

tēmi

THE PERSONAL ROBOT

S1 Technical spec

REVISION-02

9 / 21 / 2020 | ENG



- Any information regarding features and performances in this document is evaluated or approximate.
- Features and performances may change from time to time.
- Features and performances are mostly related to SW version. The Spec will be updated accordingly.
- In case of mismatch between this document and a new version release-note, the release note is determinative
- Performances may differ between devices.
- Performances are very much affected by the environment, use cases and conditions.

DOCUMENT REVISIONS

| Revision | Description | Date | Changed by |
|----------|---|------------|------------|
| 01 | Internal review release | 04/22/2020 | Zamir |
| 02 | Release for Account managers review | 04/26/2020 | Zamir |
| 03 | Added battery life cycle & Lidar MTBF | 05/21/2020 | Zamir |
| 04 | Added CE certified version. Doc revision 02 | 2020/09/16 | Zamir |
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| | | | |

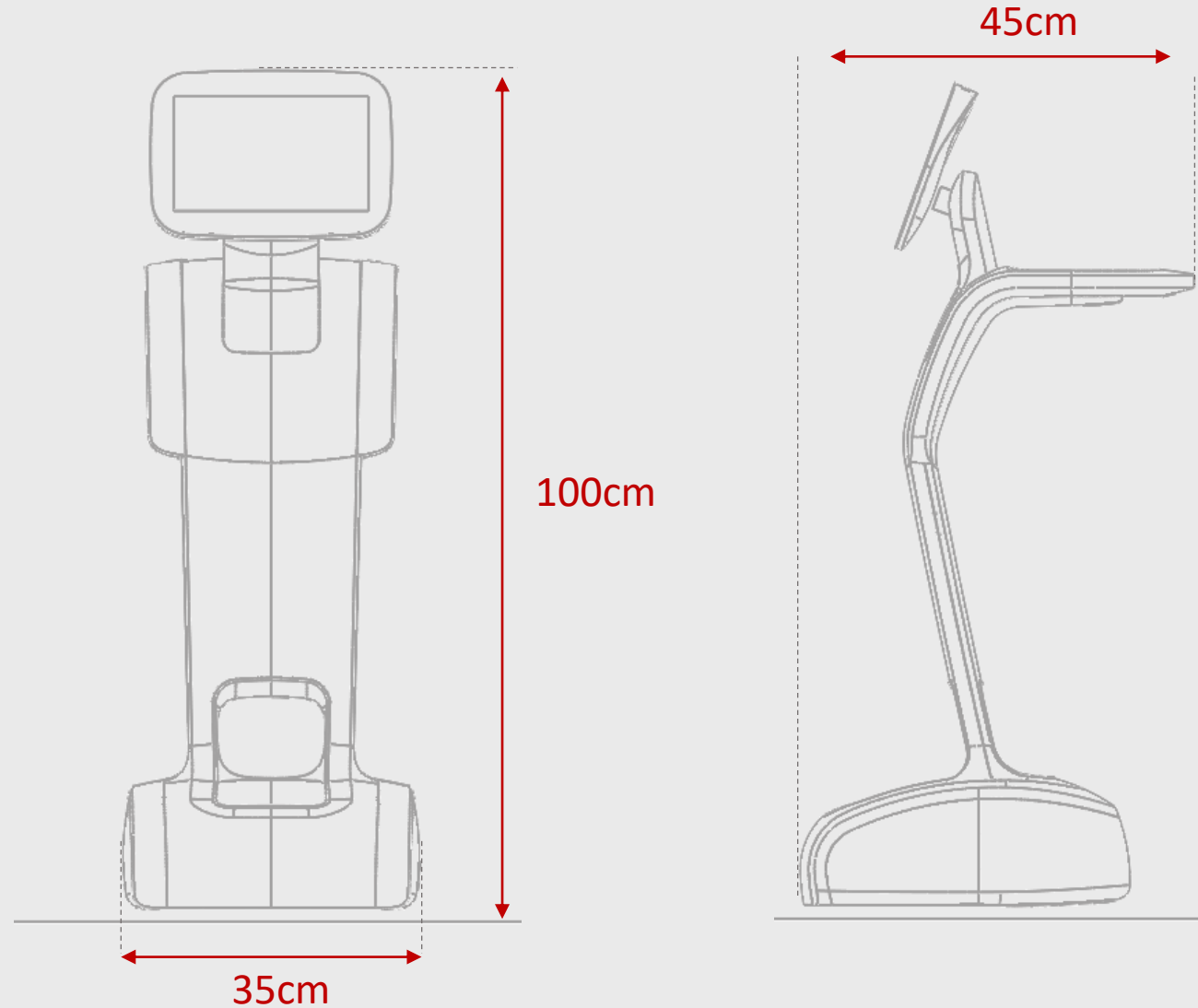
CONTENT

- Robot Dimensions
- Package dimensions + structure
- Palletization
- Storage conditions
- General performances
- Sensors coverage
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- Battery performances + Spec
- Certifications
- Accessories



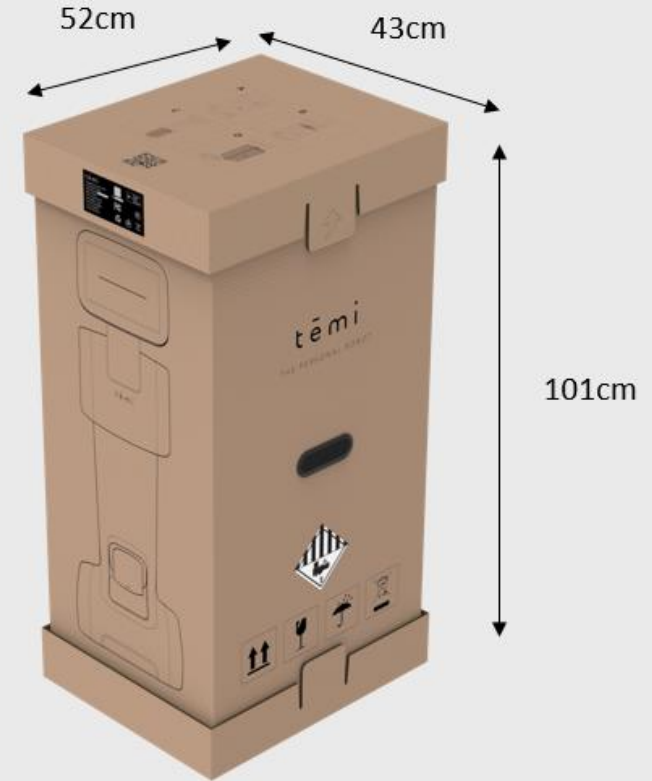
ROBOT DIMENSIONS

| Item | Weight[kg] |
|-------------------|------------|
| Robots WO battery | 12 |
| HB | 1.3 |
| Battery | 1.2kg |

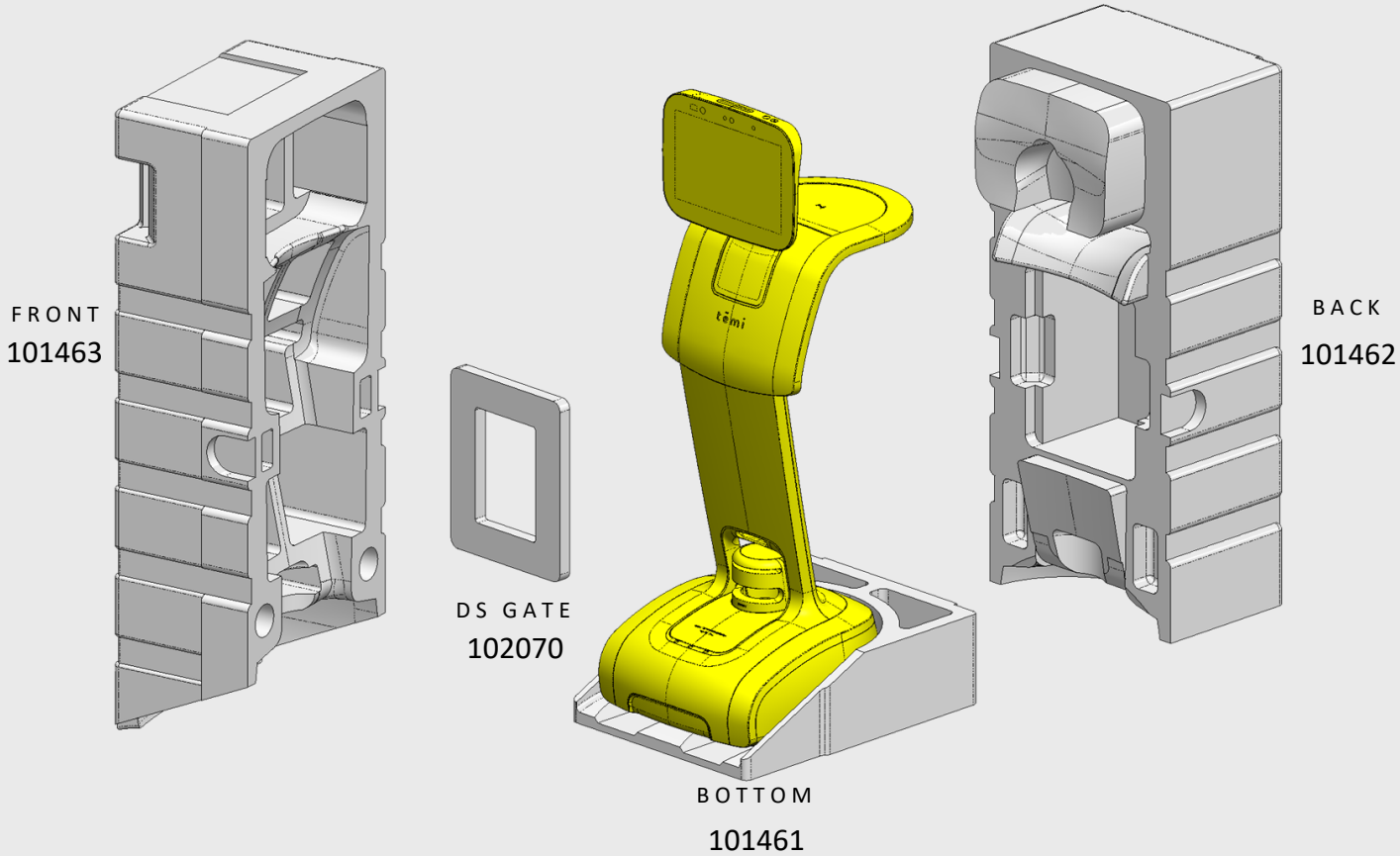


PACKAGE DIMENSIONS

| Item | Weight[kg] |
|--------------------|------------|
| Empty package | 9.2 |
| Fully packed robot | 24.1 |



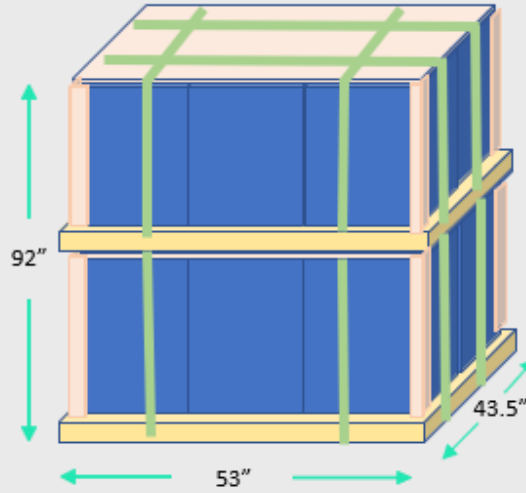
PACKAGE STRUCTURE



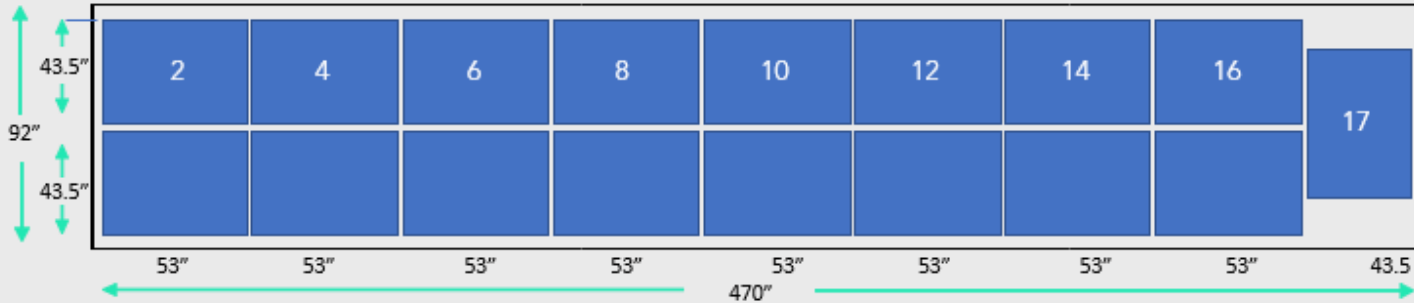
PALLETIZATION

Pallet:

- 1 pallet size with 6 units temi: 53"L X 43.5"W X 46"H
- 6 units per pallet, double stacked, total height: 92"
- Pallet gross weight: 330 lbs



Loading in container (High 40') - $17 \times 2 \times 6 = 204$ units per container



STORAGE CONDITIONS

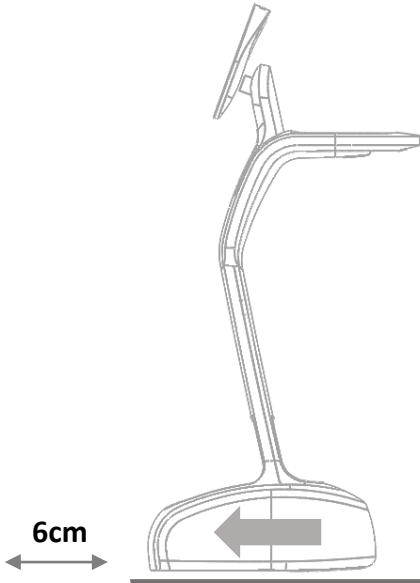
| Item | Units | Value |
|-------------------------|-------|-----------------------|
| Environment | | Indoor conditions |
| Humidity range | % | 15-65 |
| Recommended Humidity | % | <60 |
| Temperatures range | °C | 0-45 |
| Recommended Temperature | °C | 25 |
| Sunlight | | Avoid direct sunlight |

GENERAL PERFORMANCES

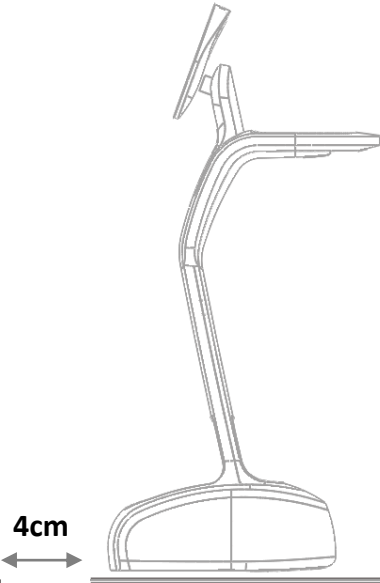
| Category | Item | Value |
|------------------|--------------------------------|---------------------------------|
| Follow | Speed | 1m/sec |
| | Recommended detection distance | ~0.6m |
| | Max detection distance | 2m |
| | Max follow distance | 3m |
| Go-To | Speed | 0.9m/sec |
| | Locations accuracy | 0.1m (map depending) |
| Remote control | Speed | 0.4m/s |
| Floor conditions | Maximum obstacle to climb over | 0.5 cm, static 1 cm at 1 m/s |
| | Maximum gap width | 4 cm, static 6 cm, at 1 m/s |
| | Floor angle | < 3° |
| Mapping | Maximum map size | 100mX100m |
| | Maximum locations allowed | 200 (v121) |

GENERAL PERFORMANCES

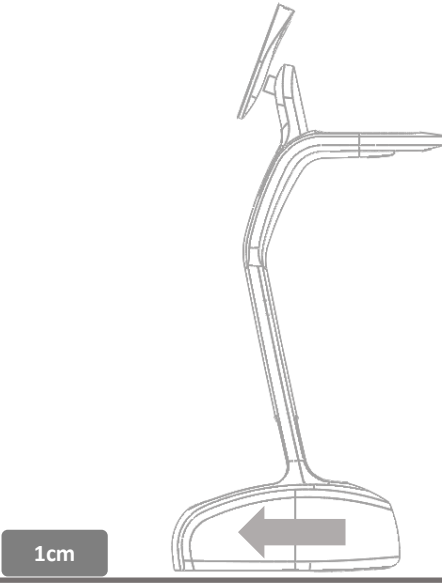
Floor angle / gaps / bumps



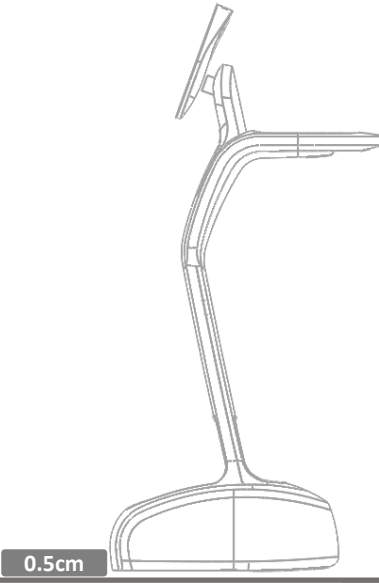
Overcome gap
Max speed 1m/sec



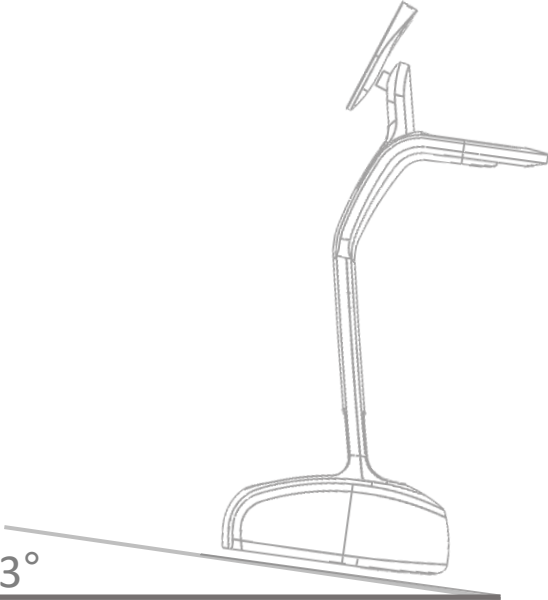
Overcome gap
0 to Low speed



Run-over obstacle
Max speed 1m/sec

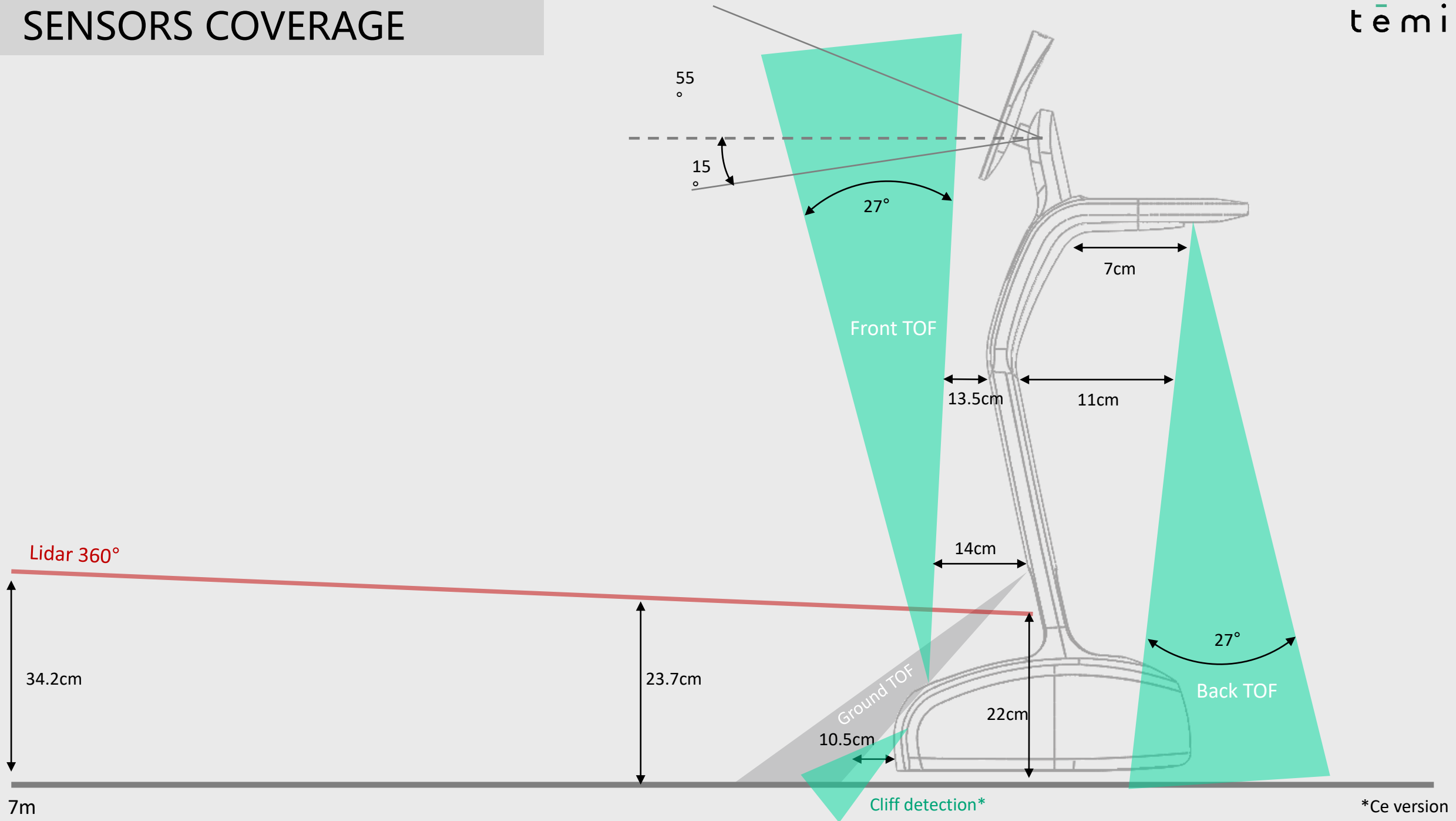


Run-over obstacle
0 to Low speed

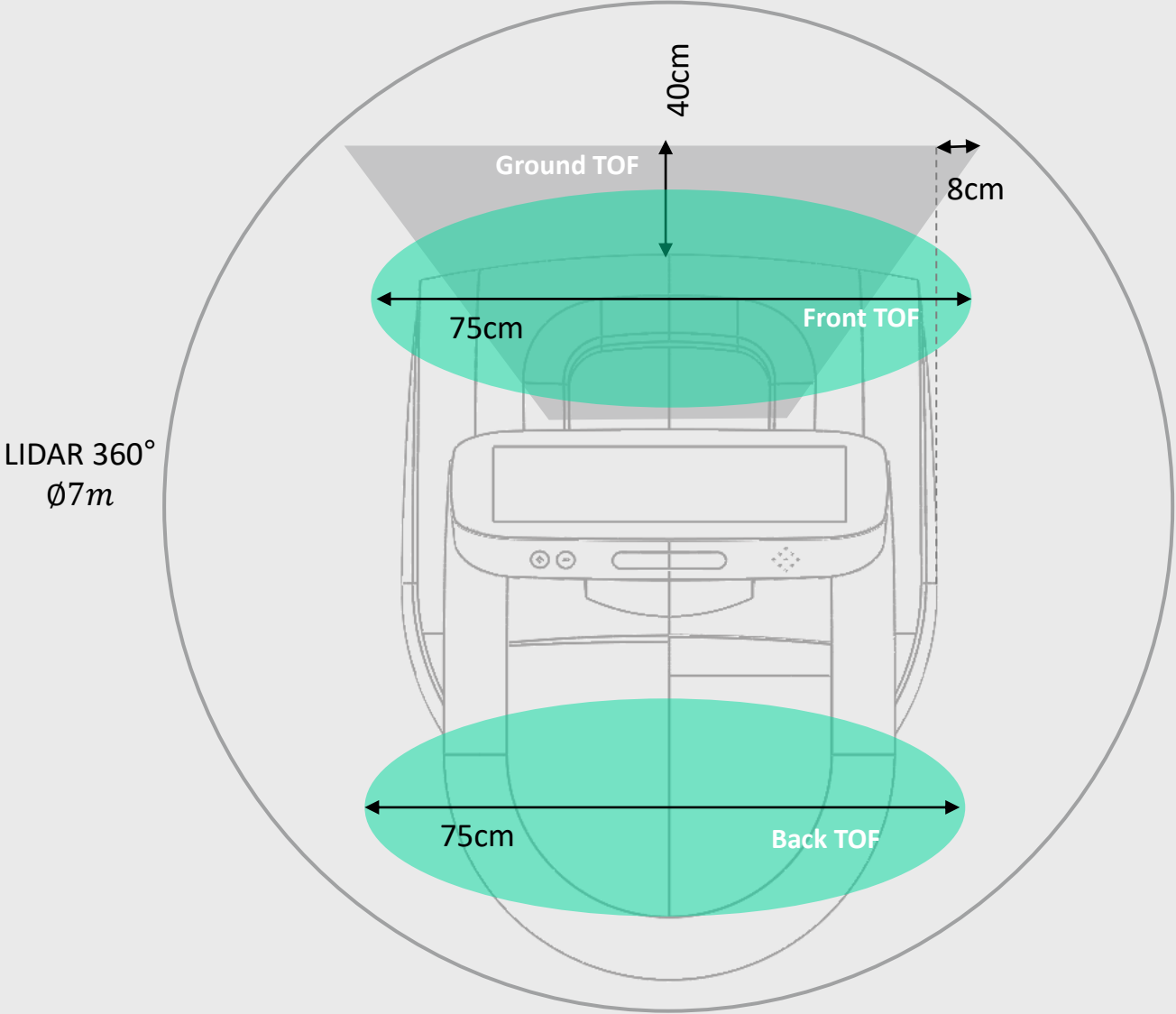


Maximum floor angle allowed

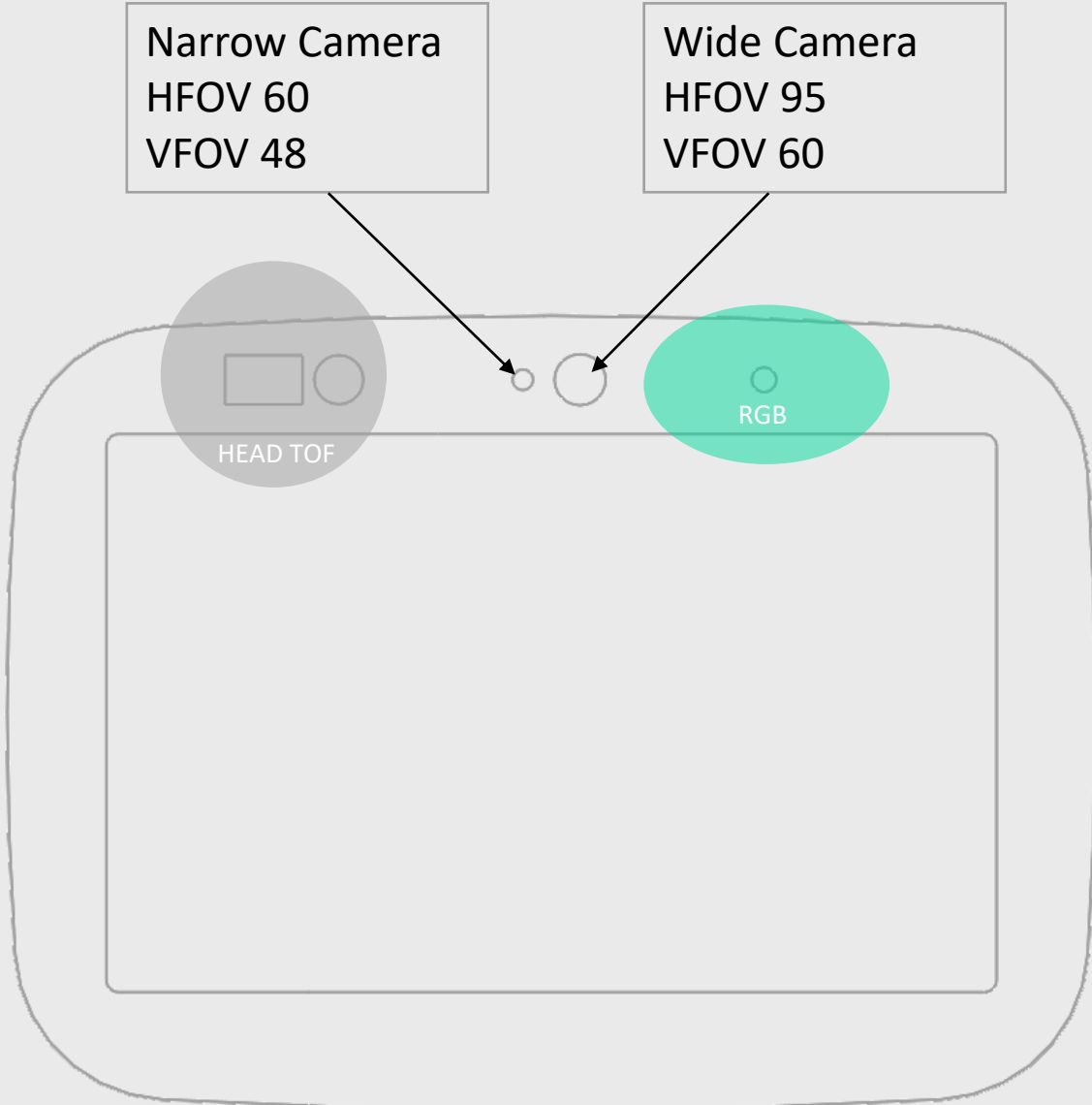
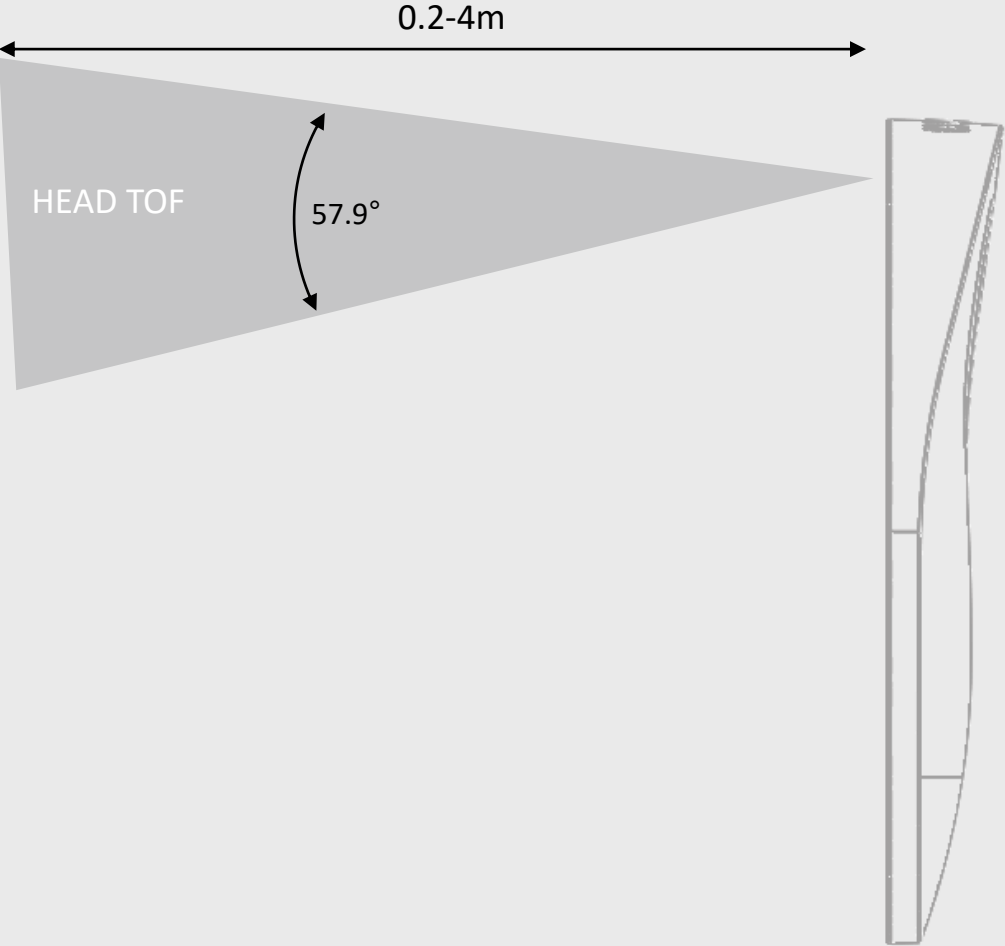
SENSORS COVERAGE



SENSORS COVERAGE



SENSORS COVERAGE



GENERAL SPEC

| Item | Units | Value |
|--|-------|--|
| CPU | | RK3399 Dual-core Cortex-A72 1.8GHz Quad-core Cortex-A53 1.4GHz |
| OS | | Ubuntu |
| Memory | | 4GB |
| Flash | | 32GB |
| Charging | | Autonomous charging, 220V/110V, Charger output 19V/5A |
| Audio - Subwoofer | W | 20 (High Fidelity equalizer) |
| Audio - Midrange | W | 2 x 15 |
| Audio – twitter | W | 2 x 1 |
| Microphone array | | 4 Omni-directional digital mics, real-time localization, beam forming, acoustic echo-cancellation, noise reduction |
| RGB Camera | | 1MP, FOV110°, Hybrid IR filter |
| Tilt | X° | Autonomous face tracking, -15° to +55° tilting |
| Robot noise level (working - lidar spinning) in 0.5m | dB | 47-50 |
| Robot noise level (Stand by – MB fan) in 0.5m | dB | < 32 |

GENERAL SPEC



0.5m

47dB at 0.5m



Head depth cam

10.1" tablet

Tweeters

Midrange speakers

Back TOF

Ground depth cam

Lidar

Subwoofer Speaker

Front TOF

GENERAL SPEC – CE VERSION



0.5m

41dB at 0.5m

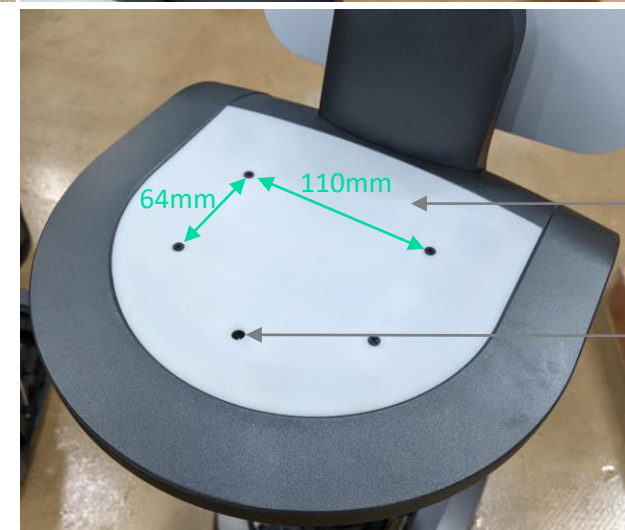


CE certified cliff detection sensor



Head USB socket:

- Standard type A USB
- 5V / 0.9A
- Access to Android



Tray accessories attachment M4 screw

Tray power outlet:

- Power barrel jack 694106402002
- 12V / 1.2A

SENSORS SPEC

| | | |
|---------------|------------------------|--|
| Ground camera | Type | TOF depth camera |
| | Detection range | ~40cm |
| | Min Obstacle detection | Height: 5cm(material sensitive) Color: Not black, opaque, No strong reflection Stairs Height: 15cm |
| | | |



| | | |
|------------|------------------------|------------------|
| Head Depth | Type | TOF depth camera |
| | Detection range | 3m |
| | Min Obstacle detection | Ref. To FOV |
| | | |

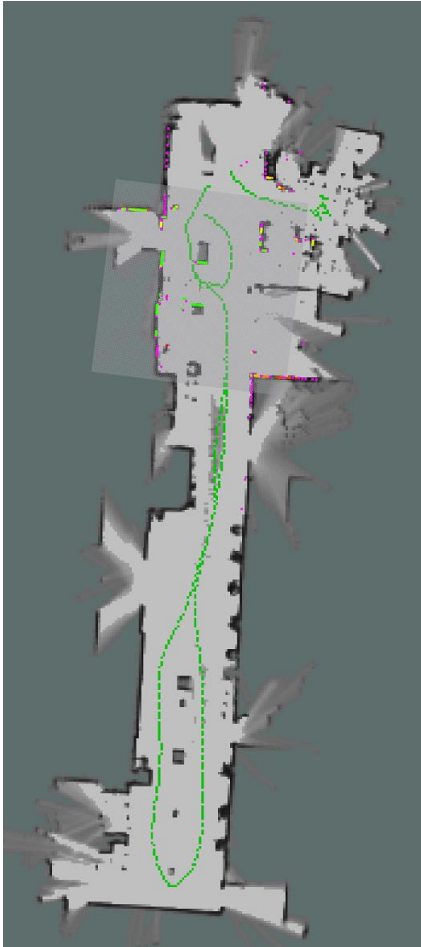


| | | |
|-------|------------------------|--|
| LIDAR | Type | Triangulation |
| | Detection range | 0.2 – 10m |
| | Min Obstacle detection | Leg size: 1.5cm X 1.5cm Height: >22cm Color: Not black, opaque, No strong reflection |
| | Accuracy | (0-3m) 1% / (3-8m)3% |
| | MTBF | 9000Hrs |
| | | |

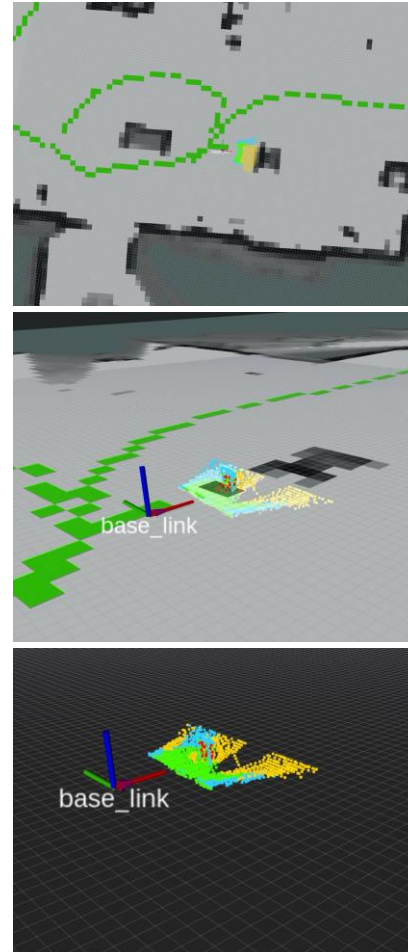


SENSORS SPEC

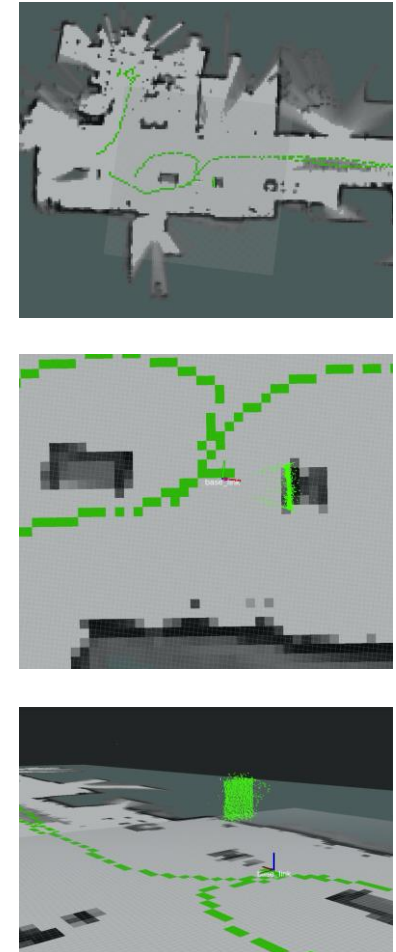
Lidar Point-cloud



Ground camera image



Head camera image



TABLET SPEC

| Item | value |
|----------------------|---|
| Android version | Android 6 |
| CPU | RK3288 Quad-core Cortex-A17 1.8GHz |
| Memory (*CE version) | LpDDR3 2GB / *LpDDR4 2GB |
| Flash | EMMC5.0 16GB |
| Display size | 10.1" |
| Max Brightness | 340 cd/m2 |
| Display resolution | 1200 X 1920 |
| Wide camera | 13MP High resolution, Fixed focus, 1080P@30FPS, FOV 90°, digital zoom |
| Narrow camera | 13MP High resolution, autofocus, 1080@30FPS, FOV 60°, digital zoom |
| Supported languages | EN / CN / KR / JP / DE / TH / HK / TW |
| Available storage | 7GB |
| Wi-Fi | 802.11 b/g/n/ac |
| Bluetooth module | 4.1BLE |

BATTERY PERFORMANCES / SPEC

| Performances | Item | value |
|--------------|----------------------------------|-----------------------|
| | Charging time 0-100% powered on | 4.5h |
| | Charging time 0-100% powered off | 3.5h |
| | Working time – normal usage | 8h |
| | Working time – heavy usage | 4-5h |
| | Return to HB level | 15% |
| | Life cycle (25°) | >500 charging cycles* |



| SPEC | Item | value |
|------|-----------------------|----------------|
| | Cell type | Li-Ion |
| | Battery output | 12-16.4V |
| | Charging voltage | 16.8V |
| | Fully charged voltage | 16.4V |
| | Return to HB voltage | 13.308-13.335V |

*After 500 charging cycles maximum capacity will degraded to 70% and lower

CERTIFICATIONS

| Item | Market | description |
|--------------------------|--------|--|
| *FCC/IC | USA/CA | EMC/RF testing |
| BQB (International) | | Bluetooth RF/Profile testing |
| FDA | | Registration based on product Laser class I test report |
| *DOE-BCS | | Energy efficiency |
| *CEC-BCS | | Energy efficiency |
| CP65 | | Mainly Chemical test for Pb,Phthalates content to touchable parts of robot |
| IEC60825 (International) | | Laser parts class I testing |
| CPSC | | Mainly Chemical test for Pb,Phthalates content to touchable parts of robot |

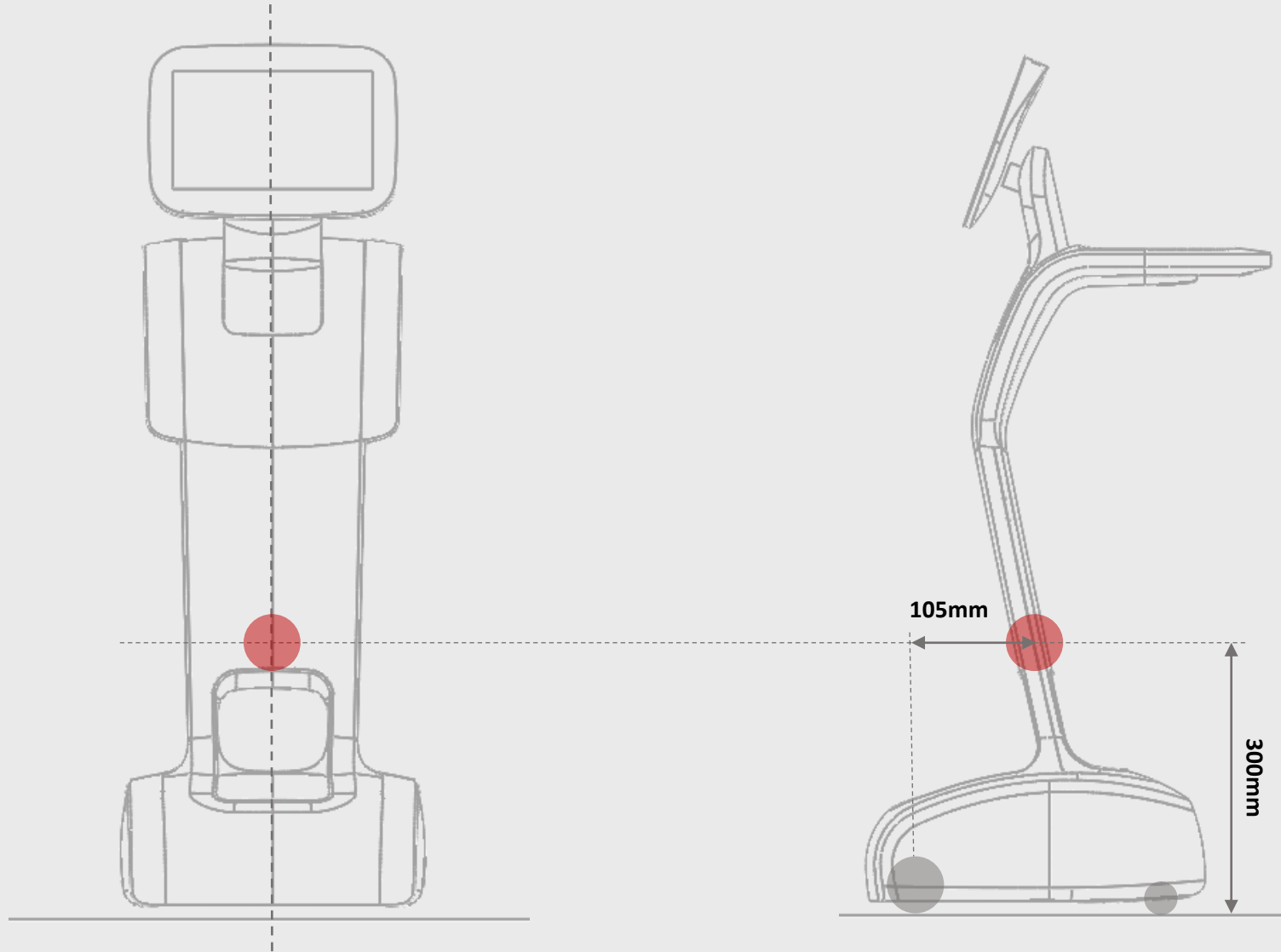
CERTIFICATIONS

| Item | Market | description |
|---------------------------|--------|---|
| *CCC | CHINA | EMC/Safety testing |
| SRRC | | WiFi&BT RF testing |
| *CE RED(RF/EMC) | EU | RF/EMC testing |
| *CE-MD | | Safety testing including ISO13482/EN60204 |
| *GDPR | | General data protection |
| *POPS | | Chemical testing |
| *WEEE | | Waste Electrical and Electronic Equipment |
| *RoHS 2.0 | | Chemical testing |
| *REACH (SVHC197 Items) | | Chemical testing |
| RCM | | AUSTRILIAN |
| MIC for telecom-JATE | JAPAN | WiFi & BT protocol testing |
| MIC for Radio-TELEC | | WiFi & BT Signaling interaction testing |

CERTIFICATIONS

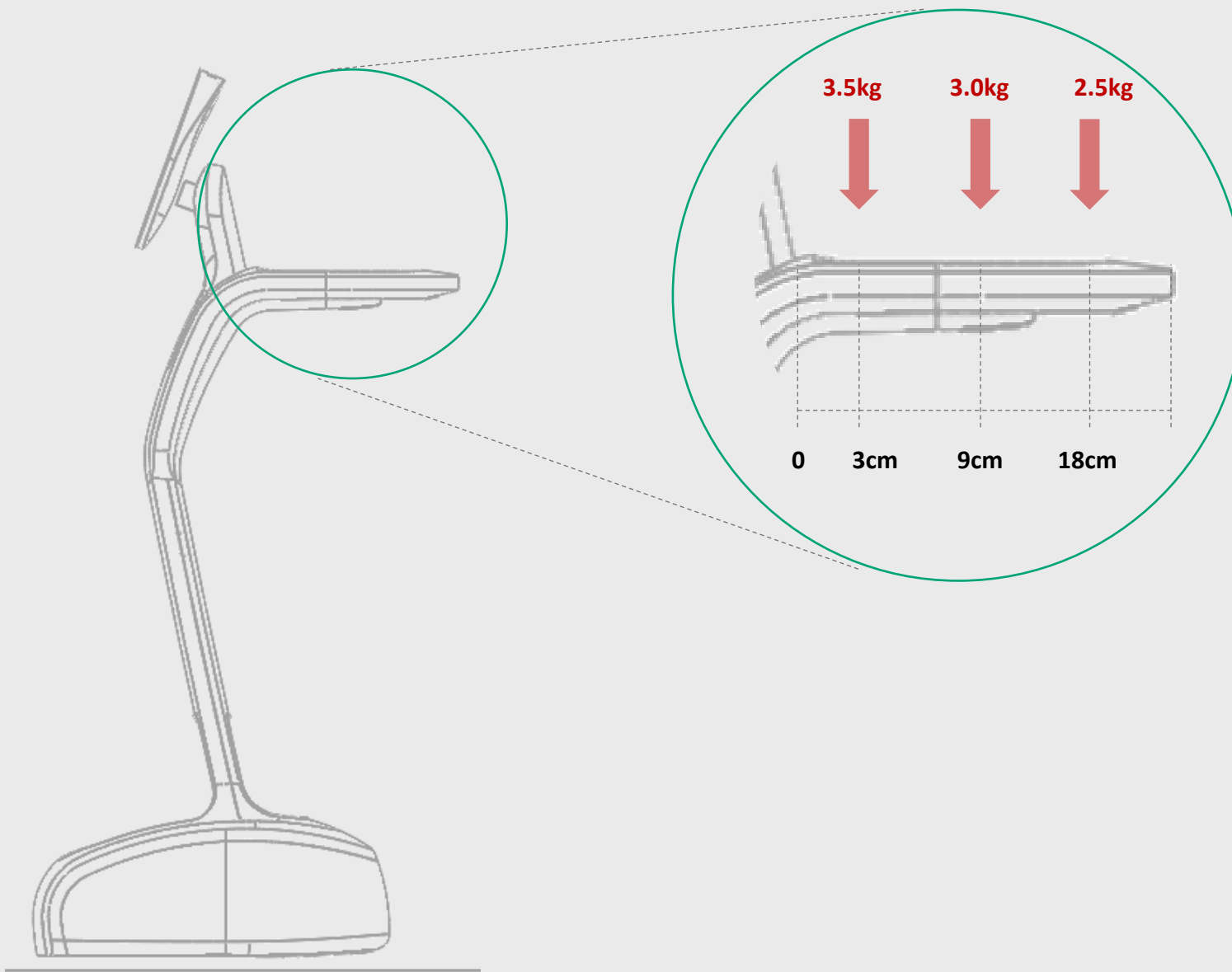
| Item | Market | description |
|-------|-------------------|--|
| IMDA | SINGAPORE | Doc transfer, need CE-RF/EMC/EN60950 Safety report |
| NTC | PHILIPPINE | Doc transfer, need CE-RF/EMC/EN60950 Safety report |
| *MSIP | KOREA | EMC/RF testing |
| WPC | INDIA | Doc transfer, need CE-RF/EMC/EN60950 Safety report |
| *NCC | TAIWAN (CHINA) | RF/EMC testing |
| OFCA | HK (CHINA) | Doc transfer, need FCC Safety report |
| NBTC | THAILAND | Doc transfer, need CE-RF |

ACCESSORIES – CENTER OF MASS

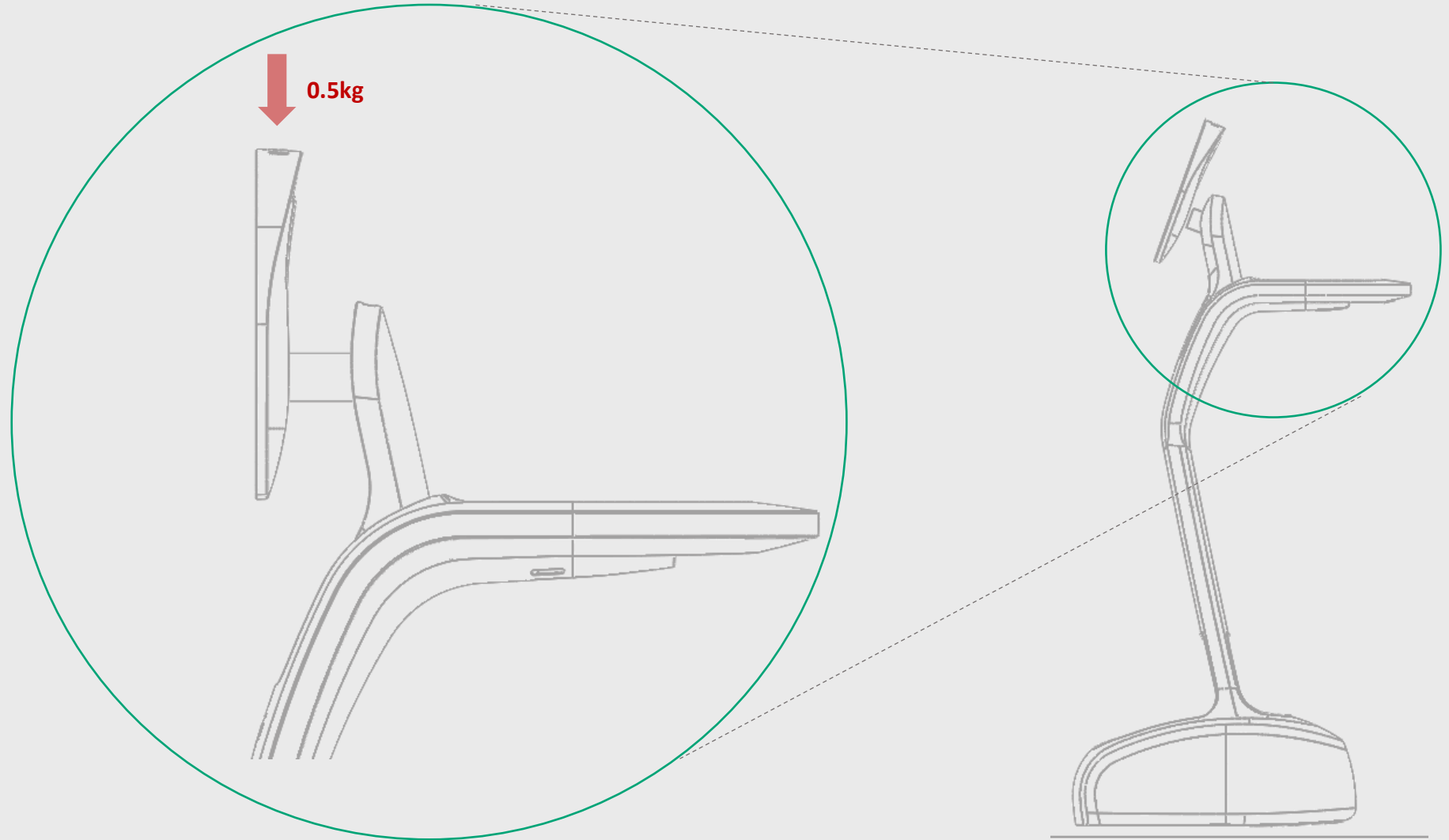


ACCESSORIES – MAX LOAD ON TRAY

Maximum load allowed
3.5kg



ACCESSORIES – MAX LOAD ON HEAD



A dark, minimalist chair with a curved backrest and a wide, flat seat. The chair is set against a dark, textured background. The text "THANK YOU" is centered on the chair's backrest in a white, sans-serif font.

THANK YOU