

MEDICAL DEVICES

Designed with Sensors from **measurement**

SPECIALTIES™



Brain Tumor Hypodermic Needle Probes

Non-contact Body Temperature

Ocular Surgery

Ear Thermometer

Oral/Esophageal/Rectal Thermometers

Hospital Gas Monitoring

Patient Fall Detection

Ablation Catheter

Spirometer

Heart Rhythm Monitoring

Ventilator and Respirator

Spinal Column Testing

Kidney Dialysis

Kidney Transplant

Skin Temperature

Blood Transfusion

Surgical Die Infusion

Blood Glucose Monitoring

Pulse Oximetry

Bone Density

Body Weight

Hospital Beds

Parkinson's Study

Sleep Apnea

Oxygen Tank Level

Electronic Stethoscope

Mycocardial Needle Probes

Thermo Dilution Sensor

Angioplasty Balloon
Inflating Pump

Angioplasty
Contrast Infusion

Disposable
Blood Pressure

Infusion Pump
and Syringe Pump

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

Assemblies

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

Cardiovascular Monitoring and Diagnosis

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

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

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, temperature sensor measures/controls RF energy used for ablation

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

Angioplasty Die Infusion – Si MEMS pressure sensor can control the injection of contrast solution during angioplasty procedure

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 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

Ventilator and Respirator – Silicon MEMS pressure sensor measure air flow in breathing machine, moisture and temperature measurements

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, patient occupancy, body weight, bed position, non-contact body temperature

Oral/Esophageal/Rectal Thermometers – To measure body temperature

Patient Fall Detection – High resolution pressure sensors can detect if a patient suddenly collapses, accelerometer measures impact upon hitting the floor

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

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

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

Patient Treatment

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

Blood Glucose Monitoring - MR sensors can control the dosage of the insulin

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

Kidney Dialysis – Oil-filled pressure sensor used to measure liquid flow pressure, temperature sensing

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

Sleep Apnea – Silicon MEMS low pressure sensor maintains positive airflow to breathing mask; humidity sensor maintains high humidity for comfort. CO₂ and temperature sensor can be used during exhalation cycle

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

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

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

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

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

Robotic Surgery – String potentiometers can mimic surgical motions from a remote location

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
Linear string potentiometers

Vibration/Acceleration

Piezoresistive silicon MEMS
Piezoelectric polymer
Piezoelectric ceramic

Humidity

Capacitive thin film

Pulse Oximetry

Photo optic sensors
HTU Series sensors

Temperature

NTC thermistors
IR thermopiles (non-contacting)
Micro-Thermocouples
RTDs
Surface mounts

measurement
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