

# haemoglobin monitoring



## VM-2400

## Haemoglobin Monitor



SpO<sub>2</sub>, non-invasive Haemoglobin and Methaemoglobin multi-parameter monitor

- Simple and intuitive operation
- Fast measurement (approximately 40 seconds)
- Detection of unphysiological MethHb
- No bio-contaminated waste
- Pain-free
- Long battery life (up to 300 measurements)
- Storage of up to 12,000 measurements



The VM-2400 Haemoglobin monitor is particularly suitable for use in blood donation centres and eliminates the need for a finger prick test. The non-invasive procedure and short measurement time provides a convenient and more comfortable experience for the donor.



European Research Funding



**VIAMED**



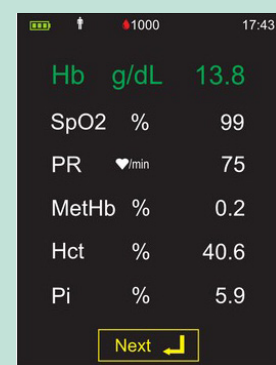
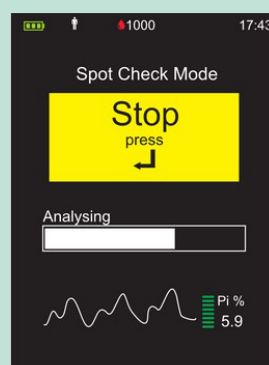
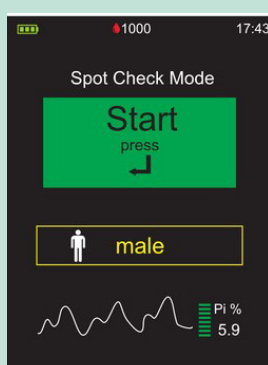
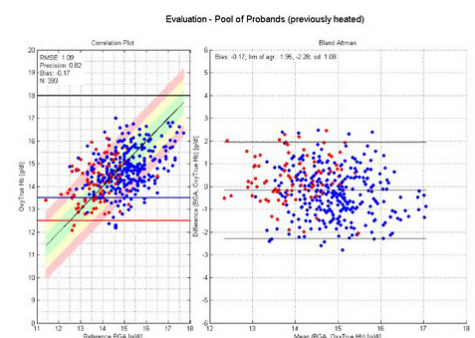
## VM-2400 Multi-parameter Monitor for SpO<sub>2</sub>, non-invasive Haemoglobin and Methaemoglobin

The SMARTsat SpO<sub>2</sub> technology platform was developed over the last few years in close co-operation with well-established research institutions and university hospitals.

The very latest and innovative signal processing technologies and algorithms enables the measurement of the following parameters:

- Hb (non-invasive Haemoglobin)
- SpO<sub>2</sub> (fractional saturation)
- PR (pulse rate)
- MetHb (Methaemoglobin)
- Hct (Haematocrit)
- PI (perfusion index)

The VM-2400 Haemoglobin monitor and dedicated sensor have been evaluated and calibrated against reference measurements from clinical studies.







## VM-2400 Multi-parameter Monitor for SpO<sub>2</sub>, enables simple and fast measurements

The VM-2400 provides increased efficiency and reduced operating costs in comparison to conventional laboratory diagnostics.

The intuitive menu structure enables a fast measurement without the need for expert knowledge. With this non-invasive procedure the patient will experience a pain-free and stress-free blood analysis, without the risk of cross-contamination.

In addition, there are environment benefits from the reduction in contaminated bio-medical waste.



Counter Keys are easily connected to the device and provide either 500, 2500 or 5000 measurements.



The VM-2400's sensor is robust and can be comfortably used with a range of finger sizes

## Methaemoglobin

MetHb is an abnormal haemoglobin which is not able to bind oxygen and reduced the oxygen uptake capacity. High and non-physiological MetHb values reduce the blood quality significantly and the donated blood should not be used for blood transfusions.

The formation of MetHb can be caused by local anaesthesia, several medications or drugs. Excluding blood donors with high MetHb concentrations can raise the quality of blood preservations.

<b>Measurement range</b>	SpO <sub>2</sub> 0 - 100% Pulse rate 30 - 240 bpm Perfusion 0.5 - 20% Haemoglobin 0 - 25% g/dl Haematocrit 35 - 53% <sup>1</sup> Methaemoglobin 0 - 10%
<b>Accuracy</b>	SpO <sub>2</sub> 60 - 100% ± 2 A <sub>RMS</sub> <sup>2</sup> Pulse rate 30 - 240 ± 2 bpm Haemoglobin 8 - 20 g/dl ± 1 A <sub>RMS</sub> <sup>2,3,4</sup> Haematocrit 35 - 53% ± 2.9 A <sub>RMS</sub> <sup>1,2,3,4</sup> Methaemoglobin 0 - 10% ± 1 A <sub>RMS</sub> <sup>2</sup>
<b>Display</b>	TFT colour display, 262,000 colours, 240 x 320 pixels
Features	Multi-parameter monitor for SpO <sub>2</sub> , non-invasive Haemoglobin (Hb), Methaemoglobin (MetHb), Pulse rate (PR), Haematocrit (Hct), plethysmogram, bar graph
Data displayed	Signal strength and signal quality, pulse amplitude, battery status, sensor disconnection
Indicators	
<b>Environmental Conditions</b>	
Operating temperature	-0 - 40°C , 15 - 95% RH (non-condensing), 800 - 1200 hPa <sup>5</sup>
Storage temperature	-30 - 70°C, 10 - 95% RH (non-condensing), 800 - 1200 hPa <sup>5</sup>
<b>Regulatory Approvals</b>	
Standards	CE Class IIb in accordance with MDD 93/42/EEC IEC 60601-1:2005 (3rd edition), IEC 60601-1 (2nd edition), IEC 60601-1-2 (3rd edition), EN ISO 80601-2-61:2011, EN ISO 9919:2009, ISO 14971:2007, IEC 60601-1-6:2010, IEC 60601-1-11:2010
Safety	Class II, Type BF - Type and degree of protection against electrical shock
<b>Assembly</b>	
Construction	IP31 (with silicone protective cover)
Dimensions	155 mm (L) x 75 mm (W) x 35 mm (H)
Weight	Approximately 550g (including batteries)
Power Supply	90 - 260 V AC/6 V DC, 50 - 60 Hz, 4 x AA alkaline batteries, 2.5 Ah Li-Poly Battery
Battery Life	up to 300 spot check measurements at an ambient temperature of 25°C
PC interface	USB 2.0
<b>Part Numbers</b>	
VM-2400 Haemoglobin monitor	0012400
Standard accessories included:	
VM-2400 Haemoglobin monitor	
VM-2400 sensor	
VM-2400 Counter key (500 units)	
USB Cable	
Silicone Protective Cover	
Power supply (EU and UK Plug)	
4 x AA batteries	
1 x Li-Poly rechargeable battery	
Instruction Manual	
<b>Additional Accessories</b>	
Anti-stress ball	0024001
IR-A radiator Philips InfraCare® HP3621	0024002

<sup>1</sup> Calculated from Hb value (Hb [g/dl] \* 2.94) | J.D. Bauer, P.G.Ackermann, G. Tori, Clinical laboratory methods  
The C.V. Mosby Company, Saint Luis 1974, S. 156

<sup>2</sup> A<sub>RMS</sub> ± 1 A<sub>RMS</sub> represents approximately 68% of measurements

<sup>3</sup> Preheated

<sup>4</sup> Valid if SpO<sub>2</sub> > 89% and MetHb < 6%

<sup>5</sup> With Li-Poly battery the conditions are reduced to: operating while charging at 0 - 40°C and 860 - 1060 hPa, storage (1 month) at -20 - 60°C and 860 - 1060 hPa

CE 0086

Specifications subject to change

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