



Pressure Measurement Solutions

MEDICAL EQUIPMENT

ABOUT KAVLICO PRESSURE SENSORS

For more than 50 years Kavlico Pressure Sensors has been a leading expert in designing, developing, and manufacturing a broad range of precision, pressure, pressure and temperature, fluid level and specialty sensors.

Focused on premium products, and adapting innovative technologies to meet customer needs, Kavlico Pressure Sensors is the reliable solutions provider for the harshest and most demanding applications across the globe.

Kavlico Pressure Sensors is a brand of Sensata Technologies.

Sensata Technologies

Our highly engineered devices satisfy the world's growing need for safety, energy efficiency, and a clean environment. These are devices that improve safety, efficiency and comfort for millions of people every day and are used in automotive, appliance, aircraft, industrial, military, heavy vehicle, heating, air conditioning, data, telecommunications, recreational vehicle and marine applications.

Until 2006, we were called Texas Instruments Sensors & Controls. Today we are the world's leading supplier of sensors and controls across a broad range of markets and applications.

www.sensata.com



Your Pressure Sensing Partner in Medical Equipment

Pressure sensing technology is playing a more important role in the complex array of medical devices. Pressure sensors used in medical devices save lives and must meet the most demanding, and in many cases, unique requirements.

Small in size, Kavlico's pressure sensors for healthcare and medical devices provide a linear amplified voltage output proportional to pressure. The low power consumption sensors are compatible with a wide array of process media and are available in remote or board-mount designs.

Kavlico Pressure Sensors is the reliable source for all medical pressure sensing requirements and has been providing pressure sensors for use in the medical market for more than 15 years for applications ranging from anesthesia, gas and oxygen transport, medical air and vacuum plants.

Our specialised R&D team allows premium support from product concept through manufacturing and our Management System is fully certified according to **ISO 9001, ISO-TS 16494, ISO 14001** as well as **OHSAS 18001**.



Pressure Measurement in Anaesthesia Machines

Anaesthesia Machines are medical apparatus for administering inhalation anesthetic gases and vapors and for controlling ventilation.

Most modern anaesthesia machines are essentially a ventilator that uses pressure to move air, oxygen, and nitrous oxide (anesthesia gas) into the lungs of the patient. This pressure is known as positive pressure.

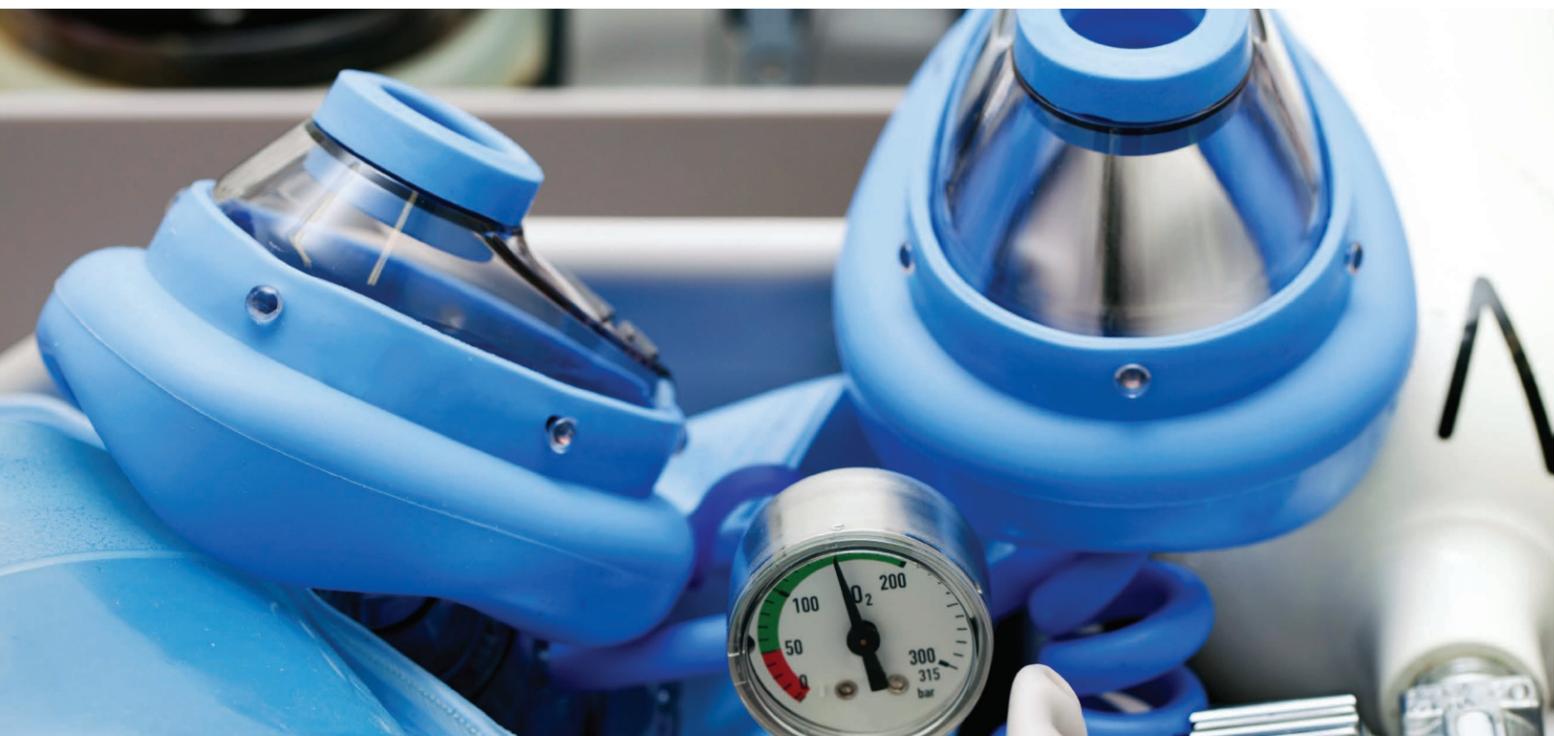
You usually exhale (breathe out) the air on your own, but in some situations the ventilator portion of the machine may have to perform this function for the person.

Product Fit

P992, P993, P1J, P1K, P500, P265, PTA5000 and PTE5000

Therefore another branch showing the path of nitrous oxide has been added to the overall anesthesia delivery system. The ventilator portion of the machine can be programmed to “breathe” a specific number of times over a certain time frame, usually minutes. And it can also be programmed to trigger the ventilator to force air into the lungs. But, if you fail to trigger it within a certain amount of time, the machine automatically supplies air to keep you breathing.

Kavlico’s sensors are measuring the pressure between the filter and regulator from the initial nitrous oxide, air and oxygen inputs, but also the inhalation and exhalation pressure to and from the patient.



Pressure Measurement in Oxygen Concentrators

Oxygen Concentrators are medical devices that are used to deliver oxygen to those who require it due to low levels of oxygen in their blood.

Concentrators are powered by batteries or conventional electrical wall outlets and are made up of compressors, sieve bed filters and circuit boards.

In comparison with an oxygen tank that has a set amount of oxygen a concentrator filters in air, compresses it and delivers air continuously.

The air supply should never run out like an oxygen tank would as long as electrical power is provided. An oxygen concentrator is similar to how a window air conditioning unit works. It takes in air, modifies it and delivers it in a new form. An oxygen concentrator takes in air and purifies it for use by people requiring medical oxygen.

The concentrator takes in air from its surroundings and compresses the air, while the cooling mechanism prevents overheating of the concentrator. The concentrator removes nitrogen from the air by way of a filter and sieve beds and uses an electronic interface to adjust delivery settings.

The delivery of the purified oxygen is by use of a nasal cannula or mask.

Product Fit

P992, P993, P1J, P1K, P500, P265, PTA5000 and PTE5000

An oxygen concentrator takes in air and purifies it for use by people requiring medical oxygen.



Pressure Measurement in Sleep Apnea Machines

Sleep Apnea Machines and Ventilators are machines designed to move breathable air in and out of the lungs to aide a person that is having trouble breathing or is unable to physically breathe on their own.

They are mainly used in emergency care, home care and intensive care and as a component of anesthesia machines.

A ventilator uses pressure to move air or a mixture of gases (like oxygen and air) into the lungs. This pressure is known as positive pressure. You usually exhale (breathe out) the air on your own, but in some situations the ventilator may have to perform this function for the person.

The machines can be programmed to “breathe” a specific number of times over a certain time frame, usually minutes. And they can also be programmed to trigger the ventilator to force air into the lungs.

But, if you fail to trigger it within a certain amount of time, the machine automatically supplies air to keep you breathing.

Product Fit

P1J, P1K, P500, P265, PTA5000 and PTE5000

Pressure Measurement of Medical Air, Gases and Vacuum Plants

Using outside air and going through a filtering and conditioning system, the medical air is provided to the patient by a specific local air compressor plant. Whether for respiratory or surgical applications in operation rooms or even dental usage, the medical air pressure is maintained at constant values from 4 to 7 bar.

Medical vacuum for surgical or dental usage is provided by a centralized vacuum plant. From a vacuum maintained at -900 to -600 mbar surgery exhausting material is evacuated to the atmospheric pressure.

Product Fit

PTE5000, P1A and P1E (ISO15001 certified)

Medical gas and oxygen are provided to patients in hospital rooms and operating rooms having alarmed monitoring distribution piped gas systems.

An optimized pressure sensor for medical gas distribution and onsite N2/O2 generators has to be certified free of oil and grease and ensure the distribution of gas at 0...6 bar to 0...16 bar, and a gas storage at 0...250 bar to 0...600 bar.

The most suitable pressure sensor for Medical Air and Gas usage is the PTE5000 and P1A. The P1E pressure sensor is the perfect fit for Medical Air plant applications supported by an oil free compressor. Its wetted parts are free of oil and grease according to ISO15001 and it comes with an individually sealed plastic bag for cleanliness safety.



Kavlico Pressure Sensor Products



ISO 15001 Certified

P1E - Pressure Sensors for Medical Air

Pressure Ranges	0 - 6 up to 0 - 400 bar (Gage)
Electrical Connection	DIN 175301-803 A, M12-4 Pin, GDS307
Pressure Connection	G1/4" A DIN 3852-A
Housing Material	Stainless steel 1.4301
Output Signal	4-20 mA



PTE5000 - Thin Film Pressure Sensors

Pressure Ranges	0 - 6 ... 0 - 600 bar, 0 - 100 ... 0 - 10.000 PSI
Electrical Connection	DIN 175301-803 A, M12-4 Pin, GDS307, Packard Metri Pack 150, Overmold connector
Pressure Connection	G 1/4" A DIN 3852-E or -A, 1/4"-18NPT, 7/16"-20UNF-2A or 2B with Schrader Deflator
Housing Material	304 Stainless steel 1.4301
Output Signal	4 - 20 mA, 0 - 10 VDC, 0.5 - 4.5 VDC ratiometric



PTA5000 - Thin Film Pressure Sensor

Pressure Ranges	0 - 100 up to 0 - 10000 PSI
Electrical Connection	M12-4 Pin, Packard Metri-Pack 150, Overmold connector
Pressure Connection	1/4"-18 NPT
Housing Material	304 Stainless Steel (1.4301)
Output Signal	4 - 20 mA, 0 - 10 VDC, 0.5 - 4.5 VDC ratiometric



P1A - Ceramic Capacitive Pressure Sensor

Pressure Ranges	0 - 0.25 ... 0 - 16 bar G and -1 - 1 bar G, 0 - 5 ... 0 - 200 PSI G 0 - 1.6... 0 - 16 bar A, 0 - 20 ... 0 - 200 PSI A
Electrical Connection	DIN 175301-803 A, M12-4 Pin, Packard Metri Pack 150, Overmold connector
Pressure Connection	G1/4" A DIN 3852-A 7/16"-20 UNF-2A (male) SAE J1926/2 (modified) w/ 45° cone Further options available
Housing Material	Stainless steel 1.4301
Output Signal	4 - 20 mA, 0 - 10 VDC, 0.5 - 4.5 VDC ratiometric



P500 - Ceramic Capacitive Pressure Sensor

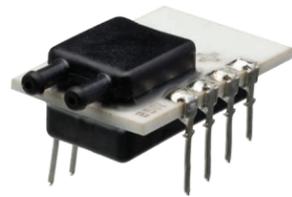
Pressure Ranges	0 - 1 ... 0 - 70 bar, 0 - 15 ... 0 - 1000 PSI
Electrical Connection	Packard Metri Pack 150
Pressure Connection	1/4"-18 NPT (external), 1/8"-27 NPT (external) For more options consult datasheet
Housing Material	Brass and stainless steel
Output Signal	0.5 to 4.5 VDC



P265 - Ceramic Capacitive Pressure Sensor

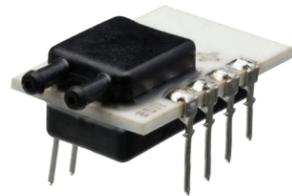
Pressure Ranges	0 - 15 up to 0 - 1000 PSI
Electrical Connection	Packard Electric Metri-Pack 150 Series, 12" 20" AWG leads
Pressure Connection	1/4"-18 NPT (external), 3/8"-24 UNF-2A (male)
Housing Material	303 Stainless Steel
Output Signal	0.5 - 4.5 VDC

Kavlico Pressure Sensor Products



P1J - Piezo-Resistive Pressure Sensor

Pressure Ranges	2, 5, 10, ± 2 , and ± 5 inches of H ₂ O Differential
Electrical Connection	PCB solderable pin
Pressure Connection	1/8" diameter tube fitting with barb for 3/16" ID tubing
Housing Material	PPS and cremamic
Output Signal	SPI and I2C



P1K - Silicon Capacitive Pressure Sensor

Pressure Ranges	1, 1.5, 2, 5, 10, ± 1 , ± 2 , and ± 5 inches of H ₂ O Differential
Electrical Connection	PCB solderable pin
Pressure Connection	1/8" diameter tube fitting with barb for 3/16" ID tubing
Housing Material	PPS and cremamic
Output Signal	0.25 to 4.0 VDC



P992 - Silicon Capacitive Pressure Sensor

Pressure Ranges	1, 1.5, 2, 5, 10, ± 1 , ± 2 , and ± 5 inches of H ₂ O Differential
Electrical Connection	PCB mount; 3 foot PCB (Compatible with Kavlico P892); 2 foot PCB with lead wires (Compatible with Kavlico P592/P593/P792)
Pressure Connection	1/8" diameter tube fitting with barb for 3/16" ID tubing
Housing Material	PET, 30% glass
Output Signal	0.25 to 4.0 VDC



P993 - Silicon Capacitive Pressure Sensor

Pressure Ranges	1, 1.5, 2, 5, 10, ± 1 , ± 2 , and ± 5 inches of H ₂ O Differential
Electrical Connection	3 solderable pins, tin plated
Pressure Connection	1/8" diameter tube fitting with barb for 3/16" ID tubing
Housing Material	PET, 30% glass
Output Signal	0.25 to 4.0 VDC

Committed to Premium Quality

Customer Commitment – To continuously improve our products and services beyond the expectations of our customers. To provide cost-effective solutions to their applications. To always listen.

Process Integrity – To maintain manufacturing systems and processes which produce consistently flawless products and to continuously improve the systems of manufacturing. To prevent defects and eliminate waste through the application of statistical process control (SPC), FMEAs, control plans, and other statistical techniques.

Supplier Covenant – To develop mutually beneficial partnerships with our suppliers that demand nothing less than the same commitment to the pursuit of excellence that we demand of ourselves. To see each supplier as an extension of Kavlico Pressure Sensors.

We recognize that each employee plays a vital role in bringing these three principles to life. The development and empowerment of each employee in a team environment is necessary to ensure Kavlico's continued prosperity.

Kavlico Pressure Sensors is certified according to ISO/TS 16949, ISO 9001, ISO 14001 and OHSAS 18001. Furthermore many of our standard products are compliant to CE, UL and RoHs marks.

Committed to Innovation

Kavlico Pressure Sensors offers state-of-the-art pressure sensing and signal treatment technologies innovatively packaged to fit the highest quality requirements in the harshest environments.

Designing and developing pressure sensors for mission critical applications is our focus and specialty.

Our strength lies in our ability to apply one of Kavlico's innovative sensing technologies to meet an application specific requirement and provide perfect package expertise to adapt to customer specifications.

Kavlico offers multiple pressure sensing technologies: Ceramic Capacitive, Silicon Micro-Machined Capacitive (MEMS), Silicon Piezoresistive (PRT), and Thin Film (TiON), with an extensive network of development and support functions to design, develop, validate and manufacture pressure sensors for the most demanding applications.

Customization Capabilities

Kavlico's customization team is a dedicated and highly qualified engineering team, adapting our pressure sensors to meet customer specific requirements.

Extended by the latest testing and analyses capabilities, Kavlico Pressure Sensors' customization team is offering exclusive designs tailored for unique applications.

Kavlico Pressue Sensors - The right sensor for your application!



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