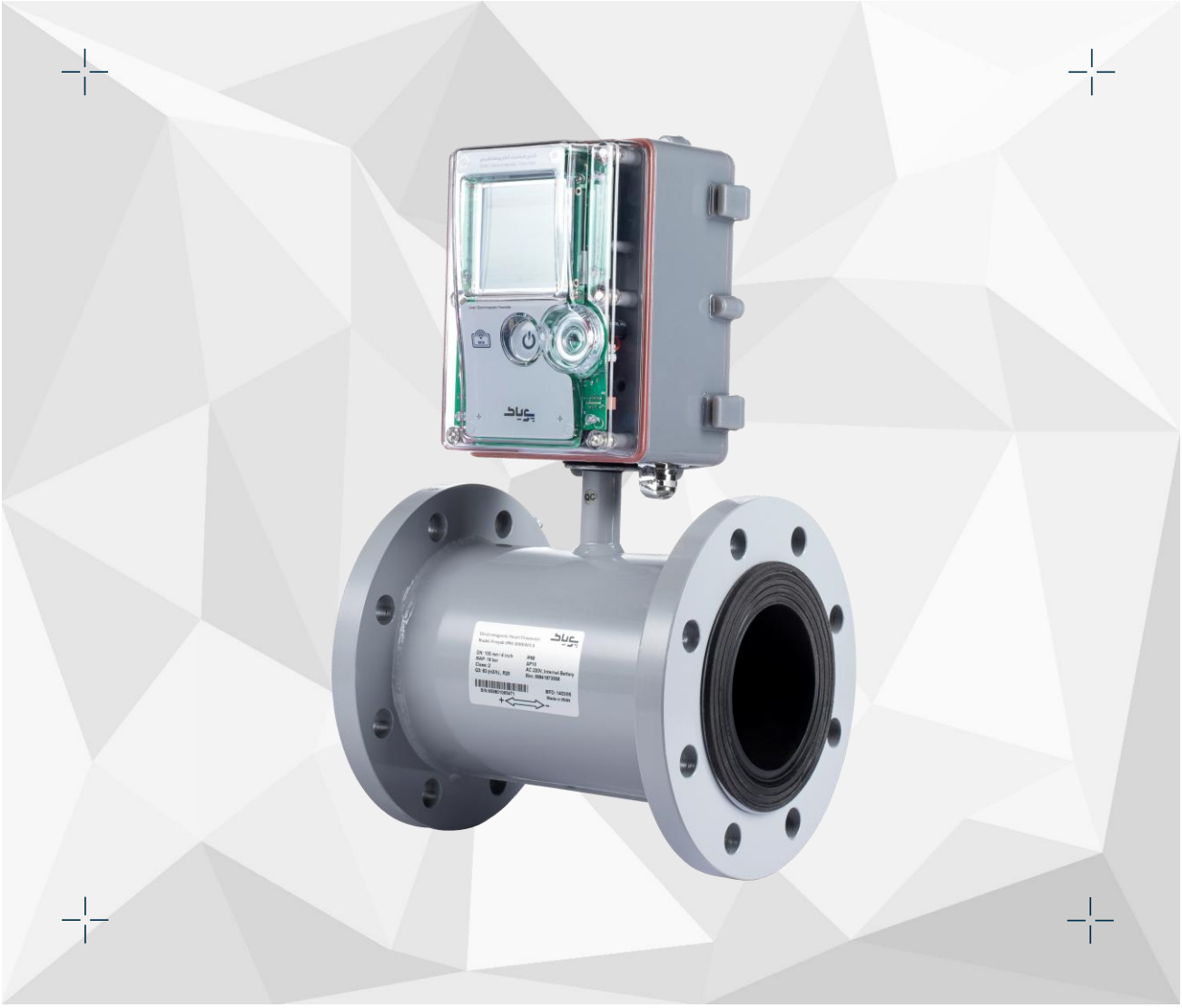


POOYAB–SM4 Technical Datasheet

Smart Electromagnetic Water Meter

Applications:

- Agricultural Irrigation Systems
- Water Transmission and Distribution Systems
- Water Resource Monitoring and Management

Smart Electromagnetic Water Meter

POOYAB-SM4

Introduction:

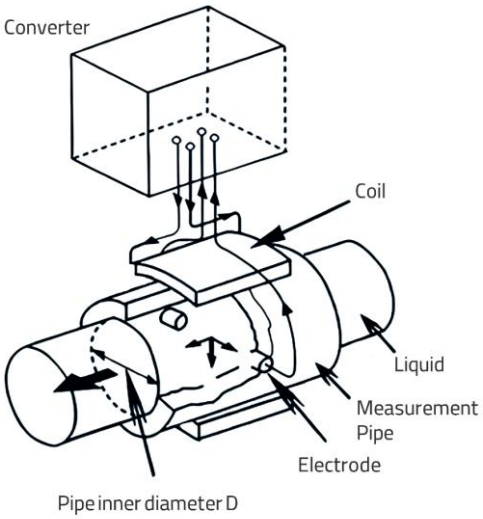
This water meter works as an electromagnetic flowmeter which delivers more facilities specifically designed to accommodate the needs demanded in the resource management of the water and waste water. This device comprises an integrated metering system and an advanced datalogger that accurately measures and collects consumption data and events.

Daily, the Events and data submitted by each device are exchanged with the “Pooyac Online Monitoring Platform” by the GPRS/SMS platform or on the requested duration. To learn more about the Monitoring Platform please refer to the product page on the website.

Additionally, this device complies with industrial communication requirements. Several communication interfaces are incorporated to enable integrity with industrial controllers, including M-Bus, 2wire Loop Current, Modbus-RTU, and pulse output. Moreover, the POOYAB water meter is connectable wired or wireless to the MEJ Industrial Switch which can telecontrol the electromotor based on the consumption quota. To find out more about the MEJ series please refer to the website.

Working Principle:

The medium passing through the pipe is subjected to a constant alternating magnetic field. According to Faraday's law of electromagnetic induction, the voltage induced in the medium is proportional to its velocity as it moves through the magnetic field. This induced voltage is picked up by two internal electrodes in contact with the medium. The signal is then amplified, and the volumetric flow rate is calculated by considering the pipe's cross-sectional area.



Features:

- Forward and reverse metering
- Internal EM disruption detector
- Empty pipe recognition
- Available in separate and integrated models
- Anti-UV & Anti-impact display box
- 3-Year Extended-life battery
- Internal Clock with backup battery (IEC62054)
- Internal GPS Module (Optional)
- 360° rotatable LCD for consumption and event display
- RFID contactless card reader (ISO14443 & ISO7816)
- M-Bus Port for External Electricity Meter Connection
- Optical Port for Device Reading and Configuration (IEC62056)
- RS485 (Modbus-RTU) for Real-Time Flow and Cumulative Consumption Display
- Internal GPS Module (Optional)

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Technical Parameters			
Measuring Principle	Electromagnetic	Minimum Conductivity	5µS/cm
Accuracy Class	Class 2	Battery Type	Non-Rechargeable, 2x19mAh
Dynamic Range	R80	Battery Life	3 years (Usage) 10 years (Expiration)
Ambient Temp.	-20 … +60°C		
Process Temp Range	Depending on the Liner Material	AC Power	220vAC / 380vAC
Protection Class	IP68	Max. Static Pressure [bar]	16,25 [Optional]
Process Connection	Flange DIN, ANSI	Output Signal	4-20mA RS485 [Modbus-RTU] Pulse M-Bus Infrared Reading
Pipe Size [inch]	2,3,4,5,6,8,10, 12,14,16,20		
Compatible Media	Water Wastewater		

Material		Design Features
Liner	Polyethylene [PE] PTFE Hard Rubber EPDM Custom	Sleek, compact and suited design to the specific conditions of the installation location. The ability to install in all horizontal, inclined and vertical situations Waterproof with IP68 degree of protection 360° rotatable LCD Structure: integrated and separated
Body Material	Carbon Steel	
Electrode	Titanium SS316L Hastelloy	
Display Box	Polycarbonate (Anti-UV & Anti-impact)	

Standards & Certificates

ISO 17025, ISO 4064, IMOL Standards
license number 11101/100/98 dated 06/20/98 from the IRI Ministry of Energy.
Conformity certificate of 0.2% accuracy (Certificate No. 971415 dated 10/08/98 of SAM laboratory.

Flow Value Table

Size	Recommended Flow Value		Factory Setting			
	$\sim Q_{min}$	$\sim Q_{max}$	Current Output 4 … 20mA	Pulse Output		Cut-off Level
			Measuring Range	Volume/Pulse	Pulse/m3	
[Inch]	[m³/h]	[m³/h]	[m³/h]	[Liter/Pulse]	[#/m3]	[m³/h]
2	0.2	20	0 … 16	120	8.33	0.12
3	0.5	50	0 … 40	300	3.33	0.3
4	0.7875	78.75	0 … 63	472.5	2.12	0.4725
5	1.25	125	0 … 100	750	1.33	0.75
6	2	200	0 … 160	1200	0.83	1.2
8	3.125	312.5	0 … 250	1875	0.53	1.875
10	5	500	0 … 400	3000	0.33	3
12	7.875	787.5	0 … 630	4725	0.21	4.725
14	12.5	1250	0 … 1000	7500	0.13	7.5
16	20	2000	0 … 1600	12000	0.08	12
20	31.25	3125	0 … 2500	18750	0.05	18.75

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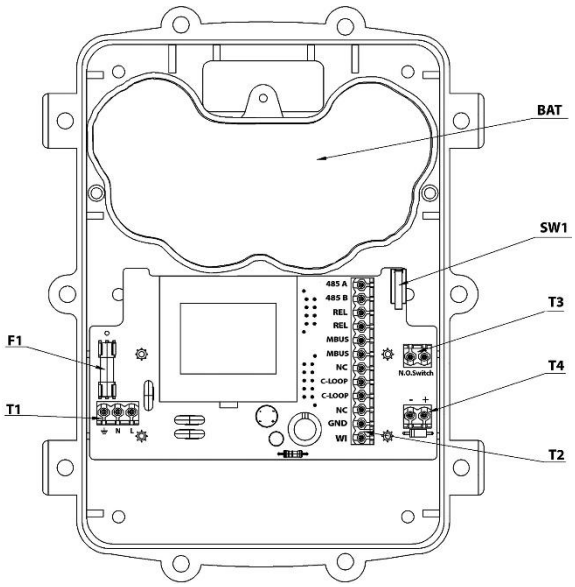
Wiring Diagrams:

Item	Tag	Description	Item	Tag	Description
AC Fuse	F1	0.5A 250VAC	T2 Interfaces	485A	Modbus
T1 AC Power	⏚	Earth		485B	
	N	Null		Normally Close	SPST Relay (For allocation management)
	L	220v 50Hz		Common	
T3 Encloser Switch	N.O.			MBUS	M-BUS Port (No Polarity)
	Switch			MBUS	
T4 DC Power	-	GND		NC	-
	+	12 … 28vDC		C-LOOP	2-wire Loop Current (No Polarity)
SW1 Door Switch		Lock Seal Alarm		C-LOOP	
				NC	-
BAT Battery Box		Replaceable Battery Box		GND	-
				WI	



Modbus RTU Transmission Settings:

Data in the RS485 physical layer are transmitted serially. The communication protocol follows the Modbus RTU standard, and the following formats must be used.

Start	1	2	3	4	5	6	7	8	Stop

Bit sequence without parity checking (8N1)

- Baud rate 9600 bps
- 1 Start bit
- 8 data bits (LSB is sent first)
- No bit for parity checking
- 1 stop bit

All Modbus RTU messages are sent in the following format:

Slave Address	Function Code	Data	CRC
1 byte	1 byte	0 up to 252 byte(s)	2 bytes - CRC16 CRC Low & CRC High

Slave Address:

The address “0” is reserved for broadcasting in the query mode of the Master device. The individual Slave devices can be assigned in the range of 1 – 247. In one network, more than one device with the same address is forbidden. The default address is set to “1”.

Function Code:

0x03 (3) “Read Holding Register”

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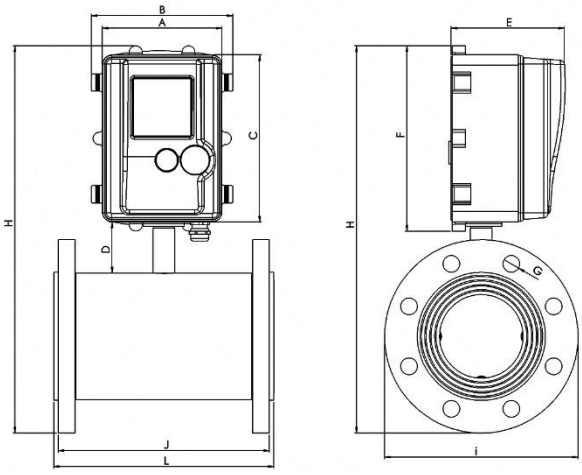
Modbus register layout:

Type	Address (decimal)	Description
Float	44112	Flow (m^3/h)
Long	44114	Positive Cumulative flow (m^3) (Integral part)
Float	44116	Positive Cumulative flow (m^3) (decimal part)
Long	44124	Negative Cumulative flow (m^3) (Integral part)
Float	44126	Negative Cumulative flow (m^3) (decimal part)

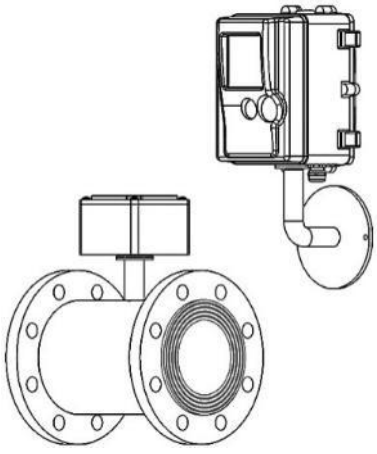
Dimensions:

A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
136	160	190	43	145	211.6

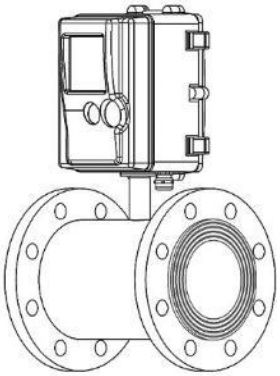
Size [Inch]	Nom. Size [DN]	G [mm]	H [mm]	I [mm]	J [mm]	L [mm]	Screws [#]	Weight [Kg]
2	50	18	390	165	192	200	4	12
3	80	18	422	200	192	200	8	14.5
4	100	18	444	220	240	250	8	17
5	125	18	472.5	250	230	250	8	21
6	150	20	505	285	286	300	8	26
8	200	22	567	340	334	346	8	33
10	250	22	620.5	407	384	400	12	54.6
12	300	25	688.5	457	488	400	12	80
14	350	26	747	520	525	550	12	102
16	400	29	800.5	580	580	600	16	130
20	500	33	942	715	560	600	20	200



Structure Types:



Separated



Integrated

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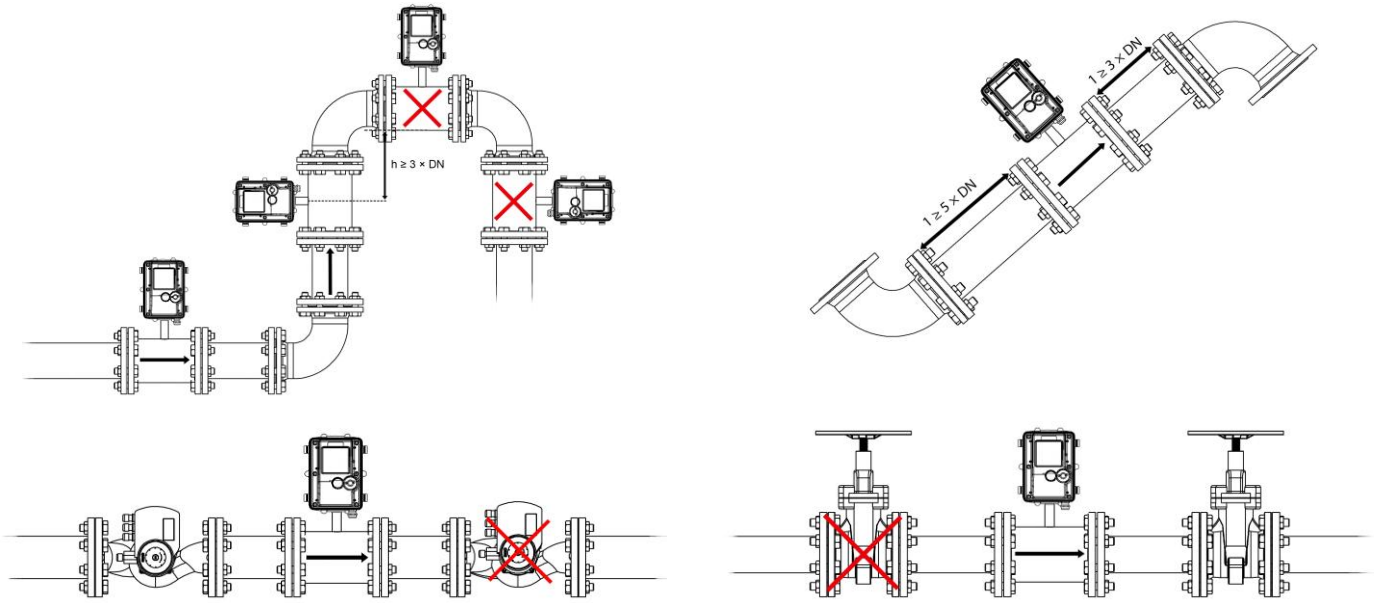
Recommendations Regarding Installation:



Ordering Procedure:

Model	POOYAB-SM4									
Pipe Size	2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	20"
	DN50	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN500
Liner Material	PE	Hard Rubber	PTFE	EPDM	Custom						
	L1	L2	L3	L4	Lx						
Static Pressure	16Bar	25Bar									
	P16	P25									
Electrode Material	Titanium	316L	Other								
	E1	E2	Ex								
Structure	Integrated	Separated									
	S1	S2									
Power	220vAC / 24vDC / Internal Battery	380vAC / 24vDC / Internal Battery									
	PW1	PW2									
Output Signal	Modbus	Modbus + 4...20mA	Modbus + Pulse	Modbus + 4...20mA + Pulse							
	O1	O2	O3	O4							

Additional Options		
MEJ Industrial Switch	Wireless Industrial Switch	Wired Industrial Switch
	/MEJ-W	/MEJ-C
External Antenna	External GSM/GPRS Antenna Plug	
	/ANT	
GPS	Internal Global Positioning System Module	
	/GPS	
M-BUS	Enable M-BUS Connection	
	/M-BUS	

Example: POOYAB-SM4-DN100-L1-P16-E1-S1 -PR1-O1 /MEJ-W/ANT

Revision: 014 (07/28/2025)

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