

POWER BOX

USER'S MANUAL AND INSTRUCTIONS

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FSA PowerBox by fullspeedahead

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1 Quick Start Guide

⚠ WARNING

Please read the user's manual carefully before installation and use. Improper installation can cause accidents. In case of doubt, consult a professional bicycle mechanic. Observe the indicated torque values when installing screws and bolts. Before going on a ride, get to know the functions and operation of your power meter. Get a checkup from a sports physician before starting your training program. Pay attention to traffic and road conditions before checking any data.

Introduction

Congratulations! Your PowerBox power meter is an excellent choice for accurate power training. Please read these instructions and follow them for correct use. Failure to follow the warnings and instructions could result in damage to product not covered under warranty, damage to bicycle; or cause an accident resulting in injury or death. Since specific tools and experience are necessary for proper installation, FSA recommends that the product be installed by a qualified bicycle technician. FSA & Vision assume no responsibility for damages or injury related to improperly installed components.

Specification

These instructions are for the installation of the following FSA components only:

FSA NS ROAD Carbon PowerBox
CK-OS8304NCC/86/PBOX



FSA NS ROAD Alloy PowerBox
CK-OS6071NCC/86/PBX



FSA NS MTB Carbon PowerBox
CKM-OS9310CC/92/PBOX



FSA NS MTB Carbon 1xDirect Mount PowerBox
CKM-OS9310C/92/PBX



Installation and operation:

1. Remove the red isolation strip by pulling it out of the battery compartment. (You do not need to open the battery compartment.)
2. The LED indicator is now flashing green. Please pair the power meter to your cycling computer (observe computer manufacturer's instructions).
3. Install the crankset to the bicycle (observe manufacturer's instructions and torque values!).

After installing, check the function of the front derailleur and adjust as necessary.
Finished! Now: go ride and have fun with your FSA PowerBox!

2 PowerBox Crankset Installation

2.1 Road PowerBox Crankset Installation Instructions

Specification

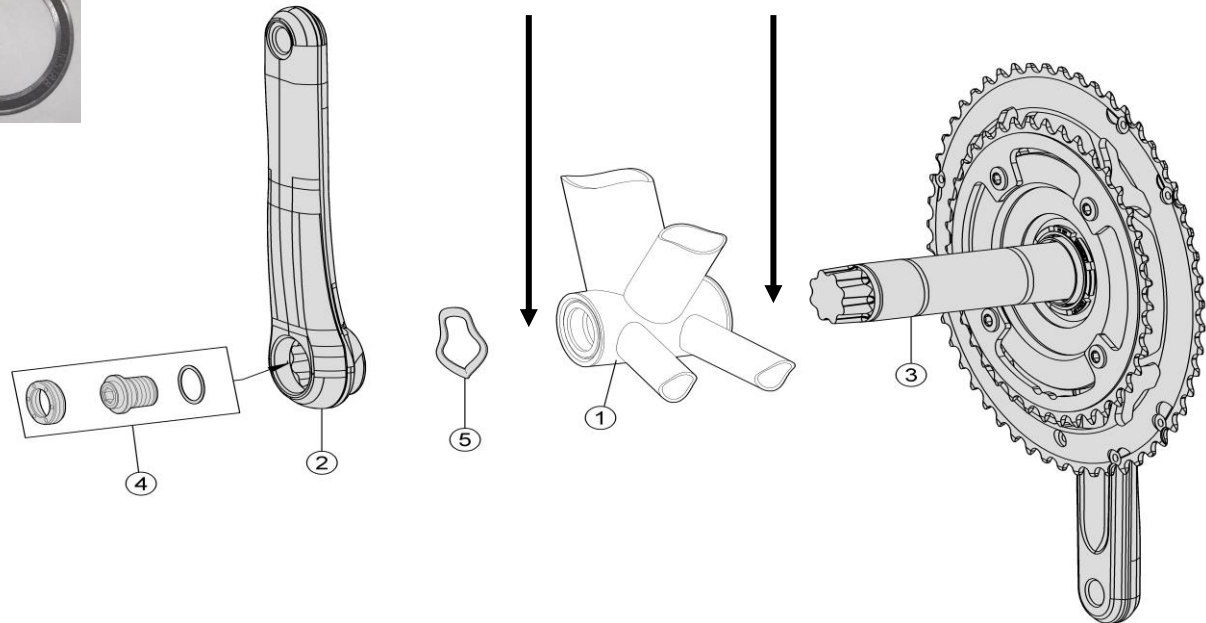
Item Number / Model Name

CK-OS8304NCC/86/PBOX / FSA NS Road Carbon PowerBox

CK-OS6071NCC/86/PBOX / FSA NS Road Alloy PowerBox



⑥ To adjust Side Play, the MS188 x1pc ⑥ may be used on the left side or right side



Components

Follow the assembly order in the illustration:

- ① Bottom Bracket Shell
- ② Left Crank Arm
- ③ Right Crank Arm & Spindle
- ④ Self Ext. Crank Bolt Assembly x1
- ⑤ Wave Washer
- ⑥ MS188 Adjustment Spacer x1 (optional)

Crankset Installation

1. Install bottom bracket and any necessary BB386EVO adapters according to manufacturer's instructions.
2. Lightly grease spindle and insert the drive side crank ③ through BB shell ①.
3. Install wave spring washer ⑤ over spindle on left side of BB Shell.
4. Install the left crank arm ② on spindle. The self-extracting crank bolt assembly ④ is pre-installed. Thread self-extracting crank bolt into spindle using a 10mm Allen key. Tighten crank bolt to 380-410 kgf.cm / 38-41 Nm / 337-363 in.lbs. Note: Always use a calibrated torque wrench to tighten crankbolt. Stripping or breakage due to installing without a torque wrench is NOT covered under manufacturing warranty.

CAUTION Do not completely flatten the wave spring washer ⑤. Proper clearance between non-drive arm and bottom bracket is 1.5-2.0mm. If the clearance is not within 1.5-2.0mm after applying correct torque, DO NOT tighten the crank bolt further. Recheck installation procedure and order of assembled parts. Ensure correct torque is used. Note: Adjustment Spacers ⑥ are for adjusting spindle movement side to side in the bottom bracket; referred to as "Side Play". Spacers may be used if there is still side play and the wave spring washer is not compressed when proper torque is applied.

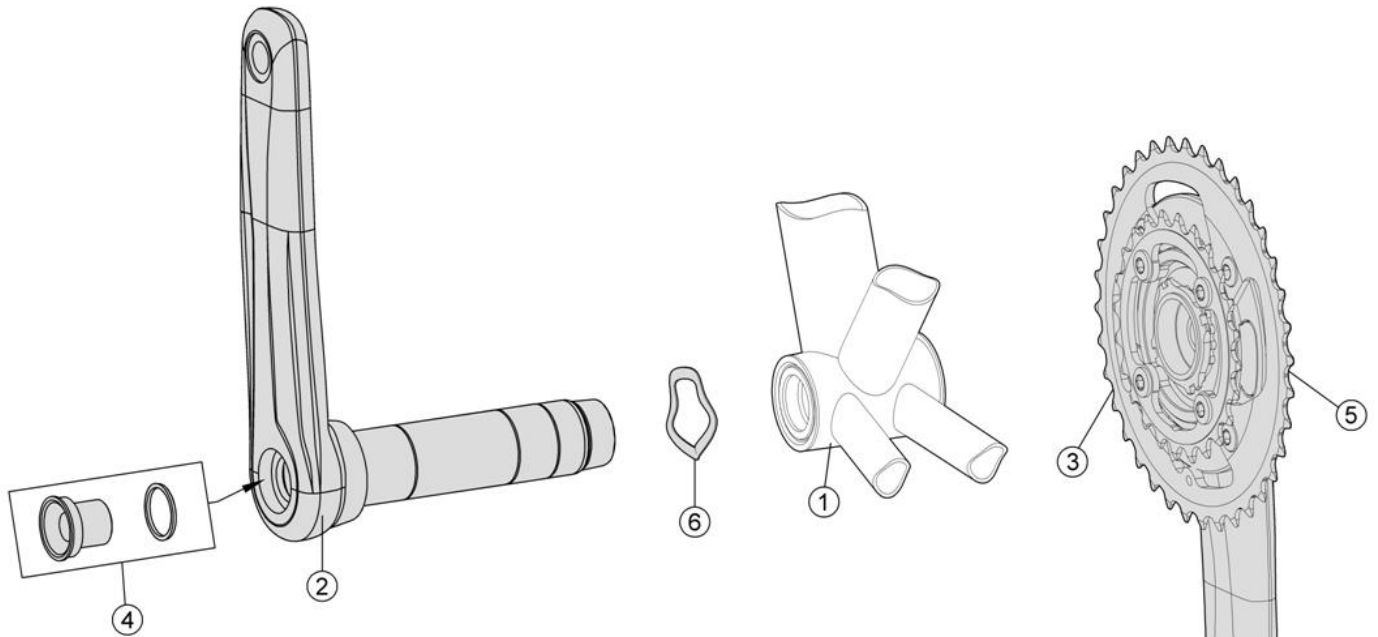
2.2 MTB PowerBox Crankset Installation Instructions

Specification

Item Number / Model Name

CKM-OS9310CC/92/PBOX /FSA NS MTB Carbon PowerBox

CKM-OS9310C/92/PBOX /FSA NS MTB Carbon 1x Direct Mount PowerBox



Components

Follow the assembly order in the illustration:

- ① Bottom Bracket Shell
- ② Left Crank Arm & Spindle
- ③ Right Crank Arm
- ④ Crank Bolt Assembly x1 (left crank only)
- ⑤ Self Extracting Crank Bolt x1
- ⑥ Wave Washer

Crankset Installation

1. Install bottom bracket and any necessary BB392EVO adapters according to manufacturer's instructions.
2. Install Wave Washer ⑥ on Spindle ②. Lightly grease the spindle and insert in to the Bottom Bracket Shell ①.
3. Install the Right Crank Arm ③ on Spindle. Use 10mm hex wrench to tighten the Self Extracting Crank Bolt ⑤ to 380-410 kgf.cm / 38-41 Nm / 337-363 in.lbs. Do not tighten crank bolt over 410 kgf.cm / 41 Nm / 363 in.lbs.

⚠ CAUTION Do not completely flatten the wave spring washer ⑤. Proper clearance between non-drive arm and bottom bracket is 1.5-2.0mm. If the clearance is not within 1.5-2.0mm after applying correct torque, DO NOT tighten the crank bolt further. Recheck installation procedure and order of assembled parts. Ensure correct torque is used.

3 Declaration of Conformity

Saxonar GmbH hereby declares that **PowerBox** power **meters** comply with the essential requirements and further relevant regulations of the 1999/5/EG Directive. You can view the complete text of the declaration of conformity at www.fullspeedahead.com.

RoHS declaration of conformity

Saxonar GmbH certifies that this product and its packaging are in compliance with the directive 2002/95/ EG of the European Union on the Restriction of Hazardous Substances in Electrical and Electronic Equipment (commonly known as RoHS).

4 Warranty

4.1 Scope of Warranty

Full Speed Ahead (FSA) warrants all FSA, Vision, Metropolis and RPM products to be free from defects in materials or workmanship for a period of two years after original purchase unless otherwise stated in the full warranty policy. The warranty is non-transferable and valid to the original purchaser of the product only. Any attempt to modify the product in any way such as drilling, grinding, and painting will void the warranty. For more information on warranty policy and instructions for completing a warranty claim, check out the Full Warranty Policy found at our website:

<http://www.fullspeedahead.com/support/warranty-policy/>

4.2 Warranty Disclaimer

The warranty does not apply to products that are not installed and/or adjusted professionally or in accordance with Full Speed Ahead's owner's manual. Full Speed Ahead owner's manuals can be downloaded at www.fullspeedahead.com.

This warranty does not apply to damages to the product as a result of accidents, crashes or incorrect use, not observing manufacturer's specifications or other circumstances in which the product was subject to loads or forces that the product was not intended for.

This warranty does not apply if the product was modified; this includes but is not limited to any attempt at opening or repairing any electronic and associated components including motors, controllers, batteries, wiring, switches and charging units.

Warranty claims are also void if the serial number or manufacturing code has been altered, made illegible or removed. Normal wear and tear are excluded from warranty. Normal wear of components can take place as a result of appropriate use, not adhering to **FSA** maintenance recommendations and /or riding in conditions that are not recommended.

The following components are subject to "normal wear":

- Dust seals
- Sockets/bushings
- Airtight O-rings
- Mechanical seals
- Moveable rubber parts
- Foam rubber rings
- Stripped threading/screws (aluminum, titanium, magnesium or steel)
- Tools
- Batteries

The warranty for the batteries and the power meter does not apply to damages resulting from power surges, a lack of maintenance or any other inappropriate use.

Damages that are caused by third-party components are excluded from this warranty.

Damages resulting from the use of parts that are not compatible or appropriate or are not authorized for use for **FSA PowerBox crankset** are excluded from this warranty.

The warranty shall not cover any damages that are caused by commercial use (rentals).

5 PowerBox Power Meter Operation

Your PowerBox power meter has an LED light to indicate its function. This enables you to easily test functionality and operate the system in a quick and uncomplicated way.

1. Remove the isolation strap by pulling it out of the battery compartment. Check if the battery cap is in the correct position.
2. Now, the LED indicator light flashes green for approximately one minute.
3. Connect the power meter to your head unit (observe manufacturer's instructions). As long as the green LED indicator light blinks, the PowerBox power meter is emitting signals that can be received by an ANT+ enabled head unit. Pair your power meter-compatible computer with your PowerBox power meter. Observe the respective manufacturer's manual. Pairing your computer unit is only necessary when operating the power meter for the first time. Numerous PowerBox power meters on different bicycles should be put into operation one after another to avoid unwanted connections between different PowerBox power meters and computer head units. You can repeat the pairing of your ANT+ enabled computer unit at any time. To do so, you just have to activate your PowerBox power meter by turning the crankarm. Your PowerBox power meter then signals its availability for pairing by blinking its green LED indicator light for one minute.

You need an ANT+-compatible computer unit that supports the power-only profile (PWR). For example, suitable computer units are:

CYCLEOPS: Joule 2.0 and 3.0

GARMIN: Edge 500/510/520/800/810/820/1000, Forerunner 310XT/910XT

O-SYNCE: navi2coach, Macro X and Macro High X

You can find a current list of compatible products at the ANT+ Alliance:

<http://www.thisisant.com/directory/fullspeedahead-road-rotor-3d-plus-bcd-110-or-130/>

The data for power and cadence are calculated and transmitted via ANT+.

6 Using your Power Meter

Using your PowerBox power meter is as easy as the initial operation and installation is.

6.1 Before your ride

When your bicycle isn't being used, the PowerBox power meter is in standby. Once the crank is moved, the PowerBox power meter is activated automatically, and it begins emitting a signal. This is shown by the blinking of the green LED indicator light.

6.2 During your ride

Your PowerBox power meter updates the parameters power and cadence in 1 second intervals; they are transmitted per ANT+ protocols.

6.3 Zero-point adjustment and thermal correction

To ensure a precise power measurement, the zero-point (the measured value when no torque is present) is automatically determined by your PowerBox power meter. The zero-point adjustment compensates for influences caused by temperature variations and mechanical zero-point shifts. It is possible to repeatedly set the zero point at the head unit, but it isn't necessary! This is performed by the system automatically when it is not under power. "Not being under power" means a stop in pedaling for at least two seconds during a ride. If a de-powering as described above is not possible, for example during a long mountain climb, then your PowerBox power meter automatically compensates for temperature. Thus your PowerBox guarantees a reliable power measurement.

6.4 Battery life

Battery life is approximately 400 hours. Battery life can be decreased by low temperatures and by transporting your bicycle, for example in your car.

6.5 After your ride

Your PowerBox power meter independently enters standby mode approximately two minutes after ending your ride. This reduces electricity consumption and increases battery life.

6.6 Battery change

To change the battery, remove the battery cap. Pull out the empty battery and insert a new battery. Pay attention to the correct position of the positive pole and negative pole. Close the battery cap and check if it is in the correct position.

6.7 Turning the power meter on and off

You can turn off your PowerBox power meter yourself by removing the battery. You can turn your PowerBox power meter back on by inserting the battery again.

NOTE: When transporting your bicycle, the PowerBox power meter is activated. Therefore, it is recommended to turn off the power meter for longer transports. You should generally turn it off when transporting your bike in a plane.

6.8 After a crash

The PowerBox power meter was developed to have a high level of reliability. Usually, crash forces are generally completely absorbed by the crankarms and the bottom bracket. Crash damage to a PowerBox power meter is thus almost completely ruled out.

In the interest of your own security and health, you should do the following checks:

Could the cranks have sustained any damage? The cranks could suffer from hairline fractures that you may eventually not recognize. This could, over time, result in sudden failure. Therefore, replacement is recommended. If anything is rattling around the crankset, this could indicate potential damage. Examine all mechanical connections.

7 Maintenance and Care

The battery cap should be checked occasionally to see whether it is seated correctly and, if necessary, it should be replaced so that it maintains its waterproof seal.

After longer rides in the rain, please examine if water has penetrated the battery cover. Should this be the case, allow this area to dry out while having removed the battery and with the battery cap off. You can assist in this process by using an absorbent cloth.

Do not use thinners or solvents to clean your PowerBox power meter. Use clear water or soapy water and a soft sponge or rag.

⚠ CAUTION

Do not clean your power meter with a high-pressure power hose!

8 Disposal



The symbol of the crossed-out garbage pail on wheels, which can be found on the product, the documentation

and the packaging, means that electrical and electronic products, batteries and accumulators need to be discarded separately in the European Union. Do not dispose of these products in general household garbage. Separate these products from other garbage in order not to damage people's health or the environment due to uncontrolled garbage disposal and in order to promote sustainable recycling of material resources.

9 Accessories, Replacement Parts

If needed, you can order accessories or replacement parts for your PowerBox cranksets at www.fullspeedahead.com.

10 Repair

To a certain degree, repairing a PowerBox power meter is possible. If repairs are needed, please contact FSA.

11 Service, Calibration and Control of Function

The PowerBox power meter is calibrated at the factory and doesn't have to be newly calibrated within the warranty period. Regardless of this fact, you still have the option of ordering a calibration and function control by contacting FSA. In this case, we will examine your PowerBox power meter on the outside, perform a new factory calibration and control of function. In addition to your PowerBox power meter, you also receive a new test and approval certificate.

⚠ WARNING

Ordering a calibration and function control can be advisable after a crash, among other things. However, it does not extend warranty coverage and only excludes a possible liability resulting from mechanical damage that has not been identified.

12 Troubleshooting

1. Green LED indicator light doesn't blink after activation

Battery is low—change battery

2. Red LED indicator light blinks after activation

Power meter error – turn off and then on. If this is unsuccessful, contact an FSA Service center.

3. Power meter does not pair with a head unit

Battery is low – change battery

Computer unit is not in pairing mode – place computer unit in pairing mode

Power meter is in standby – activate power meter by rotating the crank.

Transmission is flawed – avoid sources of disturbance such as WiFi networks, microwaves, mobile phones and other active power meters.

4. Power meter shows no function

Battery is low – change battery

Operating software is in an undefined state (the power meter has “crashed”) – Turn off and then on by removing and inserting the battery. If this is unsuccessful, contact an FSA Service center.

5. Power measurements are not plausible

The zero point has changed uncontrollably – during a ride: do a zero point adjustment by depowering

6. Water intrusion into the battery compartment

battery cap has not been closed correctly –remove battery and let area dry, insert battery again and close battery cap

battery cap is damaged or worn – remove battery and let area dry, insert battery again and close battery cap

13 Technical Specifications

Weight:

CK-OS8304NCC/86/PBOX / FSA NS Road Carbon PowerBox Crank weight: 733 grams

CK-OS6071NCC/86/PBOX / FSA NS Road Alloy PowerBox Crank weight: 921 grams

CKM-OS9310CC/92/PBOX / FSA NS MTB Carbon PowerBox Crank weight: 767 grams

CKM-OS9310C/92/PBOX / FSA NS MTB Carbon 1x Direct Mount PowerBox Crank weight: 753 grams

Power source: battery

Battery life: approximately 400 hours of active power measurement

Transmission standards: ANT+ Power Only Profile

Transmitted data:

Power,

Cadence

Accuracy: $\pm 2\%$

Additional features:

Active thermal correction

Automatic zero-point adjustment

Calibration is independent of chainring selection

No magnet necessary for cadence measurement

Range of measurement and display:

Power: 10 - 2999 W

Torque: 0 - 250 Nm

Cadence: 30 - 250 RPM

Colors: black

LED signals:

Green blinking: power meter activated, ANT+ active for pairing with computer unit

Red blinking short: power meter error

Directly after activation:

3 x green: battery charged 60 - 100%

2 x green: battery charged 40 - 60%

1 x green: battery charged 20 - 40%

1 x red short: battery charged 10 - 20% (equates to "weak battery")

1 x red long (5 seconds): battery charged 0 - 10%

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