



Point-Air Detection (PAD) Non-Invasive Sensor

The Introtek PAD Non-invasive Sensor is the ultimate air detection sensor for a fluid-handling cassette or manifold application, delivering a reflective ultrasonic signal from a single contact point. Integral to the sensor's assembly, the Micro-Electronic Controller (MEC) features programmable algorithms for the control of various functions including control response times and time delays, which can be adjusted in accordance with specific requirements. The PAD is also available in a variety of configurations including fully integrated electronics and sensor head/chip interface.

Introtek's patented pulse-type ultrasound provides highly reliable, non-invasive air detection capabilities in critical applications where patient safety or process integrity is essential.

PRODUCT FEATURES

- Compact design with integral MEC circuitry
- Programmable micro-controller expands circuit functionality
- High EMI and RFI noise immunity
- Dry coupled: no coupling gel required
- Spring load feature available for secure coupling
- Accuracy is not affected by fluid or tubing color
- Air detection threshold or bubble size can be set to a customer's specifications
- Accommodates a wide range of disposable cassette assemblies with fluidic channels
- Custom sensor configurations are available

Point-Air Detection (PAD) Sensor

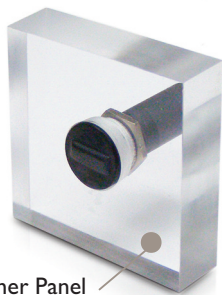
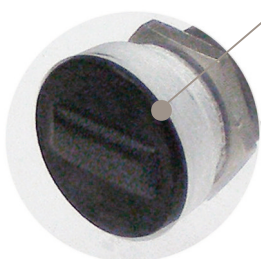


Integrated Electronic Sensor

APPLICATIONS

- Apheresis
- Chromatography and Separation Technology
- Auto-transfusion
- Immunoassay and Diagnostic Equipment
- Infusion Pumps
- Perfusion-based "Life Support" Devices
- Dialysis
- Blood Processing Equipment
- Cardiac Assist Pumps
- Heart-Lung Bypass
- Liquid and Chemical Dispensing

Enlarged View of PAD Sensor Surface Area



Customer Panel



The Introtek Advantage

Introtek provides products of unsurpassed quality, functionality, and dependability that are manufactured to the highest medical device standards and backed by a three-year warranty.

GENERAL CHARACTERISTICS/TECHNICAL DATA

Medium/Liquid	Saline, Blood, Water Based Solutions, Low-Viscosity Liquids
Measurement Technology	Ultrasonic
Sensor Housing	ABS, Plastics with Silicone Coupling Pad (Spring Loaded Feature Optional)
Mounting	Fixed Installation
LED	Bicolor LED indicates power on and liquid state. Green color for Wet, Red color for Dry. Other options available.
Input Voltage	5V and 12V or 24 VDC
Response Time	Air Detection (Wet to Dry): 215 μ S typical Liquid Detection (Dry to Wet): 46 mS typical
Input Current	15mA
Operating Temperature	41° to 140°F (5° to 60°C)
Humidity	0-95% Non-Condensing
Output Signal	CMOS levels, programmable for High or Low on Wet Output levels to within 0.5 V of power rails with 5mA loading Open collector and Analog outputs available
Self-Test Input	Provides an electronic check for false and wet output signals

AVAILABLE OPTIONS

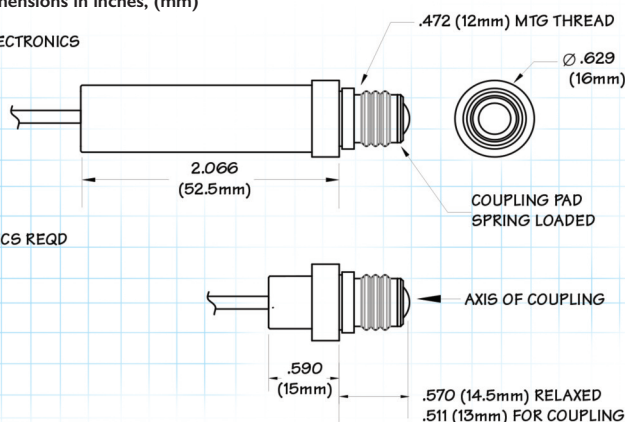
- Reverse output logic
- Custom response times
- Integral or remote circuitry
- Custom OEM designs

MECHANICAL SPECS

Dimensions in inches, (mm)

WIRING: WITH INTEGRAL ELECTRONICS
#28 RED (+28VDC)
#28 BLK (GND)
#28 YEL (OUT TTL)
FLOATING SHIELD

WIRING: REMOTE ELECTRONICS REQD
#32 BLU (+2)
#32 WHT (-)
FLOATING SHIELD



Remote Electronic Sensor



VALIDATION TESTING

The PAD sensor was designed to be tested in conjunction with the following specifications:

- **Electrical Fast Transients:** IEC 61000-4-4:2012
- **Radiated Emissions, Group 1, Class B:** CISPR 11
- **Electrostatic Discharge:** IEC 61000-4-2:2008
- **Radiated Immunity:** IEC 61000-4-3:2006 and AMD1:2007 and AMD2:2010 CSV
- **Power Frequency Magnetic Fields:** Performed per IEC 60601-1-2:2014
- **General Safety Requirements:** IEC 60601-1:2005+A1:2012 (E)

THREE YEAR WARRANTY

All Introtek systems are warranted free of defects in materials or workmanship for three full years from the date of original factory shipment.

If returned within the warranty period, with no modifications to the sensor, the original manufacturing label intact, and, upon factory inspection of the unit, the cause of the malfunction is determined to be defective material or workmanship, Introtek will repair or replace the system at no cost to the purchaser (or owner) other than transportation. If a unit is returned without an original label, the warranty is void.

Introtek shall not be liable for misapplication, labor claims, direct or consequential damage or expense arising from the installation or use of the equipment. There are no other warranties expressed or implied except special written warranties covering some Introtek products.

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