

MiR250 specifications

Date: 2025-04-14

The product specifications in English are the most recently updated on the Support Portal.

See the latest updates [here](#).

Specifications may vary based on local conditions and application setup.

General information

Designated use	Autonomous mobile robot (AMR) for internal transportation of small- and medium-sized loads
Type	Autonomous Mobile Robot (AMR)
Color	RAL 7011 / Iron Gray
Color - ESD version	RAL 9005 / Jet Black
Cover material	Polycarbonate, Lexan Resin 221R
Product design life	5 years or 20 000 hours of active operation, whichever comes first
IP rating	IP 21
Drive wheel material	Thermoplastic Polyurethane

Dimensions

Length	800 mm
Width	580 mm
Height	300 mm
Weight	94 kg + 21 kg on robots with traction kits
Ground clearance	25–28 mm
Load surface	800 × 580 mm

Drive wheel diameter	200 mm
Caster wheel diameter	125 mm
Dimensions for mounting top modules	Equal to robot footprint. Contact MiR if a bigger top module is required.
Top plate	Anodized aluminum, 5 mm

Payload

Maximum payload	250 kg
Footprint of payload	<p>Equal to robot footprint. Contact MiR if a bigger payload footprint is required.</p> <p>MiR250 does not validate the height of the payload. It is the responsibility of the commissioner to ensure tall payloads do not collide with any hanging objects.</p>
Payload placement	Place center of mass according to directions in the manual.

Performance

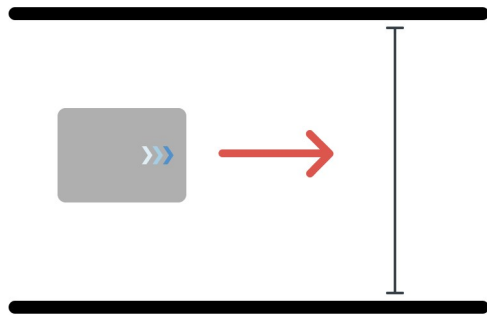
Maximum speed (with maximum payload on a flat surface)	2.0 m/s (7.2 km/h)
Maximum noise level	Standard wheels: 42–51 dBA Cleanroom wheels: 44–54 dBA
Positioning accuracy when docking to VL-marker	X-axis: ± 3 mm Y-axis: ± 3 mm Orientation: $\pm 0.5^\circ$
Positioning accuracy when docking to V-marker	X-axis: ± 9 mm Y-axis: ± 17 mm Orientation: $\pm 3^\circ$
Positioning accuracy when docking to Bar-marker	X-axis: ± 18 mm Y-axis: ± 4 mm Orientation: $\pm 1.5^\circ$

Positioning accuracy when docking to L-marker	X-axis: ± 6 mm Y-axis: ± 3 mm Orientation: $\pm 1^\circ$
Positioning accuracy when moving to position	X-axis: ± 60 mm Y-axis: ± 85 mm Orientation: $\pm 4^\circ$
Time used when docking to or undocking from a charging station	Docking time: up to 44 s Undocking time: up to 8 s
Time used when docking to or undocking from a VL-marker	Docking time: up to 14 s Undocking time: up to 11 s
Time used when docking to or undocking from a V-marker	Docking time: up to 13 s Undocking time: up to 6 s (Offsets used: -0.45 m on X-axis, 0.2 m on Y-axis, 0° yaw)
Time used when docking to or undocking from an L-marker	Docking time: up to 16 s Undocking time: up to 9 s With default offsets and 1.6 m undocking distance
Time used when docking to or undocking from a bar-marker	Docking time: up to 13 s Undocking time: up to 11 s (Bar length: 400 mm, bar distance: 750 mm , default offsets)
Minimum distance to achieve maximum speed	9.5 m length \times 2 m width
Minimum size of detectable object	90 x 90 x 90 mm (Object on floor in front of robot, default speed and default camera configurations)
Docking types	Forward and reverse to bar, V, and VL markers, and sideways docking to L-markers

Space requirements

For an in-depth explanation of the space requirements and how to achieve the reduced safety settings for the absolute minimum operational space, see the space requirements guide for your robot model.

Operational corridor width



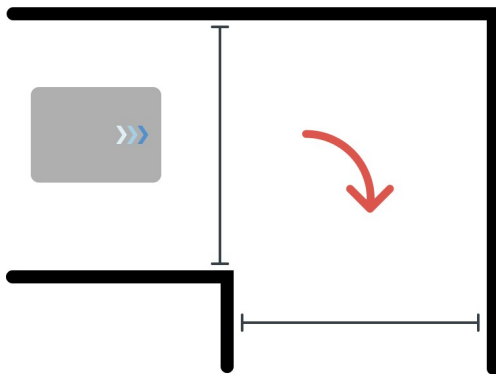
MiR250

Standard settings: 1.45

MiR250 Dynamic

Standard settings: 1.30 m

Operational corridor width for a 90° turn



MiR250

Standard settings: 1.50 m

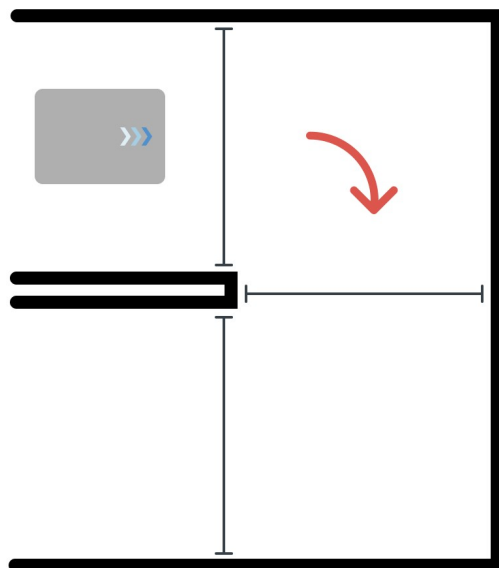
Reduced safety settings: 1.00 m

MiR250 Dynamic

Standard settings: 1.35 m

Reduced safety settings: 1.00 m

Operational corridor width for a U-turn



MiR250

Standard settings: 1.60 m

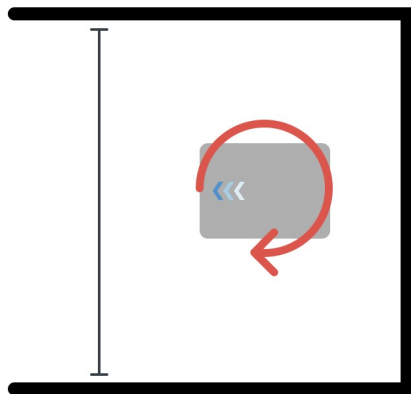
Reduced safety settings: 1.15 m

MiR250 Dynamic

Standard settings: 1.55 m

Reduced safety settings: 1.15 m

Operational width for pivoting



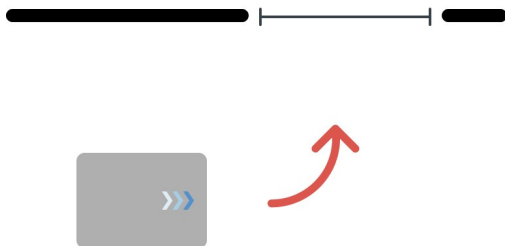
MiR250

Standard settings: 1.80 m
Reduced safety settings: 1.20 m

MiR250 Dynamic

Standard settings: 1.55 m
Reduced safety settings: 1.20 m

Operational doorway width



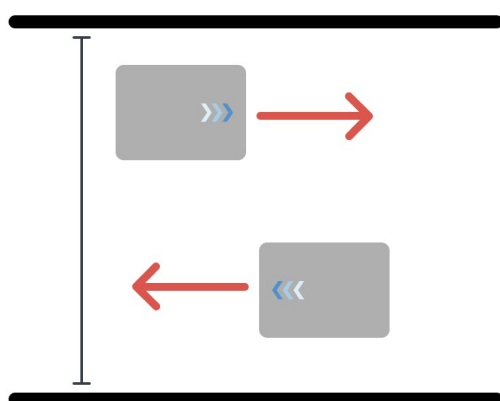
MiR250

Standard settings: 1.50 m

MiR250 Dynamic

Standard settings: 1.00 m
With zones: 0.95 m

Operational corridor width for two robots passing



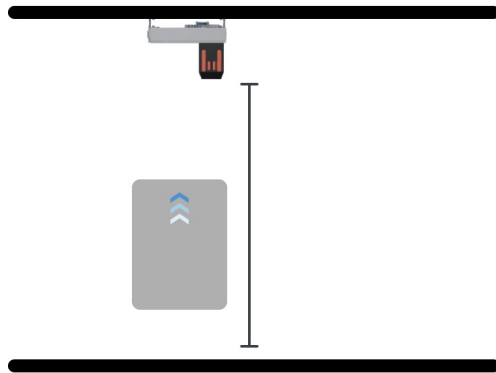
MiR250

Standard settings: 3.00 m
With zones: 2.80 m

MiR250 Dynamic

Standard settings: 2.45 m
With zones: 2.10 m

Minimum space in front of charging station



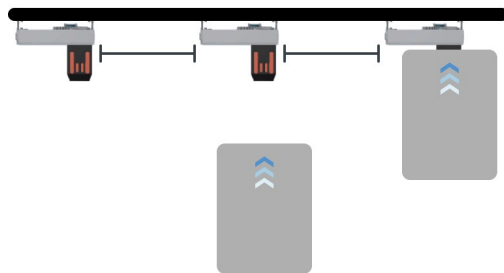
MiR250

Standard settings: 2.8 m

MiR250 Dynamic

Standard settings: 2.6 m

Minimum distance between charging stations



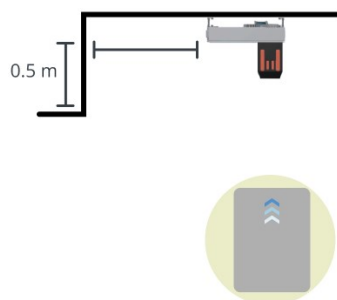
MiR250

Standard settings: 0.8 m

MiR250 Dynamic

Standard settings: 0.45 m

Minimum space to the sides of charging stations 0.5 m from marker



MiR250

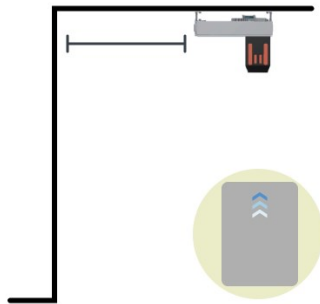
Standard settings - Right: 0.7 m

Standard settings - Left: 0.35 m

MiR250 Dynamic

Standard settings: 0.35 m

Minimum space to the sides of charging stations to
Entry position



MiR250

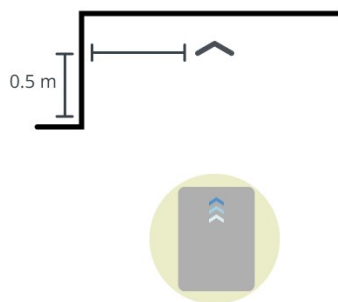
Standard settings: 0.5 m

MiR250 Dynamic

Standard settings - Right: 0.6 m

Standard settings - Left: 0.35 m

Minimum space to the sides of V-markers 0.5 m from
marker



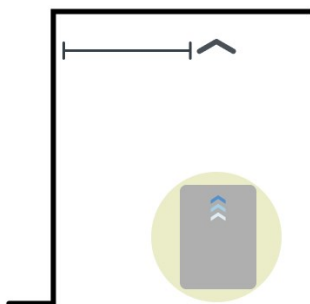
MiR250

Standard settings: 0.45 m

MiR250 Dynamic

Standard settings: 0.3 m

Minimum space to the sides of V-markers to Entry
position



MiR250

Standard settings - Right: 0.65 m

Standard settings - Left: 0.7 m

MiR250 Dynamic

Standard settings - Right: 0.6 m

Standard settings - Left: 0.55 m

Minimum space in front of V-markers

MiR250

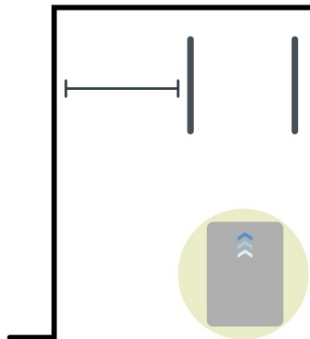
Standard settings: 2.25 m

MiR250 Dynamic

Standard settings: 2.2 m

Minimum distance between V-markers	0.44 m
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Minimum space to sides of a Bar-marker



MiR250

Standard settings: 0.45 m
Reduced safety settings: 0.20 m

MiR250 Dynamic

Standard settings - Right: 0.25 m
Standard settings - Left: 0.35 m
Reduced safety settings: 0.20 m

Minimum space in front of Bar-markers

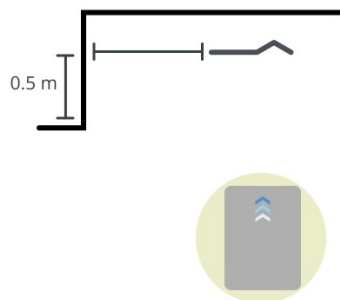
MiR250

Standard settings: 2.1 m
Reduced safety settings: 1.75 m

MiR250 Dynamic

Standard settings: 2.0 m
Reduced safety settings: 1.75 m

Minimum space to the sides of VL-markers 0.5 m from marker



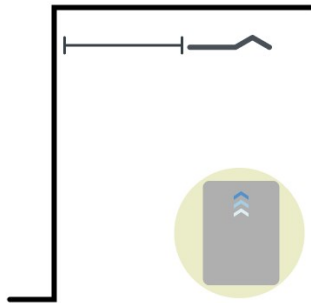
MiR250

Standard settings: 0.15 m

MiR250 Dynamic

Standard settings: 0.15 m

Minimum space to the sides of VL-markers to Entry position



MiR250

Standard settings - Right: 0.45 m

Standard settings - Left: 0.50 m

Reduced safety settings - Right: 0.30 m

Reduced safety settings - Left: 0.20 m

MiR250 Dynamic

Standard settings - Right: 0.30 m

Standard settings - Left: 0.50 m

Reduced safety settings - Right: 0.30 m

Reduced safety settings - Left: 0.20 m

Minimum space in front of VL-markers

MiR250

Standard settings: 2.40 m

MiR250 Dynamic

Standard settings: 2.40 m

Minimum distance between VL-markers

0.03–0.04 m

Power

Battery type	Lithium-ion
Charging options	MiR Charge 48V, Battery Charger 48V 12A, Cable Charger Lite 48V 3A
Charging time from 10%–90% with MiR Charge 48V (at an ambient temperature of 22°C)	52 min
Charging time from 10%–90% with cable charger	1 h 10 min
Charger communication	The robot communicates with MiR Charge 48V through a CAN interface. Charging starts only when the robot connection is present

Charging current, MiR Charge 48V	Up to 35 A depending on battery temperature and constant voltage ramping down towards end of charge cycle
Battery weight	11 kg
Battery dimensions	495 × 210 × 75 mm
The minimum number of full charging cycles before the battery capacity drops below 80%	3 000 cycles
Battery voltage	47.7 V nominal, minimum 42 V, maximum 54 V
Battery capacity	1.63 kWh (34.2 Ah at 47.7 V)
Charging an empty battery	Only possible with a cable charger. To dock to MiR Charge 48V, the robot requires at least 3% battery (or equal to 10 min of operating time).
Cable charger	Robot cannot drive with cable charger connected and charging
Charging ratio and runtime	<p>With maximum payload:</p> <p>10 min charging: 2 h and 40 min runtime (1:16 charging to runtime ratio)</p> <p>20 min charging: 4 h and 30 min runtime (1:14 charging to runtime ratio)</p> <p>30 min charging: 6 h and 5 min runtime (1:12 charging to runtime ratio)</p> <p>60 min charging: 10 h and 20 min runtime (1:10 charging to runtime ratio) Fully charged</p>
Active operation time with no payload (100–0%)	17 h 30 min
Active operation time with maximum payload (100–0%)	13 h
Active standby time where robot is idle (100–0%)	22 h

Environment

Environment	For indoor use only
Ambient temperature range, operation	5–25°C for continuous use, maximum 40°C for 1 hour
Ambient temperature range, storage	1 month: -20–60°C
	3 months: -20–45°C
Humidity	20–95% non-condensing
Floor conditions	Clean and dry
Maximum incline/decline	5% at 0.5 m/s
Traversable gap and step tolerance	0-20 mm from all angles 20-30 mm at maximum 40° angle with reduced speed Above 30 mm not recommended, risk of personal injury
Floor to wheel frictional coefficient	0.60–0.80
Material the robots cannot detect reliably	Transparent, translucent, glossy, reflective, and light emitting
Optimal light conditions	Even and steady lighting (strong directional light can cause the robot to detect non-existent obstacles)
Maximum altitude	2 000 m

Compliance

EMC	EN 61000-6-4, EN 61000-6-2, EN 12895
Cleanroom	Optional Class 4 (ISO 14644-1)— see the cleanroom certificate here
Design based on principles in safety standards for industrial vehicles	ISO 3691-4 (Except Clause 4.4, 4.9.4, 5.1, 6, and Annex A), ISO 13849-1, ISO 13850, ISO 12100, ITSD F B56-5, RIA R15.08-1
ESD	Certified (ESD version)— see the certificate here

Safety

Safety functions	12 safety functions according to ISO 13849-1. The robot stops if a safety function is triggered.
Personnel detection safety function	Triggered when obstacles or people are detected too close to the robot
Emergency stop	Triggered by pressing the Emergency stop button
Overspeed avoidance	Prevents the robot from driving faster than the predefined safety limit
Collision avoidance	Triggered by a human or other obstacle in the path of travel.
Manual control in robot interface	Token-based system for accessing the manual control. The robot issues only one token at a time.
Safe guarded stop	Yes

Communication

Wi-Fi (robot computer)	Wi-Fi adapter: 2.4 GHz and 5 GHz, 2 external antennas
I/O connections	4 digital inputs, 4 digital outputs (GPIO), 1 Ethernet port, 1 Auxiliary emergency stop
Safety I/O connections	6 digital inputs, 6 digital outputs
Ethernet (top module)	M12 plug, 4p. 10/100 Mbit Ethernet with Modbus protocol, adapter for external antenna
Ethernet (personnel access)	RJ45 Ethernet port in rear compartment

Sensors

SICK safety laser scanners	2 pcs, (front and rear), give 360° visual protection around the robot 200 mm from ground
Minimum range for each safety laser scanner	10 m

3D cameras	2 pcs, for detecting obstacles in front of robot outside of safety laser scanner plane
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Proximity sensors	8 pcs
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Lights and audio

Audio	Speaker
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Indicator lights	Status light bands all around robot to indicate the robot status Signal lights to indicate robot driving behavior and direction
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