



The Mobile Robot Company

Knowledge Center — Safety · 2026-08-04

<https://info.mobilerobot.com/support/faq/safety>

Safety

Common questions about how the J1600 keeps people safe while driving autonomously. For the complete architecture, see [How J1600 safety works](https://info.mobilerobot.com/safety-compliance/safety-overview/how-j1600-safety-works/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/how-j1600-safety-works/>).

Is the J1600 safe to operate around people?

The J1600 uses a layered safety design: [navigation and obstacle avoidance](https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/) (<https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/>), certified safety sensing, an independent safety controller, certified actuation, [human confirmation before autonomous work](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/>), and physical override. A full 360-degree protective field supports both forward and reverse autonomous travel. The built-in safety functions improve predictability and may [reduce workplace accidents](https://info.mobilerobot.com/applications/results/safety-improvements/) (<https://info.mobilerobot.com/applications/results/safety-improvements/>), compared with manual pallet handling.

What safety components does it have?

- an independent safety controller;
- two 2D safety LiDAR scanners covering front and rear;
- three emergency-stop buttons;
- a belly button for stop and reverse;
- a [load-detection sensor](https://info.mobilerobot.com/safety-compliance/safety-functions/load-detection/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/load-detection/>);
- [tiller-position switches](https://info.mobilerobot.com/safety-compliance/safety-functions/tiller-detection/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/tiller-detection/>), for emergency stop and for manual control;
- [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/>);
- two safety-certified motor controllers.

The 2D safety LiDARs are [separate from the 3D navigation LiDAR](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/>): navigation maps and avoids objects, while the certified 2D safety stack provides personnel

protection. See [Navigation and mapping](https://info.mobilerobot.com/support/faq/navigation-and-mapping/) (https://info.mobilerobot.com/support/faq/navigation-and-mapping/).

How does the protective field work?

The protective field surrounds the vehicle in 360 degrees and [changes with speed](https://info.mobilerobot.com/safety-compliance/safety-functions/safety-field-adjustment/) (https://info.mobilerobot.com/safety-compliance/safety-functions/safety-field-adjustment/) — it expands as travel speed increases. Blue floor-light strips display the current protected area while the robot works autonomously; white light indicates manual mode. [Person detection](https://info.mobilerobot.com/safety-compliance/safety-functions/person-detection/) (https://info.mobilerobot.com/safety-compliance/safety-functions/person-detection/) in the safety field triggers the assigned safety functions, including [braking](https://info.mobilerobot.com/safety-compliance/safety-functions/braking/) (https://info.mobilerobot.com/safety-compliance/safety-functions/braking/).

What happens before the robot starts driving by itself?

The operator 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 the physical start/resume button, and the robot instructs the operator to step away before it moves. Autonomous work never starts without a deliberate human confirmation.

How do I take over or stop the robot?

Grab or move the tiller — the vehicle returns to manual control immediately. You can also use any of the [three emergency-stop buttons](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/), the belly button (stop and reverse), or the [key switch](https://info.mobilerobot.com/safety-compliance/safety-functions/mode-selection/) (https://info.mobilerobot.com/safety-compliance/safety-functions/mode-selection/), which selects power off, manual only, or automatic mode.

What Performance Levels do the safety functions have?

The preliminary datasheet assigns these [Performance Levels \(PL\)](https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/) (https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/) per [EN ISO 13849-1](https://info.mobilerobot.com/safety-compliance/standards/iso-13849-1/) (https://info.mobilerobot.com/safety-compliance/standards/iso-13849-1/):

Safety function	Performance Level
Braking system	PL d
Speed monitoring and control	PL c
Safety-field size adjustment	PL d
Load detection	PL b
Charging-current relay	PL b
Emergency-stop button	PL d
Person detection in safety field	PL d
Automatic/manual mode selection	PL c
Tiller-position detection	PL c

These are levels of individual functions, not a statement that every subsystem shares the same PL.

Which standards and directives does the J1600 comply with?

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/>). The preliminary [compliance list](https://info.mobilerobot.com/safety-compliance/certificates/compliance-statements/) (<https://info.mobilerobot.com/safety-compliance/certificates/compliance-statements/>), includes:

- [Directive 2006/42/EC \(Machinery\)](https://info.mobilerobot.com/safety-compliance/standards/eu-machinery-requirements/) (<https://info.mobilerobot.com/safety-compliance/standards/eu-machinery-requirements/>), [2014/30/EU \(EMC\)](https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/), [2014/53/EU \(Radio Equipment\)](https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/), [2011/65/EU \(RoHS\)](https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/), and [Regulation \(EU\) 2023/1542 \(Batteries\)](https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/) (<https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/>);
- [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/>), [EN ISO 13849-1:2023](https://info.mobilerobot.com/safety-compliance/standards/iso-12100/), [EN ISO 12100:2010](https://info.mobilerobot.com/safety-compliance/standards/iso-12100/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-12100/>), and [EN ISO 3691-1:2015+A1:2020](https://info.mobilerobot.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/>);

- [UN 38.3 battery transport testing](https://info.mobilerobot.com/safety-compliance/certificates/battery-un-38-3-documentation/) (<https://info.mobilerobot.com/safety-compliance/certificates/battery-un-38-3-documentation/>).

This is summarized as compliance with EU and US safety requirements, especially ISO 3691-4 and ANSI/ITSDF B56.5. No [certificates](https://info.mobilerobot.com/safety-compliance/certificates/) (<https://info.mobilerobot.com/safety-compliance/certificates/>), test reports, declaration numbers, notified-body information, or country-specific approvals are published; use current product documentation for deployment decisions.

Can it reverse safely in autonomous mode?

Yes. The 360-degree protective field supports certified safe reversing without specially marked target zones.

Is human supervision the only safety mechanism?

No. Human takeover complements the [certified safety architecture](https://info.mobilerobot.com/safety-compliance/safety-overview/safety-architecture/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/safety-architecture/>) — the independent controller, safety LiDARs, emergency stops, and speed-dependent protective field operate regardless of the operator. See [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/>) for how the human role and the safety system fit together.