

HPM412 Submersible Level Transmitter



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Overview

HPM412 submersible level transmitter features a fully sealed, submerged design and utilizes a high-quality, highly stable pressure sensor as its sensing element. The built-in pressure sensor has no sealing ring and is fully welded to the housing, significantly reducing the risk of leakage. Furthermore, multiple layers of reliable sealing are incorporated into the connections of the housing, cables, and other components. Internal potting ensures a long service life. The top threaded connection allows for easy installation and mounting in ship compartments, containers, and other similar locations.

This product is widely used in various applications in the marine industry, including pressure and level monitoring in ship compartments, level measurement in various containers, water treatment, and industrial process control.

Features

- ◆ Pressure core with no sealing ring, fully welded
- ◆ Top connection thread for easy installation and fixing
- ◆ High-precision liquid level measurement, up to 0.1%FS
- ◆ Temperature compensation for excellent stability
- ◆ Wide measurement range, from 1 meter to 300 meters
- ◆ Dual anti-condensation and anti-condensation technology
- ◆ Multiple protection and sealing structure design, achieving IP68 rating

Applications

- ◆ Ship tank pressure and level monitoring
- ◆ Water treatment industry
- ◆ Level monitoring of various containers
- ◆ Environmental Protection Industry
- ◆ Industrial process control

Technical Parameters

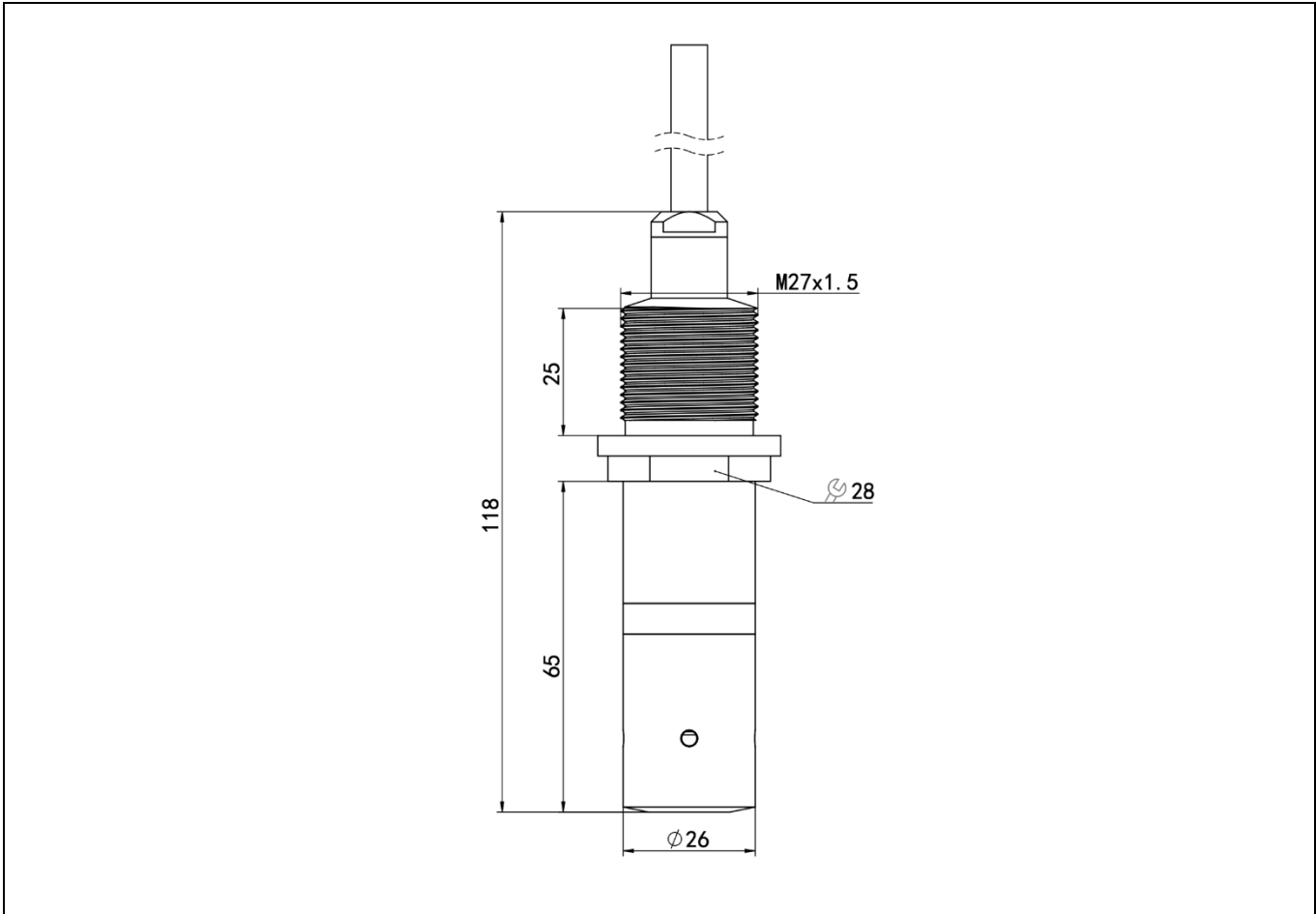
| | |
|---|---|
| Measuring range | 0~1...300mH ₂ O 0~10kPa...3.0MPa |
| Overload | 1.5 times full scale |
| Note: Measurement units can be converted to ftH ₂ O@4°C, inH ₂ O@4°C, m, mm, etc. When m, mm, etc. are used as units, the density value of the measured medium is given. | |
| Measuring Medium | Various liquids compatible with contact materials |
| Output Signal/Power Supply (1) | 2-wire 4~20mA _{DC} / V _S =10~30 V _{DC} |
| Output Signal/Power Supply (2) | 2-wire 0~10V etc. / V _S =12~32 V _{DC} |
| Output Signal/Power Supply (3) | 3-wire 0~5V etc. / V _S =10~30 V _{DC} |
| Output Signal/Power Supply (4) | 3-wire 0.25~1.25V, 0.5~2.5V etc. / V _S =2.8~5.5V _{DC} |
| Output Signal/Power Supply (5) | 4-wire Modbus-RTU/RS485 / V _S =10~30 V _{DC} |

| | |
|--|--|
| Accuracy | ±0.25%FS (typical) ±0.1%FS (optional) |
| Long-term Stability | ±0.2%FS/year (typical accuracy) ±0.1%FS/year (optional accuracy) |
| *Accuracy complies with IEC 60770 (non-linearity, hysteresis, repeatability) | |
| Response Time | about 1ms |
| Compensation Temperature Range | 0~70°C (typical accuracy) -20~85°C (optional accuracy) Note: For measuring range ≤35kPa, please consult. |
| Temperature Coefficient of Zero | ±1.0%FS Reference 25°C, within the temperature compensation range (temperature drift ±1.5%FS for ≤35kPa range, 0~70°C) |
| Temperature Coefficient of Full Scale | ±1.0%FS Reference 25°C, within the temperature compensation range (temperature drift ±1.5%FS for ≤35kPa range, 0~70°C) |
| Operation Temperature | -20~85°C |
| Medium Temperature | -20~85°C |
| Storage Temperature | -20~85°C |
| Protection Grade | IP68 |
| Short circuit protection | With |
| Reverse polarity protection | No damage, circuit does not work |
| Vibration resistance | 20g (20~5000Hz) |
| Shock resistance | 20g (11ms) |
| Insulation resistance | >100MΩ, 500VDC |
| Dielectric strength | Apply 500VAC 50Hz test voltage, no breakdown or arcing for 1 minute. |

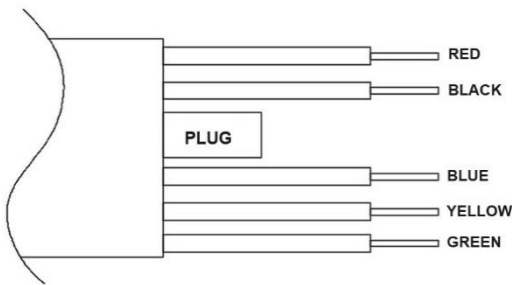
Structure Material

| Code | Part | Note |
|------|-----------------|---|
| S4 | Probe shell | 304 |
| S6 | | 316L |
| Ti | | titanium or titanium alloy |
| M1 | Pressure sensor | Silicon Piezoresistive,316L |
| M2 | | Silicon Piezoresistive, titanium & titanium alloy |
| C2U | Cable | PU polyurethane cable, external diameter (7.2±0.2) mm |
| C2N | | NBR nitrile cable, external diameter (7.2±0.2) mm |

Structure Drawings (Unit: mm)



Electrical Connection



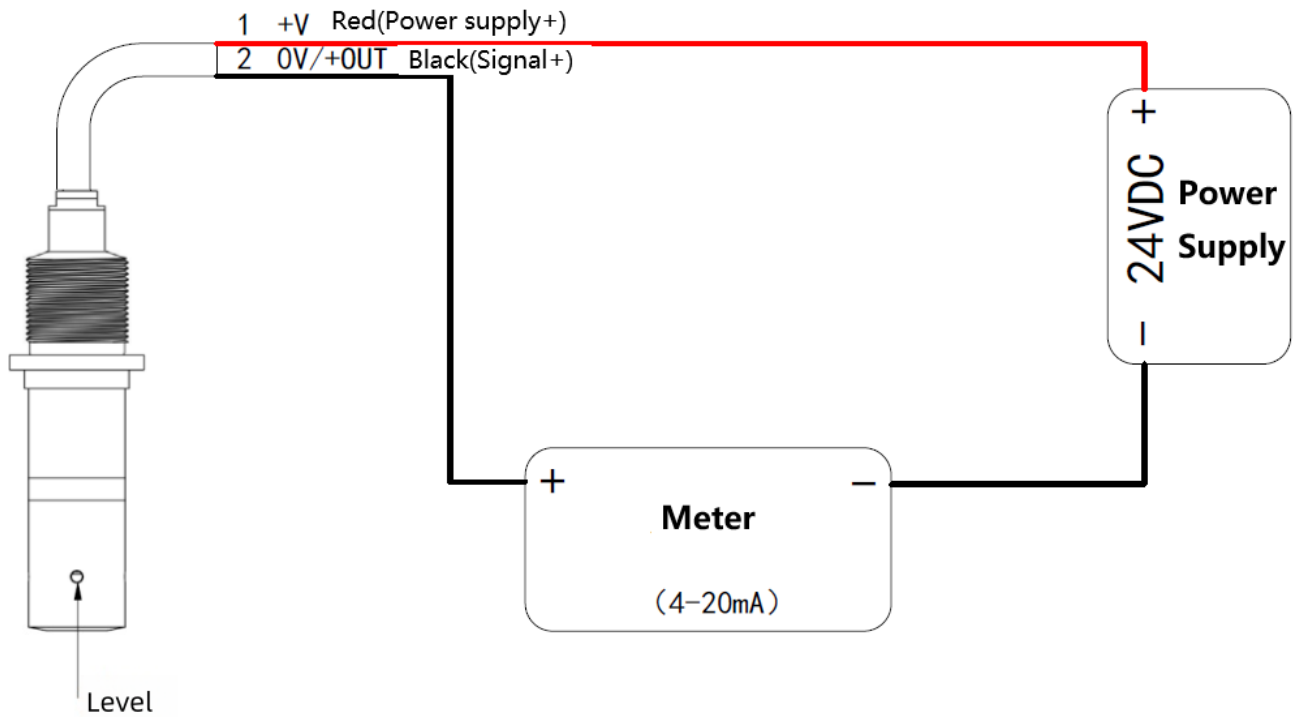
| Wire color | 4~20mA 2-wire | Voltage 3-wire | Modbus-RTU/RS485 |
|------------|-------------------------|--------------------|--------------------|
| Red | Power supply+ (+V) | Power supply+ (+V) | Power supply+ (+V) |
| Black | Power supply- (0V/+OUT) | Common (GND) | Power supply- (-V) |
| Blue | - | Output+ (+OUT) | - |
| Yellow | - | - | RS485A |
| Green | - | - | RS485B |



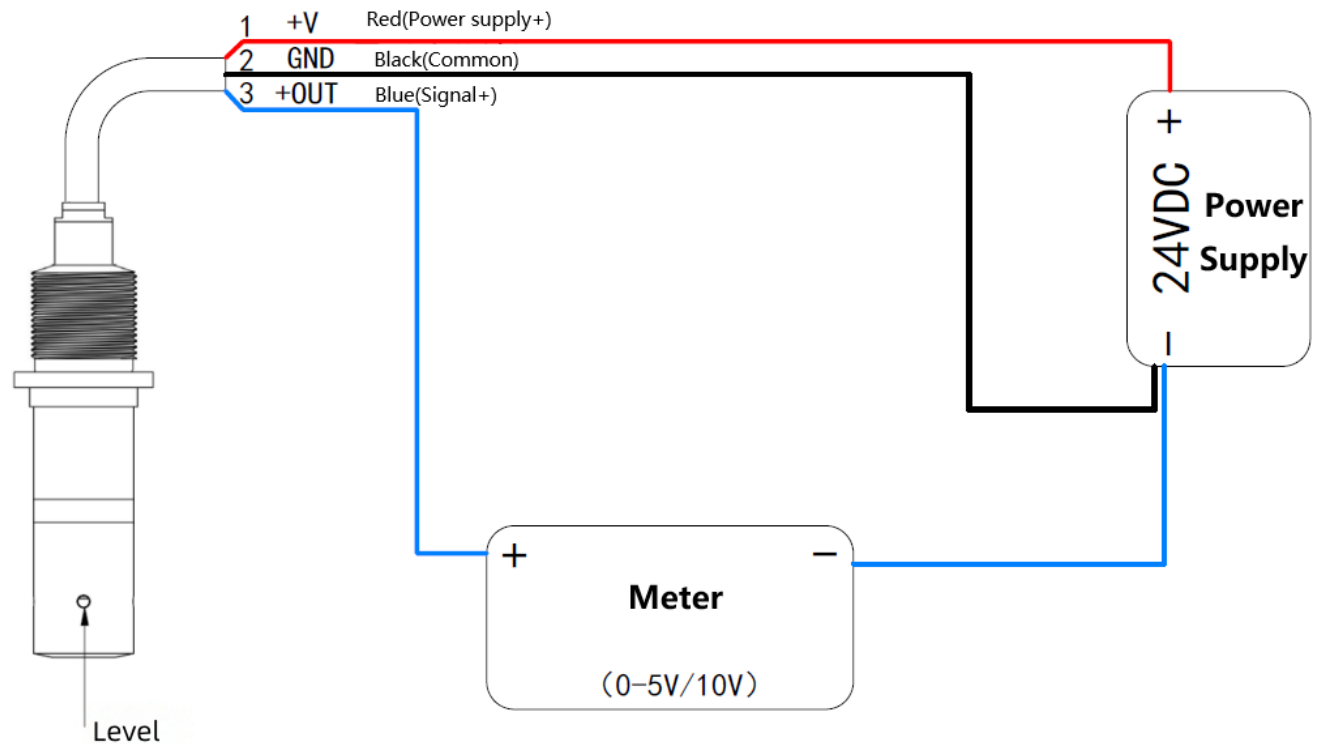
Gauge pressure products should refer to the current atmospheric pressure, and the breathable plug must be kept dry and prevented from falling off.

Electrical wiring diagram

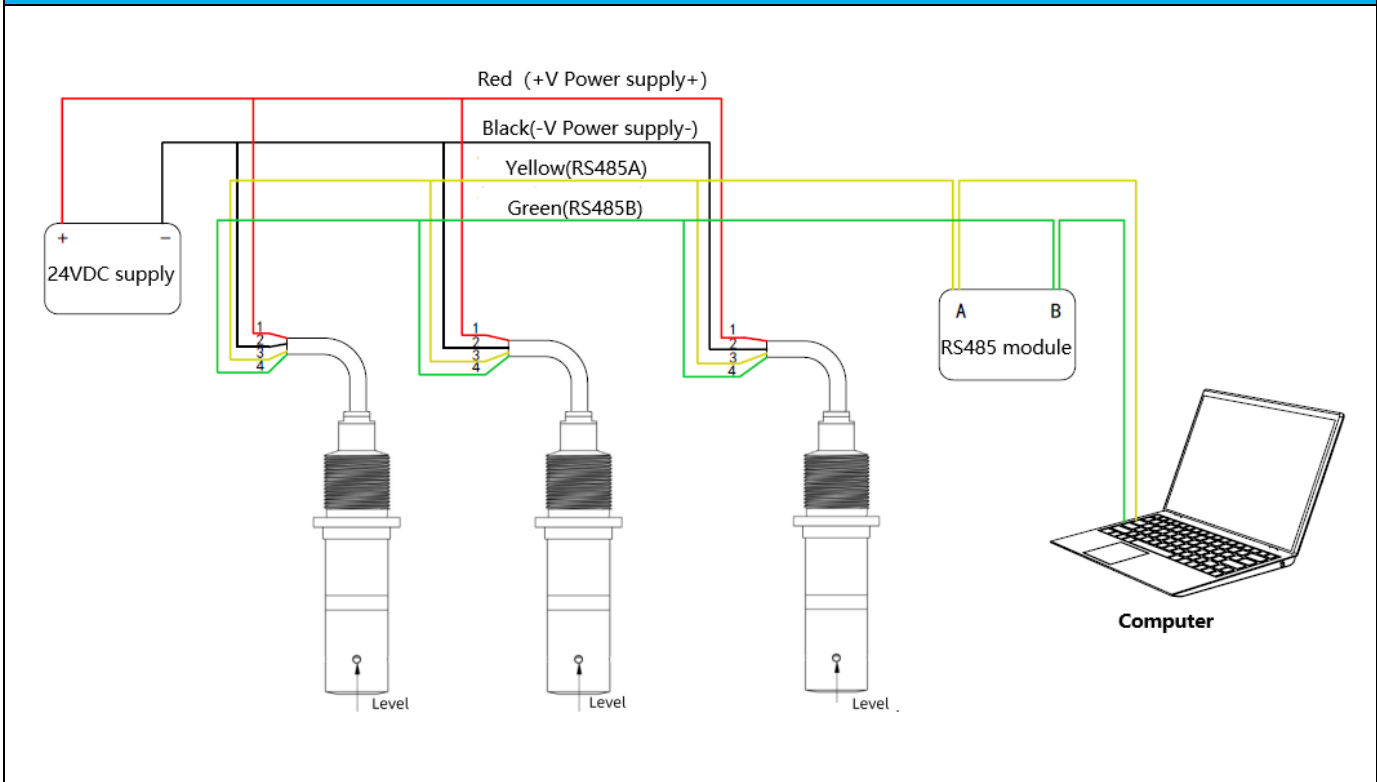
2-wire 4-20mA output



3-wire voltage output

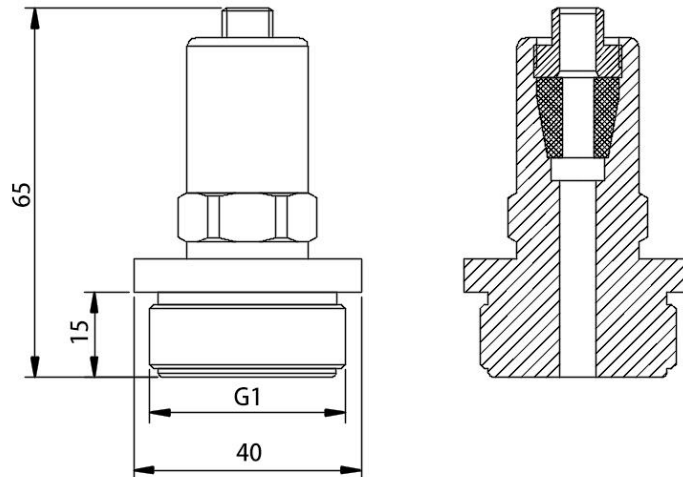


Modbus-RTU/RS485 output



Mounting (Unit: mm)

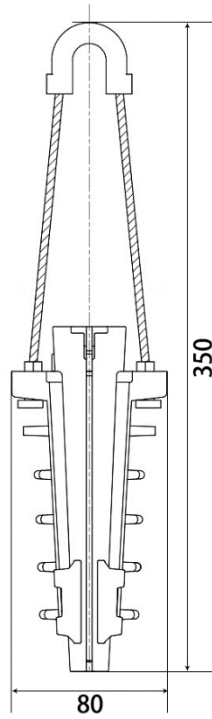
Threaded Mounting Parts (Ordering Code W1)



1. Used to fix the entire product at the top
2. Except for G1 thread, other threads can be customized if required

Weight ~450g

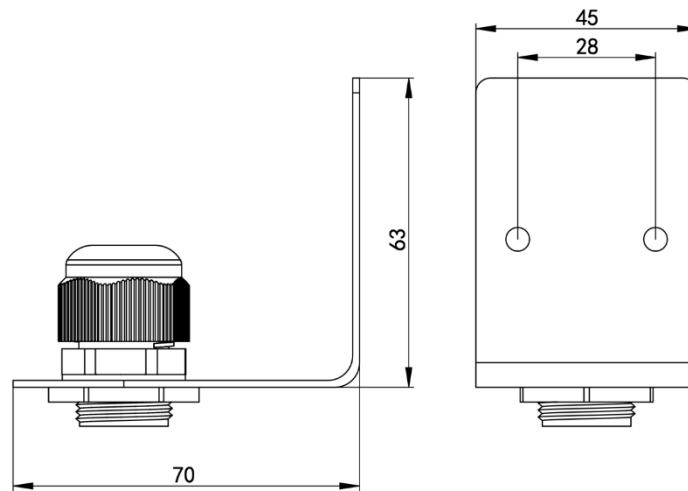
Cable clip (Ordering code W8)



Used to fix the entire product at the top

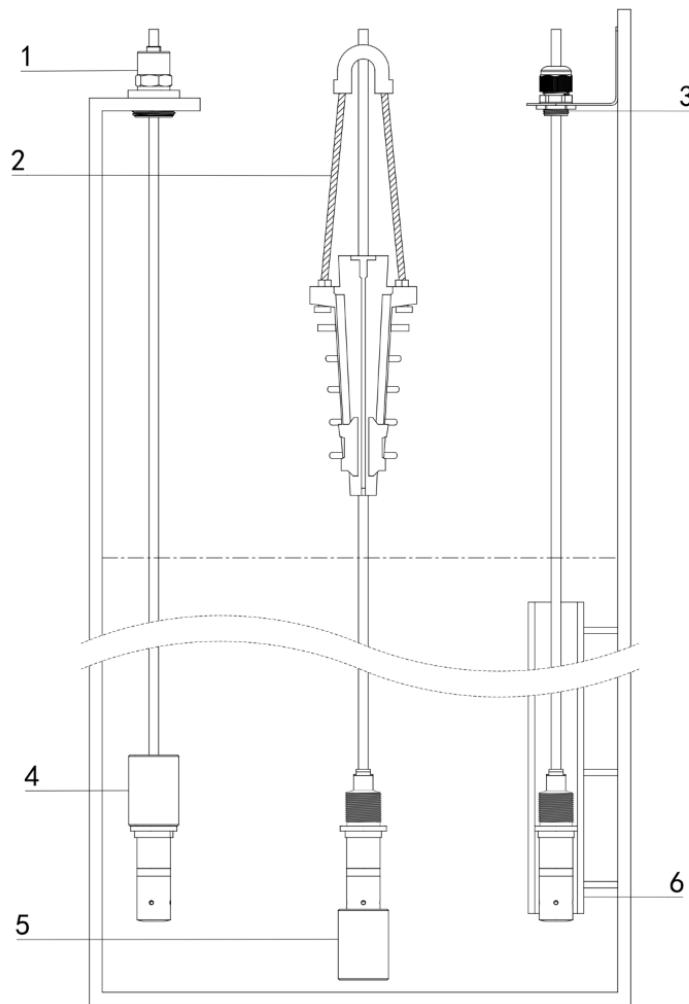
Weight ~340g

Right Angle Mounting Bracket Kit (Ordering code W4) Dimensions



Used to secure and support the entire product at the top.

Weight ~75g

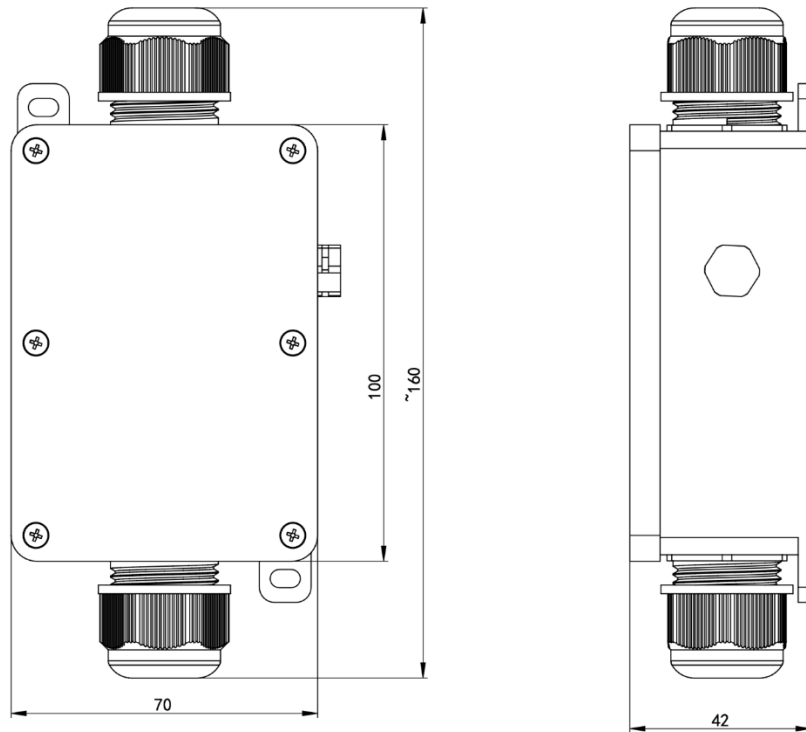
Installation diagram

1. Threaded mounting parts (W1)
2. Cable clip (W8)
3. Right-angle mounting bracket kit (W4)
4. Top connecting counterweight (W2)
5. Bottom connecting counterweight(W3)
6. Protective tube

Note: This product can be installed and secured at the measuring position via the top connecting thread.

Accessories (unit: mm)

Waterproof and breathable junction box (Ordering code W9)



Weight ~150g

1. Junction box with IP68 protection rating
2. Used to extend the ventilated cable and ensure the product's waterproof and breathable function
3. Recommended cable diameter range is 5-8mm. After wiring, ensure the waterproof cable connectors at both ends are tightened securely.

Ordering Guide

| Item NO | Type | | | | | |
|------------|-------------------------------|---|--|---|----|--------|
| HPM412 | Level transmitter | | | | | |
| | Pressure Range | Measuring Range | | | | |
| | [0 ~ X]mH ₂ O (Ln) | X is measuring range Ln is the length of cable | | | | |
| | | Code | Output Signal | | | |
| | | B1 | (4 ~ 20)mA | | | |
| | | B3 | (0 ~ 10)V | | | |
| | | B4 | (0 ~ 5)V | | | |
| | | B7 | RS485 | | | |
| | | Code | Cable Material | | | |
| | | C2N | NBR Nitrile | | | |
| | | C2U | PU Polyurethane | | | |
| | | Code | Mounting method | | | |
| | | N | NA | | | |
| | | W1 | Threaded mounting parts | | | |
| | | W2 | Top weight | | | |
| | | W3 | Bottom weight | | | |
| | | W4 | Right-angle mounting bracket kit | | | |
| | | W8 | Clip | | | |
| | | Code | Pressure sensor | | | |
| | | M1 | 316L | | | |
| | | M2 | Titanium or Titaniumalloy | | | |
| | | Code | Probe shell material | | | |
| | | S4 | 304 | | | |
| | | S6 | 316L | | | |
| | | Ti | Titanium or Titaniumalloy | | | |
| | | Code | Additional Functions | | | |
| | | QF | Factory report | | | |
| | | W9 | Waterproof and breathable junction box | | | |
| | | J25 | 0.25G accuracy | | | |
| | | J1 | 0.1G accuracy | | | |
| | | | Other requests | | | |
| Eg: HPM412 | [0 ~ 5]mH ₂ O (L7) | B1 | C2U | N | M1 | S4 |
| | | | | | | |
| | | | | | | W9 J25 |

Certification Information

| | |
|----------------------------|---|
| Factory certification | |
| Certification organization | CQM |
| Quality management system | ISO 9001:2015 |
| Certification scope | Research, development and manufacture of pressure transmitter and temperature transmitter |
| Certificate No. | 00223Q21711R1S |

| | |
|----------------------------|----------------------|
| CE | |
| Certification organization | ECM |
| Certification scope | Pressure Transmitter |
| Standard | 2014/30/EU |
| Certificate No. | 6G241223.NHEWC83 |