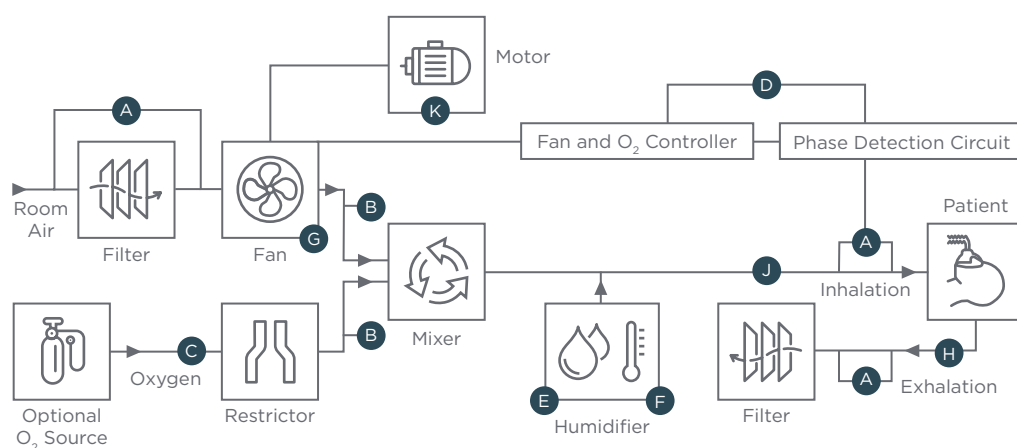# NON-INVASIVE VENTILATOR SENSORS

Non-Invasive ventilators are life saving devices for patients who are unable to breathe unassisted or need additional oxygen intake. Non-Invasive ventilators pump air with optional supplemental oxygen via a mask that is placed over the patient's mouth and nose. These units may be used in a hospital or as home units. TE Connectivity's (TE) sensor technologies provide highly reliable and accurate measurements for these life critical applications. This offering expands to temperature, humidity, Oxygen and CO_2 sensors as well as equipment for motor control.

TE CONNECTIVITY ADVANTAGES

- Portfolio Breadth
- Medical Experience
- Manufacturing Scale
- Customization Capability

NON-INVASIVE VENTILATOR

A Pressure 0 to 5 cmH_2O (flow +300 slpm measured via Δp)

B Pressure 30 to 40 cmH_2O

C Pressure 35 to 90 PSI

D Barometric Air Pressure

E Temperature 60 to 120 F

F Humidity 33 to 44 mg H_2O/L

G Rotation 15,000 to 60,000 RPM

H CO_2 Level 30,000 to 40,000 ppm

J O_2 Sensors

K Position and Vibration

NON-INVASIVE VENTILATOR SENSORS

	Sensor Technology		Application	Key Product Features	Benefits
A	Pressure SM9000 SM7000		• Air flow and respiration control • Filter cleanliness monitoring	• MEMS board mount pressure sensor • Ultra-low pressure ranges as low as 125 Pa • 16-bit digital output • Insensitive to mounting orientation	• Detects minimal changes in pressure • Simplified signal read-out • Easy system integration
A	Pressure LMI LME		• Air flow and respiration control • Filter cleanliness monitoring	• SMD hybrid ultra low pressure sensor • 25 to 2500 Pa • I^2C and SPI outputs	• System design flexibility • High resolution and accuracy for enhanced system performance • Low power for battery operation
B	Pressure SM6000		• Fan pressure	• MEMS board mount pressure sensor • Digital or dual (digital and analog) output • ±1% FS accuracy (digital) • Insensitive to mounting orientation	• System design flexibility • Reliable and accurate measurements over time
C	Pressure MS4525 MS4525DO		• Oxygen flow control for compressed air and gas pressure	• MEMS board mount pressure sensor • Analog or digital output interface • Total error band less than ±1.0% • Various ceramic package configurations available	• System design flexibility • Reliable and accurate measurements over time
C	Pressure HDI		• Oxygen flow control for compressed air and gas pressure	• MEMS board mount pressure sensor • 12-bit ADC • I^2C and analog output • +0.5% FS accuracy	• System design flexibility • High accuracy • Reliable and accurate measurements over time
C	Pressure HMA-Series		• Oxygen flow control for compressed air and gas pressure	• MEMS board mount pressure sensor • 12-bit ADC • SPI/I^2C and analog output • ±0.75% FS total accuracy	• System design flexibility • Reliable and accurate measurements over time
C	Pressure HCLA		• Oxygen flow control for compressed air and gas pressure	• MEMS board mount pressure sensor • Robust to anesthesia • Low pressure as low as 250 Pa • Analog and I^2C output, 12-bit ADC	• Detects minimal changes in pressure • Simplified signal read-out • Easy system integration
D	Pressure SM11X1		• Barometric compensation	• MEMS board mount pressure sensor • Compact SOIC-8 housing • Digital or analog version available	• Compact design • System design flexibility
D	Pressure MS5611		• Barometric compensation	• MEMS board mount pressure sensor • I^2C and SPI interface up to 20 MHz • Minimal footprint package 5.0 x 3.0 x 1.0 mm^3	• Excellent long-term stability • Fast conversion speed • Low power consumption
E	Temperature TSYS03		• Air and gas temperature management	• Digital temperature measurement • Available in super small 1.5 mm x 1.5 mm package • Resolution up to 0.01°C • Supply voltage range from 2.4 V to 5.5 V	• Ultra-compact design • Precise digital output • Low power consumption
E	Temperature 44000 Series		• Air and gas temperature management	• NTC (Negative Temperature Coefficient) thermistor • Miniaturized components • Rapid time response	• High sensitivity • Proven long-term stability and reliability
E	Temperature PTF Family		• Air and gas temperature management	• RTD (Resistance Temperature Detector) sensor • Thin film platinum deposited on ceramic substrate, glass coated • Tube outline available • Dimensions 1.2 x 4.0 x 1.1 mm^3	• Long-term stability • High electrical insulation • Small dimensions
E F	Humidity and Temperature HTU31		• Air and gas mixture humidity and temperature management	• Digital or analog output available • Fast response time of t63% in 10 sec after condensation • Optional filter membrane for protection	• Humidity and temperature combined • System design flexibility • Environmental robustness
G	Position KMT36H		• Fan speed regulation	• Magnetic angle sensor for precise position feedback for fans and motors • Three bridge signals with 120° phase difference • Accuracy better than ±0.5°	• Contactless absolute angular measurement over full 360° • Highly sensitive
H	CO_2 Detection TS418		• Exhalation carbon dioxide level measurement	• Filter for NDIR CO_2 gas detection • 4.26 µm narrow band pass • Small TO-18 package	• Accurate reference sensor • Very high signal • Compact design
J	Oxygen Sensor P19-OXYZ		• Home therapy devices, medical ventilators, oxygen concentrators	• No degradation of sensitivity over time • No short term recalibration or sensor replacement required	• Does not consume or chemically alter the gas sample • Immune to vibrations and mounting orientation • Temperature, relative humidity, and barometric pressure data
K	Position KMA36		• Motor speed control	• Magnetic angle sensor with 360° • Digital output with resolution up to 0.01° • Small TSSOP package	• Contactless • Maintenance free operation • Precise and reliable measurements
K	Vibration 820M1		• Motor condition monitoring	• Board mountable accelerometer • Amplified analog output • Hermetically sealed LLC package	• Reliable and long-term stable output • Low power consumption

te.com/sensors

TE connectivity