

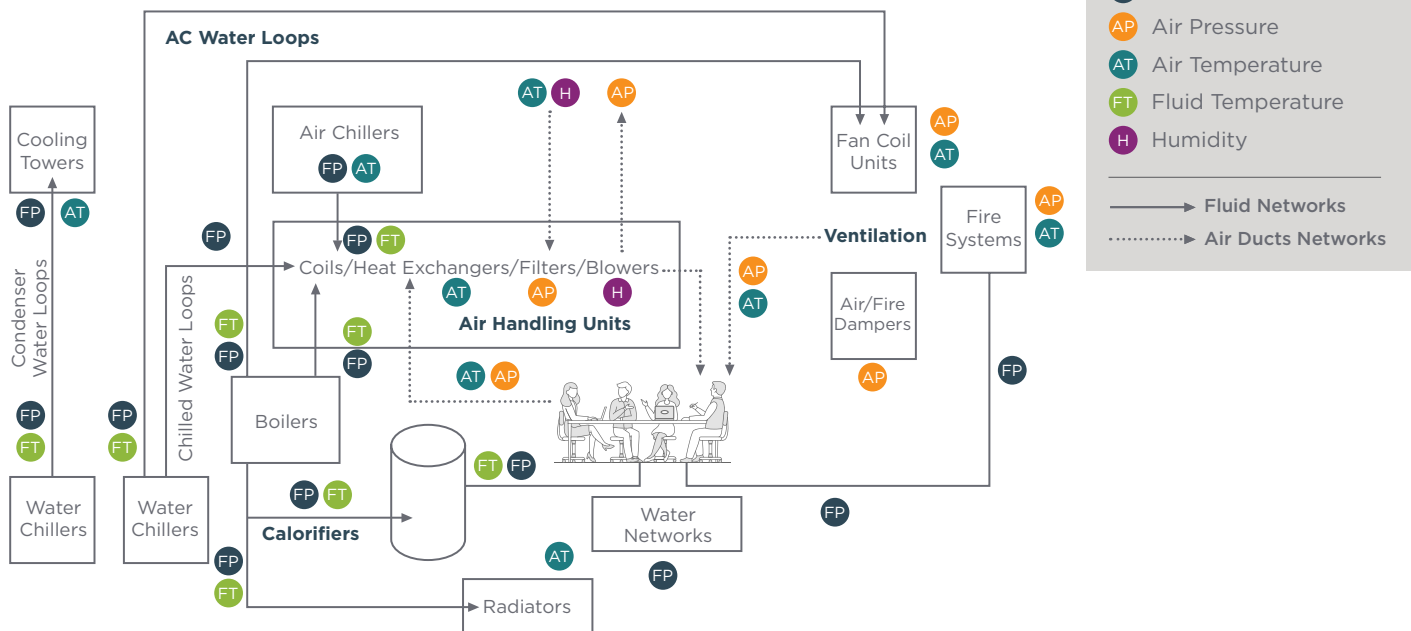
# SENSORS FOR BUILDING AUTOMATION SYSTEMS

Tightening regulations on efficiency and mounting environmental concerns have driven improvements in building automation systems. Applications in Building Automation include heating, ventilation, air conditioning and refrigeration (HVACR), with control interfaces as well as monitoring and diagnostic systems – all with the help of sensors and connectivity solutions. Sensors provide the data to one or more processing units that uses that information to drive heating and cooling equipment as well as actuators, dampers, fans and other components to control a building's operation. Over time advances in technology have made it possible to greatly increase the number of control points, improved system accuracy and provided the ability to fine tune the system based on occupancy, specific zones as well as outdoor heat loads and much more.

## TE CONNECTIVITY ADVANTAGES

- Sensing Element Portfolio Breadth
- Industrial Technology Leadership
- Manufacturing Scale
- Customization Capability

## BUILDING AUTOMATION SYSTEMS



## SENSORS FOR BUILDING AUTOMATION SYSTEMS

Sensor Technology	Application	Key Product Features	Benefits
<a href="#">MS5839</a> 	<ul style="list-style-type: none"> <li>Miniature, high performance and precise embedded sensor for HVAC equipment in harsh environments</li> </ul>	<ul style="list-style-type: none"> <li>MEMS based sensor offering advanced shielding for harsh HVAC environments</li> <li>Low power consumption and digital interconnectivity in an ultra-compact low profile package</li> </ul>	<ul style="list-style-type: none"> <li>Low power consumption to help facilitate IoT applications and condition monitoring practices</li> <li>Highly precise even in harsh industrial environments</li> </ul>
<a href="#">SM9000</a> 	<ul style="list-style-type: none"> <li>Monitoring very low pressure properties for ventilation, VAV and filter monitoring within HVAC systems</li> </ul>	<ul style="list-style-type: none"> <li>Low pressure MEMS transducer technology and CMOS mixed signal processing technology</li> <li>Pressure and temperature compensated with high accuracy and repeatability</li> </ul>	<ul style="list-style-type: none"> <li>Accurate, reliable and repeatable operation over the life of the part</li> <li>The pressure sensor can be mounted directly onto a standard PCB</li> <li>Compensation and calibration eliminates need for additional circuitry or separate calibration</li> </ul>
<a href="#">SM7000</a> 	<ul style="list-style-type: none"> <li>Monitoring low air pressure within ventilation systems</li> </ul>	<ul style="list-style-type: none"> <li>Low pressure MEMS transducer technology and CMOS mixed signal processing technology to produce either an analog and/or digital output fully conditioned</li> <li>Multi-order pressure and temperature compensated</li> </ul>	<ul style="list-style-type: none"> <li>Accurate, reliable and repeatable operation over the life of the part</li> <li>The pressure sensor can be mounted directly onto a standard PCB</li> <li>Compensation and calibration eliminates need for additional circuitry or separate calibration</li> </ul>
<a href="#">HCLA</a> 	<ul style="list-style-type: none"> <li>Measure low pressure properties within HVAC systems</li> </ul>	<ul style="list-style-type: none"> <li>Miniature calibrated and temperature compensated low pressure sensors that perform precision digital signal conditioning and provide analog and digital output at the same time</li> </ul>	<ul style="list-style-type: none"> <li>Space-saving sensor packaging for PCB-mounting and maximum OEM design flexibility</li> <li>Special compensation technique to achieve very high offset stability and virtually no position sensitivity</li> </ul>
<a href="#">LMI</a> 	<ul style="list-style-type: none"> <li>Monitors extremely low pressure of VAVs</li> <li>Filter monitoring</li> <li>Burner control and other areas of the HVAC system</li> </ul>	<ul style="list-style-type: none"> <li>Extremely low full scale pressure range</li> <li>Accuracy is a percent of reading not a percent of full scale</li> <li>Provides temperature and humidity data also</li> <li>I<sup>2</sup>C output only</li> </ul>	<ul style="list-style-type: none"> <li>High immunity to dust</li> <li>Extremely high accuracy at very low pressures</li> <li>Longterm stability</li> <li>Small footprint and low profile for space savings</li> </ul>
<a href="#">LHD</a> 	<ul style="list-style-type: none"> <li>Large dynamic range monitoring found in airflow applications within VAVs</li> <li>Filter monitoring</li> <li>Burner control and other areas of the HVAC system</li> </ul>	<ul style="list-style-type: none"> <li>Extremely low full scale pressure range</li> <li>Accuracy is a percent of reading not a percent of full scale</li> <li>Provides temperature and humidity data also</li> <li>I<sup>2</sup>C output only</li> </ul>	<ul style="list-style-type: none"> <li>High immunity to dust</li> <li>Extremely high accuracy at very low pressures</li> <li>Low profile surface</li> </ul>
<a href="#">MS8607</a> 	<ul style="list-style-type: none"> <li>Digital sensor is optimal for applications in which key requirements such as ultra low power consumption and high PHT accuracy, such as in HVAC</li> </ul>	<ul style="list-style-type: none"> <li>Integrated pressure</li> <li>Humidity and temperature sensor</li> <li>Compact sensor packaging</li> <li>I<sup>2</sup>C interface</li> </ul>	<ul style="list-style-type: none"> <li>Product is well suited for applications with ultra low power consumption</li> <li>High PHT accuracy</li> <li>Compact</li> <li>Multi-sensing design</li> </ul>
<a href="#">MSP100</a> 	<ul style="list-style-type: none"> <li>Water leak detection or pressure monitoring</li> <li>Single piece construction</li> <li>Suitable for harsh environments</li> </ul>	<ul style="list-style-type: none"> <li>Digital output pressure transducer</li> <li>Stainless steel media compatibility</li> <li>Low cost</li> <li>Small profile solution</li> </ul>	<ul style="list-style-type: none"> <li>Very compact, compatible with harsh media and suitable for harsh environments and freeze/thaw applications</li> </ul>
<a href="#">M3200</a> 	<ul style="list-style-type: none"> <li>Compact industrial pressure transducer suitable for measurement of gas pressure, refrigerants, and media such as contaminated water, steam, and mildly corrosive fluids</li> </ul>	<ul style="list-style-type: none"> <li>Rugged Microfused design</li> <li>Variety of ports</li> <li>Analog or digital output configurations</li> <li>17-4PH stainless wetted surfaces</li> <li>Low cost</li> </ul>	<ul style="list-style-type: none"> <li>Compact</li> <li>Customizable</li> <li>Weatherproof</li> <li>CE Compliant</li> </ul>
<a href="#">TSYS Series</a> 	<ul style="list-style-type: none"> <li>Providing accurate temperature data for HVAC applications</li> </ul>	<ul style="list-style-type: none"> <li>Ultra compact</li> <li>Digital temperature sensor that provides factory calibrated highly accurate temperature data</li> </ul>	<ul style="list-style-type: none"> <li>Very small and have low thermal mass which provides a quick response to temperature changes</li> <li>Ideal for mobile and battery power applications</li> </ul>
<a href="#">SERIES II DISCRETE NTC THERMISTORS</a> 	<ul style="list-style-type: none"> <li>Temperature sensing, control and compensation within HVAC applications</li> </ul>	<ul style="list-style-type: none"> <li>Thermally conductive epoxy coated thermistor</li> <li>30 AWG Solid Silver-Plated Copper Leads with White PTFE Insulation</li> <li>Four Temperature Tolerance Classifications Available</li> <li>RoHS Compliant</li> </ul>	<ul style="list-style-type: none"> <li>Rapid time response</li> <li>Proven stability and reliability</li> <li>Interchangeability</li> <li>PTFE insulated lead wires</li> </ul>
<a href="#">HTU21</a> 	<ul style="list-style-type: none"> <li>Humidity and temperature combination sensors for HVAC applications</li> </ul>	<ul style="list-style-type: none"> <li>Calibrated, linearized signals in digital I<sup>2</sup>C format</li> <li>Humidity and temperature plug and play transducers</li> <li>Direct interface with a micro-controller with the module for humidity and temperature digital outputs</li> <li>Low power sensor</li> </ul>	<ul style="list-style-type: none"> <li>Relative Humidity and Temperature Digital Output, I<sup>2</sup>C interface; low power consumption for IoT applications; fast response time; Full interchangeability with no calibration required in standard conditions</li> </ul>
<a href="#">HTU31</a> 	<ul style="list-style-type: none"> <li>Humidity and temperature combination sensors for HVAC applications</li> </ul>	<ul style="list-style-type: none"> <li>High performance humidity and temperature combination sensor</li> <li>Compact and accurate</li> <li>Available in digital and analog versions</li> </ul>	<ul style="list-style-type: none"> <li>Provides fast response time</li> <li>Precision measurement</li> <li>Low hysteresis and sustained performance even in the harshest environments</li> </ul>

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<a href="#">HTU35</a>		<ul style="list-style-type: none"> <li>Humidity and temperature combination sensors for HVAC applications</li> </ul>	<ul style="list-style-type: none"> <li>High performance humidity and temperature combination sensor</li> <li>Compact and accurate</li> <li>Analog output</li> </ul>	<ul style="list-style-type: none"> <li>Relative Humidity and Temperature analog output</li> <li>Low power consumption</li> <li>Fast response time</li> <li>Full interchangeability with no calibration required in standard conditions</li> </ul>
<a href="#">HTG35</a>		<ul style="list-style-type: none"> <li>Humidity and temperature combination sensors designed for high volume and demanding applications where power consumption is critical</li> </ul>	<ul style="list-style-type: none"> <li>Humidity and temperature plug and play transducers</li> <li>Direct interface with a micro-controller with the module for humidity linear voltage and direct NTC outputs</li> <li>Low power sensor</li> </ul>	<ul style="list-style-type: none"> <li>Suitable for small bulk assembly</li> <li>RoHS compliant</li> <li>Full interchangeability</li> <li>Demonstrated reliability and long term stability</li> <li>Reliability not affected by repeated condensation</li> </ul>
<a href="#">KMT</a>		<ul style="list-style-type: none"> <li>Position sensing for motor motion control within HVAC applications</li> </ul>	<ul style="list-style-type: none"> <li>Magnetic non-contact</li> <li>360° range</li> <li>Low cost</li> </ul>	<ul style="list-style-type: none"> <li>Ideal for harsh environments</li> <li>Contactless absolute angular measurement</li> </ul>
<a href="#">KMP</a>		<ul style="list-style-type: none"> <li>Contactless linear or angular position measurement in applications like industrial HVAC equipment</li> </ul>	<ul style="list-style-type: none"> <li>Sensor that performs well, even when exposed to oil, dirt and dust</li> <li>Provide reliable and accurate measurements in harsh environments including high temperatures</li> </ul>	<ul style="list-style-type: none"> <li>Superior performance even within harsh industrial environments</li> <li>High resolution and high precision with contactless measurement</li> </ul>
<a href="#">820M1</a>		<ul style="list-style-type: none"> <li>Accelerometer designed for embedded condition monitoring and predictive maintenance applications</li> </ul>	<ul style="list-style-type: none"> <li>Low cost; board mountable accelerometer</li> <li>Designed and qualified for machine health monitoring and has superior resolution, dynamic range and bandwidth to MEMS devices.</li> </ul>	<ul style="list-style-type: none"> <li>Proven track record for offering the reliable and long-term stable output required for condition monitoring applications</li> </ul>
<a href="#">830M1</a>		<ul style="list-style-type: none"> <li>Embedded Piezoelectric (PE) accelerometer offering advanced acceleration sensing for machine health monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Embedded Piezoelectric (PE) accelerometer offering advanced acceleration sensing</li> <li>Wide bandwidth</li> <li>Small size</li> <li>Low power, and robust performance are essential</li> </ul>	<ul style="list-style-type: none"> <li>Optimized for critical machine health monitoring the 830M1 offers an outstanding measurement bandwidth (up to 15 kHz)</li> <li>Superior resolution and is designed with highly stable PE sensing technology, to provide long-term, reliable, stable and accurate performance for condition monitoring applications in harsh environments</li> </ul>
<a href="#">8911</a>		<ul style="list-style-type: none"> <li>Wireless accelerometer sensor for Proof of concept (POC) is designed for vibration monitoring in applications such as predictive maintenance and condition monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Compact</li> <li>LoRaWAN™</li> <li>Wireless accelerometer for POC with edge computing for condition monitoring</li> <li>Corrosion resistant stainless steel case and plastic covering</li> </ul>	<ul style="list-style-type: none"> <li>Rugged, IP66 rated O-ring seal allows the sensor to perform well in harsh environments</li> <li>Piezo sensing element which has the advantage of high bandwidth and ultra low power vs MEMS solutions</li> <li>Longer battery life of up to 10 years and ultra low sleep power usage</li> </ul>
<a href="#">8711-01</a>		<ul style="list-style-type: none"> <li>Shielded rugged IEPE accelerometers designed for industrial condition monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Available in four standard dynamic ranges from ±5g to ±80g</li> <li>Wide bandwidth up to greater than 10kHz</li> <li>Designed to operate in ambient temperature ranges from -55°C to +125°C</li> </ul>	<ul style="list-style-type: none"> <li>Rugged, IP67 rated seal allows the sensor to perform well in harsh environments</li> <li>Piezo sensing element which has the advantage of high bandwidth and ultra low power vs MEMS solutions</li> </ul>