K5 WEARABLE METABOLIC TECHNOLOGY



Wearable Metabolic System for both Field and Laboratory Testing

COSMED
The Metabolic Company

- *1987 ... introducing K2, the first compact Metabolic system (O_2 consumption) for field testing*
- *1994 ... introducing K4, the first mobile metabolic system (both O2 and CO2) with patented dynamic mixing chamber*
- *1997 ... introducing K4 b², the first "breath by breath" mobile metabolic system with integrated GPS*
- *2014 ... K5 wear it!*



It has been almost 30 years since COSMED introduced the first generation of compact metabolic systems. During this time we have collected significant feedback and ideas directly from the most important institutions around the world.

The result of such an experience has been carefully implemented in a complete new piece of technology incorporating latest design and providing researchers, sport professionals and clinical users new ways to explore human exercise physiology.

COSMED is proud to introduce **K5**, the 4th generation of the most popular wearable metabolic system, a breakthrough in the field of exercise physiology and human performance assessment.

The K5 is the most innovative and versatile metabolic system ever created. K5 reaps the benefits of more than 25 years of experience with metabolic systems. K5 features a list of new and unique characteristics that expand the scope of metabolic testing from clinical exercise testing to performance assessment.

Accuracy & Reliability

K5 has been designed with a focus on accuracy and usability. With this new generation of metabolic system COSMED introduces new patented technologies for gas exchange measurements.

IntelliMET™ (Intelligent Dual Metabolic Sampling Technology - US Patent 9581539) sets a new standard in metabolic measurements by providing a dual gas sampling system able to provide both micro-dynamic mixing chamber and breath by breath gas exchange measurements.

With IntelliMET (option) users can select between the mixing chamber and the breath by breath mode depending on the protocol type, research or other factors.

K5 features proven and reliable, highly linear and rapid response O_2 (GFC) and CO_2 (NDIR) sensors. The O_2 sensor has an average lifespan of 12 months. Once exhausted, the O_2 cell is replaced by the user without the need of technical assistance.

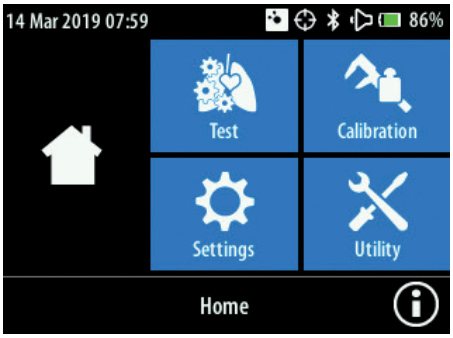




VCO_2 VO_2	2	IntelliMET±
	Mix & BxB	Dual Metabolic Sampling Technology

Design

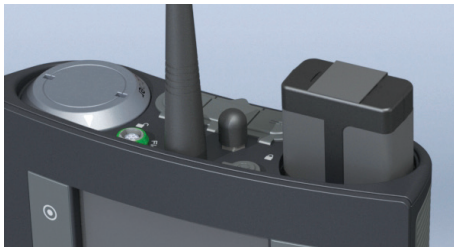
- Designed according to **IP54 standard**, K5 is a tough/rugged device. Rubber seals protect the body, connectors and ports against water, moisture and dust intrusion.
- Single-body device, reduces weight (900g including battery) and simplifies setup.
- 3.5" touch-screen LCD (320 x 240) with LED-back-lit TFT for optimal viewing in all lighting conditions.
- Resistive touch-screen technology allows use in outdoor conditions with either gloves or wet fingers.
- The integrated tripod mount (1/4"-20 UNC) located at the bottom of the unit allows the K5 to be mounted on several standard supports (i.e for biking, outdoor activities and sports or when used in lab testing) providing extreme versatility.



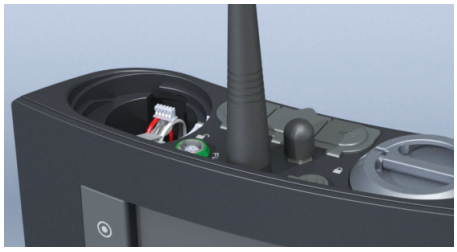
The 3,5" LCD is transflective with backlit TFT for optimal viewing in all lighting conditions

User Interface

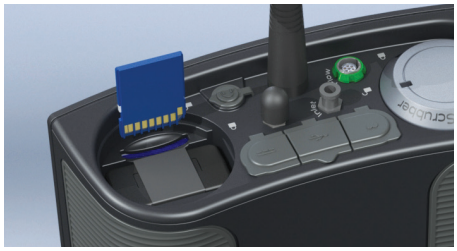
- 4 keys keyboard for rapid access to frequent functions (On/Off and Rec buttons, Back/Check and Home/Marker keys).
- Two large compartments located on the top of K5 allow users to easily access the O_2 sensor, the battery and the SD-card slot.
- Intuitive user interface allows simple navigation and quick access to all commands and features, with big easy-to-click icons
- Status bar provides information regarding time, date, battery status, Bluetooth® (on/off), GPS and notification icons (for QC messages, warnings etc.).
- Li-ion "smart battery" with an LCD showing charge status. Battery life is up to 4 hours. Batteries are easily replaceable.



All plugs, connectors and caps are protected by seals and are water, moisture and dust resistant



User replaceable O_2 sensor and/or battery; an easy operation not requiring special tools



SD-card slot to simplify data sharing without connecting to the PC



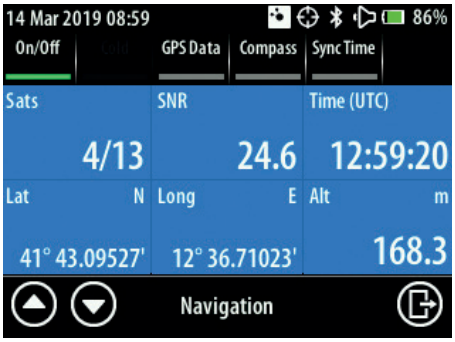
“K5 complies with IP54 standard, it has been specifically designed for outdoor use and provides protection against heavy water (rain, sweat) or dust.”

Wearable

Great attention has been paid to simplify subject setup and improve ergonomics. The preferred position of the device is mounted on the back of the subject.

- New harness design provides great comfort and ergonomics during dynamic field testing.
- The harness consists in 2 pieces: the skeleton is a robust/rigid/rugged part adjustable in length; the soft piece is made of breathable material, is detachable and washable, providing great comfort while walking or running.



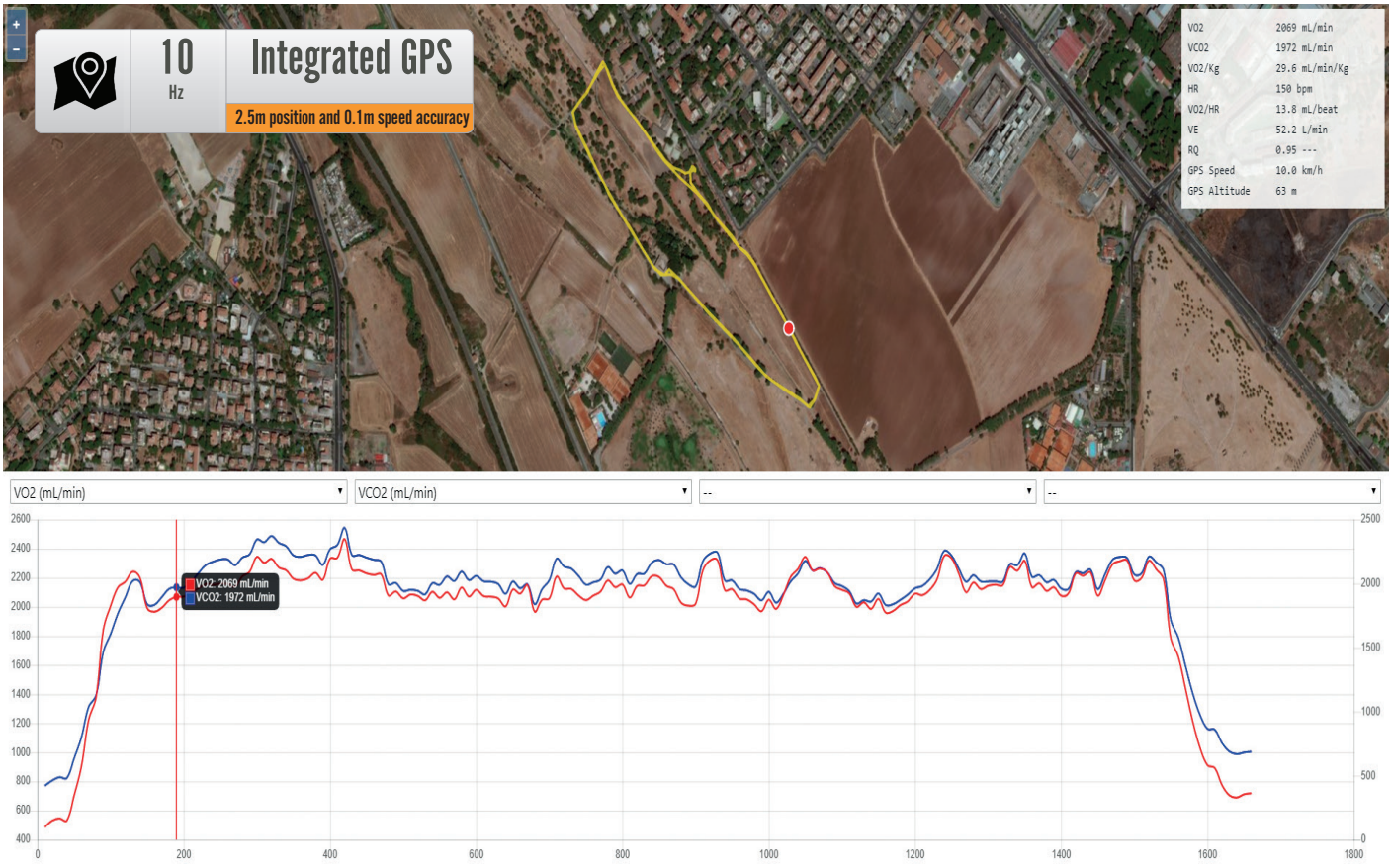


Navigation

The K5 features a standard integrated 10Hz GPS/QZSS receiver, with high position and speed accuracy.

- K5 accurately measures both altitude and grade by using the internal barometric pressure sensor coupled with GPS readings.
- Data can be monitored real time on K5 display and, eventually, downloaded (together with K5 metabolic parameters) in a dedicated interactive browser or in mapping software such as Google Earth.

GPS data can be monitored in real time or downloaded in a dedicated interactive mapping software.



Wireless Connectivity

Great attention has been given to allow K5 more efficient wireless data transmission and seamless integration with other devices. Provided with wireless data transmission K5 can be controlled via remote and integrated with Bluetooth® external peripherals.

K5 is also fully compatible with ANT+ technology. ANT+ is a wireless technology that allows monitoring devices to communicate each other and integrating and synchronizing data in a single source.

- **Standard Bluetooth 2.1 + EDR** with data transmission range ~**10m** in line-of-sight (standard).
- **Long Range Bluetooth 2.1 + EDR** with data transmission range **up to 1000 m** in line-of-sight (option).
- **ANT+ engine** for integration with external devices (SRM, CycleOps, Garmin etc.). Up to 8 channels simultaneously and compatible with 5 profiles (Bike Power & Torque, Bike Speed & Cadence, HR monitor, Muscle Oxygen Monitor, Stride Based Speed & Distance)[1] .





1 *More information at: www.thisisant.com/directory/k5*



The real-time GUI of K5 allows users to switch views between different data sets.

	Profile
HR	*Heart Rate (HR)*
CAD SPD S&C	*Bike Speed (SPD)* *Bike Cadence (CAD)* *Bike Speed & Cadence (S&C)*
PWR CTF	*Bike Power (PWR)* *Bike Crank Torque Frequency (CTF)*
SPD STP	*Foot Speed (SPD)* *Step Count (STP)*
MO_2	*Muscle Oxygen (MO_2)*
	Body Temperature *Pulsoximeter (SpO_2)*

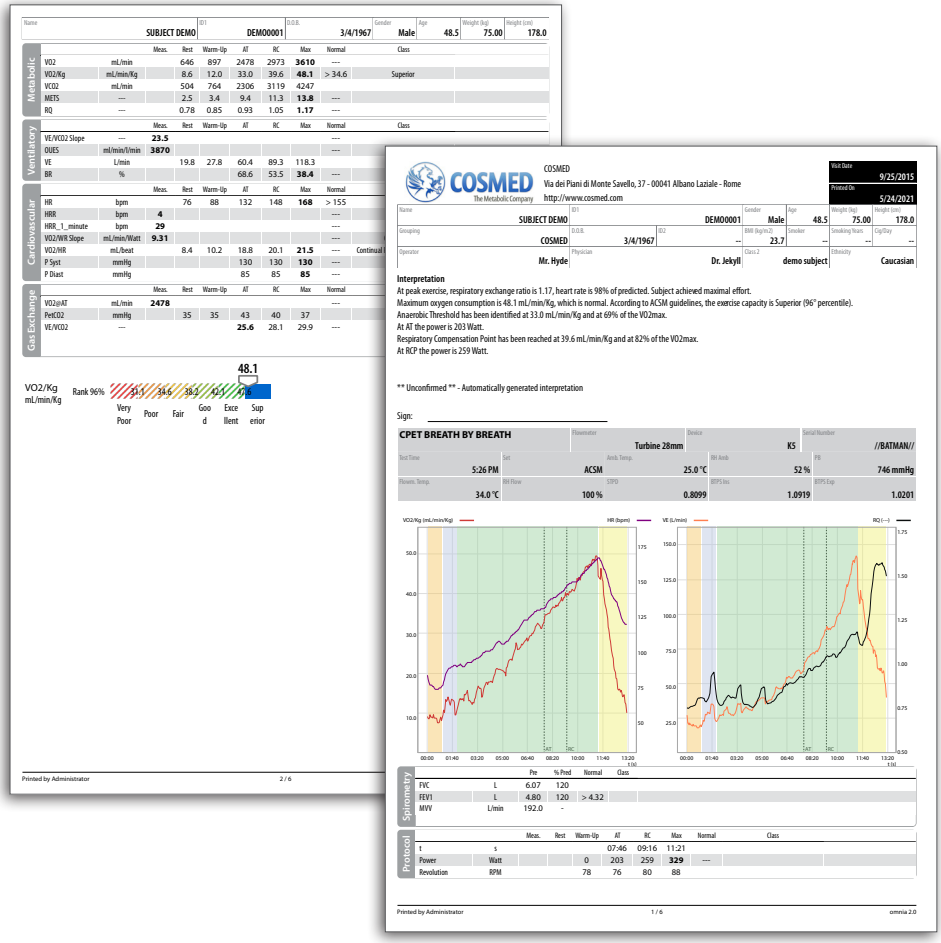


Data Management & Software

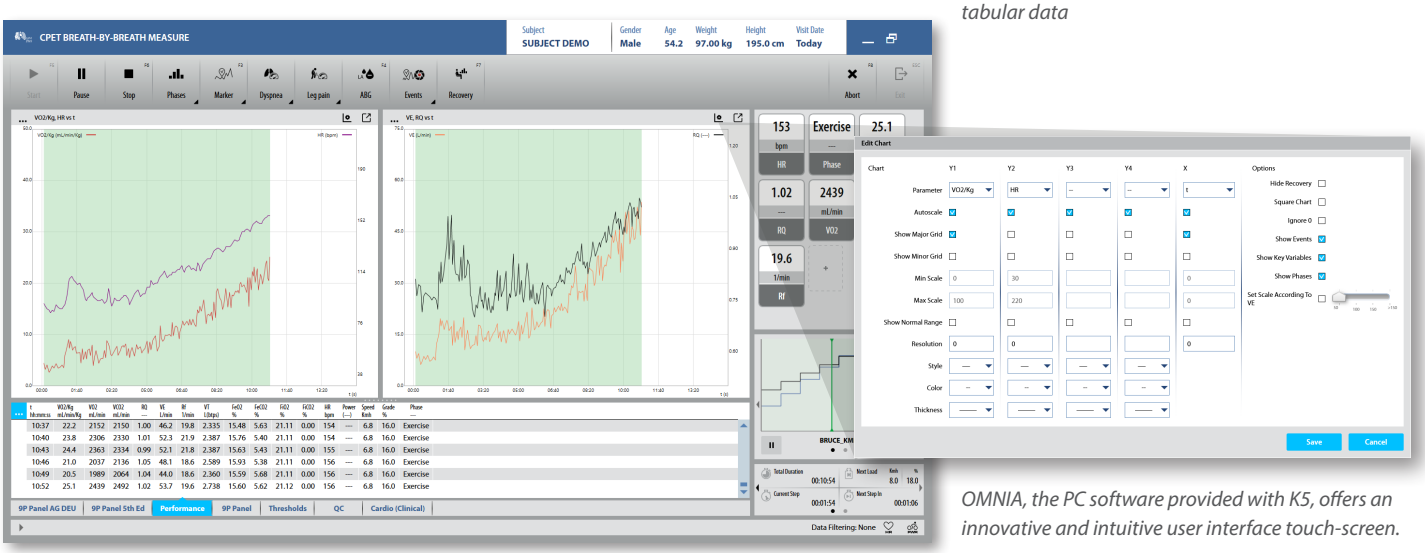
Every K5 comes with the OMNIA Metabolic Module of OMNIA, the modular software suite from COSMED with an intuitive and innovative user interface.

OMNIA allows the user to operate complex equipment without requiring long learning paths.

- Easy-to-use touch-screen graphic user interface with intuitive workflow and hierarchy.
- Multi-language environment
- SQL Database allowing virtually unlimited records and data safety.
- Full Network solution (optional) allows installations in complex Client/Server environments.
- User access ID and password protected. Multi-users access rights management (Principal Investigator, Physician, Technician, Administrator…) with event logging.
- Allows easy data and graphs display through either pre-defined dashboards (9 panel plot, etc.) or user defined templates.
- Real time acquisition and capture of Exercise Flow-Volume loops (EFVL) for the evaluation of ventilatory limitation.
- Powerful post-test editing phase for data filtering, calculation of thresholds (AT, RCP), VO2max, EFVL, VE/VCO2 slope, intercept and other parameters requested for interpretation.
- Multi-layers environment allows multiple views easy to access either by a click of the mouse or simply sliding the finger on a touch-screen device.
- Built-in Protocol editor (graphical) to design any type of exercise protocol (for both bikes and treadmills).
- Comprehensive interpretation tool with a powerful algorithm automatically elaborating results and providing interpretation text strings including numerical results.
- Ergometer control: **standard** (COSMED Bike, COSMED Treadmill, Ergoline, HPCosmos, Monark, Trackmaster,...) and **optional** (Archimed, BCube, Bike-Max, Bosh 601, CatEye, clubLine, CSafe Treadmill, CT100-ErgocardII, Cyclus 2, ErgoFit Bike, Excalib.Sport, Excalibur, Excite-Bike, Excite-Treadmill, Imbramed-Bike, Imbramed-TmillATL, Imbramed-Treadmill, Lodebike, Powerjog, RAM770, TechnogymRunRace, Tecmachine1800, TrackEmul, Woodway, Woodway Pro, Marquette T2100/T2000,...).



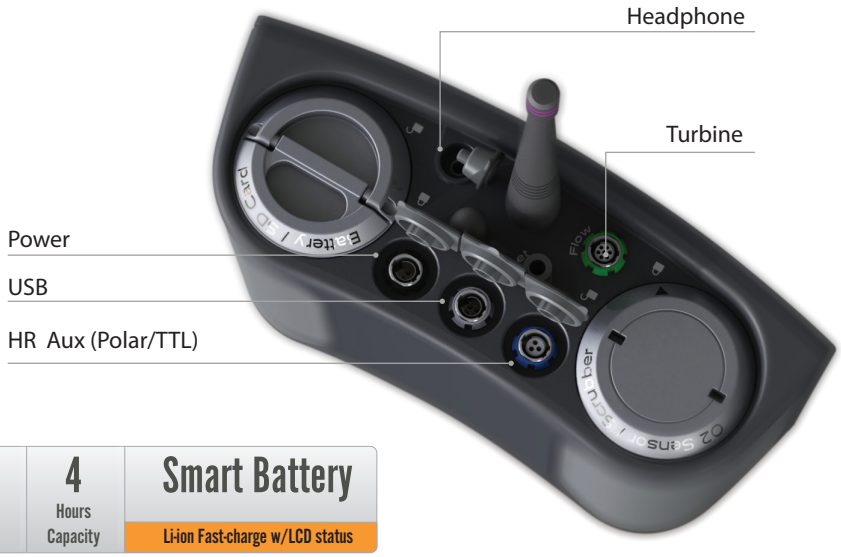
OMNIA allows to print fully customisable reports that may include also interpretation, graphical and tabular data



OMNIA, the PC software provided with K5, offers an innovative and intuitive user interface touch-screen.

Ports

- K5 comes standard with USB port for real-time communication with PC or for data download. Connecting K5 to a USB port turns the device into a conventional metabolic cart (PC controlled via software only).
- Medical grade AC/DC Power Plug for supplying direct current from the mains power (international plugs provided).
- HR Aux (auxiliary Heart Rate port) for reading HR obtained from an ECG (by TTL) or a Polar® belt (by plugging a Polar® HR receiver).



CPU & Data Storage

- 456 MHz CPU with 128 MB RAM.
- 512 MB internal flash memory for data storage and OS. Up to 2.048.000 breaths recordable.
- 32 GB SD-Card slot (HC type) user accessible for easy data sharing without passing through PC software.

Standard equipment

- K5 Wearable Metabolic System.
- 2 rechargeable Li-ion "smart" batteries.
- Dual bay battery charger adapter.
- AC/DC adapter 100-240V w/ INTL plugs for direct supply from the main power.
- 3 face masks w/ inspiratory valves (extra-small, small, medium) and 2 headgears (M, XS).
- 2 turbine flowmeters and one reader.
- 1 nafion line.
- HR monitor belt (COSMED ANT+).
- 1 harness.
- Rugged Peli™ carrying case .
- OMNIA PC software.



The replaceable battery has an LCD showing status of the charge



The K5 face masks are provided with inspiratory valves that can reduce inspiratory resistance while breathing (available in Large, Medium and Small sizes, adult only)

Optional modules

- Long Distance Bluetooth Module.
- IntelliMET™ w/ Micro Dynamic Mixing Chamber.
- ANT+ Engine.
- Wireless wrist-worn pulse oximeter, NONIN WristOx2 3150
- Aquatrainer kit
- 3L Calibration syringe, gas & regulators.





K5 is supplied with a new rugged-waterproof professional case. The case has two compartments for separating wet items from the electrical parts

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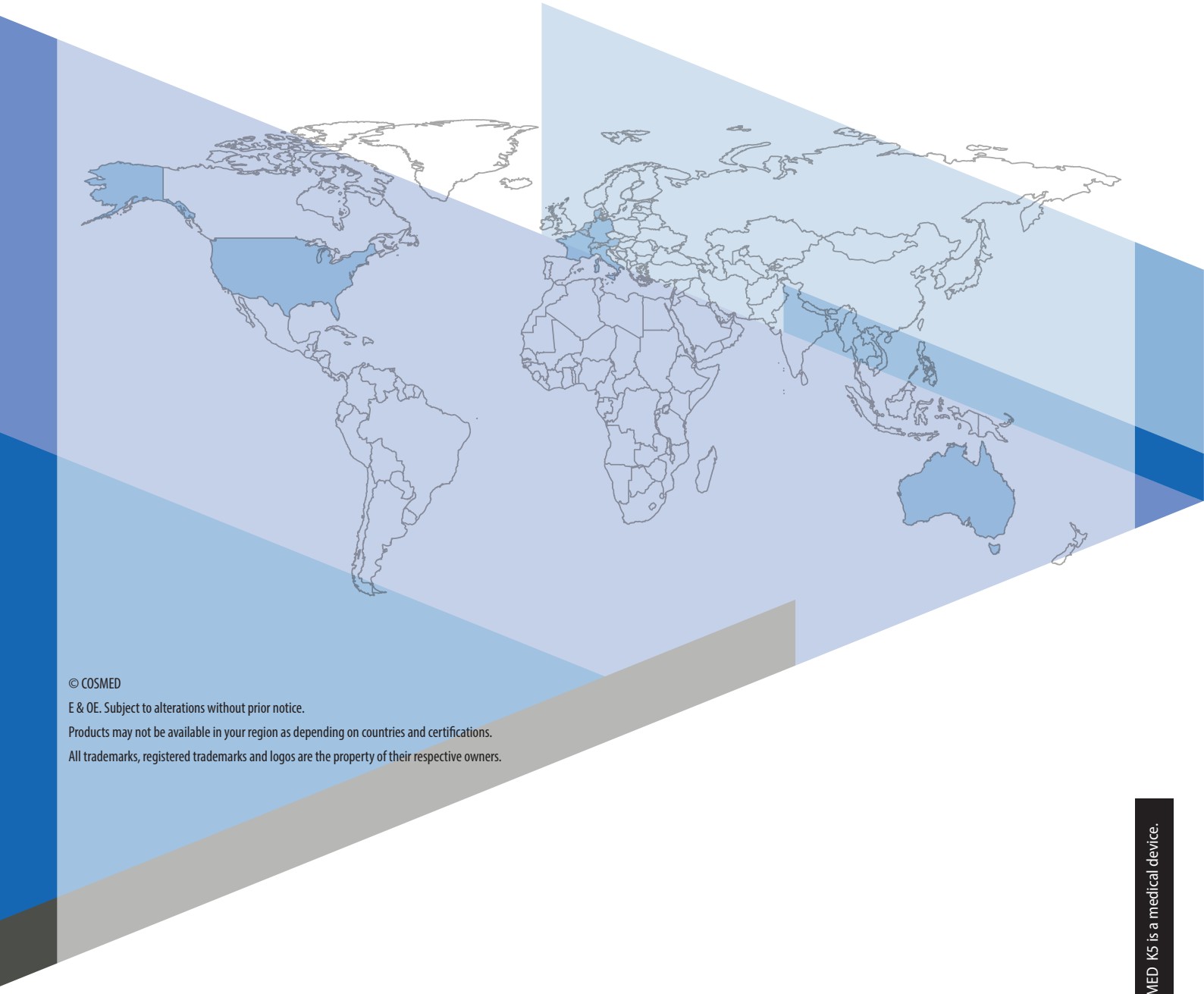
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COSMED K5 is a medical device.

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