

PS-A (ADP5)

Panasonic
ideas for life

Pressure sensor with built-in amplification and temperature compensation circuit

PS-A PRESSURE SENSOR

(built-in amplification and
temperature compensating circuit)

NEW

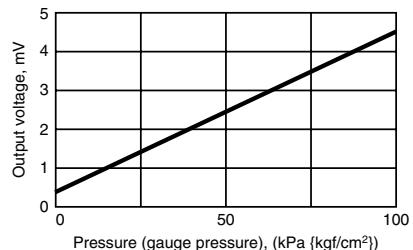


FEATURES

1. Contains built-in amplification and temperature compensation circuit. Circuit design and adjustment of characteristics are not required by users.
2. High-level precision and high reliability realized. (Overall accuracy is $\pm 1.25\%$ FS.)
3. Compact pressure sensor unit that saves space.
Same size and footprint (7.0 mm (W) x 7.2 mm (D)) as previous PS pressure sensor.

Example of pressure characteristics (ADP5140)

Drive voltage: 5V DC rated voltage;
ambient temperature: 25°C 77°F



TYPICAL APPLICATIONS

- **Gas equipment:** Microprocessor gas meter, gas leakage detector
- **Industrial equipment:** Absorption device, etc.

ORDERING INFORMATION

Ex. ADP 5

Part No.	Terminal profile	Rated pressure	Pressure inlet hole length
ADP5: PS-A pressure sensor	1: DIP terminal  2: SMD terminal 	0: ± 100 kPa 1: -100 kPa 2: 25 kPa 3: 50 kPa 4: 100 kPa 5: 200 kPa 6: 500 kPa 7: $1,000$ kPa	0: 3 mm .118 inch 1: 5 mm .197 inch

PRODUCT TYPES

Pressure inlet hole length	Part No.		Part No.		Packing quantity	
	3mm	5mm	3mm	5mm	Inner	Outer
Terminal	DIP terminal	DIP terminal	SMD terminal	SMD terminal		
Pressure						
±100kPa	ADP5100	ADP5101	ADP5200	ADP5201	100 pcs.	1,000 pcs.
-100kPa	ADP5110	ADP5111	ADP5210	ADP5211		
25kPa	ADP5120	ADP5121	ADP5220	ADP5221		
50kPa	ADP5130	ADP5131	ADP5230	ADP5231		
100kPa	ADP5140	ADP5141	ADP5240	ADP5241		
200kPa	ADP5150	ADP5151	ADP5250	ADP5251		
500kPa	ADP5160	ADP5161	ADP5260	ADP5261		
1,000kPa	ADP5170	ADP5171	ADP5270	ADP5271		

SPECIFICATIONS

Type	Specifications								Remarks
Type of pressure	Gauge pressure								
Pressure medium	Air								Note ^{*1}
Rated pressure	Unit: kPa	±100	-100	25	50	100	200	500	1,000
Drive voltage					5±0.25V DC				
Temperature compensation range					0 to 50°C				
Offset voltage	2.5±0.05				0.5±0.05V				Note ^{*2}
Rated output voltage	4.5±0.05 (when +100kPa)				4.5±0.05V				Note ^{*2}
Overall accuracy					±1.25%FS				Note ^{*2} Note ^{*3}
Current consumption					Max. 10mA				
Output impedance					Approx. 50Ω				
Source current					Max. 0.2mA				
Sink current					Max. 2mA				

Notes) 1. Please consult us for pressure media other than air.

2. Indicates output when drive voltage is 5 V. Although output fluctuates due to fluctuations in the drive voltage, this is not included.

3. Overall accuracy indicates the accuracy of the offset voltage and rated output voltage at temperatures between 0 and 50°C. (FS=4V)

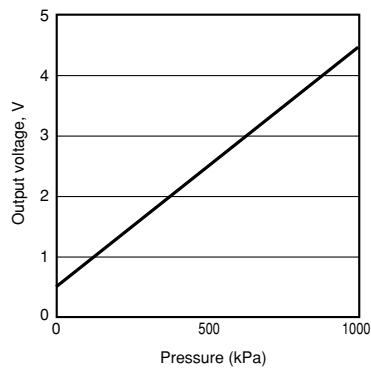
4. Where no particular temperature is indicated, the specification is for use at 25°C

DATA

1-(1) Output voltage

ADP5170

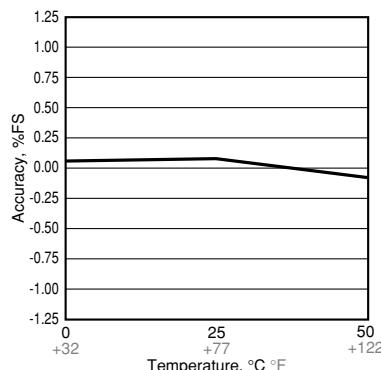
Drive voltage: 5V DC;
temperature: 25°C 77°F
Applied pressure: 0 to +1,000kPa



1-(2) Overall accuracy (Offset voltage)

ADP5170

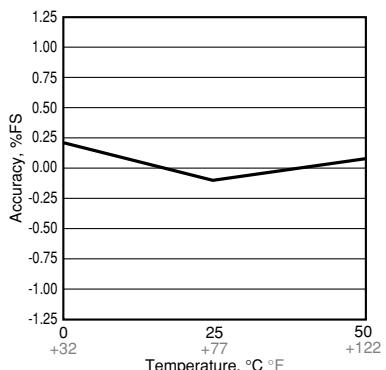
Drive voltage: 5V DC;
temperature: 0 to 50°C 32 to 122°F
Applied pressure: 0kPa



1-(3) Overall accuracy (Rated output voltage)

ADP5170

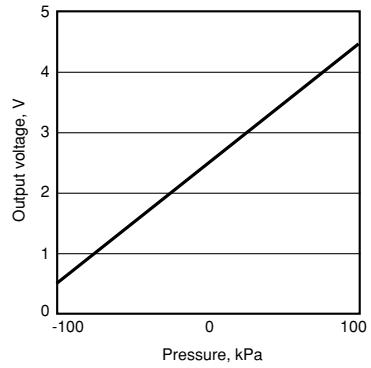
Drive voltage: 5V DC;
temperature: 0 to 50°C 32 to 122°F
Applied pressure: +1,000kPa



2-(1) Output voltage

ADP5100

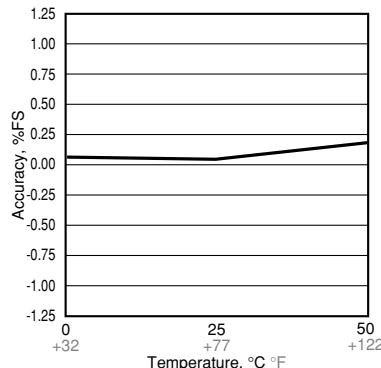
Drive voltage: 5V DC;
temperature: 25°C 77°F
Applied pressure: -100 to +100kPa



2-(2) Overall accuracy (Offset voltage)

ADP5100

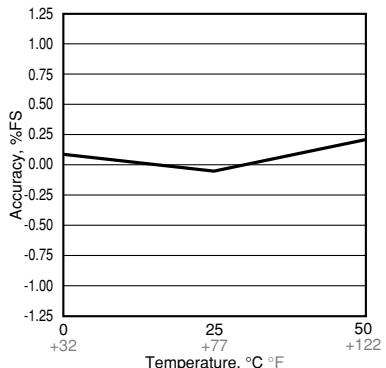
Drive voltage: 5V DC;
temperature: 0 to 50°C 32 to 122°F
Applied pressure: 0kPa



2-(3) Overall accuracy (Rated output voltage)

ADP5100

Drive voltage: 5V DC;
temperature: 0 to 50°C 32 to 122°F
Applied pressure: +100kPa



PS-A (ADP5)

3. Evaluation test

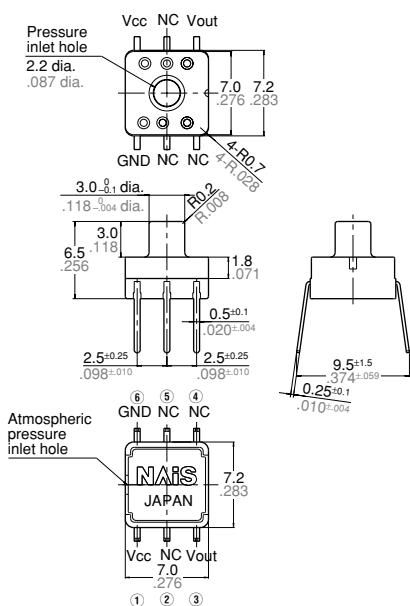
	Tested item	Tested condition	Result
Environmental characteristics	Storage at high temperature	Temperature: Left in a 85°C 185°F constant temperature bath Time: 100 hrs.	Passed
	Storage at low temperature	Temperature: Left in a -20°C -4°F constant temperature bath Time: 100 hrs.	Passed
	Humidity	Temperature/humidity: Left at 40°C 104°F, 90% RH Time: 100 hrs.	Passed
	Temperature cycle	Temperature: -20°C to 85°C -4°F to 185°F 1 cycle: 30 min. Times of cycle: 100	Passed
Endurance characteristics	High temperature/high humidity operation	Temperature/humidity: 40°C 104°F, 90% RH Operation times: 10 ⁶ , rated voltage applied	Passed
Mechanical characteristics	Vibration resistance	Double amplitude: 1.5 mm .059 inch Vibration: 10 to 55 Hz Applied vibration direction: X, Y, Z 3 directions Times: 2 hrs each	Passed
	Dropping resistance	Dropping height: 75 cm 29.528 inch Times: 2 times	Passed
	Terminal strength	Pulling strength: 9.8 N {1 kgf}, 10 sec. Bending strength: 4.9 N {0.5 kgf}, left and right 90° 1 time	Passed
Soldering Resistance	Soldered in DIP soldering bath	Temperature: 230°C 446°F Time: 5 sec.	Passed
	Temperature (DIP)	Temperature: 260°C 500°F Time: 10 sec.	Passed

Note: For details other than listed above, please consult us.

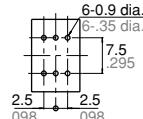
DIMENSIONS

1. DIP terminal (Pressure inlet hole: 3mm) ADP51*0

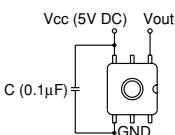
mm inch
General tolerance: ±0.3 ±.012



Recommended PC board pattern
(TOP VIEW 2:1)



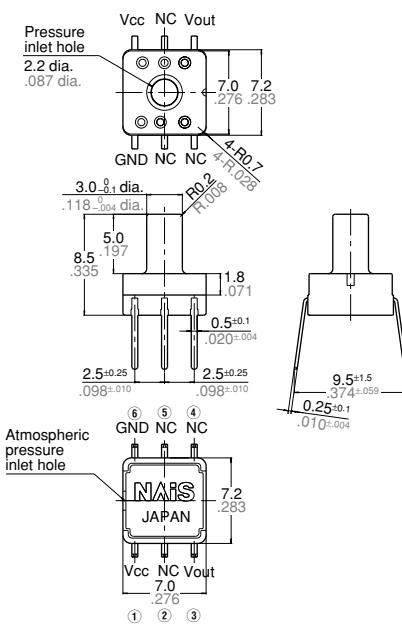
Terminal connection diagram



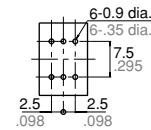
Terminal No.	Name
1	Vcc (Power supply [+])
2	NC (No connection)
3	Vout (Output)
4	NC (No connection)
5	NC (No connection)
6	GND (Ground)

2. DIP terminal (Pressure inlet hole: 5mm) ADP51*1

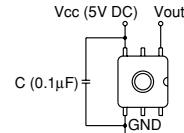
mm inch
General tolerance: $\pm 0.3 \pm 0.012$



Recommended PC board pattern
(TOP VIEW 2:1)

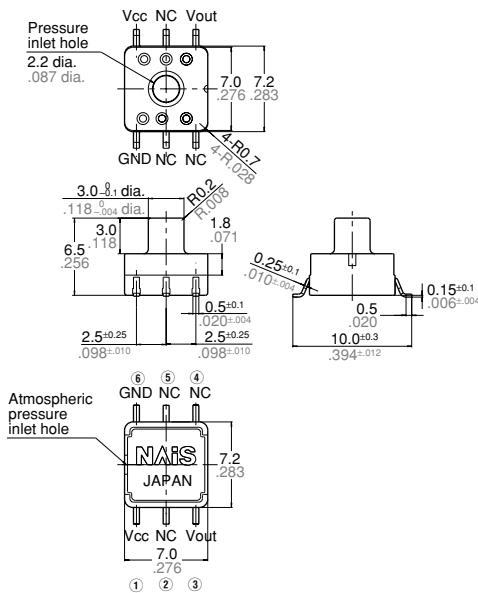


Terminal connection diagram

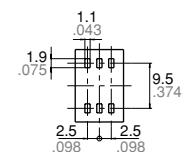


Terminal No.	Name
1	Vcc (Power supply [+])
2	NC (No connection)
3	Vout (Output)
4	NC (No connection)
5	NC (No connection)
6	GND (Ground)

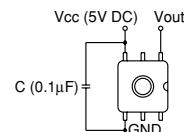
3. SMD terminal (Pressure inlet hole: 3mm) ADP52*0



Recommended PC board pattern
(TOP VIEW 2:1)



Terminal connection diagram



Terminal No.	Name
1	Vcc (Power supply [+])
2	NC (No connection)
3	Vout (Output)
4	NC (No connection)
5	NC (No connection)
6	GND (Ground)

4. Cleaning

- 1) Since the pressure sensor chip is exposed to the atmosphere, do not allow cleaning fluid to enter inside.
- 2) Avoid ultrasonic cleaning since this may cause breaks or disconnections in the wiring.

5. Environment

- 1) Please avoid using or storing the pressure sensor chip in a place exposed to corrosive gases (such as the gases given off by organic solvents, sulfurous acid gas, hydrogen sulfides, etc.) which will adversely affect the performance of the pressure sensor chip.
- 2) To ensure resistance to power supply superimposed noise, you must provide a capacitor at the power supply input terminal of the sensor in order to stabilize the power supply voltage. We recommend to provide 0.1 μ F and 1,000 pF capacitor in parallel. Please confirm the noise resistance with the actual equipment and choose adequate capacitor.
- 3) Since the internal circuitry may be destroyed if an external surge voltages is supplied, provide an element which will absorb the surges.
- 4) Malfunctioning may occur if the product is in the vicinity of electrical noise such as that from static electricity, lightning, a broadcasting station, an amateur radio, or a mobile phone.

- 5) Since this pressure sensor chip does not have a water-proof construction, please do not use the sensor in a location where it may be sprayed with water, etc.
- 6) Avoid using the pressure sensors chip in an environment where condensation may form.

Furthermore, its output may fluctuate if any moisture adhering to it freezes.

- 7) The pressure sensor chip is constructed in such a way that its output will fluctuate when it is exposed to light. Especially when pressure is to be applied by means of a transparent tube, take steps to prevent the pressure sensor chip from being exposed to light.

- 8) Avoid using the pressure sensor chip where it will be susceptible to ultrasonic or other high-frequency vibration.

6. Quality check under actual loading conditions

To assure reliability, check the sensor under actual loading conditions. Avoid any situation that may adversely affect its performance.

7. Other handling precautions

- 1) That using the wrong pressure range or mounting method may result in accidents.
- 2) The only direct pressure medium you can use is dry air. The use of other media, in particular, corrosive gases (organic solvent based gases, sulfurous acid based gases, and hydrogen sulfide based

gases, etc.) and media that contains moisture or foreign substances will cause malfunction and damage. Please do not use them.

- 3) The pressure sensor chip is positioned inside the pressure inlet. Never poke wires or other foreign matter through the pressure inlet since they may damage the chip or block the inlet. Avoid use when the atmospheric pressure inlet is blocked.

- 4) Use an operating pressure which is within the rated pressure range. Using a pressure beyond this range may cause damage.

- 5) Since static charge can damage the pressure sensor chip, bear in mind the following handling precautions.

- When storing the pressure sensor chips, use a conductive material to short the pins or wrap the entire chip in aluminum foil. Plastic containers should not be used to store or transport the chips since they readily become charged.

- When using the pressure sensor chips, all the charged articles on the bench surface and the work personnel should be grounded so that any ambient static will be safely discharged.

- 6) Based on the pressure involved, give due consideration to the securing of the pressure sensor DIP type and to the securing and selection of the inlet tube. Consult us if you have any queries.