

## Autonomous Mobile Robots

# OL-450S Series

**Self-navigating, ultra-low, mobile robots that transport cages and carts with a combined payload up to 450 kg**

- Natural feature navigation:  
Automatically plans efficient routes and prevents collisions;  
capable of omni-directional navigation
- Fleet management:  
Scale deployment with AMR prioritization and multi-robot  
coordination, for manufacturing environments
- Easy integration:  
Installs quickly, without facility modifications
- Ultra-low design:  
Fits underneath roll cages and carts for autonomous  
transportation of existing storage solutions
- Wireless charging



## Ordering Information

Model	Lift Plate Length	Mast	Ordering Code
OL-450S2	771 mm	1.6 m	37590-70000
		None	37590-70009
OL-450S3	851 mm	1.6 m	37590-80000
		None	37590-80009

**Note:** All AMRs in a fleet must have the same version of the FLOW Core software installed. Other considerations must be made when adding AMRs to a fleet. Contact your local OMRON representative for more information.

**Note:** The battery for the OL-450S Series AMR must be ordered separately (part number 28110-020). Before ordering lithium-ion batteries, please verify local shipping regulations to ensure compliance with applicable laws and restrictions.

## Items Included with AMR

Item	Description
Labels	Warning and product labels
Printed Documentation	Printed guides for safety, unpacking and assembling
Lift Rings	Hardware for lifting the AMR
Triangle Spanner Key	Tool for removing the front skin

## Accessories and Optional Items

Item	Details	Ordering Code
Battery*1	Rechargeable power source for the AMR.	28110-020
Stationary Electronics and Stationary Coil	Power supply box for charging the AMR battery. Includes the external charging coil for wireless charging, cables and covers. Power cable and mounting hardware are user supplied.	28110-101
Charging Ramp	Floor mounted wireless charging protective surface.	28110-102
Service Charger	Portable charger for use in an AMR power loss event. Includes cables for five different regions.	28110-113
Manual Mover	Used for moving unpowered AMRs.	28110-501
Mast	1.6 m mast.	28110-522
	1.2 m mast.	28110-518

## OL-450S Series

Item	Details	Ordering Code
Lift Bridge	Provides an alternate method to lower the lifting mechanism. Includes battery charger for European region.	28110-503
Lift Bridge Charger (Europe only)	Charger for charging the Lift Bridge. Rated for 220 - 240 VDC at 50 Hz.	28110-508
Work Bench	Adjustable height table used for performing maintenance tasks.	28110-504
Maintenance Kit 1	Cleaning wipes for scanners.	28110-506
Maintenance Kit 2	Cleaning fluid for scanners.	28110-505
Mobile I/O Box	Used with a Fleet Manager to summon an AMR to a goal or control connected devices with I/O.	23419-802
Mobile I/O Box Power Supply	Recommended for purchase with the Mobile I/O Box.	23419-812

\*1 Before ordering lithium-ion batteries, please verify local shipping regulations to ensure compliance with applicable laws and restrictions.

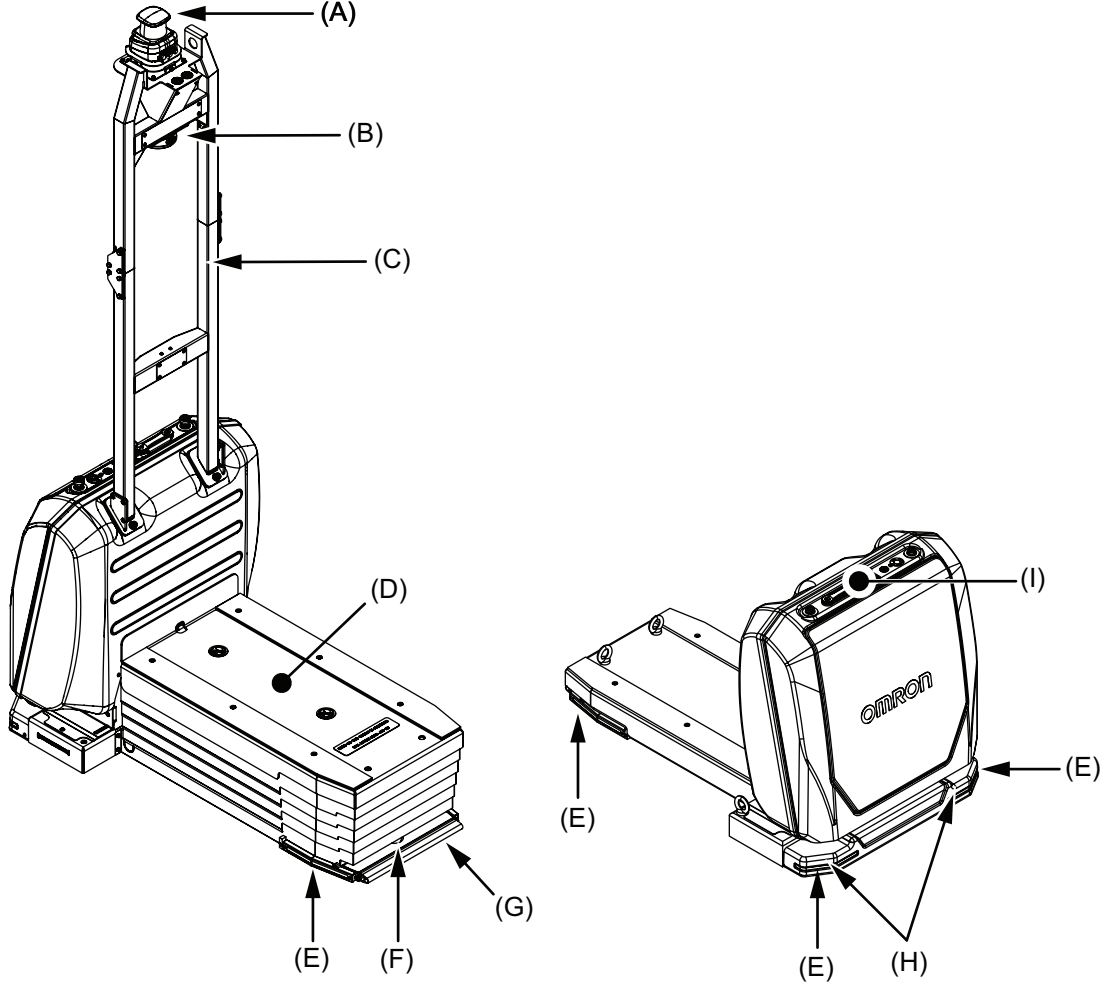
## Software Licenses

Product Name	Applicable For	Configuration	Ordering Code
Fleet Operations Workspace Core Fleet Manager License, 3 Year	Virtual Fleet Manager	Initial entitlement for a 3 year renewable FLOW Core license. Replace □□ with 01, 05, 10, 15, 20, 25, 30, 50 to indicate the number of AMRs licensed to connect. For 31 or more AMRs, use 50.	30271-1□□*1
Fleet Operations Workspace Core Fleet Upgrade		Entitlement for fleet connection limit increase by one additional AMR (used for existing installations).	30271-001
Fleet Operations Workspace Core Renewal		Entitlement for a 1 year renewal of the FLOW Core license. Replace □□ with a value of 05 to 30, or 50 to indicate the number of AMRs licensed to connect. For 31 or more AMRs, use 50.	30271-2□□
Unified Fleet License		Provides interoperability within complex and diverse fleets. Includes Traffic Light Sector to allow for secure, reliable intersection and area exclusion management among multi-vendor AMRs. Entitlement for a perpetual Unified Fleet license.	30271-601
Fleet Operations Workspace iQ License (FLOW iQ)		Entitlement for a 1 year renewable FLOW iQ license. Entitlement for a 3 year renewable FLOW iQ license.	30271-701 30271-703
Cell Alignment Positioning System (CAPS) License	AMR	AMR Alignment using software-defined target. Entitlement for a perpetual CAPS license.	20271-805
Cycle Time Optimization License		Enables reduced cycle times with fewer stops and path caching. Entitlement for a perpetual Cycle Time Optimization license.	20271-905

\*1 After expiration of a FLOW Core Fleet Manager license, all Virtual Fleet Manager functionality will continue to operate without requiring subscription renewals. An active subscription will still be required to access subsequent software releases, including bug fixes, feature upgrades, and performance improvements.

**Note:** To upgrade to the latest version of the FLOW Core software, contact your local OMRON representative. Please note that an active subscription is required for access to software upgrades.

Features and Components



Item	Description	Item	Description
A	360-degree Scanner*1	B	LED Signal Lamp*1
C	Mast*1	D	Lifting Plate
E	Light Strips	F	Rear Scanner
G	Rear Bumper	H	Front Safety Scanners
I	Control Strip		

\*1 Optional equipment.

Specifications

Item	Details	
	OL-450S2	OL-450S3
<b>Model</b>		
<b>Weight (with Battery)</b>	201 kg	205 kg
<b>Weight, no mast (with Battery)</b>	188 kg	192 kg
<b>Environment</b>	<b>Ambient Temperature</b>	5 to 40°C
	<b>Storage Temperature</b>	-20 to 60°C
	<b>Operating / Storage Humidity</b>	5% to 95% (non-condensing)
	<b>Operating Environment</b>	Indoors only, no excessive dust, no corrosive gas
	<b>Altitude</b>	2000 m (max.)
	<b>Pollution degree</b>	2
	<b>Ingress Protection Class</b>	IP20
	<b>Dust / Smoke</b>	< 11.7 mL / m <sup>2</sup> of dust with a particle size < 40 μm, avoid dusty or smoky areas
	<b>Enclosure Rating</b>	NEMA Type 2
<b>Atmospheric</b>	Non-hazardous environments (no explosive gas or oil mist)	

# OL-450S Series

Item		Details	
Model		OL-450S2	OL-450S3
Floor Conditions	Ground Clearance	10 mm	
	Minimum Floor Flatness	NEN 2747-2001 / flatness category 5, DIN 18202 Group 3	
	Minimum Levelness	FL25 (per ACI 117 standard)	
	Electrical Conduction	Maximum floor resistance 1 GΩ	
	Abrasion Resistance	NEN 2743-1999 / Abrasion resistance 1	
	Maximum Step Traversal	No step traversal permitted	
	Maximum Gap Traversal*1	10 mm	
	Maximum Slope	Flat surfaces only	
	Minimum Floor Compressive Strength	9.9 MPa, NEN-EN 206-1: 2014 / strength category C25 / 30	
	Minimum Coefficient of Friction	Static coefficient of friction $\mu_s \geq 0.6$ Dynamic coefficient of friction $\mu_d \geq 0.4$	
Navigation	Routing	Autonomous routing by localizing with safety scanning laser, based on environment mapping	
	Environmental Map-making Method	Scan by driving the AMR through the environment and upload the scan data to MobilePlanner	
Lifting	Lifting Capacity	450 kg	
	Lifting Height	308 mm	
	Lifting Speed	40 mm/s	
Mobility	Run Time	Full payload: approximately 7 hours No payload: approximately 11 hours	
	Swing Radius	685 mm	
	Turn Radius	750 mm	
	Maximum Translational Speed (forward and lateral)	1200 mm/s	
	Maximum Reverse Speed	300 mm/s	
	Maximum Translational Acceleration	750 mm/s <sup>2</sup>	
	Maximum Translational Deceleration	1000 mm/s <sup>2</sup>	
	Maximum Rotational Speed	65°/s	35°/s
	Maximum Rotational Acceleration	165°/s <sup>2</sup>	85°/s <sup>2</sup>
	Maximum Rotational Deceleration	165°/s <sup>2</sup>	85°/s <sup>2</sup>
	Maximum Moment of Inertia	100 kg·m <sup>2</sup>	
	Stop Position Repeatability (Single AMR)*2	To a position: $\pm 160$ mm, $\pm 7^\circ$ With CAPS: $\pm 6$ mm, $\pm 0.6^\circ$	
	Stop Position Repeatability (Fleet)*2	To a position: $\pm 160$ mm, $\pm 7^\circ$ With CAPS: $\pm 10$ mm, $\pm 0.8^\circ$	
Drive Wheels	Materials	Steel with Vulkollan (polyurethane) tread	
Standards	AMR	EN ISO 12100, EN ISO 13849-1, EN IEC 60204-1, EN ISO 3691-4 (except clause 4.12), EN61000-6-2, EN61000-6-4	
	Battery	UN 38.3	
	Stationary Electronics and Stationary Coil	EN 60335-2-29, EN 62311, EN 55011, EN 61000-6-2, UL 1564, CAN/CSA C22.2 107.2	
	Wireless	IEEE 802.11 a/b/g	
Regulatory Markings	AMR	KC, CE, RCM	
	Stationary Electronics and Stationary Coil	CE, cMETus	
	Battery	CE	
Safety Features	Safety Scanners	2 Front Safety Scanners, 29 zone sets, selected based on velocity. Lasers are rated as Class 1/M, eye-safe	
	E-Stop Buttons	2 buttons on Control Strip	
	Rear Bumper	Stops AMR when rear bumper is depressed by physical contact	
	Audible Indicators	Audible warning buzzer, programmable through MobilePlanner	
Visual Indicators	LED Light Strips	Shows direction of movement and operational status, located on front and rear of AMR	
	LED Signal Lamp	Shows direction of movement and operational status, located on mast*3	

\*1: A 10 mm gap cannot be traversed at speeds greater than 750 mm/s.

\*2: Stop position repeatability values were obtained using default AMR parameters and a map created by the OL-450S Series AMR.

\*3: Optional equipment.

## Charging Station

<b>Maximum Input Current</b>	16 A
<b>Input Voltage</b>	200 to 240 VAC, 50 to 60 Hz, single phase
<b>Output Voltage</b>	15 VDC to 60 VDC (28 VDC nominal)
<b>Power Consumption</b>	3.3 kW
<b>Maximum Output Current</b>	60 A
<b>Maximum Output Power</b>	3 kW
<b>Relative Humidity</b>	0 to 95% non-condensing
<b>Charging Method</b>	Wireless (primary), wired (secondary)
<b>Ambient Operating Temperature</b>	-10 to 40°C
<b>Storage Temperature</b>	-20 to 55°C
<b>Ingress Protection</b>	Stationary Electronics: IP20 Stationary Coil: IP68
<b>Altitude</b>	2000 m maximum
<b>Pollution Degree</b>	1
<b>Equipment Class</b>	Class A
<b>Weight</b>	Stationary Electronics 5.9 kg Stationary Coil 2.8 kg

## Battery

<b>Type</b>	Lithium-ion (LiFePO4)
<b>Voltage</b>	25.6 VDC
<b>Capacity</b>	42 Ah nominal
<b>Recharge Time</b>	25 min. (from 20% to 80%)*1
<b>Charge Cycles</b>	Approx. 6000 cycles*2*3
<b>Duty Cycle (depth of discharge)</b>	80%
<b>Charging Method</b>	Wireless (primary), wired (secondary)
<b>Ambient Charging Temperature</b>	10 to 40°C
<b>Discharging temperature</b>	0 to 50°C
<b>Storage Temperature</b>	-20 to 60°C
<b>Humidity (operating and storage)</b>	10 to 90%, non-condensing
<b>Altitude</b>	2000 m
<b>Ingress Protection</b>	IP54
<b>Weight</b>	20 kg

\*1: Charging time can vary based on battery cell temperature and state of charge to prolong battery life.

\*2: Approximately 80% of nominal battery capacity will be available after using the battery at 100% depth of discharge.

\*3: Under the following conditions:

- Temperature: 15 to 50°C
- Relative humidity: 25% to 85%

## Version Information

The details in this document apply to products operating with the following hardware and software versions.

- AMR Version 2.1.0
- FLOW Core Software Version 5.3
- Battery Version V1

## MobilePlanner Software Requirements

<b>MobilePlanner PC</b>	<b>Operating System</b>	Windows 10 (64-bit version), Windows 11
	<b>CPU</b>	1.5 GHz dual-core CPU recommended
	<b>Main Memory</b>	1.5 GB min. (4 GB min. recommended)
	<b>Hard Disk</b>	At least 400 MB of available space
	<b>Video Memory</b>	256 MB min.
	<b>Display</b>	XGA 1024 x 768, 16 million colors minimum
<b>MobilePlanner Tablet Edition</b>	<b>Operating System</b>	Android® OS, Version 9 or newer, minimum 2 GB of RAM iOS®, Version 10 or newer
<b>Supported Languages</b>	English, German, Japanese, French, Italian, Korean, Spanish, Polish, Simplified Chinese and Traditional Chinese	

## Virtual Fleet Manager Software, Minimum Hardware Requirements

<b>Fleet Size / AMR Count</b>	Small ≤ 5	Medium ≤ 15	Large ≤ 30	X-Large > 30*1
<b>Virtual CPU</b>	2 Cores		4 Cores	
<b>Clock Speed (per core)</b>	2 GHz	4 GHz	3 GHz	4 GHz
<b>Virtual RAM</b>	8 GB	16 GB	24 GB	32 GB
<b>Virtual Disk</b>	512 GB			1 TB
<b>FLOW Software Version</b>	Minimum FLOW Core 5.0			

\*1: Contact your local OMRON representative for fleets larger than 100.

**Note:** The PC/IPC/Server is supplied by the user.

## Service Charger

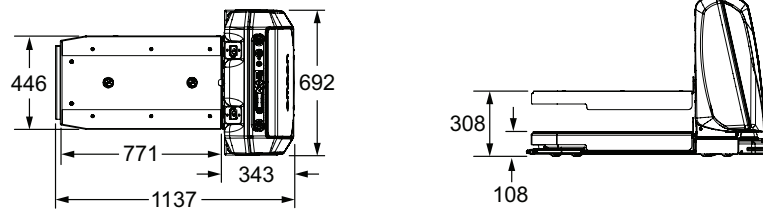
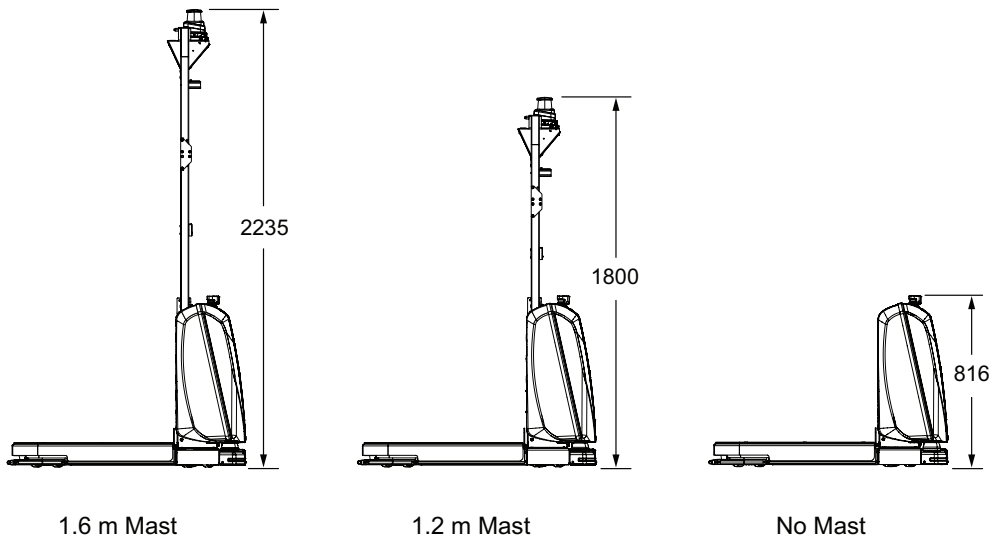
<b>Input Voltage</b>	100 to 240 VAC, 50 / 60 Hz
<b>Input Current (max.)</b>	7.5 A
<b>Output Voltage</b>	24 VDC Nominal 27.75 VDC Maximum
<b>Maximum Output Current</b>	7 A
<b>Charge Time</b>	72 minutes (from 0 to 20% state of charge)
<b>Ambient Operating Temperature</b>	-40 to 65°C
<b>Humidity</b>	0 to 95% non-condensing
<b>Weight</b>	2.9 kg
<b>Dimensions (L x W x H)</b>	252 mm x 179 mm x 120 mm

# OL-450S Series

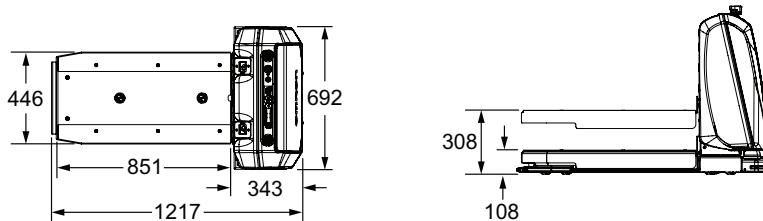
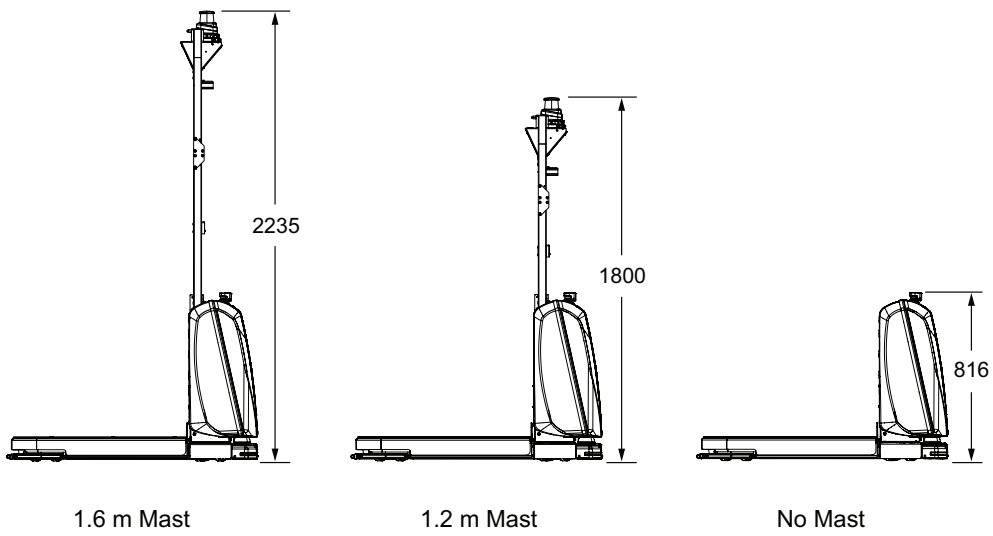
## Dimensions

(Unit: mm)

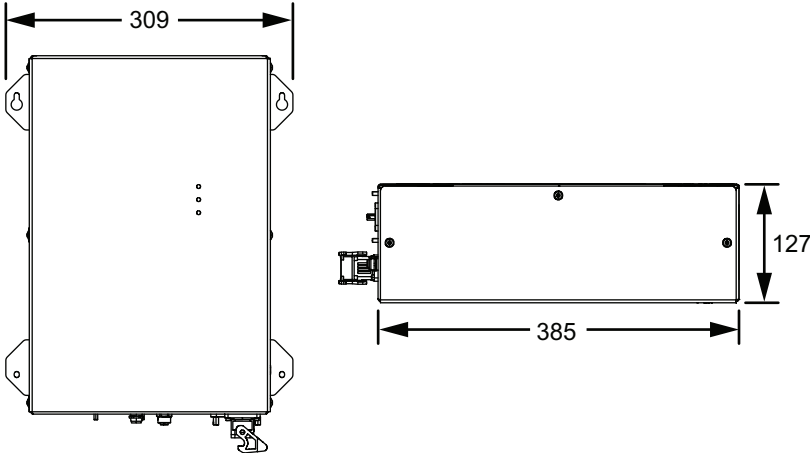
### OL-450S2



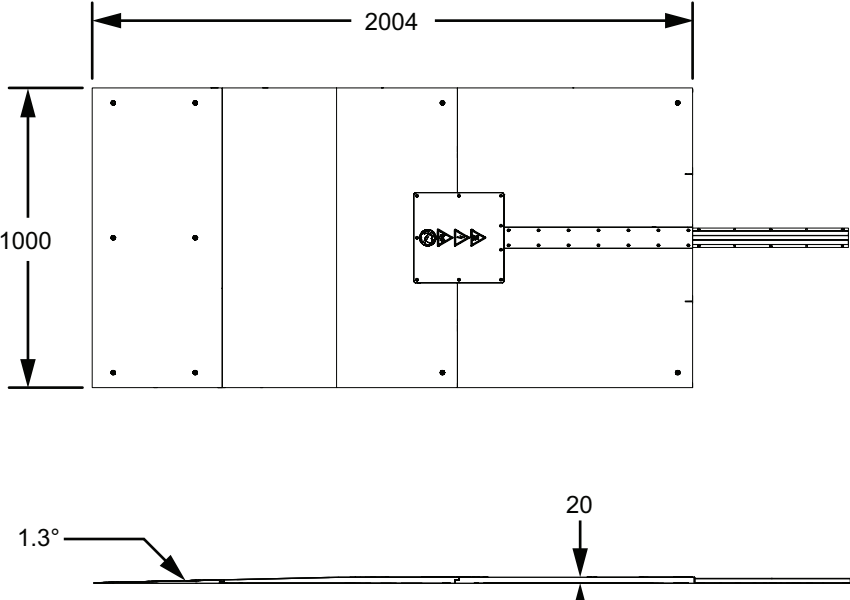
### OL-450S3



Stationary Electronics Dimensions



Charging Ramp Dimensions



## OL-450S Series

### Related Manuals

Catalog Number	Manual Title
I614	Mobile Robot Software Suite User's Guide
I617	Advanced Robotics Command Language AMR Reference Guide
I618	Advanced Robotics Control Language Fleet Manager AMR Integration Guide
I635	Fleet Operations Workspace Core User's Manual
I636	Fleet Operations Workspace (FLOW) Migration Guide
I637	Fleet Operation Workspace Core Integration Toolkit User's Manual
I665	Fleet Operations Workspace iQ User's Manual
I677	Mobile I/O Box User's Manual
I695	Virtual Fleet Manager Installation Guide
M109	AMR (Autonomous Mobile Robot) OL-series User's Manual
M110	AMR (Autonomous Mobile Robot) OL-series Safety, Unpacking, and Assembly Guide
M111	AMR (Autonomous Mobile Robot) OL-series Charging Station Safety, Unpacking, and Installation Guide
M112	AMR (Autonomous Mobile Robot) OL-series Battery Safety, Unpacking, and Installation Guide

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