

Technical Specifications



General

Description: Ultra small infrared main stream multi-gas probe comprising a multi channel IR-bench, barometric pressure sensor, power regulator, signal processor and a RS-232 interface

Interface: RS-232 serial interface operating at 9 600 bps

Power supply:

IRMA CO₂: 4.5 - 5.5 V DC, < 1.0 W

IRMA OR/AX+: 4.5 - 5.5 V DC, < 1.4 W

Weight:

IRMA CO₂/AX+: < 25 g

IRMA OR: < 38 g

Size:

IRMA CO₂: 38 x 37 x 34 mm (1.49 x 1.45 x 1.34 inches)

IRMA OR/AX+: 37 x 27 x 25 mm (1.45 x 1.1 x 0.9 inches)

Shockproof design:

IRMA CO₂: Withstands repeated 1.8 m drops

IRMA OR/AX+: Withstands repeated 1.0 m drops

Operating:

IRMA CO₂: 0 to 40 °C (32 to 104 °F)

IRMA OR: 10 to 35 °C (50 to 95 °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: 525 - 1200 hPa (4572 m)

IRMA OR/AX+: 700 - 1200 hPa (3048 m)

Data Output

Fi/ET values: CO₂, O₂, N₂O, primary agent, secondary agent

Waveforms: Up to five simultaneous

Status: Atmospheric pressure, sensor head temp. and diagnostic parameters

Flags: Apnea, oxygen sensor depleted, hardware errors, check adapter

Gas Analyzer

IRMA sensor head: Multi channel 4 - 10 μm NDIR type gas analyzer, utilizing pressure, temperature and full spectral interference correction for measurement of all respiratory gases in any mixture

Calibration: No routine calibration is required. Room air calibration of oxygen sensor is performed when changing airway adapter (<5 sec)

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 CO ₂)	Accuracy	
CO ₂	0 - 15 %	± (0.2 % _{ABS} + 2 % _{REL})	
	Range (IRMA OR)	Range (IRMA AX+)	Accuracy
CO ₂	0 - 10 %	0 - 10 %	± (0.2 % _{ABS} + 2 % _{REL})
O ₂	10 - 100 %		± (1 % _{ABS} + 2 % _{REL})
N ₂ O	0 - 100 %	0 - 100 %	± (2 % _{ABS} + 2 % _{REL})
HAL, ISO, ENF	0 - 5 %	0 - 8 %	± (0.15 % _{ABS} + 5 % _{REL})
SEV	0 - 8 %	0 - 10 %	± (0.15 % _{ABS} + 5 % _{REL})
DES	0 - 18 %	0 - 22 %	± (0.15 % _{ABS} + 5 % _{REL})

Rise Time: CO₂ < 90 ms, N₂O, AA < 300 ms, O₂ < 300 ms

Total system response time: < 1 sec

Breath detect: Adaptive threshold, minimum 1 % CO₂ change.

Respiratory rate: 0 - 150 bpm ± 1 bpm

Agent threshold: IRMA AX+: Primary agent 0.15 vol%, secondary agent 0.2 vol% + 10 % of total agent concentration, IRMA OR: 0.3 vol%. When concentration has passed the threshold, concentrations will be reported even below the threshold.

Compensation: Automatic for atmospheric pressure, temperature and spectral interference

Certifications

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

Data subject to change without notice



IRMA CO₂
(CO₂)
CAT.NO. 200101



IRMA AX+
(CO₂, N₂O, HAL, ENF, ISO, SEV, DES, Agent ID)
CAT.NO. 200601



IRMA OR
(CO₂, O₂, N₂O, HAL, ENF, ISO, SEV, DES)
CAT.NO. 200301

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



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



IRMA Airway Adapter O₂
Adult/Pediatric
Box of 25
CAT.NO. 106210



IRMA Holder Velcro
CAT.NO. 100250



IRMA Oxygen Sensor
CAT.NO. 100231



25 grams, plug-in and measure, multigas analyzer sets new standards in gas monitoring

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 subtle yet critical for your ultimate satisfaction and your choice. When it comes to IRMA™ mainstream probes, 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 solution with the flexibility to measure in different clinical applications with trouble-free operation. IRMA™ mainstream probes can measure CO₂, O₂, N₂O, anaesthetic agents (HAL, ENF, ISO, SEV, DES), provide agent identification and are available in customized configurations.

A complete monitor in a probe

The entire IRMA™ mainstream probe is as small as an oximeter sensor weighing only 25 grams. It is designed using the latest advances in component and microprocessor technology to provide a complete mainstream monitoring system with unique versatility and design. The IRMA™ probe measures infrared light absorption at ten different wavelengths in order to precisely determine gas concentrations in the mixture. A selection of disposable airway adapters is available for all your clinical applications. The IRMA™ probe comprises all the necessary components required for advanced signal processing and a comprehensive digital RS232 interface. All probes are universally calibrated and deliver processed data for display on the screen of your monitor, ventilator or anaesthesia equipment. This enables full system integration flexibility without any host device hardware modifications.

Maintenance free

The IRMA™ mainstream probe is designed to overcome the shortfalls of sidestream technologies; namely, liquid and secretion handling, calibration, service costs. The IRMA™ probe is factory-calibrated and requires no assembly or calibration. It eliminates all problems concerning handling calibration gas and complex calibration procedures both for you and your customers.

A complete monitor in the palm of your hands!

The IRMA™ probe is a complete gas solution weighing less than 25 g! Free yourself from the limitations of current solutions. Add mobility, convenience, ease of distribution, ease of service. Imagine distributing a complete gas solution to your customers by mail or courier service, at only a fraction of the costs normally associated with standard monitors.

Easy and inexpensive to integrate

Integrating new technology is often a time consuming procedure and is a major investment. This usually requires physical space within your current design, redesigning your power supply as well as a lengthy validation and verification process. With the IRMA™ probe we are talking about an integration process that takes just a couple of weeks instead of a couple of years. All integration procedures and associated expenses have been reduced to an absolute minimum. Simply connect the IRMA™ probe to the digital port of your device, secure the supply voltage and start measuring.

We call it PLUG-IN and MEASURE...™

IRMA™ PLUG-IN AND MEASURE...™ MULTIGAS TECHNOLOGIES



CO₂ O₂
2NO₂
ISO HAL
SEV
DES
ENF



phase in
MEDICAL TECHNOLOGIES