



# Sensors



*Temperature*

*Pressure*

*Humidity*

*Acceleration*

*Vibration*

*Shock*

*Inclination*

*Magnetic field*

*Particle Concentration*

*CO<sub>2</sub>*

*Rotary Signal-Transmitter*

kPa

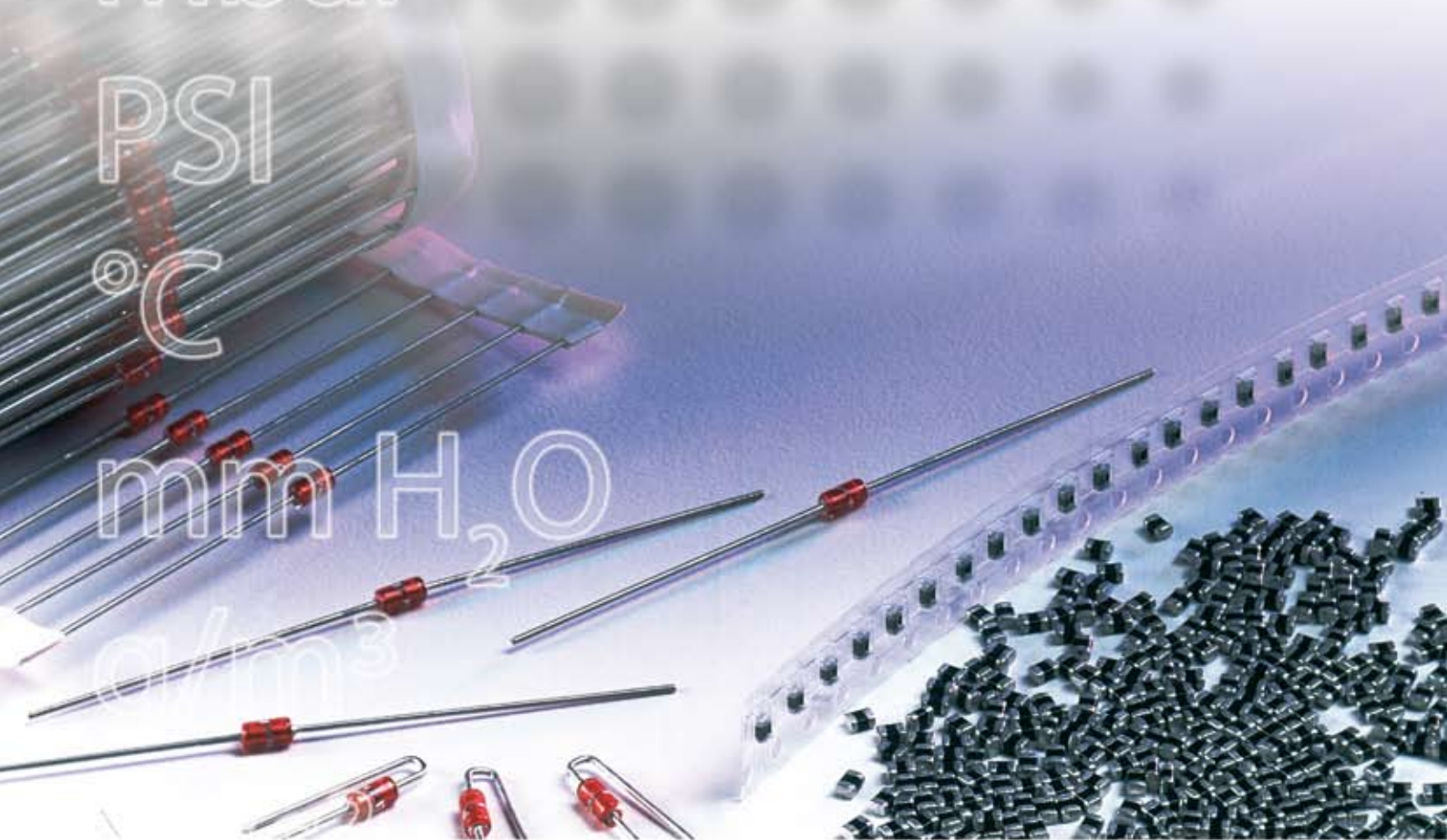
mbar

PSI

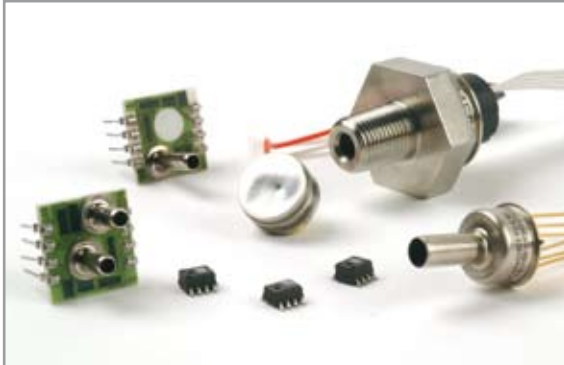
°C

mm H<sub>2</sub>O

g/m<sup>3</sup>



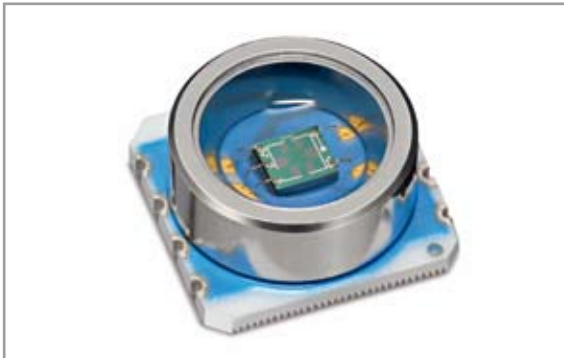
## Piezoresistive / MEMS



### Sensors & Transducers

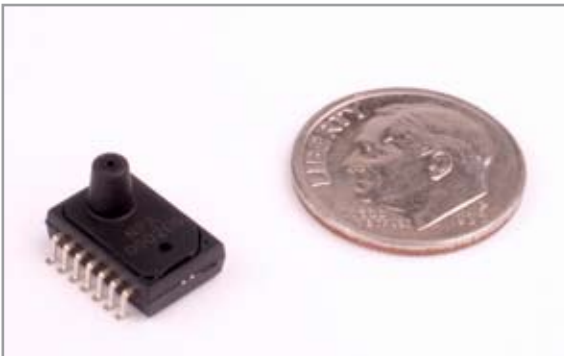
- Pressure range from 0 - 25 mbar to 0 - 345 bar
- Gauge, differential and absolute pressure
- Temperature compensated
- Calibrated
- Constant voltage or constant current power supply
- Output mV or mA
- Package styles: hybrid circuit, TO-8, SMD TO-8, media compatible stainless steel housing
- Tire pressure sensors standard or with customized asic on-chip
- Bare pressure sensor dies or wafer
- Operating temperature range -40 to 125 °C
- With or without pressure port
- Different pressure ports available
- High reliability

**Markets:** e.g. medical, industrial, automotive, measurement and control, process automation, OEM market



- Pressure range from 0 - 25 kPa to > 300 kPa
- Gauge, differential, absolute, vacuum pressure
- Temperature compensated
- Calibrated
- Integrated (amplified)
- Power supply 5 Vdc
- Output mV or V
- Package styles SMD and pin-through-hole
- Operating temperature range -40 to 125 °C
- With or without pressure port
- Price competitive for high volume production
- Evaluation kits
- Application infos available
- Interactive electronic product search

**Markets:** e.g. consumer, healthcare / fitness, automotive, industrial, gaming



# Humidity

## Relative and Absolute

### Resistive

#### Elements

- Leaded or SMD
- Measuring range 0 to 95 % rH
- Operating temperature range -40 to 120 °C
- Package style plastic cap or bare

#### Modules

- PCB-modules or probe assembly
- Measuring range 10 - 90 % rH, non-condensed
- Operating temperature range 0 to 60 °C
- Analog output V or mA
- Digital output I2C format
- With NTC or PT100/1000 temperature sensor
- Calibrated, ready-to-use
- Customized design on request



### Capacitive

- Operating range 0 to 100 % rH
- On-chip signal conditioning
- Output 0,8 to 3,9 V linear to 0 to 100 % rH
- Integrated temperature sensor PT1000 or NTC
- Package style SIP, TO-5- or TO-39 can
- Lead pitch 1,27 mm, 2,54 mm
- rH-accuracy +/- 3,5 % at 0 - 100 %, non-condensing, 25 °C, 5 Vdc supply
- rH interchangeability +/- 5 %
- Power supply 4,0 to 5,8 Vdc / 200 µA
- Operating temperature range -40 to 85 °C



### Heat Conductivity

- Ideal to detect proper cooking time in microwave ovens with grill feature
- Suitable for tumble dryer application
- Operating temperature up to 200 °C
- Short response time of about  $t_{90} = 16$  s
- Short stabilization time of 10 s
- Measuring range 0 - 130 g/m<sup>3</sup> = aH
- High volume production capability
- Competitive pricing for OEM market

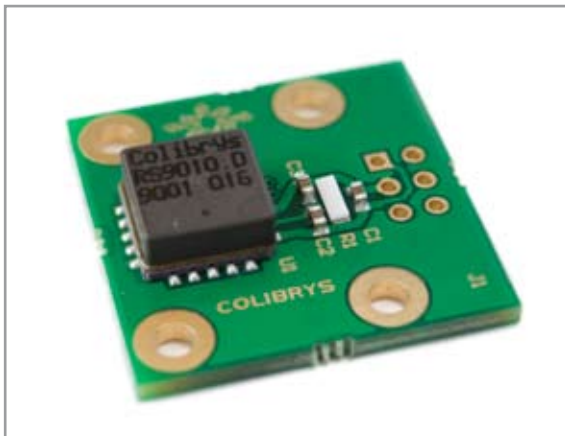




### Capacitive

- High performance
- Low noise, High Bias stability
- Low temperature sensitivity
- 1 to 100 g full scale range
- High shock resistance up to 20.000 g
- Sensitivity up to 1200 mV/g
- Extreme temperature range -55 °C to 125 °C min.
- Customized designs

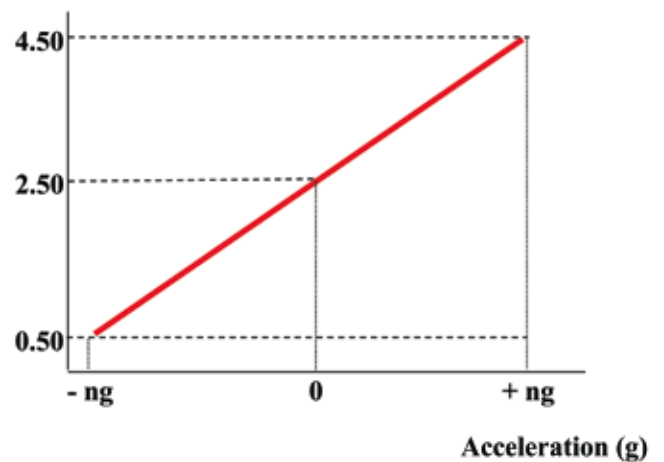
**Markets:** e.g. military, space- and avionics applications, transportation, exploration, construction, ships, seismology, surveying, datalogger, building and machine monitoring



- 1-, 2-, 3-axis
- 1,5 to 250 g full scale range
- New 3-axis device with g-select
- Low power consumption
- Sensitivity up to 120 mV/g
- Packaging style SOIC, QFN
- Interactive product search
- Evaluation kit on request

**Markets:** e.g. consumer, healthcare / fitness, industrial, automotive, gaming

### Output Voltage (V)

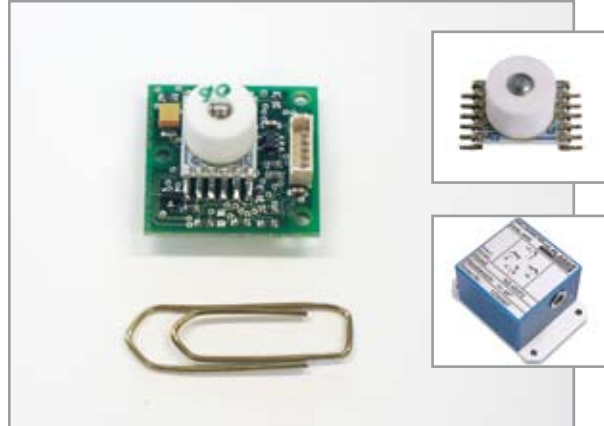


# Position

## Inclination, Length, Angle

### Conductometric Inclination Measurement

- Precision inclinometer
- Available as element, module or system
- 1- or 2-axis
- Ranges  $\pm 2^\circ$ ,  $\pm 5^\circ$ ,  $\pm 10^\circ$ ,  $\pm 15^\circ$ ,  $\pm 25^\circ$ ,  $\pm 45^\circ$
- Output:
  - Analog V or mA ranges
  - Digital, I2C, RS232, PWM
  - Limit switching contacts
- Calibrated, ready-to-use
- Low power consumption
- System robust for harsh environment
- IP65 aluminium housing
- Operating temperature range  $-40$  to  $85^\circ\text{C}$
- Connector or pigtail cable interface
- Programmable



### Magnetoresistive Sensors

- Detection of low magnetic fields
- Precise angular and position measurement
- Packages: SOT223-S, E-Line, Chip, SM8, SO8, SM14, Hybrid chip, DIL14



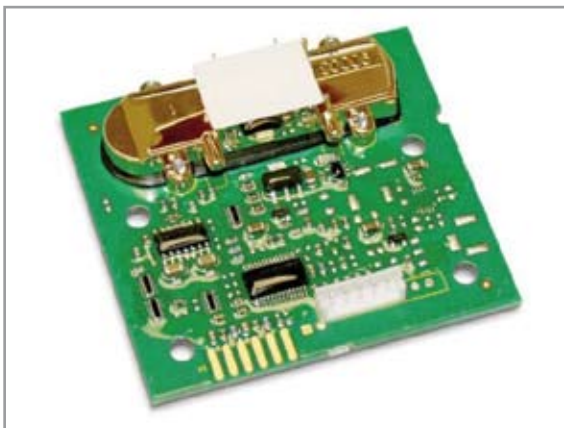
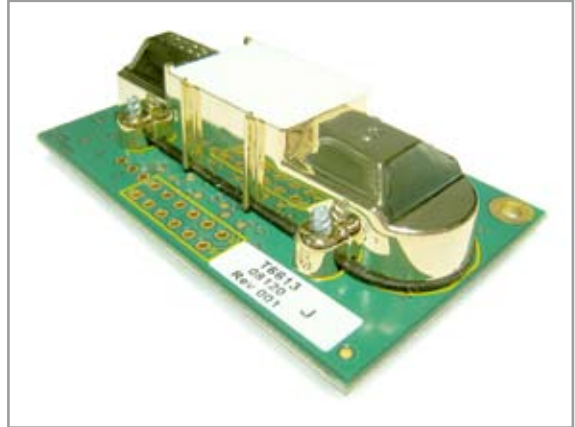
### Rotational Signal –Transmitter

- Distorsion-free transmission of sensor signals from a turning object (rotor) to a stator side
- Number of turns 0 to 42.000 RPM min.
- Number of channels 4, 8, 12, 18, 24, 30
- No slip rings
- No battery
- Arc-free
- Optional speed pick-up and encoder
- Easy-to-use
- For service and repair



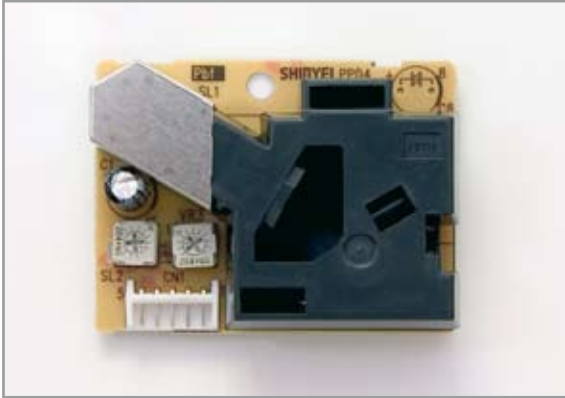
## CO<sub>2</sub> modules and meters

- Low cost CO<sub>2</sub> module
- Reliable (15 years of low cost infrared sensor manufacturing)
- Pre-calibrated
- Maintenance free
- Patented ABC (Automatic Background Calibration)
- Low power consumption
- Low profile
- RoHS & WEE compliant
- Flexible configurations
- Designed to meet OEM expectations



# Particle Sensor

## Optical



### Particle Sensor PPD-4N

- Detectable particle size approx. 1  $\mu\text{m}$  min.
- Detectable range of concentration 0 - 28.000 pcs/l
- Power supply 5Vdc +/- 10 %
- Current consumption 90 mA
- Operation condition range
  - Temperature 45  $^{\circ}\text{C}$
  - Humidity under 95 % rH, without dew condensation
- Dimensions 49 (W) x 45 (H) x 22 (D) mm
- Output: negative logic, digital
- High > 4,5 V, Low < 0,7 V at input impedance 200 kOhms
- Op-Amp output, Pull-up resistor 10 kOhms
- Life expectation about 7 years
- Competitive pricing for OEM markets



### Aerosol sensor AES 1000

- Stable and sensitive to particles of 0,3 micron and larger
- Easy-to-read air-cleanless level, equivalent to class 100 to class 100.000
- Unique air sampling method
- No suction pump needed
- Link to Ethernet for monitoring multiple points
- Longlife laser, approx. 20.000 hours
- Compact, light weight and easy installation
- Low cost

## NTC-Thermistors



### Glass Encapsulated

- Radial-, axial- and chip-shaped
- Temperature range -50 to 800 °C
- Various characteristics
- Leadwires bare or insulated
- Cut and/or formed
- Several materials available
- Outstanding longtime stability
- 100% fully automated production line
- Customized designs
- Mass production capabilities
- Competitive pricing
- UL-Listing



### Epoxy Coated

- Radial shape
- Temperature range -50 to 150 °C
- Various characteristics
- High precision within a wide temperature range
- Leadwires bare or insulated
- Long leadwires on request
- High-Reliability products for military and aerospace industries
- MIL-Standard
- Customized designs



### Inrush Current Limiter

- PC board mountable
- Rugged design
- Solderable leads
- High quality
- Low cost
- R25, +/- 20 % 0,5 to 220 Ohms
- Maximum steady state current 1 to 30 A
- Resistance at maximum steady state current 0,01 to 2,34 Ohms
- Operating temperature -40 to 185 °C
- Straight tinned copper leads, kinked available
- Max. diameter 9,5 to 32,0 mm
- Max. thickness 5,0 to 8,0 mm
- Lead diameter 0,8 to 1,0 mm

# Temperature

## Thermopiles (Infrared)

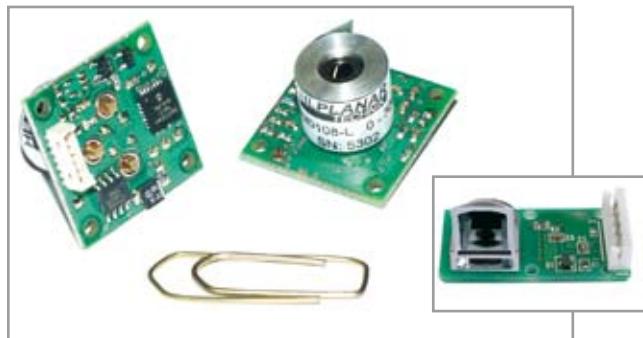
### Elements

- Infrared temperature sensor
- Contactless measurement of surface temperature
- TO5 and TO8 can housing
- Temperature compensated
- Output e. g. 0 - 13 mV at 0 - 225 °C
- Time constant  $t_{63} = 40$  ms
- Standard and customized models



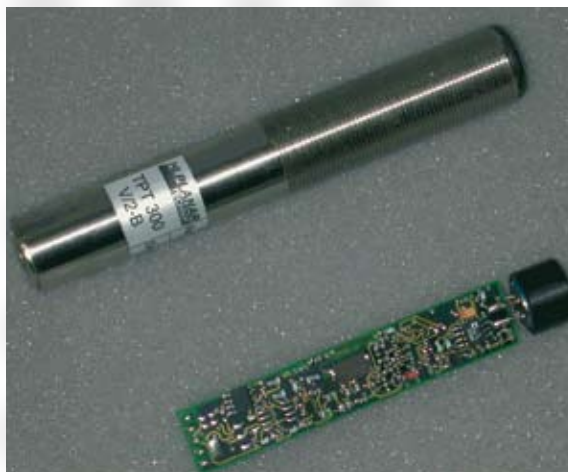
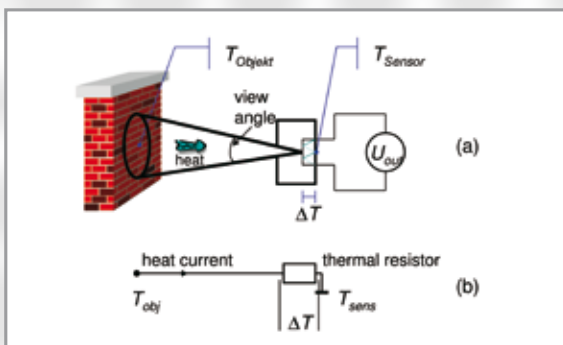
### Modules

- Printed circuit board
- Ready-for-use
- Fully calibrated
- Temperature compensated
- Output: digital I2C
- Customized design on request
- Competitive for OEM market



### Pyrometer

- Object temperature 0 - 300 °C
- Ambient temperature range -40 to 85 °C
- Output: Interface RS232, 0 - 5 (10) V, 4 - 20 mA
- Power supply 9 to 30 V dc, 40 mA
- Optical lense up to 12 mm diameter
- Housing stainless steel, M18
- Fully calibrated
- OEM-Board pre-calibrated available on request



## Platinum RTDs



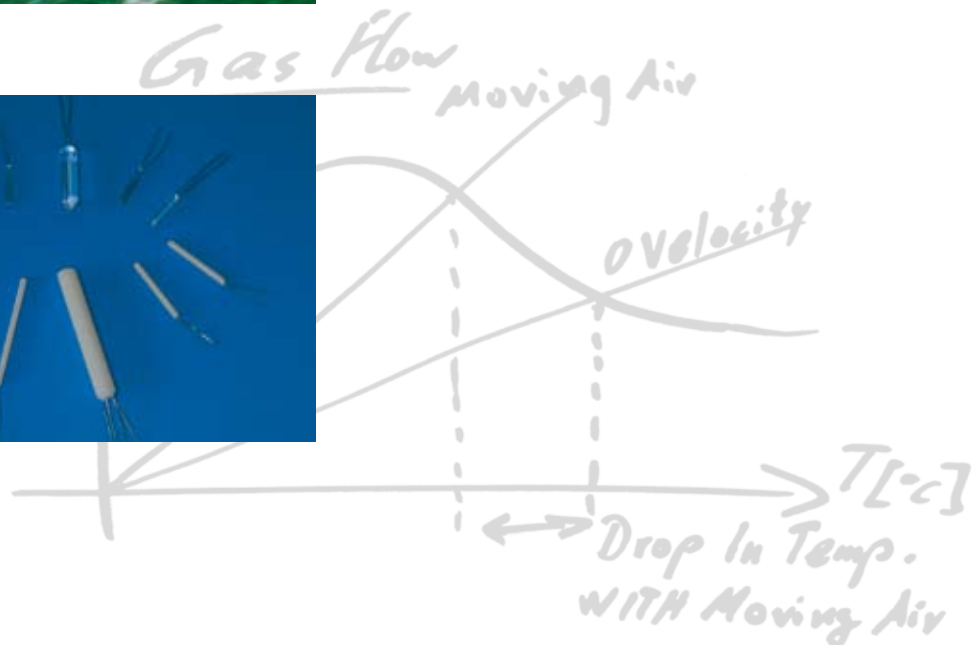
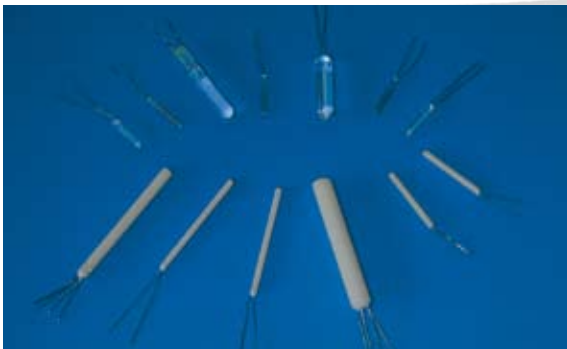
### Thinfilm Elements

- Pt6.8, Pt100, Pt500, Pt1000, Pt2000, Pt10000
- Thinfilm, leaded or SMD
- DIN EN 60751
- Class B, A, 1/3 DIN
- Operating temperature range -196 to 600 °C
- Many different sizes and shapes
- Selection of different leadwire materials
- SOT223, TO94 housing available



### Wire Wound Elements

- Pt100, Pt500, Pt1000
- Ceramic potted wire wound
- Glass encapsulated wire wound
- Operating temperature range -200 to 1000 °C
- According to DIN IEC 751
- Tolerance classes B, A, 1/3 B
- Variety of shapes and sizes
- Special designs for E-motor stator windings
- Probes designed for cryotec applications
- Probe assemblies
- Customized designs



# Temperature

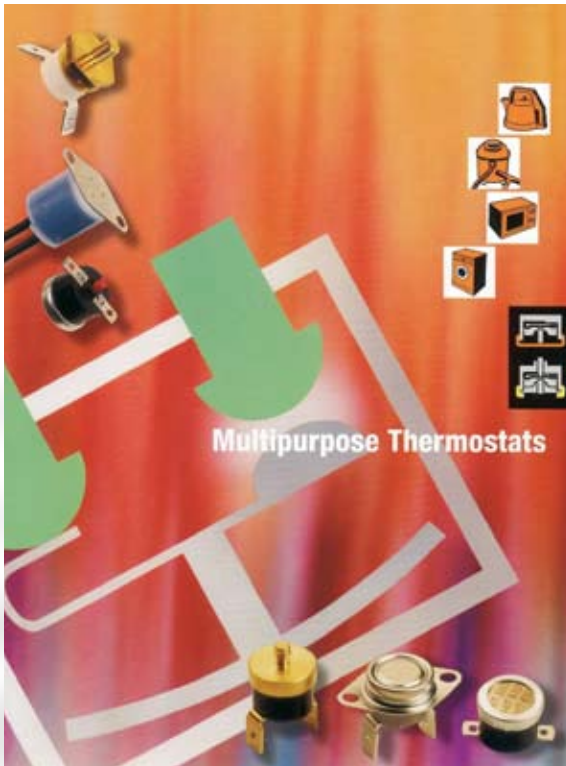
## Thermostats



### Precision

- Automatic reset, manual reset, One-Shot
- Operational temperature -29 to 260 °C
- Environmental exposure -62 to 260 °C
- Amperage up to 15 A resistive max.
- Housing style: ceramic, phenolic, hermetic, epoxy overmolded, stainless steel or brass
- Different shapes, mounting brackets and terminal configurations
- Moisture resistance acc. to MIL-Std
- Hermetic seal acc. to MIL-Std
- Contact resistance acc. to MIL-Std
- Insulation resistance acc. to MIL-Std
- Dielectric strength acc. to MIL-Std
- Customized design

**Markets:** e.g. industry, severe heavy duty industry and machinery, construction vehicles, transportation, military, avionics, aerospace



### Commercial

- Automatic reset, manual reset, One-Shot
- Operational temperature -12 to 260 °C
- Environmental exposure -20 to 316 °C
- Amperage up to 15 A resistive max.
- Housing style: ceramic, phenolic, epoxy overmolded, stainless steel, brass or aluminum
- Wide band of different shapes, mounting brackets and terminal configurations
- Lifetime capability up to 300.000 switching cycles
- Low temperature differential
- Moisture resistant versions available
- Customized designs

**Markets:** e.g. consumer, white goods, HVAC, OEM market, office automation, power supplies



**Our partners:**



**Advantages at a glance:**

- ✓ Pan-European offices
- ✓ Competent local technical support by dedicated engineers
- ✓ Taylor-made solutions or standard products
- ✓ Technologies of leading suppliers
- ✓ Efficient logistics system
- ✓ Central European warehouse
- ✓ Buffer stock capabilities
- ✓ Value added services
- ✓ First-in first-out system
- ✓ 24-hours delivery
- ✓ Full traceability
- ✓ Professional ESD-handling
- ✓ DIN ISO 9001 certified



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