

# BODAS-service Version 4.4.2



- ▶ A windows-based PC software for service and commissioning of
  - Rexroth devices:
    - BODAS controllers RC/40-family and
    - directional valves SB24EHS, SB34EHS and EHR24EHS series 2x
  - and Bosch Off-Highway devices:
    - USS-ultrasonic sensors (12 V and 24 V)
    - RADAR-radar sensors
    - INVCON3.3-inverters
- ▶ Application area  
Service repair shops, service technicians, R&D departments and manufacturing plants of OEMs and Bosch Rexroth AG, system integrators

## Features

- ▶ Graphical user-friendly interface with intuitive operation
- ▶ BODAS-app Concept for more flexibility and individuality
- ▶ Project specific diagnosis via individual BODAS-service Apps
- ▶ Standard functionalities according to UDS, ODX and OTX<sup>1)</sup>
- ▶ Compatible with Vehicle Communication Interfaces according to ISO 22900-2
- ▶ Extendable to the future devices and features due to the modular BODAS-app Concept and update mechanism
- ▶ Future-proof due to the use of international standards
- ▶ Network and device identification
- ▶ Programming / flashing of the electronic units without any programming knowledge
- ▶ Password protected access to the devices only for authorized users
- ▶ Comfortable parametrization of electronic devices
- ▶ Integrated data logger for displaying the progression of measurement variables over time
- ▶ Access to error memories and diagnosis information
- ▶ Increased security of the intellectual property due to encryption of the ECU specific data (BODAS-apps)

## Notice

- ▶ For BODAS controllers series 3x, please use BODAS-service 3.x

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<sup>1)</sup> UDS ISO 14229-1, ODX ISO 22901-1 and OTX ISO 13209

## Description

The BODAS-service PC software tool is used to execute convenient service functions for BODAS controllers RC/40-family and directional valves EHS Series 2x. It is also used by ultrasonic sensors USS OHW (12 V and 24 V), radar sensors RADAR OHW and inverters INVCON3.3 from Bosch Engineering Group. In the future, it will support further electronic devices from Bosch Rexroth AG and Bosch.

### BODAS Discovery App

Discovery App identifies the electronic devices in the network that can be flashed and diagnosed by BODAS-service 4.x. It is developed and delivered by Bosch Rexroth.

### BODAS Flashing App

After the identification of the devices in the vehicle, it allows the user the access to the comprehensive device information. Automatically, it offers the option to upload application software, so called hex-files. Only authorized users are enabled to flash the Rexroth devices as they are protected by the passwords.

The communication between the service tool and the device is based on the UDS standard.

### BODAS Service App

After loading a project specific Service App to the tool, the user will be able to use the diagnostic functions of the application software. Parameters will be displayed and

they can be edited. Process data will be visualized and their progressions can be recorded. Device and system errors (diagnostic trouble codes) will be read out, filtered and they can be reset.

Furthermore, device memory can be read out and saved to a file on a PC e.g. for documentation and analysis purposes. Uploading memory files onto the device increases the calibration time.

The Service App represents the visualization (groups, sequences, descriptions, etc.) of the diagnostic data in BODAS-service. This gives the possibility to create the diagnostics according to the end user needs. Moreover, it contains project specific textual descriptions of parameters, process values and trouble codes. It is saved on the local hard-disk of a PC. This concept increases the speed of the connection between tool and devices. It improves the efficient usage of the resources of the electronic device. For security reasons, Service Apps are encrypted by a Rexroth specific algorithm.

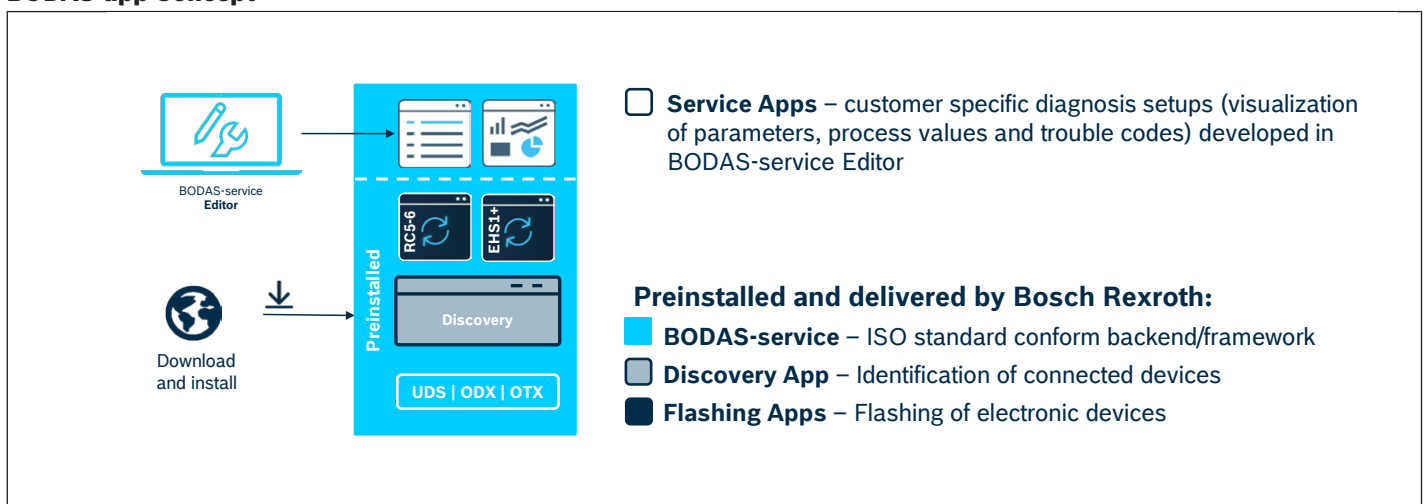
BODAS-service Apps are executed in BODAS-service and they follow the ODX and OTX standards.

They are configured and generated in BODAS-service Editor.

There are different kinds of Service App:

- ▶ Standard (with a table view / tree view)
- ▶ Dashboard App (with characteristics for calibration and graphs for measurements)
- ▶ Custom App (with a freely programmable layout).

## BODAS-app Concept



### BODAS-service delivery

The installation file will be provided regularly on [www.boschrexroth.com/p-BODAS-service](http://www.boschrexroth.com/p-BODAS-service) and can be downloaded to a PC.

It contains only the basic functionalities (network discovery and flashing) but not the project specific diagnostics of the BODAS Service Apps. The Service Apps have to be created and provided separately.

The updated software versions are enabled for the users who purchase the Maintenance and Service Package (MSP).

It is recommended to check the BODAS-service updates at least every 3 months.

The versions are indexed as follows: BODAS-service 4.x.y (status on 05.2022: 4.4.2).

The version with the higher indexes always represents the latest version.

All of the functions mentioned can be executed on a PC or a laptop.

## Licensing and ordering details

BODAS-service 4.x.y is licensed by Rexroth and available as follows:

License version	Material number	Description	MSP
USB-dongle license	R917011669	not fixed to a PC	until 2023
Softkey-license	R917012237	fixed to one PC with a possibility of transfer	until 2023
Evaluation license	1)	fixed to one PC and limited to 30 days	not available

1) on request – please, ask your sales representative

### Scope of delivery

License (USB-Dongle or Softkey-License) without the software installation files and without BODAS Service Apps.

## Required accessories

### Vehicle Communication Interface (VCI)

CAN-USB interface from Rexroth and further interfaces from PEAK and Vector following ISO 22900-2.

A VCI (CAN-USB interface) is not included in the BODAS-service's scope of delivery. It can be ordered from Rexroth under the following material number:

Designation	Material number
CAN-USB interface	R902602780

## System requirements

Computer	PC, notebook or tablet PC
Hardware	Processor speed $\geq$ 2 GHz (depends on the system configuration and the data complexity)
	RAM (depends on the data complexity): $\geq$ 2 GB
Screen resolution	At least 1280 x 768
Supported operating systems	Windows 10 (64-Bit) - Versions 1909 and 20H2

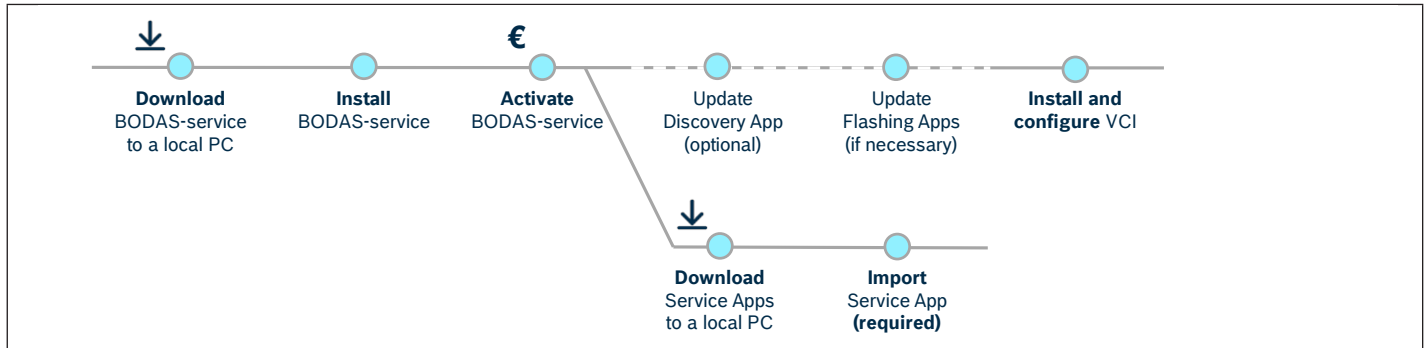
## Program installation

After downloading the current version from the Internet and unpacking the zip file locally, double click Setup.exe to install the program. All further instructions are provided on the screen. The installation in the silent mode (without UI) is also possible.

### Notice

System administrator rights are required in order to install the BODAS-service software on Windows.

### Workflow: Getting started



## Getting started

After successful installation, execute the following tasks to be fully operational:

### Activate the product

Firstly, you need to activate BODAS-service with a license that you purchased to use the tool.

### Update the Discovery and Flashing Apps

BODAS-service is delivered with the latest Discovery and Flashing Apps. However, you have always a possibility to update them if necessary.

## Start working

The first task is to discover the electronic devices within the network. Afterwards, it is possible to flash them with

### Install the Vehicle Communication Interface

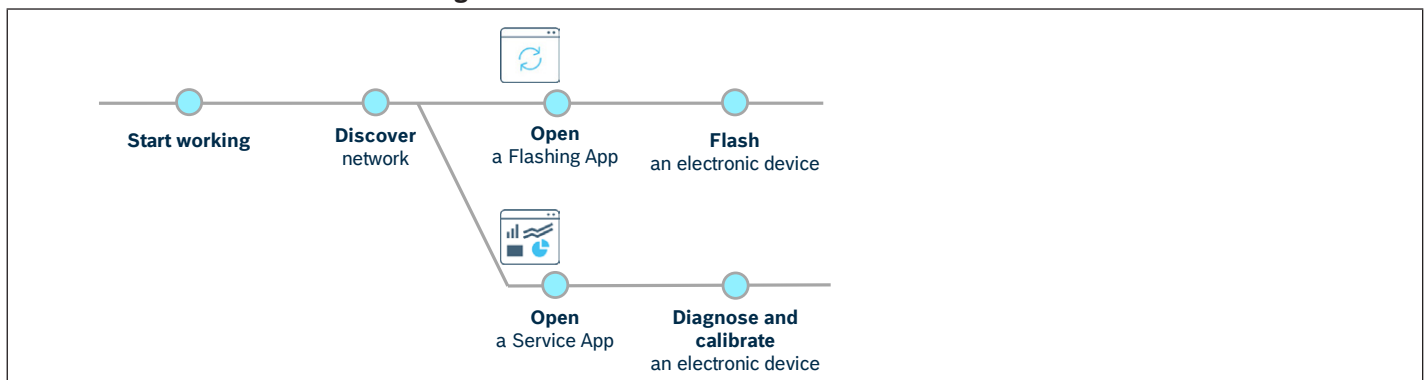
Then, install the VCI of your choice in System Configurator to enable the communication between a PC and an electronic device via CAN bus.

### Import BODAS Service App

Finally, download and import a project specific Service App into BODAS-service to run the diagnostics of the electronic device. The Service Apps will be provided by the OEM or a system provider separately.

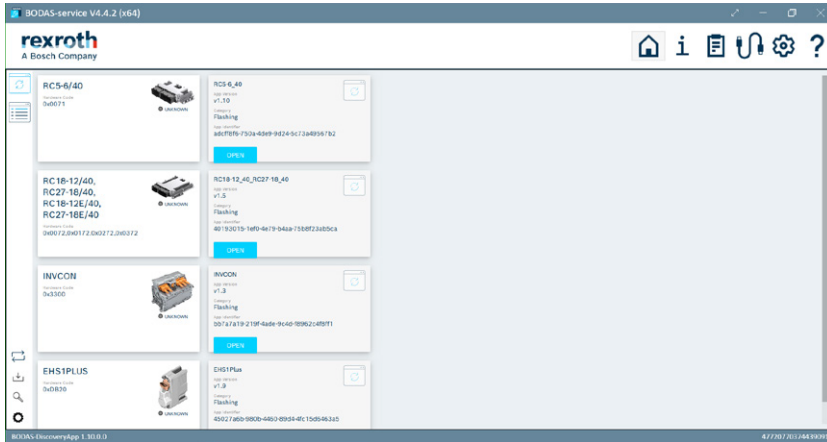
the Flashing App or diagnose them with the application specific Service App.

### Workflow: Service and commissioning



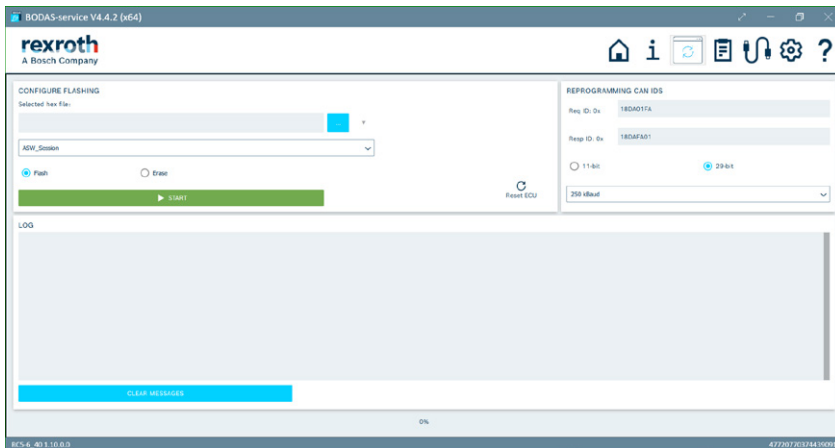
## Example application

### ▼ Overview - BODAS-apps



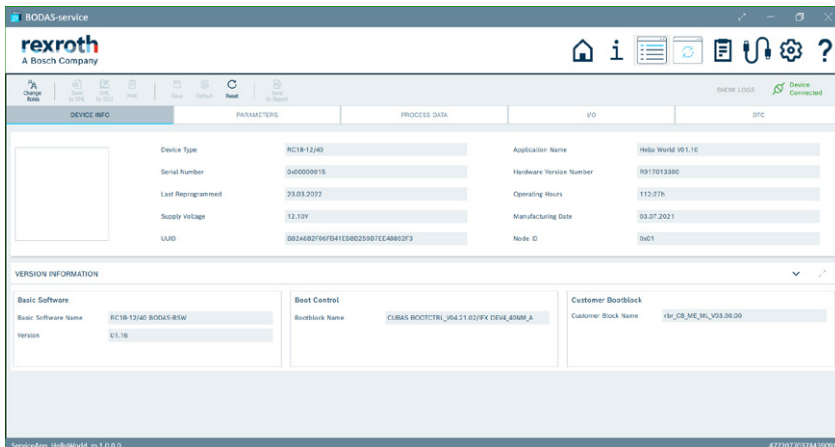
On the lefthand side you can see the BODAS-service Apps: Flashing Apps and Service Apps (incl. Network Discovery) for various hardware devices hardware and the application software. Further Service Apps, for instance for the directional valves EHS, can be added.

### ▼ Flashing App



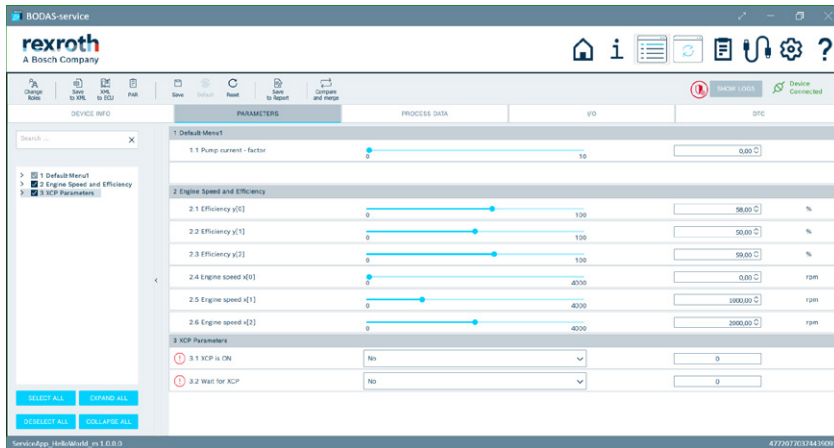
In the Flashing App you can chose the hex-files to be flashed onto the ECU and the sessions (ASW for Application Software and CB for Customer Bootblock).

### ▼ Service App - Device Info



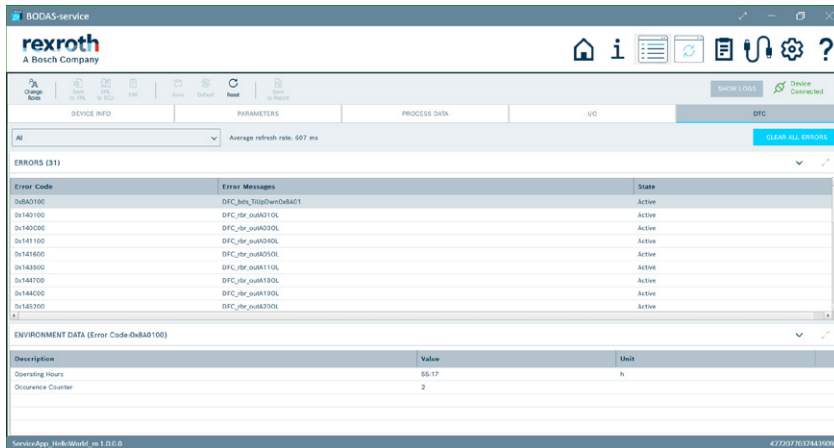
In the Service App - view Device Info you can read out all relevant information about the hardware and the application software from the electronic units. The information is sent within the Data Identifiers according to ISO UDS norm.

▼ **Service App - Parameters**



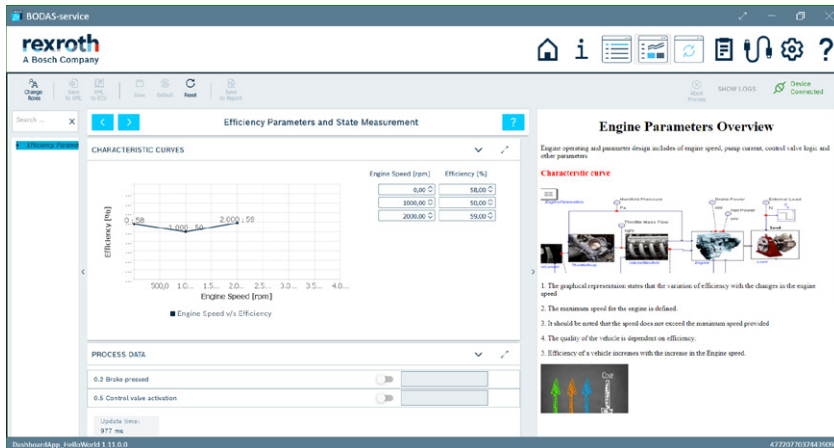
In the Service App - view Parameters the parameters are sorted by multiple menus and groups. You can easily adapt the view by choosing the relevant parameters.

▼ **Service App - Errors**



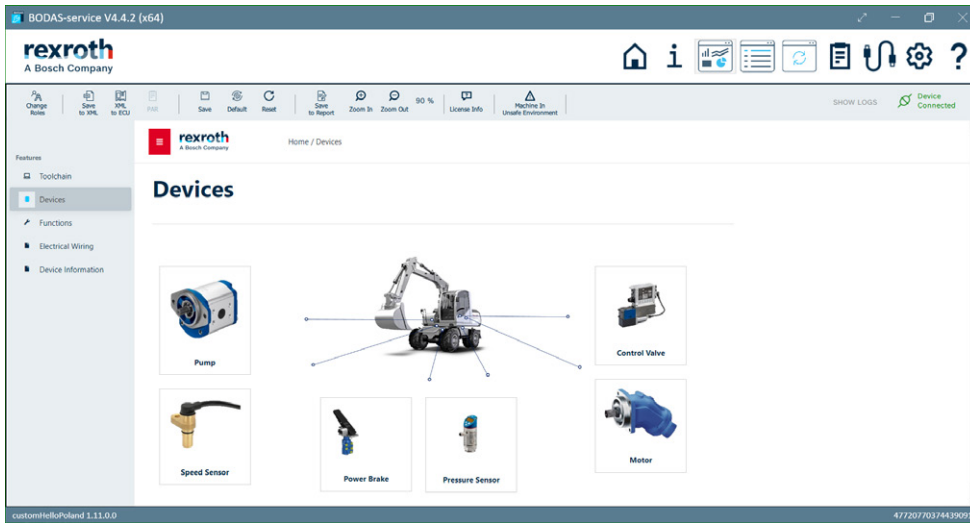
In the Service App - view Errors you can see the system errors (DTC - Diagnostic Trouble Codes) with their description and environmental data.

▼ **Dashboard App - Characteristic Curves and help**



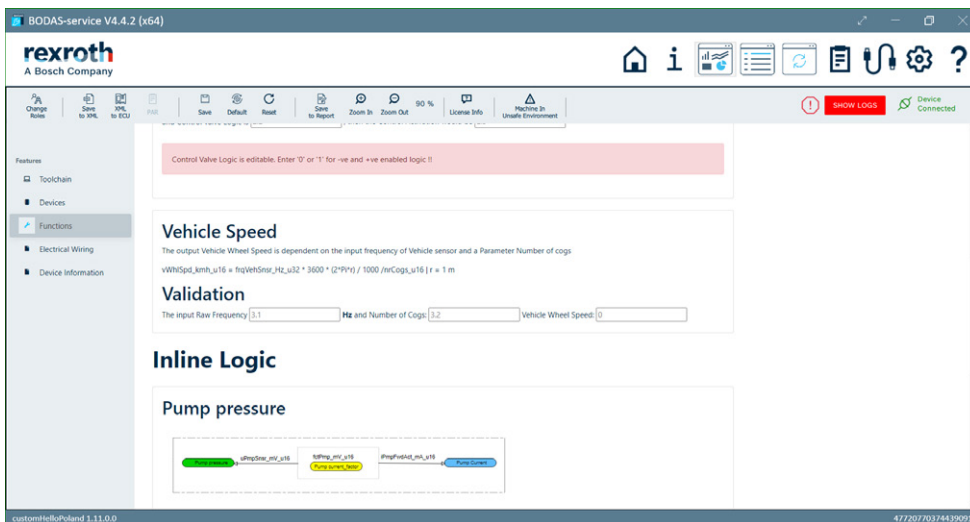
In the Dashboard App - step view you can calibrate the characteristic curves per drag-and-drop of the points or editing the tables. The html-documentation including figures on the right side support you in the quick calibration of your system.

▼ Custom App - Devices



In the Custom App you can freely implement your diagnosis concept. Thanks to the HTML5 technologie it is possible to depicture the complete system.

▼ Custom App - Functions



In the Custom App the system functions can be explained to the user in a from of pictures and texts. The current values on the diagrams help to judge the state of the system.

### **Function and operating notes**

The BODAS-service PC software tool is used to execute convenient service functions for Rexroth electronic devices.

The tool is characterized by the following functions:

- ▶ Extremely user-friendly, thanks to the project specific, freely configurable BODAS-service Apps
- ▶ Simultaneous display of multiple parameters for the modification of settings
- ▶ Simultaneous display of multiple process variables in numerical form
- ▶ Clear display of fault messages
- ▶ Selectable and expandable program languages (currently English and German)
- ▶ Flashing of software from a PC to an electronic device acc. to UDS norm
- ▶ Save the parameter data located in the non-volatile memory (NVM) to a file and vice-versa
- ▶ Display of extensive version information
- ▶ Increased data security due to the password protection and data encryption

#### **Notice**

Should you need BODAS-service Editor for the configuration of the individual BODAS-service Apps, please, contact your sales representative or email us at [info.bodas@boschrexroth.de](mailto:info.bodas@boschrexroth.de).



## Safety instructions

### General instructions

- ▶ The use of BODAS-service in the standard working mode of the machine is not permissible.
- ▶ Working on the PC with BODAS-service in combination with a controller or electronified valves in a machine or vehicle is only permissible during commissioning of the machine or during service operations. Appropriate safety measures must be provided against hazards caused by unexpected operating conditions.
- ▶ Changing parameters or loading (flashing) software onto the device may only be performed by trained and experienced specialists who are sufficiently familiar with both the components used and the complete system.
- ▶ When performing flashing, the user is responsible for ensuring that the software to be flashed is compatible with the device hardware and the machine/vehicle in question.
- ▶ Incorrect programming or parameter settings on the controller may create potential hazards while the machine is in operation.
- ▶ It is the responsibility of the machine manufacturer to identify hazards of this type in a hazard analysis and to bring them to the attention of the end user. Rexroth assumes no liability for dangers of this type.
- ▶ System developments, installations and commissioning of electronic systems for controlling hydraulic drives must only be carried out by trained and experienced specialists who are sufficiently familiar with both the components used and the complete system.
- ▶ Whilst commissioning and maintenance of the machine with BODAS-service, the machine may pose unforeseen hazards. Therefore the vehicle and the hydraulic system have to be in a safe condition during such operations.
- ▶ Make sure that nobody is in the machine's danger zone.
- ▶ No defective or incorrectly functioning components may be used. If the components should fail or demonstrate faulty operation, repairs must be performed immediately.
- ▶ After a storage time of more than 5 years, the product must be checked by the manufacturer before use.

### Disposal

- ▶ Disposal of the product must be in accordance with the national environmental regulations of your country.

### Notes on the installation location and position

- ▶ Connect an electronic device to a PC with VCI (BODAS-service connection cable). Incorrect connection cables or wiring could lead to the destruction of the PC interface.
- ▶ The controller and the PC must be switched off when a VCI (BODAS-service connection cable) is connected or disconnected.
- ▶ When using the BODAS-service flash function, the energy source (e.g. diesel engine) must be switched off during data transfer to the electronic controller.

### Intended use

- ▶ Operation of the electronic hardware in combination with BODAS-service must generally take place within the operating ranges specified and released in its data sheet, particularly with regard to voltage, temperature, vibration, shock and other described environmental influences.
- ▶ Use outside of the specified and released boundary conditions may result in danger to life and/or cause damage to the components, which could result in subsequential damage to the mobile working machine.

### Improper use

- ▶ Any use of the BODAS-service other than described in the chapter "Intended use" is deemed to be improper use.
- ▶ Use in explosive areas is not permissible.
- ▶ Damage resulting from improper use and/or from unauthorized intervention not described in this data sheet renders all warranty and liability claims void against the manufacturer.

**Use in safety-related functions**

- ▶ When using BODAS-service in safety-related applications, special measures must be observed. These can be found in the safety-related project planning guidelines of the relevant controller (for RC/40-family RE95453-01-B).
- ▶ The customer is responsible for performing a risk analysis of the mobile working machine and determining the possible safety-related functions.

- ▶ In safety-related applications, the customer is responsible for taking suitable measures for ensuring safety (sensor redundancy, plausibility check, emergency switch, etc.).
- ▶ Product data that is necessary to assess the safety of the machine can be provided upon request or are listed in this data sheet.

**Legal Information****License agreement**

The „General Terms and Conditions of Deliveries and Services of Bosch Rexroth AG” for Engineering Software shall apply.

Further details and license information are given on: <https://www.boschrexroth.com/en/xc/home/legal>

**Free and Open Source Software**

This product contains Free and Open Source Software. Further details and license information are given within the software documentation:

BODAS-service --> Help --> License information

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- ▶ We may charge you a fee to cover the cost of physical media and processing. You may send your request (i) within three (3) years from the date you received the product that included the binary that is the subject of your request or (ii) in the case of code licensed under the GPL v3 for as long as Bosch Rexroth offers spare parts or customer support for that product.

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