

# Industrial Pressure Transmitter

- Professionalization
- Customization
- Industrialization
- Intelligentization



## Integrated Temperature and Pressure Transmitter

## Overview

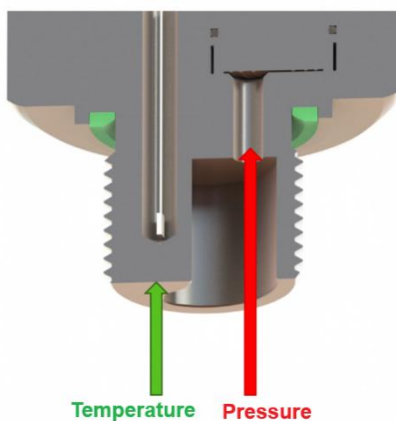
The integrated temperature and pressure transmitter is a high-performance instrument with both temperature and pressure measurement functions.

HPTM180/189 temperature and pressure transmitters use high-stability pressure sensitive elements for independent measurement and are equipped with high-precision temperature sensitive elements, which can accurately measure medium pressure and temperature at the same time. The compact size of the transmitter allows for a wide range of pressure and electrical interface options, while the unique venting design for micro-pressure measurement enables more stable pressure measurement. The original front temperature sensitive element design is more accurate than traditional temperature measurement methods, and introduces a smaller temperature difference, allowing for more accurate measurement of medium temperature.

## Features

- ◆ Parallel measurement of temperature and pressure
- ◆ Up to 0.2 level pressure channel measurement
- ◆ Temperature sensor front-mounted method measurement, smaller error
- ◆ Breathable design makes pressure measurement more stable
- ◆ Supports a variety of electrical interfaces

## 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 to reach the center 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.

# Technical Parameters

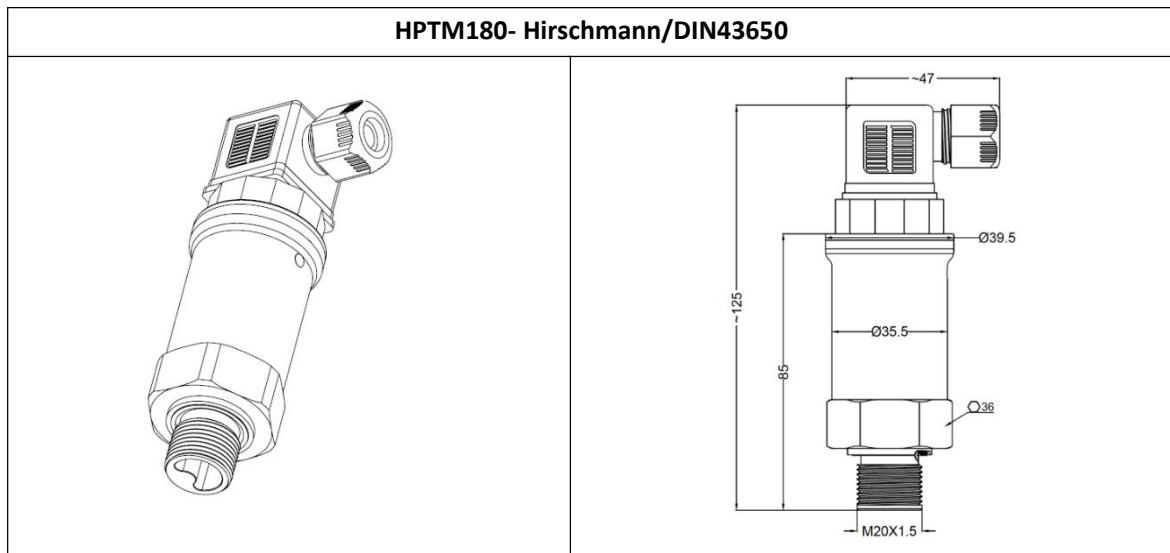
## HPTM180

<b>Pressure Range</b>	0~50kPa...40MPa (gauge pressure) 0~50kPa...10MPa (absolute pressure)
<b>Temperature Range</b>	-40~85℃ Note: Supports customized intermediate range, such as 0~80℃, etc.
<b>Measuring Medium</b>	Various liquids, gases and various compatible with contact materials
<b>Output Signal/Power Supply (1)</b>	Pressure: 2-wire 4~20mADC/ Vs=10~30 VDC Temperature: 3-wire PT100/PT1000
<b>Output Signal/Power Supply (2)</b>	Pressure: 2-wire 4~20mADC/ Vs=10~30 VDC Temperature: 2-wire 4~20mADC/ Vs=10~30 VDC
<b>Output Signal/Power Supply (3)</b>	Pressure: 3-wire 0~5VDC / Vs=8.5~30 VDC Temperature: 3-wire 0~5VDC / Vs=8.5~30 VDC
<b>Output Signal/Power Supply (4)</b>	Pressure: 3-wire 0~10VDC / Vs=12~30 VDC Temperature: 3-wire 0~10VDC / Vs=12~30 VDC
<b>Output Signal/Power Supply (5)</b>	4-wire Modbus-RTU/RS485 / Vs=10~30 VDC(Normal) / Vs=3.1~8 VDC (battery supply, low power consumption mode)
<b>Accuracy</b>	±0.5%FS (pressure measure, typical) ±0.2%FS (pressure measure, optional) ±0.4℃ (temperature measure)
<b>Long-term Stability</b>	±0.2%FS/year (pressure measure). ±0.1%FS/year(temperature measure);
<b>Response Time</b>	≤3ms (pressure)
<b>Start-up Time</b>	≤5s
<b>Compensation temperature Range(pressure)</b>	-10~70℃
<b>Temperature Coefficient of Zero (pressure)</b>	±1.5%FS(Reference 30° C, in compensation range)
<b>Temperature Coefficient of Full Scale(pressure)</b>	±1.5%FS(Reference 30° C, in compensation range)
<b>Medium Temperature</b>	<b>HPTM180:</b> -40~85℃ <b>HPTM189:</b> -40~140℃ (5 pcs heat sinks) -40~200℃ (9 pcs heat sinks) -40~350℃ (9 pcs heat sinks, microporous structure)
<b>Ambient Temperature</b>	-40~85℃
<b>Storage Temperature</b>	-40~85℃
<b>Protection grade</b>	IP65, DIN43650/Hirschmann electrical connection IP66, M12x1 connector (housing without breathable design)

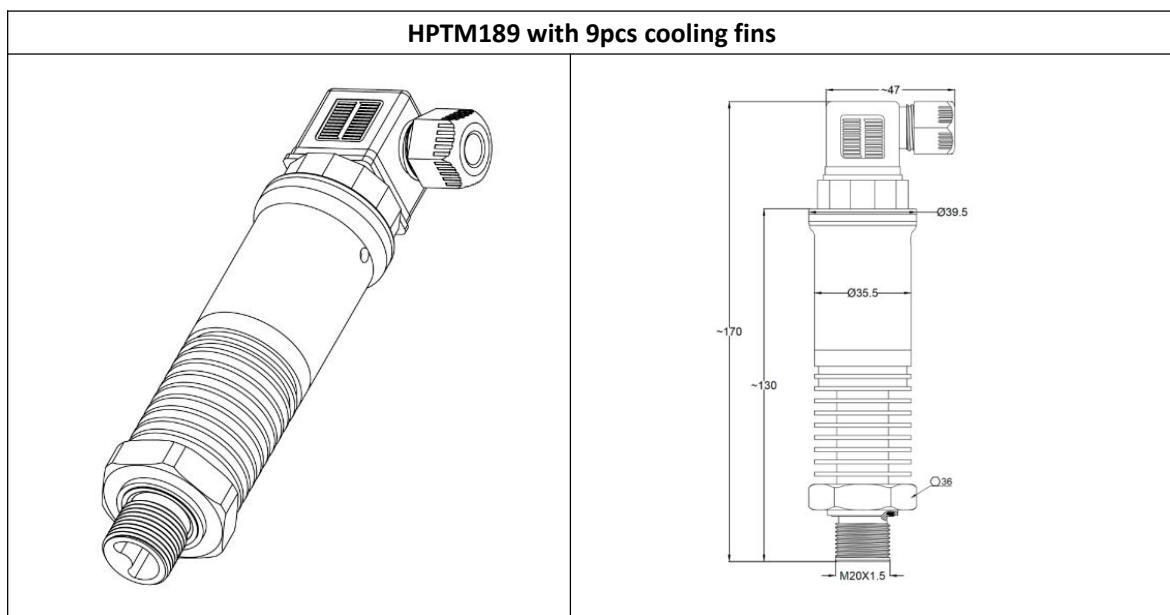
	IP67, cable outlet (housing without breathable design)
<b>Short circuit protection</b>	Permanent
<b>Reverse polarity protection</b>	No damage, circuit does not work
<b>Vibration</b>	20g(20~5000Hz)
<b>Shock resistance</b>	50g(11ms)
<b>Insulation resistance</b>	>20M $\Omega$ @500VDC
<b>Dielectric strength</b>	<2mA 500VAC 1min

## Structural Drawing(unit:mm)

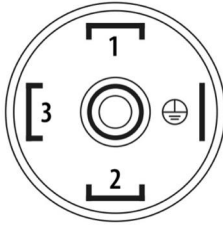
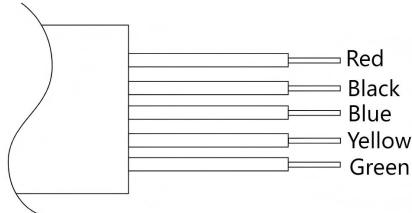
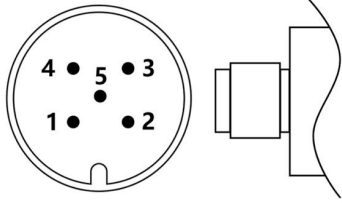
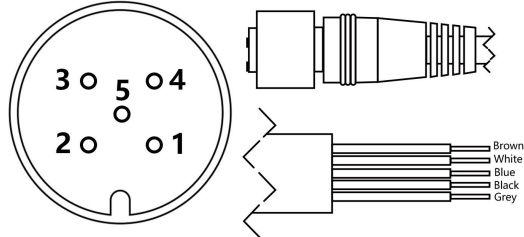
**HPTM180- Hirschmann/DIN43650**



**HPTM189 with 9pcs cooling fins**



# Electrical Interface

Hirschmann/DIN43650			Cable outlet		
					
M12×1-5P			M12×1-5P, with cable		
					
Output signal	Pressure: two-wire 4 ~ 20mA current		Temperature: three-wire PT100/PT1000		
Signal definition	Power supply+ (+V)	Power supply- (0V/+OUT)	A	B	B
Cable outlet	red	black	blue	yellow	green
M12×1	1	3	2	4	5
M12×1, with cable	brown	blue	white	black	grey
Output signal	Pressure: two-wire 4 ~ 20mA current		Temperature: two-wire 4 ~ 20mA current		
Signal definition	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	3	2	4	
M12×1, with cable	brown	blue	white	black	
Output signal	Pressure: three wire voltage		Temperature: three wire voltage		
Signal definition	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	3	2	4	
M12×1, with cable	brown	blue	white	black	

Output signal	Four-wire Modbus-RTU/RS485			
Signal definition	Power supply+ (+V)	Power supply- (-V)	RS485A	RS485B
Hirschmann /DIN43650	1	2	3	4
Cable outlet	red	black	yellow	green
M12×1	1	3	2	4
M12×1, with cable	brown	blue	white	black

## Ordering Guide

Model Name	Type														
HPTM180	Integrated Temperature and Pressure Transmitter														
Eg: HPTM180	Pressure Range	Measuring Range													
	(X1 ~ X2)kPa	X1 is the lower limit X2 is the upper limit													
			Temperature Range	Measuring Range											
			(T1 ~ T2)°C	T1 is the lower limit T2 is the upper limit											
						Code	Output Signal(pressure)	Output Signal(temperature)							
						B1PT100	(4 ~ 20)mA	3-wire PT100							
						B1PT1000	(4 ~ 20)mA	3-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								
						G14	G1/4								
										Code	Electrical connection				
										C1	DIN43650/Hirschmann				
	C1.1									DIN43650 type c/Mini-size Hirschmann					
	C2									cable outlet					
	C5	M12×1 -4P													
	C6	M12×1 -5P													
					Code	Pressure connector material									
					S4	304									
					S6	316L									
					Code	Length									
						L	L=Insertion length(mm)								
										Code	Additional functions				
G	Gauge pressure (Default)														
A	Absolute pressure														
QF	Factory Report														
	Other requirements														
Eg: HPTM180	(0 ~ 1)MPa	(0 ~ 100)°C	(0 ~ 100)°C	B1B1	P1	C1	S4	L=50mm	G						

Model Name	Type										
HPTM189	Integrated temperature and pressure Submersible transmitter										
Eg: HPTM189	Pressure Range	Measuring									
	(X1 - X2)kPa	X1 is the lower limit									
	(T1 - T2)°C	Temperature Range	Measuring Range								
			T1 is the lower limit T2 is the upper limit								
				Code	Output Signal (pressure)	Output Signal (temperature)					
				B1PT100	(4 - 20)mA	3-wire PT100					
				B1PT1000	(4 - 20)mA	3-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	M20x1.5						
				G12	G1/2						
				G34	G3/4						
				Code	Electrical connection						
				C1	DIN43650/Hirschmann						
				C1.1	DIN43650 type c/Mini-size Hirschmann						
				C2	cable outlet						
				C5	M12x1-4P						
				C6	M12x1-5P						
				Code	Pressure connector material						
				S4	304						
				S6	316L						
					Code	Length					
L					L=Insertion						
					Code	Additional functions					
					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					
					QF	Factory Report					
						Other requirements					
Eg: HPTM189	(0 - 1)MPa	(0 - 150)°C		B1B1	P1	C1	S4	L=30mm	G T9		

