HPTM180 Combined Pressure & Temperature Transmitter


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Overview

HPTM180 Combined Pressure & Temperature Transmitter is an industry leading and unique design with a highly stable pressure sensitive element for independent measurement and a high accuracy temperature sensitive element for accurate measurement of medium pressure and temperature at the same time. 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:
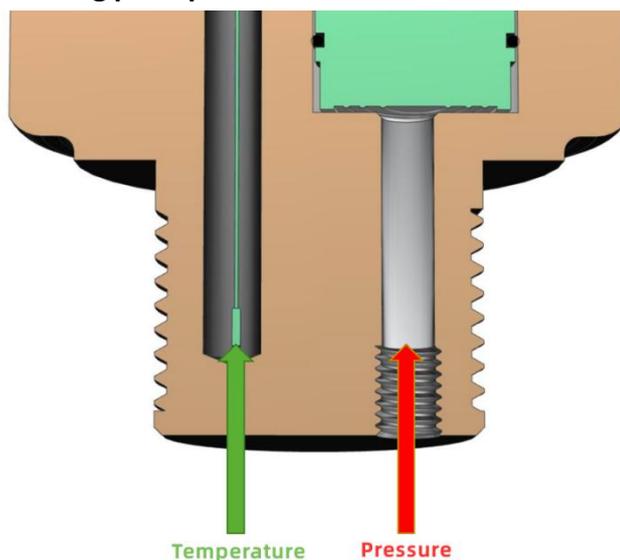
The temperature sensor is a built-in high precision PT100 or PT1000 with a measurement position close to the medium to be measured, a small temperature difference and a fast response. The temperature measurement is also supported by a probe rod structure in order to reach the centre of the temperature to be measured.

The pressure sensor is 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
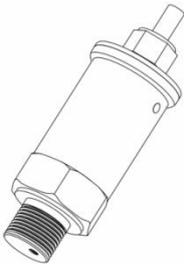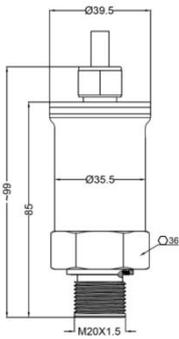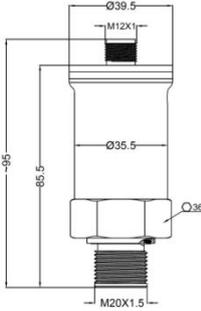- Multiple electrical interfaces supported

Parameters

Pressure Range	-100kPa...0~50kPa...40MPa[Gauge pressure]; 0~50kPa...10MPa[Absolute pressure]
Temperature Range	-40～100℃
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[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 30ºC)
Temperature Coefficient of Full Scale	±1.5%FS(Reference 30ºC)
Medium Temperature	-40～100℃
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 not designed to breathe)
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: Hirschmann/DIN43650, IP65	C1.1: Mini-size Hirschmann，IP65
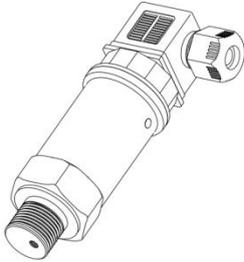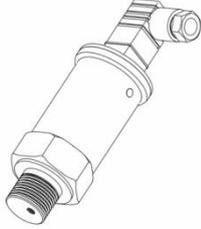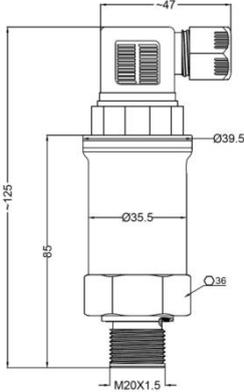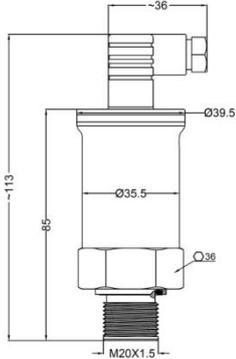
C2: Cable outlet，IP67	C5、C6: M12×1，IP66

Note:

1.The dimensions listed in the diagram may change with the update of the process.

2.RS485 communication, height increase of about 25mm.

3.Support the customization of the shape structure with temperature probe rod.

Electrical Connection

Hirschmann/DIN43650	Cable outlet

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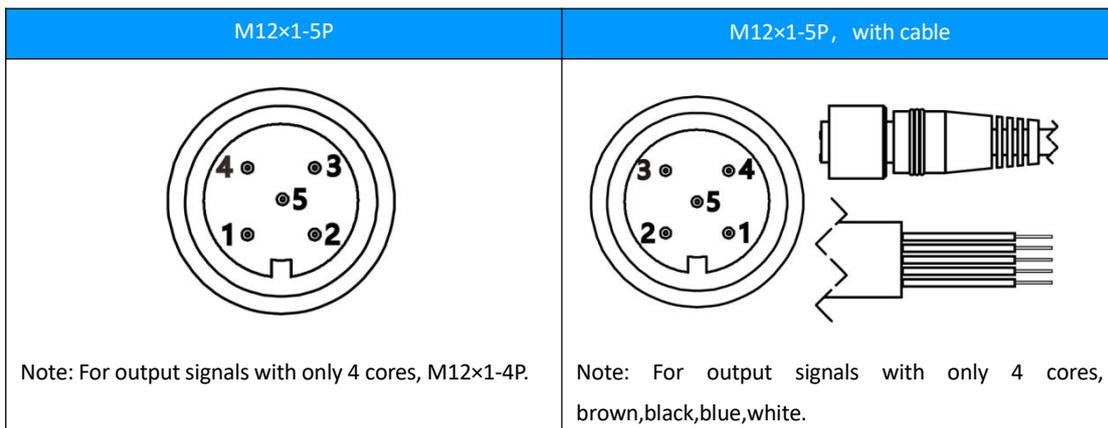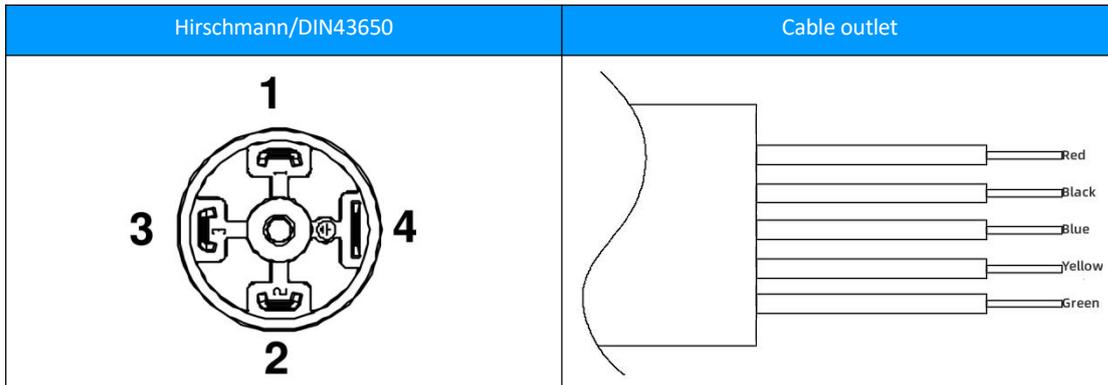
Output signal	Pressure：two-wire 4 ~ 20mA current		Temperature：three-wire PT100/PT1000		
	Power supply+(+V)	Power supply-(0V/+OUT)	A	B	B
Cable outlet	red	black	blue	yellow	green
M12×1	1	2	3	4	5
M12×1，with cable	brown	black	blue	white	grey

Output signal	Pressure：two-wire 4 ~ 20mA current		Temperature：two-wire 4 ~ 20mA current	
	Power supply+(+V)	Power supply-(0V/+OUT)	Power supply+(+V)	Power supply-(0V/+OUT)
Hirschmann /DIN43650	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	
	Power supply+(+V)	Common port(GND)	Pressure output (+OUT)	Temperature output (+OUT)
Hirschmann /DIN43650	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			
	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

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Wiring Diagram
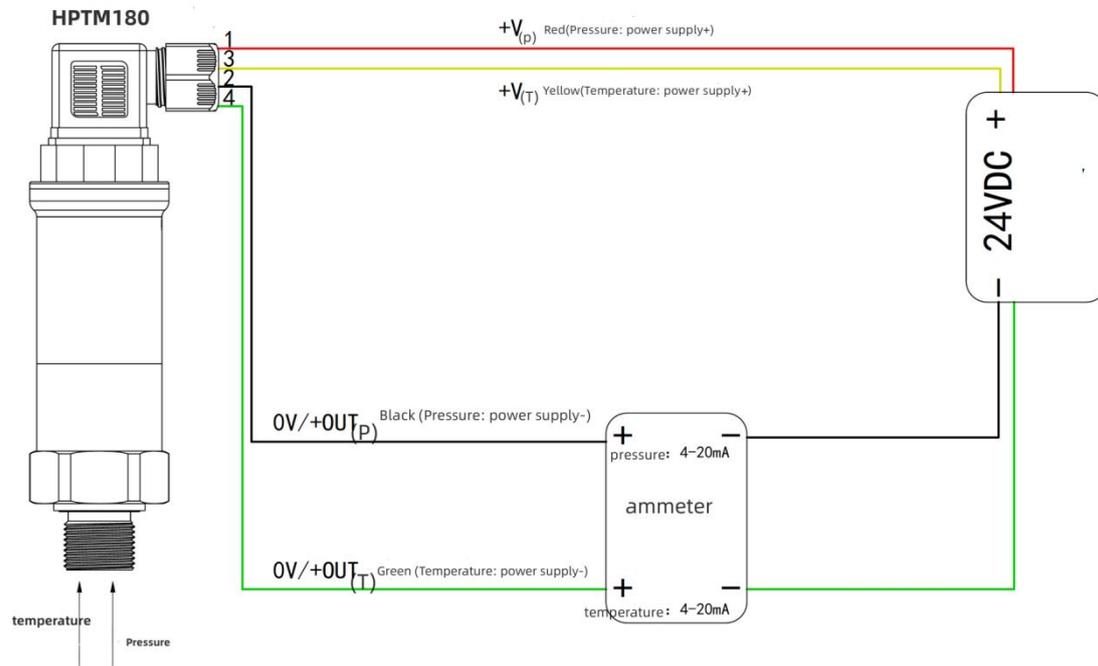
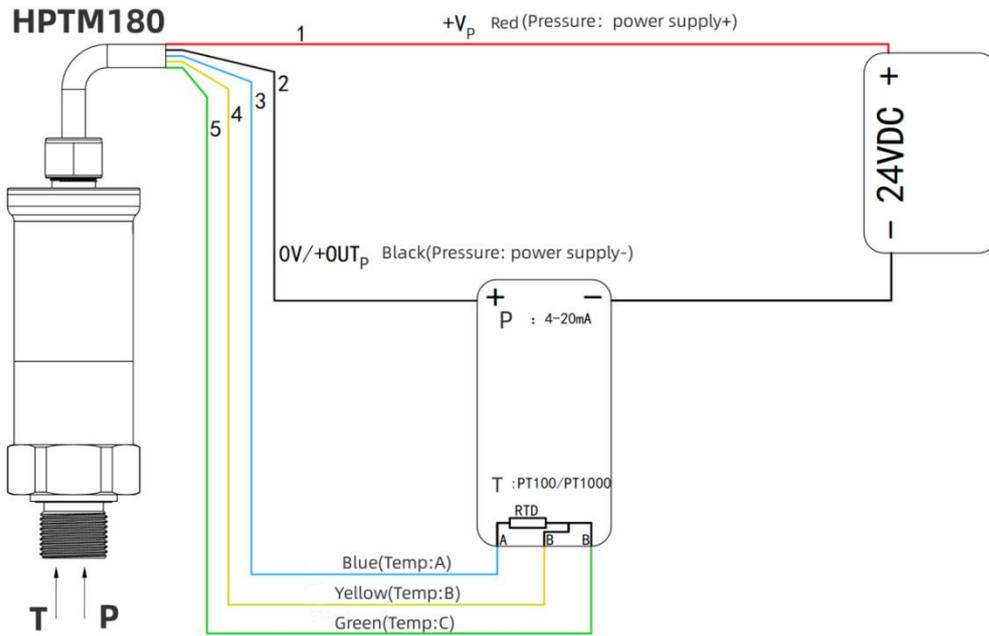**Pressure: two-wire 4 to 20mA current**
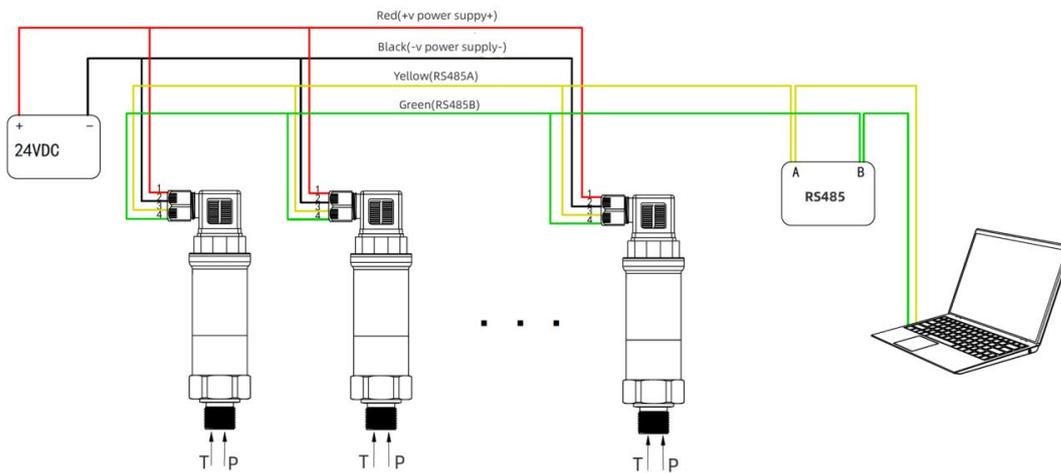**Temperature: two-wire 4 to 20mA current (Hirschmann electrical connection)**
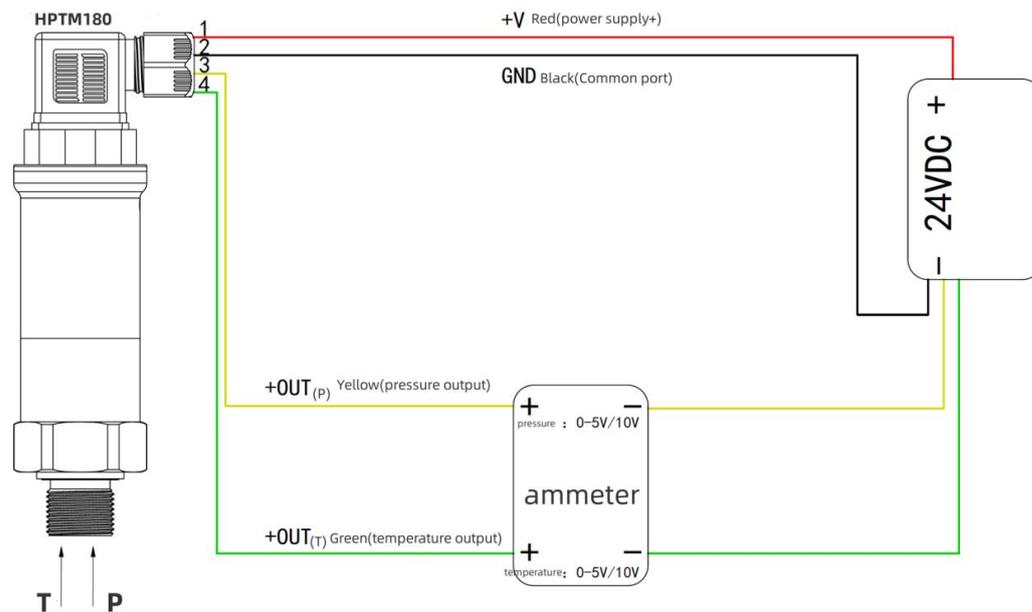
Pressure: 3-wire voltage output
Temperature: 3-wire voltage output (Hirschmann electrical connection)

Pressure: 2-wire 4 to 20mA current
Temperature: 3-wire PT100/PT1000 (Direct cable outlet)

4-wire Modbus-RTU/RS485 (Hirschmann Electrical Connection)

Ordering Guide

Model Name	Type		Temperature	Code / Output						
HPTM180	Combined Pressure & Temperature Transmitter									
	Pressure Range									
	(X1~X2)kPa									
			Temperature							
			(T1~T2)℃							
				Code	**Output**	**Output**				
				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		
							S6	316L		
								Code	**Length**	
								L	L=Insertion length(mm)	
									Code	**Additional functions**
									G	Gauge pressure (Default)
									A	Absolute pressure
										Other
Ex: HPTM180	(0~1)MPa		(0~100)℃	B1B1	P1	C1	S4	L=50mm	G	