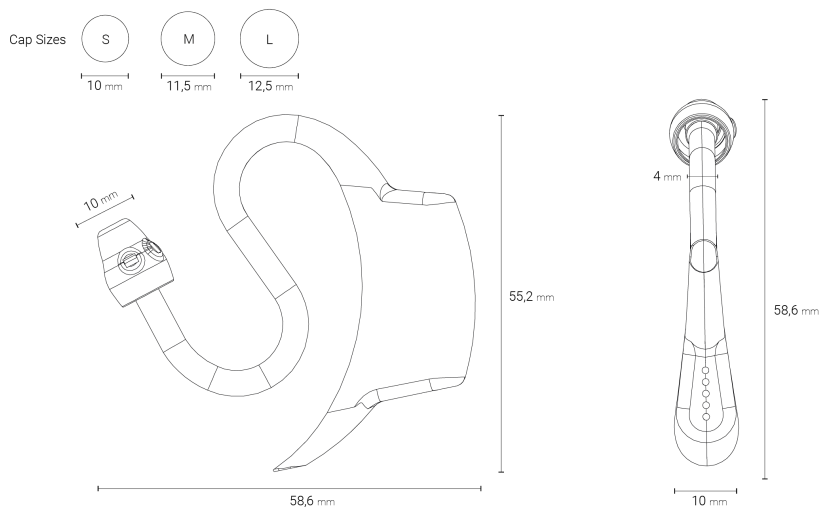


c-med° alpha - data sheet

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c-med° alpha

Medical wearable for continuous vital signs measurements



Features

- Continuous measurement of key vital signs:
 - heart rate
 - body temperature
 - blood oxygen saturation (SpO2)
 - more raw data available
- Medically certified
- Approx. 12 hours of battery life when measuring continuously, longer battery life when measuring periodically.
- IP47 protected
- Operating temperature range:
0 °C and 40 °C (32 °F – 104 °F)
- Ambient temperature for Transient Operating Conditions:
0 °C – 50 °C (32 °F – 122 °F)

General

Product specification

Type number	MS01
Generation	1
Device type	Continuous vital sign monitor
Usage	Measuring key vital signs continuously in the outer ear canal
Measuring position	Outer ear canal
Measured values	Pulse Rate, oxygen saturation (SpO2), body temperature, RR-intervals
Medical product classification	Ila
Certification	Medical CE & FCC, Bluetooth
Status indicators	RGB-LEDs
Size, H x W x D	55.2 mm x 58.6 mm x 10.0 mm
Weight	Approx. 7 g
Material	Silicone rubber, medical grade - ISO 10993-5 /-6 /-11 - USP class VI
Color	White
Battery life	Continuous: approx. 12 h Periodical (3 min every 15 min): approx. 48 h Standby: approx. 1 year
Ambient temperature for continuous usage	0 °C and 40 °C (32 °F – 104 °F)
Barometric pressure for continuous usage	620 – 1060 hPa (620 – 1060 mbar)
Ambient temperature for Transient Operating Conditions	0 °C – 50 °C (32 °F – 122 °F)
Water vapour partial pressure for Transient Operating	Smaller than 50 hPa

Condition	
Storage temperature and relative air humidity	Temperature <i>Relative Humidity</i> • -25 °C – 5 °C (-13 °F – 41 °F) 0% - 95% (non-condensing) • 5 °C – 35 °C (41 °F – 95 °F) 0% - 95% (non-condensing) • 35 °C – 70 °C (95 °F – 158 °F) <i>at a water vapor pressure up to 50 hPa</i>
Protection type	IP47
Power supply requirements	BF
Service life	2 years
Scope of delivery	c-med° alpha device, charging box, charging cable, power supply, manual

Radio transmission

Radio data transmission

Type	Bluetooth Low Energy (BLE)
Version	5.0 (backwards compatible to 4.2)
Frequency	ISM band 2.4 GHz – 2.485 GHz
Transmitting power	0 dBm
Services	Battery Service, Device Information Service, Health Thermometer Service, Heart Rate Service, Pulse Oximeter Service, Custom Profile
Encryption	AES
Transmitting range	approx. 10 m

Power supply

Rechargeable battery

Type	Lithium battery, rechargeable
Capacity	60 mAh
Charging time	approx. 1 h

Sensor technology

Sensor types	Infrared and contact thermometer, optical measurement (LEDs and photodiode), accelerometer
Raw data	PPG red, PPG infrared, PPG ambient, ACC x-axis, ACC y-axis, ACC z-axis
Quality indexes	Heart rate quality, perfusion index
Vital signs	Heart rate, body temperature, blood oxygen saturation (SpO2),
Further derived parameters	N/A

Photoplethysmography (PPG) sensor

Type	Red LED, infrared LED and photodiode
Method	Photoplethysmography (PPG)
Resolution	19 bit
Sampling rate	Variable, standard 200 Hz

Thermometer

Type	Infrared sensor
Measuring range	Measuring range: 10 °C – 43 °C Measuring limits: -25 °C – 50 °C
Resolution	0.1 °C
Technical accuracy	± 0.5 °C (± 0.9 °F) 10.0 – 20 °C (50 – 95 °F) ± 0.3 °C (± 0.5 °F) 20.0 – 35.0 °C (68 – 95 °F) ± 0.2 °C (± 0.4 °F) 35.0 – 42.0 °C (95 – 107.6 °F) ± 0.3 °C (± 0.5 °F) 42.0 – 43.0 °C (107.6 – 109.4 °F) Outside of specified measuring range ± 0.5 °C
Sampling rate	Variable, standard 0.1 Hz

Accelerometer

Type	3-axis, linear
Measuring range	Up to $\pm 16 \text{ g}$ ($\pm 156.96 \text{ m/s}^2$)
Resolution	16 bit
Technical accuracy	$\pm 0.002 \text{ m/s}^2$
Sampling rate	Variable, standard 100 Hz

Vital Signs**Body temperature**

Type	Infrared thermometer
Measuring range	Depending on App: Measuring range: $34 \text{ }^{\circ}\text{C} - 43 \text{ }^{\circ}\text{C}$ Measuring limits: $-25 \text{ }^{\circ}\text{C} - 50 \text{ }^{\circ}\text{C}$
Resolution	$0.1 \text{ }^{\circ}\text{C}$
Technical accuracy	$\pm 0.5 \text{ }^{\circ}\text{C}$ ($\pm 0.9 \text{ }^{\circ}\text{F}$) $10.0 - 20 \text{ }^{\circ}\text{C}$ ($50 - 95 \text{ }^{\circ}\text{F}$) $\pm 0.3 \text{ }^{\circ}\text{C}$ ($\pm 0.5 \text{ }^{\circ}\text{F}$) $20.0 - 35.0 \text{ }^{\circ}\text{C}$ ($68 - 95 \text{ }^{\circ}\text{F}$) $\pm 0.2 \text{ }^{\circ}\text{C}$ ($\pm 0.4 \text{ }^{\circ}\text{F}$) $35.0 - 42.0 \text{ }^{\circ}\text{C}$ ($95 - 107.6 \text{ }^{\circ}\text{F}$) $\pm 0.3 \text{ }^{\circ}\text{C}$ ($\pm 0.5 \text{ }^{\circ}\text{F}$) $42.0 - 43.0 \text{ }^{\circ}\text{C}$ ($107.6 - 109.4 \text{ }^{\circ}\text{F}$)
Interval	Variable, standard 0.1 Hz

Heart rate

Type	PPG
Measuring range	35 bpm – 220 bpm
Resolution	1 bpm
Accuracy	$\pm 4 \text{ bpm}$
Interval	Variable, standard 1 Hz

Oxygen saturation (SpO2)

Type	PPG
Measuring range	70 % – 100 %
Resolution	1 %
Accuracy	± 3 %
Interval	Variable, standard 1 Hz

Accessories**Charging box**

Model	MC01 (single charging box) / RC01 (double charging box)
Usage	Storage, transport and charging of the c-med° alpha. Also switches it on and off.
Material	PC and ABS blend, flame retardant UL 94 V-0
Protection type	IP21
Socket	Micro-USB B / USB-C

Power supply

Model	M050120-S86EUU (Plug-type C), M050120-S86BSU (Plug-type G), M050120-S86USU (Plug-type A) FJ-SW2660501000E (Plug-type C) FJ-SW2050501000E (Plug-type C)
Input	100 – 240 V ~ 50/60 Hz, 0.35 A Max.
Output	5 V, 1000 mA
Plug	Europlug CEE 7/16 (Type C) , Plug-type G (BS 1363), Plug-type A (NEMA 1)
Socket	USB A

Charger cable

Model	2464 OD3.0 1500±50mm
Socket	USB A to Micro-USB B / USB A to USB C

Compatibility

cosinuss° components	<i>c-med° App</i> and <i>cosinuss° Health App</i> , LabGateway (for study purposes)
cosinuss° Lab System	Yes (for study purposes)
Third party apps	Yes, if App adheres to the cosinuss° API specifications.
Smartwatches	Yes, if application adheres to the cosinuss° API specifications.
Bike computers	No

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Glossary

Symbol	Quantity
bpm	Beats per minute
°C	Degree Celsius
m, cm, mm	Meter, centimeter, millimeter
dBm	Decibel milliwatt
g	Grams
<i>g</i>	Gravity of earth (approx. 9.81 m/s ²)
H x W x D	Height x width x depth
hPa, Pa	Hectopascal, Pascal

Symbol	Quantity
Hz, kHz, MHz, GHz	Hertz, Kilohertz, Megahertz Gigahertz
mbar	Millibar
mAh	Milliampere hour
s, h	Second, hour
m/s ²	Acceleration in meter per second squared
Mbit	Megabit
Mbps	Megabit per second

Abbreviations

approx.	Approximately
PPG	Photoplethysmography

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