

# PHASEIN Multigas Technologies

## Which one?

### The Advantages are all yours!

If you are considering adding gas monitoring to your system then there are many important considerations you should take into account. Some are of obvious importance while others are more subtle yet critical for your ultimate satisfaction. When it comes to PHASEIN Multigas Technologies the advantages are all yours:

### Patient status in any critical environment

Whatever technology you decide to buy it will have to last for the foreseeable future. What you need is a "plug-in and measure" solution which is able to adapt to different clinical environments and applications and at the same time provide trouble-free operation. PHASEIN offers you both the IRMA™ Mainstream Analyzers and the ISA™ Sidestream Analyzers which have the ability to measure CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>O, anesthetic agents (HAL, ENF, ISO, SEV, DES), provide automatic agent identification and are available in different configurations.

### IRMA™ Mainstream Analyzers



IRMA CO2  
(CO<sub>2</sub>)  
CAT.NO. 200101



IRMA AX+  
(CO<sub>2</sub>, N<sub>2</sub>O, 5 AA, AA ID)  
CAT.NO. 200601

IRMA Airway Adapter  
Adult/Pediatric  
Box of 25  
CAT.NO. 106220

IRMA Airway Adapter  
Infant  
Box of 10  
CAT.NO. 106260

### IRMA™ Mainstream Analyzers – a 25 grams multigas monitor

The entire IRMA Mainstream Analyzer, weighing only 25 grams, is as small as a pulse oximeter sensor. It is designed using the latest advances in miniaturized components and microprocessor technology to provide a complete mainstream monitoring system with unique versatility and design. The complete system is housed in the sensor head which does not require any hardware modifications of the host device. A clinically diverse selection of disposable airway adapters are available for all your applications.

### ISA™ Sidestream Analyzers – ultimate performance at 50 ml/min

The ISA sidestream analyzers combine PHASEIN's innovative technologies with advanced features to optimize all aspects of sidestream gas monitoring. The ISA analyzers are the world's smallest sidestream analyzers and are available as stand-alone "plug-in and measure" analyzers. Recognizing that every clinical application is demanding, the intelligent features of the ISA analyzers enable you to extend the clinical application range for your products to the most acute.

Nomoline™ – The no moisture sampling line, Nomoline, has a fluid protection technology specially developed to eliminate traditional water condensation and separation problems commonly associated with other sidestream systems. Based on patented technology, Nomoline is the world's first sampling line that removes both water and water vapor from a sampling line without the use of a water trap. Nomoline can be used on intubated and non-intubated patients, from adults to neonates.

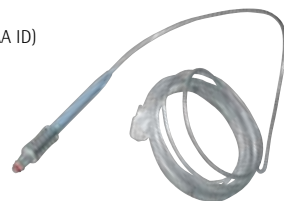
### ISA™ Sidestream Analyzers



ISA OR+  
(CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>O, 5 AA, AA ID)  
CAT.NO. 800401

ISA AX+  
(CO<sub>2</sub>, N<sub>2</sub>O, 5 AA, AA ID)  
CAT.NO. 800601

ISA CO2  
(CO<sub>2</sub>)  
CAT.NO. 800101



Nomoline with Luer Lock connector  
Box of 25  
CAT.NO. 108210

### PHASEIN's commitment to our customers

PHASEIN's commitment to its customers goes beyond its ability to deliver technically superior gas monitoring sensors. PHASEIN's support to its customers is its highest priority as it recognizes that its success is derived from the success of its customers. PHASEIN's commitment to delivering the best value proposition in multigas sensing technology, along with full support of its customers, is unshakeable.

PHASEIN's vision is to become the partner of choice for those requiring a mobile and flexible solution for measuring respiratory gases in any clinical application. With the experience which comes from developing three generations of gas measurement technology, PHASEIN offers you both the IRMA Mainstream Analyzers and the ISA Sidestream Analyzers or Modules.

We call it **PLUG-IN and MEASURE...™**

# Technical Specifications



## IRMA™ Multigas Analyzers

### General

**Description:** Ultra small infrared mainstream multi-gas probe comprising a multi channel IR-bench, barometric pressure sensor, power regulator, signal processor

**Interface:** RS-232 serial interface

**Power supply:** 4.5 - 5.5 V DC, IRMA CO2: < 1.0 W, IRMA OR/AX+: < 1.4 W

**Weight:** IRMA CO2/AX+: < 25 g

**Size:** IRMA CO2/AX+: 38 x 37 x 34 mm (1.49 x 1.45 x 1.34 inches),

**Mechanical robustness:** Meets the shock and vibration requirements for transport of SS-EN ISO 21647:2004 clause 21.102 and SS-EN 1789:2007 clause 6.3.4.2

**Operating:** IRMA CO2: 0 to 40 °C (32 to 104 °F), IRMA AX+: 10 to 40 °C (50 to 104 °F),

**Storage:** -20 to 50 °C (-4 to 122 °F)

**Humidity:** 10 - 95 %, non-condensing

**Atm.pres.:** IRMA CO2/AX+: 52,5 - 120 kPa (4572 m)

### Data Output

**Fi/ET values:** CO<sub>2</sub>, N<sub>2</sub>O, primary and secondary agents (HAL, ISO, ENF, SEV, DES)

**Waveforms:** Up to five simultaneous gas concentration waveforms

**Diagnostic parameters:** Atmospheric pressure, Serial number, Software and Hardware revisions

**Flags:** Breath detected, No breath detected, Check airway adapter, Unspecified accuracy and Sensor error

### Gas Analyzer

**IRMA sensor head:** 2-9 channel NDIR type gas analyzer measuring at 4-10 µm.

**Compensations:** Pressure, temperature and broadening effects on CO<sub>2</sub>

**Calibration:** No span calibration required.

**Warm-up time:** 10 sec, full specifications within 60 sec

### Airway adapters

**Adult/Pediatric:** 6 ml dead space

**Infant:** 1 ml dead space

### Gases

The accuracy of all measurement values is according to the requirements of EN ISO 21647:2004 and EN 864:1996

**During standard conditions:**

	Range (IRMA CO2)	Accuracy
CO <sub>2</sub>	0-15 vol%	± (0.2 vol% + 2 % of reading)
	Range (IRMA AX+)	Accuracy
CO <sub>2</sub>	0-10 vol%	±(0.2 vol% + 2 % of reading)
	0-15 vol%	±(0.3 vol% + 2 % of reading)
N <sub>2</sub> O	0 - 100 vol%	±(2 vol% + 2 % of reading)
HAL, ISO,ENF	0 - 8 vol%	±(0.15 vol% + 5 % of reading)
SEV	0 - 10 vol%	± (0.15 vol% + 5 % of reading)
DES	0 - 22 vol%	± (0.15 vol% + 5 % of reading)

**Rise time:** CO<sub>2</sub> ≤ 90 ms, N<sub>2</sub>O, Agents ≤ 300 ms

**Total system response time:** < 1 sec

**Breath detect:** Adaptive threshold, minimum 1 vol% change in CO<sub>2</sub> concentration

**Respiration rate:** 0 - 150 breaths/min

**Agent threshold:** IRMA AX+: Primary agent 0.15 vol%, secondary agent 0.2 vol% + 10 % of total agent concentration. When concentration has passed the threshold, concentrations will be reported even below the threshold.

### Certifications

CE marked according to the 93/42/EEC Medical Device Directive

## ISA™ Multigas Analyzers

### General

**Description:** Ultra-compact, low flow sidestream gas analyzers with integrated pump, zeroing valve and flow controller

**Interface:** USB or RS232 serial interface

**Power supply:** 4.5-5.5 VDC,

ISA CO2: < 1.4 W (normal op.), < 1.8 W (peak @ 5 VDC)

ISA AX+: < 1.6 W (normal op.), < 2.0 W (peak @ 5 VDC)

ISA OR+: < 2.0 W (normal op.), < 2.4 W (peak @ 5 VDC)

**Weight:** ISA CO2/AX+: 130 g, ISA OR+: 400 g, ISA CO2/AX+ Module: 70 g (cable excluded)

**Size:** ISA CO2/AX+: 33 x 78 x 49 mm (1.3 x 3.1 x 1.9 inches), ISA OR+: 49 x 90 x 100 mm (1.9 x 3.5 x 3.9 inches), ISA CO2/AX+ Module: 23 x 64 x 39 mm (0.9 x 2.5 x 1.5 inches)

**Mechanical robustness:** ISA CO2: Meets the shock and vibration requirements for transport of SS-EN ISO 21647:2004 clause 21.102 and SS-EN 1789:2007 clause 6.3.4.2, ISA OR+/AX+: Meets the shock and vibration requirements for transport of SS-EN ISO 21647:2004 clause 21.101

**Operating:** ISA CO2/AX+: 0 to 50 °C (32 to 122 °F), ISA OR+: 5 to 50 °C (41 to 122 °F)

**Storage:** -40 to 70 °C (-40 to 158 °F)

**Humidity:** < 4 kPa H<sub>2</sub>O (non-condensing) 95 % RH at 30 °C

**Atm. pres.:** 52,5 to 120 kPa, (4572 m)

**Water handling:** Sampling line with proprietary water removal tubing

**Sampling lines:** 2 ± 0.1 m

**Sampling flow rate:** 50 ± 10 ml/min

### Data Output

**Fi/ET values:** CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>O, primary and secondary agents (HAL, ISO, ENF, SEV, DES)

**Waveforms:** Up to five simultaneous gas concentration waveforms

**Diagnostic parameters:** Atmospheric pressure, Serial number, Software and Hardware revisions

**Flags:** Breath detected, No breath detected, Replace O<sub>2</sub> sensor, Check sampling line, Unspecified accuracy and Sensor error

### Gas Analyzer

**ISA sensor head:** 2-9 channel NDIR type gas analyzer measuring at 4-10 µm

**Compensations:** Pressure, temperature and broadening effects on CO<sub>2</sub>

**Calibration:** No span calibration required. An automatic zero reference calibration is performed once every startup and then once every 24 hours for ISA CO2 and every 8 hours for ISA AX+/OR+

**Warm-up time:** ISA CO2: < 10 sec, ISA OR+/AX+: < 20 sec

### Gases

The accuracy of all measurement values is according to the requirements of EN ISO 21647:2004 and EN 864:1996

**During standard conditions:**

	Range	Accuracy
CO <sub>2</sub>	0-15 vol%	±(0.2 vol% + 2 % of reading)
N <sub>2</sub> O	0-100 vol%	±(2 vol% + 2 % of reading)
HAL, ISO, ENF	0-8 vol%	±(0.15 vol% + 5 % of reading)
SEV	0-10 vol%	±(0.15 vol% + 5 % of reading)
DES	0-22 vol%	±(0.15 vol% + 5 % of reading)
O <sub>2</sub>	0-100 vol%	±(1 vol% + 2 % of reading)

**Rise time:** CO<sub>2</sub> ≤ 200 ms (≤ 250 ms for ISA OR+/AX+), N<sub>2</sub>O ≤ 350 ms, Agents ≤ 350 ms, O<sub>2</sub> ≤ 450 ms

**Total system response time:** < 3 sec (with 2 m sampling line)

**Breath detect:** Adaptive threshold, minimum 1 vol% change in CO<sub>2</sub> concentration

**Respiration rate:** 0-150 breaths/min

**Agent threshold:** Primary agent 0.15 vol%, secondary agent 0.2 vol% + 10 % of total agent concentration. When concentration has passed the threshold, concentrations will be reported even below the threshold.

### Certifications

CE marked according 93/42/EEC Medical Device Directive

*Data subject to change without notice*