

Product description

Ceramic capacitive pressure sensitive element is based on alumina ceramic (Al₂O₃) as the base material, the structure is composed of a thick ceramic matrix, a thin deformable ceramic elastic diaphragm and a metal electrode printed on the ceramic. The principle is that when the ceramic diaphragm is subjected to pressure deformation, the capacitance changes. The back-end then converts the capacitance change into a linear analog voltage signal or a digital output through signal processing

Ceramic capacitive pressure sensor as a main technical route in the pressure sensor, with corrosion resistance, wear resistance, impact resistance, temperature drift minimal, high measurement accuracy, large range, no pollution, high elasticity, overload resistance, long life and many other advantages, can be directly in contact with the vast majority of corrosive gases or liquid media, There is no liquid transfer during the working process of the ceramic capacitive pressure sensor, the process pressure directly acts on the ceramic diaphragm, when overloaded, the diaphragm touches the matrix without damage, when the pressure returns to normal, its performance will not be affected in any way, so it is widely used in automotive, industry, Internet of things and other fields.

Typical application

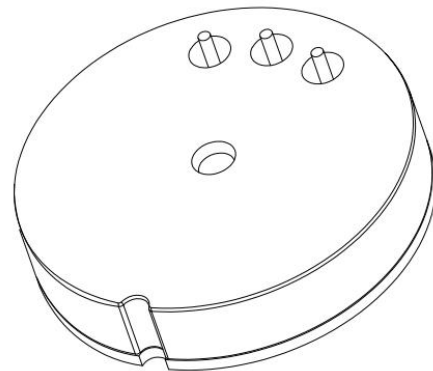
- Engine system pressure sensor
- Transmission system pressure sensor
- Brake system pressure sensor
- Pressure sensor for vehicle air conditioning system
- New energy vehicle heat management system pressure sensor
- Air compressor pressure sensor
- Diesel urea system pressure sensor
- Pressure sensors for mechanical hydraulic systems
- Chassis, shock absorption system pressure sensor
- Pressure sensors for industrial air conditioning systems
- Pressure sensor for automobile exhaust treatment system
- Automotive air intake system pressure sensor
- Pressure sensors for industrial intelligent pressure systems
- Pressure sensors for Marine, metallurgical, petrochemical, medical systems

Main advantages

- Super anti-overload capacity, overload capacity up to 5~10X
 - Very low temperature bleaching, temperature bleaching less than 0.01%FS/°C
 - Wide temperature range, -40°C~150°C
 - Long service life, pressure cycle life is more than 10 million times
 - Fast response, pressure response less than 2mS
 - Suitable for a wide pressure range of 0.5~10.0Mpa
 - Good compatibility of working media, compatible media: air, oil, Brake oil, gasoline, diesel oil, air conditioning refrigerant, etc (Compatible water optional)
 - Very low hysteresis, excellent long-term stability
 - Product nonlinear compatible conditioning chip, good fit
 - Dimensions Diameters 21mm and 18mm are optional
 - Production and quality control according to IATF16949 specification
- And AEC-Q200 reliability test
- Can be customized according to customer needs

Work principle

When the ceramic capacitive pressure sensing element is subjected to pressure, the elastic diaphragm bends and deforms, and the capacitance changes. The pressure and capacitance are linearly proportional in the range, and then the capacitance change is amplified, calibrated and nonlinear fitting through the conditioning chip, and finally the analog voltage output or digital signal with linear proportion as the pressure changes.

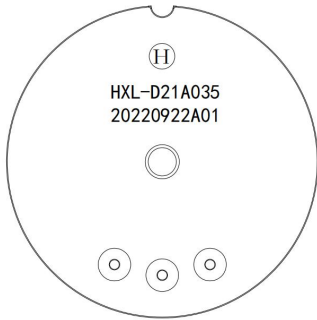


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1. Product dimensions

1.1 Product specification code

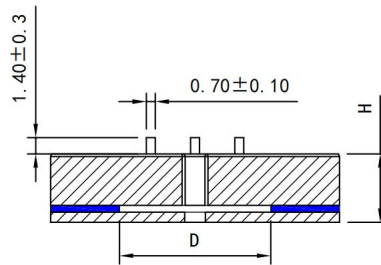
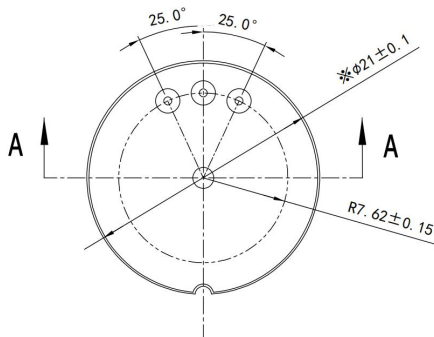


<u>HXL</u>	<u>D21</u>	<u>A</u>	<u>035</u>	<u>**</u>
(1)	(2)	(3)	(4)	(5)

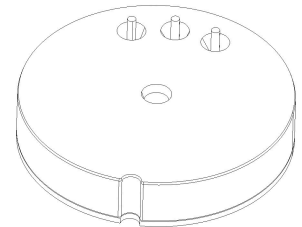
Series	The meaning of code
(1)Company code	HXL: Huaxinlian Technology
(2)Boundary dimension	D21: Dia Φ21mm D18: Dia Φ18mm
(3)Pressure datum	A: Absolute pressure G: Gage pressure
(4)Pressure range	010: 10Bar 035: 35Bar
(5)Special code	Attribute specification

1.2 Boundary dimension

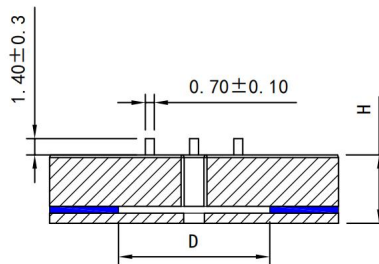
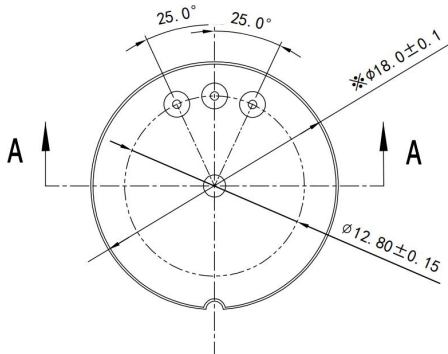
HXL-D21 Series



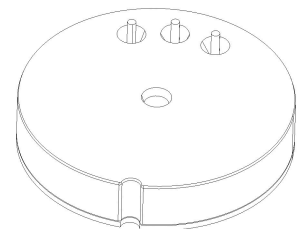
视图A-A



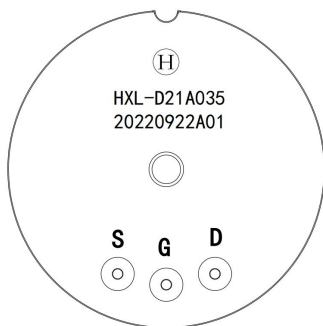
HXL-D18Series



视图A-A



1.3 Pin definition instructions



Pin code	Pin Definitions
S	Source electrode/excitation/drive
G	Ground/shield electrode
D	Detect electrode
Pin (S,D): capacitance signal output	

2.Product performance parameter

2.1 Product model and performance parameters

Model	range/ P (Bar)	Overload pressure	Burst pressure	Thickness /H (mm)	Measured Capacitance Cx /100KHz,0.5Vrms	Sensitivity y /ΔC(pF)	Pressure sensing diameter /D (mm)
HXL-D21A005	5	2X	5X	4.20±0.10	20±2	5.0-7.5	11.6
HXL-D21A010	10	2X	5X	4.30±0.10	20±2	5.0-7.5	11.6
HXL-D21A020	20	2X	5X	4.40±0.10	20±2	5.0-7.5	11.0
HXL-D21A035	35	1.5X	3X	4.53±0.10	20±2	5.0-7.5	11.0
HXL-D21A045	45	1.5X	2X	4.74±0.10	20±2	5.0-7.5	11.0
HXL-D21A070	70	1.5X	2X	4.78±0.10	20±2	5.0-7.5	10.0
HXL-D18A010	10	2X	5X	3.45±0.10	15±2	3.5-6.0	10.0
HXL-D18A020	20	2X	5X	3.55±0.10	15±2	3.5-6.0	10.0
HXL-D18A035	35	1.5X	3X	3.70±0.10	15±2	3.5-6.0	10.5

The above capacitors are all in room temperature atmospheric pressure environment (temperature: 15-35 °C, atmospheric pressure: 86~106KpaA, humidity ≤70%RH), and G pin ground,

The air source is 99.7% N2 and measured by LCR tester.

Sensitivity calculation formula $\Delta C = \text{full scale capacitance value} - \text{zero voltage capacitance value}$.

Overload pressure: When 20-25°C, the overload pressure of the specification is applied to keep 60S. After pressure relief, the ceramic capacitor pressure core meets the specification within the pressure range of the working range.

Bursting pressure: When 20-25°C, apply the standard bursting pressure to keep 60S, and there is no leakage or damage to the ceramic capacitor pressure core after pressure relief.

2.2 Characteristic parameter

Parameter type	Unit	Specification	Remark
Sensor type	-	Gauge pressure/absolute pressure/sealed gauge pressure	-
Materials	-	96% Al2O3	-
Service life	-	> 5 million pressure cycles	-
Operating temperature	°C	-40~150	-
Storage temperature	°C	-40~150	-
Hysteresis & repeatability	%FS	±0.20	-
Nonlinearity	%FS	6.0~10.0	-
Response time	ms	≤2	-
Temp characteristic	%FS/°C	0.5~1.0Mpa: <±0.015 ≥1.0Mpa: <±0.010	-

2.3 Product assembly suggestions

When installing riveting press, it is recommended to use servo riveting device or equipment, riveting press by fixed pressure and stroke control. Ceramic pressure sensors under harsh working conditions or external mechanical overpressure that exceed the operating conditions described in the relevant instructions of this specification, the ceramic pressure sensors and sensors may be damaged or the output may drift due to excessive internal stress of the sensor.

Package proposal:

It is recommended to appropriately reduce the overlapping area between the sensitive area of the ceramic pressure sensitive element and the axial Angle of the metal shell, or appropriately increase the area between the capacitive sensitive area and the metal shell

Distance, to reduce the relative position changes between the two affect the output fluctuation;

a. It is recommended to appropriately reduce the overlapping area between the sensitive area of the ceramic pressure sensitive element and the axial Angle of the metal shell, or appropriately increase the area between the capacitive sensitive area and the metal shell

Distance, to reduce the relative position changes between the two affect the output fluctuation;

b. Avoid hard contact, it is recommended that the outer ring of the plastic gasket be properly avoided to avoid the edge of the ceramic pressure core being damaged by force;

c. When riveting, the ceramic pressure sensitive element should avoid being directly pressed on the bottom of the metal housing, and the gap between the bottom and the bottom is more than 0.1mm

3. Packaging introduction and precautions

3.1 Packing introduction

HXL-D21 series: Blister tray packaging, 100 PCS/tray, 1200 PCS/box

HXL-D18 series: Blister tray packaging, 100 PCS/tray, 1200 PCS/box

3.2 Condition of packing

- Packaging products must be stored in the temperature of 10~35°C and humidity $\leq 70\%RH$ environment;
- Prevent the product pad and PIN from being corroded or oxidized, and avoid being placed in an environment with dust or harmful gases (hydrogen chloride, sulfuric acid gas or hydrogen sulfide);
- Prevent deformation or loosening of packaging materials, and avoid placing in an environment of excessive heat or direct sunlight;

3.3 Packing precautions

Because metal PIN pins and pads are easily oxidized in humid air environment, it is recommended to use them within 30 days after disassembly. If they are not used up and need to be stored for a long time, the product should be vacuum-packed and stored again. The welding period of the product is 12 months after the factory date, and after long-term storage and placement for more than 12 months. Before use, it is necessary to recheck the weldability of the product, and use it after passing the welding inspection.