PID-4100 Dynamic-Static Pressure Sensor

Parameters

- ✓ Overall accuracy across full temperature and range: ±0.05% FS.
- ✓ Dual pressure interface for static pressure and total pressure
- ✓ Wide temperature range: -55℃ to +85℃
- ✓ Flexible electrical and pressure interface configuration

Instruction

The PID-4100 dynamic and static pressure sensor is an aircraft dynamic and static pressure detection device. Its function is to detect two pressure signals in the system, corresponding to the aircraft's total pressure and static pressure. The dynamic pressure is then calculated and output as RS-422 digital signals of dynamic and static pressure.

Specification

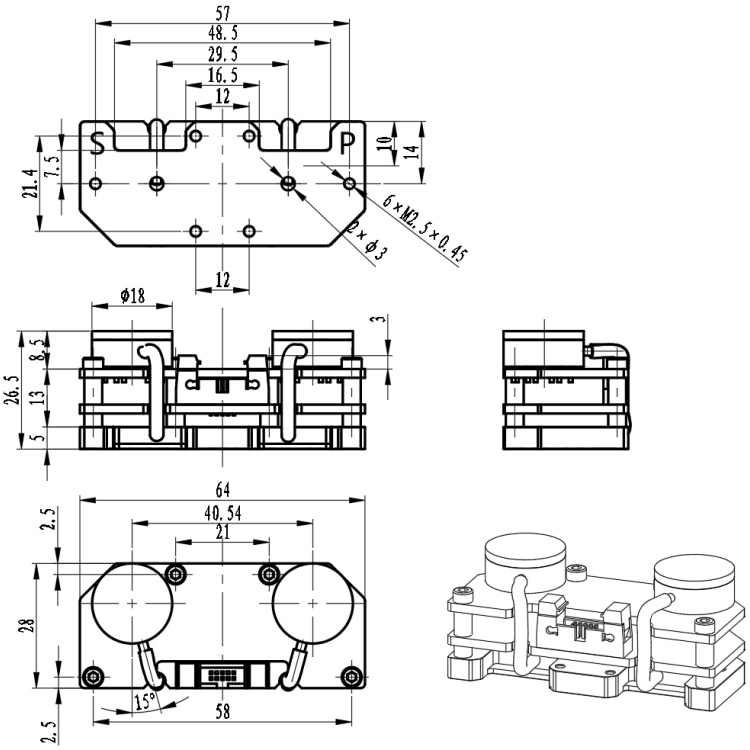
Items	Parameters
Static pressure	5 kPa ~ 120 kPa
Total pressure	0 kPa ~ 150 kPa
Max. overload pressure	3 × FS.
Max. burst pressure	3.5 × FS.
Compensation temperature	-55℃ ~ +85℃
Accuracy	±0.05% FS.
Long-term stability	±0.02% FS. /year
Operating temperature	-55℃ ~ +85℃
Power supply	12 ± 0.5 V
Consumption	⩽ 2 W
Output	RS-422
Data refresh rate	40 Hz
Response time	< 25 ms
Start-up time	Stable reading within 250 ms after power-on
Medium	Dry, non-corrosive gases
Pressure port	φ3 vent hole
Weight	<100 g

Electrical Interface

Wire	Definition	Note	Wire	Definition	Note
1 (red)	T+	Transmit data+	6	R+	Receive data+
2	VIN	+12V power supply	8	R-	Receive data-
3	DG	Signal ground	10	T-	Transmit data-
4	GND	Power ground			

Dimensions

(mm)



Communication Protocol

The PID-4100 sensor communicates with atmospheric equipment via RS-422 serial protocol. Baud rate: 460800, data refresh rate: 40 Hz, 16 bytes per frame. The data block format is as follows:

Bit	Item	Note	Length	Unit	Scope	Resolution
0	Head 1		1	N/A	Const: 0XAAH	N/A
1	Head 2		1	N/A	Const: 0X66H	N/A
2-5	Static	Ps Pressure	4	mbar	-	0.0001
6-9	Dynamic	Qc Pressure	4	mbar	-	0.0001
10	Remain		1	-	-	-
11	Remain		1	-	-	-
12	Status	Bit0 “1” Static Valid Bit1 “1” Dynamic Valid Bit2 “1” Atmosphere Valid	1	N/A	N/A	N/A
13	Data update sign	Frame Counter, Auto-increment	1	N/A	0-255	N/A
14	Checksum	sum of bytes 0–13	1	N/A	N/A	N/A
15	0XFF		1	N/A	N/A	N/A
Note: N/A means Not Applicable. The output parameters are represented in two complement format, with the most significant bit (MSB) of the high byte as the sign bit.						

Fault Analysis and Troubleshooting

Common sensor failures include chip malfunction and circuit short circuits. If a fault occurs during system operation, the sensor should be promptly removed. After confirming that the system power supply is functioning properly, install a new sensor to continue operation. Faulty sensors should be returned to the manufacturer for repair.

Product Maintenance

Calibration is required if
1) Accuracy drifts beyond specification after long-term use.
2) Sensor is impacted during handling and accuracy exceeds tolerance.

Calibration must be performed by removing the sensor, connecting it to a pressure controller, and calibrating under controlled temperature.

Routine Maintenance
1) Protect silicone hoses during installation. Avoid sharp contact that may damage airtightness.
2) Installed sensors should be powered periodically as part of the system routine.

Storage Conditions and Notes
Sensors should be stored in their packaging, in a dry warehouse at -55℃ to +85℃, relative humidity ≤ 80%, free from corrosive gases, strong vibrations, shocks, or magnetic fields.

Storage life up to 10 years, please prevent moisture and mold, in humid conditions, dry the sensor before use.

Packing List

Sensor: 1 pc
User manual: 1 pc
Cable connector with 15 cm lead: 1 pc
Silicone hose (OD φ3 mm, ID φ1 mm): 1 pc