

Pressure Switches and Transmitters in Medical Technology

SUCO products are used in numerous systems and applications in medical technology where the pressure of a medium has to be reliably monitored or controlled.

In addition to our customers in the field of mobile hydraulics and machine and plant engineering, we have also been serving customers in medical technology for several years with our pressure switches and transmitters for demanding and safety-relevant applications.

In medical technology, 100% reliability and functional safety of the devices and components are crucial. In addition to legal requirements for product purity (free of oil, grease and silicone), the focus in terms of fail-safety lies on the use of redundant systems. Our mechanical and electronic pressure and vacuum switches and transmitters have earned an excellent reputation due to their high overpressure safety (up to 4 times), reliability and long service life. As a manufacturer "Made in Germany", we guarantee that every single product undergoes a 3-stage quality test before it is put into circulation.

In the following blog post we would like to highlight the advantageous characteristics of our components.

Materials and approvals

Due to their high temperature and corrosion resistance, pressure switches made of stainless steel are very often used in medical technology.

For monitoring drinking water or media containing water, brass (free of nickel and pollutants) has established itself as a standard in many medical technology products.

For oxygen and water applications SUCO recommends the use of the following EPDM diaphragms only:

- EPDM for general applications (including oxygen). The burnout resistance has been successfully tested by the Federal Institute for Materials Research and Testing (BAM)
- EPDM-TW was designed for drinking water applications in accordance with national elastomer guidelines, WRAS, ACS and NSF 61 and for use in medical and pharmaceutical applications

In addition to EPDM, the following diaphragms are mainly used in medical technology:

- FKM was successfully tested for biocompatibility (luminescent bacteria test with *Vibrio fischeri*) in the course of the evaluation for respirators and ventilators
- FFKM fulfills the highest elastomer class and is mainly used in vacuum technology and bioanalysis due to its extremely high temperature and media resistance
- Silicone is approved by the US FDA (Food & Drug Administration) for food and pharmaceutical applications

Medical applications

Anaesthesia and respiratory equipment

Respiratory equipment is a generic term for a variety of different designs, including mobile devices for rescue services, home ventilation equipment or stationary machines in operating theatres. In intensive care units, ventilators are used to ventilate patients over long periods of time. The ventilators used to treat COVID-19 belong to the class of anaesthesia and critical care ventilators.

During an operation, an anaesthesia machine takes over the respiratory function (ventilation) of the patient, since the respiratory drive of the patient is often suspended during general anaesthesia. An additional painkiller (anaesthetic) is added to the gas mixture - consisting of compressed air, oxygen (O₂) and nitrous oxide (N₂O) - depending on the operation. Our pressure switches monitor the oxygen supply between the gas socket / connection and the ventilator. When handling oxygen, we only recommend the use of plasma-cleaned pressure switches and transmitters with EPDM membrane.

Disinfection and cleaning systems

Disinfection and cleaning systems are used in hospitals and medical practices for the sterile cleaning of instruments, tools, cutlery, endoscopes as well as clothes and shoes. The systems are manufactured in various designs, ranging from small tabletop machines for dental practices to large equipment in hospitals.

The machines work similar to a dishwasher with very high temperatures and have the option of using special cleaning liquids and disinfectants to safely remove both mechanical and biological soiling on the instruments. Autoclaves and sterilizers

Autoclaves and sterilizers achieve the killing of all reproductive pathogens by heat with steam under high pressure. In order to withstand the high pressures, the chambers are normally built in a barrel shape. Autoclaves usually sterilize at 134°C with a holding time of ~5.5 minutes. The units are first evacuated and then filled with superheated steam. These units sterilize instruments and tools contaminated with germs and viruses in combination with upstream cleaning systems.

Both in cleaning systems and autoclaves, our pressure switches perform the following functions:

- Monitoring of door lock: During the cleaning or sterilization process, a pressure switch monitors the pressure inside the process chamber to prevent unintentional opening of the device.
- Monitoring of water supply: At the end of the cleaning or sterilization process, a pressure switch monitors the water supply to the water ring pump, which evacuates the process chamber.

Gas supply of medical devices

In hospitals, the gas and media supply is normally ensured by permanently installed supply lines. SUCO pressure switches and pressure transmitters are used both in the central gas supply for monitoring the pressure of cylinders and in the treatment room behind the gas socket for monitoring medical equipment.

SUCO offers pressure switches suitable for oxygen (O₂) also for high pressures. Due to the combustion-promoting effect of oxygen, products in use with oxygen are subject to special restrictions in the choice of materials as well as country-specific approvals and handling regulations. SUCO offers pressure switches approved and tested for oxygen up to 200 bar. One application is, for example, the monitoring of the inlet pressure of ozone analysers in ozone therapy.

Hydraulic operating tables

Hydraulic systems are used, for example, in operating tables or rescue tables to lift the patient safely in all positions. SUCO offers a wide range of compact and assembled pressure switches for such systems, which have proven themselves a thousand times over due to their durability and reliability.

Convince yourself of our high quality products and send us an inquiry.