Vamos® / Vamos® plus
Anaesthetic Gas Monitors

Targeted, safe anaesthesia requires efficient anaesthetic gas monitors. This is exactly what Vamos® and Vamos® plus compact anaesthetic gas monitors provide by reliably displaying carbon dioxide, nitrous oxide and volatile anaesthetic gas concentrations.

Technical Data

Vamos® / Vamos® plus[1]

Operating characteristics

Weight	1.6 kg (3.5 lbs) without battery
	2.1 kg (4.6 lbs) with battery
Dimensions (H x W x D)	16.6 cm x 24.0 cm x 16.5 cm (6.5 in x 9.5 in x 6.5 in)
Mains power supply	100 to 240 V ~ 50/60 Hz
Maximum power consumption	45 W / 35 W / 28 W
(during warm-up, during operation, on standby)	
Operating time with battery (optional)	> 60 min.
Sample flow rate	200 ± 20 ml/min
Interface	1x RS 232 (MEDIBUS protocol)

Ambient conditions

Temperature	10 to 40 °C (50 to 104 °F)
Atmospheric pressure	620 to 1,100 hPa (9.0 to 15.9 psi)
Altitude	up to 4,000 m (13,123 ft)
Displayed curves and parameters	
Curve	CO_2
Parameters	inspiratory CO_2, expiratory CO_2
	inspiratory N_2O, expiratory N_2O
	inspiratory anaesthetic agent, expiratory anaesthetic agent
	Vamos® plus: primary and secondary anaesthetic agent
	Vamos®: manually input anaesthetic agent
	available anaesthetic agents: isoflurane, halothane, enflurane, sevoflurane, desflurane
	Respiratory rate
Displayed messages	prioritised alarm messages, status messages
Alarm list	max. 10 active alarms in addition to the two alarms in the screen header
Non-adjustable alarms	apnoea, MAC > 3, inN2O
Adjustable alarms	$inCO_2$ high, $etCO_2$ low, $etCO_2$ high
	inspiratory anaesthetic agent concentration high/low (Vamos® plus: primary and secondary anaesthetic agent, Vamos®: manually input anaesthetic agent)
Status messages	prioritised, warm-up process, mains/battery status, gas flow status, loudspeaker status, fan status

Measured value displays

Warm-up time at ambient temperature > 13 °C	< 5 min
System response time	< 3.0 s
Measuring range CO_2	0 to 10 Vol %
	0 to 10 kPa
	0 to 76 mmHg
Accuracy CO_2	±(0.43 Vol % + 8 % rel.)
	±(0.43 kPa % + 8 % rel.)
	±(3.3 mmHg % + 8 % rel.)
Response time (t10/90) CO_2	< 300 ms
Measuring range N_2O	0 to 100 Vol %
Accuracy N_2O	±(2 Vol % + 8 % rel.)
Response time (t10/90) N_2O	< 300 ms
Measuring range: anaesthetic agent	0 to 8.5 Vol % (isoflurane and halothane)

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	0 to 10 Vol % (sevoflurane and enflurane)
	0 to 20 Vol % (desflurane)
Accuracy: anaesthetic agent	±(0.20 Vol % + 15 % rel.)
Response time (t10/90) anaesthetic agent	< 450 ms
Respiratory rate measuring range	0 to 100 /min
Accuracy (I:E 1:2)	0 to 80 /min: ±1 /min
	> 80 /min: not specified
Configuration	activate/deactivate alarm
	alarm volume, brightness of display
	Settings after switching on
	Language
	Interface settings
	Connection for gas sample recycling

Equipment classification

Classification under Directive 93/42/ EEC, Annex IX	IIa
UMDNS Code	17-445

Standards

IEC 60601-1 (2nd and 3rd edition) Medical electrical equipment Part 1: General requirements for safety	
IEC 60601-1-2 (2nd and 3rd edition) Medical electrical equipment Part 1 – 2: General requirements for safety, collateral standard: Electromagnetic compatibility – Requirements and tests	
IEC 60601-1-4 (2nd edition) Medical electrical equipment Part 1 – 4: General requirements for safety, collateral standard: Programmable medical electrical systems	IEC 60601-1-2 (4th edition) Medical electrical equipment Part 1 – 2: General requirements for safety, collateral standard: Electromagnetic disturbance: requirements and tests
IEC 60601-1-8 (2nd edition) Medical electrical equipment Part 1 – 8: General requirements for safety, collateral standard: General requirements, tests and guidelines for alarm systems in medical electrical systems	IEC 60601-1-8 (3rd edition) Medical electrical equipment Part 1 – 8: General Requirements for Basic Safety and Essential Performance collateral standard: Alarm systems – general requirements, tests and guidelines for alarm systems in medical electrical devices and in medical systems
ISO 21647 Medical electrical equipment Particular requirements for the basic safety and essential performance of respiratory gas monitors	ISO 80601-2-55 Medical electrical equipment Part 2 – 55: Particular requirements for basic safety and essential performance of respiratory gas monitors

[1] Technical data are valid for the latest version of Vamos® and Vamos® plus Item no. 68 73 350.

Technical data for older versions of Vamos® and Vamos® plus may differ.

Older versions of Vamos® and Vamos® plus can be identified by their item number.

Vamos® and Vamos® plus (68 73 350) are not available in all markets.