



TIANSHUI HUATIAN SENSOR

CYX31 SERIES PRESSURE SENSOR



Tianshui Huatian Sensor Co., Ltd
天水华天传感器有限公司



CYX31

1 Summary

CYX31 series oil injection core pressure sensor is a connector type high temperature flat membrane pressure sensitive device. The high-temperature connector pressure sensor can withstand high temperatures up to 200°C by moving the pressure chip back and adding a heat sink and the welded diaphragm at the front of the thread is filled with silicone oil to conduct pressure, meeting the needs of high-temperature pressure measurement.

1.1 CYX31 series pressure sensor recommended threads

The recommended standard thread connector is M20×1.5, G1/2, other threads need to be customized. The products are used for pressure detection of media compatible with 316L stainless steel and NBR or Viton.



1.2 Negative pressure measurement, gauge type CYX31 series pressure sensor

model followed by Y

The negative pressure type pressure sensor is produced by a special process for negative pressure, which can reliably complete the detection of lower than atmospheric pressure, with a range between -100kPa to 3MPa arbitrarily selected.

2 Product features

- measuring range: 0kPa ~ 35kPa...10MPa
- pressure type: gauge pressure (G), absolute pressure (A) and seal gauge pressure (S)
- constant current / voltage power supply
- isolated structure, suitable for multiple fluid media
- process thread: M20×1.5 or G1/2
- all 316L stainless steel

3 Applications

- industrial process control
- liquid level measurement
- gas and liquid pressure measurement
- pressure switches and hydraulic systems
- medical and food equipment

4 Technical indicators

4.1 Electrical performance

- power supply: $\leq 3.0\text{mA}$; DC $\leq 10\text{V}$ DC
- electrical connection: 0.2mm^2 4-color 100 mm silicone rubber flexible conductor
- common mode voltage output: 50% of current mode input (typical value), 40% of voltage type input (typical value)
- input impedance: $2.7\text{K}\Omega \sim 5\text{K}\Omega$
- output impedance: $3.0\text{k}\Omega \sim 6\text{K}\Omega$
- response time (10% ~ 90%): $< 1\text{ms}$
- insulation resistance: $500\text{M}\Omega / 100\text{V}$ DC
- allowable overvoltage: 1.5 times of full scale



4.2 Structure performance

- diaphragm material: stainless steel 316L
- shell material: stainless steel 316L
- pressure lead-in tube material: stainless steel 316L
- pin lead: gilded Kovar
- sealing ring: NBR, Viton (optional)
- net weight: about 150g

4.3 Environment condition

- vibration: no change at 10gRMS, (20-2000) Hz
- constant acceleration: 100g, 11ms
- media compatibility: liquid or gas compatible with 316L and NBR (Viton optional)

4.4 Reference conditions

- medium temperature: $(25 \pm 3) ^\circ\text{C}$
- ambient temperature: $(25 \pm 3) ^\circ\text{C}$
- humidity: $(50\% \pm 10\%) \text{ RH}$
- ambient pressure: (86-106) kPa
- power supply: $(1.5 \pm 0.0015) \text{ mA DC}$

4.5 Standard range sensitivity output and optional pressure form

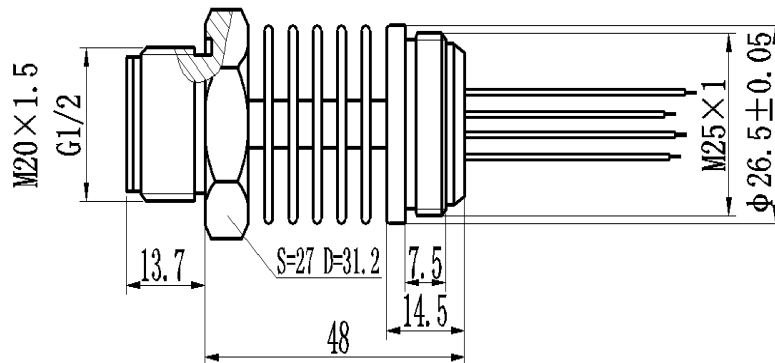
Range	Full scale output (mV)	Pressure type		Range	Full scale output (mV)	Pressure type
0~35kPa	$(40 \sim 120) \pm 20$	G/A		0~600kPa	$(55 \sim 145) \pm 20$	G/A
0~70kPa	$(20 \sim 140) \pm 20$	G/A		0~1.0MPa	$(50 \sim 160) \pm 20$	G/A
0~100kPa	$(50 \sim 145) \pm 20$	G/A		0~3.5MPa	$(60 \sim 150) \pm 20$	G/S/A
0~200kPa	$(30 \sim 125) \pm 20$	G/A		0~7.0MPa	$(60 \sim 130) \pm 20$	S
0~400kPa	$(40 \sim 150) \pm 20$	G/A		0~10MPa	$(110 \sim 230) \pm 20$	S



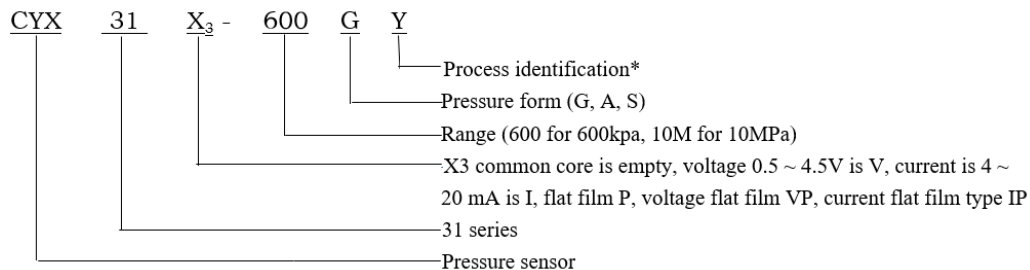
4.6 Basic parameters

Parameters	Typical value	Max value	Unit
Zero output	± 1	± 2	mV
Nonlinearity	0.2	0.5	%FS
Hysteresis	0.05	0.08	%FS
Repeatability	0.05	0.08	%FS
Input / output impedance	2.6	5.0	kΩ
Zero temperature drift (note 1)	±0.4	±1.0	%FS, @25℃
Sensitivity temperature drift (note 2)	±0.4	±1.0	%FS, @25℃
Long-term stability	0.2	0.3	%FS / year
Excitation current	1.5 (the maximum input voltage can be 10V)		mA
Insulation resistance	500 (100VDC)		MΩ
Compensation temperature	0~+50; -10~+80		℃
Working temperature	-40~+150 (thread part)		℃
Storage temperature	-40~+125		℃
Response time	≤1		ms
Housing and diaphragm material	stainless steel 316L		
O-ring	silicone rubber		
Measuring medium	fluids compatible with 316L, NBR or FKM		
Life (25 ℃)	> 1 × 10 ⁸ pressure cycle (80% FS)		times
Filling medium	Silicon oil		
ED type Sealing ring	Φ23.9×Φ18.5×1.5mm (NBR or FKM Note 3)		
Note 1 & 2. 0-10kPa zero temperature drift and sensitivity temperature drift: typical value is 0.5% FS @ 25 ℃, maximum value is 1.2% FS @ 25 ℃.			
Note 3. Viton seals are resistant to temperatures ranging from -20℃ to 200℃. Low temperature performance is poor. When the temperature range is below -20℃, please verify the sealing performance.			

5 Model structure

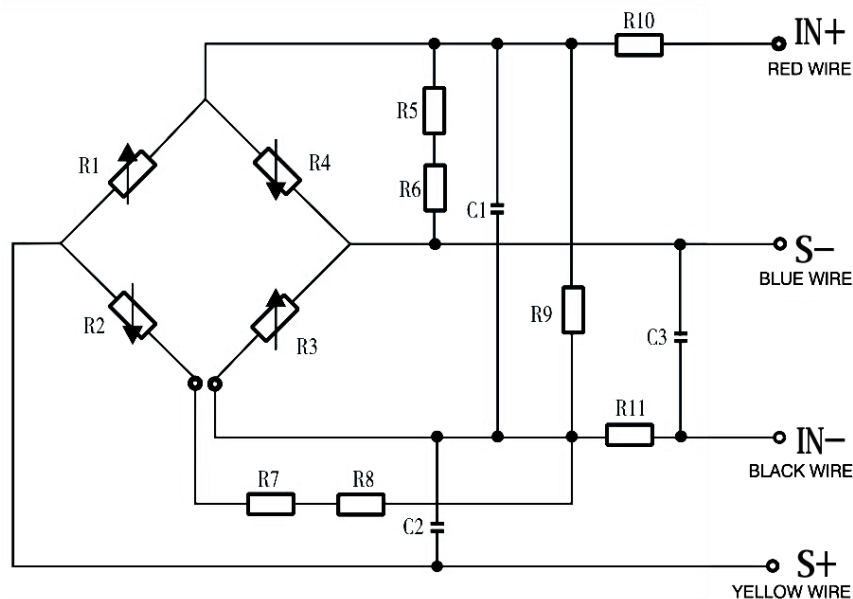


5.1 Selection Guide



*Process identification: f is general process, Y is negative pressure process.

6 Schematic diagram and wiring mode



IN + (red wire) - power supply positive

IN - (black wire) - power supply negative

S + (yellow wire) - output positive

S - (blue wire) - output negative



7 Application tips

- The sealing method of the pressure sensor is recommended for the hexagonal ED seal structure. Avoid excessive torque to affect the stability of the pressure sensor during threaded installation. It is recommended that the torque should not be greater than the following values according to the pressure range: 0~500kPa, 0.9Nm; 500kPa~2MPa, 1.1Nm; 2MPa~10MPa, 1.6Nm.
- Pay attention to protect the front diaphragm and the compensation circuit board at the back end of the pressure sensor so that the performance of the pressure sensor will not be affected by bruising or the core will be damaged.
- Do not press the metal diaphragm with hands or hard objects to avoid damage to the pressure sensor due to chip deformation or perforation.
- Keep the rear vent pipe of the G-type pressure sensor connected to the atmosphere; prohibit water, water vapor or corrosive media from entering the reference chamber at the rear of the pressure sensor.
- Avoid dropping and bumping, etc., which will affect the stability of the product.
- If there is any change in the pin lead, the label carried by the pressure sensor shall prevail.