Level Up Your Mobile Robots. ROKIT – The Robotics Kit by Bosch Rexroth

rexroth

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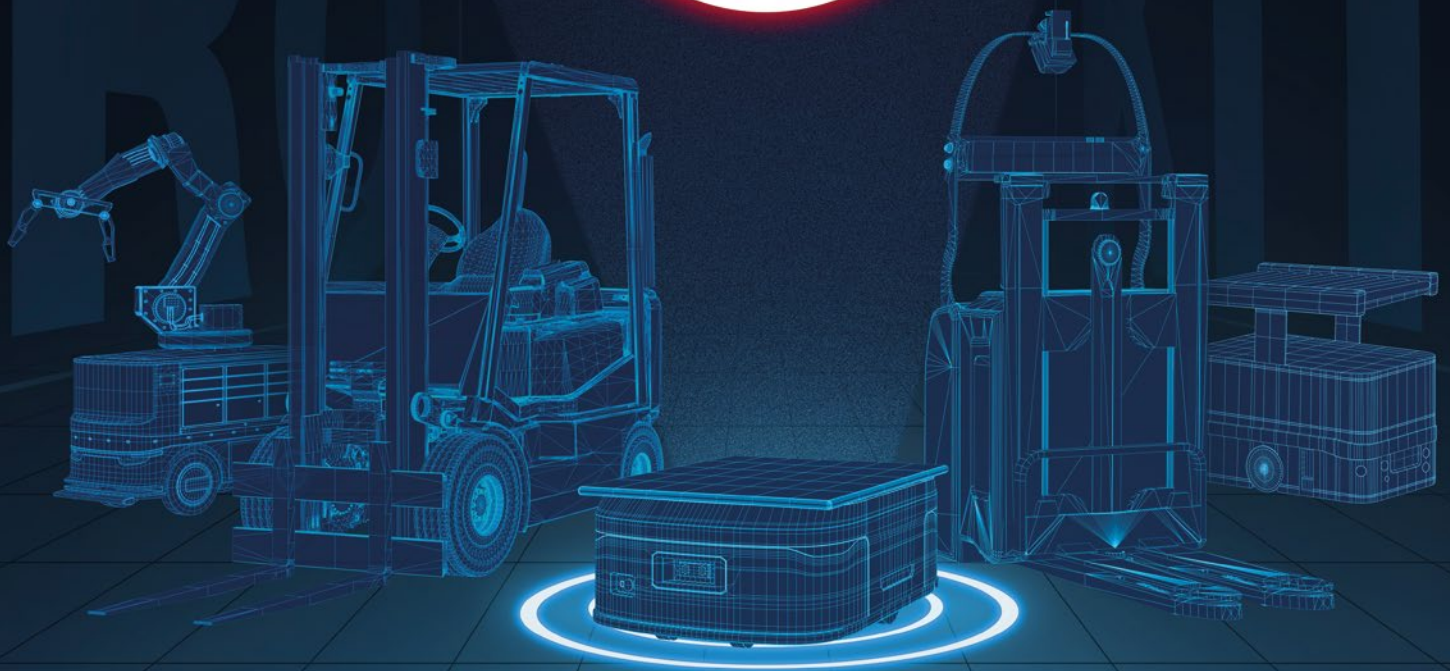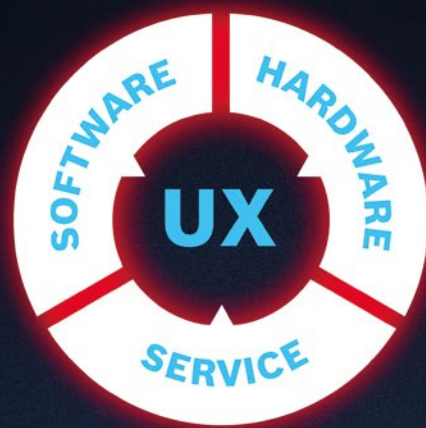
ROKIT –
The Robotics Kit by Bosch Rexroth

It's Time for Modular Systems in Mobile Robotics

With its robotics kit ROKIT, Bosch Rexroth unlocks new possibilities in the field of **mobile and service robotics.** The modular kit consisting of individual, coordinated and proven **software and hardware components** gives you the highest degree of freedom you need in the course of automating processes. The components – **ROKIT Locator, ROKIT Navigator and ROKIT Motor** – take care of positioning, navigation and motion execution for you, and can be controlled and linked with the intuitive **graphical user interface aXessor**. Supporting, product-specific **services** round off the user-focused portfolio.

Why ROKIT?

Thanks to their **flexibility** and **easy applicability**, both the individual components and the entire robotics kit are compatible with **a wide range of vehicle types** and are ready for use in **a variety of applications**. And all this without any expert knowledge. Focus on the features that differentiate you from others – and let the **ROKIT components** take care of everything else.

Rexroth ROKIT is ready to use right away, without any additional effort, since the robotics kit outstrips current technology. The **innovative software and hardware components** ensure efficiency because they are **robust, powerful and modular** – qualities to which we attach great importance at Bosch Rexroth.

Your Success Factors with Rexroth ROKIT

FLEXIBLE

- ▶ Select components that suit your needs
- ▶ Continue to use your existing software and hardware solutions
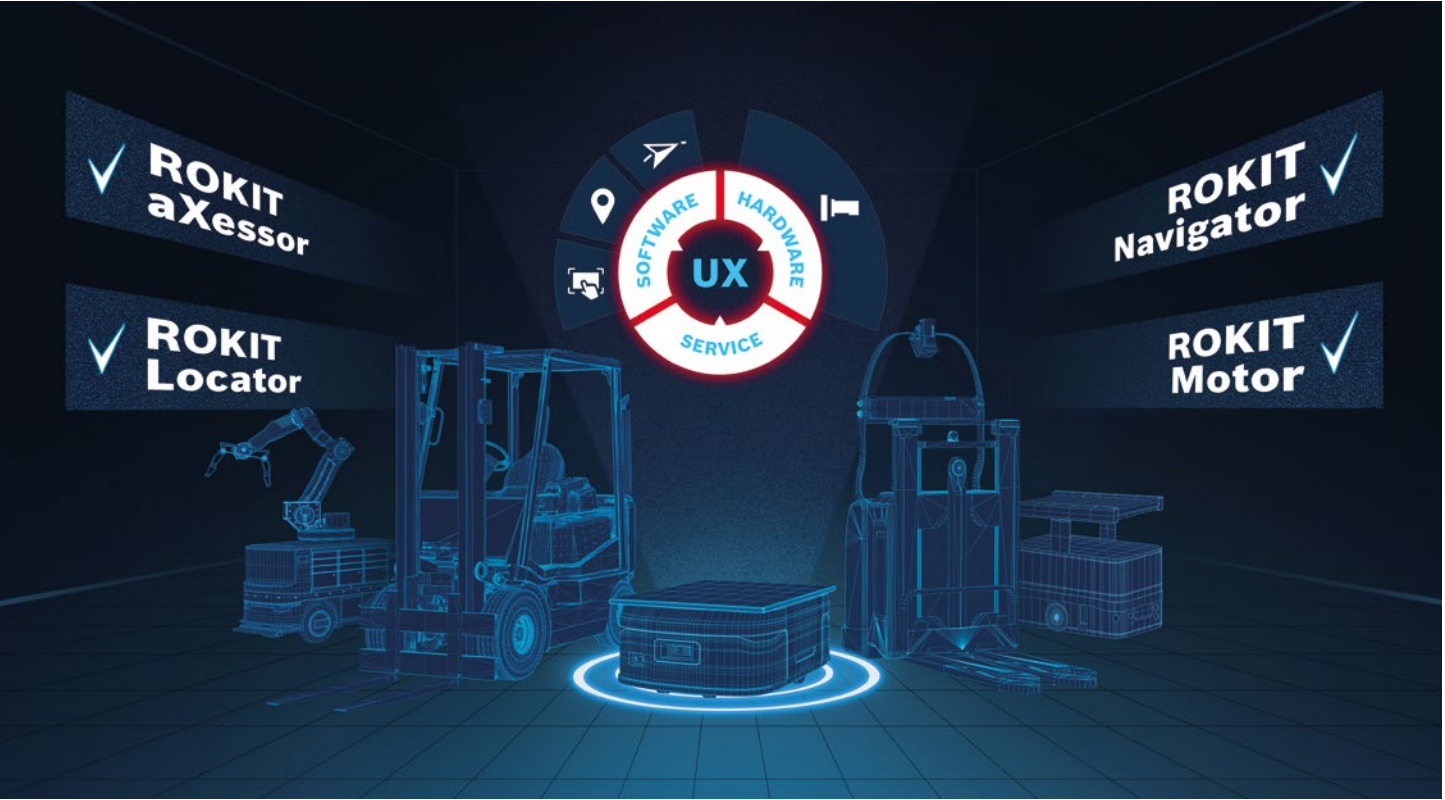- ▶ Integrate ROKIT into a wide variety of vehicle types and applications

EASY TO USE

- ▶ Less effort for integration, setup, production and maintenance thanks to easy applicability without expert knowledge
- ▶ Experience new standards in the industrial sector thanks to the user-friendly approach

EFFICIENT AND ROBUST

- ▶ Save time and resources
- ▶ Deliver high-speed automation in intralogistics
- ▶ Focus on the features that differentiate you from others – let ROKIT take care of everything else
- ▶ Benefit from a resilient robotics kit with powerful algorithms, durable and proven components, industrial-grade software and supplementary services

Step into the ROKIT Universe and Learn More about the Individual Components

Have we sparked your interest?
Discover the individual ROKIT components at **www.boschrexroth.com/rokit** or contact us at **robotics@boschrexroth.de**.

aXessor

Your GUI for Powerful Software and Hardware

The aXessor by Bosch Rexroth is an intuitive graphical user interface (GUI) enabling central access to all ROKIT components. The comprehensive technologies and high-performance software and hardware solutions can be controlled and linked with the clear and user-friendly interface of the aXessor. No expert knowledge is required to use the aXessor – which ramps up the efficiency of integration, setup and operation.

Optimal transparency of your ROKIT components
Visualize your entire fleet and stay in control of the system with the help of the aXessor. The graphical user interface enables you to easily manage your fleet by pooling processes and work steps.

User-centered operation makes the difference
The aXessor offers you a completely new kind of industrial user interface, because it was developed from the user's perspective. The modern gamification approach, combined with Bosch Rexroth's know-how and feedback from aXessor users, guarantees you an easy introduction to all ROKIT products and their inspirational use.

Your central access to all ROKIT components

**TRANSPARENCY:
STAY ON TOP OF THINGS**

- ▶ Fleet manager: easy and intuitive administration and operation of the ROKIT Locator fleet
- ▶ Live view of your fleet: visualization of all ROKIT Locator clients for a system overview
- ▶ Event Center: quick and clear access to all notifications and processes of the ROKIT components
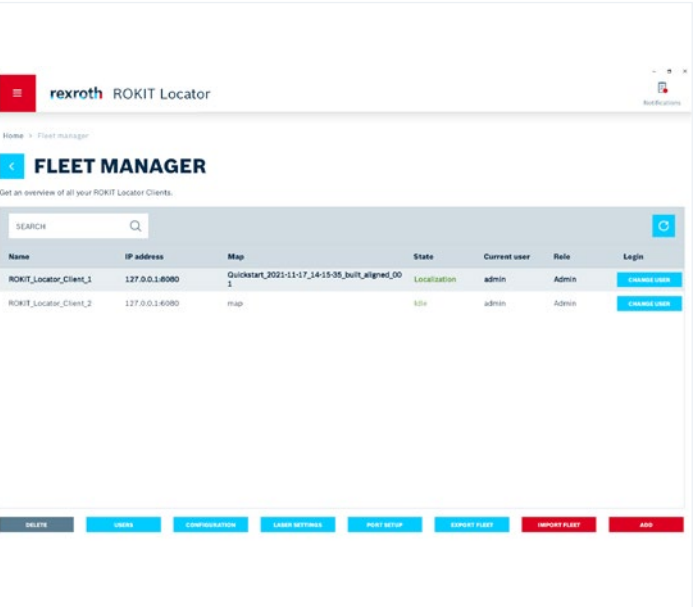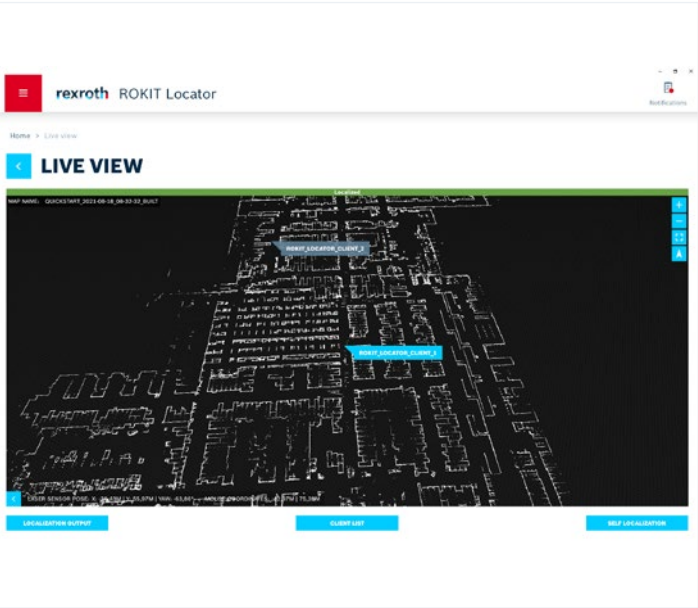
**USER-CENTRIC:
YOUR EASY CONTROL CONCEPT**

- ▶ One control concept for all ROKIT components
- ▶ Clear, wizard-supported operation
- ▶ Compatible with various operating systems (Linux/Windows)
- ▶ Customizable (light/dark mode; multilingual)
- ▶ Gamification: intuitive, inspiring and interactive use
- ▶ Simple commissioning and operation, no expert knowledge required
- ▶ Efficient, centralized map administration of the entire ROKIT Locator fleet

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Rexroth ROKIT Locator

Your Easy-to-Use Laser Localization Software

The ROKIT Locator by Bosch Rexroth is a software component that reliably determines the position and orientation of a wide range of vehicle types in a variety of changing environments. This is made possible by a high-performance algorithm that automatically detects and maps the natural environment using a laser sensor on the vehicle. Bosch Rexroth thus provides a key technology and resolves the challenge of localizing your mobile robots with maximum flexibility and usability.

Flexibility for all situations
Benefit from the effortless integration of the ROKIT Locator into a wide range of vehicle types as well as into numerous industries and application areas. Thanks to the modular approach, the software is hardware-independent.

Outstanding usability
Due to the fast and easy setup and reliable operation, you do not have to worry about locating your mobile robots. The flexible adaptation to changing environments also enables automatic map updates for your entire fleet.

ONE FOR ALL

▶ Suitable for a wide range of vehicle types, industries and application areas
▶ Available as software-only solution or as Rexroth ROKIT Locator.Box – ready to use on an extremely compact industrial computer
▶ Supports numerous brands and types of laser scanners and industrial computers
▶ Flexible laser positioning

INTUITIVE FOR YOU

▶ Express mapping
▶ No need for infrastructure adaptions or expert knowledge
▶ No maintenance of infrastructure required
▶ Automatic map updates

ROKIT Locator Features

Express mapping – guided live mapping
Maps the environment with just a few clicks without the need for infrastructure adaptions or expert knowledge.

Masking
Hides vehicle contours in sensor data.

Manual map alignment
Adjust the map with offsets and rotations.

Reference alignment
Align the ROKIT Locator map to an existing coordinate system.

Initial localization
Automatic localization after a change of position.

Robust and reliable localization
Functions smoothly in dynamic industrial environments regardless of vibrations and ramps.

Wheel odometry fusion
The positioning includes information of laser scans and estimated movements of the vehicle based on the wheel rotations.

Map update
Automatically detects changes in the environment, continuously updates the ROKIT Locator map, and shares it with the entire ROKIT Locator fleet.

Map expansion
Allows users to extend existing ROKIT Locator maps and replace map zones.

Dual laser
Supports up to two lasers.

Visual recording
Supports the commissioning of complex use cases through live mapping

Auto-calibration
Enables an easier and faster commissioning. With this function, the existing sensors can automatically be calibrated to each other.

Real-time diagnostic information
Diagnostic information is visualized in real-time for you. In addition, the feature Event Center notifications include the ROKIT Locator diagnostic messages.

Extended localization details
Within the live view of our GUI, you get a visual overview of extended localization data and information of the ROKIT Locator algorithm for a better understanding of the parameters.

WITH THE AXESSOR YOU HAVE EVERYTHING UNDER CONTROL

The graphical user interface aXessor makes real-time localization easy to use: one-click mapping, management and overview of the entire fleet, and gamification elements for optimized handling of complex use cases.

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Rexroth ROKIT Navigator
Your Advanced Motion Planning Software

ROKIT Navigator Features

Obstacle avoidance
Takes into account objects in the driving tube and avoids them within the permitted avoidance area.

Compliance with external safety requirements
Smooth integration of safety control into vehicle motion planning.

Observance of acceleration restrictions
Motion planning takes into account compliance with the maximum longitudinal and lateral acceleration.

Consideration of vehicle and load contour
Prevents vehicle or load collision with obstacles.

VDA 5050-compatible
Support of the VDA 5050 specification between vehicle and fleet management.

Consideration of orientation restrictions
Enables, depending on the drive type, motion sequences independent of the vehicle orientation.

Zone observance
Compliance with specific conditions in defined areas (e.g. speed limit, exclusive driving area).

Navigation in confined spaces
Safe vehicle manoeuvring in limited spaces.

Support of different drive types
e.g. Ackermann, differential drives, omnidirectional drives.

Fast integration and commissioning
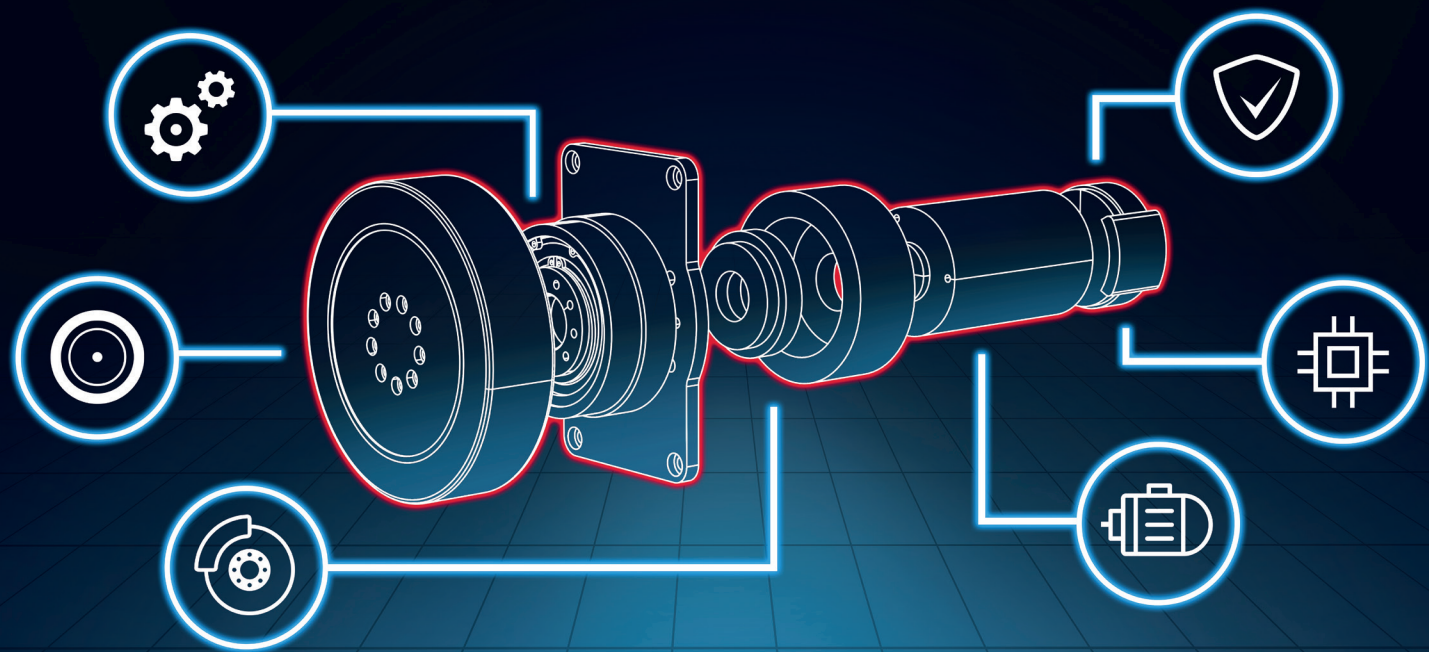Tool-supported offline calibration of system parameters.

The ROKIT Navigator by Bosch Rexroth is navigation software for the efficient motion planning of mobile robots, thus making it a natural extension of the ROKIT Locator. The modular and easy-to-integrate software reliably and transparently controls the movement of your goods from A to B. It also ensures smooth, elegant driving and responds to obstacles. Like the ROKIT Locator, the ROKIT Navigator is compatible with a wide range of mobile robots and offers interfaces for other components as standard.

Increase your productivity
Navigation made perfect: high-precision, deterministic, reliable. A straightforward targeted integration phase enables the motion planning software to simplify the parameterization effort for different types of vehicles.

Compatible with a wide range of software and hardware applications
Integrate the ROKIT Navigator into existing standards – with no need for adapters or additional interfaces. The component is compatible with VDA 5050 interface-enabled fleet management systems and takes into account your current on-premises safety requirements.

PLAN YOUR NEXT MOVE

▶ Reliable goods delivery and handling
▶ Obstacle avoidance and navigation in cramped spaces
▶ Transparent driving behavior
▶ Efficient algorithm

EASY TO INTEGRATE

▶ Fast and easy integration – no expert knowledge required
▶ Observance of general safety conditions
▶ Fast adaptation to different kinematics
▶ VDA 5050-compatible
▶ Open interfaces

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Rexroth ROKIT Motor

Your 6-in-1 Wheel Drive Module

REDUCE YOUR DEVELOPMENT EFFORT

▶ Reduces the workload of development, production and maintenance
▶ Small installation space
▶ Integrated functional safety
▶ Single-source solution
▶ Reduced complexity saves time

The ROKIT Motor by Bosch Rexroth is a complete, highly integrated and ready-to-use wheel drive module for mobile robots, like differential-driven vehicles for payloads of up to one ton. The module, consisting of wheel, planetary gear box, safety and parking brake, motor, safety encoder and motion controller, significantly reduces the workload in procurement processes as well as in development, production and maintenance – thus ensuring efficient operation and a focus on the features that differentiate you from others.

Highly integrated into your vehicle
The high-quality individual components are coordinated with each other and proven in many application areas. Integrated functional safety is ensured.

Specifically designed for mobile robots
The ROKIT Motor is tailored to the performance profile of AGVs and AMRs and comes with proven Bosch Rexroth quality and technology. All components offer optimum robustness for your mobile robots.
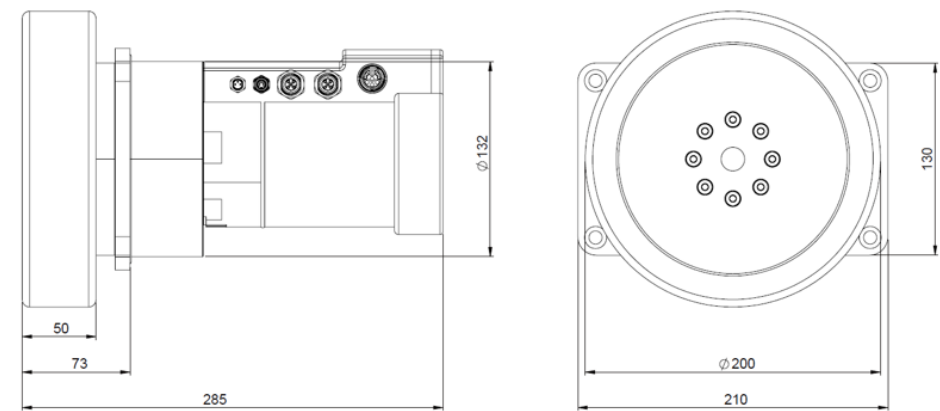
FOR YOUR MOBILE ROBOTS

▶ High quality: Rexroth – Drive & Control proven
▶ Specially designed for mobile applications
▶ Easy applicability
▶ ROS2 driver supplied

ROKIT Motor Technical Data

General	Specification
IP protection class	IP64
Lifetime	95,000 km
Safety standard	ISO 13849 PL d
Power supply voltage	Nominal 48 VDC (range 36 … 60 VDC)
Temperature range	0 to 50 °C
Payload	500 kg
Vibration resistant	According to DIN EN 60068
Shock resistant	According to DIN EN 60068
Wheel	**Specification**
Wheel diameter	200 mm
Nominal drive speed	2 m/s
Nominal torque	30 Nm
Peak torque	70 Nm
Nominal power	800 W
Peak power	1,000 W
Material	Vulkollan 92 Shore A
Gear box	**Specification**
Type	Planetary
Safety and parking brake	**Specification**
Wheel holding torque	100 Nm
Active at STO (safe torque off)	Yes
Motor	**Specification**
Type	PMSM, brushless
Encoder	**Specification**
Integrated safety	Yes
Positioning accuracy wheel	50 arcmin
Motion controller	**Specification**
Safe torque off	SIL3 and PLd over FSoE
EtherCat	EtherCat with FSoE, CoE with DS402 profile
ROS2 interface	Yes

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