

Low and Ultralow Pressure Sensors for HVAC, VAV, and Filter Applications

November 2024

EVERY CONNECTION COUNTS



HVACR – Climate Control

BUILDING AUTOMATION & CONTROL



CUSTOMER & APPLICATION REQUIREMENTS

Pressure

- Immunity to dust and clogging situations
- Long term stability / Maintenance free
- High accuracy below 500 Pa
- Large dynamic range for flow calculations
- Built in temperature and barometric corrections

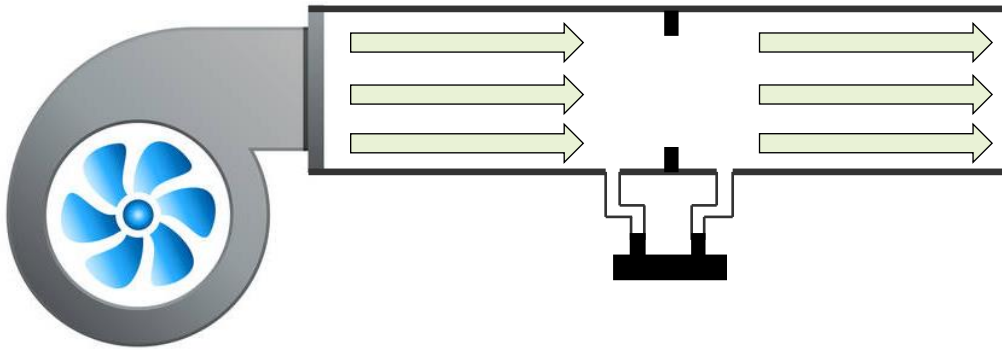
Temperature

- Fast response time
- Long term stability even in high moisture and freeze / thaw conditions
- Compact size
- Available in a wide range of base resistance values, curves and configurations

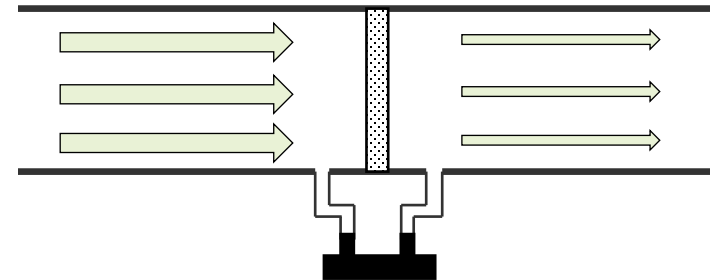
Humidity

- Resistance to free water
- Fast recovery from condensing humidity
- ESD resistance
- High accuracy, repeatability and low hysteresis

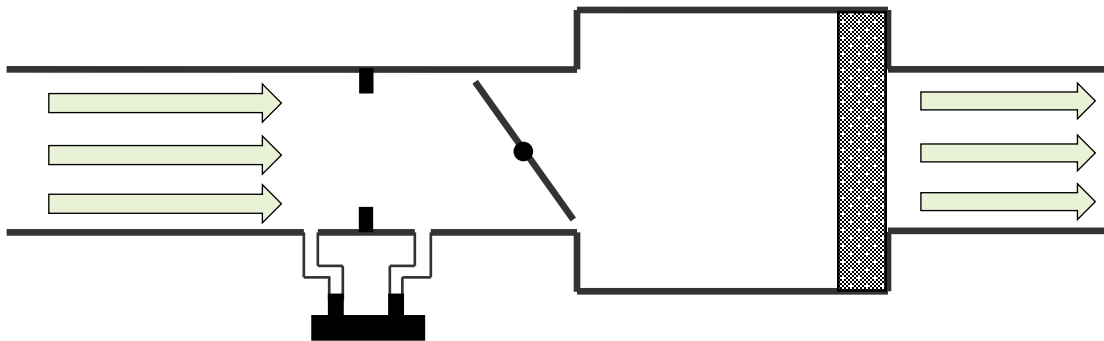
How are Low Pressure Sensors Used in HVAC Systems



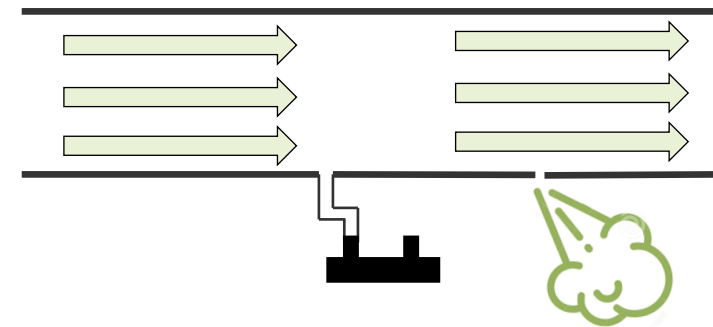
Airflow Measurements
(Volume or Mass flow)



Air Filter Monitoring
(Backpressure)



Variable Air Volume (VAV)
(Damper Control)



Leak Detection
(Static Internal Pressure)

How are Low Pressure Sensors Used in HVAC Systems

VAV (Variable Air Volume) controller types

Wall Mount VAV Controller - with Built in Air Flow Sensor

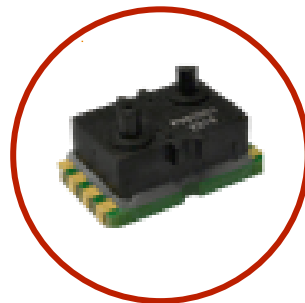
Pressure Sensors within the control box –
Some HVAC system suppliers are adding the pressure sensor into the boxes that house the electronic controls. Makes for easy electrical connection, but tubing must be brought from the system ducts and VAVs.

Stand Alone Pressure Transmitters

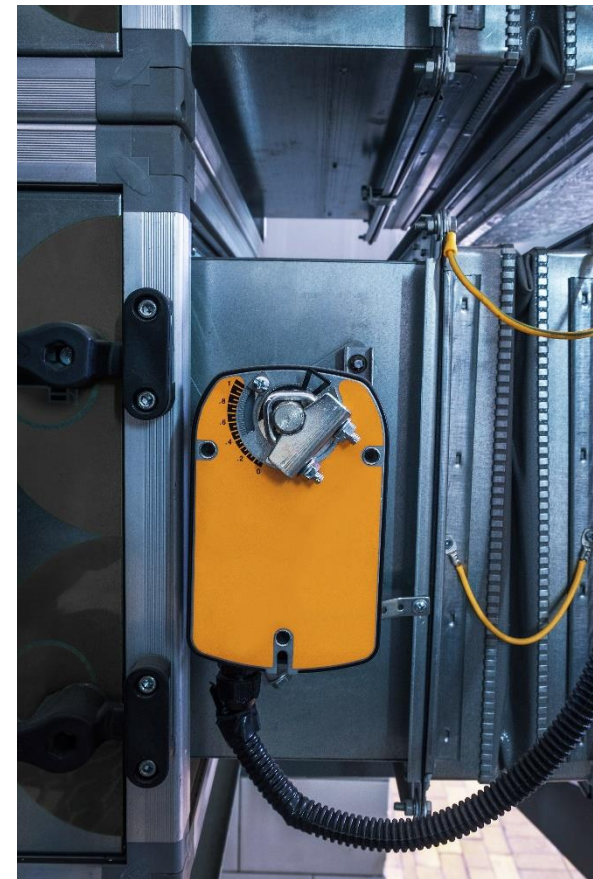
Smaller controllers, usually located close to where the duct work is located to measure pressure. Usually requires many of these in a commercial HVAC system to optimize efficiency.

Actuators

(Pressure Sensors Built in)



**VAV Actuator
with built in
Air Flow Sensor**



Which TE Sensors Work Well in HVAC Apps?

Piezoresistive Diaphragm Sensors

SM7000, SM6000, SM5000 Series



Features	
Pressure ranges	2" H ₂ O to 2.49 psi (0.5 to 17.2 kPa)
Outputs	Analog and I ² C (16 bit)
Operating voltages	5.0 VDC
Ports	Axial side ports, top ports
Mounting	16 pin SOIC
Total error band	±1.5% FS (±1.0% after A/Z)
Operating temp	-40 to 105°C
Media compatibility	Dry non-corrosive gases

SM9000 Series



Features	
Pressure ranges	0.5" to 1.0" H ₂ O (D), 1.0" to 2.4" H ₂ O (G)
Outputs	I ² C (16 bit)
Operating voltages	3.0 to 5.5 VDC
Ports	Axial side ports, top ports
Mounting	16 pin SOIC
Total error band	±1.0% FS (±1.0% after A/Z)
Operating temp	-20 to 85°C
Media compatibility	Dry non-corrosive gases

Which TE Sensors Work Well in HVAC Apps?

Piezoresistive Diaphragm Sensors

HMI Series



Features	
Pressure ranges	2.5mbar – 10 bar (250 PA – 1.0MPa)
Outputs	Analog and I ² C (16 bit)
Operating voltages	3.0 VDC
Ports	Axial side ports, top ports, manifold
Mounting	4 or 8 pin thru-hole
Accuracy	±0.25% FS
Operating temp	-40 to 85°C
Media compatibility	Gases and Liquids

Which TE Sensors Work Well in HVAC Apps?

Ultra low-pressure Sensor

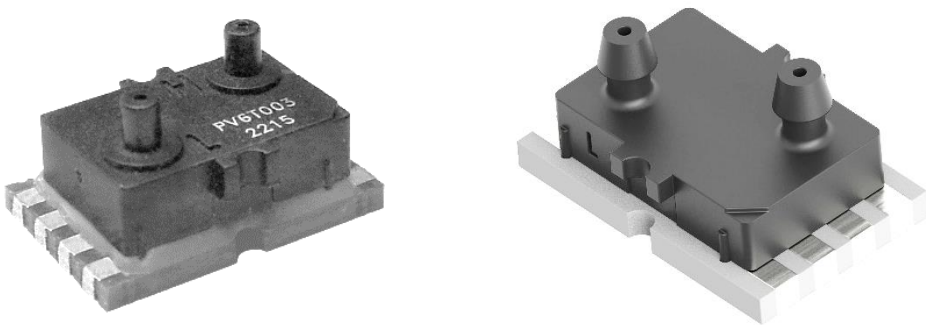
Thermal micro-flow channel technology

LDE Series



Features	
Pressure ranges	0.1 to 2.0" H ₂ O (25 to 500 Pa)
Outputs	Analog or SPI
Operating voltages	3.3 or 5.0 VDC
Ports	Radial side ports
Mounting	DIP pins, J-lead
Accuracy (typ)	±0.4% of reading
Operating temp	-20 to 80°C
Media compatibility	Dry non-corrosive gases

LMI Series

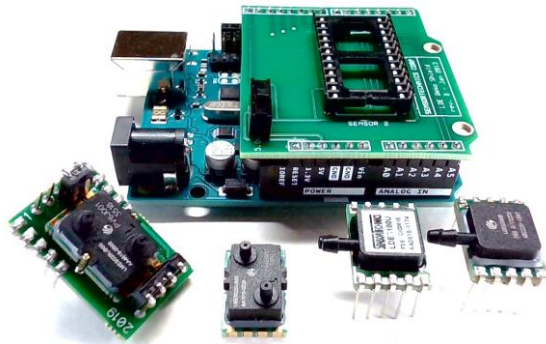


Features	
Pressure ranges	0.1 to 10.0" H ₂ O (25 to 2500 Pa)
Outputs	I ² C
Operating voltages	3.0 VDC
Ports	Top ports
Mounting	Leadless SMT
Accuracy (typ)	±0.5% of reading
Operating temp	-20 to 85°C
Media compatibility	Dry non-corrosive gases

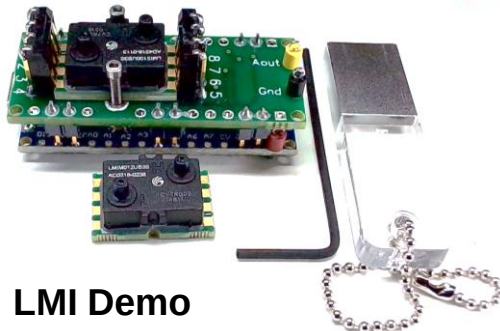
Technical Literature - Demo boards - Partnership



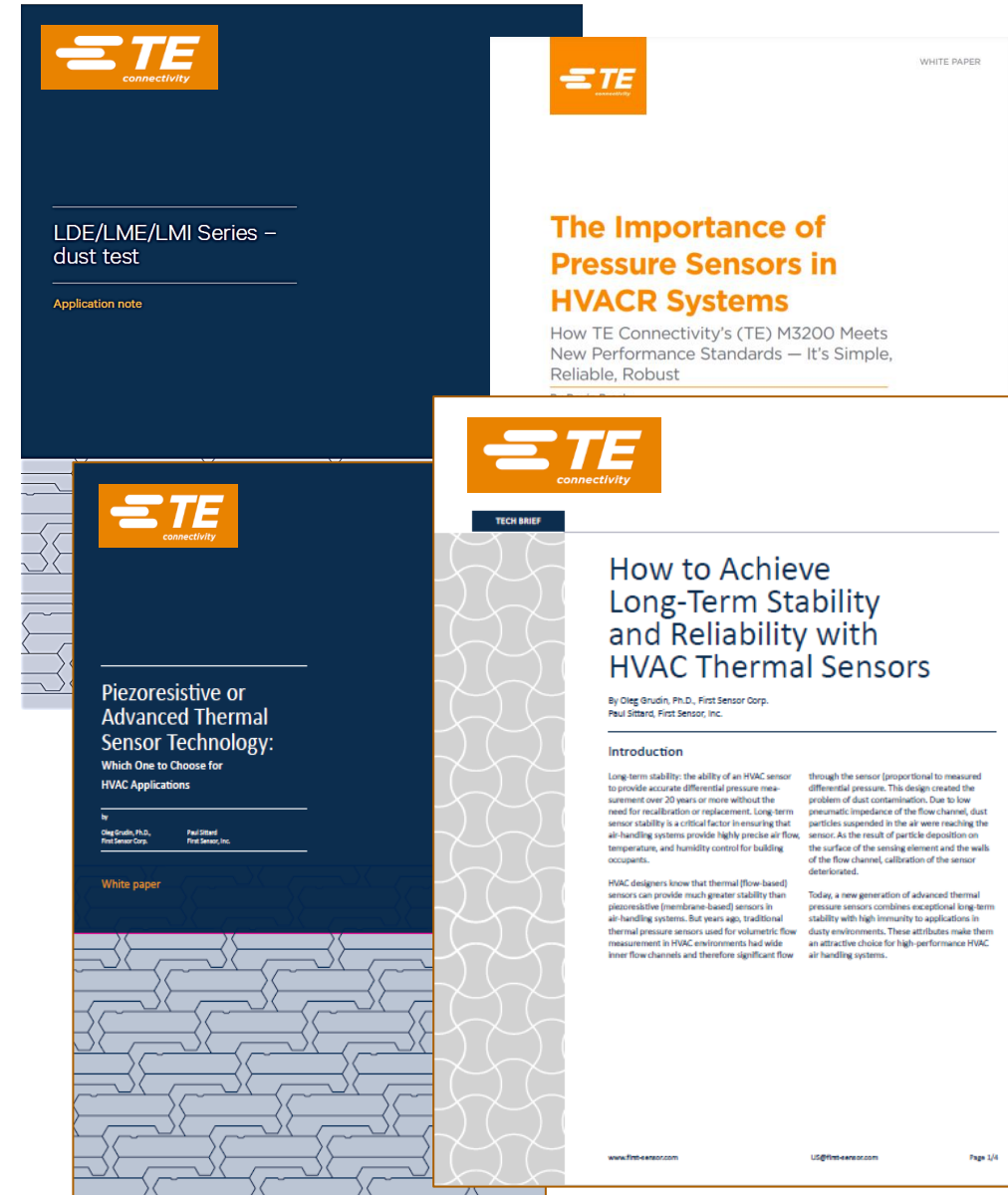
MIKROE
Click boards™



LDE Demo Kit



LMI Demo Kit





- [Low Pressure Digital / Analog Sensor](#)
- [Ultra-low Pressure Digital Sensor](#)
- [Digital Low Diff Pressure Sensors](#)

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