

Safety Instructions

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The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing.

Ericsson shall have no liability for any errors or damages of any kind resulting from the use of this document.

1 Introduction

This section contains Safety Instructions for handling the MOBITE[™]X Base Radio Unit 3 (BRU3) during installation and maintenance work.

Please read the Safety Instructions before starting any kind of installation or maintenance work.

2 Safety Instructions

Note! Reduce the risk of accidents by studying all the instructions carefully before starting work. If questions arise regarding the safety instructions, contact your supervisor or the local Ericsson company.

Read and follow all warning notices and instructions found on the product or included in the BRU3 manual. Ericsson takes no responsibility if the labels have disappeared from a BRU3 due to accident or age.

Where local regulations exist, these are to be followed. The safety information in this manual is a supplement to local regulations.

It is the responsibility of the local project manager to make certain that local regulations are known and followed.

The relevant manual (including this safety information) and specific instructions supplied by Ericsson must be followed in any work performed on the Ericsson products or systems. Sufficient knowledge of English or of any of the other languages in which the manuals or instructions are printed is necessary.

The safety information in the relevant manuals presupposes that any person performing work on Ericsson products or systems has the necessary education, training and competence required in order to perform that work correctly. For certain work, additional training or special training may be required. For more precise information on the amount and content of the general and/or special training required for work on Ericsson products or systems, please contact the supervisor or the local Ericsson company.

The BRU3 is intended to be used with a three-wire mains connection plug - a plug which has a grounding pin. This is a safety feature. Grounding of the BRU3 is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adapter.

The slots and openings in the bottom of the BRU3 are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.

Make sure that the FE Power Supply cable is not squeezed by anything and do not place the cable in such a way that there is a risk of people treading on it.

General purpose cables are provided with the BRU3. The provision of special cables, which may be required by a regulatory inspection authority for the installation site, is the responsibility of the customer.

When installed in the final configuration, the BRU3 must comply with the applicable safety standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

2.1 Definition of Expressions

The following definitions of hazard degree are used in this document:

DANGER!

Expresses a hazard that, if neglected, could be either fatal or cause life-long injuries to a human being, and/or destroy the equipment.

WARNING!

Expresses a hazard that, if neglected, could cause severe injuries to a human being, and/or severe damage to the equipment.

CAUTION!

Expresses a hazard that, if neglected, could cause injuries to a human being, or damage to equipment.

3 IT Power System

The BRU3 is not intended for use in an “IT power distribution system”. Type approval testing in accordance with EN60950, UL1950 and CSA 22.2 No. 950 has been performed excluding IT-systems.

An IT power system is a power distribution system having no direct connection to earth, only the exposed conductive parts of the electrical installation are grounded.

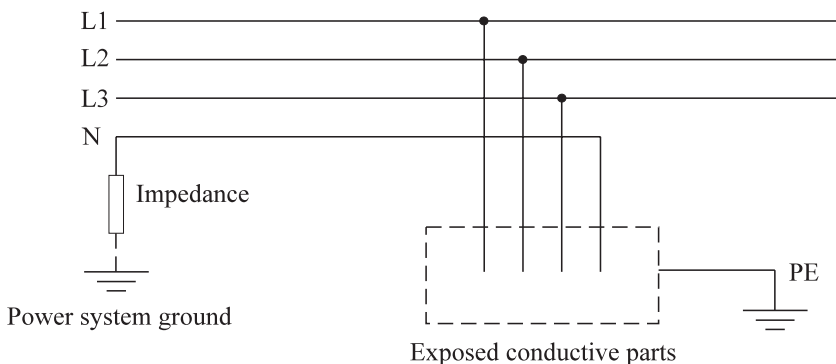


Figure 1 Example of an IT power system.

Note! For more details on IT power distribution systems and test procedures, please refer to the standard documents.

(Please note that IT Power distribution systems are not very widespread and the abbreviation should not be confused with the well-known abbreviation for Information Technology).

4 Precautions

4.1 High Voltage

DANGER!

The BRU3 is powered by 120 or 230V AC. During normal operation, live terminals or components are not accessible. If the BRU3 front cover is opened during operation, for maintenance or commissioning purposes, live terminals or components are exposed.

4.2 Grounding

DANGER!

Grounding must be done before the “MAIN SWITCH” on the FE Power Supply Unit (FPU) is switched on. Before operation of the BRU3, ensure that the BRU3 is grounded in accordance with the Installation Instructions.

4.3 RF Exposure Assessment by Calculation

BRU3 base stations mounting instructions assume tower or roof mounting of the connected antenna(s). Relevant distances for RF exposure in practice exceed the range of the RF near-field range, thus MPE (not SAR) is addressed.

TX maximum output power is 6 W (37.8 dBm) at 100% duty cycle. According to formula [1] below, power density at R=1 m distance is approximately $0.048 \text{ mW} / \text{cm}^2 \ll 0.6 \text{ mW} / \text{cm}^2$, assuming unity gain isotropic antenna and ideal feed line (lossless).

$$(TX_{Pmax} * G_{Tx}) / (4 * \pi * R * R) \quad [1]$$

TX_{Pmax}	maximum TX output power
G_{Tx}	combined transmitter antenna gain and feeder loss
π	3.1415
R	distance to point checked for RF exposure

The product is marketed without antenna and it is to be installed by professional personnel. The installation manual contains a warning note requiring the installation responsible to maintain an antenna safety distance from general public to meet RF exposure limits, considering feeder loss and antenna gain in every case.

Above example shows margin to the commission's exposure limit⁽¹⁾ in excess of 10 dB. Any installation using higher than 10 dB combined antenna gain and feeder loss arrangements and/or closer distances than 1 m to general public shall require the installation responsible to prove RF exposure performance of his installation meets applicable limits.

⁽¹⁾ Regulatory reference: CFR 47, chapter 1, part 1, subpart I, item 1.1310, Radio frequency radiation exposure limits,

table1 Limits for maximum permissible exposure

part (B) Limits for general population, uncontrolled exposure

Power density $f \text{ [MHz]} / 1500 \text{ [mW / cm}^2\text{]} = 900 / 1500 = 0.6 \text{ [mW / cm}^2\text{]}$

5 Poisonous Substances

5.1 Nickel Cadmium (NiCd)

WARNING!

The BRU3 contains a Nickel Cadmium battery pack.

- Handle the battery pack with care. Do not expose it to fire or crush it; the battery pack may release toxic substances.
- Do not short-circuit. The battery pack may cause burns.
- There is danger of explosion if the battery pack is incorrectly replaced. Replace the battery pack with the same type recommended by Ericsson.
- Return used batteries to Ericsson.

In the future the label in Figure 2 will mark the metallic shield covering the battery pack inside the BRU3.

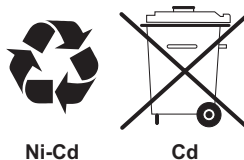


Figure 2 This label is used to mark the battery pack.

5.1.1 Locating and Removing the Battery Pack

Suitable tools:

- A standard screwdriver

CAUTION!

Before any part of the BRU3 is dismantled, all connections to power supply must be disconnected.

Refer to Figure 3 for the different parts of the BRU3:

1 = FE Case Bottom Frame (FBF)

2 = FE Power Supply Unit (FPU)

3 = FE Battery Unit (FBU)

4 = FE Mains Power Cable

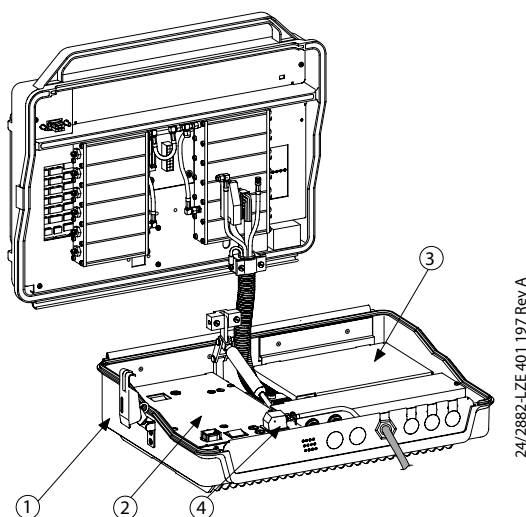


Figure 3 Base Radio Unit 3 (BRU3)

1. Unlock and open the BRU3.
2. Unplug the FE Mains Power Cable from the FE Power Supply Unit (FPU), refer to Figure 3.
3. Set the “BATTERY SWITCH” on the FPU to position “0”.
4. Disconnect the power supply cable from the FE Battery Unit (FBU) by pressing the snap-in and at the same time pulling out the cable connector, refer to “A” in Figure 4.
5. Unscrew the slot-headed screw holding the FBU to the FE Case Bottom Frame (FBF), refer to “B” in Figure 4.
6. Remove the FBU by lifting it straight up from the FBF.

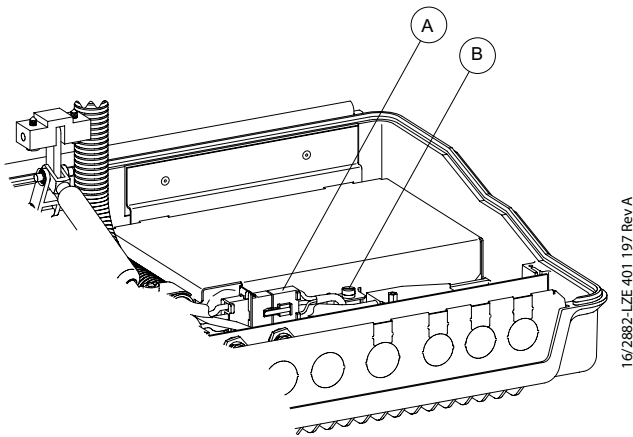


Figure 4 Removal of the FE Battery Unit (FBU)

5.2 Beryllium Oxide (BeO)

DANGER!

Study these instructions carefully before starting work with the BRU3 to reduce the risk of accidents. If questions arise regarding the safety instructions, contact the supervisor or the local Ericsson company.

Follow existing local regulations. The safety information in this manual is only a supplement to local regulations.

5.2.1 Existence of Beryllium Oxide in BRU3

BRU3 for 400 MHz and 900 MHz may contain Beryllium Oxide. In the future non-toxic substances will be used instead of Beryllium Oxide. It is easy to decide which BRU3 contains Beryllium Oxide because of the warning labels outside and inside the BRU3. If the outside warning label has disappeared, open the BRU3 to make sure. If BRU3 contains Beryllium Oxide, it is found in small amounts in ceramic form in the power amplifier on the FE radio board (FRB).

Note! BRU3 for 800 MHz does **not** contain Beryllium Oxide.

5.2.2 Grade of Toxicity

Beryllium Oxide dust is very dangerous if inhaled, even for only a few seconds. It may cause injury to skin or mucous membranes severe enough to endanger life or cause permanent injury. Particles penetrating the skin through wounds or abrasions are liable to cause chronic ulcerations.

If an FE radio board containing Beryllium Oxide has exploded, the site must be cleaned by authorized personnel, considering the rules and regulations of your country. Dust can also be created if the ceramic form is broken, chafed or filed.

5.2.3 Symptoms of Poisoning

Symptoms of Beryllium Oxide poisoning are respiratory troubles or cyanosis (grey-blue discoloration of the skin). These symptoms may develop within a week or after a period of several years.

5.2.4 First Aid

Suspected inhalation of Beryllium Oxide must be treated immediately by a doctor at a hospital.

Suspected skin contact with Beryllium Oxide or penetration of the skin through cuts or abrasions must be treated by thoroughly washing the area with water immediately. This should be followed by a medical examination.

5.2.5 Handling Components Containing Beryllium Oxide

As long as Beryllium Oxide is encapsulated in its ceramic form it is safe to handle. The ceramic form must not be damaged in any way, for example, do not file, ground, scrape or treat the ceramic with acid or mechanically damage it in any way.

Components containing Beryllium Oxide must be treated with special care:

- Compressed air should not be used to clean units containing Beryllium Oxide.
- Disused Beryllium Oxide components must be treated as environmentally hazardous waste.

- If damaged components containing Beryllium Oxide leave dust or particles you must use a safety mask, eye protectors, protective gloves and protective clothing. Collect the dust and particles with wet rags and place the wet rags in plastic bags and seal thoroughly, and treat the rags as environmentally hazardous waste.
- Dispose of defective or broken Beryllium Oxide components in approved containers, with tight-fitting capping. Mark them clearly on the outside of the wrapping: COMPONENTS CONTAIN BERYLLIUM OXIDE.
- Never send the ceramic form containing Beryllium Oxide through the mail. Instead, return them to the nearest depot manually in person.
- Beryllium Oxide must be transported to special waste handling. Instructions to remove the ceramic form containing Beryllium Oxide is to be found on the next page.

5.2.6 End of Life Treatment

Before shredding the BRU3, the Beryllium Oxide Component must be removed for special treatment. This instruction describes how to remove it. The presence of components containing Beryllium Oxide is clearly marked, using the labels described below.

5.2.7 Labels

There are different types of warning labels used for BRU3 containing Beryllium Oxide. Ericsson takes no responsibility if the labels have disappeared from a BRU3 due to accident or age.

At least one the following labels are used.


WARNING
THIS PRODUCT CONTAINS COMPONENTS WITH
BERYLLIUM OXIDE, THE DUST OF WHICH IS TOXIC.
SEE USER MANUAL BEFORE SCRAPPING.
ERICSSON 

Figure 5 This label is used outside the BRU3. Older BRU3 may not have it. "User manual" refers to this manual.

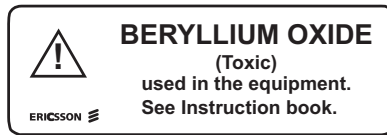


Figure 6 This label is used inside the BRU3 containing beryllium oxide. In the future it should also be used on the lid of the bigger metallic cover on the FE Radio Board for 900 MHz. The FE Radio Board for 400 MHz does not have this extra cover. “Instruction book” refers to this manual.



Figure 7 This label is used on the metallic lid covering the Beryllium Oxide Ceramic Component.

5.2.8 Locating and Removing the Beryllium Oxide Component

Suitable tools:

- A standard screwdriver
- A TORX TX10 screwdriver
- A pair of cutting pliers
- A small adjustable spanner or an 8 mm spanner

CAUTION!

Before any part of the BRU3 is dismantled, all connections to power supply must be disconnected.

1. Please read the whole section before taking any action.
2. Unlock and open the BRU3.

The Beryllium Oxide component is included on the FE Radio Board. The FE Radio Board is underneath one of the filter modules, see Figure 8.

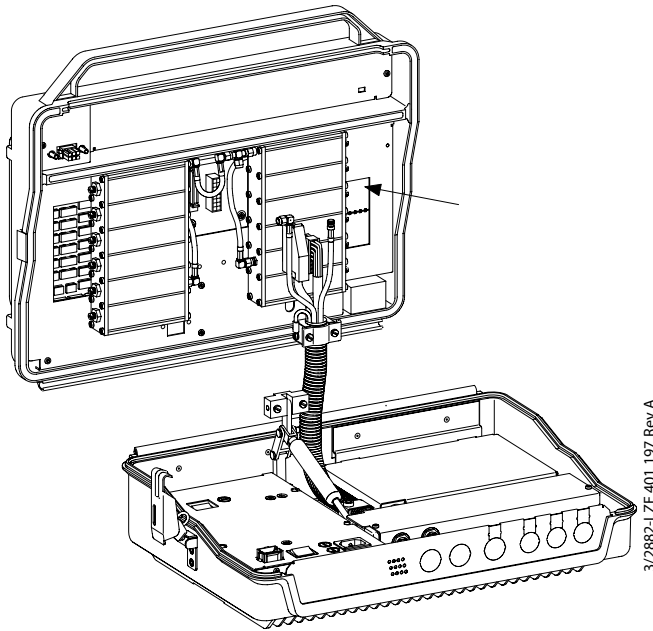


Figure 8 The FE Radio Board containing the Beryllium Oxide component is located underneath one of the filter modules. The BRU3 in the figure is used for 900 MHz. A BRU3 used for 400 MHz looks the same but has bigger filter modules and the cable kit between the lids is mounted between the filter modules instead.

3. Unscrew the four screws and loosen the cable kit between the lids to be able to remove the large black filters, as per Figure 9.

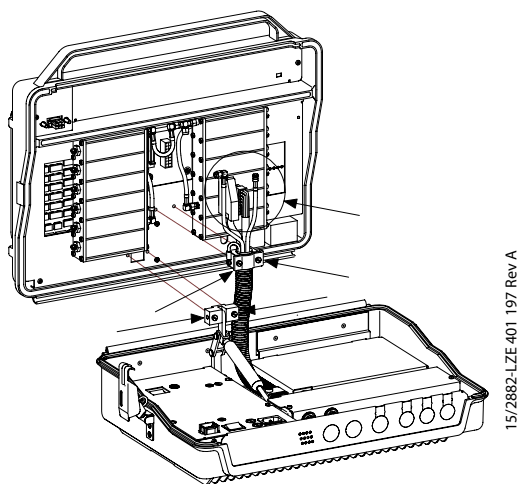


Figure 9 Removing four screws and a cable kit.

4. Unscrew all screws needed to remove the large metallic plate with the filter modules as per Figure 10.

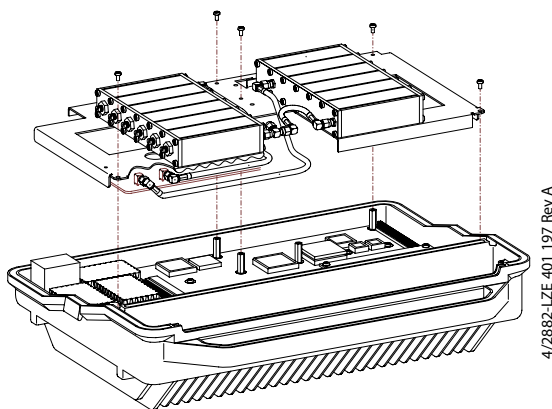


Figure 10 Removing filter modules with metallic plate.

5. Locate the FE Radio Board, see Figure 11.

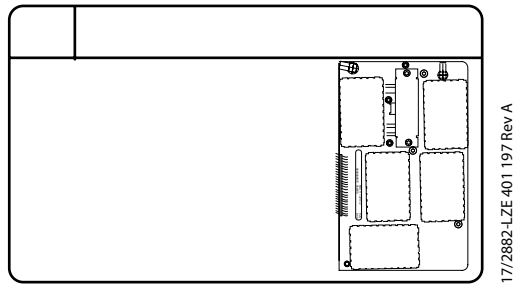


Figure 11 Locating the FE Radio Board in the FE Case Bottom Frame (FBF). The FE Radio Board is to the right in the figure.

6. Make sure that the FE Radio Board is undamaged. Do not work with the BRU3 if the FE Radio Board looks burned or damaged in any way. If this is the case close the BRU3 and treat the BRU3 as beryllium oxide hazardous waste.

.Note! For a BRU3 used for 900 MHz proceed to step 10. For a BRU3 used for 400 MHz continue with the following steps.

7. Unscrew the two screws as per Figure 12.

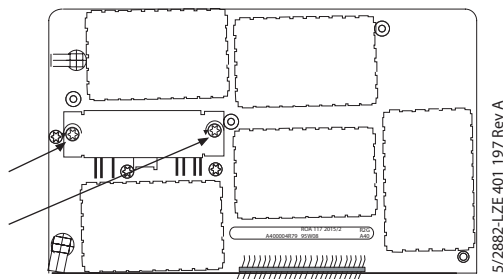


Figure 12 Removing two screws.

8. Lift off the loosened metallic cover. The Beryllium Oxide component is now visible. Cut the seven pins and the small metallic tongue as per Figure 13.

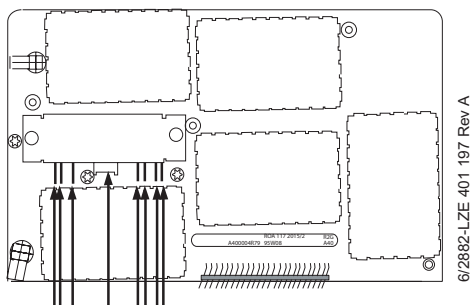


Figure 13 Locating the seven pins and the small metallic tongue to be cut off.

9. Remove the loosened Beryllium Oxide component by lifting it off as per Figure 14.

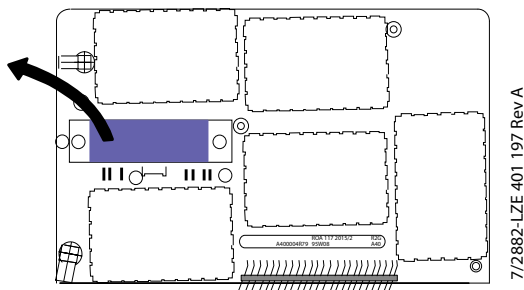


Figure 14 Removing the Beryllium Oxide component from the board.

The component containing Beryllium Oxide is now removed. Steps 10 to 13 refer to BRU3 900 MHz only.

For BRU3 used for 900 MHz:

10. Remove the metallic cover as per Figure 15.

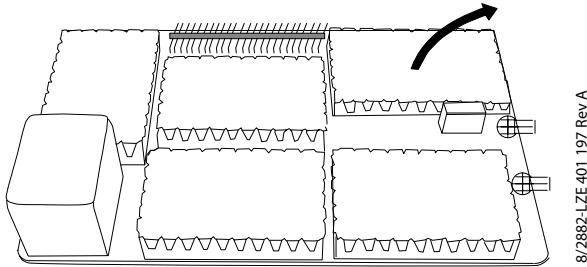


Figure 15 Removing the metallic cover.

11. Unscrew the two screws as per Figure 16.

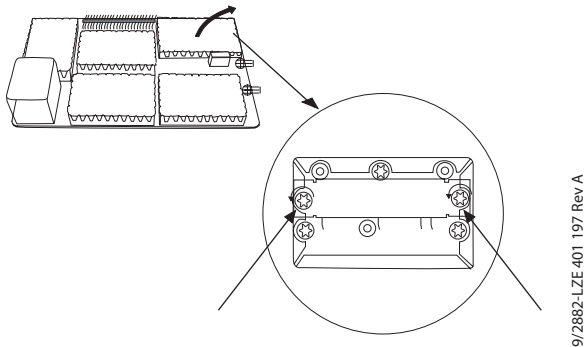


Figure 16 Removing two screws.

12. Lift off the loosened metallic cover. The Beryllium Oxide component is now visible. Cut the four pins as per Figure 17.

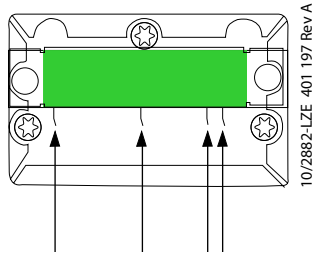


Figure 17 Locating the four pins to be cut off.

13. Remove the loosened Beryllium Oxide component by lifting it off as per Figure 18.

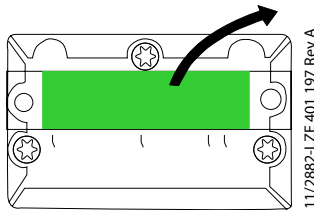


Figure 18 Removing the Beryllium Oxide component from the board.

The component containing Beryllium Oxide is now removed.

5.3 Electro Static Discharge (ESD)

CAUTION!

All types of electronic components, particularly integrated circuits, are in some way sensitive to Electro Static Discharge (ESD). Damage caused by ESD is a common reason for faults in electronic equipment.

The total operating time between failures can be extended considerably by avoiding ESD damage during installation and maintenance work. This has become more important as electronic components decrease in size and increase in sensitivity.

The following ESD basic rules have to be followed when working with electronic components.

- Avoid materials or clothes that easily create electrostatic charges.
- Retain spare parts in their transport packaging until just before use.
- Ensure that PCBs (Printed Circuit Boards) are correctly packed.
- Do not slide PCBs over any surface.
- Always wear a wrist strap connected to ground when handling PCBs.
- Not all components carry ESD warning labels. Nevertheless, always treat electronic components and units as if they were sensitive to electrostatic discharge.

6 Rules and Requirements - Europe

The BRU3 complies with the following directives:

- EMC directive 89/336/EEC
- Low voltage directive 73/232/EEC

6.1 General Safety Statements

PORT VOLTAGE LEVELS

In compliance with EN 41003, the safety status of the ports intended for the interconnection of other equipment are as follows:

Connector	Status
P1 - CONSOLE	Safety Extra Low Voltage (SELV)
P2 - ALARM	Safety Extra Low Voltage (SELV)
P3 - Telephone	Telecomm. Network Voltage (TNV)
P4 - RS232	Safety Extra Low Voltage (SELV)
P5 - RS422B	Safety Extra Low Voltage (SELV)

The definition of SELV & TNV is stated in EN 60 950.

6.2 Statements for Connection to Telephone Networks in the UK

The equipment is approved by BABT as per the following standards:

NTR3

- Connection to Public Switched Telephone Network.
- The REN value of this equipment is 3.
- Modem is using the following CCITT modulations: V.32bis, V.32, V.22bis, V.22.

BS 6328

- 2 & 4-wire private leased lines.

7 Rules and Requirements - USA/Canada

7.1 FCC - Rules and Requirements

After the tests, the BRU3 has been classified as a “Class B digital device” by the Federal Communication Commission (FCC). Please note the following notices regarding classification, interference, changes or modifications, government requirements and equipment return valid for the BRU3.

7.2 BRU3 Classification

“The BRU3 has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The BRU3 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. Operation of the BRU3 in residential areas is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.”

7.3 BRU3 Interference

“The BRU3 complies with part 15 of the FCC rules. 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.”

TO USERS OF THE BRU3 IN CANADA:

“The BRU3 does not exceed the Class B limits for radio noise emissions from digital apparatus set in the radio interference regulations of the Canadian Department of Communications.”

7.4 BRU3 Changes or Modifications

“The authority to operate the BRU3 is conditioned by the requirement that no changes or modifications will be made to the BRU3 equipment unless the changes or modifications are expressly approved by Ericsson.”

7.5 Government Requirements and Equipment Return

Certain governments require that instructions pertaining to the BRU3 connection to the public switched telephone network be included in the installation and operation manual. Specific instructions are listed in the following sections.

7.5.1 USA

Notice to users of the Public Switched Telephone Network

1. The BRU3 complies with Part 68 of the FCC rules. On the BRU3 is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for the BRU3. The label is located on the BRU3 Case top cover, below the handle. If requested, this information must be provided to the telephone company.
2. The Universal Service Order Codes (USOC) associated with the services on which the BRU3 is to be connected is RJ21X. The Canadian equivalent to the USOC is CA21A.
3. The Ringer Equivalence (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum RENs for the calling area.

4. If the BRU3 causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But in advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.
6. If there are any problems with the BRU3, please contact your local Ericsson Customer Support representative or return the BRU3 equipment for repair to the following address:

Ericsson Radio Systems, Inc.
Mobile Data Systems
710 Route 46 East
Suite 300
Farfield, NJ 07004
USA
Tel. (+1) 973 808 3156

Please package the equipment carefully for shipping, including a memo with necessary failure information.

If the problem is causing harm to the telephone network, the telephone company may request you to remove the equipment from the network until the problem is resolved.

7. The user is not authorized to repair or modify the equipment beyond that which is stated in the BRU3 manual.
8. The BRU3 cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.
9. The BRU3 is hearing-aid compatible.

7.5.2 Canada

Notice to the users of the Canadian Public Switched Telephone Network

The Canadian Department of Communications (DOC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing the BRU3, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The BRU3 must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord).

The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone line and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

On the BRU3 is a label that contains the Load Number (LN) for the BRU3. The LN is assigned to each BRU3 and denotes the percentage of the total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the LNs of all devices does not exceed 100.

If there are any problems with the BRU3, please contact your local Ericsson Customer representative or return the equipment for repair to the following address:

Ericsson Communications Canada
5255 Satellite Drive
Mississauga, Ontario L4W 5E3, Canada
Tel. (905)629-6700
Fax. (905)629-6707

Please package the equipment carefully for shipping, including a memo with necessary failure information.

CAUTION!

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

8 Electrical Safety

8.1 Safety Instructions

The following Safety Instructions have to be observed when installing the BRU3:

1. For permanently connected equipment, a readily accessible circuit breaker must be incorporated in the fixed wiring.
2. Never install telephone wiring during a thunder storm.
3. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
4. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
5. Exercise caution when installing or modifying telephone lines.
6. Avoid using a telephone, other than a cordless type, during a thunder storm. There may be a remote risk of electric shock from lighting.
7. Do not use the telephone to report a gas leak in the vicinity of the leak.

