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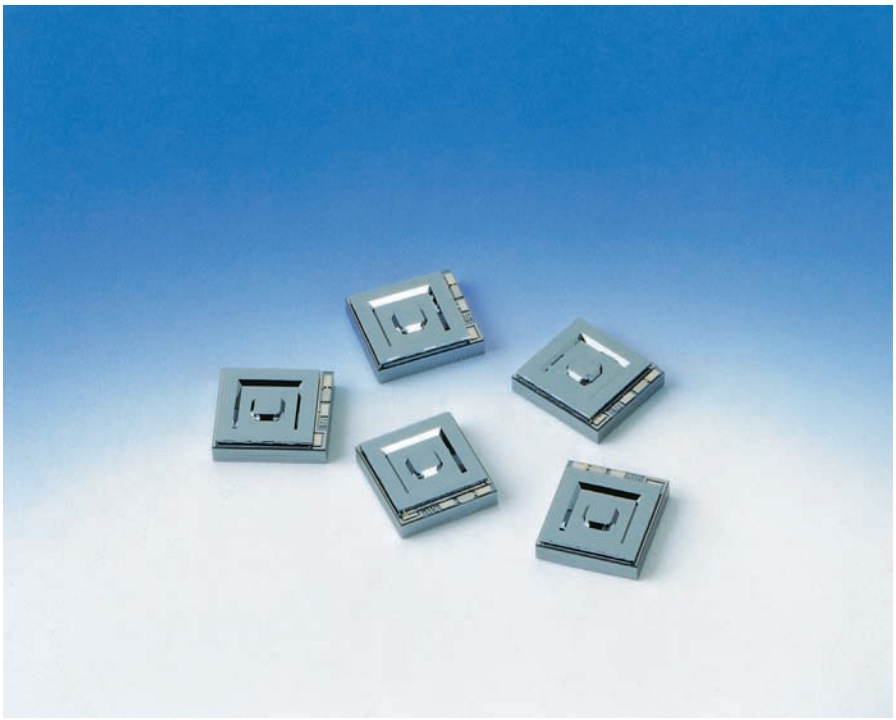
Vaisala BAROCAP® Sensor Technology for Barometric Pressure Measurement



Vaisala BAROCAP® Sensors

Features/Benefits

- Silicon-based BAROCAP® Sensor, a capacitive absolute pressure sensor
- High accuracy
- Excellent hysteresis and repeatability characteristics
- Outstanding temperature and long-term stability

The Vaisala BAROCAP® Sensor is a capacitive, absolute pressure sensor manufactured by silicon micromachining. The sensor has excellent hysteresis and repeatability characteristics, as well as outstanding temperature and long-term stability.

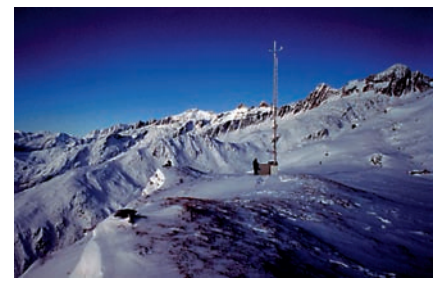
The operating principle

When the pressure changes, the silicon diaphragm bends and changes the height of the vacuum gap in the sensor. This changes the capacitance of the sensor, which is measured and converted into a pressure reading.

The Vaisala BAROCAP® Sensor combines two powerful techniques: the use of single crystal silicon as sensor material, and the capacitive measurement principle. Silicon offers good elasticity, low hysteresis, excellent repeatability, small temperature dependence and superior long-term stability. Thanks to the capacitive pressure sensor structure, the sensor has a wide dynamic range and a built-in overpressure blocking mechanism.

Applications

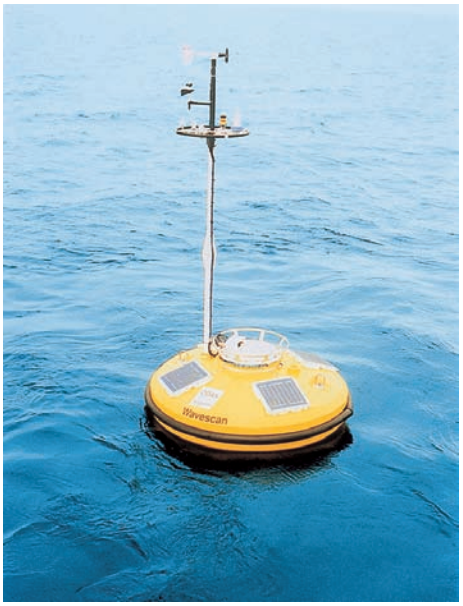
Vaisala's barometers offer excellent performance in a variety of applications. In meteorology, barometric pressure is measured in weather stations, data buoys, GPS meteorology and other environmental data logging. In industry barometric pressure data is needed for pressure sensitive industrial equipment, such as laser interferometers and litography systems, aircraft applications and engine test benches. In actual metrology typical applications include laboratory pressure standard measurements and calibration laboratory monitoring.



Automatic weather stations.

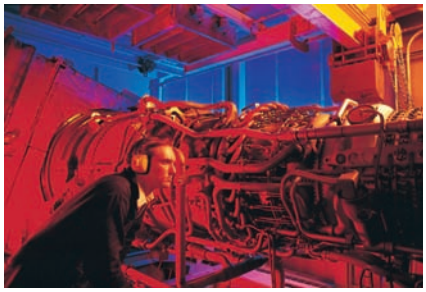
Laser interferometer applications.

GPS meteorology. Vaisala Combined Pressure, Humidity and Temperature Transmitter belongs to recommended equipment of the SuomiNet network. SuomiNet is an international network of GPS receivers. It generates real-time estimates of precipitable water vapor in the atmosphere, total electron content in the ionosphere, and other meteorological and geodetic information.



A marine meteorological buoy improves shipping safety.

Aircraft cabin pressure measurements.



Engine testing.

Pressure Conversion Chart

Multiplication factors
Note: conversions from mmHg and inHg are defined at 0 °C (32 °F) temperature and for mmH_2O and inH_2O at +4 °C (39.2 °F) temperature.

FROM

TO	hPa mbar	Pa N/m²	mmHg Torr	inHg	mmH_2O	inH_2O	atm	at	bar	psi
hPa mbar	1	0.01	1.333224	33.86388	0.09806650	2.490889	1013.25	980.665	1000	68.94757
Pa N/m²	100	1	133.3224	3386.388	9.806650	249.0889	101325	98066.5	100000	6894.757
mmHg Torr	0.7500617	0.0075006	1	24.40000	0.07355592	1.8683	760	735.559	750.0617	51.71493
inHg	0.02952999	0.00029530	0.03937008	1	0.002895903	0.073556	29.921	28.959	29.52999	2.036021
mmH_2O	10.19716	0.1019716	13.59510	345.3155	1	25.40000	10332.3	10000	10197.16	703.0696
inH_2O	0.40147	0.0040147	0.53525	13.596	0.039372	1	406.79	393.71	401.463	27.6799
atm	0.00098692	0.000009869	0.00131579	0.033422	0.000096788	0.0024583	1	0.967841	0.98692	0.068046
at	0.0010197	0.00001020	0.0013595	0.034532	0.0001	0.0025399	1.03323	1	1.01972	0.070307
bar	0.001	0.00001	0.001333224	0.03386388	0.00009807	0.0024909	1.01325	0.980665	1	0.06894757
psi	0.01450377	0.00014504	0.01933678	0.4911541	0.001422334	0.036127	14.6962	14.2233	14.50377	1

Example: 1013.25 hPa/mbar = 1013.25 x 0.02952999 inHg = 29.9213 inHg