

## HPTM189 Combined Pressure & Temperature Transmitter



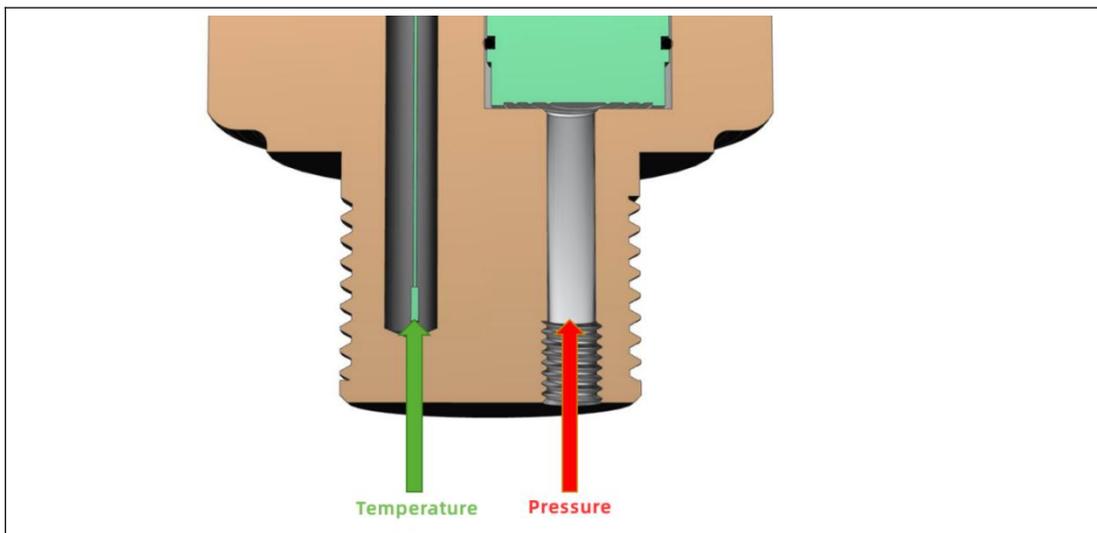
Nanjing Hangjia Electronic Technology Co.,Ltd.

## Overview

HPTM189 Combined Pressure & Temperature Transmitter is an industry leading and unique design with a highly stable pressure sensitive element and a high accuracy temperature sensitive element for independent measurement, enabling accurate measurement of both pressure and temperature. The compact size of the transmitter allows for a wide range of pressure and electrical interfaces to be selected, while the unique breathable design for small pressure measurements allows for more stable pressure measurements. The original design of the front temperature sensing element is more advanced than traditional temperature measurement methods and introduces a smaller temperature difference, allowing for a more accurate measurement of the medium temperature.

The product meets the requirements for accurate measurement of multiple parameters at one measurement point and is widely used for simultaneous measurement of pressure and temperature of fluids in industrial process control.

### Working principle:



The temperature sensor is a built-in high precision PT100 or PT1000 with a measurement position close to the medium to be measured, a small temperature difference and a fast response. The temperature measurement is also supported by a probe rod structure in order to reach the centre of the temperature to be measured.

The pressure measurement channel uses a highly stable and accurate silicon piezoresistive pressure-sensing core, where the process pressure acts directly on the isolation diaphragm, causing it to deform. The signal conditioning circuit converts the MEMS chip signal into a standard current or voltage output.

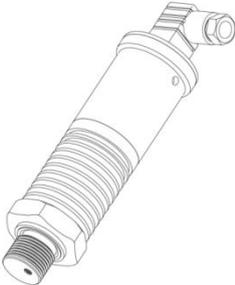
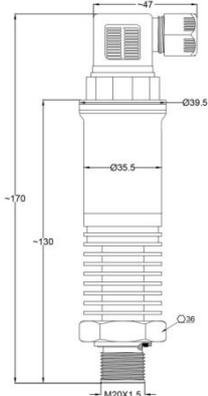
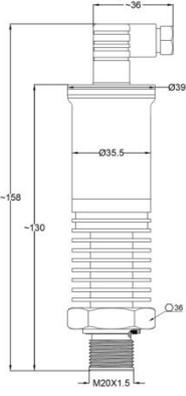
## Features

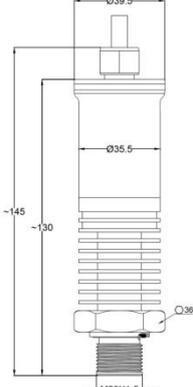
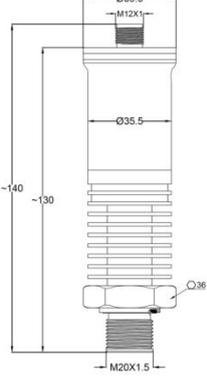
- Parallel measurement of temperature and pressure
- Up to class 0.2 pressure channel measurement
- Temperature sensor front measurement for smaller errors
- Breathable design for more stable pressure measurement
- Multiple electrical interfaces supported

## Parameters

Pressure Range	-100kPa...0~50kPa...40MPa[Gauge pressure]; 0~50kPa...10MPa[Absolute pressure]
Temperature Range	-40~200℃, maximum 350℃ (customized)
Measuring Medium	Various liquids, gases and various compatible with contact materials
Output Signal	Two way 4~20mADC[two-wire]; Two ways 0-5VDC[three-wire]; Two way 0-10VDC[three-wire]; 4~20mA pressure output[two-wires]+PT100/PT1000[three-wire]; Modbus-RTU/RS485[four-wire]
Accuracy	±0.5%FS (pressure sensor,normal), ±0.2%FS (pressure sensor, customized) ±0.4℃ (temperature sensor)
Electrical Connection	DIN43650/Hirschmann, cable outlet, M12*1
Long-term Stability	±0.2%FS/year
Response Time	≤3ms (pressure)
Start-up Time	≤5s
*Accuracy according to IEC 60770 (non-linearity, hysteresis, repeatability)	
Compensation temperature Range	-10~70℃
Temperature Coefficient of Zero	±1.5%FS(Reference 30℃)
Temperature Coefficient of Full Scale	±1.5%FS(Reference 30℃)
Medium Temperature	-40 to 140℃ (5* heat sinks ) -40 to 200℃ (9 *heat sinks) -40 to 350℃ (9* heat sinks, microporous structure)
Ambient Temperature	-40~85℃
Storage Temperature	-40~85℃
Protection grade	IP65, Hirschmann electrical connection IP66, M12 x 1 connector (housing without breathable design) IP67, cable outlet (housing without breathable design)
Electrical Protection	Short circuit protection Reverse polarity protection Electromagnetic compatibility
Mechanical Stability	Vibration 20g(20~5000Hz) Shock resistance 50g(11ms)
Insulation resistance	>20MΩ @500VDC
Dielectric strength	<2mA @500VAC 1min

**Structure Drawings(unit:mm)**

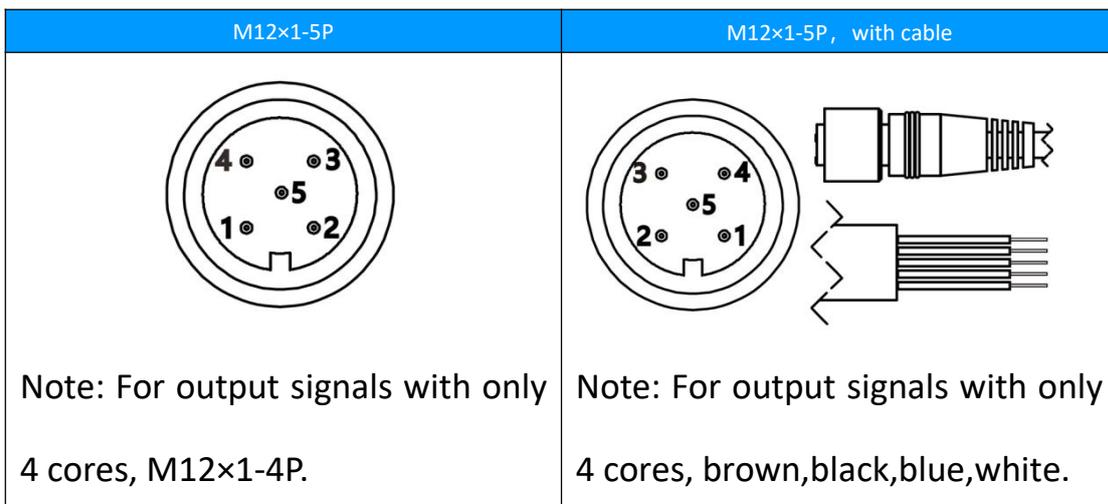
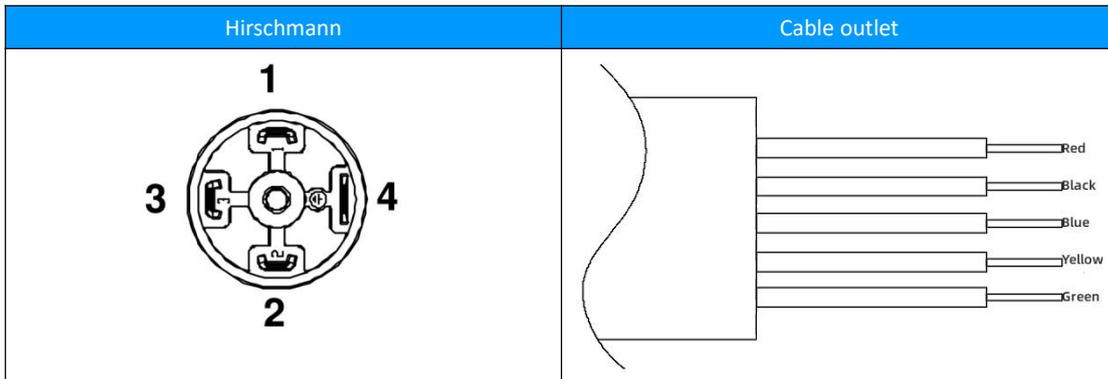
C1,T9: Normal Hirschmann , heat sinks*9	C1.1,T9: Small size Hirschmann, heat sinks*9
	
	

C2、 T9: cable outlet,heat sinks*9	C5(C6)、 T9: M12×1,heat sinks*9
	
	

Note:

1. The dimensions listed in the diagram may change with the update of the process.
2. For RS485 communication (24V power supply), the height is increased by about 25mm.
3. Support for customized shape structure with temperature probe rod.

### Electrical Connection



Output Signal	Pressure: two-wire 4 ~ 20mA current		Temperature: three-wire PT100/PT1000		
Definition	Power supply+(+V)	Power supply-(0V/+OUT)	A	B	B
Cable outlet	red	black	blue	yellow	green
M12×1	1	2	3	4	5
M12×1, with cable	brown	black	blue	white	grey

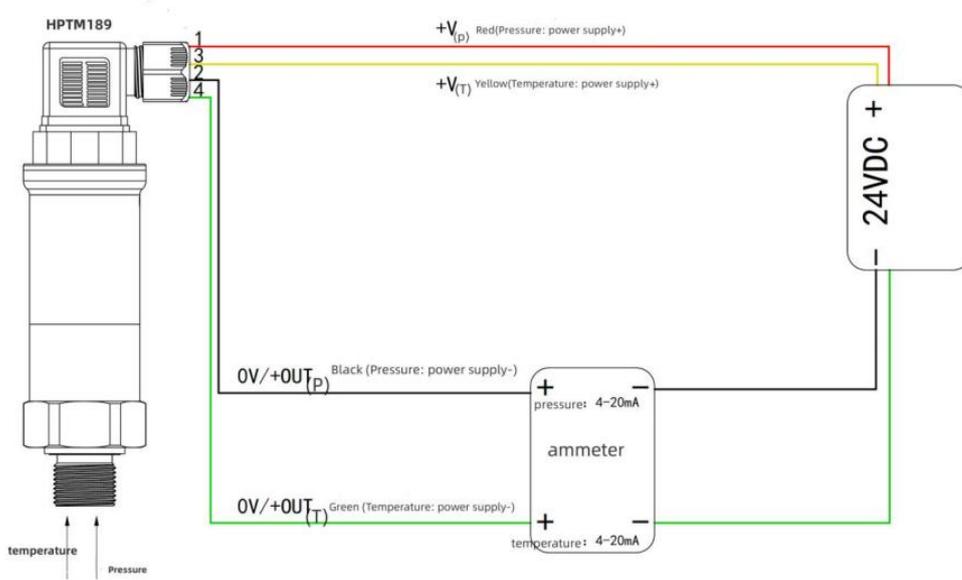
Output Signal	Pressure: two-wire 4 ~ 20mA current		Temperature: two-wire 4 ~ 20mA current	
Definition	Power supply+(+V)	Power supply-(0V/+OUT)	Power supply+(+V)	Power supply-(0V/+OUT)

Hirschmann	1	2	3	4
Cable outlet	red	black	yellow	green
M12×1	1	2	3	4
M12×1, with cable	brown	black	blue	white

Output Signal	Pressure: three wire voltage		Temperature: three wire voltage	
Definition	Power supply(+V)	Common port(GND)	Pressure output (+OUT)	Temperature output(+OUT)
Hirschmann	1	2	3	4
Cable outlet	red	black	yellow	green
M12×1	1	2	3	4
M12×1,with cable	brown	black	blue	white

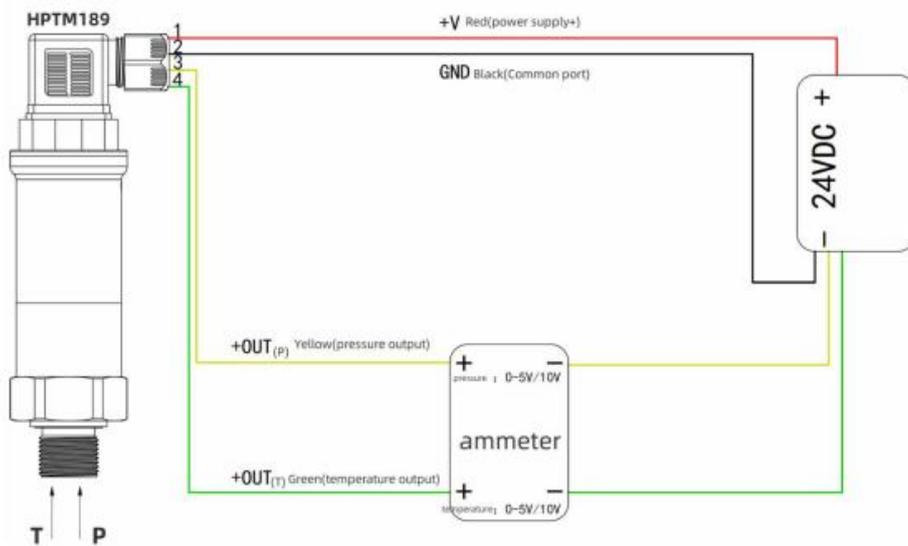
Output signal	Four-wire Modbus-RTU/RS485			
Definition	Power supply(+V)	Power supply(-V)	RS485A	RS485B
Hirschmann	1	2	3	4
Cable outlet	red	black	yellow	green
M12×1	1	2	3	4
M12×1,with cable	brown	black	blue	white

### Wiring Diagram



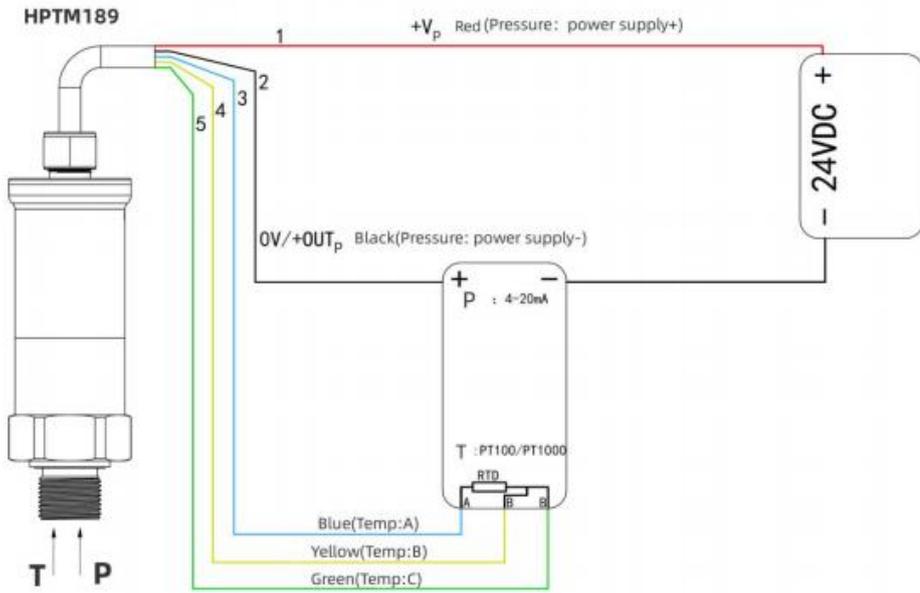
**Pressure: two-wire 4 to 20mA current**

**Temperature: two-wire 4 to 20mA current (Hirschmann electrical connection)**

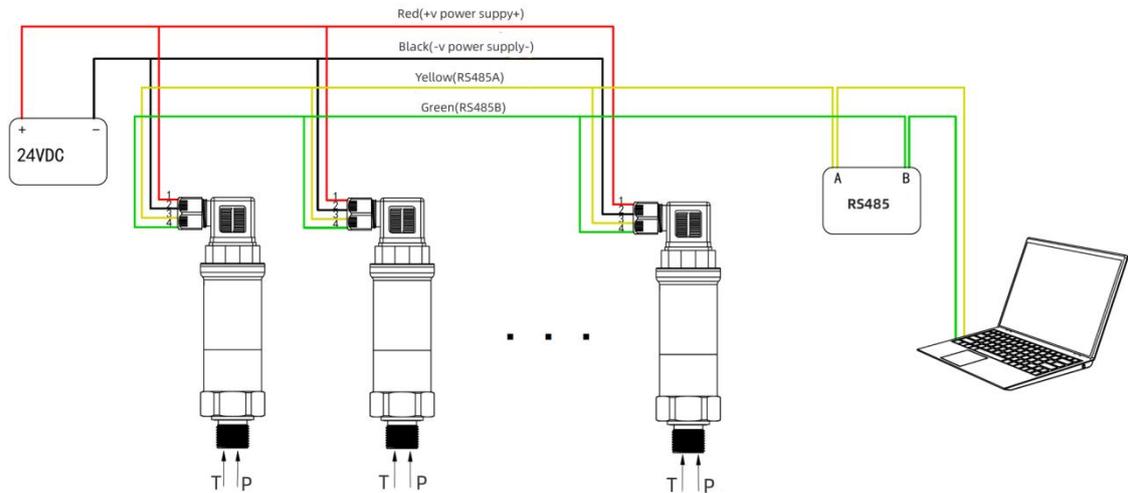


**Pressure: three-wire voltage output**

**Temperature: three-wire voltage output (Hirschmann electrical connection)**



**Pressure: two-wire 4 to 20mA current**  
**Temperature: three-wire PT100/PT1000 (Direct cable outlet)**



**Four-wire Modbus-RTU/RS485 (Hirschmann Electrical Connection)**

## Ordering Guide

Model Name	Type							
HPTM189	Combined Pressure & Temperature Transmitter							
	Pressure Range							
	(X1 - X2)kPa							
			Temperature Range					
			(T1 - T2)/°C					
			Code	Output Signal (pressure)	Output Signal (temperature)			
			B1PT100	(4 - 20)mA	three-wire PT100			
			B1PT1000	(4 - 20)mA	three-wire PT1000			
			B1B1	(4 - 20)mA	(4 - 20)mA			
			B3B3	(0 - 10)V	(0 - 10)V			
			B4B4	(0 - 5)V	(0 - 5)V			
			B7	Modbus-RTU/RS485				
				Code	Process connection			
				P1	M20× 1.5			
				G12	G1/2			
				G34	G3/4			
				Code	Electrical connection			
				C1	Normal Hirschmann			
				C1.1	Mini-size Hirschmann			
				C2	cable outlet			
				C5	M12×1 4P			
				C6	M12×1 5P			
				Code	Pressure			
				S4	304			
				S5	316L			
				Code	Length			
				L	L=Insertion length(mm)			
					Code	Additional		
					G	Gauge pressure (Default)		
					A	Absolute pressure		
					T5	5 heat sinks, temperature resistant to 140°C		
					T9	9 heat sinks temp resistant to 200°C		
					T9H	9 heat sinks, microporous structure, temp resistant to 350°C		
Ex: HPTM189	(0 - 1)MPa	(0 - 150)°C	B1B1	P1	C1	S4	L=30mm	G T9