



TE SENSOR SOLUTIONS FOR MEDICAL APPLICATIONS

SENSOR SOLUTIONS FOR MEDICAL APPLICATIONS

SENSOR TYPES

SPO₂

Photo Optic

- Pulse Oximetry
- Patient Monitoring

Air Bubble

Ultrasonic

- Infusion Pumps
- Dialysis

Vibration

Piezoelectrical Film

- Ultrasonic Imaging
- Pacemaker
- Impact Sensing

Force

- Infusion Pumps
- Medical Devices
- Patient Weight
- Oxygen Tank

Position

- Prosthetics
- Infusion Pump
- Hospital Bed
- Surgical Robots

Temperature

- Patient Monitoring
- Ablation
- Dialysis

Humidity

- Ventilators
- Premature Newborn Cabinet

Pressure

- Respirators/
Ventilators
- CPAP
- Infusion Pumps
- Blood Pressure



SENSOR SOLUTIONS FOR MEDICAL APPLICATIONS

TE Connectivity is now one of the largest sensor companies in the world, with innovative sensor solutions that help customers transform concepts into smart, connected creations. Electronic systems in medical equipment, devices and probes rely on sensor signals as a basis for control activities, accurate diagnosis and treatment. TE Connectivity designs and manufactures sensors to exacting specifications for the rigors of medical applications, with ISO 13485 certification and FDA registration for various products. Our engineers provide full support of application-specific, standard and custom requirements, from product concept through manufacturing.

APPLICATIONS

- **Cardiovascular Monitoring and Diagnosis**
- **Cardiovascular Treatment**
- **Patient Monitoring and Diagnosis**
- **Patient Treatment**
- **Surgical/Delivery**
- **Home and Mobile Health Care / Wearable Medical Devices**

SENSOR SOLUTIONS FOR MEDICAL APPLICATIONS

SENSOR TYPES

- Air Bubble
- Force
- Humidity
- Liquid Level
- Piezo Film
- Position
- Pressure
- Pulse Oximetry
- Temperature
- Vibration

QUALITY CERTIFICATIONS AND AUDITED PROCESSES

- ISO 13485
- ISO 9001
- CE-MDD
- FDA
- CMDR-Health Canada



CARDIOVASCULAR MONITORING AND DIAGNOSIS

- Disposable Blood Pressure Monitoring
- Electronic Stethoscope
- Heart Rhythm Monitoring
- Pulse Oximetry
- Thermo Dilution
- Ultrasound Imaging



DISPOSABLE BLOOD PRESSURE MONITORING



Miniature Silicon MEMS Pressure Sensor

- Used during surgical procedures, ICU monitoring
- Disposable design, replaced every 1-3 days
- Low cost, high volume
- Supplied in tape and reel
- AAMI compliant
- ETO, Gamma sterilization
- Value add capability – tubing, housing, custom cable



BLOOD OXYGEN LEVEL



Photo Optic Components

- Used for the measurement of oxygen blood level
- Low cost
- Dual drive
- Pulse oximetry

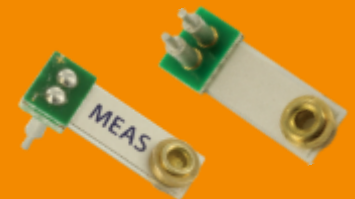


HEART RHYTHM MONITORING



Piezo Film Sensor

- Used for monitoring heart rhythms
- Low cost
- High sensitivity
- Vital signs monitoring
- Ultra low power (self generating)

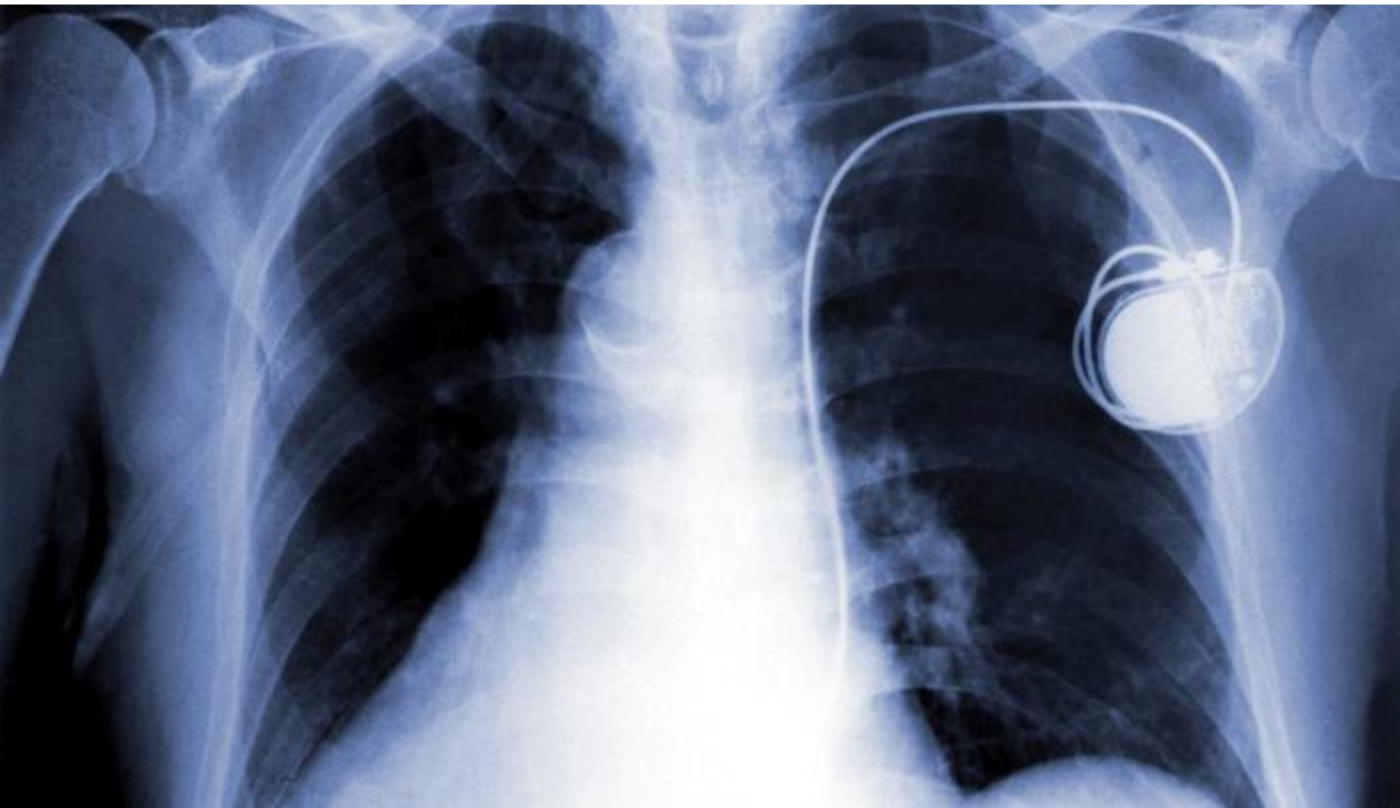


CARDIOVASCULAR TREATMENT

- Ablation Catheter
- Angioplasty Balloon Inflating Pump
- Blood Transfusion and Oxygenation
- Contrast Die Infusion
- Discrete Vital Signs Monitoring
- Myocardial Needle Probes
- Pacemaker
- Ventilator and Respirator



PACEMAKER— CARDIAC ACTIVITY MONITOR



Micro-Miniaturized Piezoelectric Film Sensor

- Measures patient activity level and adjusts pacemaker function
- Highly sensitive and reliable
- Biologically inert material

Position Magnetoresistive (MR) Sensor

- Used to detect body position



BLOOD TRANSFUSION AND OXYGENATION



Piezoresistive Silicon MEMS Pressure Sensor

- Stainless steel
- Measure blood volume

Temperature Sensor

- PT1000 or NTC Thermistor
- Monitor blood temperature



VENTILATOR AND RESPIRATOR



Piezoresistive Silicon-MEMS Pressure Sensor

- Measure air flow in breathing machine

Liquid Level Sensor

- Monitor water tank level

Temperature and Humidity Sensors

- Monitor air intake



PATIENT MONITORING AND DIAGNOSIS

- Body Weight
- Bone Density
- Hospital Bed Vital Signs
- Skin Temperature
- Urinary Catheters and Urodynamic Testing
- Sleep Apnea Studies
- Non-Contact Thermometry
- Contact Thermometry



SLEEP APNEA STUDIES



Pressure Sensors

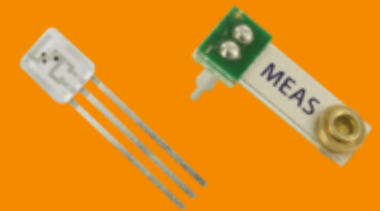
- Monitor breathing cycles and positive air pressure

Photo Optic Sensors

- Measure blood oxygen saturation (SpO₂) and pulse

Piezo Film Sensors

- Monitors breathing patterns, heart rate, and body/limb movements



NON-CONTACT THERMOMETRY



Thermopile Sensors

- Non-contact temperature measurements
- Digital thermometers (ear and forehead)



PATIENT TREATMENT

- Insulin Pump
- Bubble and Level Detection
- Dialysis Machines
- Infusion Pump
- Hospital Gas Monitoring
- Premature Newborn Cabinet
- Ventilator and Respirator



BUBBLE AND LEVEL DETECTION



Ultrasonic Sensors

- Detect bubbles or medication levels during infusion
- Temperature option
- Occlusion option
- Fluid Differentiation



INFUSION PUMP



Silicon MEMS Pressure Sensor or Microfused Load Cell

- Detect presence and/or rate of flow, occlusion, presence of needle

Magnetic Encoders or Linear Position Sensors

- Flow control

Ultrasonic sensors

- Detect air bubbles in infusion liquids

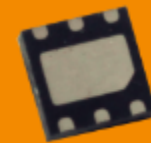


PREMATURE NEWBORN CABINET



Humidity and Temperature Sensors

- Control of airflow for optimized, safe ambience
- Measurement and control



SURGICAL / DELIVERY

- Assisted Baby Delivery
- Brain Tumor Hypodermic Needle Probes
- Endoscopic Surgery
- Intrauterine Pressure Sensor
- Ocular Surgery
- Patient Warming/Cooling
- Robotic Surgery
- Surgical Devices and Instruments
- Anesthesia Delivery



INTRAUTERINE PRESSURE SENSOR



Miniature Silicon MEMS Pressure Sensors

- Monitors contraction frequency and amplitude during labor
- Fetal activity monitoring
- Low cost
- Disposable
- Value add capability
- ETO, Gamme or E-beam sterilization compatible



ROBOTIC SURGERY



Cable Extension Sensors and Rotary Encoders

- Accurately monitor the position of surgical tools
- Compact design
- Low cost
- Custom configurations



HOME AND MOBILE HEALTH CARE / WEARABLE MEDICAL DEVICES

- Wearable Health Devices
- Mobile Infusion and Insulin Pumps
- Mobile Oxygen Delivery
- Organ Transportation
- Patient Fall Detection
- Sleep Apnea Treatment/CPAP



ORGAN TRANSPORTATION



Silicon MEMS Disposable Blood Pressure Sensor

- Can be used to monitor fluid flow in organs to extend life during transportation

Temperature Sensor

- Monitor ambience of organ during transportation



THANK YOU

www.te.com/medicalsensorsolutions

