Pro
Series

raditeq

Product Manual

RadiPower®

RF Power Meter

Models:
RPR4006R

www.raditeq.com

RadiPower® product manual

This product manual refers to the RadiPower® pro series.

Models: RPR4006R

Made by Raditeq B.V.

Carefully read the content of this manual before operating the product and make sure all the safety instructions are strictly followed.

For your convenience, a Quick Start Guide has been added to this product. This Quick Start Guide contains the basic start-up steps and main safety warnings.

Please keep the Quick Start Guide (and this regular manual) close at hand when you operate your new Raditeq product(s).

Please contact your local reseller if you have any questions.

Supplier Information

Raditeq B.V.
Vijzelmolenlaan 3
3447 GX, Woerden
The Netherlands

Tel.: +31 (0)348 200 100
Internet: www.raditeq.com
Email: support@raditeq.com

Publish date: 08/08/2023
Version: 1

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WARNINGS & PRECAUTIONS

Read the contents of this product manual carefully and become familiar with the safety markings, the product instructions and the handling of the system. Please refer to the applicable product manual(s) for further information regarding the operation and control of the product(s).

Only Raditeq qualified maintenance personnel is allowed to perform maintenance and/or repair service on the equipment.

This product® contains materials that can be recycled and reused to minimize material waste. At the 'end-of-life', specialized companies can dismantle the discarded system to collect the reusable and recyclable materials. If your product is at its 'end-of-life', please return it to your local reseller or to Raditeq for recycling.

For cleaning, use a clean, dry cloth (or a damp cloth where needed) and wipe the surface of equipment.

This product contains no hazardous substances as described in the RoHS Directive (2011/65/EU).

This Product contains embedded software, which is (stand a lone) upgradeable using the RadiMation® Software.

Introduction

This manual contains information about the RadiPower® RPR4000 Pro series range of RF power meters.

An accurate power meter is indispensable to perform reliable EMC measurements. The RadiPower® 4006R Pro is a RF power meter especially designed for power measurements during EMC tests. The RadiPower® is an affordable, accurate and fast power meter. It provides accurate RMS measurements over a wide frequency range, which enables effective measurements in accordance with the latest EMC standards.

Each RadiPower® RF power meter has an USB port that allows direct connection and control from any Microsoft® Windows PC.

Please read this manual carefully and make sure to pay special attention to the chapters regarding your new product(s).

RadiMation® Software

RadiMation® is the brand independent EMC automation software from Raditeq. RadiMation® places the EUT in the center. The software is designed to perform all EMC tests required to certify an EUT. As a result, the test data of all different tests is collected in one single software package, allowing fully automated report generation.

Our advanced report generation tool streamlines the process of creating test reports following EMC (Electromagnetic Compatibility) tests. With its user-friendly interface and efficient functionality, generating a comprehensive test report has never been easier. By simply pressing a single button, the tool automatically compiles all the necessary data and formats them into a professional and organized report.

This automation significantly reduces the time and effort traditionally required to manually compile and format test reports. Our tool ensures consistency and accuracy in report generation, minimizing the risk of errors or omissions.

Furthermore, the report generation tool supports the inclusion of all relevant graphs, charts, tables, and explanatory notes to provide a comprehensive understanding of the test results.

By simplifying the report generation process, our tool empowers EMC test engineers to focus more on their core tasks, such as analyzing results and implementing mitigation strategies if necessary. This improves overall productivity and efficiency in the testing workflow, enabling faster turnaround times for delivering test reports to clients or internal teams.

Device drivers for all main manufactures are freely made available or are made for free when required, as long as the equipment is standard comercially available and still supported by the original manufacturer. This allows you choose the best suited EMC test equipment for each specific application, instead of being locked in by a vendor.

The RadiPower® 4000 Series

The RadiPower® RF power sensor
Model: RPR4006R
True RMS Power Meter for measurements of (non) sinusoidal singals.

Shielded USB cable
Model: USB A male to Mini USB
Used to connect the RF power sensor with the PC.

Standard delivered with USB stick containing the following documents:

- The user manual and Quick Start Guide.
- The installation of RadiMation® Free software and drivers.
- Optional - The calibration certificate for the power meter (if a calibration was requested).

Theory of operation

The RadiPower® RPR4006R incorporates a hardware RMS detector, enabling direct measurement of (non)-sinusoidal signals with exceptional accuracy. This advanced feature eliminates the need for additional signal processing or waveform assumptions, making it a versatile device for a wide range of applications.

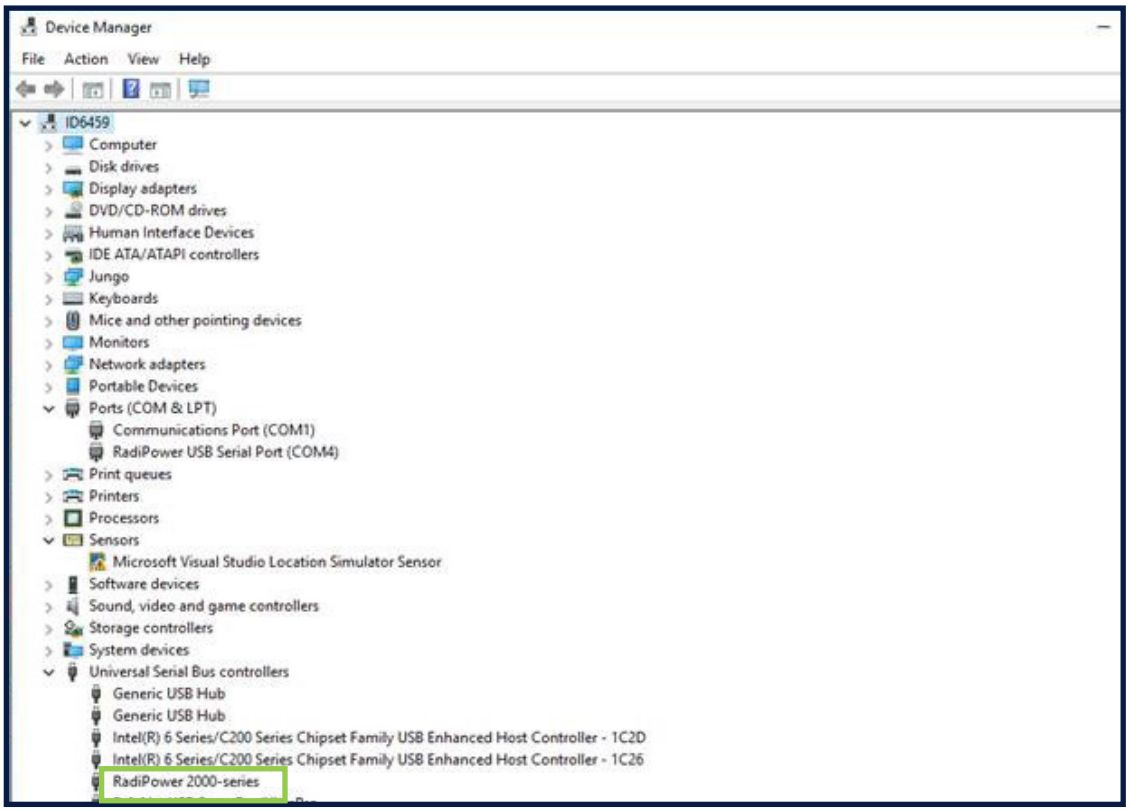
RadiPower® Installation

Stand-alone Configuration

Connect the RadiPower® sensor to a Windows computer with a USB 2.0 (USB 3.0 preferred). Use the supplied USB cable to connect the RadiPower® sensor. The hardware installation for the RadiPower® sensor is now complete.

Connect the RadiPower® sensor to a Windows computer with a USB port for 'stand-alone' use. Use the supplied USB cable to connect the sensor to your computer. Windows will prompt that new hardware has been found. The USB-driver for the RadiPower® is Windows certified and will be loaded automatically from the Windows update. If the drivers are not loaded automatically, these can be installed manually from the supplied USB-key. Follow the normal instructions from Windows to install the drivers manually.

Once the drivers are loaded successfully, the RadiPower® will be shown in the device list.

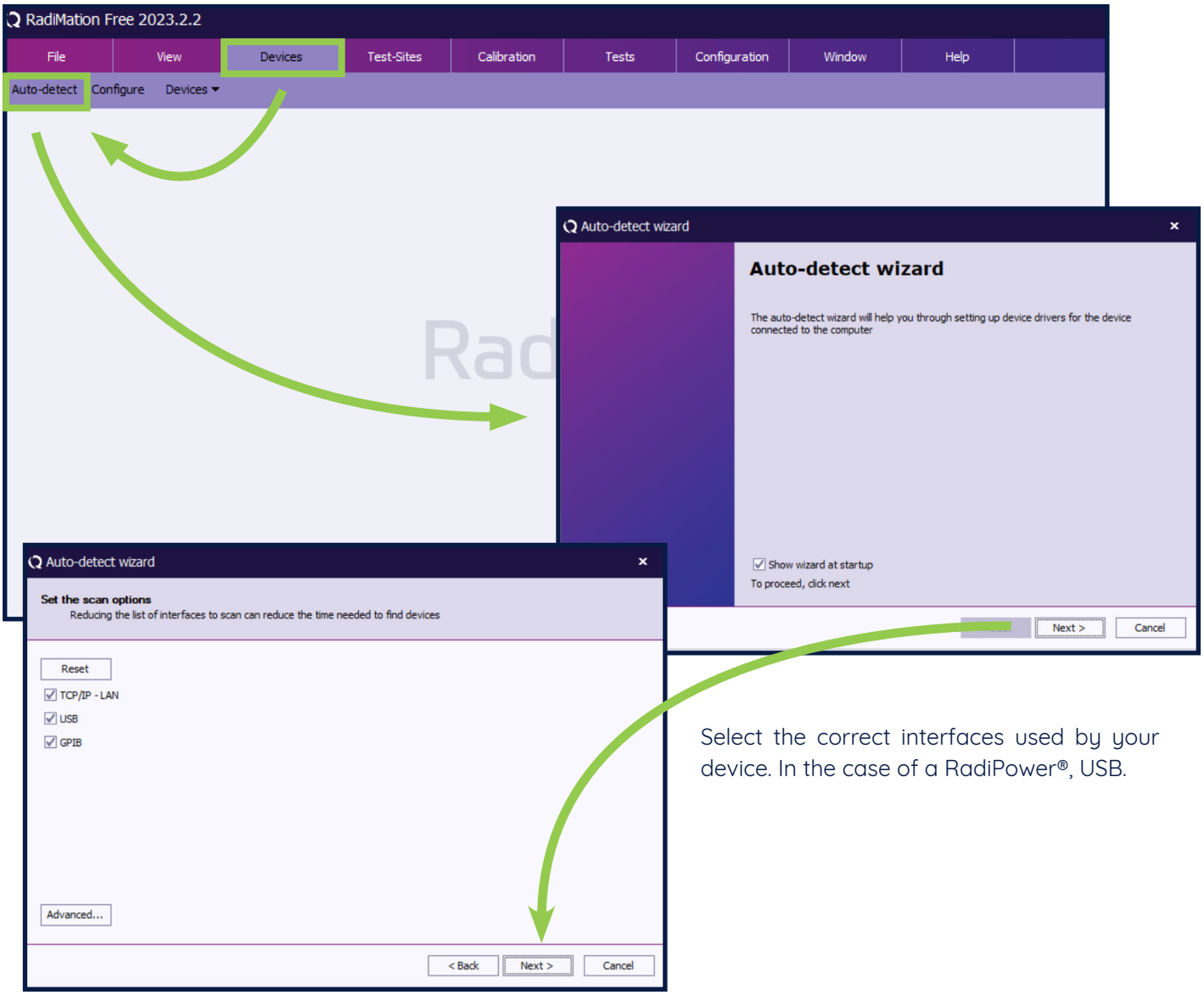


Software Configuration

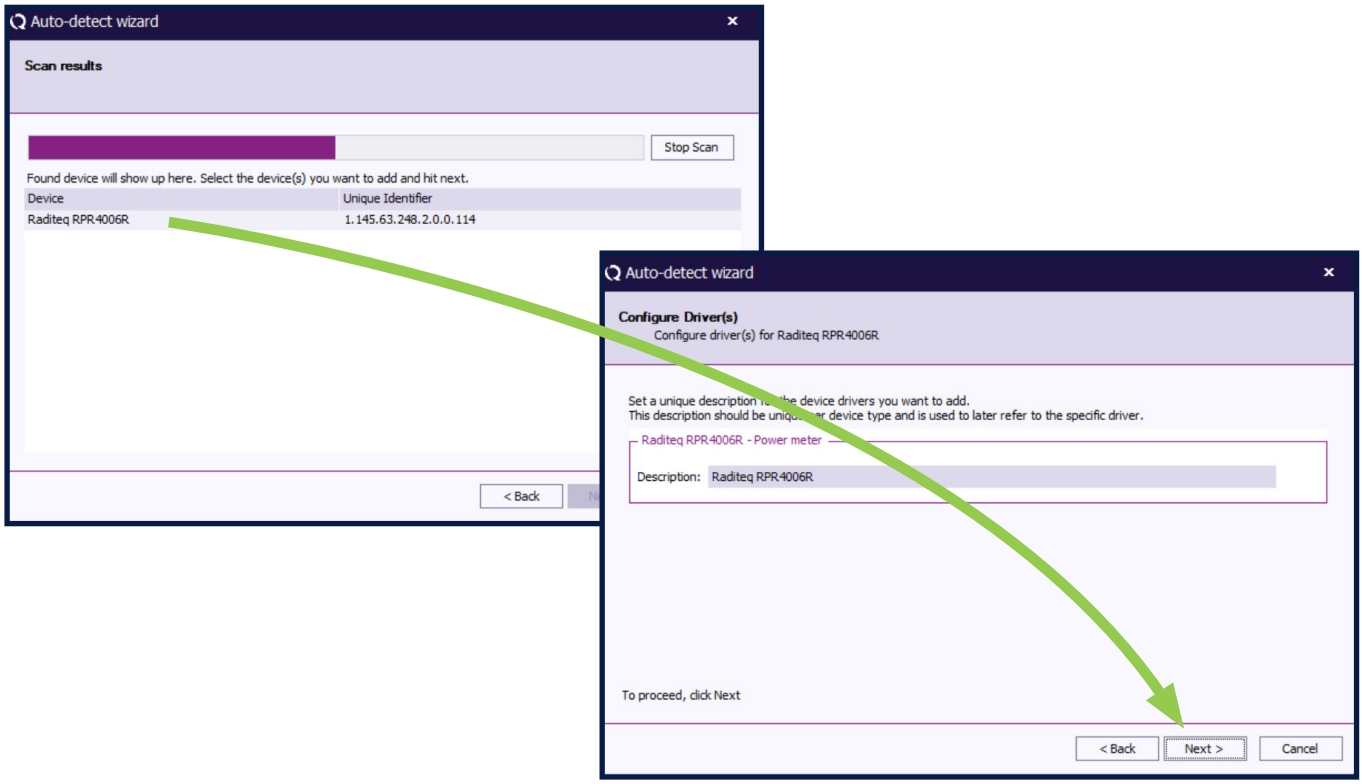
In order to control the RadiPower® from a computer, the RadiMation® EMC software package can be used. RadiMation® from Raditeq is sold separately. **A free-ware version of RadiMation® is available on:** https://www.raditeq.com/automated-emc-software/radimation-free/. If the RadiPower® is operated manually, this chapter can be skipped.

RadiMation comes after version 2022.2 with an Auto Detect feature. This makes it possible to automatically detect Raditeq (and other hardware) and configure it.

The Auto detect start when you first download and install RadiMation. Or click Devices -> Auto-detect.



Select the correct interfaces used by your device. In the case of a RadiPower®, USB.

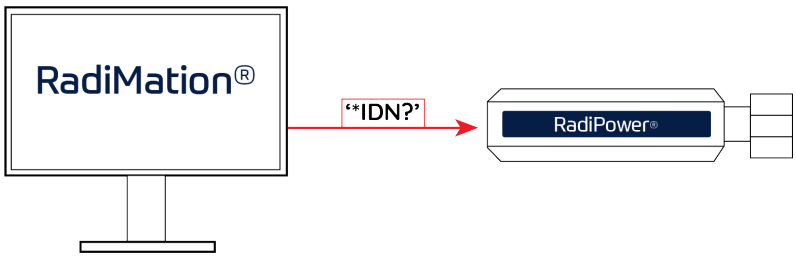


After Click the all setting on and press continue till the auto detect wizard completes and select (all) Devices to be added to your configuration. For more information and a instructional video go to:

https://www.raditeq.com/radimation-auto-detect-feature/

Stand-alone command set

The RadiPower® sensor can also be directly connected to a PC.
Communication with the RadiPower® sensor is possible using a virtual COM-port (VCP)



Command	Descritption	Power meter Reply
*IDN?	Returns the ID of the RadiPower	Raditeq, RPR4006R, 4.2.0
ID_NUMBER?	Returns unique identifier number.	For example: "1.58.95.146.21.0.0.124"
VERSION_SW?	Returns the software version	For example: "4.0.3"
VERSION_HW?	Returns the hardware version	For example: "4"
STATUS?	Check wheter an error is raised	OK or error code
REBOOT SYSTEM	Restart the RadiPower embedded software	OK
CLEAR	Error messages are cleared (if the error is still present after clear, the error is raised again)	OK
LOCAL	Return to local mode	OK
RESET	Reset the module. The following things are reset: • Frequency: 1.3 GHz • ACQ Speed: 1 MS/sec • Filter: 12 • Auto store: Off • Power offset: 0.00 dB • Power units: dB *After resetting the user parameter, the em-bedded software is restarted.	OK

RPR4006R - RadiPower Status Commands - Continued

Command	Descritption	Power meter Reply
STORE	The following parameters are stored by this command: • Frequency • ACQ Speed • Filter • Power offset • Power units	OK
AUTO_STORE<space><store>	Sets the auto store setting, with <store>: 0 = settings will not be automatically stored 1 = settings will be stored in flash after each change of the settings. *Be aware, the flash will degrade much faster when activated!	OK
AUTO_STORE?	Query the auto store setting. 0 = settings will not be automatically stored 1 = settings will be stored in flash after each change of the settings. *Be aware, the flash will degrade much faster when activated!	For example: “1”

RPR4006R - Measurement Commands

Command	Descritption	Power meter Reply
POWER?	Returns the measured power in dBm or Watt	For example: "-38,81"
POWER_UNIT<space><unit>	Set in which unit the reply on the "POWER?" command must be. <unit> can be: 0 = dBm 1 = Watt	OK
POWER_UNIT?	Replies the used unit 0 = dBm 1 = Watt	For example: "0"
POWER_OFFSET<space><offset>	Sets the power offset in dB. <offset> can be set from -100.00 to +100.00 dB.	OK
POWER_OFFSET?	Replies the power offset. See the command: "POWER_OFFSET<space><offset>" for the explanation of <offset>.	<offset> For example: "15.23"
FILTER<space><filter>	Set the filter of the power meter where <fil-ter> can be set from "1" till "12".	OK
FILTER?	Get the current used filter by the power me-ter	For example: "12"
FILTER_BW?	Returns the filter bandwidth <BW> in Hz. Filter bandwith is calculated by ACQ_speed dvidided by averaging	For example: "1000"
FREQUENCY?<space>MIN	Get the minimum frequency of the power meter	"4000"
FREQUENCY?<space>MAX	Get the maximum frequency of the power meter	"6000000000"
FREQUENCY <space><frequency>	Set the frequency of the power meter where, <frequency> is in Hertz.	OK
FREQUENCY?	Get the current used frequency by the power meter	For example: "1300000000"
GET_DATA?	Returns power, frequency, and filter in a single reply.	For example: "-6858;50000000;12" = -68.85dBm, 50MHz, filter 12

RPR4006R - Measurement Commands - Continued

Command	Descritption	Power meter Reply
GD?	Returns power, frequency, and filter in a single reply.	For example: “-6858;50000000;12” = -68.85dBm, 50MHz, filter 12
ACQ_SPEED<space><speed>	Set the ADC sample speed in kSps. <speed> can be: • 1000 • 5000 (*) *Not supported in ranging mode	OK
ACQ_SPEED?	Get the set current used ACQ_Speed used by the power meter	<speed> For example: "1000"

Specifications RPR4000 Pro Series

Model	RPR4006R		
Measuring function	RMS power		
Measurement speed	1 MS/s | 5 MS/s		
Resolution	0,01 dB		
Measuring units	dBm or Watt		
Zero adjustment	Not required		
Input damage level	> +20 dBm		
Measurement range & accuracy			
Frequency range	4 kHz to 6 GHz		
Power measuring range	**Frequency**	**MAX dBm**	**MIN dBm**
	4 kHz - 100 MHz	+10	-70
	100 MHz - 1,5 GHz	+10	-65
	1,5 GHz - 3,5 GHz	+10	-60
	3 ,5 GHz - 4,5 GHz	+10	-55
	4,5 GHz - 6 GHz	+10	-50
Frequency response accuracy (at 23° C ± 2° C)	+/- 0,2 dB		
Linearity error	0,05 dB + 0,005 dB/dB		
Temperature effect	0,15 dB max over full temperature range		
Deviation from CW for signals with high crest factor	< 0,2 dB		
VSWR			
Max SWR: < 100 MHz	1,05		
100 MHz to 6 GHz	1,10		
Connections & Dimensions			
Dimensions of measuring device (LxWxH)	125,2 * 44.5 * 32 mm		
RF input connector	N type precision		
Data connector (power head side)	Mini USB		
Power Consumption			
Supply voltage	+5Vdc from USB port (4,75 V to 5,25 V)		
Current consumption (USB)	Max. 500 mA		
Environmental conditions			
Temperature range (operating)	0° to 30° Celsius		
Temperature range (storage)	-10 to 50° C		
Relative humidity	10 – 90% (non-condensing)		
Compliance			
EMC	EN 61326		
Low Voltage	N/A		
Warranty	3 year (1)		

(1) Three years warranty will be granted only after you register the product at www.raditeq.com. Without registration, a 1 year warranty period applies.

- All specifications are measured after 30 minutes warm-up time and 0dBm unless specified otherwise.
- Typical specifications indicate that the measured values are met on at least 80% of the points.

Warranty Conditions

Raditeq B.V. offers a standard warranty term of three (3) years on their products, calculated from the shipping date, under the condition that the product is registered on www.raditeq.com. For registration of the product, the customer should provide the product model, serial number and the responsible reseller (if applicable). If the product is not registered, a limited warranty term of one (1) year will be applicable.

Return Material Authorization (RMA) & Warranty repair

If a defect occurs to our product within the warranty term, a Return Material Authorization (RMA) 'Warranty Repair' request can be issued using the RMA link at www.raditeq.com/support**.** Upon receipt of the request, an RMA number will be provided. Please do not send the product without this RMA number! The defective product should be shipped to our service department at the following address:

Raditeq B.V. – Service Department
Vijzelmolenlaan 3
3447GX WOERDEN
The Netherlands

There will be no charge for repair services (materials or labour) within the (extended) warranty term.
These warranty terms are not applicable to:

- Normal wear and tear
- Fibre optic cables
- Products that have been improperly used
- Products that have been used outside their specified range
- Products that have been improperly installed and/or maintained
- Products that have been modified without approval of Raditeq
- Calibration and/or re-calibration of the product

Repair services on products that are not covered by the Raditeq warranty will be charged to the customer.

Repairs outside warranty

If a defect is not covered under warranty, an RMA fixed-repair can be ordered on the RMA link: www.raditeq.com/support If a re-calibration is needed after repair, this calibration should be ordered separately. The calibration will be performed at the ISO17025 accredited calibration laboratories of DARE!! Calibrations, based on the applicable service code / prices.

Warranty after repair

For repairs outside the original warranty period, a limited warranty of six months is applicable on the performed repair. Shipping conditions are the same as with repairs that are covered within the original warranty period.

Shipping

The customer will need to arrange shipping and cover for the costs (like e.g. transportation costs, duties, taxes) for sending the defect product the service department of Raditeq in The Netherlands. Raditeq will arrange the courier and cover for the costs for the return shipment after repair.

EU Declaration of Conformity

We

Raditeq B.V.

of

Vijzelmolenlaan 3
NL-3447GX Woerden
The Netherlands

declare under our sole responsibility that the

Product:	**RadiPower® Series**
models:	RPR4006R

are in accordance with the European directives:

EMC Directive 2014/30/EU

Low Voltage Directive 2015/35/EU

RoHS Directive: 2015/863/EU

per the provisions of the applicable requirements of the following harmonized standards:

Emission:	EN 61326-1:2013, Class A1 Electrical equipment for measurement, control and laboratory use.
Immunity:	EN 61326-1:2013, Industrial level, performance criteria A Electrical equipment for measurement, control and laboratory use.
Safety:	EN 61010-1:2010, Safety requirements for electrical equipment for measurement, control, and laboratory use

The technical construction files are maintained at the adress specified above.

Date of issue:	Publish date: 08/08/2023
Place of issue:	Woerden, The Netherlands
Authorized by:	P.W.J. Dijkstra
Title of authority:	Director

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