

# Personal Health and Safety Information

## Ericsson Products

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### SAFETY INSTRUCTION

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**Abstract**

This document presents the personal health and safety information that applies when working with Ericsson products.



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# 1 Introduction

This document contains personal health and safety information that applies when working with Ericsson products. The instructions are mandatory to ensure personal safety when working with Ericsson system products.

**Note:** Reduce the risk of accidents by studying all the information carefully before starting work. If questions arise regarding health and safety information, contact the supervisor or the local Ericsson company for clarification.

For information about product safety for Ericsson products, refer to:



*System Safety Information*

*124 46–2886*

## Local Regulations

Any local regulations, principally national regulations, override the information in this document. When no applicable local regulations are available, use the regulations in this document.

## Product Exclusion Indication

The information in this document applies to the personal health and safety aspects of all Ericsson products. The information does not apply to specific products. Readers, therefore, must be familiar with the potential hazards of the particular product to understand which parts of this document apply.

## 1.1 Target Group

The target group for this information is personnel who work with Ericsson products. All personnel working with engineering, installation, test, and operation and maintenance of Ericsson products must be familiar with this information.

## 1.2 Educational Requirements

The safety instructions in the relevant manuals or documents require that persons performing work on Ericsson products have the necessary education, training and competence required to perform work correctly. For certain work, additional or special training may be required, for example authorization for Authorized Service Providers (ASP). ASP is an Ericsson certification procedure.



A good understanding of technical English is required, or of the language that the information is presented in, to ensure that these and other instructions can be understood and complied with.



## 2 Hazard Symbols and Admonitions

This section describes the types of admonitions and hazard symbols used in all Ericsson documentation. The three levels of personal health and safety admonitions that indicate risk to persons are as follows: danger, warning and caution. Hazard symbols are used to indicate these and to present various other hazards.

The admonition levels for personal health and safety are given in order of severity as described in Section 2.1 on page 3. When admonitions are encountered in a document, the information in the instructions must be followed.

### 2.1 Personal Health and Safety Admonitions

Personal health and safety admonitions are used to indicate hazardous activities and are normally preceded by the common hazard symbol shown in Figure 1, or in specific cases by specialized symbols. See *Section 2.2 on page 3*.



Figure 1 Safety Hazard Symbol







The hazard symbol is used with all three admonition levels that are defined as follows:

<b>Danger!</b>	Indicates that there is an imminent hazard that is likely to result in death or serious injury.
	<b>Note:</b> Other symbols can be used depending on the country of operation.
<b>Warning!</b>	Indicates that there is a potential hazard that could result in death or injury.
<b>Caution!</b>	Indicates a hazard that could result in minor or moderate injury.

### 2.2 Special Hazard Symbols

This section contains the special hazard symbols that warn of the risk of chemical, electric shock, fire, heat, laser and Radio Frequency (RF) exposure hazards, as follows:



Symbol	Symbol Name
	Chemical hazard
	Electrical hazard
	Fire hazard
	Heat hazard
	Laser hazard
	RF exposure hazard





## 3 General Safety Precautions

This section describes the general safety precautions that ensure that no one is injured when working with equipment.

- Remove all items of jewelry, for example, rings, watches, and necklaces, that might catch on moving parts or be caught when lifting equipment. Ensure that long hair, beard, and clothes, such as ties and wide sleeves, cannot catch on moving parts.
- Pay attention to the hazard labels and other information labels on the products.
- Do not remove or cover hazard symbols because this might endanger others working with the product.
- Use only the tools described in instructions and in the manner indicated.



## 4 Electric Shock Hazards

This section provides information and instructions relating to equipment operating on voltage that entails an electric shock hazard.

The term Electric Shock Hazard is defined as follows:

### **Electric Shock Hazard**

Hazard of voltages of or above 42.4 V AC peak or 60 V DC.



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### **Danger!**

Electric shock risk. Avoid both direct and indirect contact with parts connected to mains power as this is likely to be fatal. Switch off the mains power before starting work.

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### **Danger!**

Improper electrical installation may cause fire or electric shock that is likely to be fatal. Only a qualified and authorized electrician is permitted to install or modify electrical installations.

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### **Warning!**

Electric shock risk. Provide an adequate disconnect device, internally or externally, in each supply circuit.

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**Note:** Only qualified electricians are allowed to work directly with equipment that presents an electric shock hazard.

**Note:** Carry out AC mains installation according to local regulations.



## 4.1 Safety Precautions for Working with Electrical Equipment

Observe the following precautions when working with electrical equipment:

- Ensure that the AC mains is switched off.
- Ensure that the DC voltage is switched off, both A and B power feeds.
- Protect equipment exposed to moisture with a tent or other suitable protection.
- Install power cables according to instructions. Provide appropriate overcurrent protection.
- Clearly mark all cables installed with labels.
- Ensure that all personnel are familiar with and understand the warning signs on equipment.
- Use only tested electrical tools.
- Ensure that there are no concealed cables before drilling holes in equipment or walls.



## 5 Energy Hazards

This section contains information on how to avoid energy hazards.

The term energy hazard is defined as follows:

**Energy Hazard** Hazard of a stored energy level of 20 J or an available continuous power level of 240 VA.

### 5.1 Batteries

This section contains instructions and information on correct battery handling.

**Note:** In situations where Ericsson is not the supplier of battery equipment, follow the manufacturer's information on battery safety.



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#### **Danger!**

Explosion risk! Follow instructions and connect the lead-acid batteries in sealed cabinets to gas ventilation tubes that let highly flammable hydrogen gas out of the cabinet.

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#### **Warning!**

Improper handling of batteries can cause them to short-circuit, which can result in serious injury due to high energy levels. Exercise the necessary care when working with batteries. Remove any items that can cause short circuits, such as, rings and bracelets.

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### **Danger!**

Explosion risk! Overheated batteries can result in highly flammable hydrogen gas in the cabinet that can cause an explosion. Install the battery temperature sensor(s) according to the instructions.

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### **Danger!**

Explosion risk! Batteries can produce highly flammable hydrogen gas that leaves the cabinet through purpose-built vents. Keep all sources of ignition away from batteries. Ensure that the ventilation openings are not blocked.

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#### **Lithium Batteries**

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### **Warning!**

Switching poles when replacing lithium batteries can result in an explosion that can lead to injury. Always ensure that lithium batteries are connected to the right poles.

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#### **Lithium-Ion Batteries**

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### **Danger!**

Explosion risk! Damaged or defective lithium-ion batteries can explode or cause a fire. Do not use damaged or defective lithium-ion batteries.

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## 5.2 Capacitors and Uninterruptible Power Systems

This section contains information on avoiding energy hazards in capacitors and Uninterruptible Power Systems (UPS).



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### Warning!

High energy levels are present in this unit. Improper handling of the unit can lead to short circuits that can result in serious injury. Exercise care when working with this unit.

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**Note:** Some capacitors and UPSs have energy levels above 20 J.

## 5.3 Safety Precautions for Avoiding Energy Hazards

Observe the following precautions when working with batteries and other units that present an energy hazard:

- Remove all metallic objects, such as wrist watches, rings, bracelets, and so on.
- Disconnect the charger power supply until the work is complete.
- Use only insulated tools.



## 6 Fire Hazard

This section contains instructions and information on safety precautions for preventing fire.



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### Warning!

In the event of a fire, evacuate the building or equipment site and raise the fire alarm at the closest alarm point, or call the emergency number. Do not re-enter a burning building under any circumstance.

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### Warning!

Heater in operation. Do not block the heater vents or place combustible materials close to the unit, as this can cause fire and endanger life.

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### 6.1 Fire Precautions

When working with the installation or maintenance of equipment that involves interfering with the fire sectioning of a building, this should be performed as quickly as possible.

Fire can spread to neighboring rooms. When working on equipment cable ducts, channels and access holes might have to be opened, thereby interfering with the fire sectioning of the building. When work has been completed restore the fire sectioning of the building:

1. Close the cable ducts and, where applicable, the fire doors as soon as possible.
2. Seal cable ducts according to the regulations for the building.
3. Minimize the amount of inflammable material.
4. Remove empty packaging material from the equipment site.
5. Check that there is an appropriate, functioning fire extinguishing device for the equipment at the site.



## 7 Heat Hazards

This section describes how to avoid injury from hot surfaces or hot air in equipment.



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### Caution!

Parts inside this equipment reach high temperatures during normal operation, which can cause burns to the skin if touched without heat-protective clothing. Always use heat-protective clothing when working with equipment that has hot surfaces, or switch the equipment off and allow it to cool before starting work.

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### Caution!

A heater, producing hot air, is in use in this equipment. Direct contact with hot air can lead to burns. When the heater is in operation, avoid close contact with the heater vent.

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## 8 Mechanical Hazards

This section contains information on mechanical hazards in equipment containing sharp edges or rotating blades.



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### Caution!

Sharp metal edges may exist that can cause cuts to the skin or clothing. Wear protective gloves when handling this equipment.

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### Caution!

Rotating fan blades can cause injury to body parts that come into contact with the blades. Blades in fan units continue to rotate for a period of time, even after the fan has been switched off. Wait until fan blades have stopped rotating completely before starting work on or near fans.

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## 9 Radio Frequency Exposure Hazards

This section contains instructions and information on potential hazards related to Radio Frequency (RF) Electromagnetic Field (EMF) exposure from fixed radio transmitters (as opposed to mobile phones).

### 9.1 General RF Safety Information

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.



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#### 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 whilst working with or near antennas.

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### 9.2 RF Safety for Installation and Maintenance Personnel

It is important that all those 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 different situations.

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#### 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.

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### Caution!

Always be aware of other RF transmission antennas located near the antenna you are 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.

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### Caution!

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

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**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.



## 10 Laser Hazards

This section contains information about working with products that have devices that communicate through optical fibers using laser. The information applies only to products marked with the laser hazard symbol and stating the class of laser in use.

**Note:** Always assume that optical cables are in use before starting work.

### 10.1 Class 1 Laser

This section information on working with equipment containing Class 1 laser.

Products containing a Class 1 laser, according to IEC/EN 60825, are safe to use and, therefore, have no safety requirements for the use of cautions or warnings during operation or maintenance procedures.

### 10.2 Class 3 Laser

This section provides information on working with equipment containing Class 3 laser.



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#### **Danger!**

Equipment that transmits laser light can cause permanent eye damage. Never look directly into the end of a fiber optic cable or other laser source. Switch off the laser before starting work on laser equipment.

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#### **Safety Precautions for Working with Class 3 Laser**

The following precautions must be observed when working with products containing a Class 3 laser hazard symbol:

- Never look into the light emitting end of a functioning optical fibre.
- Switch off units producing the laser signal before disconnecting an optical fibre.



# 11 Chemical Hazards

This section provides information on chemical hazards that can be present in products.

## 11.1 Beryllium Oxide Hazard

This section contains information on Beryllium Oxide (BeO). BeO is a restricted substance that is contained in certain components of some Ericsson products. If a product contains BeO, this is clearly marked on the unit. The BeO hazard symbol is shown in Figure 2.

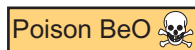
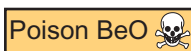


Figure 2 BeO Hazard Symbol

**Note:** This information only applies to products marked with the BeO symbol.



### Danger!

This product contains Beryllium Oxide (BeO), which can cause injury to skin or mucous membranes severe enough to endanger life or cause permanent injury. BeO dust is produced by chafing, filing, or breakage and is extremely dangerous if inhaled even for only a few seconds. Particles penetrating the skin through wounds or abrasions cause chronic ulcerations. Do not handle components containing BeO without protective clothing.

### Symptoms of BeO Poisoning

Symptoms of BeO poisoning are respiratory distress, cyanosis (grey-blue discoloration of the skin and mucous membranes), or both. These symptoms can develop within a week, or after a period of several years.

### Safety Precautions for Working with Components Containing BeO

Observe the following precautions when working with components containing BeO:

- Do not carry loose components in pockets, bags, or containers, or tamper with them in any way that could cause breakage or disintegration.
- Do not apply excessive heat during soldering.



- Do not break open components for inspection.
- Store components in their original packaging and do not mix them with other components.
- Ensure that components do not become mechanically damaged.
- Use care when replacing defective components.
- Do not blow on exposed surfaces because BeO dust might be present.
- In case of accident, or if you feel unwell, seek medical advice immediately and show the label where possible.

## 11.2 Battery Acid Hazard

This section contains information on chemical hazards related to lead-acid batteries.



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### Caution!

Excessive heat can cause battery casing to soften and warp, potentially allowing acid to escape. Acid can cause injury when in contact with the skin, and can affect the throat and lungs if inhaled. Use protective equipment when replacing batteries.



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### Caution!

Batteries can leak electrolytes if mishandled. Electrolytes in contact with skin or eyes can cause injury. In the event of an electrolyte-induced injury, rinse the affected area with water and immediately seek medical attention. Use protective equipment when replacing batteries.

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### Safety Precautions for Working with Lead-Acid Batteries

The following precaution must be observed when working with lead-acid batteries:

- Ensure that eye wash facilities, protective gloves, and aprons are available.



### Safety Precautions for Working with Lithium-Ion Batteries

The following precaution must be observed when working with lithium-ion batteries:

- Ensure that eye wash facilities, protective gloves, protective eye-glasses (goggles), and aprons are available.

## 11.3 Gas Explosion Hazard

Open-cell lead-acid batteries can give off gases that in the event of a fire can cause an explosion that is likely to be fatal. All battery areas must be adequately ventilated and protected from fire.



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### Danger!

Open-cell lead-acid batteries can give off highly flammable hydrogen gas that can cause a fatal explosion. Do not use open-cell lead-acid batteries.

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## 11.4 Refrigerant Hazard

This section contains information on refrigerant hazards.



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### Caution!

The unit contains liquid refrigerant. Inhalation of high concentration of refrigerant vapor can damage airways and cause drowsiness and dizziness. At high levels, it can cause breathing difficulties. Skin contact or splashing in the eyes of the liquefied gas can cause frostbite. Avoid inhalation and contact on the skin or in the eye.

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Observe the following precautions when working with cabinets containing liquid refrigerant media, for example, Fluorocarbon R134a, CH<sub>2</sub>FCF<sub>3</sub> (HFC134a):

- All handling must take place so that inhalation and skin and eye contact is avoided.
- Avoid the steam coming into contact with the welding arcs.
- Avoid the steam coming into contact with hot surfaces (decomposition).



- If there is a suspicion of leakage from the cooling system, ventilate and leave the place. Call for a competent cooling technician.
- In case of fire, the refrigerant, R134a, develops toxic and corrosive gases.
- The cabinet must be standing upright for at least 1 hour before starting.
- The refrigerant is banned to emit to air. Recover the refrigerant when the equipment is disposed of.





## 12 Other Hazards

This section contains safety instructions and rules for the following hazards:

- Handling Heavy Goods
- Working at Height

### 12.1 Handling Heavy Goods

This section contains instructions and rules for handling heavy goods.

Always follow local regulations for safety clothing and safety equipment for hoisting and moving goods.

#### Falling Objects



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#### Warning!

When working at height, there is a risk of falling objects. Falling objects can cause serious injury or even be fatal. Always wear a helmet and avoid standing in an area where objects can fall.

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#### Overloading



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#### Warning!

Overloading and improper use of lifting devices can cause serious injury to anyone hit by falling equipment. Do not create an angle exceeding 90° between lifting straps as this increases the strain on them and can cause them to snap.

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### **Caution!**

The equipment is heavy. Lifting the equipment without the aid of a lifting device can cause injury.

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### **Unsecured Equipment**

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### **Caution!**

Tip risk. Unsecured equipment can tip over if not secured properly, which can cause serious injury. Secure products with a high center of gravity as soon as possible to avoid accidents.

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## **12.2 Working at Height**

This section contains information about working at height.

### **Safety Precautions for Working at Height**

When working at height, follow all local safety regulations and observe the following:

- Ensure that personnel have the appropriate training and medical certificate.
- Ensure that a full-body safety harness and safety helmet are available.
- Wear adequate protective clothing and accessories as the local climate requires.
- Ensure that all lifting devices are tested and approved, and ready for use.
- All personnel in the area must wear helmets.