

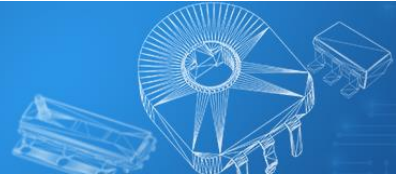
Alps Alpine

# Water Proof Pressure Sensor



Alps Alpine pressure sensors are used in various places. The newly developed HSPPAD143A has a wide measurement range and a water-resistant design, allowing you to measure open air and water from 9,000m high to a depth of 10m with a single sensor.

# Waterproof Pressure Sensors



Alps Alpine supplies air (atmospheric) pressure sensors that are waterproof. A single waterproof pressure sensor can be used to measure both air pressure and water pressure. Here we explain the difference between air and water pressure and introduce the sensor varieties that Alps Alpine has to offer along with their waterproof structures.

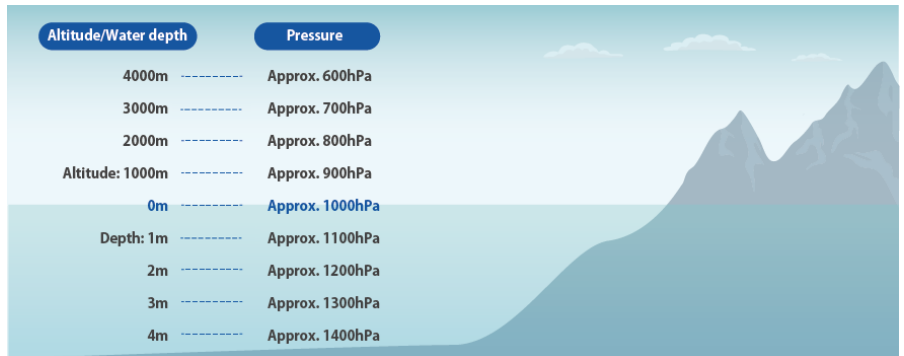
## Water Depth and Water Pressure

In the same way that air pressure changes with the weight of the air, water pressure (underwater) changes with the weight of the water. As water is heavier than air, water pressure rises quicker than air pressure. Water pressure also includes the air pressure portion from the weight of the air above. The diagram below shows the relationships between altitude and air (atmospheric) pressure and between water depth and water pressure.

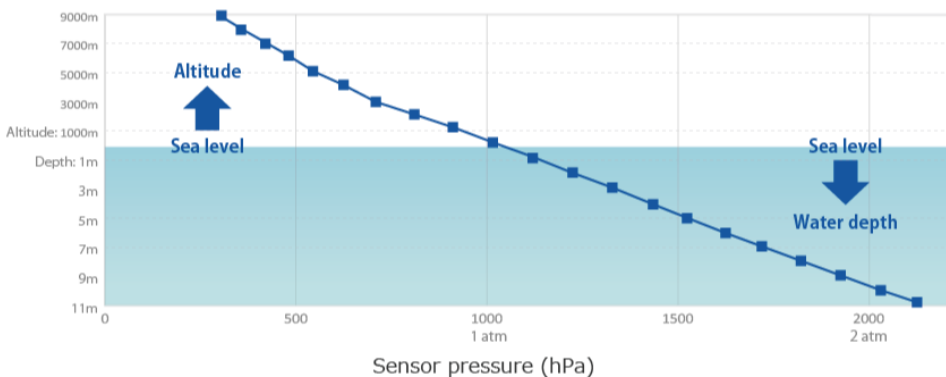
Air weighs about 1.29 grams per liter. Water weighs 1,000 grams per liter.

The ratio between them is therefore roughly **1.29:1000, water being approximately 775 times heavier than air.**

The change in pressure with a 1-centimeter change in water depth is roughly the same as for a 7.75-meter change in altitude above sea level.

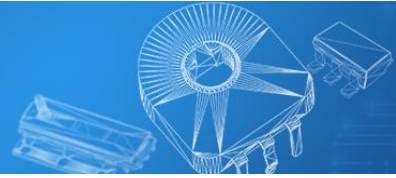


## Relationship Between Water Depth and Pressure



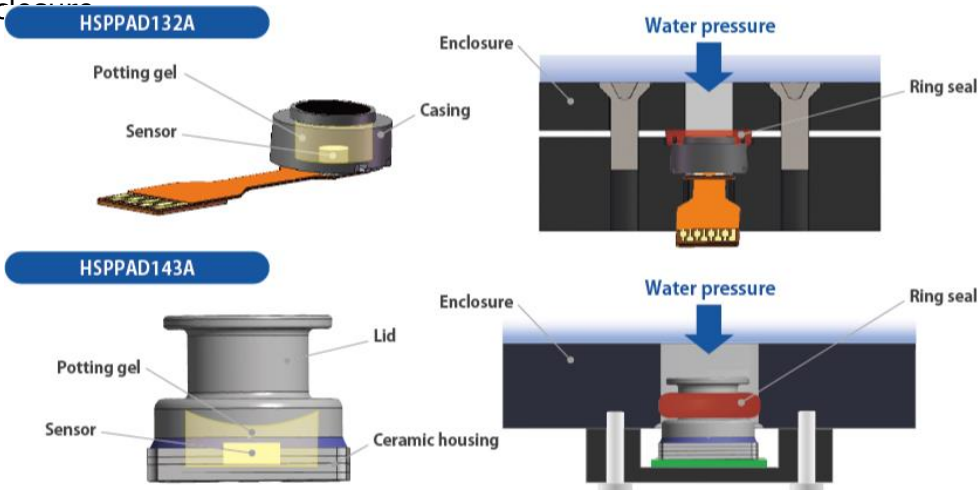
Alps Alpine's **HSPPAD143A** Pressure Sensor has an output range of 300-2100 hPa, corresponding to between around 9000 meters above sea level down to around 10 meters underwater.

# Waterproof Pressure Sensors



## Waterproof Structure of Alps Alpine Air Pressure Sensors

Here we look at the waterproof structures of waterproof air pressure sensors. Pots of both sensors are filled with a gel that has waterproof functionality and accurately conveys pressure. This potting gel makes waterproof pressure sensing possible. The waterproof structure is complete with a ring seal maintaining airtightness between casing / lid and enclosure.





HSPPAD132A and HSPPAD143A achieve IPx8\*-level water resistance.

\*Protection rating defined by the International Electrotechnical Commission (IEC). An IPx8 rating means there is no ingress of water even when operated while immersed in water. This rating applies if the customer's enclosure is designed to meet IPx8 criteria after integrating the Alps Alpine pressure sensor.

## Alps Alpine Waterproof Pressure Sensor Lineup

Alps Alpine supplies the following types of air pressure sensor, varying according to such specifications as the mounting method and the measurement range.

Type	Waterproof	
Part number	<a href="#">HSPPAD132A</a>	<a href="#">HSPPAD143A</a>
Products photo		
Mounting	FPC	Surface mount
Output(I/F)	Digital(I <sup>2</sup> C)	Digital(I <sup>2</sup> C)
Pressure measurement range	300 to 1100hPa	300 to 2100hPa