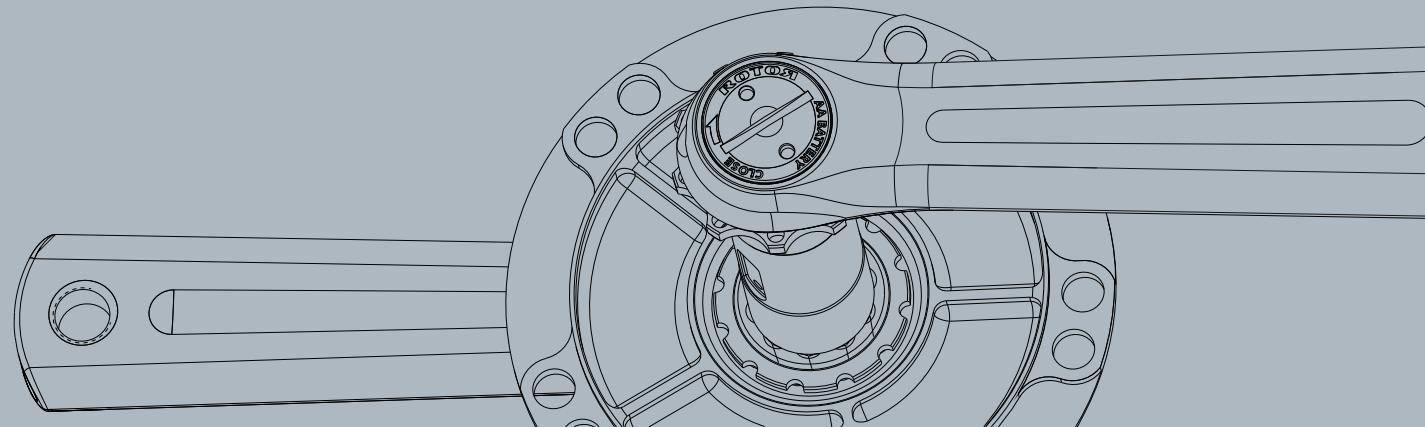


MANUAL DE USUARIO
USER MANUAL

ROTOR
POWER 4



www.rotorbike.com

info@rotorbike.com

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Model#: ROT114
IC: 10992A-ROT114
FCC ID: R3A-ROT114
Ⓜ 203A-ROT114



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PRODUCT DESCRIPTION

Crank arms are not interchangeable.
Non-drive side crank has the power meter unit and specific-sensor ID.

 Non-drive Side Crank Assembly 
WARNING: DO NOT DISASSEMBLE



 Drive Side Crank Assembly 
WARNING: DO NOT DISASSEMBLE



WARNING!

Read and understand this manual carefully before installing your cranks.
Improvement of product specifications may occur without any prior notification.

COMPATIBILITY

ROTOR POWER LT is compatible with BB30, Pressfit30, BBright, BBright Direct fit, BSA, ITA, BB86 and 386 frames.

For more information consult your ROTOR Authorized Dealer or bike dealer to ensure correct compatibility of ROTOR POWER LT with your frame.

Visit our website: www.rotorbike.com

Follow the instructions in this manual to install and calibrate your ROTOR POWER LT.

CRANKS INSTALLATION

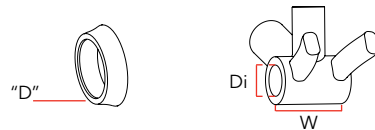
When installing your ROTOR POWER LT for the first time, complete the following steps:

- Road / MTB spacer verification (page 33 and 34).
- Non-drive side crank installation (page 35).
- Drive side crank installation (page 35).
- Non-drive side assembly (page 36).
- Preload adjustment and fine-tuning adjustment (page 36).



WARNING!

Ensure there is no interference between the cranks and the frame, or any other component part.



1.a) SPACER VERIFICATION FOR ROAD CRANKS

For correct use of your ROTOR POWER LT road cranks, it is necessary to select the appropriate spacers for your frame.

NOTE: If different bearings are used, spacing may differ.

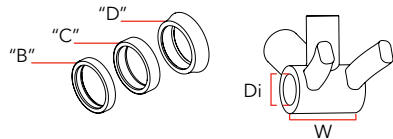
Select your frame and spacers from the list below:

- BB30 frame:** Place one "D" spacer (11,5mm) on drive side and one "D" spacer on non-drive side.
- Pressfit30 frame:** Place one "D" spacer (11,5mm) on drive side and one "D" spacer on non-drive side.
- BBright frames:** Place one "D" spacer (11,5mm) on drive side.

	BB30	Pressfit30	BBright	BSA30	ITA30	BB86	386
W	68mm	68mm	79mm	68mm	70mm	86,5mm	86mm
Di	42mm	46mm	42mm (Direct fit) / 46mm (PressFit)	BSA	ITA	41mm	46mm

- 4. BSA frame:** Place one BSA30 cup (L) on non-drive side and one BSA30 cup (R) on drive side of the frame.
- 5. ITA frame:** Place one ITA30 cup on non-drive side and one ITA30 cup on drive side of the frame.
- 6. BB86 frame:** Place one PF4130 cup on non-drive side and one PF4130 cup on drive side of the frame.
- 7. 386 frame:** Place one PF4630 cup with an "A" spacer (2,5mm) on non-drive side and one PF4630 cup with an "A" spacer on drive side of the frame. ("A" spacers not included, visit your ROTOR distributor)

Read your bottom bracket manual to verify the compatibility with your frame.



1.b) SPACER VERIFICATION FOR MTB CRANKS

For correct use of your ROTOR POWER LT MTB cranks it is necessary to select the appropriate spacers for your frame.

NOTE: If different bearings are used, spacing may differ.

Select your frame and spacers from the list below:

1. **BB30 and Pressfit30 68mm frames:** Place one "C" (8,5mm) spacer with one "D" (11,5mm) spacer on each drive side and non-drive side
2. **BB30 and Pressfit30 73mm frames:** Place one "B" (5,5mm) spacer with one "D" (11,5mm) spacer on each drive side and non-drive side

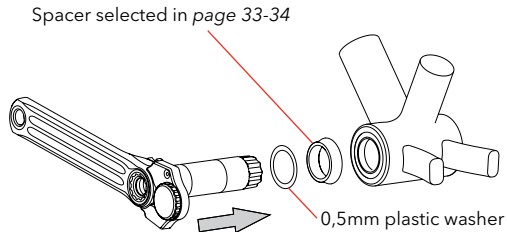
	BB30	Pressfit30	EBright	BSA30	BB89	BB92
W	68/73mm	68/73mm	84mm	68/73mm	89,5mm	92mm
Di	42mm	46mm	46mm	BSA	41mm	41mm

3. **BBright frame:** Place one PF4630 cup with one "B" (5,5mm) spacer on non-drive side and one PF4630 cup with one "D" spacer (11,5mm) and one "B" (5,5mm) spacer on drive side.
4. **BSA 68mm frame:** Place one BSA30 cup with one "C" (8,5mm) spacer on both sides of the frame.
5. **BSA 73mm frame:** Place one BSA30 cup with one "B" (5,5mm) spacer on both sides of the frame.
6. **BB89 and BB92 frames:** Place both PF4130 cups with one "B" (5,5mm) spacer on both sides of the frame.

Read your bottom bracket manual to verify the compatibility with your frame.

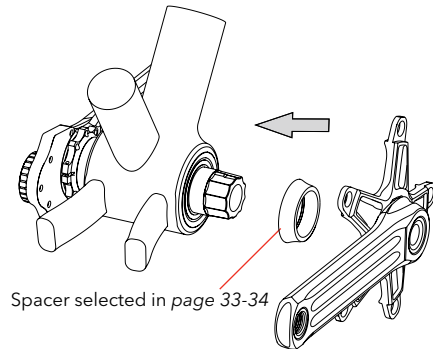
2. NON-DRIVE SIDE INSTALLATION

- 2.1. Place a 0,5mm plastic washer onto the axle.
- 2.2. Select the appropriate spacer(s) for the non-drive side on page 33 (road) or 34 (MTB) and place them onto the axle after the 0,5mm plastic washer.
- 2.3. Introduce the non-drive assembly on the frame through the bearings and frame.



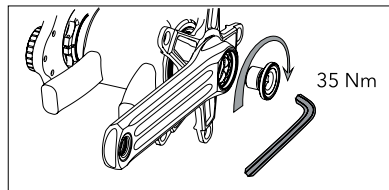
3. DRIVE SIDE INSTALLATION

- 3.1. Grease the right end of the axle.
- 3.2. Select the appropriate spacer(s) for the drive side on page 33 (road) or 34 (MTB) and place it between the frame and the drive side crank.



4. NON-DRIVE SIDE ASSEMBLY

- 4.1. Tighten drive side alloy bolt to 35 Nm using an 8mm allen torque wrench.



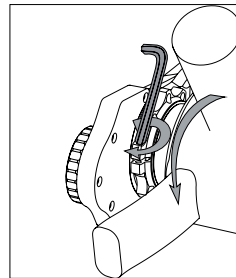
5. PRELOAD ADJUSTMENT

- 5.1. Eliminate lateral play by tightening counterclockwise the preload nut.
5.2. Lock the preload nut by tightening the pinch bolt clockwise with a 2 mm allen wrench.

WARNING! Do not overtighten the bolt

6. FINE TUNE ADJUSTMENT

- 6.1. If the crank does not turn smoothly, remove the 0,5mm plastic washer on non-drive side and repeat the "preload adjustment" steps 5.1 and 5.2.
6.2. If there is lateral play, use an additional 0,5mm plastic washer on the non-drive side and repeat the "preload adjustment" steps 5.1 and 5.2.

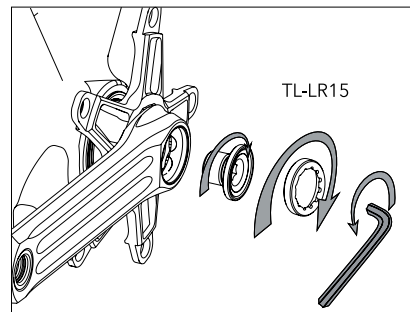


WARNING!

Ensure preload nut is still threaded on non-drive side arm.

CRANKSET REMOVAL

1. Remove **drive side** bolt.
2. Remove **drive side** steel nut using a cassette locking tool (Shimano TL-LR15 or similar).
3. Screw the drive side alloy bolt clockwise into the spindle.



4. Flip the drive side nut over and screw it clockwise into the crank arm to be used as a self-extracting cap. It must be flush with the outer face of the arm and all of its threads must be engaged.
5. Unscrew the drive side alloy bolt counterclockwise using an 8mm allen wrench until the drive side assembly disengages from the spindle.

ROTOR POWER LT INSTALLATION

Once the cranks are assembled there is no need for any other installation in order to use the power meter. All sensors and electronic parts are already mounted with the cranks.

PAIRING

Connect your ROTOR POWER LT to any ANT+™ sensor device to display output values.



For a complete listing of ANT+™ Certified Products and their specific interoperability, visit the ANT+™ Product Directory: <http://ant.com/directory/>

Read the ANT+™ device manual for further instructions.

Before pairing ROTOR POWER LT with a monitor, make sure you are at least 10 meters (30 feet) away from any other ANT+™ Power sensor. This will prevent accidental pairing with another Power sensor.

The ROTOR POWER LT retains its "SENSOR ID" throughout battery replacements and will remain properly paired.

PAIRING PROCESS

To pair the ROTOR POWER LT with any ANT+™ device:

1. Start the power meter system by riding a few meters until the red LED starts flashing. The system turns on when a 1.5 kg force is applied to the cranks.
2. Wait until red LED on crank stops flashing. ROTOR POWER LT starts sending the radio signal and is ready for measuring information.

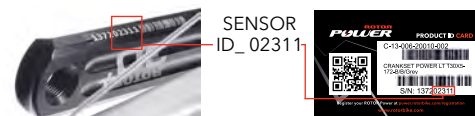


AUTOMATIC PAIRING

3. Push the "SCAN" button in your ANT+™ device at the ANT+™ Power screen. The "SCAN" button is usually placed in the menu: Settings\Bike settings\Bike profiles\Your profile\ANT+ Power.

MANUAL PAIRING

If you have more than one ANT+™ Power sensor, introduce the "SENSOR ID" of the ROTOR POWER LT into the ANT+™ device. "SENSOR ID" can be found on the inner side of the non-drive side crank, being the last 5 digits of the serial number. This serial number can also be seen under the barcode on the Identity Card included with your Power LT.
I.E.: SENSOR ID_ 02311



CALIBRATION/ZEROING

The main reason to calibrate/zero your ROTOR POWER LT is to secure an exact power measurement.

Calibrating the power meter compensates for any mechanical change that influences the measurement since the last calibration/zeroing.

Calibrate your ROTOR POWER LT cranks after assembling your bike with all its accessories, including pedals.

ROTOR POWER LT should be calibrated after any chainring, frame, or pedal changes.

WARNING

In order to save energy, the "CONNECT" command is limited to within 60 seconds after activating the cranks.

ZEROING PROCESS



To zero your ROTOR POWER LT:

1. Activate the system and place the left crank in a 6 o'clock vertical position as shown on the picture. Calibrate your ROTOR POWER LT with your pedals mounted on the cranks. Do not place any other weight on your cranks until zeroing process is finished. Do not move your cranks during steps 2 and 3.
2. Follow the specific instructions for your ANT+™ computer device to send the "CALIBRATE" signal.

The "CALIBRATE" button is usually in the menu:

Settings\Bike settings\Bike profiles\Your profile\ANT+Power.

3. Read the feedback value for the non-drive side crank from your device. For correct zeroing the value should be between: 4200-8100.

There is no need to zero your ROTOR POWER LT every time you ride.

It is recommended to repeat the calibration process after an adjustment period of approximately 30 riding hours.

For more information about the zeroing process, user utilities and training options, visit our website: www.power.rotorbike.com

ROTOR POWER LT START UP

The device has a service LED (red light) viewable on the external side of ROTOR POWER LT.

At every start-up the LED will blink several times (from 1 to 10) depending on the battery's charge.

- If LED blinks 10 times, battery is FULL 100%.
- If LED blinks 3 times, battery is EMPTY 10%.

ROTOR POWER LT becomes inactive and starts a state of rest after 1 minute of inactivity.



BATTERY

ROTOR POWER LT is powered by one standard lithium CR2477B battery.

Estimated riding time: 300 hours

The battery must be installed correctly (with positive "+" side facing outside) and must be charged enough for use. The battery charge can be checked by any computer or bike device compatible with ANT+™

The battery cover should only be removed when changing batteries. Repeated opening can damage the internal seal.

Do not extract any component from the inner side of the battery cover.

The battery cover components are assembled as shown:



Be careful when threading the battery cover to prevent any thread damage.

BATTERY REPLACEMENT

No tools are required to replace the battery.

Replacement process:

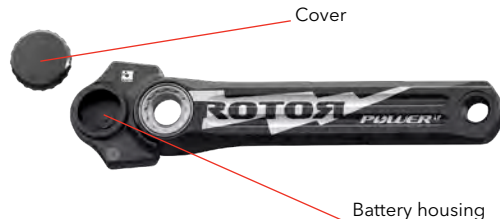
1. Open the battery cover by turning it counter-clockwise.
2. Extract the old battery from the housing.

Tip:

If you cannot remove the battery easily by hand, use a magnet to take it out.

Do not use any tool or sharp object to remove battery.

3. Place a new battery into the housing with the positive "+" side facing out.
4. Thread the battery cover screwing it clockwise by hand.



WARNING

Do not extract the white foam disc from the inner side of the battery cover. This can result in connectivity failures.

WARNING

Do not throw the old batteries away with normal waste; batteries should be disposed of properly according to local regulations.

ROTOR POWER LT TRAINING USE

After pairing ROTOR POWER LT, follow the configuration options for your ANT+™ computer device to select the measures you would like to display on your device.

Consult your trainer in order to evaluate which of the measured values provided by ROTOR POWER LT are optimal to maximize your performance.

ROTOR POWER LT MEASUREMENT

ROTOR POWER LT starts measuring automatically after moving the crank. In normal use, sampling is done every 2ms (500 times per second) and sent by radio emissions to your ANT+™ device.

ROTOR POWER LT sends the following data to the ANT+™ device:

POWER: calculated using the values generated by the left leg.

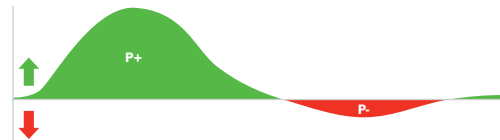
CADENCE: measured in RPM (revolutions per minute).

WARNING!

Disable any ANT+™ cadence sensor from your bike, there is no need for it and it may cause interferences with the internal ROTORPOWER LT cadence sensor.

TORQUE EFFECTIVENESS (LEFT LEG):

Positive power contribution to total power in a pedaling cycle. Measured as a percentage; 100% means no negative power.



PEDAL SMOOTHNESS (LEFT LEG):

Ratio between average power and peak power in a pedaling cycle. Measured as a percentage.

USER SOFTWARE - INTRODUCTION

The user software has been designed for customer use and is divided into the following four sections. We recommend visiting our website and downloading the user manual. User software is provided free of charge by ROTOR; software compatibility or proper functioning is not granted on any computer or device.

ROTOR will not be responsible for any failure of your computer related to this software.

For any question or queries contact ROTOR technical service at:

techservice@rotorbike.com

Or visit our official website for a description of the technical products.

www.rotorbike.com

www.power.rotorbike.com

USER SOFTWARE - DOCUMENTATION

In this section you will find the main website links to access the technical information regarding ROTOR POWER LT.



1. <http://power.rotorbike.com/>
Exclusive website dedicated to ROTOR POWER LT cranks.
2. <http://rotorbike.com/>
Official ROTOR website with technical information about every ROTOR Product.
3. <http://www.thisisant.com/directory/rotor-power/>
Specific ANT+ website showing the compatibility between devices.

USER SOFTWARE - TRAINING MODE

In this section you will find the specially-designed software for training with your ROTOR POWER LT.



TRAINING MODE SECTIONS

Shows instant values for CADENCE.

Shows the instant values and averages in 3s/10s/30s for power, torque effectiveness, and pedal smoothness.

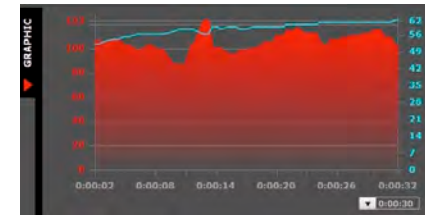
This tab can be hidden by the user.



HORIZONTAL TAB "GRAPHIC"

Shows a visual graphic for power values (shown in red) and cadence values (shown in blue) in relation to time.

Graphic resolution can be changed by selecting another time resolution from the bottom right icon.



This tab can be hidden by the user.

BOTTOM SECTION

Shows real time values for torque effectiveness and pedal smoothness for left leg.

The numerical instant values or their associated graphics can be seen in the bottom section.



USER SOFTWARE - SERVICE MODE

In this section you will find the tools to update and calibrate your ROTOR POWER LT cranks.



Follow the steps shown in the user software manual to accomplish the following tasks:

1. Upgrade the firmware for your ROTOR POWER LT.
2. Calibrate and zero your ROTOR POWER LT cranks.
3. Perform a static test to verify the functionality of your ROTOR POWER LT.
4. Take a screenshot for showing any issue related to the user software.



Screenshot for the service mode in the user software

USER SOFTWARE - UTILITIES

In this section you will find the tools needed to manage the training data obtained from your ROTOR POWER LT with format "FIT"



MAINTENANCE

Inspect your ROTOR product for wear, looseness or damage including cracks, dents and serious scratches, before each ride and after every fall or crash.

Do not use your ROTOR product until it has been thoroughly inspected, repaired or replaced.

Cyclists should inspect their bicycle and parts on a regular basis or consult with a professional bicycle mechanic to determine the need for service and to detect damage that may have occurred from normal use.

Check all parts for damage and wear before every use.

Check the bolts and other fasteners periodically for tightness. Ensure they are tightened to the correct torque values.

WARNING!

Never use high pressure cleaning equipment or chemical products to clean ROTOR POWER LT.

"Waterproof level: IPX7".

Do not try to disassemble any electronic ROTOR POWER LT part, the seal could be damaged and this invalidates the warranty.

Do not disassemble the metal bolts on the bottom cover, it can produce an electronic failure.

In case of any electronic failure, service must be performed at an authorized ROTOR technical service center.

Continuing to use damaged parts may lead to loss of control and cause serious injury or death.

TECHNICAL SPECIFICATIONS

■ Optimal operating temperature:	-5 to 55 C
■ Max. humidity for optimal use:	90%
■ Battery specifications:	3.0 V (1000 mA CR2477B lithium battery)
■ Estimated battery life:	300 hours
■ Voltage supply:	1.9 V
■ Standard averaged work consumption:	2.1 mA
■ Standard averaged standby consumption:	3.2 µA
■ Reading sensor:	Strain Gauges
■ Working frequency:	ANT+ 2.4 Ghz
■ Max RF Power output:	-5 dB
■ Total added weight:	30 g
■ Data transmitted:	power, cadence, torque efficiency, pedal smoothness
■ Power precision:	+/- 1 W
■ Cadence precision:	+/- 0,5 rpm
■ Torque effectiveness precision:	+/- 0,5%
■ Pedal smoothness precision:	+/- 0,5%

SAFETY WARNING

This owner's manual contains important and useful information regarding the proper installation, operation, care, and maintenance of your ROTOR product. Carefully read, follow and understand the instructions as detailed in this owner's manual. Keep this manual in a safe place for future reference.

If you have any doubt whatsoever regarding your ability to install or service this product, please consult your ROTOR dealer and seek the assistance of a professional bicycle mechanic. Do not perform any modifications or adjustments that are not outlined in this manual.

Incorrect installation or servicing may impair performance, and could result in a dangerous situation leading to serious injury or death. Components that have experienced excessive wear, deformations or impacts or other damage need immediate professional inspection or replacement.

Please have this product regularly inspected by a qualified mechanic for any signs of wear or damage.

Failure to perform necessary and essential maintenance could drastically reduce the service life of your ROTOR product and reduce its performance.

If you have any questions, please contact a professional bike mechanic or your nearest ROTOR dealer for additional information.

ROTOR WARRANTY POLICY

- ROTOR products and its components are guaranteed for 2 YEARS against any manufacturer defects or defective materials. In the event of a warranty defect, ROTOR's sole obligation under this warranty is to repair or replace, at its discretion, the defective part or product at no charge. Moreover, in some countries, ROTOR is obliged to ensure any legal warranty defined by law for the customer's protection.
- Elements subject to wear and failures that the manufacturer is not responsible for, are not covered by this warranty.
- Failures caused by improper use, poor assembly or inadequate maintenance as declared in the supplied instructions or the user manual are not covered by this warranty.
- Always keep your receipt or invoice.
- The following acts void this warranty:
 - Failure to fulfill the requirements above.
 - Improper installation.
 - Improper use or installation of inadequate parts.

Warranty Service: Original purchaser must send their ROTOR product along with the retailer's original bill, credit card receipt or other satisfactory proof of date of purchase.

REGULATORY STATEMENTS

This device complies with part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifications not expressly approved by this company could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s).

The letters "IC" have no other meaning or purpose than to identify the Industry Canada certification number/registration number.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.





If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product does not contain any user-serviceable parts. Repairs should only be made by ROTOR distributors. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.

CEE REGULATION

This product is compliant with Directive 93/42/EEC.

Model#: ROT114 IC: 10992A-ROT114 FCC ID: R3A-ROT114	  203A-ROT114	 
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FREQUENT ASKED QUESTIONS

POWER vs POWER LT?

POWER LT contains a single power meter on the left crank. The values shown on your GARMIN are duplicates of the left leg values. Torque effectiveness and pedal smoothness correspond to the left leg values. Balance values are not shown.

What ANT+™ devices is ROTORPOWER LT compatible with?

Visit the ANT+™ link: <http://www.thisisant.com/directory>

What software can I use to analyze my data?

<http://home.trainingpeaks.com>
<http://goldencheetah.org/>
<http://www.o-synce.com/en/software/training-software.html>
<http://www.garmin.com/en-US>

Why isn't my computer pairing with power meter?

To pair the ROTOR POWER LT with any ANT+™ device: Start the power meter system by riding a few meters until the red LED starts flashing.

The system turns on when 1.5 kg force is applied to the cranks. Wait until red LED stops flashing. ROTOR POWER LT starts sending the radio signal and is ready for measuring information. Push the "SCAN" button on your ANT+™ device at the ANT+™ Power screen. The "SCAN" button is usually in the menu: Settings\Bike settings\Bike profiles\Your profile\ANT+ Power.

What are the left power readings?

ROTOR POWER LT starts measuring data automatically after moving the crank. In normal use, sampling is done every 2ms (500 times per second) and sent by radio emissions to your ANT+™ device. ROTOR POWER LT sends the following data to the ANT+™ device:
POWER: Total power output measured in watts for both legs.
TORQUE EFFECTIVENESS (Left): Positive power contribution to total power in a pedaling cycle. Measured as a percentage; 100% means no negative power.
PEDAL SMOOTHNESS (Left): Ratio between average power and peak power in pedaling cycle. Measured as percentage.
CADENCE: measured in RPM (revolutions per minute).

How do I get spare parts?

Please contact your shop or local distributor.

Who do I contact for warranty issues?

Please contact your shop or local distributor.

What is the working temperature range for the cranks?

The optimal operating temperature range is from -5° to +55° Celsius. Out of this range, some electrical components may cause an inaccurate measurement signal or even a lack of it.

How often is the power value recorded?

Refreshing and recording depend on displays models. The ROTOR POWER LT sampling rate is 500 Hz (500 times per second), data is stored and managed and then sent to the monitor following ANT+™ protocols. Display refreshing takes place usually about every second. Recording rate can be chosen at the monitor, displays usually offer the possibility of choosing between 1 second, longer time periods, or smart recording.

There are some delays in refreshing the display during the start and the stop.

This is an expected behaviour and depends on the cadence and the stability of the signal and has no remarkable effect on the overall recordings. For example, if we intend to manage a pedal cycle at 30 rpm, that means that the cycle would last 2 seconds and some time is needed to manage and send the information.

Also, initial and final signal is sometimes filtered for a better recording stability.

How often do I need to calibrate my ROTOR POWER LT?

To ensure an accurate measurement, a calibration or zeroing is advised only after installing ROTOR POWER LT. A factory calibration is performed on every crank. It is recommended to calibrate your power meter after installing or replacing your batteries (approx. 30 hours of riding).

How can I see the new Torque Effectiveness and Pedal Smoothness metrics?

ANT+™ protocol for the new metrics is in its beta phase and the display manufacturers are responsible for developing new software releases that work with TE and PS. ROTOR POWER LT is already managing these releases; you can download the ROTOR software for indoor training from: <http://power.rotorbike.com/downloads/> In software upgrades for some monitors, the compatibility with Torque Effectiveness and Pedal Smoothness is granted, as in the Garmin monitor models 510 and 810 with the 08/13 upgrade.

