GZP6183A

Pressure Transducer

Engineer Oil Application

Datasheet

Version: V1.1

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Document Revision History

Revision	Description	Date
V1.0	Initial version	2024.03.04
V1.1	Format adjustment	2024.05.28

The company reserves the right to modify the specifications contained herein without prior notice.

1. Product Description

The GZP6183(Engineer Oil series) is a pressure sensor product developed by Sencoch for the automotive aftermarket applications.The product packaging adopt MEMS piezoresistive sensor. The measured pressure work on the silicon diaphragm and then generate a voltage signal, where the signal is processed by an automotive-grade signal conditioning chip(ASIC).

The ASIC performs calibration and compensation for raw signal and convert pressure signals into standard analog output signals (range and output is customizable).

The GZP6183 pressure transducer has the advantages of fast response, high reliability and good stability, and is a high cost-effective sensor product.

1.1 Product Features

- High accuracy pressure transducer
  The accuracy over the entire service life at room temperature is better than ±1%FS
  The full-life accuracy of high and low temperature performance exceeds ±3%FS
- Temperature range: -40°C to 125°C
- Customizable for wide range up to 5Mpa
- Insulation parameter: >10 MΩ/500 V DC
- Exceptional overvoltage protection, supporting 36V overvoltage and-28V reverse polarity
- Proportional/Fixed analog voltage output (customizable)
- Output Clamping (Customizable)

1.2. Application Fields

- Engine oil monitoring

The sensor can monitor the engine oil pressure in the main oil passage in real time and promptly provide data to the Engine Control Unit (ECU).

2. Function Description

The working principle of GZP6183A is based on the piezoresistive effect of silicon chip. The measured medium acts on the silicon oil and transmit to MEMS silicon diaphragm through the pressure interface (such as a threaded connection) and cause it to deform. The Wheatstone bridge on the back of the diaphragm converts the deformation into a weak differential voltage signal. The built-in dedicated signal conditioning circuit (ASIC) then amplifies, temperature-compensates, linearizes, and zero-adjusts this signal, ultimately outputting a high-precision, high-stability standard analog signal (e.g. 0.5-4.5V).

2.1 Electrical Connection

The recommended electrical connector type for this product is PACKARD #12065287.

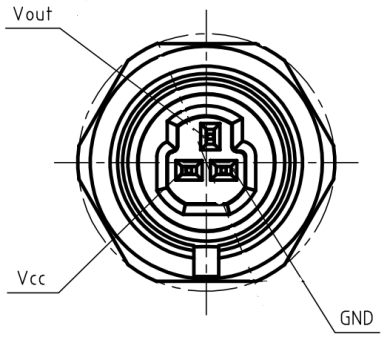

Fig. 1. PIN wire Schematic diagram

Table 1. Pin Definition

PIN Number	Definition	Description
1	VCC	Positive power input: 5±0.25VDC
2	Vout	Output voltage signal
3	GND	Negative power input

Table 1

2.2 Block Diagram

The functional block diagram of the sensor is shown in Figure 2.

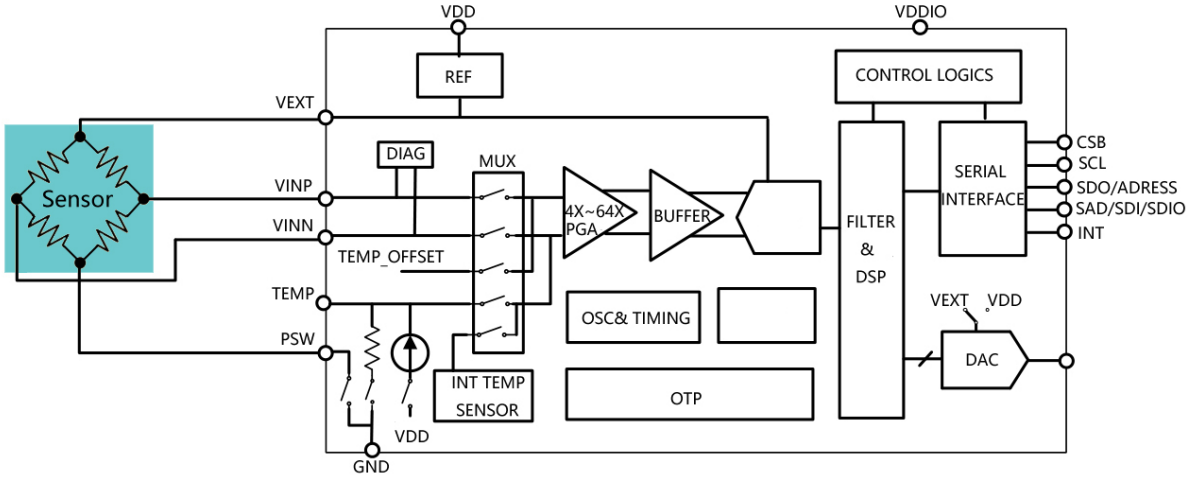

Fig. 2 Sensor Block Diagram

2.3 Pressure Function

Curve equation(Taking 0.1~1.1mPa as example): Vout = (0.02 + 0.8P) * Vin

Where: Vin is the supply voltage, in volts (V).

P is the input absolute pressure, in MPaA.

Vout is the output voltage, in volts (V).

The linear equation is shown in Figure 3:

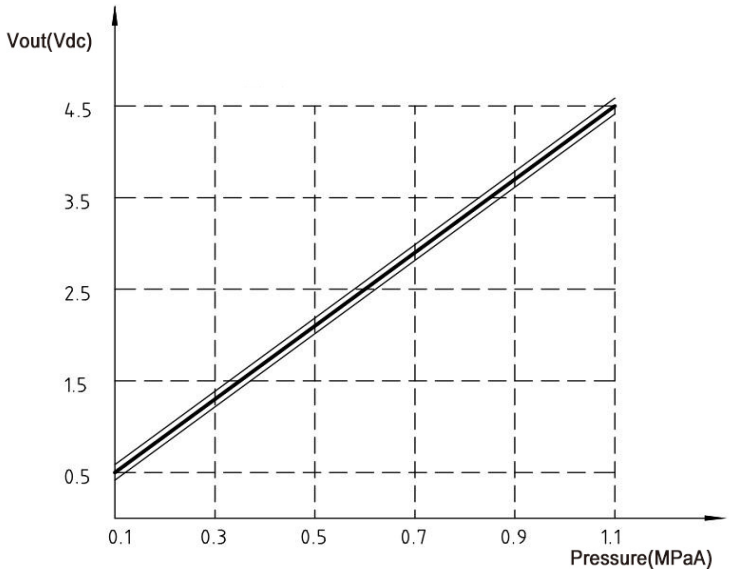

Fig.3 Voltage output curve

2.4 Accuracy

The accuracy of the GZP6183A pressure sensor is affected by power supply voltage, input pressure, ambient temperature, and aging effects. The value calculated using the transfer function is the sensor's specified value and theoretical value. The sensor's error equals the difference between the actual output voltage value at the specified input pressure and the specified output voltage value.

2.4.1 Overall Accuracy

The overall precision considers the different error sources in the measurement pressure range and working temperature range, which mainly include:

Pressure: The deviation between the actual output voltage and the specified output voltage within the specified pressure range.

Temperature: Output deviation at different temperatures within the specified range.

Aging: parameter drift over time.

The overall accuracy is expressed by the error band, which is composed of three line segments. The data are shown in Figure 4 and Table 2.

Temperature (°C)	**Accuracy (FSS)**
-40	±3%
0	±1%
60	±1%
125	±3%

Table 2 Overall Accuracy

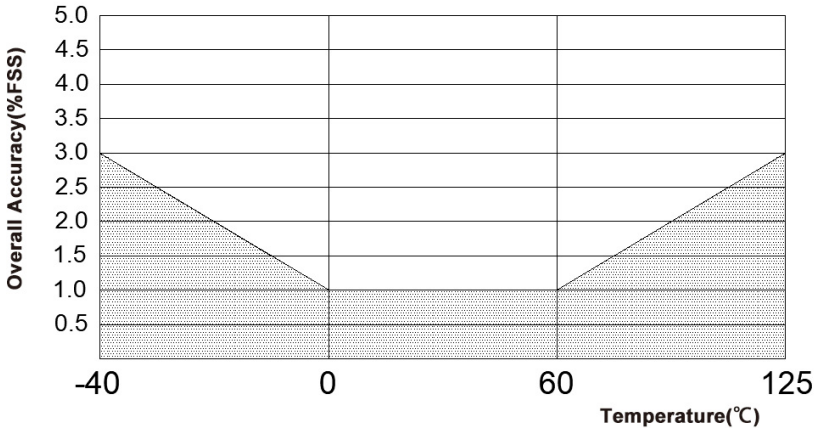

Fig. 4 Relationship between overall accuracy and temperature

3. Technical Indicators

The following sensor parameters were measured under the power supply (5±0.25) V DC and temperature of 25°C.

3.1 Maximum Rated Parameters

The maximum rated parameters of the sensor are shown in Table 3:

Parameter	Min.	Typ.	Max.	Unit	Remarks
Maximum voltage			36	V	70°C，1h
Maximum reverse voltage			-28	V	
Overload pressure			2x	FS	60s
Bursting pressure			3X	FS	3s

Table 3

3.2 Performance Indicators

The performance indicators of the sensors are shown in Table 4.

Subject	Value	Unit
Pressure Range	0.1-1.1 (customizable within 5Mpa)	MPaA
Output Signal	0.5 to 4.5 (output customizable)	V
Protection Level	IP67	/
Response Time	≤1	ms
Pressure Cycle	1	Million
Insulation Resistance	≥100MΩ/500VDC	MΩ
Working Temperature	-40～125	°C
Storage Temperature	-40～130	°C

Table 4

3.3 Electrical Characteristics

The electrical characteristics of the sensor are shown in Table 5.

Parameter	Min.	Typ.	Max.	Unit
Supply Voltage	4.75	5	5.25	V
Working Current			8	mA
Output Current Load	5			mA
Short Circuit Current Limit	15	20	25	mA
Lower Clamp Voltage	0		25%	Vcc
Upper Clamp Voltage	75%		100%	Vcc

Table 5

4. Recommended Assembly Interface

Refer to Figure 5 for recommended sensor matching installation interface

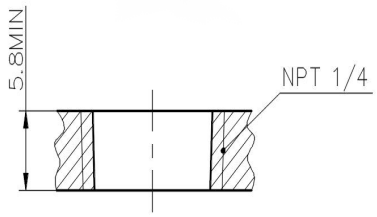

Fig. 5

5. Structure Specification(Unit: mm)

Refer to Figure 6 for the sensor's external dimensions (unspecified tolerances shall comply with GB/T1804-V).

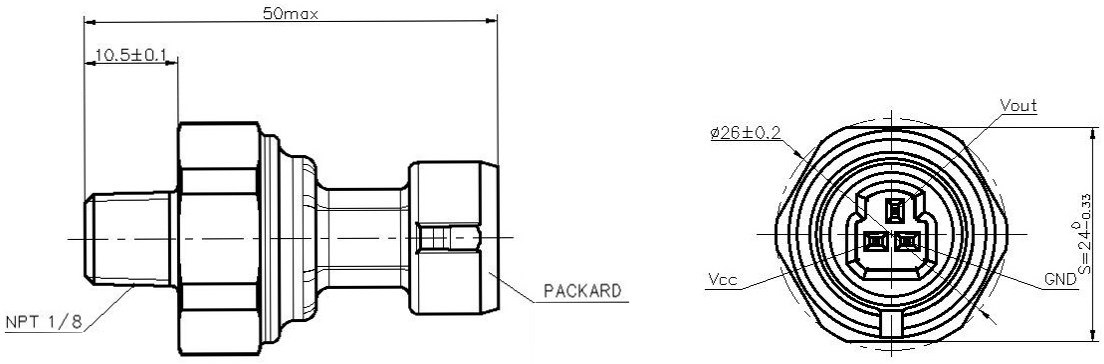

Fig. 6

6. Order Guide

GZP 6183-A-AU-00-A032 K001 B02 WX

GZP	Sencoch
6183	Product Category
A	Output type A: Analog output
AU	AU: Engine Oil Application AS: Air Brake Application
00	Pressure Port and Electrical Port 00: NPT1/8 S=24 Packard 01: M14*1.5 S=24 Packard
A032	Pressure range A032: 0.1~1.1MPa A227: 50~800kPa
K001	Power Supply and Output K001: 5V input, 0.5~4.5V output T136: 5V input, 0.5~4.5V output(Lower clamp 0.3V, upper clamp 4.7V)
B02	Packaging method B02: Plastic Tray
WX	Company interior code

*For more customized ranges and special parameter part numbers, please consult Sencoch.

7. Usage Notes

1) The sensor can only be unpacked before installation.

2) The sensor lacks anti-freezing capability when tested in water.

3) The normally packaged pressure sensors can be transported using standard handling equipment. Note: During transportation, protect the product from moisture, impact, sun exposure, and pressure.

4) Confirm under actual usage conditions

As this specification is a standalone product, to ensure reliability in practical use, verify its performance and quality under real-world conditions.

Safety Precautions

This product is made of semiconductor components for general electronic equipment (communication equipment, measuring equipment, working machinery, etc.). Products using these semiconductor components may malfunction and fail due to external interference and surges, so please confirm the performance and quality under actual use. To be on the safe side, please perform safety design on the device (setting of protection circuits such as fuses and circuit breakers, multiple devices, etc.) so that life, body, property, etc. will not be harmed in the event of a malfunction. To prevent injuries and accidents, please be sure to comply with the following matters:

·The driving current and voltage should be used below the rated values.

Please wire according to the electrical definition . In particular, reverse connection of the power supply may cause accidents due to circuit damage such as heat, smoke, and fire, so please be careful.

·Be careful when fixing the product and connecting the pressure inlet .

Warranty and Disclaimer

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