

MEDICAL DEVICES

Designed with Sensors from **measurement**

SPECIALTIES



Brain Tumor Hypodermic Needle Probes
Non-contacting Body Temperature
Ocular Surgery
Ear Thermometer
Oral/Esophageal/Rectal Thermometers
Hospital Gas Monitoring
Ablation Catheter
Spirometer
Pacemaker
Heart Rhythm Monitoring
Ventilator and Respirator
Spinal Column Testing
Blood Dialysis
Kidney Dialysis
Kidney Transplant
Infusion Pump and Syringe Pump
Skin Temperature
Blood Transfusion
Surgical Die Infusion
Pulse Oximetry
Medical Keypad
Bone Density
Body Weight
Hospital Beds

Parkinson's Study
Sleep Apnea
Oxygen Conserver
Oxygen Tank Level
Respiration Monitors
Electronic Stethoscope
Mycocardial Needle Probes
Thermo Dilution Sensor
Angioplasty Balloon Inflating Pump
Angioplasty Contrast Infusion
Blood Pressure Cuff
Disposable Blood Pressure
Arterial Tonometry
Premature Newborn Cabinet
Intra-Uterine Pressure
Portable Infusion Pumps
Baby Delivery System
Discrete Vital Signs Monitoring
Disposable Digital Display
Body Heat Exchange

Proven in the medical marketplace, Measurement Specialties has partnered with many OEMs to pioneer the use of sensor technology in commercially successful medical devices and disposables.

See the other side for medical application details.

Medical Devices and Disposables

Designed with Sensors from Measurement Specialties

Cardiovascular Monitoring and Diagnosis

Arterial Tonometry – Silicon MEMS pressure sensor measures heartbeat and blood pressure at the wrist.

Blood Pressure Cuff – Silicon MEMS pressure sensor measures inflated cuff pressure

Heart Monitor Patch – Piezoelectric film vibration sensor monitors heart rhythms and signals 911 call through telemetry for emergency care

Disposable Blood Pressure Sensor – Very low-cost miniature silicon MEMS pressure sensor used in line with IV to monitor patient blood pressure

Electronic Stethoscope – Piezoelectric film used as a contact microphone to receive heartbeat and breathing sounds

Pulse Oximetry – Photo-optic sensors used to measure blood oxygen saturation (SpO₂) and pulse

Thermo Dilution Sensor – Measures blood volume coming out of the heart by using invasive NTC thermistors to measure changes in blood temperature

Cardiovascular Treatment

Ablation Catheter – Force transducer measures precise location of catheter tip during heart ablation to correct arrhythmia

Ablation Catheter – Temperature Sensor measure/controls RF energy used for ablation

Angioplasty Balloon Inflating Pump – Silicon MEMS pressure sensor measures inflation of angioplasty balloon

Angioplasty Die Infusion – Disposable blood pressure sensor (Si MEMS) controls injection of contrast media during surgery

Blood Transfusion – Si MEMS-based stainless steel pressure sensor used in a blood separation device

Cryogenic Angioplasty – Silicon MEMS stainless steel pressure sensor measures pressure of cryogenic gas used to decrease clogged arteries

Myocardial Needle Probes – As the heart is cooled during surgery, hypodermic needles are inserted into myocardial muscles to monitor temperature

Oxygen Conserver – Piezoelectric film or Silicon MEMS pressure sensor detects inhalation and opens oxygen flow valve

Oxygen Tanks – Microfused™ load cells measure remaining oxygen level in tank

Pacemaker – Piezoelectric film sensor used as an activity monitor (vibration sensor) detecting patient movement requiring increased blood flow by increasing the heart rate

Pacemaker – An NTC thermistor measures blood temperature to determine patient activity level

Ventilator and Respirator – Silicon MEMS pressure sensor measure air flow in breathing machine

Patient Monitoring and Diagnosis

Bone Density – Piezoelectric film used as an ultrasound transducer to measure bone density

Body Weight – Microfused™ load cell used on a scale for patient weighing

Hospital Bed Vital Signs – Piezoelectric film used to measure breathing patterns and heart rate

Oral/Esophageal/Rectal Thermometers – To measure body temperature

Parkinson's Study – Miniature vibration sensors used to monitor patient movement

Respiration Monitors – Temperature sensors near the mouth and nose monitor breathing patterns

Skin Temperature – Reusable or disposable skin sensors for continuous monitoring of patient temperature

Sleep Apnea – Piezoelectric film used as a dynamic strain gage to sense chest movement, or as a contact microphone to sense snoring, or as a pyroelectric sensor to monitor breathing exhalation.

Spinal Column Testing – Silicon MEMS pressure sensor used for spinal column die testing

Patient Treatment

Ambulatory Infusion Pumps – Si MEMS pressure sensors or Microfused™ load cells used to detect presence and/or rate of flow

Blood Dialysis – After filtration, temperature sensors control reheating of blood prior to re-injection into the body

Bubble and Level Detection – Ultrasonic sensors detect bubbles or medication levels during infusion

Hospital Gas Monitoring – Si MEMS pressure sensors detect gas flow for hospital medical gas systems

Infusion Pump – Piezoresistive diaphragm used to drive fluid at very slow rates

Kidney Dialysis – Microfused™ strain gage pressure sensor used to measure liquid flow pressure

Sleep Apnea – Silicon MEMS low pressure sensor maintains positive airflow to breathing mask; humidity sensor maintains high humidity for comfort

Premature Newborn Cabinet – Humidity and temperature control of air flow for optimized, safe ambiance

Syringe Pump – Magnetic encoder determines medication flow rate through piston position

Syringe Pump and Infusion Pump – Si MEMS force sensor and Microfused™ strain gage detects blockage of medication flow

Surgical / Delivery

Baby Delivery System – Silicon MEMS pressure sensor used to monitor pressure on vacuum-assist baby delivery system

Blood Tumor Hypodermic Needle Probes – Miniature temperature sensors at needle tip monitor freezing or warming of the brain during procedure to kills cancerous cells

Body Heat Exchange – Si MEMS very low pressure sensor measures partial vacuum used to expand the blood vessels for quick heat exchange

Disposable Digital Display – Low-cost Silicon MEMS pressure sensor with display measures knee pressure during surgery

Kidney Transportation – Disposable blood pressure sensors enable flow through organs during transport to extend organ life.

Intra-Uterine Pressure Sensor – Low-cost miniature Silicon MEMS pressure sensor monitors contraction frequency and amplitude during labor

Ocular Surgery – Si MEMS pressure sensor maintains fluid pressures in the eyeball during surgery

Keypads and Assemblies

Device Subassembly – Low cost subassembly done in our offshore manufacturing facility

Medical Keypad – Elastomer keypad and membrane switch used to control portable and stationary medical devices

Measurement Specialties Sensor Technologies

Pressure

Piezoresistive silicon MEMS board level
Piezoresistive silicon MEMS stainless steel oil-filled
Microfused™ silicon bonded strain gage
Foil bonded strain gage

Force

Microfused™ silicon bonded strain gage
Piezoelectric polymer (impact)

Position (Linear & Rotary)

Electromagnetic sensors
Magnetic and optical encoders
Piezoelectric polymer – ultrasound
Tilt – capacitive fluid

Vibration / Acceleration

Piezoresistive silicon MEMS
Piezoelectric polymer
Piezoelectric ceramic

Humidity

Capacitive thin film

Pulse Oximetry

Photo optic sensors

Temperature

NTC thermistors
IR thermopiles (non-contacting)