

# Non-Indicating Pressure Transmitters



## TPS20 Series PRODUCT MANUAL

**For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**

The specifications, dimensions, etc are subject to change without notice for product improvement. Some models may be discontinued without notice.

### Features

- Excellent corrosion resistance with stainless steel housing
- High accuracy  $\pm 0.3\%$  F.S.
- Various connection method
  - Head type, DIN connector type, connector cable type
- Various user friendly function
  - Built-in zero-point, span adjustment (head type)

### Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- **⚠** symbol indicates caution due to special circumstances in which hazards may occur.

**⚠ Warning** Failure to follow instructions may result in serious injury or death.

- 01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc).**  
Failure to follow this instruction may result in personal injury, economic loss or fire.
- 02. Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**  
Failure to follow this instruction may result in explosion or fire.
- 03. Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire or electric shock.

**⚠ Caution** Failure to follow instructions may result in injury or product damage.

- 01. Do not apply beyond rated pressure.**  
Failure to follow this instruction may result in product damage.
- 02. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or product damage.
- 03. Fix the cable through the cable connection part and do not turn the cable of the unit.**  
Failure to follow this instruction may result in product damage.
- 04. Keep the product away from metal chip, dust, and wire residue which flow into the unit.**  
Failure to follow this instruction may result in fire or product damage.
- 05. Check 'Connections' before wiring.**  
Failure to follow this instruction may result in explosion or fire.
- 06. This product is designed to detect the pressure of noncorrosive medium. Do not use for corrosive medium.**  
Failure to follow this instruction may result in product damage.
- 07. Use a dry cloth to clean the unit, and do not use water or organic solvent.**  
Failure to follow this instruction may result in fire or electric shock.

### Cautions during Use

- Follow instructions in 'Cautions during Use'.  
Otherwise, it may cause unexpected accidents.
- Power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- When installing the unit on pipe line, use the hexagon part of connections not to turn the unit with a pipe wrench. Do not use the unit with strong vibrations.
- Store the unit at the place without moisture, dust, and vibration.
- This product is not needed to take maintenance because there is no moving part. But it needs to take maintenance once a year as below instructions even though inside of pressure pipe is normally clean.
  1. Check the broken status of outside.
  2. Check the pressure slot, cleanliness inside, and corrosion state.
  3. Short each terminal and check the insulation resistance between the case and power.

- When removing a sensor for maintenance, follow the below instructions.
  1. Replace an O-ring which is used once.
  2. Be sure that diaphragm part is not damaged.
- Switch or circuit breaker should be installed nearby users for convenient control.
- The unit cannot be repaired due to disassembled structure.
- The unit is fixed with bolt and nut at the both sides of case. Do not press excessive load ( $\approx 300 \text{ kg/cm}^2$ ), or it may cause damage to the unit.
- This unit may be used in the following environments.
  - Indoor / Outdoor (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II

## Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website .

TPS20 - ① ② ③ ④ (⑤)

### ① Pressure type

G: Gauge pressure  
A: Absolute pressure

### ② Connection

1: Head type  
2: DIN connector type  
3: Connector cable type

### ③ Rated Pressure range

Number: rated pressure range (unit:  $\text{kgf/cm}^2$ )

Gauge pressure	Absolute pressure
1	0 to 0.2
2	0 to 0.5
3	0 to 1
4	0 to 2
5	0 to 7
6	0 to 10
7	0 to 20
8	0 to 35
9	0 to 70
A	0 to 100
C	0 to 200
F	0 to 300
H	0 to 350
<b>Compound pressure</b>	
M	-1.03 to 0
O	-1.03 to 1
Q	-1.03 to 7
V	-1.03 to 10
X	-1.03 to 20
Y	-1.03 to 35
Z	User pressure range

01) The pressure range is set to customized pressure range. (select 'Z' at ③ Rated pressure range)

### ④ Pressure port

F8: G3/8 (standard, PF)  
P2: R1/2 (with adapter, PT)  
P8: R3/8 (with adapter, PT)  
ZZ: Others

### ⑤ User pressure range<sup>01)</sup>

Customized pressure range

## Product Components

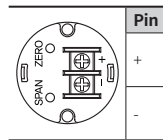
- Product
- Instruction manual

## Sold Separately

- M12 Connector cable: C□D3-2 / C□D3-5

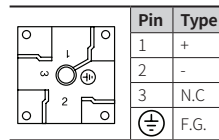
## Connections

### Head type



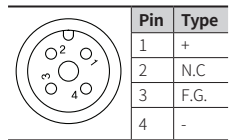
Pin	Type
1	+
2	-
3	N.C
4	F.G.

### DIN connector type



Pin	Type
1	+
2	-
3	N.C
4	F.G.

### Connector cable type

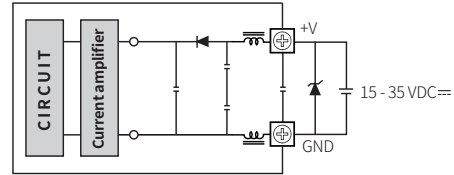


Pin	Type
1	+
2	N.C
3	F.G.
4	-



- In case of head type, remove the top cover.

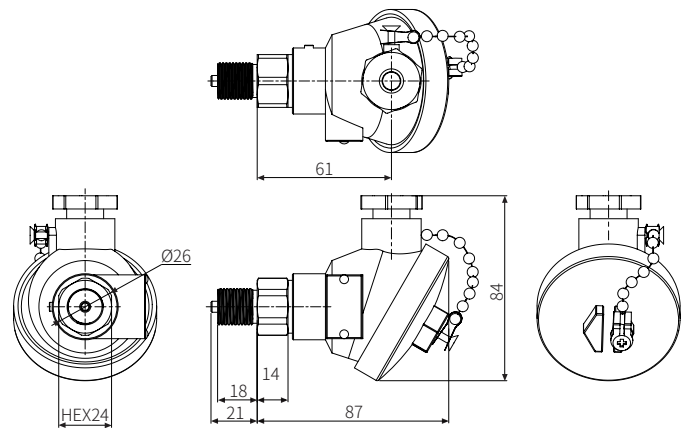
## Inner Circuit



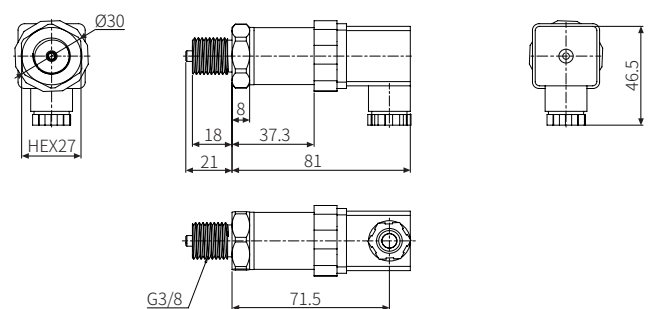
## Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.

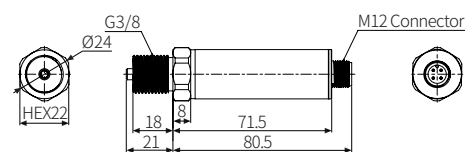
### Head type




### DIN connector type



### Connector cable type



## Specifications

<b>Series</b>	TPS20		
<b>Applicable medium</b>	Gas, liquid, fluid (except corrosive environment of SUS316)		
<b>Pressure Type</b>	Gauge pressure	Absolute pressure	Compound pressure
<b>Rated Pressure range</b> <sup>01)</sup>	0 to 0.2, 350 kgf / cm <sup>2</sup> (different by model)	0 to 1.0, 35 kgf / cm <sup>2</sup> (different by model)	-1.03 to 0, 35 kgf / cm <sup>2</sup> (different by model)
<b>Max. pressure</b>	300 % of max. rated pressure		
<b>Response time</b>	≤ 100 ms		
<b>Protection circuit</b>	Reverse polarity protection circuit		
<b>Tightening torque</b>	≥ Industrial plug 5 N		
<b>Material</b>	Sealing: SUS316, O-ring: fluoro rubber, diaphragm: SUS316, connection: SUS316		
<b>Connection</b>	+, -		
<b>Case structure</b>	Drip-proof structure		
<b>Certification</b>	CE 		
<b>Unit weight (packaged)</b>	≈ 320 g (≈ 350 g), based on head type		

01) It is different by model. Refer to 'Ordering Information'.



<b>Power supply</b>	15 - 35 VDC≡
<b>Allowable voltage range</b>	90 to 110% of rated voltage
<b>Current consumption</b>	≤ 50 mA
<b>Current Output</b>	DC 4 - 20 mA
<b>Linearity</b>	± 0.3 % F.S. (-10 to 50 °C), ± 0.5 % F.S. (50 to 70 °C)
<b>Hysteresis</b>	± 0.3 % F.S.
<b>Temp. Zero Shift</b>	± 0.03 % F.S.
<b>Temp. Span Shift</b>	± 0.03 % F.S. (at 25 °C)
<b>Load resistance</b>	≤ 600 Ω
<b>Insulation resistance</b>	≥ 100 MΩ (500 VDC≡ megger)
<b>Dielectric strength</b>	Between the charging part and the case: 500 VAC~ 50 / 60 Hz for 1 minute
<b>Vibration</b>	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
<b>Shock</b>	95 m/s <sup>2</sup>
<b>Ambient temperature</b>	-10 to 70 °C, storage: -10 to 70 °C (no freezing or condensation)
<b>Ambient humidity</b>	5 to 95% RH, storage: 5 to 95% RH (no freezing or condensation)

## Troubleshooting

Fault	Troubleshooting
No outputs	Check the power supply. Check the polarity (+, -) when wiring cable. Check the connection part.
Abnormally fluctuating output	Check the power supply. Check the supplied pressure. Check the pressure line.
Out of zero point output value	Check the power supply. Check the load resistive value of current output type for a receiver is over 600 Ω. Check the measuring point and transmission distance. Check the line resistance is below 600 Ω.

## Sold Separately: M12 Connector Cable

• For detailed information, refer to the 'M8/M12 Connector Cable' manual.

Appearance	Power	Connector 1	Connector 2	Length	Feature	Model
	DC	M12 (Socket-Female) 4-pin	3-wire	2 m	PVC	CID3-2
				5 m		CID3-5
	DC	M12 (Socket-Female) 4-pin, L type	3-wire	2 m	PVC	CLD3-2
				5 m		CLD3-5

## Pressure Conversion Table

	Pa	kgf/cm <sup>2</sup>	mmHg	mmH <sub>2</sub> O	psi	bar	inHg
<b>Pa</b>	1	0.00010197	0.007501	0.101972	0.00014504	0.00001	0.0002953
<b>kgf/cm<sup>2</sup></b>	98066.5	1	735.5592	10000.0005	14.223393	0.980665	28.959025
<b>mmHg</b>	133.3224	0.001359	1	13.595099	0.019337	0.001333	0.039370
<b>mmH<sub>2</sub>O</b>	9.80665	0.000099	0.073556	1	0.00142	0.000098	0.002896
<b>psi</b>	6894.733	0.070307	51.71475	703.016716	1	0.068947	2.036014
<b>bar</b>	100000.0	1.019716	750.062	10197.1626	14.503824	1	29.529988
<b>inHg</b>	3386.388	0.034532	25.40022	345.315507	0.491156	0.033864	1

• 1,000,000 Pa = 1,000 kPa = 1 MPa