

Oil-Filled Pressure Sensor

GS19

PRODUCT OVERVIEW

The GS19 Series oil-filled pressure sensor incorporates internationally advanced, high-stability, high-accuracy silicon pressure chips. It features a sintered base designed with stress-optimized geometry and is manufactured through a rigorous process flow including die bonding, gold wire bonding, diaphragm welding, high-vacuum oil filling, pressure cycling for stress relief, high-temperature burn-in, and temperature compensation. With over thirty years of R&D, manufacturing expertise, and continuous process innovation, this series delivers exceptional stability and outstanding performance, earning widespread recognition and trust from customers across various industries.

The standard GS19 offers the same dimensions, mounting, and sealing as leading global equivalents, providing drop-in interchangeability. The GS19Ti variant is built with titanium alloy (TC4 housing, TA1 diaphragm) to resist chloride corrosion, making it ideal for seawater and other aggressive media. Available pressure ranges: -100kPa to 100MPa



MAIN FEATURES

- Measuring range 0kPa~10kPa...100MPa
- Pressure type: gauge (G), absolute (A), and sealed gauge (S)
- Power supply: Constant current/voltage
- Isolated structure, suitable for various fluids
- Φ19mm standard OEM oil-filled pressure sensor
- All 316L stainless steel construction
- Titanium structure optional, tantalum diaphragm available on request

APPLICATIONS

- Industrial process control
- Level measurement
- Gas and liquid pressure measurement
- Pressure calibration instruments
- Pressure switches and hydraulic systems
- Refrigeration equipment and HVAC systems
- Oil well monitoring
- Fire protection IoT

TECHNICAL SPECIFICATIONS

Electrical Performance

Power supply: $\leq 3.0\text{mA DC}$; $\leq 10\text{V DC}$

Electrical interface: 0.2mm^2 4-color 100mm silicone rubber flexible wire

Common-mode voltage output: 50% of current input (typical), 40% of voltage input (typical)

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 overpressure: $1.5\times$ full scale

Structural Performance

Diaphragm material: 316L SS (GS19Ti type: Titanium TA1)

Housing material: 316L SS (GS19Ti type: Titanium TC4)

Pressure port material: 316L stainless steel Pin leads: Gold-plated Kovar

Sealing ring: NBR, FKM (optional) Net weight: approx. 23g (general-purpose & GS19Ti types)

Environmental Conditions

Vibration: no change under 10g RMS, (20~2000) Hz

Constant acceleration: 100g, 11ms

Media compatibility: liquids or gases compatible with 316L and NBR (FKM optional)

Reference Conditions

Media temperature: $(25\pm 3)^{\circ}\text{C}$ Ambient temperature: $(25\pm 3)^{\circ}\text{C}$

Humidity: $(50\%\pm 10\%)$ RH Ambient pressure: $(86\sim 106)$ kPa

Power supply: (1.5 ± 0.0015) mA DC

Standard Range Sensitivity Output & Optional Pressure Types

Range	Full-Scale Output (mV)	Typical	Pressure Type	Range	Full-Scale Output (mV)	Typical	Pressure Type
0~10kPa	35~60	45	G	0~2.0MPa	50~70	60	G/A
0~35kPa	55~80	70	G/A	0~3.5MPa	100~120	110	G/S/A
0~70kPa	55~80	60	G/A	0~7.0MPa	120~150	135	S/A
0~100kPa	60~85	75	G/A	0~10MPa	180~230	200	S/A
0~200kPa	65~85	75	G/A	0~25MPa	140~170	150	S/A
0~400kPa	60~80	70	G/A	0~40MPa	230~280	250	S/A
0~1.0MPa	80~120	100	G/A	0~60MPa	100~160	130	S/A
				0~100MPa	100~150	120	S/A

Basic Parameter

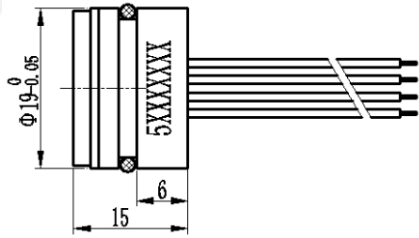
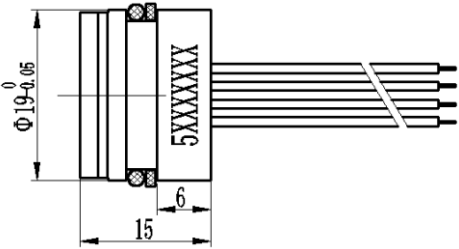
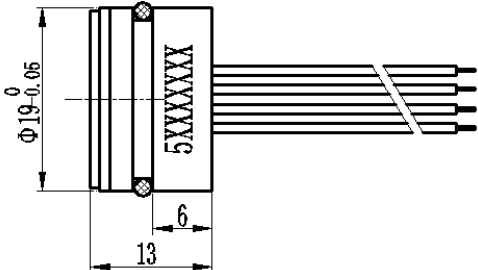
Parameter	Typical	Maximum	Unit
Full-scale output	80	150	mV
Zero offset	±1	±2	mV
Non-linearity	0.2	0.5	%FS
Hysteresis	0.05	0.08	%FS
Repeatability	0.05	0.08	%FS
Input/Output impedance	2.6	5.0	kΩ
Zero-point thermal drift	±0.4	±1.0	%FS,@25°C
Sensitivity thermal drift	±0.4	±1.0	%FS,@25°C
Long-term stability	0.2	0.3	%FS/Yr
Excitation current	1.5 (Maximum input voltage: 10V)		mA
Insulation resistance	500 (100VDC)		MΩ
Compensation temperature	0~50, -10~70 (Note)		°C
Operating temperature	-40~+125		°C
Storage temperature	-40~+125		°C
Response time	≤1		ms
Housing & diaphragm material	316L stainless steel		
O-ring	FKM, NBR, VMQ		
Measuring media	Fluids compatible with 316L stainless steel, FKM, NBR and VMQ		
Service life (25°C)	> 1×10 ⁸ pressure cycles (80%FS)		cycles
Filled fluids	Silicon oil		
Sealing ring	Φ10×1.3mm (NBR or FKM)		

Note 1: 0~10kPa: Zero-point thermal drift, Sensitivity thermal drift, typical 0.5%FS@25°C, maximum 1.2%FS@25°C.

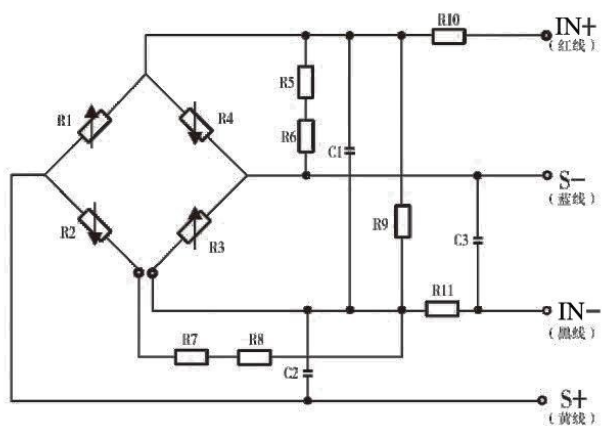
Note 2: 200kPa and below, compensated temperature 0~50°C; above 200kPa, compensated temperature -10°C~70°C.

Note 3: The temperature range of FKM sealing ring is -20°C~200°C, and poor low-temperature performance., when temperature is below -20°C, please exercise caution.

DIMENSIONS

Series	Range	Outline Drawing
GS19	-100kPa~10MPa	
	Range ≥ 25MPa	
GS19 flush diaphragm	-100kPa~10MPa	

ELECTRICAL CONNECTION



Wiring: IN+ (Red) – Excitation +
 IN- (Black) – Excitation –
 S+ (Yellow) – Output +
 S- (Blue) – Output –

ORDERING GUIDE

GS19	Pressure Sensor							
	Code	Series Model						
	01	Φ19mm standard (–100kPa~100MPa)						
	02	Titanium alloy chloride-resistant type						
	03	Φ19mm flush diaphragm (–100kPa~10MPa)						
		Code	Power supply					
		C	1.5mA constant current					
		V	≤10V constant voltage					
			Code	Pressure Type				
			G	Gauge				
			S	Sealed gauge				
			A	Absolute				
				Code	Range			
				01	0–10kPa			
				02	0–35kPa			
				03	0–100kPa			
				04	0–200kPa			
				05	0–400kPa			
				06	0–1.0MPa			
				07	0–2.0MPa			
				08	0–3.5MPa			
		09		0–7.0MPa				
		10	0–10MPa					
		11	0–25MPa					
		12	0–40MPa					
		13	0–60MPa					
		14	0–100MPa					
			Code	Lead Wire Type				
			A1	4–color silicone wire				
	A2		Gold–plated pins					
	A3		Custom					
	GS19	01	C	S	05	A1		

Notes

- The recommended sealing method for the pressure core is a floating seal structure using side-wall o-rings. Avoid front-face compression to prevent affecting core stability.
- The core cavity in the housing should be designed with a tapered angle to facilitate core assembly and prevent scratching of the sealing ring at sharp corners.

- During assembly, pay attention to the fit tolerance between the core dimensions and the inner housing of the transmitter. It is recommended that the cavity be machined to $+0.02 \sim +0.05$ mm over the core diameter to achieve the required airtightness.
- During assembly, keep the core vertical and apply force evenly to prevent jamming or damaging the compensation board.
- Protect the front diaphragm and rear compensation circuit board from damage. Do not press the metal diaphragm with hands or hard objects to prevent chip deformation or perforation causing core damage.
- When wiring, do not cut the core pins too short. Length should generally be at least 5mm, and soldering time should not exceed 5 seconds.
- Keep the vent tube at the rear of G-type cores open to atmosphere; do not allow water, moisture, or corrosive media to enter the rear reference cavity.
- Avoid dropping or impact as this may affect product stability.
- If pin connections change, refer to the label attached to the actual core.