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	Description	Ordering Code
OL-450S2	Omni Lift AMR with standard length lift plate	37590-70000
OL-450S3	Omni Lift AMR with extended length lift plate	37590-80000

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

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. The charger is rated for 200 to 240 VAC at 50/60 Hz.	28110-103
Manual Mover	Used for moving unpowered AMRs.	28110-501
Lift Bridge	Provides an alternate method to lower the lifting mechanism. No charger included.	28110-503
Lift Bridge Charger	Provides charging equipment for the Lift Bridge battery. The charger is rated for 220 to 240 VAC at 50 Hz.	28110-508
Work Bench	Adjustable height table used for performing maintenance tasks.	28110-504

OL-450S Series

Item	Details	Ordering Code
Maintenance Kit 1	Wipes for cleaning scanners.	28110-506
Maintenance Kit 2	Fluid for cleaning 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.

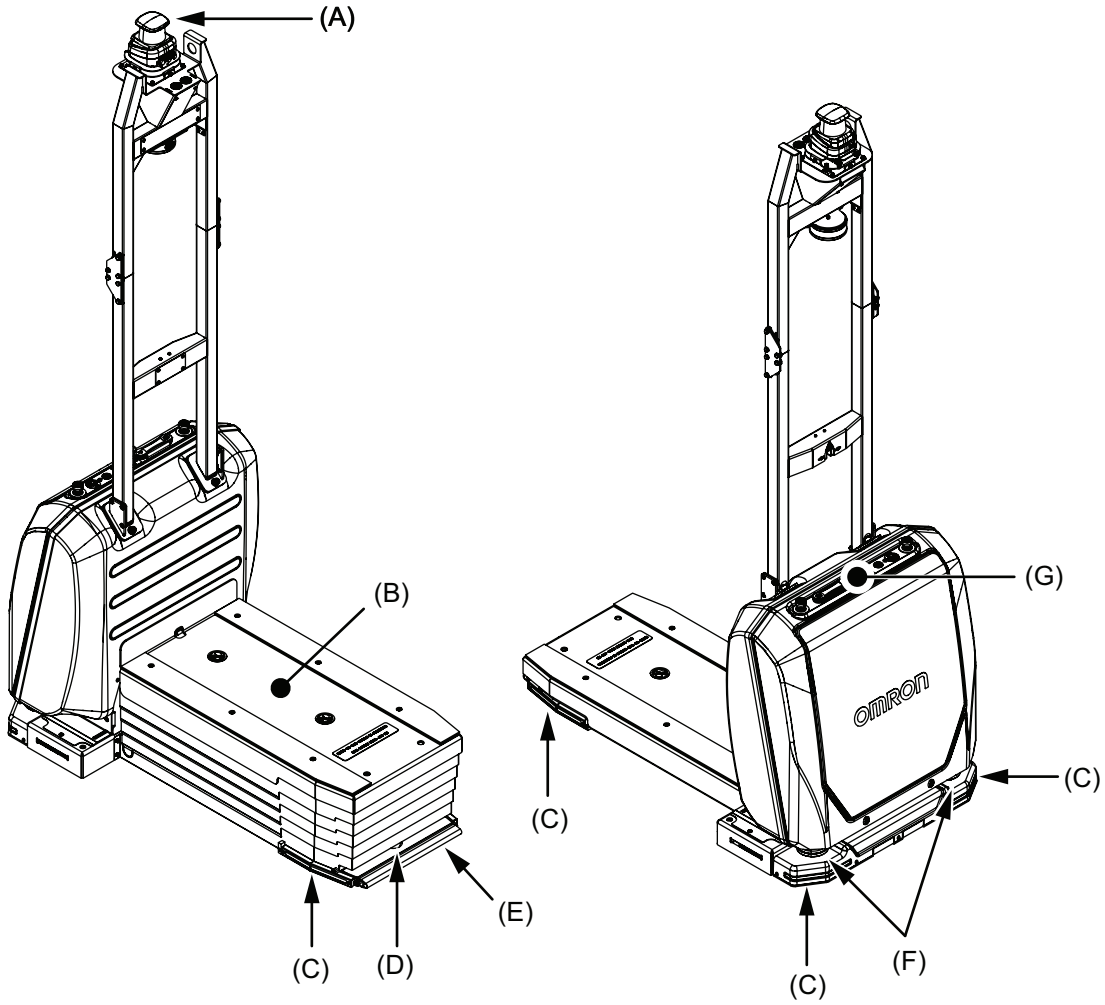
Software Licenses

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 05, 10, 15, 20, 25, 30, to indicate the number of AMRs licensed to connect. Replace □□ with 50 for 31 or more AMRs.	30271-1□□*1
Fleet Operations Workspace Core Fleet Upgrade		Entitlement for a 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 to indicate the number of AMRs licensed to connect. Replace □□ with 50 for 31 or more AMRs.	30271-2□□
Fleet Operations Workspace iQ License (FLOW iQ)		Entitlement for a 1 year renewable FLOW iQ license.	30271-701
		Entitlement for a 3 year renewable FLOW iQ license.	30271-703
		Entitlement for a 5 year renewable FLOW iQ license.	30271-705
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 is required for software upgrades and 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	E	Rear Bumper
B	Lifting Plate	F	Front Safety Scanners
C	Light Strips	G	Control Strip
D	Rear Scanner		

Specifications

Item		Details	
Model		OL-450S2	OL-450S3
Weight (with Battery)		185 kg	190 kg
Environment	Ambient Temperature	5 to 40°C	
	Storage Temperature	-20 to 60°C	
	Operating and Storage Humidity	5% to 95% (non-condensing)	
	Operating Environment	Indoors only, no excessive dust, no corrosive gas	
	Altitude	2000 m (max.)	
	Ingress Protection Class	IP20	
	Dust / Smoke	Accumulated dust smaller than 40 µm cannot exceed 11.7 mL / m^2 in the operating environment. Avoid operating in areas with smoke or dust.	
	Enclosure Rating	NEMA Type 2	
	Atmospheric	No hazardous materials, (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 (min.), NEN-EN 206-1: 2014 / strength category C25 / 30	
	Minimum Coefficient of Friction	Static coefficient of friction μs ≥ 0.6 Dynamic coefficient of friction μd ≥ 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^2	
	Maximum Translational Deceleration	1000 mm/s^2	
	Maximum Rotational Speed*2	65°/s	35°/s
	Maximum Rotational Acceleration	165°/s^2	85°/s
	Maximum Rotational Deceleration	165°/s^2	85°/s
	Maximum Moment of Inertia	100 kg-m^2	
	Stop Position Repeatability (Single AMR)*3	To a position: ±160 mm, ±7° With CAPS: ±6 mm, ±0.6°	
	Stop Position Repeatability (Fleet)*3	To a position: ±160 mm, ±7° With CAPS: ±10 mm, ±0.8°	
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, KS C 9610-6-2, KS C 9610-6-4	
	Battery	UN 38.3	
	Stationary Electronics and Stationary Coil	EN 60335-2-29, EN 62311, EN 55011, EN 61000-6-2, UL 1564	
	Wireless	IEEE 802.11 a/b/g	
Certification Markings	AMR	CE, KC	
	Battery	CE	
	Stationary Electronics and Stationary Coil	CE, cMETus	
Safety Features	Safety Scanners	2 front safety scanners, 29 zone sets, selected based on velocity	
	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	
	Safety Approach Light	Projects a visible red laser light in AMR travel direction	

*1: A 10 mm gap cannot be traversed at speeds greater than 750 mm/s.
*2: The maximum rotational speed is reduced to 17 degrees/s when the AMR is traveling at speeds over 20 mm/s.
*3: Stop position repeatability values were obtained using default AMR parameters and a map created by the OL-450S Series AMR.

MobilePlanner Software Requirements

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

Virtual Fleet Manager Software, Minimum Hardware Requirements

Fleet Size / AMR Count	Small / ≤ 5	Medium ≤ 15	Large ≤ 30	X-Large > 30*1
Virtual CPU	2 Cores		4 Cores	
Clock Speed		4 GHz	8 GHz	12 GHz
Virtual RAM		8 GB	16 GB	24 GB
Virtual Disk	512 GB			1 TB
FLOW Software Version	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.

Charging Station

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

Battery

Type	LiFePO4
Voltage	25.6 VDC
Capacity	42 Ah nominal
Recharge Time	45 min. (5 hours of operation)*1
Charge Cycles	Approx. 6000 cycles*2 *3
Duty Cycle (depth of discharge)	80%
Charging Method	Wireless (primary), wired (secondary)
Ambient Operating Temperature	10 to 40°C
Storage Temperature	-20 to 60°C
Humidity (operating and storage)	10 to 90% non-condensing
Altitude	2000 m
Ingress Protection	IP54
Weight	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 30°C, relative humidity 25% to 85%

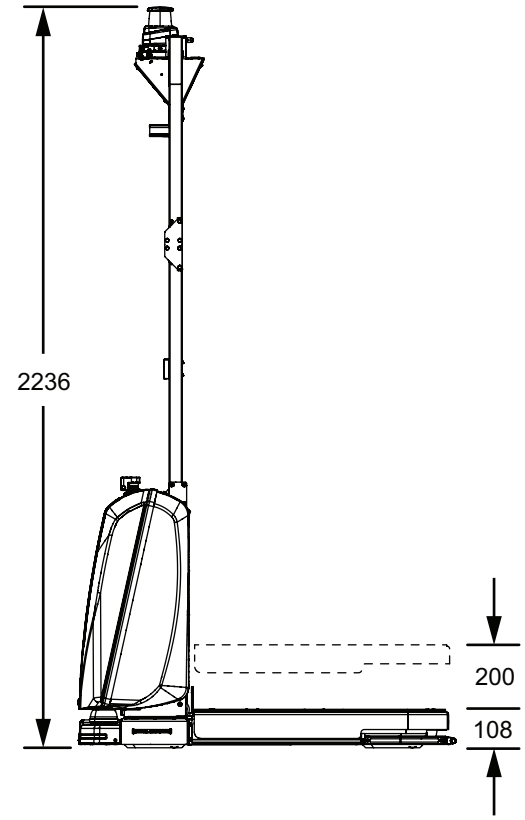
Service Charger

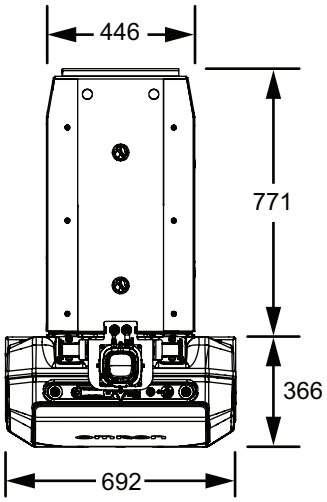
Input Voltage	200 to 240 VAC, 50/60 Hz
Input Current (max.)	2.2 A at 230 VAC
Output Voltage	24 VDC
Output Current	15 A (fused to 20 A)
Ambient Operating Temperature	0 to 35°C
Ingress Protection	IP21
Weight	3.5 kg

Dimensions

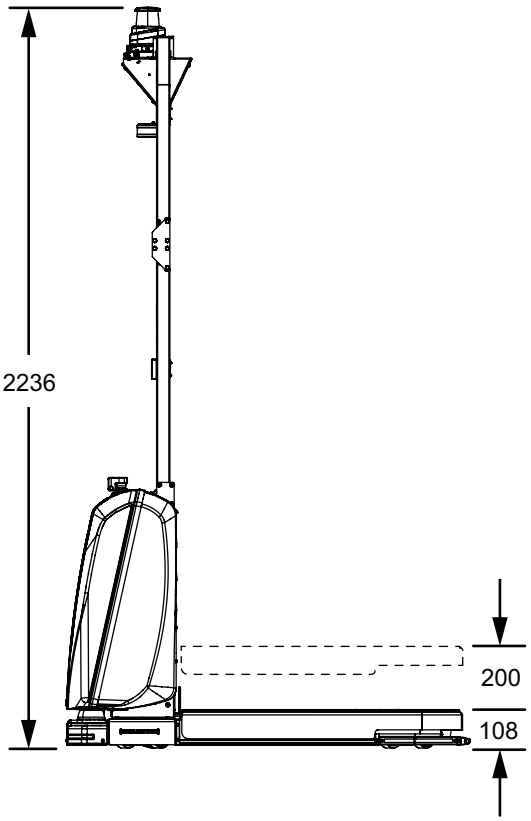
(Unit: mm)

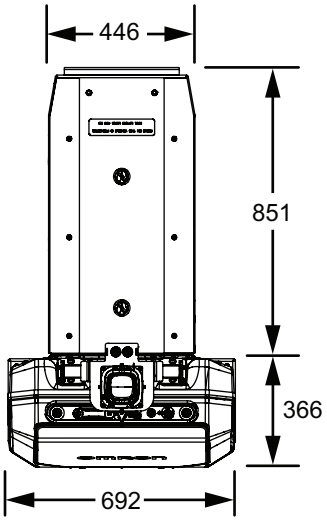
OL-450S2



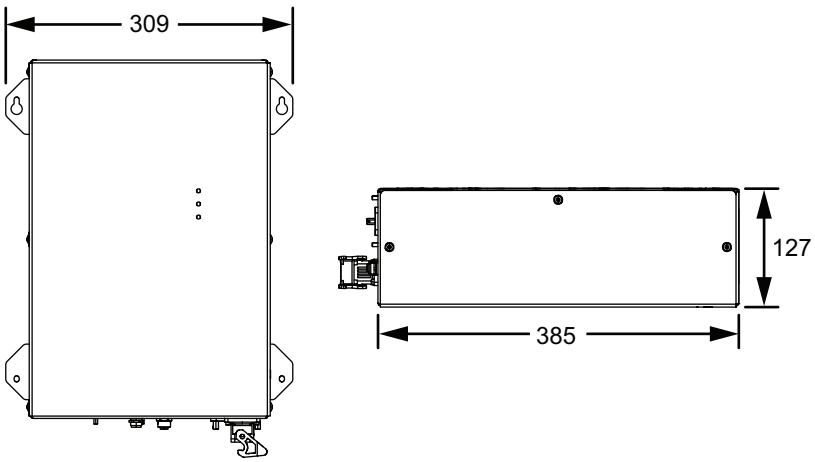


OL-450S3

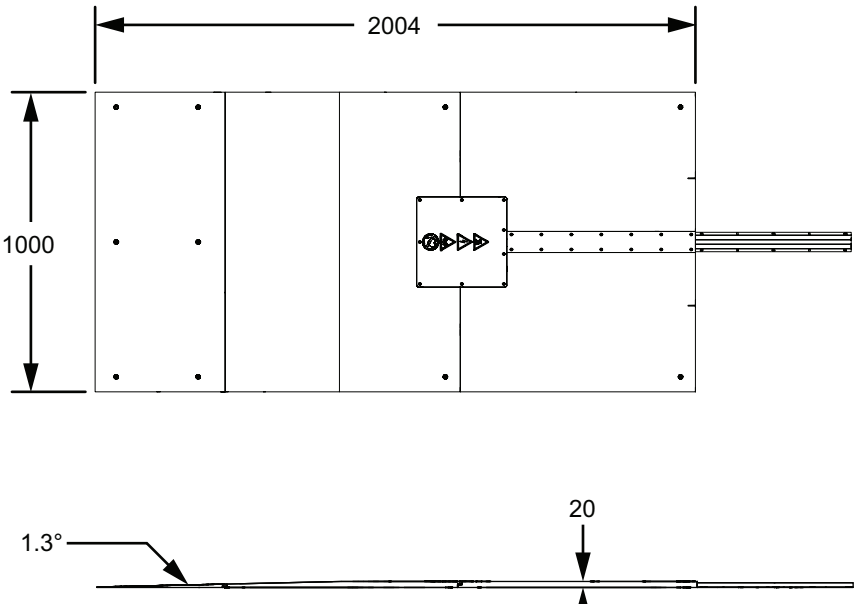




Stationary Electronics Dimensions



Charging Ramp Dimensions



Related Manuals

Catalog Number	Manual Title
M109	AMR (Autonomous Mobile Robot) OL-series User's Manual
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
M107	Fleet Operation Workspace Core Integration Toolkit - MQTT API 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

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Note: Do not use this document to operate the Unit. This document describes AMR functionality supported with FLOW v5.3

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