



# MARAKEB TECHNOLOGIES

Marakeb Technologies is a leading autonomous technology provider that designs and manufactures advanced technological products ranging from autonomous devices to ground control stations. Due to the current pandemic nature of the COVID-19 virus, Tawazun (TSDF) – a 30% stakeholder in Marakeb - has tasked us with three medical initiatives to confine and disinfect the spread of the virus in the UAE and abroad. Our core objective to ensure the safety and wellness of individuals in different workspaces and environments shaped our approach to the successful launch of four products: **EP Vent**, **MAP IR3**, **CoDi BOT**, and **UVC Broom**.

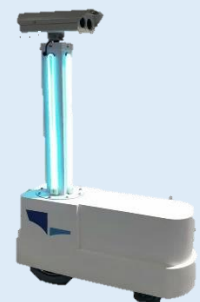
The **EP Vent** is an *emergency ventilator unit* designed for use during medical crises which require quick, affordable access to urgent, life-saving equipment. Equipped with a bag valve mask (BVM) or “self-inflating bag”, in a ruggedized aluminum enclosure, the ventilator enables the patients to move breathable air into and out of their lungs, particularly in cases of pulmonary obstruction. Once connected to a supply of pressurized air, the **EP Vent** is ready to be used.



The **MAP IR3** is a *mass fever screening system* that screens up to 300 people per minute identifies and captures images of feverish subjects, issues real-time audible alerts upon detection, and auto-tracks and captures facial snapshots of all individuals that pass within the frame providing real-time data analytics and videos recordings. All event alerts, images and videos are stored to the local PC or cloud storage for immediate action and/or post-event review.



The **CoDi BOT** is a *disinfectant robot* designed primarily for medical use for the confinement and disinfection of pandemic viruses such as COVID-19. The CoDi bot is equipped with 360-degree UVC lighting and nozzles connected to a refillable disinfectant compartment, and a MAP IR3 system. It can run in manual mode where it is controlled by a joystick remotely or in autonomous mode where it follows pre-programmed routes and functions and is monitored from an operations room.



The **UVC Broom** is a collapsible, transportable device designed to disinfect carpets, tiles, floors, and other surfaces with the use of UV-C radiation. Equipped with four UV-C lights, the **UVC Broom** utilizes UVC radiation 5 cm above the surface enabling operators to disinfect thoroughly and continuously without the need to recharge the device. UV-C Radiation has been proven to be the leading disinfection method to combat pandemic viruses. It is primarily used in mosques, malls, warehouses, airports, offices, schools, and homes.





# EP VENT

The **EP Vent** from Marakeb Technologies is an **emergency ventilator unit** designed for use during medical crises which require quick, affordable access to urgent, life-saving equipment. Equipped with a bag valve mask (BVM) or “self-inflating bag”, in a ruggedized aluminum enclosure, the ventilator enables the patients to move breathable air into and out of their lungs, particularly in cases of pulmonary obstruction. Once connected to a supply of pressurized air, the **EP Vent** is ready to be used. The knobs and buttons on its interface control values such as the tidal volume and breaths per minute, with all vital numbers displayed on its built-in LCD screen. The unit is compact, easy to transport, and a vital aid in states of emergency.



## EMERGENCY PNEUMATIC VENTILATOR

### Efficient Control of BVM

- **Pneumatically actuated**, using air supply of 2 bars or 29 psi.
- Sudden changes to pneumatic supply dampened using a **pressure regulator**.
- Easily removable and replaceable **BVM**.
- Ruggedized aluminum enclosure.

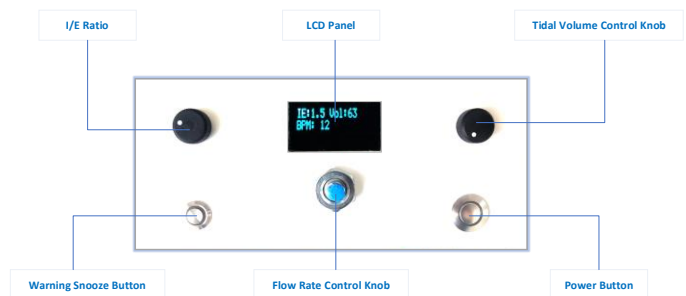
### Safety Features

- **Alarm** buzzer indicating low breaths per minute, high breaths per minute, loss of tidal volume, tidal volume overshoot, loss of power supply, and low battery.
- **BVM** fitted with emergency release valve and Positive End Expiratory Pressure (PEEP) valve.
- **Backup battery** of up to 6 hours in case of power failure from the mains supply.

### Clear, Compact Interface

The **EP Vent** control interface consists of the following:

- **LCD Panel**, which displays user parameters, hours of operation, and system alarms.
- **Tidal Volume ( $V_T$ ) Control Knob**, which adjusts between 25%-100% of the max capacity, 800mL.
- **Inspiration/Expiration Ratio (I/E Ratio) Control Knob**, with a setting range of 1:1 - 1:4.
- **Flow Rate Control Knob**, which enables the operator to adjust breaths per minute.
- **Power Button**
- **Warning Snooze Button**



### Specifications

#### Electrical Specifications

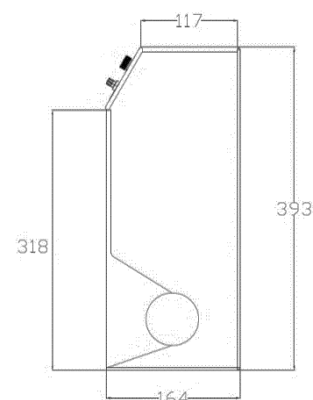
Operating Voltage	220V @ 50 Hz
Battery Life	6 hours

#### Mechanical Specifications

Weight	3.8 kg
Dimensions	393 x 164 x 191.5 (in mm)
Ambu-Bag Volume	1000 mL

#### Operating Conditions

Operating Temperature	-10 °C to 50 °C
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# MAP IR3

## MASS FEVER SCREENING & PANDEMIC CONTROL SYSTEM



### Overview

Marakeb Technologies is a leading integrator of proven pandemic control systems that are used to contain the spread of viruses such as COVID-19 through intelligent analyses and processing in real-time. Due to the pandemic nature of the virus, the utilization of these systems enables the identification and tracking of feverish people in areas with large human traffic up to 300 people per minute.

The autonomous system automatically adjusts and adapts to the surrounding ambient temperature without any human intervention. A built-in sophisticated detection algorithm accurately identifies febrile subjects, issues audible alerts upon detection, and auto-tracks to identify the subject. An intuitive dual display provides easy target identification, simplifies operation, and minimizes handling. With continuous video-recording option, operators can use the recorded videos to run post-screening data reports.

Equipped with a dual-thermal camera coupled with intelligent tracking UI that provides an essential security solution for any modern organization seeking to safeguard human assets and sustain business operations during a pandemic outbreak. The powerful system can be mounted on walls or ceilings that can scan wider areas without long waiting lines risking further contamination.

### Applications

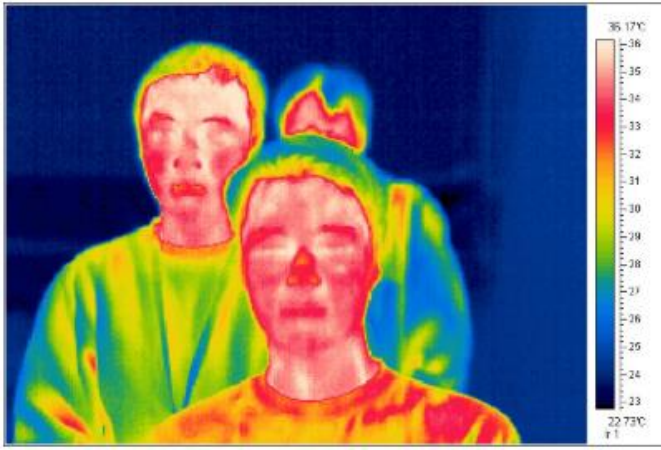
- Airports
- Schools
- Nurseries
- Hospitals
- Government Facilities
- Public Events
- Public Transport
- Buildings
- Malls

### Features

- Non-contact rapid screening
- Large area detection (300 ppm)
- Multi-point temp. measurement
- Cross-infection Avoidance
- Automatic alarm capture
- Facial recognition capture
- Temp measurement  $< +0.3C$
- Continuous video recording
- Rapid deployment



## Thermal Infrared Temperature Monitoring



The importance of detecting potential victims of infectious or contagious diseases cannot be over-emphasized. Screening people in high-traffic areas and checking them for simple fevers such as colds or influenza or something more serious needs a quick and effective system such as that provided by IR3.

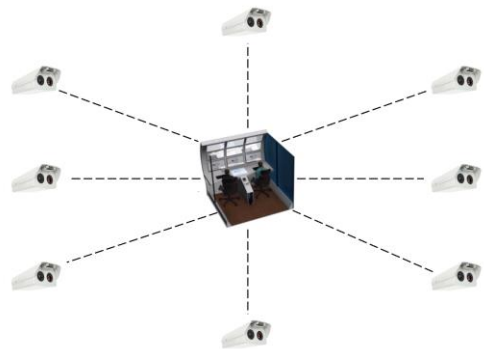
The IR3 is used to scan high traffic areas for feverish symptoms and identify and track the subjects. Any individual showing an abnormal temperature stands out from the crowd and can be automatically identified, tracked, and an alert sent to medical assurance team at the centralized command center for further inspection.

### Centralized Command Station

Marakeb Technologies designs and integrates a fully centralized station to monitor each of the installed pandemic control systems located around a specific area like hospitals, airports, and more.

Real-time video and audible alerts are routed from each of the installed systems back to the command station providing the operators with full situational awareness of their operations.

This networking system enables operators to identify and track any high-risk individuals and to alert response teams to intercept and carry out further processing.



### Technical Specifications

#### Visible Light

Sensor Type	1/1.8" CMOS 200W
Resolution	1920 x 1080
Video Encoding	H.264/H.265
Frame Rate	1~30fps adjustable
Focal Length	3.6~10mm electric adjustable

#### Thermal Imaging

Sensor Type	LWIR uncooled FPA
Resolution	384 x 288
Pixel Size	17 micrometers
NETD	<0.05C @ 27C, f1.0
Wave Range	8-14 micrometers
Non-uniform Correction	Shuttle
Lens	13mm

#### General

Measurement Range	+26C ~ +46C
Accuracy	+0.3 C
Distance	< 8 meters
Face Detection	Available
Face Recognition	Available
Mask Wearing Detection	Available
Internet	10/100m Ethernet, RJ45 Female Interface
Power	12V DC, DC5.5*2.1 Female Interface
Power Consumption	<10W
Operating Temperature	0C ~ +40C
Weight	2.4 kg
Size	365 mm x 216 mm x 138 mm





# CoDi BOT



## DISINFECTION, CONFINEMENT, AND PROTECTION

### Overview

The **CoDi BOT UGV** (Unmanned Ground Vehicle) by **Marakeb Technologies** is designed primarily for **medical use** for the confinement and disinfection of pandemic viruses such as COVID-19. Due to the pandemic nature of the virus, the utilization of CoDi BOT UGV enables the medical teams to carry out safer missions, eliminating the risk of self-contamination.

The UGV is controlled by our MAP Pro autonomous system which provides the remote operators located at a centralized command and control station either to set pre-programmed routes for disinfectant spraying across areas ranging from small confined spaces to larger areas or to manually control the UGV by utilizing a joystick to focus on specific areas within the mission.

Equipped with Gimbal-stabilized EO/IR camera with tracking capabilities, 4G communication links, fixed cameras, and a complete disinfectant system, the video is fed live from the vehicle to the Ground Control Station direct to remote operators, providing them with real-time situational awareness.

### Applications

- Schools Disinfection
- Hospital Disinfection
- Real-time Heat Monitoring
- Quarantine Support
- First-Response Unit
- Exploratory Missions

### Full UGV Control

- Plan and upload routes for autonomous navigation through the **MAP Planner** software.
- Access thermal imaging, live video, disinfectant system, power system information from the UGV.
- Control onboard payload specific to the current mission.



## Infectious Disease Control with UV-C

- 360 degree UVC Light Emitting Diodes covering the entire spectrum of germicidal UV
- No-touch automated disinfection eliminates human error in the disinfection process.

UV-C photons penetrate cells and damage the nucleic acid, rendering them incapable of reproduction, or microbiologically inactive.



## Thermal Infrared Temperature Monitoring



The importance of detecting potential victims of infectious or contagious diseases cannot be over-emphasized. Screening people in high-traffic areas and checking them for simple fevers such as colds or influenza or something more serious needs a quick and effective system such as that provided by CoDi BOT.

The CoDi BOT IR thermal cameras are used to scan a number of people at once. Anyone showing an abnormal temperature stands out from the crowd and can be automatically identified and an alert sent to medical assurance team at the centralized command center for further inspection.

## On-Demand Robotic Cleaning and Monitoring Services

The CoDi BOT software allows facility managers and cleaning teams to set pre-programmed cleaning schedules, follow, track and observe, in real-time, the cleaning and thermal monitoring operations throughout their facility. With live updates and cleaning progress reports, managers can request the assistance of the CoDi BOT on-demand to specified locations. Utilizing a team of CoDi BOTs for large facilities, operations managers can ensure 24-hour infectious disease control with live updates and tracking.



## Technical Specifications

### Physical Specifications

Dimensions	1100mm x 700mm x 1700mm
Weight	160kg
Speed	Up to 10km/hr
Operating time	4 hours

### Electrical Specifications

Power	220V AC, 12V DC
Communications System	4G LTE, Wifi

### UVC Specifications

Wavelength	200-300nm
Lifetime	10,000 hours
Warm-up Time	Instantaneous

### Thermal Specifications

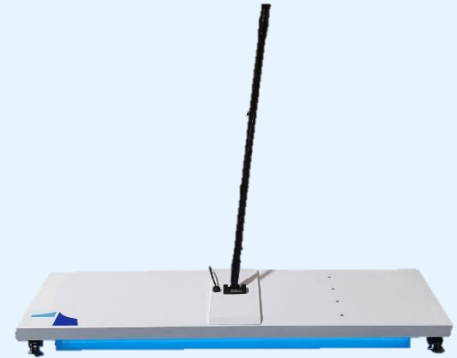
Thermal Resolution	640 x 480
Detector Type	VOx Microbolometer
Field of View	25° x 20°
Focal Length	25mm





# UVC BROOM

The **UVC Broom** is a collapsible, transportable device designed to disinfect carpets, tiles, floors, and other surfaces with the use of UV-C radiation. Equipped with four UV-C lights, the **UVC Broom** utilizes UVC radiation 5 cm above the surface enabling operators to disinfect thoroughly and continuously without the need to recharge the device. UV-C Radiation has been proven to be the leading disinfection method to combat pandemic viruses. Due to potential user error, the UVC Broom has several precautions in place to avoid any direct contact of UV light to human exposure and can operate in the presence of people as most of the UVC radiation is pointed down at the surface. It is primarily used in mosques, malls, warehouses, airports, offices, schools, and homes.

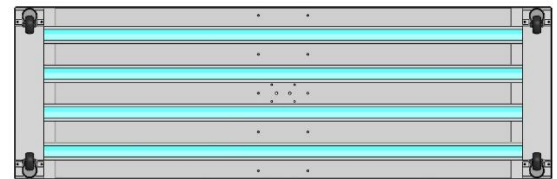


## MARAKEB TECHNOLOGIES COVID-19 RESPONSE

### Features

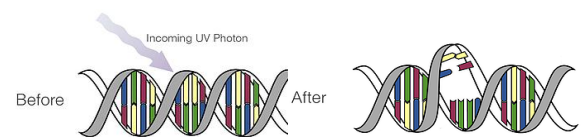
The **UVC Broom** features consist of the following:

- **UVC indicator:** which displays indicator lights that notify the operator that each of the UVC lights is operational or if it needs to be replaced.
- **Handle On/Off Button:** which is located on the handle for easy powering on and off the device.
- **Power Cord:** for continuous use as opposed to recharging so often.
- **Detachable Handle & Swivel Wheels:** which provides ease of storage and transportability



### Infectious Disease Control with UV-C

- **UVC Light Emitting Diodes:** covering the entire spectrum of germicidal UV penetrate the cells and damage the nucleic acid, rendering them incapable of reproduction, or microbiologically inactive.
- **No Human Exposure:** Disinfection only occurs on the horizontal surface beneath the device so there is no human contact.



### Specifications

#### Physical Specifications

Dimensions (Extended)	125 cm x 40 cm x 100 cm
Dimensions (Collapsed)	125 cm x 40 cm x 17 cm
Weight	6 kg

#### Electrical Specifications

Power	220V AC, 12V DC
Power Cord Length	5 meters

#### UVC Specifications

Wavelength	200-300nm
Lifetime	10,000 hours
Warm-up Time	Instantaneous

