

Prepared (also subject responsible if other) KI/EAB/TFF Nina Lövehagen		No. EAB-04:012844 Uen		
Approved	Checked	Date 2004-12-17	Rev PA1	Reference

Recommendations of EMF Health and Safety Instructions for Ericsson RBS 2109

This document contains EMF health and safety information for the “Safety Instructions” (A) and provides product specific information for RBS 2109 to be included in the “Technical Product Data” (B). The RBS specific information contains compliance boundaries for typical configurations for RBS 2109 with the integral antennas.

The RF exposure compliance boundary assessment for RBS 2109 has been performed according to the process described in [1] and reported in [2].

References

- [1] EAB/TF-03:035, “Ericsson RF exposure compliance assessment process for radio base stations”, Ericssonwide internal description, revision B, June 2004.
- [2] EAB/TF-04:012835, “RF exposure compliance boundary for the radio base station RBS 2109”, Ericssonwide internal report, revision A, December 2004.

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A Safety Instructions

The following text should be included in the Safety Instructions. For manuals where just a short text is needed section A1.1 should be used.

A1 Radio Frequency Exposure Hazards

This section provides instructions and information on potential hazards related to radio frequency (RF) electromagnetic field (EMF) exposure from fixed radio transmitters (as opposed to mobile phones).

A1.1 General RF Safety Information

Caution!

Excessive RF exposure can result in potentially adverse health effects. If it is suspected that RF exposure limits may be exceeded, ensure that transmitting antennas are switched off, or reduce output power while working with, or near, antennas.

Note: RF exposure limits are specified by national and international health authorities in standards, regulations or guidelines. The limits include wide safety margins to protect from potentially harmful tissue heating.

A1.2 Safety Requirements for Installation and Maintenance Personnel

It is important that all personnel working with the installation and maintenance of transmitting equipment and antennas have basic knowledge regarding RF safety. They must have been informed or trained to be observant of potential risks of RF exposure exceeding specified safety limits, and be aware of precautionary measures necessary for differing situations.

Caution!

Do not stand or work in front of an operational antenna, unless it has been verified or documented that RF exposure levels are within specified safety limits.

Caution!

Always be aware of other RF transmission antennas located close to the antenna you will be working with. If the RF exposure level is unknown, contact the equipment operator or ensure that measurements are done to verify that levels are below specified safety limits before starting work.

Caution!

Broken or disconnected RF cables can lead to exposure levels reaching, or exceeding, specified safety limits. Repair or reconnect cables before starting work.

Note: Working outside of the main transmission direction of ordinarily configured antennas is in most situations possible, since the RF exposure does not normally reach specified safety limits in these directions.

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B Product Specific Information

The following text should be included in the Technical Product Data for RBS 2109.

Radio Frequency Electromagnetic Exposure

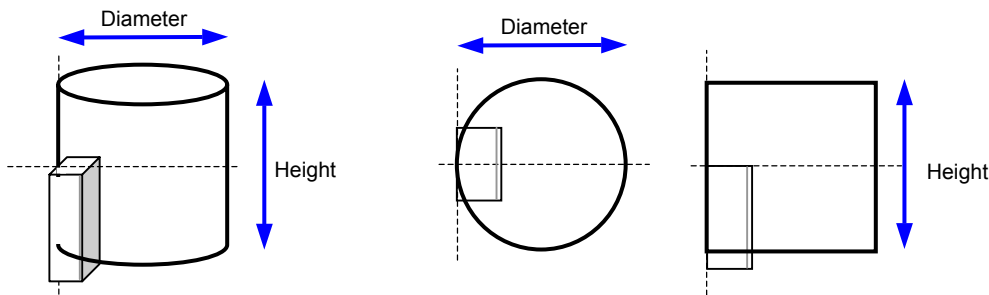
This section provides information on radio frequency (RF) electromagnetic field (EMF) exposure from the antennas integrated in the RBS 2109.

Compliance Distances for Electromagnetic Exposure

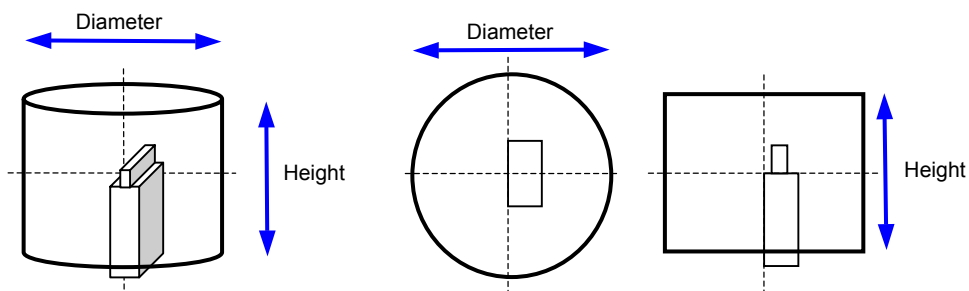
The compliance distance is the minimum separation that should be kept between an antenna and a person in order to ensure that the ICNIRP¹ and FCC² RF exposure limits are not exceeded.

Ericsson has performed free-space near-field RF exposure assessments of typical configurations of RBS 2109 with both integral omni antennas and integral sector antennas. The resulting dimensions, in meter, of the compliance boundaries for general public/uncontrolled and occupational/controlled exposure are shown in Table B1.

The compliance boundary is defined as a cylinder around the radio base station. Depending on the antenna type used, the location of the compliance cylinder around the base station varies, see figures below. In the case of integral sector antennas, the cylinder shape overestimates the compliance distances to the side the base station.



Compliance boundary for integral sector antennas (3D view, view from above and from the side)



Compliance boundary for integral omni antennas (3D view, view from above and from the side)

¹ ICNIRP, "Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300GHz)", International Commission on Non-Ionizing Radiation Protection, Health Physics, vol. 74, no. 4, 1998.

² FCC, "Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields. OET Bulletin 65. Edition 97-01." Federal Communications Commission (FCC), Office of Engineering and Technology, August 1997.

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Table B1 Compliance boundary dimensions for general public/uncontrolled (GP) and occupational/controlled (O) exposure for typical configurations.

Antenna	Frequency (MHz)	Input power	Dimensions of cylindrical compliance boundary for general public exposure in meter (m)			
			Diameter		Height	
			GP	O	GP	O
Integral omni antenna	800	50 W	4	1.5	2.7	1.4
	1900	35 W	2	1	1.7	0.6
Integral sector antenna	800	50 W	3	1.5	2.5	1.2
	1900	35 W	2	1	1.1	1.1

Compliance distances to the side of the base station cabinet for occupational/controlled exposure are below 0.35 m for the integral sector antenna configurations above.

The maximum power levels fed to the integral antennas (including tolerances) for RBS 2109 at 800 MHz and 1900 MHz are given in *Table B2*.

Note: Table B1 shows typical configurations of RBS 2109 with integral antenna solutions. As the antenna field distributions will differ, complete calculations or measurements may be necessary in order to establish the compliance boundaries for other configurations chosen by the customer. For further information on calculation methods, see: *Radio frequency electromagnetic fields, RBS 2000 and RBS 3000, Safety information, 124 46-EN /LZT 720 0399*.

Table B2 Maximum power levels for RBS 2109

RBS configurations	Frequency (MHz)	Nominal output power per carrier (dBm)/(W)	Maximum power ⁽¹⁾ into antenna (dBm)/(W)
Integral omni and sector antennas	800	43 / 20	47 / 50
	1900	41.5 / 14	45.5 / 35.5

1) Including power tolerance level (+1dB), no transmission loss.