

## HPM413 Level Transmitter



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## Overview

HPM413 liquid level transmitter is a fully sealed submersible structure and uses an anti-corrosion ceramic piezoresistive pressure sensor. The probe put into the measured medium is made of 316L or titanium alloy. Cables are made of PTFE or polyurethane cables, which are mainly used in sewage, seawater and other media and all high-demand liquid level measurements.

The shell of this product adopts a full welding process, and the connections of the shell, wires and other links are reliably sealed with multiple designs. The interior adopts a full potting process to ensure that the product has a long service life and is widely used in the chemical industry, water treatment, environmental protection, medicine, industrial process control and many other occasions.

## Features

- ◆ Ceramic (96%  $\text{Al}_2\text{O}_3$ ) piezoresistive sensor
- ◆ High-cost performance
- ◆ 22mm diameter, suitable for 1-inch pipe installation
- ◆ Quasi-flush membrane structure, anti-clogging
- ◆ Anti-corrosion, wear-resistant
- ◆ Full welding process
- ◆ Full potting process, containing polymer sieve to prevent condensation
- ◆ Multiple protection and sealing structure design

## Applications

- ◆ Urban sewage and industrial wastewater
- ◆ Viscous media
- ◆ Chemical industry
- ◆ Water treatment industry
- ◆ Environmental protection industry
- ◆ Industrial process control

## Technical Parameters

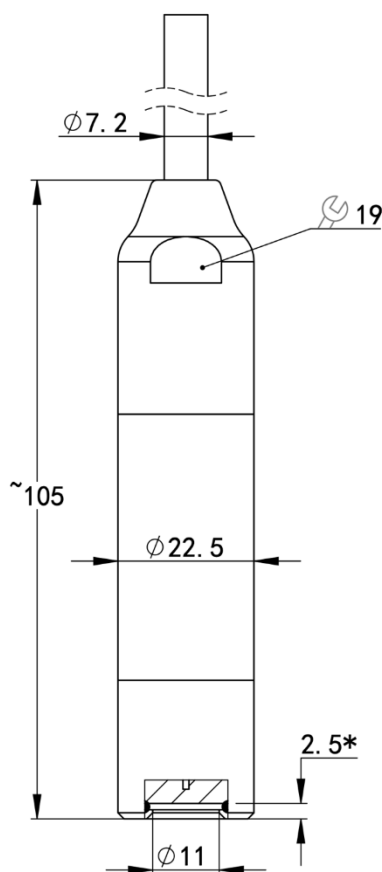
Measuring Range						
Rated range (Gauge pressure, kPa*)	50	100	200	500	1000	2000
Min Range (Gauge pressure, kPa)	20	60	120	250	500	1000
Overload(kPa)	100	200	400	1000	1500	3500
*The measurement unit can be converted to $\text{mH}_2\text{O}@4^\circ\text{C}$ , $\text{inH}_2\text{O}@4^\circ\text{C}$ , m, mm, etc. When using m, mm, etc. as the unit, please give the density value of the medium.						

<b>Measuring Medium</b>	Various liquids compatible with contact materials
<b>Output Signal/Power Supply (1)</b>	2-wire 4~20mA <sub>DC</sub> / V <sub>S</sub> =10~30 V <sub>DC</sub>
<b>Output Signal/Power Supply (2)</b>	2-wire 4~20mA <sub>DC</sub> +HART / V <sub>S</sub> =12~32 V <sub>DC</sub>
<b>Output Signal/Power Supply (3)</b>	3-wire 0~5V <sub>DC</sub> etc. / V <sub>S</sub> =10~30 V <sub>DC</sub>
<b>Output Signal/Power Supply (4)</b>	4-wire Modbus-RTU/RS485 / V <sub>S</sub> =3~8 V <sub>DC</sub> or 10~30 V <sub>DC</sub>
<b>Accuracy</b> *Accuracy complies with IEC 60770 (non-linearity, hysteresis, repeatability)	±0.5%FS (typical)
<b>Load characteristics</b>	4~20mA <sub>DC</sub> 2-wire: R <sub>L</sub> ≤ (U-10) / 0.02Ω 4~20mA <sub>DC</sub> +HART 2-wire: R <sub>L</sub> ≤ (U-12) / 0.02Ω Voltage output, 3-wire: R <sub>L</sub> >10kΩ
<b>Long-term Stability</b>	±0.25%FS/year
<b>Temperature Coefficient of Zero</b>	≤±0.04%FS/°C (25~70°C, ref 25°C)
<b>Temperature Coefficient of Full Scale</b>	≤±0.02%FS/°C (-10~70°C, ref 25°C)
<b>Operation Temperature</b>	-20~80°C
<b>Medium Temperature</b>	-20~80°C
<b>Storage Temperature</b>	-20~80°C
<b>Protection Grade</b>	IP68
<b>Short circuit protection</b>	With
<b>Reverse polarity protection</b>	No damage, circuit does not work
<b>Insulation resistance</b>	>100MΩ, 500VDC
<b>Dielectric strength</b>	Apply 500VAC 50Hz test voltage, no breakdown or arcing for 1 minute.

## Structure Material

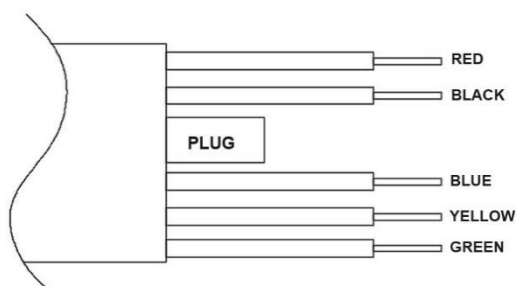
Code	Part	Note
S6	Probe shell	SS316L
TI		Titanium alloy
M6	Pressure sensor	Ceramic, Al <sub>2</sub> O <sub>3</sub> 96%
FK	O-ring	Fluorine rubber FKM (working temperature: -20~200°C)
FF		Perfluoro rubber FFKM (More corrosion resistant, working temperature: -25~300°C)
C2U	Cable	PU polyurethane cable, external diameter (7.2±0.2) mm
C2F		Fluoroplastic cable, external diameter (7.2±0.2) mm

## Structure Drawings (Unit: mm)



\* This size is the distance from the sensing diaphragm to the bottom

## Electrical Connection



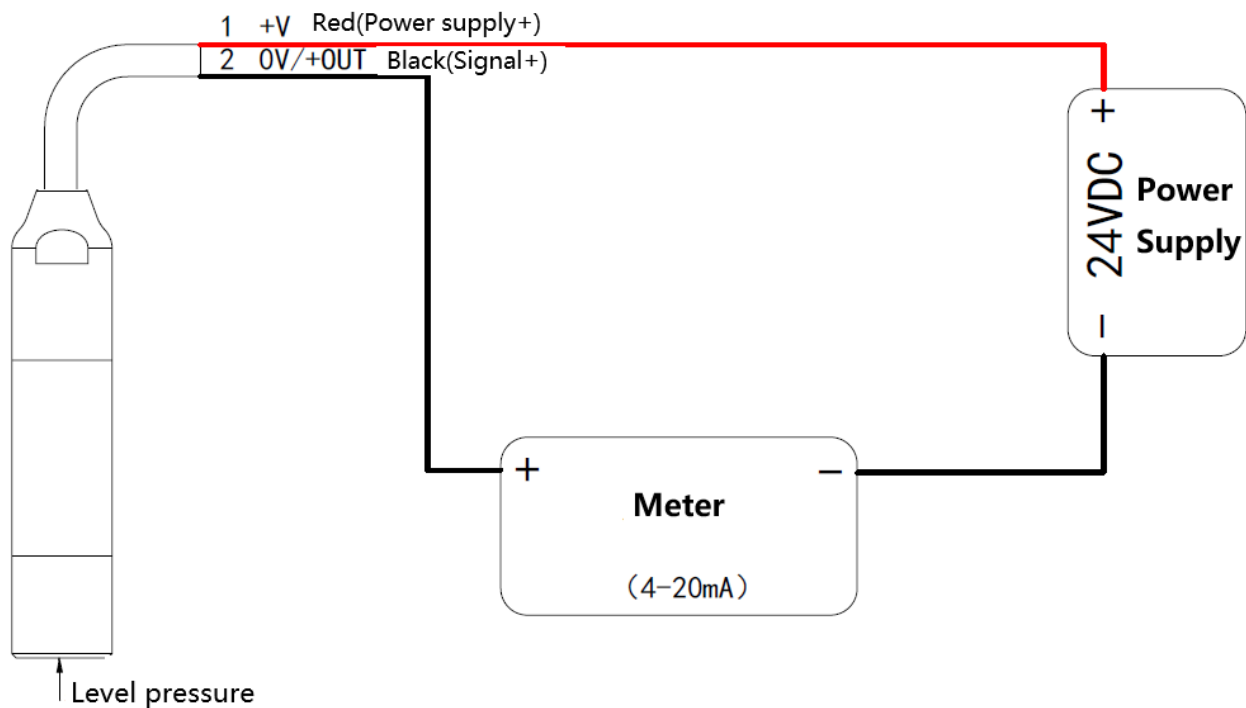
Wire color	4~20mA 2-wire	Voltage 3-wire	Modbus-RTU/RS485
Red	Power supply+ (+V)	Power supply+ (+V)	Power supply+ (+V)
Black	Power supply- (0V/+OUT)	Common (GND)	Power supply- (0V)
Blue	-	Output+ (+OUT)	-
Yellow	-	-	RS485A
Green	-	-	RS485B



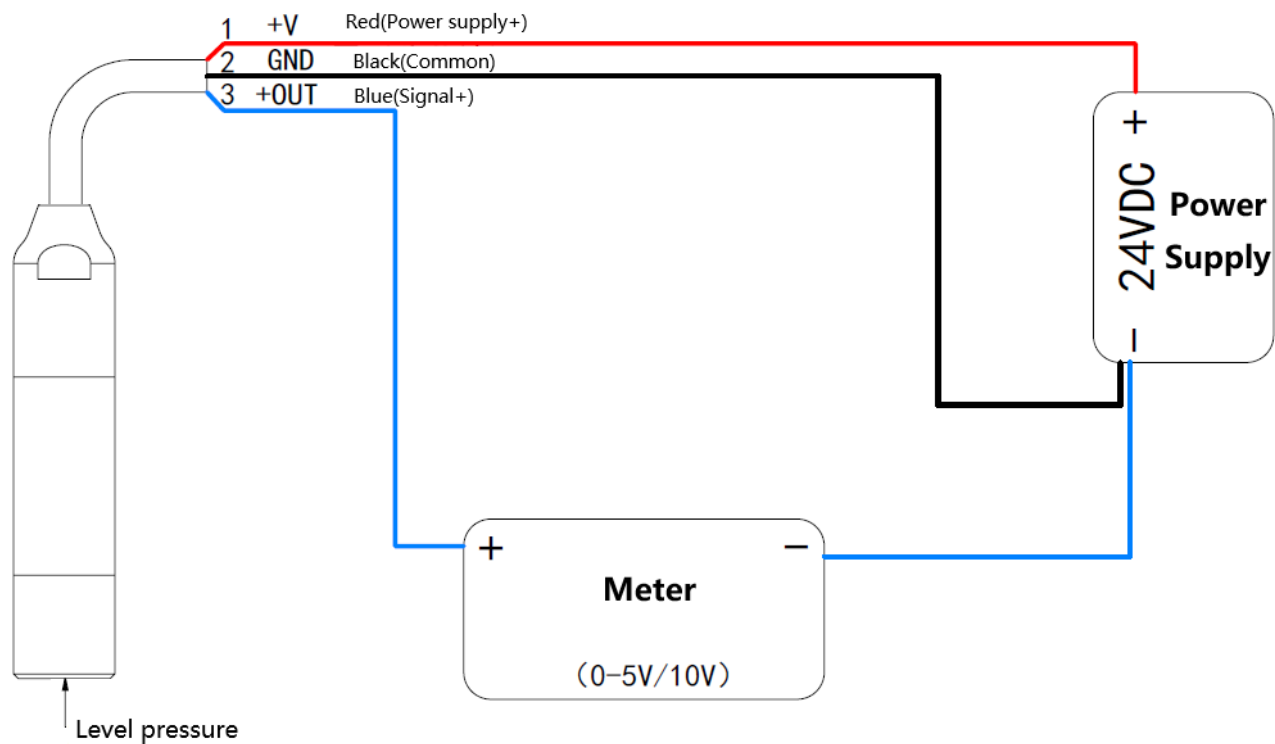
Gauge pressure products should refer to the current atmospheric pressure, and the breathable plug must be kept dry and prevented from falling off.

## Electrical wiring diagram

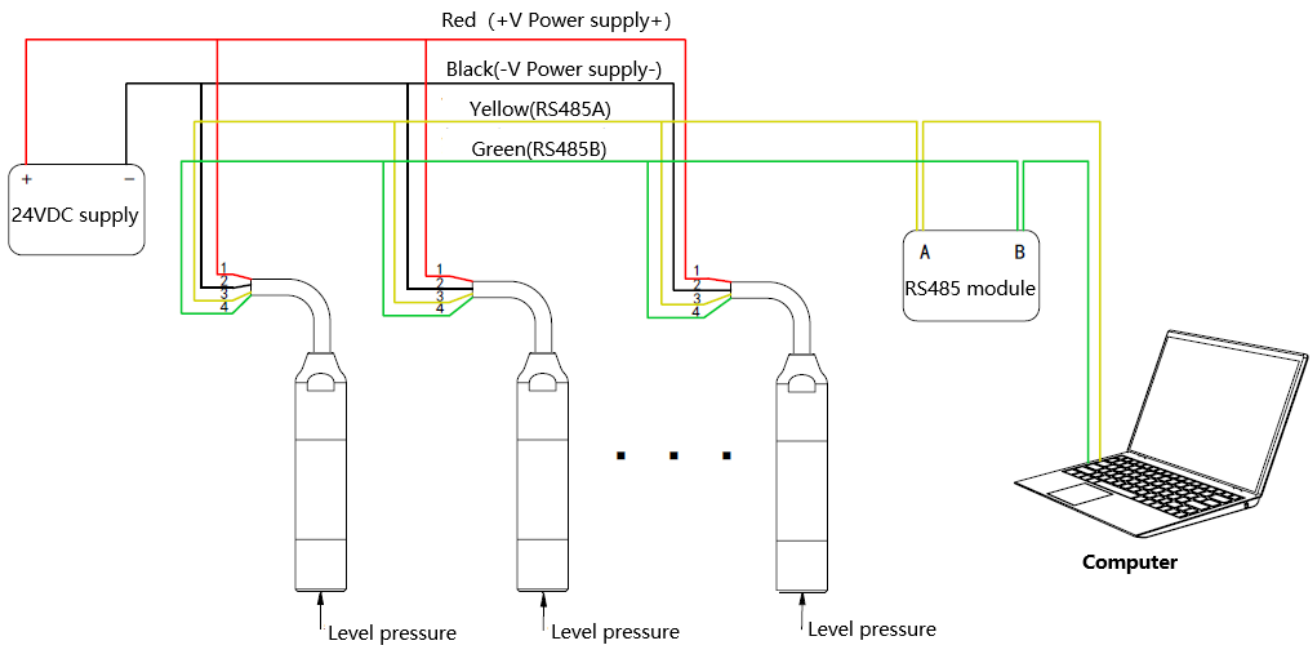
### 2-wire 4-20mA DC output



### 3-wire voltage output

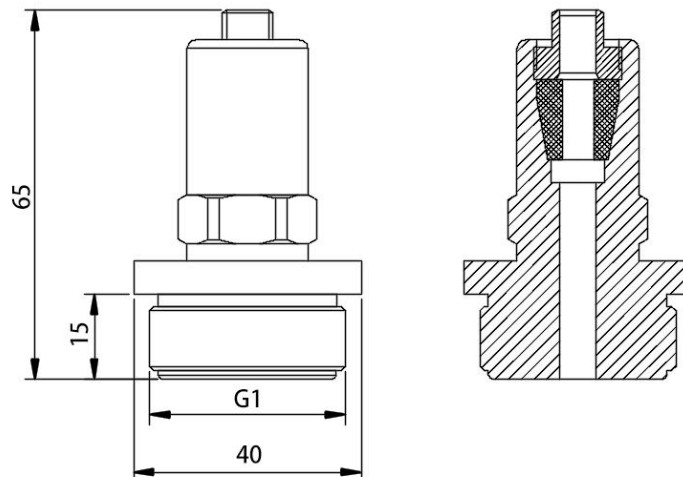


### Modbus-RTU/RS485 output



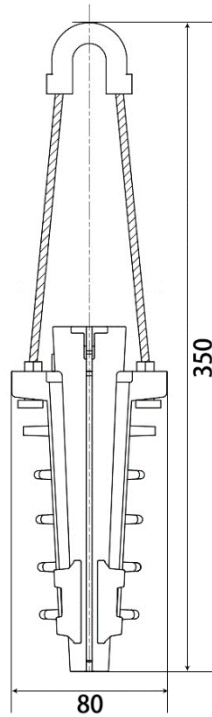
### Mounting (Unit: mm)

#### Threaded Mounting Parts (Ordering Code W1)



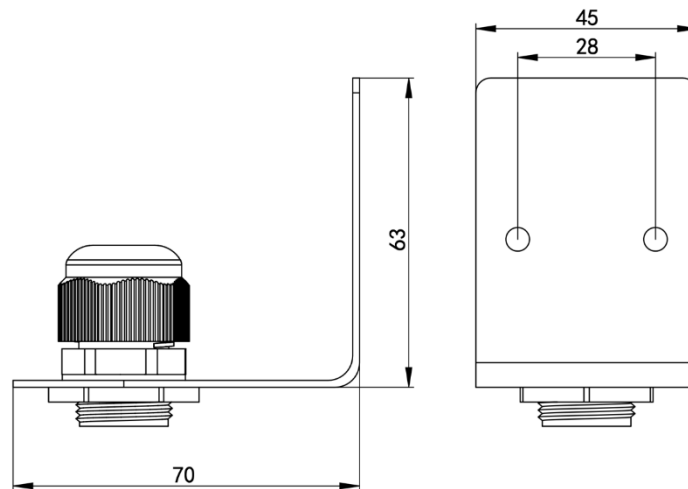
1. Used to fix the entire product at the top
2. Except for G1 thread, other threads can be customized if required

Weight ~450g

**Cable clip (Ordering code W8)**

Used to fix the entire product at the top

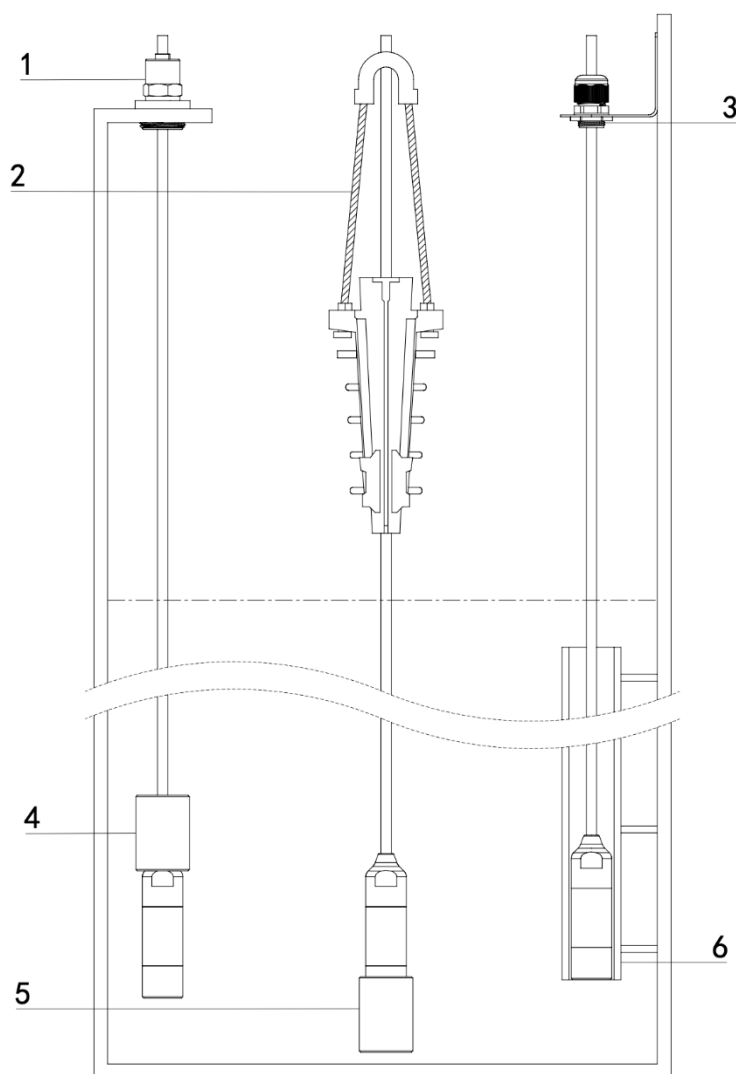
Weight ~340g

**Right Angle Mounting Bracket Kit (Ordering code W4) Dimensions**

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

Weight ~75g

## Installation diagram

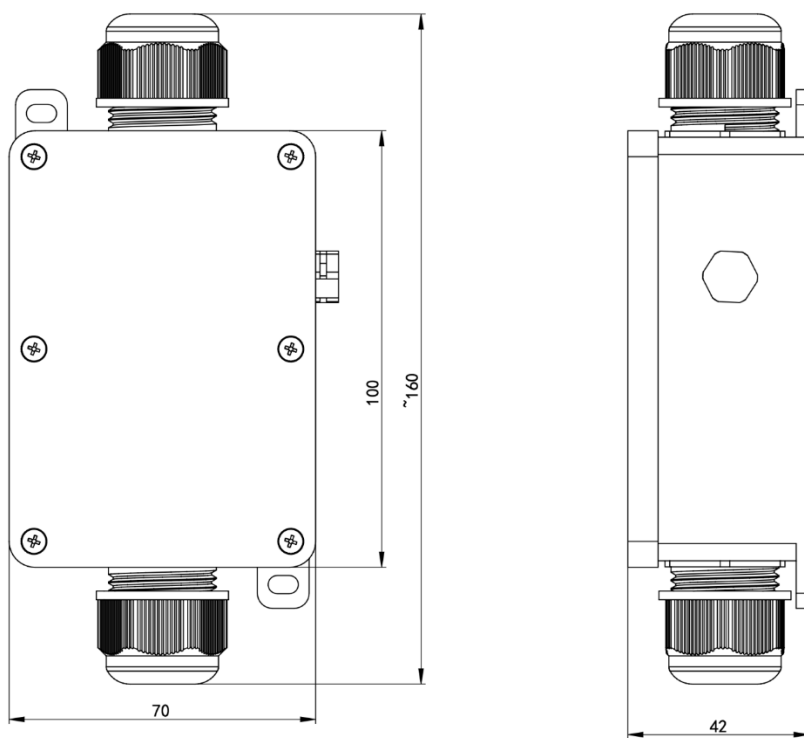


1. Threaded mounting parts (W1)
2. Cable clip (W8)
3. Right-angle mounting bracket kit (W4)
4. Top connecting counterweight (W2)
5. Bottom connecting counterweight (Not available for this model)
6. Protective tube

Notes: If counterweight in bottom, it needs to consider the influence of the height of the counterweight on the height from the sensing diaphragm to the bottom of the measurement medium.

## 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 vent cable and ensure the product's waterproof and breathable function.

## Ordering Guide

Item No.	Type										
HPM413	Submersible level Transmitter										
eg.HPM413	[0 ~ X]mH <sub>2</sub> O (Ln)	Pressure Range	Measuring Range								
			X is measuring range Ln is the length of cable								
		Code	Output Signal								
		B1	(4 ~ 20)mA								
		B4	(0 ~ 5)V								
		B7	Modbus-RTU/RS485								
		B8	(4 ~ 20)mA+HART								
		Code	Cable Material								
		C2F	PTFE								
		C2U	PU								
		Code	Mounting method								
		N	No								
		W1	Threaded mounting parts								
		W2	Top connecting counterweight								
		W4	Right-angle mounting bracket kit								
		W8	Cable clip								
		Code	Pressure sensor								
		M5	Ceramic piezoresistive								
		Code	Probe shell material								
		S6	316L								
		Ti	Titanium alloy								
		Code	Sealing ring material								
		FK	FKM								
		FF	FFKM								
		Code	Additional Functions								
		QF	Factory report								
			Other requests								
eg.HPM413	[0 ~ 3]mH <sub>2</sub> O (4)	B1	C2F	N	M5	S6	FK	QF			

## 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