

YLS series Pressure Sensors

1 Summary

YLS series piezoresistive pressure sensors adopt the internationally advanced high stability and high precision silicon pressure chip, and adopts the sintering seat with stress optimization design, which is produced by the processes of chip mounting, gold wire bonding, diaphragm welding, high vacuum oil injection, pressure cycle stress relief, high temperature aging, temperature compensation, etc..

● YLS19 pressure sensors with chloride ion corrosion resistance

YLS19Ti pressure sensors share the same shape, assembly dimension and sealing form as the general YLS19. Structure uses titanium alloy: TC4 with high strength and good corrosion resistance is selected as the shell, TA1 is selected as the diaphragm, which is more suitable for the medium with strong corrosion of chloride ions such as seawater. Working in humid atmosphere and sea water medium, its corrosion resistance is far superior to that of stainless-steel products. It has strong resistance to pitting, acid and stress corrosion, and excellent corrosion resistance to organic substances of alkali / chloride / chlorine, nitric acid, sulfuric acid, etc. Measurement range is $-100\text{kPa} \sim 0 \sim 10\text{kPa} \dots 100\text{MPa}$.

● Negative pressure measuring YLS series (model + Y)

Through the production of special negative pressure technology, the general pressure sensors and other models can reliably detect pressure below atmospheric pressure, and the range is between $-100\text{kPa} \sim 3\text{MPa}$.

2 Features

- Measuring range 0kPa to $10\text{kPa} \dots 100\text{MPa}$
- With gauge pressure G, absolute pressure A and sealed gauge pressure S
- Constant current / constant voltage power supply
- Isolated construction, suitable for a wide range of fluid media
- All 316L stainless steel
- Titanium construction optional, tantalum diaphragm customized

3 Application

- | | |
|--|---|
| ● industrial process control | ● liquid level measurement |
| ● gas and liquid pressure measurement | ● pressure detection and calibration instrument |
| ● pressure switch and hydraulic system | ● refrigeration equipment and air conditioning system |
| ● fire Internet of things | ● well monitoring |

4 Technical specifications

4.1 Electrical performance

- power supply: $\leq 3.0\text{mA}$; $\text{DC} \leq 10\text{V}$ DC
- electrical connection: 0.2mm^2 four color 100mm silicon rubber flexible wire
- common-mode voltage output: 50% of current type 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 / titanium TA1 (YLS19Ti)
- shell material: stainless steel 316L / titanium TC4 (YLS19Ti)
- pressure lead-in tube material: stainless steel 316L
- pin lead: gilded Kovar
- sealing ring: NBR, Viton (optional)

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 forms

Range	Full scale output (mV)	Pressure form	Range	Full scale output (mV)	Pressure form
0~10kPa	30~150	G/D	0~3.5MPa	60~150	G/A/D
0~35kPa	45~120	G/A/D	0~6.0MPa	60~110	S
0~70kPa	30~140	G/A/D	0~10MPa	50~100	S
0~100kPa	50~145	G/A/D	0~25MPa	30~100	S
0~200kPa	40~130	G/A/D	0~40MPa	25~100	S
0~400kPa	45~160	G/A/D	0~60MPa	70~150	S
0~1.0MPa	60~160	G/A/D	0~100MPa	55~100	S
0~2.0MPa	70~160	G/A/D			

4.6 Basic parameters

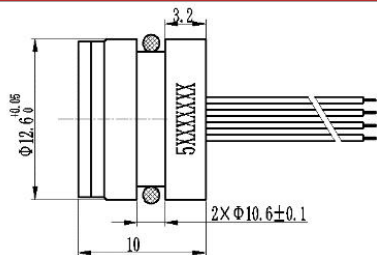
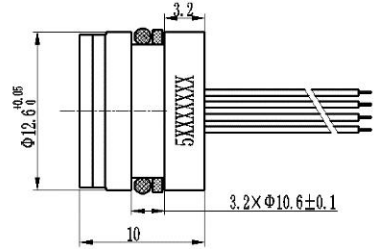
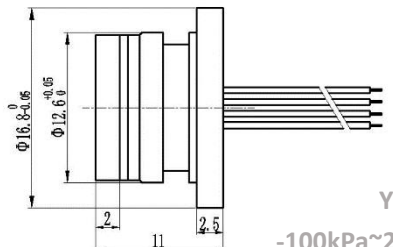
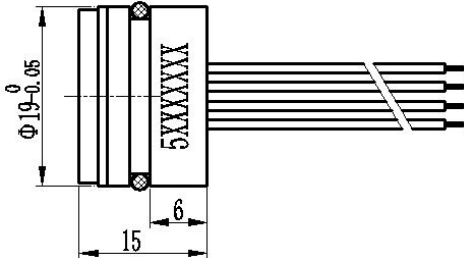
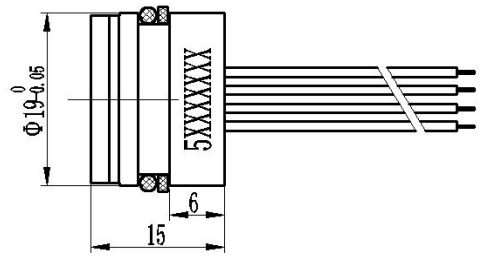
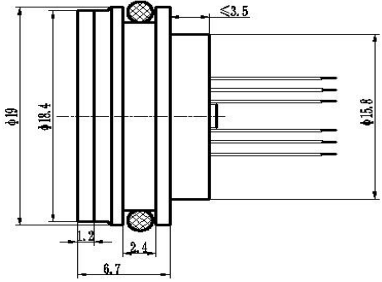
Parameters	Typical value	Max value	Unit
Full scale output	100	250	mV
Zero output	± 1	± 2	mV
Nonlinearity	0.2	0.5	%FS
Hysteresis	0.05	0.08	%FS
Repeatability	0.05	0.08	%FS
Input / output impedance	2.6	5.0	k Ω
Zero temperature drift (note 1)	± 0.4	± 1.0	%FS, @25℃
Sensitivity temperature drift (note 2)	± 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)		M Ω
Compensation temperature (note 3)	0~50; -10~70		℃
Working temperature	-40~+125		℃
Storage temperature	-40~+125		℃
Response time	≤ 1		ms
Housing and diaphragm material	stainless steel 316L		
O-ring	Viton / nitrile rubber / silicone rubber		
Measuring medium	Fluids compatible with 316L, NBR or Viton or silicone		
Life (25℃)	$> 1 \times 10^8$ pressure cycle (80% FS)		times
Filling medium	silicone oil		
Sealing ring	$\Phi 16 \times 1.8$ mm (nitrile or fluorinated rubber (note 4))		

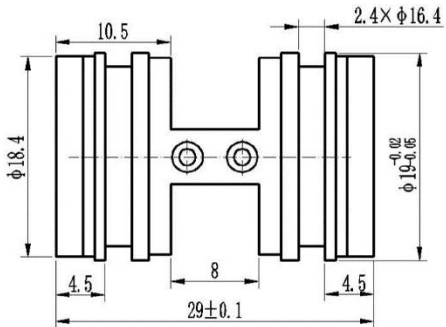
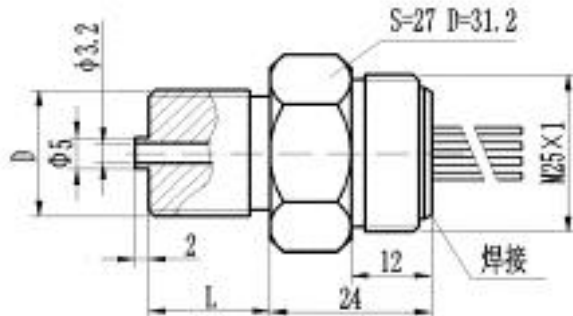
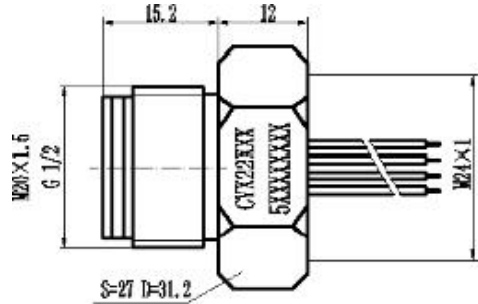
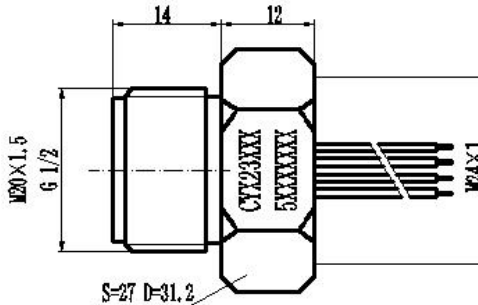
Note 1 & 2: 0-10kPa zero temperature drift and sensitivity temperature drift: typical value is 0.5% FS @ 25℃, maximum value is 1.2% FS @ 25℃.

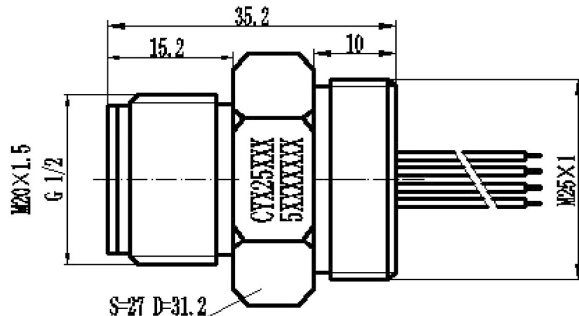
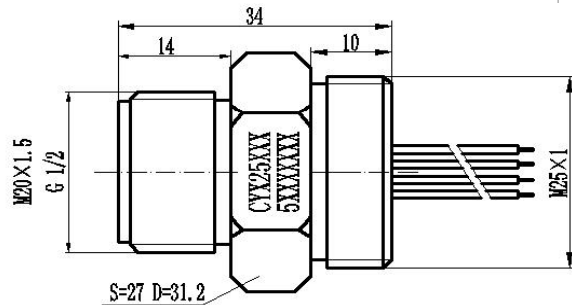
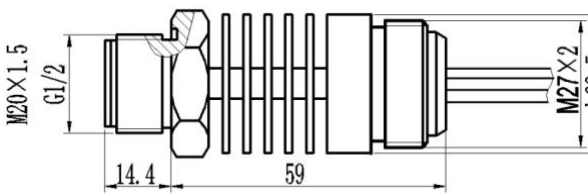
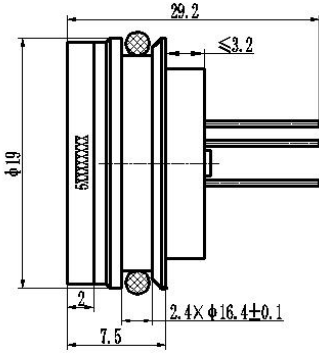
Note 3: compensation temperature 0~ 50℃ for ranges ≤ 200 kPa; - 10℃~ 70℃ for ranges > 200 kPa.

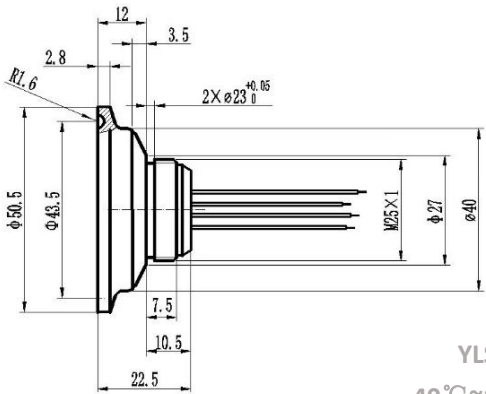
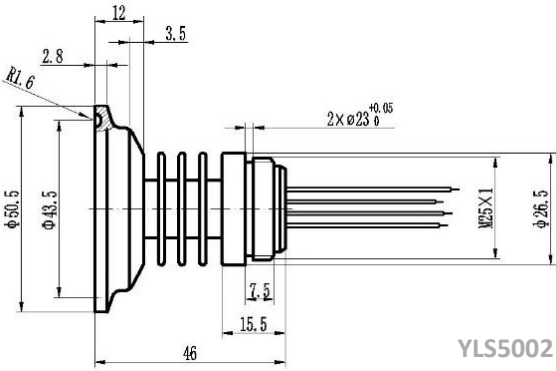
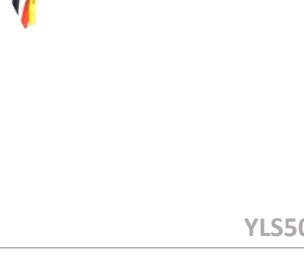
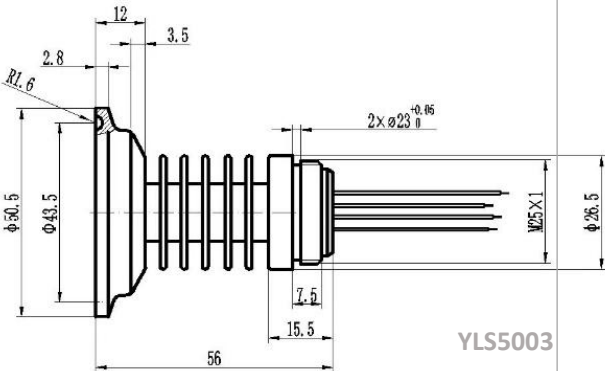
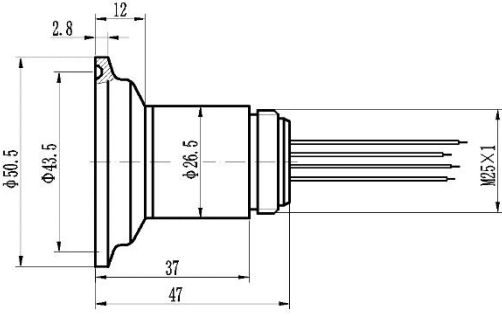
Note 4: temperature resistance range of Viton seal ring is - 20℃ ~ 200℃, low temperature performance is poor. When the temperature is lower than - 20℃, please verify before using.

5 Model selection

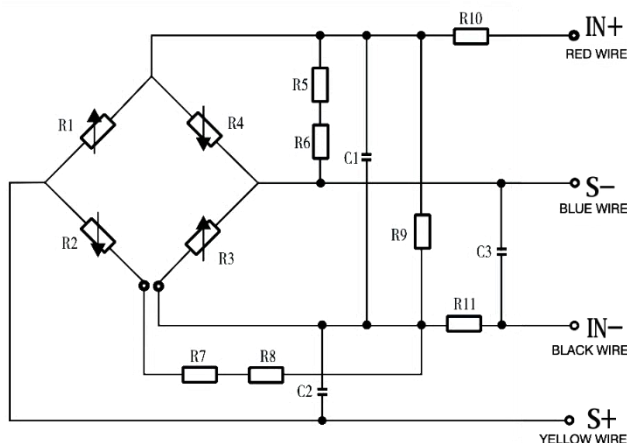
Series (Range)	Photos	Dimensions
YLS12 (200kPa~100MPa)		
		
		 YLS12A -100kPa~20MPa
YLS19/P (-100kPa~100MPa)		
		
YLST19 (10kPa~100MPa) (-10℃~100℃)		

Series (Range)	Photos	Dimensions
YLS20 (10kPa~3.5MPa)		
YLS22xx (-100kPa~10MPa ...100MPa) consult Huatian to get more models		
	YLS2210	
YLS23/P (-100kPa~10MPa)		
	YLS23	
		
	YLS23P	

Series (Range)	Photos	Dimensions
YLS25/P (-100kPa~10MPa)		
	YLS25	
		
	YLS25P	
YLS31/P (35kPa~10MPa)		
	YLS31	-40℃~150℃
YLS32 (-100kPa~3.5MPa)		

Series (Range)	Photos	Dimensions
YLS5001/2/3/4 (-100kPa~6MPa) (-40℃ ~125/150/180℃)	 YLS5001	 YLS5001 -40℃~125℃
	 YLS5002	 YLS5002 -40℃~150℃
	 YLS5003	 YLS5003 -40℃~180℃
	 YLS5004	 004 -40℃~150℃

6 Connection



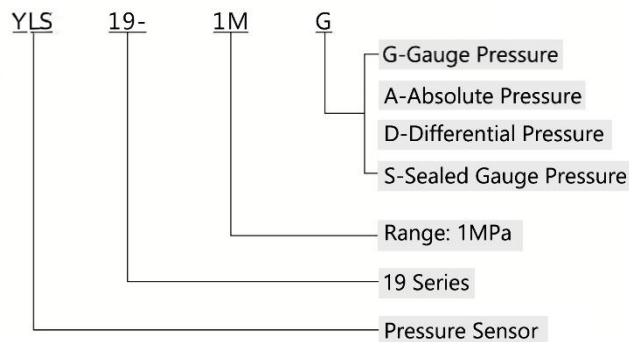
IN + (red wire) - power supply positive

IN - (black wire) - power supply negative

S + (yellow wire) - output positive

S - (blue wire) - output negative

7 Order Guide



8 Application Tips

- The recommended sealing method for the pressure sensors is the "suspension" sealing structure with sidewall O-rings to avoid pressure on the front surface, which may affect the stability of the pressure sensors.
- Pay attention to protect the front diaphragm of the pressure sensors and the compensation circuit board at the back end to avoid bruising the performance of the pressure sensors or causing damage to the sensors.
- It is easy to assemble the sensors and prevent the right angle from scratching the seal.
- When assembling, pay attention to the tolerance fit between the sensors size and the inner shell of the transmitter housing. It is recommended that the cavity be machined to +0.02 to +0.05 of the sensors diameters to achieve the required air tightness.
- When assembling, put it vertically and press down evenly to prevent jamming or crushing the compensation piece.
- Do not press the metal diaphragm with hands or hard objects to avoid the sensors being damaged due to chip deformation or perforation.
- The pin lead should not be cut too short when wiring, the length is generally not less than 5mm and the welding time is not more than 5 seconds.
- The ventilation tube at the rear of the G-type sensors should be kept connected to the atmosphere; it is prohibited for water, water vapor or corrosive medium to enter the reference cavity at the rear of the sensors.
- Avoid dropping and touching, etc., which will affect the stability of the product.
- If there is any change in the pin leads, the label carried by the sensors shall prevail.