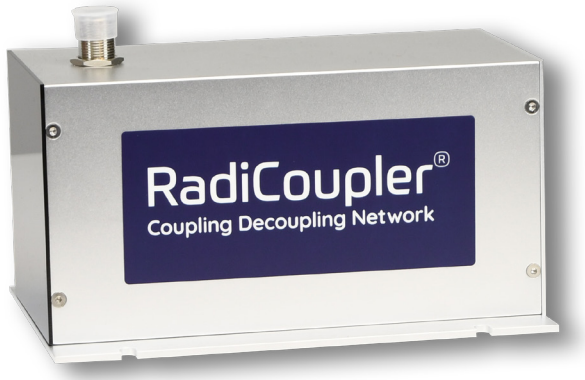
raditeq

Product Manual

RadiCoupler®

Coupling & Decoupling Networks (CDN)



Models:

CPL M | CPL AF2 | CPL T2 | CPL USB

www.raditeq.com

RadiCoupler® product manual

This product manual pertains to the RadiCoupler series®.
Models: CPL M | CPL AF2 | CPL T2 | CPL USB **Made by Raditeq.**

Read this manual carefully 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 the 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: sales@raditeq.com

09/06/21

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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).

This product requires a protective earth connection. The mains power source for the equipment must supply an uninterrupted safety ground to the IEC input connector(s).

This equipment is designed to be used as a plug-in card for the RadiCentre® series. Do not use this card on its own or in combination with any other mainframe. Using this product with any other mainframe can cause harm and will void warranty.

To make the product as safe as possible, this plug-in card has its own safety interlock system that is designed to work with the RadiCentre® series.

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.

Position the product in such a fashion that power cables are easily accessible or connect the equipment to a mains network that can be easily disconnected from the mains.

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 (2015/863/EU).

This product contains embedded software, which is field upgradeable from the RadiCentre® using the USB-A connection port on the backside panel of the RadiCentre®. For more information about updating your Raditeq plug-in card, please read the RadiCentre® manual.

Introduction

The international basic standard for conducted immunity testing (IEC 61000-4-6) specifies the design and characteristics of a range of coupling / decoupling networks (CDN's). To be able to perform conducted immunity testing on an EUT (Equipment Under Test) with several types of connecting cables, different CDN's are needed.

Raditeq introduces a complete range of high quality, full compliant and easy-to-use CDN's that enables customers to perform full compliant, simple and reliable conducted immunity testing on any kind of EUT cable.

RadiCentre® system

The RadiCentre® is a modular EMC/RF test system that serves as the user and computer interface for all the RadiCentre® plug-in cards and modules.

RadiMation® Automated EMC/RF Test Software

RadiMation

RadiMation® is the EMC software package from Raditeq. RadiMation is used for remote control and automated RF and EMC testing. In combination with the RadiCentre® the software really shines brightest and enables the user fully automated and effective EMC and RF testing. Plug-in cards and modules are sold separately.

RadiField® Electric field generator

The patented RadiField® Triple A is no less than a revolution in EMC immunity testing. A complete paradigm shift involves a combination of high-level integration and a field combining technique, making several discrete components like combiner, coupler, power meters and cabling superfluous. This product is sold separately.

The RadiCoupler

Product Characteristics

The RadiCoupler® Coupling / Decoupling Network (CDN) is intended for conducted immunity testing on EUT cables. The RadiCoupler® is full compliant to the international standards CISPR16, IEC61000-4-6, EN55015 and EN55035.The models cover a frequency range from 100 kHz to 300 MHz. The RadiCoupler® has a robust RF N-type input connector and uses a magnetic-grounding connection for easy and conductive ……?

Components

The RadiCoupler® is delivered with the following items:

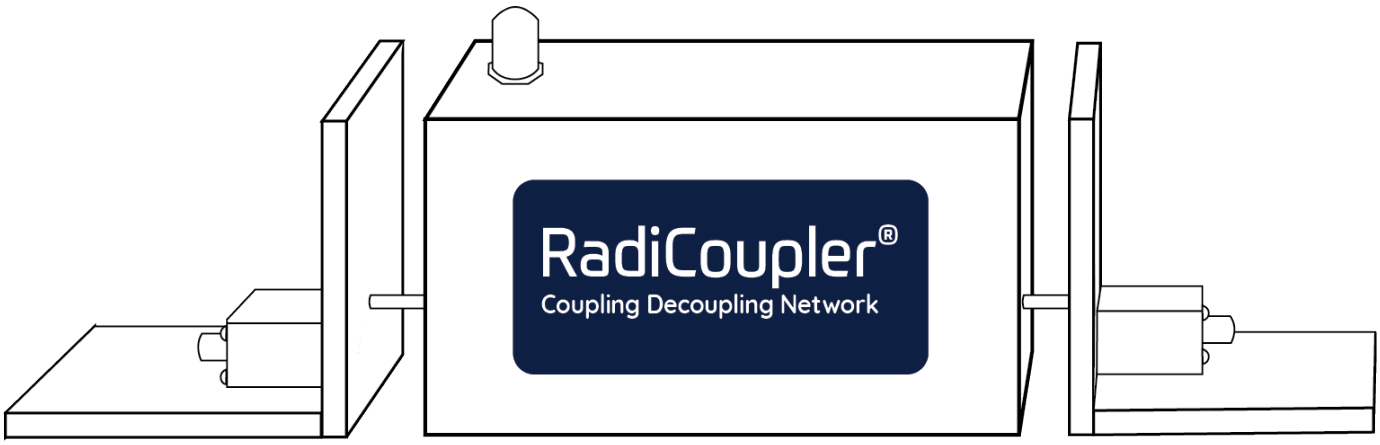
- The RadiCoupler® Coupling / Decoupling Network
- 2x calibration adapter connectors
- Traceable calibration certificate (ISO17025 accredited calibration is optional)
- USB stick containing the (digital) User Manual

Different models

The RadiCoupler® is available as a range, suitable for different types of cables and/or connectors

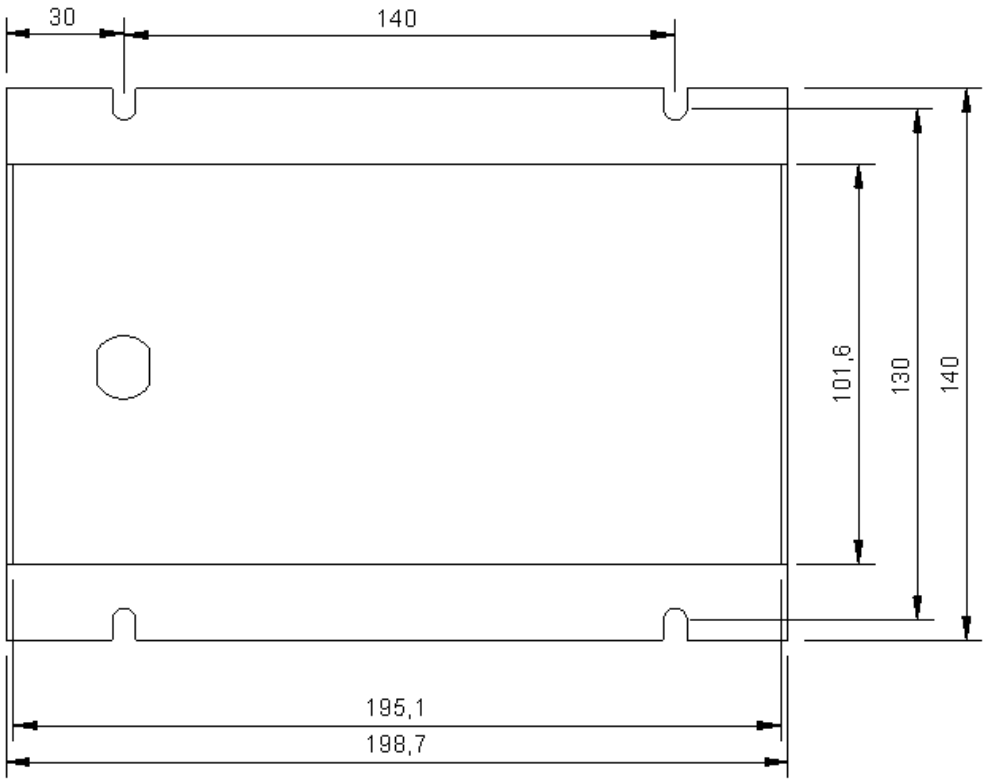
Cable type	Product Name	Application	Connector EUT port	Connector AE port
Mains	CPL M1 16A	1 line, 16 A	4 mm safety banana	4 mm safety banana
Mains	CPL M2 16A	2 line, 16 A	4 mm safety banana	4 mm safety banana
Mains	CPL M3 16A	3 line, 16 A	4 mm safety banana	4 mm safety banana
Mains	CPL M3 32A	3 line, 32 A	4 mm safety banana	4 mm safety banana
Unscreened	CPL T2	2 line, balanced	4 mm safety banana	4 mm safety banana
Unscreened	CPL T4 RJ11	4 line, balanced	RJ11	RJ11
Unscreened	CPL T8 RJ45	8 line, RJ45	RJ45	RJ45
Screened	CPL S8 RJ45	8 line, RJ45	RJ45	RJ45
Screened	CPL USB-C	USB	USB-B	USB-A
Screened	CPL USB-P	USB	USB-A	USB-B
Screened	CPL USB-3.0-C	USB 3	USB-B 3.0	USB-A 3.0
Screened	CPL USB-3.0-P	USB 3	USB-A 3.0	USB-B 3.0
Screened	CPL HDMI	HDMI	HDMI	HDMI
Unbalanced	CPL AF2	2 line, unbalanced	4 mm safety banana	4 mm safety banana
Unbalanced	CPL AF3	3 line, unbalanced	4 mm safety banana	4 mm safety banana
Unbalanced	CPL AF4	4 line, unbalanced	4 mm safety banana	4 mm safety banana

Hardware

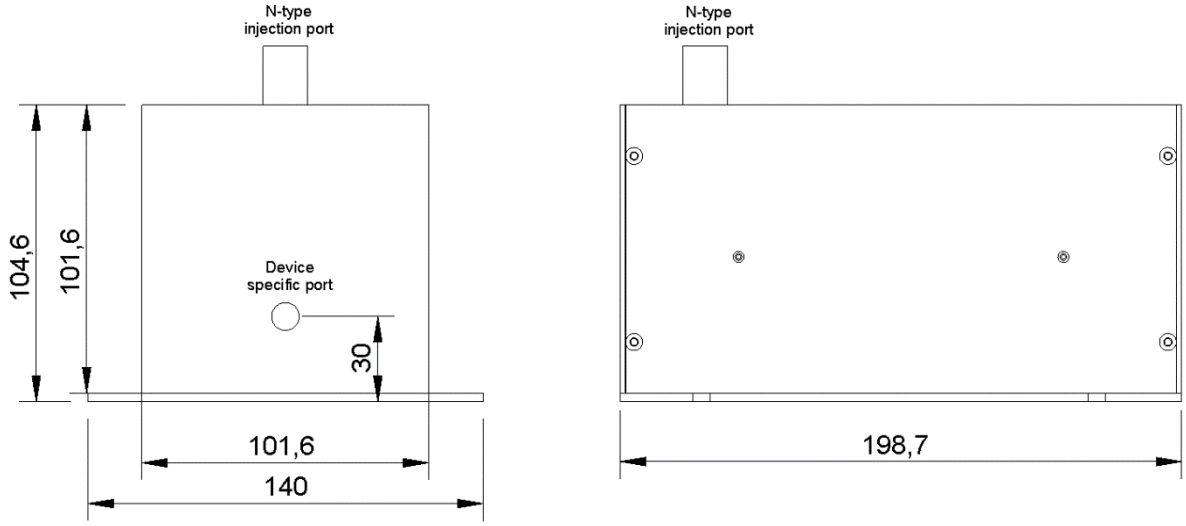


CDN Dimensions

Top view of the RadiCoupler®



Side views of the RadiCoupler®



Each RadiCoupler® has a device specific connector for the EUT and AE-port. This connector is located at 30mm above the bottom plate of the CDN.

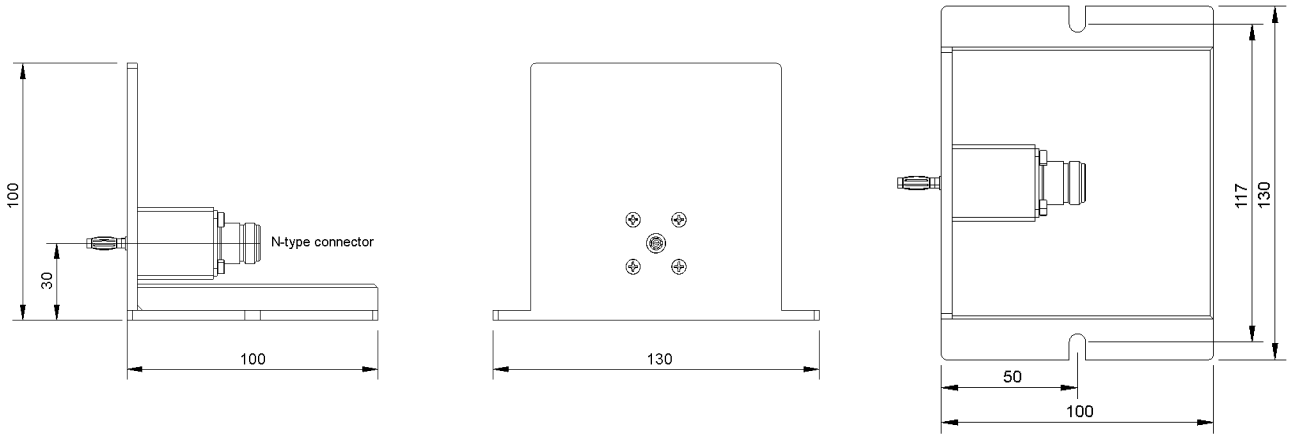
CPL CAL set

The optional RadiCoupler® CPL CAL SET consists of:

- 2x CAL adapter (100 Ohm)
- 1x 50 Ohm terminator

The CPL CAL set is required to calibrate the CDN in accordance to IEC61000-4-6. The set consists of 2x mechanical CAL adapter (one for EUT side, one for AE side) to match the impedance from 50 Ohm to 150 Ohm. Each CAL adapter has an internal 100 Ohm resistor and matches the height of the CDN. The CAL adapter can be connected to the CDN using the adapter connectors, which are standard delivered with each RadiCoupler® CDN.

Side, back, top view of the CAL adapter



Calibration of RadiCoupler® CDN's

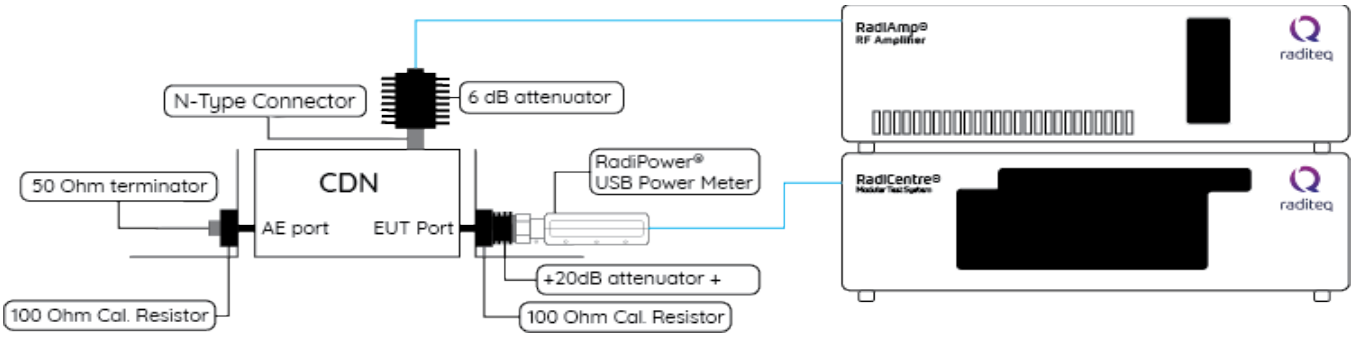
Before the RadiCoupler® CDN can be used for immunity testing, the CDN needs to be calibrated in a 150 Ohm common mode impedance environment. This can be achieved by connecting the EUT side of the RadiCoupler® CDN to the RF port of the RadiPower® model RPR2006C via one of the 100 Ohm CAL adapters. This adapter ensures that the impedance is matched from 150 Ohm to 50 Ohm. Please ensure that a 20dB @ 1w attenuator is used.

The USB port of the RadiPower® needs to be connected to the 'current sensor' USB input of the BCI1004A plug-in card.

The other side (AE port) of the RadiCoupler® CDN will need to be connected to the other 100 Ohm CAL adapter and needs to be closed with a 50 Ohm terminator.

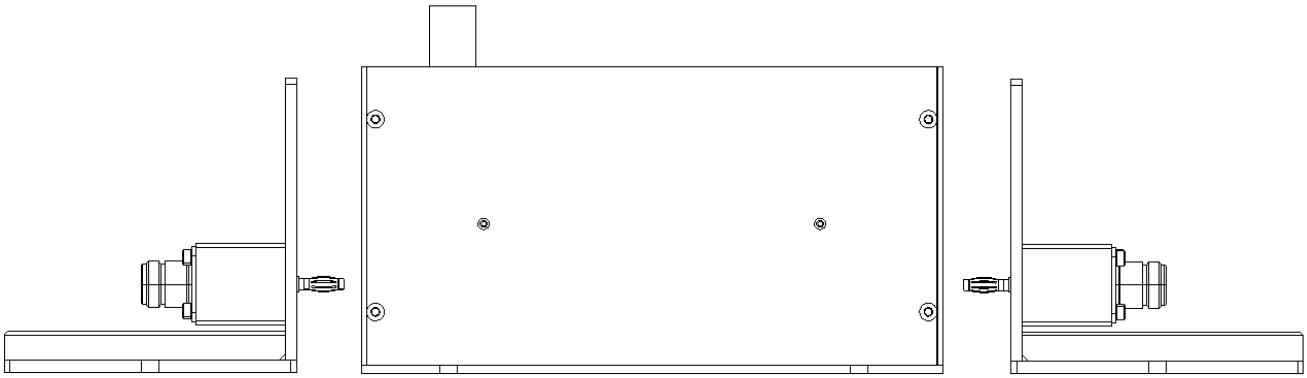
The RF port of the second RadiPower® model RPR2006C will need to be connected to the 'forward power output port' of the RadiAmp® RF amplifier (on the back side).

The USB port of this RadiPower® needs to be connected to the 'forward power' USB input of the BCI1004A plug-in card.



Mechanical fixation

All RadiCoupler® CDN's as well as the Cal adapters are provided with an integrated powerful magnet for easy and quick fixation to a metal ground plane. Please beware that while placing the CDN or Cal adapter on any metal plate, the force can be quite large. The housings of the CDN's and Cal adapters are all conductive to provide good grounding to the ground plane of the test setup.



RadiCoupler® specifications

For measurements using CDN's, several standards are available. The table below gives an overview of these standards with each specific requirement for the impedances, transfer and isolation.

Standard - CISPR 16-1-2	Value	Frequency	RadiCoupler®
Impedance (magnitude)	150 ± 20 Ω	0,15 - 30 MHz	
Impedance (phase)	± 20 °C	0,15 - 30 MHz	✓
Response	- 9,6 to 12,6	0,15 - 150 MHz	
Isolation	> -40 dB	0,15 - 108 MHz	
Standard - IEC 61000-4-6	**Value**	**Frequency**	**RadiCoupler®**
Impedance (magnitude)	150 ± 20 Ω	0,15 - 24 MHz	
	150 ± 60 Ω / -45 Ω	24 - 80 MHz	✓
	150 ± 60 Ω	80 - 230 MHz	
Standard - EN 55015	**Value**	**Frequency**	**RadiCoupler®**
Impedance (magnitude)	150 ± 20 Ω	0,15 - 26 MHz	
	150 ± 0 Ω / -45 Ω	26 - 80 MHz	✓
	150 ± 60 Ω	80 - 300 MHz	
Standard - EN 55020	**Value**	**Frequency**	**RadiCoupler®**
Impedance (magnitude)	150 ± 20 Ω	0,15 - 30 MHz	
Impedance (phase)	± 20 °C	0,15 - 30 MHz	✓
Standard - EN 55035	**Value**	**Frequency**	**RadiCoupler®**
Response	± 30 dB	0,15 - 30 MHz	
			✓
Standard - All Combined	**Value**	**Frequency**	**RadiCoupler®**
Impedance (magnitude)	150 ± 20 Ω	0,15 - 30 MHz	
Impedance (phase)	± 20 °C	0,15 - 30 MHz	✓
Response	- 9,6 to 12,6	0,15 - 150 MHz	
Isolation	> -40 dB	0,15 - 108 MHz	

Mechanical Specifications	Dimensions
Dimensions CDN housing (W x H x D)	100 mm x 100 mm x 200 mm
Dimensions CDN outline (W x H x D)	140 mm x 120 mm x 206 mm
Weight	± 1.2 kg

EU Declaration of Conformity

We

Raditeq B.V.

of

Vijzelmolenlaan 3
NL-3447GX Woerden
The Netherlands

declare under our sole responsibility that the

Product: **RadiCoupler®**
models: CPL M | CPL AF2 | CPL T2 | CPL USB

are in accordance with the European directives:

EMC Directive 2014/30/EU
Low Voltage Directive 2015/35/EU
RoHS Directive: 2011/65/EG

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: 09/06/21
Place of issue: Woerden, the Netherlands
Authorized by:

P.W.J. Dijkstra

Title of authority: Director

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.

Raditeq B.V. | Vijzelmolenlaan 3 | 3447GX Woerden | The Netherlands
www.raditeq.com | T:+31 348 200 100