



The Mobile Robot Company

Knowledge Center — How J1600 Safety Works · 2026-08-04

<https://info.mobilerobot.com/safety-compliance/safety-overview/how-j1600-safety-works>

How J1600 Safety Works

This page explains the safety design of the [J1600 self-driving pallet jack](https://info.mobilerobot.com/products/j1600/overview/) (<https://info.mobilerobot.com/products/j1600/overview/>) at a glance: what protects people around the vehicle, what the operator is responsible for, and where to find the details. It is written for anyone evaluating or working near the J1600.

Safety in layers

The J1600 does not rely on a single mechanism. Protection comes from several independent layers working together:

1. **Navigation and mapping.** [3D LiDAR SLAM](https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/) (<https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/>) (simultaneous localization and mapping) builds and updates a three-dimensional model of the facility so the vehicle plans routes around obstacles.
2. **Certified safety sensing.** Two separate 2D safety LiDAR scanners, mounted front and rear, provide a full 360-degree protective field around the vehicle. The field is speed-dependent and expands as travel speed increases.
3. **Independent safety control.** An independent safety controller, [safety-certified driving-speed and driving-direction encoders](https://info.mobilerobot.com/safety-compliance/safety-functions/speed-monitoring/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/speed-monitoring/>), and two safety-certified motor controllers supervise motion.
4. **Human confirmation.** A person initiates every task and must [confirm entry into automatic mode](https://info.mobilerobot.com/documentation/user-guides/autonomous-operation/) (<https://info.mobilerobot.com/documentation/user-guides/autonomous-operation/>) with a physical button press. The vehicle only enters autonomous mode when the operator judges the environment ready.
5. **Physical override.** Three emergency-stop buttons, a belly button for stop and reverse, and tiller-based takeover let anyone stop the vehicle or return it to manual control immediately.

The navigation stack and the safety stack are deliberately separate systems — see [Navigation sensors vs. safety sensors](https://info.mobilerobot.com/safety-compliance/safety-overview/navigation-sensors-vs-safety-sensors/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/navigation-sensors-vs-safety-sensors/>).

What the vehicle does

- [Detects people](https://info.mobilerobot.com/safety-compliance/safety-functions/person-detection/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/person-detection/>) and obstacles in a 360-degree protective field that supports both forward and reverse autonomous travel.
- [Adjusts the size of its protective field with speed](https://info.mobilerobot.com/safety-compliance/safety-functions/safety-field-adjustment/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/safety-field-adjustment/>), expanding it at higher speeds.
- Shows its status on the floor: white light indicates manual mode, and blue light strips display the current protected area in automatic mode.
- Stops on any emergency-stop input and brakes with a [certified braking function](https://info.mobilerobot.com/safety-compliance/safety-functions/braking/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/braking/>).
- Asks the operator to confirm automatic mode and instructs the operator to step away before starting.

Each certified safety function carries an assigned Performance Level (PL) between PL b and PL d under [EN ISO 13849-1](https://info.mobilerobot.com/safety-compliance/standards/iso-13849-1/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-13849-1/>). The full list is in [Performance levels](https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/>).

What the operator does

The J1600 is built for [human-in-the-loop automation](https://info.mobilerobot.com/documentation/concepts/human-in-the-loop-automation/) (<https://info.mobilerobot.com/documentation/concepts/human-in-the-loop-automation/>): the operator keeps judgment-heavy work and full authority over when the machine drives itself. Pallet pickup is always manual, autonomous mode must be confirmed by a person, and grabbing or moving the tiller returns the vehicle to manual control at once. See [Human responsibilities](https://info.mobilerobot.com/safety-compliance/safety-overview/human-responsibilities/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/human-responsibilities/>) and [Emergency stops and manual takeover](https://info.mobilerobot.com/safety-compliance/safety-overview/emergency-stops-and-manual-takeover/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/emergency-stops-and-manual-takeover/>).

Standards and certification

The J1600 is [CE marked](https://info.mobilerobot.com/safety-compliance/certificates/ce-declaration-of-conformity/) (<https://info.mobilerobot.com/safety-compliance/certificates/ce-declaration-of-conformity/>). Its preliminary [compliance list](https://info.mobilerobot.com/safety-compliance/certificates/compliance-statements/) (<https://info.mobilerobot.com/safety-compliance/certificates/compliance-statements/>) includes [EN ISO 3691-4:2023](https://info.mobilerobot.com/safety-compliance/standards/iso-3691-4/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-3691-4/>) (driverless industrial trucks), [EN ISO 13849-1:2023](https://info.mobilerobot.com/safety-compliance/standards/iso-13849-1/) (safety-related control systems), [EN ISO 12100:2010](https://info.mobilerobot.com/safety-compliance/standards/iso-12100/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-12100/>), [EN ISO 3691-1:2015+A1:2020](https://info.mobilerobot.com/safety-compliance/standards/iso-3691-1-2015+A1-2020/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-3691-1-2015+A1-2020/>).

[obilerobot.com/safety-compliance/standards/iso-3691-1/](https://info.mobilerobot.com/safety-compliance/standards/iso-3691-1/)), [ANSI/ITSDF B56.5-2024](https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-5/) (<https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-5/>), and [ANSI/ITSDF B56.1-2020](https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-1/) (<https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-1/>), together with the Machinery, [EMC](#), [Radio Equipment](#), and [RoHS](#) directives and the [EU Batteries Regulation](#) (<https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/>). The battery is tested to [UN 38.3](https://info.mobilerobot.com/safety-compliance/certificates/battery-un-38-3-documentation/) (<https://info.mobilerobot.com/safety-compliance/certificates/battery-un-38-3-documentation/>) for transport.

PRELIMINARY SPECIFICATIONS

The January 2026 specifications, including the assigned Performance Levels, are preliminary and subject to change. No stopping-distance curves, validation reports, or declaration of conformity are published; use current product documentation for deployment decisions.

Where to go next

- [Human responsibilities](https://info.mobilerobot.com/safety-compliance/safety-overview/human-responsibilities/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/human-responsibilities/>) — the operator's share of safe operation.
- [Manual and autonomous mode safety](https://info.mobilerobot.com/safety-compliance/safety-overview/manual-and-autonomous-mode-safety/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/manual-and-autonomous-mode-safety/>) — how safety behaves in each mode and during handover.
- [Safety architecture](https://info.mobilerobot.com/safety-compliance/safety-overview/safety-architecture/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/safety-architecture/>) — the complete list of safety components.
- [Emergency stops and manual takeover](https://info.mobilerobot.com/safety-compliance/safety-overview/emergency-stops-and-manual-takeover/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/emergency-stops-and-manual-takeover/>) — every way to stop the vehicle.
- [Performance levels](https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/>) — each certified function and its Performance Level.