BIKESPEED-REAL SPEED

Instructions for installation and description of the functions for Specialized RX 3.1 *Brose* mid-motor design

WWW.BIKESPEED.DE

„einfach schnell"

Note about this printed manual

Congratulations on the purchase of your bikespeed-RS. You are holding the original manual for the bikespeed-RS and bikespeed-RSc for Bosch mid-mounted motors in your hands.

Printed manuals may not always be up to date for technical, logistical, and economic reasons. This applies, for example, to the listed compatible motors, displays and model years. You can find a current version of the manual for download on our homepage (https://www.bikespeed.de) If you are unsure, please feel free to contact us.

Product description

The bikespeed-RS is a simple and compact kit to bypass the speed limit of 25 km/h of Brose pedelec drives. The installation is completely invisible.

The bikespeed-RS is also available in a customizable version, called bikespeed-RSc (custom). You can find more information about this on page 15 of this manual. For the sake of simplicity and a better overview, the bikespeed-RSc is the same as the bikespeed-RS except for the personalization and therefore only the term bikespeed-RS is used in these instructions.

In contrast to other commercial tuning kits for pedelecs the bikespeed-RS displays the "real" speed on the tachometer instead of the half value. The data of the cycled distance, average/maximum speed, calculated range, ... are usable without any limitations. The levels of support as well as any special profile will be certainly maintained. Light activation is also

unnecessary, and you can use the tuning if you have an additional lighting system powered by the battery.

The tuning makes the final speed void, that means the terminal velocity is only limited by the power of the drive and the muscular strength invested.

We designed the installation as simple as we could. All the necessary connections are pluggable and consequently they can be removed without any traces.

Deactivation of the speed limit at 25 km/h is possible with the help of a key sequence on the actuator (see page 9, paragraph “description of functions”).

The tuning will adapt to your pedelec when it is activated. During this process the drive, the display and the size of the tires will be recognized automatically. The tuning is thus universally applicable, and you do not have to adjust anything.

Compatibility list

Please note that the following list may not be up to date. At the time of printing this manual, the bikespeed-RS is compatible with the following motors and displays. If updates are made to your pedelec, it is also possible that compatibility may no longer be given. You can find an up-to-date list on our homepage (https://www.bikespeed.de).

This bikespeed-RS is compatible with the following mid-range motors and displays:

- Specialized custom RX 3. 1 Brose motors from year 2015 up to 2026
- TCU Mastermind (Gen 4) Display from year 2025 up to 2026

Safety instructions, product liability and exclusion of liability

By using the bikespeed-RS on your pedelec, a relevant safety feature (the speed-dependent limitation of the motor power) is overridden. You must assume that your pedelec is not suitable for this and e.g., frame, brakes, chassis, tires, etc. are not designed for the higher speed. The conversion must be carried out by a specialist (e.g., the manufacturer of the pedelec or an authorized specialist workshop) who will also check other components on your pedelec accordingly and convert them if necessary.

Tuning an ordinary pedelec with a maximum speed of 25 km/h is not recommended for the ordinary user, as S-pedelecs are intended for reaching higher speeds with the corresponding legal requirements, in particular the approval of the Federal Motor Transport Authority of your country (in Germany KBA/Kraftfahrtbundesamt).

We have not been able to conclusively clarify whether operation with the bikespeed-RS installed but deactivated is permitted on public roads. Therefore, we expressly point out that the mere presence of the tuning can constitute an offence in the sense of the Road traffic regulations or riding without insurance, §6 Compulsory Insurance Act!

A modified bicycle may only be used by an authorized, trained and instructed person. We assume the following level of training:

Function	User
Operator	Only persons trained and instructed about the special dangers
Maintenance personnel / technicians	Only the manufacturer of the pedelec or an authorized specialist workshop by persons with the appropriate expertise
Trainees or apprentices	the use is prohibited
General public	the use is prohibited

Trained users should be made aware of the increased risk when using the modified pedelec:

Increased risk of impact: Due to the increased speed, obstacles are reached more quickly, and reaction time may not be sufficient to brake or swerve in time.

Increased braking distance: The increased speed also increases the braking distance. Furthermore, it must be checked before use whether the installed brake system is designed for the increased speed.

Increased risk of discomfort / neurological disorders: Due to the increased speed, vibrations can increase, which can lead to discomfort. Furthermore, due to the increased speed, more concentration is required from the user. This can lead to increased stress during use. Therefore, only persons who do not have any physical, mental, or neurological disorders may be users.

Possible loss of control: The increased speed can make it easier to lose control of the pedelec. The user must therefore be of age and equipped

with suitable protective clothing (helmet, protectors, etc.) to be adequately protected from injury in the event of a fall.

Modified bicycles may only be used on fenced private property. Furthermore, it must be ensured before use that there is sufficient space to obstacles on the route. (e.g., stones, trees, water areas, etc.).

No other persons are allowed on the fenced off area during use and precautions must be taken to ensure that no other person can enter the area during use.

The converted pedelec must be equipped with a warning notice that is clearly visible before the pedelec is used. The warning notice must prohibit the use by untrained persons and outside the fenced private area.

Operation on public roads is expressly prohibited by the Road traffic regulations!

The bikespeed-RS is installed and operated at your own responsibility; any liability for damage or consequential damage, as well as legal consequences for bikespeed or the manufacturer of the pedelec are excluded in any case.

Before using the system, please enquire about the legal consequences that may arise for you because of the installation.

We expressly point out that the use of bikespeed RS will result in the loss of the manufacturer's warranty. Furthermore, the manufacturer and bikespeed have no product liability for your pedelec.

Bikespeed or the manufacturer of your pedelec cannot guarantee that brakes, frame, chassis, tires, etc. are designed for the use of the tuning part.

Before use, the more highly stressed components of the pedelec (e.g., frame, brakes, tires, bearings, and suspension, etc.) must be tuned by the manufacturer or tested and approved by a suitable testing Centre (e.g., TÜV or Dekra). If the speed is doubled, it must be considered that the acting forces are quadrupled. In accordance with EN 15194, it must therefore be checked that the modified pedelec still meets the requirements. It is to be assumed that the higher stress is permanently given.

If a component of the pedelec cannot withstand the higher stress, it must be upgraded by the manufacturer of the pedelec or by an authorized specialist workshop, or the bikespeed-RS must not be installed.

Description of functions

The bikespeed-RS removes the limit at 25 km/h of your pedelec. All other features and functions of your bike remain as usual. This also includes the protective measures installed by the manufacturer (e.g., short circuit, overcurrent, power, torque, temperature, etc.), except for the safety device for limiting the maximum speed.

After activating your pedelec the display will show an animation. Depending on the display, this is shown via the capacity display of the battery, the speedometer or both together. If the capacity runs from empty to full, or from 0 km/h to 4 km/h your pedelec will support you with motor power even if you exceed 25 km/h. If the capacity runs from full to empty or from 4 km/h to 0 km/h the support will end at 25 km/h.

To switch on or off the support above 25 km/h please change the level of support down, up, down, and up again. If the procedure was successful you will see the animation of the battery's capacity once more just like when you activate your pedelec and this way you are informed about the current setting.

Here is an example beginning on the "Trail" level:

Pushbutton down (new level: "Eco")
Pushbutton up (new level: "Trail")
Pushbutton down (new level: "Eco")
Pushbutton up (new level: "Trail")

Please enter the combination quickly without a pause of 3 seconds between two keys. Repeat the procedure if necessary, to obtain the desired setting.

With the bikespeed-RSc you use of course your chosen combination. (see also section „Description of the custom-variant“ on page 15)

Furthermore, please note that you must switch the stages to enter the combination. For example, you cannot enter a combination that starts with the "down" key from the "off" level (or a combination that starts with the "up" key from the highest level). If the combination consists of several keys in one direction, you must therefore start the input at a sufficiently low or sufficiently high level.

Hint: A switched off bikespeed-RS cannot be switched on with the combination for service-mode (see on page 12)!

Hints for the removal of battery

Please always deactivate your bicycle before removing the battery. If the battery is removed in operating state, there could be interferences with your bikespeed-RS and the mileage is no longer correct.

Hint for the odometer

Please note that after the deinstallation of the bikespeed-RS your odometer may show a lower value under certain circumstances like you are traveled with your bike. This behavior is caused by the design and not a fault.

Please note this primarily when selling your bike.

Important hint when visiting the repair shop or software-updates on your Brose-system

Important: **If you have in mind** to update your pedelec software or wish to perform the Brose system with a customer service, **please first have a look at bikespeed** for compatibility and check on our website www.bikespeed.de, whether the tuning continues to work with a later software or not. You can find out the software approved for your tuning by checking the line with the purchase date for your tuning, as well as your motor and display.

We would like to point out that the warranty for your tuning is not valid if you install an update on your bike that has not been approved by us for your bikespeed-RS!

For a software-update to your Brose-system you have to uninstall the bikespeed-RS. Alternatively, there is the service mode on the bikespeed-RS that needs to be activated at your retailer.

Therefore, change the level of support 3x down and then 3x up. Please enter the combination continuous without a pause of 3 seconds between two keys. Begin on the highest level. In case of success the entire battery index will blink 3x and meanwhile the software state of the bikespeed-RS will be shown on the speed indicator. Now the tuning is in service mode and maintenance as well as software updating can be executed.

If you have a bikespeed-RS*c* you use the combination you chose beforehand. (see also section „Description of the custom-variant“ on page 15)

This state is maintained even after deactivating the system. That is why there will not be an animation of the battery's capacity informing about the state of the tuning.

For the deactivation of the service-mode please use the same key-combination as for the activation or the combination you chose for activating and deactivating the tuning. Please keep in mind that in service-mode the support of the drive ends at 25 km/h.

Hints:

- If you are not sure, whether the service-mode is activated, please uninstall the bikespeed-RS before you update!
- Please activate the service-mode only for updates on your pedelec!
- A switched off bikespeed-RS cannot be switched on with the combination for service-mode!

After activating the service mode, we recommend switching off the bike without moving it again. If a speed is displayed it could change the trip, avg- or max-speed.

Description of the *custom*-variant (bikespeed-RS*c*)

After many requests of our customers, we offer a new feature of the bikespeed-RS additionally. The individual customer configuration gives you the opportunity with you selectable personal setting to protect your tuning for discovering.

With your individual key combination, you can decide if the tuning should be displayed its status with an animation above the battery indicator or not. The tuning can be switched on/off at any time, and you can control the behavior (tuning on/off) after on switching your bike.

The configuration options can be found in the shop on our website. There all possibilities are described with many tips and videos.

If you are interested to upgrade your standard bikespeed RS on a custom version, you can feel free to contact us.

Help in case of problems

If your bikespeed-RS does not work correctly at any given time, please check the following steps to help yourself.

Should you still have problems please write an email before sending back the bikespeed-RS.

Problem	Solution
- bicycle doesn't start or deactivates itself immediately	- Please check whether the display and battery are properly engaged in the bracket. - Please check the 5-pole connector from the tuning to the motor and to the display.
- no animation visible when starting the bicycle	- Please check if the service-mode is activated as by entering the combination. - Check the 2-pole connector from the tuning to the motor
- no support or rather only briefly when starting - no speed-indication (0 km/h)	- Please check the 2-pole connector from the tuning to the motor and to the speed-sensor - Check the magnet on the sensor and align it anew - Test the magnet by holding another magnet in front of the sensor for a second and take it away again several times.
- support only until up to 25 km/h are reached - miles are missing	- Check if the tuning is activated and service-mode is off.

Continue next page.

Problem	Solution
- bikespeed-RS (c) cannot switched on or off	- Keep in mind you must switch the stages to enter the combination. Please start in a sufficient high or low stage.
- The bike can no longer be switched on at the display, only at the battery	- You have not connected the single wire of the 5-pin connector correctly. (see notes at step 4 of the installation instructions)

Help in case of problems (continue)

In our experience, the cause for problems most often are connectors which are not correctly plugged in. Therefore, please always check if they are set correctly and plugged in the correct socket. Please insert the connectors as far as you cannot see the seals anymore. If that is not possible please apply some Vaseline onto the seals for greasing. The plugs are coded and only fit in one direction. Please do not use force!

Notes on installation, removal, storage, maintenance, and use

Installation, repair, commissioning, and decommissioning may only be carried out by the manufacturer of the pedelec or an authorized specialist workshop.

During installation, ensure that the ergonomic principle and functionality of the pedelec are not changed or impaired.

The protection class of the bikespeed-RS is IP64. The bikespeed-RS does not require a separate power source. It is supplied with energy from the battery of the pedelec in which the tuning is installed. This battery is charged via the power supply unit provided by the manufacturer of the pedelec.

No maintenance or service is required on the bikespeed-RS. After decommissioning, no special precautions need to be taken to put the product back into operation.

If the product is stored in a dismantled state, this must be done in a dry place between 0 and 40 degrees Celsius and 30 to 70 % relative humidity.

Use in the installed state may only be carried out by specially trained and adult users without physical and physical limitations.

The use is not limited in time but may only take place as long as the physical and mental condition of the user allows to operate the pedelec under full concentration.

Example installation on a Specialized Levo Alloy G4 NB

Since we cannot provide detailed installation instructions for every bike available on the market with this motor and display, we have decided to use this installation example. This example will give you an overview of the work to be done and you can transfer it to your bike. If you still have questions, please feel free to contact us at any time.

To access the connectors for connecting the bikespeed-RS the gravel deflector of your motor has to be dismantled. Therefore, your first step is to remove the foot pedal on the opposite side of the chain.
Please follow the pictured set of instructions on the next pages.

Tools required: - Allen keys (Size 4 and Size 5)

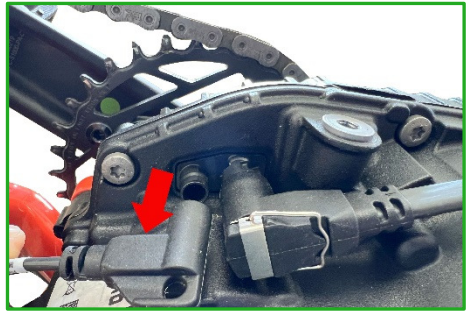
The installation may only be carried out by an expert!

1. First, the battery is removed from the bike. To do this, loosen the screw using a 5 mm hex key and remove the cover. Then take the battery out of the frame.

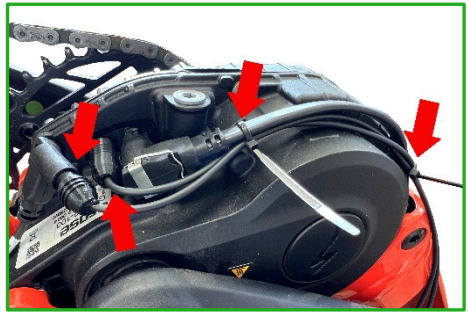
2. Above the battery there is a tool bag. Pull it downward into the battery compartment and remove the bag.

3. For the next steps, it's best to turn the bike upside down or secure it in a stand.
Remove the two screws for the motor's gravel deflector using a 4 mm hex key. Then take off the cover.

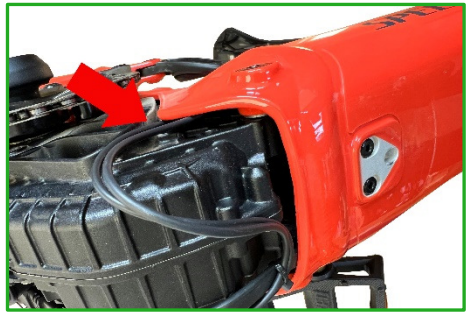
4. Disconnect the connector to the speed sensor.



5. Connect the two connectors of the approx. 1 m long cables to the speed sensor connector and to the corresponding port on the motor. Route the cables along the existing wiring and secure them with cable ties so that the rock guard cover can be reinstalled.

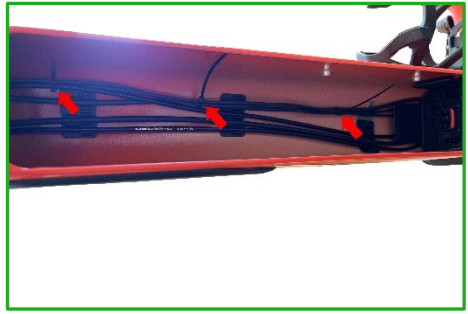


6. Route the two cables past the motor and into the battery compartment. Then reinstall the gravel deflector and fasten it with the screws. The bike can now be set upright again for the next steps.

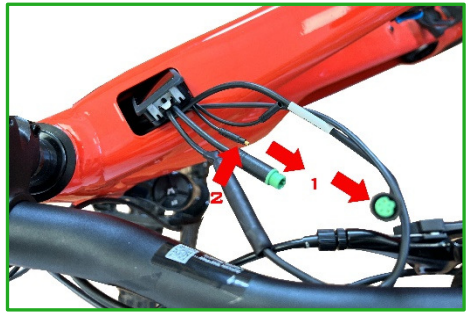


7. Remove the display from the frame. First, slide the display downward (in the direction of arrow 1). Then it can be tilted out of the frame at the top (see direction of arrow 2)

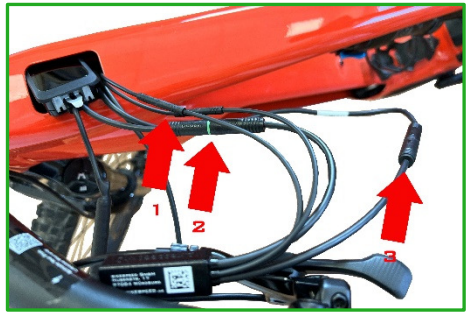
8. Secure the two cables installed in step 5 to the existing wiring in the battery compartment using cable ties. Then route the ends of the two cables through the frame opening for the display.



9. Disconnect the data connection between the display and the motor. The connectors are marked in green (arrows 1) and are 5-pin. If you accidentally disconnected the 4-pin connection, simply reconnect it. From arrow 2 onward, you can see the two cables from steps 5, 6, and 8.



10. Connect the bikespeed-RS to the corresponding connectors. Then stow the bikespeed-RS and the cables inside the frame and reinstall the display. Place the tool bag back into the frame and reinstall the battery along with its cover.



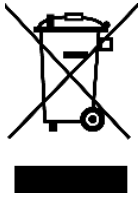
Hint for disposal

Electric and electronic devices that have become waste are called old devices. Owners of such old devices must bring these to recycling facilities, where these are handled and recorded separately from urban solid waste. Old devices must not end up in the household refuse. In fact, they must be collected in special collecting and recycling systems.

Owners of old devices from private households can dispose these at the public waste disposal authorities or bring them to producer or seller related disposal locations. You can find these disposal locations online:

https://www.ear-system.de/ear-verzeichnis/sammel-und-ruecknahmestellen.jsf

The labelled symbol showing the „crossed out waste container“ on electric and electronic equipment indicates that the concerning equipment has to be disposed separately from urban solid waste.



As a producer in terms of the German ElektroG we are registered with the German registration authority Stiftung Elektro-Altgeräte-Register (Benno-Strauß-Str. 1, 90763 Fürth), having been granted the following WEEE registration number: **DE 87104747**
As well at the Elektro Recycling Austria (ERA) GmbH with contract number: **40624**

EG Konformitätserklärung / EU Declaration of Conformity

Wir, die Firma	**bikespeed GmbH**
We, the company	Huberstr. 17 97084 Würzburg

erklären in eigener Verantwortung, dass das weiter unten aufgeführte Produkt
declare under our sole responsibility that the following product

Geräteart / Type of Product:	Tuningkit

Modell	**weitere Angaben**
bikespeed-RS	für Brose Motoren

die grundlegenden Anforderungen der aufgeführten EU-Richtlinien erfüllt:

2014/30/EU	Richtlinie über die elektromagnetische Verträglichkeit
2011/65/EU	Richtlinie zur Beschränkung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten
2006/42/EG	Maschinenrichtlinie

meets the essential requirements of the following EU-Directives:

2014/30/EU	Directive on Electromagnetic Compatibility
2011/65/EU	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment
2006/42/EC	Machinery directive

angewandte Standards und Verordnungen / applied standards and regulations:

EN 15194:2017
EN 12100:2011
EN 62321:2009
EN 61000-3-2:2014
EN 61000-3-3:2013

Bevollmächtigter zur Zusammenstellung der technischen Unterlagen:
Authorized person for technical documentation:

Name/Name, Position: Matthias Braun, CEO

Würzburg, 01.05.2014

Datum / Date **Unterschrift** / Signature