P006770A

Ericsson GSM System

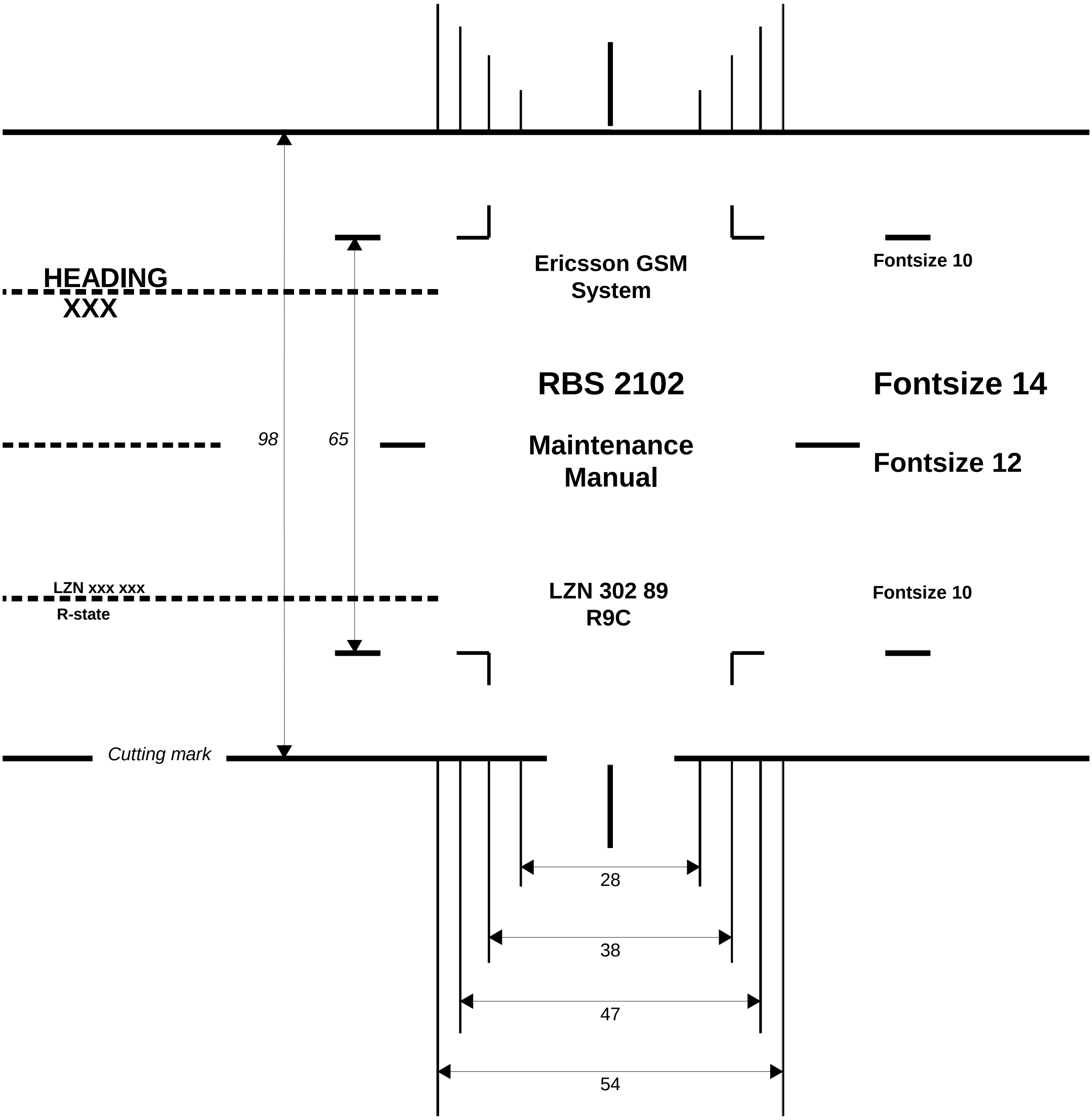
RBS 2102
Maintenance Manual

ERICSSON

LZN 302 89 R9C

BINDER LABEL 1 (1)

Uppgjord (även faktaansvarig om annan) - *Prepared (also subject responsible if other)*		Nr - *No.*		
ERA/SRB/ZP Per Olof Höglund		1/001 59-LZN 302 89 Uen		
Dokansv/Godkänd - *Doc respons/Approved*	Kontr - *Checked*	Datum - *Date*	Rev	File
ERA/SRB/ZP		2001-11-14	E	



ERICSSON

CAPTION LIST

Document No.	
2/001 59-LZN 302 89 RBS 2102 Maintenance Manual	
Date 2001-11-14	Rev E

R-State

R9C

RBS 2102 Maintenance Manual

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

Contents

1 Introduction

This Maintenance Manual is valid for the Ericsson GSM Base Station System (BSS) from release R7 up to R8.

The purpose of the manual is to provide the information necessary for first line maintenance. First line maintenance includes the following activities:

- Repairs that entail replacement on site. Only Replaceable Units (RUs) are handled.
- Preventive maintenance.

The instructions in this manual apply to a Radio Base Station (RBS) connected to a Base Station Controller (BSC), and it is assumed that the RBS is installed and in operation.

1.1 Product Overview

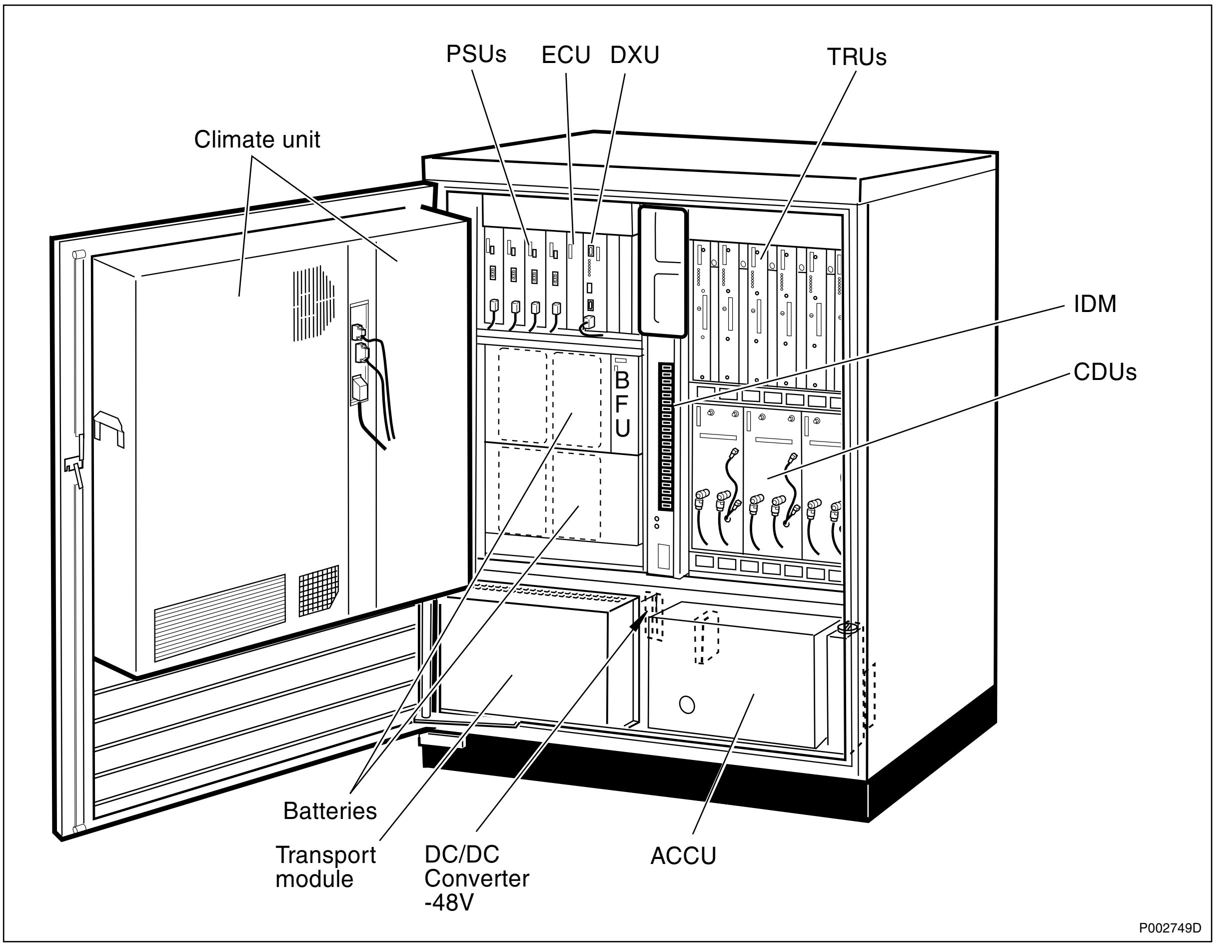


Figure 1 RBS 2102 cabinet overview

This is a brief overview of the RBS 2102. For further information about the RBS 2102 manual, see:

Reference Manual *EN/LZT 720 0001*

The RBS 2102 is a member of the RBS 2000 family of indoor and outdoor RBSs operating in the GSM 900, GSM 1800 and GSM 1900 frequency bands.

The RBS 2102 is designed for outdoor installation. See chapter “Positioning of RUs” for more detailed product overview.

Cable entries for transmission and power cables are concentrated to the connection fields in the transport module in the lower part of the cabinet. Cable entries for feeders are located behind the ACCU.

1.2 RBS 2000 Library Overview

The user documentation for all RBS 2000 models consists of customer manuals divided to suit different process events. The *Library Overview* contains the following information for each manual:

- A short description
- The recommended target group
- The product number

Library Overview *LZN 302 73*

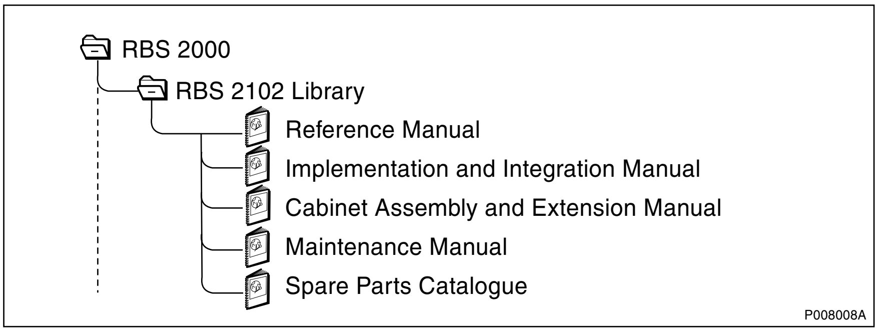


Figure 2 The customer documentation library

This manual is part of the RBS customer documentation library shown in the figure above.

1.3 How to Order CPI

CPI can be ordered in the same way as all other Ericsson products using the product number to identify each product. Orders can be placed through any local Ericsson company, or alternatively, on the internet. How operators and customers and Ericsson companies order CPI is described in detail below.

1.3.1 Outside Ericsson

To place an order for CPI, contact any Ericsson company and follow the same procedure as with all other Ericsson products.

The most up-to-date CPI can be downloaded from the extranet by customers and contractors that have obtained access by visiting Ericsson’s extranet e-business site. *See access information below*.

How to Obtain Access to the Extranet

Access is granted by the Key Account Manager (KAM) from your local Ericsson company. The extranet address is:

https://ebusiness.ericsson.net/

To be able to access the extranet site you need to ensure that:

- ☐ your company allows access to secure sites (HTTPS) through its firewall.
- ☐ your PC has either Microsoft Internet Explorer 4.01 with SP2 or later, or Netscape Navigator 4.61 or later.
- ☐ your browser has the plug-ins necessary to view or download PDF and Microsoft Office files.

If you are unsure of any of these preconditions, please check with your local IS/IT support or help desks within your company.

The Access Process

- To access the site you must have an individual user name and password. To request access, send an e-mail to the support centre **asq.ex@era.ericsson.se** stating your name, telephone number, email address and with which customer or Ericsson company you work.

  Once your access is set up, a reply with all the details you need will be sent to you.

- The first time you log in to the site, we recommend that read the user instructions.

More information about extranet can be found at the extranet address above. For support on issues related to the Extranet, Tel.:
+46 8 585 33085

1.3.2 Inside Ericsson

The intranet is an internal Ericsson web that can only be accessed by Ericsson personnel.

All CPI products are available on the intranet at CPI Store:

http://cpistore.ericsson.se

Ericsson personnel, who may require access to CPI while operating outside Ericsson’s firewall, can get more information about extranet access from the following address:

http://inside.ericsson.se/ebusiness/

A Portal Order form can be downloaded from the How to Start menu at this site to make the application process easier.

1.4 Target Group

This manual is written for RBS 2000 field technicians. The sub-section "Fault Analysis from OMC" in the section "Maintenance Process

Overview" is written for the Operation and Maintenance Centre (OMC) operators.

Local safety regulations may require that all work (installation, repair, revision and so on) with high-voltage equipment must be done by a qualified or certified electrician only.

The field technician is expected to be experienced in radio and mobile communications, and have a good understanding of technical English. The required knowledge of the equipment can be acquired by following the courses for RBS 2000 field technicians. The courses are:

- GSM System Survey LZU 108 852
- RBS Site Maintenance LZU 108 874

Call an Ericsson Training Centre for a complete training plan.

1.5 Maintenance Process Overview

The purpose of this chapter is to provide an overview of the maintenance process and describe how to perform the correct maintenance procedures.

1.5.1 General

RBS 2000 radio base stations are administered and controlled by the BSC. There is a master/slave relationship between the BSC and the RBS, and the BSC has an overview of the status of the radio network and its resources.

The BSC manages the O&M of the RBS across the Abis Interface. The RBS equipment is seen as an MO by the BSC. This is a way of describing the RBS, in a functional way and as a logical model, in the BSC. All O&M actions are based on this logical model structure created in the BSC. An MO does not necessarily have a one-to-one relationship with a physical unit in the RBS.

The MO, describing RBS 2000 (G12), is divided into two sub-classes: AO and SO. The SO is the abstract sub-class of the MO that owns the hardware. The AO only handles functions.

The RBS can be set in local or remote mode. Local mode means that the RBS has been disconnected and isolated from the BSC, while in remote mode the RBS is controlled by the BSC.

When the RBS is in remote mode, the BSC acts as a master in the BSC-RBS relationship and all RBS maintenance actions are ordered by the BSC. Faults in the RBS are reported to the BSC on an MO basis. All faults reported by the MOs in the RBS are stored in the BSC error log.

Tests on MOs with RBS hardware can be ordered by a BSC operator in order to check the status of the RBS. The operator can also test the connection between the BSC and a TRU in the RBS by ordering a loop test. A test pattern is passed through the loop created between the BSC and one specific time slot in a specified TRU.

The RBS contains test and supervision functions that detect malfunctions and report them to the BSC. Tests and supervision are performed on an MO basis, which means that the different MOs supervise their own equipment.

Statistics are collected on an MO basis in the BSC, for example, the number of call setup attempts, or the number of abnormally terminated calls.

1.5.2 Fault Handling Workflow

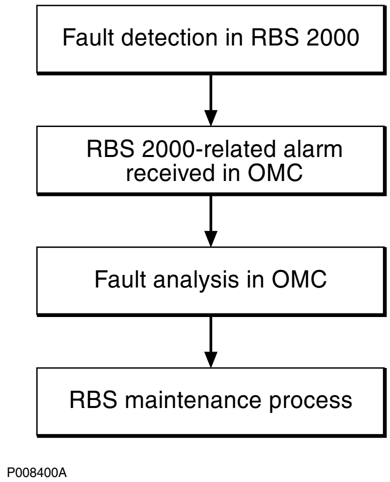


Figure 3 Fault handling workflow

Steps one and two are automatically performed by the BSS. Step three is performed at the OMC by an operator who handles the RBS alarm with support from OPI. By analysing the fault situation, the OMC operator will be able to choose the appropriate action. At the RBS site, step four is performed by a field technician, who follows the instructions in this manual.

1.5.3 Fault Analysis from OMC

This section very briefly describes a typical fault analysis process, performed from an OMC. It describes procedures that have to be done before sending a field technician to the site.

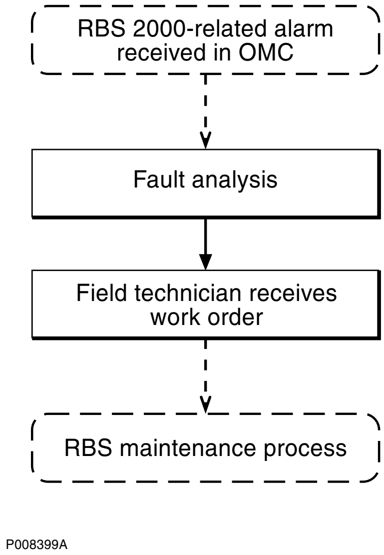


Figure 4 Fault analysis from OMC

Fault analysis

The fault is given in plain text at the BSC. The faults are divided into class 1 and class 2 alarms. Some of the alarms also indicate the suspected faulty HW unit in a, so called, RU map.

Field technician receives work order

Before writing the work order, the following questions are asked to optimise the site visit:

- Is preventive maintenance scheduled at this site in the near future?
- Are there any other faults at this site that have been postponed?
- Are there any other reasons for sending a field technician to the site?

The work order must include information about the following:

- Site location
- How to get to the site
- Cabinet identity
- The suspected RU
- The error log must be included, if a logical RU is suspected to be faulty
- If the fault situation is unclear, site history must be included; for example, whether the same type of fault has been detected and repaired a few weeks earlier

With the information above, the field technician carries out the maintenance work at the site. When the maintenance work is completed, the field technician sends a report back to the MSC.

1.5.4 RBS Maintenance Process

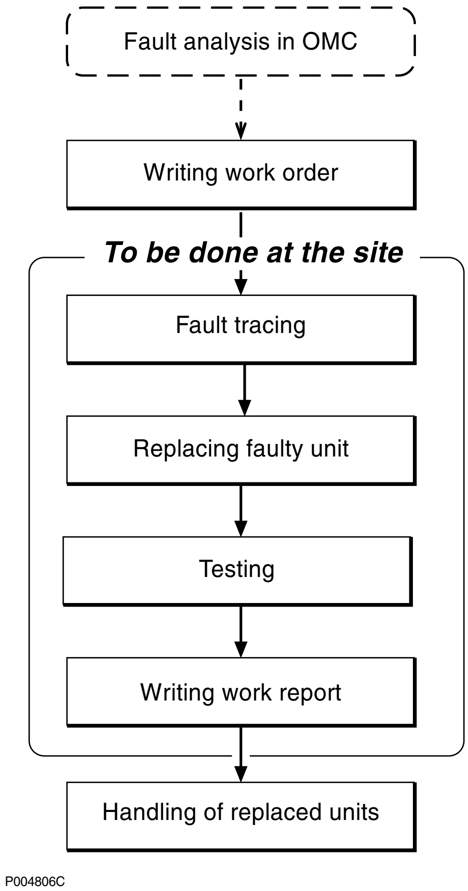


Figure 5 The RBS Maintenance Process

Preparatory Actions

Writing work order

As a result of the fault analysis a work order is written. The work order includes information about site location, how to get to the site, cabinet identity, the suspected RU and site history. An error log is included if the fault is defined as logical.

Note: The chapter *Safety Instructions* must be read through to ensure knowledge of potential risks prior to beginning work on the RBS equipment.

The work order is analysed before personnel are sent to the site. The flowchart(s) in the chapter *Fault Localisation* that concern the faulty unit(s) is read. This providesinformation on:

- Selecting the spare parts and tools required at the RBS site.
- Informing the OMC operator if the site visit requires taking the RBS out of traffic or reduces RBS functions.

To Be Done at the Site

Fault tracing

The chapter *Fault Localisation* provides methods for finding the faulty unit in the RBS that causes the alarm reported to the BSC. For example, when the work order denotes that a TRU is faulty, fault localisation will point out the position of the faulty TRU.

All alarms given in the RU maps correspond to a section in the chapter *Fault Localisation*.

Replacing faulty unit

The chapter *RBS Field Repair* describes how to replace a faulty unit.

Testing

The RBS is tested before the field technician leaves the site. The chapter *Test after Repair* describes how to verify that the RBS is functioning properly.

Writing work report

The chapter *Concluding Routines* provides information on the different administrative routines that must be performed before leaving the site.

After Maintenance

Handling of replaced units

The chapter *Concluding Routines* describes which units are repairable and which are disposable and the different administrative routines connected to both.

1.5.5 Fault Cases

The purpose of this section is to explain the different fault cases that can arise in the RBS 2000. This forms the basis for choosing between different methods when localising a detected fault.

- Unambiguous indication with an indicator and an RU map.
- Unambiguous indication with an RU map only.
- Unit that is unambiguously indicated, but consists of several replaceable parts.
- Logical RU indicated.

Note that the BSS only pinpoints one RU in the RU Map.

Indication with an indicator and an RU Map

Examples of units	DXU, TRU, BFU, PSU, ECU and CDU
Method of localisation	The work order states which unit is affected. When the cabinet is opened, a red Fault indicator will be on in the faulty unit. If this indicator should be defective, only an RBS fault indicator will be on. In this case, the OMT is used to localise the faulty unit.

Indication with an RU Map

Examples of units	RX cables
Method of localisation	The work order states the unit concerned. The Maintenance Manual is used to find out where the unit is located.

Indication of Units that Consist of Several Replaceable Parts

Examples of units	Fan unit
Method of localisation	The work order states which unit is affected. The OMT is used to identify which parts are faulty, for example, which fan is faulty.

Logical RU Indicated

The logical RU is identified when it is not obvious which physical RU is faulty. For example, EPC bus can be indicated, which means that anything connected to it can be faulty.

Examples of units	Local bus, X bus,Timing bus and Environment.
Method of localisation	A systematic order of replacement is used to determine the unit that has generated the fault.

The following applies to the logical RU Environment

This logical RU records conditions that cannot be affected from the RBS. The RU is divided into two parts:

- External Power and Climate (condensation, air humidity and temperature). When this RU is identified, the OMC Operator must analyse the fault to determine possible RBS repairs. The OMC Operator must be able to determine whether the reported fault requires maintenance personnel to respond or not.
- In the case of the fault message "Indoor temperature out of safe range", the trouble may cease when local weather conditions change, that is, the sun sets or the temperature changes. Alternatively, in the case of External Power Fault, it is necessary to determine whether or not the cause of the fault is a commercial power failure, prior to dispatching maintenance. If a technician is sent, the work order must include the fault history for the RBS.

1.6 How to Use this Manual

Detailed information about the use of this manual and how to perform maintenance in the correct order, is found in the section "Maintenance Process Overview"in this chapter. A brief description of the contents of each chapter is given below.

Chapter		Brief description
1.	Introduction	Introduces this manual.
2.	Safety Instructions	Describes the risks involved when working with RBS equipment.
3.	Tools and Instruments	Specifices recommended equipment.
4.	Handling of the RBS during Maintenance	Gives important information about requirements before starting a maintenance process on the RBS 2000.
5.	Fault Localisation	Recommends actions for each suggested RU. The purpose is to find the faulty unit so it can be replaced.
6.	RBS Field Repair	Describes actions to be performed as soon as the suspected unit has been localised.
7.	Test after Repair	Describes verification procedures for the RBS.
8.	Concluding Routines	Describes administrative routines resulting from maintenance activity.
9.	Optical Indicators and Switches	Describes optical indicators and switches on all RUs in the RBS.
10.	Preventive Maintenance	Describes recommendations for preventive maintenance activities.
11.	Cable Connections	Provides information about cabling in the RBS.
12.	Positioning of RUs	Gives the positioning of RUs for each RBS model.
13.	Glossary	Explains terms and abbreviations.
Appendix A	Fault List	Gives a brief description of all faults reported across the ABIS interface. Also, provides information about related faults and possible reasons for the faults.
Appendix B	Spare Parts Catalogue	Catalogue of all spare parts of the RBS.

1.7 Denominations of RUs

The names of the various RUs are given in the chapter "Positioning of RUs". Regarding the ACCU and the climate unit, different versions exist. In this manual, the following denominations have been used.

ACCU

There are two different versions of the ACCU for RBS 2102. Use the following list to distinguish the different versions from each other:

Version	Product no. / Description
V1	BMG 980 307/X BMG 980 318/X • The ACCU is divided into two parts; a Fuse box and a Connection box. • The fuse box is mounted horizontally in the mounting base and includes a control board, a mains switch, circuit breakers and varistors. • The connection box is mounted to the right of the fuse box and includes a connection plinth only. • The circuit breaker for the climate unit is rated at 10 A (BMG 980 307/X) respectively 16 A (BMG 980 318/X).
V2–V3	BMG 815 066/X • The ACCU is divided into two parts; a Basic unit and a Connection box. Both items are mounted vertically at the bottom of the cabinet. • The basic unit includes a control board and circuit breakers. • The connection box includes a mains switch, varistors and gas disharge tube.

Climate unit

There are several versions of the climate unit for RBS 2102. Pictures on the different versions can be found in the latest version of *Spare Parts Catalogue*, see *Appendix B.* Use the list below to distinguish the different versions from each other:

Version	Product no. / Description
V1	BPD 104 02/01, up to rev. R1F (50 Hz) • The AC mains power cable is attached to the top of a relay unit. • The relay unit is located on the outside of the cover of the compressor section. • There is a coolant gas window in the compressor section of the climate unit.
V2	BPD 104 02/01, rev. R2B and on (50 Hz) BPD 104 02/02 (60 Hz) • The AC mains power cable is attached to an AC interface card. • The AC interface card is mounted within the climate unit, near the compressor, on the right hand side of the climate unit. • There is a coolant gas window in the compressor section of the climate unit.
V3	BPD 104 08/01, up to rev. R2A (50/60 Hz) • The AC mains power cable is attached to the CCU. The CCU is mounted within the climate unit, near the internal fan, in the centre of the climate unit. •The climate unit is mounted to the door of the radio cabinet without the use of hinges. • The coolant gas window is removed from the climate unit.

V4	BPD 104 08/01, rev. R3A and on (50/60 Hz)
	• The AC mains power cable is attached to the CCU. The CCU is mounted within the climate unit, near the internal fan, in the centre of the climate unit.
	• The climate unit is, by an aluminium frame, hinged to the door of the radio cabinet.
V5	BPD 104 08/01, rev. R3B and on (50/60 Hz)
	• The AC mains power cable is attached to the CCU. The CCU is mounted within the climate unit, near the internal fan, in the centre of the climate unit.
	• The climate unit is, by small hinges, hinged to the door of the radio cabinet.

Replacement set for Climate Units V3, V4, V5 is NTZ 112 466

IDM

There are two different variants of the IDM for RBS 2102:

Version	Product no. / Description
V1	BMG 980 304/1 (IDM1 to the left)
	BMG 980 303/1 (IDM2 to the right)
	• The IDM function is divided into two units, IDM1 and IDM2, that are mounted horizontally at the top of the radio sub-cabinet.
	• The IDMs include resetable fuses for various units in the RBS. Each IDM also houses an FCU for the control of the fans in the radio sub-cabinet.
V2	BMG 980 315/1
	• The IDM is mounted vertically in the middle of the radio sub-cabinet.
	• The IDM includes circuit breakers for various units in the RBS.
	• The FCUs are mounted onto blind panels at the top of the radio sub-cabinet and are not part of the IDM.

OVP

There are two different versions of the OVP box. Use the following list to distinguish the different versions from each other:

Version	Product no. / Description
OVP	NTM 201 2037/1 (75 Ohm)
	NTM 201 2039/1 (100 Ohm)
	NTM 201 2038/1 (120 Ohm)
	•OVP is used for PCM connections only. It has two printed circuit boards, each holding two sub-boards with protection modules. This OVP is mounted onto the rear panel behind the ACCU or on the back of the ACCU.
OVP-11	In RBS without a mounting base:
	NTM 503 706/1 (75 Ohm)
	NTM 503 707/1 (100 Ohm)
	NTM 503 708/1 (120 Ohm)
	In RBS with a mounting base:
	NTM 503 710/1 (75 Ohm)
	NTM 503 711/1 (100 Ohm)
	NTM 503 712/1 (120 Ohm)
	•OVP-11 is used for PCM connection as well as TG synch connection. It has one printed circuit board for the PCM cables and one for the ESB cables (for the TG synch connection). The PCM board holds two sub-boards with protection modules, the ESB board holds three sub-boards with protection modules. This OVP is mounted on the back of the ACCU.

1.8 Release History

1.8.1 Rev R5A to R6A

The following paragraphs describe changes that have been made in between these two versions of the *Maintenance Manual*.

General update of the manual

- The OMT User’s Manual has a new product number.

Update of the chapter "Introduction"

- The following section has been updated:
  - "Customer Documentation Library"

Update of the chapter "Fault Localisation"

- The following section has been added:
  - "PSU DC Cable"
- The following sections have been updated:
  - "BFU"
  - "Environment"
  - "PSU"

Update of the chapter "RBS Field Repair"

- The following section has been added:
  - "PSU DC Cable"
- The following sections have been updated:
  - "DXU"
  - "OVP Box"
  - "PSU"

Update of the chapter "Concluding Routines"

- The following section has been updated:
  - "Repair Delivery Note — Blue Tag"

Update of the chapter "Fault Code List"

- The Fault Code List has been updated according to SW release RBS 2000 R7D.

Update of the chapter "Cable Connections"

- The complete chapter has been updated.

1.8.2 Rev R6A to R7A

The following paragraphs describe changes that have been made in between these two versions of the *Maintenance Manual*.

Update of the chapter "Introduction"

- The following section has been updated:
  - "Denominations of RUs"

Update of the chapter "Fault Localisation"

- The following sections have been updated:
  - "DXU"
  - "External Alarms"
  - "Local Bus"
  - "Power Communication Loop"

Update of the chapter "RBS Field Repair"

- The following section has been added:
  - "EACU"
- The following sections have been updated:
  - "Air Conditioner, Climate Unit Version V3"
  - "Air Conditioner, Climate Unit Versions V4 and V5"
  - "Batteries"
  - "CDU-D RUs"
  - "OVP Box"

– "TRU Sub-Rack"

Update of the chapter "Fault Code List"

- The following section has been updated:

  – The "Fault Code List" has been improved according to customer demands. This is the improvement step one.

Update of the chapter "Preventive Maintenance"

- The following sections have been updated:

  – "Preventive Maintenance Intervals"
  – "DXU Maintenance"
  – "Battery Maintenance"

1.8.3 Rev R7A to R8A

The following paragraphs describe changes that have been made in between these two versions of the *Maintenance Manual*.

General update

- The chapter "Fault Code List" has been moved and renamed to "Fault List".

Update of the chapter "Introduction"

- The following section has been updated:

  – "Customer Documentation Library"

Update of the chapter "Tools and Instruments"

- The following section has been updated:

  – "Test Equipment"
  – "Personal Tool Kit, LTT 601 107/1"

Update of the chapter "Fault List"

- The Fault List has been improved according to customer demands.

Update of the chapter "Fault Localisation"

- General update due to the new OMT software.

- The following section has been updated:

  – "DXU"

Update of the chapter "RBS Field Repair"

- The following section has been added:

  – "ESB Cable"

Update of the chapter "Optical Indicators"

- The chapter Optical Indicators has been improved.

Update of the chapter "Cable Connections"

- The following section has been updated:
  - "DXU/ECU Backplane in Cabinet SEB 112 1050"

1.8.4 Rev R8A to R9A

The following paragraphs describe changes that have been made in between these two versions of the *Maintenance Manual*.

Update of the chapter "Tools and Instruments"

- The following sections have been updated:
  - "Personal Tool Kit"
  - "Special Tools"
  - "Tents"

Update of the chapter "Fault Localisation"

- The following section has been updated:
  - "Local Bus"

Update of the chapter "RBS Field Repair"

- The following sections have been changed:
  - "Batteries"
  - "DXU"
  - "Temperature Sensors"

Update of the chapter "Optical Indicators and Switches"

- The chapter Optical Indicators and Switches has been improved.

Update of the chapter "Preventive Maintenance"

- The following section has been updated due to new batteries:
  - "Battery Maintenance"

Update of the chapter "Cable Connections"

- The following section has been updated:
  - "DXU/ECU Backplane in Cabinet SEB 112 1050"

1.8.5 Rev R9A to R9B

The following paragraphs describe changes that have been made in between these two versions of the *Maintenance Manual*.

Update of the chapter "RBS Field Repair"

- The following section has been improved:
  - "Batteries"

Update of the chapter "Preventive Maintenance"

- The following section has been improved:
  - "Battery Maintenance"

1.8.6 Rev R9B to R9C

The following paragraphs describe changes that have been made in between these two versions of the *Maintenance Manual*.

General updates

- The chapter "Preface" has been renamed to chapter "Introduction".
- The chapter "Maintenance Process Overview" has been updated and moved into chapter "Introduction".
- The chapter "Fault List" has been improved and moved to the appendix.
- The chapter "Corrective Action" has been renamed to chapter "RBS Field Repair".
- The chapter "Test after Corrective Action" has been renamed to chapter "Test after Repair".
- The following chapters have been removed from the manual:
  - "Frequency Lists"
  - "Country Codes"

Update of the chapter "Introduction".

- There are three new sections:
  - "Product Overview"
  - "How to order CPI"
  - "Maintenance Process Overview"

Update of the chapter "Fault Localisation"

- The following sections have been improved:
  - "DC/DC Converter"
  - "Local Bus"
- There is a new section called "RBS Door".

Update of the chapter "RBS Field Repair".

- There are two new sections:
  - "Door Switch"
  - "DC/DC Converter"

Update of the chapter "Test after Repair".

- The section "Before Leaving the Site"has been improved and moved to the chapter "Concluding Routines".

Update of the chapter "Concluding Routines"

- The section "Before Leaving the Site"from the chapter "Test after Repair" has been inserted.
- The following section has been improved:
  - "Repair Delivery Note — Blue Tag"

2 Safety Instructions

This chapter shows the system used for presenting safety information.

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

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. A 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.

2.1 Warnings

Warnings are used to indicate hazardous activities. The warnings are preceded by the common hazard symbol.

Figure 6 Hazard symbol

The following three warning levels, shown here in order of urgency, are used:

DANGER

Danger means that an accident may occur if the safety precautions are neglected. This type of accident is likely to be fatal.

WARNING

Warning means that an accident may occur if the safety precautions are neglected. This type of accident may be fatal or cause serious injury. It may also damage the product.

CAUTION

Caution means that an accident may occur if the safety precautions are neglected. This type of accident may cause injury or damage the product.

The following special symbols are used to indicate the risk of radio frequency radiation, electrical hazards and electrostatic discharge:


P002644A

Figure 7 Radio frequency radiation

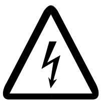

P002645A

Figure 8 Electrical hazard


P002646A

Figure 9 Electrostatic discharge

Warnings are used throughout this manual to alert the reader to special instructions concerning a particular task or operation that may be hazardous if performed incorrectly or carelessly. Therefore, read the instructions carefully.

Strict compliance with the special instructions while performing a task is the best way of preventing accidents.

2.2 Notes

Note: Notes are used to call the reader's attention to key points that might otherwise be overlooked.

2.3 Beryllium Oxide (BeO)

WARNING

⚠

Do not handle transistors and components without protection. Beryllium Oxide is highly toxic and may be found in transistors, and other components.

Hazard

Beryllium Oxide dust is created by chafing, filing or breakage. It is very dangerous if inhaled, even for only a few seconds. It can 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.

Symptoms of Poisoning

Symptoms of Beryllium 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.

First Aid

- A suspected inhalation of Beryllium Oxide should be treated immediately by a doctor at a hospital.
- Wash the area thoroughly if it is suspected that Beryllium Oxide has been in contact with the skin or entered the skin through cuts or abrasions. This should be followed by a medical examination.

Components Containing Beryllium Oxide

Do not store components and washers loose. Do not file or machine them in any way. Do not apply heat except when the components are clamped in a heat sink application.

Power Transistors, Diodes and Thyristors

WARNING

⚠

Do not carry loose components in pockets, bags or containers, or tamper with them in any way that could cause them to break or disintegrate. Do not apply excessive heat during soldering. Do not break open components for inspection.

Components containing Beryllium Oxide are clearly marked in the manufacturer's packing, and identified by attached information.

- Store components in their original packing and do not mix them with other components.
- Ensure that they do not become mechanically damaged. Use care when replacing defective components.
- Beryllium Oxide is encapsulated and components are safe to handle for normal replacement purposes.

Heat Sink Washers

Note: Not all heat sink washers contain Beryllium. Heat sinks containing Beryllium, are individually packed when new.

WARNING

⚠

Do not store washers loose. Do not file or machine them in any way. Do not apply heat, except when the components are clamped in a heat sink.

- Handle with gloves or cloth when removing heat sink washers from packaging and mounting them into place in the equipment.

Cathode Ray Tubes (CRTs) and Ceramic Applications

WARNING

Do not handle broken glass with bare fingers. Do not blow on exposed surfaces due to the danger of Beryllium Oxide.

Ceramic cylinders or formers containing Beryllium are marked by blue colorations or black lines. They are safe to handle provided they are not damaged. If they are damaged, take precautions as with other components containing Beryllium.

Disposal

Dispose of defective and/or broken Beryllium components in approved containers. Mark them clearly on the outside of the wrapping “COMPONENTS CONTAIN BERYLLIUM”

WARNING

Never send defective and/or broken components containing Beryllium Oxide through the mail. Instead, return them to the nearest depot by hand.

2.4 Electrical Hazards

High Voltage

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

- The AC installation must be carried out according to local regulations. These regulations may require the work to be carried out by a qualified and authorized electrician.
- Remove wrist watches, rings, bracelets, etc.
- Switch off the power if the cabinet is damp inside.

- Prevent damp entering the equipment during work in bad weather conditions.

DANGER

Improper electrical installation may cause fire or electrical shock. Approved circuit breakers for the AC mains and the cable's cross sectional areas must always be selected in accordance with local laws and regulations. Only a qualified and authorized electrician is permitted to install or modify the electrical installation.

Cable Markings

CAUTION

Verify that the cable markings correspond before connecting cables.

Faulty Electric Tools

WARNING

Do not repair a faulty electric tool yourself. Hand it over to your supervisor in exchange for a functioning tool.

Drilling

WARNING

Do not drill holes in the Radio Base Station. The drill bit may come into contact with live wires.

- Always use insulated protective gloves, such as the LYB 1032, when drilling where live wires might be hidden.
- Always use eye protectors (goggles) when drilling. Flying chips and dust may get into your eyes.

Thunderstorms

DANGER

Avoid working on electrical installations or towers/masts during thunderstorms.

Thunderstorms create strong electric fields. For that reason, and to avoid direct strokes of lightning, it is essential that the equipment is properly earthed for thunderstorm conditions.

2.4.1 Electrostatic Discharge, ESD

CAUTION

Sensitive components such as Integrated Circuits (IC) can be damaged by discharges of static electricity.

Electrical charges are generated by friction when a body moves, rubs against clothes, slides against a chair, when shoes rub against the floor, and when you handle ordinary plastics, etc. Such charges may remain for a considerable period of time.

Handling of printed board assemblies and IC components

Always use an approved antistatic bracelet to avoid damage to components mounted on printed board assemblies. The ESD wrist strap contains a resistor with an ohmic value greater than 1 MΩ in the cable to protect the operator. The resistance value is low enough to discharge the electrostatic voltage. Never replace the cable with any other cable. The ESD wrist strap must be connected to earth. Ericsson recommends wrist strap LYB 250 01/14.

Storing and Transporting printed board assemblies and IC Components

Use the original packaging. If this is not available, use a conductive material, or a special IC carrier that either short-circuits or insulates all leads of the components.

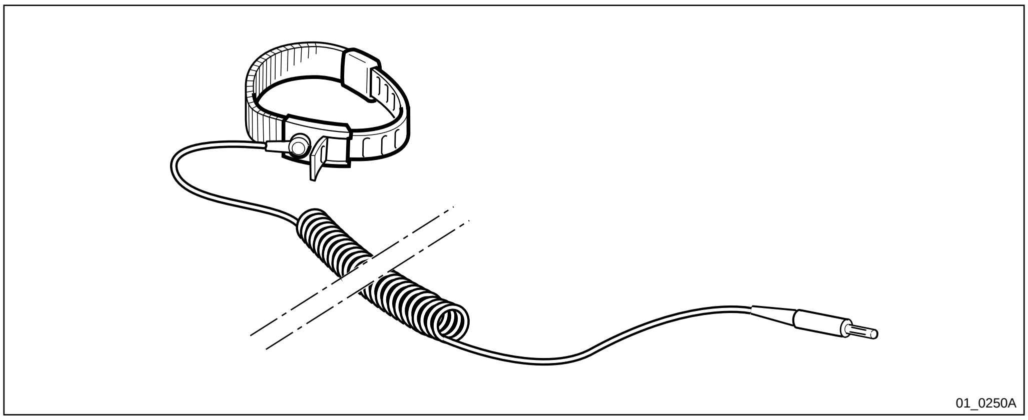


Figure 10 ESD wrist strap LYB 250 01/14

DANGER

To avoid potentially fatal circuits through the body to earth, wrist strap connections must include a resistor of at least 1 MΩ. Test the wrist strap regularly.

2.5 Batteries

Batteries can be hazardous if improperly handled. Special care must be used to prevent short-circuiting batteries, or loss of electrolyte. Electrolyte contains potentially hazardous material.

Work

DANGER

Read Safety Instructions regarding handling and connecting batteries.

General Precautions

When working with batteries:

- Remove wrist watches, rings, bracelets, etc.
- Use insulated tools.
- Make sure that eye wash facilities, or portable eye wash equipment, is available prior to starting work.

Use all the required PPE (Personal Protective Equipment) such as:

- Rubber gloves and aprons.

- Eye protection (goggles or a face shield).

Short-Circuiting of Batteries

CAUTION

⚠

Short circuits can cause injury or damage. Although the battery voltage may be low, the released power can be extremely high.

It is necessary to ensure that no metal object, such as a tool, short-circuits the batteries. If necessary, disconnect or remove the batteries before beginning work.

Explosive Gases

Batteries may give off explosive gases. All battery areas must be adequately ventilated and protected from fire.

CAUTION

⚠

Do not use open cell-lead acid batteries. They give off hazardous gases that may cause an explosion or corrosion of the equipment. The battery must be suitable for horizontal operation.

Overheated Batteries

CAUTION

⚠

Excessive heat can cause the battery casings to become soft and to warp, allowing acid to escape.

If the internal temperature of the cabinet exceeds + 60 °C (140 °F), take the following precautions:

- Check that the batteries have not leaked.
- If the batteries have leaked, see the section Hazardous Waste Material from Leaks.

Hazardous Waste Material from Leaks

Ensure that there are sufficient absorbers or neutralizing materials available on site, in case of spillage of hazardous substances. There is a danger of spillage occurring when installing, removing, replacing or servicing batteries. The absorbers and neutralizing materials must be suitable for the hazardous substances involved.

Table 1 Typical Neutralizers

Typical neutralisers	
Baking soda (bicarbonate)	$NaHCO_3$
Sal soda	$Na_2CO_3IOH_2O$
Soda ash	Na_2CO_3

Consult the battery manufacturers for specific details of absorbers and neutralizing materials. Absorbers and neutralizing products will vary, depending on country and manufacturer.

2.6 Working at Heights

WARNING

⚠

Some working areas involve the risk of accidents caused by falling objects.

For example, when working on a mast, tower or a roof, the following precautions must be taken:

- Personnel working at heights must have the appropriate training and medical certificate.
- Full body safety harness and safety helmet must be used.
- Adequate protective clothing is essential in cold weather.
- All lifting devices must be tested and approved.
- During work on a mast, all personnel in the area must wear helmets.

2.6.1 Rules and Advice for the Safe Use of Ladders

- Make sure that the ladder is undamaged and has been approved for use.
- Do not overload the ladder.

The following types of ladders must be guyed or otherwise secured

- Leaning ladder longer than 5m.

- Free-standing ladder with a platform and knee-support, and with over 2 meters height to the platform.
- Any other free-standing ladder longer than 3m.

Positioning the ladder

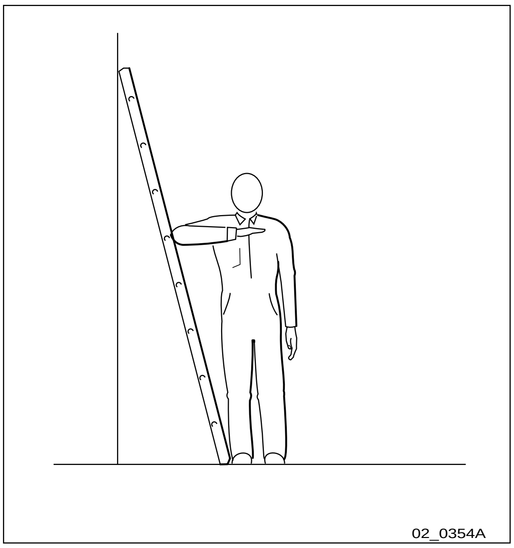


Figure 11 Checking the angle

- The ladder's inclination should be approximately 1:4 (75°). Position the ladder according to its gradation indicator (if there is one) or check the angle with your elbow.
- Use the ladder foot or a ladder support to reduce the risk of tipping over sideways.
- Always attach extension legs to a ladder that is to be used on a sloping base. Never prop up a ladder with boxes, stones or the like.
- Extend the ladder completely.
- Check that all four anti-slipping treads are firmly positioned on the base.

Climbing and using the ladder

Figure 12 Climbing the ladder

- Climb the ladder facing it.
- When you lean sideways, outward from the ladder, your navel should never be outside the edge of the ladder’s frame.
- Always keep 3 points of contact (two feet and one hand, two hands one foot) with the ladder when working on it. This will reduce the risk of falling.
- Never climb the topmost four rungs of a ladder. If you have to climb up on a roof, the ladder should extend at least one meter above the eaves.

2.7 Radio Frequency Radiation

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Co-ordinate with all mast users to switch off the transmitters when working with, or near, antennas.

2.8 Other Hazards

Handling Heavy Goods

> **WARNING**
>
> ⚠
>
> **Read the Safety chapter regarding handling of heavy goods.**

- Use tested and approved lifting devices only. They must only be used by trained personnel.
- Always check that all parts of the lifting devices are intact.
- Make sure that all lifting devices are properly stabilised or attached to fixed objects such as walls or buildings before lifting.
- Give clear and consistent command signals, for example
  - lift
  - lower
  - stop
- Make sure that there is never an angle of more than 90° between the straps at the point where they are attached to the lifting hook.

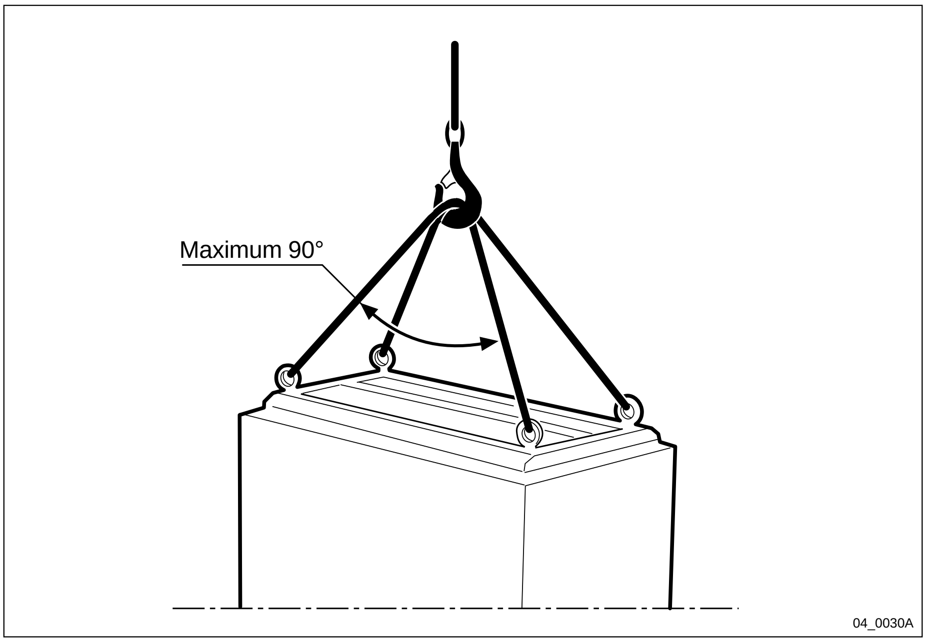


Figure 13 Use long straps

- Too large an angle between the lifting straps increases the strain on them and may cause them to snap. Overloading, or wrong use of lifting devices in other ways, can have catastrophic consequences.

- Never walk under hoisted loads.
- Follow local regulations for safety clothing and safety equipment for hoisting and moving goods.
- Unsecured cabinets have a high centre of gravity. They can easily tip over and harm personnel.

WARNING

⚠

There is a danger of the assembly toppling over, which could cause injury to personnel or damage to the equipment.

Fire

WARNING

⚠

Fire may spread to neighbouring rooms. When working on a radio base station you may have to open cable ducts, channels and access holes, thereby interfering with the fire sectioning of the building.

- Close the cable ducts and fire doors (if applicable) as soon as possible.
- After completing work on cables, seal the cable ducts according to the regulations for the building.
- Minimize the amount of inflammable material.
- Avoid storing empty packaging material on the site.
- Use a powder or carbon dioxide type of fire extinguisher due to the electric nature of the equipment inside the Radio Base Station.

Sharp Edges

WARNING

⚠

Wear protective gloves when handling the equipment. There may be sharp metal edges.

3 Tools and Instruments

This chapter describes tools and instruments required for maintenance activities.

3.1 Test Equipment

Table 2 Test equipment

Product No.	Description	Specification / Remark
FAB 801 0187	TEMS SW kit TEMS cable User's manual TEMS R320 for both 900 and 1800 MHz (Dual Band) Antenna adapter Click-in-holder, Car kit	TEMS
FAB 801 0194	TEMS SW TEMS cable User's manual TEMS T28 World for both 900 and 1900 MHz Antenna adapter Click-in-holder, Car kit	TEMS
LPK 102 024/2	Digital multimeter	Fluke 79 III
LPB 111 142/1	Climate unit tester	Only for climate unit versions V1 and V2.
LPB 111 142/2	Climate unit tester	Only for climate unit versions V3 and V4.
LPK 102 102/1	Frequency counter set (including cables)	Only for DXU-03

3.2 OMT Kit

The OMT is used for installation, testing, site acceptance and maintenance of the RBS 2000 system.

Table 3 OMT Kit

Product No.	Description
NTM 201 2289/1	OMT Kit

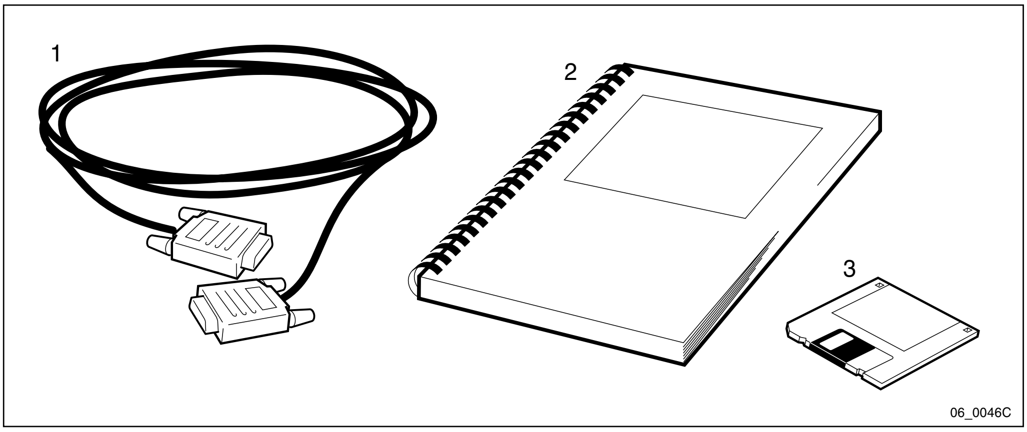


Figure 14 OMT Kit

Table 4 OMT kit specification

Item	Description	Qty	Product No.
1	C1, 9 pin D-sub connector male to female	1	RPM 113 463
2	OMT User’s Manual	1	LZN 302 01
3	OMT SW	1	

Note: The OMT require a PC with operating system Win 95, NT 4.0 or later.

3.3 Personal Tool Kit

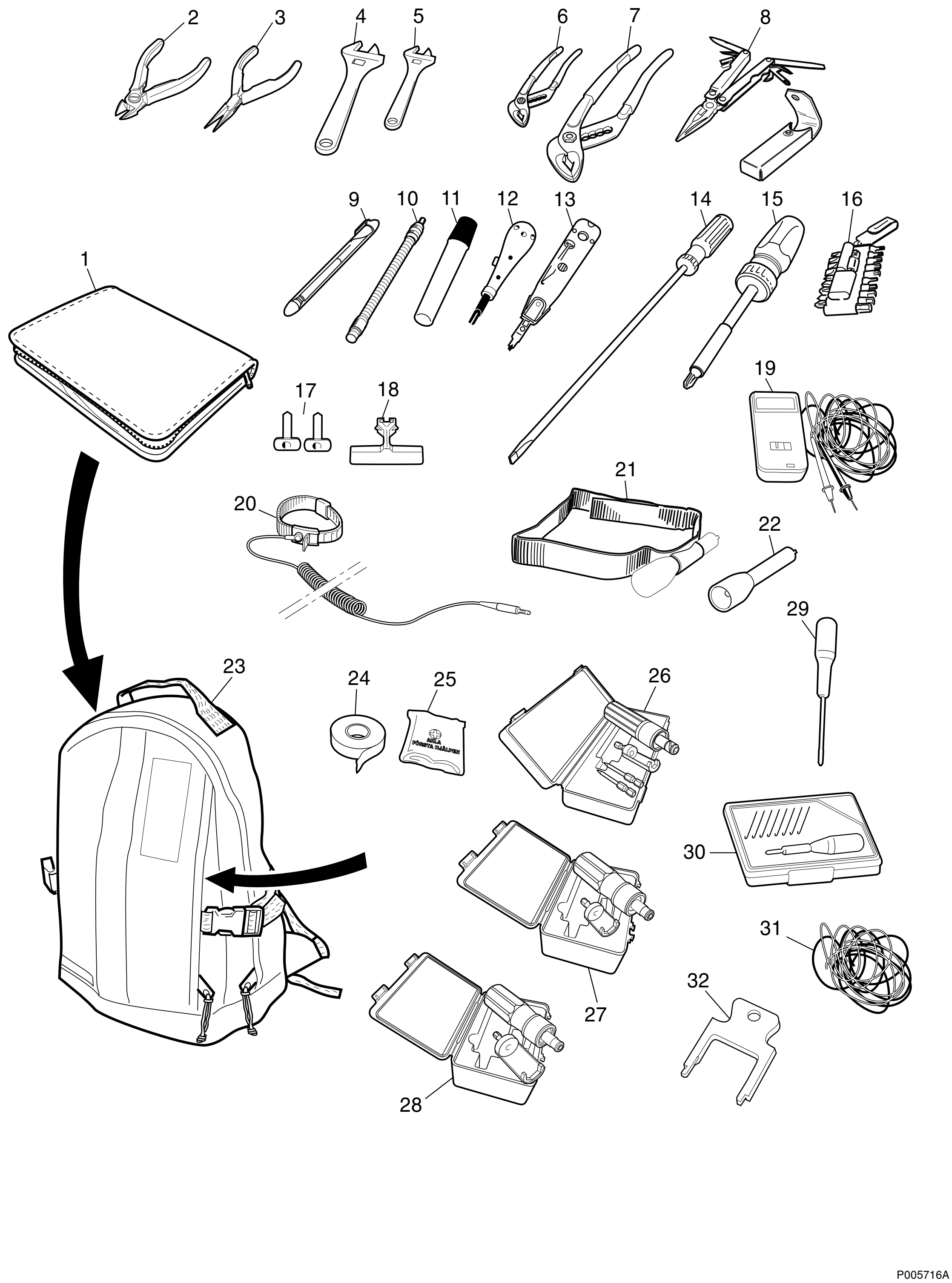


Figure 15 Tool Set, Maintenance Tools

Note: The contents of this kit may be subject to change without notice.

Table 5 Tool Set, Maintenance Tools

Product No.	Description
LTT 601 107/1	Tool Set, Maintenance Tools

Table 6 Tool Set, Maintenance Tools specifications

Pos.	Description	Qty
1	Tool case	1
2	Side cutting pliers	1
3	Snip nose pliers	1
4	Adjustable spanner l=160 mm	1
5	Adjustable spanner l=100 mm	1
6	Slip joint pliers l=125 mm	1
7	Slip joint pliers l= 245 mm	1
8	Pocket survival tool	1
9	Marking pen, gold colour	1
10	Flexible shaft 1/4"	1
11	Marking pen	1
12 [1)]	Termination tool LSY 138 252, supplier: Ericsson	1
13	Termination tool, supplier: Krone	1
14	Screwdriver l=200 mm	1
15	Universal bit holder	1
16	Bits kit	1
17 [1)]	RU-extractor, button 35 mm LTD 117 13	2
18 [1)]	RU-extractor, handle LTD 117 02	1
19	Voltage tester	1
20 [1)]	Static control wrist strap LYB 250 01/14	1
21	Head band for lamp holding	1
22	Penlight, mini	1
23	Tool rucksack	1
24	Electrical tape, white	2
25	First aid kit	1
26 [1)]	Torque wrench kit 0.8 Nm LTT 601 83	1
27 [1)]	Torque wrench kit 1.7 Nm LTT 601 93	1
28 [1)]	Torque wrench kit 2.8 Nm LTT 601 94	1
29	Screwdriver, Torx T8	1
30	Precision screwdriver set	1
31	Jumper wire (2x0.5 mm) l=10 m	1
32	Extractor tool for overvoltage protector covers	1

Note: [1)]This part of the set can be ordered separately.

Tools for antenna feeders

Table 7

Product No	Product name	Function/description
LSB 107 04/1	Tool Set	Slotted socket for 32mm screw joint
LTT 601 115	Tool Set	Mounting torque wrench 32mm (1 1/4

3.4 Special Tools

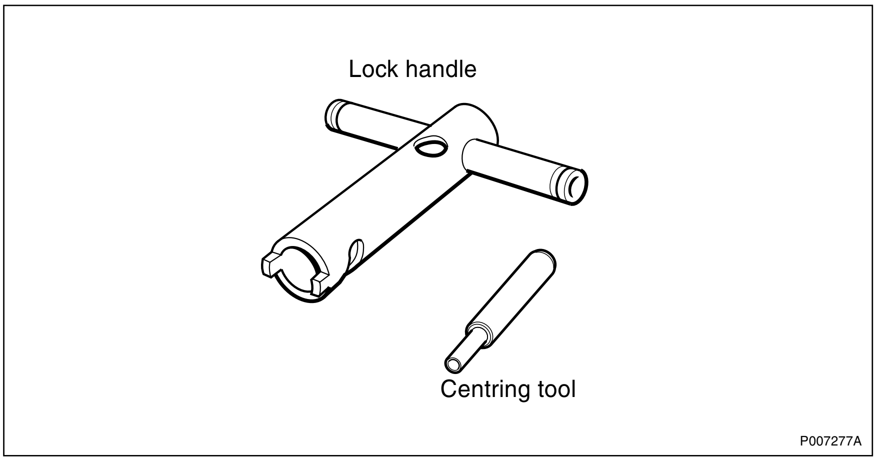


Figure 16 Lock handle and Centring tool

Table 8 Special tools specifications

Product No.	Product Name	Function/Description
SXK 107 2465/1	Handle	Lock handle
SXK 107 2300/1	Centring tool	Tool for aligning coaxial pins on TRUs

3.5 Compressor for preventive maintenance

The table below lists the specifications for the air compressor recommended to perform cleaning during preventive maintenance routines.

Table 9 Compressor specifications

Voltage	Locally dependent (230 V AC, 110 V AC, and so on.)	
Power consumption	1.1 kW (maximum) (The service outlet in the mounting base is rated at 1.5 kW)	
Air Pressure	8 kPa/bar (maximum) 5 kPa/bar (minimum)	116 PSI (maximum) 72 PSI (minimum)
Air Flow	200 l/min	7.06 CFM
Motor speed	2800 rpm	

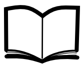
3.6 Tent

A tent, product number LYA 175 101/2, has been developed specifically for the RBS 2102.

It can also be used for RBS 2106.

The tent is for use where the RBS is mounted on a surface that is soft enough to permit the tent being secured to the ground. When erected over the RBS, it protects the sensitive electronic equipment from environmental conditions such as cold, damp, dust, and so on.

For instructions on how to put up the tent, see:



	Standard Site Material Installation Instructions	*EN/LZT 720 0014*

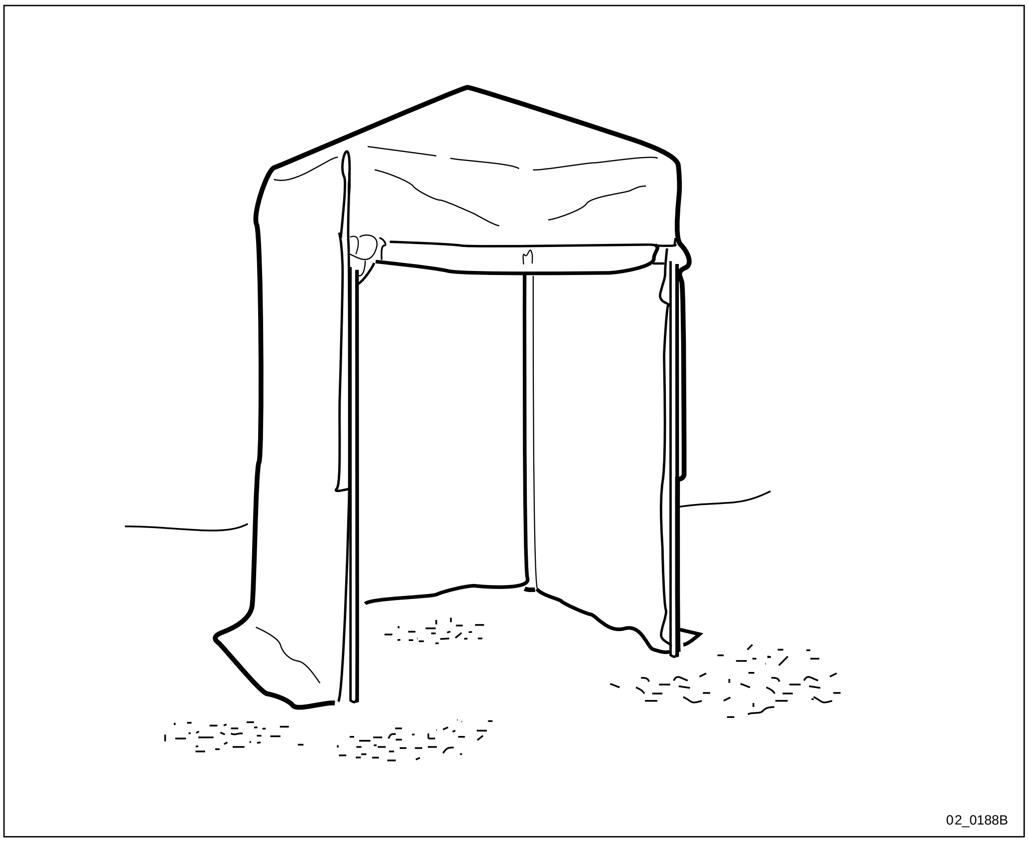


Figure 17 Recommended tent, LYA 175 101/2

Table 10 Material characteristics of the tent LYA 175 101/2

	Dimensions	
Specifications	**Metric**	**Imperial**
Length	2400 mm	94.5 inches
Width	2400 mm	94.5 inches
Height	2600 mm	102.3 inches
Weight of frame	27 kg (aluminium)	60 lbs

	Dimensions	
Weight of fabric	8 kg	17.8 lbs
Temperature range	-35°C to + 70°C	-31°F to +158°F

3.7 References

For general information about cable connections, see:

Cabinet Assembly and Extension Manual LZN 302 78

For product numbers of replaceable units and other spare parts, see *Spare Parts Catalogue, Appendix B.*

This page is intentionally left blank

4 Handling of the RBS during Maintenance

4.1 Opening the Cabinet Door

The cabinet has a high centre of gravity. Ensure that the cabinet is secured to either the ground, the wall, or a suitable base prior to opening the door.

Figure 18 Warning label on the cabinet door

Note: Maintain a firm grip on the door if opening it while the RBS is located outdoors until the door locking mechanism can become engaged.

This is necessary to prevent the wind from catching it and possibly causing personal injury or damage to the equipment.

4.2 Numbering of RUs

Note that the RU numbers always starts from 0 (zero) when they are read from the OMT, while they are starting from 1 (one) in the mechanical positioning system. This means, for example, that TRU 1 is called TRU 0 in the OMT and that PSU 2 is called PSU 1 in the OMT.

This numbering system includes **all** RUs in the RBS, see the chapter "Positioning of RUs".

4.3 Update of IDB

The DXU must be in Local mode before it is possible to update the IDB backup copy from the OMT.

Whenever an RU is replaced, the IDB in the DXU is updated automatically. Every time the IDB changes, save the IDB to the IDB backup disk. The OMT can read the updated IDB from the DXU when the RBS is in either local or remote mode.

For procedures in saving the IDB to backup disk, refer to:

OMT User's Manual *LZN 302 01*

4.4 Working in Cold Weather Conditions

When the ambient temperature is below 0 °C (32 °F) it is necessary to use a tent and an electric heater. Otherwise the ECU will shut off the power supply to the RBS.

4.5 Temperature Requirements for an RU

All units included in the RBS have been designed to operate according to specifications in the temperature range of +5°C to +45°C (41°F to 113°F). It is very important to ensure that the temperature of a spare unit is within the specified limits before inserting it into the RBS, otherwise the specified functions of that unit cannot be guaranteed.

4.6 General Instructions for Replacement of an RU

Protection against ESD

CAUTION

Sensitive components such as Integrated Circuits (IC) can be damaged by discharges of static electricity.

To avoid damage due to ESD the use of a wrist strap is required. Wear the wrist strap on the wrist and connect the lead to the earth outlet of the IDM panel, or to the negative outlet if earth is missing. The wrist strap must be worn at all times when handling units.

DANGER

To avoid potentially fatal circuits through the body to earth, wrist strap connections must include a resistor of at least 1 MΩ. Test the wrist strap regularly.

Note that the functionality of the wrist strap must be checked at regular intervals.

Restart of TRU

To be able to restart in a correct way, the TRU must have been out of power for at least three seconds.

Instructions for removal of a magazine-mounted RU

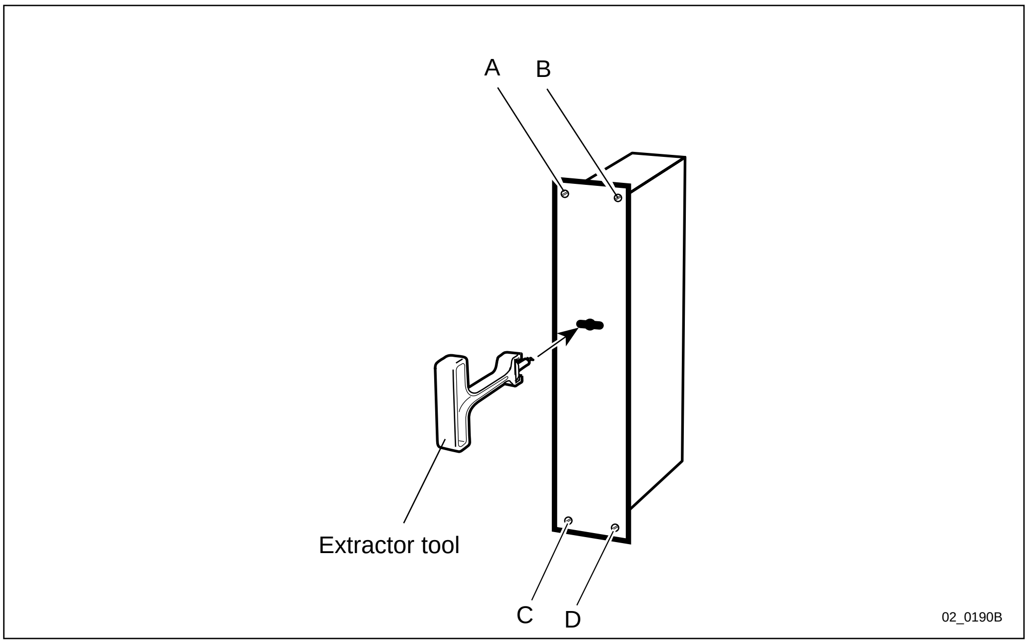


Figure 19 How to handle the extractor tool

1. Put the unit in local mode (TRU and DXU only).
2. Release the associated circuit breaker or pull the associated fuse. The location of either can be found in the chapter "Fault Localisation".
3. Remove all the connections on the front of the unit.
4. Loosen the screws (A - D) that fasten the unit to the magazine.
5. Pull out the unit with the extractor tool.
6. Insert the new unit, and restore in reverse order.

4.7 Cable Connections

The TX and RX cables between the TRU and CDU are connected with SMA connectors. The connectors must be tightened with a torque wrench/spanner 0.8 Nm.

Please note the following when using the torque wrench:

- Grasp the cable to prevent the connector rotating.
- Fit the wrench key to the SMA connector as shown below.
- Rotate the wrench handle clockwise until the wrench clutch begins to slip

This results in the correct torque setting.

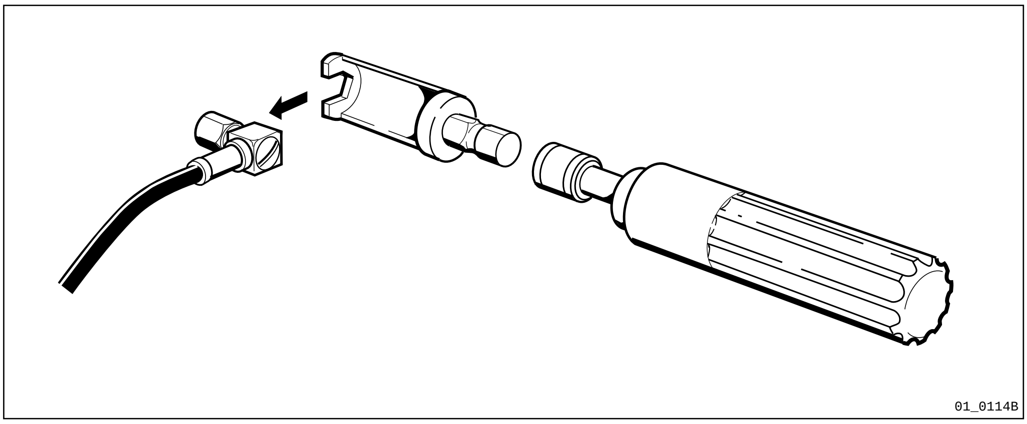


Figure 20 SMA connector and torque wrench (LTT 601 83)

4.8 About the Locking Mechanism

The locking mechanism is not coded in the same way in the radio sub-cabinet as in the mounting base. The key to the locking mechanism of the radio sub-cabinet also fits into the mounting base, but the mounting base key only fits into the locking mechanism of the mounting base.

Therefore, do not mix up the locking mechanisms.

5 Fault Localisation

5.1 Introduction

The instructions in this chapter describe how to handle fault situations that arise in the RBS.

The flowcharts in this chapter are for reference only. The text accompanying each flowchart contains more detailed instructions. Maintenance personnel should therefore only use the charts to locate the information in the text.

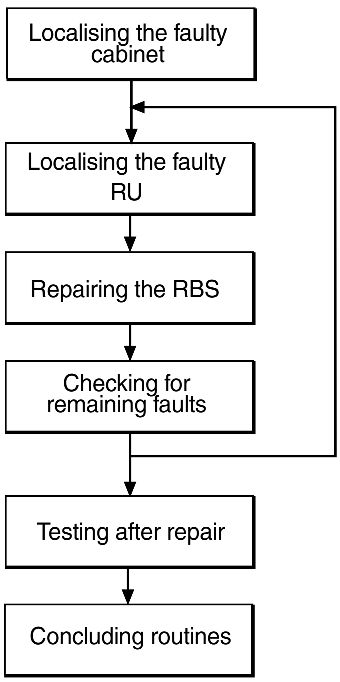
All subsequent sections provide instructions on how to localise faults in the RBS. Each title of a section corresponds to a fault code in either the SO CF RU map or the SO TRXC RU map. These sections appear in alphabetical order.

5.1.1 Preconditions

Information from the replacement unit map is required as input when reading this chapter.

5.1.2 Work Process for Fault Localisation

The work process for fault localisation is shown below and described in brief.



P008272A

Figure 21 Work process for fault localisation

Localising the faulty cabinet

The work order from the OMC operator must include information stating which RBS cabinet is faulty. The faulty cabinet is also identified by the yellow BS fault indicator, which is on when there is a fault. The BS fault indicator is located on the DXU.

Localising the faulty RU

The work order from the OMC operator also includes information stating which RU is faulty. The sections below describe the fault localisation processes relating to each faulty RU that is indicated in the fault lists. *See Appendix A, Fault List.*

Most RUs are equipped with a red Fault indicator. This indicator is on if a fault has been detected in the RU. RUs that do not have a Fault indicator, can, if faulty, only be localised by means of the OMT.

Note: Always check for a released circuit breaker on the IDM, where applicable. The very first action must always be to reset a circuit breaker, that has released. If the circuit breaker releases again, the fault localisation procedure shall continue. *See chapter Optical Indicators and Switches* for the positions of all circuit breakers on the IDM.

Repairing the RBS

When the faulty RU has been identified, it shall be handled according to specified procedures. *See chapter RBS Field Repair.*

Checking for remaining faults

When the faulty RU is replaced and the reported fault has ceased, the field technician has to check that there are no faults remaining in the RBS.

If any faults remain in the RBS, these faults have to be localised and rectified. See the sections below in this chapter.

Testing after repair

When all faults in the RBS have been cleared, the RBS has to be tested in order to verify that it is fully functional. *See chapter Test after Repair.*

Concluding routines

Before leaving the site, the field technician has to go through a checklist and fill in the repair delivery note, “Blue tag”. The routines also define how the faulty, replaced RUs shall be treated. *See chapter Concluding Routines.*

5.2 Circuit Breakers and Fuses

DANGER

Improper electrical installation may cause fire or electrical shock. Approved circuit breakers for the AC mains and the cable's cross sectional areas must always be selected in accordance with local laws and regulations. Only a qualified and authorized electrician is permitted to install or modify the electrical installation.

Note: Use only Ericsson recommended fuses of the correct voltage and amperage ratings as replacements.

Use of any other type of fuses could cause serious damage to the RBS, fire or personnel injury and affect RBS product type approvals (such as UL, CSA and so on).

Part numbers for fuses can be found in the RBS *Spare Parts Catalogue, Appendix B.*

When a fault occurs in the RBS, inspect the circuit breaker or fuse corresponding to the unit generating the fault, and reset or replace if necessary. Resetting a released circuit breaker or replacing a blown fuse is not a complete fault-eliminating action. The HW RU corresponding to the released circuit breaker or blown fuse should be replaced. This is necessary to prevent a recurrence of the fault.

This section contains figures showing the location of circuit breaker panels and fuses for the base station. All circuit breakers and most fuses are labelled. Due to varying configurations and unique site requirements, local installation documentation should be consulted if in doubt as to which HW RU a given circuit breaker or fuse corresponds.

5.2.1 Positions of Circuit Breakers and Fuses

RBS 2102 mounted with two IDMs and ACCU version V1

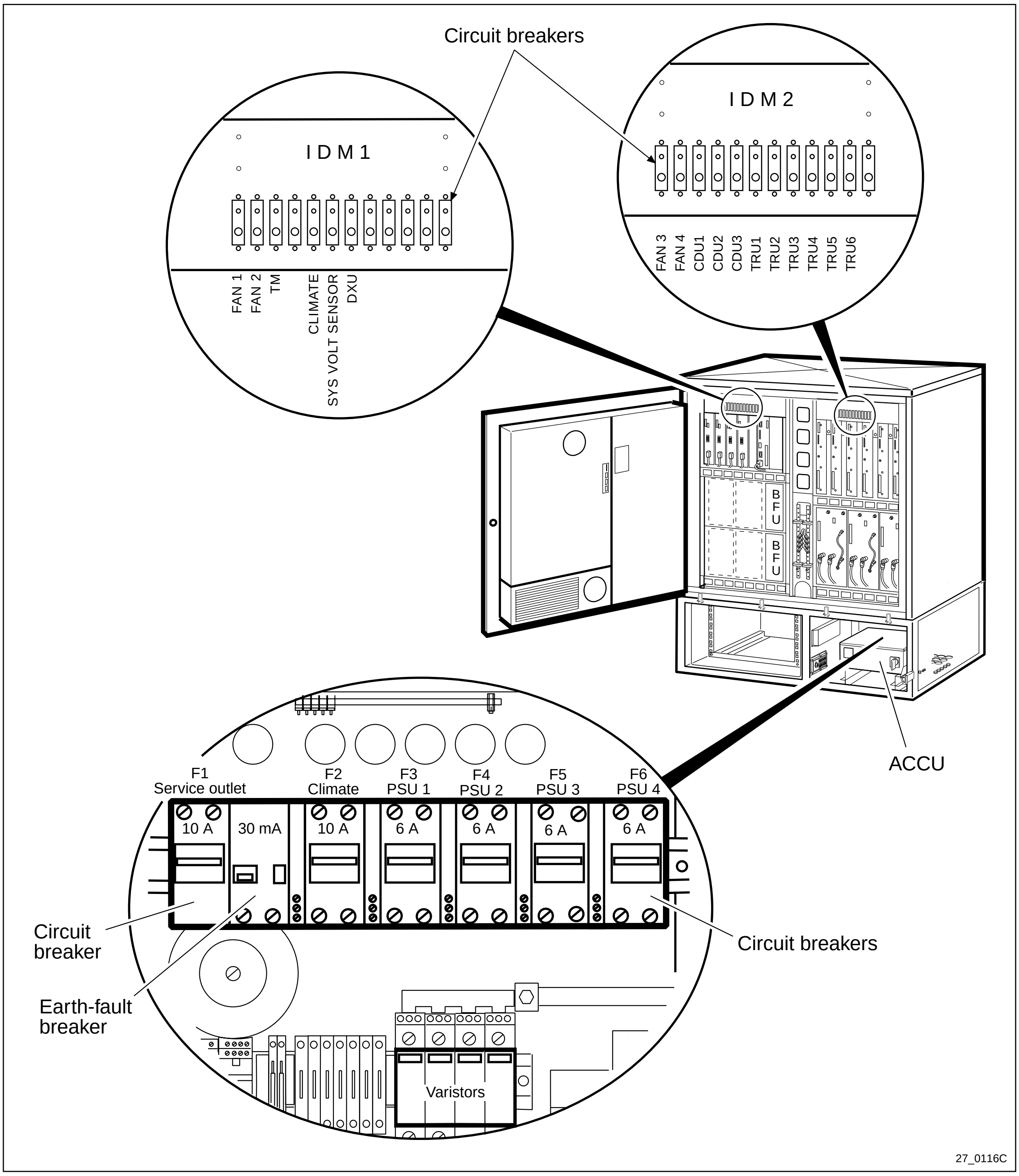


Figure 22 RBS 2102 with 2 IDMs, circuit breakers

Note: The circuit breaker F2 Climate is designed for two different amperages:

- 10 A is installed in ACCU BMG 980 307/X as shown in the figure.
- 16 A is installed in ACCU BMG 980 318/X, not shown.

RBS 2102 mounted with a mid-mounted IDM and ACCU version V1

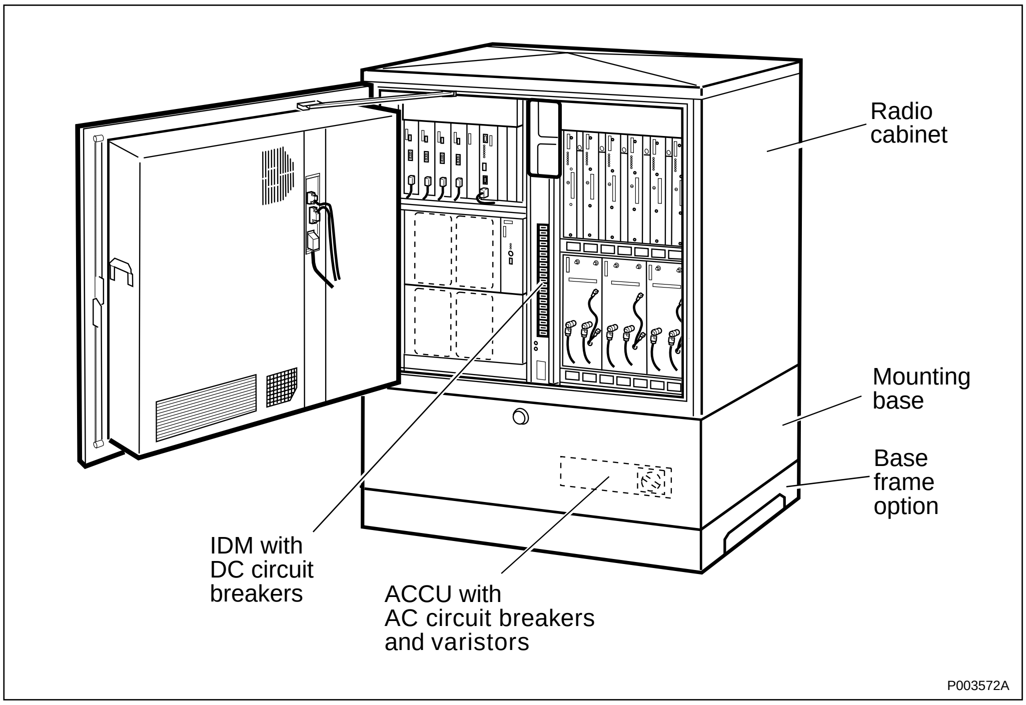


Figure 23 RBS 2102 with mid-mounted IDM. Circuit breakers are shown in the picture below

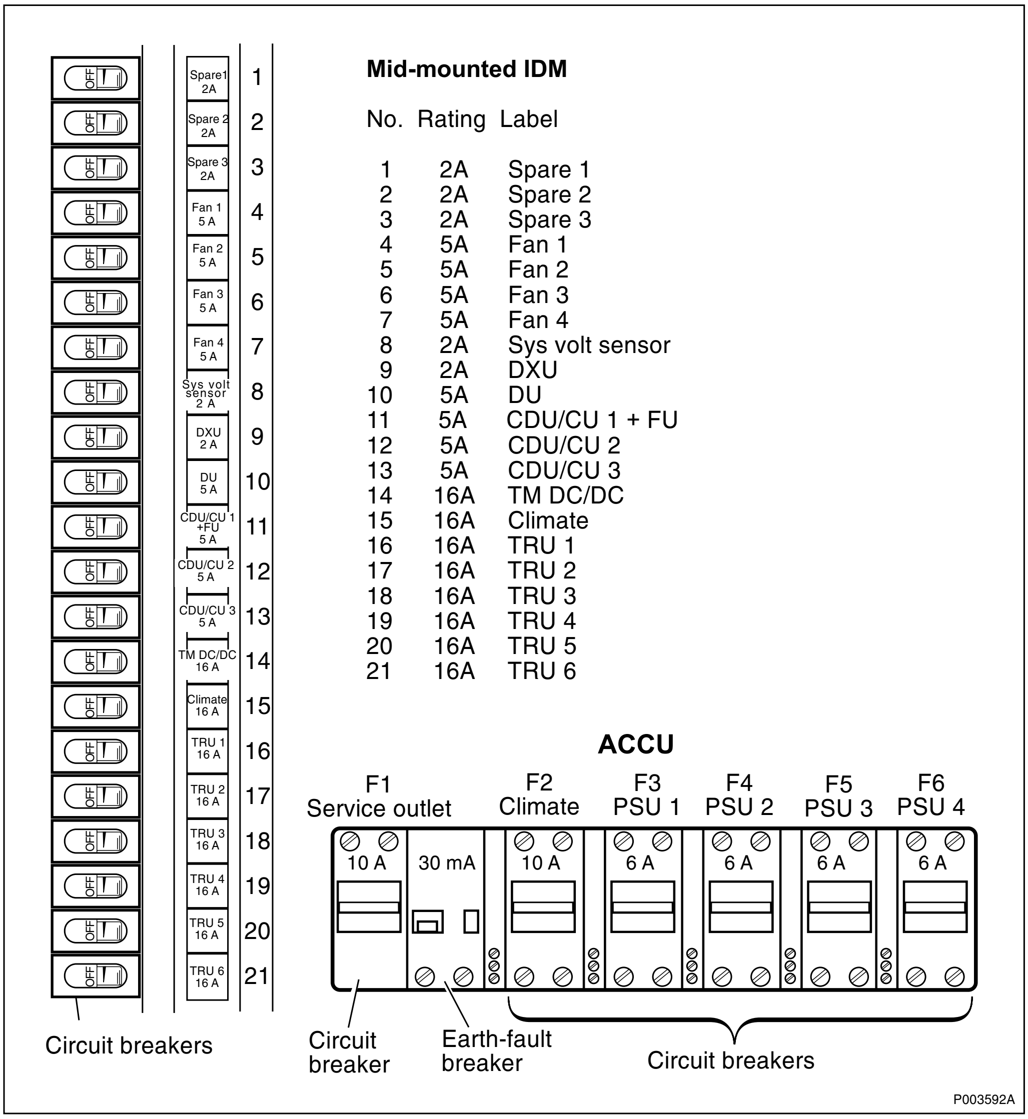


Figure 24 Circuit breakers of mid-mounted IDM and ACCU

Note: The circuit breaker F2 Climate is designed for two different amperages:

- 10 A is installed in ACCU BMG 980 307/X as shown in the figure.
- 16 A is installed in ACCU BMG 980 318/X, not shown.

RBS 2102 mounted with a mid-mounted IDM and ACCU version V2

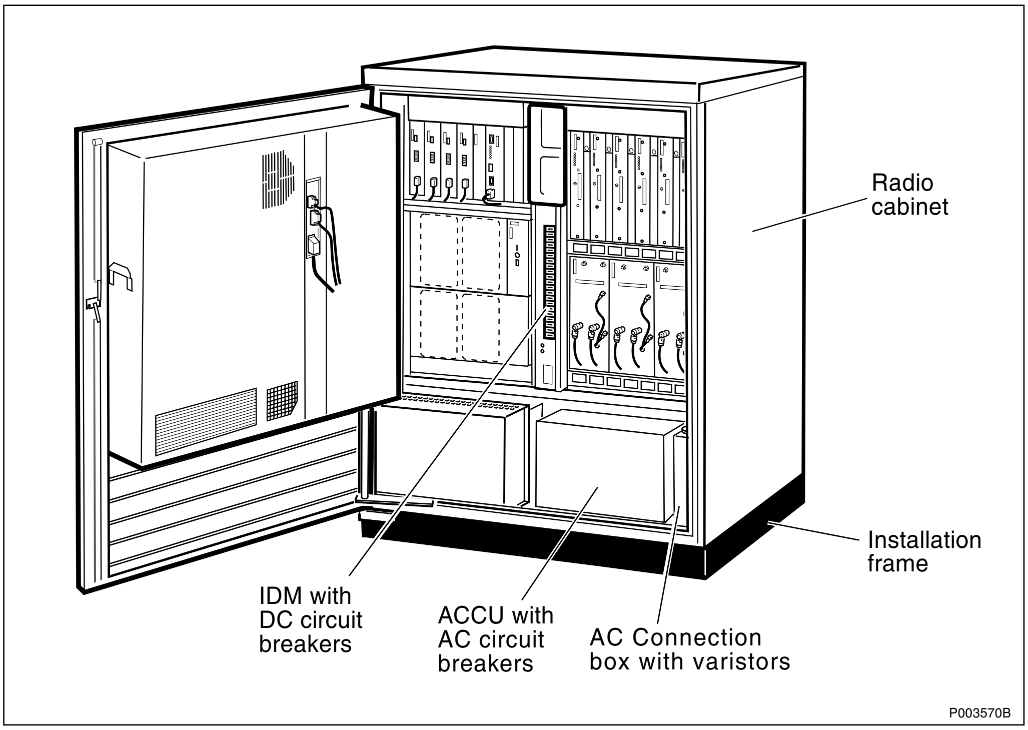


Figure 25 RBS 2102 with mid-mounted IDM. Circuit breakers are shown in the picture below

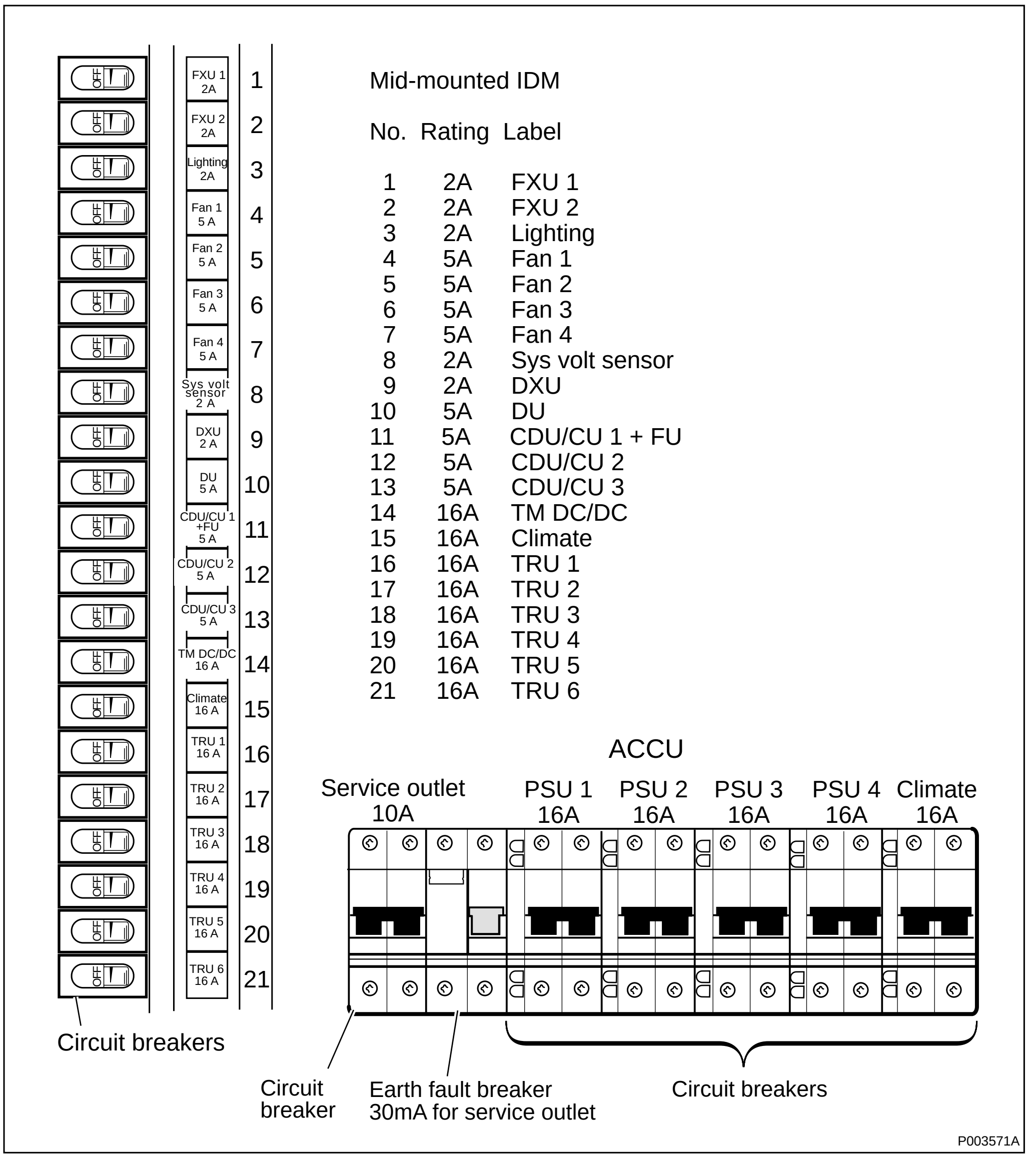


Figure 26 Circuit breakers of mid-mounted IDM and ACCU

5.3 ACCU

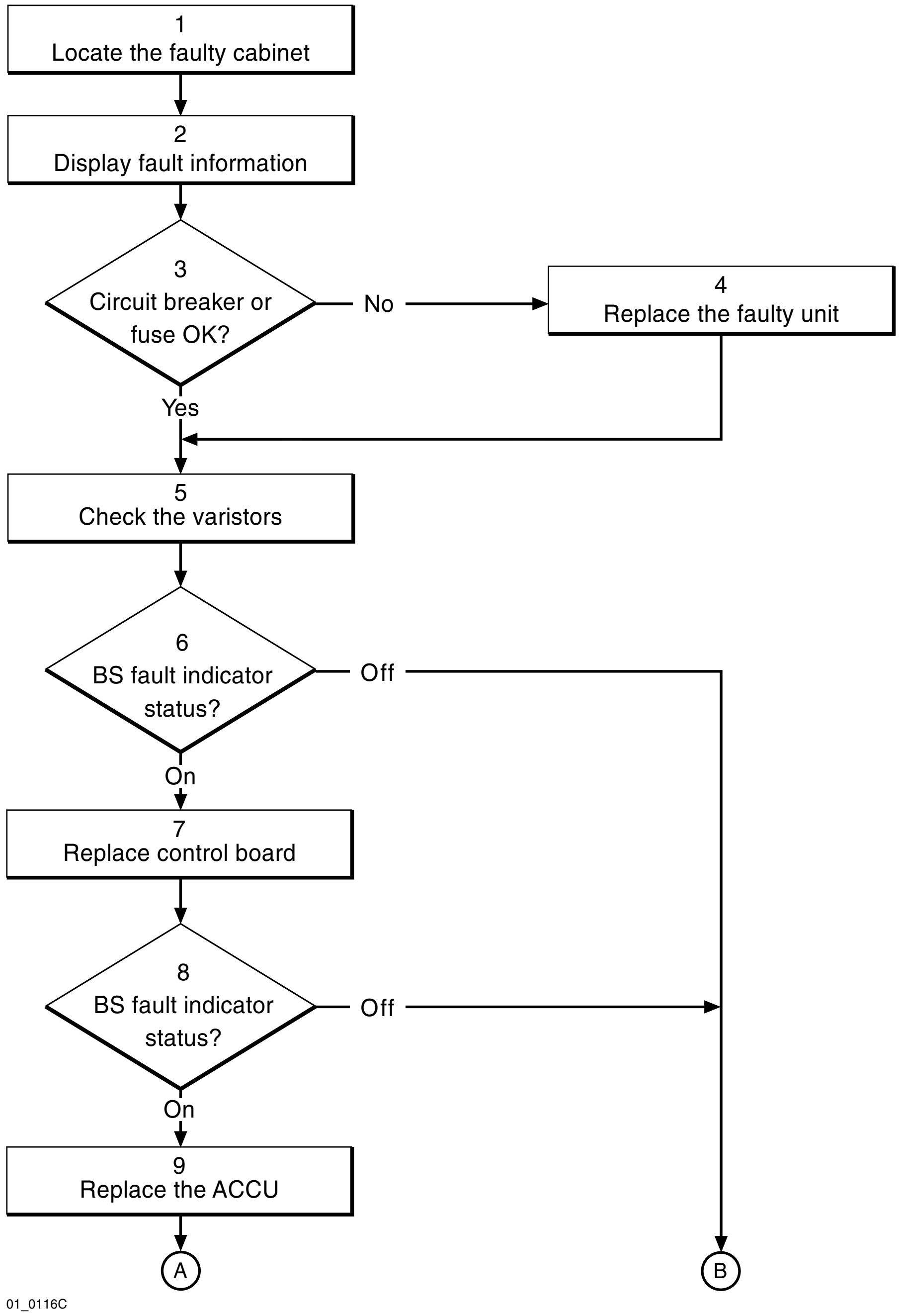


Figure 27 ACCU (part 1 of 2)

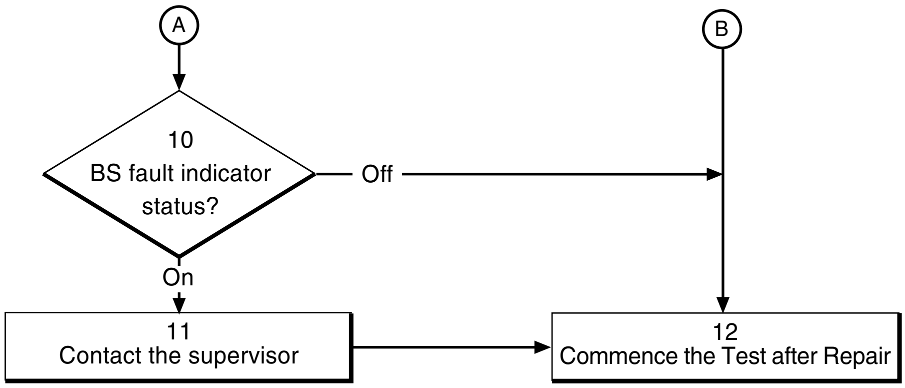


Figure 28 ACCU (part 2 of 2)

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

Note: The denominations "ACCU version V1" and "ACCU version V2", used in the text below, are explained in the chapter "Introduction".

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Circuit breaker or fuse OK?

See the section "Circuit Breakers and Fuses" in this chapter for location of the circuit breakers and fuses.

Circuit breaker or fuse OK?

- No: Proceed to step (4).
- Yes: Proceed to step (5).

(4) Replace the faulty unit

Replace the unit associated with the released circuit breaker or blown fuse. Replacement procedures can be found in the chapter "RBS Field Repair".

(5) Check the varistors

1. Check for defective varistors. Varistors have been installed for lightning protection.

   ACCU version V1

   The varistors are located inside the ACCU. Defective varistors are indicated by a red flag with the text "DEFECT" in their display window.

   ACCU version V2

   The varistors are located inside the connection box. Defective varistors are indicated by a red flag in a display window.

2. If a varistor is defective, see the section "Varistors"in the chapter "RBS Field Repair" for replacement instructions.

(6) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (12). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu select "Display Faulty RUs".

(7) Replace the control board

Replace the control board in the ACCU according to instructions in the section "ACCU" in the chapter "RBS Field Repair".

(8) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (12). No fault is detected in the RBS.

- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, and select "Display Faulty RUs".

(9) Replace the ACCU

Replace the ACCU according to instructions in the section "ACCU"in the chapter "RBS Field Repair".

(10) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (12). No fault is detected in the RBS.
- On: Proceed to step (11). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(11) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(12) Commence the Test after Repair

Proceed to the chapter "Test after Repair" and follow the information below:

- After replacement of the climate unit:
  - Follow the instructions given in the section *Climate System Test*.
  - Proceed to the section *Before Leaving the Site*, in the chapter *Concluding Routines*.
- After replacement of a PSU or a varistor:
  - Follow the instructions given in the section *Before Leaving the Site*, in the chapter *Concluding Routines*.

5.4 Air Conditioner

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3) and (V4) are used as abbreviations designating the four versions of the climate unit.

5.4.1 Fault Localisation Procedure – Climate Unit Versions V1 and V2

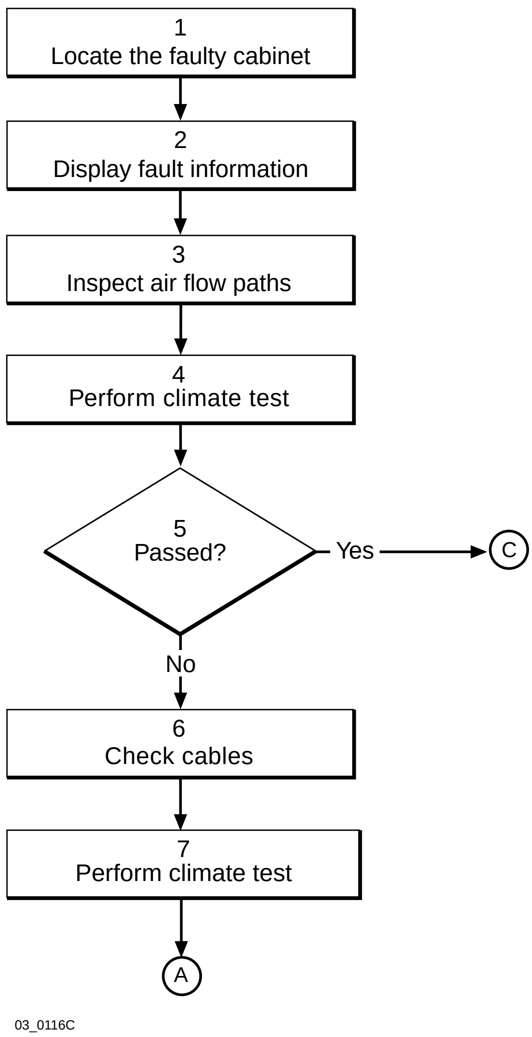


Figure 29 Air conditioner flowchart (part 1 of 4)

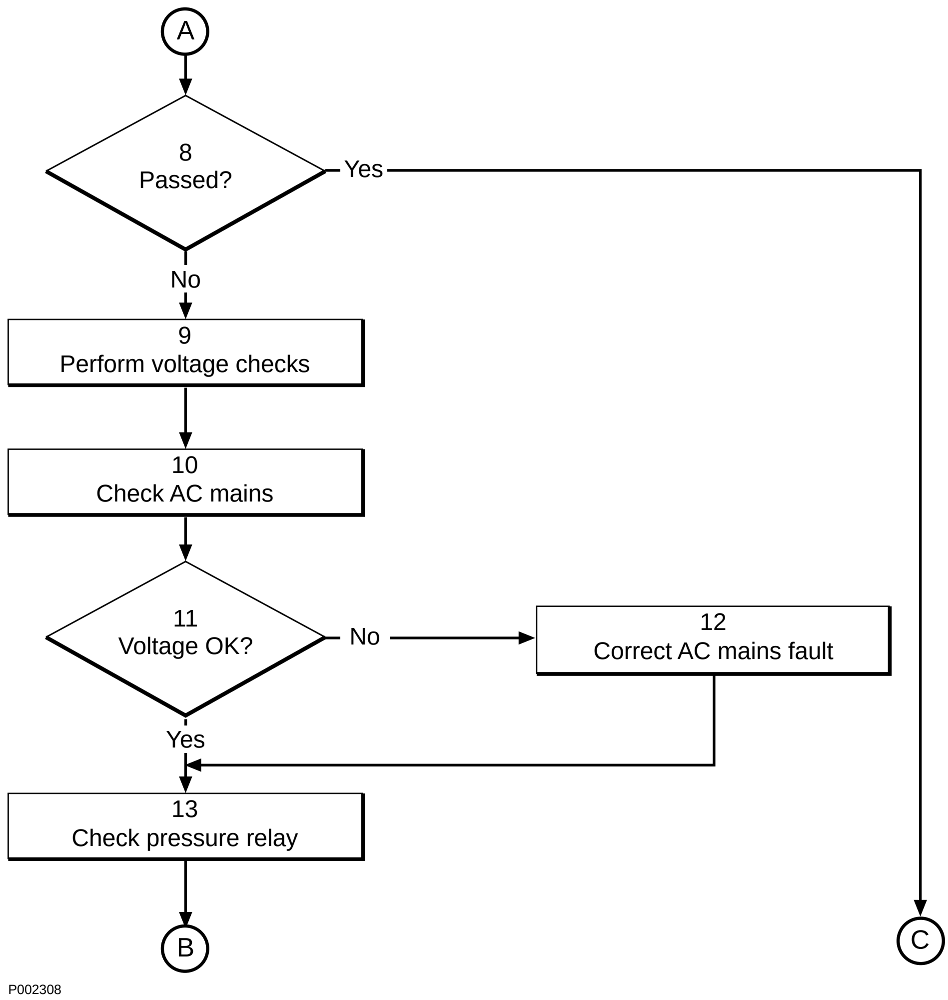


Figure 30 Air conditioner flowchart (part 2 of 4)

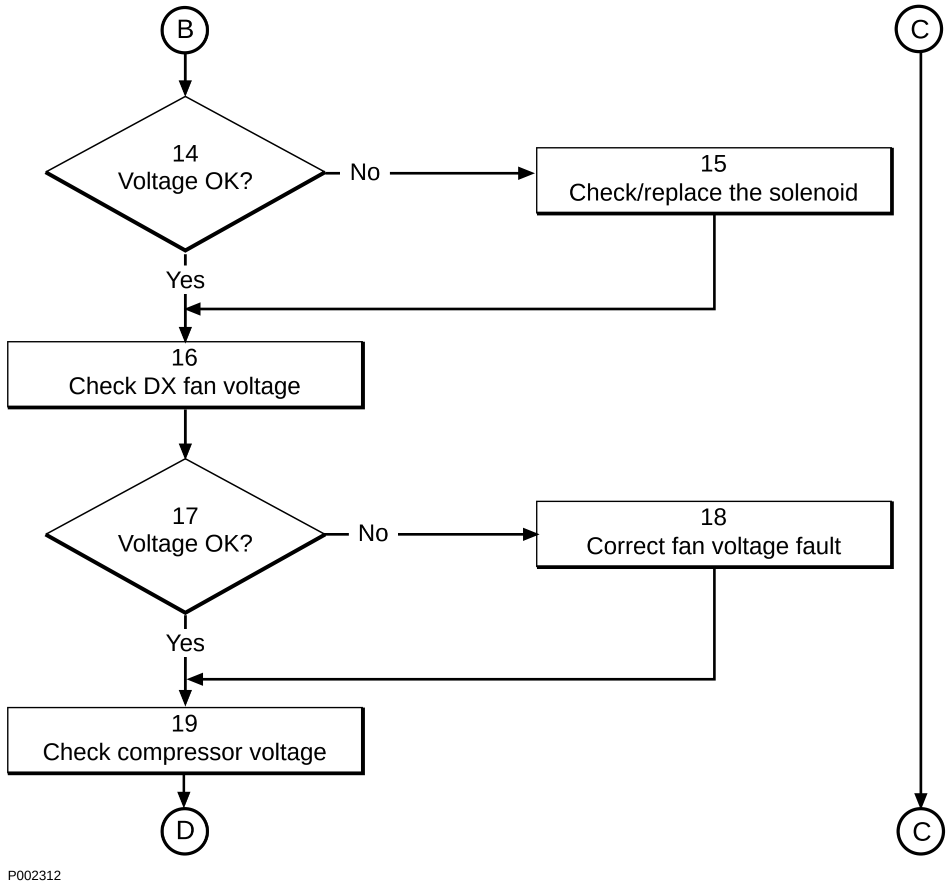


Figure 31 Air conditioner flowchart (part 3 of 4)

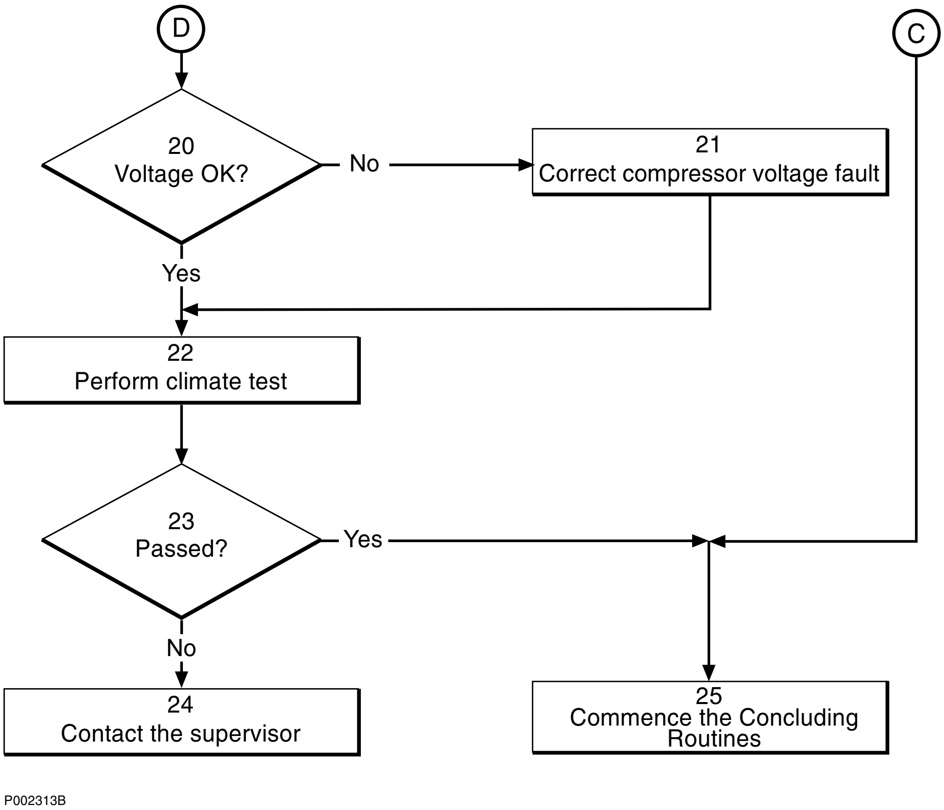


Figure 32 Air conditioner flowchart (part 4 of 4)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Inspect air flow paths

1. Inspect the vents on the outside of the cabinet door to make sure that nothing is obstructing the flow of air to, or from, the heat exchanger external fan or the condenser section. If necessary, clean the vents.

2. In some cases, the channels through which the external air flows, from the vents of the door to the various parts of the climate unit,

may become blocked. To clean these channels, it may be necessary to remove the climate unit from the cabinet door.

3. Make sure that you understand how the climate unit works regarding air flow paths. Refer to Section 5.4.3 RBS 2102 Climate Unit – Theory of Operation on page 90.

Note: The internal air and external air flows should never mix. If there is a damaged or missing cable gland, seal, or an improperly secured door to the TM box in either air flow path, this can cause one or more of the following problems and damages to the RBS:

• Contaminants and outside humidity can enter the radio sub-cabinet and corrode connectors and damage equipment.

• In areas where there is high humidity, this mixture of air flow paths will cause the evaporator section of the air conditioner to create excessive amounts of water, causing corrosion within the radio sub-cabinet and the mounting base.

• In areas where the external air temperature is very high, the mixing of these two air flow paths greatly reduces the efficiency of the evaporator and can directly lead to generating over-temperature, +55 °C (+131 °F), reduced cooling capacity, or air conditioner alarms.

4. Make sure that all the covers are in place on the climate unit. This ensures that the air can flow over the evaporator.

5. Activate the compressor as given in Section 5.4.3 RBS 2102 Climate Unit – Theory of Operation on page 90.

   After approximately 10 seconds, cool air should be felt coming out of the evaporator. After about 30 seconds, the condensor section should start to get warm and warm air should be flowing through the exhaust vent on the cabinet door.

6. Remove the covers over the inside of the climate unit. Inspect each of the three different air flow paths.

7. If any of the air flow paths are found dirty or clogged they should be cleaned. Always clean the air flow paths with compressed air blowing against the air flow path. When cleaning the condenser section, the DX fan should also be removed and cleaned.

Note: Do not rotate the fan with compressed air. If the fan runs with overspeed, the bearings can be worn exessively.

8. Inspect the evaporator section. If this section is too cold, ≤ -17 °C (+1 °F), the system cannot evaporate enough coolant and the low pressure valve is open. A heater can be used to gently warm this section enough to release the low pressure valve and allow the climate test to be run.

9. If the condenser section is too hot, ≥ +77 °C (+196 °F), the fault could be that:

- The condenser is dirty and must be cleaned.
- The DX fan is faulty and must be replaced.

Note: The DX fan should always rotate when AC mains voltage is applied to the compressor. Depending on the temperature sensed, the speed of the DX fan could be slow.

- There is a major fault within the cooling system caused by an open circuit high pressure valve. This can only be repaired by a qualified refrigeration specialist, or by replacing the entire climate unit.

(4) Perform climate test

Note: The climate system test should never be run if the compressor is too hot (+77 °C or +196 °F) or too cold (-17 °C or +1 °F) or if the evaporator or condenser section is iced over. The pressure valves may break.

Allow the system to warm up prior to performing the climate system test.

The climate test is the best method to activate the system without damaging the compressor or the coolant system. Perform the climate test according to the section "Climate System Test" in the chapter "Test after Repair".

(5) Passed?

Was the system test was passed successfully?

- No: Proceed to step (6).
- Yes: Proceed to step (25).

(6) Check the control cables

There are two different control cables:

- One cable comes from the DXU/ECU backplane and connects to the CCU as well as to the relay board (V1) **or** the AC interface card (V2).
- The other cable is internal in the climate unit and connects the CCU with the relay board (V1) **or** the AC interface card (V2).Check the cables using a multimeter. Refer to the chapter "Cable Connections" for details about the cables.

(7) Perform climate test

Note: The climate system test should never be run if the compressor is too hot (+77 °C or +196 °F) or too cold (-17 °C or +1 °F) or if the evaporator or condenser section is iced over. The pressure valves may break.

Allow the system to warm up prior to performing the climate system test.

The climate test is the best method to activate the system without damaging the compressor or the coolant system. Perform the climate test according to the section "Climate System Test" in the chapter "Test after Repair".

(8) Passed?

Was the system test passed successfully?

- No: Proceed to step (9).
- Yes: Proceed to step (25).

(9) Perform voltage checks

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

The outage may be caused by a lack of AC mains power. Trace the AC mains path through the climate unit using the following steps.

To measure the AC mains voltage on the DX control card, the compressor must be activated. Use the momentary switch (V2) **or**perform the voltage measurements during step 4 of the climate test (V1).

(10) Check AC mains

1. Remove the AC mains cable from the radio sub-cabinet to the climate unit and measure the voltage.

   Attachment of the AC mains cable:

   • Climate unit version V1: To the top of the relay unit.

   • Climate unit version V2: To the bottom connector of the AC interface card.

2. Measure the AC mains voltage inside the climate unit.

   On the DX control card, measure the AC mains voltage on pins 1 and 2, "MAINS", with the compressor activated, see Figure 33 on page 72. The reading should correspond to:

   • 50 Hz connection – what the ACCU is strapped for.

   • 60 Hz connection – what the AC interface is strapped for.

Note: (60 Hz only) If the voltage value measured on pins 1 and 2, "MAINS", when the compressor is activated is approximately 270 V AC, and the input voltage is 250 V AC, make sure that the step-up transformer on the

AC interface card has been wired out of the power circuit. Wire the step-up transformer out of the power circuit according to instructions in the section "Relay Unit/AC Interface" in the chapter "RBS Field Repair".

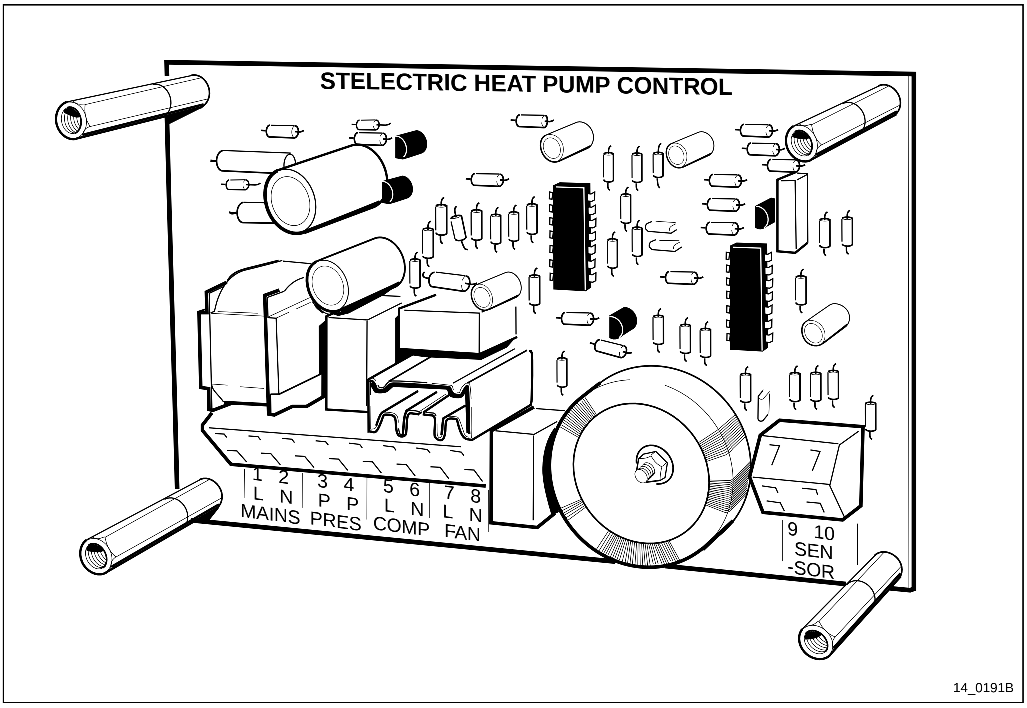


Figure 33 DX control card for climate unit, both (V1) and (V2)

(11) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (12).
- Yes: Proceed to step (13).

(12) Correct AC mains fault

- If the AC mains cable from the ACCU to the climate unit was found to be defective, replace it.
- If the voltage value measured on the DX control card on pins 1 and 2, "MAINS", is well below the value of the AC mains, the AC interface card or relay unit should be replaced according to instructions in the section "Relay unit/AC interface" in the chapter "RBS Field Repair".

(13) Check pressure relay

Note: The pressure stat relay has adjustable limits. These limits are factory set and should only be adjusted by a qualified, certified refrigeration specialist.

Incorrect adjustment will severely damage the compressor and coolant system.

Note: The momentary switch on the AC interface card activates the compressor by by-passing the low pressure and high pressure valves. The voltage measurement in this step can only be accurately performed by using the Climate Unit Tester for the climate unit versions V1 and V2.

1. Check AC mains:

   On the DX control card, measure the AC mains on pins 3 and 4, "PRES", with the compressor activated.

Note: There may be a jumper between pins 3 and 4. If so, measure the voltage between either of the pins 3 or 4 and the ground. The mounting posts for the DX card are marked as ground on the card.

2. If the AC mains is present, but the compressor fails to start, there is probably a fault with the high pressure/low pressure valve system. Check that the compressor is not too hot (above +77 °C or +196 °F), or that the condenser or evaporator sections are not too cold (below -17 °C or +1 °F), or iced over. If the system is either too hot or too cold, allow the system to stabilise prior to measuring the voltage again.

3. Refer to Figure 34 on page 73 and inspect the contacts on the pressure valve relay. Activate the relay manually on both sides to make sure that the contacts have not become frozen together.

Note: It may not be possible to access the sides of the pressure valve relay to manipulate it manually. In this case, place a hand on the pressure valve and when the compressor is activated, the relay will be felt or heard.

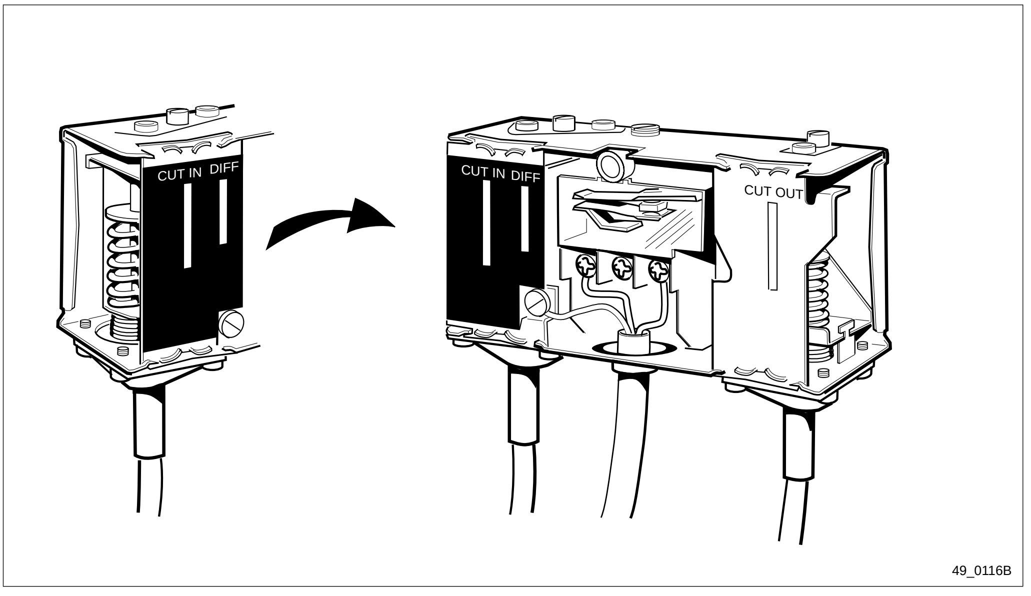


Figure 34 Pressure valve relay

4. Activate the system and measure the voltage again. If the AC mains is present on pins 3 and 4, "PRES", of the DX control card

when the compressor is activated, the pressure valve relay is not defective.

(14) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (15).
- Yes: Proceed to step (16).

(15) Check/replace the solenoid

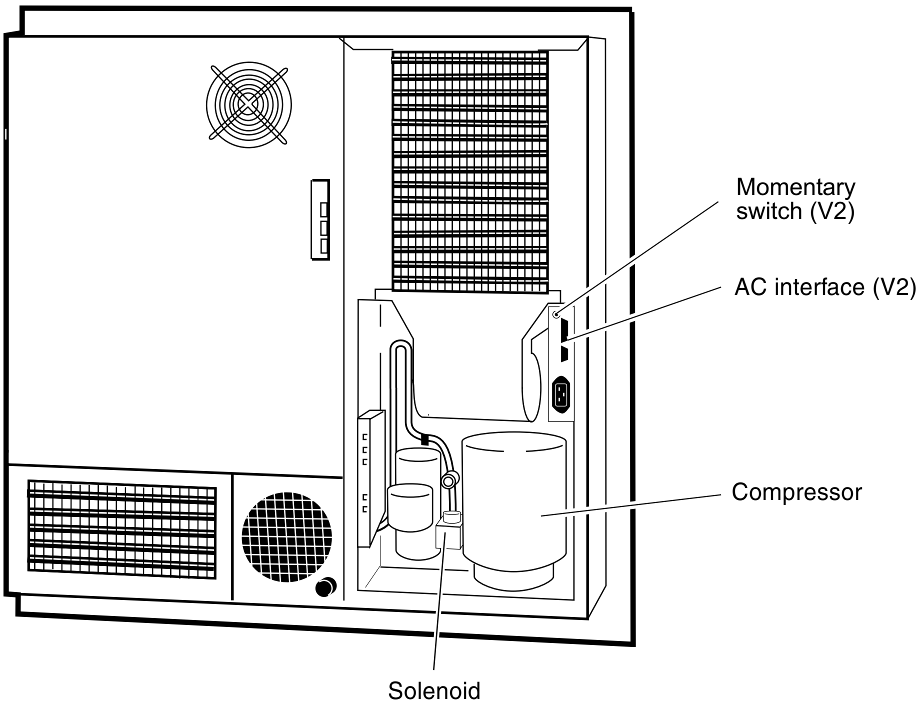


Figure 35 Air conditioner

The solenoid, which operates the magnetic valves for the coolant within the compressor system may be defective.

1. Put a finger on the solenoid and activate the compressor:

   • Press the momentary switch on the AC interface card (V2).

   or

   • Activate the climate test and during step 4 the compressor starts (V1).

   The opening and closing of the solenoid valve(s) should be felt every time the compressor starts or stops.

2. If it is difficult to determine the working status of the solenoid, do as follows:

   • Remove the grey screw-on cap on top of the solenoid and the click-on cap that holds the solenoid on the post of the magnetic valve.

• Try to remove the solenoid from the post when the compressor is not operating. This will give a reference on the amount of resistance that can be determined prior to trying to remove the solenoid from the post with the compressor running.

• Try to remove the solenoid from the post when the compressor is operating. If the solenoid is operating properly, the magnetic field generated should hold it to the post so that an easily noticeable amount of resistance is encountered when trying to remove it during compressor operation.

3. If no resistance is encountered, or the valve cannot be felt opening or closing, replace the solenoid according to the section "Solenoid" in the chapter "RBS Field Repair".

(16) Check DX fan voltage

Note: The exact voltage level of the DX fan is controlled by a TRIAC transistor on the DX control card. Due to this, the AC voltage reading for the DX fan should be a value ≥ 100 V AC, but less than the level of the AC mains (even if the DX fan is running at maximum speed). The DX fan should also rotate, even if at a slow speed whenever the compressor is activated.

On the DX control card, measure the AC voltage on pins 7 and 8, "FAN", with the compressor activated.

(17) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (18).
- Yes: Proceed to step (19).

(18) Correct fan voltage fault

- If AC voltage exceeding 100 V AC cannot be measured on pins 7 and 8, "FAN", replace the DX control card according to instructions in the section "DX Control Card" in the chapter "RBS Field Repair".
- If the AC mains is present on pins 7 and 8, "FAN", but the DX fan does not run when the compressor is activated, replace the DX fan according to instructions in the section "DX Fan" in the chapter "RBS Field Repair".

(19) Check compressor voltage

1. If the AC mains cannot be measured, check that the compressor is not too hot (≤ +77 °C or 196 °F), or that the condenser or evaporator sections are not too cold (≥ -17 °C or +1 °F) or iced over.
2. Measure the AC mains on pins 5 and 6, "COMP", on the DX control card with the compressor activated.

(20) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (21).
- Yes: Proceed to step (22).

(21) Check/replace starting unit and compressor

Note: The compressor can only be repaired by a qualified refrigeration specialist, or by replacing the entire climate unit.

To access the starting capacitor or the relay in the climate unit, the compressor must be moved, so therefore only a qualified, certified refrigeration specialist can check these units.

1. Replace the DX control card according to instructions in the section "DX Control Card" in the chapter "RBS Field Repair".
2. Activate the system again and measure the voltage on pins 5 and 6, "COMP", again.
3. If the AC mains still cannot be measured on pins 5 and 6, "COMP", after replacing the DX control card, the fault may lie with either the starting capacitor and relay, or the compressor. In either case, contact a certified refrigeration specialist.

(22) Perform climate test

Note: The climate system test should never be run if the compressor is too hot (+77 °C or +196 °F) or too cold (-17 °C or +1 °F) or if the evaporator or condenser section is iced over. The pressure valves may break.

Allow the system to warm up prior to performing the climate system test.

The climate test is the best method to activate the system without damaging the compressor or the coolant system. Perform the climate test according to the section "Climate System Test" in the chapter "Test after Repair".

(23) Passed?

Was the system test was passed successfully?

- No: Proceed to step (24).
- Yes: Proceed to step (25).

(24) Contact the supervisor

1. Contact the supervisor who will take further action for example:

   • Instruct maintenance personnel to replace the air conditioner. Procedures for the replacement of the air conditioner can be found in the section "Air Conditioner" in the chapter "RBS Field Repair".

• Call for a refrigeration repair specialist to replace the compressor or charge the system with coolant.

• Consult an FSC.

2. To determine if there is a coolant problem with the air conditioner use the procedures below.

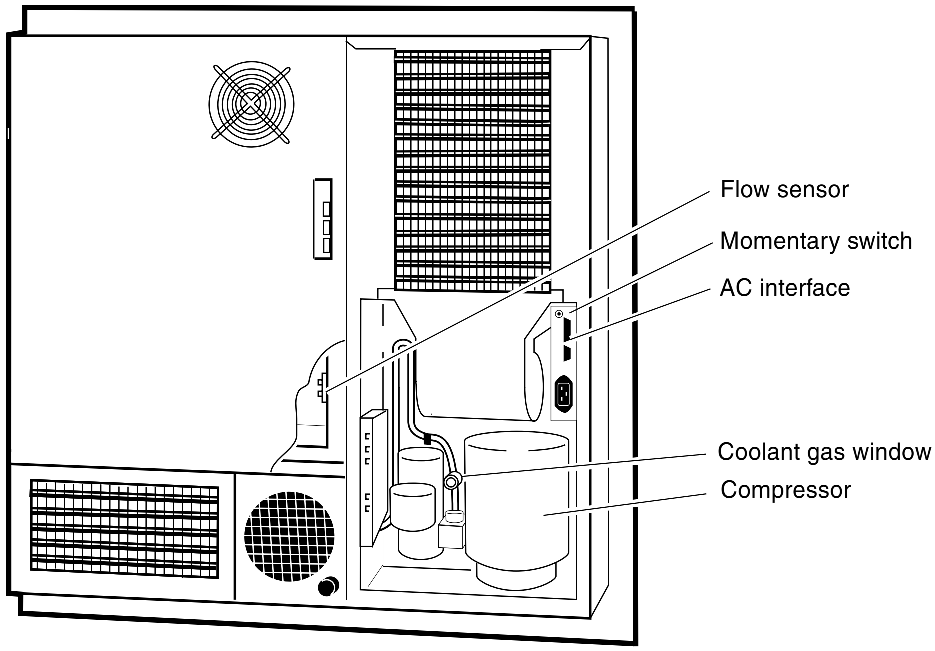


Figure 36 Air conditioner

- Activate the compressor.

  Climate unit version V1

  Use the climate system tester to activate the compressor.

  Climate unit version V2

  The air conditioner in the climate unit version V2 includes a momentary switch on the AC interface card that is used to activate the heater or air conditioner for both testing and coolant reading purposes.
- Make sure that the compressor has been running during the last 10 minutes. This indicates that the internal cabinet temperature has exceeded 35 °C or that the flow sensor was heated sufficiently during the climate test to start the compressor. Either of these conditions is needed for the gauge to read correctly.
- Check indications at the middle point of the window on the gauge:

  – Green indications at the middle point show that the system is operating correctly.

  – Yellow indications at the middle point denote water in the system and require the whole climate unit to be replaced.

- Check that you can see liquid around the middle point of the coolant gas window. The window does not need to be completely full of liquid.

  There is a fault in the system when:

  – Bubbles are visible in the window. This indicates a coolant leak somewhere in the system.
  – Foam is visible in the window. This indicates that the system is running too hot and may require replacement as repair on site could be too difficult.

(25) Commence the Concluding Routines

Proceed to the section *Before Leaving the Site* in the chapter *Concluding Routines*.

5.4.2 Fault Localisation Procedure – Climate Unit Versions V3 and V4

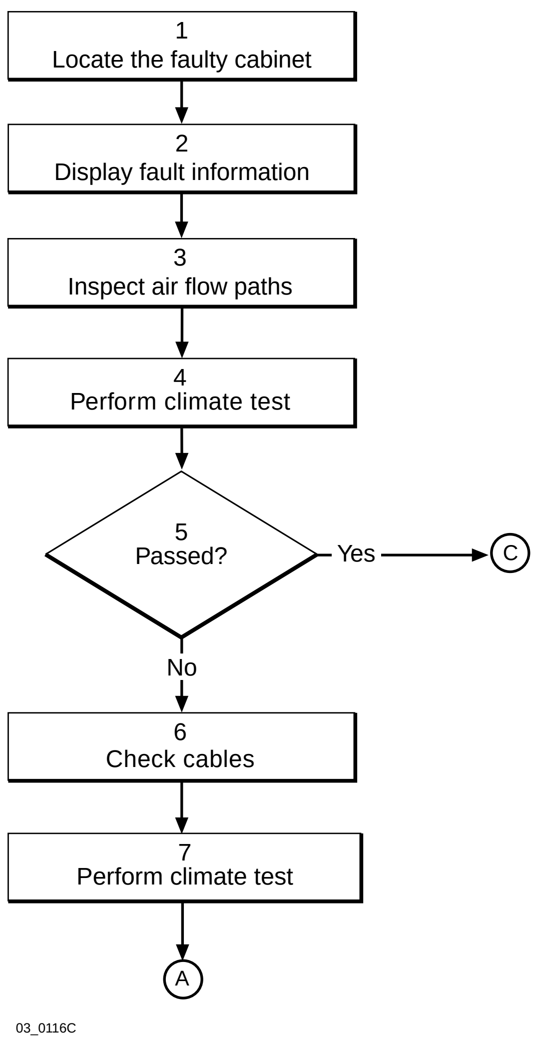


Figure 37 Air conditioner flowchart (part 1 of 4)

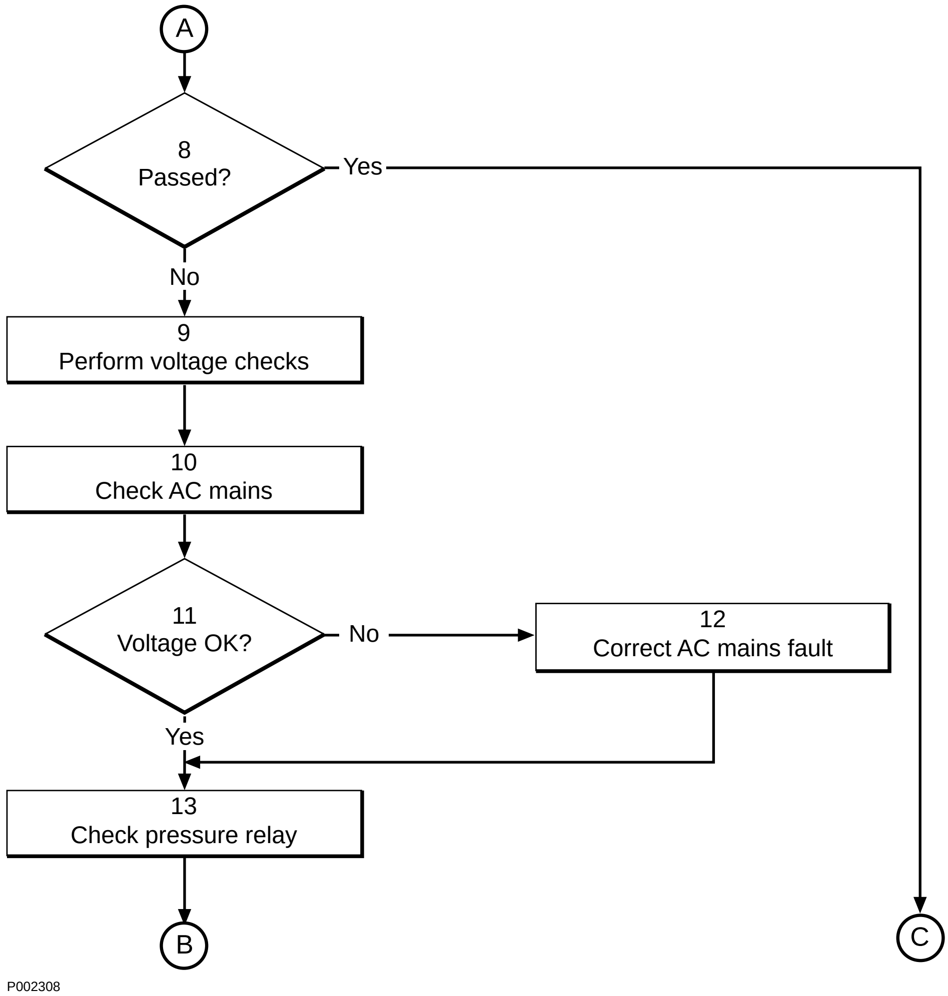


Figure 38 Air conditioner flowchart (part 2 of 4)

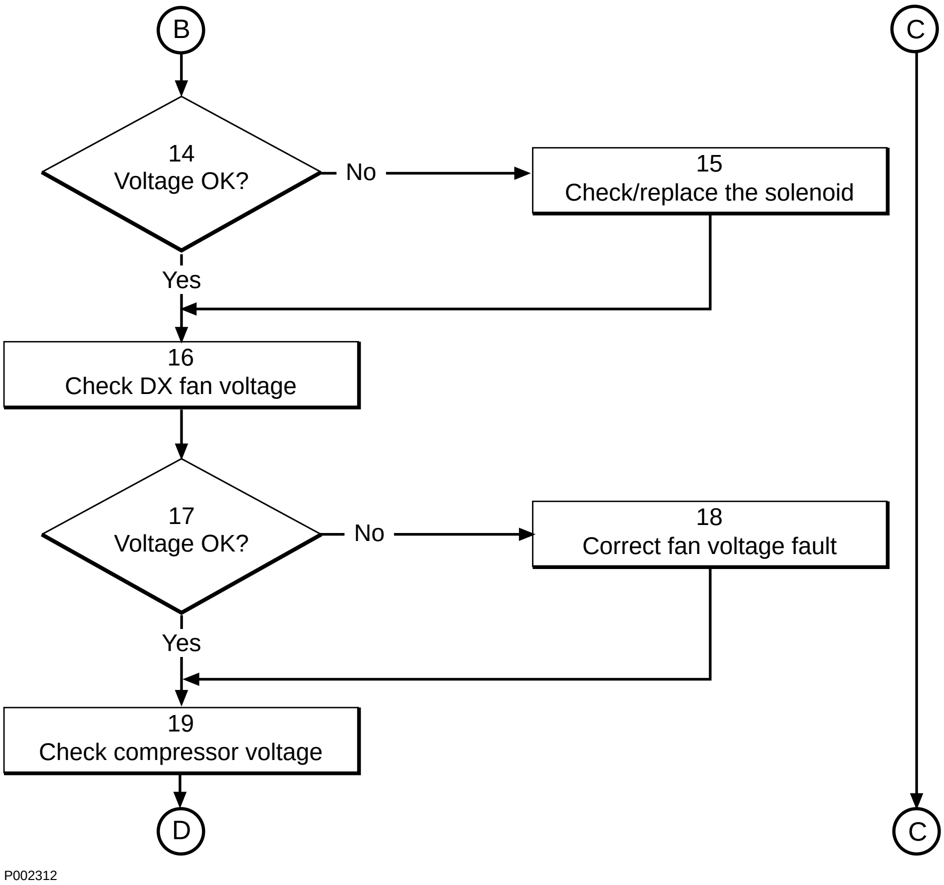


Figure 39 Air conditioner flowchart(part 3 of 4)

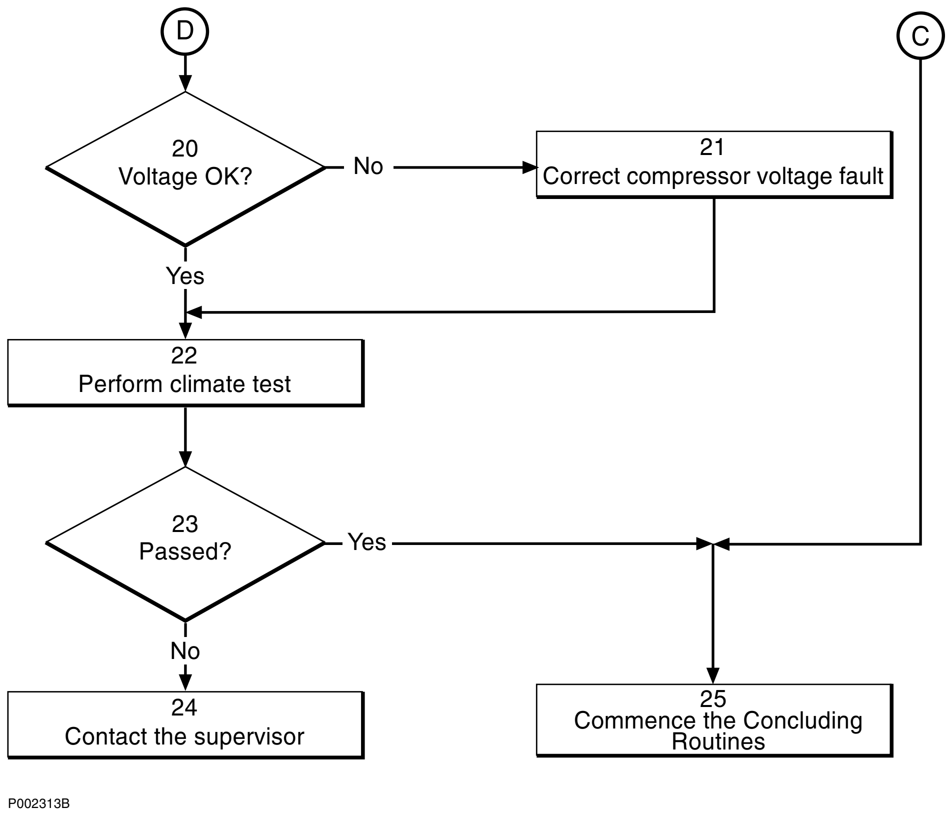


Figure 40 Air conditioner flowchart (part 4 of 4)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Inspect air flow paths

1. Inspect the vents on the outside of the cabinet door to make sure that nothing is obstructing the flow of air to, or from, the heat exchanger external fan or the condenser section. If necessary, clean the vents.

2. In some cases, the channels through which the external air flows, from the vents of the door to the various parts of the climate unit, may become blocked.

   Climate unit version V3

   To clean these channels, it may be necessary to remove the climate unit from the door.

   Climate unit version V4

   Remove the three screws at the left edge of the climate unit that hold the climate unit to the cabinet door and open the climate unit on its hinges. This gives full access to the external air flow channels.

3. Make sure that you understand how the climate unit works regarding air flow paths. Refer to Section 5.4.3 RBS 2102 Climate Unit – Theory of Operation on page 90.

Note: The internal air and external air flows should never mix. If there is a damaged or missing cable gland, seal, or an improperly secured door to the TM box in either air flow path, this can cause one or more of the following problems and damages to the RBS:

• Contaminants and outside humidity can enter the radio sub-cabinet and corrode connectors and damage equipment.

• In areas where there is high humidity, this mixture of air flow paths will cause the evaporator section of the air conditioner to create excessive amounts of water, causing corrosion within the radio sub-cabinet and the mounting base.

• In areas where the external air temperature is very high, the mixing of these two air flow paths greatly reduces the efficiency of the evaporator and can directly lead to generating over-temperature, +55 °C (+131 °F), reduced cooling capacity, or air conditioner alarms.

4. *Climate unit version V3*

   • Make sure that all the covers are in place on the climate unit. This ensures that the air can flow over the evaporator.

   Climate unit version V4

   • If the climate unit is open, close it and fix it to the cabinet door with the three screws at the left edge.

   • Make sure that all the covers are in place on the climate unit. This ensures that the air can flow over the evaporator.

5. Activate the compressor as given in Section 5.4.3 RBS 2102 Climate Unit – Theory of Operation on page 90.

   After approximately 10 seconds, cool air should be felt coming out of the evaporator. After about 30 seconds, the condensor section should start to get warm and warm air should be flowing through the exhaust vent on the cabinet door.

6. Remove the covers over the inside of the climate unit. Inspect each of the three different air flow paths.
7. If any of the air flow paths are found dirty or clogged they should be cleaned. Always clean the air flow paths with compressed air blowing against the air flow path. When cleaning the condenser section, the DX fan should also be removed and cleaned.

Note: Do not rotate the fan with compressed air. If the fan runs with overspeed, the bearings can be worn exessively.

8. Inspect the evaporator section. If this section is too cold, ≤ -17 °C (+1 °F), the system cannot evaporate enough coolant and the low pressure valve is open. A heater can be used to gently warm this section enough to release the low pressure valve and allow the climate test to be run.
9. If the condenser section is too hot, ≥ +77 °C (+196 °F), the fault could be that:

   - The condenser is dirty and must be cleaned.
   - The DX fan is faulty and must be replaced.

Note: The DX fan should always rotate when AC mains voltage is applied to the compressor. Depending on the temperature sensed, the speed of the DX fan could be slow.

   - There is a major fault within the cooling system caused by an open circuit high pressure valve. This can only be repaired by a qualified refrigeration specialist, or by replacing the entire climate unit.

(4) Perform climate test

Note: The climate system test should never be run if the compressor is too hot (+77 °C or +196 °F) or too cold (-17 °C or +1 °F) or if the evaporator or condenser section is iced over. The pressure valves may break.

Allow the system to warm up prior to performing the climate system test.

The climate test is the best method to activate the system without damaging the compressor or the coolant system. Perform the climate test according to the section "Climate System Test" in the chapter "Test after Repair".

(5) Passed?

Was the system test was passed successfully?

- No: Proceed to step (6).
- Yes: Proceed to step (25).

(6) Check the control cables

Check the cable coming from the DXU/ECU backplane and connecting to the CCU using a multimeter. Refer to the chapter "Cable Connections"for details about the cable.

(7) Perform climate test

Note: The climate system test should never be run if the compressor is too hot (+77 °C or +196 °F) or too cold (-17 °C or +1 °F) or if the evaporator or condenser section is iced over. The pressure valves may break.

Allow the system to warm up prior to performing the climate system test.

The climate test is the best method to activate the system without damaging the compressor or the coolant system. Perform the climate test according to the section "Climate System Test" in the chapter "Test after Repair".

(8) Passed?

Was the system test passed successfully?

- No: Proceed to step (9).
- Yes: Proceed to step (25).

(9) Perform voltage checks

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

The outage may be caused by a lack of AC mains power. Trace the AC mains path through the climate unit using the following steps.

To measure the AC mains voltage on the CCU, the compressor must be activated. Use the momentary button on the CCU, or perform the voltage measurements during the pause at Testpoint 32 of the climate test.

(10) Check AC mains

1. Remove the AC mains cable from the radio sub-cabinet to the bottom connector of the CCU and measure the voltage.

2. On the CCU card, measure the AC mains voltage between pins 40 and 41, "MAINS". Also check the AC mains fuse located to the right of pins 40 and 41, "MAINS". If the fuse is OK it should measure 0 Ω.

(11) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (12).
- Yes: Proceed to step (13).

(12) Correct AC mains fault

- If the AC mains cable from the ACCU to the climate unit was found to be defective, replace it.
- If the AC fuse on the CCU is bad, replace it. Activate the system and measure the voltage at pins 22 and 23, "COMP", again.
- If the AC mains still cannot be measured on pins 40 and 41, "MAINS", after replacing the fuse, replace the CCU card according to instructions in the section "CCU" in the chapter "RBS Field Repair".

(13) Check pressure relay

Note: The pressure stat relay has adjustable limits. These limits are factory set and should only be adjusted by a qualified, certified refrigeration specialist.

Incorrect adjustment will severely damage the compressor and coolant system.

Note: The momentary switch on the CCU activates the compressor by by-passing the low pressure and high pressure valves. The voltage measurement in this step can only be accurately performed by using the Climate Unit Tester for the climate unit versions V3 and V4.

1. Check AC mains.

   On the CCU card, measure the AC mains on pins 24 and 25, "PRES", with the compressor activated.

2. If the AC mains is present, but the compressor fails to start, there is probably a fault with the high pressure/low pressure valve system. Check that the compressor is not too hot (above +77 °C or +196 °F), or that the condenser or evaporator sections are not too cold (below -17 °C or +1 °F), or iced over. If the system is either too hot or too cold, allow the system to stabilise prior to measuring the voltage again.

3. Refer to Figure 41 on page 86 and inspect the contacts on the pressure valve relay. Activate the relay manually on both sides to make sure that the contacts have not become frozen together.

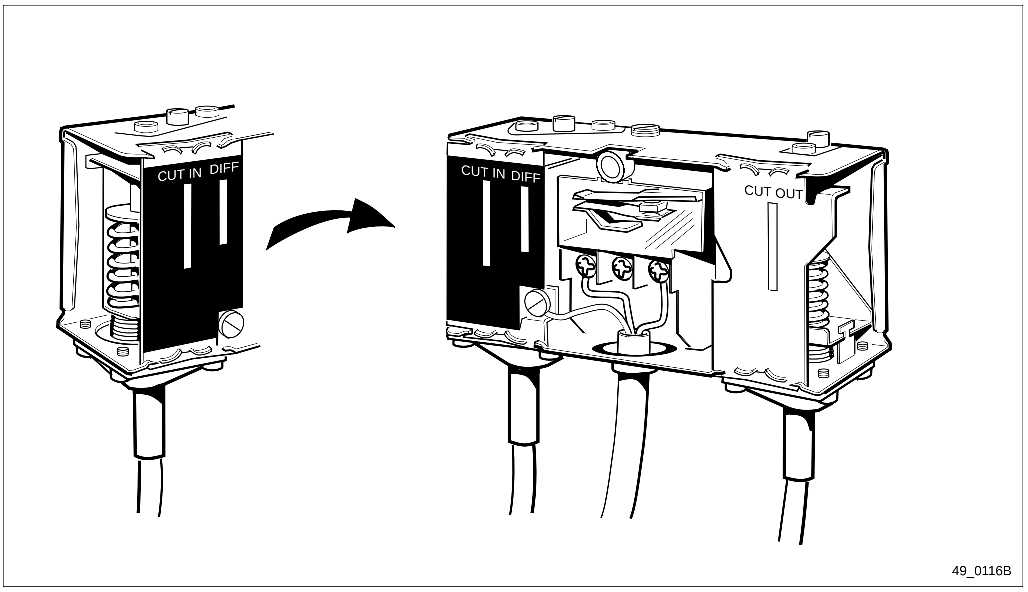


Figure 41 Pressure valve relay

4. Activate the system and measure the voltage again.

   If the AC mains is present on pins 24 and 25, "PRES", of the CCU card when the compressor is activated, the pressure valve relay is not defective.

(14) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (15).
- Yes: Proceed to step (16).

(15) Check/replace the solenoid

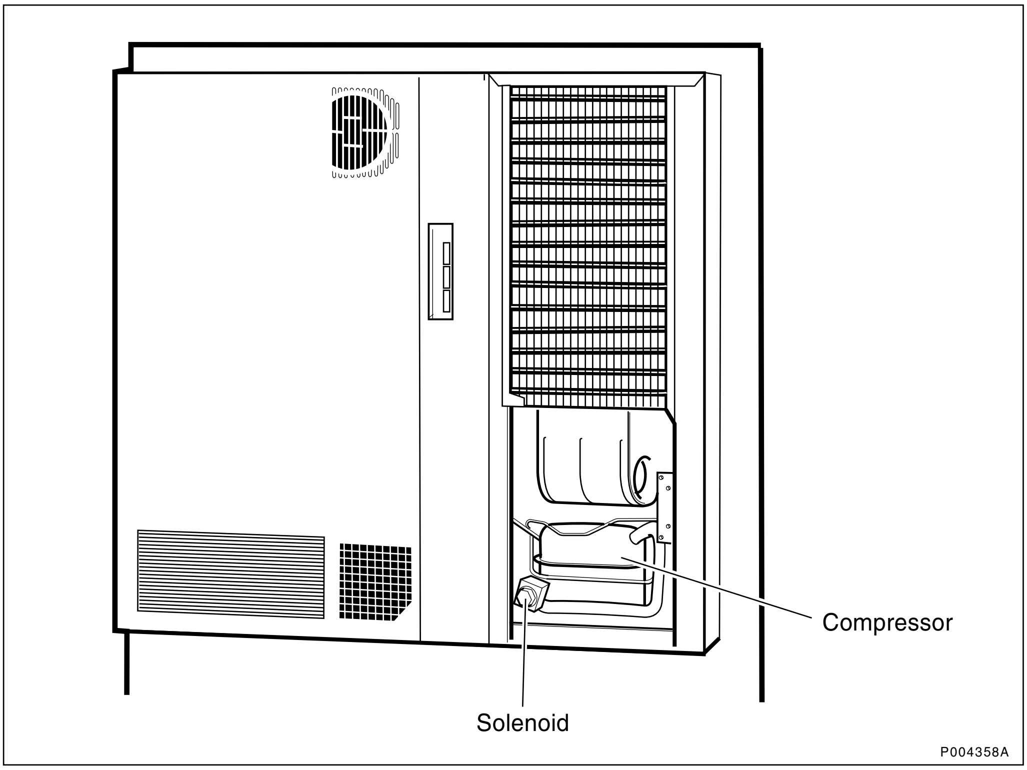


Figure 42 Air conditioner

The solenoid, which operates the magnetic valves for the coolant within the compressor system may be defective.

1. Put a finger on the solenoid and activate the compressor by performing a part test on the tester (testpoint 23). The opening and closing of the solenoid valve(s) should be felt every time the compressor starts or stops.

2. If it is difficult to determine the working status of the solenoid, do as follows:

   • Remove the grey screw-on cap on top of the solenoid and the click-on cap that holds the solenoid on the post of the magnetic valve.

   • Try to remove the solenoid from the post when the compressor is not operating. This will give a reference on the amount of resistance that can be determined prior to trying to remove the solenoid from the post with the compressor running.

   • Try to remove the solenoid from the post when the compressor is operating. If the solenoid is operating properly, the magnetic field generated should hold it to the post so that an easily noticeable amount of resistance is encountered when trying to remove it during compressor operation.

3. If no resistance is encountered, or the valve cannot be felt opening or closing, replace the solenoid according to the section "Solenoid" in the chapter "RBS Field Repair".

(16) Check DX fan voltage

Note: The exact voltage level of the DX fan is controlled by a TRIAC transistor on the CCU. Due to this, the AC voltage reading for the DX fan should be a value ≥ 100 V AC, but less than the level of the AC mains (even if the DX fan is running at maximum speed). The DX fan should also rotate, even if at a slow speed whenever the compressor is activated.

On the CCU, measure the AC voltage on pins 20 and 21, "C. FAN", with the compressor activated.

(17) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (18).
- Yes: Proceed to step (19).

(18) Correct fan voltage fault

1. If the AC voltage exceeding 100 V AC cannot be measured on pins 20 and 21, "C. FAN", replace the CCU card according to instructions in the section "CCU" in the chapter "RBS Field Repair".
2. If the AC mains is present on pins 20 and 21, "C. FAN", but the DX fan does not run when the compressor is activated, replace the DX fan according to instructions in the section "DX Fan" in the chapter "RBS Field Repair".

(19) Check compressor voltage

1. If the AC mains cannot be measured, check that the compressor is not too hot (≤ +77 °C or 196 °F), or that the condenser or evaporator sections are not too cold (≥ -17 °C or +1 °F) or iced over.
2. Measure the AC mains on pins 22 and 23, "COMP", on the CCU with the compressor activated.

(20) Voltage OK?

Is the measured voltage OK?

- No: Proceed to step (21).
- Yes: Proceed to step (22).

(21) Check/replace starting unit and compressor

Note: On the side of the climate unit there is a view window which lets RBS maintenance personnel test and replace the starting capacitor or the relay. The compressor can only be repaired by a qualified refrigeration specialist, or by replacing the entire climate unit.

1. Replace the CCU card according to instructions in the section "CCU" in the chapter "RBS Field Repair".
2. Activate the system and measure the voltage at pins 22 and 23, "COMP", again.
3. If the AC mains still cannot be measured on pins 22 and 23, "COMP", after replacing the CCU card, refer to Figure 43 on page 89and replace the starting capacitor on the compressor.
4. Activate the system and measure the voltage at pins 22 and 23, "COMP", again.
5. If the voltage is still incorrect, after replacing the starting unit and the capacitor for the compressor, measure the resistance on the coils in the compressor motor according to Figure 43 on page 89.

   The C must be measured when the compressor temperature is cool as excessive heat in the compressor motor will change the coil's resistance.
6. If the resistance in the coils in the compressor motor is either infinite (∞) or nearly 0 Ω (short circuit), the compressor is defective.

   Replace the entire air conditioner according to instructions in the section "Air Conditioner" in the chapter "RBS Field Repair", or call for a refrigeration specialist to replace the compressor and charge the system with coolant.

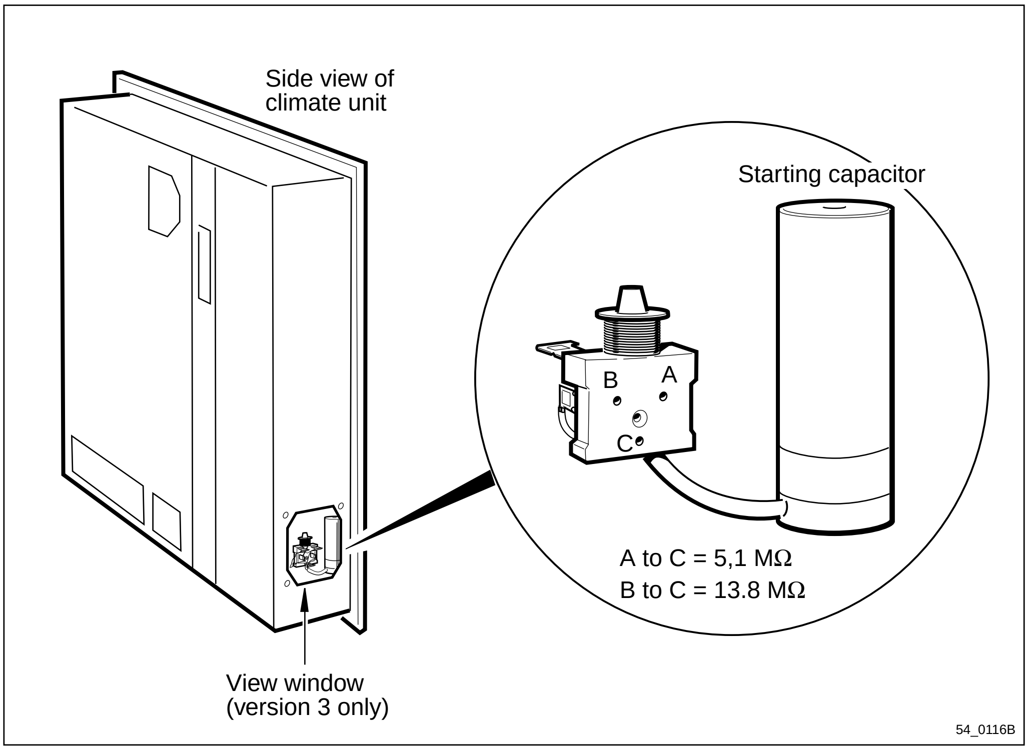


Figure 43 Starting relay and capacitor for all climate unit versions

(22) Perform climate test

Note: The climate system test should never be run if the compressor is too hot (+77 °C or +196 °F) or too cold (-17 °C or +1 °F) or if the evaporator or condenser section is iced over. The pressure valves may break.

Allow the system to warm up prior to performing the climate system test.

The climate test is the best method to activate the system without damaging the compressor or the coolant system. Perform the climate test according to the section "Climate System Test" in the chapter "Test after Repair".

(23) Passed?

Was the system test was passed successfully?

- No: Proceed to step (24).
- Yes: Proceed to step (25).

(24) Contact the supervisor

Contact the supervisor who will take further action for example:

- Instruct maintenance personnel to replace the air conditioner. Procedures for the replacement of the air conditioner can be found in the section "Air Conditioner" in the chapter "RBS Field Repair".
- Call for a refrigeration repair specialist to replace the compressor or charge the system with coolant.
- Consult an FSC.

(25) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.4.3 RBS 2102 Climate Unit – Theory of Operation

Air flow paths in the climate unit

Refer to the picture below for the location of the flow paths.

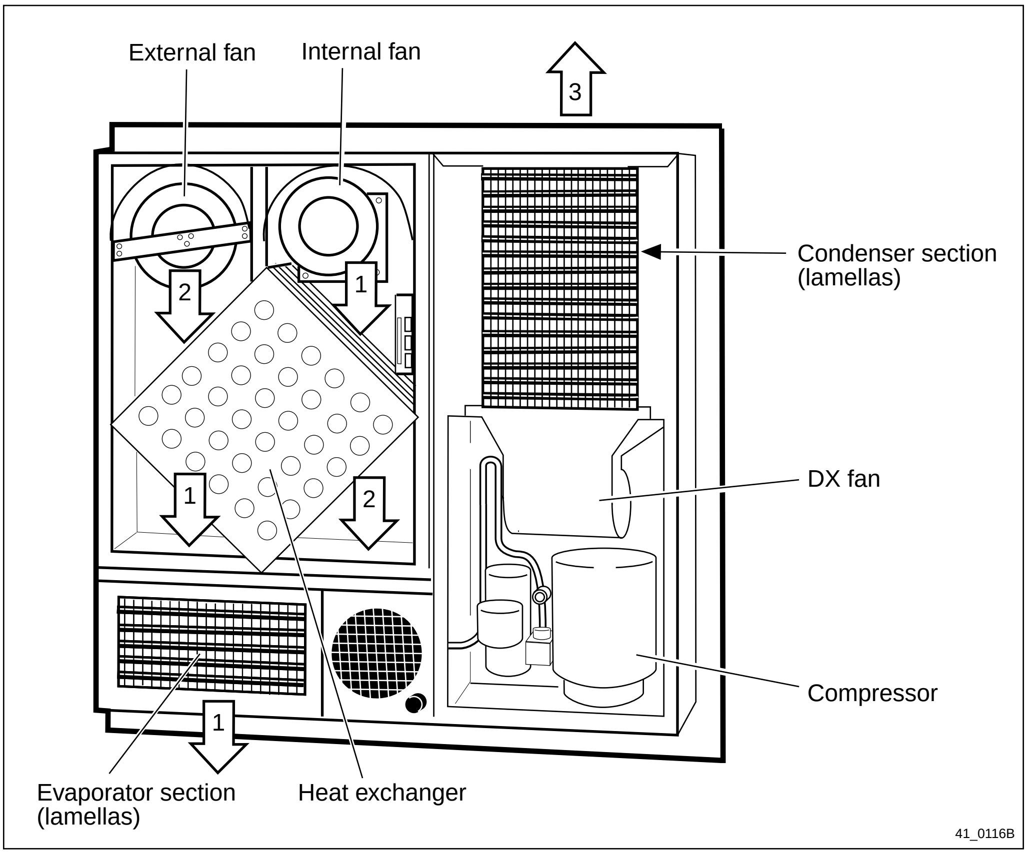


Figure 44 Air conditioner with air flow paths

Air flow path one [1] is internal air.

The air flow comes from the radio sub-cabinet fans via the centre section of the radio sub-cabinet. The air flow is drawn into the climate unit by the internal fan and flows down through the heat exchanger, out of the climate unit via the evaporator section (which also acts as a de-humidifier) and returns into the radio sub-cabinet underneath the CDUs and the battery sub-racks. Part of the air flow also enters the TM box area of the mounting base. This air flow path is constantly active when DC power is supplied to the climate unit.

It is the internal air flow path which actually cools the radio sub-cabinet. An indication of the presence of coolant within the system can be achieved by activating this air flow path and placing your hand in front of the evaporator section, see Figure 44 on page 91.

The air flow through air flow path [1] can be activated in any of the following ways.

- Climate unit version V1:
  - The internal cabinet temperature is ≥ +35 °C (+95 °F)
  - Forced activation with the climate unit tester LPB 111 142/1.
- Climate unit version V2:
  - The internal cabinet temperature is ≥ +35 °C (+95 °F)
  - Forced activation with the climate unit tester LPB 111 142/1.

- Forced activation by pressing the momentary switch on the AC interface card, see Figure 35 on page 74.

- Climate unit versions V3 and V4:

  - The internal cabinet temperature is ≥ +45 °C (+113 °F)
  - Forced activation with the climate unit tester LPB 111 142/2. Allow the test to pause at testpoint 32.

Note: The momentary button on the CCU card cannot be used. Use of this button requires that you take the cover of the heat exchanger section off. This then stops the air from the internal fan flowing through the evaporator section.

- Climate unit version V4:

  - The internal cabinet temperature is ≥ +45 °C (+113 °F)
  - Forced activation with the climate unit tester (product number is not yet defined).

Note: The momentary button on the CCU card cannot be used. Use of this button requires that you take the cover of the heat exchanger section off. This then stops the air from the internal fan flowing through the evaporator section.

Air flow path [2] is external air.

External air is drawn into the climate unit and forced down through the heat exchanger. The air flow exits the climate unit through the exhaust vent in the cabinet door.

Air flow path (2) is only active when the internal air exceeds +20 °C (+68 °F). At this temperature the current load of the external fan is nominally 1.2 A. At maximum speed (when the internal radio sub-cabinet temperature is ≥ +55 °C (+131 °F) the current load of the external fan is 2.5 A.

Note: The internal air and external air flows should never mix. If there is a damaged or missing cable gland, seal, or an improperly secured door to the TM box in either air flow path, this can cause one or more of the following problems and damages to the RBS:

• Contaminants and outside humidity can enter the radio sub-cabinet and corrode connectors and damage equipment.

• In areas where there is high humidity, this mixture of air flow paths will cause the evaporator section of the air conditioner to create excessive amounts of water, causing corrosion within the radio sub-cabinet and the mounting base.

• In areas where the external air temperature is very high, the mixing of these two air flow paths greatly reduces the efficiency of the evaporator and can directly lead to generating over-temperature, +55 °C (+131 °F), reduced cooling capacity, or air conditioner alarms.

The internal air and external air flow paths are isolated by:

- Seals around the door in the radio sub-cabinet.
- A sealing pad between the radio sub-cabinet and the mounting base.
- Cable glands (Roxtec) in the mounting base between the section containing the ACCU and the section containing the TM box.
- A door cover to the TM box.

Refer to the picture below for the location of sealing pad, cable glands, and TM box door.

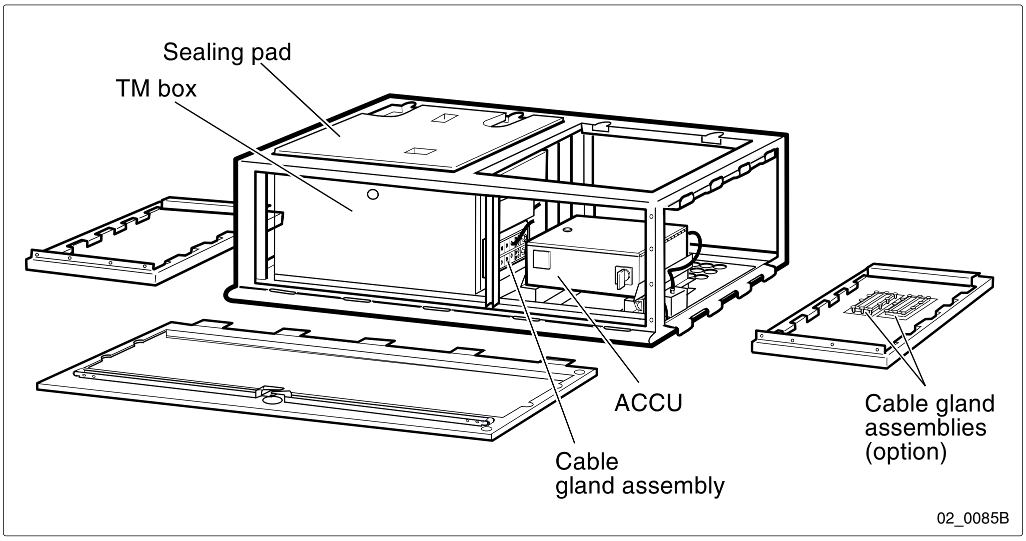


Figure 45 Seals and cable glands separating internal and external air flows

Air flow path [3] is for cooling the condenser section.

- Climate unit versions V1 and V2:

  External air is drawn into the climate unit by the DX fan. This air flow is forced by the DX fan through the condenser section. The air flow exits the cabinet via a vent on the cabinet door.

  This air flow path is only active when the internal temperature ≥ +35 °C (+95 °F), or the temperature of the coolant within the condensor section is ≥ +50 °C (+131 °F).
- Climate unit versions V3 and V4:

  This air flow path is an extension of air flow path (2). It is active whenever the external fan is operating. The external fan is operating whenever the internal cabinet temperature is ≥ +20 °C (+68 °F).

  The DX fan and the compressor are only active when the internal air temperature in the radio sub-cabinet is ≥ +45 °C (+113 °F), or the temperature of the coolant within the condensor section is ≥ +50 °C (+131 °F).

5.5 ALNA A, ALNA B, ALNA/TMA A and , ALNA/TMA B

Note: Depending on the on the system software release, the fault code can be either "ALNA A respectively ALNA B" or

"ALNA/TMA A respectively ALNA/TMA B". In all cases the procedure below is exactly the same. However, in the text below, only the designation ALNA is used. When a TMA is used, it shall be treated in the same way as the ALNA in the procedure below.

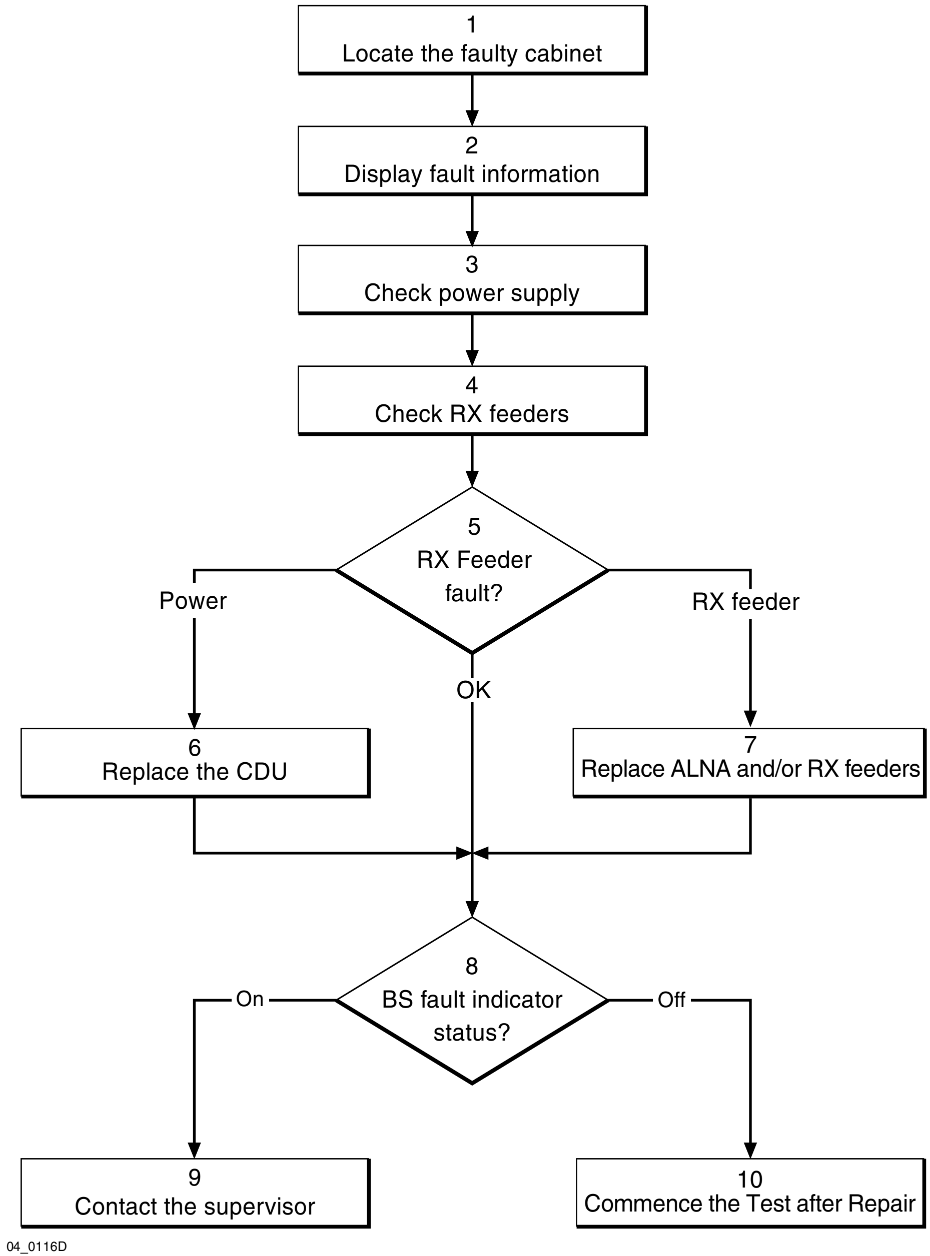


Figure 46 ALNA A and B flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(3) Check power supply

The ALNA is supplied with DC power from the CDU. The feeder is used to connect the DC power between the CDU and the ALNA. The ALNA will be pointed out as faulty if it is not supplied with voltage from the CDU.

The following method is used to measure the DC power from the CDU:

1. With a multimeter, measure the voltage according to the figure below. The correct value is 14 – 16 V DC.
2. Measure the other RX feeder inlet on the CDU.

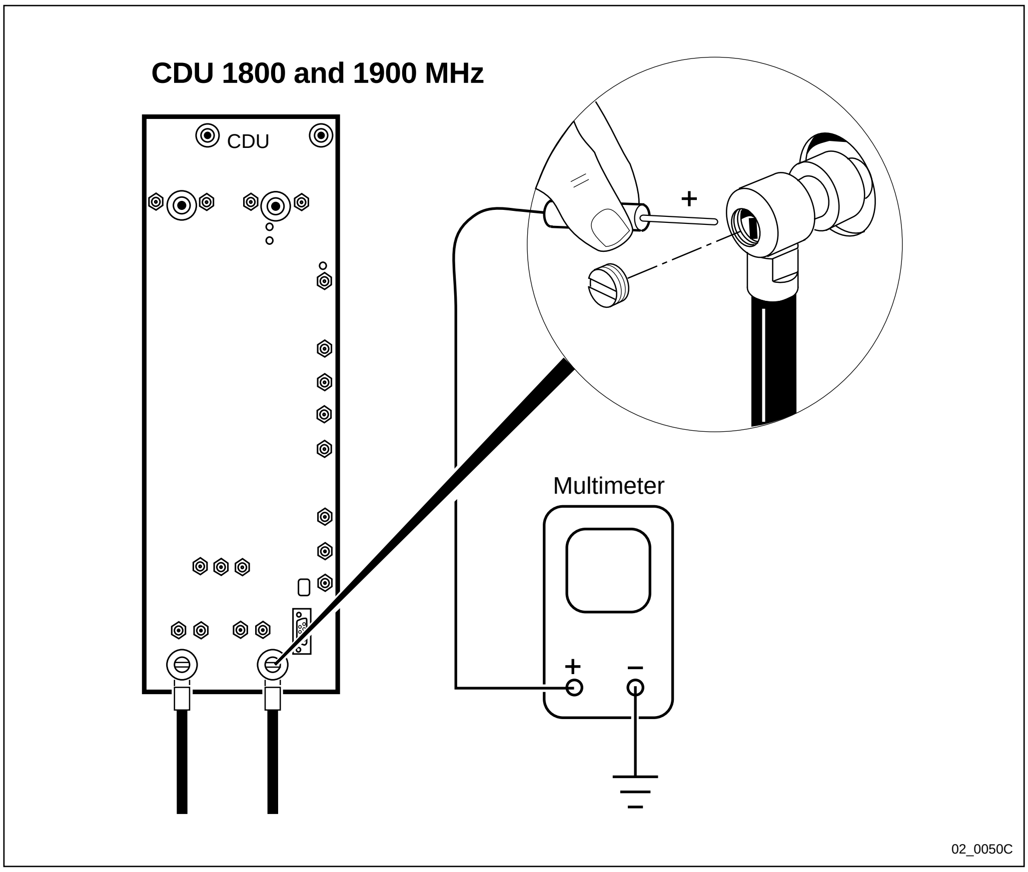


Figure 47 ALNA DC power supply measurement

(4) Check RX feeders

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent exposure to RF radiation and damage to TRUs, be sure that the Local mode indicator on the TRU has a fixed yellow light before further action is taken.

Put all TRUs connected to the CDU in step (3) into Local mode:

1. Press the Local/remote buttons on the TRUs. The Local mode indicators will start flashing.
2. Wait until the Local mode indicators have a fixed yellow light. This indicates that the TRUs connected to the CDU are in local mode.

Measure the feeder cable resistance:

WARNING

Some working areas involve the risk of accidents caused by falling objects.

Note: Follow local safety regulations when climbing antenna poles and masts. These regulations will also determine the limitations of working under severe weather conditions. Use all the prescribed Personal Protective Equipment (PPE) while doing maintenance on an antenna tower.

3. Using a multimeter, measure the resistance between the centre conductor and ground. The positive lead should be connected to the centre conductor. The typical resistance will be greater than 1 kΩ.
4. If a reading of less than 1 kΩ is measured, disconnect the feeder cable from the ALNA and measure the resistance again to verify a defective feeder cable.
5. To further isolate a fault with the feeder cable, a DTF measurement may need to be taken. For instructions on how to perform a DTF measurement, see:

Implementation and Integration Manual

(5) RX Feeder fault?

- If the power supply measurement is incorrect, proceed to step (6).
- If any of the RX feeders is found defective, proceed to step (7).
- If both checks are OK, power supply and RX feeders, proceed to step (8).

(6) Replace the CDU

Replace the CDU according to the section "CDU" in the chapter "RBS Field Repair".

(7) Replace ALNA and/or RX feeders

Replace the ALNA according to the section "ALNA" in the chapter "RBS Field Repair".

(8) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(10) Commence the Test after Repair

Take the following actions:

1. After replacing a CDU only: Make a test call according to the section "Test Call" in the chapter "Test after Repair".
2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.6 Antenna

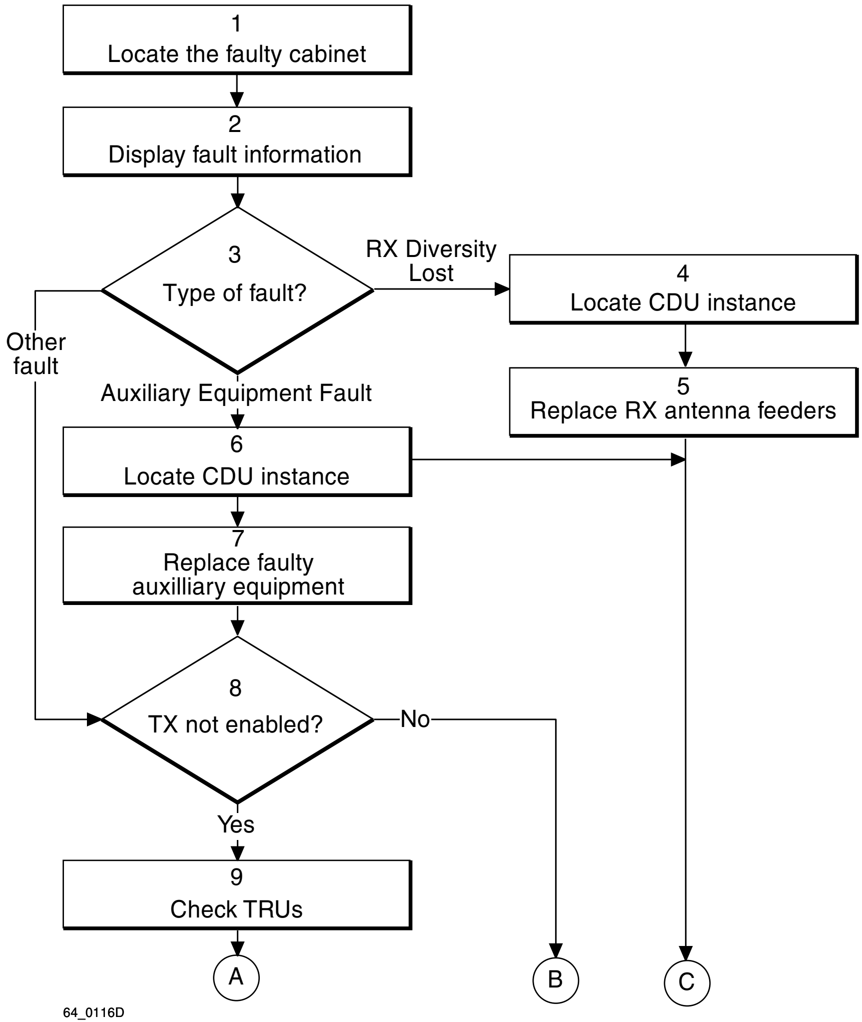
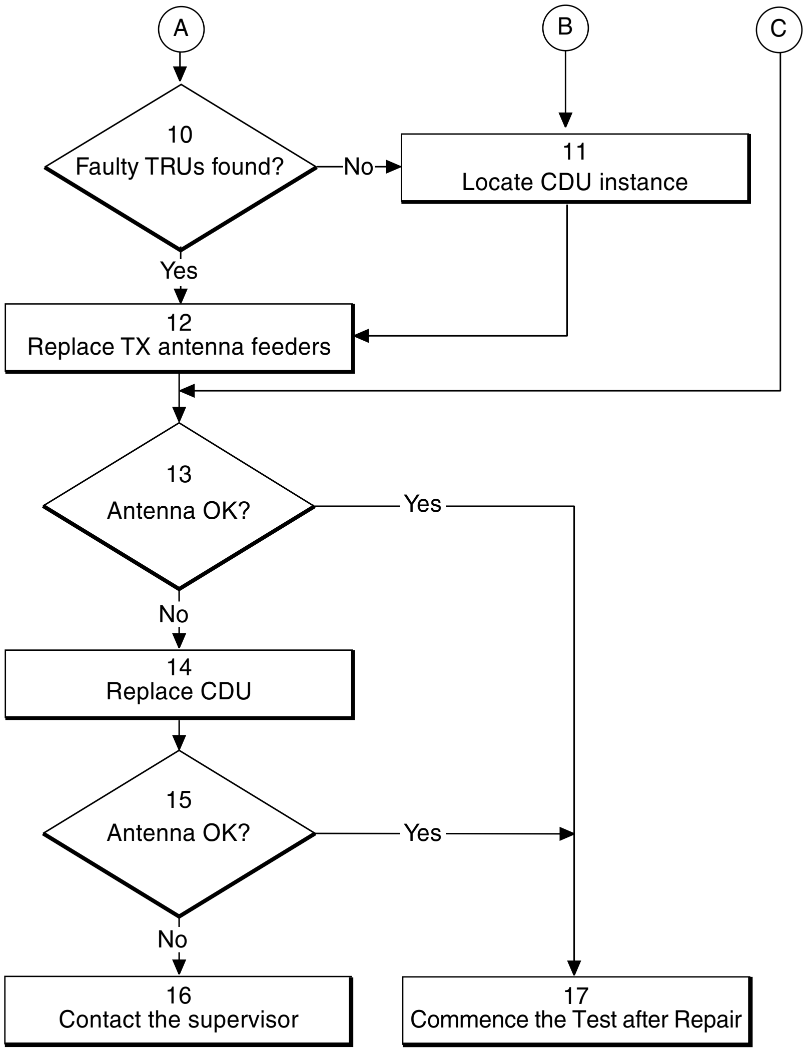


Figure 48 Antenna flowchart (part 1 of 2)



66_0116E

Figure 49 Antenna flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

1. Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

2. Use the OMT to display the type of fault: Go to the Operation menu and select "Monitor". In the RBS Monitor Setup window, select "Fault Status" and click the "Start Monitor" button.

(3) Type of fault?

Which type of fault was found in step (2)?

- "RX Diversity Lost": Proceed to step (4).
- Other fault: Proceed to step (6).

(4) Locate CDU instance

1. Select "Hardware view" in the OMT.
2. – Tick the check box "Faults".

   – Look for a red line between a CDU-object and an antenna-object.
3. When the faulty antenna instance is found, check which CDU it is connected to. This information indicates which RX antenna feeder to replace in step (5).

(5) Replace RX antenna feeders

The following instruction is valid for CDU-A and CDU-D only:

1. Replace the RXA or RXB feeder according to instructions in the section "RX Antenna Feeder" in the chapter "RBS Field Repair".
2. Proceed to step (13).

The following instructions are valid for CDU-C and CDU-C+ only:

1. Check if the CDUs in the cabinet are cross-connected via the HL connectors. If that is the case, check which outlet the RXA or RXB cable from TRU is connected to.
2. If the RXA or RXB cable is connected to outlet number 1 or outlet number 2 on the CDU, replace the RXA or RXB feeder on the CDU twin according to instructions in the section "RX Antenna Feeder"in the chapter "RBS Field Repair".
3. If the RXA or RXB cable is connected an other outlet than number 1 and number 2, or if no cross-connection is in use, replace the RXA or RXB feeder on the current CDU according to instructions in the section "RX Antenna Feeder" in the chapter "RBS Field Repair".
4. Proceed to step (13).

(6) Locate CDU instance

1. Select “Hardware view” in the OMT.
2. — Tick the check box “Faults”.

   — Look for a red line between a CDU-object and an antenna-object.
3. When the faulty antenna instance is found, check which CDU it is connected to. This information indicates which auxilliary equipment to replace in step (7).

(7) Replace the faulty auxiliary equipment

1. Replace or repair the faulty auxiliary equipment.
2. Proceed to step (13).

(8) TX not enabled?

Check all TRUs in the cabinet(s).

Are any of the "TX not enable" indicators on?

- Yes: Proceed to step (9).
- No: Proceed to step (11).

(9) Check TRUs

1. In the OMT, select "System view" and the object RBS 2000. Go to the Operation menu and select "Monitor".
2. In the RBS Monitor Setup window, select "Fault Status" and click the "Start Monitor"button.
3. Look for the alarm "TX antenna VSWR limits exceeded" in the AOTX map. This will point at which TRU(s) generated the alarm. The indicated TRU(s) should match those indicated in step (8) above.

(10) Faulty TRUs found?

Could the faulty TRU(s) be found by the OMT?

- Yes: Proceed to step (12).
- No: Proceed to step (11).

(11) Locate CDU instance

1. Select "Hardware view" in the OMT.
2. – Tick the check box "Faults".

   – Look for a red line between a CDU-object and an antenna-object.
3. When the faulty antenna instance is found, check which CDU it is connected to. This information indicates which TX antenna feeder to replace in step (10).

(12) Replace the TX antenna feeders

Replace all the TX feeders in the cell according to instructions in the section "RX and TX Antenna Feeder" in the chapter "RBS Field Repair".

(13) Antenna OK?

Use the OMT to display the type of fault: Go to the Operation menu and select "Monitor". In the RBS Monitor Setup window, select "Fault Status" and click the "Start Monitor" button.

- If the fault was "RX Diversity Lost", it will take at least 1h 40m for the fault in the RBS to cease.
- If the fault was "VSWR Limits Exceeded", the TX has to be re-initiated from the BSC.

For further information, see the section "RX and TX Antenna Feeder" in the chapter "RBS Field Repair".

Is the antenna OK?

- Yes: Proceed to step (17).
- No: Proceed to step (14).

(14) Replace the CDU

Replace the CDU according to instructions in the section "CDU"in the chapter "RBS Field Repair".

(15) Antenna OK?

Use the OMT to display the type of fault: Go to the Operation menu and select "Monitor". In the RBS Monitor Setup window, select "Fault Status" and click the "Start Monitor" button.

- If the fault was "RX Diversity Lost", it will take at least 1h 40m for the fault in the RBS to cease.
- If the fault was "VSWR Limits Exceeded", the TX has to be re-initiated from the BSC.

For further information, see the section "RX and TX Antenna Feeder" in the chapter "RBS Field Repair".

Is the antenna OK?

- Yes: Proceed to step (15).
- No: Proceed to step (14).

(16) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(17) Commence the Test after Repair

Take the following actions:

1. After replacing a CDU only: Make a test call according to the section "Test Call" in the chapter "Test after Repair".
2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.7 Battery

The fault localisation for "Battery" is divided into two subsections:

- External Batteries
- Internal/Expanded Batteries

5.7.1 External Batteries

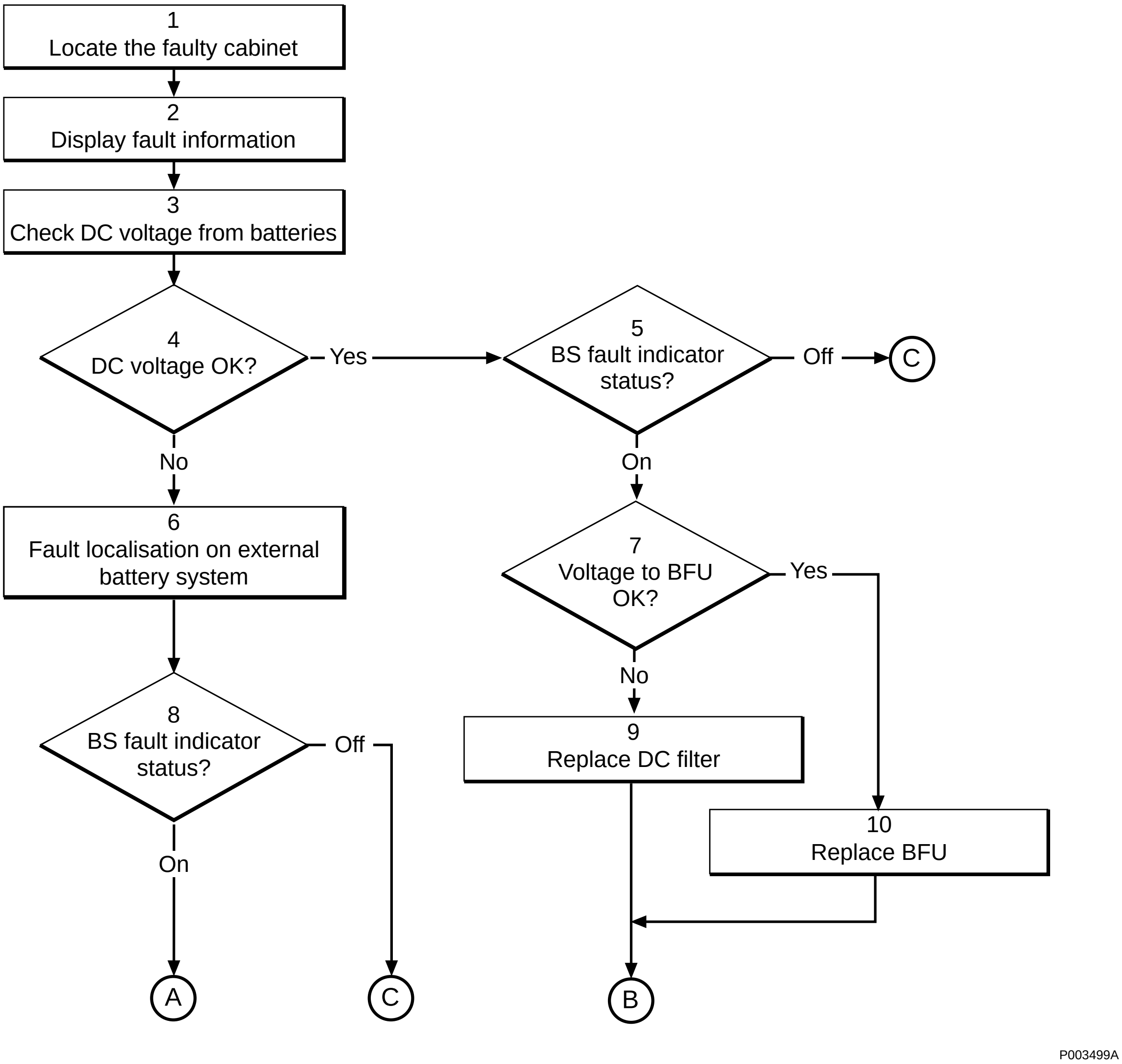


Figure 50 External batteries flowchart (part 1 of 2)

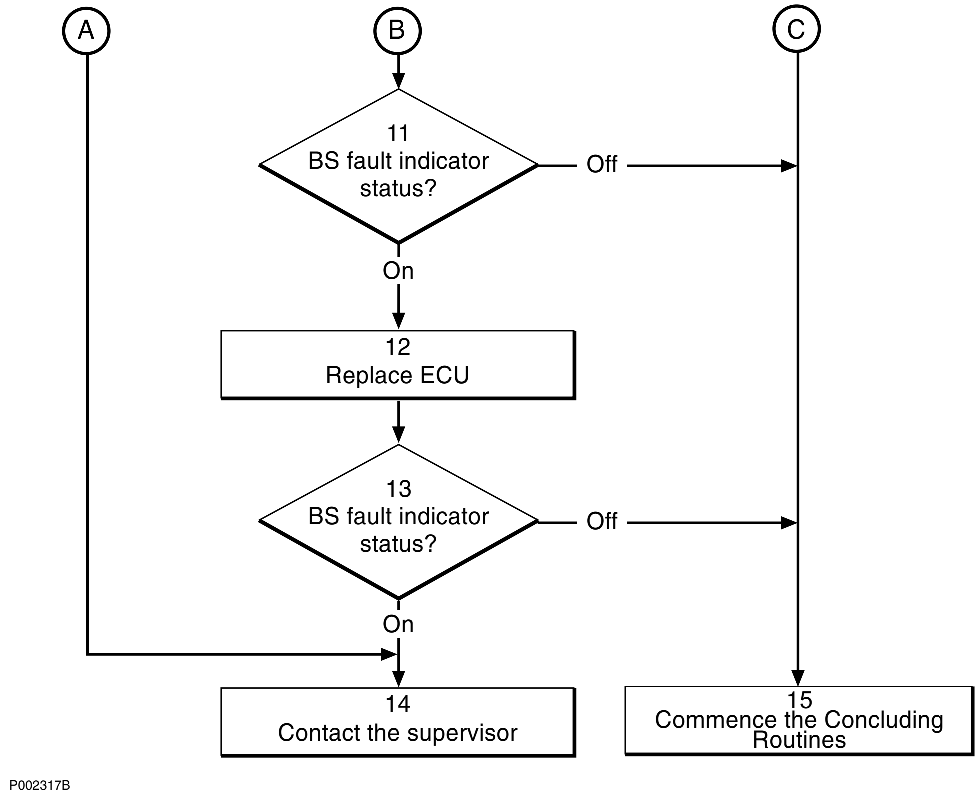


Figure 51 External batteries flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Check DC voltage from batteries

Old design

Note: This instruction applies to old RBS 2102 cabinets with a mounting base.

Open the mounting base, and measure the DC voltage from the external batteries. Refer to Figure 52 on page 105.

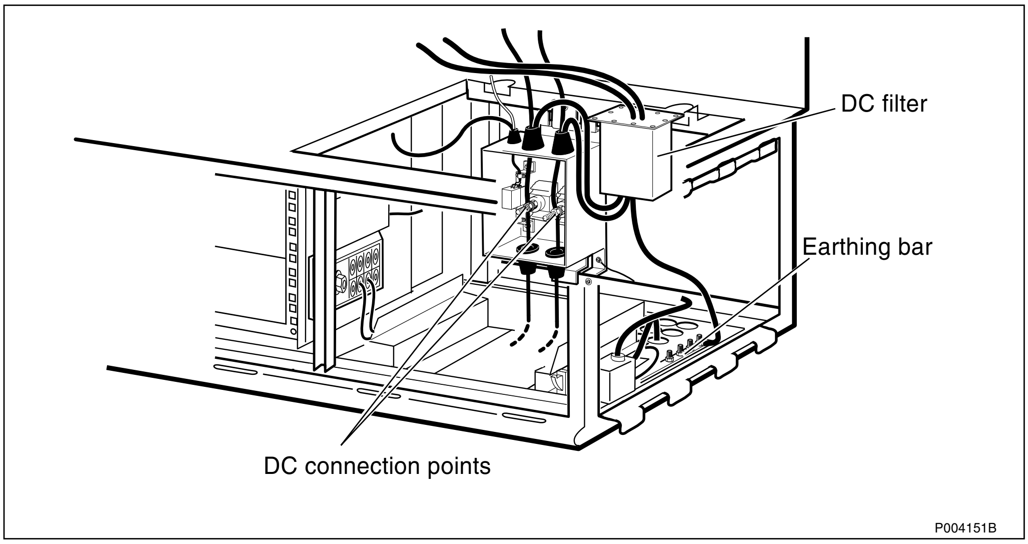


Figure 52 Measurement of DC voltage from external batteries, old design

New design

Note: This instruction applies to new RBS 2102 enlarged cabinets without a mounting base.

Remove the ACCU to access the DC connection points, and measure the DC voltage from the external batteries. Refer to Figure 53 on page 105.

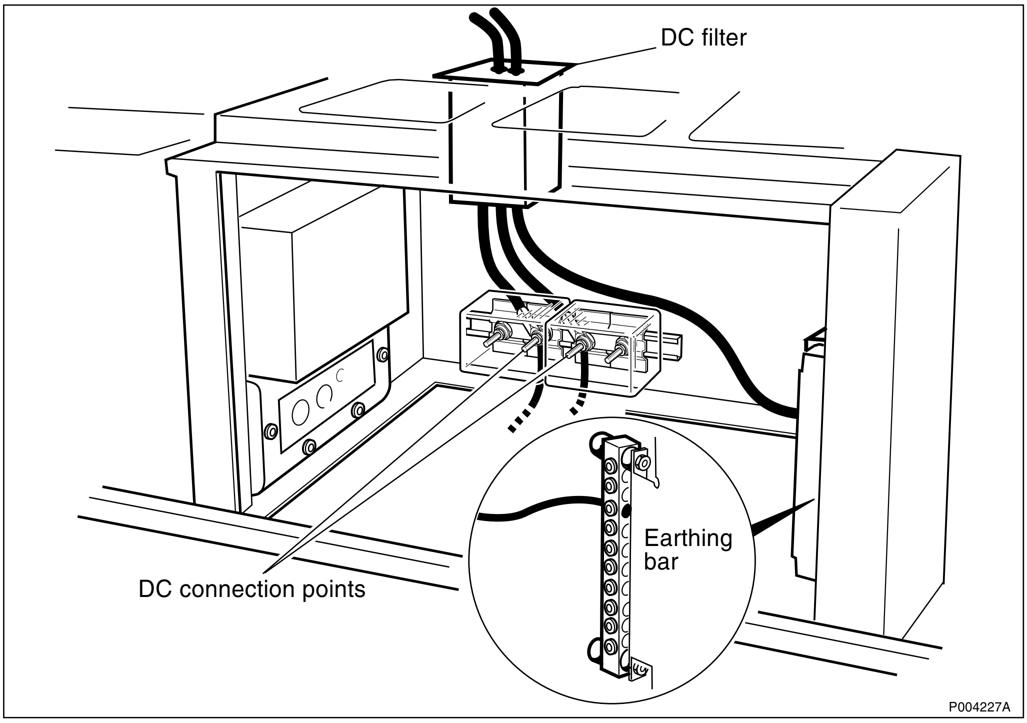


Figure 53 Measurement of DC voltage from external batteries, new design

(4) DC voltage OK?

Is the measured DC voltage OK?

- Yes: Proceed to step (5).

- No: Proceed to step (6).

(5) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (15). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(6) Fault localisation on external battery system

1. Check that the battery cable is properly connected to the RBS.
2. Check the battery cable from the external battery system to the RBS. Replace if needed.
3. Refer to local documentation to perform fault localisation on the external battery system.
4. Proceed to step (8).

(7) Voltage to BFU OK?

Remove the screws which hold the BFU to the frame and pull the BFU out. Measure the DC voltage between the lower BFU connector and earth. Refer to figure Figure 54 on page 106.

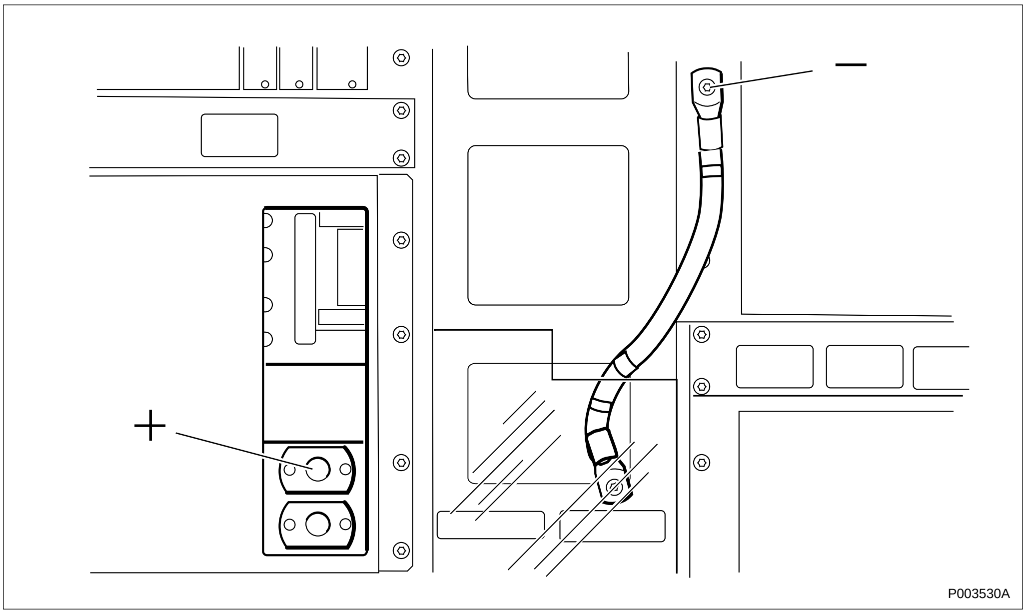


Figure 54 Measurement of battery voltage on BFU terminals

Is the measured DC voltage OK?

- Yes: Proceed to step (10).
- No: Proceed to step (9).

(8) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (15). No fault is detected in the RBS.
- On: Proceed to step (14). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Replace DC filter

1. Replace the DC filter according to instructions in the section "DC Filter" in the chapter "RBS Field Repair".
2. Proceed to step (11).

(10) Replace BFU

Replace the BFU according to instructions in the section "BFU"in the chapter "RBS Field Repair".

(11) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (15). No fault is detected in the RBS.
- On: Proceed to step (12). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(12) Replace ECU

Replace the ECU according to instructions in the section "ECU"in the chapter "RBS Field Repair".

(13) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (15). No fault is detected in the RBS.
- On: Proceed to step (14). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(14) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(15) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.7.2 Internal/Expanded Batteries

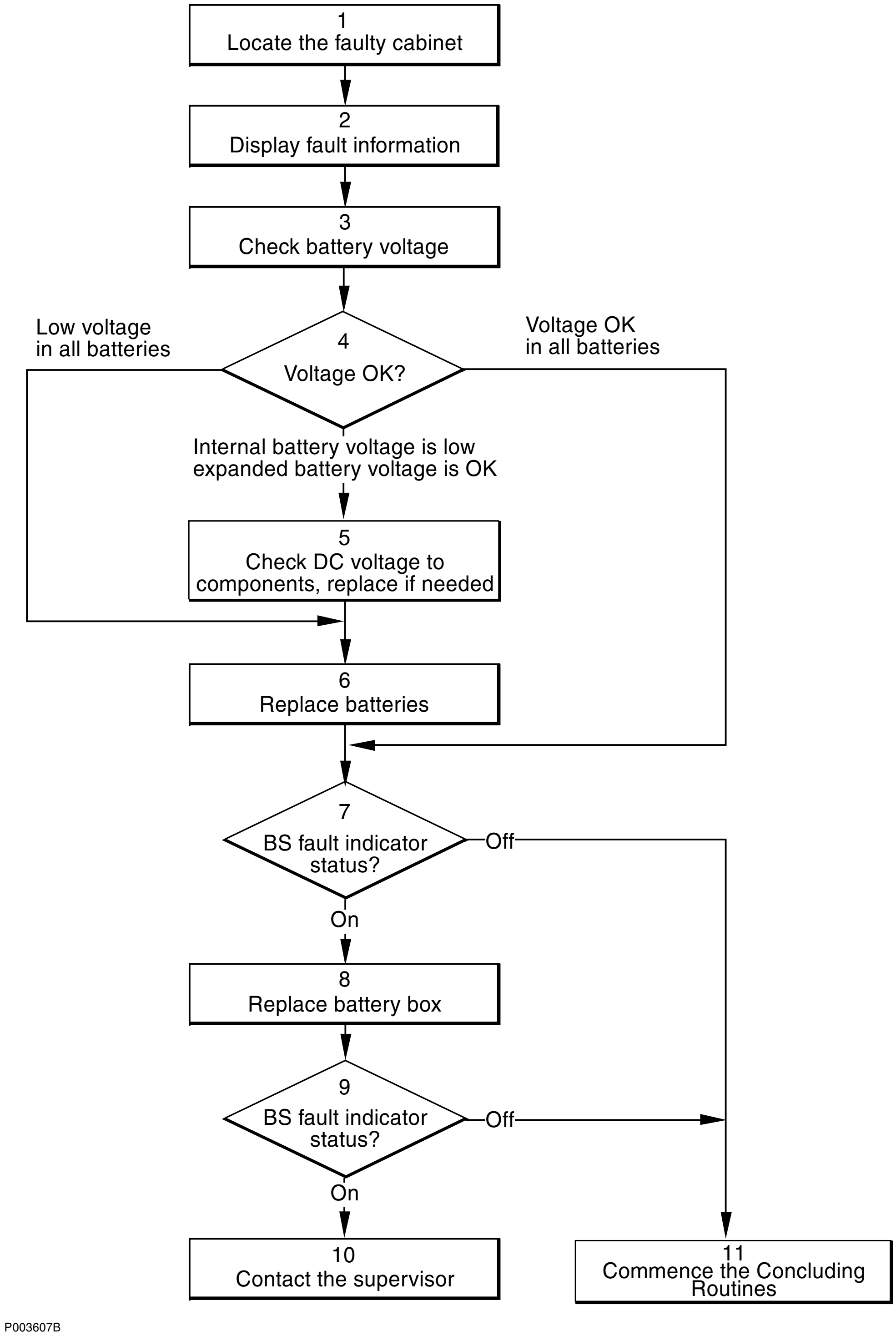


Figure 55 Internal/expanded batteries flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Check battery voltage

Measure the voltage on the battery poles. If the RBS is equipped with expanded batteries, check the voltage on both internal and expanded batteries.

(4) Voltage OK?

Voltage status?

- Low voltage in all batteries: Proceed to step (6).
- Internal battery voltage is low, expanded battery voltage is OK: Proceed to step (5).
- Voltage OK in all batteries: Proceed to step (7).

(5) Check DC voltage to components, replace if needed

1. Refer to Figure 56 on page 110 or Figure 57 on page 111and measure the DC voltage at the end points of the expanded battery cable (at the connection points). If the voltage is OK, proceed to step 2.

   If the voltage is low, replace the battery cables. Repeat the measurement after replacement and proceed to step 2.

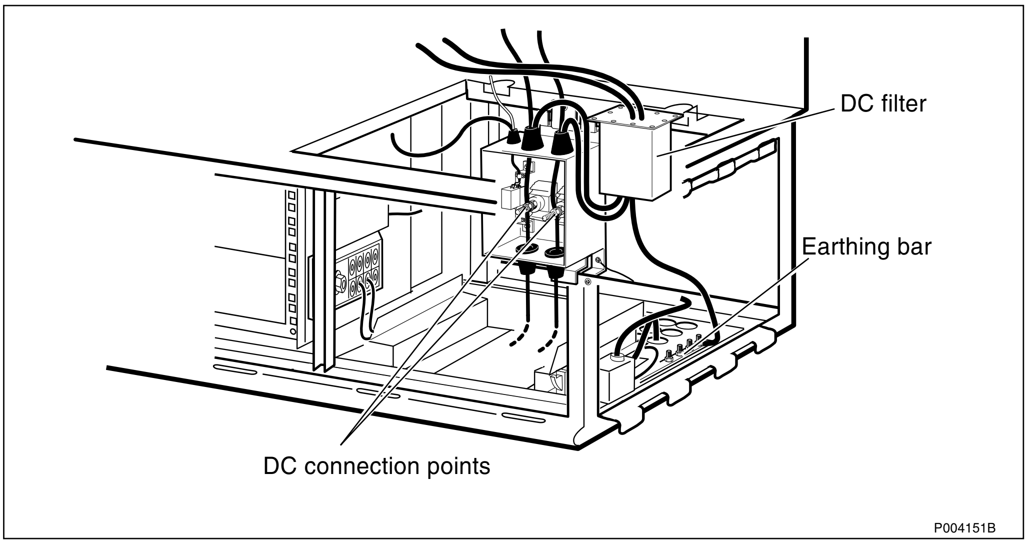


Figure 56 Measurement of battery voltage on connection points, old design

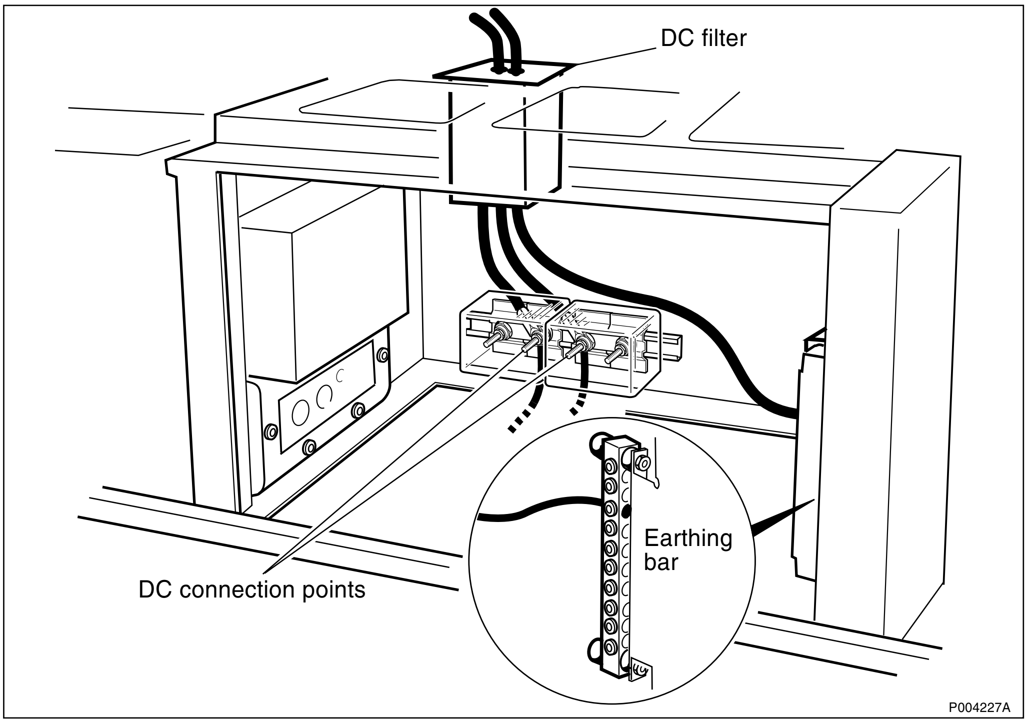


Figure 57 Measurement of battery voltage on connection points, new design

2. Refer to Figure 58 on page 111 and measure the DC voltage on the BFU terminals. If the voltage is low, replace the DC filter according to instructions in the section "DC Filter" in the chapter "RBS Field Repair". Repeat the measurement after replacing the DC filter.

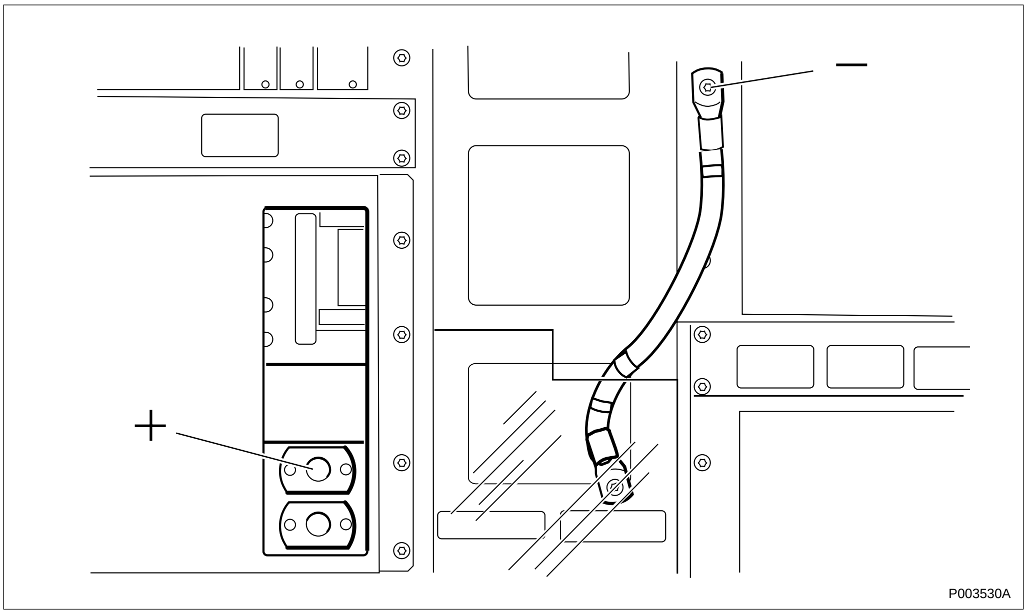


Figure 58 Measurement of battery voltage on BFU terminals

(6) Replace batteries

Replace all batteries according to instructions in the section "Batteries" in the chapter "RBS Field Repair".

(7) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (8). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(8) Replace battery box

Replace the faulty internal battery box according to instructions in the section "Batteries" in the chapter "RBS Field Repair".

(9) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (10). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(10) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(11) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.8 BFU

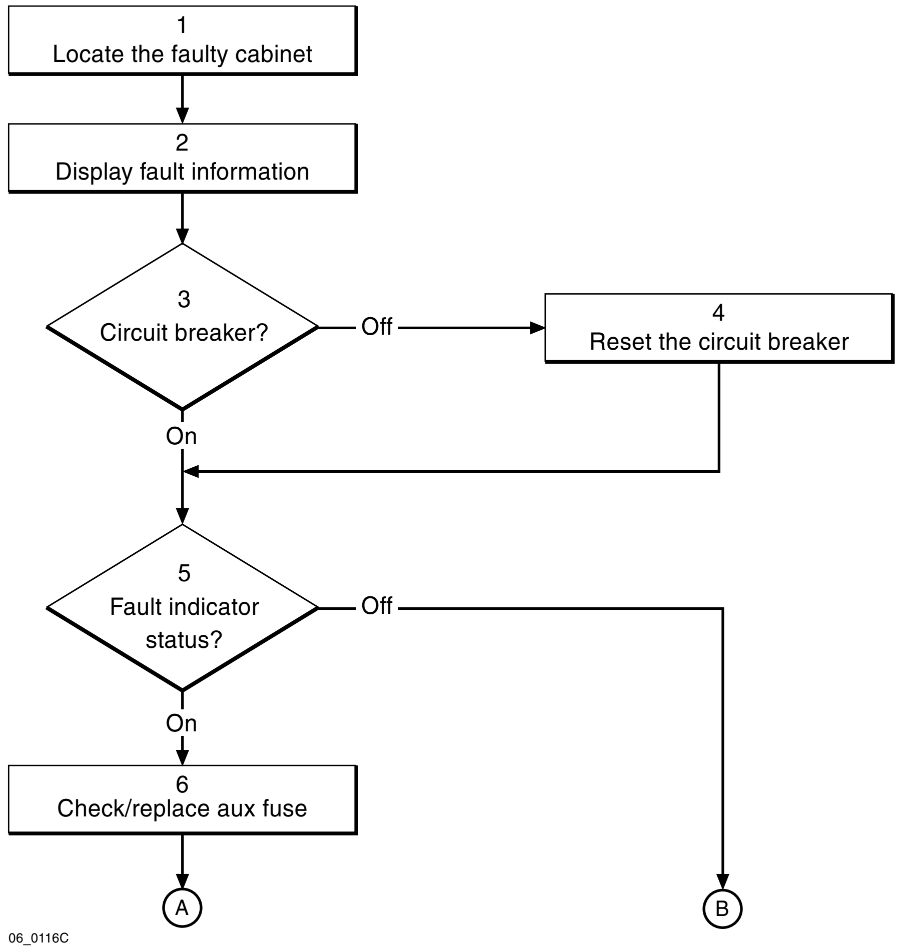


Figure 59 BFU flowchart (part 1 of 2)

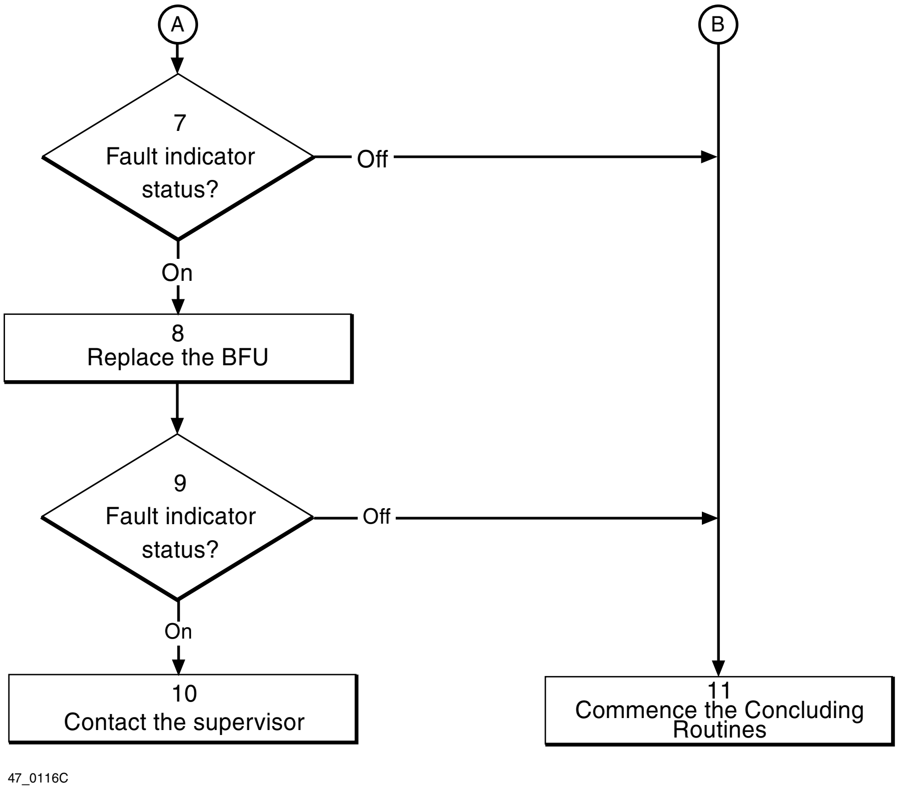


Figure 60 BFU flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Circuit breaker?

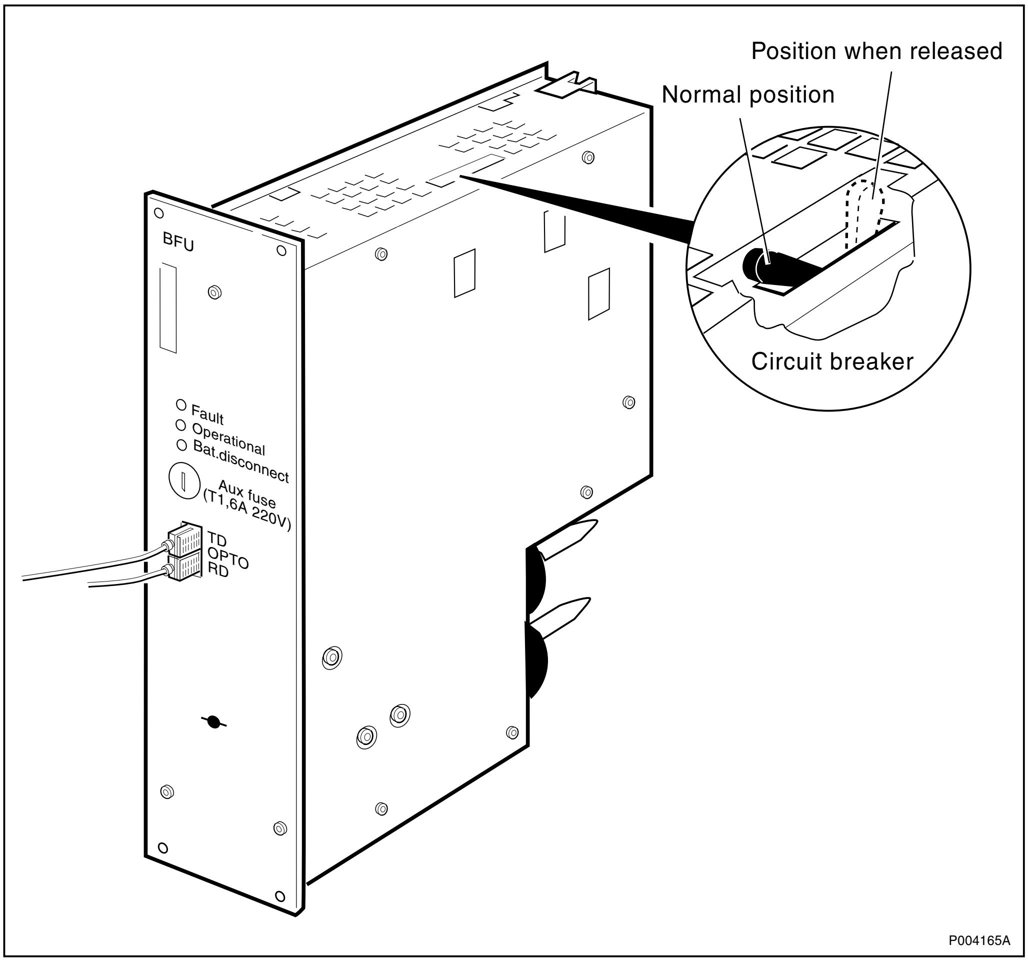


Figure 61 BFU with circuit breaker

The BFU is equipped with a circuit breaker.

Is the circuit breaker released?

- No: Proceed to step (5).
- Yes: Proceed to step (4).

(4) Reset the circuit breaker

Refer to the picture above and reset the circuit breaker. This can be done by, for example, using a screwdriver.

(5) Fault indicator status?

The red indicator labelled Fault on the BFU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (11). No fault is detected in the BFU.
- On: Proceed to step (6). One or more faults are detected in the BFU.
- *BFU revision R2A or later*. Flashing (red Fault indicator): Proceed to step (6). The BFU has lost communication with the ECU.

- *BFU revision R1A.*Flashing (green Operational indicator): Proceed to step (6). The BFU has lost communication with the ECU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (6). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(6) Check/replace aux fuse

Check the auxiliary fuse on the front of the BFU, replace when needed.

(7) Fault indicator status?

The red indicator labelled Fault on the BFU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (11). No fault is detected in the BFU.
- On: Proceed to step (8). One or more faults are detected in the BFU.
- Flashing (red Fault indicator): Proceed to step (8). The BFU has lost communication with the ECU (BFU revision R2A or later).
- Flashing (green Operational indicator): Proceed to step (8). The BFU has lost communication with the ECU (BFU revision R1A).

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (8). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(8) Replace the BFU

Replace the faulty BFU according to instructions in the section "BFU" in the chapter "RBS Field Repair".

(9) Fault indicator status?

The red indicator labelled Fault on the BFU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (11). No fault is detected in the BFU.
- On: Proceed to step (8). One or more faults are detected in the BFU.
- Flashing (red Fault indicator): Proceed to step (8). The BFU has lost communication with the ECU (BFU revision R2A or later).
- Flashing (green Operational indicator): Proceed to step (8). The BFU has lost communication with the ECU (BFU revision R1A).

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (8). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(10) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(11) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.9 CAB HLIN Cable

Refer to "CDU HLOUT HLIN Cable", Section 5.13 on page 128.

5.10 CDU

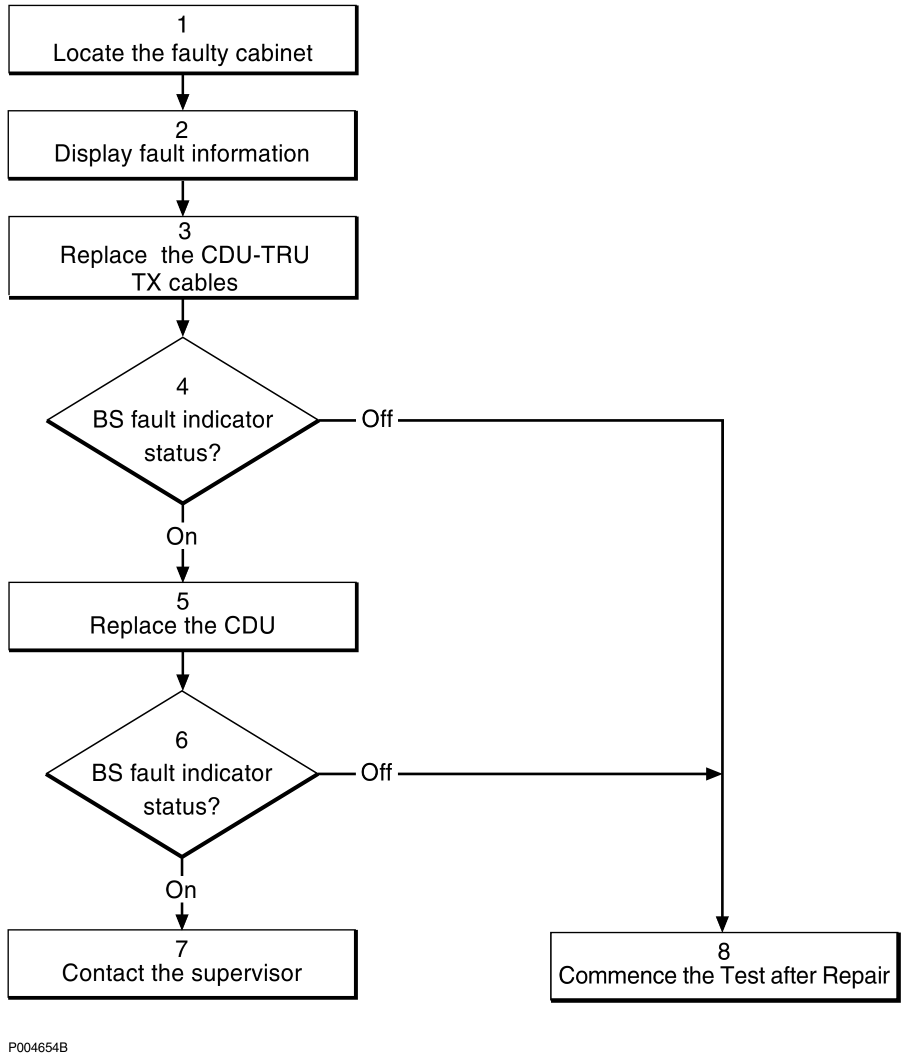


Figure 62 CDU flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Replace the CDU-TRU TX cables

Replace one or both CDU-TRU TX cables according to instructions in the section "CDU-TRU TX Cables" in the chapter "RBS Field Repair".

(4) BS fault indicator status?

The red indicator labelled Fault on the CDU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (8). No fault is detected in the CDU.
- On: Proceed to step (5). One or more faults are detected in the CDU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace the CDU

Replace the faulty CDU according to instructions in the section "CDU" in the chapter "RBS Field Repair".

(6) BS fault indicator status?

The red indicator labelled Fault on the CDU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (8). No fault is detected in the CDU.
- On: Proceed to step (7). One or more faults are detected in the CDU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(8) Commence the Test after Repair

Take the following actions:

1. Make a test call over the CDU concerned according to the section "Test Call" in the chapter "Test after Repair".

2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.11 CDU Bus

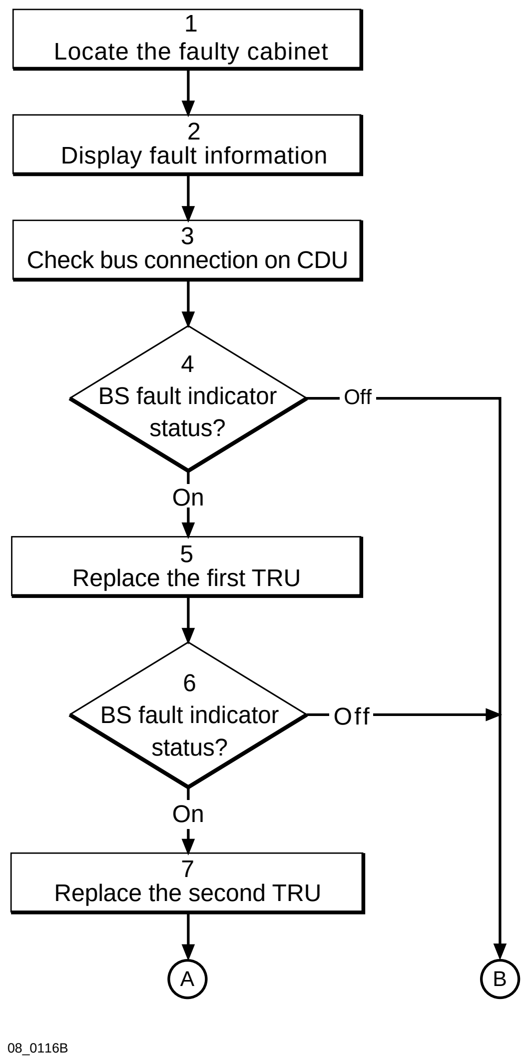


Figure 63 CDU bus flowchart (part 1 of 2)

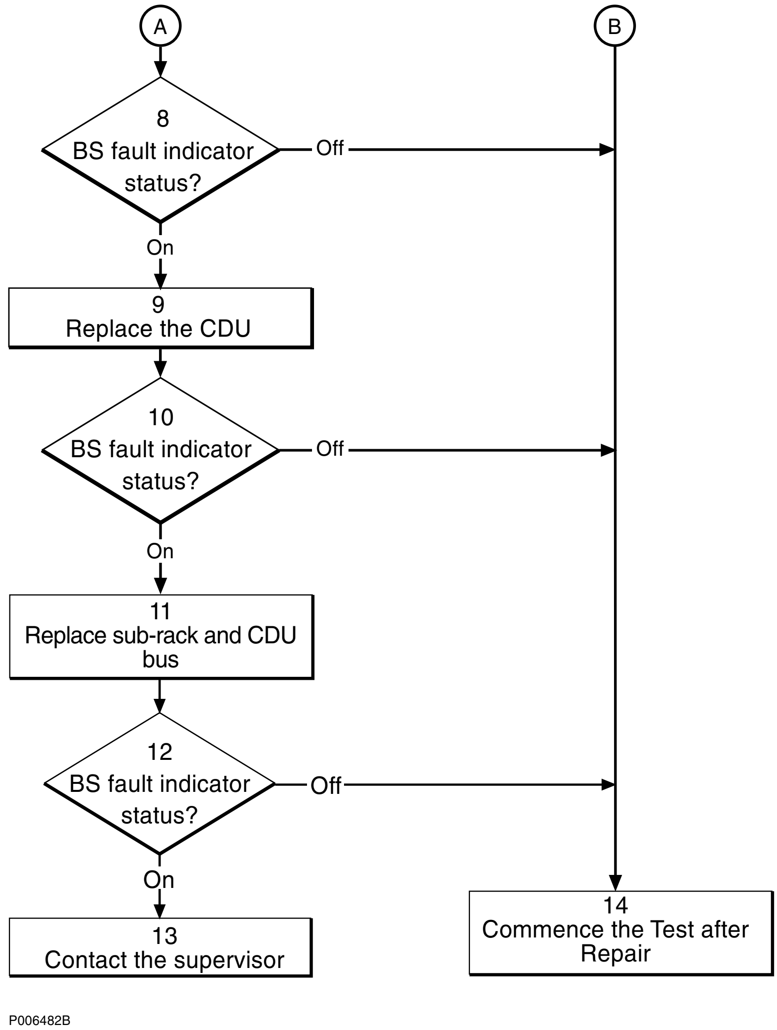


Figure 64 CDU bus flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

Note: When using CDU-C in an extension cabinet with for example a 1+4+1 configuration, one TRU can be connected to two CDUs (cable RPM 513 1396/1). The CDU bus number will then be the same as the lowest numbered CDU.

For example, if TRU 1 is connected to CDU 1 and CDU 2. The CDU bus number then is CDU 1.

- CDU bus 1 is connected to CDU 1.
- CDU bus 2 is connected to CDU 2.
- CDU bus 3 is connected to CDU 3.

(3) Check bus connection on CDU

Check that the connection between the CDU bus and the CDU is OK.

(4) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (14). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace the first TRU

Replace one of the TRUs (that connects to the suspected CDU bus) according to instructions in the section "TRU" in the chapter "RBS Field Repair".

- CDU bus 1 is connected to TRU 1 and TRU 2.
- CDU bus 2 is connected to TRU 3 and TRU 4.
- CDU bus 3 is connected to TRU 5 and TRU 6.

Note: When using CDU-C in an extension cabinet with for example a 1+4+1 configuration, one TRU can be connected to two CDUs (cable RPM 513 1396/1). The CDU bus number will then be the same as the lowest numbered CDU.

For example, if TRU 1 is connected to CDU 1 and CDU 2. The CDU bus number then is CDU 1.

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

(6) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (7). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Replace the second TRU

Replace the other TRU (that connects to the suspected CDU bus) according to instructions in the section "TRU" in the chapter "RBS Field Repair".

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

(8) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (14). No fault is detected in the RBS.
- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Replace the CDU

Replace the CDU (that connects to the suspected CDU bus) according to instructions in the section "CDU" in the chapter "RBS Field Repair".

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

(10) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (14). No fault is detected in the RBS.
- On: Proceed to step (11). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(11) Replace sub-rack and CDU bus

The fault is located in the backplane or in the CDU bus.

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

1. Replace the TRU sub-rack according to instructions in the section "TRU Sub-Rack" in the chapter "RBS Field Repair".
2. Replace the CDU bus.

(12) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (14). No fault is detected in the RBS.
- On: Proceed to step (13). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(13) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(14) Commence the Test after Repair

Take the following actions:

1. Make a test call over the CDU that connects to the CDU bus concerned according to instructions in the section "Test Call" in the chapter "Test after Repair".
2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.12 CDU-D RUs

Note: This procedure is common for the three RUs in the CDU-D: CU, DU and FU (FUd).

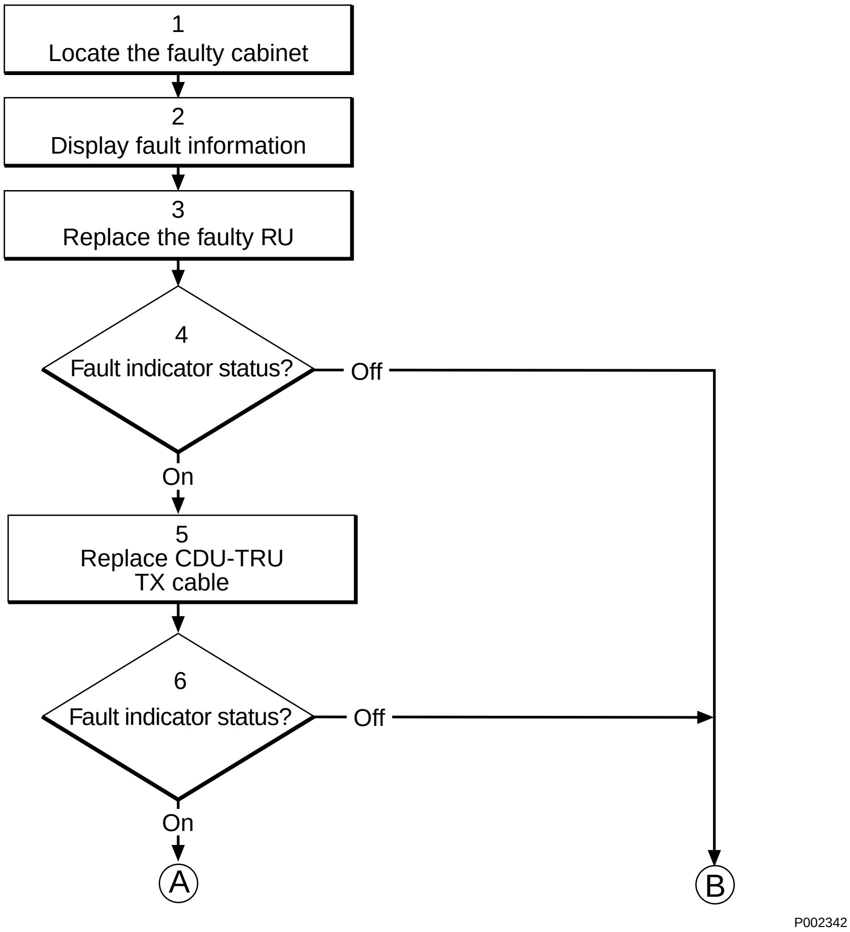


Figure 65 CDU-D RUs flowchart (part 1of 2)

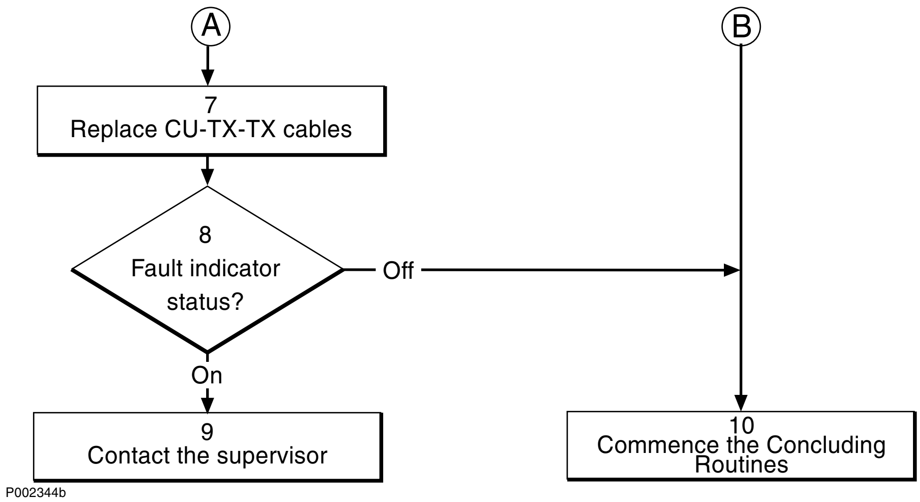


Figure 66 CDU-D RUs (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Replace the faulty RU

Replace the faulty RU according to instructions in the section "CDU-D RUs" in the chapter "RBS Field Repair".

Note: If the unit to be replaced is a DU and part of an extension cabinet system using ALNA, always work in the master cabinet first, then in the extension cabinet.

(4) Fault indicator status?

The red indicator labelled Fault on an RU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RU.
- On: Proceed to step (5). One or more faults are detected in the RU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace CDU-TRU TX cables

Replace one or both CDU-TRU TX cables according to instructions in the section "CDU-TRU TX Cables" in the chapter "RBS Field Repair".

(6) Fault indicator status?

The red indicator labelled Fault on an RU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RU.

- On: Proceed to step (7). One or more faults are detected in the RU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Replace CU-TX-TX cables

Replace one or both CU-TX-TX cables according to instructions in the section "CU-TX-TX Cable" in the chapter "RBS Field Repair".

(8) Fault indicator status?

The red indicator labelled Fault on an RU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RU.
- On: Proceed to step (9). One or more faults are detected in the RU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(10) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.13 CDU HLOUT HLIN Cable

Note: This procedure is common for the two RUs CDU HLOUT HLIN Cable and CAB HLIN Cable. CAB HLIN Cable connects the master and the extension cabinet.

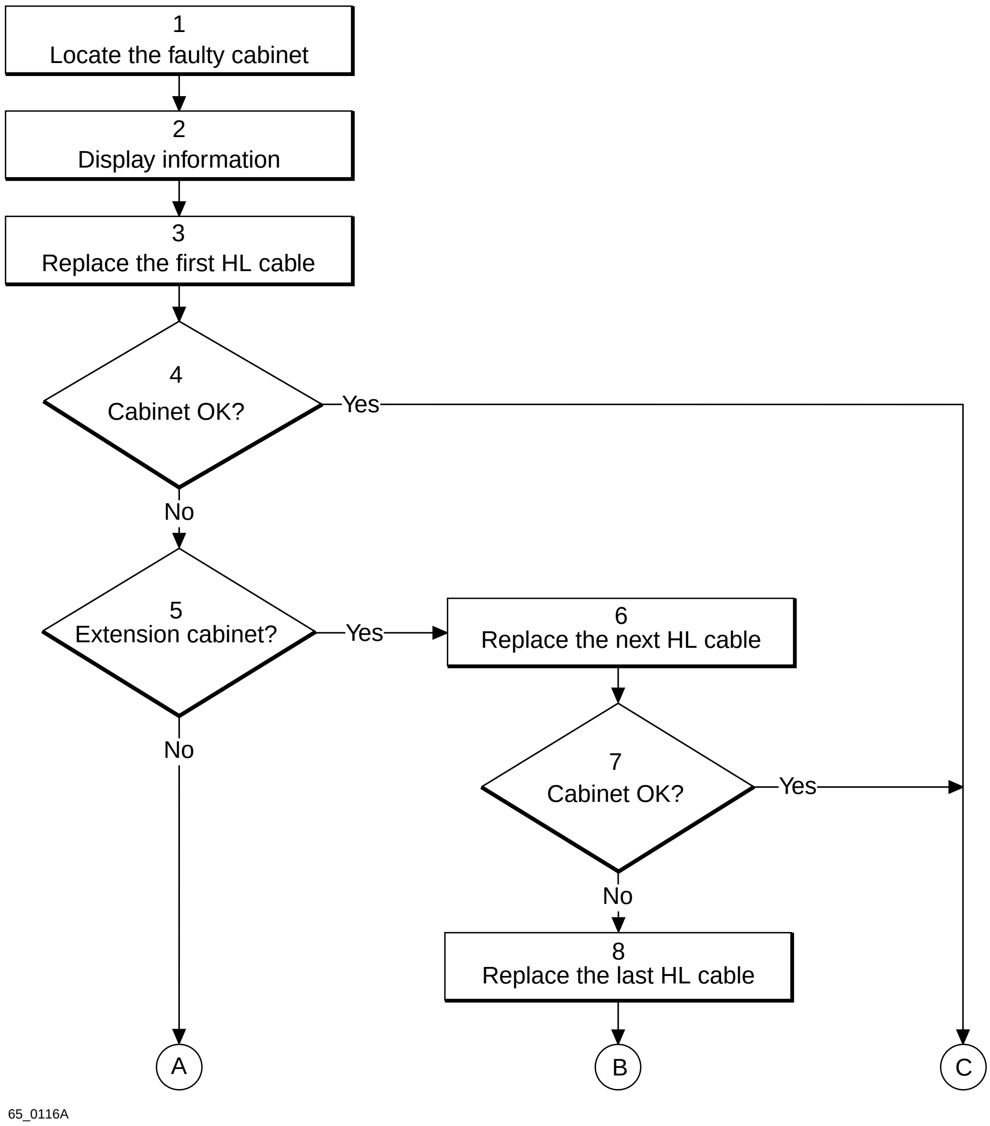


Figure 67 CDU HLOUT HLIN cable flowchart (part 1 of 2)

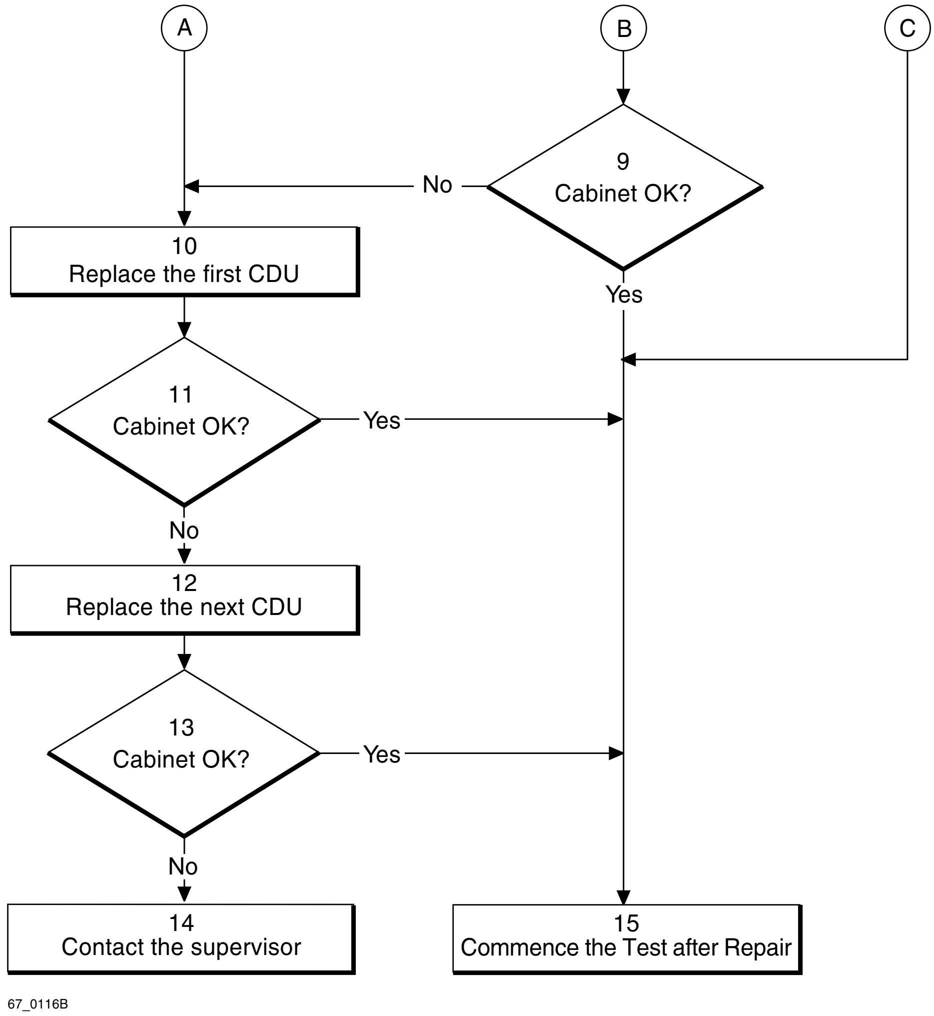


Figure 68 CDU HLOUT HLIN cable flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

1. Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also determines whether the fault is in the master cabinet, or in an extension cabinet (if connected).

2. Search for "Fault Status CDU HLOUT HLIN#1". For example, if number 0 is faulty, it means that the faulty cable is connected to the HLOUT connector on CDU 0.

(3) Replace the first HL cable

Replace the faulty HL cable that is connected between the CDUs or between the CDU and the connection field if an extension cabinet is used. See instructions in the section "HLIN and HLOUT Cables" in the chapter "RBS Field Repair".

(4) Cabinet OK?

Use the OMT to list all RUs that are faulty. Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". Check in particular that the fault "22 CDU HLOUT HLIN cable" has disappeared from the SO CF Replacement Unit Map.

Has the fault disappeared and is the RBS free from other faults?

- No: Proceed to step (5).
- Yes: Proceed to step (15).

(5) Extension cabinet?

Is there an extension cabinet connected?

- No: Proceed to step (10).
- Yes: Proceed to step (6).

(6) Replace the next HL cable

Replace the HL cable that connects the extension cabinet to the master cabinet (CAB HLIN Cable) according to instructions in the section "HLIN and HLOUT Cables" in the chapter "RBS Field Repair".

(7) Cabinet OK?

Use the OMT to list all RUs that are faulty. Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". Check in particular that the fault "22 CDU HLOUT HLIN cable" has disappeared from the SO CF Replacement Unit Map.

Has the fault disappeared and is the RBS free from other faults?

- No: Proceed to step (8).
- Yes: Proceed to step (15).

(8) Replace the last HL cable

Replace the faulty HL cable that is connected between the CDU and the connection field in the extension cabinet according to instructions in the section "HLIN and HLOUT Cables" in the chapter "RBS Field Repair".

(9) Cabinet OK?

Use the OMT to list all RUs that are faulty. Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". Check in particular that the fault "22 CDU HLOUT HLIN cable" has disappeared from the SO CF Replacement Unit Map.

Has the fault disappeared and is the RBS free from other faults?

- No: Proceed to step (10).
- Yes: Proceed to step (15).

(10) Replace the first CDU

Replace the CDU with the faulty HL cable according to instructions in the section "CDU" in the chapter "RBS Field Repair".

(11) Cabinet OK?

Use the OMT to list all RUs that are faulty. Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". Check in particular that the fault "22 CDU HLOUT HLIN cable" has disappeared from the SO CF Replacement Unit Map.

Has the fault disappeared and is the RBS free from other faults?

- No: Proceed to step (12).
- Yes: Proceed to step (15).

(12) Replace the next CDU

Replace the CDU that the other end of the HL cable is connected to according to instructions in the section "CDU" in the chapter "RBS Field Repair".

(13) Cabinet OK?

Use the OMT to list all RUs that are faulty. Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". Check in particular that the fault "22 CDU HLOUT HLIN cable" has disappeared from the SO CF Replacement Unit Map.

Has the fault disappeared and is the RBS free from other faults?

- No: Proceed to step (14).
- Yes: Proceed to step (15).

(14) Contact the supervisor

Contact the supervisor or manager who will take further action, for example consult an FSC.

(15) Commence the Test after Repair

If the CDU has been replaced, a test call has also to be made. See the section *Test Call* in the chapter *Test after Repair*.

Then proceed to the section *Before Leaving the Site* in the chapter *Concluding Routines*.

5.14 CDU RX in Cable

Note: In configurations with *CDU-C+ and duplexer*, the cable DPX RXIN is, in case of malfunction, also identified as CDU RX in cable in the SO CF, replacement unit map. However, the OMT can distinguish between the two cables. The fault handling procedure is common for the DPX RXIN and CDU RX in cables. See also the section "CDU-C+" in the chapter "Cable Connections".

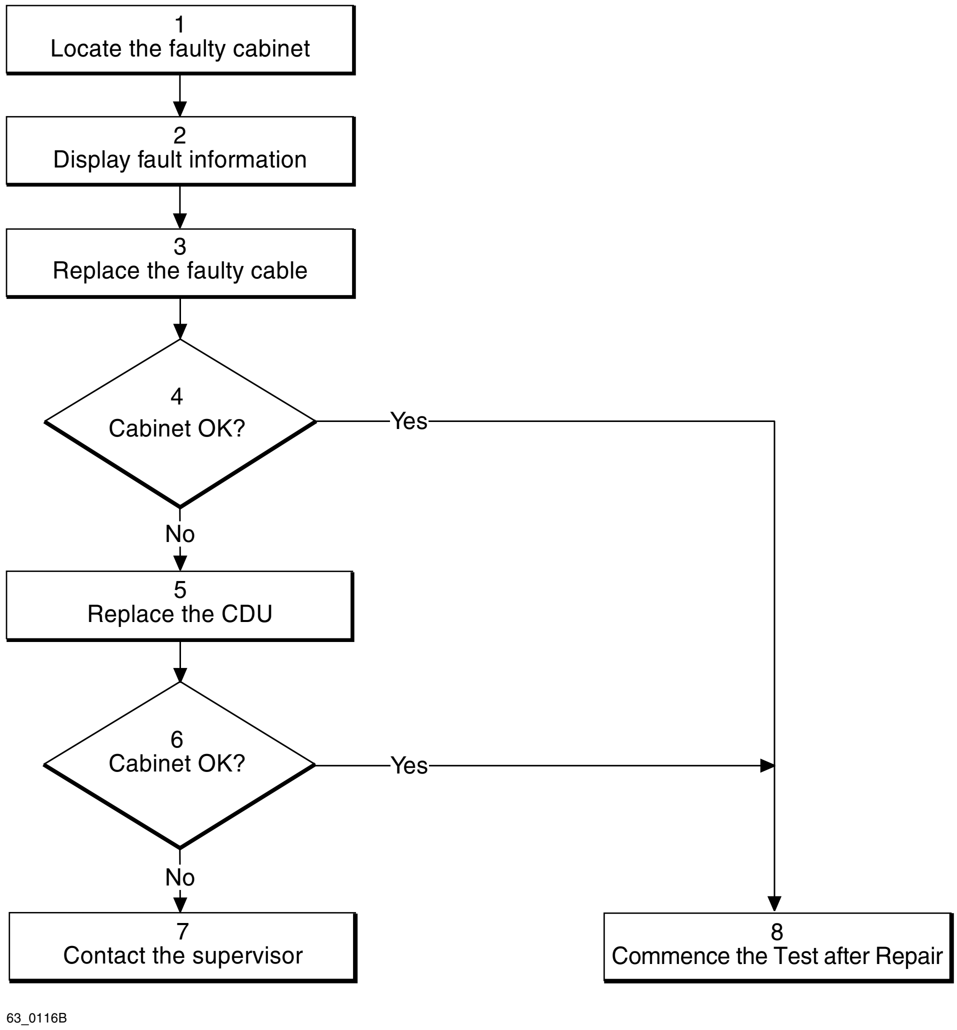


Figure 69 CDU RX in cable flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

1. Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also determines whether the fault is in the master cabinet, or in an extension cabinet (if connected).

2. Search for "Fault Status CDU RX IN #1". For example, if CDU RX IN CABLE 2 is faulty, it means that the faulty cable is located on CDU 2.

(3) Replace the faulty cable

Replace the faulty cable according to instructions in the section "CDU-TRU RX Cables" in the chapter "RBS Field Repair".

(4) Cabinet OK?

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". Check in particular that the fault "23 CDU RX in cable" has disappeared from the SO CF Replacement Unit Map.

Has the fault disappeared and is the RBS free from other faults?

- No: Proceed to step (5).
- Yes: Proceed to step (8).

(5) Replace the CDU

Replace the CDU according to instructions in the section "CDU"in the chapter "RBS Field Repair".

(6) Cabinet OK?

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". Check in particular that the fault "23 CDU RX in cable" has disappeared from the SO CF Replacement Unit Map.

Has the fault disappeared and is the RBS free from other faults?

- No: Proceed to step (7).
- Yes: Proceed to step (8).

(7) Contact the supervisor

Contact the supervisor or manager who will take further action, for example consult an FSC.

(8) Commence the Test after Repair

If the CDU has been replaced, a test call must be performed. See the section *Test Call* in the chapter *Test after Repair*.

Then proceed to the section *Before Leaving the Site* in the chapter *Concluding Routines*.

5.15 CDU-TRU PFWD Cable and CDU-TRU PREFL Cable

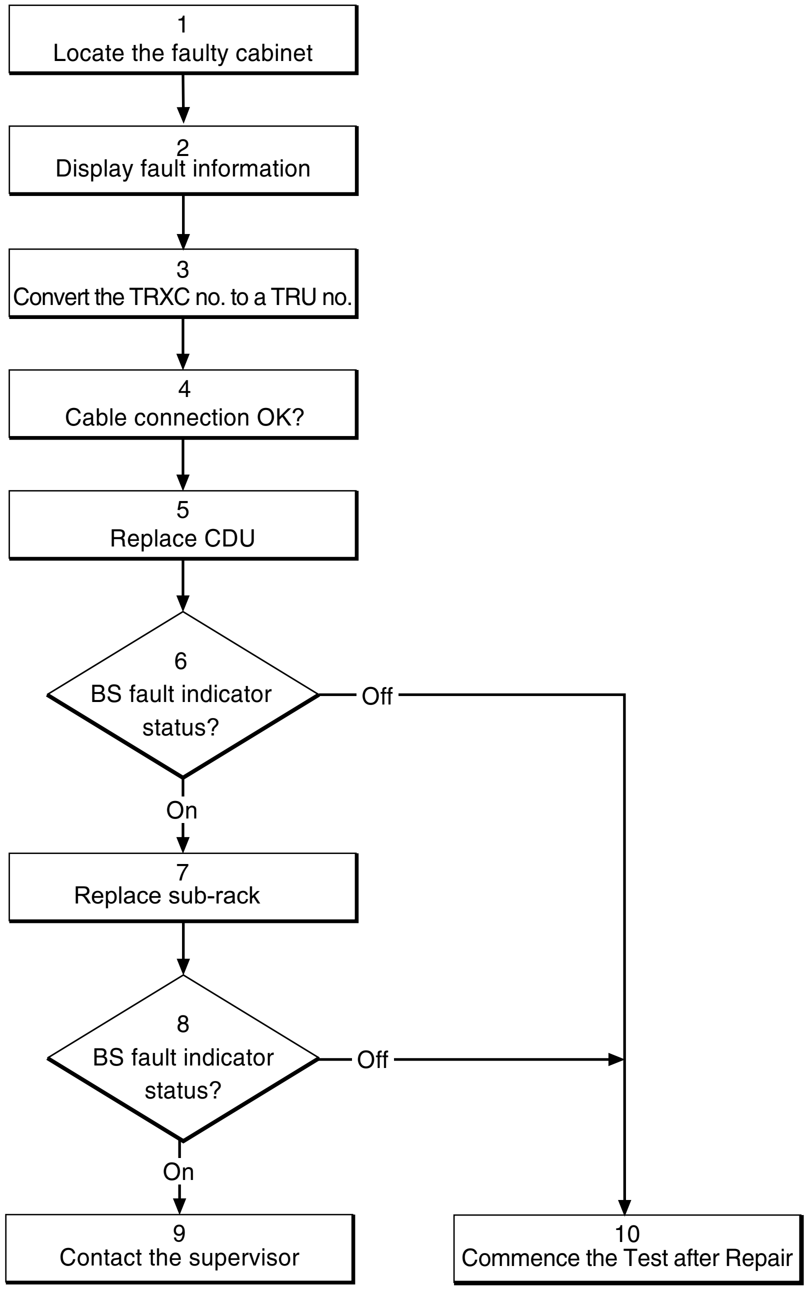


Figure 70 CDU-TRU PFWD and PREFL cable flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Convert the TRXC no. to a TRU no.

Read the work order to see which TRXC is reporting the cable as faulty. The TRXC number is converted according to the information below.

- TRXC 0 = TRU 1
- TRXC 1 = TRU 2
- TRXC 2 = TRU 3
- TRXC 3 = TRU 4
- etc.

For further information, see the chapter "Positioning of RUs".

(4) Cable connection OK?

Check that the cable is properly connected to the CDU.

To properly tighten the cable connections, refer to the section "Cable Connections" in the chapter "Handling of RBS during Maintenance".

(5) Replace CDU

If the cable was connected properly, replace the CDU (that connects to the suspected cable) according to instructions in the section "CDU"in the chapter "RBS Field Repair".

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

(6) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Replace sub-rack

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

1. Replace the TRU sub-rack according to instructions in the section "TRU Sub-Rack" in the chapter "RBS Field Repair".

(8) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(10) Commence the Test after Repair

1. Make a test call over the TRUs concerned according to instructions in the section "Test Call" in the chapter "Test after Repair". (Over all TRUs, if the sub-rack was replaced. Over TRUs connected to the CDU, if that unit was replaced.)

2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.16 CDU-TRU RXA Cable and CDU-TRU RXB Cable

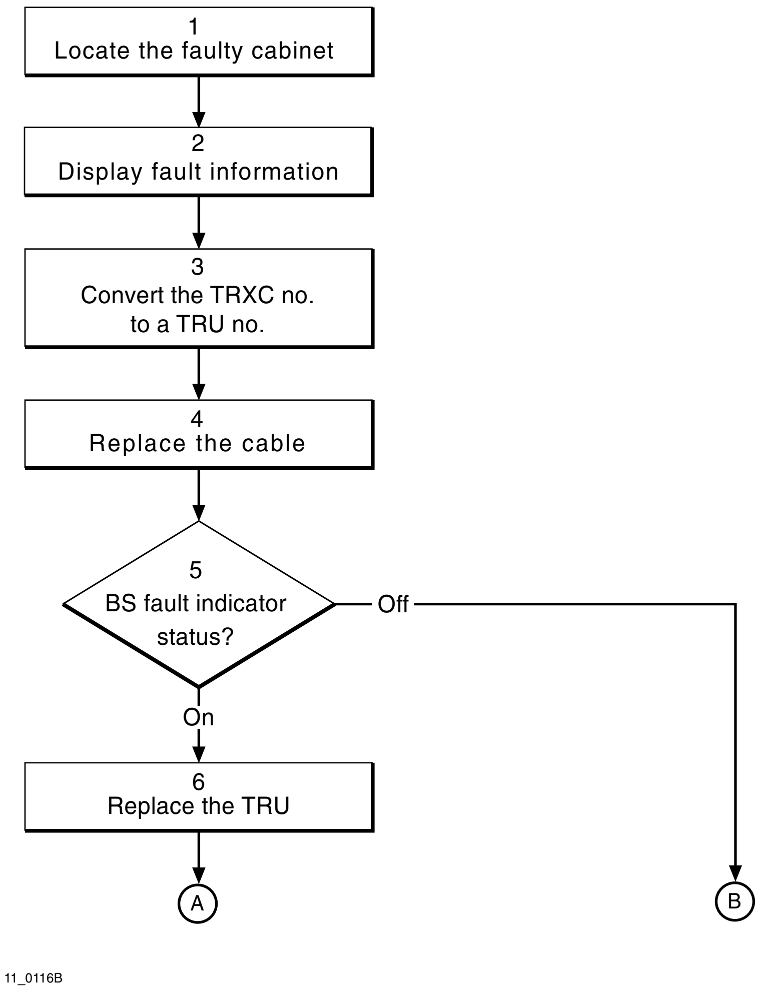


Figure 71 CDU-TRU RXA and RXB cable flowchart (part 1 of 2)

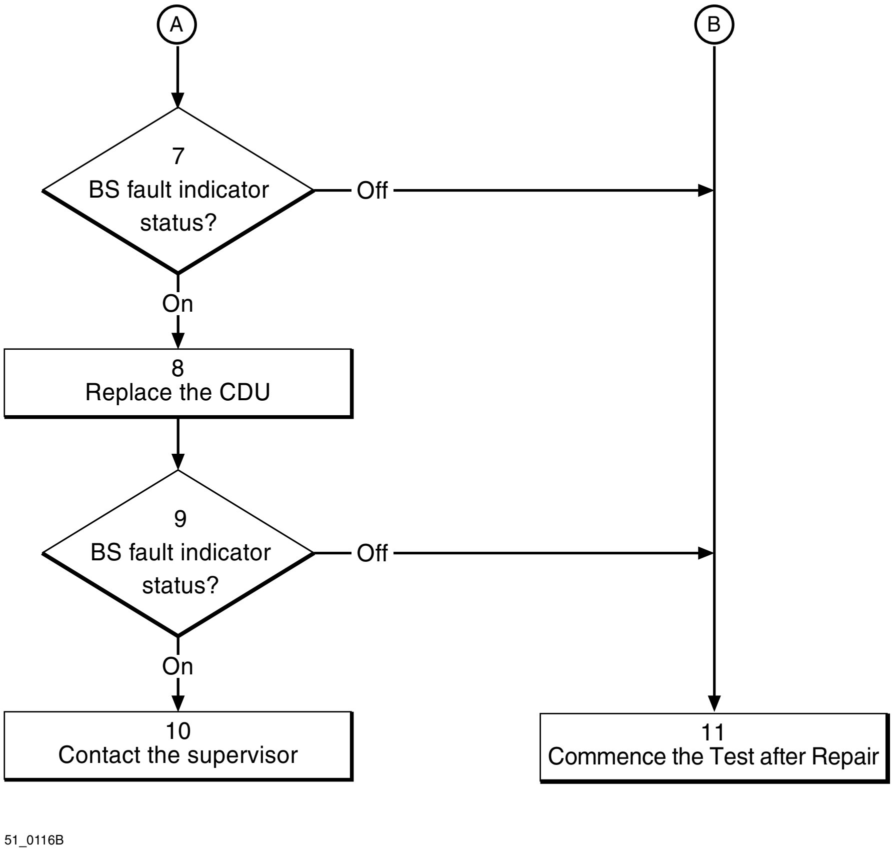


Figure 72 CDU-TRU RXA and RXB cable flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Convert the TRXC no. to a TRU no.

Read the work order to see which TRXC is reporting the cable as faulty. The TRXC number is converted according to the information below.

- TRXC 0 = TRU 1
- TRXC 1 = TRU 2
- TRXC 2 = TRU 3

- TRXC 3 = TRU 4

  etc.

For further information, see the chapter "Positioning of RUs".

(4) Replace the cable

Check the connections on the TRU and CDU. If the connections are OK, replace the CDU-TRU RX cable according to instructions in the section "CDU-TRU RX Cables" in the chapter "RBS Field Repair".

(5) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (6). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(6) Replace the TRU

Replace the TRU (that connects to the suspected cable) according to instructions in the section "TRU" in the chapter "RBS Field Repair".

(7) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (8). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(8) Replace the CDU

Replace the CDU (that connects to the suspected cable) according to instructions in the section "CDU" in the chapter "RBS Field Repair".

(9) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (10). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(10) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(11) Commence the Test after Repair

Take the following actions:

1. Make a test call over the TRU(s) concerned according to the section "Test Call" in the chapter "Test after Repair".
2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.17 CU

Refer to Section 5.12 CDU-D RUs on page 124.

5.18 DC/DC Converter

This section describes the procedure to be used when there is a fault in the DC/DC converter.

Faults in the DC/DC converter are reported to the network operator via an external alarm.

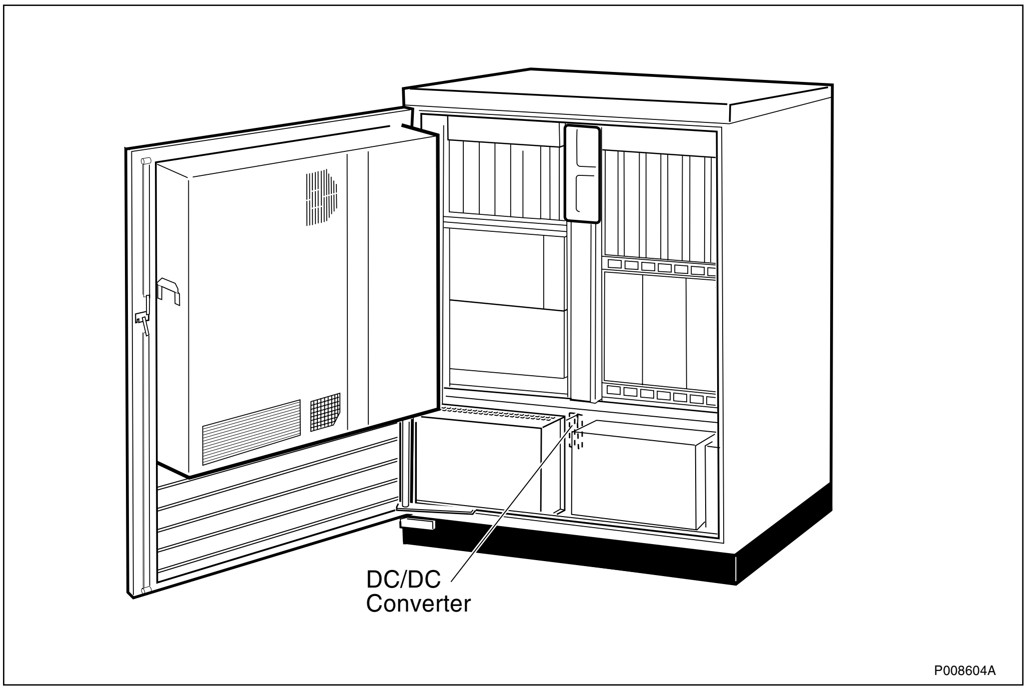


Figure 73 DC/DC converter

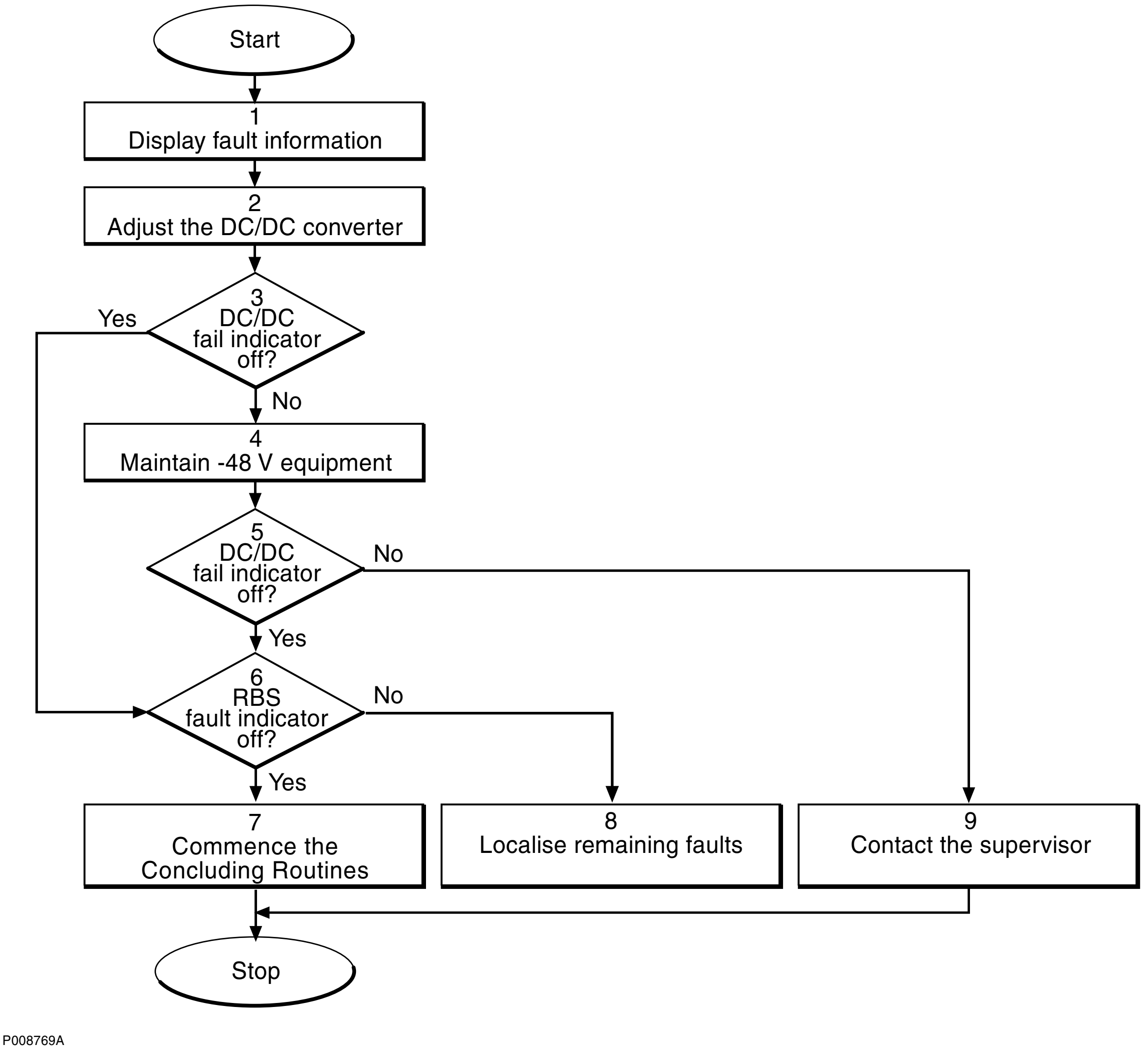


Figure 74 DC/DC converter flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Display fault information

Use the OMT to list all RUs that are faulty.

3. In the System view, click **RBS 2000**.
4. In the Operation menu, click **Monitor**and **Display Faulty RUs**.

   The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(2) Adjust the DC/DC converter

1. Adjust the DC/DC converter according to the instructions in the section *DC/DC Converter* in the chapter *RBS Field Repair*.

(3) DC/DC Fail indicator off?

Check the red Fail indicator on the DC/DC converter.

Is the Fail indicator off?

Answer	Comment	Action
Yes	The output voltage is within limits.	Proceed to step (6)
No	The output voltage is out of alarm limits due to overload, overvoltage or failure.	Proceed to step (4)

(4) Maintain -48 V equipment

Perform maintenance on -48 V equipment supplied from the DC/DC converter.

(5) DC/DC Fail indicator off?

Check the red Fail indicator on the DC/DC converter.

Is the Fail indicator off?

Answer	Comment	Action
Yes	The output voltage is within limits.	Proceed to step (6)
No	The output voltage is out of alarm limits due to overload, overvoltage or failure.	Proceed to step (9)

(6) RBS Fault indicator off?

1. Check that there are no remaining faults in the RBS. The yellow BS Fault indicator is located on the DXU.

   Is the BS Fault indicator off?

Answer	Comment	Action
Yes	There are no faults in the RBS.	Proceed to stage (7)
No	There is still one or more faults in the RBS.	Proceed to stage (8)

The status of the RBS can also be checked with the OMT. Use the monitor "Display Faulty RUs" in the OMT to list all RUs that are faulty.

(7) Commence the Concluding Routines

1. Proceed to section *Before Leaving the Site* in the chapter *Concluding Routines*.

(8) Localise remaining faults

1. Use the monitor **Display Faulty RUs**in the OMT to list all RUs that are faulty.
2. Do fault localisation on the RUs that are listed by the OMT as faulty. See respective section in chapter "Fault Localisation".

(9) Contact the supervisor

1. Contact the supervisor or manager who will take further action, for example, to consult an FSC.

5.19 DPX RXIN Cable

Refer to the section "CDU RX in Cable", Section 5.14 on page 131.

5.20 DU

Refer to the section *Section 5.12 CDU-D RUs on page 124.*

5.21 DXU

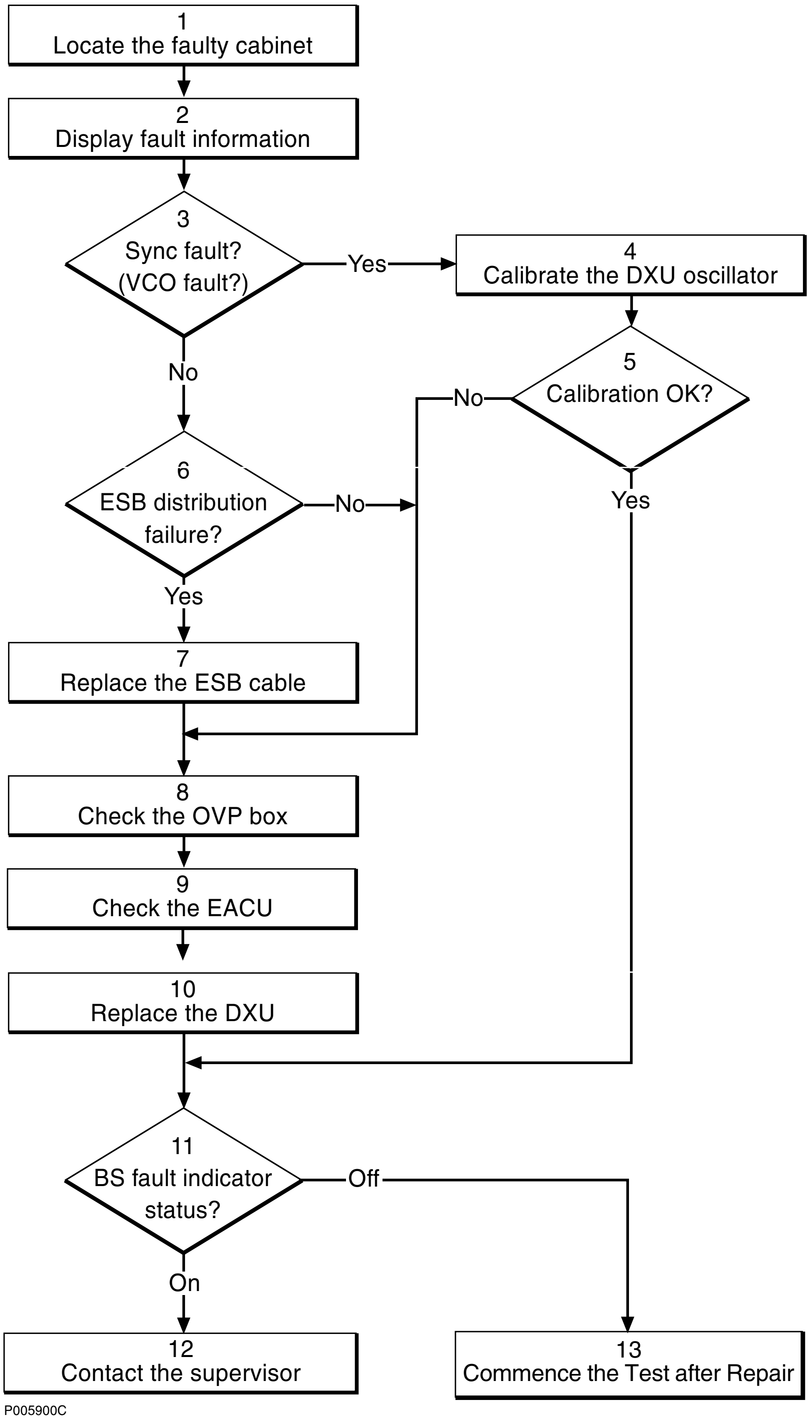


Figure 75 DXU flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

1. Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".
2. In the "Cabinet view", select the object DXU.
3. In the "Operation menu", select "Display Status" to list faults in the DXU.

(3) Sync fault? (VCO fault?)

Check for any of the following two alarms:

- "Timing unit VCO ageing" in "SO CF Internal Fault Map Class 2A"
- "Timing unit VCO fault" in "SO CF Internal Fault Map Class 1A"

Are any of these faults indicated in the OMT?

- Yes: Proceed to step (4).
- No: Proceed to step (6).

(4) Calibrate the DXU oscillator

Calibrate the DXU oscillator according to instructions in the section "DXU Maintenance" in the chapter "Preventive Maintenance".

(5) Calibration OK?

Was the calibration of the DXU oscillator OK?

- Yes: Proceed to step (11).
- No: Proceed to step (8).

(6) ESB distribution failure?

Is the RBS syncronized with another RBS?

- Yes: Proceed to next question in this step.
- No: Proceed to step (8).

Check for the fault "ESB distribution failure" in "SO CF Internal Fault Map Class 2A" with the OMT. Is this fault indicated?

- Yes: Proceed to step (7).
- No: Proceed to step (8).

Note: In SW release R7D the alarm is found in "AO TF Internal Fault Map Class 2A".

(7) Replace the ESB cable

Replace the ESB cable according to instructions in the section "ESB cable" in the chapter "RBS Field Repair".

(8) Check the OVP box

Check if the PCM-connection or ESB cable is equipped with an OVP box. Whenever a fault is suspected in the DXU, the gas discharge tubes in the OVP box shall be replaced. Refer to instructions in the section "OVP box" in the chapter "RBS Field Repair".

In case there is no OVP box, proceed directly to step (7).

(9) Check the EACU

Note: If the DXU is faulty due to surges caused by lightning, then the overvoltage arrestors in the EACU are faulty.

Whenever a fault is suspected in the DXU, the overvoltage arrestors in the EACU shall be replaced. Refer to instructions in the section "EACU" in the chapter "RBS Field Repair".

(10) Replace the DXU

Replace the faulty DXU according to instructions in the section "DXU" in the chapter "RBS Field Repair".

(11) Fault indicator status?

The red indicator labelled Fault on the DXU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (13). No fault is detected in the DXU.
- On: Proceed to step (12). One or more faults are detected in the DXU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (13). No fault is detected in the RBS.
- On: Proceed to step (12). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(12) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(13) Commence the Test after Repair

Take the following actions:

1. Make a test call over all TRUs, including those in an extension cabinet (if connected), handled by the DXU according to the section "Test Call" in the chapter "Test after Repair". If the DXU has been changed in a Slave cabinet in a TG-sync configuration, make a test call over the Slave cabinet according to the section "Test Call" in the chapter "Test after Repair".
2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.22 ECU

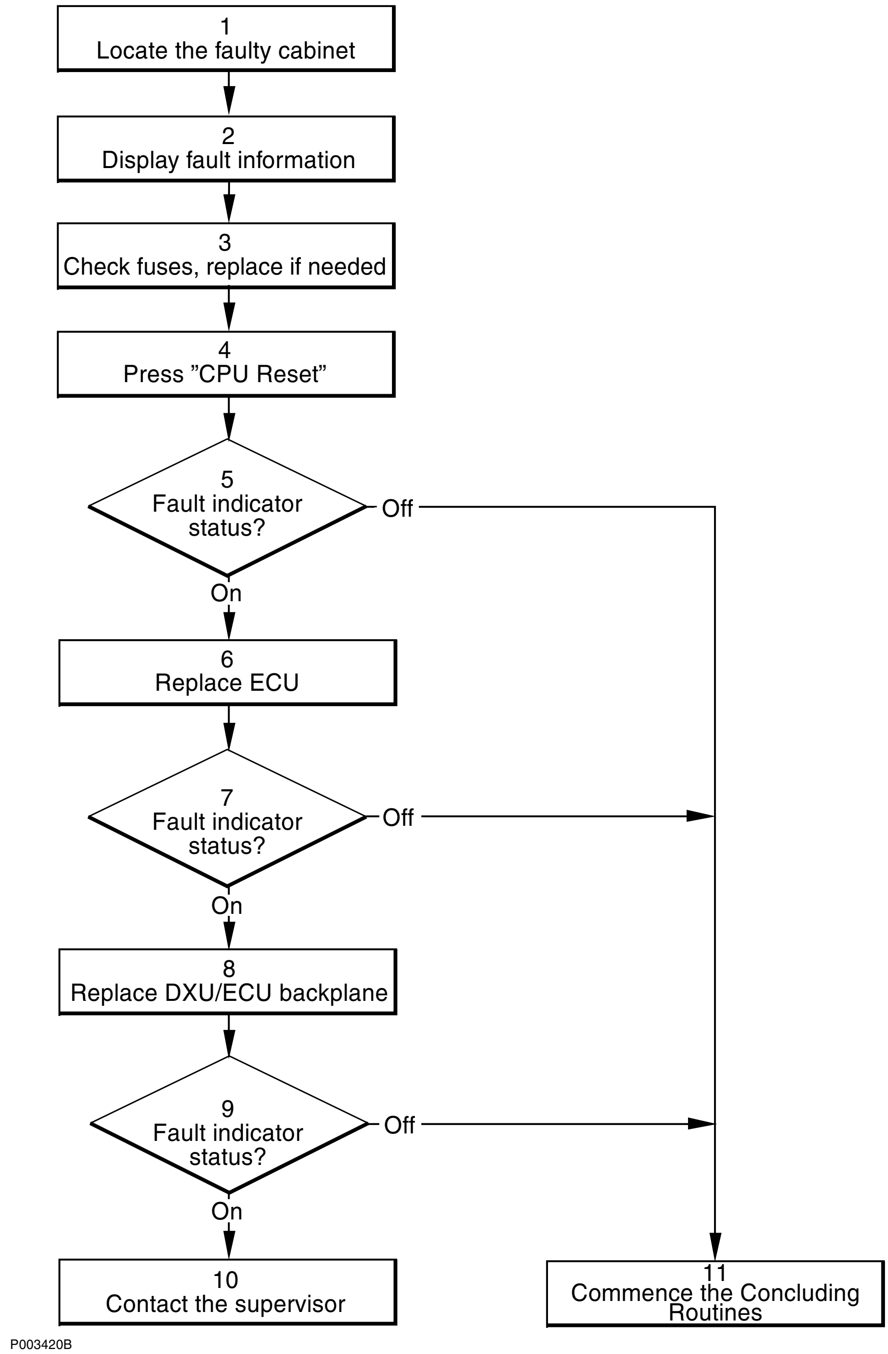


Figure 76 ECU flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User’s Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

For further information on the use of the OMT, see the *OMT User's Manual*.

(3) Check fuses, replace if needed

Check the ECU circuit breaker on the IDM according to instructions in the section "IDM" in the chapter "RBS Field Repair".

(4) Press the “CPU Reset”

Press the button labelled "CPU Reset" on the ECU for approximately 3 seconds. Wait at least 30 seconds to allow the ECU to restart.

(5) BS fault indicator status?

The red indicator labelled Fault on the ECU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (11). No fault is detected in the ECU.
- On: Proceed to step (6). One or more faults are detected in the ECU.
- Flashing: Proceed to step (6). The communication is lost with either the DXU, PSU(s) or BFU(s).

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (6). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(6) Replace the ECU

Replace the faulty ECU according to instructions in the section "ECU" in the chapter "RBS Field Repair".

(7) BS fault indicator status?

The red indicator labelled Fault on the ECU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (11). No fault is detected in the ECU.
- On: Proceed to step (8). One or more faults are detected in the ECU.
- Flashing: Proceed to step (8). The communication is lost with either the DXU, PSU(s) or BFU(s).

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (8). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(8) Replace the DXU/ECU backplane

The fault is probably located in the DXU/ECU backplane. Replace the DXU/ECU backplane according to the section "DXU/ECU Backplane" in the chapter "RBS Field Repair".

(9) BS fault indicator status?

The red indicator labelled Fault on the ECU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (11). No fault is detected in the ECU.
- On: Proceed to step (10). One or more faults are detected in the ECU.
- Flashing: Proceed to step (10). The communication is lost with either the DXU, PSU(s) or BFU(s).

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (11). No fault is detected in the RBS.
- On: Proceed to step (10). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(10) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(11) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.23 Environment

This RU records conditions that cannot be affected from the base station. For example, if the temperature in the cabinet is outside the specified range or if the incoming AC mains power is faulty, the RU "Environment" is reported as faulty. The RU "Environment" can be divided into two sub-groups: "Climate" and "Power".

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

- BS fault indicator ON means that one or more faults are detected in the RBS.
- BS fault indicator OFF means that no fault is detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". For further information on the use of OMT, see the *OMT User's Manual*.

OMT User's Manual	*LZN 302 01*

The environmental alarms are given in Section 5.23.1 SO CF internal fault map, class 1A on page 152and Section 5.23.2 SO CF internal fault map, class 2A on page 153.

5.23.1 SO CF internal fault map, class 1A

Fault: 10 Indoor Temp Out Of Safe Range

Note: This fault is valid only for master cabinet.

Description

The temperature inside the cabinet is out of permissible range for safe function. An alarm will be sent before the DC is disconnected.

Fault localisation

1 Air conditioner, see Section 5.4 on page 64

2 Fan, see Section 5.25 on page 160

3 ECU, see Section 5.22 on page 149

Fault: 12 DC Voltage Out Of Range

Note: This fault is valid only for master cabinet.

Description

The batteries have been discharged so that cut-out will be made. Alarm will be sent to main supervision before the DC supply of the load is disconnected by the AC unit and the contactor of the BFU is broken.

Fault localisation

1 BFU, see Section 5.8 on page 113

2 PSU, see Section 5.33 on page 203

3 ECU, see Section 5.22 on page 149

4 Battery, see Section 5.7 on page 102

5.23.2 SO CF internal fault map, class 2A

Fault: 16 Indoor Temp Out Of Normal Conditional Range

Note: This fault is valid only for extension cabinet.

Description

The temperature inside the cabinet is out of permissible range.

Fault localisation

1 Air conditioner, see Section 5.4 on page 64

2 Fan, see Section 5.25 on page 160

Fault: 17 Indoor Humidity

Description

Air humidity exceeds the permissible value.

Fault localisation

1 Air conditioner, see Section 5.4 on page 64

Fault: 18 DC Voltage Out Of Range

Description

This fault type has two causes:

Overvoltage. A fault report is sent if the DC voltage is above the overvoltage level.

Undervoltage. The RBS is powered from batteries. Therefore, the DC supply will only last for a limited time.

Fault localisation

1 ACCU, see Section 5.3 on page 61

2 PSU, see Section 5.33 on page 203

3 Battery, see Section 5.7 on page 102

4 BFU, see Section 5.8 on page 113

5 ECU, see Section 5.22 on page 149

Fault: 20 External Power Fault

Description

Incoming mains failure. System powered by batteries.

Fault localisation

1 Check incoming power for disturbances.

5.24 External Alarms

This procedure should be used when there is a fault in the external alarm system.

External alarms are customer-defined alarms in the RBS. The alarm detector activates the alarm input by an open or closed external alarm sensor loop. For each alarm inlet it is possible to define and change an alarm set-up with the OMT. The set-up is stored as RBS information in the IDB.

The yellow indicator marked External alarm on the DXU will light up if any external alarms are activated. When a fault in the external alarm system occurs, the OMT should be used to check the alarm status and the alarm set-up.

Two cases are described in the following fault localisation procedure:

- An alarm is active in the BSC, but there should be no alarm. This can happen where an open sensor circuit should indicate an alarm.
- An alarm is not active in the BSC when it should be. This can happen where a closed sensor circuit should indicate an alarm.

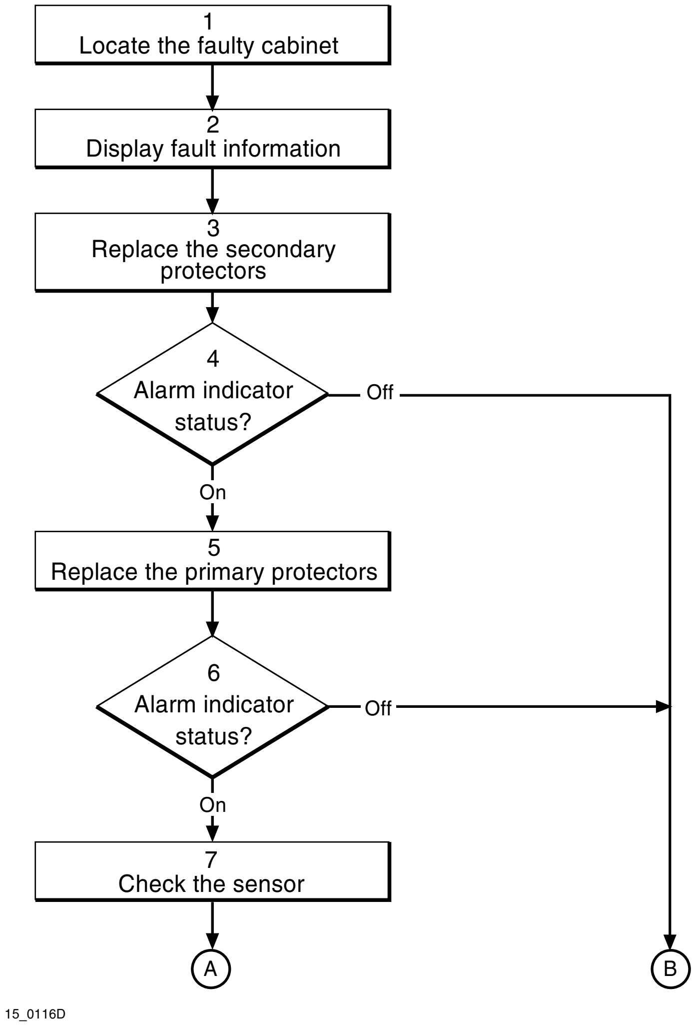


Figure 77 External alarms flowchart (part 1 of 2)

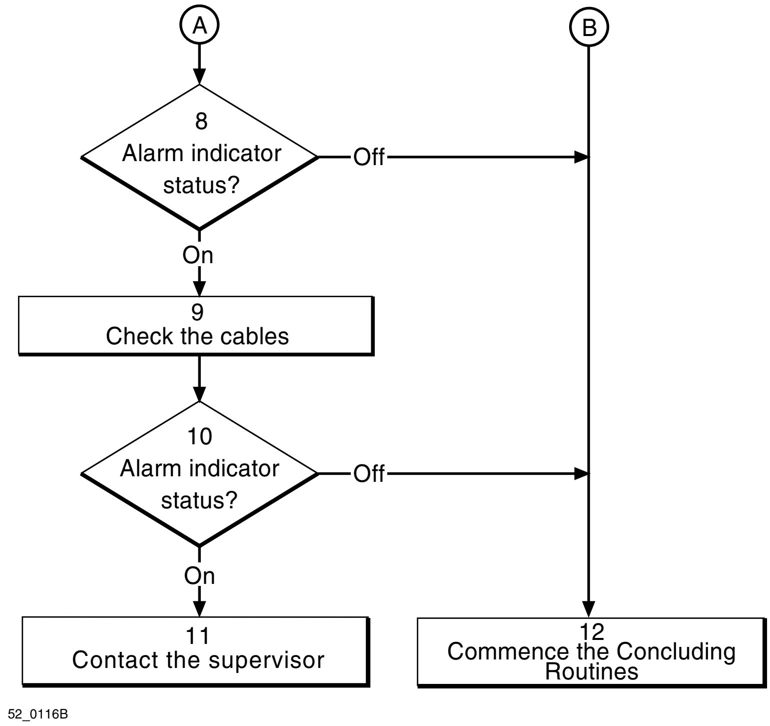


Figure 78 External alarms flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to monitor the external alarm that is activated.

Look at the alarm set-up concerned to investigate whether the alarm should be activated by a closed or open sensor circuit. Find out which module number in the EACU the alarm is associated with. This information will be used later in the fault localisation procedure.

(3) Replace the secondary protectors

The secondary protectors are located in the EACU. Replace the secondary protectors according to instructions in the section "EACU" in the chapter "RBS Field Repair"

(4) Alarm indicator status?

The yellow indicator labelled External alarm indicates that one or more alarms are activated. The External alarm indicator is located on the DXU.

External alarm indicator status?

- Off: Proceed to step (12). No external alarms are activated.
- On: Proceed to step (5). One or more alarms are activated.

Additionally, use the OMT to monitor Fault status.

When an open sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU goes off.

When a closed sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU is lit.

(5) Replace the primary protectors

The primary protectors are located in the EACU. Replace the primary protectors according to instructions in the section "EACU" in the chapter "RBS Field Repair"

(6) Alarm indicator status?

The yellow indicator labelled External alarm indicates that one or more alarms are activated. The External alarm indicator is located on the DXU.

External alarm indicator status?

- Off: Proceed to step (12). No external alarms are activated.
- On: Proceed to step (7). One or more alarms are activated.

Additionally, use the OMT to monitor Fault status.

When an open sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU goes off.

When a closed sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU is lit.

(7) Check the sensor

1. Determine whether or not the sensor works. Measure the resistance with a multimeter directly in the connection points where the external alarm sensor cables are connected in the EACU. A closed sensor should have a resistance close to zero and an open sensor should have an infinite resistance.
2. Replace the sensor if it is suspected of being faulty.

(8) Alarm indicator status?

The yellow indicator labelled External alarm indicates that one or more alarms are activated. The External alarm indicator is located on the DXU.

External alarm indicator status?

- Off: Proceed to step (12). No external alarms are activated.
- On: Proceed to step (9). One or more alarms are activated.

Additionally, use the OMT to monitor Fault status.

When an open sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU goes off.

When a closed sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU is lit.

(9) Check the cables

There could be something wrong with the cables to the DXU or the external alarm sensor cables.

Instructions when an open sensor circuit activates the alarm.

1. Strap the connection point for the external alarm concerned, see the figure below. This should be done on the external alarm side of the EACU, where the cables from the external alarm are connected. If the external alarm indicator on the DXU goes off, there is probably something wrong with the external alarm sensor cables. Otherwise the DXU cables may be faulty.
2. Change the faulty cable(s).
3. Restore the units.

Instructions when a closed sensor circuit activates the alarm.

1. Strap the connection point for the external alarm concerned, see the figure below. This should be done on the DXU side of the EACU, where the cables to the DXU are connected. If the external alarm indicator on the DXU lights up, there is probably something wrong with the external alarm sensor cables. Otherwise the DXU cables may be faulty.
2. Change the faulty cable(s).
3. Restore the units.

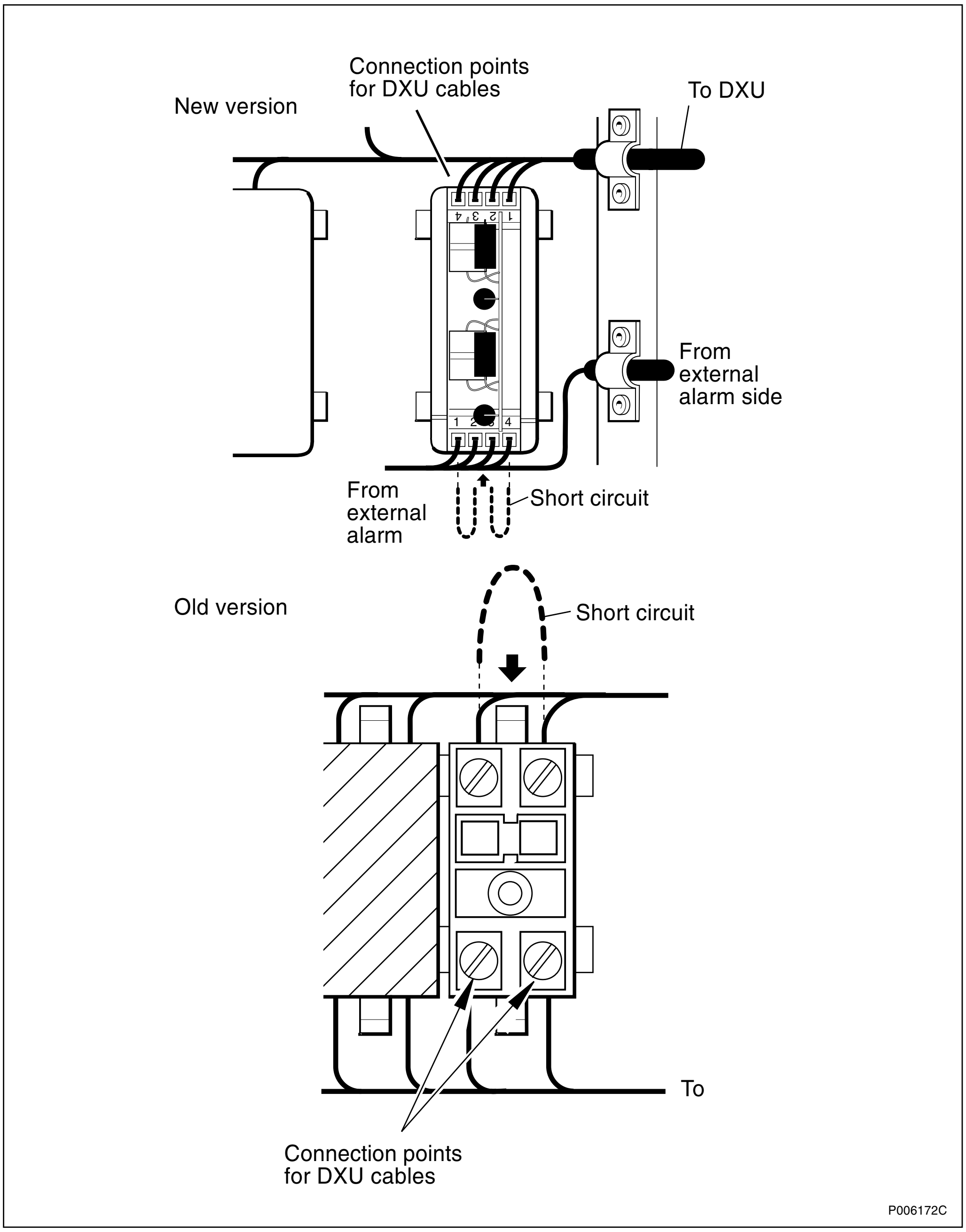


Figure 79 Strapping in a connection point in the EACU

(10) Alarm indicator status?

The yellow indicator labelled External alarm indicates that one or more alarms are activated. The External alarm indicator is located on the DXU.

External alarm indicator status?

- Off: Proceed to step (12). No external alarms are activated.
- On: Proceed to step (11). One or more alarms are activated.

Additionally, use the OMT to monitor Fault status.

When an open sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU goes off.

When a closed sensor circuit activates the alarm concerned:

- Continue with the fault localisation until the External alarm indicator on the DXU is lit.

(11) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(12) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.25 Fan

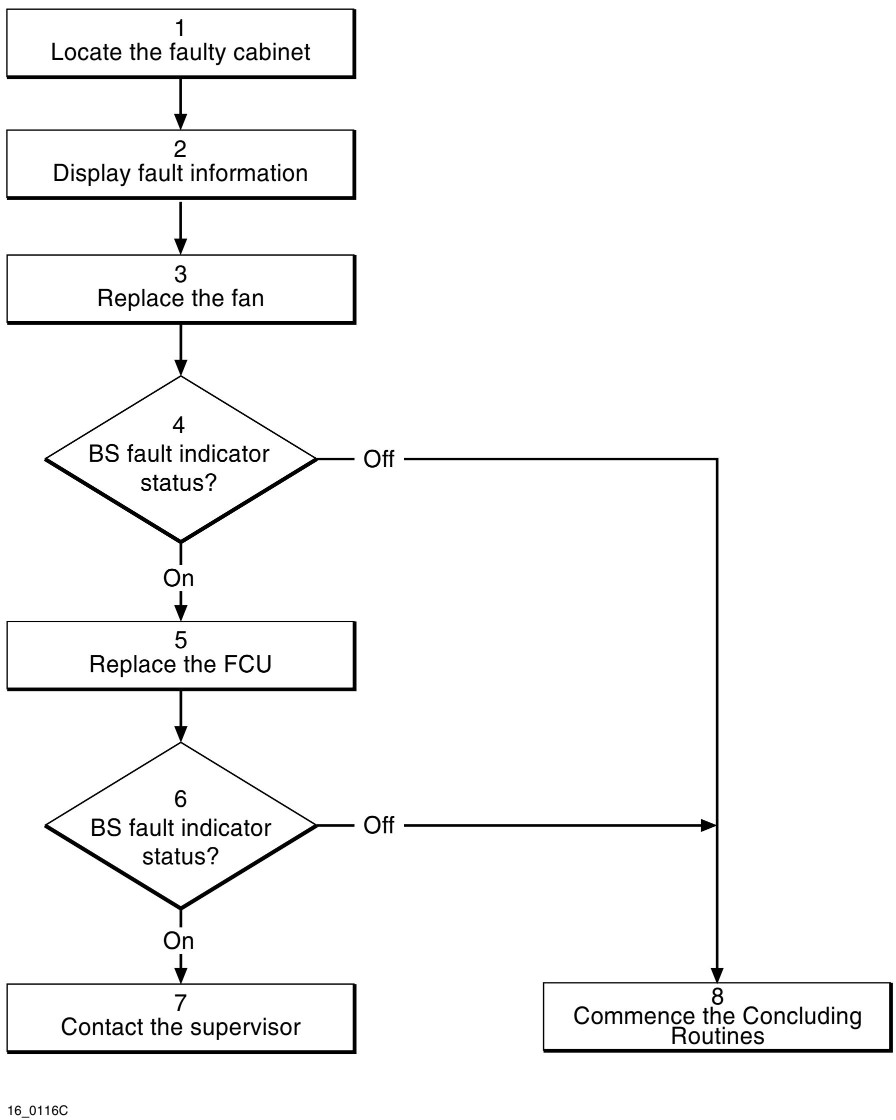


Figure 80 Fans flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Replace the fan

Replace the faulty fan according to instructions in the section "Fans" in the chapter "RBS Field Repair".

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Replace the fan if OMT identifies it as faulty, although it appears to operate.

(4) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace the FCU

Replace the FCU according to instructions in the section "FCU"in the chapter "RBS Field Repair".

(6) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(8) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.26 FU (FUd)

Refer to Section 5.12 CDU-D RUs on page 124.

5.27 Heater

Note: There are five different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V5", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3), (V4) and (V5) are used as abbreviations designating the four versions of the climate unit.

5.27.1 Climate Unit Version V1

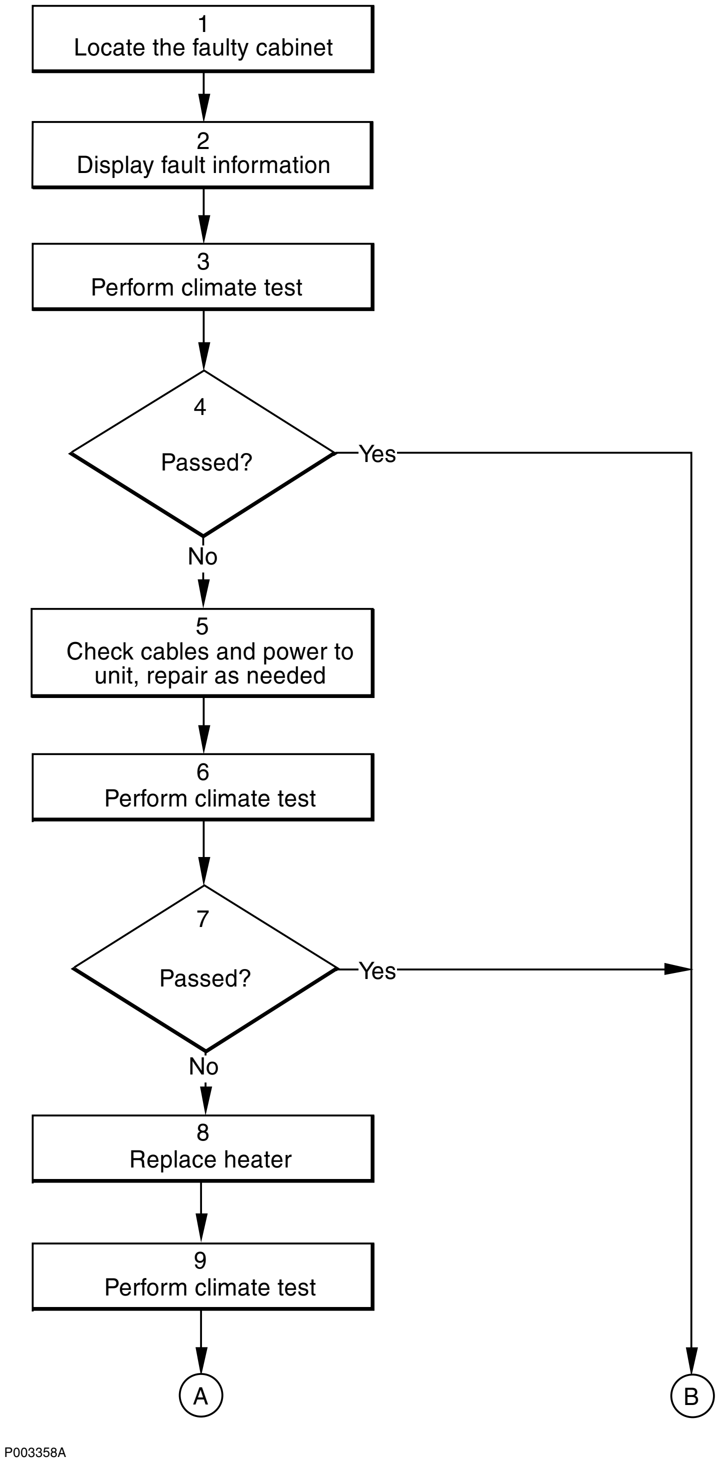


Figure 81 Heater, climate unit version V1 (part 1 of 2)

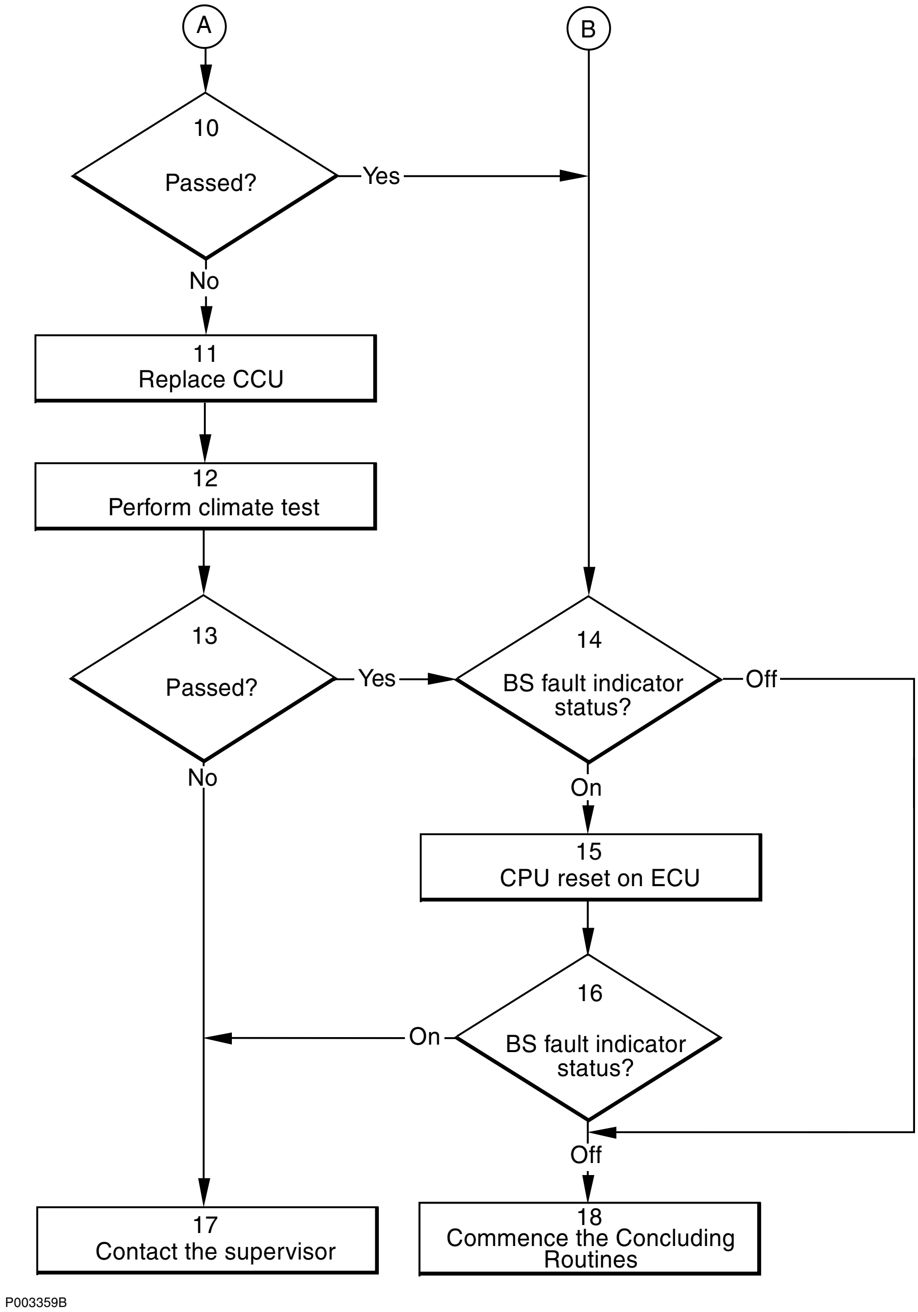


Figure 82 Heater, climate unit version V1 (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(4) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (5).

(5) Check cables and power to unit, repair as needed

1. Check that the AC circuit breaker for the climate unit in the ACCU has not tripped. Reset if necessary. If the circuit breaker cannot be reset, refer to the section "ACCU" in the chapter "Fault Localisation" and follow the procedures there before proceeding with this fault finding procedure.
2. Check the AC cable going to the climate unit. Replace the AC power cable if found faulty.
3. Check the control cable from the DXU/ECU backplane to the CCU. Replace if defective.

(6) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

Use the climate unit tester to activate the heater. Once the heater is activated, a hand should be placed in the air flow path coming from the heater to test for an increase in the air temperature.

(7) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (8).

(8) Replace heater

Replace the faulty heater according to instructions in the section "Heater" in the chapter "RBS Field Repair".

(9) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(10) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (11).

(11) Replace CCU

Replace the CCU according to instructions in the section "CCU"in the chapter "RBS Field Repair".

(12) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(13) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (15).

(14) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (18). No fault is detected in the RBS.
- On: Proceed to step (15). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(15) CPU reset on ECU

Press the button labelled "CPU Reset" on the ECU for approximately 3 seconds. Wait at least 30 seconds to let the ECU restart.

(16) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (18). No fault is detected in the RBS.
- On: Proceed to step (17). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(17) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(18) Commence the Concluding Routines

Proceed to the section *Before Leaving the Site* in the chapter *Concluding Routines*.

5.27.2 Climate Unit Version V2

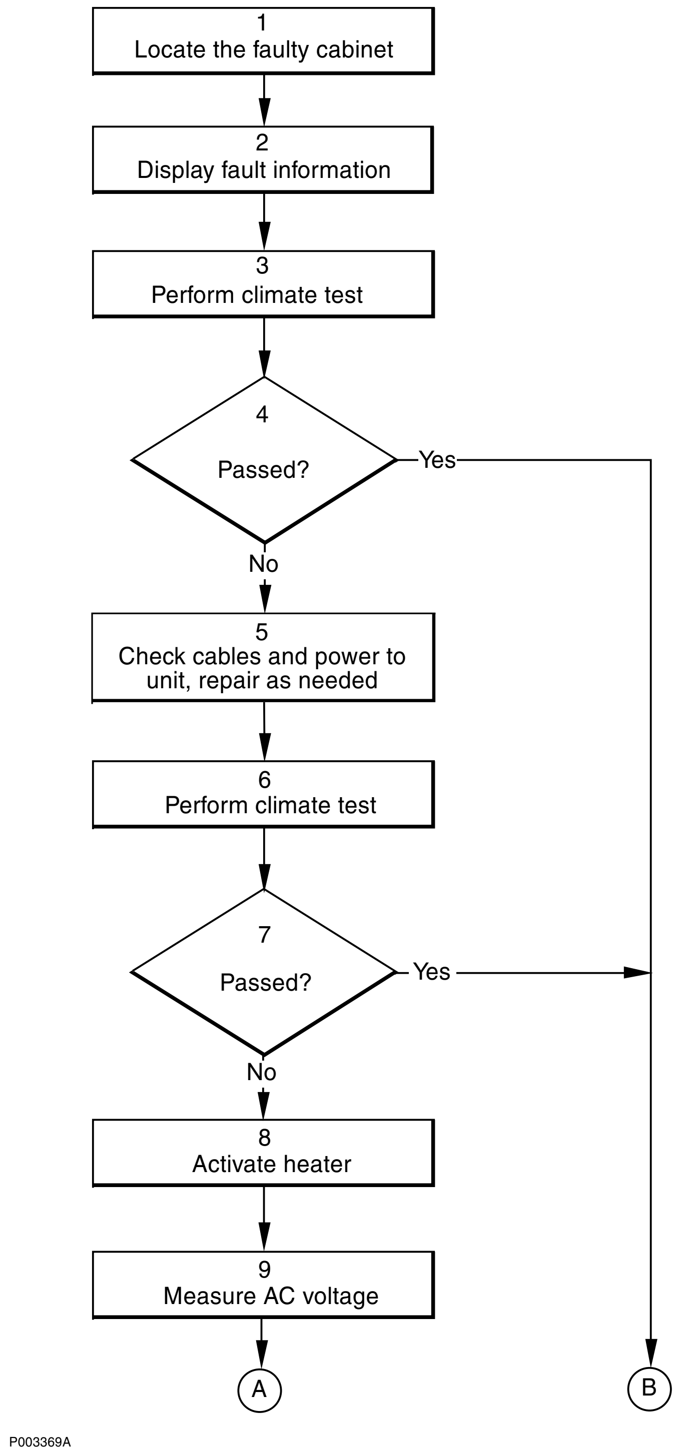


Figure 83 Heater, climate unit version V2 (part 1 of 3)

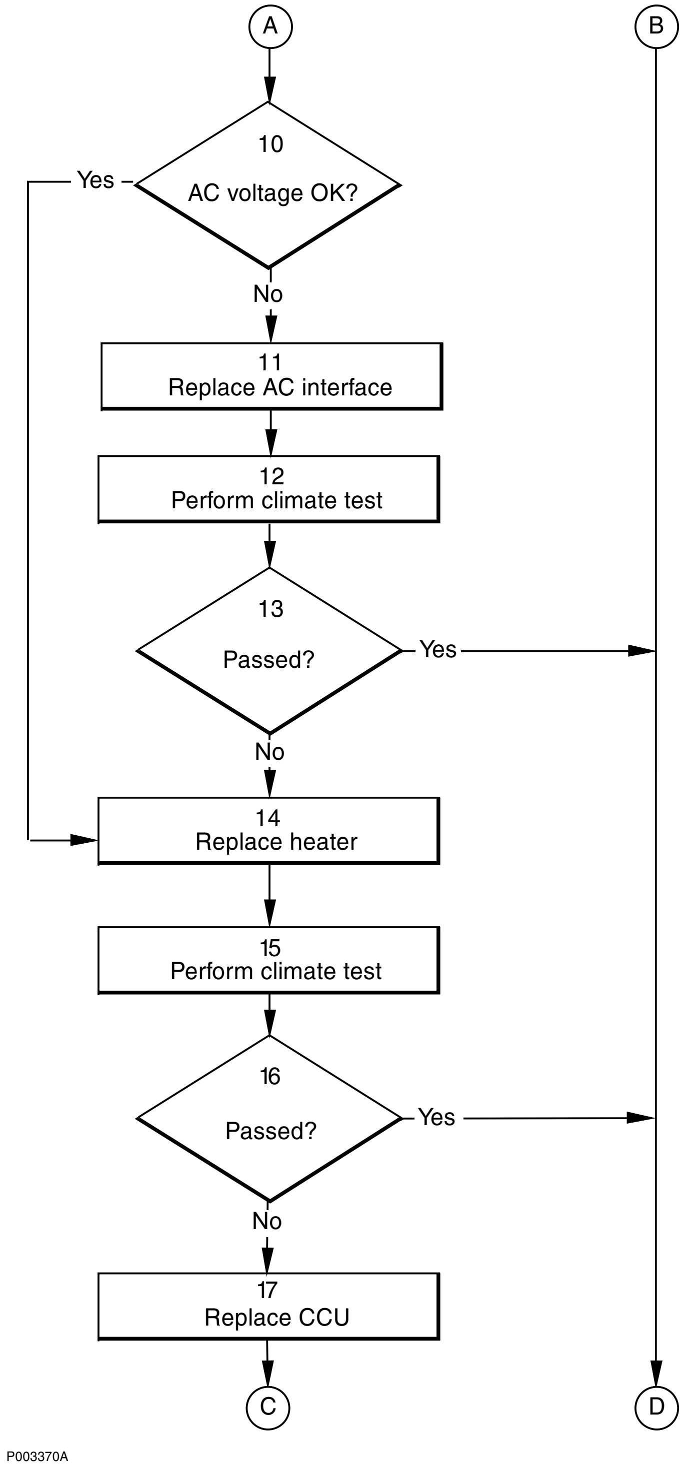


Figure 84 Heater, climate unit version V2 (part 2 of 3)

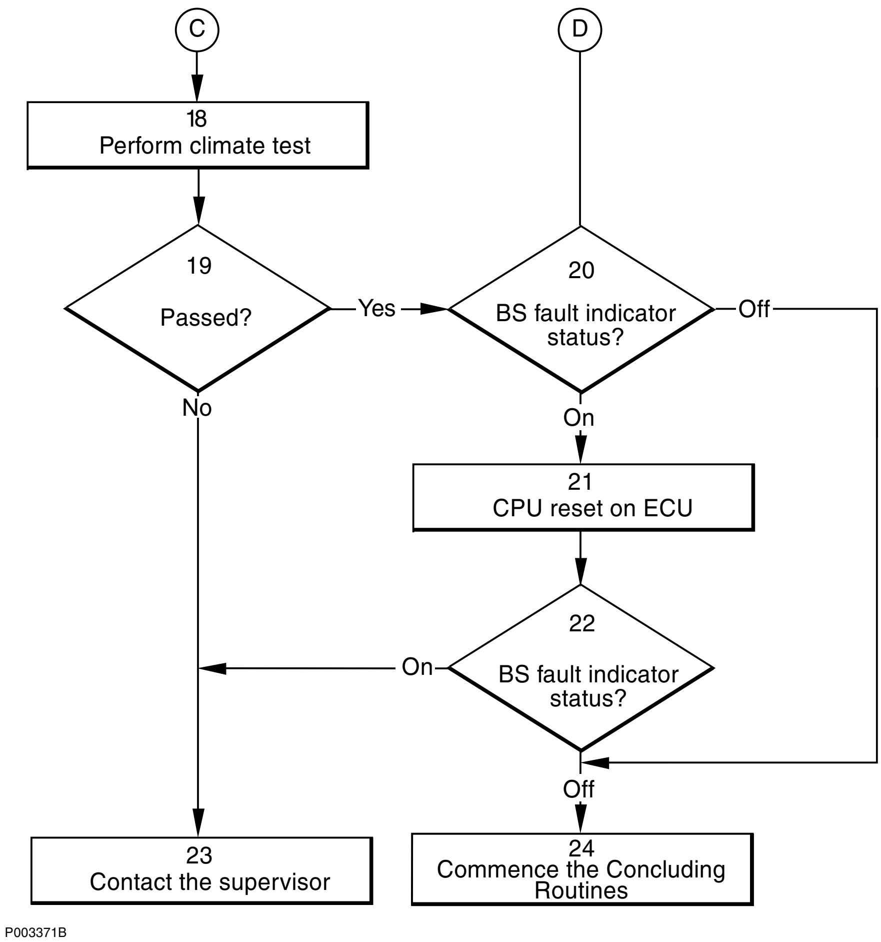


Figure 85 Heater, climate unit version V2 (part 3 of 3)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(4) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (20).
- No: Proceed to step (5).

(5) Check cables and power to unit, repair as needed

1. Check that the AC circuit breaker for the climate unit in the ACCU has not tripped. Reset if necessary. If the circuit breaker cannot be reset, refer to the section "ACCU" in the chapter "Fault Localisation" and follow the procedures there before proceeding with this fault finding procedure.
2. Check the AC cable going to the climate unit. Replace the AC power cable if found faulty.
3. Check the control cable from the DXU/ECU backplane to the CCU. Replace if defective.

(6) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(7) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (20).
- No: Proceed to step (8).

(8) Activate heater

Activate the heater with the momentary switch on the front of the AC interface. Refer to the figure below.

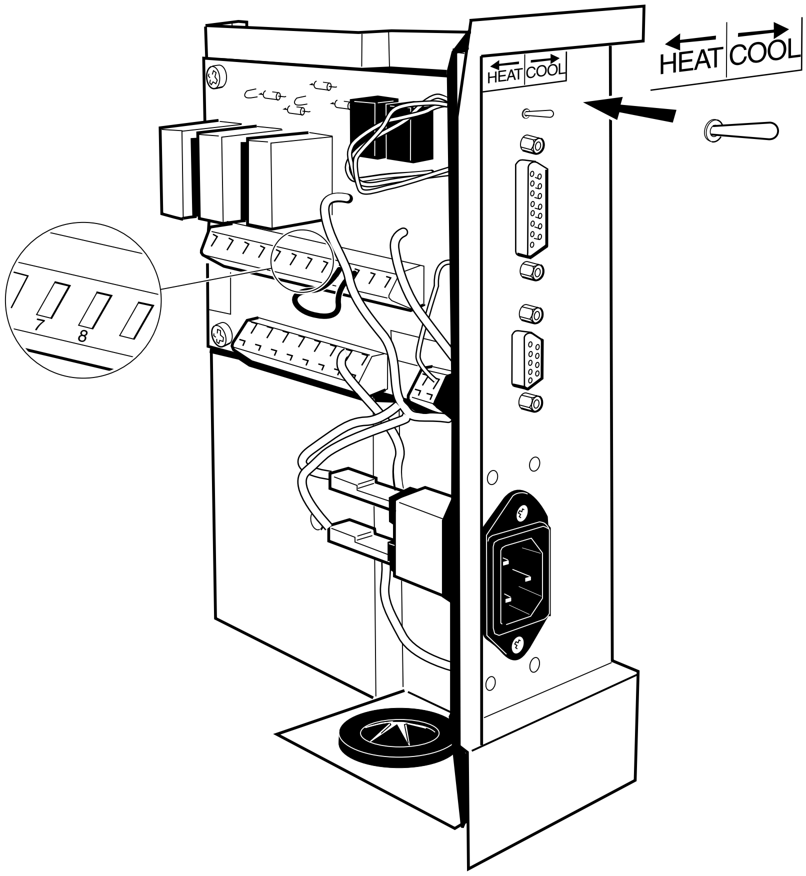


Figure 86 AC interface

(9) Measure AC voltage

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

1. Refer to the figure in step (8) and measure the AC voltage between pins 7 and 8 of the AC interface card. The voltage can also be measured on the AC terminal on the back of the heater. The expected voltage is 230 V.

2. Measure the voltage coming into the AC interface card. The expected voltage is 230 V.

Note: On a 60 Hz RBS, the expected value of the incoming voltage is 208, 230 or 250 V depending on the strapping of the AC interface card transformer. Regardless of the incoming voltage, the expected voltage between pins 7 and 8 is 230 V.

(10) AC voltage OK?

Is the AC voltage OK?

- Yes: Proceed to step (14).
- No: Proceed to step (11).

(11) Replace AC interface

Replace the AC interface card according to the section "Relay Unit/AC Interface" in the chapter "RBS Field Repair".

(12) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(13) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (20).
- No: Proceed to step (14).

(14) Replace heater

Replace the faulty heater according to instructions in the section "Heater" in the chapter "RBS Field Repair".

(15) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(16) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (20).
- No: Proceed to step (17).

(17) Replace CCU

Replace the CCU according to instructions in the section "CCU"in the chapter "RBS Field Repair".

(18) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(19) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (20).
- No: Proceed to step (21).

(20) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (24). No fault is detected in the RBS.
- On: Proceed to step (21). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(21) CPU reset on ECU

Press the button labelled "CPU Reset" on the ECU for approximately 3 seconds. Wait at least 30 seconds to let the ECU restart.

(22) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (24). No fault is detected in the RBS.
- On: Proceed to step (23). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(23) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(24) Commence the Concluding Routines

Proceed to the section *Before Leaving the Site* in the chapter *Concluding Routines*.

5.27.3 Climate Unit Versions V3, V4 and V5

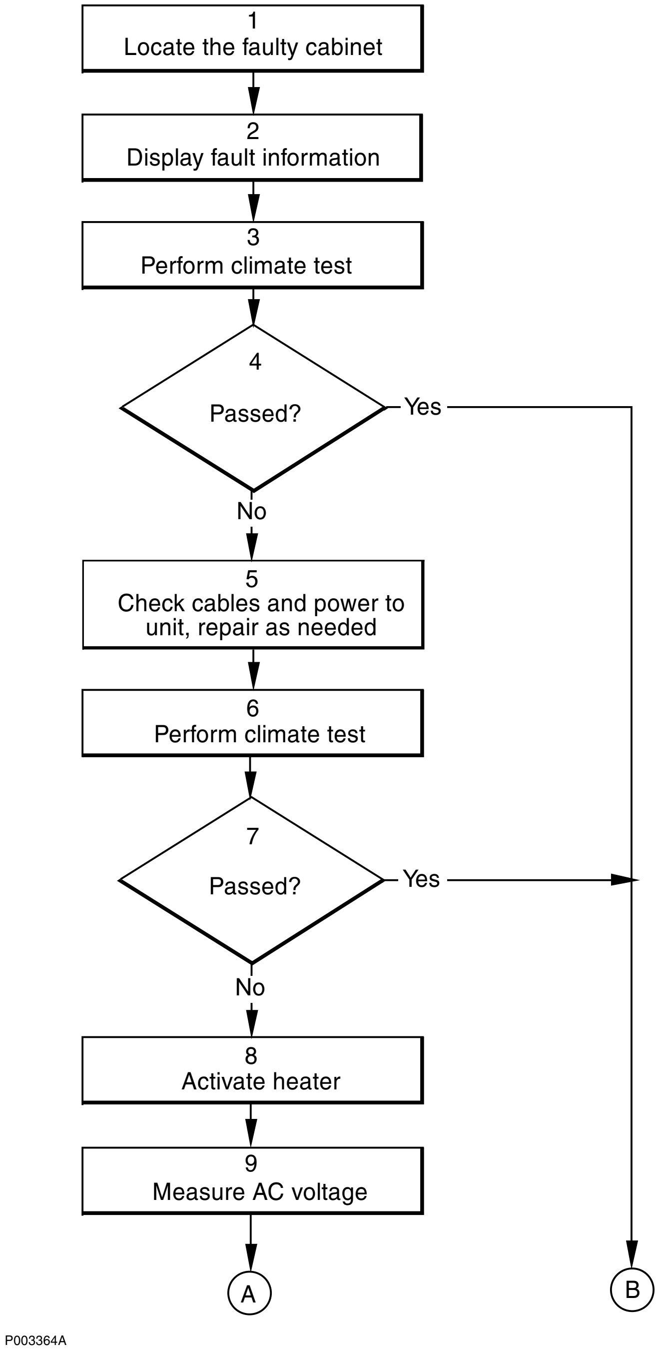


Figure 87 Heater, climate unit versions V3, V4 and V5 (part 1 of 3)

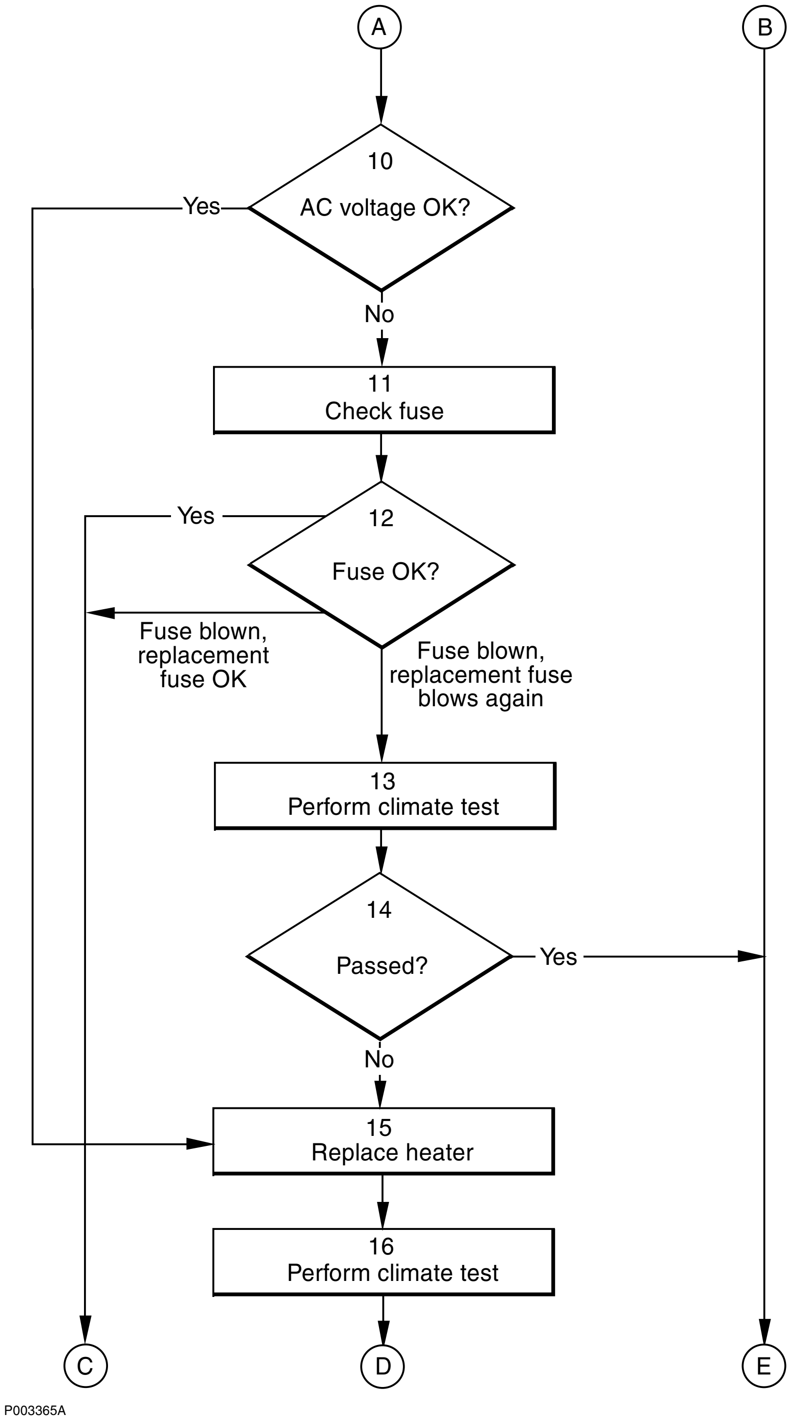


Figure 88　Heater, climate unit versions V3, V4 and V5 (part 2 of 3)

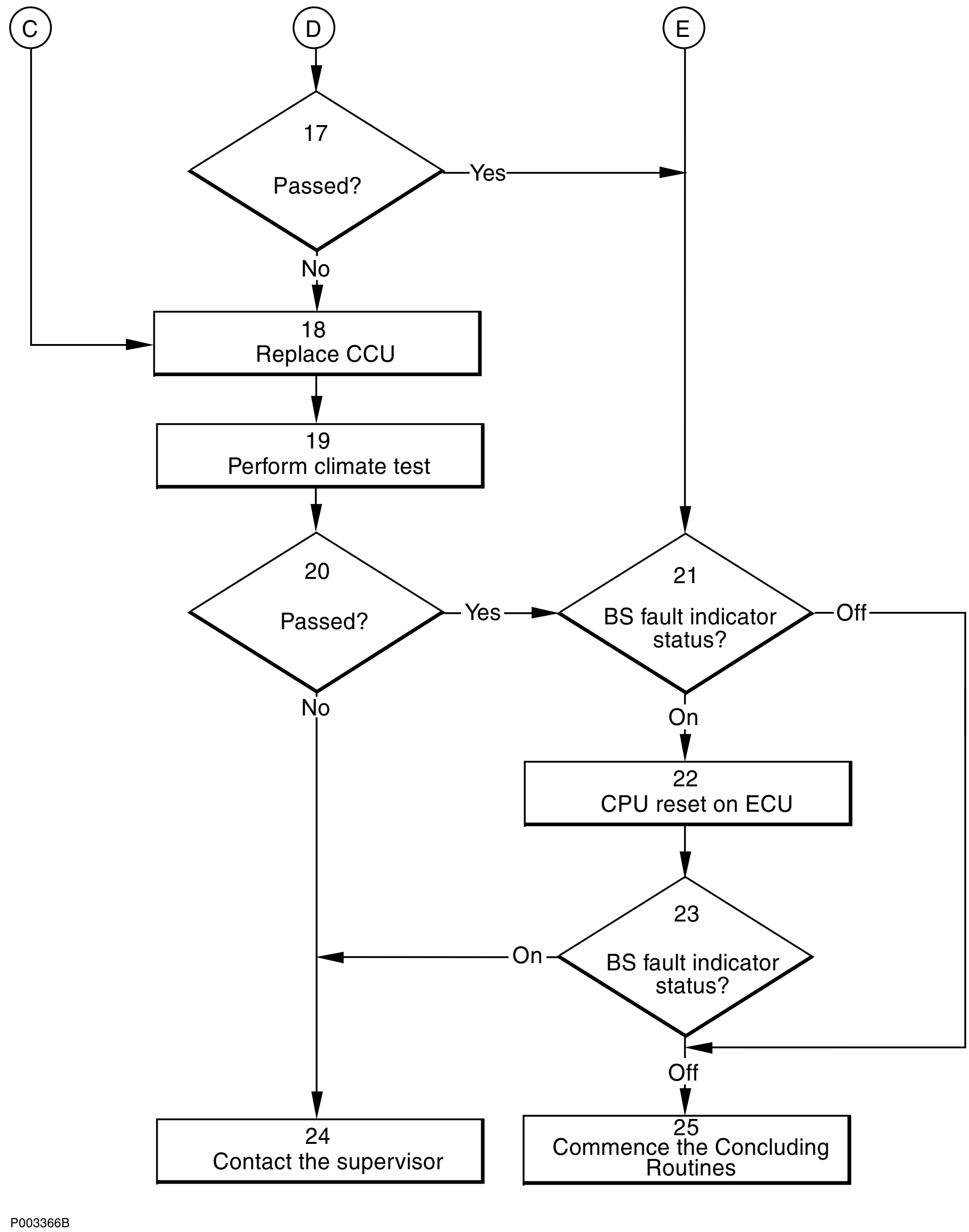


Figure 89 Heater, climate unit versions V3, V4 and V5 (part 3 of 3)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(4) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (21).
- No: Proceed to step (5).

(5) Check cables and power to unit, repair as needed

1. Check that the AC circuit breaker for the climate unit in the ACCU has not tripped. Reset if necessary. If the circuit breaker cannot be reset, refer to the section "ACCU" in the chapter "Fault Localisation" and follow the procedures there before proceeding with this fault finding procedure.
2. Check the AC cable going to the climate unit. Replace the AC power cable if found faulty.
3. Check the control cable from the DXU/ECU backplane to the CCU. Replace if defective.

(6) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(7) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (21).
- No: Proceed to step (8).

(8) Activate heater

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

Activate the heater with the momentary button "HEAT" on the CCU. Refer to the figure below.

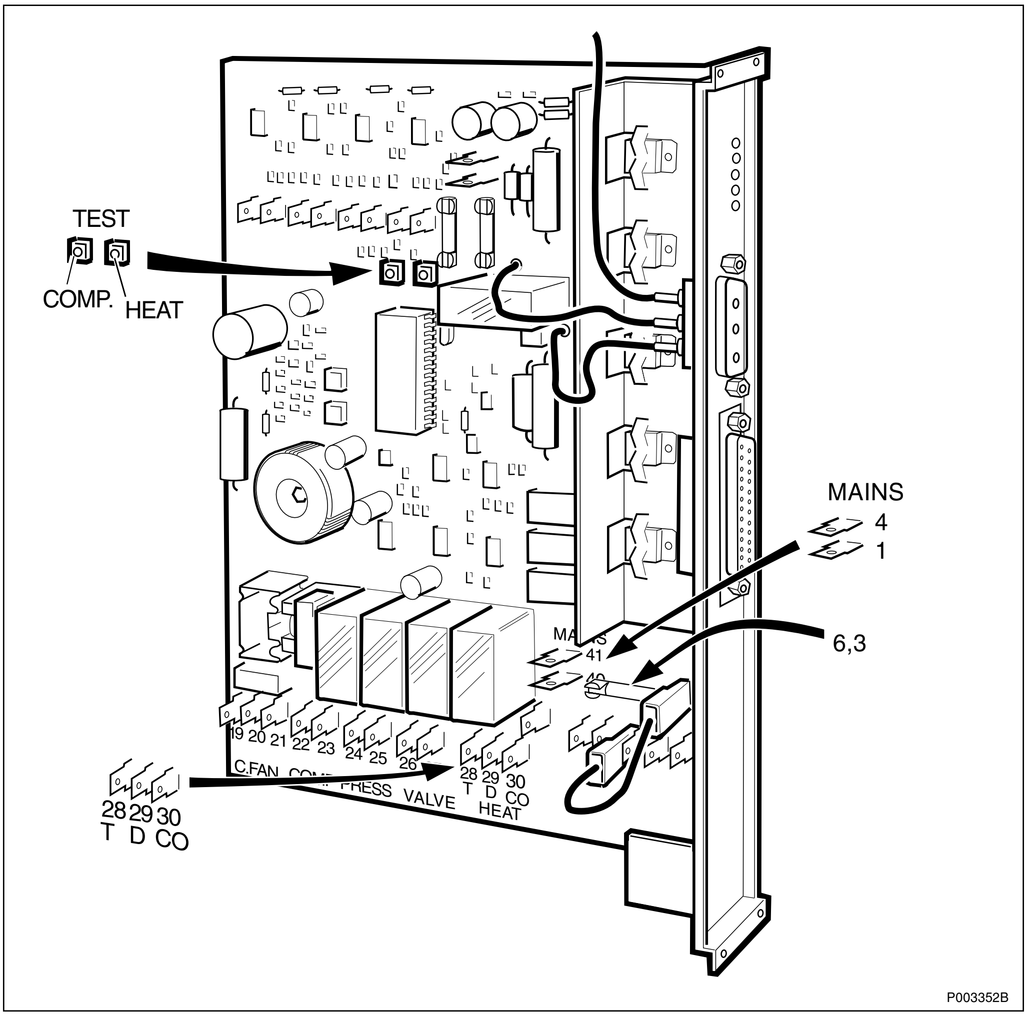


Figure 90 CCU

(9) Measure AC voltage

1. Refer to the figure in step (8) and measure the AC voltage between pins 28 (T) and 30 (CO) on the CCU. The expected voltage is 230 V.

2. Measure the AC voltage between pins 29 (D) and 30 (CO) on the CCU. The expected voltage is equal to the mains voltage on the site (200, 208, 230, 240 or 250 V AC).
3. Measure the AC voltage between pins 40 and 41. The expected voltage is equal to the mains voltage on the site (200, 208, 230, 240 or 250 V AC).

(10) AC voltage OK?

Is the AC voltage OK?

- Yes: Proceed to step (15).
- No: Proceed to step (11).

(11) Check fuse

1. Release the AC circuit breaker for the climate unit in the ACCU. Refer to Figure 26 on page 60.
2. Check the 6.3 Amp AC fuse on the CCU to the right of pins 40 and 41. If the fuse is defective, replace it. Refer to the figure in step (8) above.
3. Reset the AC circuit breaker in the ACCU.

(12) Fuse OK?

Is the fuse OK?

- Yes: Proceed to step (18).
- Fuse blown, replacement fuse OK: Proceed to step (18).
- Fuse blown, replacement fuse blows again: Proceed to step (13).

(13) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(14) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (21).
- No: Proceed to step (15).

(15) Replace heater

Replace the faulty heater according to instructions in the section "Heater" in the chapter "RBS Field Repair".

(16) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(17) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (21).
- No: Proceed to step (18).

(18) Replace CCU

Replace the CCU according to instructions in the section "CCU"in the chapter "RBS Field Repair".

(19) Perform climate test

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(20) Passed?

Was the climate test passed successfully?

- Yes: Proceed to step (21).
- No: Proceed to step (22).

(21) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (25). No fault is detected in the RBS.
- On: Proceed to step (22). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(22) CPU reset on ECU

Press the button labelled "CPU Reset" on the ECU for approximately 3 seconds. Wait at least 30 seconds to let the ECU restart.

(23) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (25). No fault is detected in the RBS.
- On: Proceed to step (24). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(24) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(25) Commence the Concluding Routines

Proceed to the section *Before Leaving the Site* in the chapter *Concluding Routines*.

5.28 Heat Exchanger External Fan

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V5", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3), (V4) and (V5) are used as abbreviations designating the four versions of the climate unit.

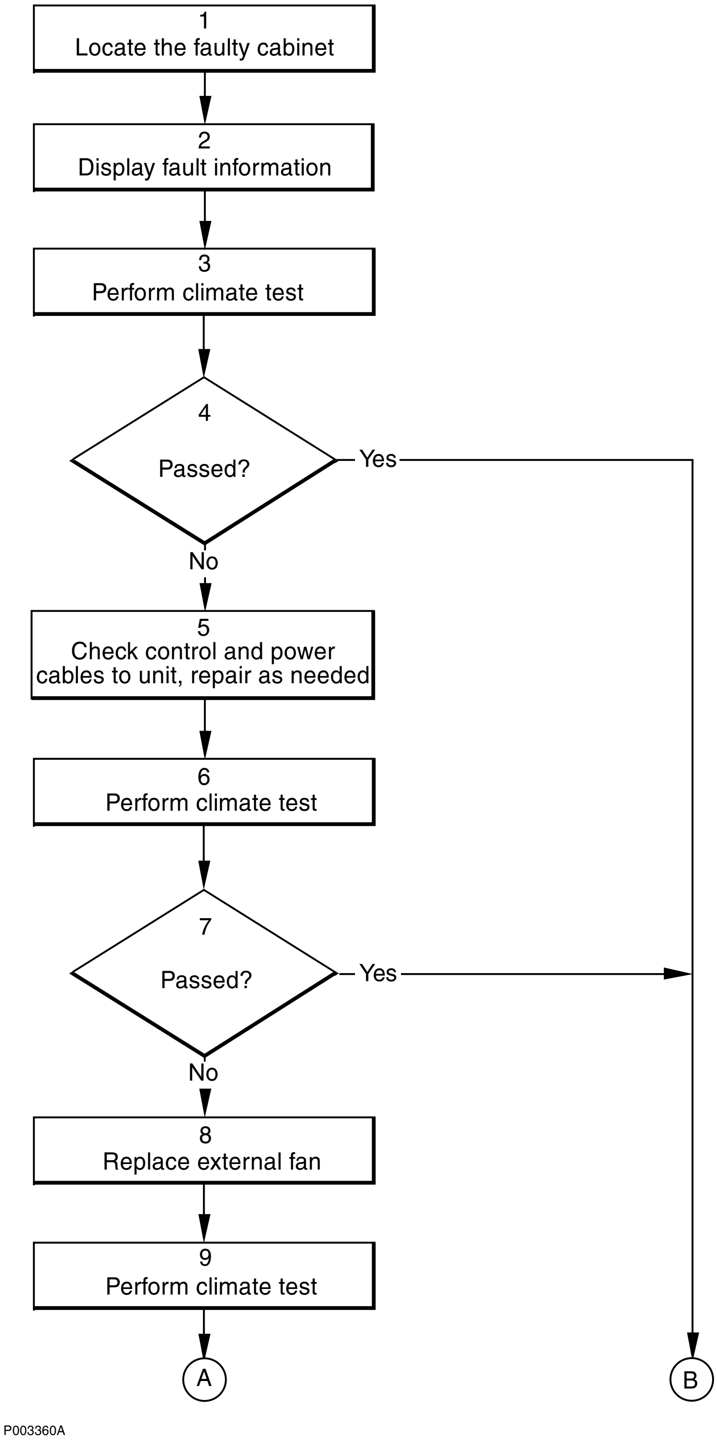


Figure 91 Heat exchanger external fans (part 1 of 2)

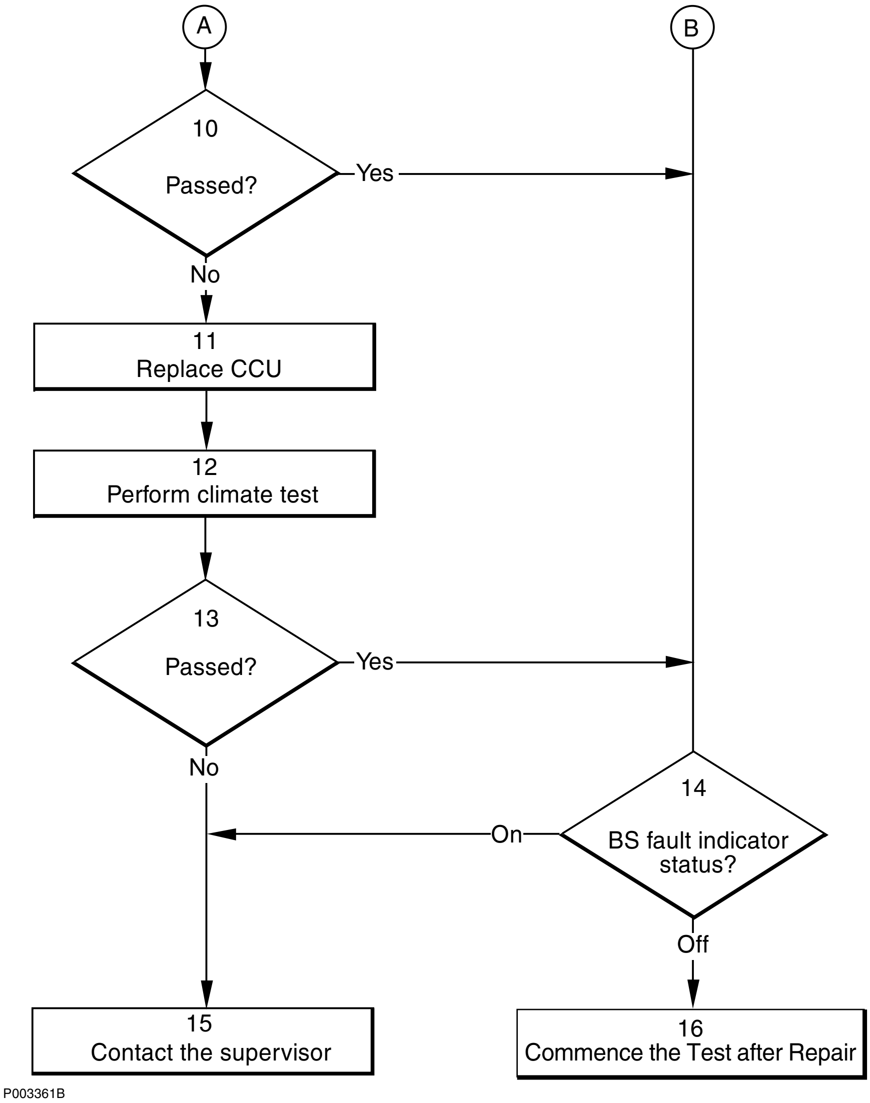


Figure 92 Heat exchanger external fans (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(4) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (5).

(5) Check control and power cables to unit, repair as needed

Climate unit versions V1 and V2

Follow the procedure below if the external fan is not running:

1. Check that the DC circuit breaker on the IDM has not tripped. Reset if necessary
2. If the circuit breaker cannot be reset, measure the DC voltage at the IDM to check that it is correct.
3. If defective, replace the DC circuit breaker for the climate unit according to instructions in the section "IDM"in the chapter "RBS Field Repair".
4. Measure the DC voltage to the top of the CCU. If the DC power cable is found defective, replace it prior to continuing this procedure.
5. Refer to the section "Climate Unit Versions V1 and V2, Control Cables" in the chapter "Cable connections" and check the control cable from the CCU to the DXU/ECU backplane. Replace if necessary.

Climate unit versions V3 and V4

Follow the procedure below if the external fan is not running:

1. Check that the DC circuit breaker on the IDM has not tripped. Reset if necessary
2. If the circuit breaker cannot be reset, measure the DC voltage at the IDM to check that it is correct.
3. If defective, replace the DC circuit breaker for the climate unit according to instructions in the section "IDM"in the chapter "RBS Field Repair".
4. Measure the DC voltage to the top of the CCU. If the DC power cable is found defective, replace it prior to continuing this procedure.
5. Check the DC fuses on the CCU. The two DC fuses are located to the right of pin 5 and are labelled on the circuit card as "EXT FAN" "INT FAN". The EXT FAN fuse controls the DC voltage for the external fan only. The INT FAN fuse controls all DC voltage in the climate unit.

6. Refer to the section "Climate Unit Versions V3 and V4, Control Cable" in the chapter "Cable connections"and check the control cable from the CCU to the DXU/ECU backplane. Replace if necessary.

(6) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(7) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (8).

(8) Replace external fan

Replace the external fan according to the section "Heat Exchanger Fans" in the chapter "RBS Field Repair".

(9) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(10) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (11).

(11) Replace CCU

Replace the CCU according to instructions in the section "CCU"in the chapter "RBS Field Repair".

(12) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(13) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (15).

(14) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (16). No fault is detected in the RBS.
- On: Proceed to step (15). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(15) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(16) Commence the Test after Repair

1. Proceed with the section "Climate System Test" in the chapter "Test after Repair".
2. Proceed with the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.29 Heat Exchanger Internal Fan

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3) and (V4) are used as abbreviations designating the four versions of the climate unit.

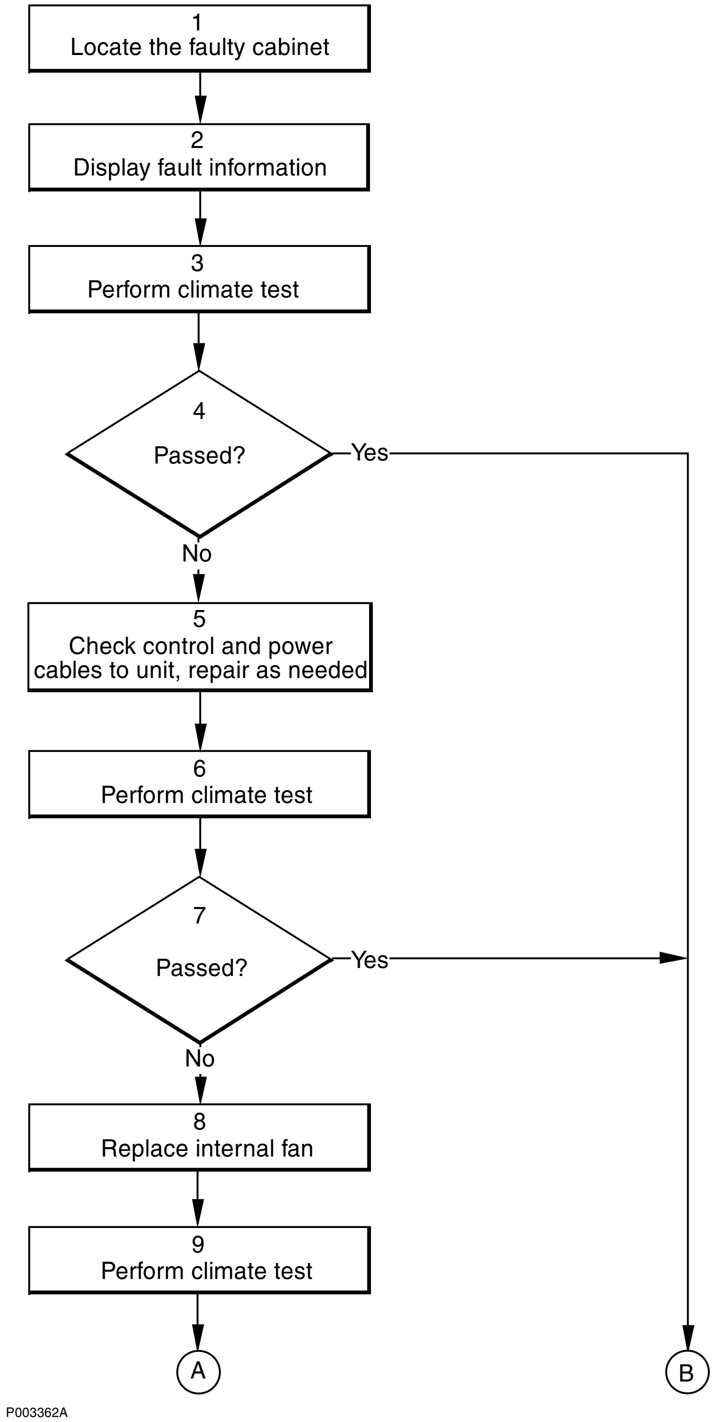


Figure 93 Heat exchanger internal fan (part 1 of 2)

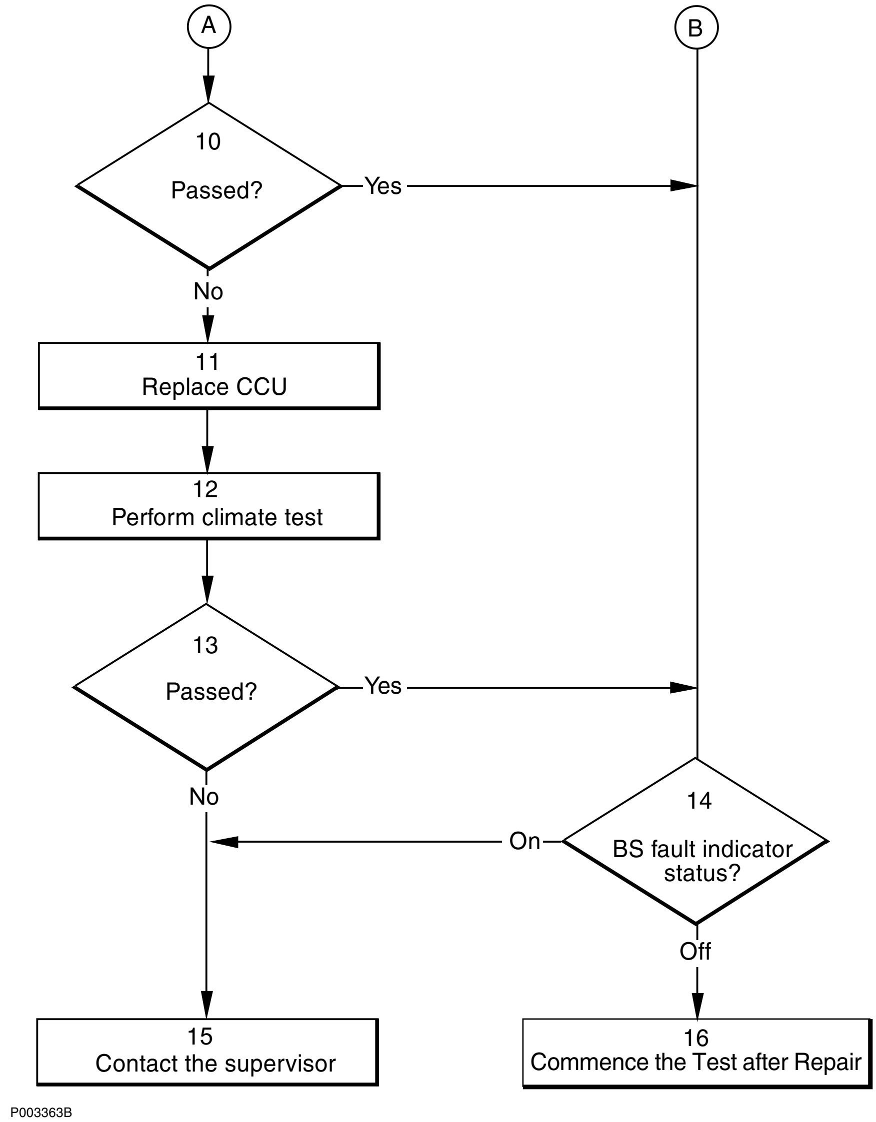


Figure 94 Heat exchanger internal fan (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(4) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (5).

(5) Check control and power cables to unit, repair as needed

Climate unit versions V1 and V2

Follow the procedure below if the internal fan is not running:

1. Check that the DC circuit breaker of the IDM has not tripped. If the circuit breaker cannot be reset, measure the DC voltage at the IDM. If the voltage is correct, replace the climate unit DC circuit breaker according to instructions in the section "IDM" in the chapter "RBS Field Repair".
2. Measure the DC voltage to the top connector of the CCU. If the DC power cable is found defective, replace it prior to continuing this procedure.
3. Refer to the section "Climate Unit Versions V1 and V2, Control Cables" in the chapter "Cable Connections" and check the control cable from the CCU to the DXU/ECU backplane. Replace if necessary.

Climate unit versions V3 and V4

Follow the procedure below if the internal fan is not running:

1. Check that the DC circuit breaker of the mid-mounted IDM has not tripped. If the circuit breaker cannot be reset, measure the DC voltage at the IDM. If the voltage is correct, replace the mid-mounted IDM according to instructions in the section "IDM" in the chapter "RBS Field Repair".
2. Measure the DC voltage to the top connector of the CCU. If the DC power cable is found defective, replace it prior to continuing this procedure.
3. Check the DC fuse of the internal fan on the CCU. The DC fuse is the second fuse to the right of pin 5 and is labelled on the circuit card "INT FAN". This fuse controls all the DC power for the climate unit.

   Replace the fuse if defective.
4. Refer to the section "Climate Unit Versions V3 and V4, Control Cable" in the chapter "Cable Connections" and check the control

cable from the CCU to the DXU/ECU backplane. Replace if necessary.

(6) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(7) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (8).

(8) Replace internal fan

Replace the internal fan according to the section "Heat Exchanger Fans" in the chapter "RBS Field Repair".

(9) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(10) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (14).
- No: Proceed to step (11).

(11) Replace CCU

Replace the CCU according to instructions in the section "CCU"in the chapter "RBS Field Repair".

(12) Perform climate test

Note: It is not always possible to tell visually if a fan is failing as an alarm is raised when a fan rotates at less than 85 % of its normal speed. Only the climate unit tester can determine if either an internal or external fan is too slow or too fast.

Perform the climate test according to instructions in the section "Climate System Test" in the chapter "Test after Repair".

(13) Passed?

Was the climate test performed successfully?

- Yes: Proceed to step (13).
- No: Proceed to step (15).

(14) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (16). No fault is detected in the RBS.
- On: Proceed to step (15). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(15) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(16) Commence the Test after Repair

1. Proceed with the section "Climate System Test" in the chapter "Test after Repair".
2. Proceed with the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.30 Humidity Sensor

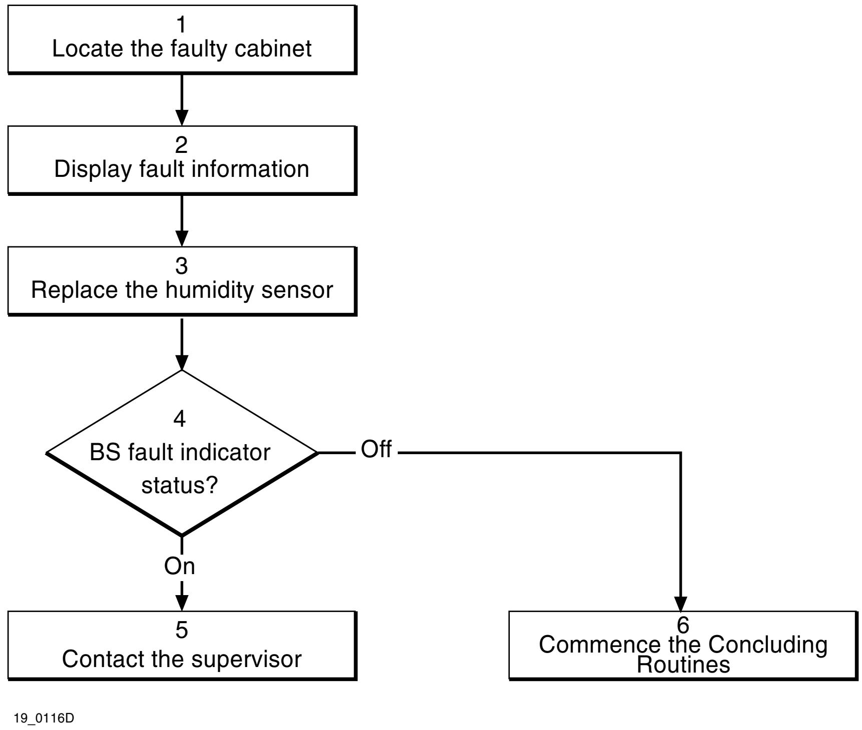


Figure 95 Humidity sensor

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User’s Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Replace the humidity sensor

Replace the humidity sensor according to instructions in the section "Humidity Sensor" in the chapter "RBS Field Repair".

(4) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (6). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(6) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.31 Local Bus

This section describes the procedure to be used when there is a fault on the Local Bus. The sub-sections included are *Primary actions*, *Secondary actions*, *The fault is in the RU or in the Backplane* and *If the fault remains*.

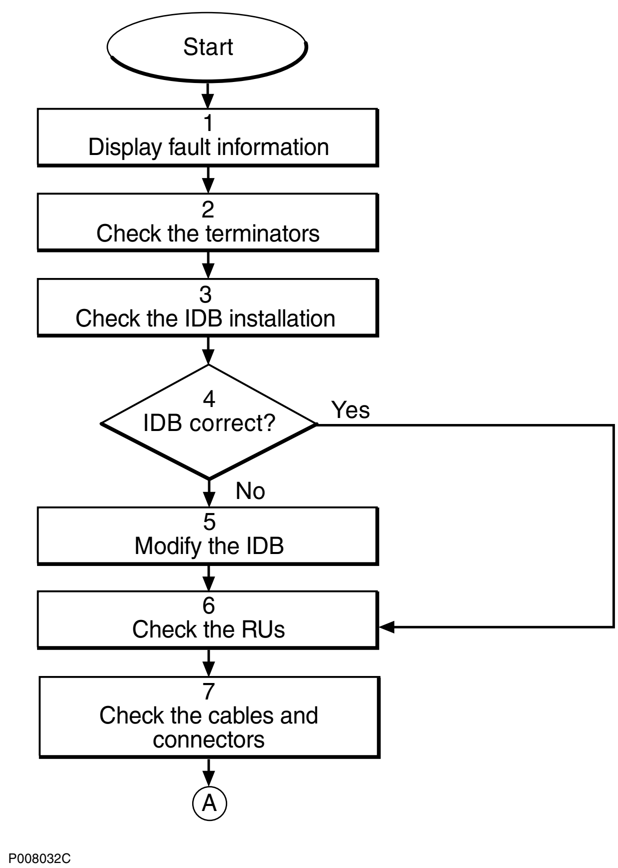


Figure 96 Local bus flowchart (part 1 of 2)

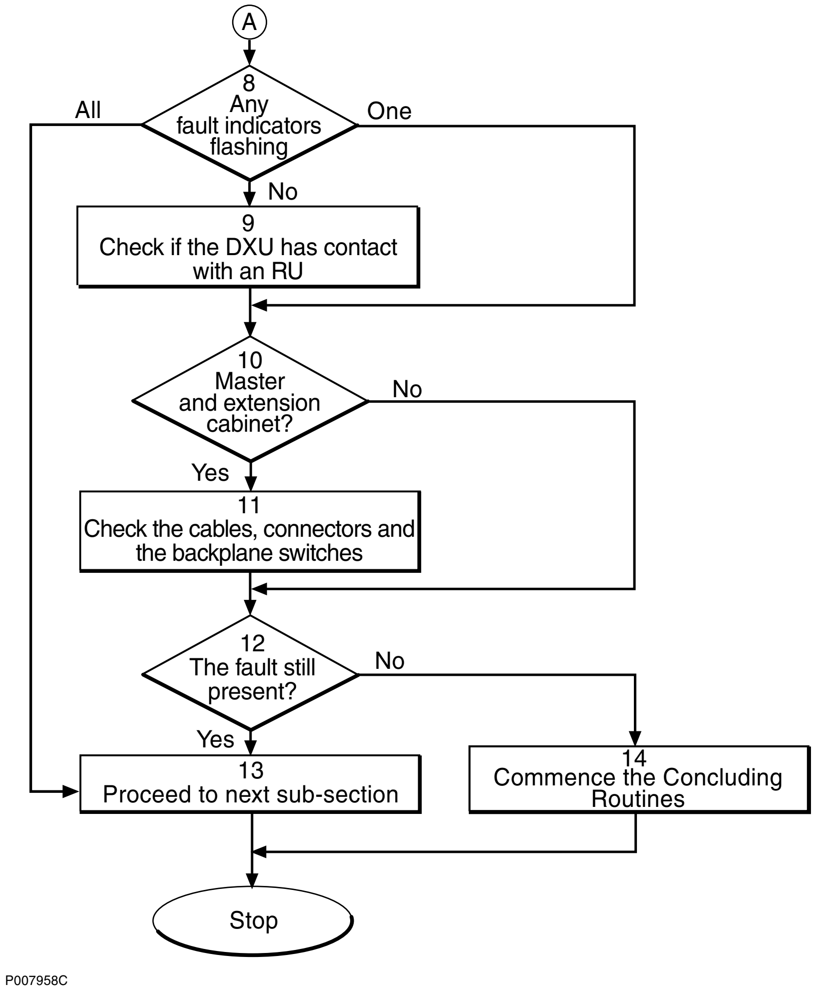


Figure 97 Local bus flowchart (part 2 of 2)

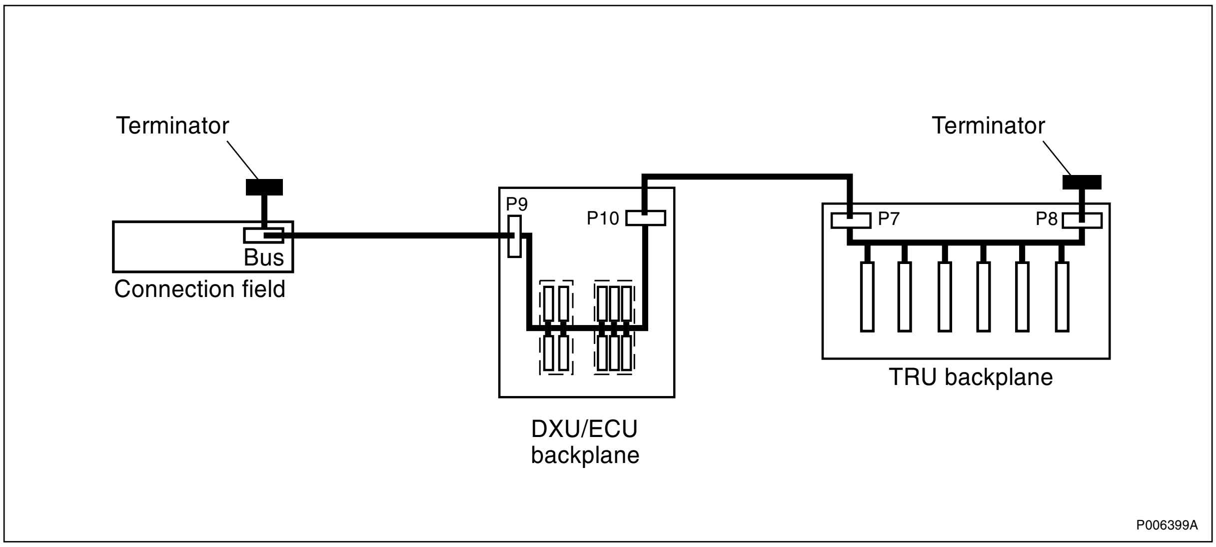


Figure 98 Local bus in a single cabinet

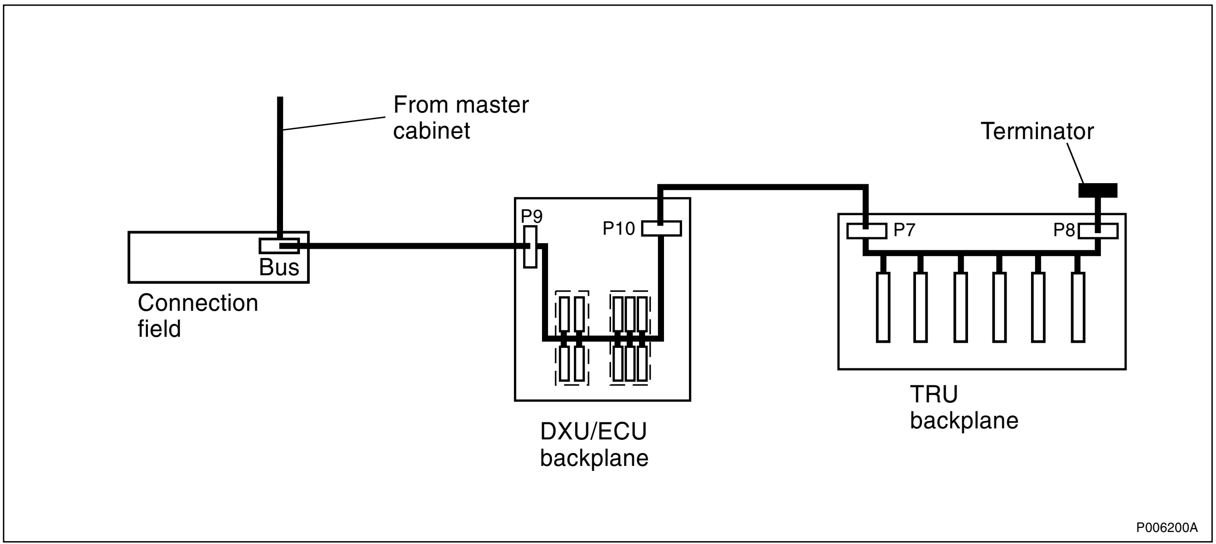


Figure 99 Local bus in an extension cabinet

5.31.1 Primary actions

Simple actions for the most common faults:

(1) Display information

Ust the OMT to see all fault messages and to get status on all RUs:

1. In the System view, click **RBS 2000**.
2. In the Operation menu, click **Monitor**and **Display Faulty RUs.**

(2) Check the terminators

1. Check that the terminators are placed according to the figures above.
2. Check that the terminator at the connection field has a revision label indicating product number RPT 403 804/01, revison R2A or higher. If not, change the terminator.

(3) Check the IDB installation

To check that the correct IDB is installed:

1. In the **Cabinet view**, check the cabinet type in particular and that the actual TRUs correspond with the TRUs definied in the IDB.

(4) IDB correct?

Is the IDB correct?

- Yes: Proceed to step (6).
- No: Proceed to step (5).

(5) Modify the IDB

1. In the System view, click **Installation Data Base**.

2. In the Operation menu, click **Modify IDB/Define Present RUs** to deactivate the TRUs that are not in use in the cabinet.

(6) Check the RUs

1. Check that the RUs are properly inserted into the backplane and fastened with all screws.

(7) Check the cables and connectors

1. Check the internal local bus cables.

2. Check connector pins on the back of the RUs. Remove the TRUs, the DXU and the ECU to reach the connector pins.

3. Check that the DXU/ECU backplane switches and TRU backplane switches are set correctly. If they are not, set the switches according to the section *DXU/ECU Backplane* and the section *TRU Backplane* in the chapter *RBS Field Repair*.

(8) Any Fault indicators flashing?

Are there any indicators flashing?

- One Fault indicator is flashing, proceed to step (10).
- No Fault indicators are flashing but there still is a local bus alarm, proceed to step (9).
- All Fault indicators are flashing on the TRUs and the ECU, proceed to step (13).

(9) Check if the DXU has contact with an RU

1. In the System view, click **RBS 2000**.

2. In the Operation menu, click **Display Software Versions**. If an RU has the message "Could not start monitor in RBS”, it means that the DXU has no contact with the RU.

3. If there is no contact, check cables and connections between the RU and the DXU.

(10) Master and extension cabinet?

Is there a master with an extension cabinet?

- Yes: Proceed to step (11).
- No: Proceed to step (12).

(11) Check the cables, connectors and the backplane switches,

1. Check the cables between the master and extension cabinet and the internal local bus cables in the extension cabinet.

2. Check connector pins on the back of the RUs in the extension cabinet. Remove the TRUs and the ECU to reach the connector pins (there is no DXU in the extension cabinet).

3. Check that the DXU/ECU backplane switches and the TRU backplane switches in the extension cabinet are set correctly. If

they are not, set the switches according to the section *DXU/ECU Backplane* and the section *TRU Backplane* in the chapter *RBS Field Repair*.

(12) The fault still present?

Is the fault still present?

- Yes: Proceed to step (13).
- No: Proceed to step (14).

(13) Proceed to next sub-section

1. If the fault remains, proceed to *Section 5.31.2 Secondary actions on page 198*.

(14) Commence the Concluding Routines

1. Proceed to the section *Before Leaving the Site* in the chapter *Concluding Routines*.

5.31.2 Secondary actions

Note: The instructions in *Section 5.31.1 Primary actions on page 196* must be carried out before continuing on with this section.

Check for additional fault codes received in the OMT and proceed with the relevant instruction below:

SO CF I1A:14 Bus fault (Local bus fault) alarm

1. When the OMT or the BSC shows Fault Class I1A:14 Bus fault (Local bus fault), replace the DXU according to the section *DXU* in the chapter *RBS Field Repair*.
2. If the fault remains, proceed to *Section 5.31.3 The Fault is in the RU or in the backplane on page 199*.

SO CF I2A:41, Lost communication to TRU

1. In the Cabinet view, verify that actual TRUs correspond with the TRUs defined in the IDB.
2. If they do not correspond, In the System view, click the **Installation Data Base** icon.
3. In the Operation menu, click **Modify IDB/Define Present RUs** to inactivate TRUs that are not in use in the cabinet.
4. If the fault remains, proceed to *Section 5.31.3 The Fault is in the RU or in the backplane on page 199*.

SO CF I2A:42, Lost communication to ECU

1. In the Cabinet view, verify that actual TRUs correspond with the TRUs defined in the IDB.

2. If they do not correspond, in the System view, click the **Installation Data Base** icon.

3. In the Operation menu, select **Modify IDB/Define Present RUs** to inactivate the TRUs that are not in use in the cabinet.

4. If the fault remains, proceed to *Section 5.31.3 The Fault is in the RU or in the backplane on page 199*.

5.31.3 The Fault is in the RU or in the backplane

1. Remove one TRU to see if the fault disappears.

   • If the fault disappears, proceed to step 2.

   • If the fault does not disappear, remove each subsequent TRU, the ECU and the DXU, one at the time, until the fault is located.

   • In the extension cabinet, if used, remove each subsequent TRU and the ECU (there is no DXU in the extension cabinet).

2. To see whether the fault is in the TRU or in the backplane, replace the suspected TRU with a functional TRU.

   • If the fault disappears, the fault is in the suspected TRU. Change the TRU.

   • If the fault does not disappear, the fault is in the backplane. Replace the TRU sub-rack according to the section *TRU Sub-Rack*in the chapter *RBS Field Repair*.

5.31.4 If the fault remains

1. Contact the supervisor or manager who will take further action, for example, to consult an FSC.

5.32 Power Communication Loop

The power communication loop is a fibre optic loop used for control and supervision of the power system. When the loop is opened, the power system switches to stand alone mode and the RU "Power Communication Loop"is set in the RU map.

Possible faults are a faulty RU or a faulty fibre optic cable. A indicator on an RU will start flashing when the unit has lost communication with the ECU.

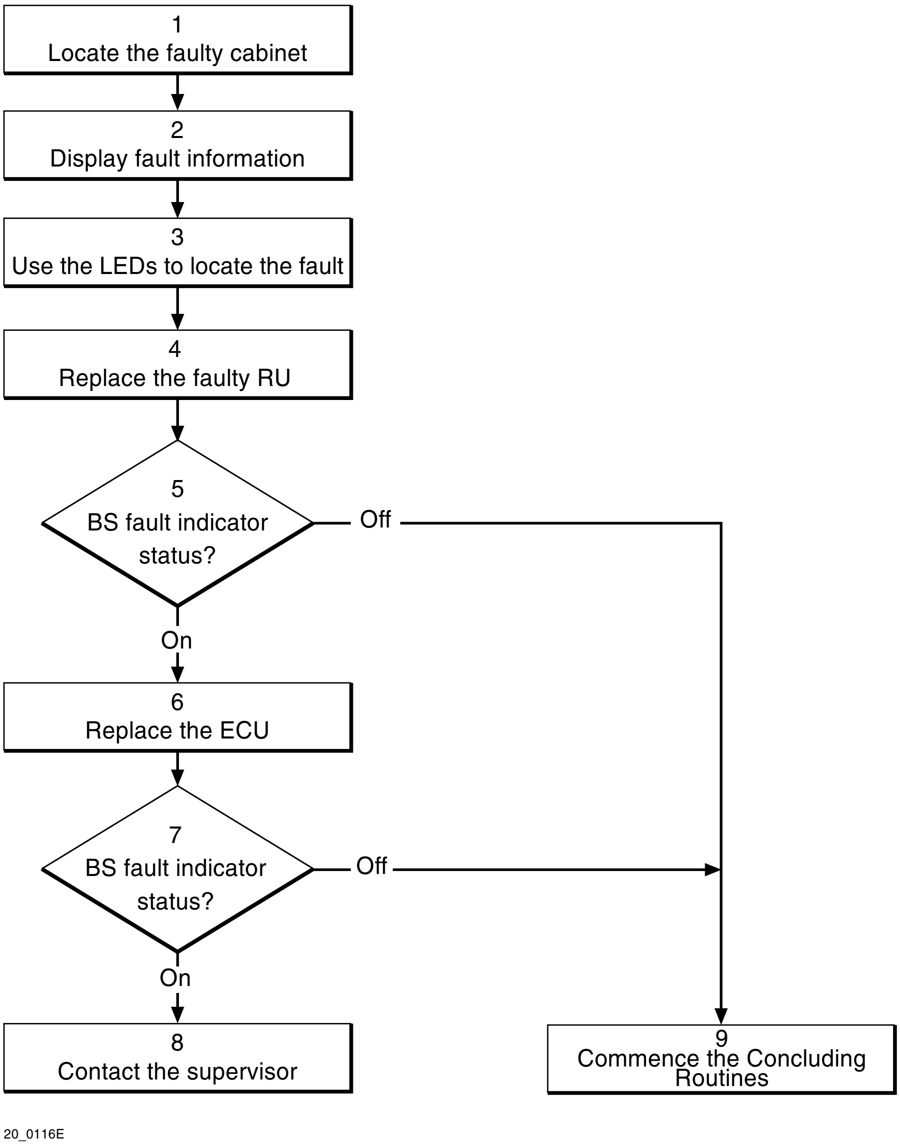


Figure 100 Power communication loop flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Use the indicators to locate the fault

To locate the fault, use by-passing of the suspected faulty units in order to get a closed loop, that is when the indicators stop flashing. (By-passing means that, for example, the opto bus cable from TD output on BFU 2 goes directly to RD input on PSU 2. Refer to the figures below.)

Repeat until the faulty RU or cable is identified.

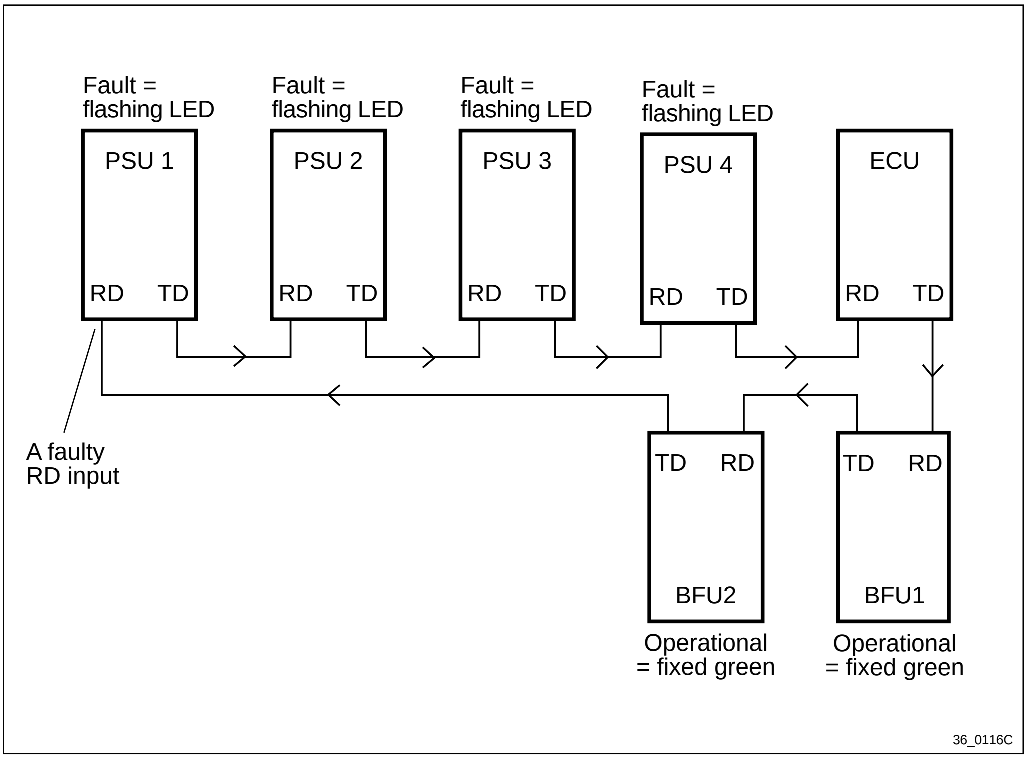


Figure 101 Example of a fault situation in the power communication loop

Flashing behaviour

If a unit gets a faulty RD input, the indicator on that unit and on the following units, starts flashing.

- BFU revision R1A: The green indicator "Operational"will start flashing.

  In BFU revision R1A, the green indicator "Operational" on BFU2 will also after some time start flashing if there is a break anywhere in the power communication loop, for example between BFU2 and PSU1. BFU2 will not stop flashing until the power communication loop is fully operational again. This will not happen from BFU revision R2A and on.

- BFU revision R2A or later: The red indicator "Fault"will start flashing.
- PSU revision R3A or earlier: The green indicator "Operational" will start flashing.
- PSU revision R4A or later: The red indicator "Fault"will start flashing.

- A BFU or a PSU that is still in communication with the ECU will show a fixed green "Operational" indicator.

(4) Replace the faulty RU

Replace the faulty RU according to instructions in the section "PSU" and "BFU"in the chapter "RBS Field Repair", or replace the opto bus cable if it is found being faulty.

Note: The opto bus cables must have a bent radius of at least 35 mm.

(5) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (9). No fault is detected in the RBS.
- On: Proceed to step (6). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(6) Replace the ECU

Replace the ECU according to instructions in the section "ECU"in the chapter "RBS Field Repair".

(7) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (9). No fault is detected in the RBS.
- On: Proceed to step (8). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(8) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(9) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.33 PSU

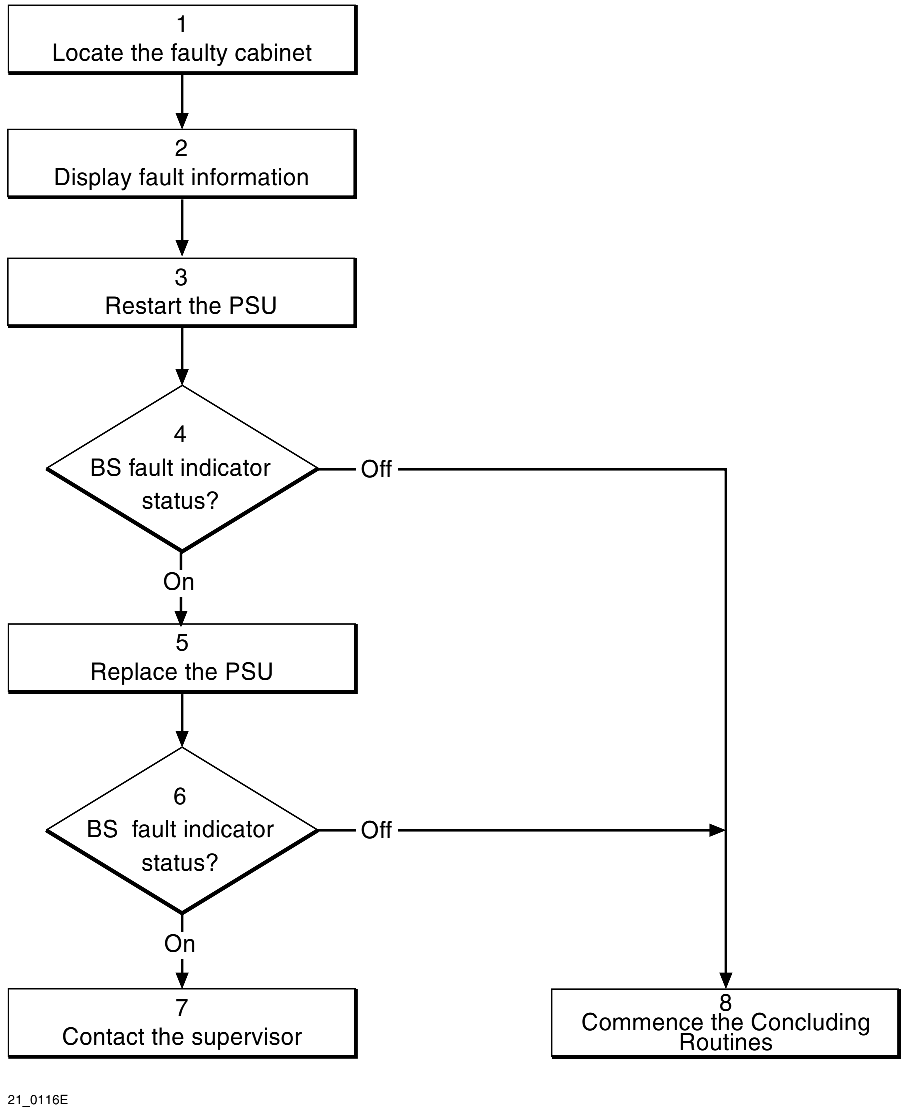
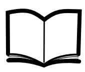


Figure 102 PSU flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:



OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Restart the PSU

Disconnect all cables from the PSU, wait a few seconds and then reconnect the cables again, see the section "PSU" in the chapter "RBS Field Repair". If the PSU is in a so-called "overvoltage stop" condition it will function properly after being disconnected.

(4) BS fault indicator status?

The red indicator labelled Fault on the PSU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (8). No fault is detected in the PSU.
- On: Proceed to step (5). One or more faults are detected in the PSU.
- *PSU revision R4A or later.*

  Flashing (red Fault indicator): Proceed to step (5). The PSU has lost communication with the ECU.
- *PSU revision R3A or earlier.*

  Flashing (green Operational indicator): Proceed to step (5). The PSU has lost communication with the ECU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace the PSU

Replace the faulty PSU according to instructions in the section "PSU" in the chapter "RBS Field Repair".

(6) BS fault indicator status?

The red indicator labelled Fault on the PSU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (8). No fault is detected in the PSU.
- On: Proceed to step (7). One or more faults are detected in the PSU.
- *PSU revision R4A or later.*

Flashing (red Fault indicator): Proceed to step (7). The PSU has lost communication with the ECU.

- *PSU revision R3A or earlier.*

  Flashing (green Operational indicator): Proceed to step (7). The PSU has lost communication with the ECU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(8) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.34 PSU DC Cable

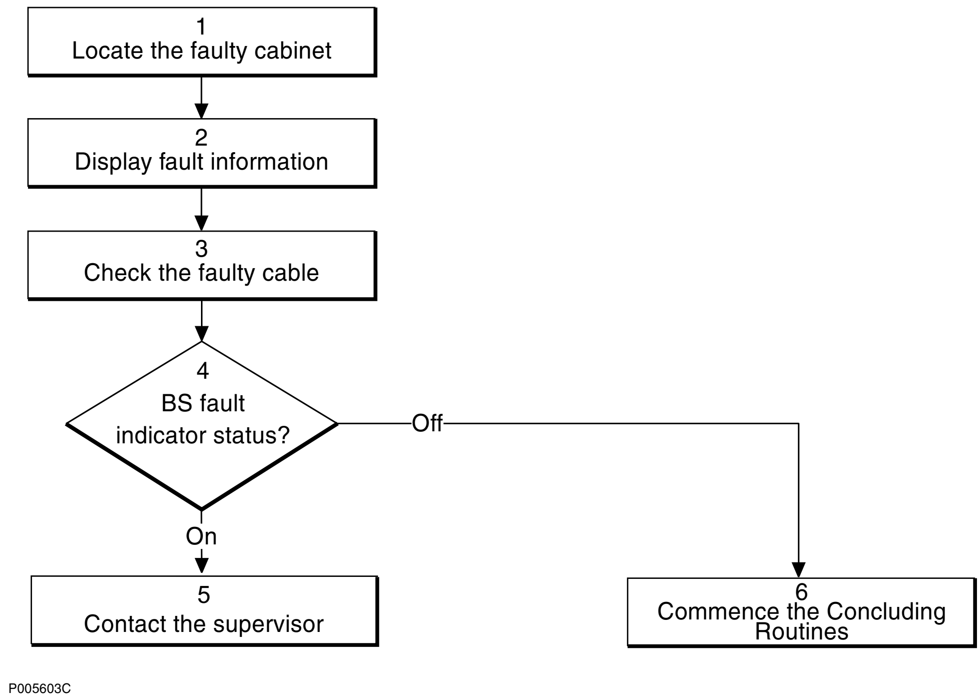


Figure 103 PSU DC cable flowchart

Note: This alarm only applies to a PSU DC cable connected to a PSU 230, not to a PSU –48.

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Check the faulty cable

1. Check that the cable connector is fastened properly to the PSU.
2. Check that the cable connector as well as the matching connector in the PSU is not burned or mechanically damaged.
3. Replace the cable if necessary according to instructions in the section "PSU DC Cable" in the chapter "RBS Field Repair".

(4) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

Note: It can take up to ten minutes for the alarm to cease.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (6). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(6) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.35 RBS DB

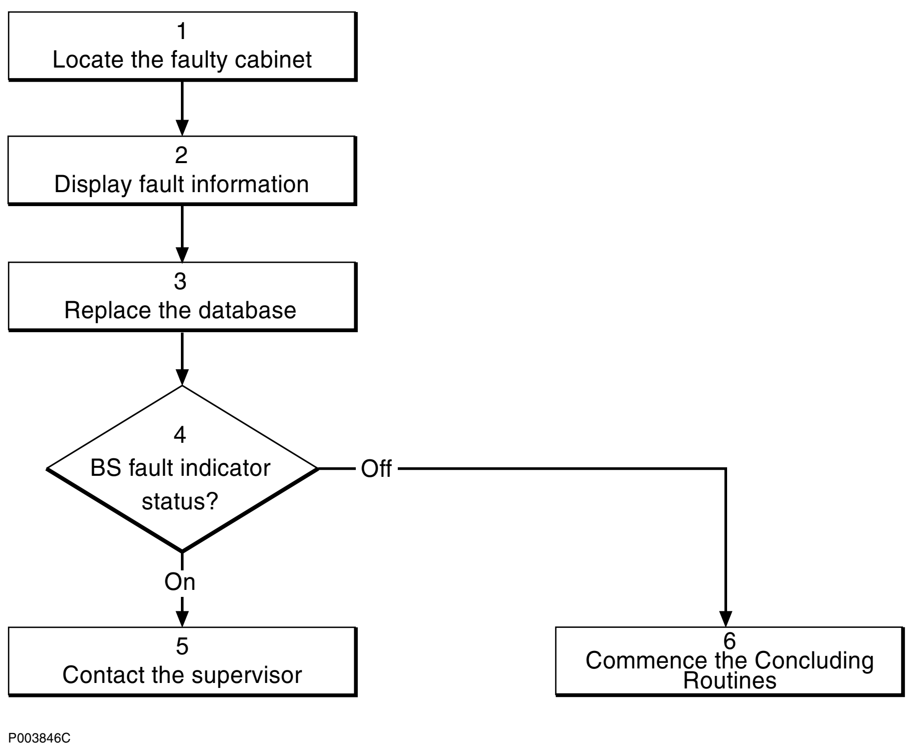


Figure 104 RBS DB flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(3) Replace the database

Replace the faulty database according to instructions in the section "RBS DB" in the chapter "RBS Field Repair".

(4) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (6). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(6) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.36 RBS Door

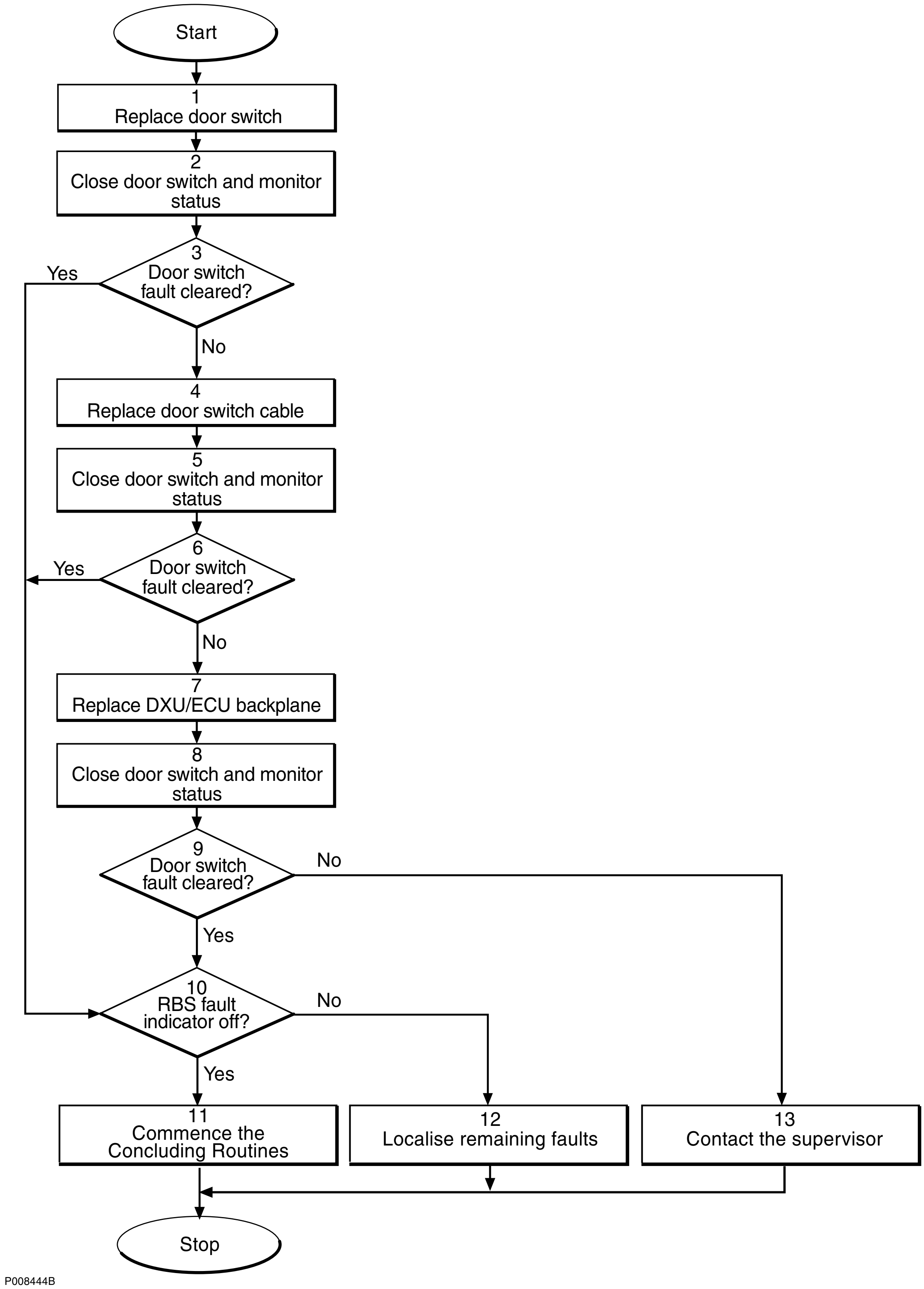


Figure 105 RBS Door flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

	OMT User's Manual	*LZN 302 01*
	OMT User's Manual	*LZN 302 01*

(1) Replace door switch

If damage to the door switches, wires and connectors is found, repair or replace the door switch or the damaged item.

1. Inspect door switches, wires and connectors for damage.
2. Check that the switches open and short correctly according the following instructions:
   - Disconnect the two wires from the switch.
   - Using an Ohm meter, measure across the two terminals.
   - Activate the door switch manually.

   The Ohm meter should indicate a short circuit when the door switch is activated, and an open circuit when not activated.

If any of the above faults are found, repair or replace the door switch or the damaged item according to the instructions in the section *Door Switch* in the chapter *RBS Field Repair.*

(2) Close door switch and monitor status

1. Use the monitor **Display Faulty RUs**in the OMT.
2. Close the door switch manually.

Note: Depending on the version of BTS software in the DXU, there will be a delay of approximately 5 minutes from the time the door switch is closed, until the fault monitor shows the alarm is cleared.

(3) Door switch fault cleared?

1. Use the monitor **Display Faulty RUs**in the OMT to list all RUs that are faulty.

   Has the door switch fault disappeared?

Answer	Comment	Action
Yes	The switch fault is cleared.	Proceed to stage (10)
No	There is still a switch fault.	Proceed to stage (4)

(4) Replace door switch cable

1. Remove the cable connected to the door switch and to the backplane.
2. Replace the cable.

(5) Close door switch and monitor status

1. Use the monitor **Display Faulty RUs**in the OMT.
2. Activate the door switch manually.

Note: Depending on the version of BTS software in the DXU, there will be a delay of approximately 5 minutes from the time the door switch is closed, until the fault monitor shows the alarm is cleared.

(6) Door switch fault cleared?

1. Use the monitor **Display Faulty RUs**in the OMT to list all RUs that are faulty.

   Has the door switch fault disappeared?

Answer	Comment	Action
Yes	The door switch fault is cleared.	Proceed to stage (10)
No	There is still a door switch fault.	Proceed to stage (7)

(7) Replace DXU/ECU backplane

1. Replace the DXU/ECU backplane, see the section *DXU/ECU Backplane* in chapter *RBS Field Repair* for instructions.

(8) Close door switch and monitor status

1. Use the monitor **Display Faulty RUs**in the OMT.
2. Activate the door switch manually.

Note: Depending on the version of BTS software in the DXU, there will be a delay of approximately 5 minutes from the time the door switch is closed, until the fault monitor shows the alarm is cleared.

(9) Door switch fault cleared?

1. Use the monitor **Display Faulty RUs**in the OMT to list all RUs that are faulty.

   Has the door switch fault disappeared?

Answer	Comment	Action
Yes	The switch fault is cleared.	Proceed to stage (10)
No	There is still a switch fault.	Proceed to stage (13)

(10) RBS fault indicator off?

1. Check that there are no remaining faults in the RBS. The yellow BS fault indicator is located on the RBS Status Panel as well as on the DXU.

   Is the BS fault indicator off?

Answer	Comment	Action
Yes	There are no faults in the RBS.	Proceed to stage (11)
No	There is still one or more faults in the RBS.	Proceed to stage (12)

The status of the RBS can also be checked with the OMT. Use the monitor **Display Faulty RUs** in the OMT to list all RUs that are faulty.

(11) Commence the Concluding Routines

1. Proceed to section *Before Leaving the Site* in chapter *Concluding Routines*.

(12) Localise remaining faults

1. Use the monitor **Display Faulty RUs**in the OMT to list all RUs that are faulty.
2. Do fault localisation on the RUs that are listed by the OMT as faulty. See respective section in this chapter, *Fault Localisation*.

(13) Contact supervisor

1. Contact the supervisor or manager who will take further action, for example, to consult an FSC.

5.37 Temperature Sensors

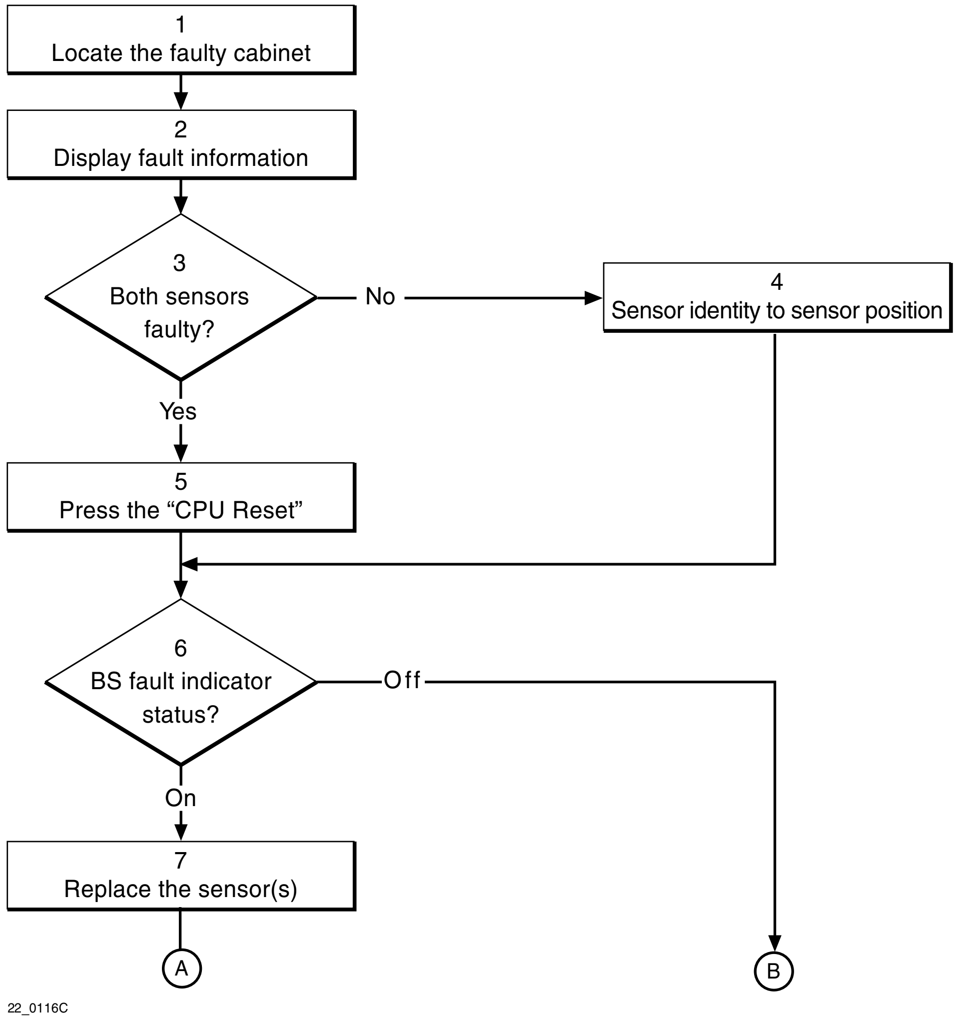


Figure 106 Temperature sensors flowchart (part 1 of 3)

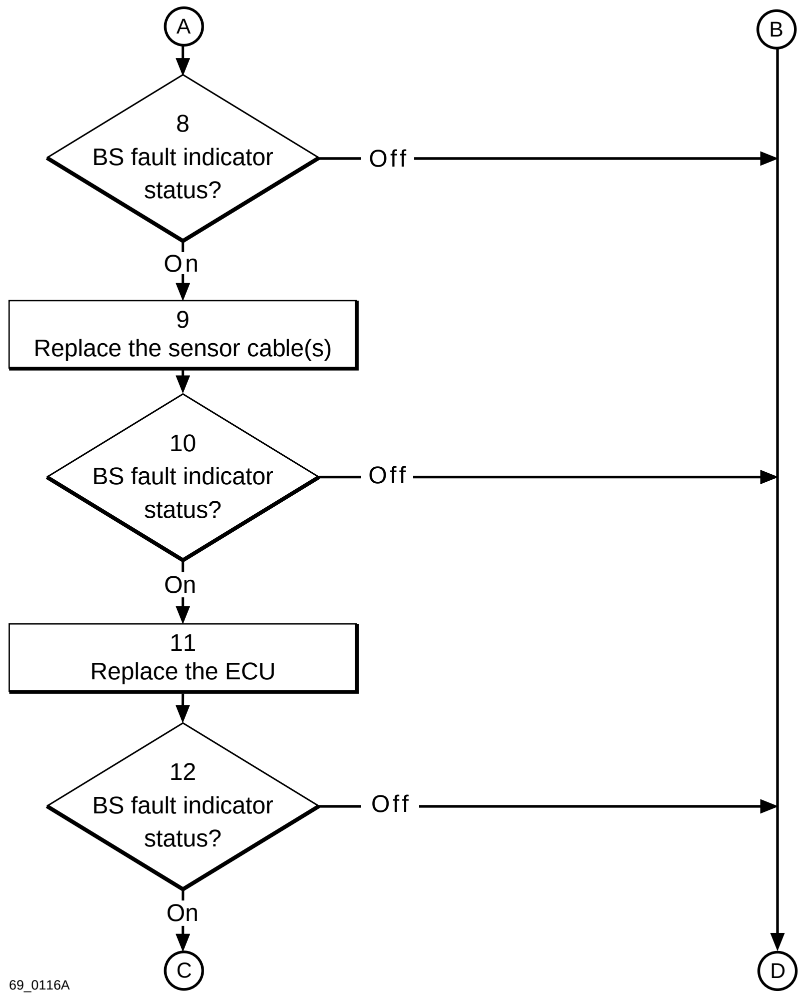


Figure 107 Temperature sensors flowchart (part 2 of 3)

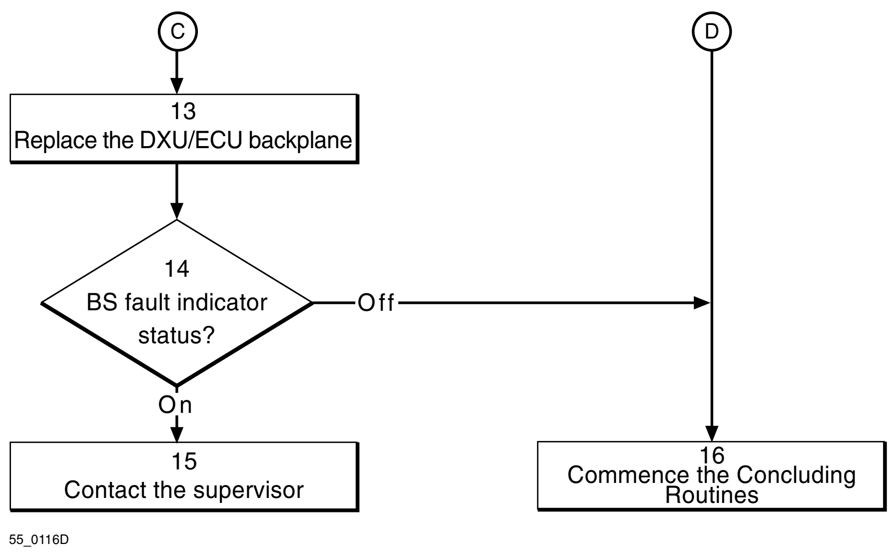


Figure 108 Temperature sensors flowchart (part 3 of 3)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User’s Manual	*LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Both sensors faulty?

Both sensors faulty?

- No: Proceed to step (4). Only one temperature sensor is faulty.
- Yes: Proceed to step (5). Both temperature sensors are faulty.

(4) Sensor identity to sensor position

Convert the sensor identity to a sensor position. For further information, see the chapter "Positioning of RUs".

Proceed to step (6).

(5) Press the “CPU Reset”

Press the button CPU Reset on the ECU for approximately 3 seconds.

After approximately 30 seconds, the system should function without alarm, and the Fault indicator on the ECU should go out.

(6) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (16). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Replace the sensor(s)

Replace the faulty temperature sensor(s) according to instructions in the section "Temperature Sensors" in the chapter "RBS Field Repair".

(8) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (16). No fault is detected in the RBS.
- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Replace the sensor cable(s)

For information about cable connections, refer to the section "DXU/ ECU backplane" in the chapter "Cable Connections".

(10) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (16). No fault is detected in the RBS.
- On: Proceed to step (11). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(11) Replace the ECU

Replace the ECU according to instructions in the section "ECU"in the chapter "RBS Field Repair".

(12) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (16). No fault is detected in the RBS.
- On: Proceed to step (13). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(13) Replace the DXU/ECU backplane

Replace the DXU/ECU backplane according to instructions in the section "DXU/ECU Backplane" in the chapter "RBS Field Repair".

(14) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (16). No fault is detected in the RBS.
- On: Proceed to step (15). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(15) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(16) Commence the Concluding Routines

Proceed to the section "Before Leaving the Site" in the chapter "Concluding Routines".

5.38 Timing Bus

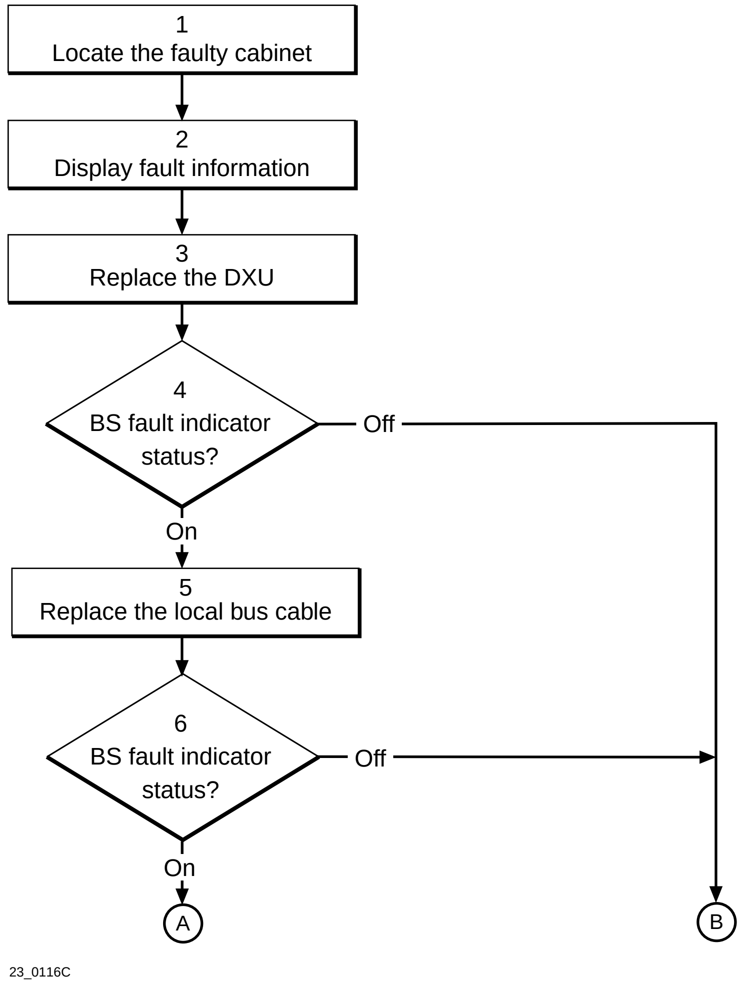


Figure 109 Timing bus flowchart (part 1 of 2)

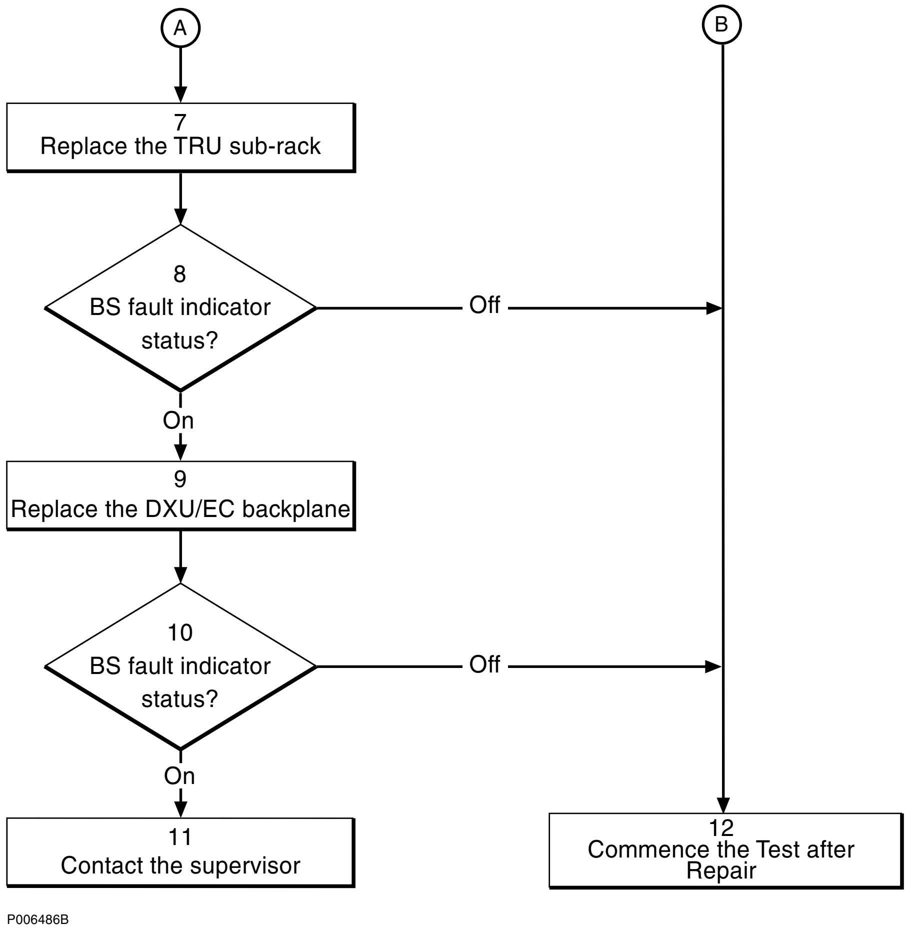


Figure 110   Timing bus flowchart (part 2 of 2)

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual   *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(3) Replace DXU

Replace the DXU according to instructions in the section "DXU"in the chapter "RBS Field Repair".

(4) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (12). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace the local bus cable

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

Replace the local bus cable connecting the DXU/ECU backplane with the TRU backplane. Cable information for backplanes can be found in the chapter "Cable Connections".

(6) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (12). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Replace TRU sub-rack

Replace the TRU sub-rack according to the section "TRU Sub-Rack"in the chapter "RBS Field Repair". If an extension cabinet is used, replace the TRU sub-rack in the master cabinet first, then in the extension cabinet.

(8) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (12). No fault is detected in the RBS.

- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Replace DXU/ECU backplane

Replace the DXU/ECU backplane according to the section "DXU/ECU Backplane" in the chapter "RBS Field Repair". If an extension cabinet is used, replace the DXU/ECU backplane in the master cabinet first, then in the extension cabinet.

(10) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (12). No fault is detected in the RBS.
- On: Proceed to step (11). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(11) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(12) Commence the Test after Repair

Take the following actions:

1. Make a test call over all TRUs according to the section "Test Call" in the chapter "Test after Repair".
2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.39 TMA A and TMA B

Refer to the section "ALNA A, ALNA B, ALNA/TMA A and , ALNA/ TMA B" in this chapter.

5.40 TRU

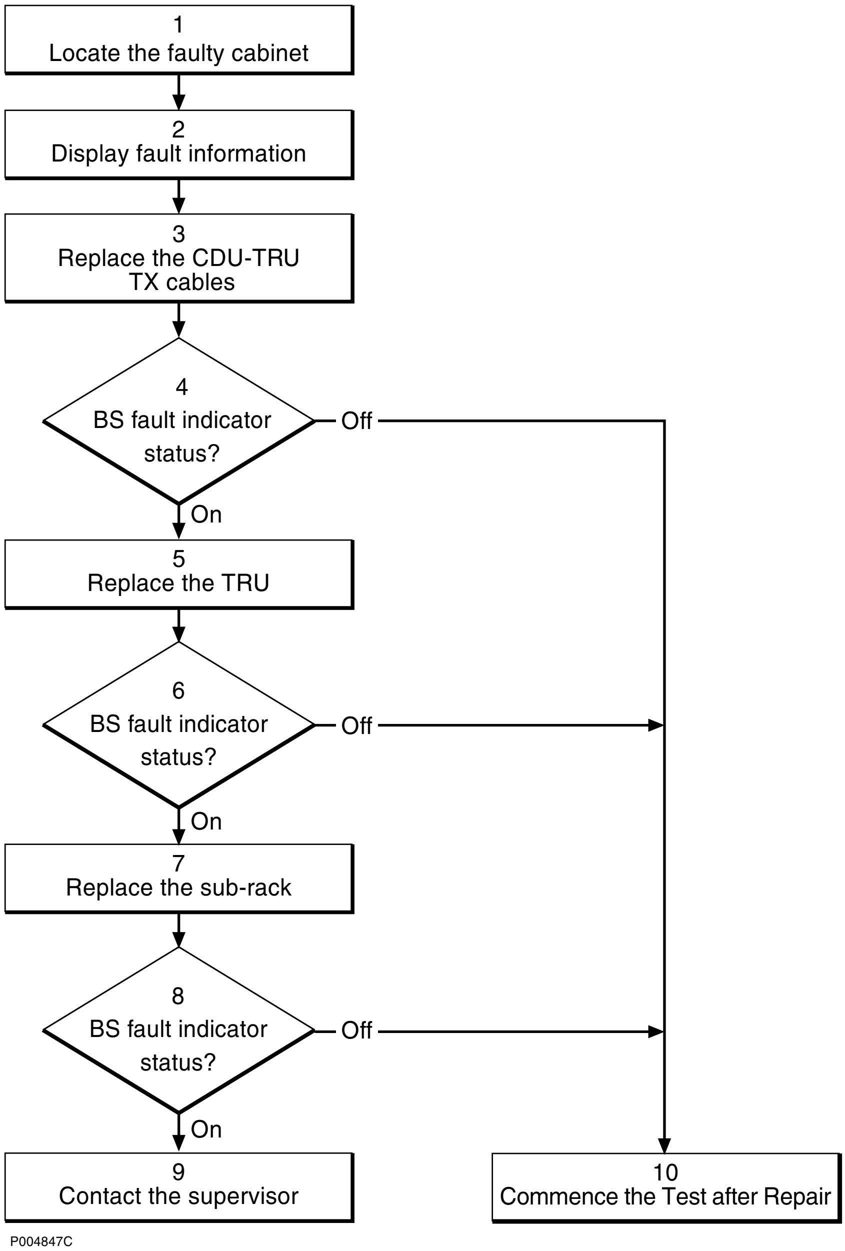


Figure 111 TRU flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Replace the CDU-TRU TX cables

Replace one or both CDU-TRU TX cables according to instructions in the section "CDU-TRU TX Cables" in the chapter "RBS Field Repair".

(4) BS fault indicator status?

The red indicator labelled Fault on the TRU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (10). No fault is detected in the TRU.
- On: Proceed to step (5). One or more faults are detected in the TRU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace the TRU

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

Replace the faulty TRU according to instructions in the section "TRU" in the chapter "RBS Field Repair".

(6) BS fault indicator status?

The red indicator labelled Fault on the TRU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (10). No fault is detected in the TRU.
- On: Proceed to step (7). One or more faults are detected in the TRU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Replace the sub-rack

The fault is probably located in the backplane.

1. Replace the TRU sub-rack according to the section "TRU Sub-Rack" in the chapter "RBS Field Repair".

(8) BS fault indicator status?

The red indicator labelled Fault on the TRU indicates the fault status of the unit.

Fault indicator status?

- Off: Proceed to step (10). No fault is detected in the TRU.
- On: Proceed to step (9). One or more faults are detected in the TRU.

There are two additional methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (10). No fault is detected in the RBS.
- On: Proceed to step (9). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(9) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(10) Commence the Test after Repair

Take the following actions:

1. Make a test call:

• If a TRU was replaced, make a test call over just that TRU according to the section "Test Call" in the chapter "Test after Repair".

• If a sub-rack was replaced, make a test call over all TRUs according to the section "Test Call" in the chapter "Test after Repair".

2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

5.41 X Bus

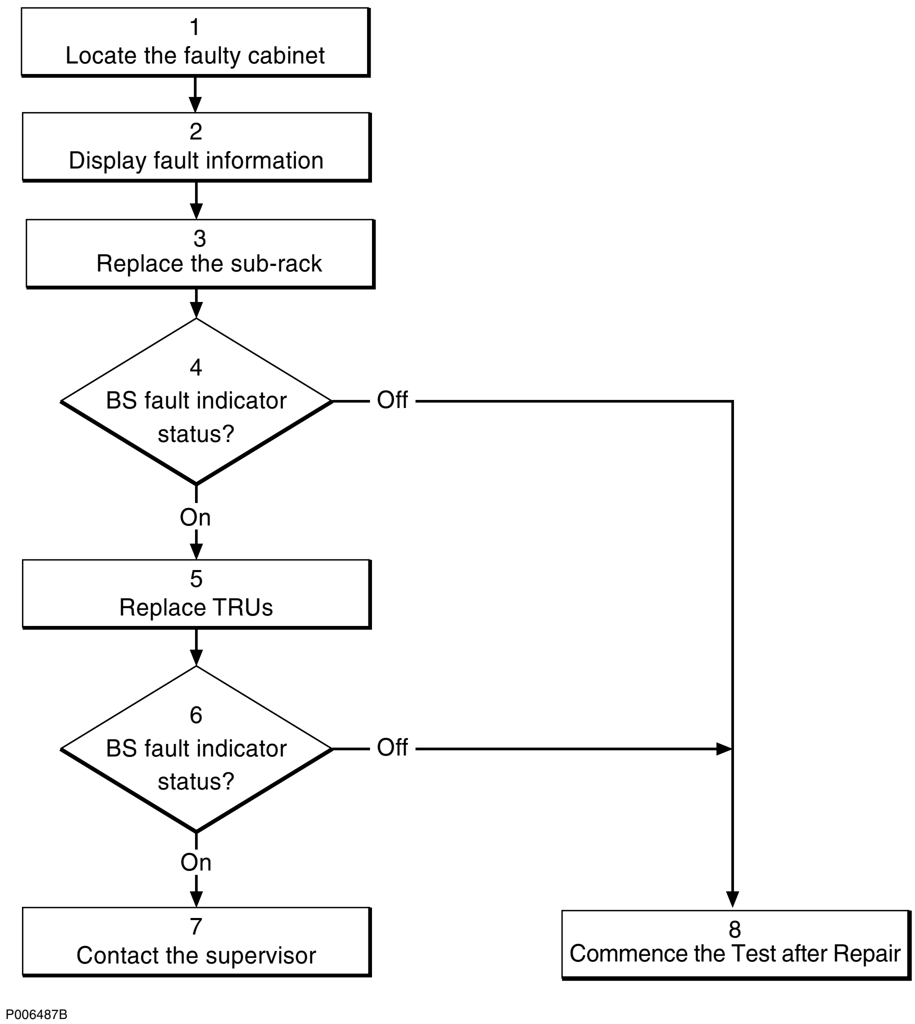


Figure 112 X bus flowchart

Note: Several instructions in this section require the OMT. For further information on the use of OMT, see:

OMT User's Manual *LZN 302 01*

(1) Locate the faulty cabinet

Locate the faulty cabinet according to work order information.

(2) Display fault information

Use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs". The window also shows whether the fault is in the master cabinet, or in an extension cabinet (if connected).

(3) Replace the sub-rack

The fault is probably located in the backplane.

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

1. Replace the TRU sub-rack according to the section "TRU Sub-Rack" in the chapter "RBS Field Repair".

(4) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (5). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(5) Replace TRUs

Note: If the unit to be replaced is part of an extension cabinet system, always work in the extension cabinet first, then in the master.

1. Replace the (first) TRU according to the section "TRU"in the chapter "RBS Field Repair".
2. Put the replacement TRU in remote mode.
3. Make a test call according to one of the following alternatives:

   • If the fault is cleared, the BS fault will be off and test calls over all TRUs according to the section "Test Call" in the chapter "Test after Repair" should be made.

   • If the faulty TRU was not found (BS fault = ON at the DXU), continue to replace the next TRU as described in step 1.

(6) BS fault indicator status?

There are two methods to determine whether the fault has been cleared.

The first method is to inspect the yellow indicator labelled BS fault on the DXU.

BS fault indicator status?

- Off: Proceed to step (8). No fault is detected in the RBS.
- On: Proceed to step (7). One or more faults are detected in the RBS.

The second method is to use the OMT to list all RUs that are faulty: Select the "System view" and the object RBS. In the Operation menu, select "Display Faulty RUs".

(7) Contact the supervisor

Contact the supervisor or manager who will take further action, for example, to consult an FSC.

(8) Commence the Test after Repair

Take the following actions:

1. Make a test call over all TRUs and ATRUs according to the section "Test Call" in the chapter "Test after Repair".
2. Proceed to the section "Before Leaving the Site"in the chapter "Concluding Routines".

This page is intentionally left blank

6 RBS Field Repair

The instructions in this chapter describe the replacement of RUs and how to put the RBS into operation after a fault has been localised in the RBS.

6.1 Local/remote Mode

The Local/remote button can change RU mode between local and remote control. A Local/remote button is located on the DXU and the TRUs. RUs in local mode do not have communication with the BSC via the Abis interface and are therefore isolated from the BSC.

The Local/remote button is used to isolate the unit from the BSC, for example, when exchanging faulty units in the RBS.

RUs cannot be changed to remote mode until the data base has been downloaded to the DXU.

Below is a brief description of the two different changes of state and how to stop a change of mode to remote.

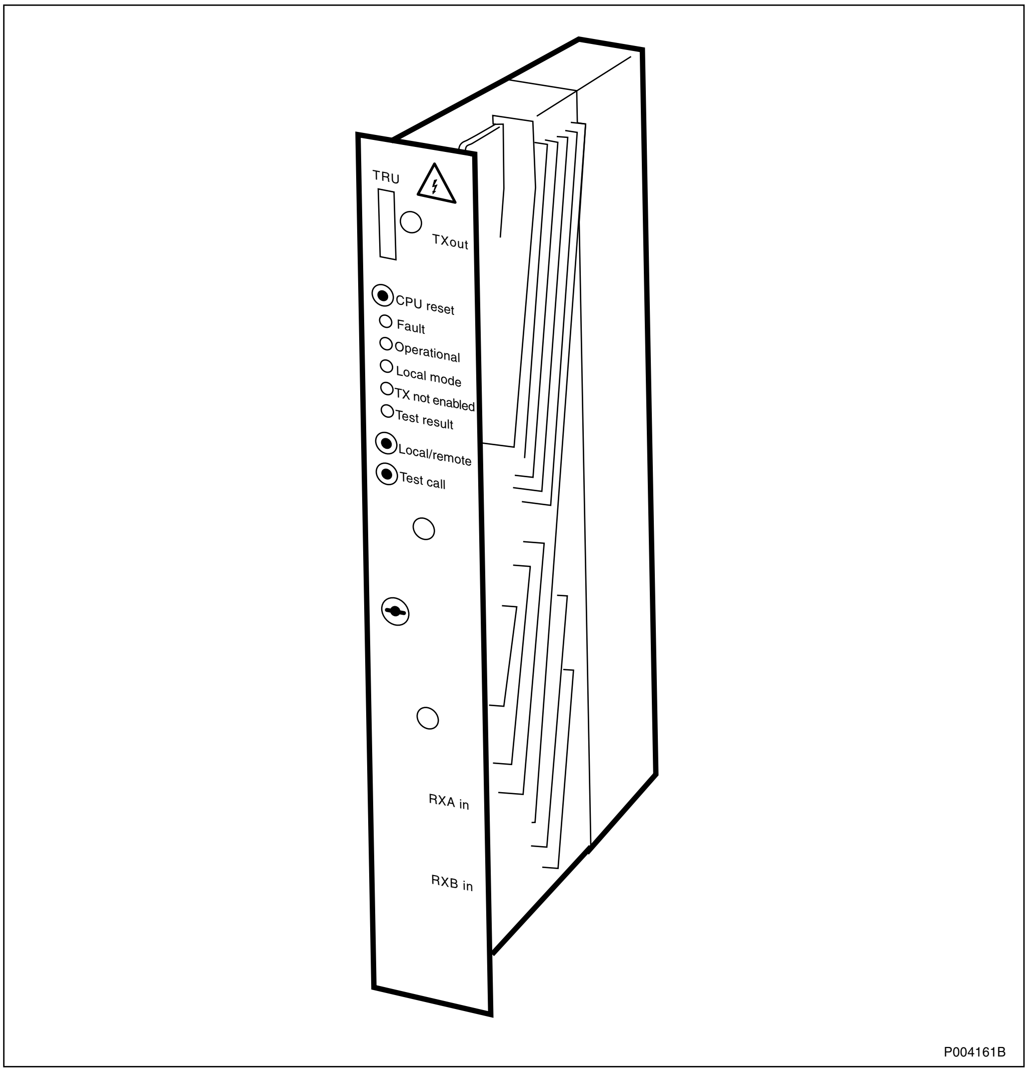


Figure 113 Control panel on TRU

6.1.1 Changing RU Mode from Remote to Local

- The Local/remote button is pressed.
- The Local/remote button is disabled in order to prevent mistakes.
- The Local mode indicator starts flashing to indicate that a change of RU mode to local is in progress.
- The Operational indicator turns off in order to indicate that the RU has been taken out of operation.
- A fault report message is sent to the BSC via the Abis interface. This means that an external condition class 1 alarm will be raised in the BSC.
- The communication link on the Abis interface is disconnected and the RU mode is changed to local.
- The Local mode indicator turns on. The Operational indicator is also turned on if the RU is free from class 1 faults, in order to indicate that the RU is in local operation.
- The Local/remote button is enabled again.

6.1.2 Changing RU Mode from Local to Remote

- The Local/remote button is pressed.
- The Local mode indicator starts flashing to indicate that a change of RU mode to remote is in progress.
- The Operational indicator turns off in order to indicate that the RU has been taken out of operation.
- The communication link on the Abis interface is established by order from BSC. The RU is changed to remote mode immediately after the link towards the BSC has been established.
- The Local mode indicator turns off.
- In order to indicate that the RU is ready to carry traffic the Operational indicator turns on. Note that this will only happen if the RU is considered as operational by the BSC. (For example, the unit may be blocked from BSC.)

6.1.3 Stopping a Change of RU Mode from Local to Remote

If the Local/remote button is pushed while the Local mode indicator is flashing, the change of RU mode to remote is interrupted. Note that this function is only valid during a change of RU mode to remote.

- The Local/remote button is pressed.
- The attempt to enable a connection with the BSC will stop.
- The RU will then remain in local mode with the communication link disconnected and the Local mode indicator on.

6.2 ACCU

Depending on ACCU version, refer to the sections "ACCU Version V1" or "ACCU Version V2" below.

Note: The denominations "ACCU version V1" and "ACCU version V2" are explained in the chapter "Introduction".

6.3 ACCU Version V1

Note: The denomination "ACCU version V1" is explained in the chapter "Introduction".

The instructions in this section describe replacement of ECU fuses on the control board in the fuse box, the entire control board, and the entire fuse box.

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

6.3.1 Initial Instructions

Note: If the RBS has a battery backup facility, proceed to the section "Accessing the ACCU" below.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
3. Wait until the Local mode indicator has a fixed yellow light indicating that the DXU is in local mode.

Accessing the ACCU

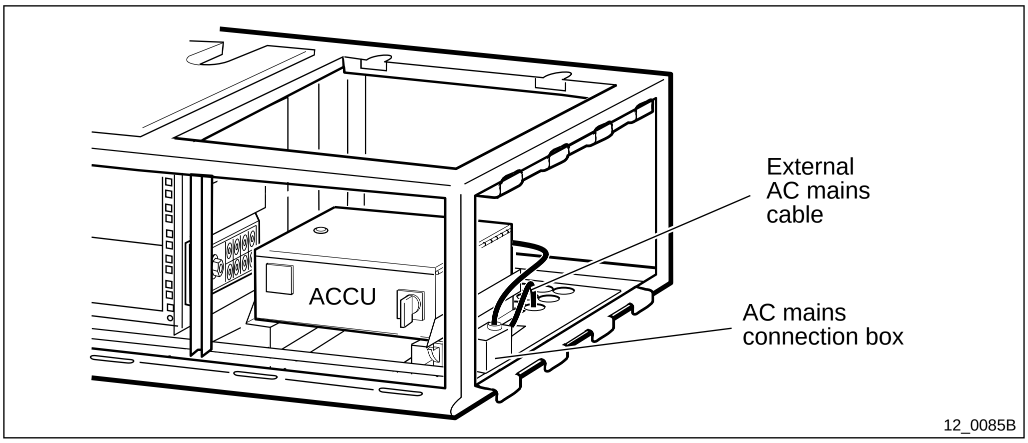


Figure 114 ACCU

4. Isolate the entire cabinet, including the mounting base, from AC mains power. The AC mains switch is located somewhere external to the mounting base.

5. Loosen the two screws holding the ACCU to the mounting base and pull the unit out on its rails.

6. Proceed to one of the following sections to replace the appropriate item:

   • ECU fuses — Proceed to the section "Replacement of ECU Fuses" below.

   • Control board — Proceed to the section "Replacement of Control Board" below.

   • ACCU — Proceed to the section "Replacement of ACCU"below.

6.3.2 Replacement of ECU Fuses

Note: The instructions in the Section 6.3.1 Initial Instructions on page 231 must be carried out before replacement.

1. Open the top cover of the ACCU.

2. Loosen the four screws to remove the plastic cover on the inside of the ACCU.

3. Refer to the figure below to identify all ECU fuses on the control board. Replace blown fuses.

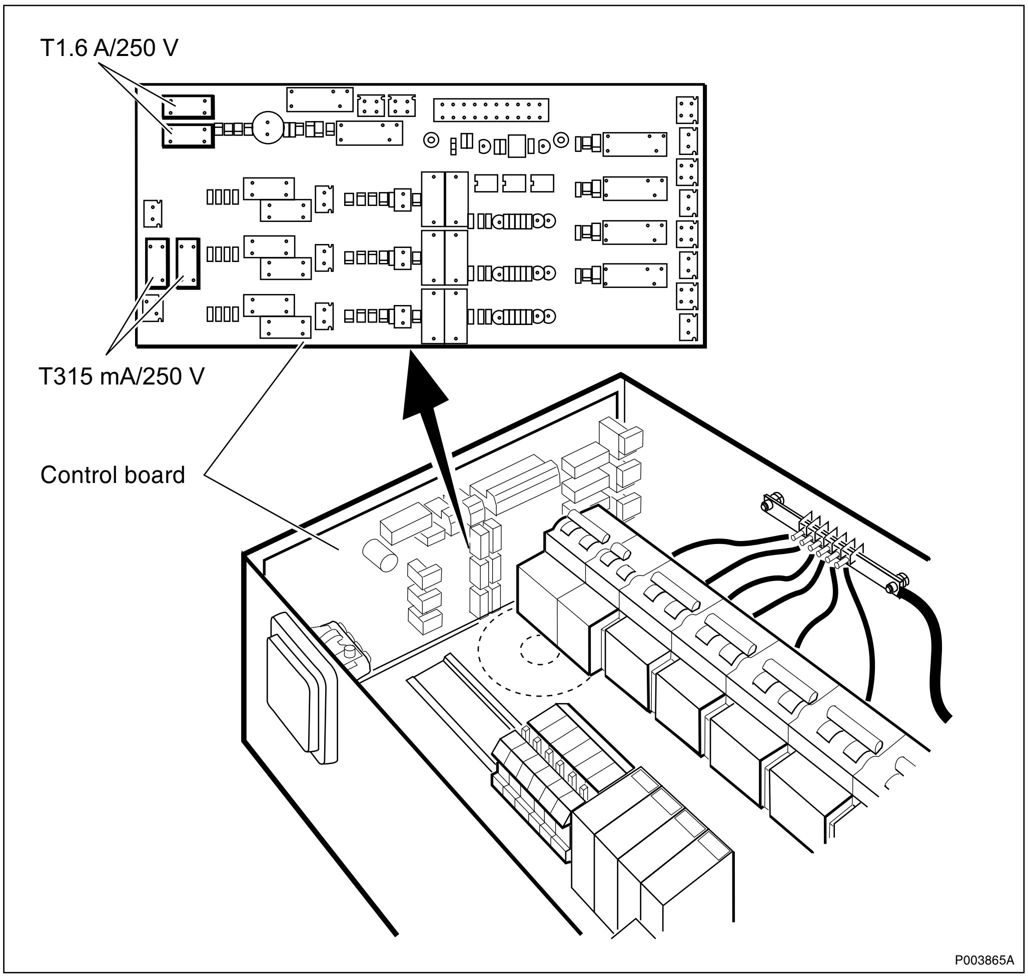


Figure 115 Replacement of ECU fuses

4. Reset the plastic cover, close the top cover and push the ACCU back into place.

5. Proceed to the sub-section Section 6.3.6 Take into operation on page 237in this section.

Note: After replacement, the fuse shall be disposed of locally.

6.3.3 Replacement of Control Board

Note: The instructions in Section 6.3.1 Initial Instructions on page 231 must be carried out before replacement.

1. Open the top cover of the ACCU.

2. Loosen the four torx screws to remove the plastic cover on the inside of the ACCU.

3. Mark all wires connecting to the control board and then disconnect them.

4. Release the latches located on either side of the control board and pull out the board.

5. Replace the control board and set the jumper X29 in one of two possible positions. Position two gives supervision of three phases

while position one only gives supervision of one phase. Refer to the section "Strapping Options for the ACCU" below, or check the strapping on the old control board.

6. Proceed to the sub-section Section 6.3.6 Take into operation on page 237in this section.

Note: Unless under contractual warranty, after replacement, the control board shall be disposed of locally. Do not return the control board to Ericsson for replacement, repair or disposal.

6.3.4 Replacement of Circuit Breaker

Note: The instructions in Section 6.3.1 Initial Instructions on page 231 must be carried out before replacement.

1. Open the top cover of the ACCU.
2. Loosen the four torx screws to remove the plastic cover on the inside of the ACCU.
3. Mark all wires connecting to the circuit breaker(s) and then disconnect them.
4. Use a screwdriver or equivalent to pull out the snap-lock latch and lift the circuit breaker off the rail it is attached to. Refer to the figure below.

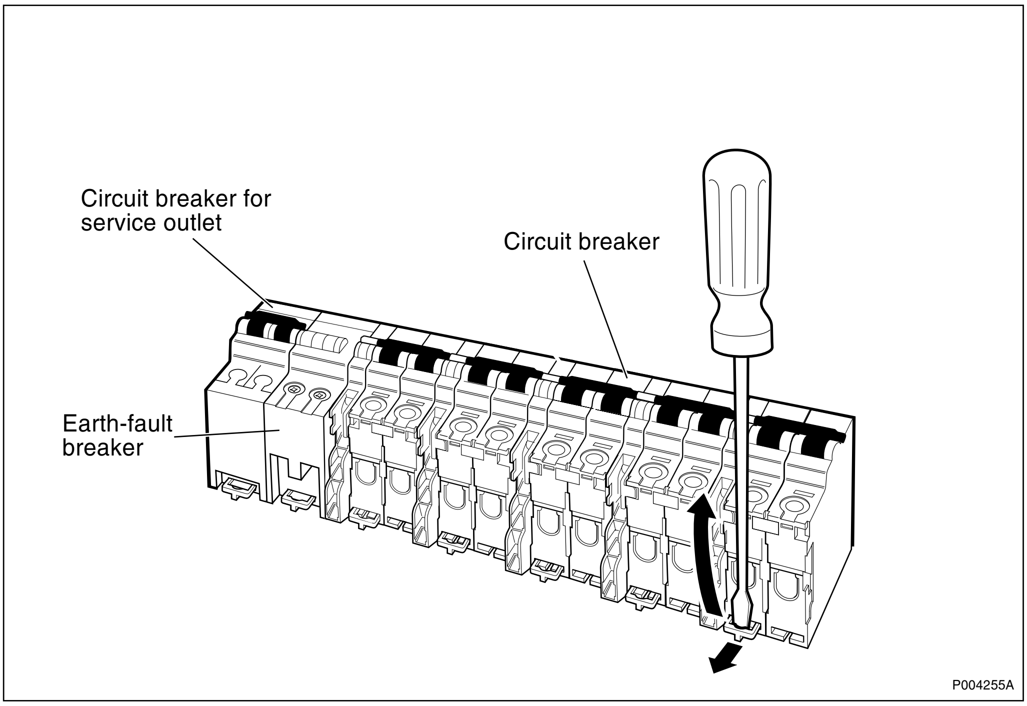


Figure 116 Removing the circuit breaker

Note: The earth-fault breaker and service outlet circuit breaker are attached to each other and cannot be removed separately. In case of a faulty earth-fault breaker or service outlet circuit breaker, remove the whole unit as described above.

5. Insert a screwdriver or an equivalent tool under the contact snap lock and remove the auxiliary contact from the circuit breaker. Refer to the figure below.

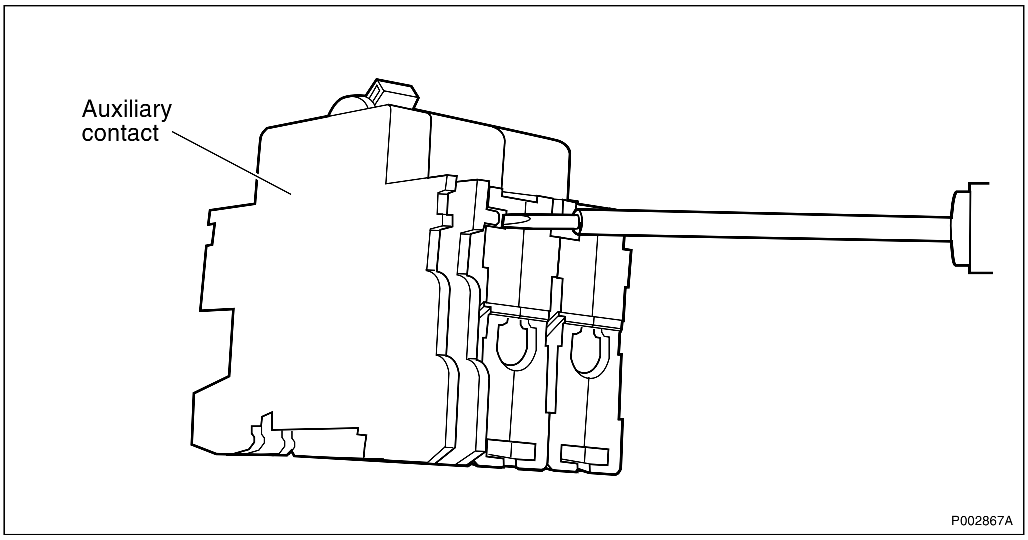


Figure 117 Separating circuit breaker and auxiliary contact

6. Remove the lid on the circuit breaker. Refer to the figure below.

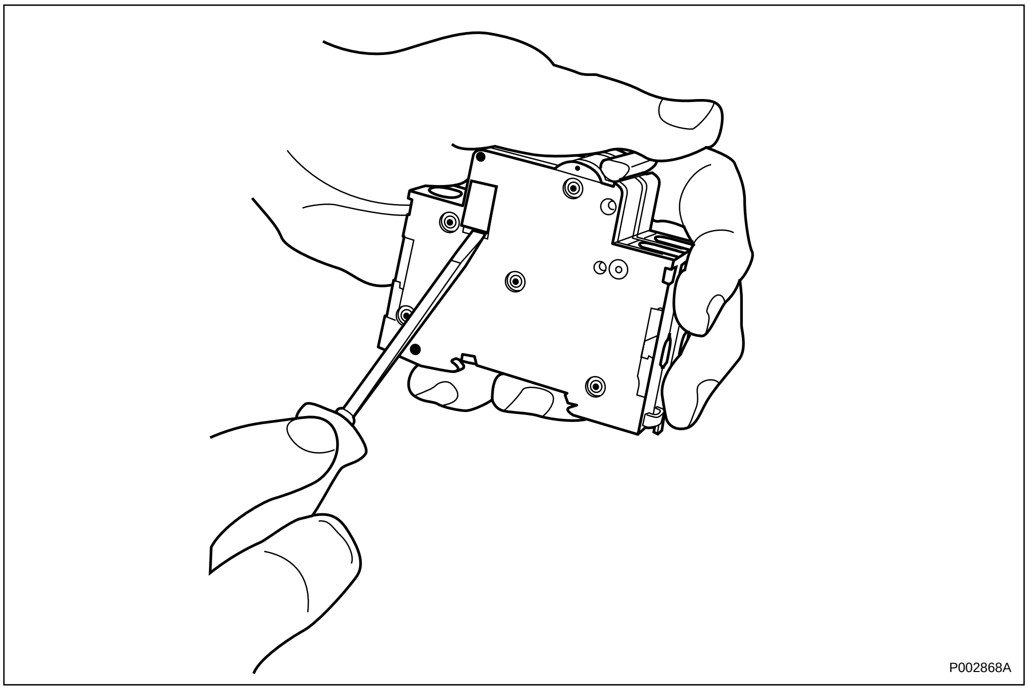


Figure 118 Removing the lid on a circuit breaker

7. Ensure that the contact lever on both circuit breaker and auxiliary contact is in the Off position. Attach the auxiliary contact at the rear end of the new circuit breaker as shown in the figure below. Then gently press the units together.

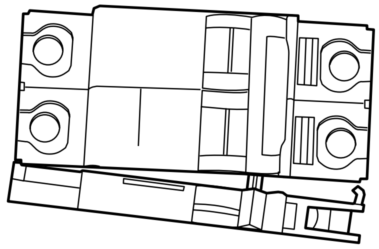


Figure 119 Mating the auxiliary contact and the circuit breaker

8. Reset in reverse order.

9. Proceed to Section 6.3.6 Take into operation on page 237.

Note: Unless under contractual warranty, after replacement, the circuit breaker shall be disposed of locally. Do not return the circuit breaker to Ericsson for replacement, repair or disposal.

6.3.5 Replacement of ACCU

The instructions in Section 6.3.1 Initial Instructions on page 231 must be carried out before replacement.

1. Disconnect all ACCU cables from the connection field above the ACCU.

2. Disconnect the AC mains cable from the AC mains connection box.

3. Open the new ACCU and verify that all AC circuit breakers are on.

4. Verify that the jumper X29 on the control board is set in the correct position. Position two gives supervision of three phases while position one only gives supervision of one phase. Refer to the section "Strapping Options for the ACCU" below, or check the strapping in the old ACCU configuration.

5. Check the strapping of the termination block and the AC mains connection box. Refer to the section "Strapping Options for the ACCU" below, or check the strapping in the old ACCU configuration.

6. Check that the external AC mains cable is connected to the AC mains connection box.

7. Close the ACCU.

8. Connect the external cable connectors to the cabinet.

9. Install the new ACCU in the mounting base.

10. Proceed to the sub-section Section 6.3.6 Take into operation on page 237in this section.

Note: Unless under contractual warranty, after replacement, the ACCU shall be repaired locally at the RBS site or in a local repair shop. If the ACCU is unrepairable, it shall be disposed of locally by the customer. Do not return the ACCU to Ericsson for replacement, repair or disposal.

6.3.6 Take into operation

1. Verify that the AC mains switch is off.
2. Connect AC mains power to the cabinet.
3. Switch on the AC mains switch on the ACCU.

Note: The following last two steps shall only be carried out if the RBS does not have a battery backup facility.

4. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
5. Wait until the Local mode indicator is off. This indicates that the DXU is in remote mode.

6.3.7 Strapping Options for the ACCU

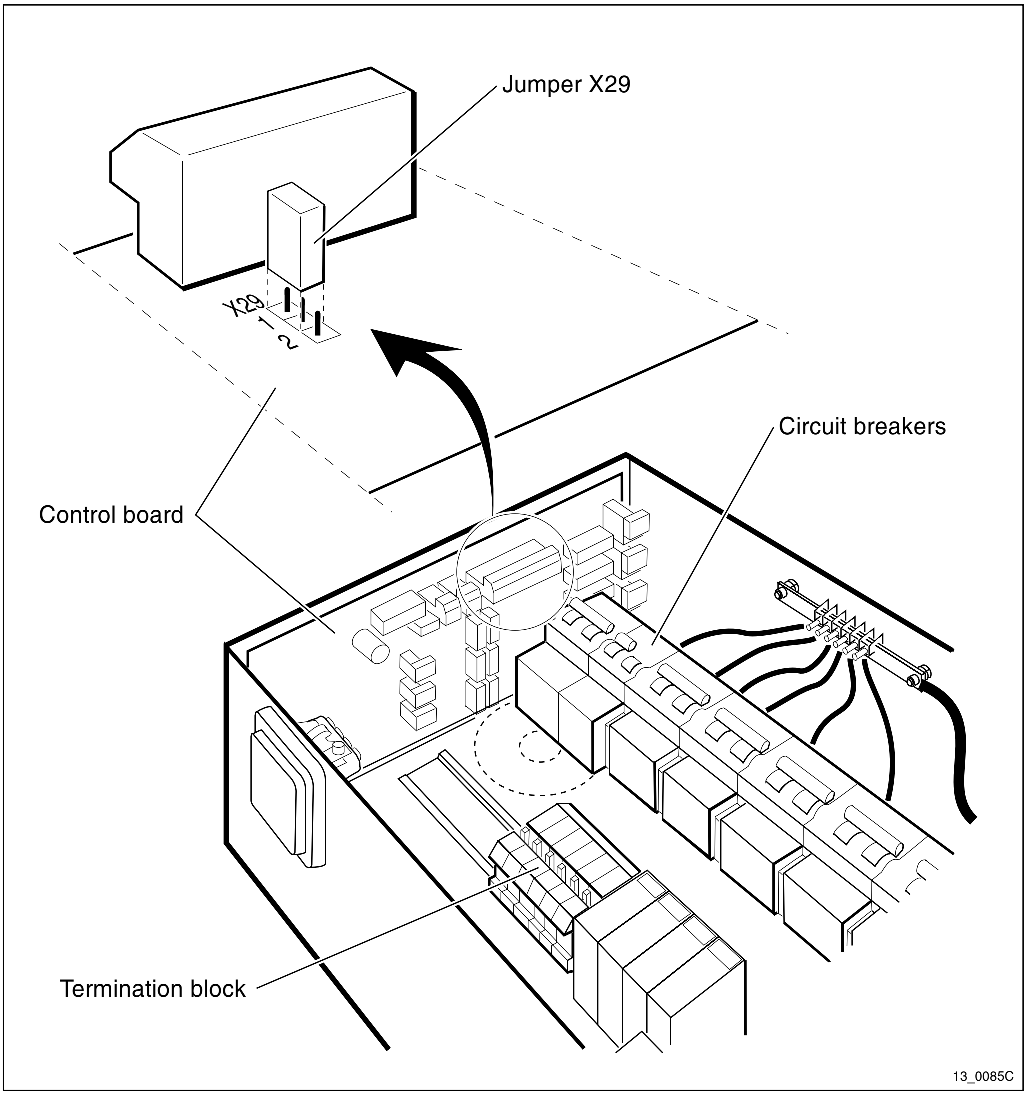


Figure 120 Termination block and jumper X29 inside the ACCU

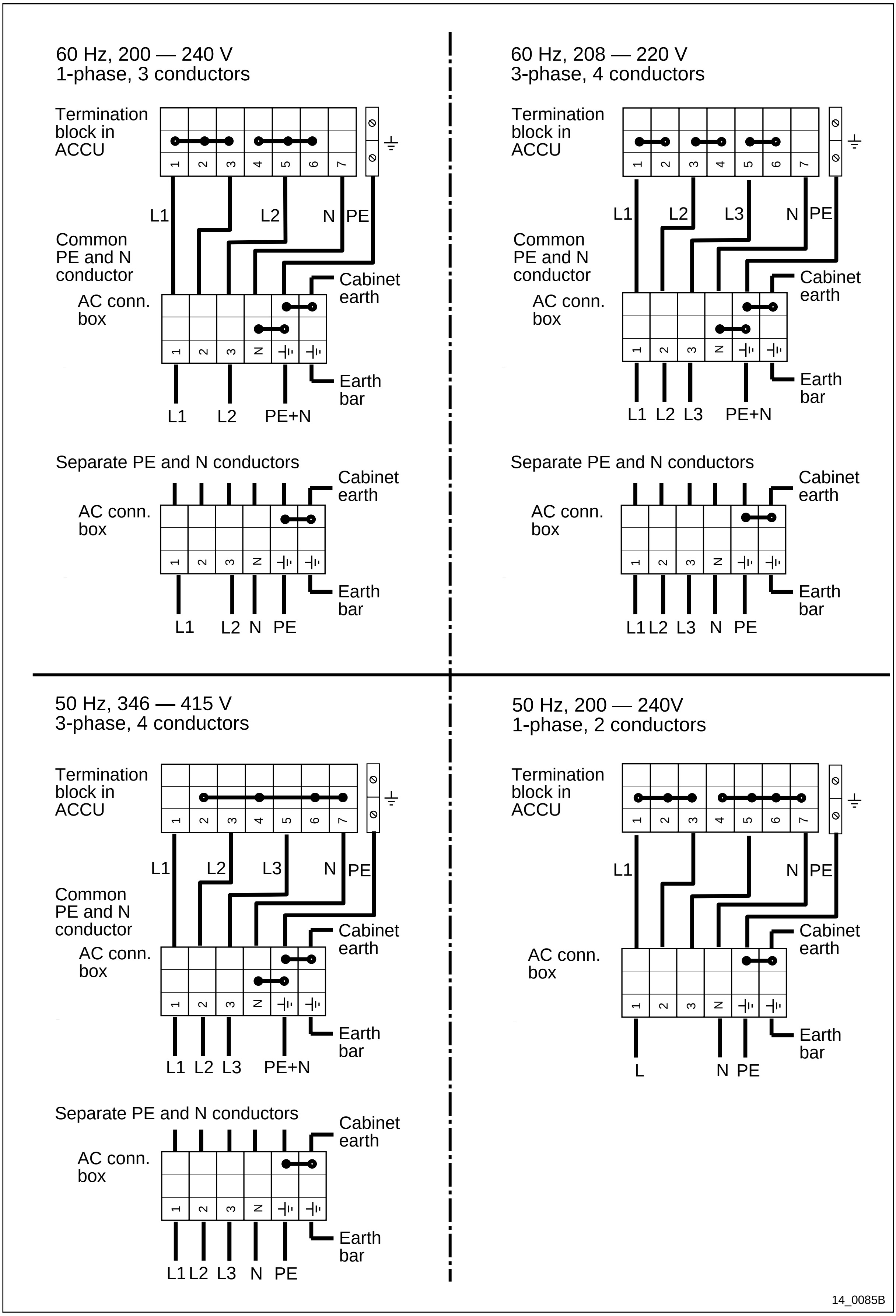


Figure 121 Strapping options for the ACCU

6.4 ACCU Version V2

Note: The denomination "ACCU version V2" is explained in the chapter "Introduction".

The instructions in this section describe replacement of ECU fuses on the control board in the basic unit, the entire control board, and the entire basic unit.

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

6.4.1 Initial Instructions

Note: If the RBS has a battery backup facility, proceed to the section "Accessing the ACCU" below.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
3. Wait until the Local mode indicator has a fixed yellow light. This indicates that the DXU is in local mode.

Accessing the ACCU

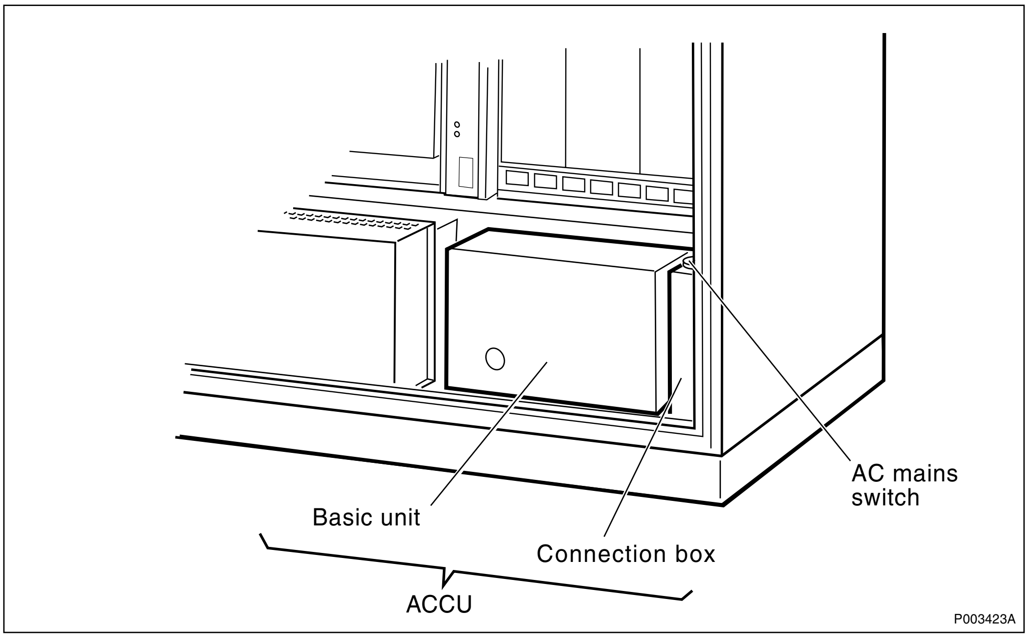


Figure 122 ACCU

4. Isolate the entire cabinet from AC mains power. The AC mains switch is located somewhere external to the RBS.

5. Proceed to one of the following sections to replace the appropriate item:

   • ECU fuses — Proceed to the section "Replacement of ECU Fuses" below.

   • Control board — Proceed to the section "Replacement of Control Board" below.

   • ACCU — Proceed to the section "Replacement of ACCU"below.

6.4.2 Replacement of ECU Fuse

Note: The instructions in Section 6.4.1 Initial Instructions on page 240 must be carried out before replacement.

1. Open the front cover of the ACCU.
2. Remove the plastic cover on the inside of the ACCU.
3. Refer to the figure below to identify the ECU fuse on the control board. If the fuse if blown, replace it.

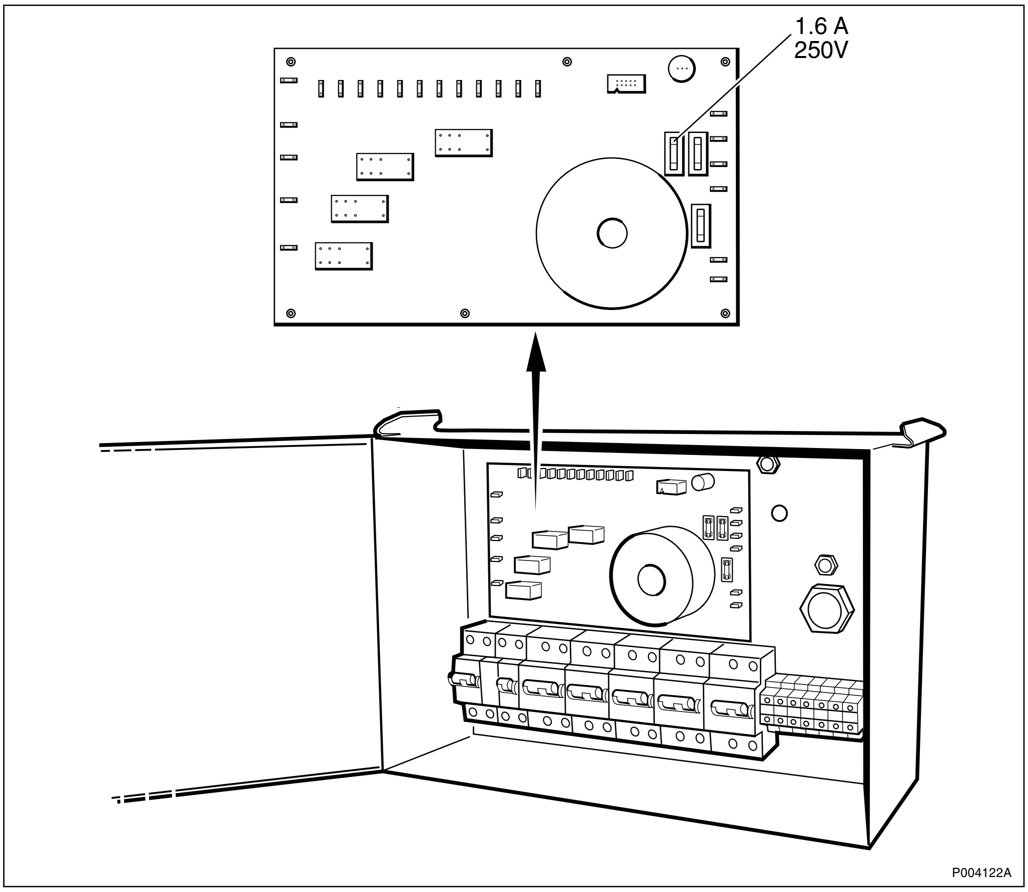


Figure 123 Replacement of ECU fuse

4. Proceed to Section 6.4.6 Take into operation on page 244.

Note: After replacement, the fuse shall be disposed of locally.

6.4.3 Replacement of Control Board

Note: The instructions in Section 6.4.1 Initial Instructions on page 240 must be carried out before replacement.

1. Open the front cover of the ACCU.
2. Mark all wires connecting to the control board and then disconnect them.
3. Replace the control board and reset in reverse order.
4. Proceed to the sub-section Section 6.4.6 Take into operation on page 244in this section.

Note: Unless under contractual warranty, after replacement, the control board shall be disposed of locally. Do not return the control board to Ericsson for replacement, repair or disposal.

6.4.4 Replacement of Circuit Breaker

Note: The instructions in Section 6.4.1 Initial Instructions on page 240 must be carried out before replacement.

1. Open the front cover of the ACCU.
2. Remove the plastic cover on the inside of the ACCU.
3. Use a screwdriver or equivalent to pull out the snap-lock latch and lift the circuit breaker off the rail it is attached to. Refer to the figure below.

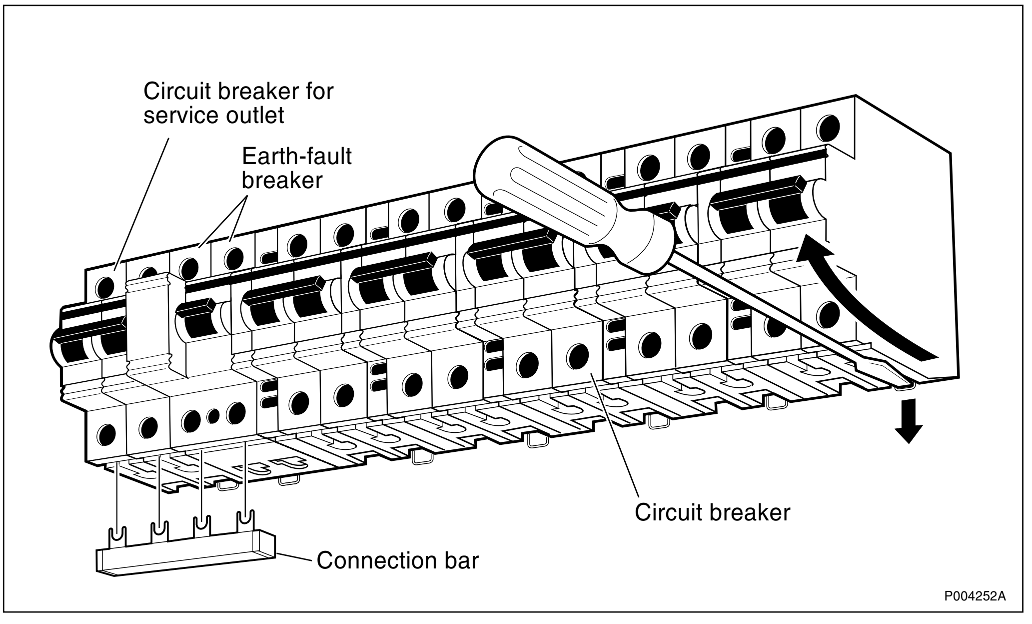


Figure 124 Removing the circuit breaker

Note: To remove the service outlet circuit breaker or the earth-fault breaker, first remove the connection bar using a screwdriver and then remove the faulty part according to the above instructions.

Note: Before mounting the new service outlet circuit breaker, remove the auxiliary contact as shown in the figure below.

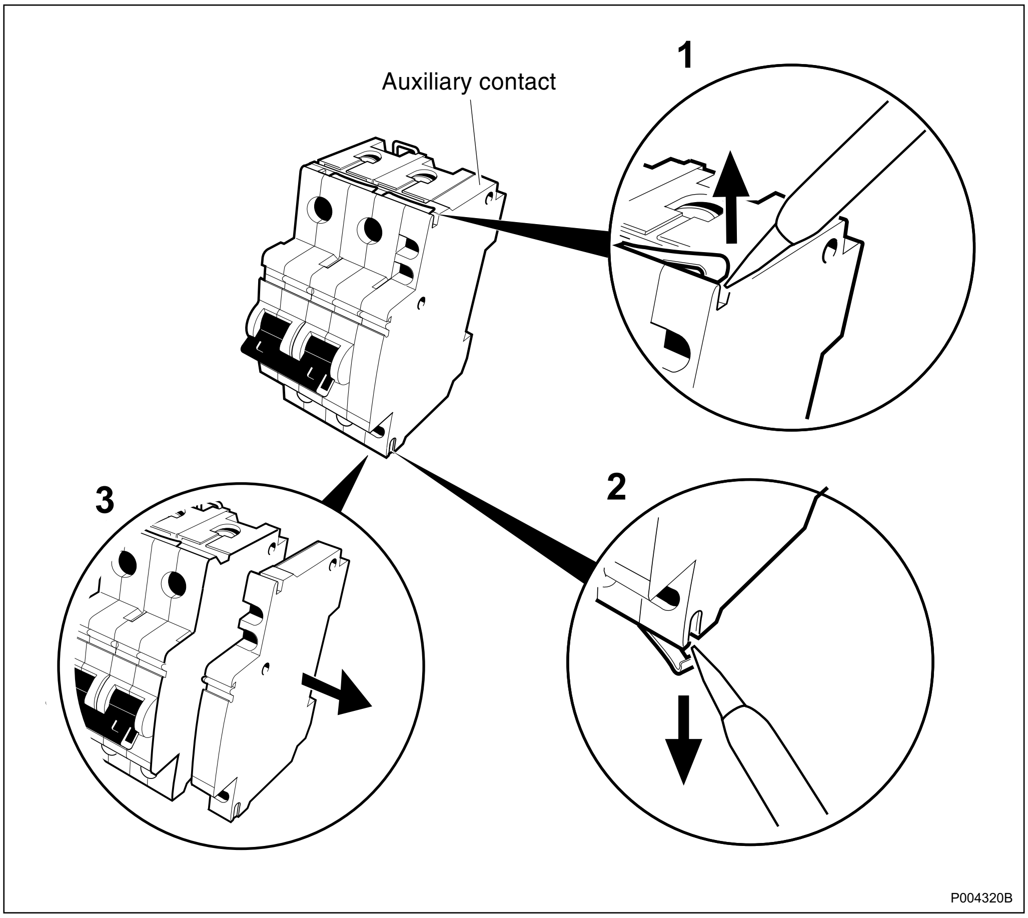


Figure 125 Removing the auxiliary contact from a circuit breaker

4. Mark all wires connecting to the control board and then disconnect them. Also check the amperage of the old circuit breaker in order to get the correct replacement unit.
5. Replace the unit by resetting in the reverse order.
6. Proceed to Section 6.4.6 Take into operation on page 244.

Note: Unless under contractual warranty, after replacement, the circuit breaker shall be disposed of locally. Do not return the circuit breaker to Ericsson for replacement, repair or disposal.

6.4.5 Replacement of ACCU

Note: The instructions in Section 6.4.1 Initial Instructions on page 240 must be carried out before replacement.

1. Remove all ACCU cables from the connection field above the TM.
2. Remove the ACCU by loosening the two screws located at the rear top of the ACCU. Lift the ACCU straight up. Refer to the figure below.

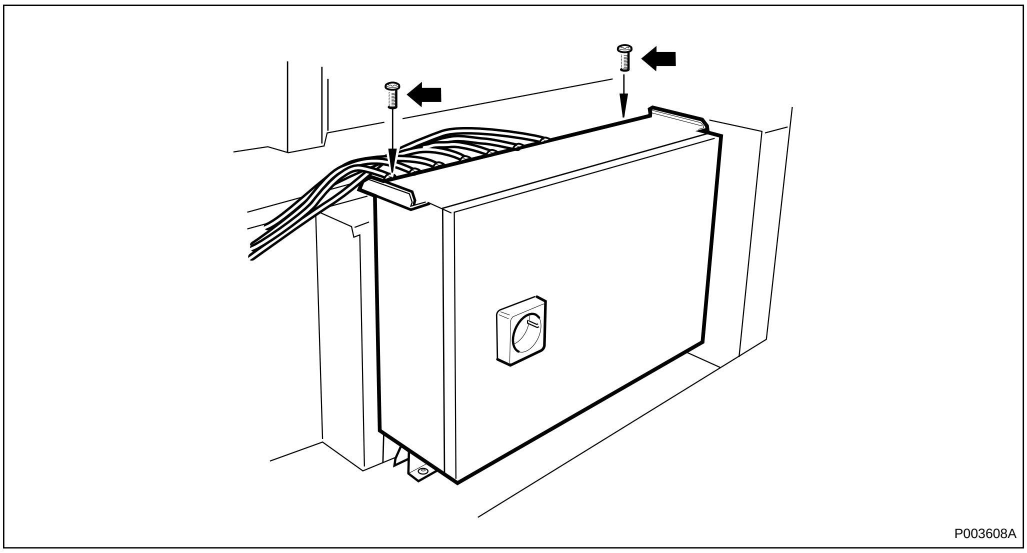


Figure 126 Removing the ACCU

3. Disconnect the AC mains cable from the AC mains connection box.
4. Open the new ACCU and verify that all AC circuit breakers are on.
5. Check the strapping of the termination block and the AC mains connection box. Refer to the section "Strapping Options for the ACCU" below, or check the strapping in the old ACCU configuration.
6. Connect the ACCU mains cable to the connection box.
7. Close the ACCU.
8. Connect all ACCU cables to the connection field above the TM.
9. Put the new ACCU in place and fasten it by tightening the two screws located at the rear top of the ACCU.
10. Proceed to the sub-section Section 6.4.6 Take into operation on page 244in this section.

Note: Unless under contractual warranty, after replacement, the ACCU shall be repaired locally at the RBS site or in a local repair shop. If the ACCU is unrepairable, it shall be disposed of locally by the customer. Do not return the ACCU to Ericsson for replacement, repair or disposal.

6.4.6 Take into operation

1. Verify that the AC mains switch is off.
2. Connect AC mains power to the cabinet.
3. Switch on the AC mains switch on the ACCU.

Note: The following last two steps shall only be carried out if the RBS does not have a battery backup facility.

4. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
5. Wait until the Local mode indicator is off. This indicates that the DXU is in remote mode.

6.4.7 Strapping Options for the ACCU

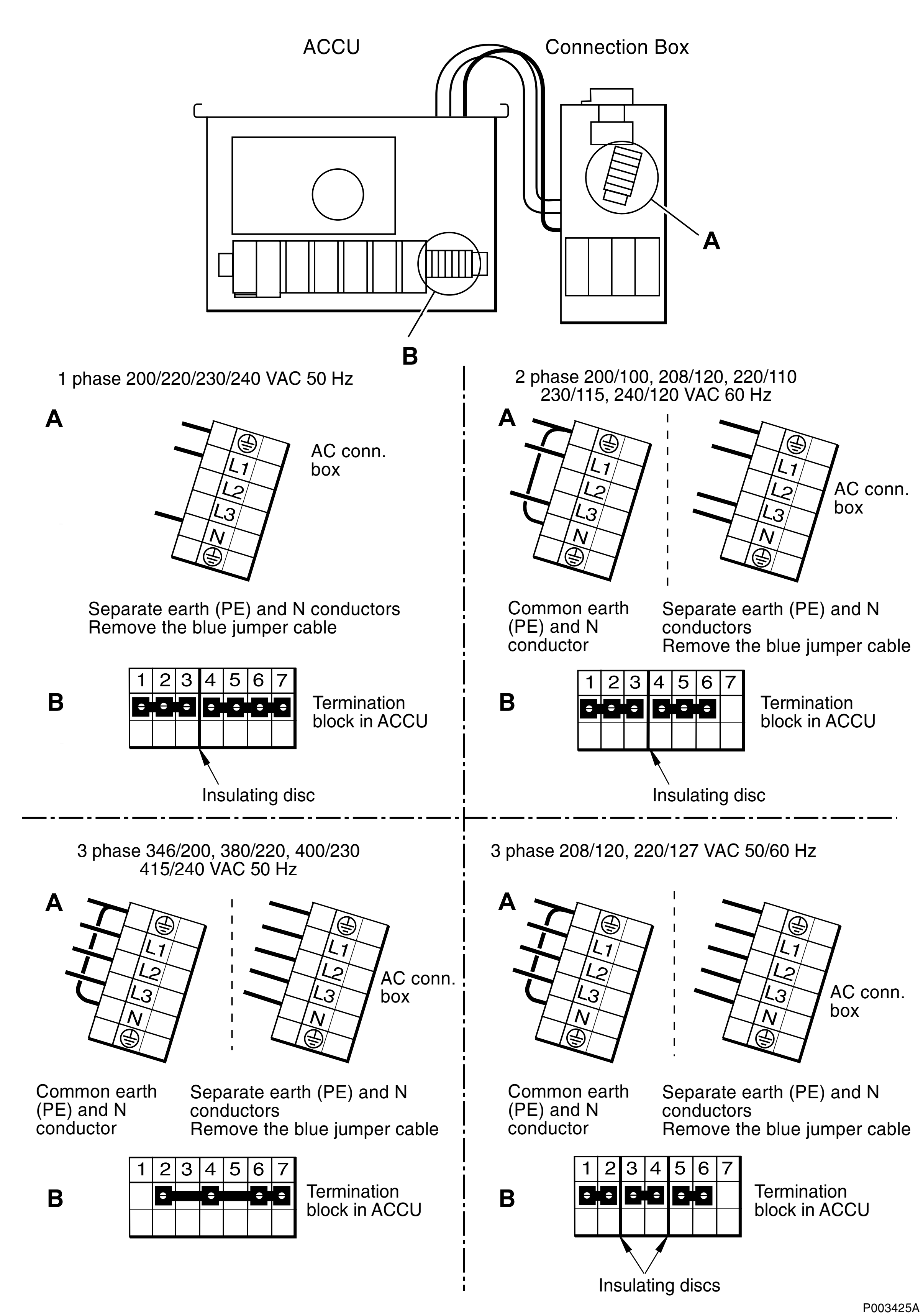


Figure 127 Strapping options for the ACCU

6.5 Air Conditioner, Climate Unit Versions V1 and V2

Note: There are five different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V5" are explained in the chapter "Introduction".

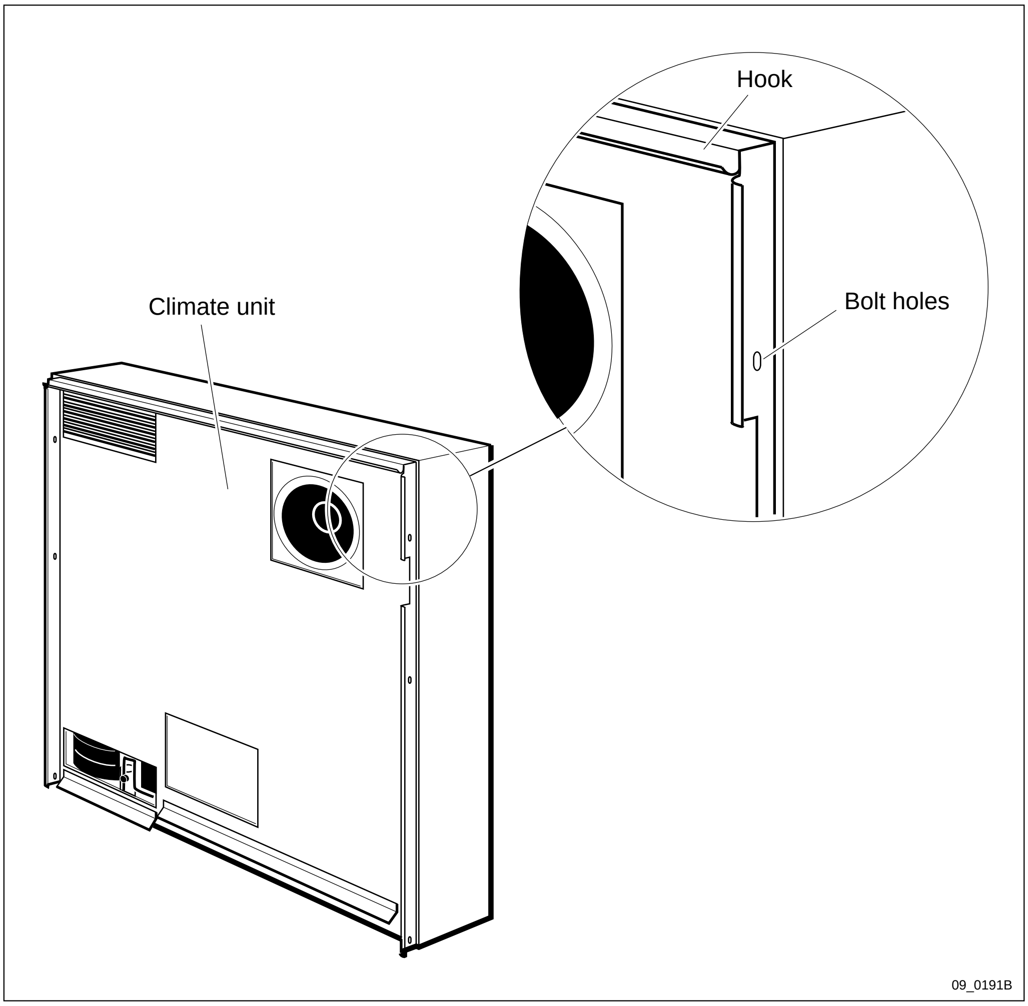


Figure 128 Inner view of climate unit

WARNING

⚠

Read the Safety chapter regarding handling of heavy goods.

Note: The climate system weighs 90 kg (approximately 200 lb.). Removal or replacement of this unit requires a lifting device or a multi-person lift.

Take care when removing or installing the climate unit to prevent damage to the gaskets between the climate unit and the door.

Removal of the Climate Unit

1. Open the mounting base and release the AC circuit breaker for the climate unit. The circuit breaker is located inside the ACCU.
2. On IDM 1, release the DC circuit breaker for the climate unit by pressing its red button. The circuit breaker is released when its black button is extended.
3. Disconnect all cables to the climate unit from the rest of the cabinet.
4. Loosen the six bolts (three on each side) which hold the climate unit onto the door.
5. Lift up the climate unit, then away, to separate it from the door.
6. Replacement is the reverse of the above procedures.

Note: Unless under contractual warranty, after replacement, the air conditioner shall be repaired locally at the RBS site or in a local repair shop. If the air conditioner is unrepairable, it shall be disposed of locally by the customer. Do not return the air conditioner to Ericsson for replacement, repair or disposal.

The location of the RBS may make replacement of the entire air conditioner impracticable. If this is the case, and the fault within the air conditioner is isolated to the compressor, have a qualified refrigeration repairman refer to the table below when changing the compressor.

Table 11 Compressor data

Hz(1)	Product number	Cryogen	Pressure	Refrigerant load	Pipes (adapter)
50	24/BPD 104 02/01	R134A	24 bar	1.25 kg	1/4 inch SAE
60	24/BPD 104 02/02	R134A	24 bar	1.25 kg	1/4 inch SAE

(1) Voltage is dependent upon the strapping within the climate unit. This should not need changing when the compressor is replaced.

6.6 Air Conditioner, Climate Unit Version V3

Note: There are five different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V5" are explained in the chapter "Introduction".

Note: This instruction shall always be used on a cabinet with a mounting base and where an earlier version of the climate unit, V1 and V2, is not used. See the figure below.

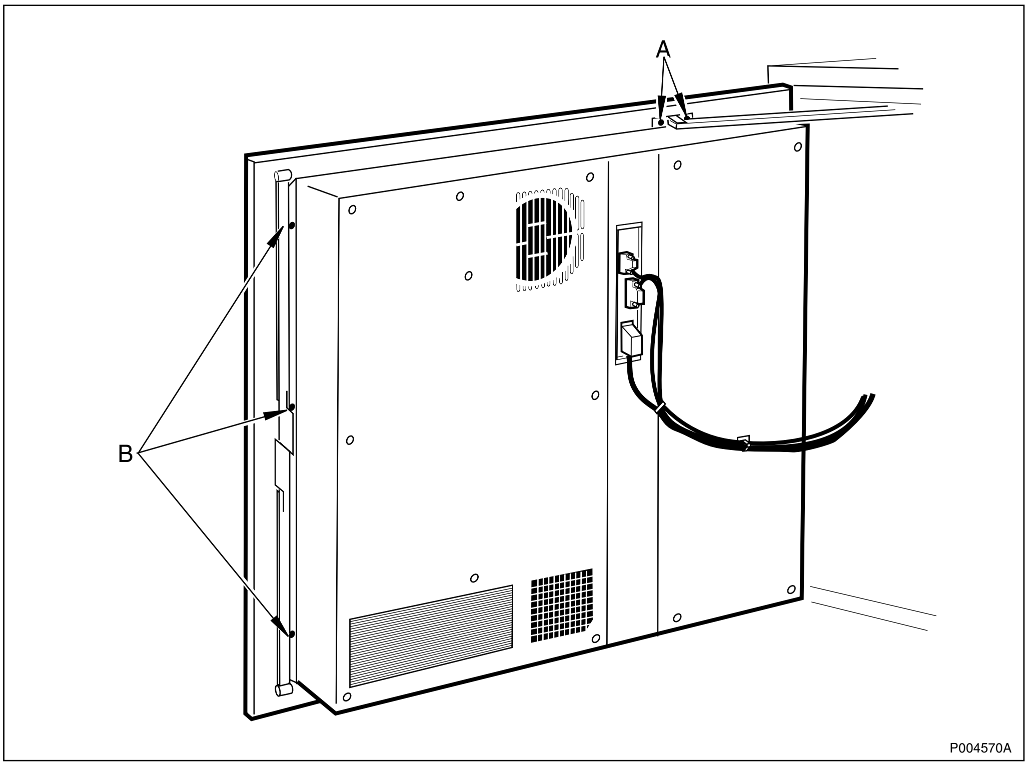


Figure 129   Climate unit V3

WARNING

Read the Safety chapter regarding handling of heavy goods.

Note: The climate system weighs 90 kg (approximately 200 lb.). Removal or replacement of this unit requires a lifting device or a multi-person lift.

Take care when removing or installing the climate unit to prevent damage to the gaskets between the climate unit and the door.

Removal of the climate unit

1. Open the ACCU and release the AC circuit breaker for the climate unit.
2. On the IDM, release the DC circuit breaker for the climate unit. The circuit breaker is released when it is labelled "OFF".
3. Remove the following cables:
   - AC cable **Note:** Save the spacer.
   - DC cable
   - Signal cable

4. Loosen the earth connection on top of the door.
5. Loosen the door stop by unscrewing screws A and open the door fully, see figure above.
6. Remove the three screws B on each side that hold the climate unit onto the door.
7. Lift the climate unit, then away, to separate it from the door.

Preparation of the new climate unit

Note: This instruction shall always be used on a cabinet with a mounting base and where an earlier version of the climate unit, V1 and V2, is not used.

8. Remove the three screws on top and the three screws on the bottom. Remove the small hinges (version V5) or the large hinges (version V4) on the climate unit.
9. Plug the two left bolt holes, on top and bottom. Use the two plastic plugs that come with the new climate unit. See figure below. The two plastic plugs prevent from condensation in the RBS.

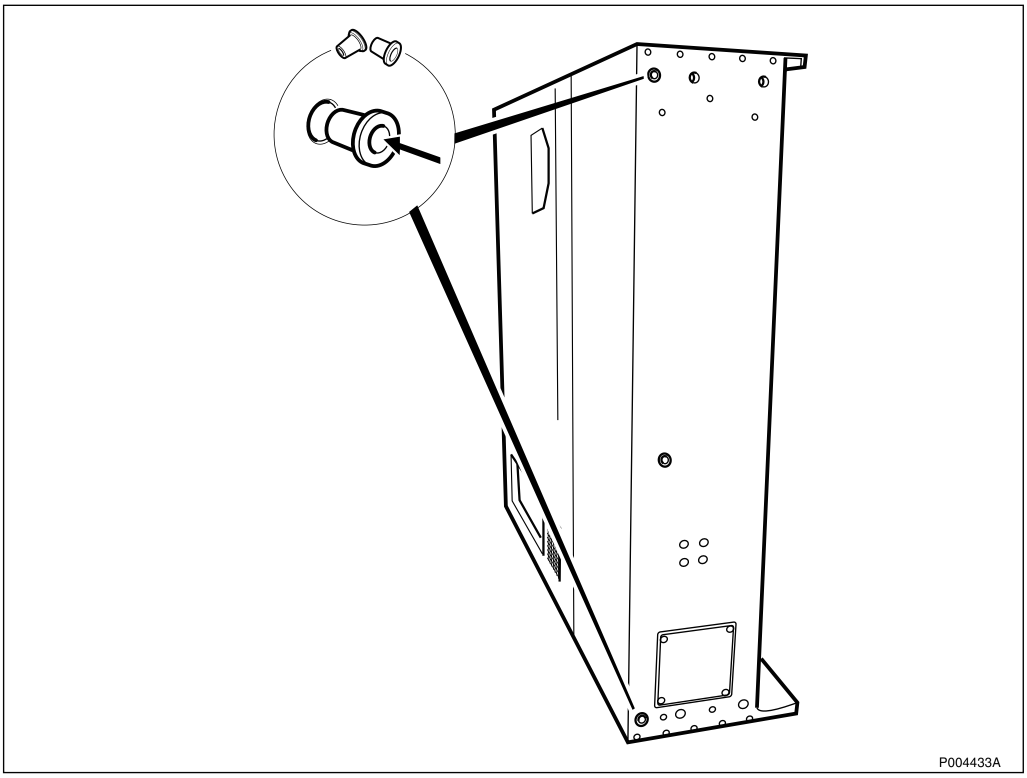


Figure 130 Plastic plugs that prevent from condensation in the RBS

10. Attach the hinges (which are now used as an frame) with four screws. See figure below. Note that the hinges will protrude somewhat behind the climate unit.

Note: If the hinges are taken from a climate unit, version V4, the hinges shall be turned upside down (180 degrees) before mounting it on the climate unit.

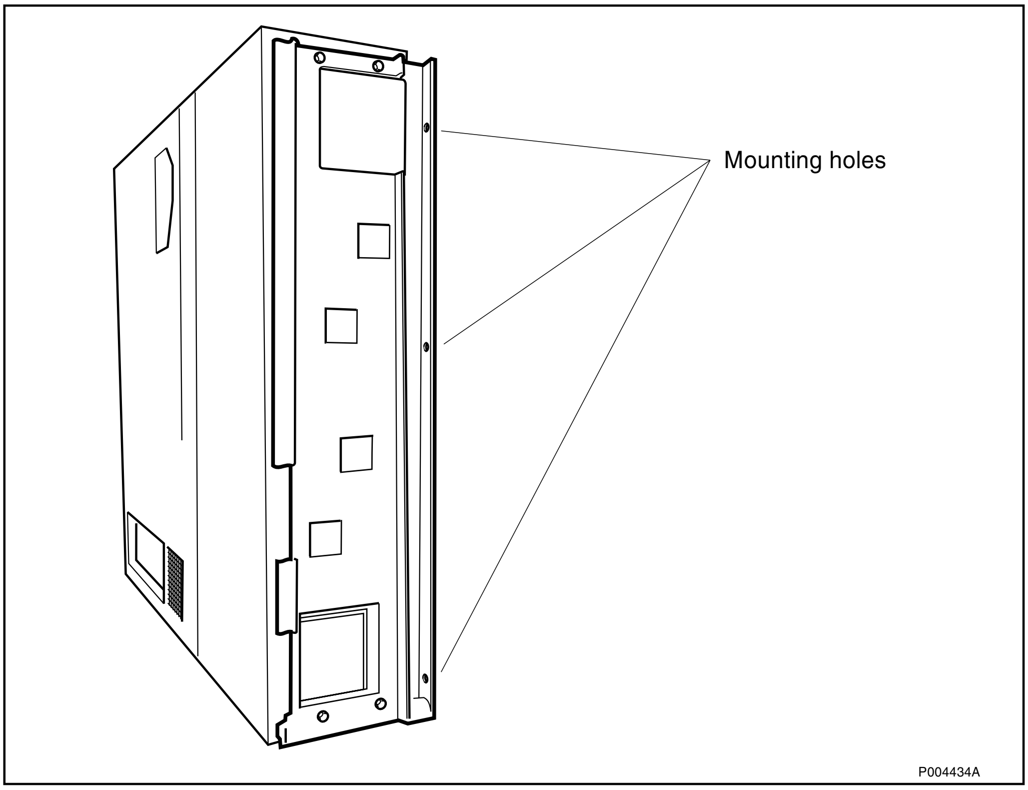


Figure 131 Large hinges (used as a frame) mounted on climate unit V3

Replacement of rubber gasket

11. Remove the old rubber gasket from the door ledge.
12. Wet a rag with some denatured alcohol and clean the door ledge.
13. Attach the new self-adhesive rubber gasket to the door ledge, use the gauge that comes with the new climate unit. Be careful to hold the gauge with its notch upwards. See picture below.

    Start at one end of the door and attach the rubber gasket gradually while sliding the gauge along the entire length of the door ledge.
14. Remove the gauge.

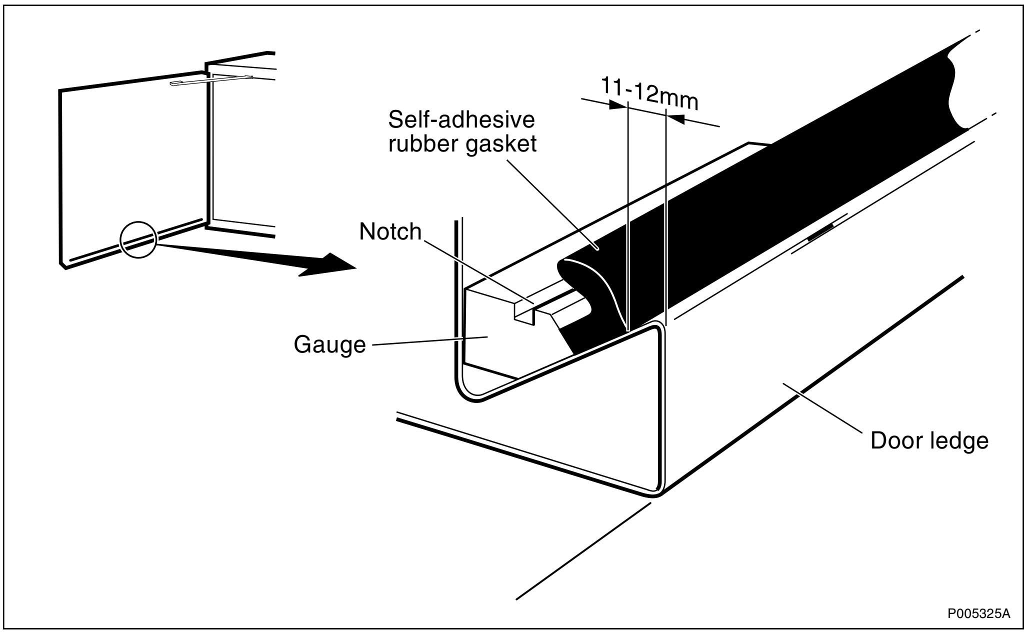


Figure 132 Attaching self-adhesive rubber gasket to the door ledge

Mounting the bracket

The bracket prevents from condensation in the RBS.

15. Mount the bracket on the climate unit ledge, where a corner is cut off. Fasten the bracket by squeezing the rivets with a slip joint pliers.

Note: If the holes for the drivets are too tight, drill to a diameter of 3 mm. To prevent shavings in the RBS, the drilling must be done before attaching the climate unit onto the door.

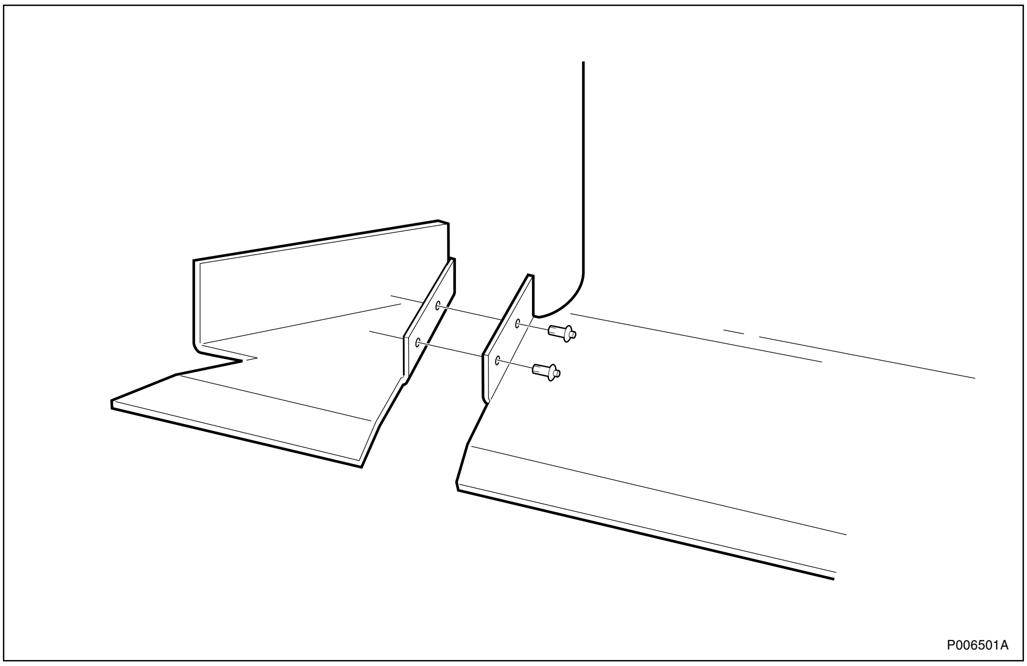


Figure 133 Mounting of the bracket

Mounting the new climate unit

16. Lift the climate unit, hold it in a vertical position and attach it on top of the door.

    Note: The climate unit must be set in place in a straight, vertical movement to avoid damage to the rubber gasket underneath.

17. Fasten the climate unit to the door with six screws. Use the offset screwdriver (delivered with the spare part) to fasten the two lower bolts on the right side. See figure Figure 129 on page 249.

18. Fasten the door stop to the door.

19. Attach the earth connection.

20. Restore the cables to the CCU board:

    - Signal cable
    - DC cable

    Note: Be sure to attach the DC cable (three pins) correctly.

    - AC cable

    Note: The spacer, removed from the replaced climate unit, shall be mounted between the AC connector and the board.

21. Reset the climate circuit breaker on the IDM.

22. Reset the AC circuit breaker on the ACCU.

Note: Unless under contractual warranty, after replacement, the air conditioner shall be repaired locally at the RBS site or in a local repair shop. If the air conditioner is unrepairable, it shall be disposed of locally by the customer. Do not return the air conditioner to Ericsson for replacement, repair or disposal.

The location of the RBS may make replacement of the entire air conditioner impracticable. If this is the case, and the fault within the air conditioner is isolated to the compressor, have a qualified refrigeration repairman refer to the table below when changing the compressor.

Table 12 Compressor data

Hz(1)	Product number	Cryogen	Pressure	Refrigerant load	Pipes (adapter)
50	24/BPD 104 02/01	R134A	24 bar	1.25 kg	1/4 inch SAE
60	24/BPD 104 02/02	R134A	24 bar	1.25 kg	1/4 inch SAE

(1) Voltage is dependent upon the strapping within the climate unit. This should not need changing when the compressor is replaced.

Mounting the protection plate

23. Wet a rag with some denatured alcohol and clean the bottom side of the right corner of the climate unit. Se figure below.

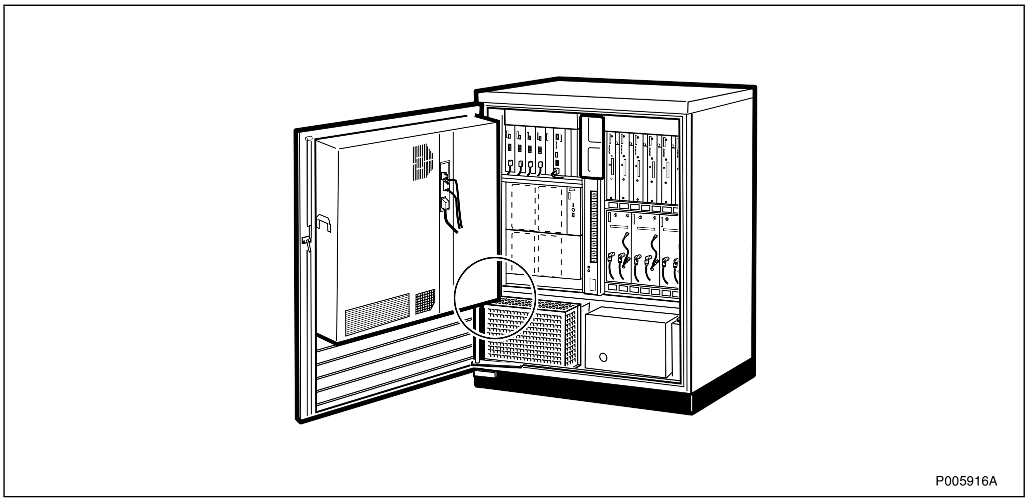


Figure 134 Where to mount the protection plate

24. Peel of the protection on the sticky tape and slide the protection plate into place. Se figure below.

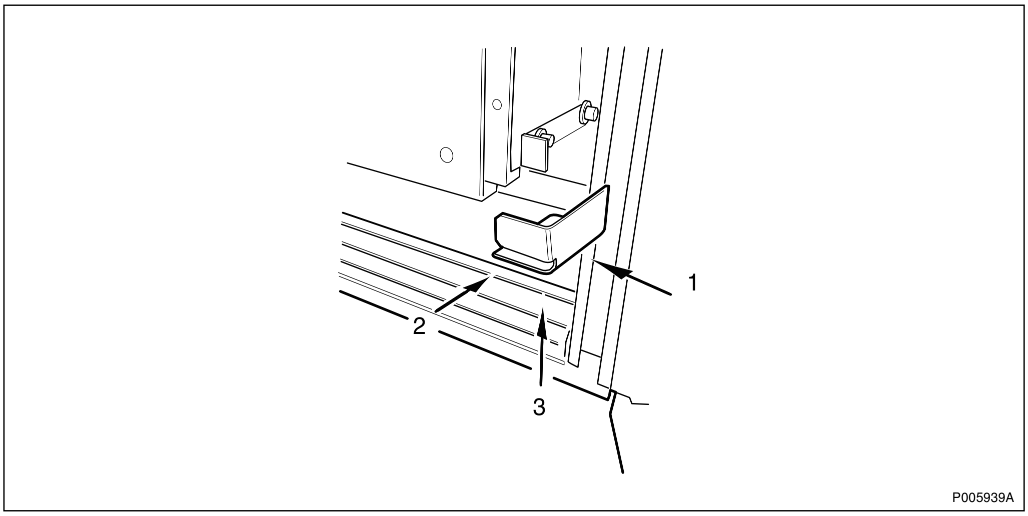


Figure 135 Mounting of the protection plate

25. Press firmly from below against the protection plate to accomplish good grip between the protection plate and the climate unit. See figure below.

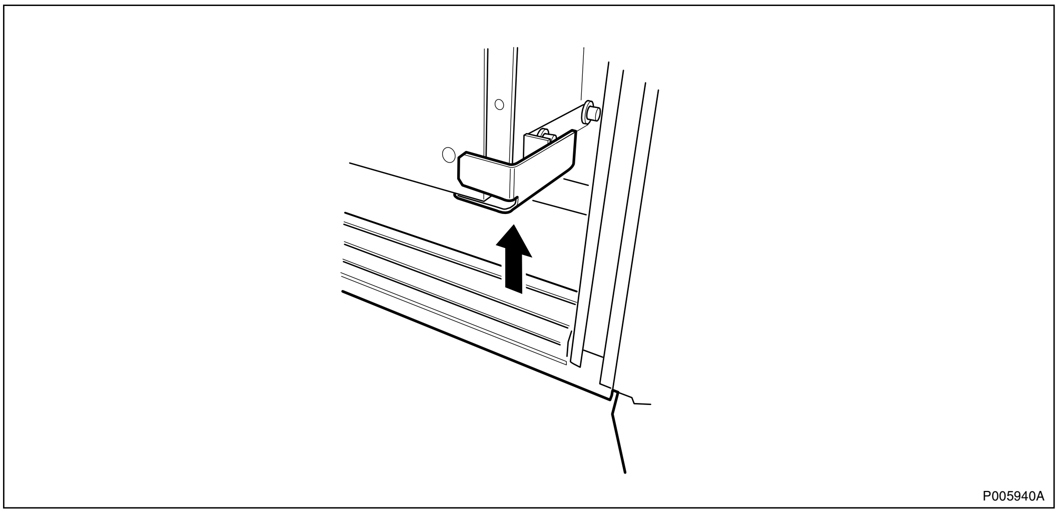


Figure 136 Pressing from below

6.7 Air Conditioner, Climate Unit Versions V4 and V5

Note: There are five different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V5" are explained in the chapter "Introduction".

Note: This instruction shall always be used on a cabinet with a high door, see the figure below.

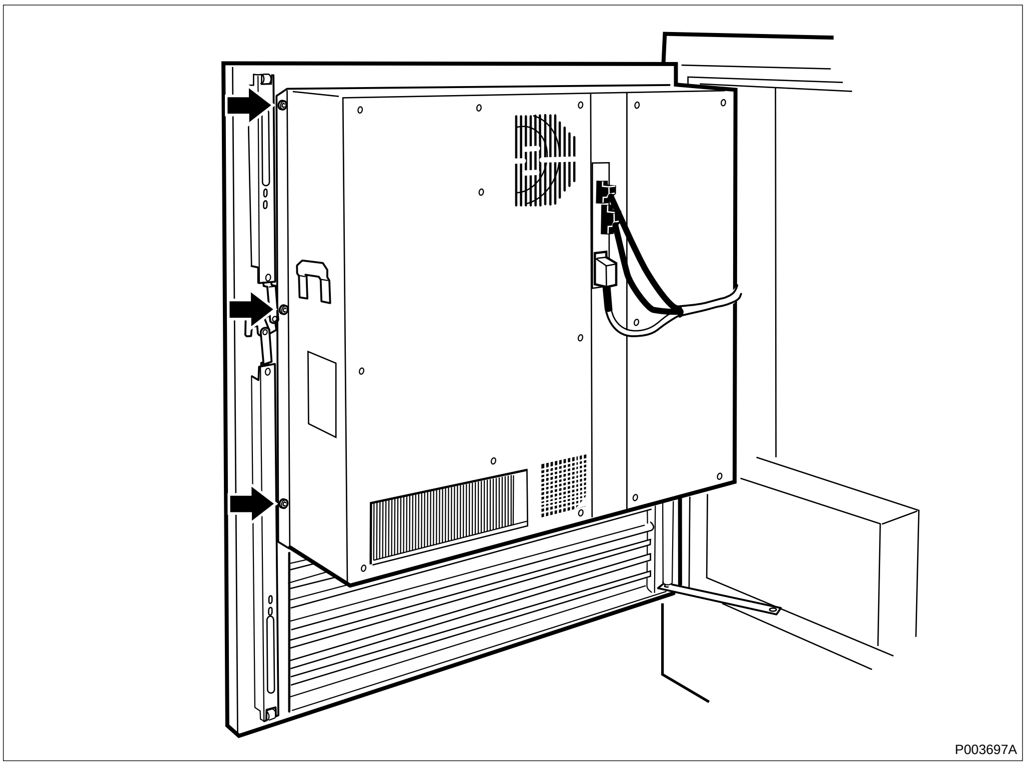


Figure 137 Opening the climate unit

Note: Both the climate unit V4, with large hinges, and the climate unit V5, with small hinges, can be used where an earlier version of the climate unit V4 or V5 has been used. See figures below.

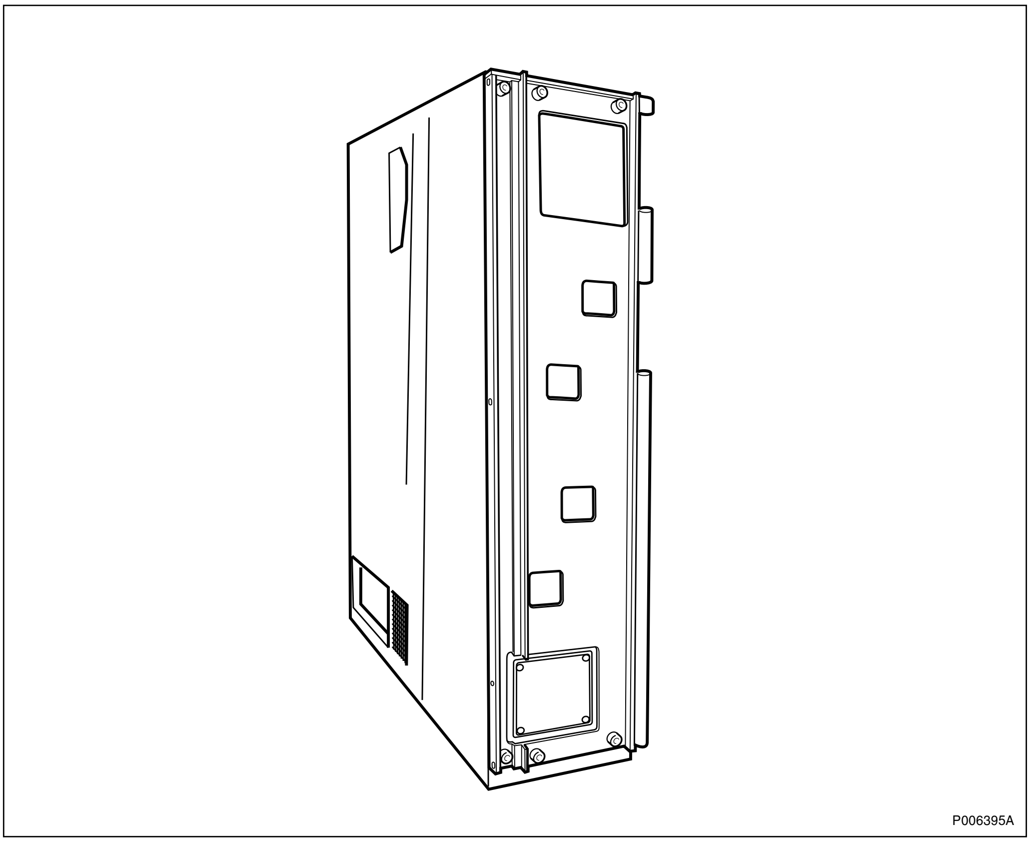


Figure 138 Climate unit version V4, with large hinges

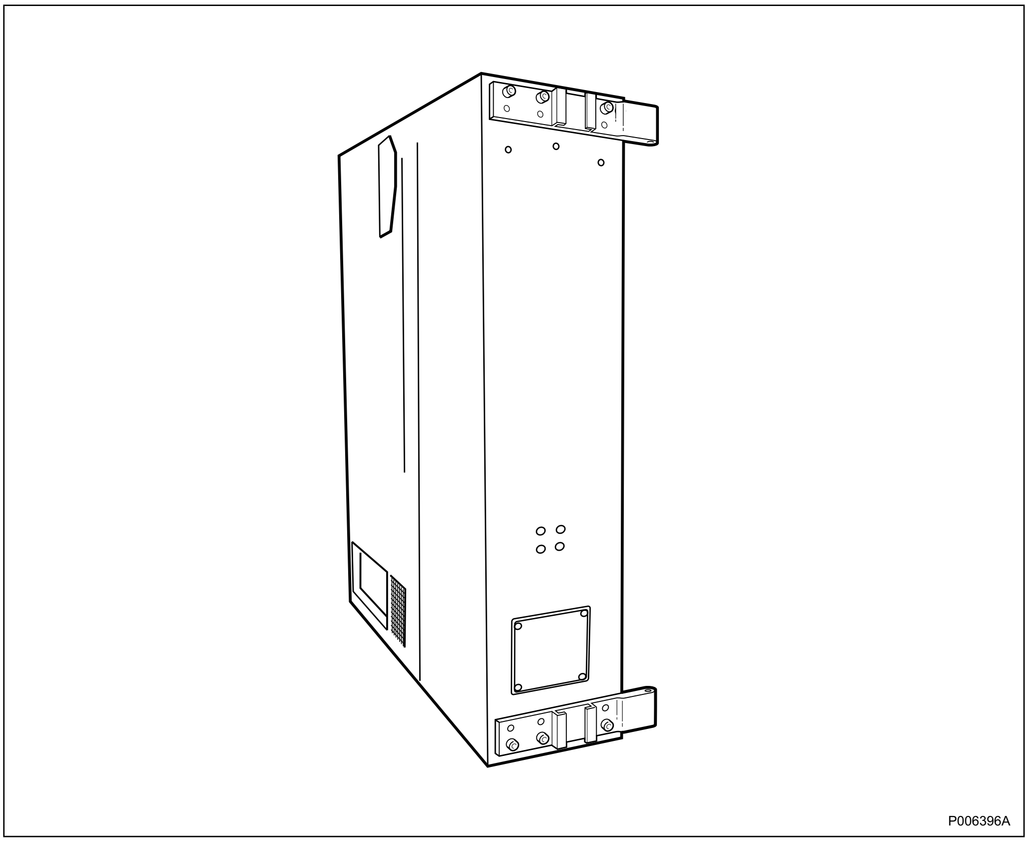


Figure 139 Climate unit version V5, with small hinges

WARNING

Read the Safety chapter regarding handling of heavy goods.

Note: The climate system weighs 90 kg (approximately 200 lb.). Removal or replacement of this unit requires a lifting device or a multi-person lift.

Take care when removing or installing the climate unit to prevent damage to the gaskets between the climate unit and the door.

Note: When changing climate unit, only the climate unit from the spare part kit is needed. Other items are not used on this RBS.

Removal of the climate unit

1. Open the ACCU and release the AC circuit breaker for the climate unit.
2. On the IDM, release the DC circuit breaker for the climate unit. The circuit breaker is released when it is labelled "OFF".

3. Remove the following cables:
   - AC cable **Note:** Save the spacer.
   - DC cable
   - Signal cable
4. Disconnect all cables to the climate unit from the rest of the cabinet.
5. Loosen the three screws on the left side that hold the climate unit onto the door. See Figure 137 on page 255.
6. Open the climate unit slightly on its hinges.
7. Lift up the climate unit, then away, to separate it from the door.
8. Replacement is the reverse of the above procedures.

Note: Unless under contractual warranty, after replacement, the air conditioner shall be repaired locally at the RBS site or in a local repair shop. If the air conditioner is unrepairable, it shall be disposed of locally by the customer. Do not return the air conditioner to Ericsson for replacement, repair or disposal.

The location of the RBS may make replacement of the entire air conditioner impracticable. If this is the case, and the fault within the air conditioner is isolated to the compressor, have a qualified refrigeration repairman refer to the table below when changing the compressor.

Table 13 Compressor data

Hz(1)	Product number	Cryogen	Pressure	Refrigerant load	Pipes (adapter)
50	24/BPD 104 02/01	R134A	24 bar	1.25 kg	1/4 inch SAE
60	24/BPD 104 02/02	R134A	24 bar	1.25 kg	1/4 inch SAE

(1) Voltage is dependent upon the strapping within the climate unit. This should not need changing when the compressor is replaced.

6.8 ALNA

This section discribes the replacement of ALNA (Antenna Low Noise Amplifier) and how to put the RBS into operation after the repair.

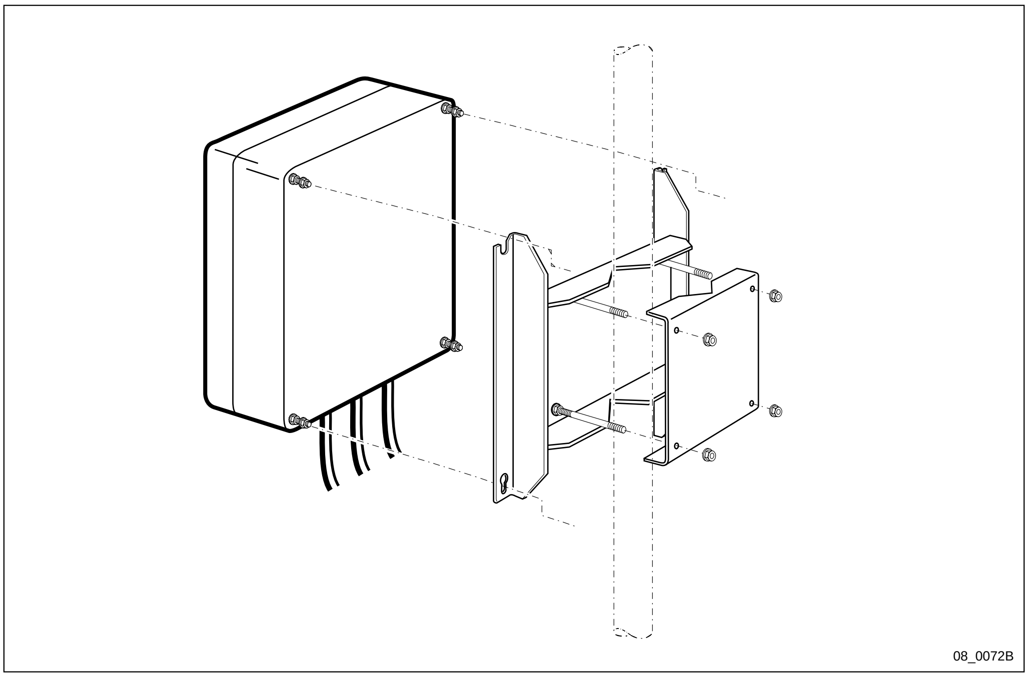


Figure 140 ALNA with mounting bracket

WARNING

Some working areas involve the risk of accidents caused by falling objects.

Note: Follow local safety regulations when climbing antenna poles and masts. These regulations will also determine the limitations of working under severe weather conditions.

Use all the prescribed PPE while doing maintenance on an antenna tower.

Prior to replacement

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
3. Wait until the Local mode indicator has a fixed yellow light. This indicates that the DXU is in local mode.

Replacement

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent exposure to RF radiation and damage to TRUs, be sure that the Local mode indicator on the DXU has a fixed yellow light.

All TRUs connected to the antenna tower where the faulty ALNA is mounted must have their TX not enabled indicator on before further action is taken.

1. At the bottom of the ALNA, disconnect the RF cable to the antenna and the RX and TX cables going to the RBS.
2. Remove the four screws holding the ALNA to the mounting bracket on the pole.
3. Replace the defective ALNA and reconnect the three RF cables.

Note: After replacement, the ALNA must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the ALNA. The repair delivery note shall include a clear description of the fault found. Refer to the chapter "Concluding Routines"for instructions on completing a repair delivery note.

Put into operation

1. Connect the OMT and verify that there is no fault in the ALNA. Mixing the antenna feeder or jumper cables will cause an ALNA fault and damage the ALNA.
2. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
3. Wait until the Local mode indicator is off. This indicates that the DXU is in remote mode.
4. Carry out the following checks:
   - BS fault on DXU will be off.
   - Operational on DXU will be on.
   - TX not enabled indicator on all TRUs will be off.

Note: The reason why the TX not enabled indicator does not turn off can be that the TRU is not configured and therefore not able to carry traffic.

6.9 Batteries

6.9.1 General

DANGER

⚠

Read Safety Instructions regarding handling and connecting batteries.

The battery temperature alarm is generated when the temperature of the battery is > +60°C (+140°F). When the temperature is > +65°C (+149°F), the BFU disconnects the batteries from the radio equipment to prevent them from becoming damaged. When the battery temperature falls to < +55°C (+131°F), the batteries are reconnected to the radio equipment by the BFU and the alarm ceases.

The battery under-voltage alarm is generated by the BFU to the ECU when the voltage of the batteries drops to 20.5 V DC (BFU R1A) respectively 21.0 V DC (R2A and on). After a delay of approximately 30 seconds, the BFU disconnects the battery from the entire system except the DXU and ECU. With the resulting decrease in load, the voltage rises. If the voltage drops again to 20.5 V DC (BFU R1A) respectively 20.8 V DC (R2A and on), the DXU and ECU are disconnected from the batteries. When the battery voltage returns to 25.0 V DC, the alarm ceases and the batteries are reconnected to the entire system.

The table below shows the output float voltage of the batteries (V DC) in relation to the battery temperature.

Table 14 Float voltage in relation to battery temperature (±0.1 V DC)

°C	°F	V DC	°C	°F	V DC	°C	°F	V DC
±0	+32	28.5	+15	+59	27.7	+30	+86	26.9
+1	+34	28.4	+16	+61	27.7	+31	+88	26.9
+2	+36	28.4	+17	+63	27.6	+32	+90	26.8
+3	+37	28.3	+18	+64	27.6	+33	+91	26.8
+4	+39	28.3	+19	+66	27.5	+34	+93	26.7
+5	+41	28.2	+20	+68	27.5	+35	+95	26.7
+6	+43	28.2	+21	+70	27.4	+36	+97	26.6
+7	+45	28.1	+22	+72	27.4	+37	+99	26.6
+8	+46	28.0	+23	+73	27.3	+38	+100	26.5
+9	+48	28.0	+24	+75	27.2	+39	+102	26.5
+10	+50	28.0	+25	+77	27.2	+40	+104	26.4
+11	+52	27.9	+26	+79	27.2	+41	+106	26.4
+12	+54	27.9	+27	+81	27.1	+42	+108	26.3
+13	+55	27.8	+28	+82	27.0	+43	+109	26.3
+14	+57	27.8	+29	+84	27.0	+44	+111	26.2
						+45	+113	26.2

6.9.2 Replacement Procedure

This section describes the replacement of internal batteries, expanded batteries and battery boxes.

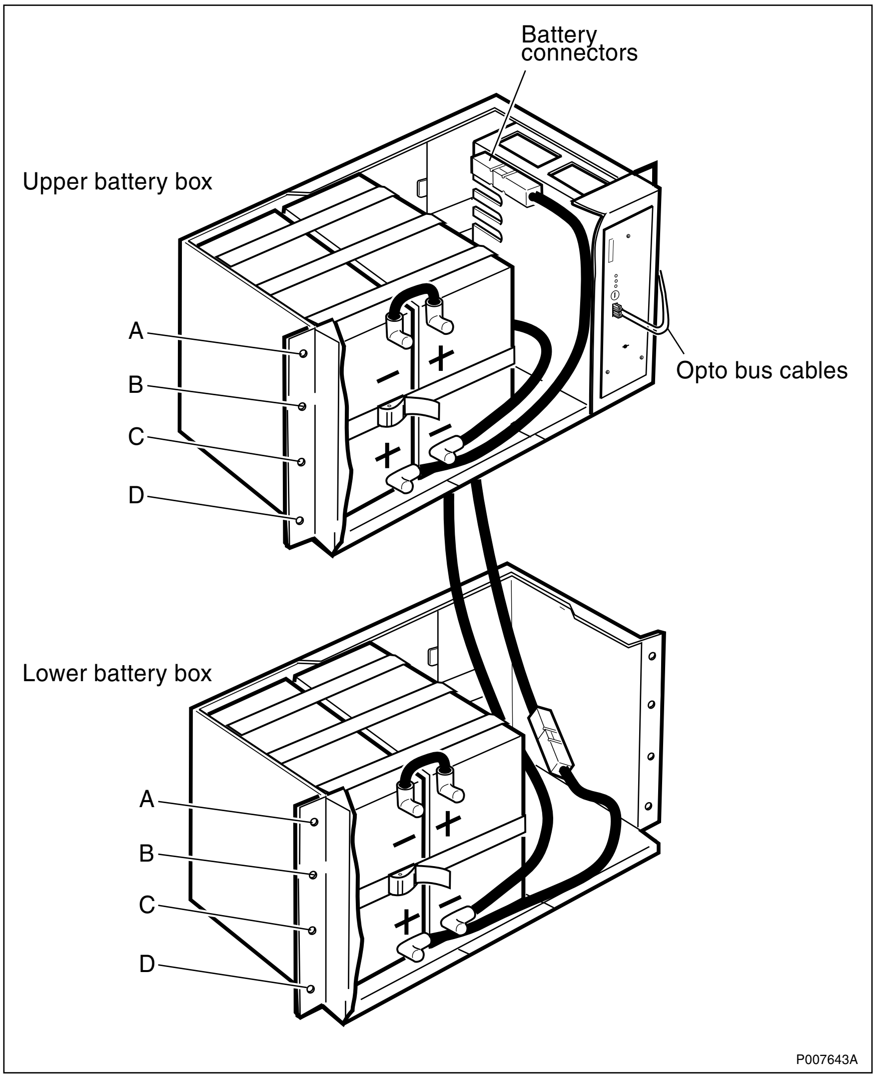


Figure 141 Battery and battery box, new version

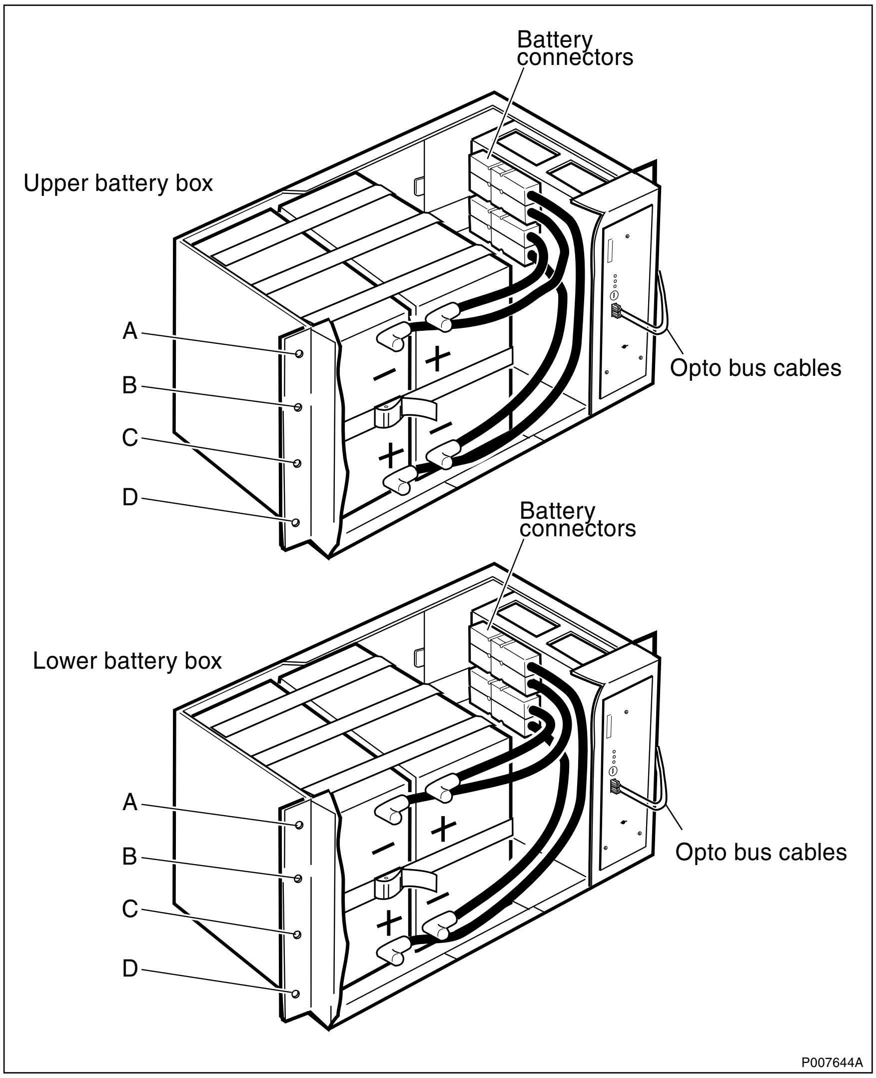


Figure 142 Battery and battery box, old version

Internal batteries

Refer to the figures above when performing the following procedures. To guarantee the optimum battery functions, it is recommended that all batteries in the battery boxes are replaced at the same time, even if only one is defective. Thus there are two batteries to be changed when one battery box is used, four when two battery boxes are used and eight when the expanded batteries are used.

Note: There are two versions of the battery box for the RBS 2102. The procedures for changing batteries are the same for both boxes.

CAUTION

⚠

Short circuits can cause injury or damage. Although the battery voltage may be low, the released power can be extremely high.

Note: Use only insulated tools when disconnecting or connecting cables to the battery terminals. Care must be taken when the cables from the battery terminals are disconnected, so that they do not short together.

Note: If supplied, the opto bus cables must have a bent radius of at least 35 mm.

1. Disconnect the opto bus cables connected to the front of the BFU (ignore this step if no BFU is installed in the battery box).
2. Loosen the screws holding the BFU to the battery box and remove the BFU (ignore this step if no BFU is installed in the battery box).
3. Remove the top and bottom screws on both sides of the cover plate (labelled A and D in the figures above).
4. Remove the cover plate.
5. (Old version of the battery box only) Disconnect the cables from the battery connectors.
6. Loosen the strap that holds the batteries in the battery box.
7. Disconnect the battery cables from the battery terminals, negative (-) first, then positive (+).

Note: In some battery models the negative and positive poles have opposite positions to those in the figures above. Read the instructions on the battery box cover in order to get information about the positions of the poles on the actual batteries.

8. Lift out the batteries using the webbed harness around them.
9. Remove the harness from the old batteries and place it over the new batteries.
10. Replacement is the reverse of the above.

Note: If an information label comes with the new batteries do not forget to paste it on the battery box cover.

11. Reset the ECU by pressing the button labelled CPU Reset on the ECU for approximately 3 seconds. After approximately 30

seconds, the system should function without alarm, and the Fault indicator on the ECU should go out.

Note: Unless under contractual warranty, after replacement, the batteries shall be disposed of locally. Do not return the batteries to Ericsson for replacement, repair or disposal.

Expanded batteries

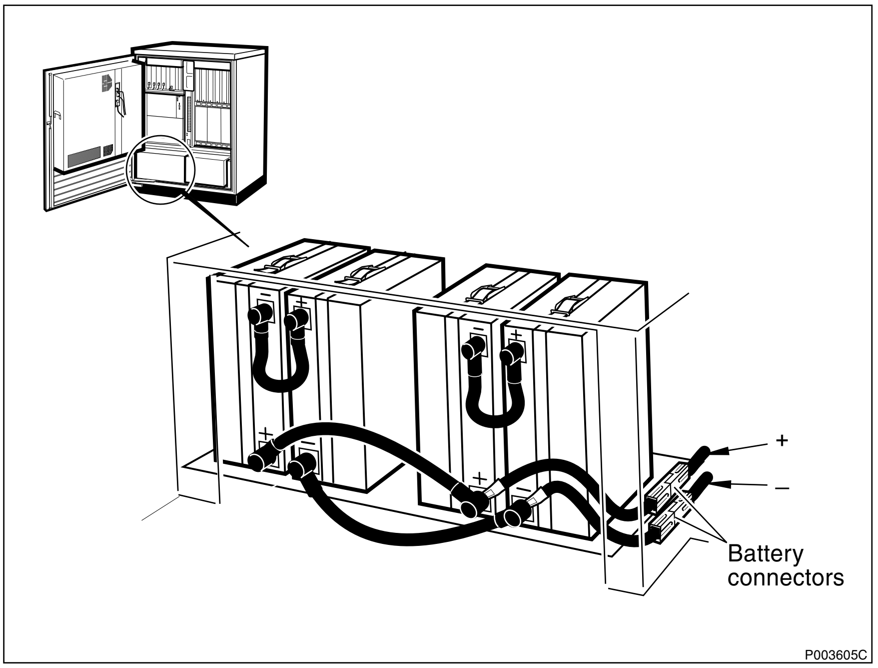


Figure 143 Expanded batteries in the transport module

CAUTION

Short circuits can cause injury or damage. Although the battery voltage may be low, the released power can be extremely high.

Note: Use only insulated tools when disconnecting or connecting cables to the battery terminals. Care must be taken when the cables from the battery terminals are disconnected, so that they do not short together.

1. Loosen the two screws on the top of the transport module and lift it off.
2. Disconnect the cables from the battery terminals to the connectors.
3. Disconnect the battery cables from the battery terminals, negative (-) first, then positive (+).

Note: Some battery models have opposite positions for the negative and positive poles to those illustrated in the figure above. Read the instructions on the battery box cover in order to get information about the positions of the poles on the actual batteries.

4. Loosen the straps that hold the batteries in the transport module. Remove the old batteries.

5. Replacement is the reverse of the above.

Note: If an information label comes with the new batteries do not forget to paste it on the battery box cover.

6. Reset the ECU by pressing the button labelled CPU Reset on the ECU for approximately 3 seconds. After approximately 30 seconds, the system should function without alarm, and the Fault indicator on the ECU should go out

Note: Unless under contractual warranty, after replacement, the batteries shall be disposed of locally. Do not return the batteries to Ericsson for replacement, repair or disposal.

Battery box for internal batteries

Refer to the figure below when replacing the battery box.

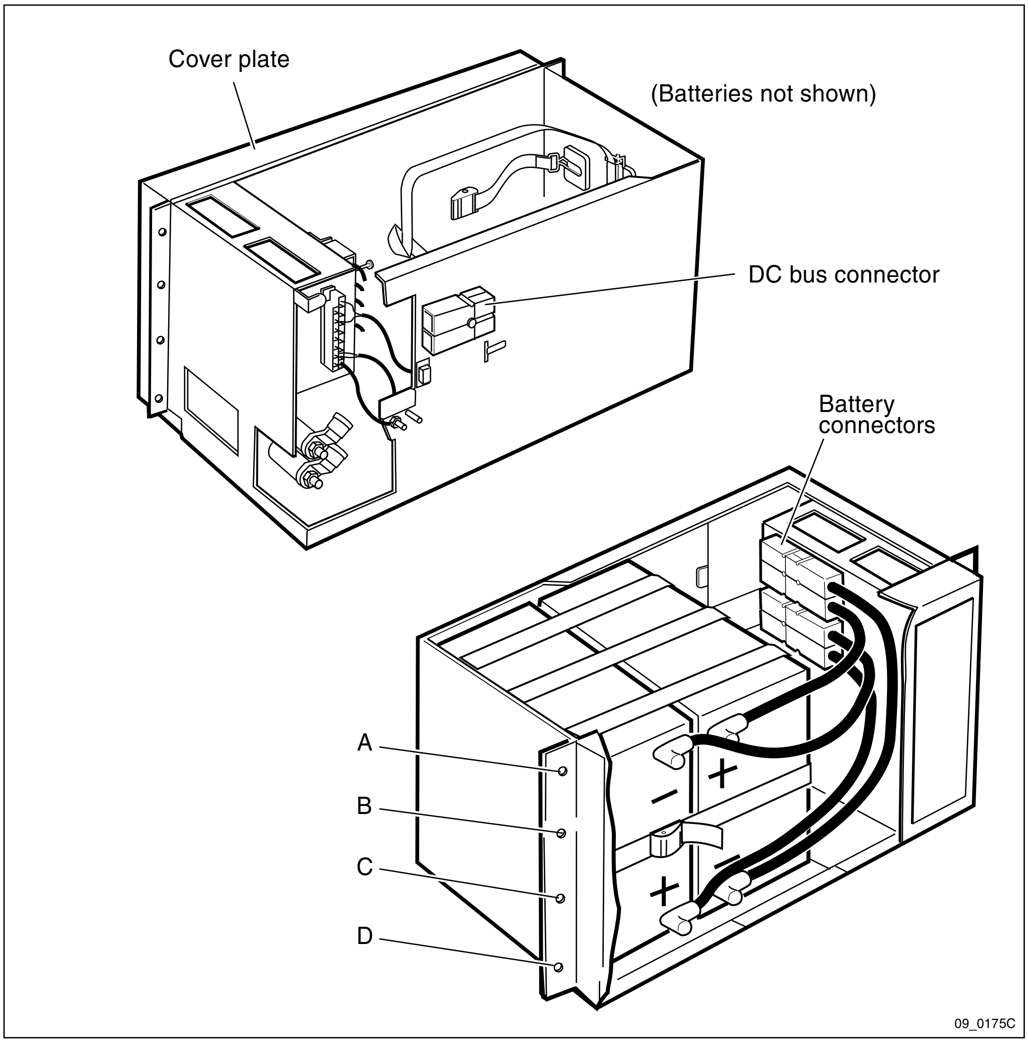


Figure 144 Battery box, back view

1. 1. Remove the batteries from the battery box. See instructions under the heading *Internal Batteries* earlier in this section.
2. Remove screws B and C on each side of the battery box, see figure above.
3. Slowly pull the battery box out of the cabinet until the DC bus connector on the back of the battery box can be reached.
4. Disconnect the DC bus connector.
5. Replace the battery box and tighten screws B and C.
6. Replace the batteries in the battery box. See instructions under the heading *Internal Batteries* earlier in this section.
7. Connect the cables from the battery terminals to the connectors.
8. Reset the ECU by pressing the button labelled CPU Reset on the ECU for approximately 3 seconds. After approximately 30 seconds, the system should function without alarm, and the Fault indicator on the ECU should go out.

Note: Unless under contractual warranty, after replacement, the batteries and the battery box shall be disposed of locally. Do not return the batteries or the battery box to Ericsson for replacement, repair or disposal.

6.10 BFU

This section discribes the replacement of the Battery Fuse Unit (BFU). The BFU is installed in the BBS cabinet.

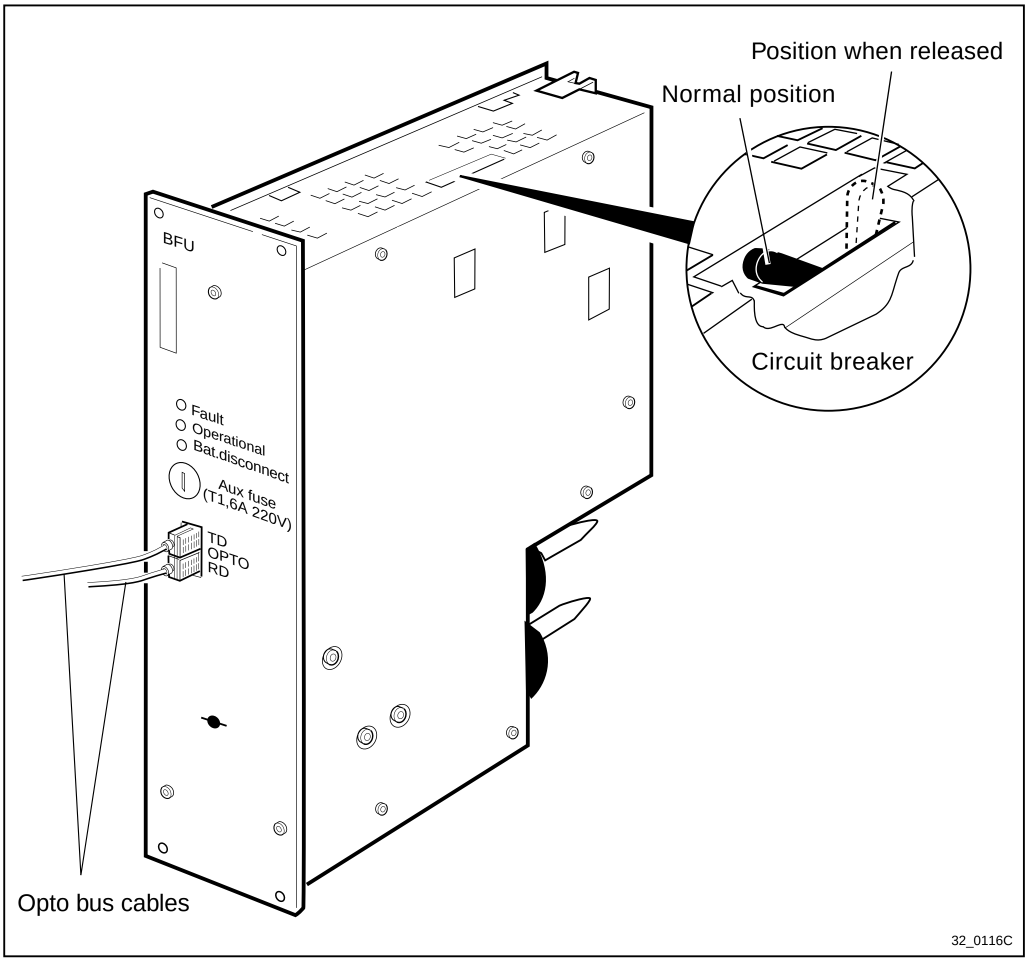


Figure 145 BFU with circuit breaker

Note: The opto bus cables must have a bent radius of at least 35 mm.

Replacement

1. Disconnect the opto bus cables connected to the BFU.
2. Make sure that the circuit breaker is in normal position.
3. Replace the faulty BFU.
4. Reset the ECU by pressing the button labelled CPU Reset on the ECU for approximately 3 seconds. After approximately 30 seconds, the system should function without alarm, and the Fault indicator on the ECU should go out.

5. Connect the opto bus cables.

Note: After replacement, the BFU must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the BFU. The repair delivery note shall include a clear description of the fault found. Refer to the chapter "Concluding Routines"for instructions on completing a repair delivery note.

6.11 CCU

Note: There are five different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V2", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3), (V4) and (V5) are used as abbreviations designating the four versions of the climate unit.

CCU in climate unit versions V1 and V2

Note: If labelled, the top three indicators on the CCU (Fault, Operational and Heat fault) are for use with the climate tester only. They will not light during normal operation of the climate unit. The flow sensor is part of the replacement CCU.

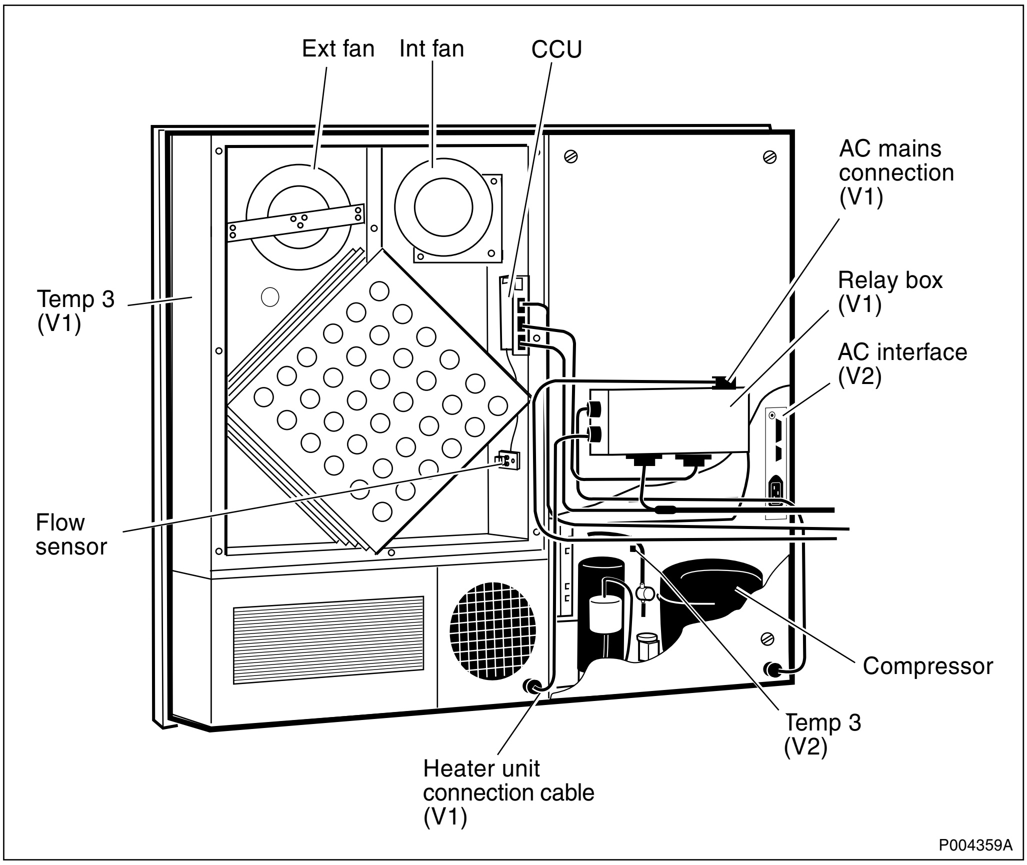


Figure 146 Climate unit (all versions) and the CCU

Note: Depending upon the version of the climate unit, temp sensor 3 can be found in two different locations.

1. Turn off the DC circuit breaker for the climate unit on IDM 1.
2. Remove all cables connected to the CCU.
3. Remove the AC power cable from the top of the relay unit or the bottom connector of the AC interface (depending on the version of the climate unit).
4. (If required). Remove the cable to the temperature sensor 3 on the side of the climate unit.
5. Remove the cover plate over the section containing the internal and external fans.
6. Disconnect the wires for the fans connected to the connection block on the CCU as given in the table below.
7. Remove the screws holding the flow sensor to the air conditioner.
8. Remove the screws holding the CCU to the air conditioner.
9. Replacement is the reverse of the above procedures.

Note: Unless under contractual warranty, after replacement, the CCU shall be disposed of locally. Do not return the CCU to Ericsson for replacement, repair or disposal.

Table 15 Wiring on connection block for CCU, climate unit versions V1 and V2

Wire no.	1	2	3	4	5	6	7	8	9
Colour	Blue	White	Red	Blue	Red	Black	Brown	White	Red
Signal	(-) Neg.	Rotation signal	(+) Pos.	(-) Neg.	(+) Pos.	(-) Neg.	Opto signal	Flow signal	(+) Pos.
To	Internal fan	Internal fan	Internal fan	External fan	External fan	Flow sensor	Flow sensor	Flow sensor	Flow sensor

CCU in climate unit versions V3, V4 and V5

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

Note: Ensure that all circuit breakers on the IDM, and in the ACCU, for the climate unit are off prior to replacing this unit.

Ensure when sliding the CCU back into the climate unit, that it is seated correctly in the plastic guides on top of and below the printed circuit board. Failure to do so could cause the CCU to come into contact with the metal of the climate unit and short the AC mains to the cabinet.

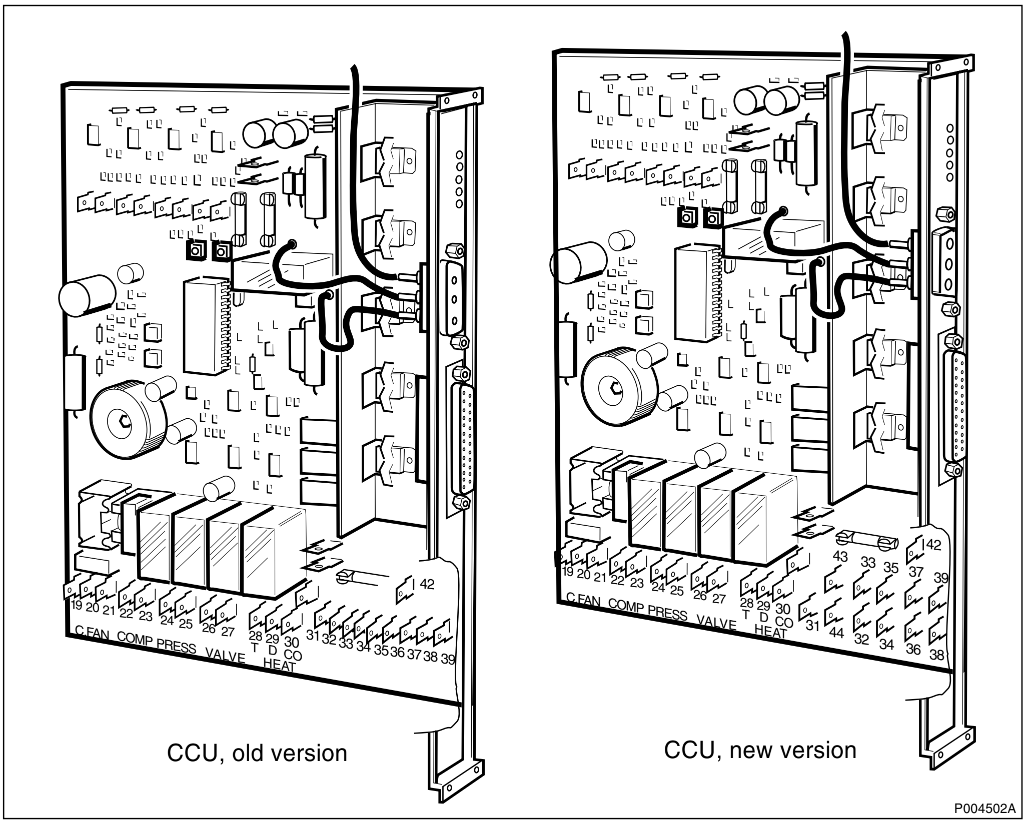


Figure 147 CCU, old version and new version

1. Release the DC circuit breaker for the climate unit on the mid-mounted IDM.
2. Open the mounting base and release the AC mains circuit breaker for the climate unit in the ACCU.
3. Remove the following cables from the CCU:

   a) AC cable **Note:** Save the spacer.

   b) DC cable

   c) Signal cable
4. Remove the 4 screws holding the CCU to the climate unit.
5. Disconnect all the wires connected to the spade terminals on the CCU and remove the faulty CCU.
6. Strap the replacement CCU for the correct AC mains voltage as shown in the table and figure below.

Table 16 Climate unit versions V3/V4. AC mains strapping options on the CCU

AC Voltage	Strap pins
200 *New CCU*	43 - 42
200 *Old CCU*	33 - 42
208	33 - 42
230	35 - 42
240	37 - 42
250	39 - 42

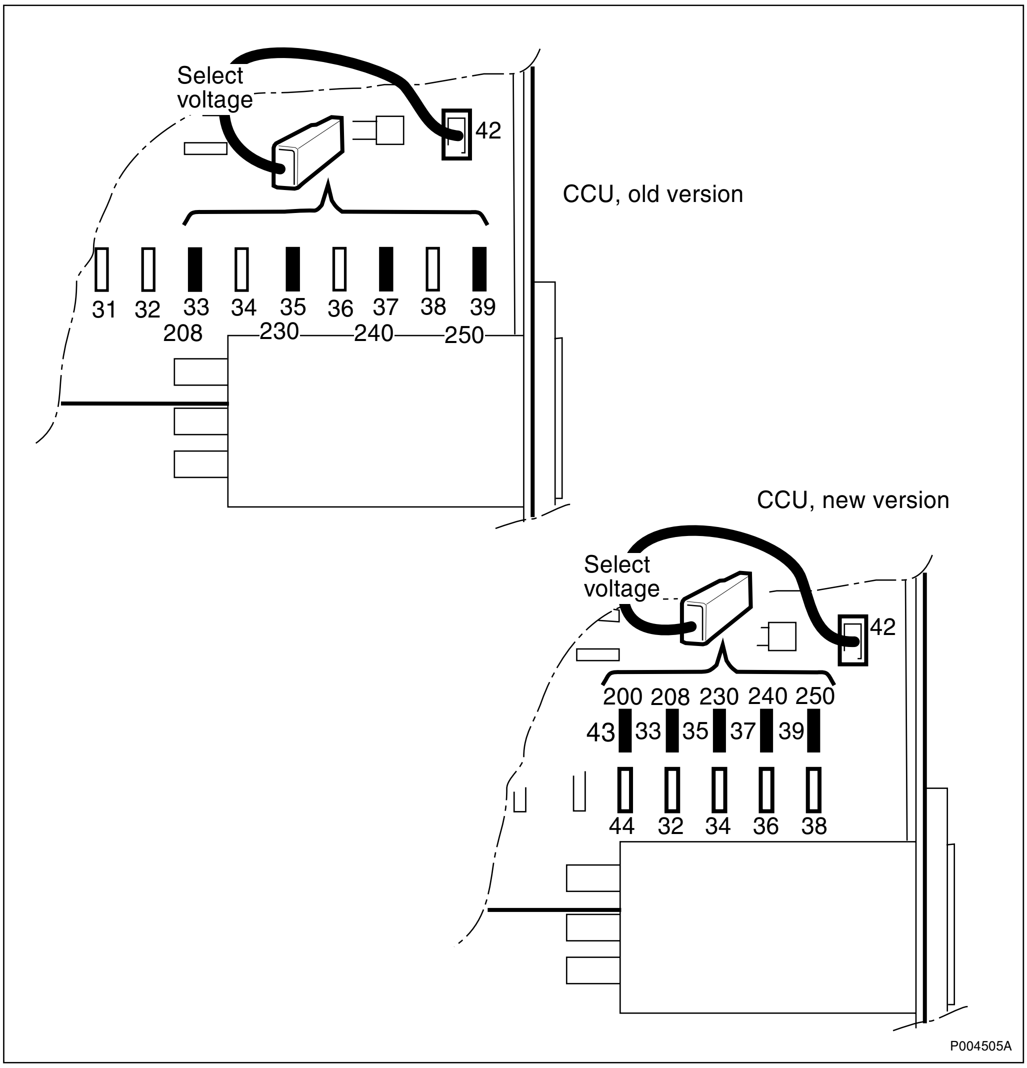


Figure 148 CCU, old version and new version. AC mains connection alternatives

7. Reconnect all wires on their spade terminals.

   Note: All wires and their corresponding terminals are numbered.

8. Slide the replacement CCU into the climate unit and fasten it with the 4 mounting screws.

9. Restore the cables to the CCU board:

   a) Signal cable

b) DC cable

Note: Be sure to attach the DC cable (three pins) correctly.

c) AC cable

Note: The spacer, supplied with the climate unit, is mounted between the AC connector and the board.

10. Turn on the AC circuit breaker for the climate unit in the ACCU.
11. Turn on the DC circuit breaker for the climate unit on the mid-mounted IDM.

Note: Unless under contractual warranty, after replacement, the CCU shall be disposed of locally. Do not return the CCU to Ericsson for replacement, repair or disposal

6.12 CDU

Note: CDUs are marked on the front with a coloured label showing the frequency. Make sure that the appropriate CDU is available.

Further information about colour coding versus frequency and encryption can be found in the *Spare Parts Catalogue, Appendix B.*

Note: If the CDU is faulty, but no replacement unit is available, leave the faulty CDU in the cabinet (do not remove it) and replace it when the new CDU arrives.

If there are sever damages, like burns, on the CDU, remove the faulty CDU and replace it with a dummy CDU.

Empty RU positions can affect the required cooling airflow to units in operation and cause overheating.

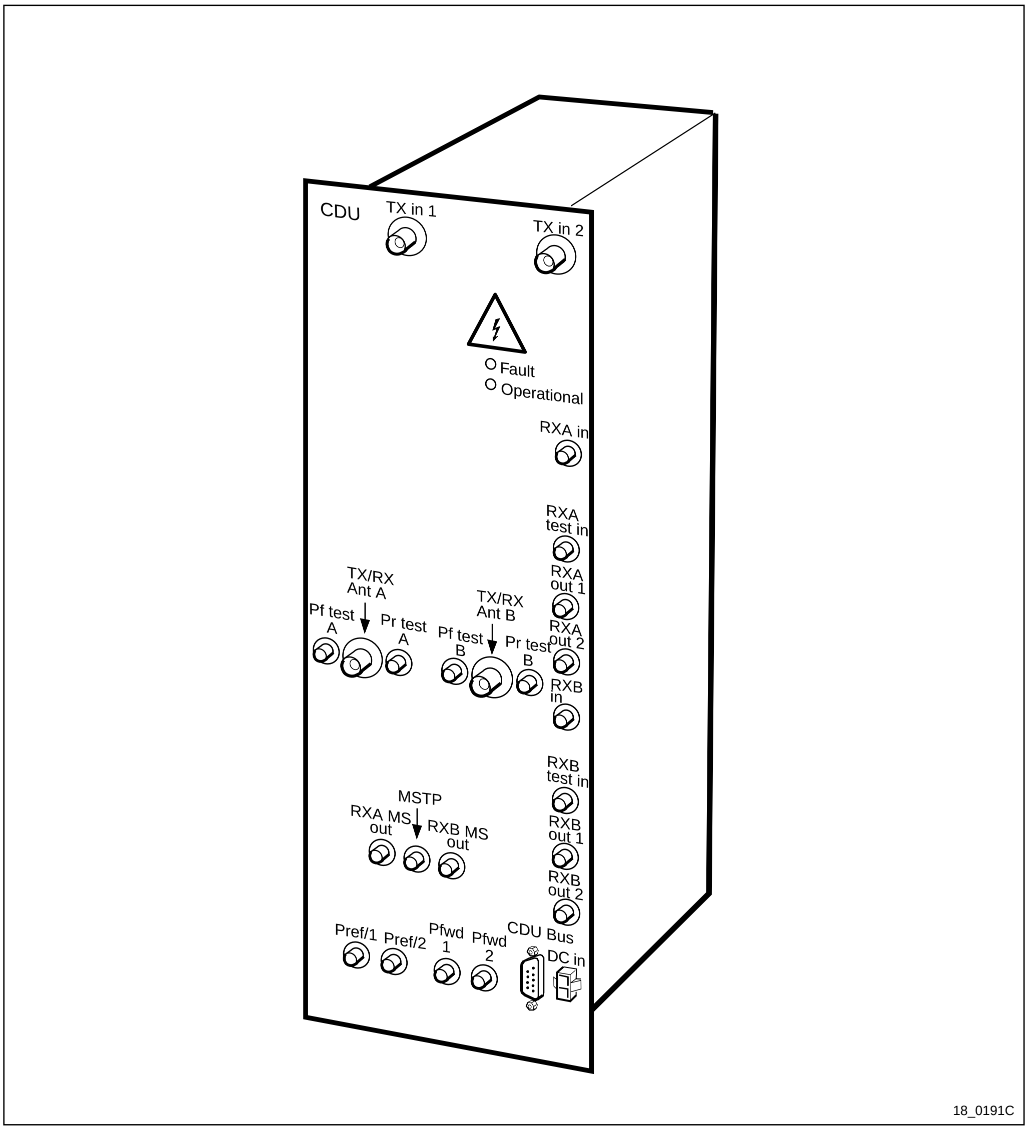


Figure 149 CDU, this example shows a CDU-A

Prior to replacement

Note: During the replacement procedure of the CDU, either the RBS will have reduced traffic handling capability due to the loss of one of the CDUs, or the RBS will be temporarily removed from service if there is only one CDU in the cabinet.

1. Inform the OMC operator that the CDU will be replaced.
2. Press the Local/remote button on the TRUs that are connected to the faulty CDU. The Local mode indicator will start flashing.
3. Wait until the Local mode indicator on the TRU concerned has a fixed yellow light. This indicates that the TRU is in local mode.
4. Switch off the applicable CDU circuit breakers.

Replacement

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent damage to TRUs and exposure to RF radiation, be sure that the Local mode indicators on the TRUs that are connected to the faulty CDU, have a fixed yellow light before taking any further actions.

1. Replace the CDU.
2. Switch on the CDU circuit breakers.
3. Press CPU Reset on the DXU. The RU information from the new CDU will then be loaded into the RBS database.

Note: After replacement, the CDU must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the CDU. The repair delivery note shall include a clear description of the fault found. Refer to the chapter "Concluding Routines"for instructions on completing a repair delivery note.

Put into operation

Note: If base band hopping is used, the hopping sequence can only be re-initiated by the BSC/MSC. After placing the TRU(s) in remote mode, contact the BSC/MSC personnel and request they take the required actions.

1. Press the Local/remote buttons on both TRUs that are connected to the new CDU.
2. The Local mode indicators will start flashing.
3. Wait until the Local mode indicators turn off. This indicates that the TRUs are in remote mode.

6.13 CDU Bus

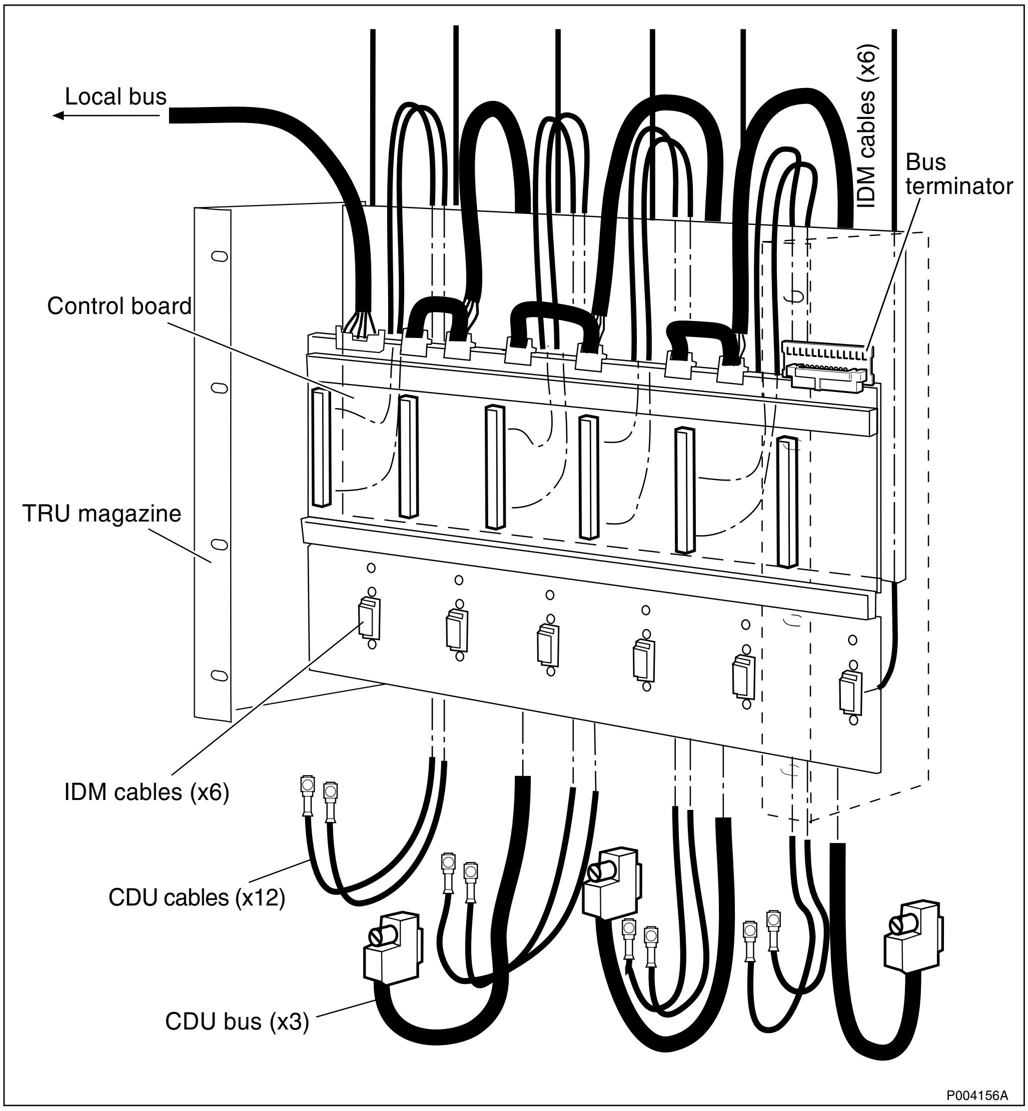


Figure 150 TRU backplane

Prior to replacement

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The yellow Local mode indicator will start flashing. Wait until it has a fixed yellow light. This indicates that the DXU is in local mode.
3. Switch off the AC mains power to the cabinet with the AC mains switch on the ACCU.
4. Turn off the DC circuit breakers on the IDM for all the TRUs and CDUs.
5. Disconnect the opto bus cables connected to the BFU(s).

6. Pull out the BFU(s) to isolate the 24 V DC battery voltage from the RBS.
7. (If supplied.) Isolate the cabinet from external batteries.

Replacement

1. Depending on cabinet version:

   • (Cabinets with two IDMs). Loosen the IDM above the TRU sub-rack.

   • (Cabinets with a mid-mounted IDM). Loosen the panel over the TRU sub-rack that holds FCU2.
2. Remove the fan clamps that keep the fans in place.
3. Unseat the fans from their housing so that they are not inserted into the top of the TRU sub-rack.
4. Depending on cabinet version, provide DC power cable relief:

   • (Cabinets with two IDMs). Disconnect all the DC power cables that go from the TRU backplane to the IDM. The DC power cables connectors are located on the back of the IDM on the right-hand side.

   • (Cabinets with a mid-mounted IDM). Disconnect all the cables that go from the TRU backplane to the mid-mounted IDM. The connectors are located on the right hand side of the IDM under the cover panel.
5. (Cabinets with two IDMs only). Put the IDM back temporarily.

Note: The cables connecting the CDU antenna connectors to the connection field are of a low loss cable type. These cables may be damaged if repeatedly bent. Be very careful when handling these cables.

6. Disconnect the cables to the CDUs and remove the CDUs.
7. Loosen the screws that hold the CDU sub-rack and take it out.
8. Remove the air channel below the CDU sub-rack.
9. Remove the TRUs.
10. Loosen the screws that hold the TRU sub-rack.
11. Partially pull out the TRU sub-rack.
12. Disconnect the faulty CDU bus from the TRU sub-rack, pull it out and replace it.
13. Reset in reverse order.

Note: Unless under contractual warranty, after replacement, the CDU bus shall be disposed of locally. Do not return the CDU bus to Ericsson for replacement, repair or disposal.

Put into operation

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Connect AC mains power to the cabinet with the AC mains switch on the ACCU.
2. Put the BFUs back and reconnect the opto bus cables.
3. Check that the Operational indicator on the DXU has a fixed green light and that the BS fault indicator is off.
4. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
5. Wait until the Local mode indicator on the DXU is off. This indicates that the DXU is in remote mode.

6.14 CDU-D RUs

Note: This procedure is common for the three RUs in the CDU-D: CU, DU and FU (FUd).

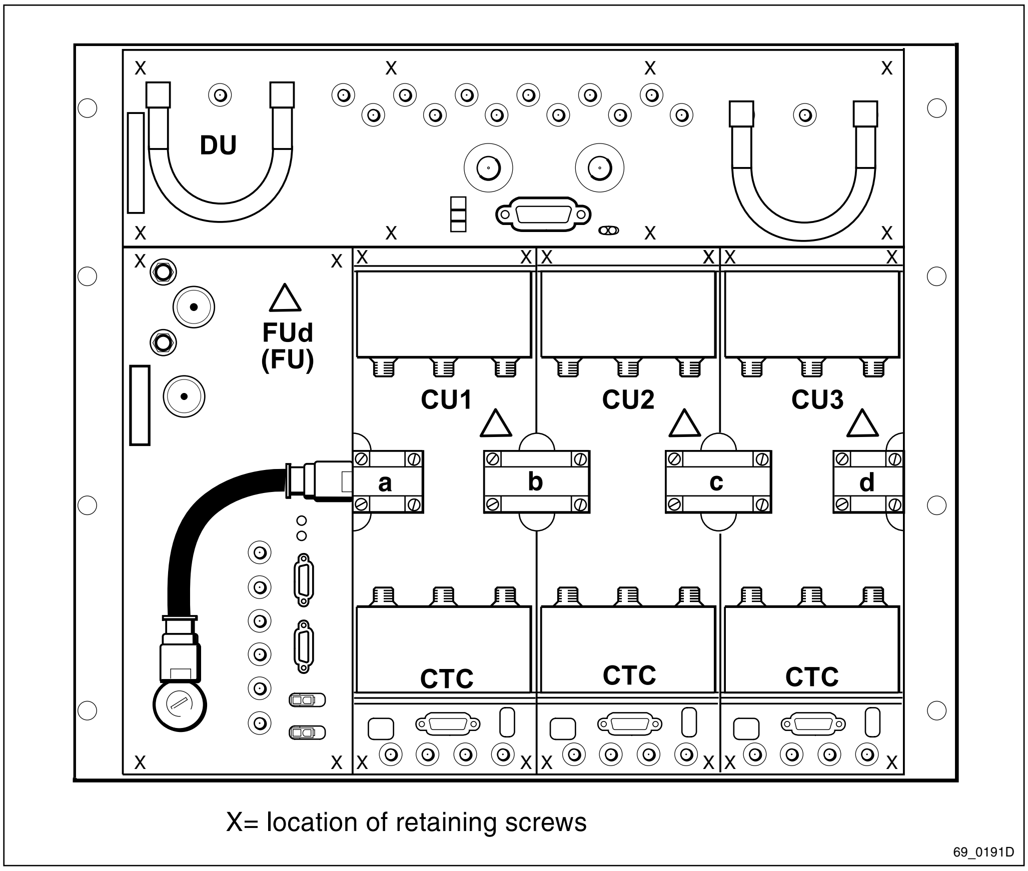


Figure 151 The figure shows a CDU–D 900, front view

Prior to replacement

Note: During the replacement procedure of CDU-D RUs, the RBS will be temporarily removed from service.

1. Inform the OMC operator that a RU is going to be replaced.
2. Press the Local/remote button on all TRUs that are connected to the CDU-D. The Local mode indicator will start flashing on the TRUs.
3. Wait until the Local mode indicator on each TRU concerned has a fixed yellow light. This indicates that the TRU is in local mode.

Replacement

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent damage to TRUs and exposure to RF radiation, be sure that the Local mode indicators on the TRUs that are connected to the faulty CDU-D, have a fixed yellow light before taking any further actions.

1. Press once the Local/remote switch on each TRU listed in Table 17 on page 280 to take them out of traffic.

   It is safe to work on the CDU-D when the Local mode indicators on the TRUs are continuously illuminated.

Table 17 TRUs to take out of traffic

CDU-D RU to be replaced	TRUs required in Local mode
DU	1, 2, 3, 4, 5 and 6
FU (FUd)	1, 2, 3, 4, 5 and 6
CU1	1, 2, 3, 4, 5 and 6(1)
CU2	3, 4, 5 and 6(1)
CU3	5 and 6(1)

(1) If the CDU variant uses a single coaxial link, instead of the four separate links a, b, c and d, then **all** TRUs must be put into local mode.

2. Remove all external cables connected to the faulty RU.
3. (CU only). Remove the coaxial links a, b, c and d.

Note: If the CDU variant uses a single coaxial link, instead of the four separate links a, b, c and d, then remove the single link.

4. Loosen the retaining screws securing the faulty RU.
5. Replace the faulty RU.
6. Secure the new RU by tightening the screws.

7. Reconnect all cables.
8. Press again the Local/remote switch on each TRU in local mode to return them to traffic.

Put into operation

Note: If base band hopping is used, the hopping sequence can only be re-initiated by the BSC/MSC. After placing the TRUs in remote mode, contact the BSC/MSC and request that they take the required action.

1. Press the CPU reset button on the DXU and wait approximately 1 minute.
2. Make sure that the TRUs are in remote mode, that is, the Local mode indicator is off.

   If not, press the Local/remote button on the TRUs that are connected to the repaired CDU-D. The Local mode indicator will start flashing.
3. Wait until the Local mode indicators on the TRUs are turned off. This indicates that the TRUs are in remote mode.

Note: After replacement, the CU, DU or FU (FUd) must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the CU, DU or FU (FUd). The repair delivery note shall include a clear description of the fault found. Refer to the chapter "Concluding Routines" for instructions on completing a repair delivery note.

6.15 CDU-TRU RX Cables

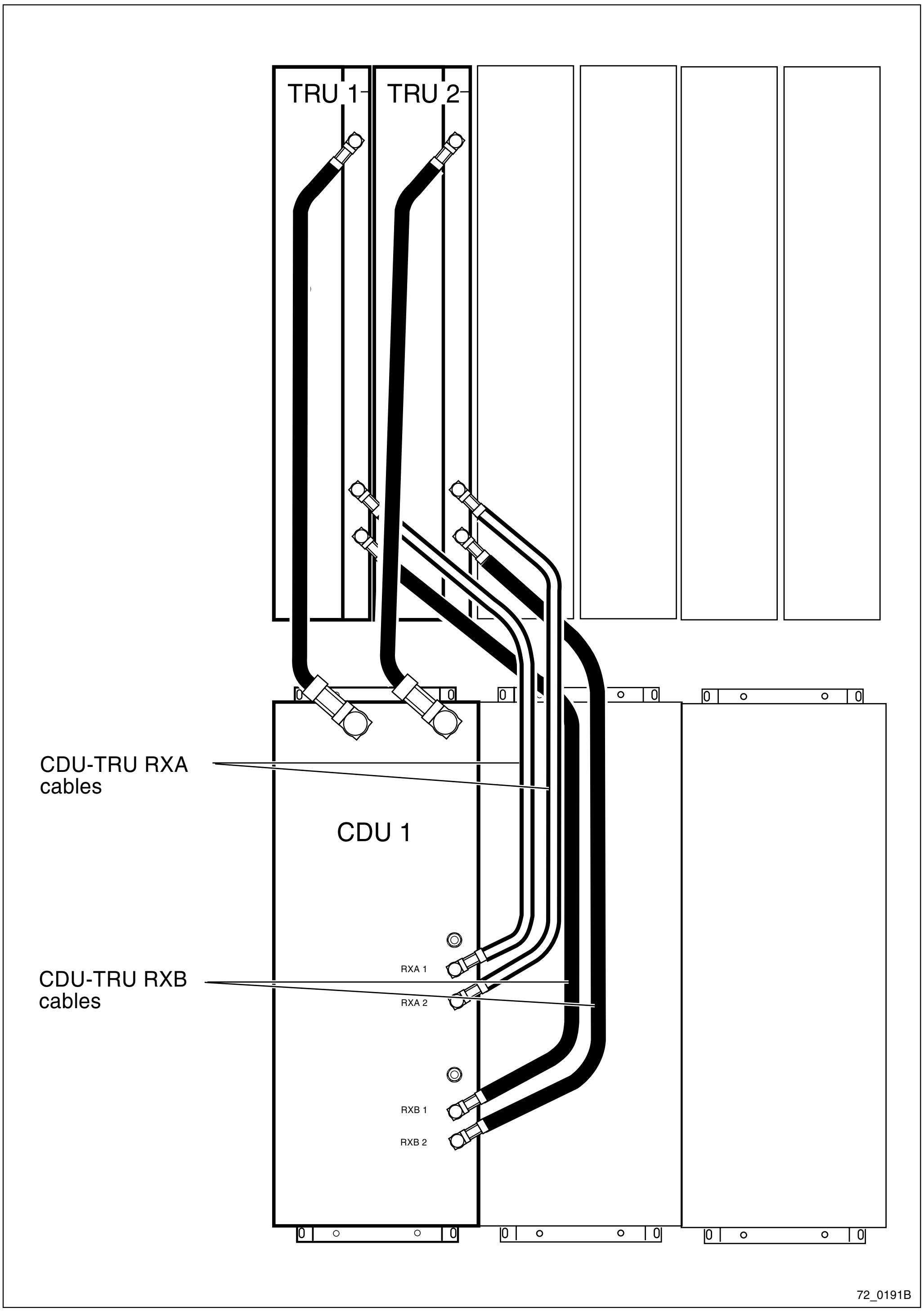


Figure 152 CDU-TRU RXA and RXB cables

Prior to replacement

1. Press the Local/remote button on the TRU that is connected to the faulty cable. This will set the TRU in local mode.
2. Wait until the Local mode indicator has a fixed yellow light.

Replacement

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent damage to TRUs and exposure to RF radiation, be sure that the Local mode indicator on the TRU that is connected to the faulty CDU-TRU RX cable has a fixed yellow light before taking any further actions.

1. Replace both the RXA and RXB cables. The fault indicator on the CDU will still be lit.
2. Press the CPU reset button on the TRU.
3. Press the Local/remote button on the TRU that is connected to the new cable(s) and wait until the Local mode indicator turns off. This will set the TRU in remote mode.
4. Check that the BS fault indicator (DXU) is off. This means that there are no active faults in the RBS.

Note: Unless under contractual warranty, after replacement, the cables shall be disposed of locally. Do not return the cables to Ericsson for replacement, repair or disposal.

6.16 CDU-TRU TX Cables

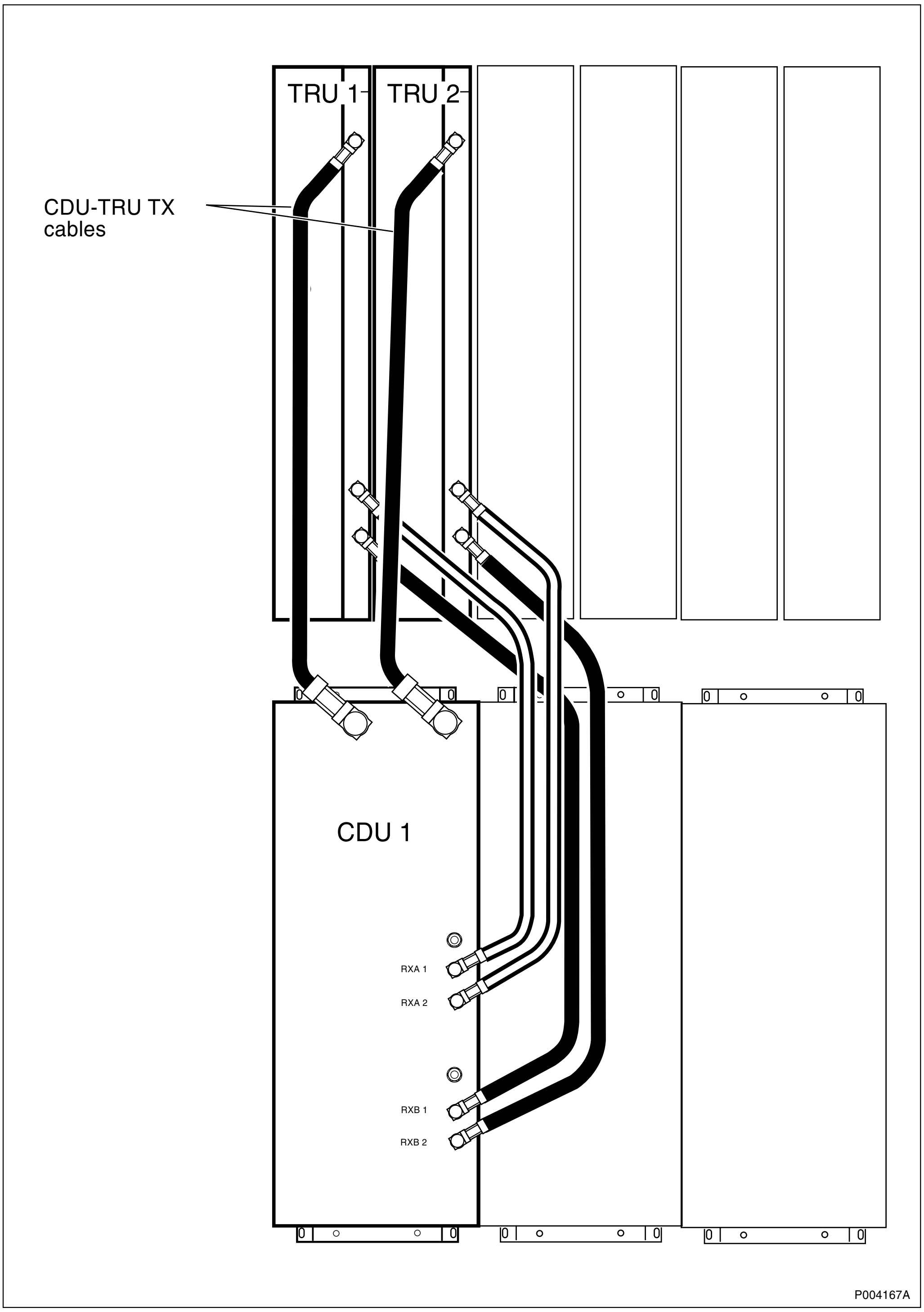


Figure 153 CDU-TRU TX cables

Prior to replacement

1. Press the Local/remote button on the TRU that is connected to the faulty cable. This will set the TRU in local mode.
2. Wait until the Local mode indicator has a fixed yellow light.

Replacement

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent damage to TRUs and exposure to RF radiation, be sure that the Local mode indicator on the TRU that is connected to the faulty CDU-TRU TX cable has a fixed yellow light before taking any further actions.

1. Replace the cable. The fault indicator on the CDU will still be lit.
2. Press the CPU reset button on the TRU.
3. Press the Local/remote button on the TRU that is connected to the new cable and wait until the Local mode indicator turns off. This will set the TRU in remote mode.
4. Check that the BS fault indicator (DXU) is off. This means that there are no active faults in the RBS.

Note: Unless under contractual warranty, after replacement, the cables shall be disposed of locally. Do not return the cables to Ericsson for replacement, repair or disposal.

6.17 DC/DC Converter

The instructions below describe how to adjust the DC/DC converter.

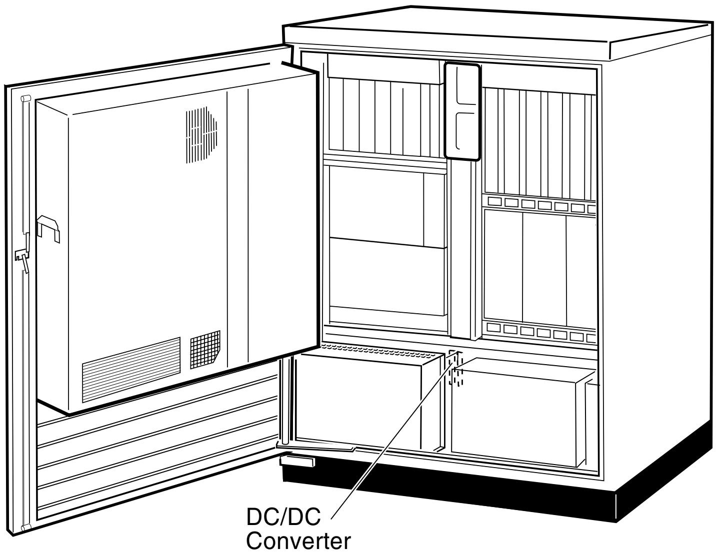


Figure 154 DC/DC converter

1. Connect a multimeter to the U OUT test point and check the voltage.
   - If the voltage is approximately 0, go to step 2.
   - If the voltage is between –60 V and –37 V, go to step 5.
2. Turn off the DC/DC converter and wait 15 seconds.
3. Adjust the U OUT potentiometer anti clockwise a couple of turns.
4. Turn the DC/DC converter back on and check the voltage again.
   - If the voltage is approximately 0, repeat the steps 2 – 4.
   - If the voltage is between –60 V and –37 V, go to step 5.
5. Adjust the U OUT potentiometer until the multimeter reaches the value –54 ±0.1 V.
6. Connect the multimeter to the STOP TEST input and adjust the stop level with the STOP ADJUST potentiometer to the value 1.78 ±0.2 V.
7. Check the Start level by connecting the multimeter to the START TEST input. The value must be 2.28 ±0.2V.
8. If any of the voltages above cannot be obtained or if the Fail indicator is still on, then replace the DC/DC converter.

Note: Unless under contractual warranty, after replacement, the DC/DC converter shall be disposed of locally. Do not return the DC/DC converter to Ericsson for replacement, repair or disposal.

6.18 DC Filter

Note: These instructions are valid only for cabinets equipped with external or expanded batteries. Cabinets with internal batteries only are not equipped with a DC filter.

DANGER

Read Safety Instructions regarding handling and connecting batteries.

Prior to replacement

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
3. Wait until the Local mode indicator has a fixed yellow light. This indicates that the DXU is in local mode.
4. Switch off all the AC circuit breakers on the ACCU.
5. Switch off any external battery power.
6. If the BFU is supplied with a battery disconnection button, isolate the internal battery by pressing the button "Battery disconnect"on the BFU.

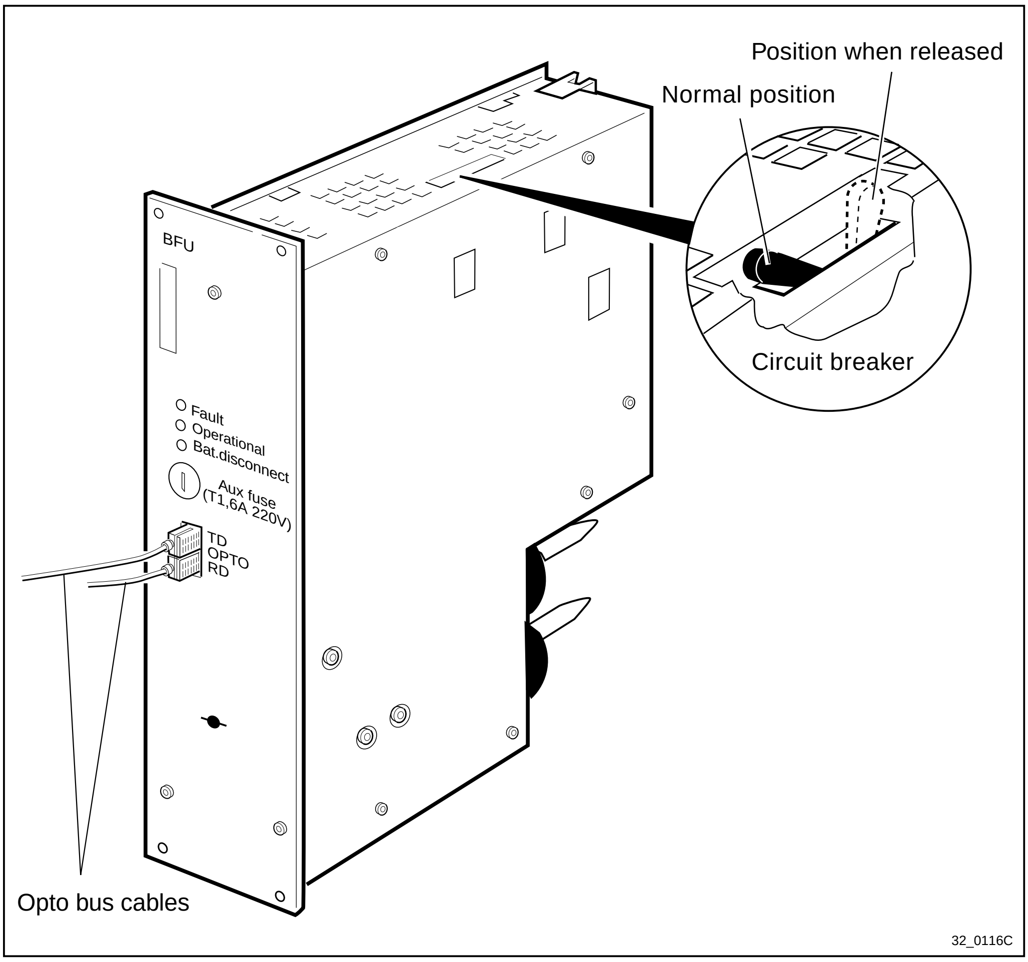


Figure 155 BFU

Replacement

1. Set the Mains power switch to its OFF position.
2. Mark the two opto cables on the BFU and then disconnect them.
3. Remove the BFU using the replacement unit extractor.
4. Remove the internal battery box covers.
5. Disconnect the battery terminals on each battery, beginning with the negative (-), and pull out the batteries. Mark the cables before disconnecting to facilitate replacement.
6. Pull out the battery boxes beginning with the lower box. Disconnect the DC filter cables from the battery box. Refer to Figure 156 on page 289or Figure 157 on page 289.

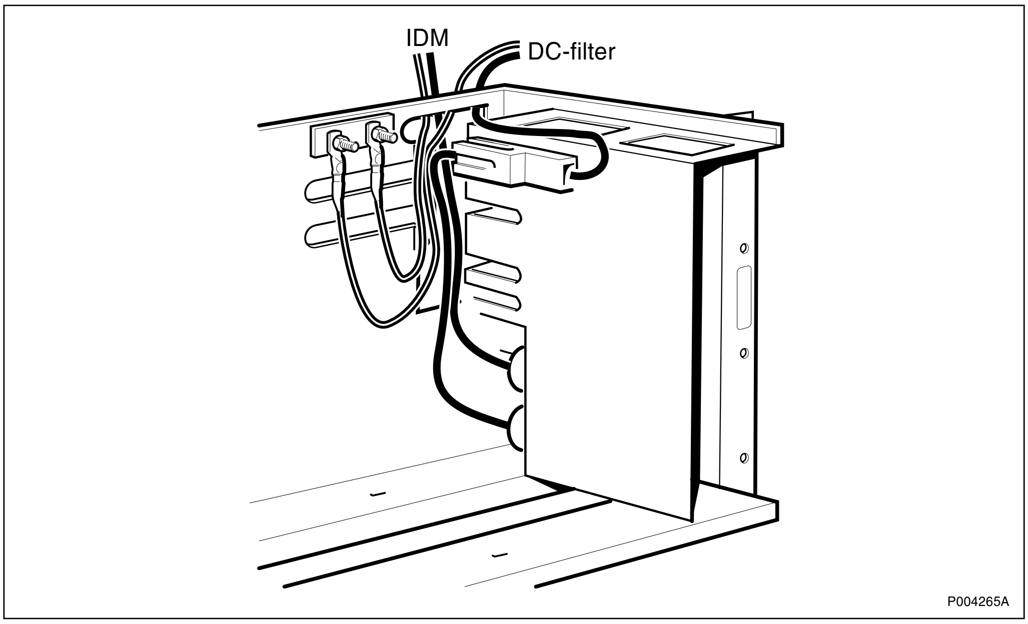


Figure 156 Connections in old battery box design

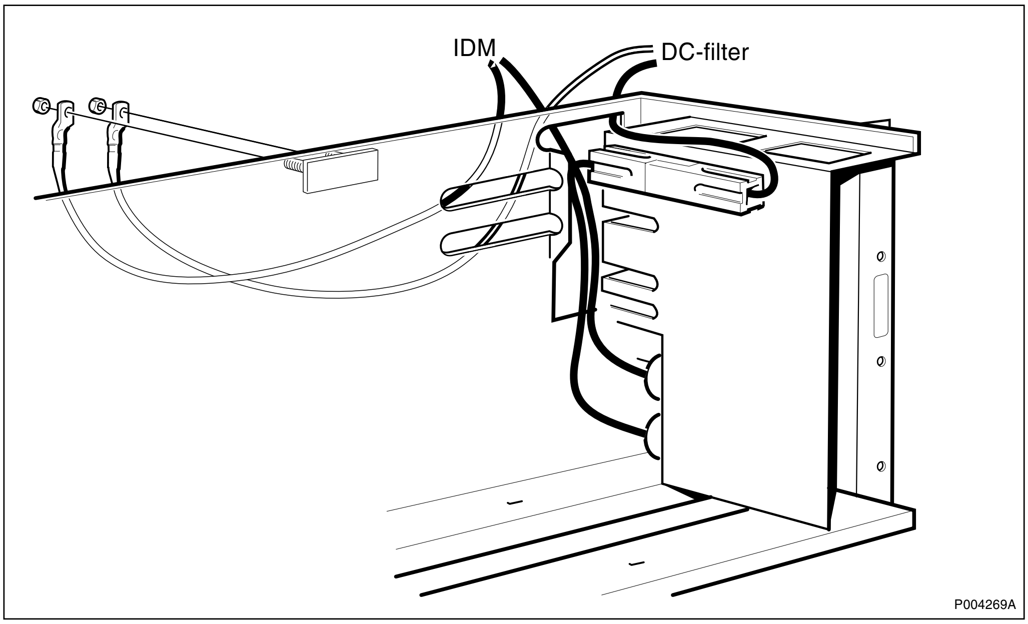


Figure 157 Connections in new battery box design

7. Bundle the cables of the old DC filter and attach a cord using electrician's tape as shown in the figure below. The cord will be used to draw the new DC filter cables to the battery box for the internal batteries.

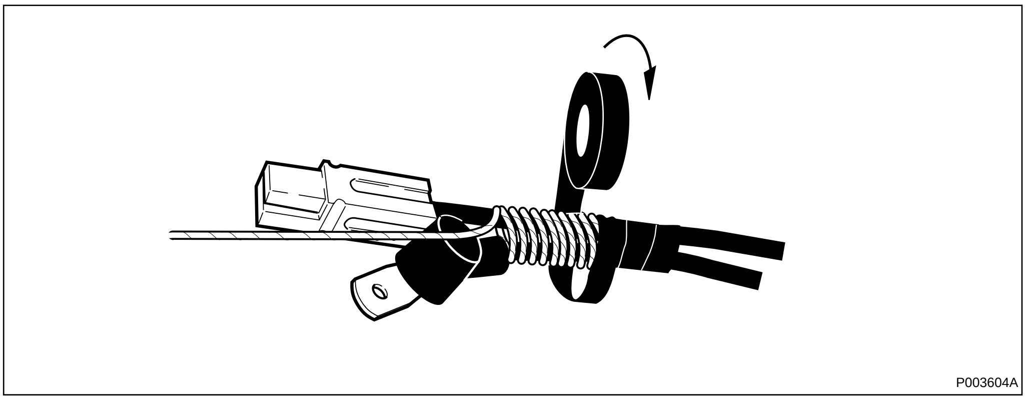


Figure 158 Attaching a draw cord to DC filter cables

8. Remove the DC filter connectors from the DC connection points and the earthing cable from the earthing bar. Refer to Figure 159 on page 290or Figure 160 on page 291.

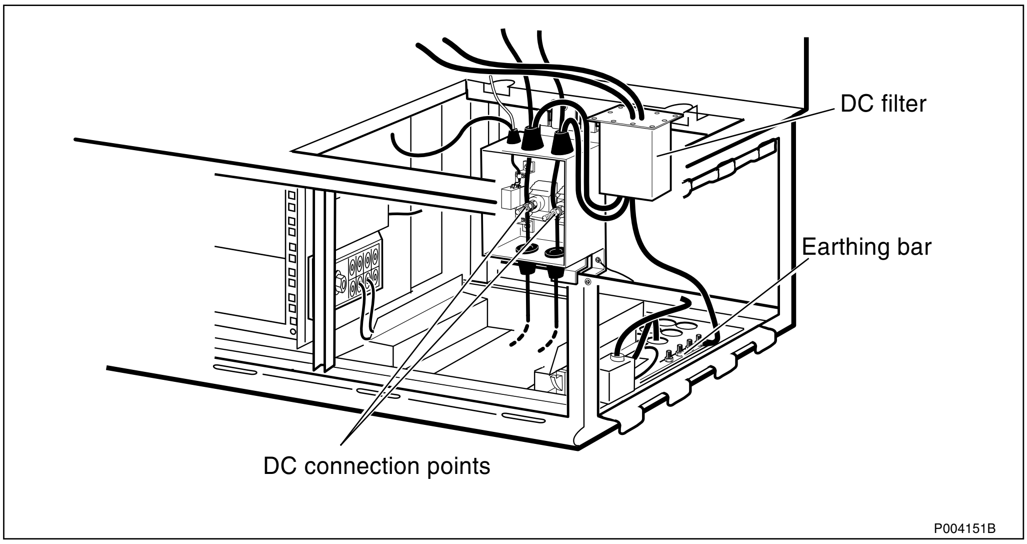


Figure 159 Replacement of DC filter, old design

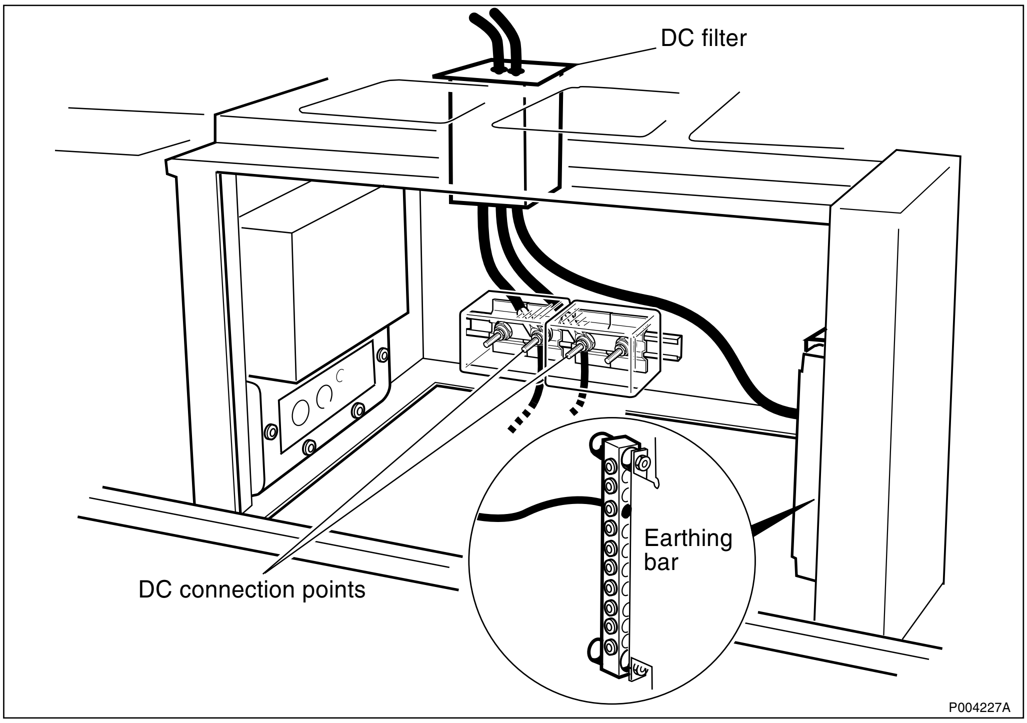


Figure 160 Replacement of DC filter, new design

9. Loosen the screws which hold the DC filter, and remove the filter.
10. Pull the cables of the DC filter from the battery box to the DC filter position.
11. Remove the draw cord from the old DC filter cables and attach it to the cables of the new DC filter, refer to Figure 158 on page 290. Ensure that the tape covers the connectors.
12. Replace in the reverse order.

Note: Unless under contractual warranty, after replacement, the DC filter shall be disposed of locally. Do not return the DC filter to Ericsson for replacement, repair or disposal.

Put into operation

1. Switch on the circuit breakers on the ACCU.
2. Reset the ECU by pressing the button labelled CPU Reset on the ECU for approximately 3 seconds.

   After approximately 30 seconds, the system should function without alarm, and the Fault indicator on the ECU should go out.
3. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
4. Wait until the Local mode indicator is off. This indicates that the DXU is in remote mode.

6.19 Door Switch

The instructions in this section describe the replacement of the door switch.

The figure below shows the door switch position in the cabinet.

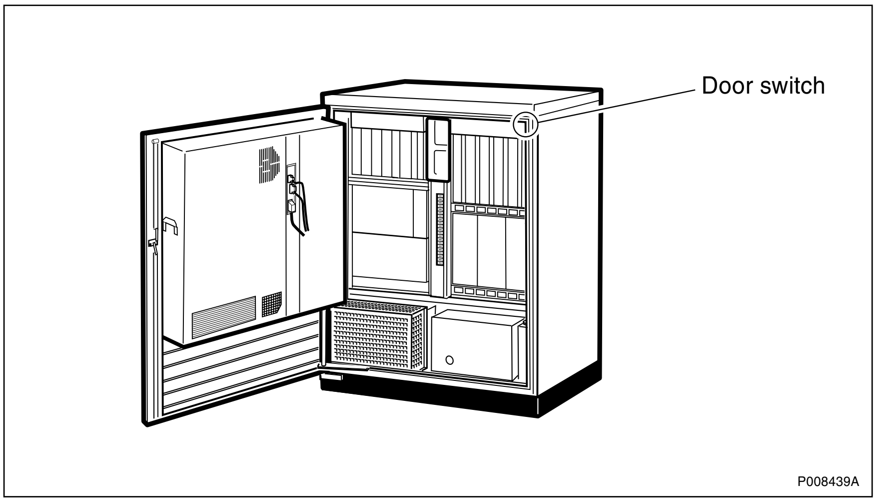


Figure 161 Door switch

Replacing door switch

1. Disconnect the two wires from the door switch.
2. Unscrew the door switch and remove it.
3. Attach the replacement door switch and tighten the screws.
4. Reconnect the wires to the new door switch.

Note: Unless under contractual warranty, after replacement, the door switch shall be disposed of locally. Do not return the door switch to Ericsson for replacement, repair or disposal.

6.20 DX Control Unit

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Introduction".

Note: The DX control unit is used only in the climate unit versions V1 and V2. It is replaced by the CCU in the climate unit versions V3 and V4.

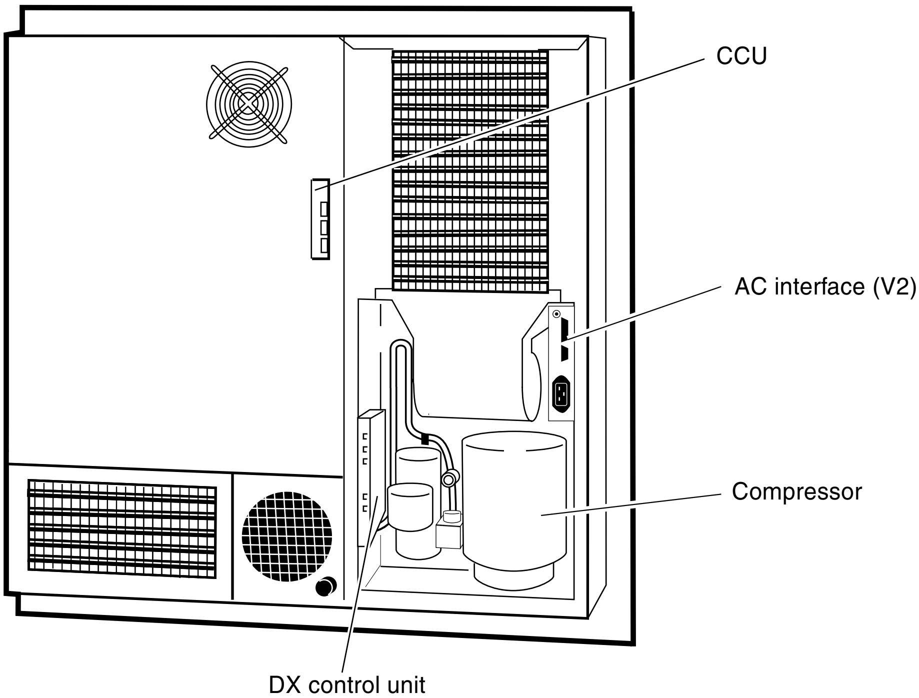


Figure 162 Location of DX control unit

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

1. Turn off the DC circuit breaker for the climate unit on IDM 1.
2. Remove all cables connected to the CCU.
3. Remove the AC power cable from the top of the relay unit or the bottom connector of the AC interface (depending on the version of the climate unit).
4. Remove all other control cable connectors to either the relay unit or the AC interface.
5. (If required) Remove the cable to temperature sensor number 3 mounted on the side of the climate unit.
6. Remove the cover plate for the section containing the DX control unit and the compressor. To make access easier, it may be necessary to cut the tie wraps holding the power and control cables to the cover plate.
7. Remove the screws holding the DX control unit to the side of the cabinet.

8. Disconnect all external wires connected to the DX control unit.

Note: The connection block is labeled and numbered on the DX control unit. Cables may need to be marked when removed to make sure that they are reconnected properly.

9. Remove the DX control unit from its housing.

10. Replacement.

Note: When replacing the cover plate, make sure all tie wraps holding the cables to the cover plate are replaced. This is necessary to prevent the cables from becoming caught by the door and cut when it is closed.

Replacement is the reverse of the above.

Note: Unless under contractual warranty, after replacement, the DX control unit shall be disposed of locally. Do not return the DX control unit to Ericsson for replacement, repair or disposal.

6.21 DX Fan

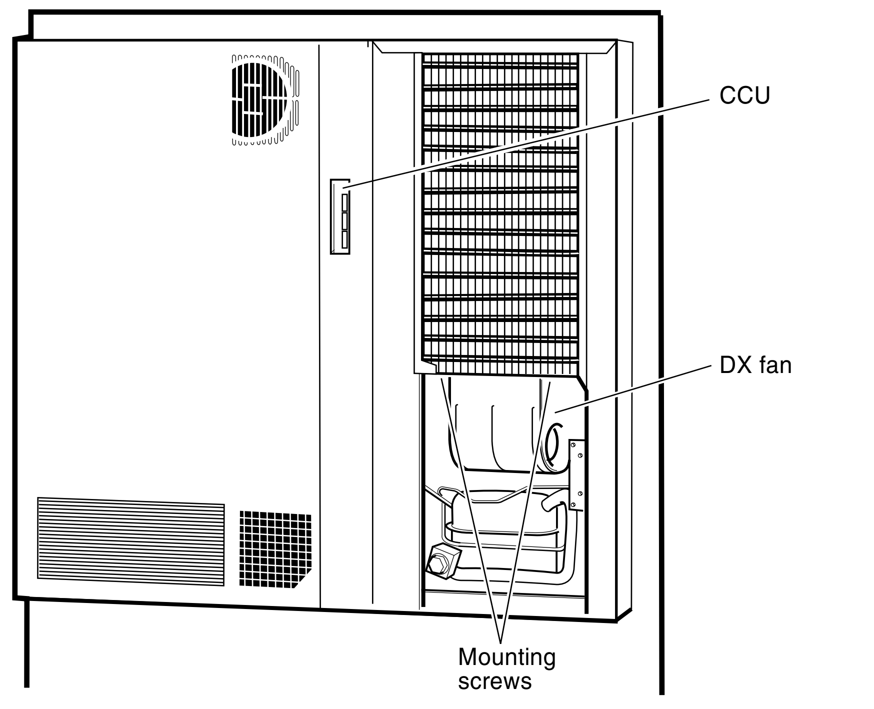


Figure 163 DX fan location (all versions)

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

1. Release the DC circuit breaker for the climate unit on the applicable IDM.
2. Depending on the version of the climate unit, remove all cables from:
   - CCU
   - relaybox
   - AC interface **Note:** Save the spacer.
3. Remove the cover plate to the right for the section containing the DX fan and the compressor. To make access easier, it may be necessary to cut the tie wraps holding the power and control cables for the climate unit to the cover plates.

   Climate unit versions V3, V4 and V5

   - Also remove the left cover plate.

4. Remove the two mounting screws holding the fan to the climate unit.

5. Slide the fan forwards to clear the rear brackets holding it.

6. Preparation of the spare part:

   Climate unit versions V1 and V2

   a) Move the air funnel to the spare part. Fasten the funnel with four self drilling screws delivered with the spare part, two in front of the fan and two behind the fan. See figure below.

   Note: Keep away from the RBS when mounting the self drilling screws. Be sure to remove all drilling chips from the fan.

   b) Cut the cable on the spare part approximately 300 mm from the cable clamp on the fan. See figure below.

   c) Remove approximately 40 mm of insulation of the cable and 5 mm of each wire.

   d) Connect the cable to the plinth on the inner side of the air funnel. See figure below.

   e) Remove the connectors on the new capacitor and then remove approximately 5 mm insulation from the wires.

   f) Replace the old capacitor. Connect to the plinth on the inner side of the air funnel. See figure below.

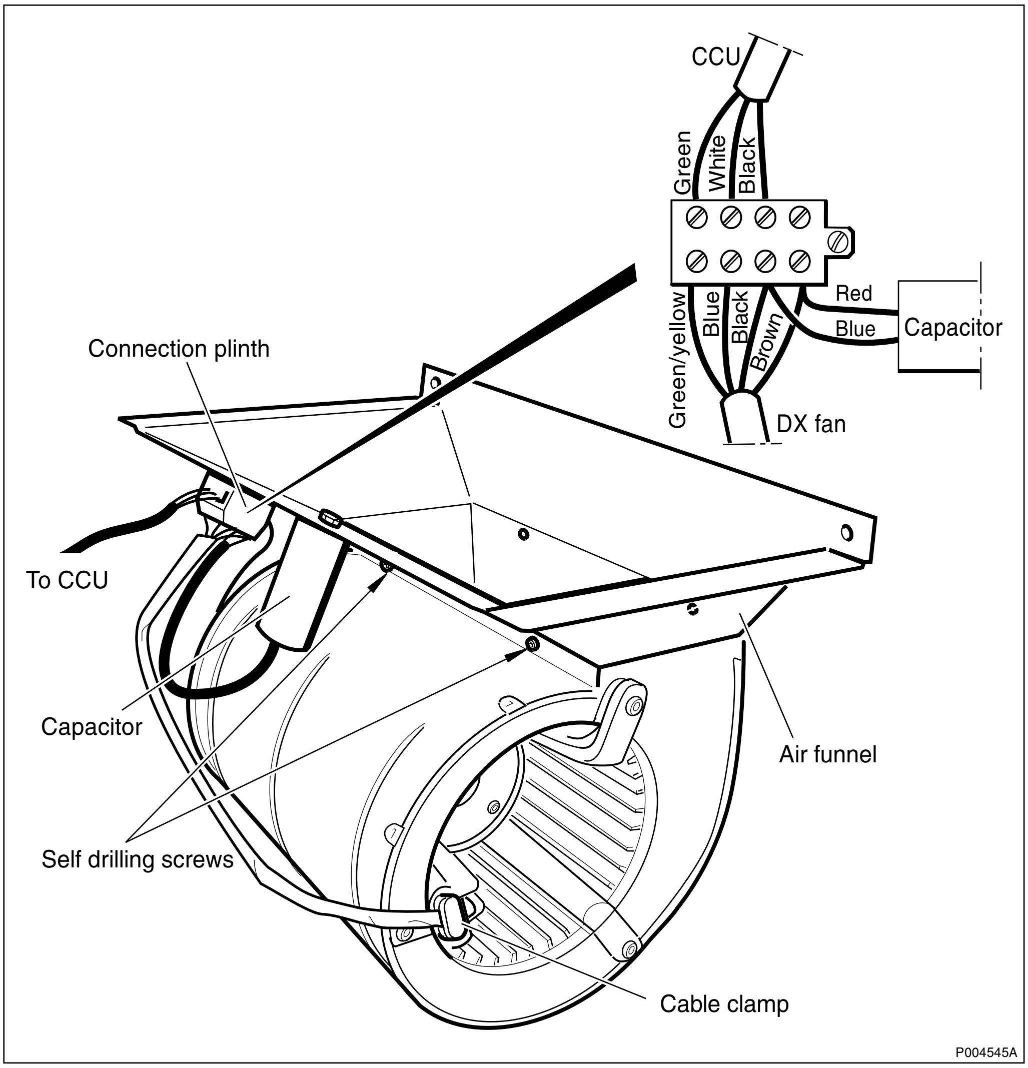


Figure 164 DX fan, prepared for climate unit V1/V2

Climate unit version V3

a) Cut the existing cable approximately 10 mm from the faulty fan.

b) Mount the female connector on the existing cable. See separate instruction delivered with the spare part.

c) Attach the self adhesive gasket to the spare part. See figure below.

d) Mount the brackets on the spare part. See figure below.

e) Remove the heat exchanger internal fan (do not disconnect).

f) Replace the capacitor, placed behind the heat exchanger internal fan. See figure below.

Climate unit version V4 and V5

a) Attach the self-adhesive gasket to the inner side of the spare part. See figure below.

b) Fasten the brackets on the spare part with two screws. See figure below.

c) Remove the heat exchanger internal fan (do not disconnect).

d) Replace the capacitor, placed behind the heat exchanger internal fan. See figure below.

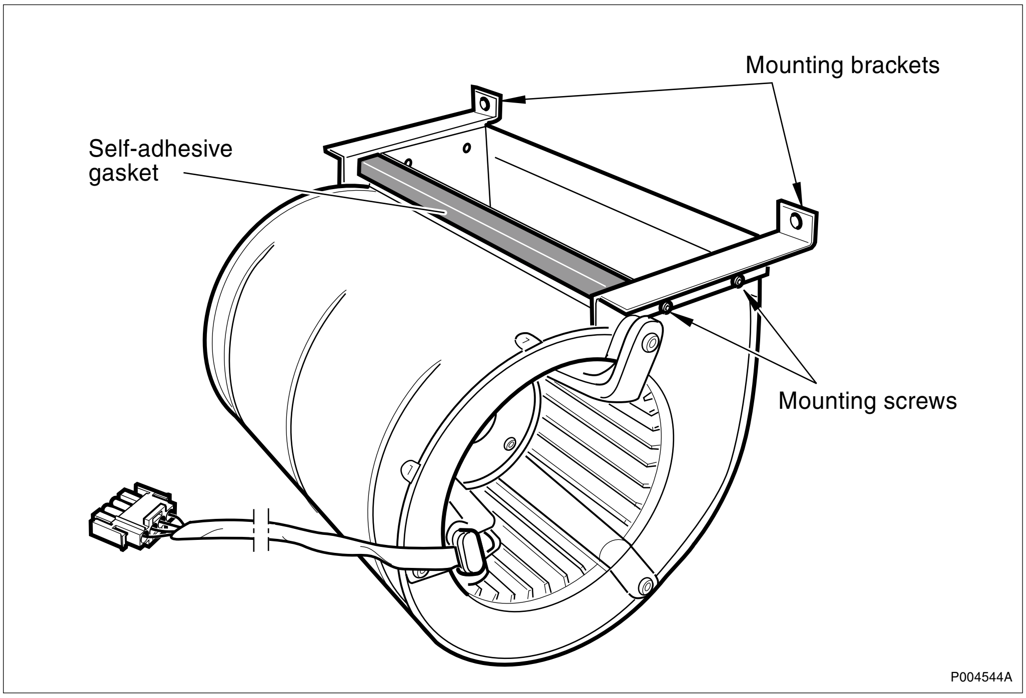


Figure 165 DX fan, prepared for climate unit V3/V4

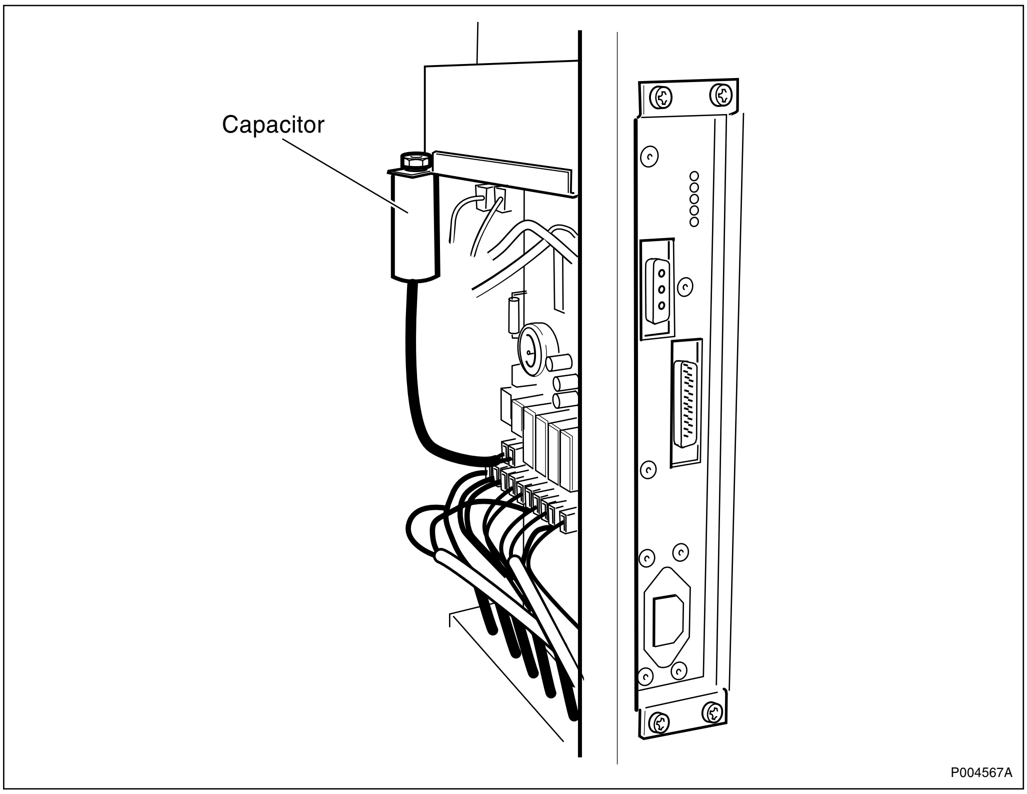


Figure 166 Capacitor connected to the CCU

7. Mount the fan with the two mounting screws. See Figure 163 on page 295.

8. Fasten the cover plate(s).
9. Depending on the version of the climate unit, restore all cables to:
   - CCU
   - Relay box
   - AC interface
10. Restore the DC circuit breaker for the climate unit on the IDM.

Note: Restore all tie wraps, use the tie wraps delivered with the spare part.

Note: When replacing the cover plate, make sure that all tie wraps holding the cables to the cover plate are replaced. This is necessary to prevent the cables from becoming caught by the door and cut when it is closed

Note: Unless under contractual warranty, after replacement, the DX fan shall be disposed of locally. Do not return the DX fan to Ericsson for replacement, repair or disposal.

6.22 DXU

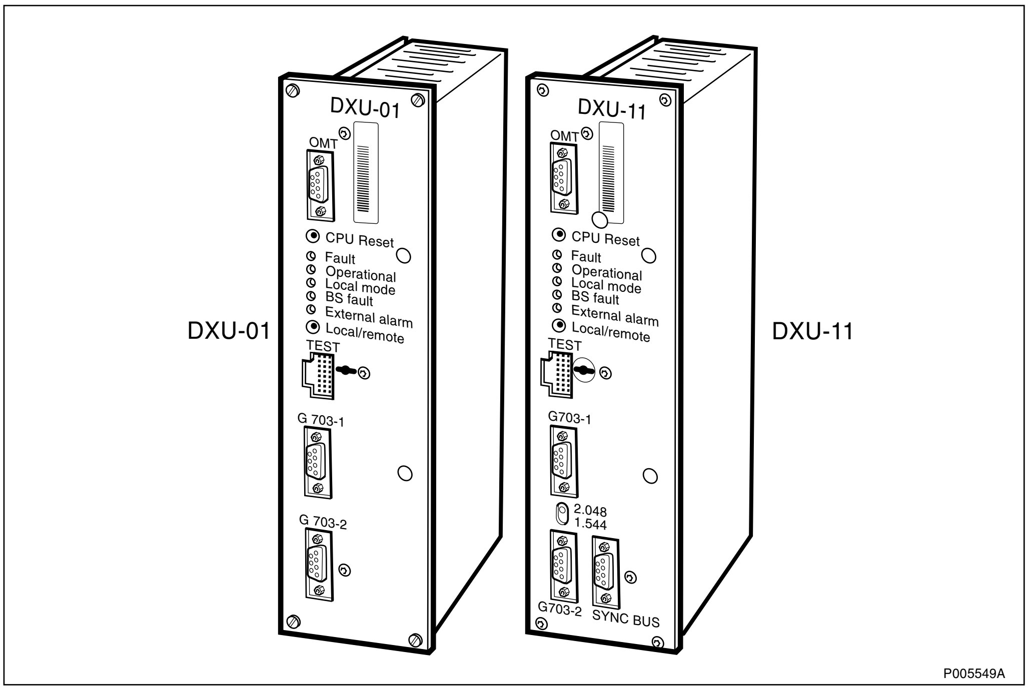


Figure 167 DXU-01 and the new DXU-11

Note: Prior to the installation of the new DXU, update it with the same BTS SW as used in the network.

Note: DXU-11 requires BTS SW R7 or later.

DXU-11 is backwards compatible with DXU-01 if an adapter is used. See figure below.

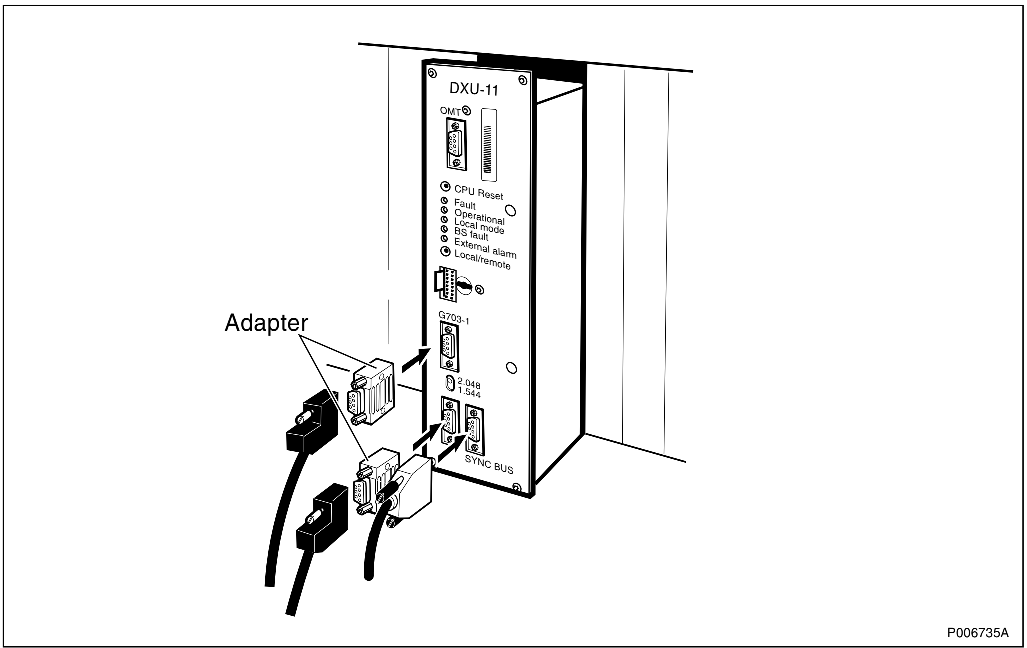


Figure 168 Adapter for the DXU-11

Prior to replacement

1. Inform the OMC operator that the RBS will be removed from service temporarily.

2. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.

3. Wait until the Local mode indicator has a fixed yellow light, indicating that the DXU is in local mode.

4. Connect on the OMT and read the RBS IDB. This may not be possible depending on the nature of the fault in the DXU.

   The alternative is to use the original RBS IDB that was saved on a disk during installation. On outdoor versions the disk is stored inside the cabinet. It is important to remember to verify that the information on the disk is up to date when using this alternative.

Replacement

5. Switch off the DXU circuit breakers.

6. Remove all cables connected to the DXU.

7. Replace the DXU and reconnect the disconnected cables.

8. Switch on the DXU circuit breakers.

9. *(DXU-11 only)* Set the switch labelled 2.048/1.544 to the correct position:

   - Position 2.048 is used for GSM connection.

   - Position 1.544 is used for DS1 connection.

10. *(DXU-11 only)*

Reset the DXU by pressing the button labelled CPU reset on the DXU for approximately three seconds.

Note: The DXU must be reset each time the switch position is changed, otherwise the new position will not take effect.

11. Connect the OMT and download the original RBS IDB into the DXU. There are three alternative ways to do this:

    • Use the database that was acquired when reading the RBS database.

    • Use the database that is stored on a disk. This disk should be stored inside the cabinet.

    • Create a new database.

12. Press the CPU reset button on the DXU. This will distribute the IDB to the RUs.

13. Wait until the Operational indicator on the new DXU has a fixed green light.

Note: After replacement, the DXU must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the DXU. The repair delivery note shall include a clear description of the fault found. See the chapter "Concluding Routines" for instructions on completing a repair delivery note.

Put into operation

14. Check that the TRUs are in remote mode. If not, press the Local/ remote button on the respective TRU.

15. Press the Local/remote button on the new DXU. The Local mode indicator will start flashing.

16. Wait until the Local mode indicator is off. This indicates that the new DXU is in remote mode.

17. Make a request to the OMC operator to check that all MOs are operational.

18. Make a request to the OMC operator to activate the cell(s).

19. Carry out the following checks:

    • BS fault indicator on the DXU is off.

    • Operational indicator on the DXU is on.

    • The TX not enabled indicator on each TRU is off.

Note: The reason why the TX not enabled indicator may not turn off is that the TRU is not configured and therefore not able to carry traffic.

6.23 DXU/ECU Backplane

Note: When changing the DXU/ECU backplane, refer to the chapter "Cable Connections". Note the position of RUs within the original sub-rack, so that they can be replaced into the correct position without changing the IDB. Refer to the drawings of switch settings in this section to make sure that replacement DXU/ECU backplane switches are set correctly.

Prior to replacement

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The yellow Local mode indicator will start flashing. Wait until it has a fixed yellow light. This indicates that the DXU is in local mode.
3. Switch off the AC mains power to the cabinet with the AC mains switch on the ACCU.
4. Disconnect the opto bus cables connected to the BFU(s).
5. Pull out the BFU(s) to isolate the 24 V DC from the RBS.

Replacement

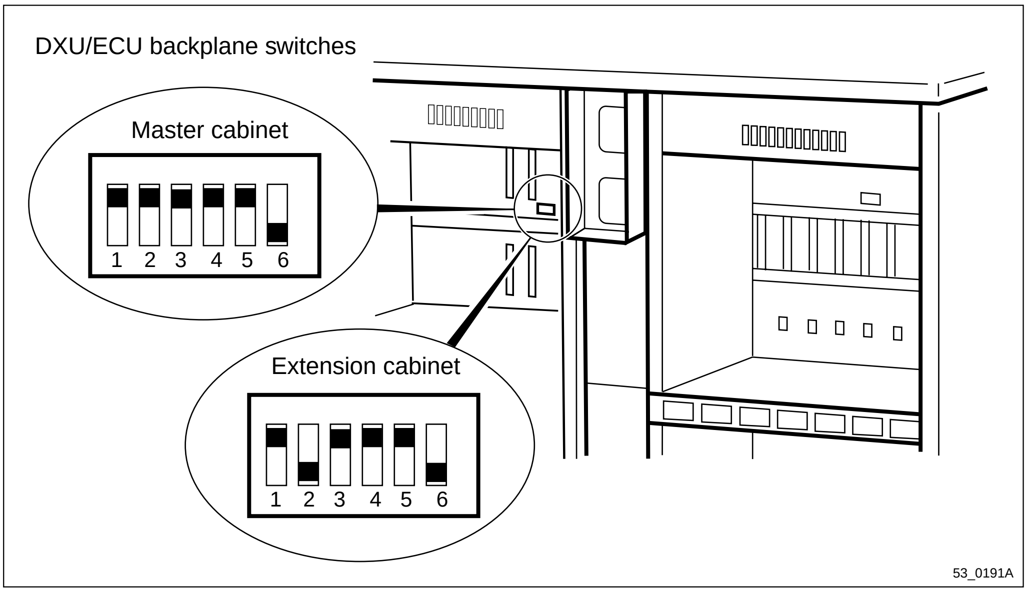


Figure 169 Location and settings of DXU/ECU backplane switches

1. Loosen the IDM above the PSU sub-rack.
2. Disconnect the fan cables. The connectors are located at the back of the IDM on the right-hand side.
3. Remove the fan clamps that keep the fans in place.
4. Remove the fans.

5. Take out the PSUs, the ECU and the DXU.
6. Disconnect all the cables to the DXU/ECU backplane.
7. Loosen the screws that hold the PSU sub-rack.
8. Pull out the PSU sub-rack.
9. Loosen the screws that attach the circuit board to the PSU sub-rack.
10. Put in a new circuit board.
11. Ensure that the switch settings for the replacement part are in accordance with the figure above.
12. Reset in reverse order.

Note: Unless under contractual warranty, after replacement, the DXU/ECU backplane shall be disposed of locally. Do not return the DXU/ECU backplane to Ericsson for replacement, repair or disposal.

Put into operation

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Connect AC mains power to the cabinet with the AC mains switch on the ACCU.
2. Put the BFU back and reconnect the opto bus cables.
3. Check that the Operational indicator on the DXU has a fixed green light and that the BS fault indicator is off.
4. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
5. Wait until the Local mode indicator on the DXU is off. This indicates that the DXU is in remote mode.

6.24 EACU

Prior to replacement of the overvoltage arrestors

The primary and secondary protectors are located in the EACU. See the figure below.

1. Open the door of the mounting base.
2. Loosen the EACU from the left side of the mounting base by removing the screws.
3. Replace the primary and secondary protectors concerned.

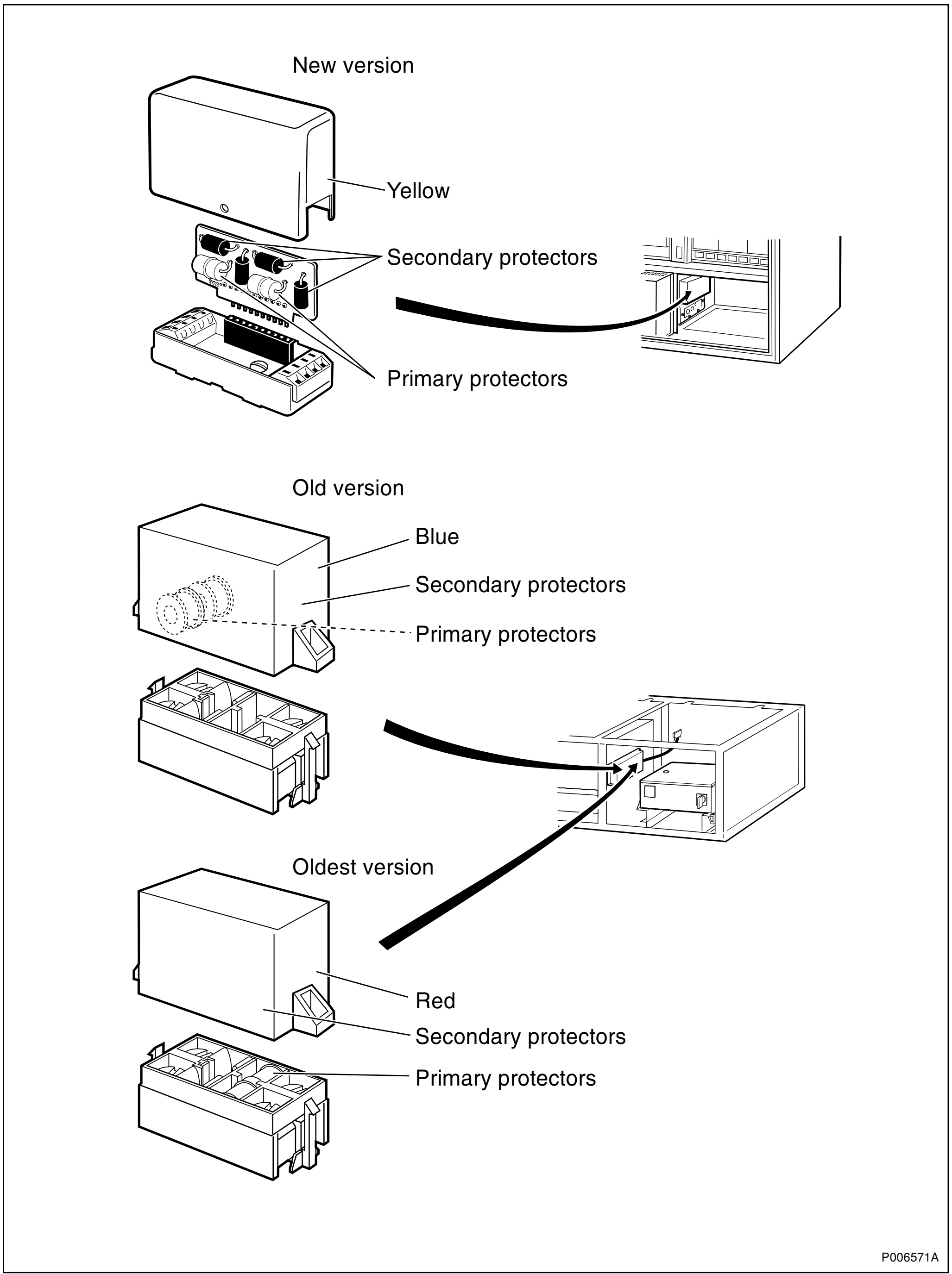


Figure 170 EACU, overvoltage arrestors

6.25 ECU

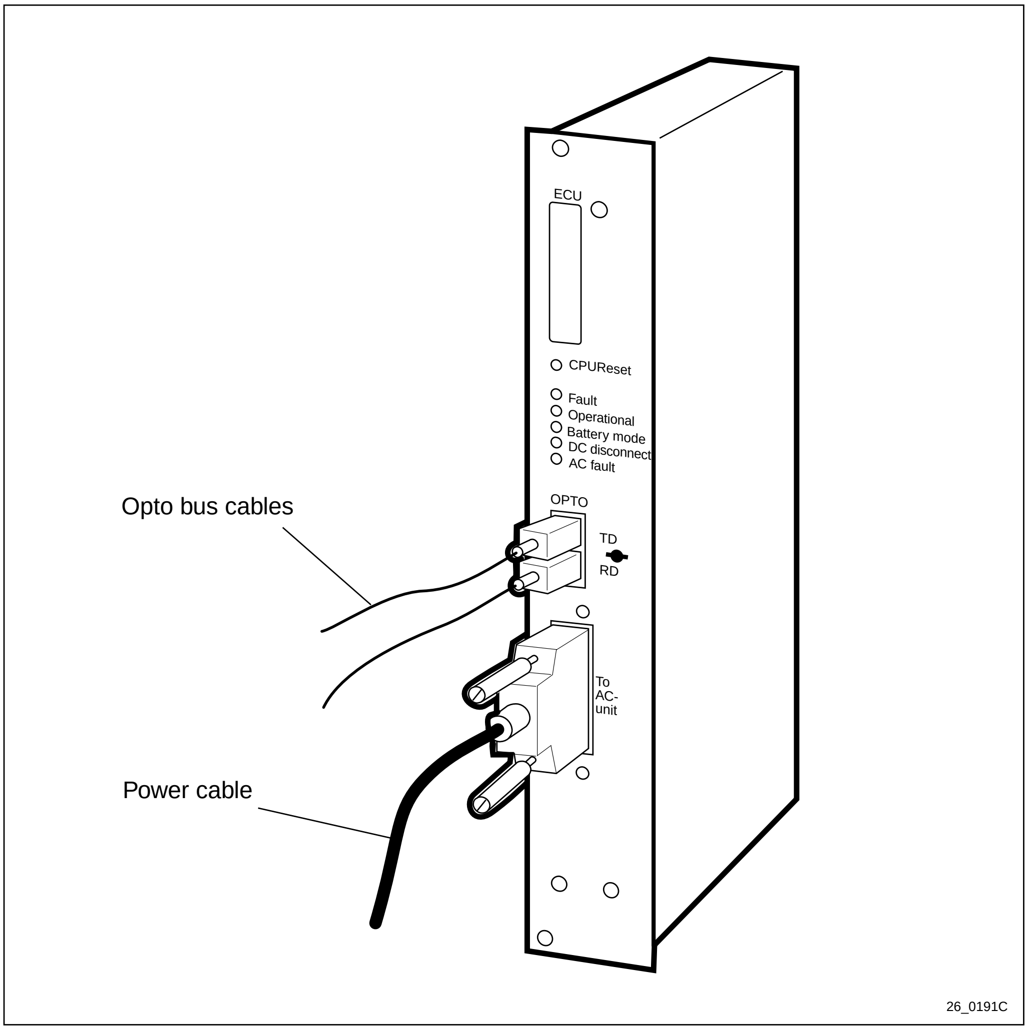


Figure 171 ECU

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Disconnect the cables connected to the ECU.
2. Replace the faulty ECU.
3. Press the button labelled CPU Reset for approximately 3 seconds. After approximately 30 seconds, the unit should function without alarm.
4. Reconnect the cables.

Note: After replacement, the ECU must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the ECU. The repair delivery note shall include a clear description of the fault found. Refer to the chapter "Concluding Routines"for instructions on completing a repair delivery note.

6.26 ESB Cable

6.26.1 Replacement in cabinet with mounting base

1. Open the cabinet and the mounting base doors and secure them.

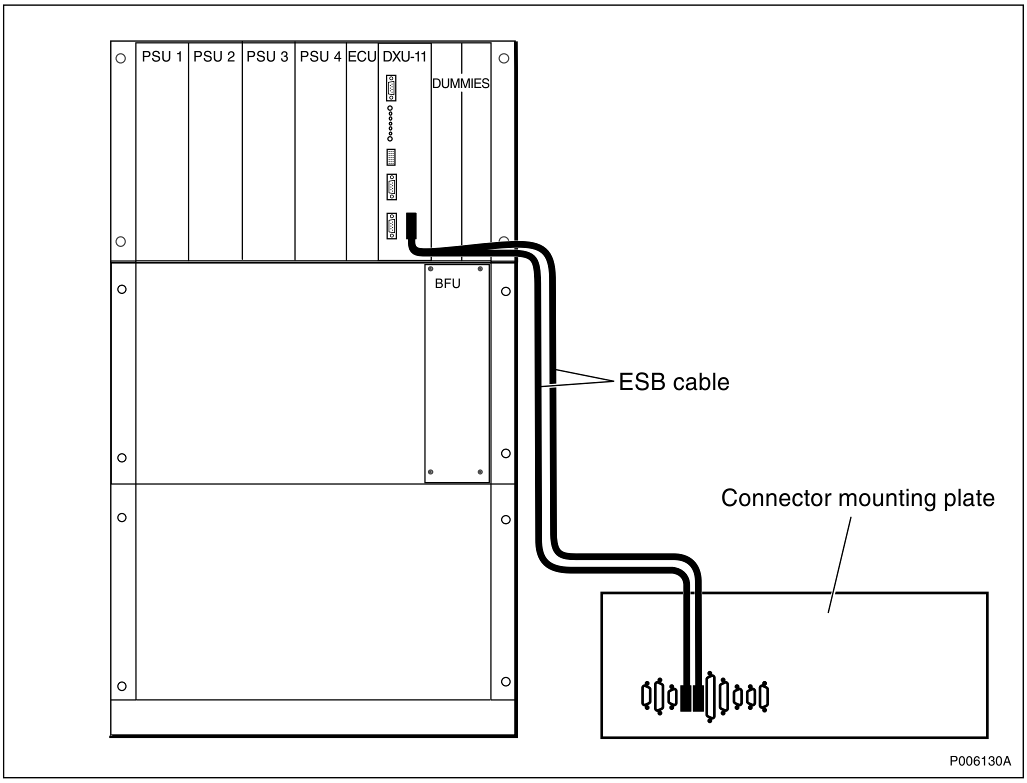


Figure 172 Change of ESB cables from the connector mounting plate to DXU-11

2. Change the ESB cable between the connector mounting plate and the ESB outlet on the DXU-11.
3. Close the cabinet and the mounting base doors.

6.26.2 Replacement in cabinet without mounting base

1. Open the cabinet door and secure it.

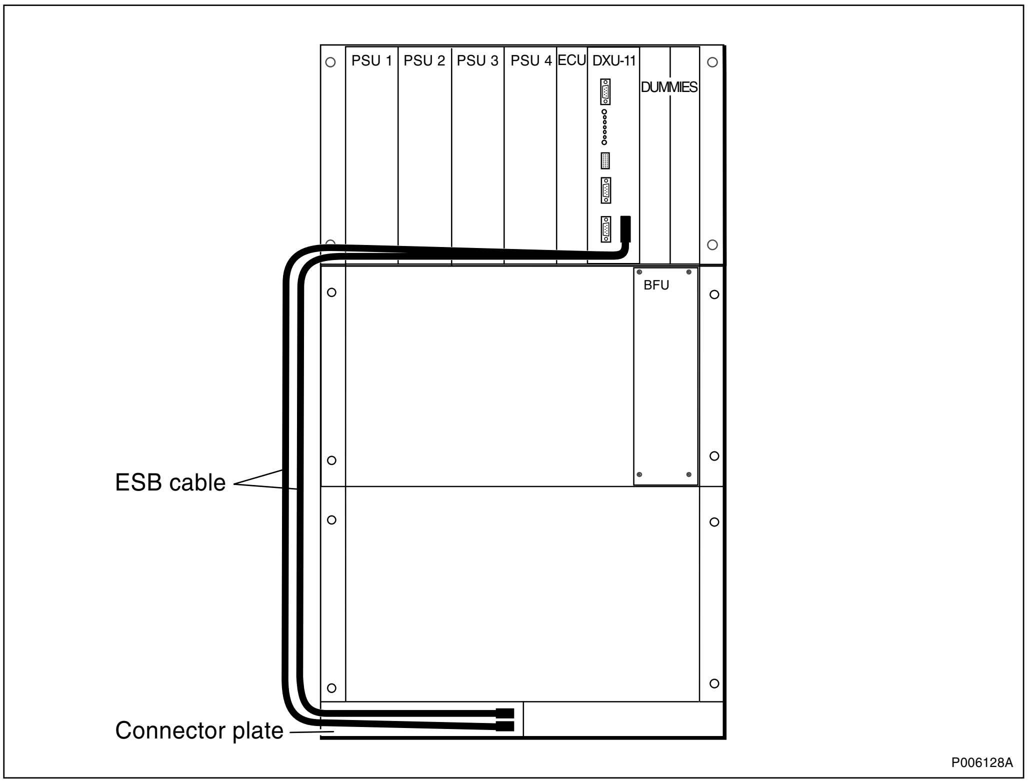


Figure 173 Change of ESB cable from connector plate to DXU-11

2. Change the ESB cable between the left connector plate and the ESB outlet on the DXU-11.
3. Close the cabinet door.

6.27 Fans

Note: It is important to replace only one fan at a time because changing the air flow can cause equipment to become too warm. A defective fan operating at reduced speed may not be detectable by eye.

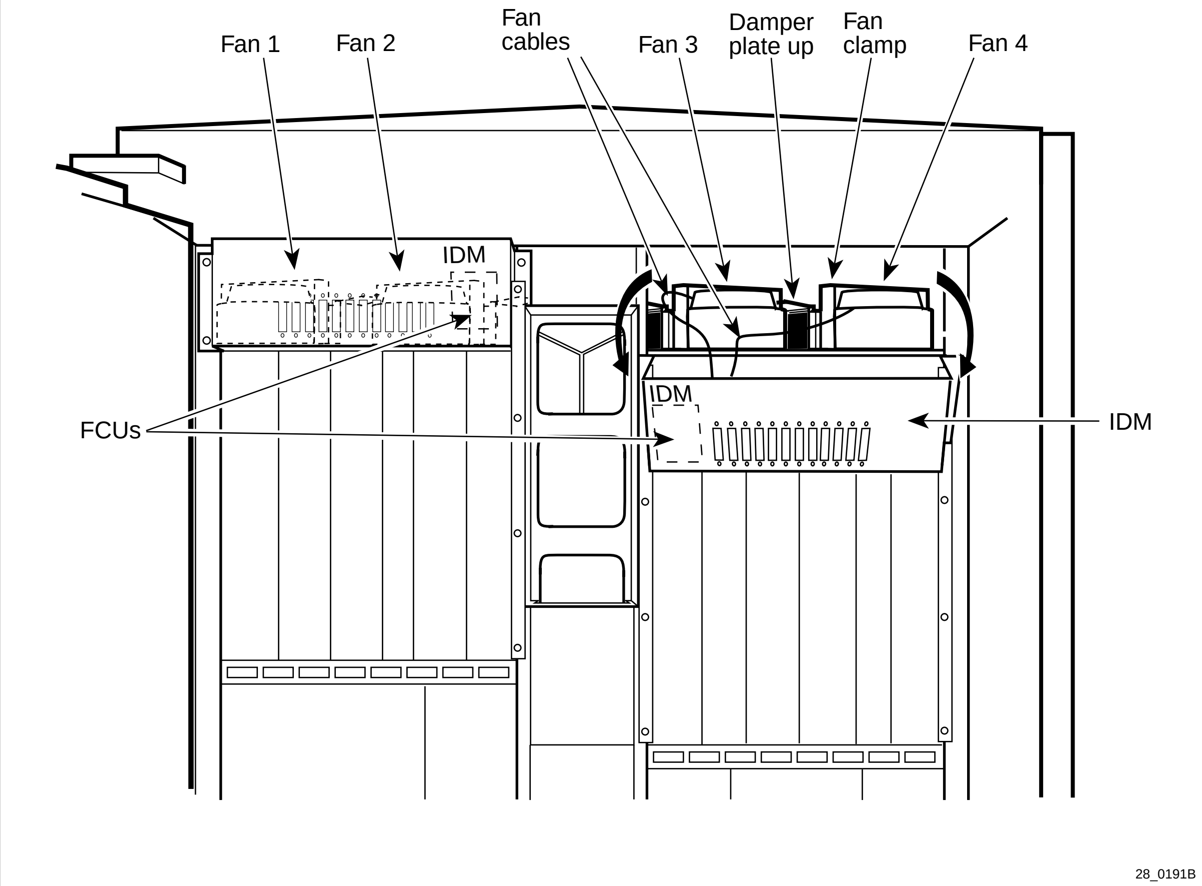


Figure 174 Cabinet fans

CAUTION

Short circuits can cause injury or damage. Although the battery voltage may be low, the released power can be extremely high.

Note: If the cabinet being worked on is not supplied with a mid mounted IDM, the 24 V DC connection block is live when the back of the IDM panel is exposed during the following procedure (version with two IDMs only). Remove all rings, watches and jewellery prior to proceeding.

It is important to replace only one fan at a time because the change of air flow can quickly cause the cabinet to become too warm.

Note: This procedure applies to units supplied with either two IDMs or a single mid-mounted IDM. The picture in this section shows the location of the cabinet fans for both versions.

1. Release the circuit breaker for the defective fan on the appropriate IDM.
2. Loosen the IDM or the panel which covers the replaced fan.
3. Disconnect the fan cable from the FCU.
4. Remove the fan clamp that keeps the fan in place.
5. Remove the faulty fan, and insert the new fan.
6. Replace the fan clamp, and reconnect the fan cables to the FCU.
7. Fasten the IDM or the panel which covers the replaced fan.

Note: Unless under contractual warranty, after replacement, the fan shall be disposed of locally. Do not return the fan to Ericsson for replacement, repair or disposal.

6.28 FCU

6.28.1 General

Note: The loss of air flow from the fans during replacement can quickly cause other RUs to overheat. Therefore do not stop the fans more than 1 minute when replacing the FCU.

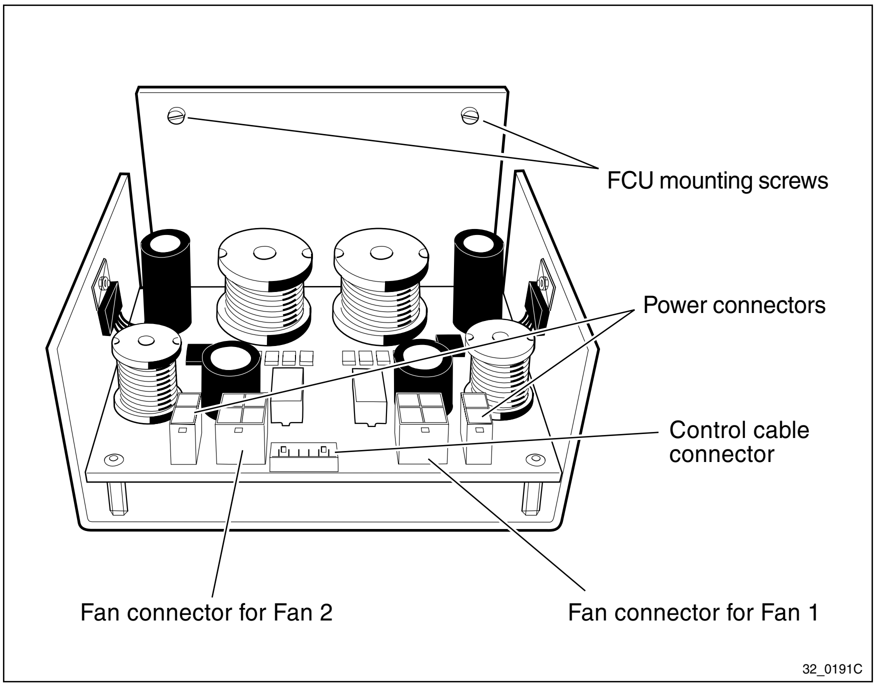


Figure 175 FCU

Note: During these procedures, DC power is still connected to the FCU. Therefore, the unit must be handled carefully.

6.28.2 Replacement

There are two different types of IDM panel. The first type consists of two different top-mounted IDMs in front of the cabinet fans. The second type has only one mid-mounted vertical IDM.

Two top-mounted IDMs

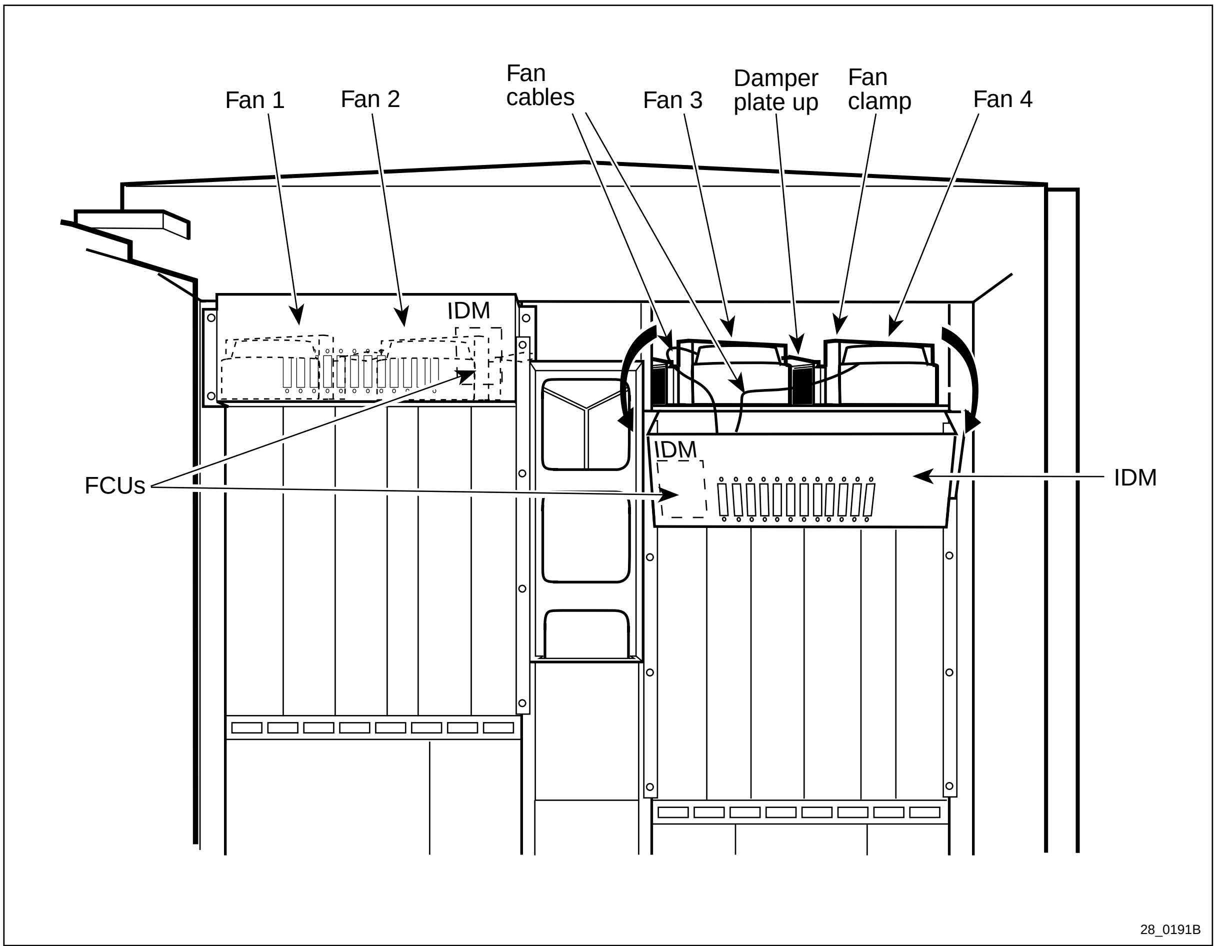


Figure 176 Two top-mounted IDMs. FCUs

CAUTION

⚠

Short circuits can cause injury or damage. Although the battery voltage may be low, the released power can be extremely high.

Note: If the cabinet being worked on is not supplied with a mid mounted IDM, the 24 V DC connection block is live when the back of the IDM panel is exposed during the following procedure (version with two IDMs only). Remove all rings, watches and jewellery prior to proceeding.

1. Loosen the screws holding the IDM to the cabinet and gently lower the unit providing access to the FCU.
2. Remove the two screws holding the defective FCU to the IDM panel.
3. Install the replacement FCU on the IDM panel.
4. Disconnect the control cable connector from the defective unit and attach it to the replacement unit.
5. Move the power and fan connectors (for one fan at a time) from the defective FCU to the replacement FCU. This allows enough airflow so that the RBS will not overheat.
6. Replace the IDM panel.

Note: Unless under contractual warranty, after replacement, the FCU shall be disposed of locally. Do not return the FCU to Ericsson for replacement, repair or disposal.

Mid-mounted IDM

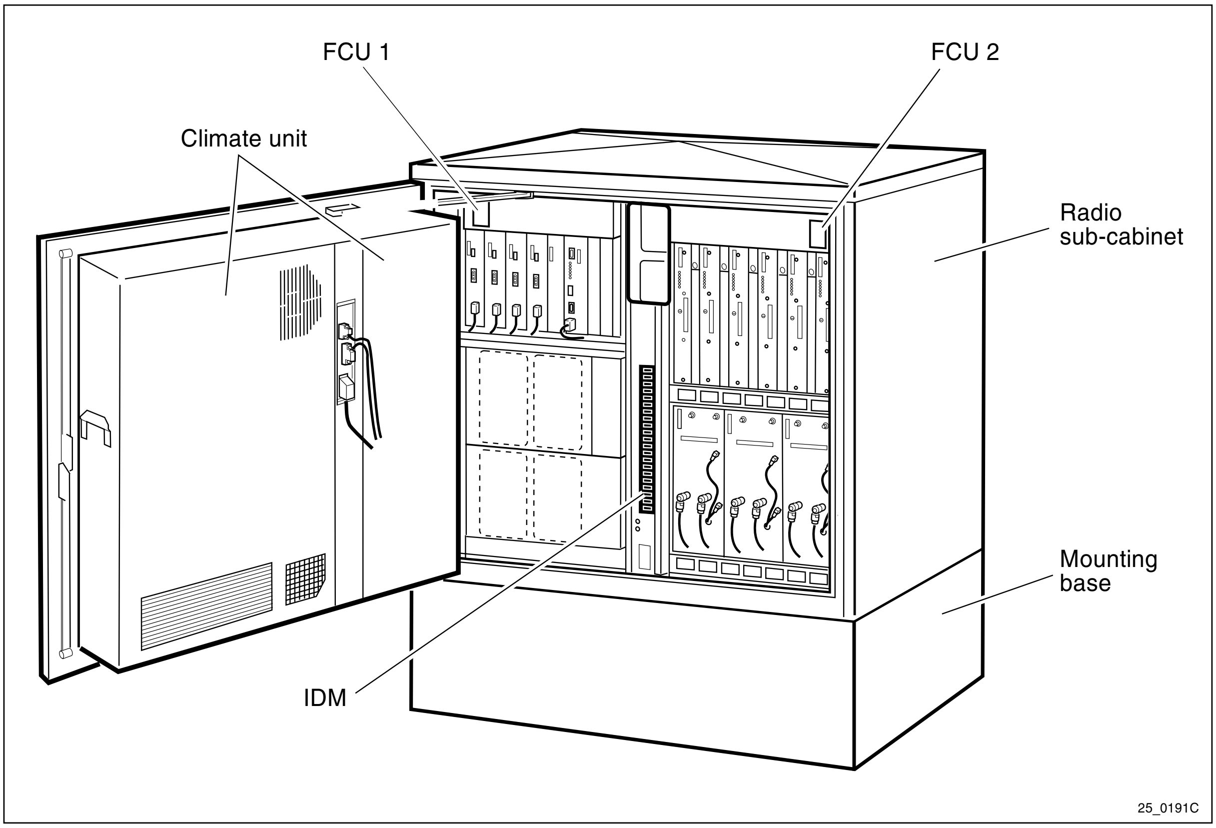


Figure 177 Mid-mounted IDM. FCUs

1. Loosen the screws holding the FCU mounting panel to the cabinet fan panel and gently lower the panel providing access to the FCU.
2. Remove the two screws holding the defective FCU to the mounting panel.
3. Install the replacement FCU on the mounting panel.

4. Disconnect the control cable connector from the defective unit and attach it to the replacement unit.
5. Move the power and fan connectors (for one fan at a time) from the defective FCU to the replacement FCU. This allows enough airflow so that the RBS will not overheat.
6. Replace the FCU mounting panel into the cabinet fan panel.

Note: Unless under contractual warranty, after replacement, the FCU shall be disposed of locally. Do not return the FCU to Ericsson for replacement, repair or disposal.

6.29 Heater

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3) and (V4) are used as abbreviations designating the four versions of the climate unit.

Climate unit versions V1 and V2

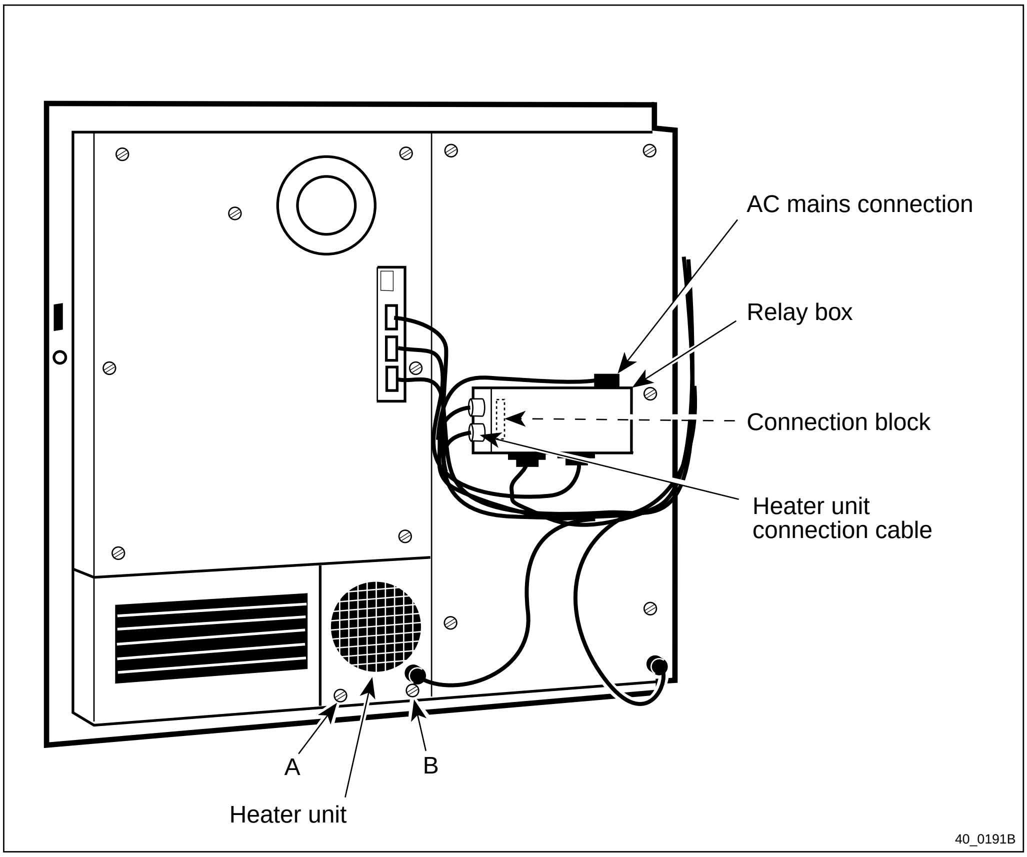


Figure 178 Heater with external power connection to the relay unit

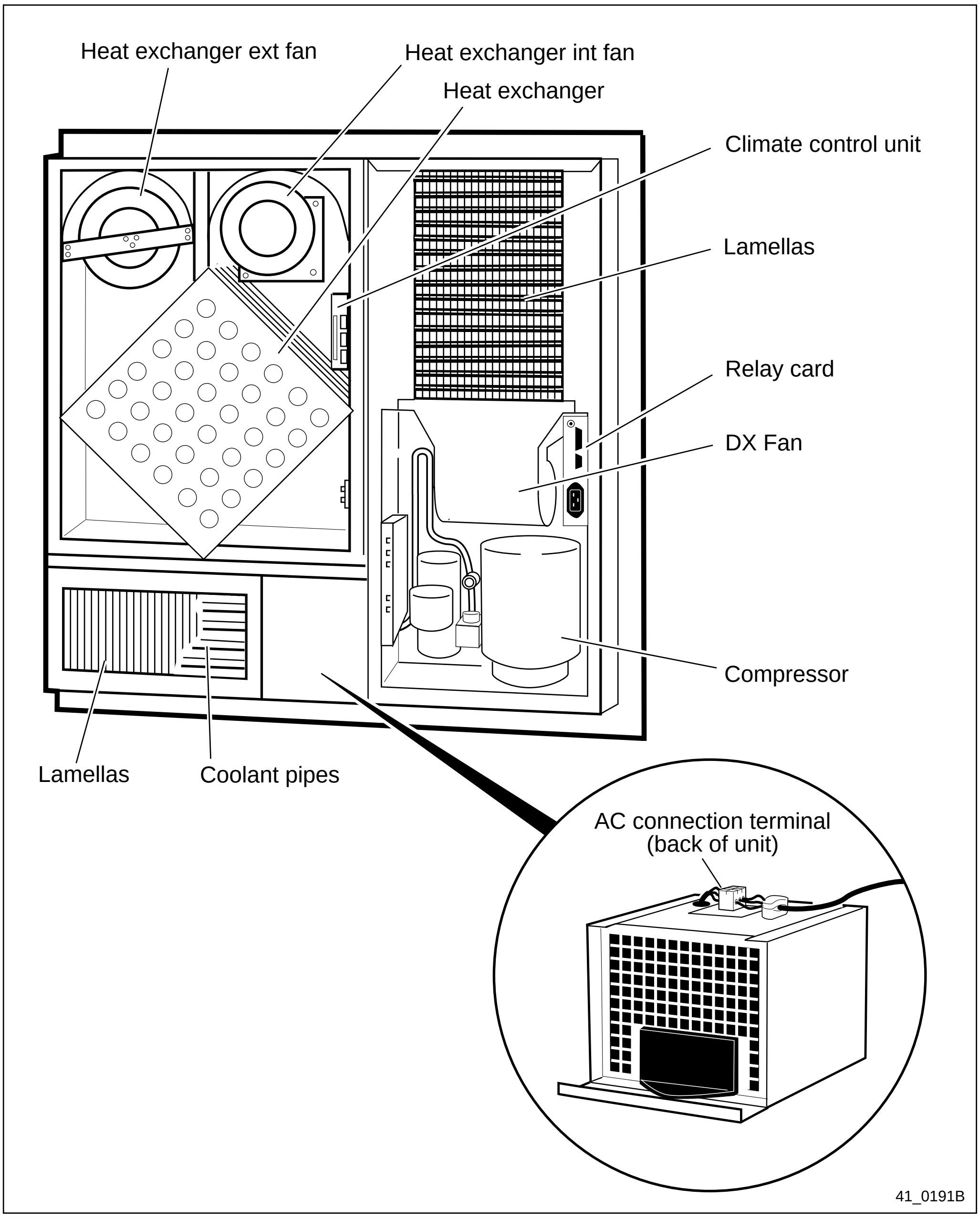


Figure 179 Heater with internal power connection to AC interface

1. Remove the AC mains connection from the top of the relay unit or the bottom connector of the AC interface.
2. Release the DC circuit breaker for the climate unit on IDM 1.
3. Depending on the version of the climate unit installed in the base station, disconnect the heater power cable by using either of the following methods:

   • Removing the cover plate to the relay unit and disconnecting the heater unit power cable on the connection block.

   • Loosening screws A and B and pulling out the heater and disconnecting the power cable at the terminal mounted on the back of the heater.

4. If not already done, loosen the screws A and B and pull out the heater.

5. Insert the new unit and reset in reverse order.

Note: Unless under contractual warranty, after replacement, the heater shall be disposed of locally. Do not return the heater to Ericsson for replacement, repair or disposal.

Climate unit versions V3, V4 and V5

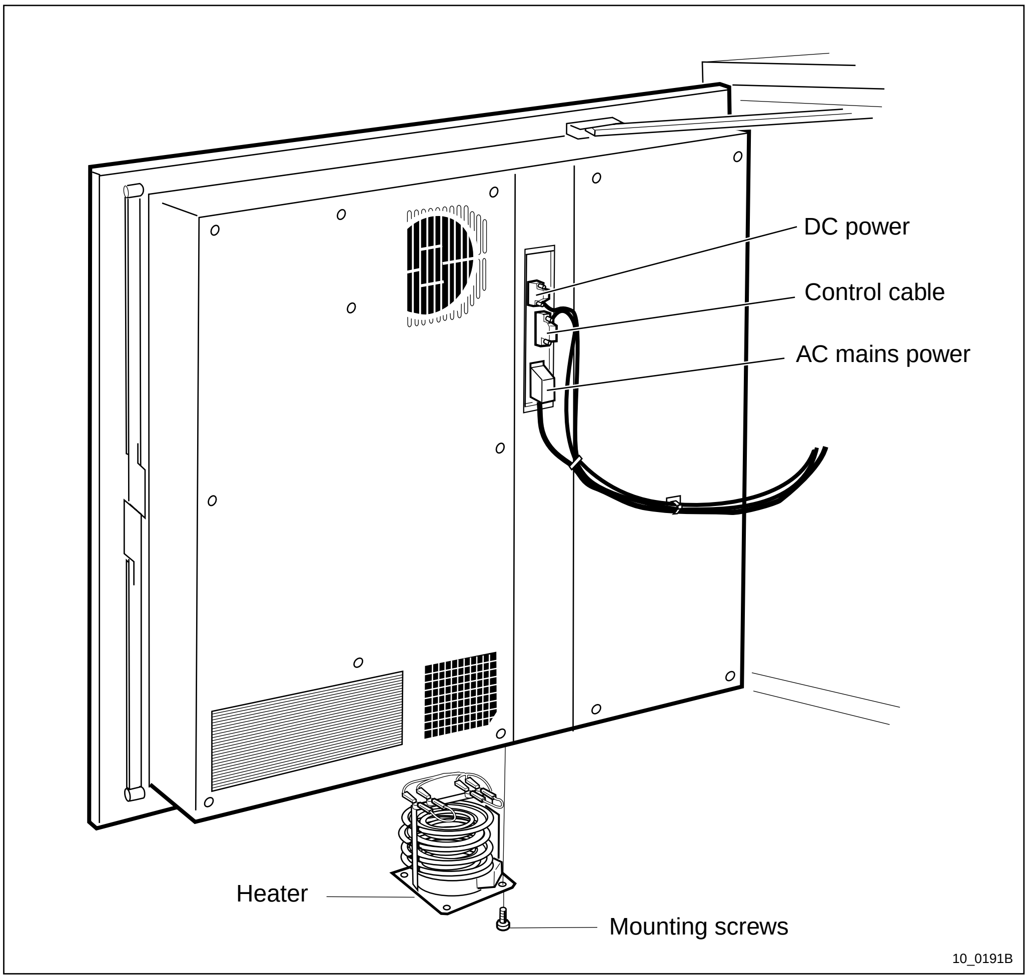


Figure 180 Climate unit versions V3, V4 and V5, heater

1. On the CCU, remove the AC power cable.

2. Release the DC circuit breaker for the climate unit on IDM 1.

3. Remove the four screws on the bottom of the climate unit that hold the heater.

4. Gently lower the heater and disconnect the power cables.

5. Replacement is the reverse of the above.

Note: Unless under contractual warranty, after replacement, the heater shall be disposed of locally. Do not return the heater to Ericsson for replacement, repair or disposal.

6.30 Heat Exchanger Fans

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3) and (V4) are used as abbreviations designating the four versions of the climate unit.

6.30.1 Climate Unit Versions V1 and V2

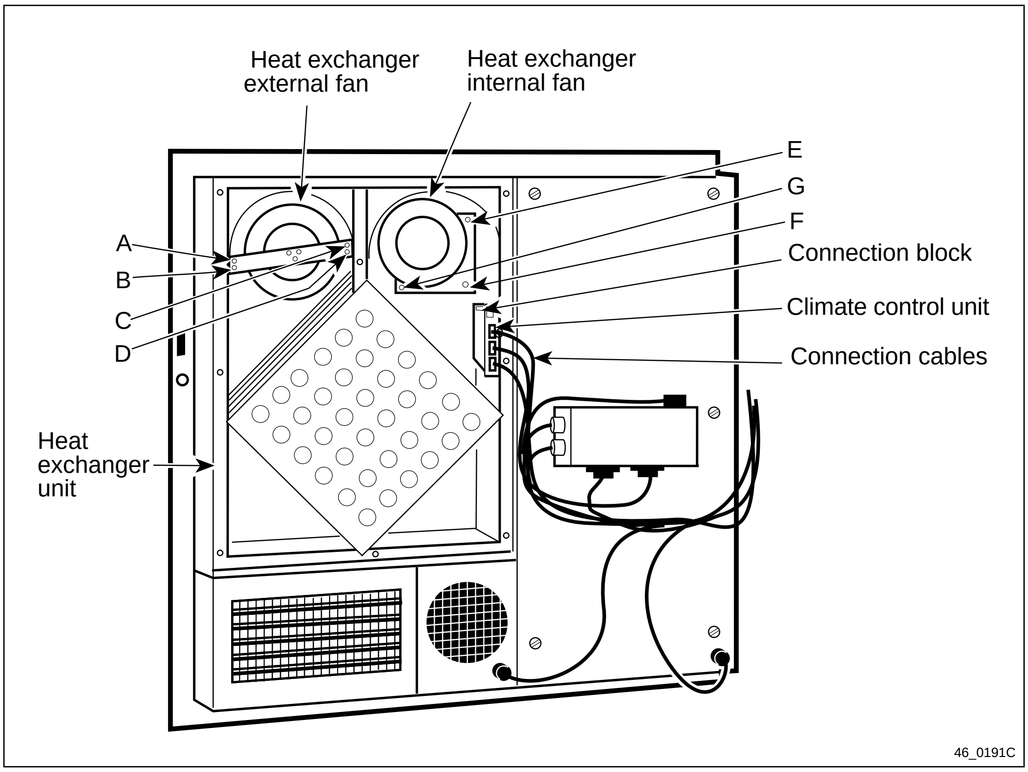


Figure 181 Climate unit versions V1 and V2. Heat exchanger fans

External fan

1. Remove the connecting cables to the CCU, climate control unit.

   Note: Save the spacer for the AC cable.

2. Remove the cover plate to the heat exchanger unit.
3. Cut the cable approximately 10 mm from the faulty fan.
4. Unscrew screws A-B-C-D.
5. Mount the female connector on the existing cable. See separate instruction delivered with the spare part.
6. Shorten the cable on the spare part so that 200 mm is left. Mount the male connector. See separate instruction delivered with the spare part.

7. Replace the fan. Refer to Table 18 on page 317for the correct terminations on the connection block.
8. Restore all tie wraps, use the tie wraps delivered with the spare part.
9. Fasten the cover plate to the heat exchanger unit.
10. Restore the connecting cables to the CCU.

Note: Unless under contractual warranty, after replacement, the fan shall be disposed of locally. Do not return the fan to Ericsson for replacement, repair or disposal

Internal fan

1. Remove the connecting cables to the CCU.

   Note: Save the spacer for the AC cable.

2. Remove the cover plate to the heat exchanger unit.
3. Remove the connections to the faulty fan on the connection block.
4. Unscrew screws E-F-G, see Figure 181 on page 316.
5. Remove (cut) the connectors on the spare part and remove approximately 5 mm of insulation of the wires.
6. Replace the fan. Refer to the table below for the correct terminations on the connection block.
7. Restore all tie wraps, use the tie wraps delivered with the spare part.
8. Fasten the cover plate to the heat exchanger unit.
9. Restore the connecting cables to the CCU.

Table 18 Wiring on connection block for CCU

Wire no.	1	2	3	4	5	6	7	8	9
Colour	Blue	White	Red	Blue	Red	Black	Brown	White	Red
Signal	(-) Neg.	Rotation signal	(+) Pos.	(-) Neg.	(+) Pos.	(-) Neg.	Opto signal	Flow signal	(+) Pos.
To	Internal fan	Internal fan	Internal fan	External fan	External fan	Flow sensor	Flow sensor	Flow sensor	Flow sensor

Note: The connection block is labelled and numbered on the CCU.

Note: Unless under contractual warranty, after replacement, the fan shall be disposed of locally. Do not return the fan to Ericsson for replacement, repair or disposal

6.30.2 Climate Unit Versions V3, V4 and V5

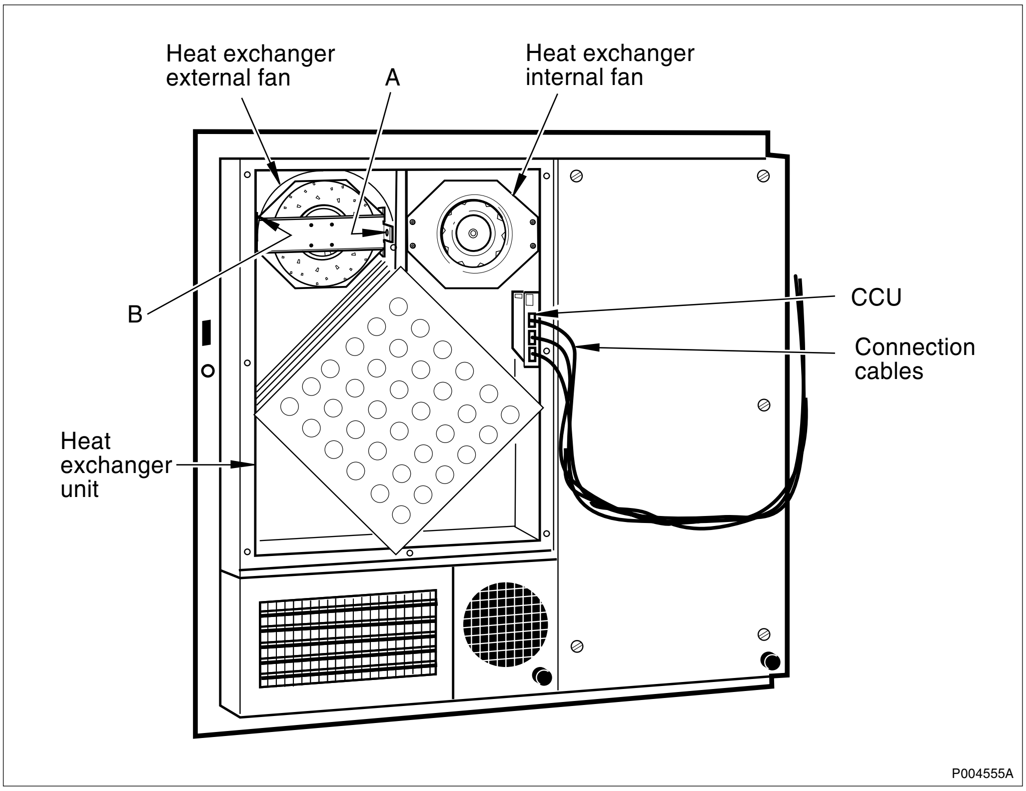


Figure 182 Climate unit versions V3, V4 and V5. Heat exchanger fans

External fan

1. Remove the connecting cables to the CCU.

   Note: Save the spacer for the AC cable.

2. Remove the cover plate to the heat exchanger unit.
3. ***Climate unit version V3***

   • Cut the existing cable approximately 10 mm from the faulty fan. Mount the female connector. See separate instruction delivered with the spare part.

   • Shorten the cable on the spare part so that approximately 200 mm is left. Mount the male connector. See separate instruction delivered with the spare part.

   Climate unit version V4

   • Shorten the cable on the spare part so that 200 mm is left. Mount the male connector. See separate instruction delivered with the spare part.

4. Remove the fan by loosing the screws A and B. Screw A also keeps the internal fan in position.
5. Loosen the screws C and D, then replace the fan. See figure below.

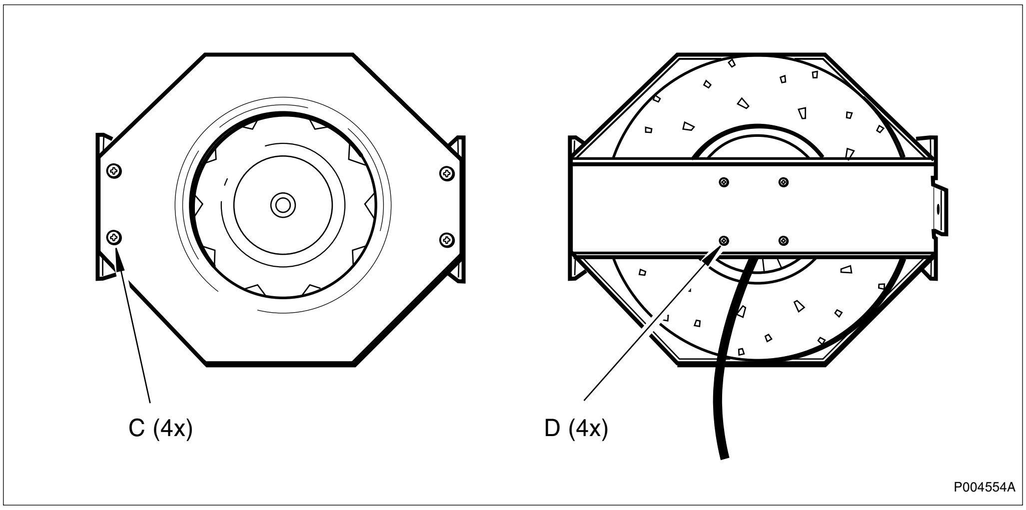


Figure 183 Heat exchanger fan

6. Be sure to wrap the cables with tie wraps so that they cannot be damaged.
7. Fasten the cover plate.
8. Restore the cables to the CCU.

Note: Unless under contractual warranty, after replacement, the fan shall be disposed of locally. Do not return the fan to Ericsson for replacement, repair or disposal.

Internal fan

1. Remove the connection cables to the CCU.

   Note: Save the spacer for the AC cable.
2. Remove the cover plate to the heat exchanger unit.
3. Disconnect the faulty fan from the CCU.
4. Remove the fan by loosing screw A that also keeps the external fan in position. See figure above.
5. Loosen the screws C and D, then replace the fan. See figure above.
6. Restore all tie wraps, use the tie wraps delivered with the spare part.
7. Fasten the cover plate.
8. Restore the cables to the CCU.

Note: Unless under contractual warranty, after replacement, the fan shall be disposed of locally. Do not return the fan to Ericsson for replacement, repair or disposal.

6.31 HLIN and HLOUT Cables

This section is divided into the following sub-sections:

- "HL Cable between Two CDUs"
- "HL Cable between the CDU and the Connection Field"
- "CAB HLIN Cable, connects the Master Cabinet and the Extension Cabinet"

6.31.1 HL Cable between Two CDUs

Replacement

1. Remove carefully the faulty HL cable that is connected between the HL-out connector on the CDU (that was pinpointed by OMT) and its CDU twin.

Note: Unless under contractual warranty, after replacement, the HL cable shall be disposed of locally. Do not return the HL cable to Ericsson for replacement, repair or disposal.

2. Carefully connect the new HL cable between the two CDUs.
3. Tighten the cable connectors in both ends of the HL cable with a torque of 0.6 – 0.8 Nm

6.31.2 HL Cable between the CDU and the Connection Field

Replacement

1. Remove the faulty HL cable that is connected between the HL-out connector on the CDU (that was pinpointed by OMT) and the connection field.

Note: Unless under contractual warranty, after replacement, the HL cable shall be disposed of locally. Do not return the HL cable to Ericsson for replacement, repair or disposal.

2. Carefully connect the new HL cable between the CDU and the connection field.
3. Tighten the cable connector in the CDU end of the HL cable with a torque of 0.6 – 0.8 Nm.

6.31.3 CAB HLIN cable

Replacement

1. Remove the faulty HL cable that is connected between the master and extension cabinets.

Note: Unless under contractual warranty, after replacement, the HL cable shall be disposed of locally. Do not return the HL cable to Ericsson for replacement, repair or disposal.

2. Connect the new HL cable between the connection fields of the master and extension cabinets.

6.32 Humidity Sensor

Note: When changing the humidity sensor, refer to the chapter "Cable Connections". Note the position of RUs within the original sub-rack, so that they can be replaced into the correct position without changing the IDB.

The humidity sensor is located under the Battery 2 sub-rack.

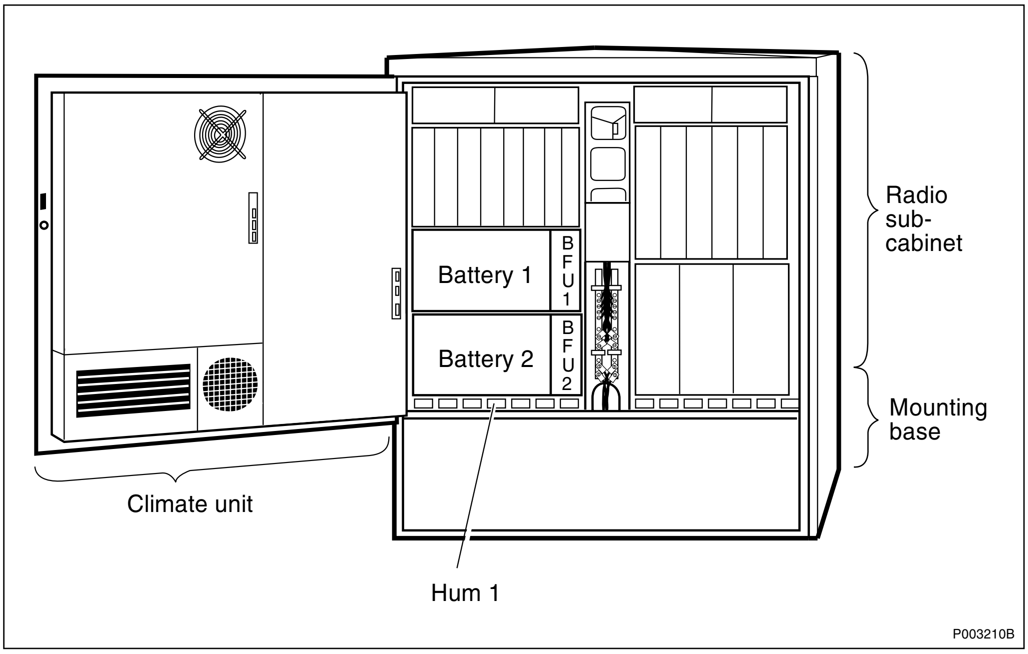


Figure 184 Humidity sensor

Prior to replacement

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The yellow Local mode indicator will start flashing. Wait until it has a fixed yellow light. This indicates that the DXU is in local mode.
3. Switch off the AC mains power to the cabinet with the AC mains switch on the ACCU.
4. Disconnect the opto bus cables connected to the BFU(s).
5. Pull out the BFU(s) to isolate the 24 V DC from the RBS.

Replacement

1. Remove the following unit(s) as described in the appropriate section in this chapter:
   - Fans
   - ECU

- PSU(s)
- DXU
- BFUs
- Batteries
- Battery box
- DXU/ECU backplane

2. Loosen the plastic nut holding the humidity sensor to the bottom of the cabinet.
3. Loosen the screws that hold the PSU and battery sub-racks and take them out.
4. Unplug the humidity sensor from the DXU/ECU backplane.
5. Remove the humidity sensor and cable.
6. Installation of the replacement part is in the reverse order.

Put into operation

1. Connect AC mains power to the cabinet with the AC mains switch on the ACCU.
2. Check that the Operational indicator on the DXU has a fixed green light and that the BS fault indicator is off.
3. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
4. Wait until the Local mode indicator on the DXU is off. This indicates that the DXU is in remote mode.

Note: Unless under contractual warranty, after replacement, the humidity sensor shall be disposed of locally. Do not return the humidity sensor to Ericsson for replacement, repair or disposal.

6.33 IDM

The only replacement parts within the IDM are the circuit breakers and the FCU.

- For replacement of the FCU, refer to the section "FCU" of this chapter.
- The instructions below give the procedures for replacing the circuit breakers.

Note: There are two different versions of the IDM. Either there are two top-mounted and one mid-mounted. Choose the appropriate instructions below.

- In the top-mounted IDMs, the circuit breakers are replaced.
- In the mid-mounted IDM, the whole IDM is replaced.

6.33.1 Prior to replacement

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The yellow Local mode indicator will start flashing. Wait until it has a fixed yellow light. This indicates that the DXU is in local mode.
3. Switch off the AC mains power to the cabinet with the AC mains switch on the ACCU.
4. Disconnect the opto bus cables connected to the BFU(s).
5. Pull out the BFU(s) to isolate the 24 V DC from the RBS.
6. Proceed with one of the following sub-sections:

   • Section 6.33.2 Replacement of circuit breakers in a top-mounted IDM on page 323.

   • Section 6.33.3 Replacement of a mid-mounted IDM on page 324.

6.33.2 Replacement of circuit breakers in a top-mounted IDM

Note: Instructions in the Section 6.33.1 Prior to replacement on page 323 must be carried out before replacement.

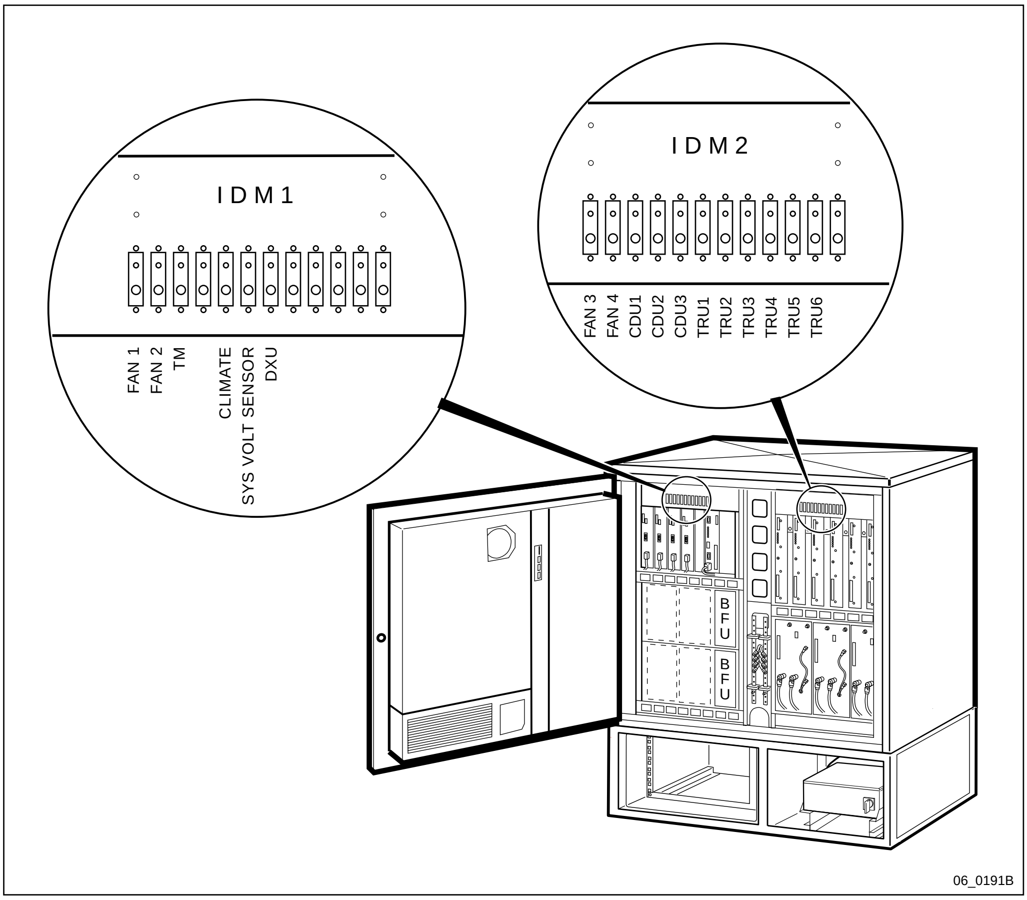


Figure 185 Top-mounted IDMs circuit breakers

1. Loosen the IDM panel from the cabinet.
2. Remove the two wires connected by a spade type terminal on the back of the circuit breaker.
3. Remove the two screws holding the defective circuit breaker to the IDM.
4. Replacement is the reverse of the above.

   Proceed with Section 6.33.4 Take into operation on page 325.

Note: Unless under contractual warranty, after replacement, the IDM shall be repaired locally at the RBS site or in a local repair shop. If the IDM is unrepairable, it shall be disposed of locally by the customer. Do not return the IDM to Ericsson for replacement, repair or disposal.

6.33.3 Replacement of a mid-mounted IDM

Note: Instructions in the Section 6.33.1 Prior to replacement on page 323 must be carried out before replacement.

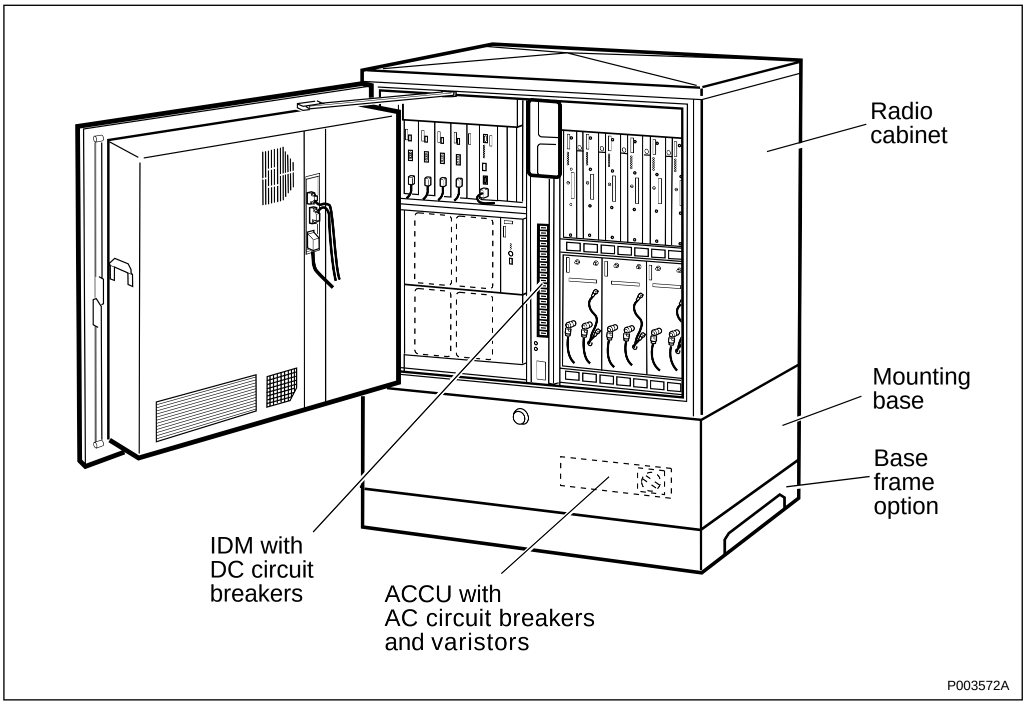


Figure 186 Mid-mounted IDM with DC circuit breakers

1. Remove the coverplate of the IDM by loosing the nine screws.
2. Disconnect all external contacts and cables from the IDM.
3. Remove the four screws holding the IDM and lift it out of the cabinet.
4. Mount the replacement IDM into the cabinet and fasten it with the four screws.
5. Connect all external contacts and cables to the replacement IDM.
6. Fasten the IDM panel with the nine screws.
7. Proceed with Section 6.33.4 Take into operation on page 325.

Note: Unless under contractual warranty, after replacement, the IDM shall be repaired locally at the RBS site or in a local repair shop. If the IDM is unrepairable, it shall be disposed of locally by the customer. Do not return the IDM to Ericsson for replacement, repair or disposal.

6.33.4 Take into operation

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Connect AC mains power to the cabinet with the AC mains switch on the ACCU.
2. Put the BFU(s) back and reconnect the opto bus cables.
3. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
4. Wait until the Local mode indicator on the DXU is off. This indicates that the DXU is in remote mode.

6.34 OVP Box

There are two versions of the RBS cabinet, with mounting base and without mounting base. Refer to Section 6.34.1 on page 326 respectively Section 6.34.2 on page 328.

6.34.1 OVP Box in RBS 2102 with a Mounting Base

Note: The OVP box is mounted on a mounting bracket behind the ACCU in the right part of the mounting base.

Note: This procedure describes the replacement of the sub-boards with protection modules only.

Prior to replacement of protection modules

1. Take the ACCU out of the mounting base to provide access to the OVP box, see figure below. This can be done without disconnecting the ACCU.

   • Loosen the two screws holding the ACCU to the mounting base and pull the unit out on its rails.

   • Put down the ACCU in front of the RBS.

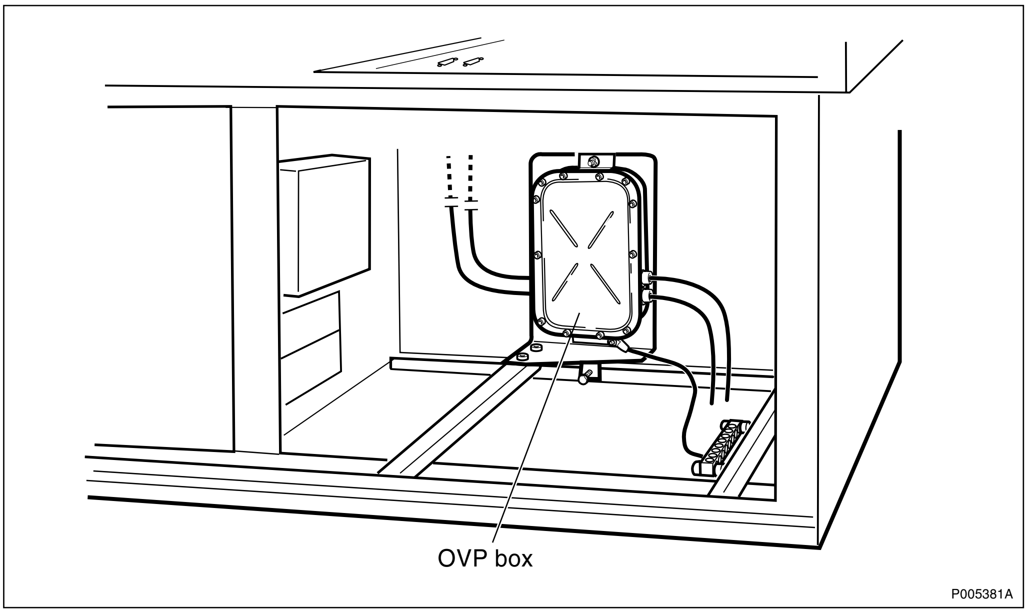


Figure 187 OVP box in the mounting base

2. Remove the two nuts holding the OVP box onto the mounting plate and bring the OVP box out of the mounting base.
3. Open the lid of the OVP box by removing the nine screws on top of the box.
4. Inspect the OVP box for possible damages. Look for burns in printed circuit boards and cables. If any damages are found, it is recommended that the complete OVP box is exchanged. If there are damages on cables, these must be exchanged too.
5. If there are no visible damages, proceed to the next step.

Replacement of protection modules

6. Locate the correct connection for the actual RBS inside the OVP box.

7. Disconnect the sub-boards with protection modules and replace them with new sub-boards, see the following figure.

Note: The sub-boards shall be intended for the version of OVP that has a number starting with NTM 201 on the cover. New sub-boards can be taken from the spare part "Overvoltage arrester board" of the OVP box.

It is **not** recommended to change the overvoltage arrester board since this is more complicated and time consuming.

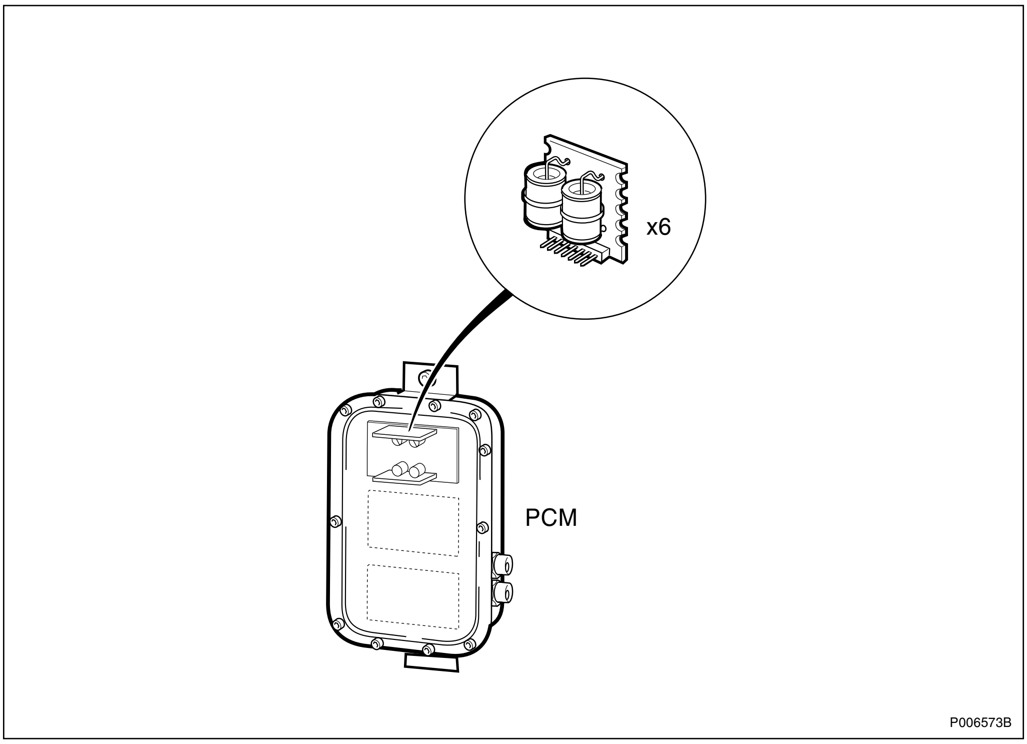


Figure 188 OVP box — sub boards with protection modules.

8. Put back the lid of the OVP box and replace all nine screws.

9. Put back the OVP box to the mounting plate and fasten it with the two nuts.

10. Put back the ACCU into the mounting base and fasten it to the rails with two screws.

Note: Unless under contractual warranty, after replacement, the OVP box, the "Overvoltage arrester board"or the sub-boards with protection modules shall be disposed of locally. Do not return any of these items to Ericsson for replacement, repair or disposal.

6.34.2 OVP Box in RBS 2102 without Mounting Base

Note: The OVP box is either mounted on the back of the ACCU or, onto the rear panel behind the ACCU in the lower right part of the cabinet.

This procedure describes the replacement of the sub-boards with protection modules only.

Prior to replacement of protection modules

1. Remove the ACCU by loosening the two screws located at the rear top of the ACCU. Lift the ACCU straight up. Refer to the figure below.

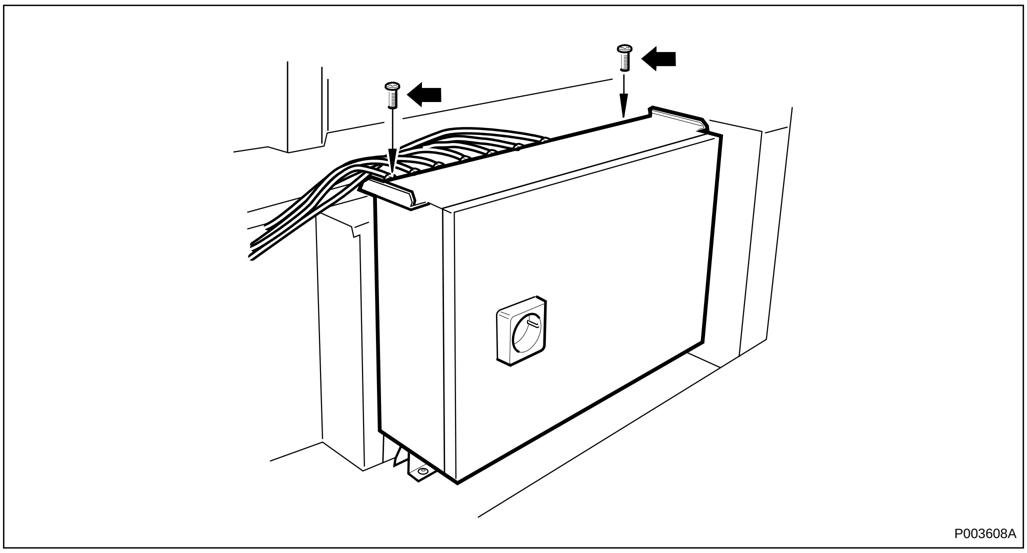


Figure 189 Removing the ACCU

Note: There are two different versions of the OVP box:

• OVP-11 is used for PCM connection as well as TG synch connection. It has one printed circuit board for the PCM cables and one for the ESB cables (for the TG synch connection). The PCM board holds two sub-boards with protection modules, the ESB board holds three sub-boards with protection modules. This OVP is mounted on the back of the ACCU.

• OVP is used for PCM connections only. It has two printed circuit boards, each holding two sub-boards with protection modules. This OVP is mounted onto the rear panel behind the ACCU or on the back of the ACCU.

This procedure describes the replacement of the sub-boards with protection modules only.

2. OVP box mounted on the back of the ACCU: Let the OVP remain on the ACCU.

OVP box mounted onto the rear panel behind the ACCU: Remove the screws holding the OVP box and bring the OVP box out of the mounting base.

See figures below.

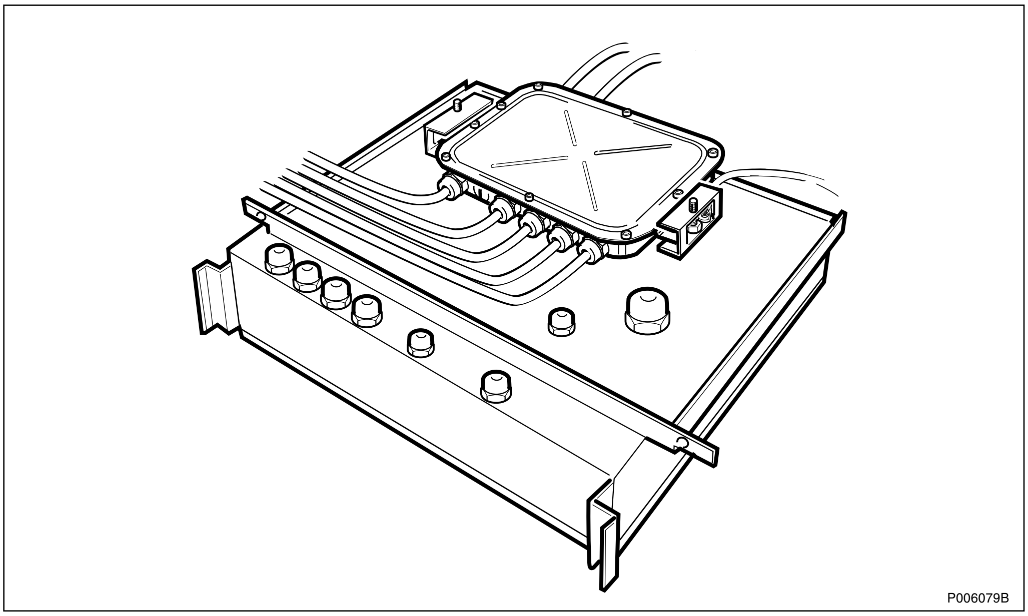


Figure 190 OVP box on the back of the ACCU

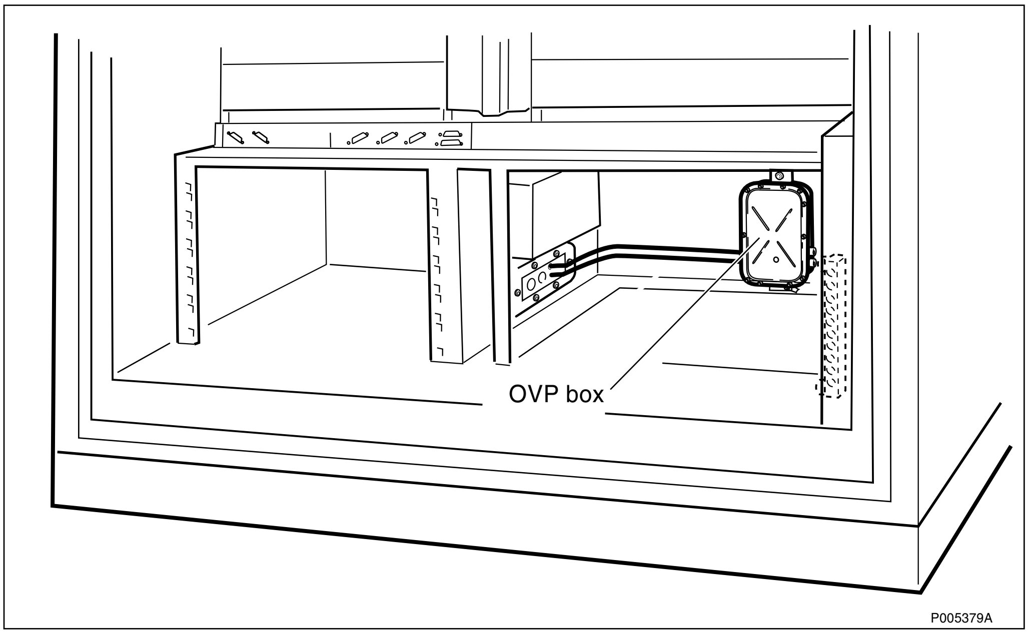


Figure 191 OVP box on the rear panel of the RBS

3. Open the lid of the OVP box by removing the nine screws on top of the box.
4. Inspect the OVP box for possible damages. Look for burns in printed circuit boards and cables. If any damages are found, it is recommended that the complete OVP box is exchanged. If there are damages on cables, these must be exchanged too.

5. If there are no visible damages, proceed to the next step.

Replacement of protection modules

6. Locate the correct connection for the actual RBS inside the OVP box.

7. Disconnect the sub-boards with protection modules and replace them with new sub-boards. Ensure to get the right version of OVP. See figure below.

   • On top of the OVP-11, there is a product number starting with NTM 503.

   • On top of the OVP, there is a product number starting with NTM 201.

Note: New sub-boards can be taken from the spare part "Overvoltage arrester board" of the OVP box.

It is **not** recommended to change the overvoltage arrester board since this is more complicated and time consuming.

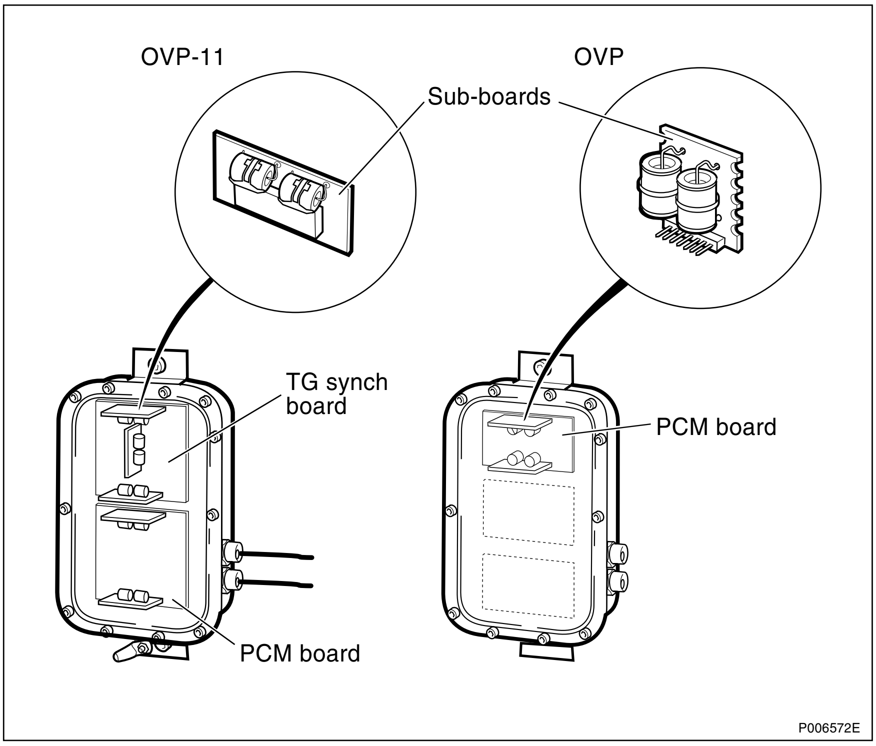


Figure 192 OVP box — sub-boards with protection modules.

8. Put back the lid of the OVP box and replace all nine screws.

9. Put back the OVP box to the rear panel and fasten it with the two screws.

10. Put back the ACCU into the mounting base and fasten it with the two screws at the top of the ACCU.

Note: Unless under contractual warranty, after replacement, the OVP box, the "Overvoltage arrester board"or the sub-boards with protection modules shall be disposed of locally. Do not return any of these items to Ericsson for replacement, repair or disposal.

6.35 PSU

Note: The opto bus cables for the power communication loop must have a bend radius of at least 35 mm.

Note: If the cabinet, from which the PSU is being removed, has either internal or external battery backup, the DC cable will be live when disconnecting it from the PSU.

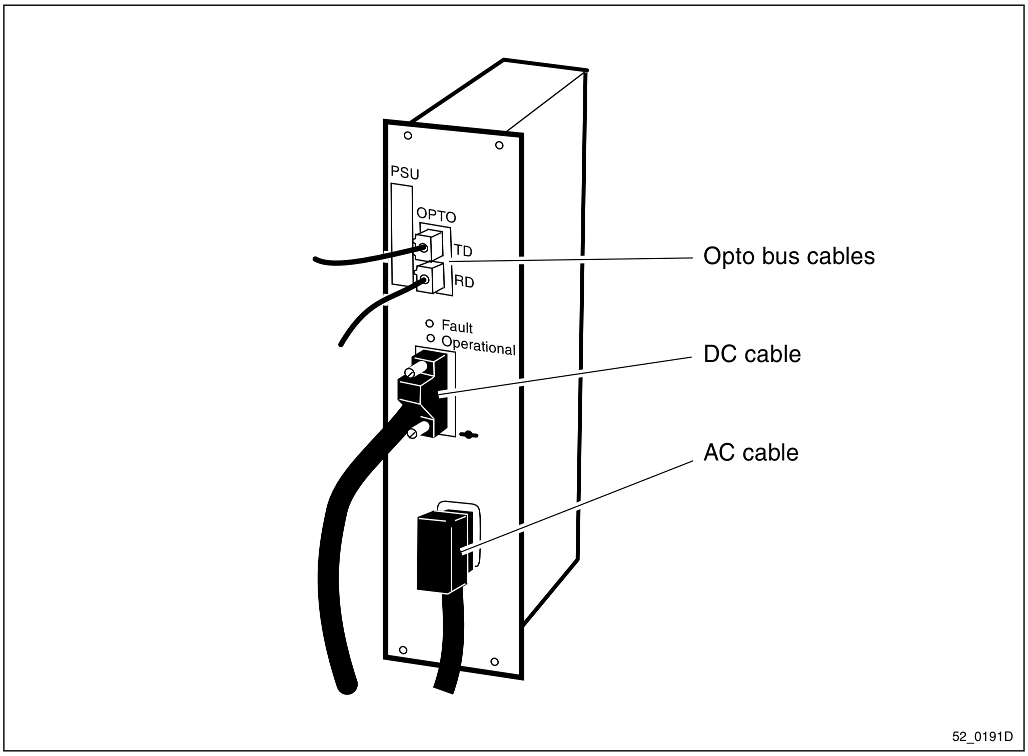


Figure 193 PSU

Note: If the PSU is faulty, but no replacement unit is available, leave the faulty PSU in the cabinet (do not remove it) and replace it when the new PSU arrives.

If there are sever damages, like burns, on the PSU, remove the faulty PSU and replace it with a dummy PSU.

Empty RU positions can affect the required cooling airflow to units in operation and cause overheating.

Replacement

1. Disconnect the opto bus cables.
2. Disconnect the AC cable.
3. Disconnect the DC cable.
4. Replace the faulty PSU.

5. Connect the AC cable.
6. Connect the DC cable and the opto bus cables.
7. Reset the ECU by pressing the button labelled CPU Reset on the ECU for approximately 3 seconds. After approximately 30 seconds, the system should function without alarm, and the Fault indicator on the ECU should go out.

Note: After replacement, the PSU must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the PSU. The repair delivery note shall include a clear description of the fault found. Refer to the chapter "Concluding Routines"for instructions on completing a repair delivery note.

6.36 PSU DC Cable

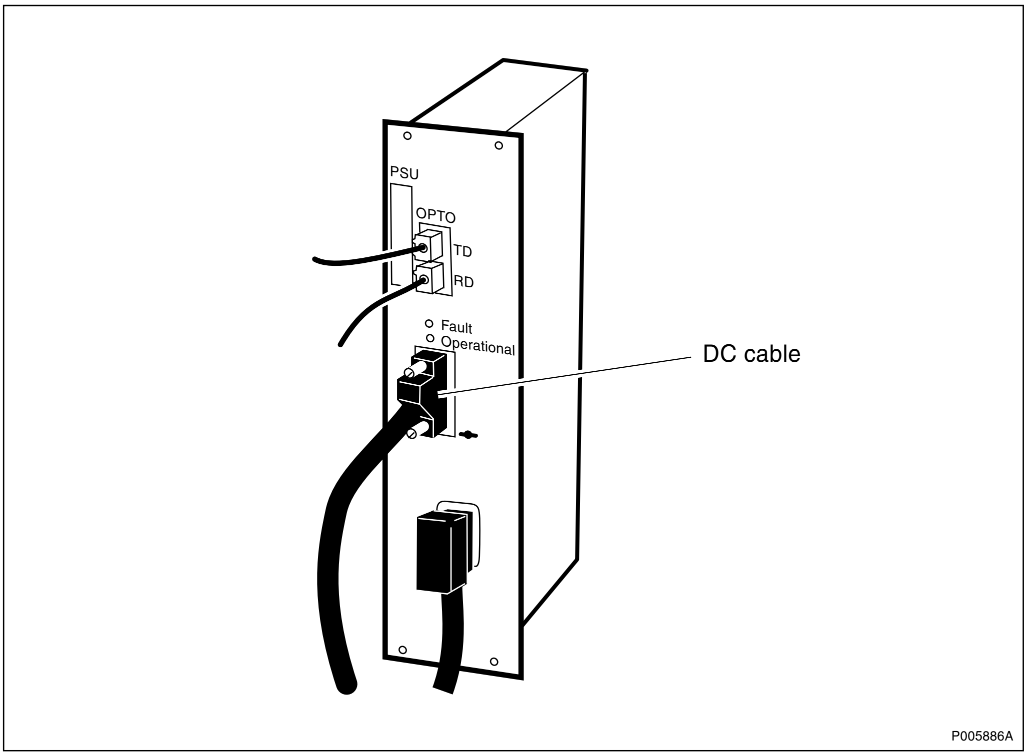


Figure 194 PSU DC cable

Prior to replacement

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The yellow Local mode indicator will start flashing. Wait until it has a fixed yellow light. This indicates that the DXU is in local mode.
3. Switch off the AC mains power to the cabinet with the AC mains switch on the ACCU.

4. Disconnect the opto bus cables.
5. Pull out the BFU(s) to isolate the 24 V DC from the RBS.

Replacement

In a cabinet with a mid-mounted IDM, the cable is connected to the bus bar inside the IDM.

In a cabinet with two top-mounted IDMs, the cable is connected to the bus bar to the right of the BFU sub-rack.

6. *(Mid-mounted IDM only)*. Remove the cover plate to the IDM.
7. Remove the faulty PSU DC cable.
8. Replacement is the reverse of above.
9. Restart the RBS.

6.37 RBS DB

Use the OMT to install a new IDB. For further information on the use of OMT, see:

OMT User's Manual	*LZN 302 01*

6.38 Relay Unit/AC Interface

The AC interface for the climate unit is placed in two different locations. The first location is in a box on the outside of the access cover over the compressor. The second is located inside the climate unit above the compressor. Each will be addressed separately.

The AC interface comes in a 50 Hz and a 60 Hz version. The AC interface section has been divided into two subsections describing replacement of each version.

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

6.38.1 Relay Unit

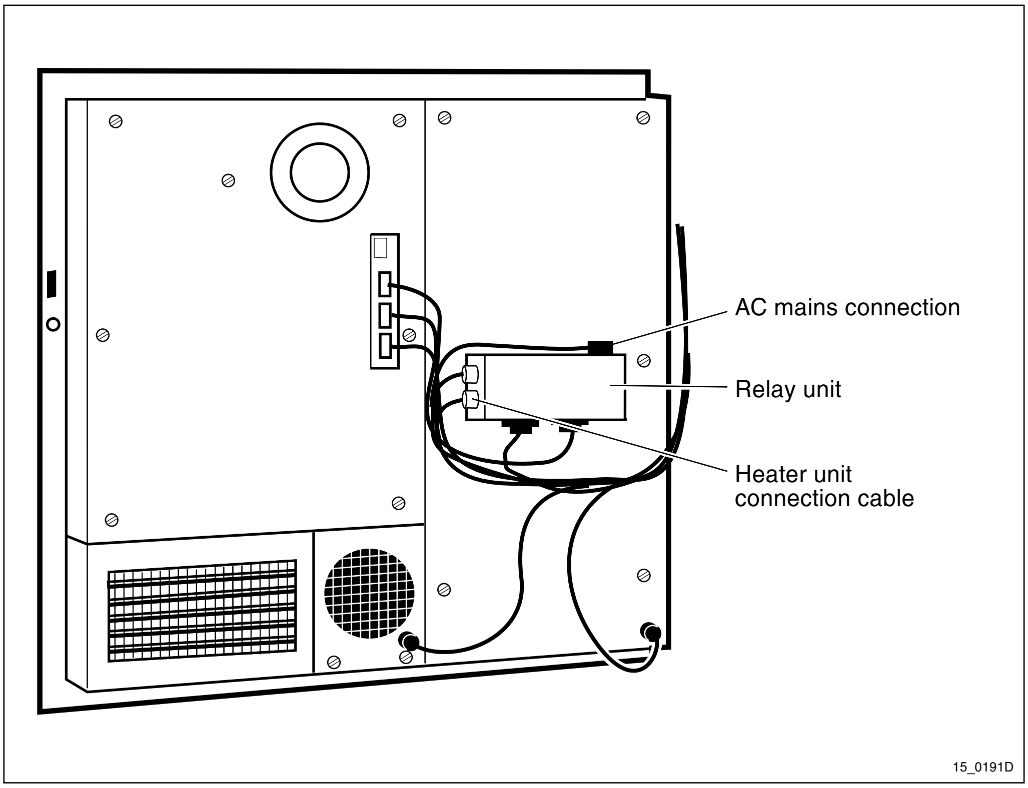


Figure 195 Climate unit with relay unit

1. Open the radio sub-cabinet and turn off the DC circuit breaker for the climate system on the IDM.
2. Remove all plugs on the outside on the relay unit.
3. Remove the cover of the relay unit.
4. Disconnect all wiring connected to the relay unit.
5. Remove the screws holding the relay unit to the cabinet.
6. Replacement is the reverse of the above.

Note: Unless under contractual warranty, after replacement, the relay unit shall be disposed of locally. Do not return the relay unit to Ericsson for replacement, repair or disposal.

6.38.2 AC Interface 50 Hz

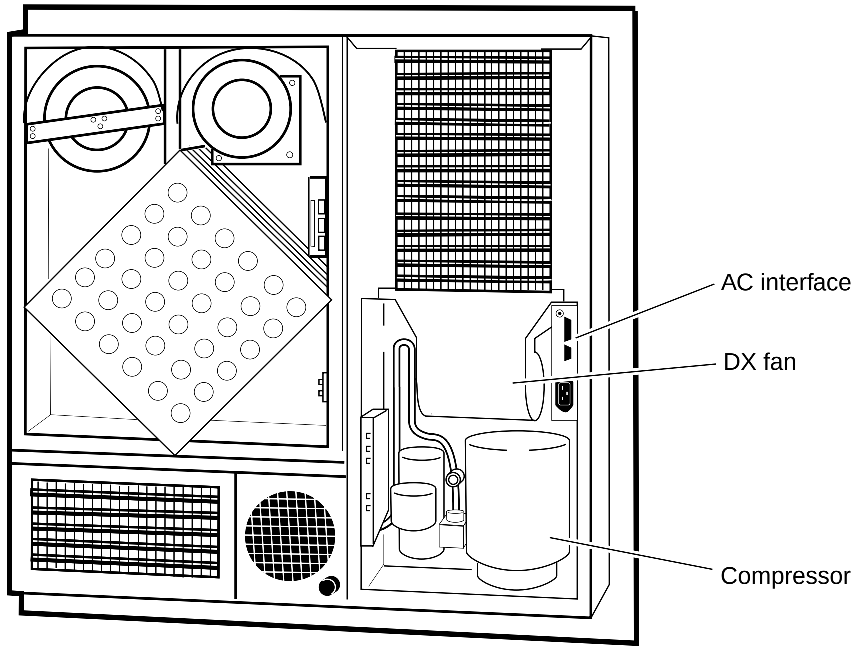


Figure 196 AC interface located internally

1. Open the radio sub-cabinet and release the DC circuit breaker for the climate system on the IDM.
2. Remove the cables from the front of the AC interface.
3. Remove the access cover over the compressor.
4. Remove the DX fan to provide access to the AC interface.
5. Remove the screws attaching the AC interface to the side of the climate unit.
6. Remove the cover of the AC interface to verify that a jumper cable is connecting terminal 9 and 10 on the connection plinth. Before proceeding with these instructions, check that the jumper cable is also present on the replacement card. Refer to the figure below.

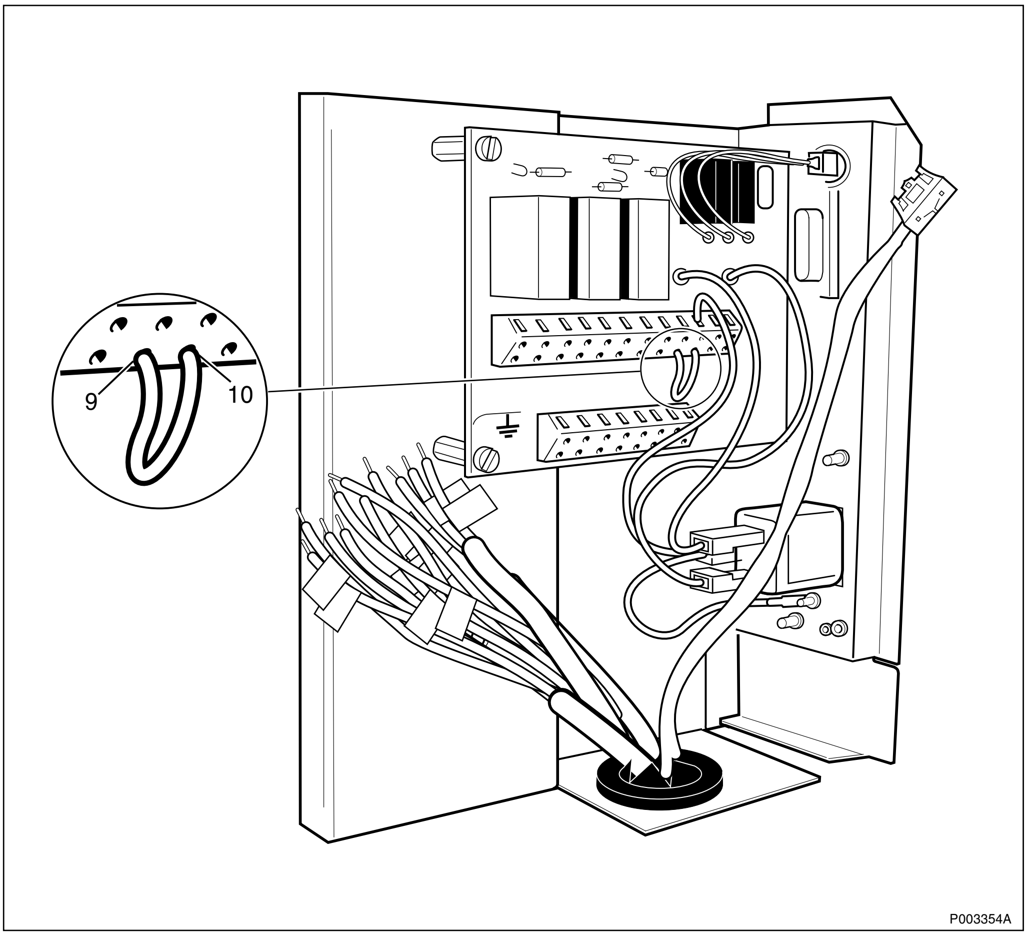


Figure 197 AC interface card

7. Mark all wires connecting to the old AC interface card and then remove them. Refer to the figure above.

8. Replace the AC interface and reset in reverse order.

Note: Unless under contractual warranty, after replacement, the AC interface shall be disposed of locally. Do not return the AC interface to Ericsson for replacement, repair or disposal.

6.38.3 AC Interface 60 Hz

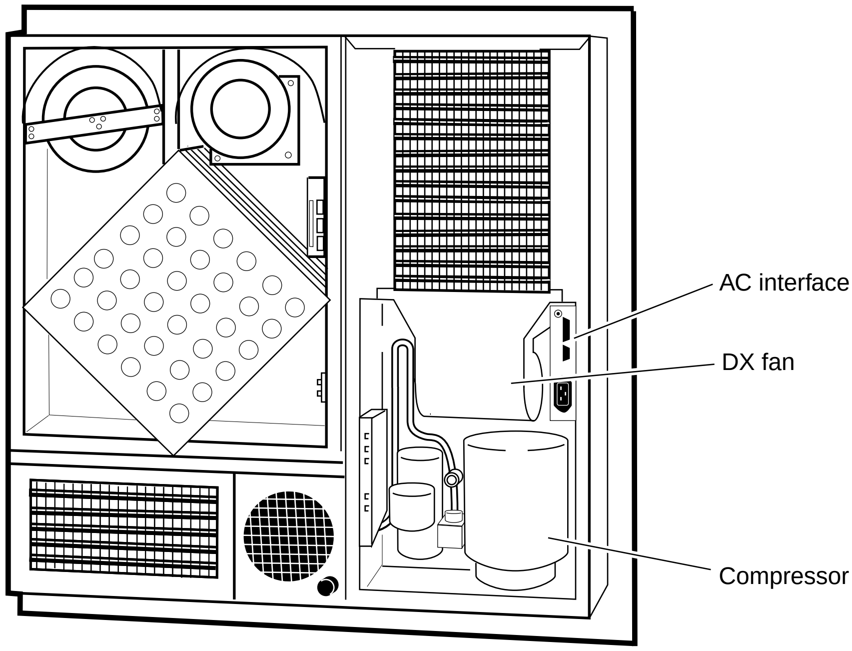


Figure 198 AC interface located internally

1. Open the radio sub-cabinet and release the DC circuit breaker for the climate system on the IDM.
2. Remove the cables from the front of the AC interface.
3. Remove the access cover over the compressor.
4. Remove the DX fan to provide access to the AC interface.
5. Remove the screws attaching the AC interface to the side of the climate unit.
6. Remove the cover of the AC interface.
7. Refer to the instructions below depending on the mains supply used on the site:

   208 V AC

   • Remove the cover of the replacement card.

   • Check that the transformer cables connect to the connection plinth as shown in the figure below.

   • Check that there is no jumper cable between terminal 9 and 10

   • Correct the new card if needed.

   230 V AC

   • Remove the cover of the replacement card.

• If the replacement card is configured for 208 V use, remove the jumper cable and the socket joint from the old card. Refer to the figure below.

• On the replacement card, mount the jumper cable between terminal 9 and 10 on the connection plinth.

• Mount the socket joint and fix all transformer cables in it.

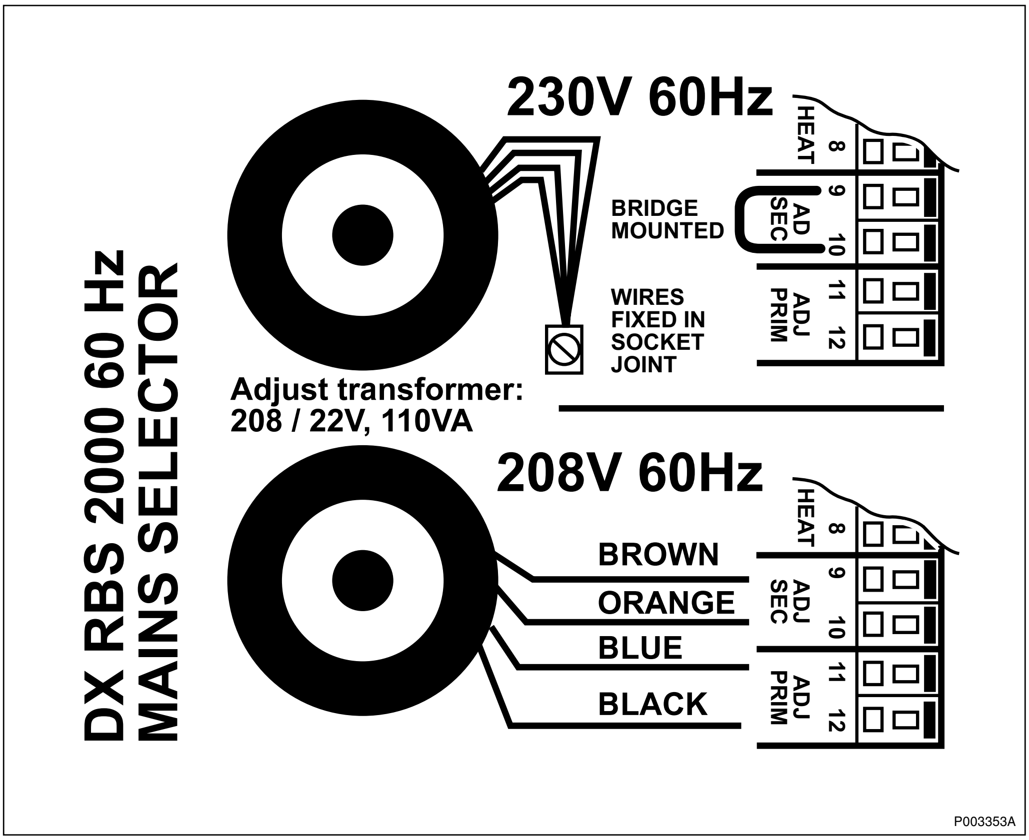


Figure 199 AC interface transformer wiring

8. Mark all wires connecting to the old AC interface card and then remove them. Refer to the figure below.

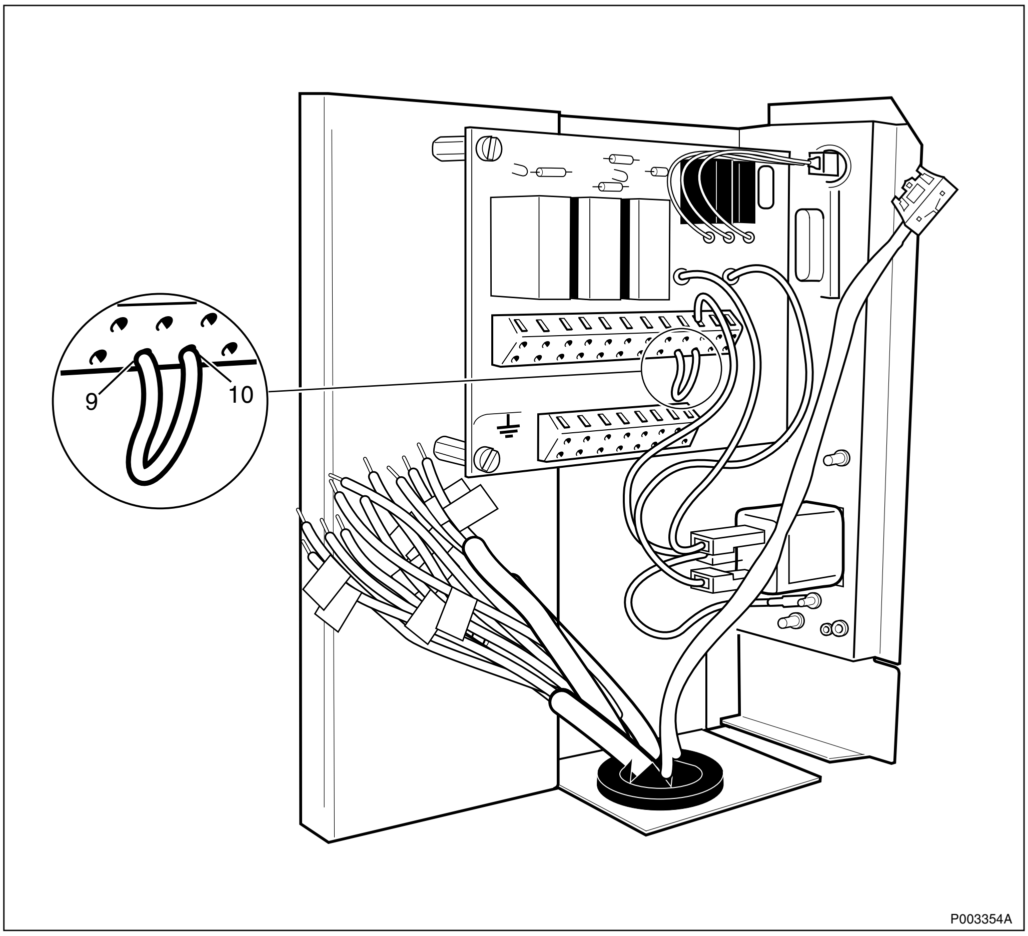


Figure 200 AC interface card

9. Replace the AC interface and reset in reverse order.

Note: Unless under contractual warranty, after replacement, the AC interface shall be disposed of locally. Do not return the AC interface to Ericsson for replacement, repair or disposal.

6.39 RX Antenna Feeder

Note: When changing antenna feeders, refer also to the chapter "Cable Connections".

Prior to replacement

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent exposure to RF radiation and damage to TRU(s), check before taking any further actions, that the TRU(s) that are connected to the CDU with the faulty RX antenna feeder have Local mode indicators with a fixed yellow light.

These instructions are valid when a CDU-C or a CDU-C+ is used only:

1. Press the Local/remote button on all TRU(s) that are transmitting on the faulty RX cable. The Local mode indicators will start flashing.
2. Wait until the Local mode indicators have fixed yellow lights. This indicates that the TRUs are in local mode.

Replacement

1. Remove the faulty antenna feeder that connects the CDU to the connection plate by unscrewing it carefully at both ends.

Note: Unless under contractual warranty, after replacement, the antenna feeder shall be disposed of locally. Do not return the antenna feeder to Ericsson for replacement, repair or disposal.

2. Put the new cable in and attach it to the CDU with a torque of 8 Nm ±1 Nm and to the connection plate with a torque of 15 Nm ±1 Nm.

Put into operation (only if CDU-C or CDU-C+ is used)

Note: If base band hopping or mixed hopping was used, the hopping sequence can only be re-initiated by the BSC or MSC. After placing the TRU(s) in remote mode, contact the BSC or MSC and request they take the required actions.

1. Press the "Local/remote" button on the concerned TRU(s). The "Local mode" indicator will start flashing.
2. Block the following MOs from the BSC in the given order: RX, TS, TX, TRX.

   Use the MML command RXBLI.
3. Deblock the following MOs from the BSC in the given order: TRX, TX, TS, RX.

   Use the MML command RXBLE.
4. Wait until the "Local mode" indicators turn off. This indicates that the TRU(s) are in remote mode.

6.40 Solenoid

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Introduction".

In the procedures below, (V1), (V2), (V3) and (V4) are used as abbreviations designating the four versions of the climate unit.

The location of the solenoid is the same in all versions of the climate unit.

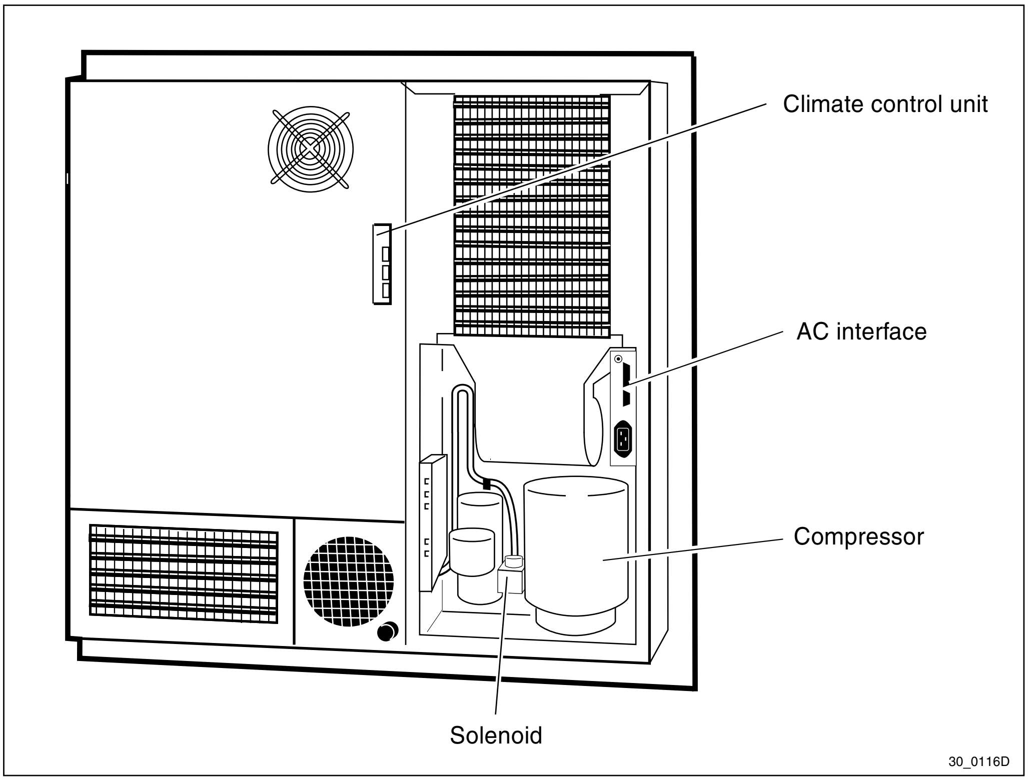


Figure 201 Solenoid, climate unit version V2 is shown

1. Turn off the AC circuit breaker for the climate unit in the ACCU.
2. Remove the AC mains power cord to the climate unit from either:
   - Climate unit version V1: The top of the relay unit
   - Climate unit version V2: The AC interface card
   - Climate unit versions V3 and V4: The CCU.
3. Unscrew the cap on the solenoid.
4. Remove the cap on the mounting pole.
5. Remove the solenoid from the mounting pole.
6. Remove the screw holding the cable connector to the solenoid and disconnect the cable.
7. Replacement is the reverse of the above.

Note: Unless under contractual warranty, after replacement, the solenoid shall be disposed of locally. Do not return the solenoid to Ericsson for replacement, repair or disposal.

6.41 Temperature Sensors

There are two temperature sensors for internal temperature measurement. Temperature sensor number 1 is placed in the air outlet of the cabinet. Temperature sensor number 2 has three alternative positions. It is placed either under the CDUs, under the battery 2 sub-rack or behind the IDM. For the positions see the figure bilow.

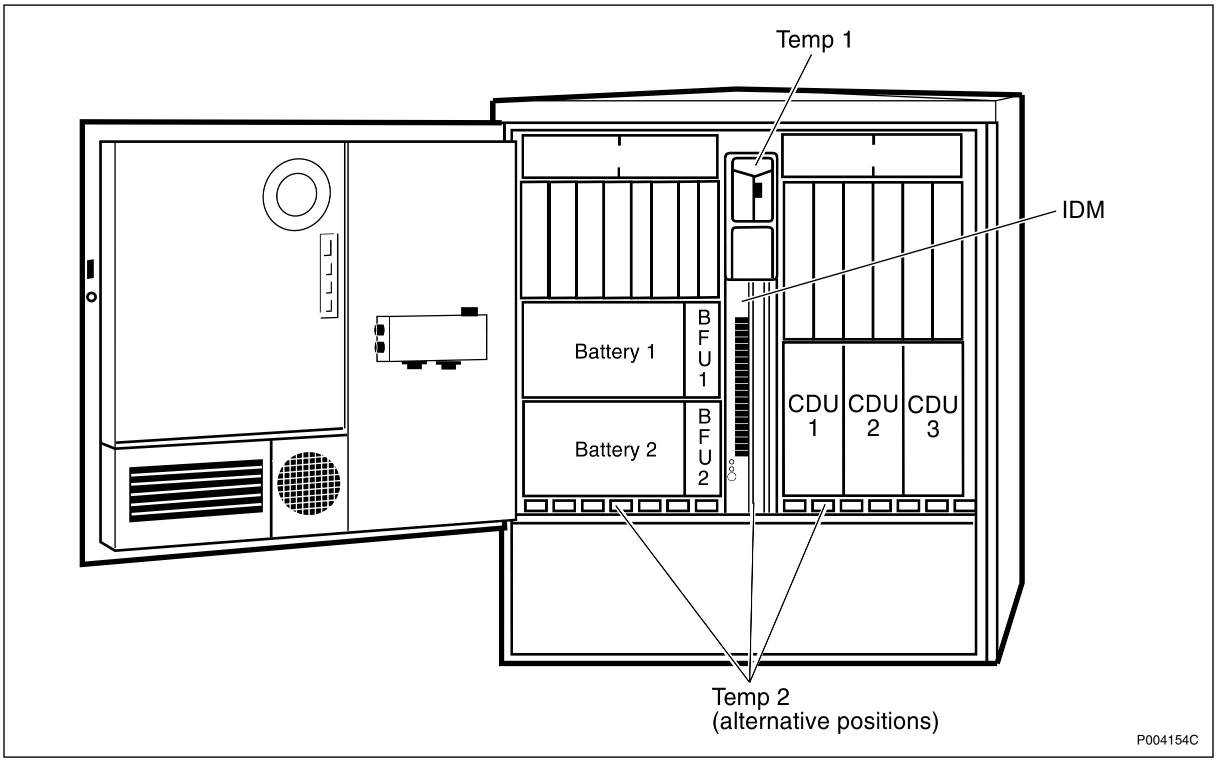


Figure 202 Temperature sensors

For replacement do the following:

1. Disconnect the cable attached to the faulty temperature sensor.
2. Loosen the screw holding the temperature sensor to the cabinet and remove the defective part.
3. Replacement is the reverse of the above.

Note: Unless under contractual warranty, after replacement, the temperature sensor shall be disposed of locally. Do not return the temperature sensor to Ericsson for replacement, repair or disposal.

6.42 TRU

Note: TRUs will successively be marked on the front with a coloured label showing frequency and encryption. To simplify identification, different frequencies have different colours. Be sure to have the appropriate TRU.

Further information about colour coding versus frequency and encryption can be found in the *Spare Parts Catalogue, Appendix B.*

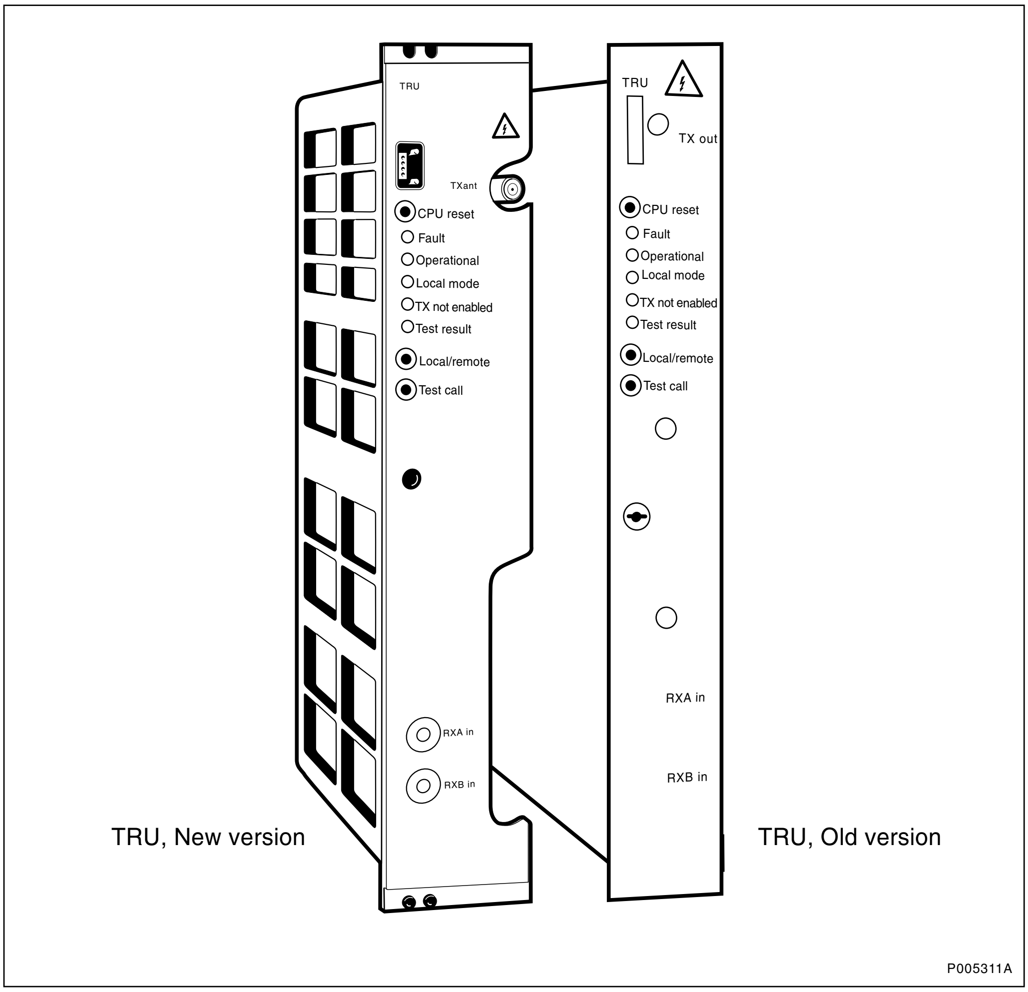


Figure 203 TRU, new version and old version

Note: If the TRU is faulty, but no replacement unit is available, leave the faulty TRU in the cabinet (do not remove it) and replace it when the new TRU arrives.

If there are sever damages, like burns, on the TRU, remove the faulty TRU and replace it with a dummy TRU.

Empty RU positions can affect the required cooling airflow to units in operation and cause overheating.

Replacement

1. Press the Local/remote button on the TRU. The Local mode indicator will start flashing.
2. Wait until the Local mode indicator has a fixed yellow light. This indicates that the TRU is in local mode.
3. Switch off the applicable TRU circuit breakers (or remove the fuse) on the IDM.
4. Remove all cables connected to the TRU.
5. Replace the TRU.

Make sure that the coaxial pins in the connector on the replacement TRU are centered in order not to damage the backplane. See figure below. If the coaxial pins are OK and the TRU slides easily into the sub-rack, proceed with step 6 otherwise proceed with step 5.

6. Some TRUs do not fit in the sub-rack. The main cause for this problem is that the coaxial pins in the TRU connector are not centered.

   a) Make sure that the coaxial pins in the backplane are not damaged.

   b) Use the centring tool, part no. SXK 107 2300/1, to gently align the TRU coaxial pins. See figure below.

   c) With care, try to fit the TRU into the sub-rack. The TRU should slide in to its position without need of extreme force.

Note: If the TRU can not be installed do not apply extra force since this will destroy the coaxial pins in the backplane.

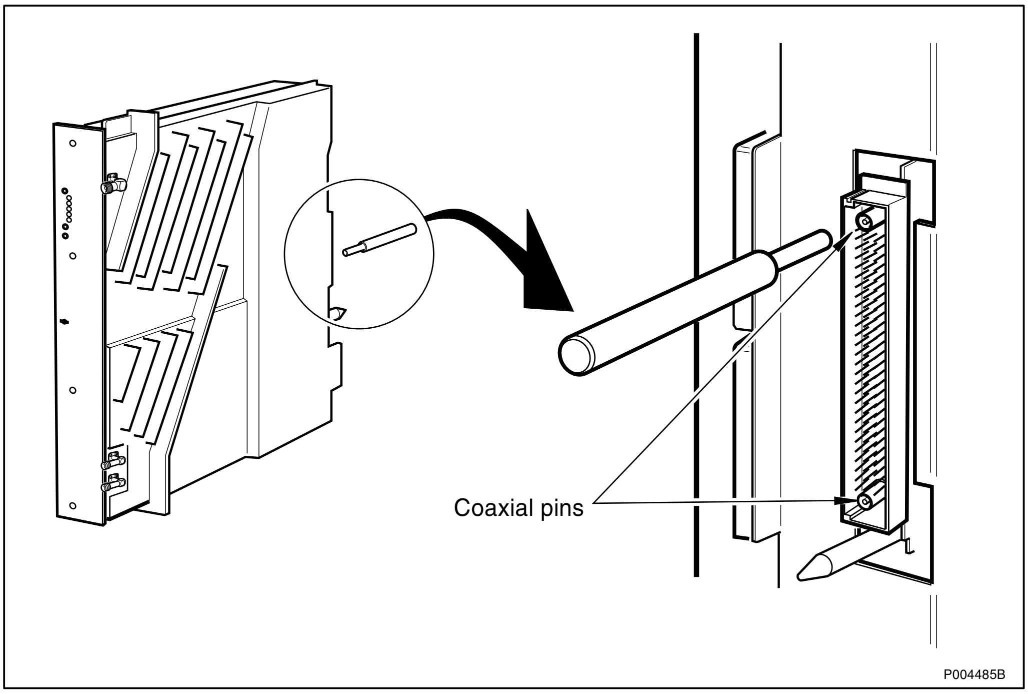


Figure 204 Aligning the TRU coaxial pins

7. Reconnect the disconnected cables.

8. Switch on the TRU circuit breakers (or replace the fuse) on the IDM.

9. Wait until the Operational indicator has a fixed green light. If the new TRU contains an old software version the DXU will automatically download the correct version. The software-download procedure is indicated by a flashing Operational indicator and may take some time (up to 10 minutes).

Note: After replacement, the TRU must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the TRU. The repair delivery note shall include a clear description of the fault found. Refer to the chapter "Concluding Routines"for instructions on completing a repair delivery note.

Attach the repair delivery note with a string to the antenna plug on the TRU. Tape should not be used.

Put into operation

Note: If base band hopping is used, the hopping sequence can only be re-initiated by the BSC/MSC. After placing the TRU(s) in remote mode, contact them and request they take the required actions.

1. Press the Local/remote button on the new TRU. The Local mode indicator will start flashing.
2. Wait until the Local mode indicator is off. This indicates that the new TRU is in remote mode.

6.43 TRU Sub-Rack

Note: When changing the TRU sub-rack, refer to the chapter "Cable Connections". Note the position of RUs within the original TRU sub-rack, so that they can be replaced into the correct position without changing the IDB. Refer to the drawings of switch settings in this section to make sure that the backplane switches of the replacement TRU sub-rack are set correctly.

Note: It is always recommended to change the complete TRU sub-rack and not only the TRU backplane. This is due to problems to adjust the backplane correctly within the sub-rack. An incorrectly fitted backplane can cause damages both to the TRUs and to the backplane itself.

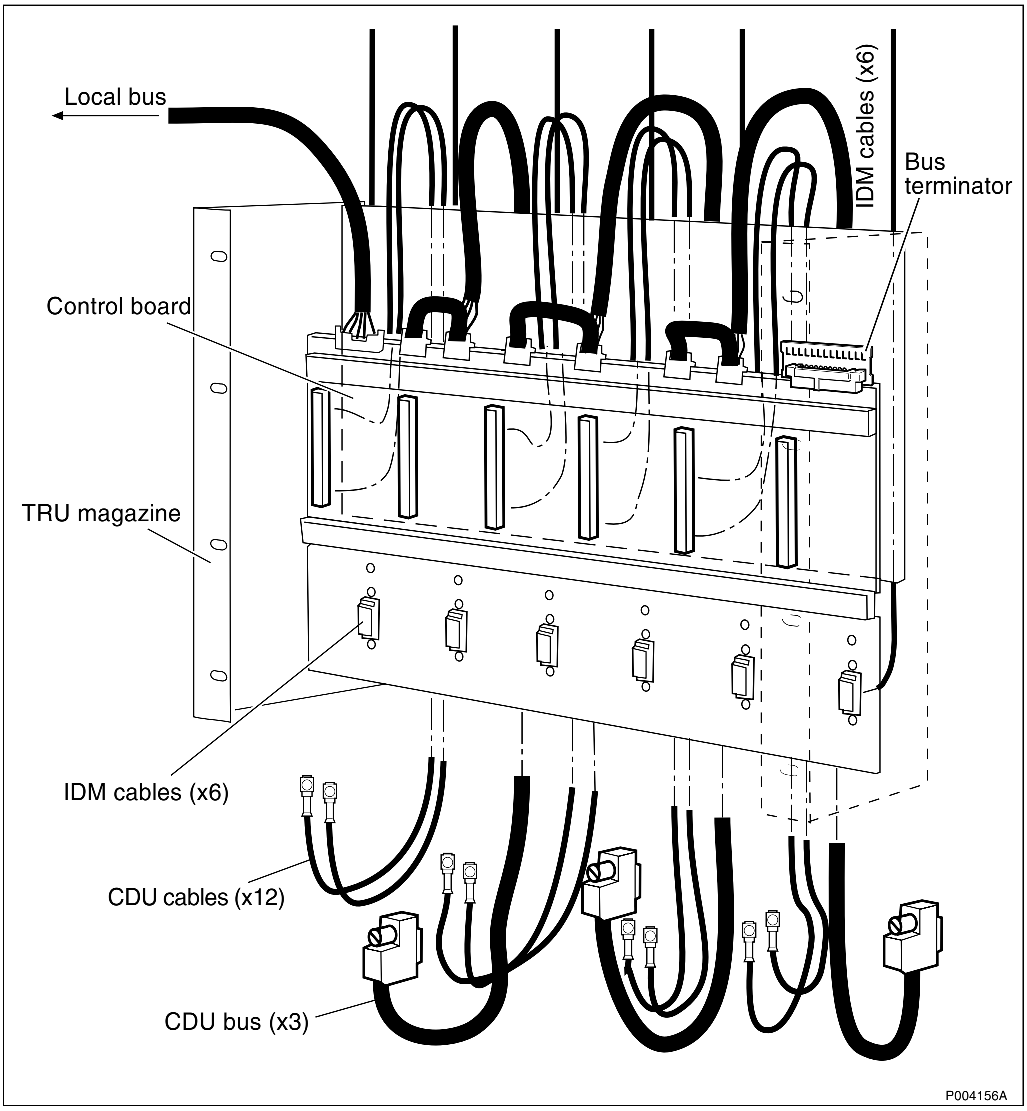


Figure 205 TRU sub-rack with backplane

Prior to replacement

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Inform the OMC operator that the RBS will be removed from service temporarily.
2. Press the Local/remote button on the DXU. The yellow Local mode indicator will start flashing. Wait until it has a fixed yellow light. This indicates that the DXU is in local mode.
3. Switch off the AC mains power to the cabinet with the AC mains switch on the ACCU.
4. Disconnect the opto bus cables connected to the BFU(s).
5. Pull out the BFU(s) to isolate the 24 V DC from the RBS.

Replacement

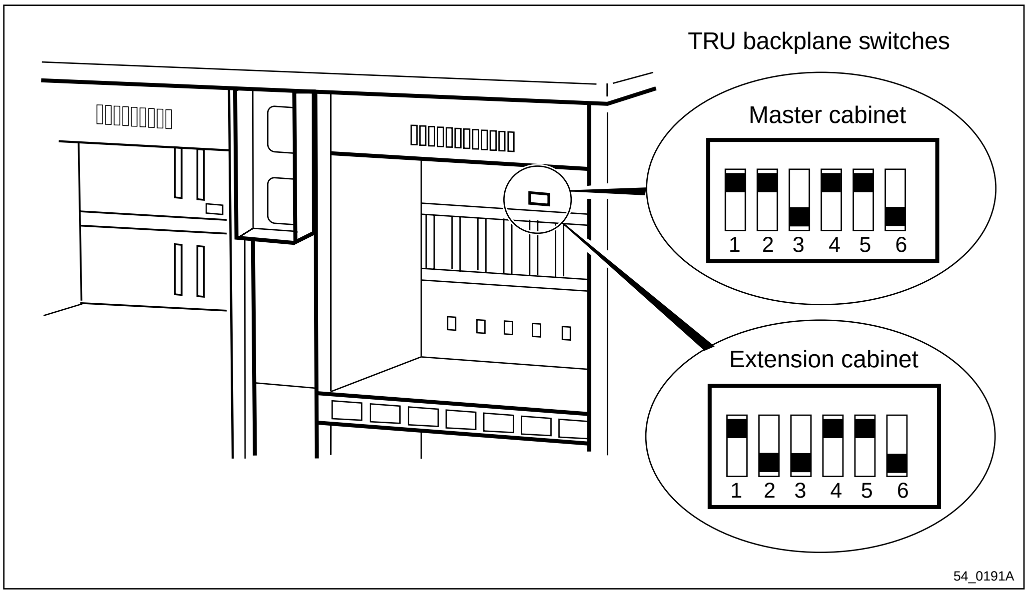


Figure 206 Location and setting of backplane switches in the TRU sub-rack

1. New version: Loosen the panel over the TRU sub-rack that holds FCU2. Disconnect the cables from the FCU2 card.

   Old version: Loosen the IDM above the TRU sub-rack.

2. Disconnect the fan cables. The connectors are located on the back of the IDM on the left-hand side.
3. Remove the fan clamps that keep the fans in place.
4. Remove the fans.
5. Disconnect all the cables that go from the TRU backplane up to the IDM. The connectors are located on the back of the IDM on the right-hand side.
6. Old version: Put the IDM back temporarily.
7. Disconnect the cables to the CDUs and remove the CDUs.
8. Loosen the screws that hold the CDU sub-rack and take it out.
9. Remove the air channel below the CDU sub-rack.
10. Remove the TRUs.
11. Loosen the screws that hold the TRU sub-rack.
12. Disconnect all the local bus cables that are connected to the top of the TRU backplane.
13. Pull out the TRU sub-rack. The cables to the CDUs and the IDM will come out with the TRU sub-rack since they are integrated with the connectors on the rear of the TRU backplane.
14. Put in a new TRU sub-rack.
15. Ensure that the switch settings for the replacement part are in accordance with the drawing above.

16. Reset in reverse order.

Note: Unless under contractual warranty, after replacement, the TRU sub-rack shall be disposed of locally. Do not return the TRU sub-rack to Ericsson for replacement, repair or disposal.

Put into operation

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Connect AC mains power to the cabinet with the AC mains switch on the ACCU.
2. Put the BFUs back and reconnect the opto bus cables.
3. Check that the Operational indicator on the DXU has a fixed green light and that the BS fault indicator is off.
4. Press the Local/remote button on the DXU. The Local mode indicator will start flashing.
5. Wait until the Local mode indicator on the DXU is off. This indicates that the DXU is in remote mode.

6.44 TX Antenna Feeders

Note: When changing antenna feeders, refer also to the chapter "Cable Connections".

Prior to replacement

CAUTION

Radio frequency (RF) radiation from antenna systems can endanger your health.

Note: To prevent exposure to RF radiation and damage to TRU(s), check before taking any further actions, that the TRU(s) that are connected to the CDU with the faulty TX antenna feeder have Local mode indicators with a fixed yellow light.

1. Press the "Local/remote" button on the TRU(s) that are transmitting on the faulty TX cable. The Local mode indicators will start flashing.
2. Wait until the "Local mode" indicator has a fixed yellow light. This indicates that the TRUs are in local mode.

Replacement

1. Remove the faulty antenna feeder that connects the CDU to the connection plate by unscrewing it carefully at both ends.

Note: Unless under contractual warranty, after replacement, the antenna feeder shall be disposed of locally. Do not return the antenna feeder to Ericsson for replacement, repair or disposal.

2. Put the new cable in and attach it to the CDU with a torque of 8 Nm ±1 Nm and to the connection plate with a torque of 15 Nm ±1 Nm.

Put into operation

Note: If base band hopping or mixed hopping was used, the hopping sequence can only be re-initiated by the BSC or MSC. After placing the TRU(s) in remote mode, contact the BSC or MSC and request they take the required actions.

1. Press the "Local/remote" button on the concerned TRU(s). The "Local mode" indicator will start flashing.
2. Block the following MOs from the BSC in the given order: RX, TS, TX, TRX.

   Use the MML command RXBLI.
3. Deblock the following MOs from the BSC in the given order: TRX, TX, TS, RX.

   Use the MML command RXBLE.
4. Wait until the "Local mode" indicators turn off. This indicates that the TRU(s) are in remote mode.

6.45 Varistors (2102)

Depending on ACCU version, refer to the sections "ACCU Version V1" or "ACCU Version V2" below.

Note: The denominations "ACCU version V1" and "ACCU version V2" are explained in the chapter "Introduction".

6.45.1 ACCU Version V1

Note: The denomination "ACCU version V1" is explained in the chapter "Introduction".

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

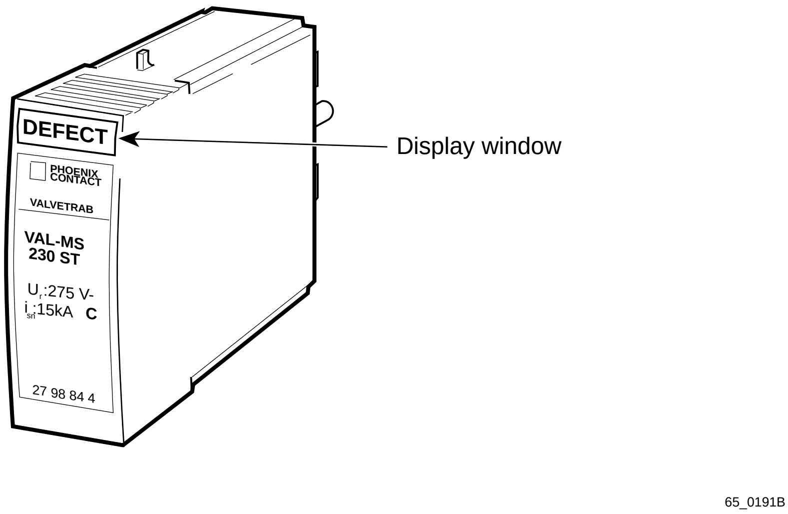


Figure 207 Varistor

1. Access the ACCU.
2. Remove the defective varistor by hand.

Note: A damaged mounting frame for the varistor can cause a short circuit and consequently a fire.

Replace the mounting frame if it is damaged in any way.

3. Inspect the mounting frame of the varistor.

   Replace the mounting frame if it is

   – burned

   – mechanically damaged

   – covered with dust

4. Replace the defective varistor.

Note: Unless under contractual warranty, after replacement, the varistor shall be disposed of locally. Do not return the varistor to Ericsson for replacement, repair or disposal.

6.45.2 ACCU Version V2

Note: The denomination "ACCU version V2" is explained in the chapter "Introduction".

DANGER

High voltage is used in the operation of this equipment. Both direct contact with the mains power and indirect contact via damp items or moisture can be fatal.

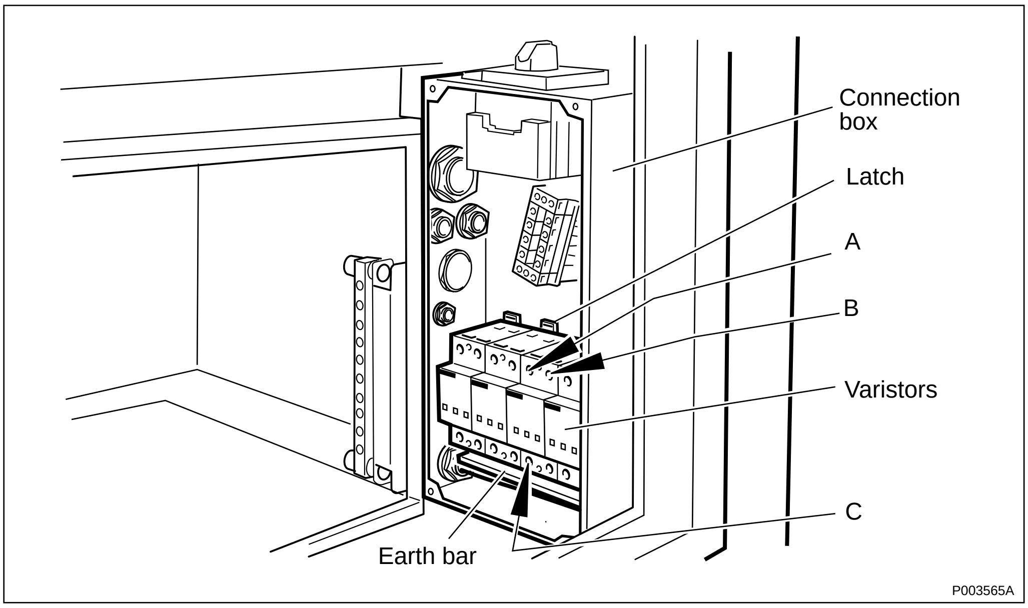


Figure 208 Varistors in the connection box

1. Isolate the entire cabinet from AC mains power. The AC mains switch is located somewhere external to the RBS.
2. Remove the ACCU.
3. Open the connection box by unscrewing the four screws on top of the lid.
4. Pull up the the white latch of all varistors and remove the varistors from the mounting bracket in the connection box.
5. Remove the earth bar from all varistors by loosening screws C. The earth cable to the rightmost varistor will be disconnected simultaneously.

6. Disconnect the cables on top of the defective varistor by loosening screws A and B.
7. Disconnect the sensor cable from the bottom of the defective varistor.
8. Replace the defective varistor.
9. Connect the cables from step 5 to the new varistor. Tighten screws A and B.
10. Connect the earthbar to all varistors. Tighten screw C on each of the varistors **except** the rightmost varistor.

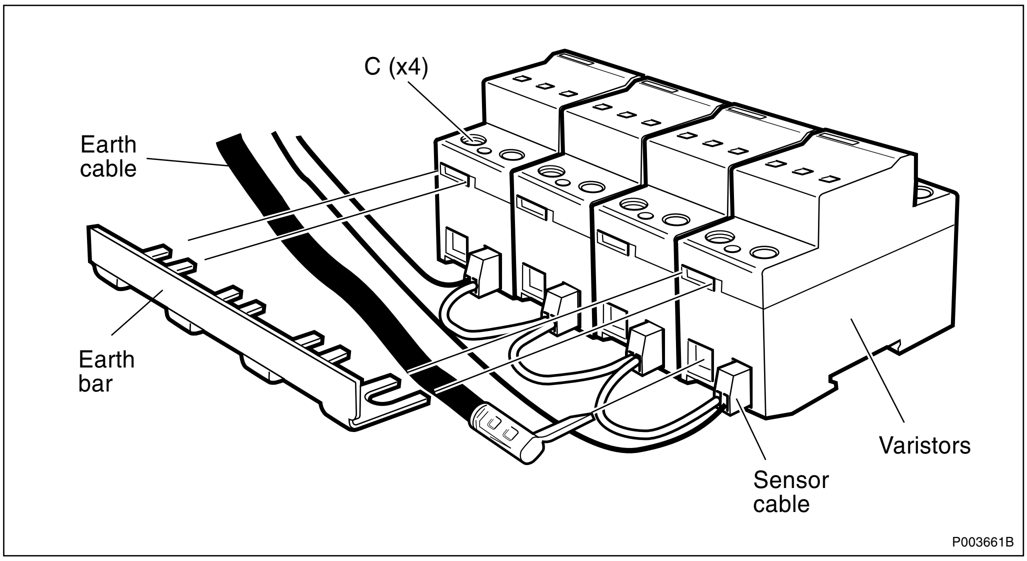


Figure 209 Connection of varistors

11. Connect the sensor cable to the replaced varistor. Check that the sensor cable is correctly connected to the other varistors.
12. Put all the varistors back onto the mounting bracket in the connection box. Push down the latch on each varistor and check that the varistor is correctly mounted.
13. Insert the eart cable into the rightmost varistor and tighten screw C.
14. Put the lid onto the connection box and tighten the four mounting screws.
15. Replace the ACCU.

Note: Unless under contractual warranty, after replacement, the varistor shall be disposed of locally. Do not return the varistor to Ericsson for replacement, repair or disposal.

7 Test after Repair

This chapter describes the methods for verifying the RBS. The intention is to verify that the problem has been solved and that the RBS is fully functional.

Note: All known faults must be cleared before performing the tests.

7.1 How to use Test after Repair

Note that after replacing some types of unit, only the section “Before Leaving the Site” in chapter *Concluding Routines* is used as a verification test.

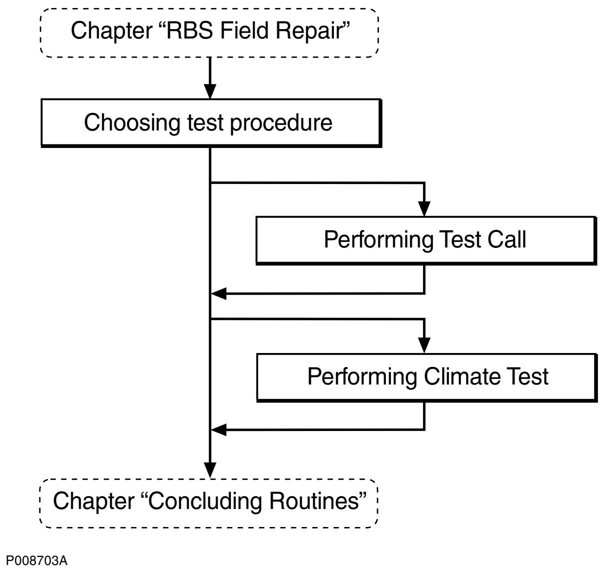


Figure 210 How to use Test after Repair

7.2 Choosing test procedure

Choose test procedure as given in the chapter Fault Localisation.

7.3 Performimg Test Call

Preconditions

Note: Test calls should be performed with a TEMS using the TEMS Software.

Test calls must be made when TRU(s) or CDU(s) have been replaced to ensure that the replaced unit(s) carry traffic.

To be able to make a test call on a specific Replacement Unit, you need information on the ARFCN(s) for the TRU(s). Contact the BSC personnel for information on ARFCN(s).

The test procedure is divided into two parts, that shall be made sequentially. The first test sequence of the downlink connection is monitored by the TEMS program. The second test sequence of the uplink connection is monitored by the OMT.

Note: Before starting with the test call, the Operational indicators on the DXU and TRUs should be lit. Set all units to remote mode.

Monitoring the Dedicated channel with a TEMS

1. Connect the TEMS to the PC serial port.
2. Start the TEMS program in the Windows environment.
3. Select **Enable Connections** in the **Externals** menu and specify the serial port for the TEMS.
4. Contact the BSC personnel to find out which ARFCN and TS that a test call should be performed on.

   The BSC personnel can use the printout command:

   ```
   RXCDP:MO=RXOTG-tg;
   ```

Note: The RXCDP gives, for the TG specified, the ARFCN and TN (timeslot number on the air interface) that corresponds to the equipment TS. The TS and TN are normally the same, but there are exceptions. Therefore always check the TN with RXCDP).

5. Choose **Cell Selection** in the **Control** menu.
6. Choose **Target frequency** and select the ARFCN for the TRU that is to be tested. Mark the frequency in the list.
7. Disable the Handover button in the **Cell Selection** menu.
8. Select **Status information** in the **Monitor** menu.
9. Choose Dedicated channel.
10. Make a call from the TEMS.
11. Monitor the Dedicated channel in TEMS and verify the downlink (DL) by checking that the targeted ARFCN and TN appear in the monitor.
12. Make repeated calls until the desired information appears in the monitor, *see the figure below.*

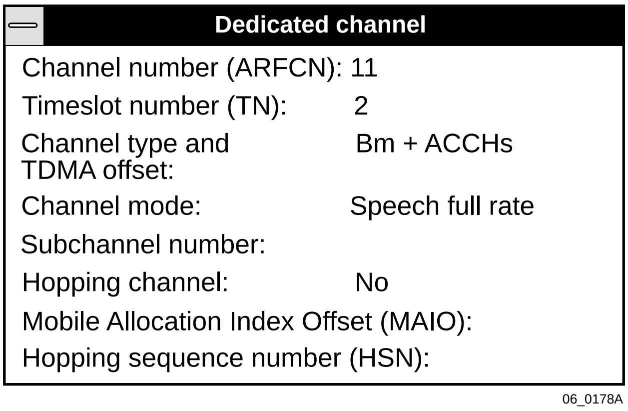


Figure 211 TEMS Dedicated channel monitor

Supervising the traffic channel with the OMT

1. Connect the OMT cable between the OMT connector on the DXU and the PC serial port.
2. Start the OMT program in the Windows environment.
3. Select **Connect** in the Connection menu.
4. Select the **Read IDB** function in the **File** menu.
5. Change view mode to **MO view**.
6. Select the appropriate TRXC object.
7. Choose **Operation Monitor**.
8. In the Monitor Setup dialogue box, scroll down the list and select the desired TCH-TS to monitor.
9. Make a call on the TEMS.
10. While a call is in progress in the correct timeslot, select the **Start monitor** button.
11. Check the **RX-LEV full** and **RX-LEV sub** values, *see the figure below* .

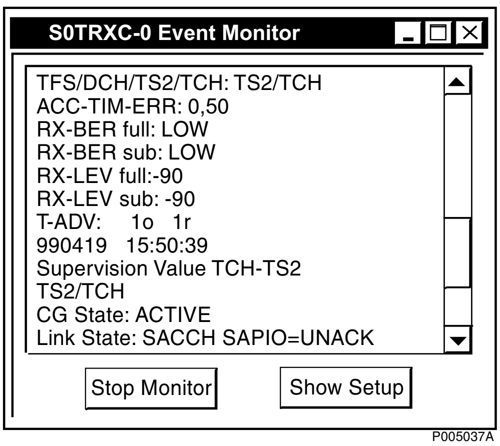


Figure 212 Example of OMT Supervision value TCH-TS 2

12. Repeat the procedure above for additional TN values as well as other TRUs.

13. Compare the RX-LEV values. Note that the values should be in the same range for all TRUs.

Before leaving the site

1. Proceed to *chapter Concluding Routines* and complete the checklist.

7.4 Performing Climate System Test

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Preface".

In the procedures below, (V1), (V2), (V3) and (V4) are used as abbreviations designating the four versions of the climate unit.

7.4.1 Climate System Test using Climate Unit Versions V1 and V2

The following procedures describe how to use the RBS 2102 climate unit tester, Ericsson part number LPB 111 142/1.

Note: The climate unit versions V1 and V2 use analogue signalling in the CCU, the climate unit versions V3 and V4 use digital signalling. Care must be used to select correct tester for the climate unit under test.

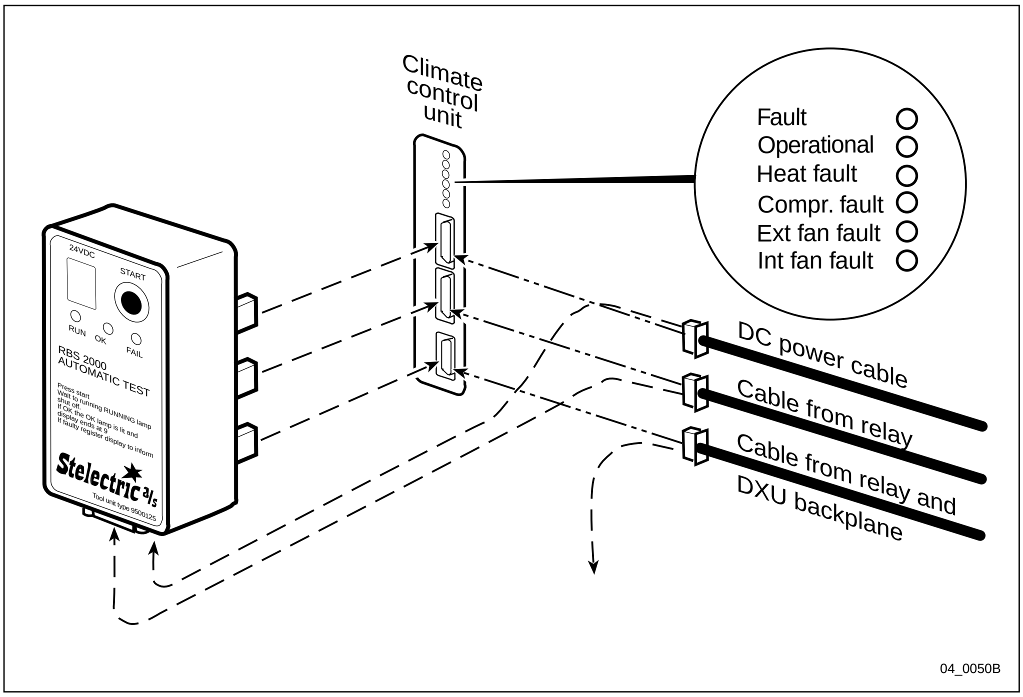


Figure 213 Test unit for air conditioner

Purpose

The purpose of the climate system test is to verify the operation of the climate unit. The test is passed when the test program has been run and no faults are detected.

Test Set-up

1. Disconnect the three cables on the front of the CCU.
2. Plug the test unit into the CCU.
3. Insert the "DC power cable" and the "Cable from relay" into the bottom of the test unit.
4. Disconnect the "Cable from relay and DXU/ECU backplane"at the CCU end as well as at the relay unit/AC interface.
5. Check that the yellow indicator labelled "Int fan fault" on the CCU is on before the test is started.

Test Operation

Note: To prevent damage to the coolant valve, wait approximately 4 minutes after each test before testing the same unit again.

1. Press the green START button on the tester to start the test sequence.
2. The indicator RUN is lit and the display shows which step is being performed
3. During the test the three indicators on the CCU, "Fault", "Operational" and "Heat fault", will flicker to show that the test is progressing normally.
4. A digital display on the tester shows the actual step being done. If a failure is detected, a red indicator FAIL is lit on the tester, the test stops and the digit on the display is fixed.
5. When the test is completed, the indicator "OK" on the tester and the indicator "INT FAN FAULT" on the CCU are lit. The number "9" will be displayed on the tester.

Note: If the START switch is continuously pressed during the test, the test unit will bypass failures. This can be used to continue the test even though a failure is detected.

The table below gives a brief description of what occurs during each step of the test.

Table 19 Test sequence and operations

Step	Operation
0	This is the initial step. The tester is connected, and all the fans plus the compressor are stopped.
1	Heat on. The heater fan will run at maximum speed and the heater will operate. The internal air fan will idle and the internal fan fail indicator will turn off. **Operator's action:** Depending on ambient temperature, the operator can observe, that the heater temperature air flow in front of the heater is rising by holding a hand in the heater air stream. The operator should also look at, and listen to, the heater fan to note that it is operating and generates no abnormal noise. **Note:** The heater is provided with a thermal switch. When the internal temperature reaches 40 °C, the heater coils are switched off, but the heater fan will still run.
2	Heat off. The heater will stop.
3	The heat exchanger fans (external and internal fans) are accelerated. In the beginning of this step, the external fan fail indicator will light, but will go off shortly afterwards.
4	The compressor starts. The following parts of the air conditioner section are activated: • Low pressure pressostat • Compressor • DX fan **Operator's action:** The operator can observe that the temperature of the internal air is falling by holding a hand in the internal air stream.
5	The pump down valve is indirectly switched off, and the compressor is forced to fail
6	When the coolant system has been pumped down, the low pressure pressostat will stop the compressor. The CCU assumes that the compressor must run, but it does not. The compressor failure indicator will be lit.
7	The control input for removing compressor fail is activated on the CCU. The compressor failure indicator will go off.
8	The internal and external fans are accelerated to maximum speed. **Operator's action:**The increase in the speed of the fans will be noticeable. The operator should listen to the fans to note that they are operating and generate no abnormal noise.
9	The internal and external fans are stopped. The internal fan fail indicator will be lit again. The test sequence is completed.

Test Fault Codes

The table below shows that each step number will in turn be the fault number if an error, or defect, is detected. The column "Fault localisation" shows which RUs could cause the fault. The RUs are numbered in the order that they should be replaced until the fault is cleared. After each RU is replaced, the test should be run again to see if the fault has cleared.

Table 20 Test sequence, fault codes, and possible faulty RUs

Step/ Fault no.	Test name	Simu- lated temp.	Time	Fault localisation (to be used if the test stops at this step)
0	Initial	0 °C	35 sec	None. Make sure that tester is properly connected to the CCU
1	Heat on	3 °C	20 sec	1. Heater 2. Relay unit or AC interface 3. CCU
2	Heat off	17 °C	10 - 95 sec	1. Relay unit or AC interface 2. CCU
3	Ext fan fail	33 °C	3 - 60 sec	1. Heat exchanger fans 2. CCU
4	Compressor on	45 °C	33 sec	1. DX control unit 2. CCU 3. Relay unit or AC interface 4. Active cooler
5	Compressor on, forced to fail	45 °C	20 - 90 sec	1. DX control unit 2. CCU 3. Relay unit or AC interface 4. Active cooler
6	Compressor fail	45 °C	1 sec	1. DX control unit 2. CCU 3. Relay unit or AC interface 4. Active cooler
7	Compressor fail	45 °C	20 - 90 sec	1. DX control unit 2. CCU 3. Relay unit or AC interface 4. Active cooler
8	Both fans max	60 °C	15 sec	1. Heat exchanger fans 2. CCU
9	Int fan fail	60 °C	Max 30 sec	1. Heat exchanger fans 2. CCU

7.4.2 Climate System Test using Climate Unit Versions V3 and V4

The following procedures describe how to use the RBS 2102 climate unit tester, Ericsson part number LPB 111 142/2.

Note: The climate unit versions V1 and V2 use analogue signalling in the CCU, the climate unit versions V3 and V4 use digital signalling. Care must be used to select correct tester for the climate unit under test.

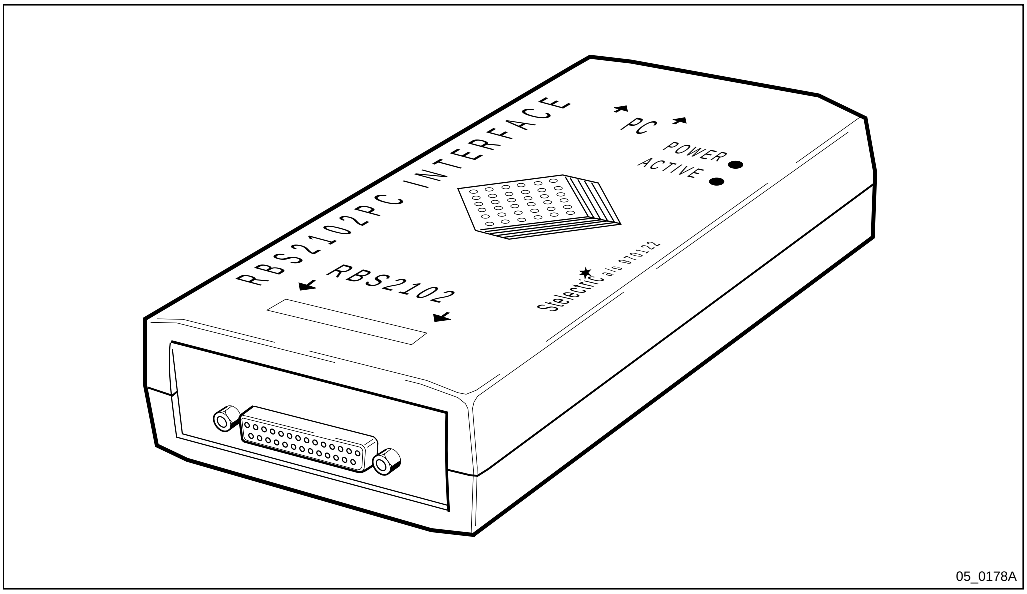


Figure 214 Tester for RBS 2102 climate unit versions V3 and V4

Purpose

The purpose of the climate system test is to verify the operation of the climate unit. The test is passed when the test program has been run and no faults are detected.

Connecting the tester to the climate unit

Refer to the picture below. The tester is equipped with two 25 pin D-sub connectors. The tester is labelled as to which end should be connected to the PC and which end should be connected to the climate unit.

1. Connect the tester to the PC as well as to the center connector of the climate unit.

2. Use the internal battery of tester or connect the tester to the service outlet of the ACCU.

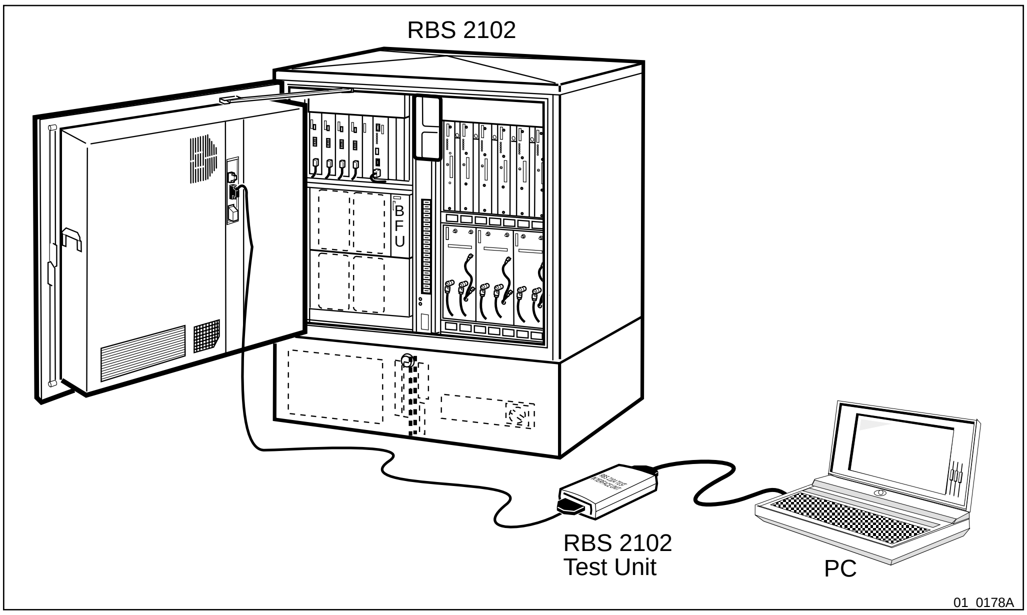


Figure 215 Test setup

Running the test program

1. Click on the RBS 2102 icon in the Program Manager. A test panel will appear on the computer screen. For a description of the test panel refer to the heading "Test panel" in this section.

2. Click on the button Run Test (F1) on the test panel or, alternatively, press the F1 key on the keyboard.

When all connections are properly terminated, the green indicator POWER on the test box will light. The internal fan will also stop operating. As the program is run, the yellow indicator ACTIVE on the test box will flicker. This indicates that there is a good connection between the PC and the CCU and that they are communicating.

3. If you fail to get either of these indications, do the following:

   – Check that the cables to the CCU and the PC are connected properly and not defective.

   – Check that the +27 V DC cable to the CCU is OK.

   – Check that the fuse labelled "Int. fan" on the CCU is OK.

4. Prior to starting the test, select the Status panel and press the Update key. This will give the CPU version from the CCU and the Program version of the test box.

Note: If there is no power to the test box, the Status Panel will give the value 65535 in the two fields "CPU Version" and "Program Version".

If the LPT address is incorrect, the Status Panel will give the value 30583 in the two fields "CPU Version" and "Program Version".

Test panel

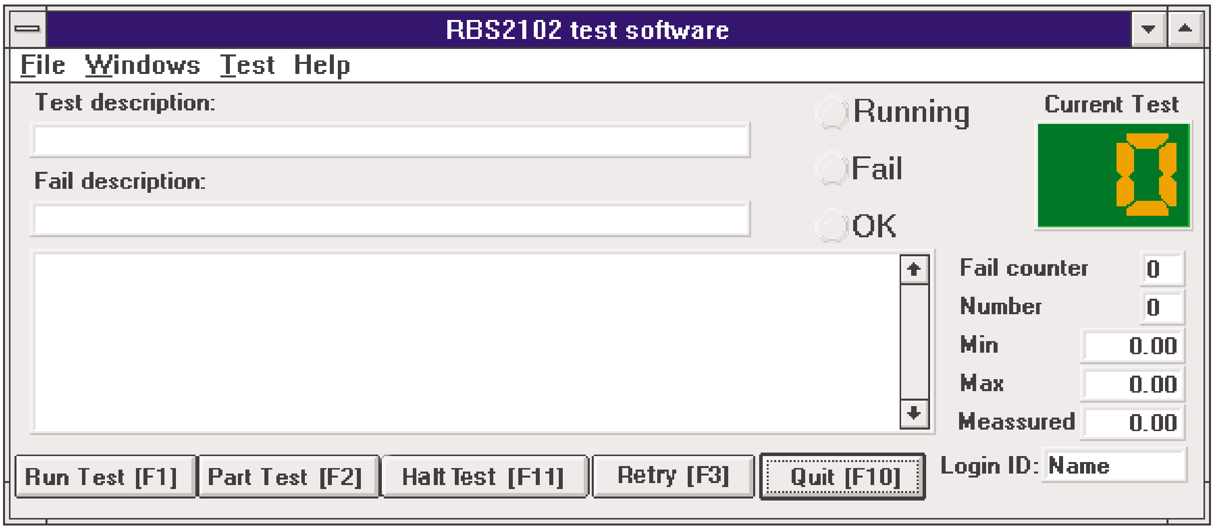


Figure 216 Test panel

Below is given a list of the different parts of the test panel, fields, buttons and indicators and their basic functions:

Label	Function
Test description	The text in the window describes the current test being performed.
Fail description	Should the test unit detect a fault, the suspected unit generating the fault will be displayed here.
	In the larger field below will be listed suggested sections of this manual, which should be used for further fault localisation. The actions are listed in probability order. By that, it is meant that action A is the most likely cause of the fault, action B the next likely and so forth.
Run Test (F1)	Use this button to run the entire automatic test from beginning to end.
Part Test (F2)	Use this button to select at which point in the test series you wish to begin. In this case, the test will run from the selected test step to the final test. The following sub-list gives the range of steps for each Part Test.

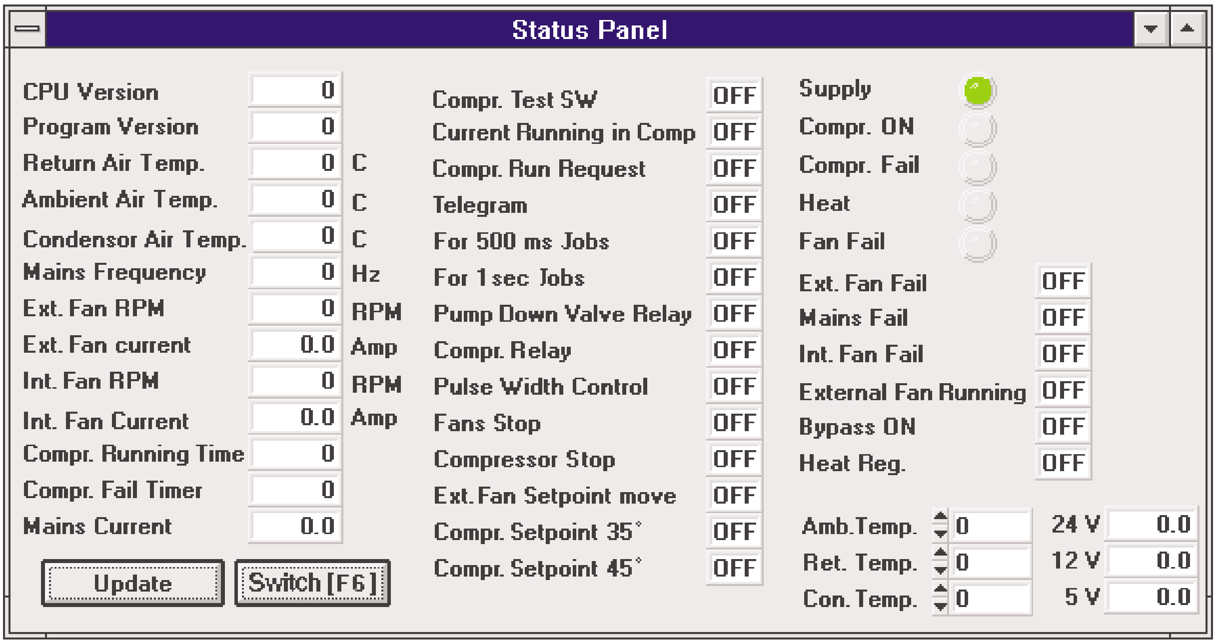
Steps	**Description**
1 to 9	Initial
10 to 19	Heat Test
20 to 29	Int. and Ext Fan Test
30 to 39	Compressor and Condenser Fan Test
60 to 69	Int. and Ext. Fan bypass Test
77	Switch unit off
78	Saving test results

Halt Test (F11)	This button stops any test in progress. A dialogue box will appear, asking you to verify whether or not you wish to stop the test. The answer YES will stop the test, whereas NO will continue the test.
Retry (F3)	If a failure is detected the program will halt. At this point the necessary corrective action as shown under Fail description can be performed. After the corrective action is completed, the Retry button enables immediate retesting of the failed unit.
Quit (F10)	This button is used to exit the program. A dialogue box will appear, asking you to verify whether or not you wish to exit the test. The answer YES will exit the test, whereas NO will return you to the test panel.
Min, Max and Measured	These fields show the minimum, maximum and the actually measured values of the current test described in the field Test description.
Number	This field shows the current subpoint being performed of the main test point. If a fault is detected, the number in this field indicates which number in the corrective action window to refer to. For example if the number 2 is shown, refer to the number 2 in the corrective action window to determine the required corrective action.
Fail counter	A test will be run up to 15 times nominally before a complete fail is registered. This multiple fail function simulates the way in which the ECU monitors the climate system and prevents erroneous failure indications.
Login ID	This field shows the user ID. The default is Ericsson.
Current Test	This field shows which test that is currently running.
Running	This yellow indicator is lit whenever the tester is performing a test.
Fail	This red indicator is lit whenever a fault is detected.
OK	This green indicator is lit when the entire test sequence has been successfully completed.

Note: When the test data has been saved, all indicators will go out.

Status Panel

A status panel, showing various data from the test just completed, can be accessed from the test panel screen.



04_0178A

Figure 217   Status Panel

Opening and closing the Status panel:

Opening the Status Panel

1. Select the Program Manager.
2. Click on the Status Panel icon in the Program Manager.

Closing the Status Panel

1. Select the test panel window.
2. Press the F6 key on the keyboard.

Functions in the Status Panel:

Update When this button is clicked, the fields on the Status Panel are updated. The update function is always the same, whether it is a complete or a partial test.

CPU Version	The CPU version of the CCU is displayed.
Program Version	The program version of the tester is displayed.
Data fields	The test data from the climate unit test are displayed.

Switch [F6] The test panel window becomes active and the Status Panel becomes inactive.

Alternatively, press the F6 key on the keyboard.

Amb. Temp Ambient air temperature. This is a simulated test value, that can be set manually from 0 °C to +60 °C ±2 °C. The default value is +20 °C.

Ret. Temp Return air temperature. This is a simulated test value, that can be set manually from 0 °C to +60 °C ±2 °C. The default value is +20 °C.

Con. Temp Condensor air temperature. This is a simulated test value, that can be set manually from 0 °C to +60 °C ±2 °C. The default value is +20 °C.

Changing the air temperatures in the Status Panel

1. Set the temperature value using either of the three following methods:

   • Click on the up or down arrow to the left of the field to increase or decrease the temperature setting in steps of 1 °C at a time.

   • Press repeatedly the tab key on the keyboard until the cursor stops at the setting, that you wish to change. Press the up or down arrow key on the keyboard to increase or decrease the temperature setting in steps of 1 °C at a time.

   • Press repeatedly the tab key on the keyboard until the cursor stops at the setting, that you wish to change. Then, press the Delete key and type in the new temperature value.

2. When the desired temperature has been set, click on the Update button in the Status Panel.

   The other values will be changed to reflect the performance of the climate unit at the selected temperature values. This may take a few seconds as the system (climate unit and test box) adjusts.

Saving the test results

When the test is completed, a dialogue box will appear, asking for the unit serial number. The following procedure will save the test results:

1. Enter an 8-character alphanumeric designator, such as the serial number of the climate unit, or the RBS site designator

2. Click the OK button in the dialogue box.

The test results will now be saved in an Excel file in the directory Testdata of the PC's C drive. Two separate files will be created. They are:

XX.ER1	This file contains all the testdata from the last test in one line. If the unit is retested, the testdata will be stored in the next line of the file. Multiple tests on the same unit can be stored in this file.
XX.ER2	This file contains only the INT and EXT fans RPM and current measurements. Multiple tests on the same unit can be stored in this file. It is recommended to make a copy of this file onto a diskette in the A drive and leave the diskette at the RBS site. This information will be able to help track if the fans are starting to break down.

Viewing the test result files

If you wish to view either file, use a normal text editor, or a spreadsheet program such as Excel. You can also copy the test data to the file called DATATEXT.XLS which is found on the C drive under the directory C:\RBS 2102. To do this:

1. Open the file DATATEXT.XLS.

2. Open either the XX.ER1 or XX.ER2 file.
3. Select all cells of the desired ER file by clicking the Select All button. The Select All button is found in the worksheet, where the row and column headings meet.
4. Copy the ER worksheet by pressing the Ctrl+C keys on the keyboard.
5. Select the window with the file DATATEXT.XLS.
6. Paste the copied ER worksheet by pressing the Ctrl+V keys on the keyboard.

Each column in the DATATEXT.XLS file is labelled so that the data under it will be easier to interpret.

An explanation of the printed report is contained in the document 1524-LPB 111 142/2.

Full operation instructions are found in the document 1553-LPB 111 142/2

Before leaving the site

1. Proceed to chapter *Concluding Routines* and complete the checklist.

8 Concluding Routines

The following is a description of the different administrative routines that must be carried out as a result of a maintenance procedure.

8.1 Before Leaving the Site

The following checklist is strongly recommended. Local procedures and safety regulations must be evaluated and incorporated into this checklist.

Do not leave the site until the problem/fault has been cleared or investigated.

Table 21 Before leaving the site, checklist.

ITEM		OK
1	The BS fault indicator on DXU is off.	
2	The red fault indicators are off.	
3	All operational green indicators are on.	
4	The RBS is in remote mode	
	a The yellow local mode indicator on the DXU is off.	
	b The yellow local mode indicators on all TRUs are off.	
5	All the warning signs are fixed and located correctly in the cabinet.	
6	All RU positions are filled with either an RU or a dummy.(1)	
7	The cabinet is dry inside.	
8	The inside and outside of the cabinet is free from mechanical damage and rust.	
9	The radio sub-cabinet and mounting base are free from foreign objects and all cables are undamaged.	
10	The back-up copy of the RBS IDB is saved on a disk.	
11	All tools are accounted for.	
12	The drainage holes at the bottom of the sub-cabinet door are free from obstructing particles and dust.	
13	The cabinet is locked (including mounting base).	
14	The external air intake is free from obstructions.	
15	All other necessary paper work is completed.	
16	The defective part packed for for shipment including repair delevery note (Blue Tag).	
17	The hazard lights on the antenna are operational.	
18	The antennas, towers, and RF cables are operational.	
19	The OMC is notified and alarms are ceased.	
Signature:		
Date:		

(1) Empty RU positions for the CDU, PSU and TRU must be occupied with dummies. The dummies will secure correct cooling airflow to units in operation. Neglecting the use of dummies can result in overheated units.

8.2 Report of Finished Work

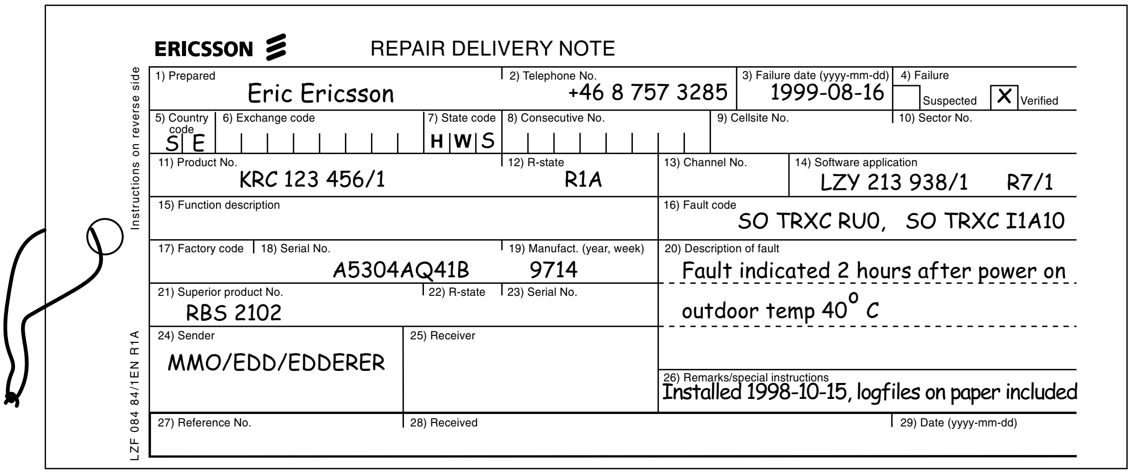
When a maintenance procedure has been completed, a report will be written including a detailed description of actions taken, all observations made in accordance with local routines for work orders, site log-book and so on.

8.3 Repair Delivery Note – “Blue Tag”

When a faulty unit is returned, it must be accompanied by a repair delivery note. When the note has been completed it must be attached to the faulty unit with a string, before sending it for repair. Tape can only be used to attach the note to the sides of the unit.

Note: Do not tape a repair delivery note on the front panel as it is hard to remove and causes extra work at the Ericsson repair center.

The repair delivery note LZF 084 84 can be ordered from the local FSC. A description of how to fill in a repair delivery note follows below.


ERICSSON REPAIR DELIVERY NOTE

Instructions on reverse side

LZF 084 84/1EN R1A

1) Prepared	Eric Ericsson
2) Telephone No.	+46 8 757 3285
3) Failure date (yyyy-mm-dd)	1999-08-16
4) Failure	Suspected ☐ Verified ☒
5) Country code	SE
6) Exchange code	
7) State code	HWS
8) Consecutive No.	
9) Cellsite No.	
10) Sector No.	
11) Product No.	KRC 123 456/1
12) R-state	R1A
13) Channel No.	
14) Software application	LZY 213 938/1 R7/1
15) Function description	
16) Fault code	SO TRXC RU0, SO TRXC I1A10
17) Factory code	
18) Serial No.	A5304AQ41B
19) Manufact. (year, week)	9714
20) Description of fault	Fault indicated 2 hours after power on outdoor temp 40° C
21) Superior product No.	RBS 2102
22) R-state	
23) Serial No.	
24) Sender	MMO/EDD/EDDERER
25) Receiver	
26) Remarks/special instructions	Installed 1998-10-15, logfiles on paper included
27) Reference No.	
28) Received	
29) Date (yyyy-mm-dd)	

The following fields are mandatory. Use block letters.

1	Prepared	Service technician´s name
2	Telephone	Service technician´s telephone number
3	Failure date	
4	Failure	Mark with an X if failure is Suspected or Verified
5	Country code	Two letter country code
7	State code	Hardware (HW) status when failure occurred: S = Unit in service when failure occurred (Repair) T = New unit failed during installation or test (Claim) R = Repaired unit failed during installation or test (Claim or Repair)
11	Product No.	Faulty unit
12	R-state	Faulty unit
14	Software application	RBS load, product number and R-state
16	Fault code	Check OMT or work order
18	Serial No.	Faulty unit
19	Manufact. (year week)	
20	Description of fault	Observations and external factors
21	Superior product No.	RBS type
24	Sender	Customer, Company, Corporate ID
26	Remarks/special instructions	Information about installation date, logfiles and modification requirements

P005537C

Figure 218 The “Blue tag”

The above explanations to the Repair delivery note are also given on its reverse side.

8.4 Handling of Replaced Parts and RUs

Replaced parts and RUs are divided into three categories:

- Customer disposable
- Customer repairable
- Depot repairable

The definitions of these categories as well as explanations how to treat the parts is given below.

Customer disposable

Customer disposable parts are consumable parts, which have no lower sub-assembly or component that can be used to repair them.

These items are identified in the RBS *Spare Parts Catalogue, Appendix B*, as "Recommended spare parts for customer stock (not repairable)" or "Other available parts".

Examples of these parts are:

- Cables and wiring
- Connectors
- Fuses, circuit breakers, varistors and overvoltage arresters
- Fans, compressors and heaters
- Printed circuit board assemblies (circuit cards, backplanes, temperature sensors and humidity sensors)
- Batteries
- Antennas
- Transformers
- Capacitors
- Mechanical hardware (doors, hinges, plates, locks, seals, gaskets, brackets and other parts of the RBS cabinet)

Unless under contractual warranty, after replacement, these parts shall be disposed of locally. Do not return these parts to Ericsson for replacement, repair or disposal.

Customer repairable

Customer repairable parts are such parts, which have a lower sub-assembly or component that can be used to repair them.

These items are identified in the appropriate RBS *Spare Parts Catalogue, Appendix B* as "Recommended spare parts for customer stock (not repairable)" or "Other available parts".

Examples of these parts are:

- Climate units (air conditioner, active cooler and heat exchanger)
- ACCU
- IDM

Unless under contractual warranty, after replacement, these parts shall be repaired locally at the RBS site or in a local repair shop. If the ACCU is unrepairable, it shall be disposed of locally by the customer. Do not return the ACCU to Ericsson for replacement, repair or disposal.

Depot repairable

Depot repairable parts are for direct one to one replacement at the RBS site.

These items are identified in the RBS *Spare Parts Catalogue, Appendix B*, as "Recommended spare parts for customer stock (repairable)".

Examples of these parts are:

- ALNA
- BFU
- CDU
- DC/DC converter
- DXU

- ECU
- PSU
- TRU

After replacement, these parts must be returned to Ericsson for repair. Maintenance personnel must attach a repair delivery note, LZF 084 64 (Blue Tag), to the returned part. The repair delivery note shall include a clear description of the fault found. Refer to the section "Repair Delivery Note – ‘Blue Tag’" for instructions on completing a repair delivery note.

8.5 Transport of a Repairable Unit

The repairable unit must be protected against ESD and damage due to transport. Therefore the repairable unit must be packed in an ESD-insulated plastic bag and transported in a shock-absorbing box. This must be done by re-using the same packing material as the spare unit was delivered in. See *Spare Parts Catalogue, Appendix B,* to determine which repairable units should be returned for repair.

8.6 Trouble Report on Equipment or on this Manual

A trouble report should be written when system components are not operating as expected or when disturbances occur repeatedly. It should not be written for occasional hardware failures. A trouble report should also be written when a fault is found in this manual. Any comments on this manual can be submitted in a similar way.

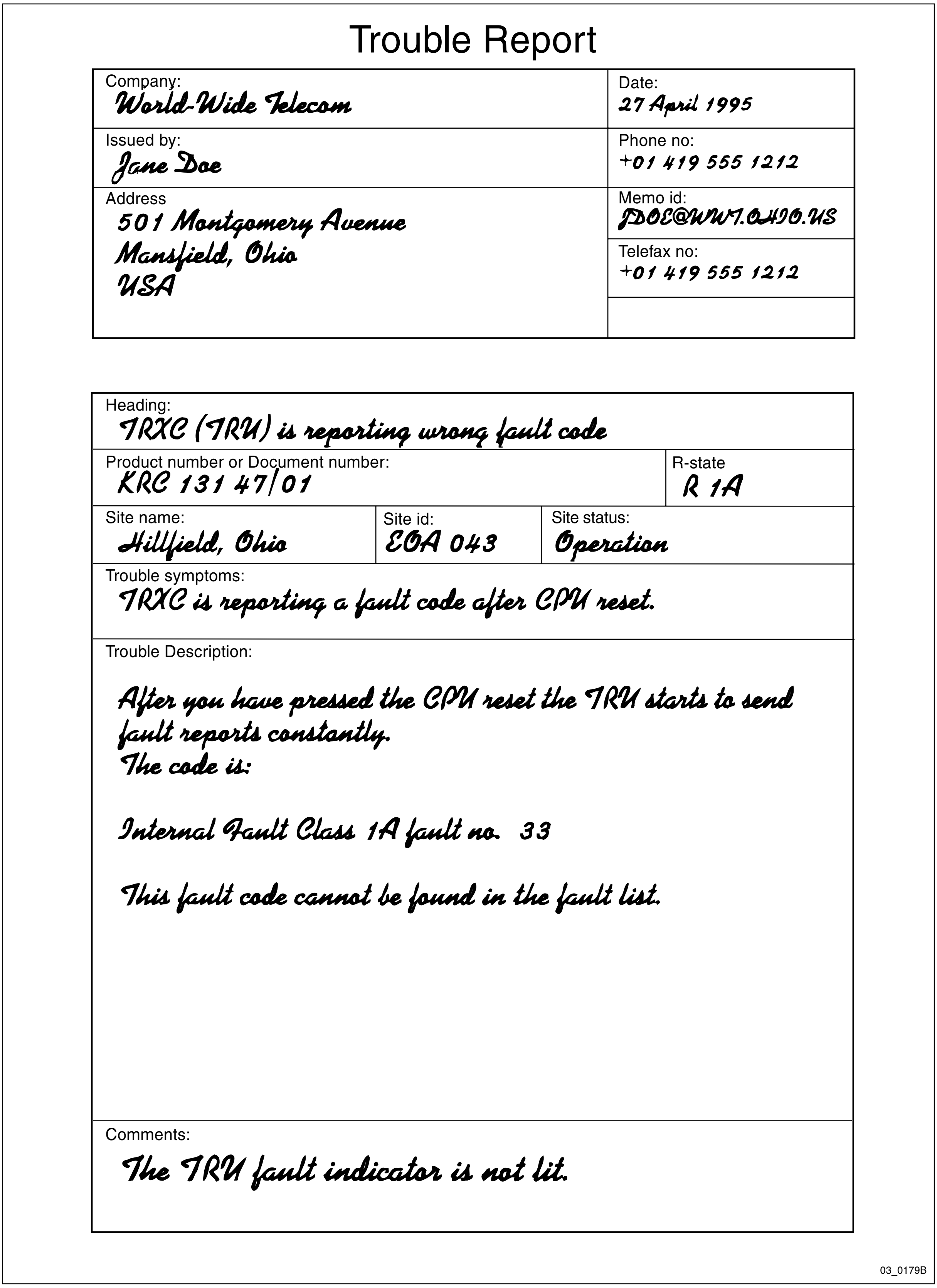
When writing a trouble report, always include as much information as possible. Write the trouble report as soon as possible, preferably at the RBS site. The next pages contain an example of a filled-in trouble report and a blank trouble report.

The trouble report should be sent to the nearest FSC for resolution and registration in the Ericsson trouble report system MHS (Modification Handling System). The FSC should forward the trouble report via the node MHO ERA BTS.

8.6.1 Special Explanations

Product number	The product number can be found on the label of the unit. For example KRC 131 47/01
R-state	Revision state, found on the label of the unit after the product number. For example R1A
Site status	Can be “Installation Test” or “Operation”

8.6.2 Example of Filled-in Trouble Report



Trouble Report

Company: World-Wide Telecom	Date: 27 April 1995
Issued by: Jane Doe	Phone no: +01 419 555 1212
Address 501 Montgomery Avenue Mansfield, Ohio USA	Memo id: JDOE@WWT.OHIO.US Telefax no: +01 419 555 1212

Heading: TRXC (TRU) is reporting wrong fault code

Product number or Document number: KRC 131 47/01	R-state R 1A

Site name: Hillfield, Ohio	Site id: EOA 043	Site status: Operation

Trouble symptoms: TRXC is reporting a fault code after CPU reset.

Trouble Description:

After you have pressed the CPU reset the TRU starts to send fault reports constantly.
The code is:

Internal Fault Class 1A fault no. 33

This fault code cannot be found in the fault list.

Comments: The TRU fault indicator is not lit.

03_0179B

Figure 219 Example of filled-in trouble report

8.6.3 Trouble Report, Blank

Trouble Report

Company:	Date:
Issued by:	Phone No:
Address:	Memo Id:
	Telefax No:

Heading:			
Product number or Document number:			R-state:
Site Name:	Site Id:	Site status:	
Trouble Symptoms:			
Trouble Description:			
Comments:			

02_0179B

Figure 220 Trouble report, blank

This page is intentionally left blank

9 Optical Indicators and Switches

9.1 Indicator Types

RBS 2000 optical indicators are either red, green or yellow. The indicators can be on, off or flashing. Their general functions are:

- Red, fault
- Green, operational
- Yellow, status

9.1.1 Self test of indicators

On the RUs ECU, DXU and TRU, there is a self test of indicators performed at startup or restart. All indicators are switched on and remain switched on until the BTS software is started.

9.2 Units with optical indicators and switches

The BFU, CCU, CDU-A, CDU-C, CDU-C+, CDU-D, DC/DC Converter, DXU, ECU, PSU and TRU units in the cabinet are equipped with indicators.

The CCU (V3, V4, V5), DXU, ECU and TRU units in the cabinet are equipped with switches.

9.3 BFU

The BFU is installed in the BBS cabinet.

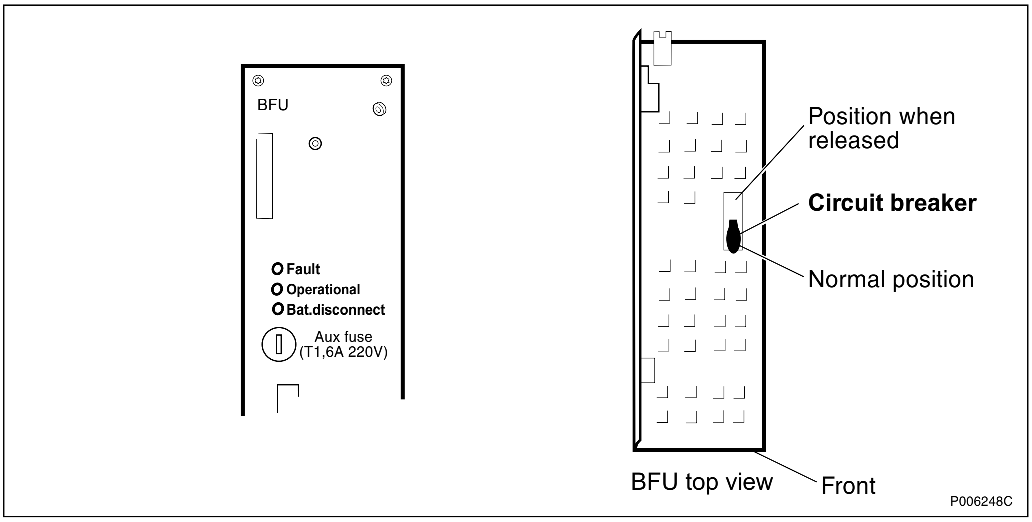


Figure 221 BFU

Table 22 BFU optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the BFU.
	On	One or more faults are localised in the BFU.
	Flashing	BFU revision 2 or later: Communication fault on the power communication loop.
Green, Operational	Off	The BFU is not operational.
	On	The BFU is operational.
	Flashing	BFU revision 1: Communication fault on the power communication loop.
Yellow, Battery disconnect	Off	Battery connected.
	On	Battery disconnected.

Table 23 BFU switch

Label	Position	Function
Circuit breaker	Normal position (ON)	Connects the battery power to the base station.
	Position when released (OFF)	Breaks the battery power to the base station.

9.4 CCU in climate unit (V3, V4 and V5)

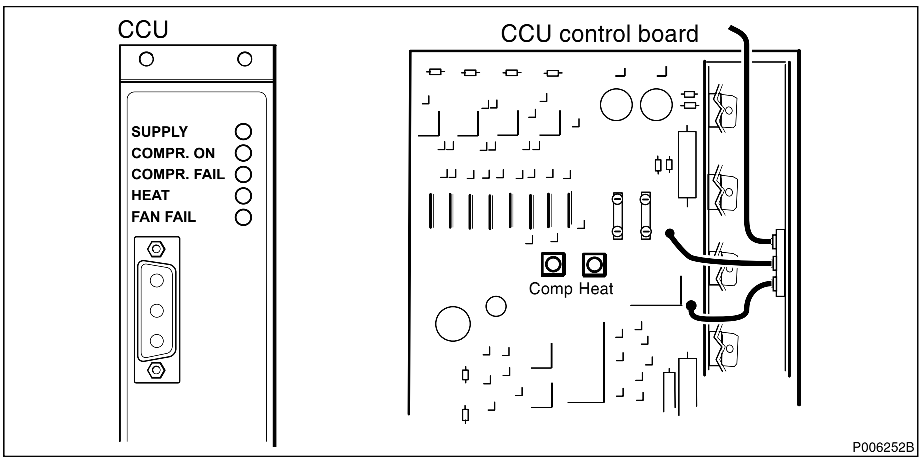


Figure 222 CCU (V3, V4 and V5)

Table 24 CCU optical indicators (V3, V4 and V5)

Colour, Label	Mode	Indication
Green, Supply	Off	No power to the CCU.
	On	Power to the CCU is OK.
Yellow, Compr. on	Off	The compressor is not operational.
	On	The compressor is operational.
Yellow, Compr. fail	Off	No faults detected in the compressor.
	On	One or more faults are detected in the compressor.
Yellow, Heat	Off	The heater is not operational.
	On	The heater is operational.
Yellow, Fan fail	Off	No fault is detected in the external or internal fan.
	On	One or more faults are detected in the external or internal fan.

Note: The switches are placed on the CCU control board, not on the CCU frontplate.

Table 25 CCU switches (V3, V4 and V5)

Label	Function
Comp	Tests the compressor function. The compressor starts when the button is pressed once and stops when pressed a second time.
Heat	Tests the heater function. The heater is in operation while the button is pressed.

9.5 CCU in climate unit (V1 and V2) and AC interface (V2)

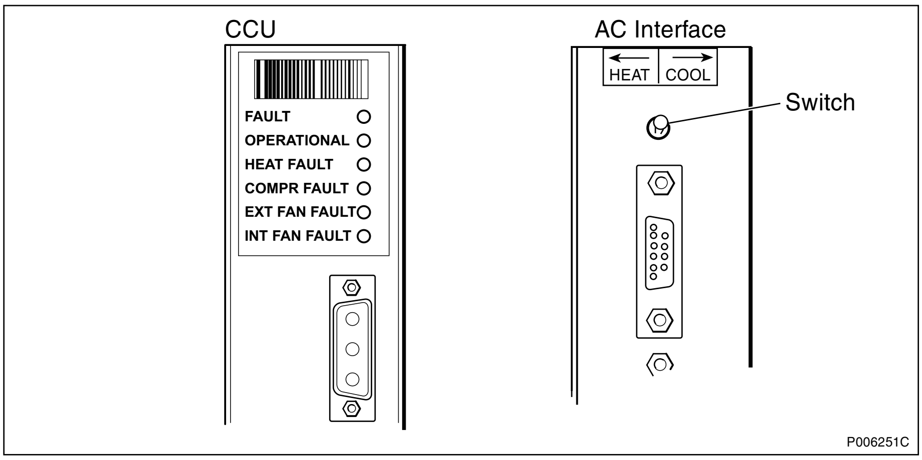


Figure 223 CCU (V1 and V2) and AC interface (V2)

Table 26 CCU optical indicators (V1 and V2)

Colour, Label	Mode	Indication
Red, Fault	Off	The indicator has no function.
Green, Operational	Off	The indicator has no function.
Yellow, Heat fault	Off	The indicator has no function.
Yellow, Compr. fault	Off	No fault is detected in the compressor.
	On	One or more faults are detected in the compressor.
Yellow, Ext. fan fault	Off	No fault is detected in the external fan.
	On	One or more faults are detected in the external fan.
Yellow, Int. fan fault	Off	No fault is detected in the internal fan.
	On	One or more faults are detected in the internal fan.

Table 27 AC interface switch (V2)

—	Position	Function
Heat	Right	Tests heater function. The heater starts when pressed to the right and stops when released.
Released	Middle	No action.
Cool	Left	Tests cooler function. The cooler starts when pressed to the left and stops when released.

9.6 CDU-A and CDU-C

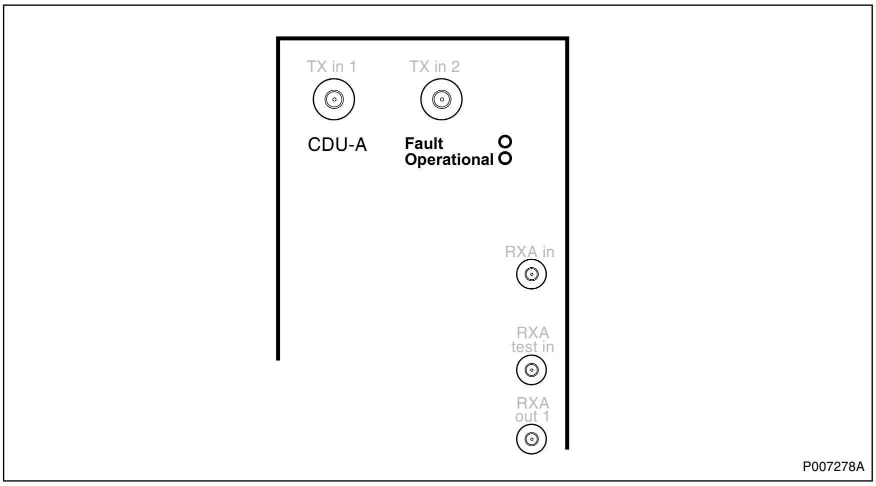


Figure 224 CDU-A

Table 28 CDU-A and CDU-C optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the CDU.
	On	One or more faults are localised in the CDU.
	Flashing	The CDU-A and CDU-C has detected lost communication to superior RU.
Green, Operational	Off	The CDU is not operational.
	On	The CDU is operational.

9.7 CDU-C+

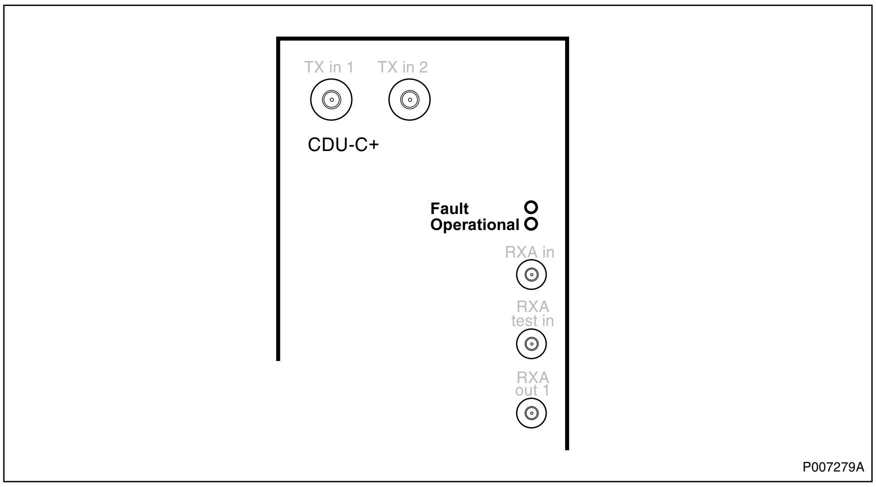


Figure 225 CDU-C+

Table 29 CDU-C+ optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the CDU.
	On	One or more faults are localised in the CDU.
	Flashing	The CDU-A and CDU-C has detected lost communication to superior RU.
Green, Operational	Off	The CDU is not operational.
	On	The CDU is operational.

9.8 CDU-D

The CDU-D consists of three different types of subunits (number of units in parenthesis):

- CU (1–3)
- FUd or FU (1)
- DU (1)

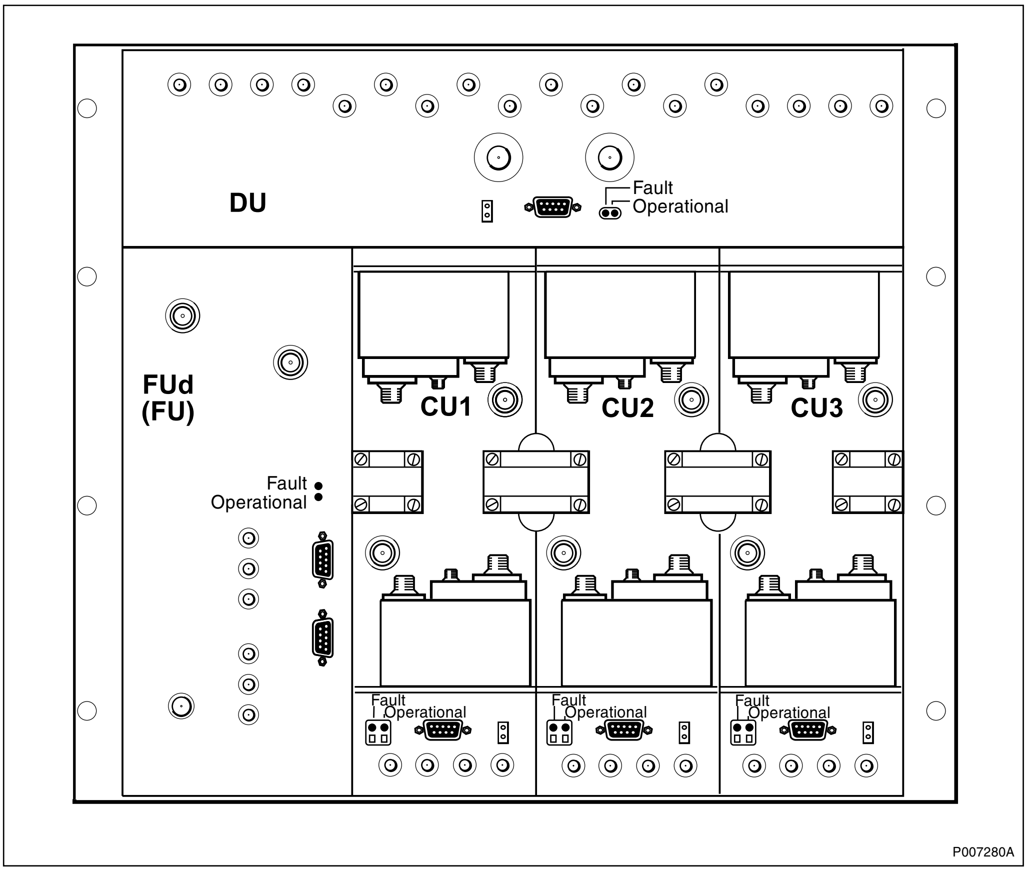


Figure 226 A typical configuration of the CDU-D

CU

Table 30 The CU (subunit to CDU-D) optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the CU.
	On	A fault is localised in the CU.
	Flashing	One of the following applies: • RBS database is missing for DXU, or CU data for any RU is missing. • Software in RBS is missing.
Green, Operational	Off	The CU is not operational.
	On	The CU is operational.
	Flashing	Software is being received.

FUd and FU

Table 31 The FUd and FU (subunits to CDU-D) optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the FUd/FU.
	On	A fault is localised in the FUd/FU.
	Flashing	RBS database is missing for DXU, or FUd/FU data for any RU is missing.
Green, Operational	Off	The FUd/FU is not operational.
	On	The FUd/FU is operational.

DU

Table 32 The DU (subunit to CDU-D) optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the DU.
	On	A fault is localised in the DU.
	Flashing	RBS database is missing for DXU, or DU data for any RU is missing.
Green, Operational	Off	The DU is not operational.
	On	The DU is operational.

9.9 DC/DC Converter

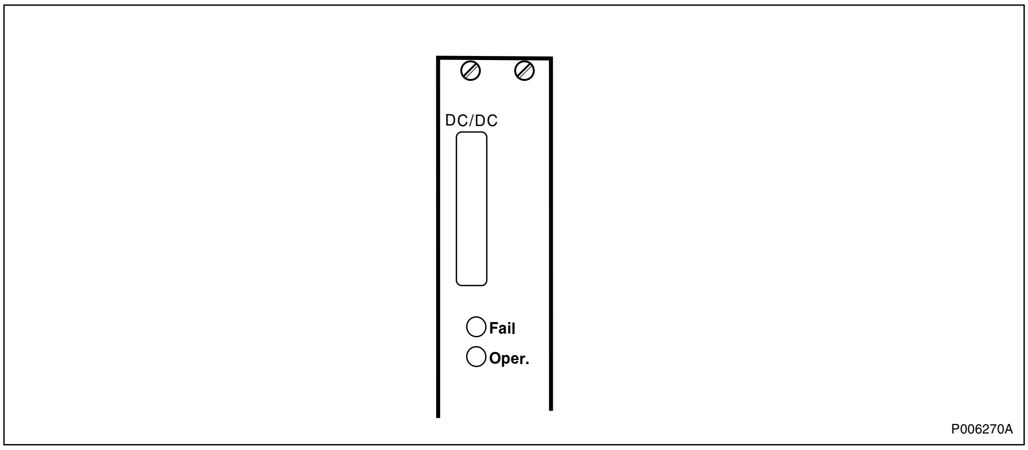


Figure 227 DC/DC Converter

Table 33 DC/DC Converter optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the DC/DC converter.
	On	One or more faults are localised in the DC/DC converter.
	Flashing	One of the following applies: • RBS database is missing for DXU, or DC/DC converter database for any RU is missing. • Software is missing. • The DC/DC converter has detected lost communication to superior RU.
Green, Operational	Off	The DC/DC converter is not operational.
	On	The DC/DC converter is operational.

9.10 DXU

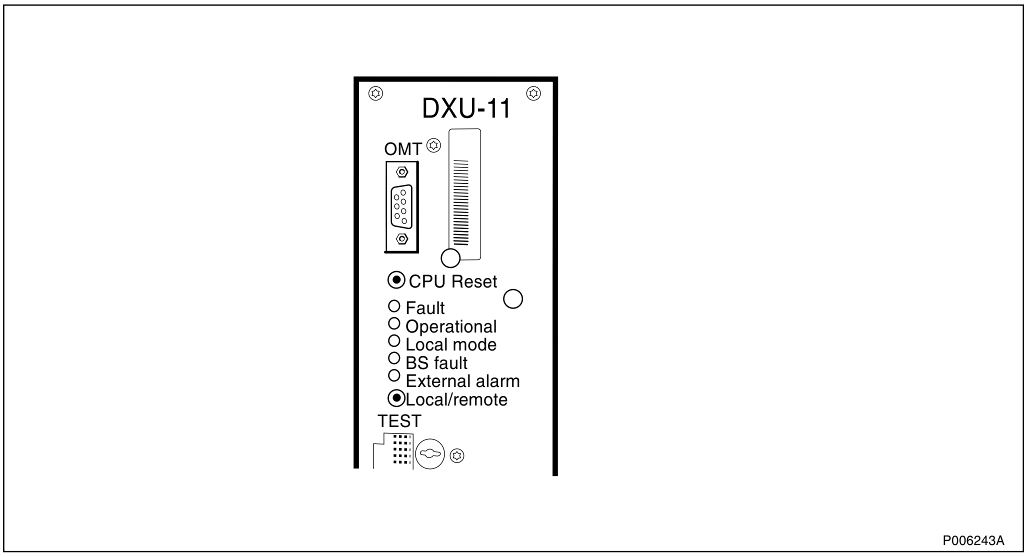


Figure 228 DXU

Table 34 DXU optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the DXU.
	On	One or more faults are localised in the DXU.
	Flashing	One of the following applies: • RBS database is missing for DXU. •Software is missing.

Colour, Label	Mode	Indication
Green, Operational	Off	The DXU is not operational.
	On	The DXU is operational.
	Flashing	One of the following applies: • Software is being received. • Configuration activity in progress which may take longer than 10 seconds to complete. • Restart by BSC pending.
Yellow, Local mode	Off	The DXU is in remote mode. The DXU is controlled by the BSC.
	On	The DXU is in local mode. The DXU has no established link to the BSC.
	Flashing	A change of the DXU mode (from local mode to remote mode or from remote mode to local mode) is in progress. The link between the BSC and the RBS is being established or released.
Yellow, BS fault	Off	No faults are detected in the RBS.
	On	One or more faults are detected in the DXU or in the RBS.
Yellow, External alarm	Off	No external alarms are active.
	On	One or more external alarms are active.

Table 35 DXU switches

Label	Function
CPU reset	Resets the DXU, the ECU and the TRU.
Local/remote	Changes the DXU mode between local and remote.

9.11 ECU

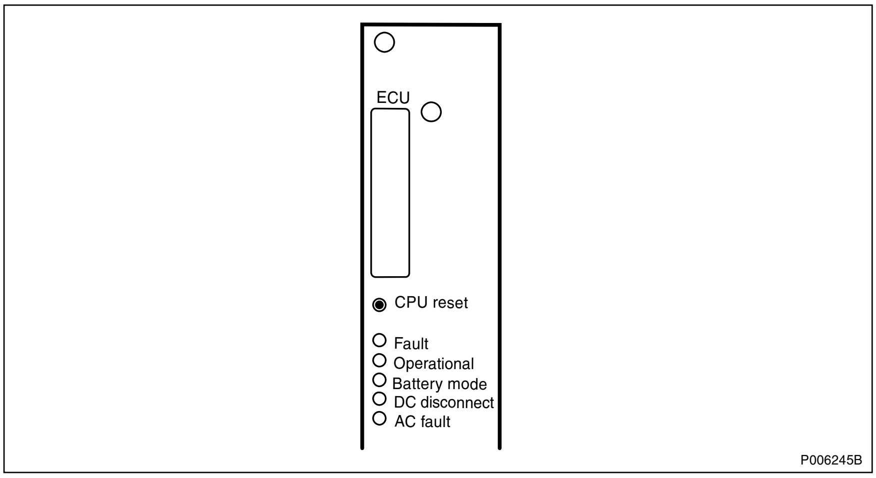


Figure 229 ECU

Table 36 ECU optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is localised in the ECU.
	On	One or more faults are localised in the ECU.
	Flashing	One of the following applies: • RBS database is missing for DXU, or the ECU database for any RU is missing. • Software is missing. • The ECU has detected lost communication to superior RU (DXU).
Green, Operational	Off	The ECU is not operational.
	On	The ECU is operational.
	Flashing	Software is being received.
Yellow, Battery mode	Off	Mains power supply only.
	On	The RBS is powered from batteries.
Yellow, DC disconnect	Off	Environmental conditions are fulfilled.
	On	Environmental requirements are not fulfilled and power to the rest of the RBS is switched off.
Yellow, AC fault	Off	No AC fault.
	On	Mains power is faulty.

Table 37 ECU switches

Label	Function
CPU reset	Resets the ECU.

9.12 PSU

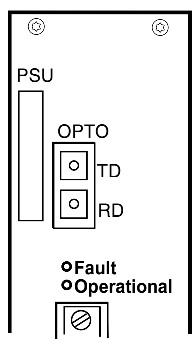


Figure 230 PSU

Table 38 PSU optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is detected in the PSU.
	On	New version: A fault is localised in the PSU. Old version: A fault is localised in the PSU or the PSU is not supplied with power.
	Flashing	The PSU has detected lost communication to superior RU. The opto bus cable can be faulty.
Green, Operational	Off	The PSU is not operational.
	On	The PSU is operational.

9.13 TRU

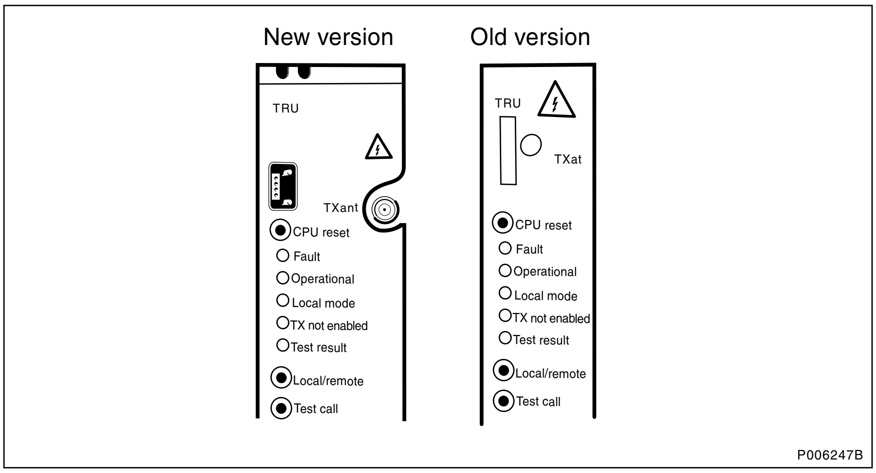


Figure 231 TRU, new and old version

Table 39 TRU optical indicators

Colour, Label	Mode	Indication
Red, Fault	Off	No fault is detected in the TRU.
	On	A fault is localised in the TRU.
	Flashing	One of the following applies: • RBS database is missing for TRU. • Software is missing. • The TRU has detected lost communication to superior RU (DXU).

Colour, Label	Mode	Indication
Green, Operational	Off	The TRU is not operational.
	On	The TRU is operational.
	Flashing	One of the following applies: • Software is being received. • Configuration activity in progress which may take longer than 10 seconds to complete. •Restart by BSC pending.
Yellow, Local mode	Off	The TRU is in remote mode. The TRU is controlled by the BSC.
	On	The TRU is in local mode. The TRU is controlled by the RBS.
	Flashing	A change of the TRU mode (from local mode to remote mode, or from remote mode to local mode) is in progress. The link between the BSC and the RBS is being established or released.
Yellow, TX not enabled	Off	TX is enabled.
	On	TX is not enabled.
Yellow, Test result	Off	The indicator has no function.

Table 40 TRU switches

Label	Function
CPU reset	Resets all units subordinated to the TRU.
Local/remote	Changes the TRU mode between local and remote.
Test call	The switch has no function.

10 Preventive Maintenance

During normal use, parts of the RBS become dirty or worn. To prevent a fault within the RBS, regularly scheduled cleaning or replacement of parts is necessary.

This chapter gives the information needed to perform preventive maintenance. The process causes a minimum of interruption to the RBS's operation.

10.1 Preventive Maintenance Process

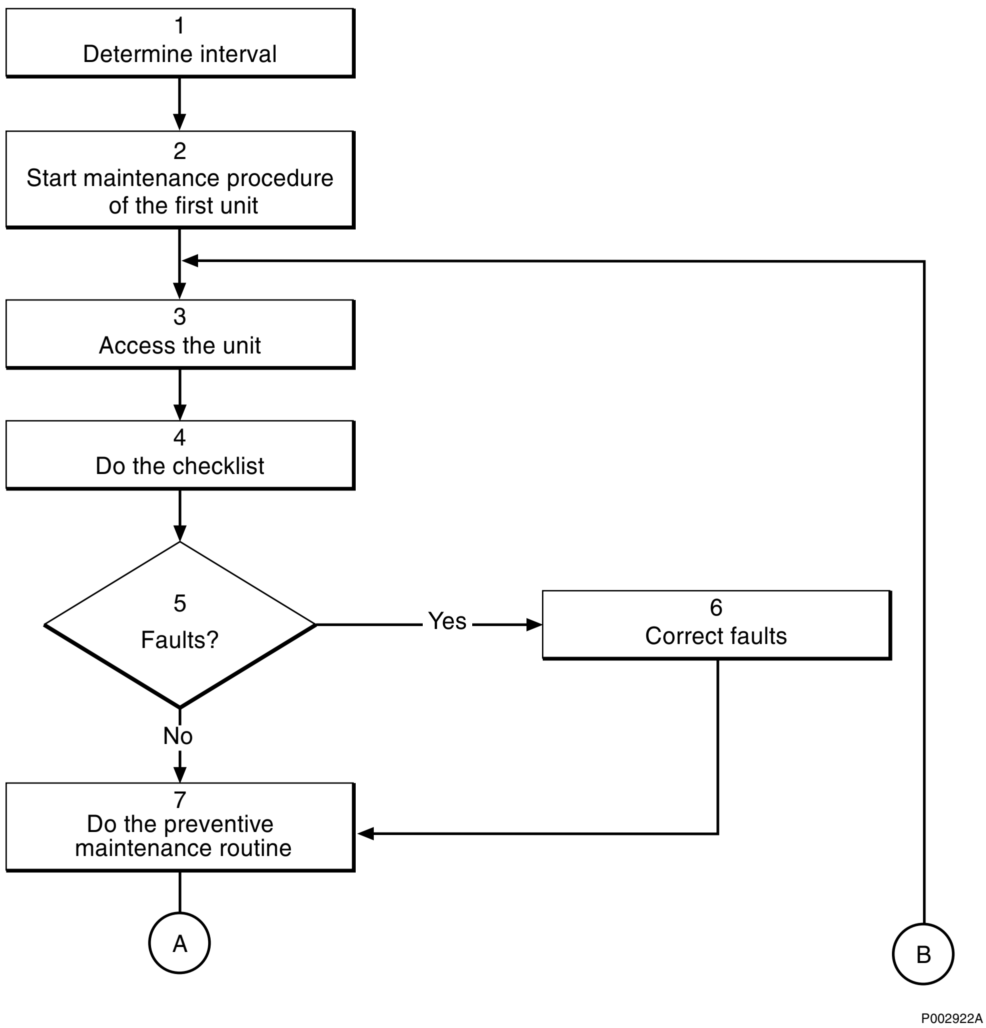


Figure 232 The "Preventive Maintenance Process"

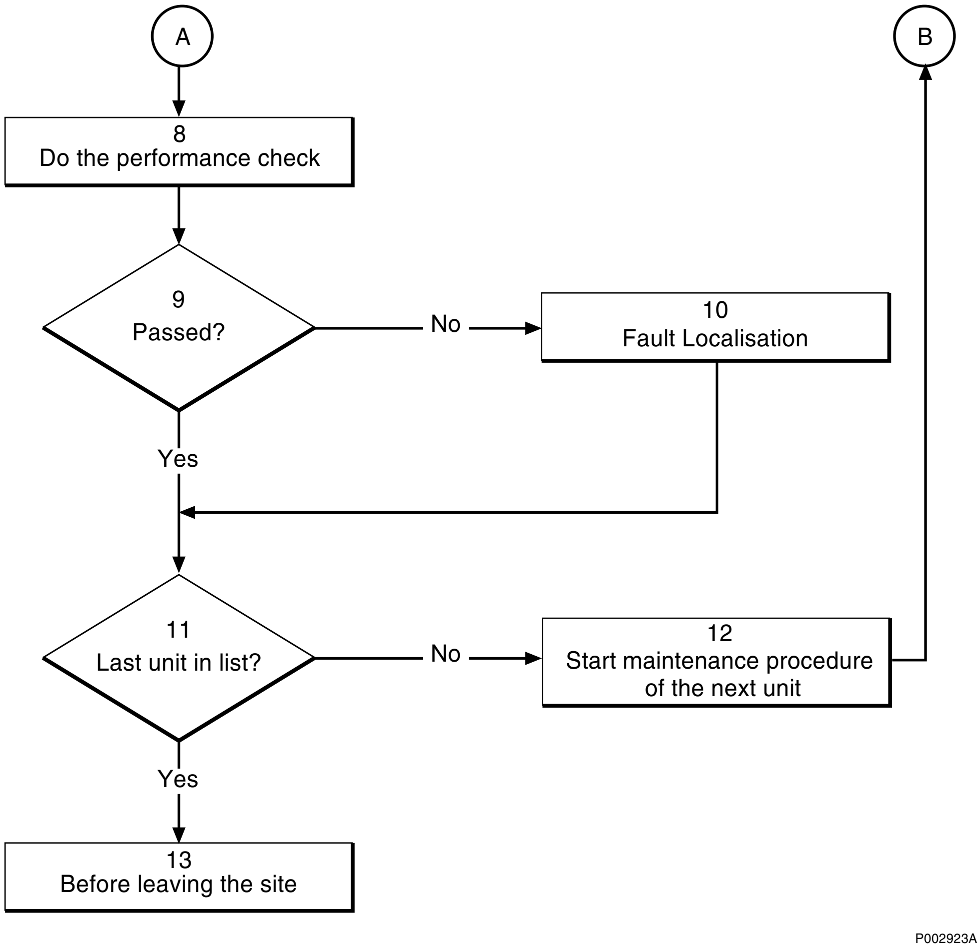


Figure 233 The "Preventive Maintenance Process"

(1) Determine interval

Determine the appropriate preventive maintenance interval according to work order information.

(2) Start maintenance procedure of the first unit

Use the table in the section "Preventive Maintenance Intervals"to determine which routines must be performed. Always perform the routines in the same order as they appear in the table.

Note: It is in particular important that the DXU maintenance is the first routine, as it requires a waiting time of 10 minutes before it is finished. During this waiting time, other maintenance routines can be performed.

(3) Access the unit

Start the preventive maintenance routine by accessing the appropriate unit.

(4) Do the checklist

Do the checklist first. The purpose of the checklist is to help determine maintenance requirements without affecting the operation of the RBS.

All questions on the checklist are written to get a "yes" response. Should the answer to any of the questions be "no", use the section "Correct Faults".

(5) Faults?

Were any faults found while doing the checklist?

- Yes: Proceed to step (6) Correct faults.
- No: Proceed to step (7) Do preventive maintenance routines.

(6) Correct faults

This section is shall instruct to clear the fault or determine if a per son with special qualifications shall respond to clear the fault. When possible, correct the faults found when using the checklist before doing the preventive maintenance routine.

(7) Do the preventive maintenance routines

Do the preventive maintenance routines according to instructions in this chapter. All routines shall be performed with power off unless specifically stated otherwise.

(8) Do the performance check

Some units have performance checks that shall be done.

(9) Passed?

Did the unit passed the performance check?

- Yes: Proceed to step (11).
- No: Proceed to step (10).

(10) Fault localisation

If the performance check uncovers a fault, use the chapter "Fault Localisation".

(11) Last unit in list?

Has the last unit been treated in the preventive maintenance routine?

- No: Proceed to step (12) Start maintenance procedure of the next unit.
- Yes: Proceed to step (13) Before leaving the site.

(12) Start maintenance procedure of the next unit

Select the next unit for the preventive maintenance routine.

(13) Before leaving the site

Proceed to the section "Before Leaving the Site"in the chapter "Test after Corrective Action" and perform the checklist provided.

10.2 Preventive Maintenance Intervals

The interval between inspections at each RBS site may vary depending upon the environmental conditions found there. Outdoor sites receive greater exposure to large amounts of contaminants and require more frequent maintenance. As a result, the RBS operator can decide to increase or decrease the recommended interval between inspections.

Table 41 Preventive maintenance intervals

Action	Period
DXU maintenance (1)	Every three years
Climate unit maintenance	Twice a year
Antenna system maintenance	Once a year
Battery maintenance (2)	Once a year
Replace batteries (2) (3)	Every five years
Replace fans	Every five years
DXU maintenance, oscillator verification (1)	Every three years
Checklist "Before Leaving the Site"	Every site visit

(1) This activity applies to DXU-03 only.
(2) It is recommended that batteries be purchased locally. Refer to information supplied by the manufacturer for the correct inspection and replacement interval.
(3) This procedure is included in the "Battery maintenance procedure"

10.3 DXU Maintenance

Note: The preventive maintenance process for the DXU comprises "DXU access" and "DXU preventive maintenance routines"only.

Note: This procedure only applies to DXU–03 and system release R7 and on.

Note: Climatic requirements, specified for the frequency counter being used, must be met during the calibration procedure.

DXU access

Open the RBS cabinet to allow access to the DXU.

DXU preventive maintenance routines

Note: The calibration procedure requires that a high precision frequency counter is used. Refer to the section "Test Equipment " in the chapter "Tools and Instruments".

1. Connect the frequency counter input A to the Test connector on the DXU-03, see Figure 234 on page 391.

   The connector labelled "Ext. trig." shall not be connected anywhere.

Note: After switching on, wait until the Unlock/Standby lamp is extinguished before performing any measurements.

2. Set the input impedance to 1 MOhm.
3. Set the trigger level to Auto.
4. Set the measurement time to 10 seconds.

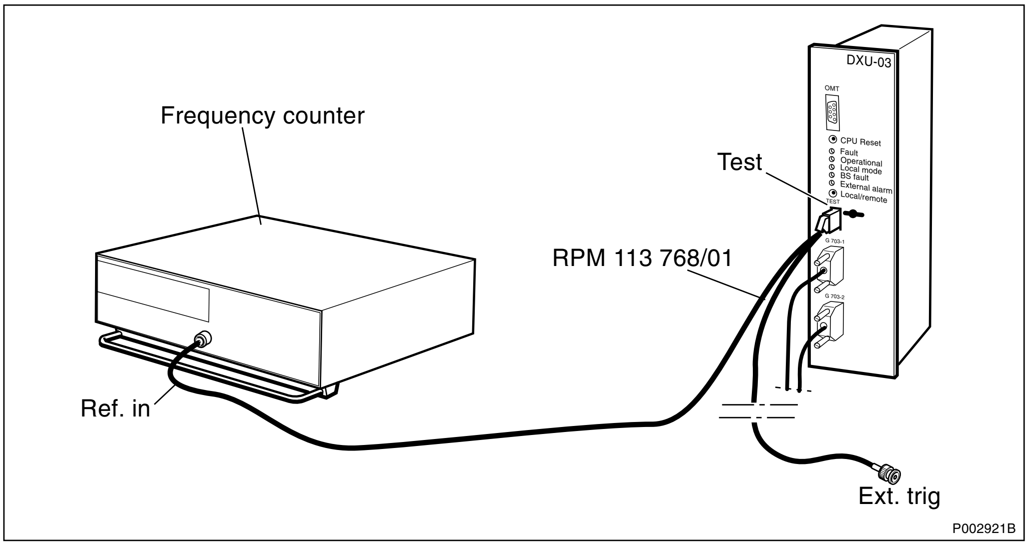


Figure 234 Connection of the frequency counter to DXU-03

The MO TF (RBS) must be syncronised to the optional reference oscillator. This is done by preforming step 5.

5. Enter the command RXMOP:MO=RXOTF-x;
6. Read the value (INTI, INTE, PCM or DEFAULT) of parameter SYNCSRC an write it down.

If the value is INTE, proceed with step 7.

7. If the value is not INTE enter:

   RXMSC:MO=RXOTF-x, TFMODE=SA, SYNCSRC=INTE;

8. Enter the command RXMOP:MO=RXOTF-x; again and make sure that the value of the parameter SYNCSRC is INTE.

9. Read off the measurement of the frequency counter.

   Is the reading within 13 MHz ±0.208 Hz?

   • Yes: The DXU oscillator frequency is within limits and no calibration shall be performed. Proceed to step 13.

   • No: Proceed to step 10.

10. Use the OMT to make the calibration of the DXU oscillator. For further information on the use of the OMT, see the *OMT User's Manual*.

Note: The GSM specification states that the frequency shall be 13 MHz ±0.208 Hz. The calibration shall thus give a result that is as close as possible to 13 MHz.

However, a class 2 alarm will not be raised until the frequency is above or below 13 MHz ±8 Hz.

11. Wait 10 minutes before a new measurement is made. This is necessary for the oscillator to stabilise at the adjusted frequency.
12. The preventive maintenance routine will be finished in Section 10.8 DXU maintenance, oscillator verification on page 408. During the 10 minutes waiting time, other units in the cabinet can be maintained.
13. If the parameter SYNCRC value (step 6) was not INTE then enter: RXMSC:MO=RXOTF-X, TFMODE=SA, SYNCSRS= [original value].

10.4 Climate Unit Maintenance

10.4.1 Introduction

The recommended interval for climate unit preventive maintenance is twice a year. One time should be in the spring (or beginning of the hot season) and the other in the autumn (or beginning of the cold season).

In the spring, inspect and clean the entire unit paying special attention to the cooling portion of the unit.

In the autumn, only cleaning and a general inspection, with special attention to the heater and fans, should be necessary.

Brief description

Note: There are four different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V4", used in the text below, are explained in the chapter "Preface".

In the procedures below, (V1), (V2), (V3) and (V4) are used as abbreviations designating the four versions of the climate unit.

In all versions of the climate unit, the RBS 2102 climate system tester described in the chapter "Test after Corrective Action" can be used to do a performance check.

On the V2 version of the climate unit, a momentary switch, located at the top of the AC interface, is provided to activate either the heater or the air conditioner. On the V3 and V4 versions of the climate unit the momentary switch is located on the CCU circuit board. To prevent damage to the system, use this switch sparingly.

Most components within the climate unit can be easily maintained on site. Exceptions are the compressor and coolant system.

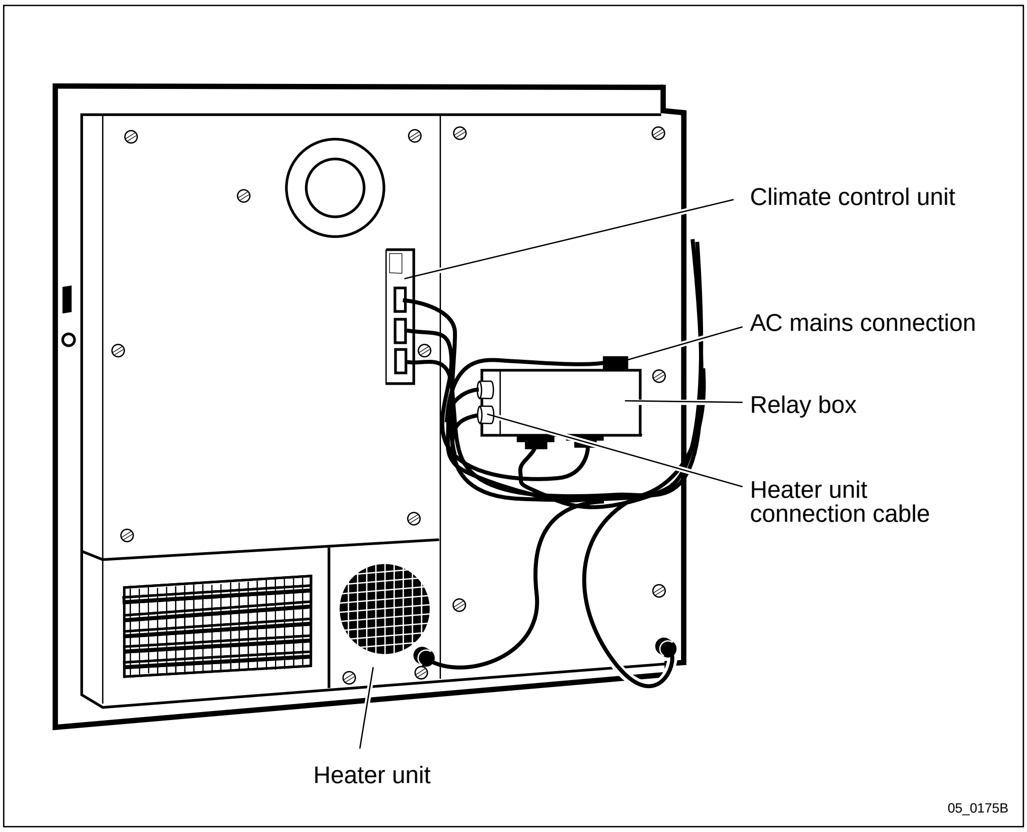


Figure 235 Climate unit version V1

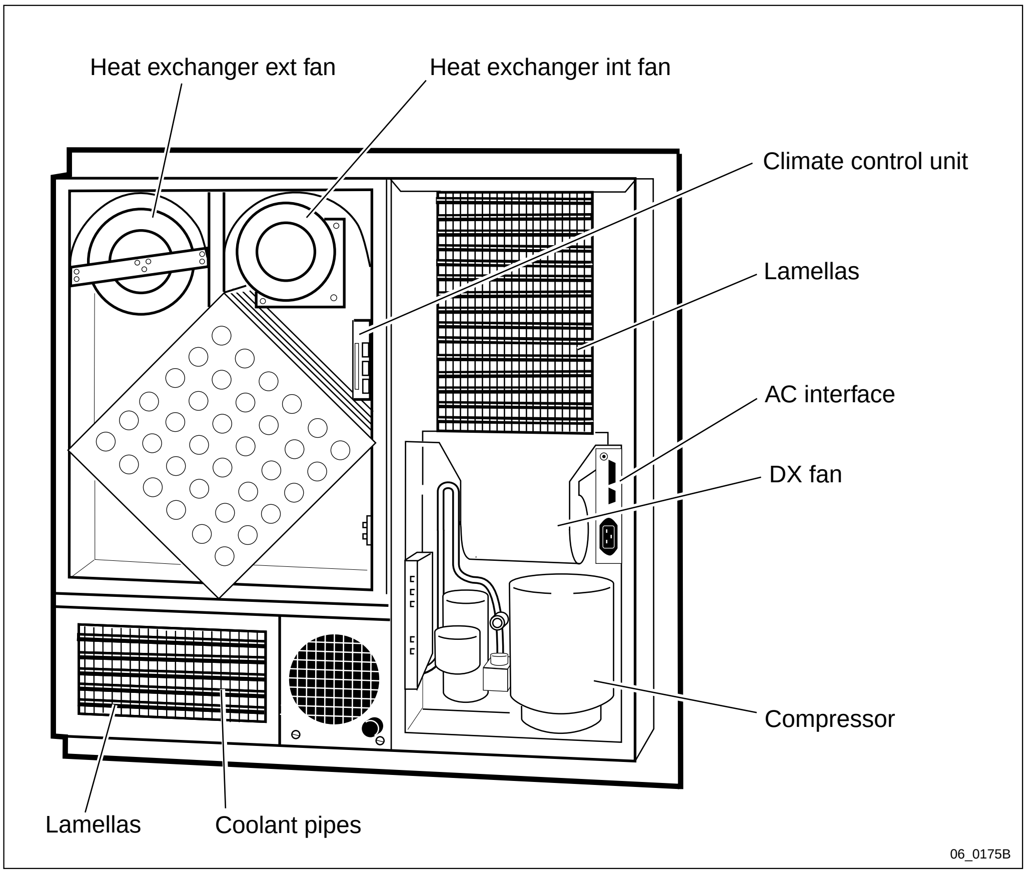


Figure 236 Climate unit version V2

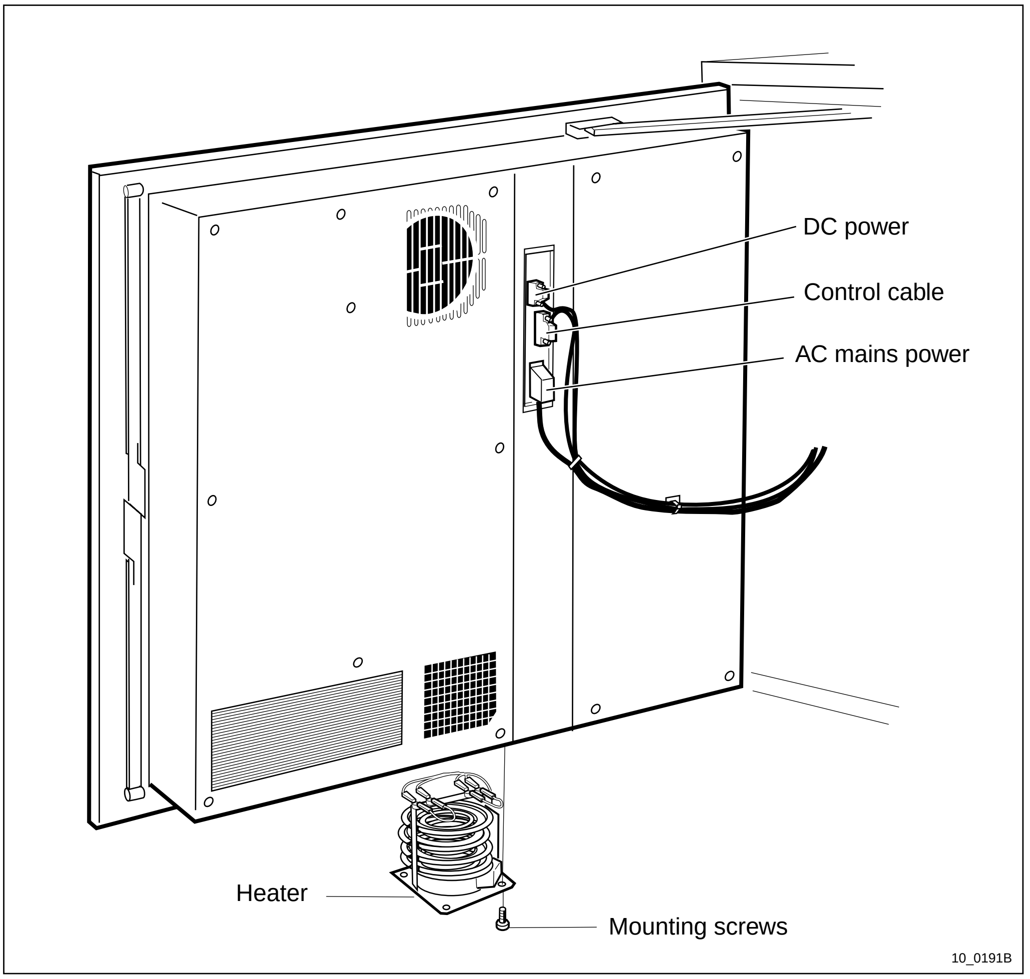


Figure 237 Climate unit versions V3, V4 and V5

10.4.2 Maintenance Procedures

Climate system access

1. Open the mounting base and connect an air compressor to the service outlet on the ACCU.
2. Switch off the AC circuit breaker for the climate unit on the ACCU.
3. Open the radio sub-cabinet and switch off the DC circuit breaker for the climate system on IDM 1 on the left side of the radio sub-cabinet.
4. Remove the cables from the CCU.
5. *Climate unit version V2 only*

   Remove the cables from the AC interface.
6. Turn on the air compressor. Adjust the pressure for a minimum of 5 bars (approximately 70 PSI) to a maximum of 8 bars (approximately 116 PSI).
7. Remove the covers to the climate units.

Note: *Climate unit version V1 only*

Lower the cover over the compressor slowly as the cables will still be connected to the relay unit.

8. *Climate unit version V4 only*

   Remove the three screws at the left of the climate unit. The climate unit can now be swung open on its hinges to give access to the back of the climate unit.

9. Reconnect the cables to the CCU and the AC interface.

10. Turn on the AC circuit breaker for the climate system on the ACCU.

11. Turn on the DC circuit breaker for the climate system on IDM 1 or the mid-mounted IDM.

Climate unit checklist

All points in the checklist are written to be answered "yes". Should any point have a "no" answer, complete the checklist first, then proceed to the section "Correct Faults".

Table 42 Climate Units checklist. N/A means not applicable

ITEM		N/A	YES	NO
1	Are the fans, heater and the compressor clean and free of corrosion?			
2	Are the fan, heater and compressor mounts secure and free of excessive vibration?			
3	Is the compressor free of excessive noise?			
4	Are the coolant pipes free of obstructions, damage, corrosion and show no obvious signs of leakage?			
5	Are the lamellas and heat exchangers clean and damage-free?			
6	Is excess condensation draining properly from the unit?			
7	Are all climate fans still within their replacement date?			
8	Are all fan blades free of obstruction, cracks, missing blades and in balance?			
9	Do all fans rotate freely and are free from excessive vibration or noise?			
10	Is the heater unit coil intact and serviceable?			
11	Is all wiring and insulation free of damage?			
12	Are all connectors seated properly and in good condition?			
Signature:				
Date:				

Correct faults

Note: Switch off the AC circuit breaker on the ACCU and the DC circuit breaker on the BDM/IDM, or remove the DC fuse on the ACB, prior to using compressed air within the climate unit.

1. If a unit is found dirty, use compressed air to clean it. It may also be necessary to use a soft bristle brush and a mild detergent (both purchased locally). If corrosion is found, treat it accordingly.
2. Tighten any loose mounts discovered. If the mounts cannot be tightened enough to stop excessive vibration, replace the entire unit according to the appropriate section in the chapter "Corrective Action".
3. Excessive compressor noise will require a qualified refrigeration specialist to repair on site, or replacement of the entire unit and returning it to a central location for repair. For replacement instructions see the section "Air Conditioner" in the chapter "Corrective Action".
4. Faults with the coolant pipes will require either a qualified refrigeration specialist to repair on site, or replacement of the entire unit and returning it to a central location for repair. For replacement instructions see the section "Air Conditioner" in the chapter "Corrective Action".
5. Clean the lamellas and heat exchangers using compressed air. If the damage affects the units, replace the entire unit and return it to a central location for repair. For replacement instructions see the section "Active Cooler" in the chapter "Corrective Action".
6. Clear the drain pipe.
7. If the replacement date of a fan has passed, replace all fans at the same time according to the appropriate instructions in the chapter "Corrective Action".
8. Go to step 9.
9. If a fan is found defective, replace it according to instructions located in the chapter "Corrective Action".
10. If the heater coil is broken or unserviceable, replace the unit according to instructions in the chapter "Corrective Action".
11. Damaged wiring or insulation may necessitate unit replacement. Replacement instructions are found in the chapter "Corrective Action".
12. Reset all loose connectors. If a defective connector is found, and the whole cable cannot be replaced easily on site, it will be necessary to replace the entire unit. For replacement instructions see the section "Air Conditioner" in the chapter "Corrective Action".

Preventive maintenance routines

Note: The fan blades must be held while they are being cleaned with compressed air. This is necessary to prevent the blades from rotating too fast and damaging the fan motor.

Refer to the drawings of the various climate units, for locations of fans and heaters.

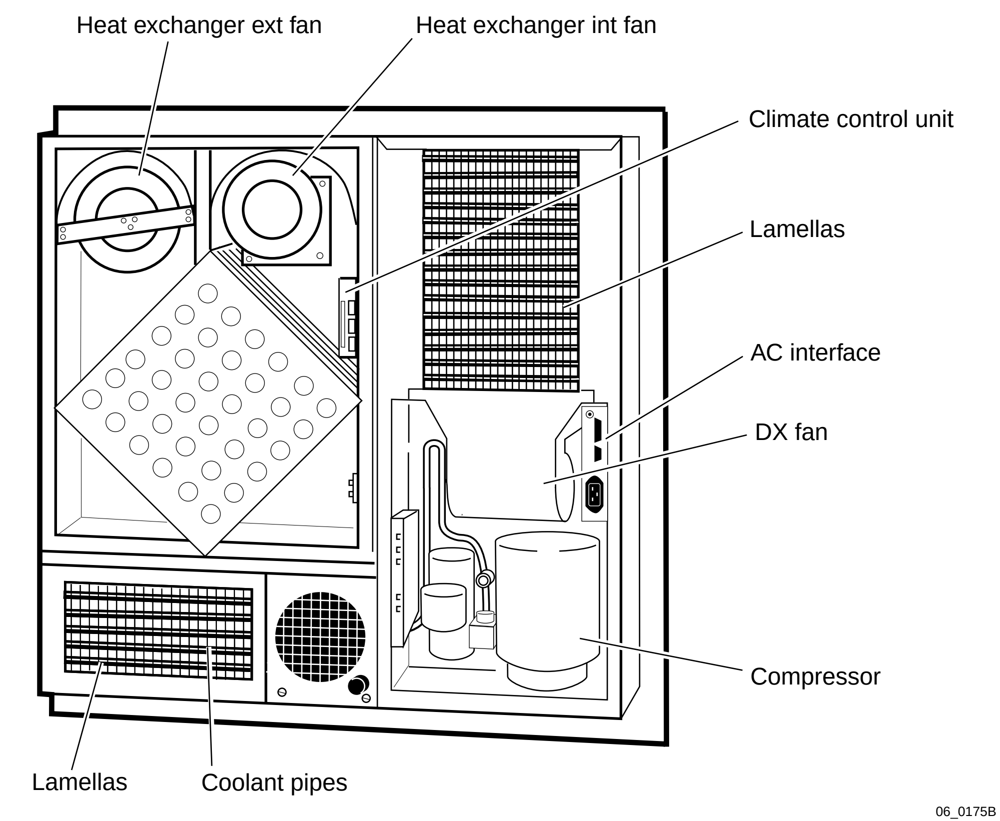


Figure 238 Climate unit (all versions), location of fans

1. Switch off the AC circuit breaker for the climate unit on the ACCU.
2. Switch off the DC circuit breaker for the climate unit on the IDM.
3. Use the air compressor to clean all fans in the climate unit.
4. *Climate unit version V4 only*

   • Open the back of the climate unit by loosening the three screws on the left side of the climate unit. See the figure below.

   • Use the compressor to clean all airflow paths in the climate unit as well as the cabinet door.

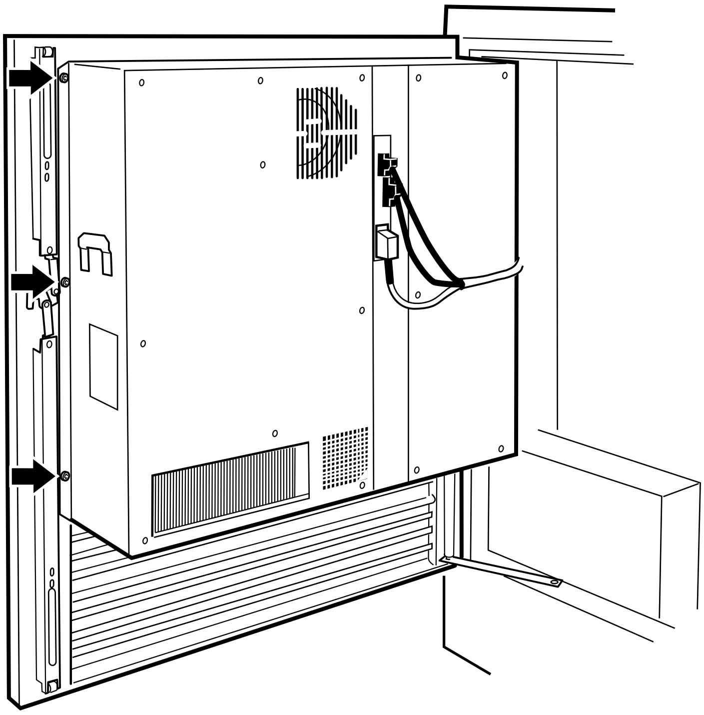


Figure 239 Opening the climate unit version V4

5. Switch off the air compressor. Unplug it from the service outlet in the ACCU.
6. Return the climate unit to operation by reversing the access procedures described in this chapter.
7. Close and lock the door, first for the radio sub-cabinet and then for the mounting base.

Performance check

The performance test is found in the section "Climate System Test" in the chapter "Test After Corrective Action".

10.5 Antenna System Maintenance

The checklist below is designed for a visual inspection of the antenna system. Refer to the safety warning below.

WARNING

⚠

Some working areas involve the risk of accidents caused by falling objects.

Note: Local safety regulations may require that any maintenance on antennas, or antenna towers, be performed by an individual who has been certified to climb antenna poles and masts.

Antenna access

Open the RBS cabinet to allow for an inspection of the RF cables.

Antenna checklist

All points in the checklist are written to be answered "yes". Should any point have a "no" answer, complete the checklist first, then proceed to the section "Correct Faults".

Table 43 Antenna checklist. N/A means not applicable

ITEM		N/A	YES	NO
1	Are poles in safe condition, that is, free of cracks, not bent or loose?			
2	Is lightning protection secure and functional?			
3	Is the ALNA firmly mounted and in good condition?			
4	Do cables still have markers?			
5	Are cables secured to poles (approximately once every 0.6 meters)?			
6	Are the cable seals at the entry point into the cabinet in good condition?			
7	Are all cables free from abrasions, cuts and cracks?			
8	Are all cable connector seals in good condition?			
9	Are all cable ducts dry and the seals in good condition?			
10	Are all pressurised cables identified and in good condition?			
11	Are antenna towers and legs free of corrosion?			
12	Are antenna towers free of bowing or bends?			
13	Are hazard lights in operational order?			
14	Are support pedestals free of signs of wear and/or cracks?			
15	Are the guy wires relatively free of corrosion?			
16	Are the guy wires free of signs of slipping?			
17	Are the guy wires free of broken strands?			
18	Are the antennas correctly orientated?			
19	Are the antennas firmly mounted?			
20	Is the RBS transmission path free of obstructions? (No new buildings, towers, etc. blocking it since installation.)			
Signature:				
Date:				

Antenna checklist

All points in the checklist are written to be answered "yes". Should any point have a "no" answer, complete the checklist first, then proceed to the section "Correct Faults".

Table 44 Antenna checklist. N/A means not applicable

ITEM		N/A	YES	NO
1	Are poles in safe condition, that is, free of cracks, not bent or loose?			
2	Is lightning protection secure and functional?			
3	Do cables still have markers?			
4	Are cables secured to poles (approximately once every 0.6 meters)?			
5	Are the cable seals at the entry point into the cabinet in good condition?			
6	Are all cables free from abrasions, cuts and cracks?			
7	Are all cable connector seals in good condition?			
8	Are all cable ducts dry and the seals in good condition?			
9	Are all pressurised cables identified and in good condition?			
10	Are antenna towers and legs free of corrosion?			
11	Are antenna towers free of bowing or bends?			
12	Are hazard lights in operational order?			
13	Are support pedestals free of signs of wear and/or cracks?			
14	Are the guy wires relatively free of corrosion?			
15	Are the guy wires free of signs of slipping?			
16	Are the guy wires free of broken strands?			
17	Are the antennas correctly orientated?			
18	Are the antennas firmly mounted?			
19	Is the RBS transmission path free of obstructions? (No new buildings, towers, etc. blocking it since installation.)			
Signature:				
Date:				

Correct faults

Only tighten loose connections, or replace RF cables in the cabinet. Contact the supervisor to inform them of any other faults found when performing the checklist as further corrective action may require individuals trained and certified to climb towers.

Preventive maintenance routines

Except for the checklist provided, there are no preventive maintenance routines for the antenna system.

Performance Check

There are no performance checks for the antenna system.

10.6 Battery Maintenance

This section describes how to get access to the batteries, both internal and external when used. There is also a battery checklist and instructions on how to correct faults at the end of the section.

DANGER

⚠

Read Safety Instructions regarding handling and connecting batteries.

Note: It is recommended that batteries are purchased locally. Refer to information supplied by the manufacturer for the correct inspection and replacement interval.

Battery access – internal batteries

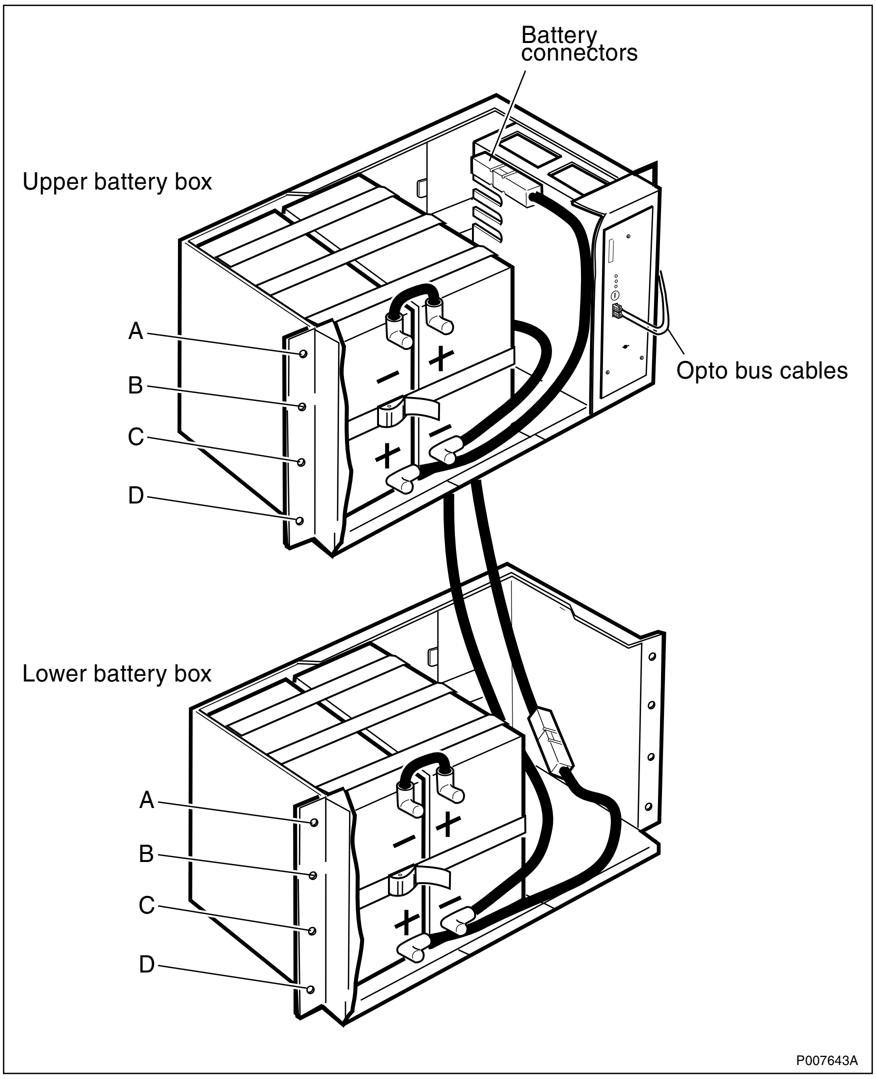


Figure 240 Battery box with batteries, new version

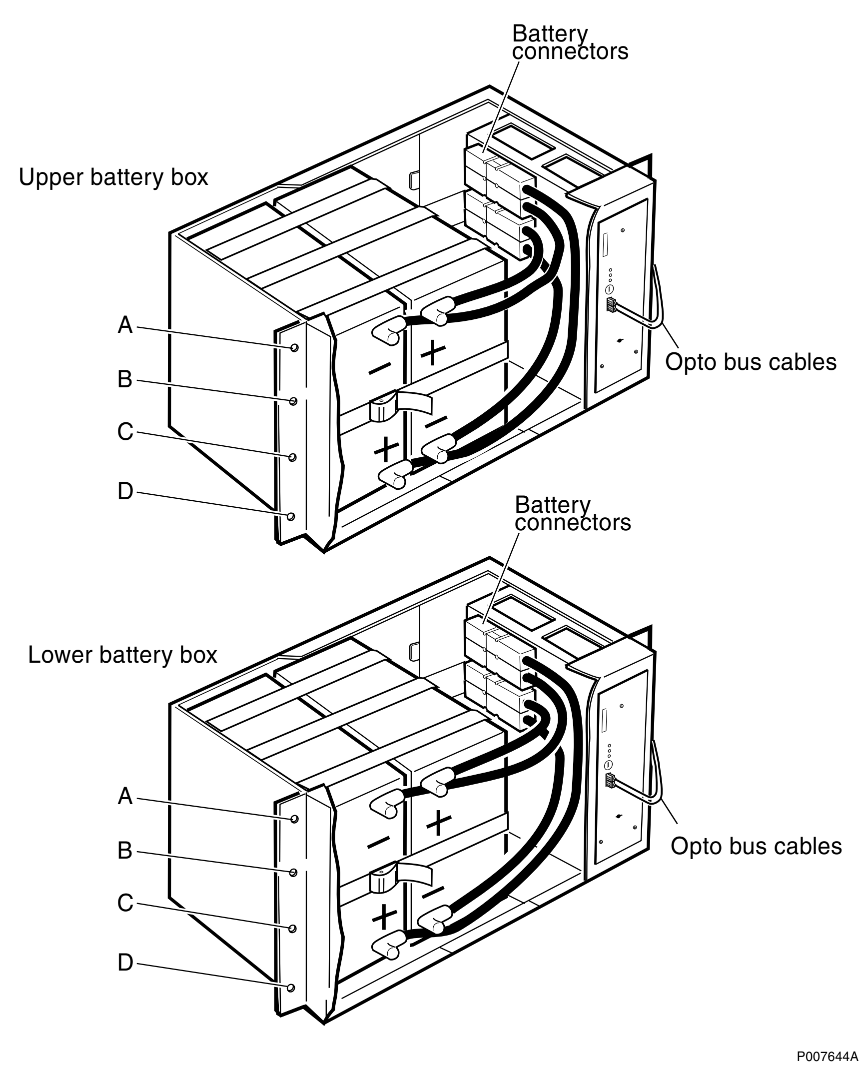


Figure 241 Battery box with batteries, old version

Note: The opto bus cables must have a bent radius of at least 35 mm.

1. Disconnect the opto bus cables connected to the BFU (ignore this step if no BFU is installed in the battery box).
2. Loosen the screws holding the BFU to the magazine and remove it (ignore this step if no BFU is installed in the battery box).
3. Remove screws A and D on both sides of the cover plate.
4. Remove the cover plate.
5. Perform the battery checklist.
6. If the batteries require replacement, refer to the section "Batteries" in the chapter "Corrective Action".

Note: To guarantee correct operation it is recommended that all batteries in the RBS are replaced at the same time, even if only one is defective.

This means two batteries in a single battery box, four batteries if two battery boxes are installed and eight batteries if expanded batteries are used.

7. Replace the cover plate and fasten it with screws A and D.

8. Replace the BFU and connect the opto bus cables to it.

Battery access – expanded batteries

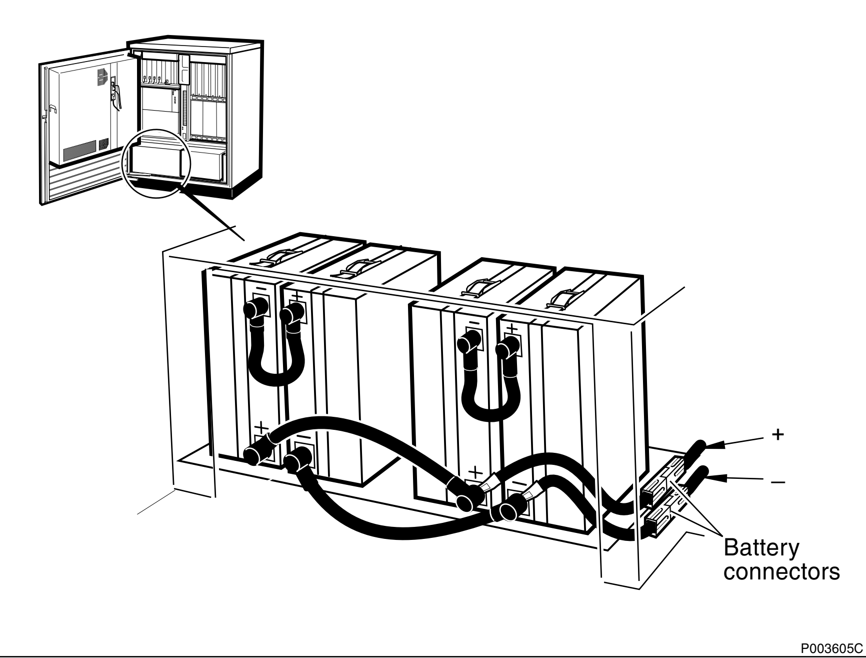


Figure 242 Compartment for expanded batteries

Refer to the picture above when performing the following procedures. To guarantee correct operation of the batteries, it is recommended that all expanded batteries are replaced at the same time, even if only one is defective.

CAUTION

Short circuits can cause injury or damage. Although the battery voltage may be low, the released power can be extremely high.

Note: Use only insulated tools when disconnecting or connecting cables to the battery terminals. Care must be taken when the cables from the battery terminals are disconnected, so that they do not short together.

1. Loosen the two screws located at the rear top of the cover of the transport module and lift off the cover.

2. Perform the battery checklist.

3. If the batteries require replacement, refer to the section "Batteries" in the chapter "Corrective Action".

Note: To guarantee correct operation it is recommended that all batteries in the RBS are replaced at the same time, even if only one is defective.

This means two batteries in a single battery box, four batteries if two battery boxes are installed and eight batteries if expanded batteries are used.

4. Replace the cover of the transport module and fasten it with the screws at the rear top.

Battery checklist

All points in the checklist are written to be answered "yes". Should any point have a "no" answer, complete the checklist first, then proceed to the section "Correct Faults".

Table 45 Battery checklist. N/A means not applicable

ITEM		N/A	YES	NO
1	Are the batteries and battery box free of dirt, excessive grease, oxidation and corrosion?			
2	Are all cables firmly connected and in good condition?			
3	Are the battery casings free from discoloration and deformities?			
4	Are the battery terminals unbent and free from excessive cuts or slices?			
5	Are the batteries still within their replacement date?			
6	Are there any (acid) leaks from the batteries?			
Signature:				
Date:				

Correct faults

1. Clean dirt and grease off the batteries and battery box with a mild detergent, a soft bristle brush and rags. All cleaning items should be purchased locally. Treat all corrosion or oxidation in accordance with local procedures.
2. Tighten any loose cables found, or replace them if necessary.
3. If a discoloured or deformed battery is found during the inspection, replace all batteries in the same battery box at the same time. See the section "Batteries" in the chapter "Corrective Action" for replacement instructions.
4. If the poles show signs of excessive damage, replace both batteries in the same battery box at the same time. See the section

"Batteries" in the chapter "Corrective Action"for replacement instructions.

5. If the expiry date on a battery has passed, replace all batteries in the battery box at the same time. See the section "Batteries" in the chapter "Corrective Action"for replacement instructions.

6. If the batteries have leaked acid (or are leaking), replace both batteries in the Battery Box or BDM. See the section "Batteries" in the chapter "Corrective Action"for replacement instructions.

Preventive maintenance routines

Except for the checklist provided, there are no specific preventive maintenance routines for the battery system for first line maintenance.

Performance check

There are no specific performance checks for the battery system for first line maintenance.

10.7 Fans Replacement

Note: The only preventive maintenance included in this procedure is replacement.

When replacement is necessary for preventive maintenance, refer to the following sections:

DX fan	Section "DX Fan" in the chapter "Corrective Action"
Cabinet fans	Section "Fans" in the chapter "Corrective Action"
Heat exchanger fans	Section "Heat Exchanger Fans" in the chapter "Corrective Action"

10.8 DXU maintenance, oscillator verification

Note: This is the concluding part of the maintenance routine of the Section 10.3 DXU Maintenance on page 390.

1. Read off the measurement of the frequency counter.

   Is the reading within 13 MHz ±0.208 Hz?

   • Yes: The calibration of the DXU oscillator frequency was successful. The calibration procedure is finished.

   • No: The calibration of the DXU oscillator frequency was unsuccessful. Replace the DXU according to instructions in the section "DXU"in the chapter "Corrective Action".

10.9 Checklist Before Leaving the Site

Refer to the section "Before Leaving the Site"in the chapter "Test after Corrective Action" and perform the checklist provided.

11 Cable Connections

The purpose of this chapter is to provide maintenance personnel assistance when replacing any of the following units where applicable:

- CDU
- DXU/ECU backplane
- IDM
- TRU backplane
- Any RU which has a cable terminated on a backplane, a CDU or an IDM

For general information about cable connections, see:

Cabinet Assembly and Extension Manual LZN 302 78

11.1 Interchanging CDU-C and CDU-C+

As previously stated, the CDU-C+ may replace a CDU-C but there are differences between the front panel legends of the CDU-C variants. The difference in the legends occur between:

- CDU-C 900 MHz (with duplexer)
- CDU-C 1800 / 1900 MHz (without duplexer)
- CDU-C+ all bands (with or without duplexer)

The following table lists the connectors with identical functions.

Table 46 CDU-C and CDU-C+ connector comparison

CDU-C		CDU-C+	
With duplexer	**Without duplexer**	**With / without duplexer**	
None	None	=	RX in B
None	None	=	HL out B
HL-in	HL-in	=	HL in
HL-out	HL-out	=	HL out
TX/RX Ant A	TX Ant B	=	TX/RX Ant
RX Ant	RX Ant	=	RX in A
RX-out1	RX-out1	=	RX out1
RX-out2	RX-out2	=	RX out2
RX-out3	RX-out3	=	RX out3
RX-out4	RX-out4	=	RX out4
RX-out5	RX-out5	=	RX out5
RX-out6	RX-out6	=	RX out6
CDU-Bus	CDU-Bus	=	CDU Bus
RXA MS out	RX MS out	=	None
MSTP	MSTP	=	None

DC in, Pfwd1, Pfwd2, Prefl1 and Prefl2 are all identical in all three variants.

11.2 Cable Set Modules

11.2.1 Cable Set Module Numbering

Modules are numbered consecutively from CDU 1 in the master cabinet to the CDU 3 in the extension cabinet. Each module covers one cell, unless the cell spans more than one cabinet.

Table 47 Example of module numbering

Configuration example	Module number	CDUs
2 + 4	1	CDU 1
	2	CDUs 2 and 3
4 + 2	1	CDUs 1 and 2
	2	CDU 3
3 x 2	1	CDU 1
	2	CDU 2
	3	CDU 3
3 x 4	1	CDUs 1 and 2
	2 **	CDU 3
	3 **	CDU 4*
	4	CDUs 5* and 6*
* indicates CDU is fitted in extension cabinet		
** indicates one cell spanning two cabinets = two modules		

11.2.2 Cable Set Modules

CDU-type	SCC*	Frequency MHz	BB=CDU\Freq\ duplex_antenna\ TRU´s	Master Cabinet CDU 1	Master Cabinet CDU 2	Master Cabinet CDU 3	Extension Cabinet CDU 1	Extension Cabinet CDU 2	Extension Cabinet CDU 3
CDU-A	1x2	900	A9d_2.2	Module 1	Module 2	Module 3			
	1x2	1800	A18_4.2	Module 1	Module 2	Module 3			
	1x2	1800/1900	A18/19_2.2	Module 1	Module 2	Module 3			
	1x4	1800/1900	A18/19_4.4	Module 1		Module 2 and 3		Module 4	
CDU-C+ used as CDU-C	1x6	900	C9d_3.6	Module 1 (1x4)		Module 2(1x6)			
	1x6	1800/1900	C18/19_5.6	Module 1 (1x4)		Module 2(1x6)			
	1x6	1800/1900	C18/19_3.6	Module 1 (1x4)		Module 2(1x6)			
	1x4	900	C9d_2.4	Module 1					
					Module 2			Module 2	
						Module 3 and 4			
	1x4	1800/1900	C18/19_4.4	Module 1					
					Module 2			Module 2	
						Module 3 and 4			
	1x4	1800/1900	C18/19_2.4	Module 1					
					Module 2			Module 2	
						Module 3 and 4			
CDU-C+	1x6	900/1800/1900	C+9d/18d/19d_3.6	Module 1 (1x4)		Module 2(1x6)			
	1x6	1800/1900	C+18/19_3.6	Module 1 (1x4)		Module 2(1x6)			
	1x4	900/1800/1900	C+9d/18d/19d_2.4	Module 1					
					Module 2			Module 2	
						Module 3 and 4			
	1x4	1800/1900	C+18/19_2.4	Module 1					
					Module 2			Module 2	
						Module 3 and 4			
	1x2	900/1800/1900	C+9d/18d/19d_2.2	Module 1	Module 2	Module 3			
	1x2	1800/1900	C+18/19_2.2	Module 1	Module 2	Module 3			

* SCC = Site Cell Configuration

1x2 = Indicates cable set module covers max. 1 CDUs and max. 2 TRUs

1x4 = Indicates cable set module covers max. 2 CDUs and max. 4 TRUs

1x6 = Indicates cable set module covers max. 3 CDUs and max. 6 TRUs

P006036A

Figure 243 Cable Set Modules

Note: Cable set modules are not used for CDU-D.

11.3 CDU-A and CDU-C

Each CDU is connected to antenna sockets located on the connection field of the cabinet. The connection field is located in the base of the cabinet.

The upper ends of the antenna coaxial cables must be terminated to the CDUs and are marked accordingly. The lower ends of these cables are connected to RF sockets in the base of the cabinet for termination to antennas.

The following information details the base panel sockets and the CDU connections to which they are terminated.

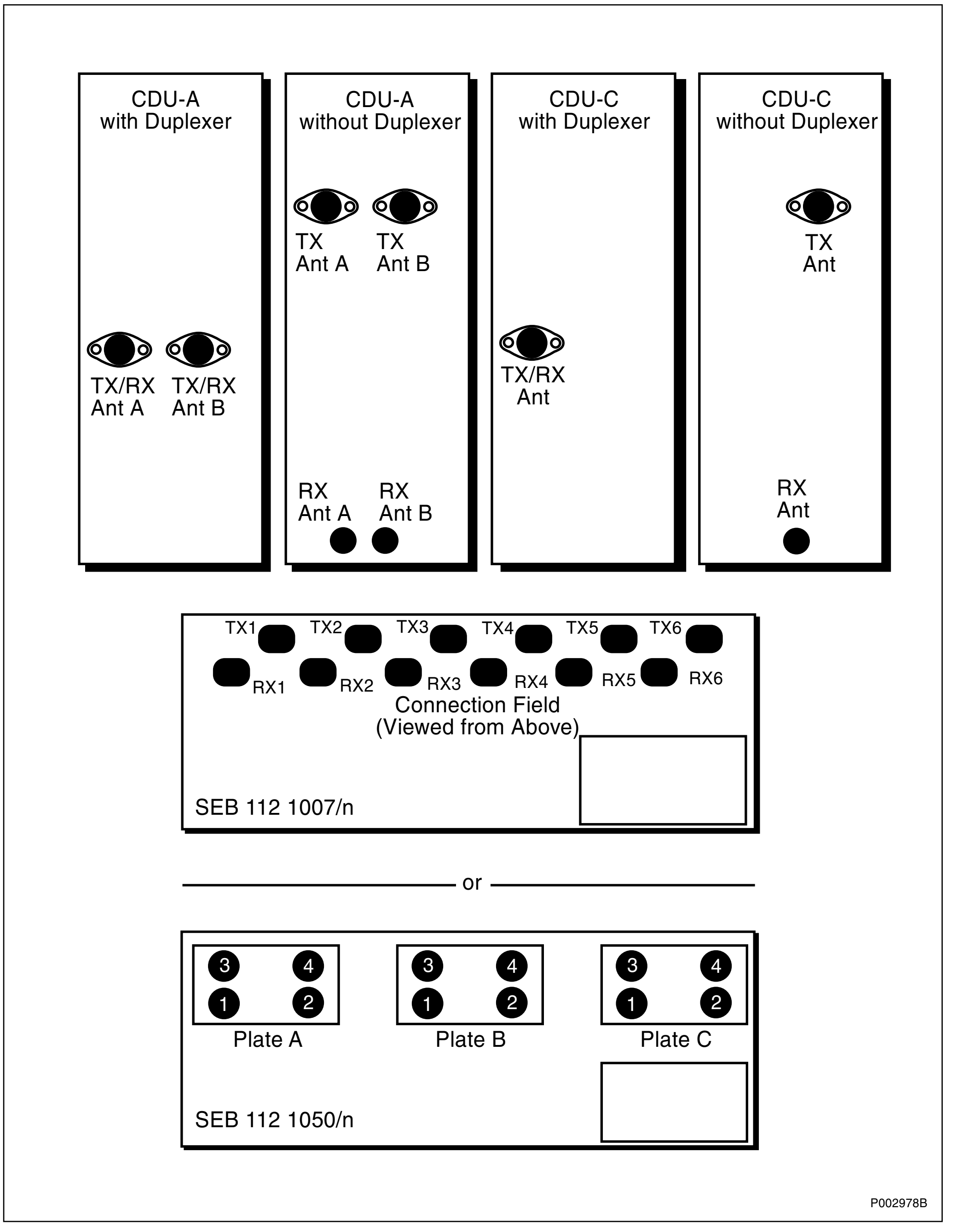


Figure 244   CDU-A and CDU-C variants at the top, connection field at the bottom

The CDUs are numbered 1 to 3 from left to right as they appear in the cabinet.

11.3.1 Previous Cabinet Wiring

Table 48 CDU-A with Duplexer

CDU	CDU Connector	Connection Field	Signal
1	TX/RX Ant A	TX 1	TX A + RX A
	TX/RX Ant B	TX 2	TX B + RX B
2	TX/RX Ant A	TX 3	TX A + RX A
	TX/RX Ant B	TX 4	TX B + RX B
3	TX/RX Ant A	TX 5	TX A + RX A
	TX/RX Ant B	TX 6	TX B + RX B

Table 49 CDU-A without Duplexer

CDU	CDU Connector	Connection Field	Signal
1	TX Ant A	TX 1	TX A
	TX Ant B	TX 2	TX B
	RX Ant A	RX 1	RX A
	RX Ant B	RX 2	RX B
2	TX Ant A	TX 3	TX A
	TX Ant B	TX 4	TX B
	RX Ant A	RX 3	RX A
	RX Ant B	RX 4	RX B
3	TX Ant A	TX 5	TX A
	TX Ant B	TX 6	TX B
	RX Ant A	RX 5	RX A
	RX Ant B	RX 6	RX B

Table 50 CDU-C with Duplexer

CDU	CDU Connector	Connection Field	Signal
1	TX/RX Ant	TX 1	TX + RX
2	TX/RX Ant	TX 3	TX + RX
3	TX/RX Ant	TX 5	TX (+ RX**)
3 (M)	HL in	RX 2	HL in
-	HL out	RX 4	HL out
1 (E)	HL in	RX 2	HL in
	HL out	RX 4	HL out
M	Master Cabinet		
E	Extension Cabinet		
**	Only TX in single cell configurations		

Table 51 CDU-C without Duplexer

CDU	CDU Connector	Connection Field	Signal
1	TX Ant	TX 1	TX
	RX Ant	RX 1	RX
2	TX Ant	TX 3	TX
	RX Ant	RX 3	RX
3	TX Ant	TX 5	TX
X	RX Ant	RX 5	RX
3 (M)	HL in	RX 2	HL in
	HL out	RX 4	HL out
1 (E)	HL in	RX 2	HL in
	HL out	RX 4	HL out
X	Not used in 1 x 4 and 1 x 6 configurations		
M	Master Cabinet		
E	Extension Cabinet		

11.3.2 Cable Set Module Wiring CDU-A

Table 52 CDU-A with Duplexer, A9d_2.2, Module = CDU

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant A	TX 1	Plate A 3	TX A + RX A
	TX/RX Ant B	RX 1	Plate A 4	TX B + RX B
2	TX/RX Ant A	TX 3	Plate B 3	TX A + RX A
	TX/RX Ant B	RX 3	Plate B 4	TX B + RX B
3	TX/RX Ant A	TX 5	Plate C 3	TX A + RX A
	TX/RX Ant B	RX 5	Plate C 4	TX B + RX B

Table 53 CDU-A without Duplexer, A18/19_2.2, Module = CDU, and A18/19_4.4, Module 1 = CDU 1+2(M), Module 2 = 3(M), Module 3 = 1(E), Module 4 = 2+3(E)

CDU	CDU Connector	Connection Field		Signal
1	TX Ant A	TX 1	Plate A 1	TX A
	TX Ant B	TX 2	Plate A 2	TX B
	RX Ant A	RX 1	Plate A 3	RX A
	RX Ant B	RX 2	Plate A 4	RX B
2	TX Ant A	TX 3	Plate B 1	TX A
	TX Ant B	TX 4	Plate B 2	TX B
	RX Ant A	RX 3	Plate B 3	RX A
	RX Ant B	RX 4	Plate B 4	RX B
3	TX Ant A	TX 5	Plate C 1	TX A
	TX Ant B	TX 6	Plate C 2	TX B
	RX Ant A	RX 5	Plate C 3	RX A
	RX Ant B	RX 6	Plate C 4	RX B

11.3.3 Cable Set Module Wiring CDU-C+ used as CDU-C

Table 54 CDU-C+ used in CDU-C with Duplexer. C9d_2.4

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	TX 1	Plate A 1	TX + RX A
2	TX/RX Ant	TX 3	Plate B 1	TX + RX B

Table 55 CDU-C+ used in CDU-C without Duplexer. C18/19_2.4

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	TX 1	Plate A 1	TX + RX A
	RX in	RX 2	Plate A 2	RX B
2	TX/RX Ant	TX 3	Plate B 1	TX + RX A
	RX in	RX 4	Plate B 2	RX B

Table 56 CDU-C+ used in CDU-C with/without Duplexer. C9/18/19_3.6, Subset of 1x6, Extension of Building Block C9d_2.4 or C18/19_2.4

CDU	CDU Connector	Connection Field		Signal
3	TX/RX Ant	TX 5	Plate C 1	TX + RX A

11.4 CDU-C+

Each CDU is connected to antenna sockets located on the connection field of the cabinet. The connection field is located in the base of the cabinet.

The upper ends of the antenna coaxial cables must be terminated to the CDUs and are marked accordingly. The lower ends of these cables are connected to RF sockets in the base of the cabinet for termination to antennas.

The following information details the base panel sockets and the CDU connections to which they are terminated.

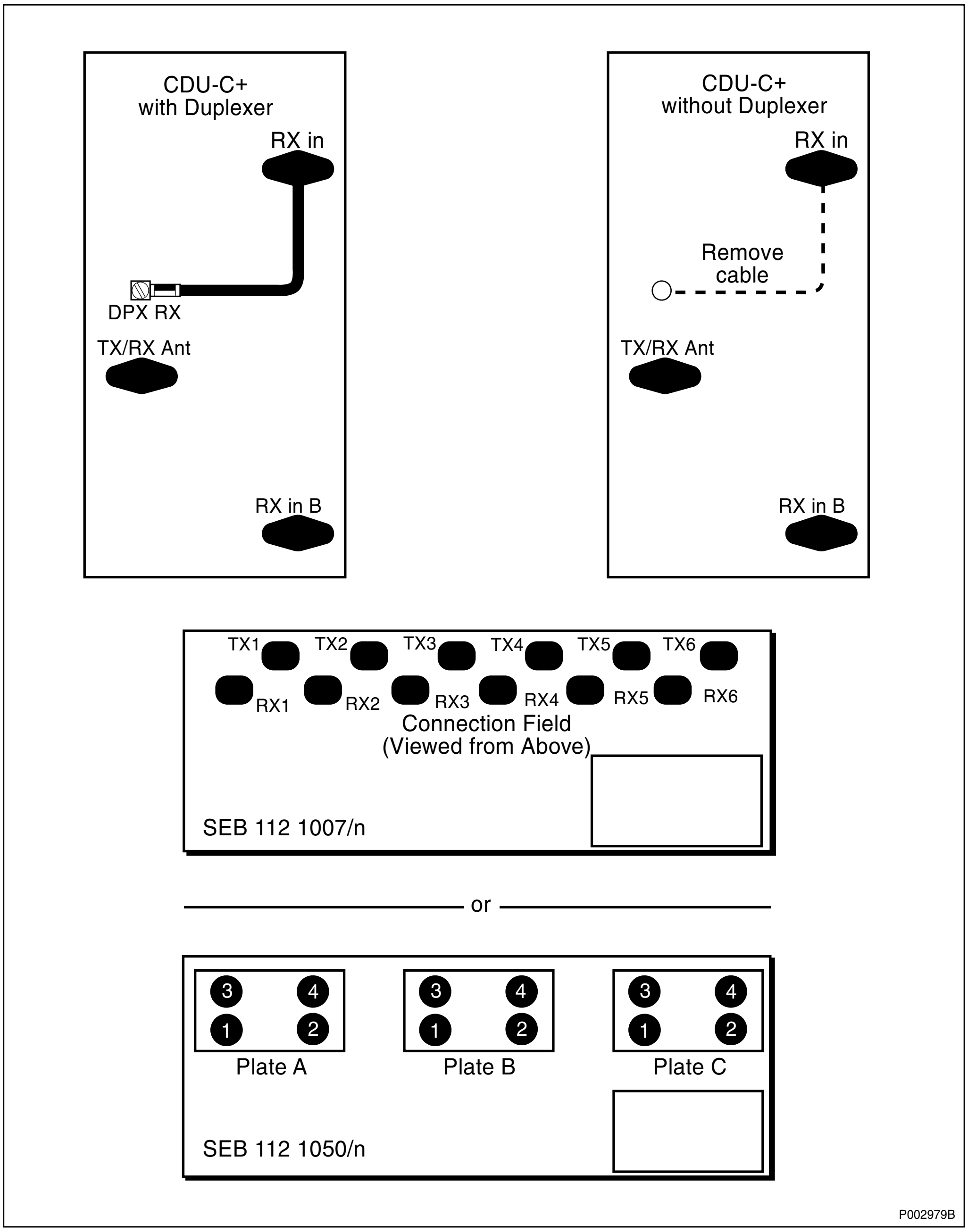


Figure 245 CDU-C+ at the top, connection field at the bottom

The CDUs are numbered 1 to 3 from left to right as they appear in the cabinet.

11.4.1 Previous Cabinet Wiring

Table 57 CDU-C+ with Duplexer, single CDU only

CDU	CDU Connector	Connection Field	Signal
1	TX/RX Ant	TX 1	TX A + RX A
	RX Ant B	RX 1	RX B
2	TX/RX Ant	TX 3	TX A + RX A
	RX Ant B	RX 3	RX B
3	TX/RX Ant	TX 5	TX A + RX A
	RX Ant B	RX 5	RX B

Table 58 CDU-C+ with Duplexer

CDU	CDU Connector	Connection Field	Signal
1	TX/RX Ant	TX 1	TX + RX
2	TX/RX Ant	TX 3	TX + RX
3	TX/RX Ant	TX 5	TX + RX

Table 59 CDU-C+ without Duplexer

CDU	CDU Connector	Connection Field	Signal
1	TX/RX Ant	TX 1	TX A
	RX in	RX 1	RX A
	RX in B	RX 2	RX B
2	TX/RX Ant	TX 3	TX A
	RX in	RX 3	RX A
	RX in B	RX 4	RX B
3	TX/RX Ant	TX 5	TX A
	RX in	RX 5	RX A
	RX in B	RX 6	RX B
3 (M)	HL in	RX 2	HL in
	HL out	RX 4	HL out
	HL out B	Not used, fit 50Ω termination	
1 (E)	HL in	RX 2	HL in
	HL out	RX 4	HL out
	HL out B	Not used, fit 50Ω termination	
M	Master Cabinet		
E	Extension Cabinet		

11.4.2 Cable Set Module Wiring CDU-C+

Table 60 CDU-C+ with Duplexer, single CDU. Cp9d/18d/19d_2.2 Module = CDU

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	TX 1	Plate A 1	TX A + RX A
	RX in B	RX 1	Plate A 3	RX B
2	TX/RX Ant	TX 3	Plate B 1	TX A + RX A
	RX in B	RX 3	Plate B 3	RX B
3	TX/RX Ant	TX 5	Plate C 1	TX A + RX A
	RX in B	RX 5	Plate C 3	RX B

Table 61 CDU-C+ with Duplexer. Cp9d/18d/19d_2.4 Module 1

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	TX 1	Plate A 1	TX + RX A
2	TX/RX Ant	TX 3	Plate B 1	TX + RX B

Table 62 CDU-C+ with Duplexer. Cp9d/18d/19d_3.6 Subset of 1x6, extension to subset 1x4

CDU	CDU Connector	Connection Field		Signal
3	TX/RX Ant	TX 5	Plate C 1	TX

Table 63 CDU-C+ with Duplexer. Cp9d/18d/19d_2.4, Module 2

CDU	CDU Connector	Connection Field		Signal
2	TX/RX Ant	TX 3	Plate B 1	TX + RX A
3	TX/RX Ant	TX 5	Plate C 1	TX + RX B

Table 64 CDU-C+ with Duplexer, Cp9d/18d/19d_2.4, Module 3 + 4

CDU	CDU Connector	Connection Field		Signal
3 (M)	TX/RX Ant	TX 5	Plate C 1	TX + RX A
	HL in	RX 5	Plate C 3	HL in
	HL out	TX 6	Plate C 4	HL out
1 (E)	TX/RX Ant	TX 1	Plate A 1	TX + RX B
	HL in	RX 1	Plate A 3	HL in
	HL out	TX 2	Plate A 4	HL out

Table 65 CDU-C+ without Duplexer, single CDU. Cp18/19_2.2, Module = CDU

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	TX 1	Plate A 1	TX
	RX in B	RX 1	Plate A 3	RX B
	RX in	RX 2	Plate A 2	RX A
2	TX/RX Ant	TX 3	Plate B 1	TX
	RX in B	RX 3	Plate B 3	RX B
	RX in	RX 4	Plate B 2	RX A
3	TX/RX Ant	TX 5	Plate C 1	TX
	RX in B	RX 5	Plate C 3	RX B
	RX in	RX 6	Plate C 2	RX A

Table 66 CDU-C+ without Duplexer. Cp18/19_2.4, Module 1

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	TX 1	Plate A 1	TX + RX A
	RX in	RX 2	Plate A 2	RX B
2	TX/RX Ant	TX 3	Plate B 1	TX + RX A
	RX in	RX 4	Plate B 2	RX B

Table 67 CDU-C+ without Duplexer. Cp18/19_3.6 Subset of 1x6, extension to subset 1x4

CDU	CDU Connector	Connection Field		Signal
3	TX/RX Ant	TX 5	Plate C 1	TX

Table 68 CDU-C+ without Duplexer, Cp18/19_2.4, Module 2

CDU	CDU Connector	Connection Field		Signal
2	TX/RX Ant	TX 3	Plate B 1	TX + RX A
	RX in	RX 4	Plate B 2	RX B
3	TX/RX Ant	TX 5	Plate C 1	TX + RX A
	RX in	RX 6	Plate C 2	RX B

Table 69 CDU-C+ without Duplexer, Cp18/19_2.4, Module 3 + 4

CDU	CDU Connector	Connection Field		Signal
3 (M)	TX/RX Ant	TX 5	Plate C 1	TX + RX A
	RX in	RX 6	Plate C 2	RX B
	HL in	RX 5	Plate C 3	HL in
	HL out	TX 6	Plate C 4	HL out
1 (E)	TX/RX Ant	TX 1	Plate A 1	TX + RX A
	RX in	RX 2	Plate A 2	RX B
	HL in	RX 1	Plate A 3	HL in
	HL out	TX 2	Plate A 4	HL out

11.5 CDU-D

The CDU is connected to antenna sockets located on the connection field of the cabinet. The connection field is located in the base of the cabinet.

The upper ends of the antenna coaxial cables must be terminated to the CDUs and are marked accordingly. The lower ends of these cables are connected to RF sockets in the base of the cabinet for termination to antennas.

The following information details the base panel sockets and the CDU connections to which they are terminated.

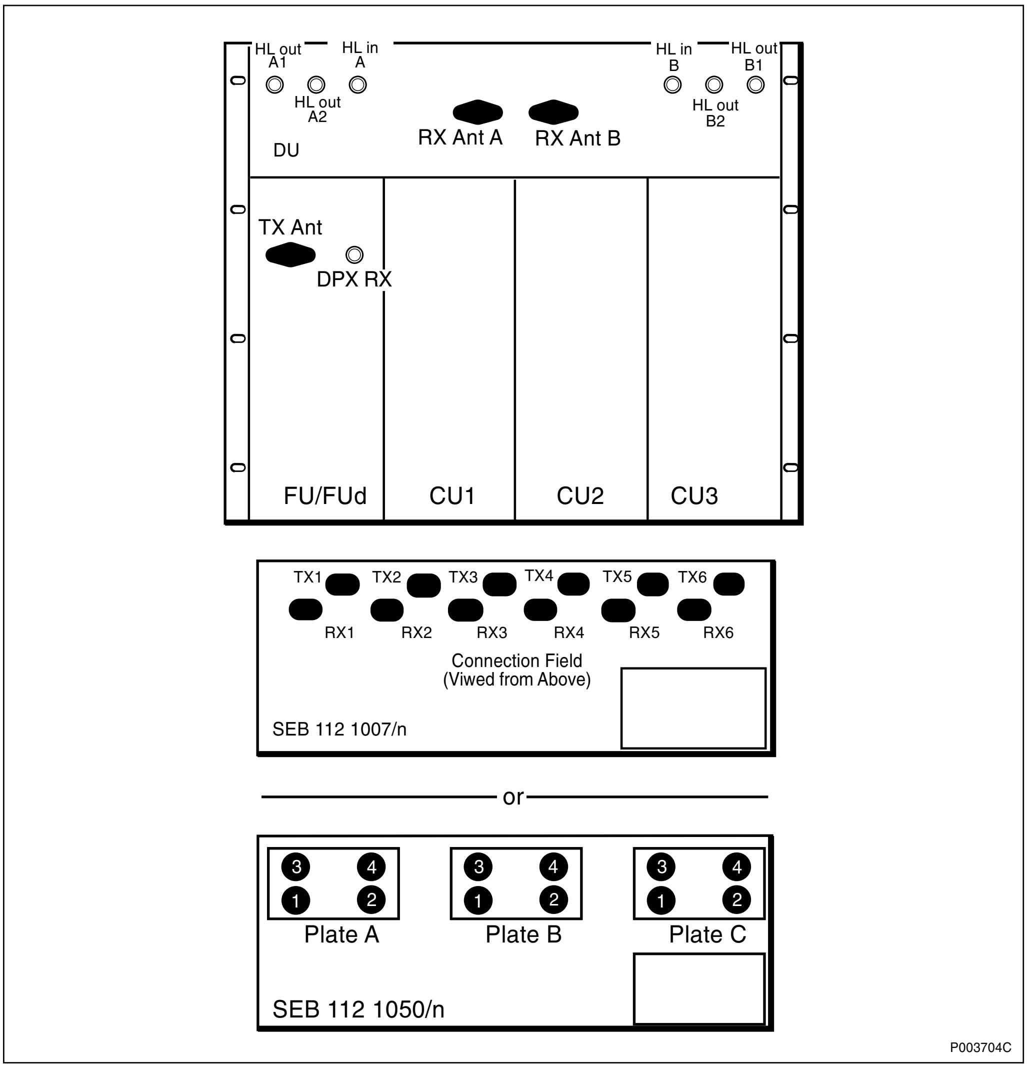


Figure 246 CDU-D at the top, connection field at the bottom

Table 70 CDU-D with duplexer, D9d/18d_2.6 (single cabinet)

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	RX 2	A 2	TX + RX A
	RX Ant B	RX 6	C 2	RX B

Table 71 CDU-D with duplexer, D9d/18d_2.12 (master cabinet)

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	RX 2	A 2	TX + RX A
	HL out A2	TX 1	A 3	HL out A2
	HL in B	TX 5	C 3	HL in B

Table 72 CDU-D with duplexer, D9d/18d_2.12 (extension cabinet)

CDU	CDU Connector	Connection Field		Signal
1	TX/RX Ant	RX 2	A 2	TX + RX B
	HL in A	TX 1	A 3	HL in A
	HL out B2	TX 5	C 3	HL out B2

Note: In the extension cabinet the connection DPX/RX will be connected to RX Ant B on the CDU-D

Table 73 CDU-D without duplexer, D9_3.6 and D18_2.6 (single cabinet)

CDU	CDU Connector	Connection Field		Signal
1	TX Ant	RX 2	A 2	TX
	RX Ant A	RX 1	A 1	RX A
	RX Ant B	RX 6	C 2	RX B

Table 74 CDU-D without duplexer, D18_2.12 (master cabinet)

CDU	CDU Connector	Connection Field		Signal
1	TX Ant	RX 2	A 2	TX
	RX Ant A	RX 1	A 1	RX A
	RX Ant B	RX 6	C 2	RX B
	HL out A2	TX 1	A 3	HL out A2
	HL out B2	TX 5	C 3	HL out B2

Table 75 CDU-D without duplexer, D18_2.12 (extension cabinet)

CDU	CDU Connector	Connection Field		Signal
1	TX Ant	RX 2	A 2	TX
	HL in A	TX 1	A 3	HL in A
	HL in B	TX 5	C 3	HL in B

11.6 Climate Unit Versions V1 and V2, Control Cables

Control cable DXU/ECU backplane — CCU — relay unit/AC interface

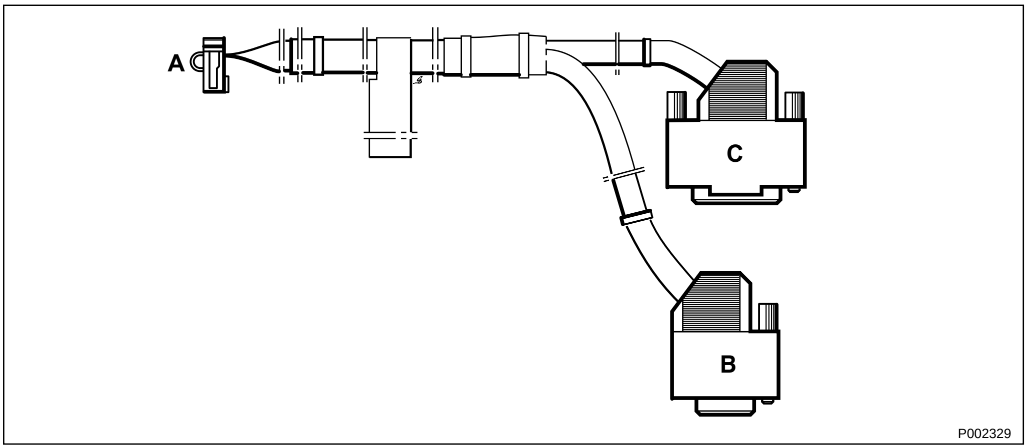


Figure 247 Climate unit versions V1 and V2, control cable DXU/ECU backplane — CCU — relay unit/AC interface

Table 76 Climate unit versions V1 and V2, control cable DXU/ECU backplane — CCU — relay unit/AC interface

Product Number	Connector B	Connector C
RPM 513 874/02500	Clim. Unit CTRL IN	Relay Unit (15-pol)

Control cable CCU — relay unit/AC interface

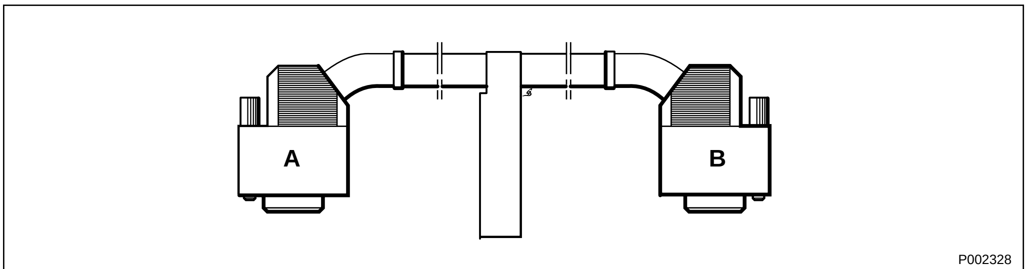


Figure 248 Climate unit versions V1 and V2, control cable CCU — relay unit/AC interface

Table 77 Climate unit versions V1 and V2, control cable CCU — relay unit/AC interface

Product Number	Connector A	Connector B
RPM 513 853/00800	Clim. Unit CTRL OUT	Relay Unit (9-pol)
RPM 513 853/00650	Clim. Unit CTRL OUT	Relay Unit (15-pol)

11.7 Climate Unit Versions V3 and V4, Control Cable

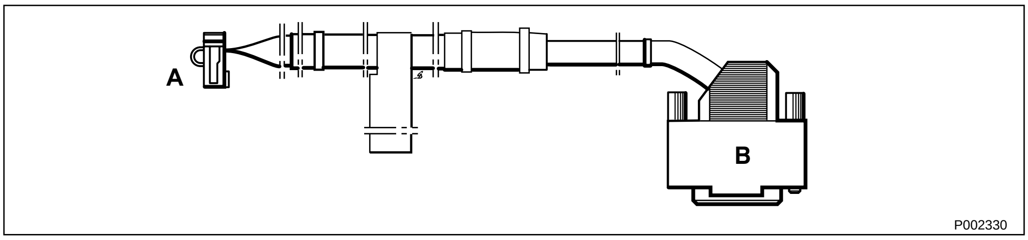


Figure 249 Climate unit versions V3 and V4, control cable DXU/ECU backplane — CCU

Table 78 Climate unit versions V3 and V4, control cable DXU/ECU backplane — CCU

Product Number	Connector A	Connector B
RPM 513 1337/02320	DXU/ECU Backplane P23	Climate Unit CTRL IN/OUT
RPM 513 1337/02000	DXU/ECU Backplane P23	Climate Unit CTRL IN/OUT

11.8 DXU/ECU Backplane in Cabinet with Mounting Base

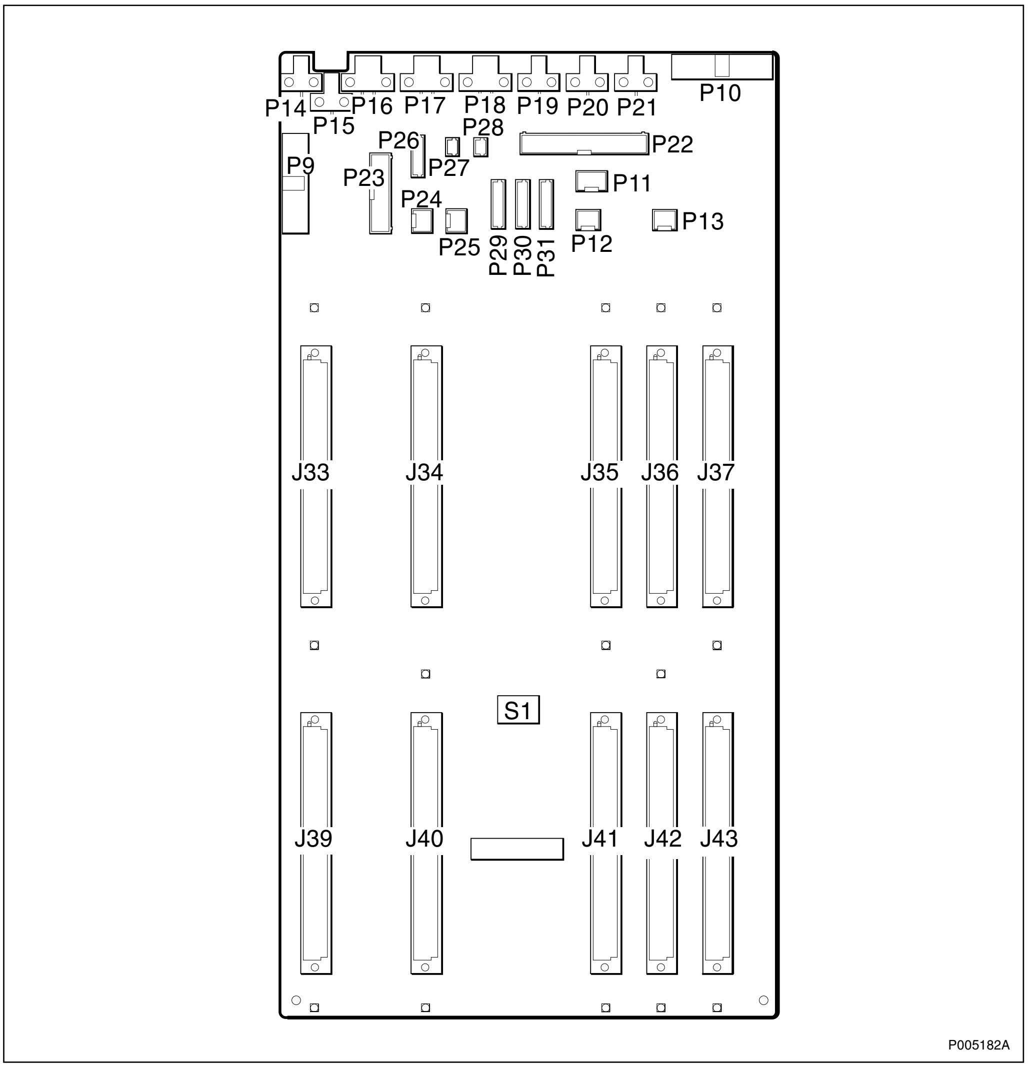


Figure 250 DXU/ECU backplane

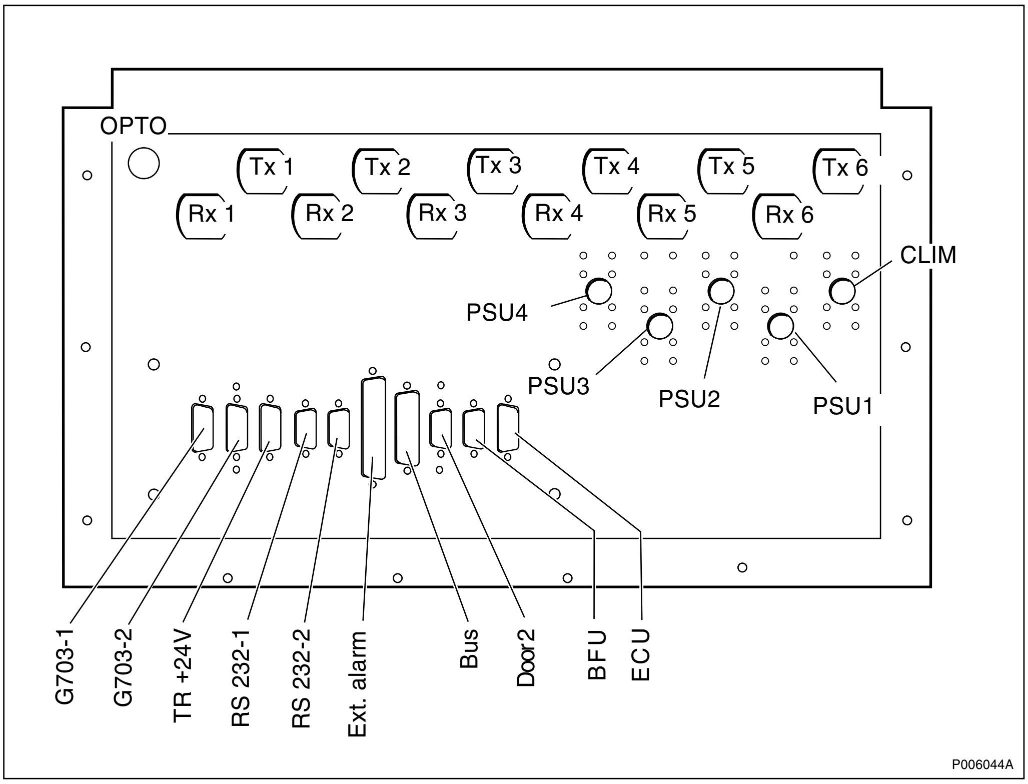


Figure 251 Connection field

Table 79 Cable connections, connection field, in cabinet with mounting base — DXU/ECU backplane

A-End Connection Connection Field	←	Cable Number	→	B-End Connection DXU/ECU Backplane
Bus on connection field	←	RPM 513 854/02160	→	P9
P7 TRU backplane (Local bus)	←	RPM 513 696/00520	→	P10
(Not used)				P11
RS 232-1 on connection field	←	RPM 513 740/01800	→	P12
RS 232-2 on connection field	←	RPM 513 740/01800	→	P13
24 V DC to ECU from IDM				P14
24 V DC to DXU from IDM				P15
BFU 1	←	RPM 513 872/01600	→	P16
BFU 2 (if supplied)				P17
BFU on connection field				P18
(Not used)				P19
(Not used)				P20
(Not used)				P21
Ext. alarm on connection field	←	RPM 513 707/02160	→	P22
CCU middle connector	←	RPM 513 718/3000	→	P23
Temp sensor 1	←	RPM 513 425/2	→	P24
Temp sensor 2	←	RPM 513 425/1	→	P25
Humidity sensor	←	RPM 513 743/01700	→	P26
Radio sub-cabinet door switch	←	RPM 513 1381/01800	→	P27
Door 2 on connection field	←	RPM 513 875/01950	→	P28
FCU 1	←	RPM 513 738/01200	→	P29
FCU 2	←	RPM 513 738/01700	→	P30
(Not used)				P31

11.9 DXU/ECU Backplane in Cabinet without Mounting Base

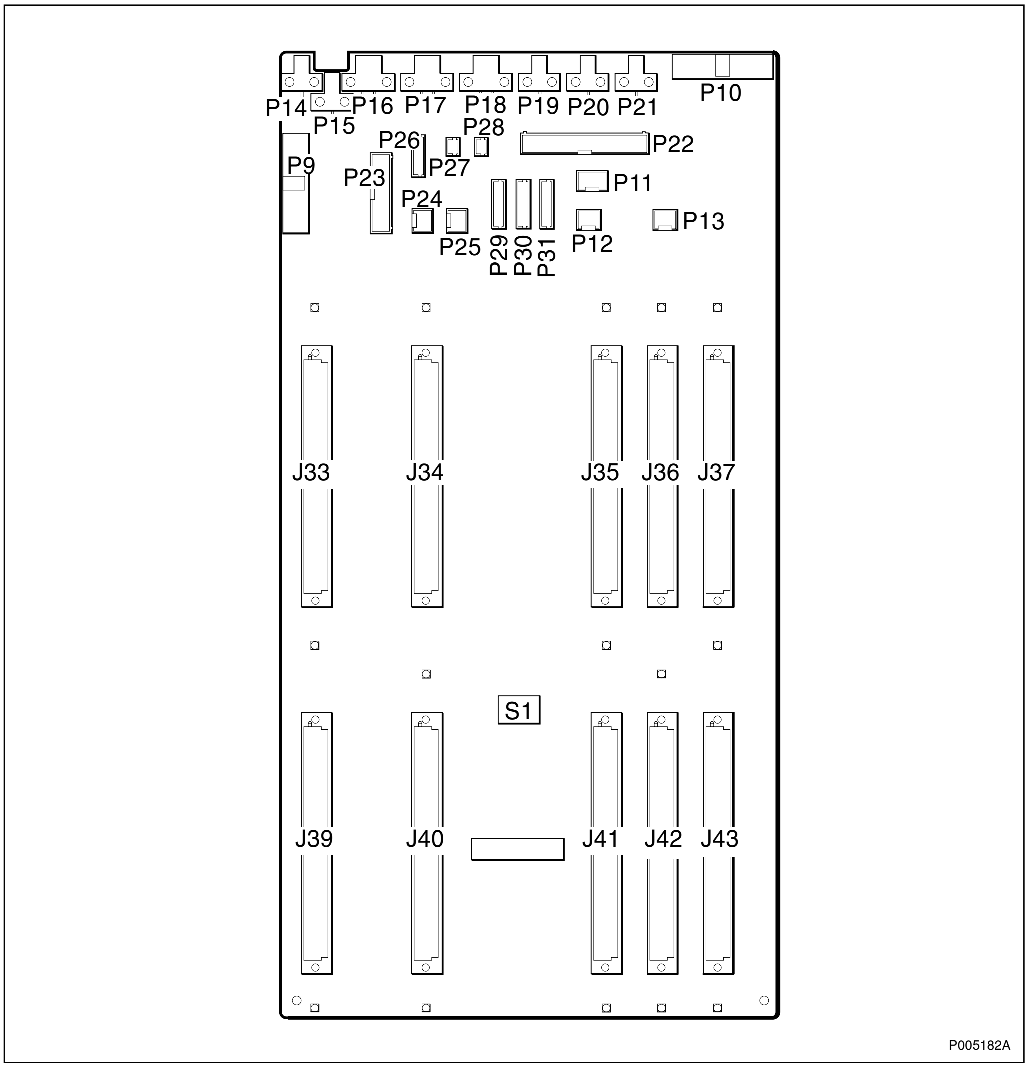


Figure 252 DXU/ECU backplane

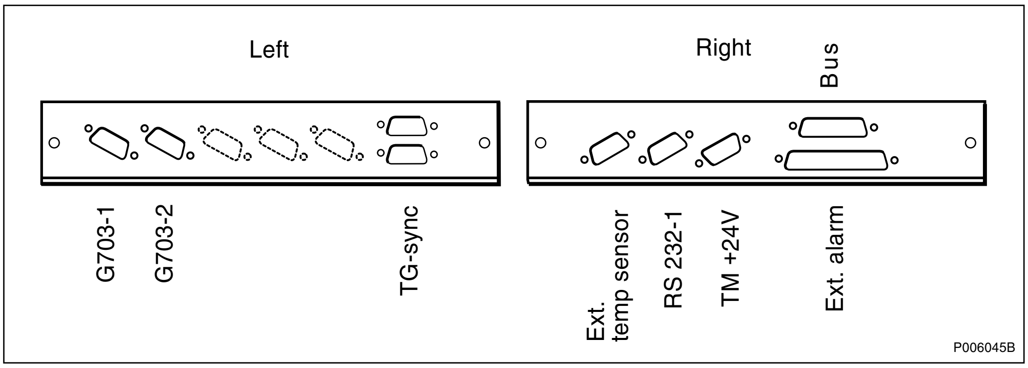


Figure 253 Connection field

Table 80 Cable connections, connection field, in cabinet without mounting base — DXU/ECU backplane

A-End Connection Connection Field	←	Cable Number	→	B-End Connection DXU/ECU Backplane
Bus on connection field	←	RPM 513 854/01620	→	P9
P7 TRU backplane (Local bus)	←	RPM 513 696/00520	→	P10
(Not used)				P11
RS 232-1 on connection field	←	RPM 513 740/01925	→	P12
RS 232-2 on connection field				P13
24 V DC to ECU from IDM				P14
24 V DC to DXU from IDM				P15
BFU 1	←	RPM 513 872/01600	→	P16
BFU 2 (if supplied)				P17
BFU on connection field				P18
(Not used)				P19
(Not used)				P20
(Not used)				P21
Ext. alarm on connection field	←	RPM 513 707/02160	→	P22
CCU middle connector	←	RPM 513 718/3000	→	P23
Temp sensor 1	←	RPM 513 425/2	→	P24
Temp sensor 2	←	RPM 513 425/1	→	P25
Humidity sensor	←	RPM 513 743/02000	→	P26
Radio sub-cabinet door switch	←	RPM 513 1381/01800	→	P27
Door 2 on connection field	←	RPM 513 1151/1	→	P28
FCU 1	←	RPM 513 738/01200	→	P29
FCU 2	←	RPM 513 738/01500	→	P30
(Not used)				P31

11.10 TRU Backplane

Note: If the RBS is equipped with a mid-mounted IDM, the connection board on the mid-mounted IDM is labelled with the cable destination.

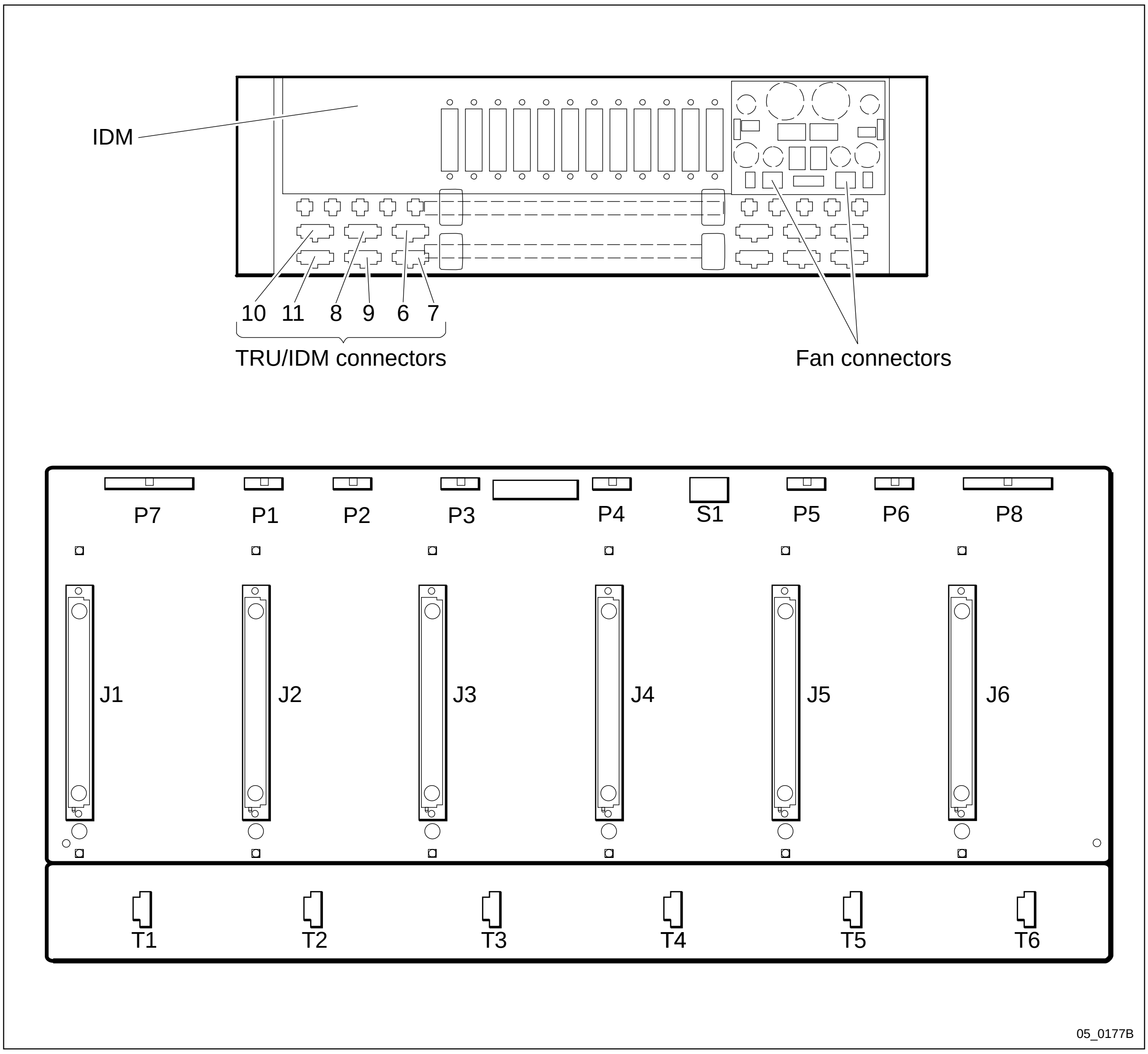


Figure 254 TRU backplane at bottom, rear of IDM 2 at top

Table 81 TRU backplane cable connectionsΩ

A-End Connection	← Cable Number →	B-End Connection
(Not used)		P1
CDU 1 CDU bus	← RPM 513 717/01500 →	P2 (jumper to P1)
(Not used)		P3
CDU 2 CDU bus	← RPM 513 717/01500 →	P4 (jumper to P3)
(Not used)		P5
CDU 3 CDU bus	← RPM 513 717/01500 →	P6 (jumper to P5)
P10 on ECU/DXU backplane	← RPM 513 696/00520 →	P7
120 Ω bus termination	← ROA 117 2130/1 →	P8
CDU 1 Pfwd1	← RPM 513 703/01640 →	J1 top
CDU 1 Prefl1	← RPM 513 703/01640 →	J1 bottom
CDU 1 Pfwd2	← RPM 513 703/01640 →	J2 top
CDU 1 Prefl2	← RPM 513 703/01640 →	J2 bottom
CDU 2 Pfwd1	← RPM 513 703/01640 →	J3 top
CDU 2 Prefl1	← RPM 513 703/01640 →	J3 bottom
CDU 2 Pfwd2	← RPM 513 703/01640 →	J4 top
CDU 2 Prefl2	← RPM 513 703/01640 →	J4 bottom
CDU 3 Pfwd1	← RPM 513 703/01640 →	J5 top
CDU 3 Prefl1	← RPM 513 703/01640 →	J5 bottom
CDU 3 Pfwd2	← RPM 513 703/01640 →	J6 top
CDU 3 Prefl2	← RPM 513 703/01640 →	J6 bottom
DC power IDM 6	← RPM 513 715/02200 →	T1 DC power for TRU 1
DC power IDM 7	← RPM 513 715/02200 →	T2 DC power for TRU 2
DC power IDM 8	← RPM 513 715/02200 →	T3 DC power for TRU 3
DC power IDM 9	← RPM 513 715/02200 →	T6 DC power for TRU 4
DC power IDM 10	← RPM 513 715/02200 →	T6 DC power for TRU 5
DC power IDM 11	← RPM 513 715/02200 →	T6 DC power for TRU 6

12 Positioning of RUs

Note: There are two different versions of the ACCU for RBS 2102. The denominations "ACCU version V1" through "ACCU version V3", used in the text below, are explained in the chapter "Introduction".

Note: There are five different versions of the climate unit for RBS 2102. The denominations "Climate unit version V1" through "Climate unit version V5", used below, are explained in the chapter "Introduction".

12.1 RBS 2102 with Two IDMs, ACCU version V1 and Climate Unit Version V1

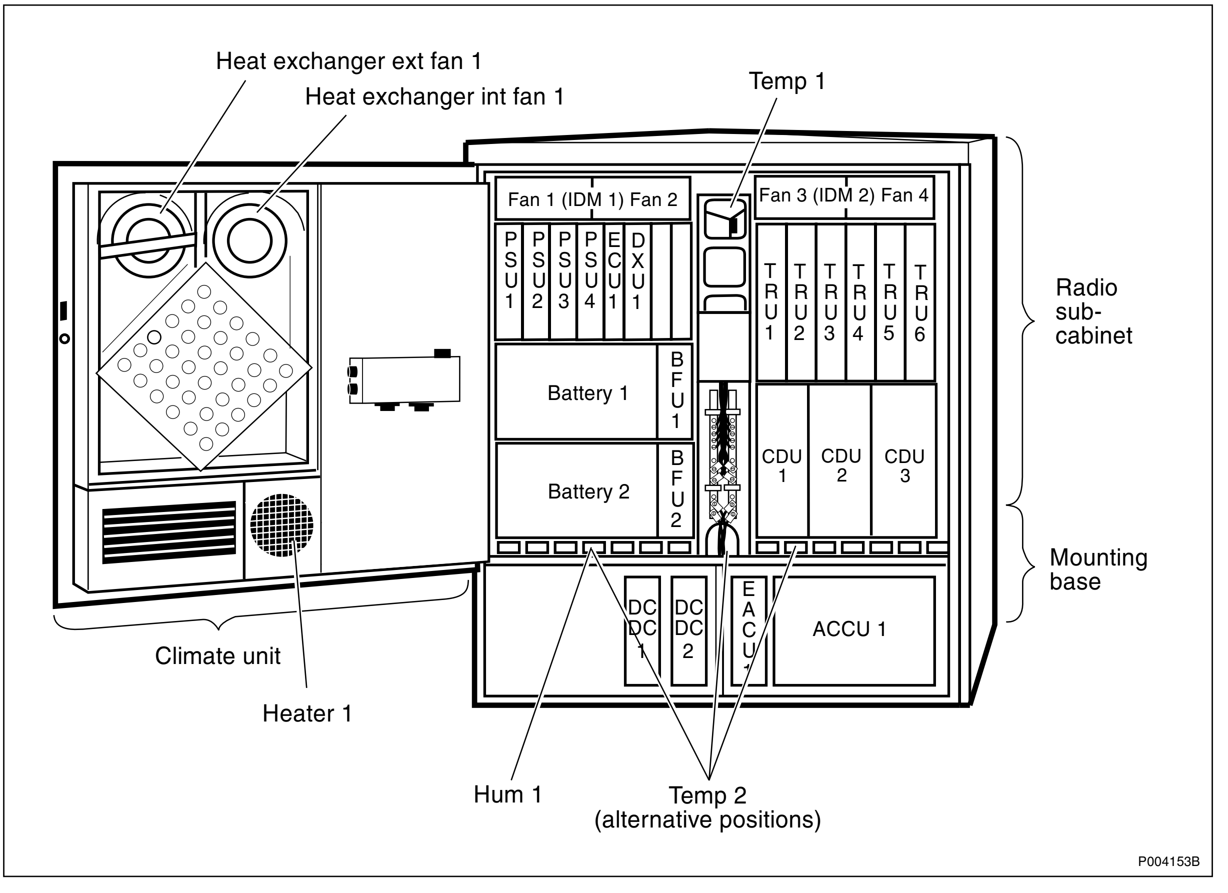


Figure 255 RBS 2102 with two IDMs. Positioning of RUs

12.2 RBS 2102 with a Single Mid-Mounted IDM, ACCU Version V1 and Climate Unit Version V3

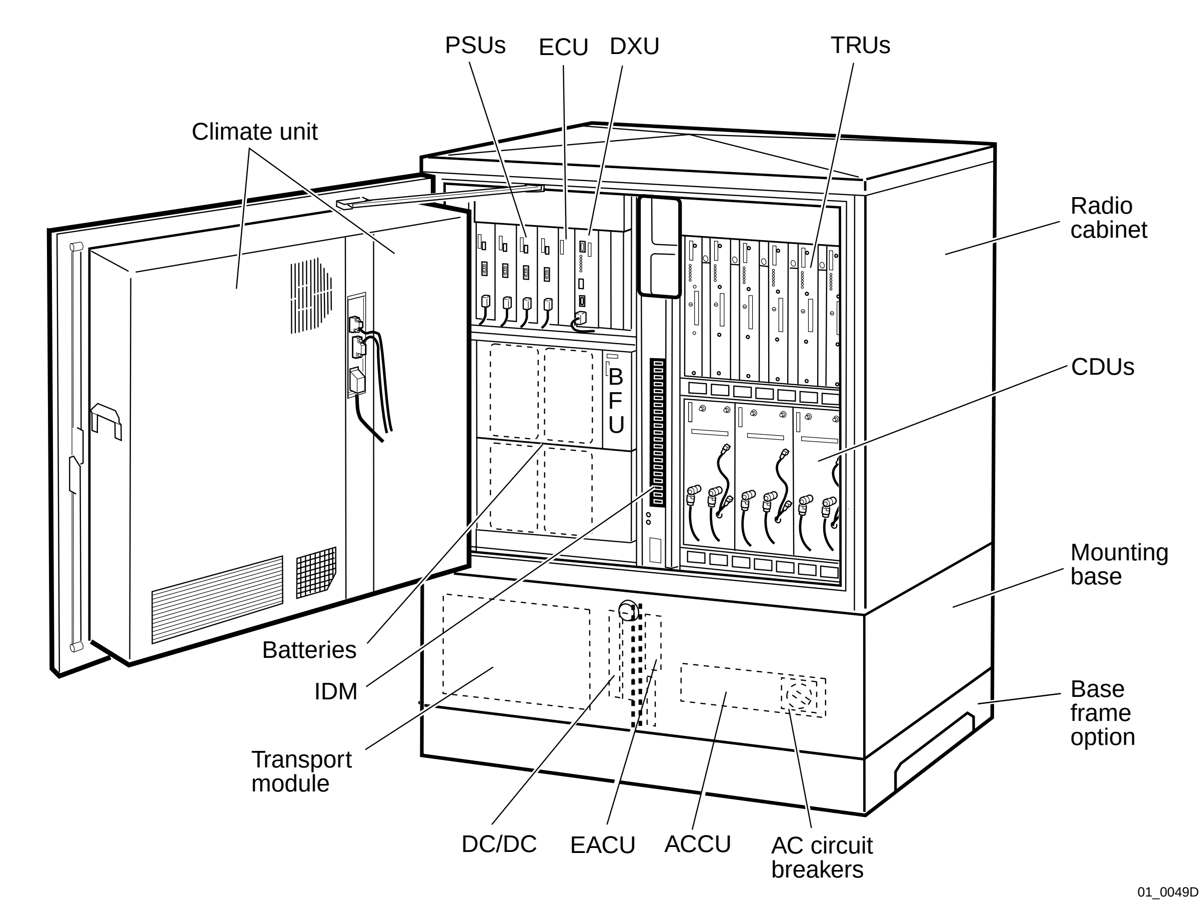


Figure 256 RBS 2102 with mid-mounted IDM, ACCU V1 and climate unit V3

12.3 RBS 2102 with a Single Mid-Mounted IDM, ACCU Version V2 or V3 and Climate Unit Version V4 or V5

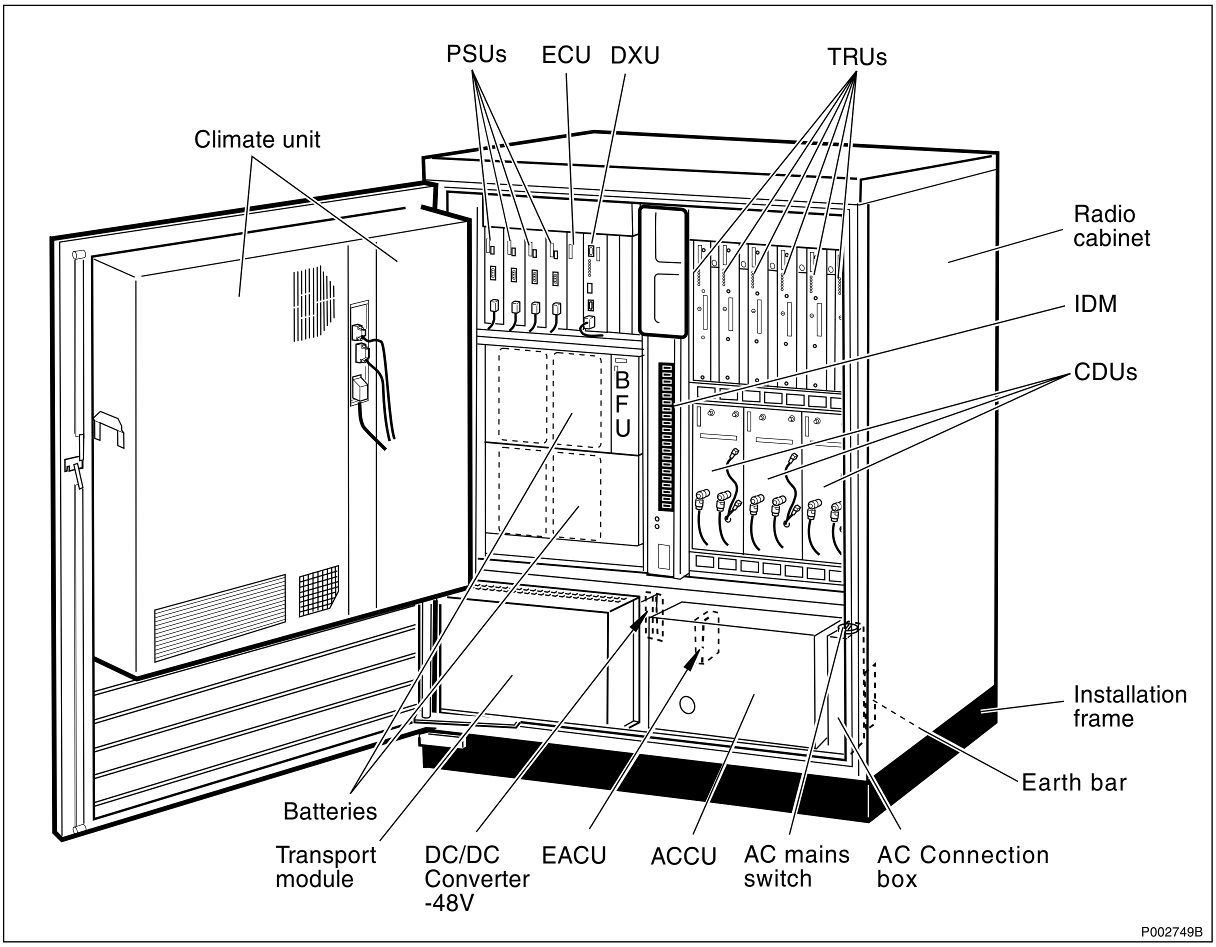


Figure 257 RBS 2102 with mid-mounted IDM, ACCU V2 and climate unit V4

This page is intentionally left blank

13 Glossary

This glossary lists abbreviations and acronyms used in texts dealing with RBS 2000 cabinets. Some basic terms and acronyms needed for cross-reference are included in the list.

Terms and Abbreviations

An arrow ⇒ is used to indicate a reference to another entry in this list.

1–P	One-Pair connection with echo cancellation (= two wires)
2–P	Two-Pair connection with echo cancellation (= four wires)
AAU	Active Antenna Unit
Abis	GSM interface standard defining attributes of the communication between BSC and BTS
AC	Alternating Current
ACB	Alarm Collection Board
ACCU	Alternating Current Connection Unit
A/D converter	Analog to Digital converter
AGW	Abis Gateway
Air conditioner	One version of the climate unit (Active cooler)
AIS	Alarm Indication Signal
ALBO	Automatic Line Build Out
ALNA	Antenna Low Noise Amplifier
ALPU	Antenna Lightning Protection Unit
AO	Application Object
ARAE	Antenna Related Auxiliary Equipment
ARFCN	Absolute Radio Frequency Channel Number
ARP	Antenna Reference Point
ARU	Active Replaceable Unit
ASIC	Application Specific Integrated Circuit
Astra	ASIC in the TRU
ASU	Antenna Sharing Unit

AT	Alphanumeric Terminal
ATRU	Adaptive Transceiver Unit
ATSR	Air Time Slot Resource
AU	Antenna Unit GSM 900 = CEU + Passive Antenna GSM 1800/1900 = AAU
BALUN	BALance and UNbalance transformer
Batt	Battery
BB	Battery Box
BBS	Battery Back-up Stand
BCCH	Broadcast Control CHannel Downlink only broadcast channel for broadcast of general information at a base station, on a base station basis.
BCS	Block Check Sequence
BDM	Battery Distribution Module The BDM is an IDM with a battery and a local processor.
BER	Bit Error Rate
BFU	Battery Fuse Unit
Bias injector	Injects DC power in the coaxial cable to feed the TMA. Isolates the DC power from the RF signal fed to the CDU.
Bm	Denotes a full rate traffic channel
BPC	Basic Physical Channel Denotes the air interface transport vehicle formed by repetition of one time slot on one or more radio frequency channels.
BS	Base Station
BSC	Base Station Controller GSM network node for control of one or more BTSs.
BSCSim	Base Station Controller Simulator
BSS	Base Station System

	GSM network logical unit comprising one BSC and one or more BTSs.
BTS	Base Transceiver Station GSM network unit operating on a set of radio frequency channels in one cell.
Burst	A portion of digital information, the physical content, that is transferred within the time interval of one time slot.
Cabinet	The physical housing of a base station
Cascade connections	Connection of several cabinets by the PCM cable. Similar to serial connection. ⇒ Cascading
Cascading	Connection of several cabinets by the PCM cable. Similar to serial connection. ⇒ Cascade connections
CBCH	Cell Broadcast CHannel This is a downlink only channel used by the GSM defined SMSCB function.
CCCH	Common Control CHannel Channel combining the following common control channels: PCH Paging CHannel RACH Random Access CHannel AGCH Access Grant CHannel
CCU	Climate Control Unit
CDU	Combining and Distribution Unit
CE	Conformité Européenne
Cell	An area of radio coverage identified by the GSM network by means of the cell identity
CEU	Coverage Extension Unit
CF	Central Functions
Channel	The common term channel denotes the virtual connection, consisting of physical and logical channels, between BSS and MS, during a call in progress. ⇒ Logical Channel ⇒ Physical Channel

Channel Combination	A physical channel on an air interface carrying a defined set of logical channels.
Channel group	A channel group is a group of dedicated logical channels to a specific MS.
CM	Control Module (for TMA)
CMD	Digital Radio Communication Tester
CMRU	Central Main Replaceable Unit. Main RU. The RBS is physically connected to the Base Station Controller (BSC) via the CMRU. There is only one CMRU in each RBS.
CNU	Combining Network Unit
Compr	Compressor
CON	LAPD concentrator LAPD concentration is used to reduce the number of required physical links between the BSC and BTS.
Config	Configuration
Co-siting	Co-siting is the operation of a radio base station in GSM together with the radio base station in Total Access Communication System (TACS) or Nordic Mobile Telephone system (NMT) on the same site by sharing common equipment.
CPI	Communication and Power Interface
CPI	Customer Product Information
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
CS	Coding Scheme
CSA	Canadian Standards Association
CSES	Consecutive Severely Errored Second
CSU	Channel Service Unit
CU	Combining Unit (RU in CDU_D)
CXU	Configuration Switch Unit
Dannie	ASIC in the TRU
DB	DataBase

DC	Direct Current
DCC	Digital Cross Connector
DCCH	Dedicated Control CHannel Dedicated control channels carry signalling data.
DCCU	DC Connection Unit
ddTMA	Dual Duplex Tower Mounted Amplifier This type needs only one combined TX/RX feeder from the BTS to the TMA. ⇒ dTMA ⇒ rTMA ⇒ TMA ⇒ BTS
DF	Distribution Frame
DFU	Distribution and Fuse Unit
DIP	DIgital Path The name of the function used for supervision of the connected PCM lines.
Dixie	ASIC in the TRU
DM	Degraded Minute
DM	Distribution Module
DMRU	Distributed Main Replaceable Unit If a Main RU is subordinated to the CMRU, it is said to be distributed.
Downlink	Signalling direction from the system to the MS
DP	Digital Path
DP	Distribution Panel
DPX	Duplexer
DS1	Digital Signal level 1 (1544 kbit/s)
DSP	Digital Signal Processor
DT	Data Transcript
DTE	Data Terminal Equipment
DTF	Distance To Fault
dTMA	Duplex TMA

	dTMA is similar to the old ALNA except for different characteristics. ⇒ ddTMA ⇒ rTMA ⇒ TMA
dTRU	double Transceiver Unit
DU	Distribution Unit (RU in CDU-D)
DUT	Device Under Test
DX	Direct Exchange
DXB	Distribution Switch Board
DXC	Digital Cross Connector
DXU	Distribution Switch Unit
DXX	Ericsson Cellular Transmission System including NMS
E1	Short for G.703 2048 kbit/s PCM link
E-GSM	Extended GSM
EACU	External Alarm Connection Unit
EC1	External Condition Map Class 1
EC2	External Condition Map Class 2
ECU	Energy Control Unit
EDGE	Enhanced Data rate for Global Evolution
EDT	Electrical Down Tilt
EEPROM	Electrically Erasable Programmable Read-Only Memory
EIRP	Effective Isotropic Radiated Power
EMC	Electro Magnetic Compatibility
EMF	ElectroMotive Force
EMI	Electromagnetic Interference
ENV	Environmental
EOC	Embedded Operations Channel
EPC	Environmental and Power Control
ES	Errored Second
ESB	External Synchronization Bus

ESD	ElectroStatic Discharge
ESO	Ericsson Support Office
ETS	European Telecommunication Standard
EXT	External
FACCH	Fast Associated Control CHannel Main signalling channel in association with a TCH.
FCC	Federal Communications Commission
FCCH	Frequency Correction CHannel
FCOMB	Filter COMBiner
FCU	Fan Control Unit
FDL	Facility Data Link
FDU	Feeder Duplexer Unit
FER	Frame Erasure Ratio
FIU	Fan Interface Unit
FS	Function Specification
FSC	Field Support Centre
FU	Filter Unit (RU in CDU-D)
FUd	Filter Unit with duplexer (RU in CDU-D)
FXU	Future Expansion Unit
G01	MO model for RBS 200
G12	MO model for RBS 2000
G.703	CCITT Standard for transmission
GPRS	General Packet Radio Services
GS	General Specification
GSL	GPRS Signalling Link
GSM	Global System for Mobile communications International standard for a TDMA digital mobile communication system. Originally, GSM was an abbreviation for Group Special Mobile, which is a European mobile telecommunication interest group, established in 1982.

GSM 900	GSM system 900 MHz (generic)
GSM 1800	(GSM-based) Digital communication system 1800 MHz (generic)
GSM 1900	(GSM-based) Digital communication system 1900 MHz (generic)
HCE	HDSL Central Equipment
HCOMB	Hybrid COMBiner
HDLC	High level Data Link Control
HDSL	High bit rate Digital Subscriber Line
Heat Exchanger	A version of the climate unit
HEU	Heat Exchanger Unit
HISC	Highway Splitter Combiner
HLIN	High Level IN
HLOUT	High Level OUT
HMS	Heat Management System
Hum	Humidity
HW	HardWare
HWU	HardWare Unit An HWU consists of one or more SEs. An HWU is a functional unit within the RBS. The HWU is either active (equipped with a processor) or passive (without processor).
I1A	Internal Fault Map Class 1A
I1B	Internal Fault Map Class 1B
I2A	Internal Fault Map Class 2A
IA	Immediate Assignment
IC	Integrated Circuit
ID	IDentification
IDB	Installation Data Base
IDM	Internal Distribution Module
IEC	International Electric Commission
IF Box	Interface Box

IMSI	International Mobile Subscriber Identity
INIT	Initial
INT	Internal
IOG	Input/Output Group
IOM	Internal Operation and Maintenance bus
IR	InfraRed
IS	Interface Switch
IWD	InterWork Description
JTC	Joint Technical Committee
LAPD	Link Access Procedures on D-channel LAPD is the data link layer (layer 2) protocol used for communication between the BSC and the BTS on the Abis interface. Abis layer 2 is sometimes used synonymously with LAPD.
LBO	Line Build Out
LED	Light Emitting Diode
LLB	Line Loop Back
LNA	Low Noise Amplifier
Local bus	The local bus offers communication between a central main RU (DXU) and distributed main RUs (TRU and ECU).
Local mode	When the RU is in Local mode, it is not communicating with the BSC.
Local/Remote switch	A switch used by the operator to order the RU to enter Local or Remote mode.
LOF	Loss Of Frame
Logical Channel	A logical channel represents a specified portion of the information carrying capacity of a physical channel. GSM defines two major categories of logical channels: TCHs Traffic CHannels, for speech or user data

	CCHs Control CHannels, for control signalling. ⇒ Physical Channel ⇒ Channel Combination
Logical RU	A unit which can be referred to, but is not a single physical unit. There are three different kinds of logical RUs: 1. Buses 2. Antennas 3. Environment
LOS	Loss Of Signal
LVD	Low Voltage Directive
LVF	Low Voltage Filter
MAC	Medium Access Controller
MADT	Mean Accumulated DownTime
Magazine	A magazine is a reserved space in the cabinet, which may hold one or more RUs.
Main RU	A main replaceable unit is a replaceable unit that contains one or more processors, to which software can be downloaded from the BSC.
MCB	MultiCasting Box
MHS	Modification Handling System Ericsson trouble report database
MMI	Man-Machine Interface
MO	Managed Object
MR	Measurement Receiver
MRT	Mean Repair Time
MS	Mobile Station
MSC	Mobile services Switching Centre GSM network unit for switching, routing and controlling calls to and from the Public Switched Telephone Network (PSTN) and other networks.
MSTP	Mobile Station Test Point
MTBF	Mean Time Between Failure

MTBCF	Mean Time Between Catastrophe Failure
Multidrop	Two or more RBSs are connected in a chain to the same transmission system. All the relevant time slots are dropped out by each RBS. (This function is sometimes called cascading.)
NCS	National Colour System
NEBS	Network Equipment Building System
NMS	Ericsson Network Management System in DXX
Nominal Power	The nominal power is the power level defined when configuring the transceiver.
N terminal	Neutral terminal in an AC mains connection
NTU	Network Terminating Unit
OL/UL	Overlaid/Underlaid
O&M	Operation and Maintenance General term for activities such as configuration, utilization of channels (frequency bands), cell planning, system supervision, hardware and software maintenance, subscriber administration, and so forth.
OMC	Operation and Maintenance Centre
OML	Operation and Maintenance Link Layer 2 communication link for operation and maintenance services on Abis.
OMT	Operation and Maintenance Terminal The OMT is a terminal that supports functions for handling the RBS on site. The terminal can be a portable PC.
Operation	Operation is the normal, everyday running of the RBS with full functions.
OPI	OPerational Instructions
OVP	OverVoltage Protection
OXU	Space for Optional Expansion
P-GSM	Primary GSM
PA	Power Amplifier

PAM	Power Amplifier Module
Passive RU	A passive replaceable unit has a very low level of intelligence and is independent of the processor system.
PBA	Printed Board Assembly
PBC	Power and Battery Cabinet
PC	Personal Computer
PCAT	Product CATalogue A web-based ordering system on Ericsson's Intranet.
PCB	Printed Circuit Board
PCH	Paging CHannel Downlink only subchannel of CCCH for system paging of MSs. ⇒ CCCH
PCM	Pulse Code Modulation
PCU	Packet Control Unit
PDCH	Packet Data Channel
PE terminal	Protective Earth terminal in an AC mains connection
PFWD	Power Forward
Physical Channel	An air interface physical channel carries one or more logical channels. A physical channel uses a combination of frequency and time division multiplexing and is defined as a sequence of radio frequency channels and time slots. ⇒ TDMA frame ⇒ Logical channel
PIN	Personal Identification Number
PLB	Payload Loop Back
PLMN	Public Land Mobile Network A network, established and operated by an administration or its licensed operator(s), for the specific purpose of providing land mobile communication services to the public. It provides communication possibilities for mobile users. For communication between mobile and fixed

	users, interworking with a fixed network is necessary.
PPE	Personal Protective Equipment
PREFL	Power Reflected
PSA	Power Supply Adapter
PSU	Power Supply Unit
PWU	Power Unit
RACH	Random Access CHannel Uplink only subchannel of CCCH for MS request for allocation of a dedicated channel. ⇒ CCCH
RAI	Remote Alarm Indication
RAM	Random Access Memory
RBER	Radio Bit Error Ratio
RBS	Radio Base Station All equipment forming one or more Ericsson base station. ⇒ BTS
RCB	Radio Connection Box
RD	Receive Data
Remote mode	When the RU is in RU Remote mode, a link is established between the BSC and the central main RU.
RF	Radio Frequency
RFCH	Radio Frequency CHannel A radio frequency carrier with its associated bandwidth.
RFTL	Radio Frequency Test Loop
RLC	Radio Link Control
RLC	Repair Logistic Centre
RSL	Radio Signalling Link
R-state	Release state

RS232	American standard for term/MODEM interconnection
rTMA	Receiver TMA rTMA has no duplexers. It is used for amplification of the RX signal. ⇒ ddTMA ⇒ dTMA ⇒ TMA
RTN	Return
RU	Replacement Unit An RU consists of one or more HWUs. An RU may be replaced by another RU of the same type. The RU is the smallest unit that can be handled on site.
RX	Receiver
RX1	Receiver antenna branch 1
RX2	Receiver antenna branch 2
RXA	Receiver antenna branch A
RXB	Receiver antenna branch B
RXD	Receiver Divider
RXDA	Receiver Divider Amplifier
RXDP	Receiver Distribution Plane
RXLEV	Measure of signal strength as defined in GSM:05.08:8.1.4
RXQUAL	Measure of signal quality as defined in GSM:05.08:8.2.4
SACCH	Slow Associated Control CHannel
SCH	Synchronization CHannel
SDCCH	Stand alone Dedicated Control CHannel Main dedicated signalling channel on the air interface, mainly used for call locating and establishment.
SCU	Switching and Combining Unit
SE	Supervised Entity
SES	Severely Errored Second
SIG	Signalling
SIM	Subscriber Identity Module

SIR	Small Indoor RBS
SMS	Short Message Service (point to point) A short message, up to 160 alphanumeric characters long, can be sent to or from an MS (point to point).
SO	Service Object
SS	Swedish Standard
Sub-RU	A sub-replaceable unit is always connected to a superior Main RU. This connection is used for example for retrieval of the RU identity. A sub-RU normally does not have a processor. Note that an RU with a processor, which cannot be loaded, is classified as a sub-RU.
SVS	System Voltage Sensor
SW	SoftWare
SWR	Standing Wave Ratio
SYNC	Synchronous
T1	Transmission facility for DS1 (1544 kbit/s)
TA	Timing Advance A signal sent by the BTS to the MS which the MS uses to advance its timing of transmissions to the BTS to compensate for propagation delay.
TC	Transaction Capabilities
TCB	Transceiver Control Board
TCH	Traffic CHannel The traffic channels carry either encoded speech or user data.
TCH SIG	Traffic CHannel Signalling
TD	Transmit Data
TDMA	Time Division Multiple Access Multiplexing of several channels in a common frequency band. Each channel is assigned a certain time division, a time slot.
TDMA frame	GSM air interface time frame comprising eight time slots

TEI	Terminal Endpoint Identifier TEI is an identification code carried by a LAPD frame as a terminal connection endpoint within a Service Access Point (SAP).
TEMS	TEst Mobile Station
TF	Timing Function
TG	Transceiver Group
Timing bus	The timing bus carries air timing information from the timing unit in the DXU to the TRUs.
TLS	Terrestrial Link Supervision
TM	Transport Module The Transport module is non-RBS equipment belonging to the transport network.
TMA	Tower Mounted Amplifier There are three types of TMAs: dTMA, rTMA and ddTMA. ⇒ dTMA ⇒ rTMA ⇒ ddTMA
TMA CM	Tower Mounted Amplifier Control Module
TN	Time slot Number
TN O&M	Transport Network operation and Maintenance (in general)
Tora	ASIC in the TRU
TRA	Transcoder Rate Adapter The TRA Unit in BSC performs transcoding of speech information and rate adaption of data information.
Tracy	ASIC in the TRU
TRS	Transceiver System
TRU	Transceiver Unit
TRX	Transceiver (combined transmitter and receiver)
TRXC	Transceiver Controller
TS	Time Slot

	A 0.577 ms period (TDMA frame subunit) corresponding to 156.25 raw bits of information. The eight time slots of each TDMA frame are numbered 0...7. ⇒ Burst
TT	Total Time
TU	Timing Unit
TX	Transmitter
TXA	Transmitter Antenna A
TXB	Transmitter Antenna B
TXBP	Transmitter BandPass filter
TXU	Radio Transmitter Unit
UAS	Unavailable Seconds
UL	Underwriter Laboratories
Uplink	Signalling direction from the MS to the system
UPS	Uninterrupted Power Supply
VCO	Voltage Controlled Oscillator
VSWR	Voltage Standing Wave Ratio RF signal measure. The quotient between transmitted and reflected voltage.
X-bus	The X-bus carries transmit air data frames between transceivers.
Y-link	The interface between the DXU and each DSP System in core based TRUs

RBS 2102 Fault List

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

Contents

This page is intentionally left blank

1 Fault List

Note: This document gives the reader advice on how to deal with fault codes that are read in the OMT (R-OMT). The actions are not to be treated as instructions, rather they give helpful hints when the fault appears. All hints should be followed one at a time and not collectively. The document is currently under revision and is not complete.

Note: The fault must be verified before returning the faulty unit to the Ericsson repair center.

This chapter describes faults reported to the BSC and HW units suspected of causing the fault.

Where applicable, the fault lists indicate faults with restricted validity for SW releases R7.0, R7C, R7D and R8A respectively.

Note: Unused fault numbers are not indicated in the fault maps.

1.1 Terminology

The following terminology is used throughout this chapter.

1.1.1 Fault Number

The fault number is identical with the bit position in the fault map reported over the Abis interface.

1.1.2 Fault Maps

Note: No decoding of fault maps is necessary when using RBS 2000 release HRB 105 01/2, version R7 and subsequent updates. The fault maps will be presented in plain text (fault type).

Internal Fault Map Class 1A (I1A)

Faults reported in this class are faults that affect MO function. Faulty HW is part of the signalling MO.

Internal Fault Map Class 1B (I1B)

Faults reported in this class are faults that affect MO function. The origin of the fault is external to the signalling MO.

Internal Fault Map Class 2A (I2A)

Faults reported in this class are faults that do not affect MO function. Faulty HW is part of the signalling MO.

External Condition Map Class 1 (EC1)

Conditions reported in this class are conditions that affect MO function. The conditions are TG external.

External Condition Map Class 2 (EC2)

Conditions reported in this class are conditions that do not affect MO function. The conditions are TG external.

Replacement Unit Map (RU Map)

Units reported in this map are HW units suspected of causing the faults in the internal fault maps described above.

1.1.3 Logical RU

A logical RU is defined as a unit that can be referred to but is not a single physical unit. There are four different kinds of logical RUs.

Logical RUs in 1 and 2 above are pointed out when the analysis fails to give a more detailed localisation of the fault. However, the intention is still not to point out a logical RU.

1. **Buses**. These are often referred to as a single physical unit, but are implemented in the backplane of the cabinet with cables. When a bus is pointed out in the RU map it should be understood that faulty HW can be any unit connected to the bus, or the bus itself. Logical bus RUs are:

   - CDU bus
   - Local bus
   - Power communication loop
   - PSU DC cable
   - Timing bus
   - X bus

2. **Antenna**. A logical antenna means the whole signal path between the Transmitter/Receiver and the physical antenna. The logical antenna RU is:

   - Antenna

3. **Environment**. This RU records conditions that cannot be affected from the base station. There are two groups under this RU:

   - Power, that handles external power
   - Climate, that handles humidity and temperature

   For example, if the temperature in the cabinet is too high, or the incoming AC mains power is out of range, the logical RU "Environment"is denoted as faulty.

   The logical RU is:

   - Environment

4. **RBS DB**. The RBS database is regarded as a replaceble unit even though it is not a physical unit. It comprises the data in the database only, not the medium it resides in.

1.2 Fault Map Overview

Fault codes on the Abis interface are defined per MO. The SO RU map and the I1A/I2A fault maps should be read together. The SO fault map denotes which fault it is, and the RU map denotes where the fault is located.

An AO I1B fault has a corresponding SO I2A fault. So by reading the I2A fault map and the RU map for SO CF or SO TRXC, the HW that is causing the AO I1B fault can be found. This is the case when BTS internal HW affects a single AO.

The AO is not allowed to report the HW itself as this task is assigned to the HW responsible SO. One could say that the consequence is reported by the AO I1B fault map and the cause is reported by the SO I1A/I2A fault maps and the RU map.

1.2.1 Notes to the Fault Maps

Note 1: RBS behavior due to DC undervoltage

Nominal DC voltage

27.2 V DC ±0.1 V DC at 25 °C and nominal load

DC voltage falling

The following list describes what happens when the DC voltage is falling from nominal voltage to undervoltage level.

- The DC voltage is within nominal range
- Fault SO CF I2A:18 arises (DC voltage out of range)
- Fault SO CF I1A:12 arises (DC voltage out of range) and the RBS is shut down
- Batteries are disconnected

DC voltage rising

The following list describes what happens when the DC voltage is rising from undervoltage to nominal voltage level.

- The DC voltage is within nominal range
- Fault SO CF I2A:18 ceases
- Batteries are reconnected
- Fault SO CF I1A:12 ceases and the RBS is restarted

Note 2: Fault reporting connected to temperature and humidity ranges supported inside the cabinet (RBS macro) or outside the cabinet (RBS micro):

Normal Conditional Range

All RUs are able to function as specified

Temperature range:	5 – 45 °C
Humidity range:	5 – 85 % (relative)

Safe function

The RUs are able to function but with reduced performance. This operating mode should not be allowed to last more than 72 consecutive hours, and a total of not more than 15 days in one year.

Temperature range: 0 – 5 °C and 45 – 55 °C

Fault SO CF I2A:16 arises – Indoor temp out of normal conditional range (macro)

Fault SO CF I2A:44 arises – Indoor temp above normal conditional range (micro)

Fault SO CF I2A:45 arises – Indoor temp below normal conditional range (micro)

Humidity range: 85 – 90 % (relative)

Fault SO CF I2A:17 arises – Indoor humidity (macro)

Non-destruction

The RUs are not able to function properly but they will not be damaged. This condition should not be allowed to last more than 96 consecutive hours, and a total of not more than 5.5 days in a 3 year period.

Temperature range: -10 – 0 °C and 55 – 60 °C

Fault SO CF I1A:10 arises – Indoor temp out of safe range (macro)

Fault SO CF I1A:19 arises – Indoor temp above safe range (micro)

Fault SO CF I1A:20 arises – Indoor temp below safe range (micro)

1.3 SO CF Fault Maps

1.3.1 SO CF, external condition map class 1

Table 1 SO CF EC1

Fault No.	**SO CF EC1:4**
Fault name	L/R SWI (BTS in local mode)
Description	The DXU is in local mode and cannot be controlled by the BSC.
Action	Press the Local/remote button to bring the DXU into remote mode.

Fault No.	**SO CF EC1:5**
Fault name	L/R TI (Local to remote while link lost)
Description	This fault tells the BSC that the DXU went into remote mode while the link was down.
Note:	For information only, not a fault.

1.3.2 SO CF, external condition map class 2

Table 2 SO CF EC2

Fault No.	**SO CF EC2:9**
Fault name	RBS door (RBS cabinet door open)
Description	This fault indicates that the cabinet door is open. When the door is closed, the alarm will cease after 5 minutes.
Action	If the alarm is still active when the 5 minute limit is passed, try the following actions until the fault is corrected: •Check the door switch and adjust it if required. •Replace the door switch.

Fault No.	**SO CF EC2:10**
Fault name	Mains fail (External power source fail)
Remark	SW release R8A
Description	There is a failure in AC mains supply.
Possible reasons	•AC mains failure. •ACCU fault (or wrong strapping). •Disconnected AC input cable to ECU or PSU.
Note:	If this fault and the fault Nos. SO CF I2A:23, 29 and 37 arise at the same time, then there is probably a bad connection between ACCU and ECU provoking false alarms.

Fault No.	**SO CF EC2:11**
Fault name	ALNA/TMA fault
Remark	SW release R8A
Related fault	AO RX I1B:1 – ALNA/TMA fault
Description	A TMA has probably malfunctioned. The RX is getting a weaker signal from the side using this TMA, which reduces the sensitivity by about 3.5 dB. If the other RX side is also faulty, then the fault AO RX I1B:1 arises. The current consumption in the TMA is supervised from the CDU and can be monitored with the OMT. The fault arises when the current in the TMA is outside the range 33 – 147 mA. These limits are set in the IDB but can be changed with the OMT.
Action	Try the following actions until the fault is corrected: •Check that feeders and jumpers are OK. •Check and that the correct IDB is installed. •Replace the TMA.
Note:	If the TMA has two amplifiers, and if only one is faulty, the current will be pulsated. This will be detected by the CDU and reported as fault SO CF EC2:12.
Note:	In SW releases R7.0, R7C and R7D, this fault is found in SO CF I2A:11.

Fault No.	**SO CF EC2:12**
Fault name	ALNA/TMA degraded
Remark	SW release R8A
Related fault	AO RX I1B:1 – ALNA/TMA fault
Description	A TMA has probably malfunctioned. The RX is getting a weaker signal from the side using this TMA, which reduces the sensitivity by about 3.5 dB. If the other RX side is also faulty, then the fault AO RX I1B:1 arises. The current consumption in the TMA is supervised from the CDU and can be monitored with the OMT. The fault arises when the current in the TMA is outside the range 33 – 147 mA. These limits are set in the IDB but can be changed with the OMT.
Action	Try the following actions until the fault is corrected: •Check that feeders and jumpers are OK. •Check and that the correct IDB is installed. •Replace the TMA.

Fault No.	**SO CF EC2:13**
Fault name	Auxiliary equipment fault
Remark	SW release R8A
Related fault	AO TX I1B:47 – Auxiliary equipment fault
	AO TX I2A:0 – Diversity fault
Description	
Action	

1.3.3 SO CF, internal fault map class 1A

Table 3 SO CF I1A

Fault No.	**SO CF I1A:0**
Fault name	Reset, failed restart attempt
Remark	SW releases R7.0, R7C and R7D
Description	Reset has occurred in the DXU.
Note:	For information only, not a fault.

Fault No.	**SO CF I1A:1**
Fault name	Reset, power on
Description	Reset has occurred in the DXU.
Note:	For information only, not a fault.

Fault No.	**SO CF I1A:2**
Fault name	Reset, switch
Description	Reset has occurred in the DXU.
Note:	For information only, not a fault.

Fault No.	**SO CF I1A:3**
Fault name	Reset, watchdog
Description	Reset has occurred in the DXU.
Note:	For information only, not a fault.

Fault No.	**SO CF I1A:4**
Fault name	Reset, SW fault
Description	Reset has occurred in the DXU.
Note:	For information only, not a fault.

Fault No.	**SO CF I1A:5**
Fault name	Reset, RAM fault
Description	Reset has occurred in the DXU.
Note:	For information only, not a fault.

Fault No.	**SO CF I1A:6**
Fault name	Reset, internal function change
Description	Reset has occurred in the DXU.
Note:	For information only, not a fault.

Fault No.	**SO CF I1A:7**
Fault name	X bus fault
Related fault	SO TRXC I1A:15 – X bus communication fault
Description	This fault arises when 2 or more TRUs have reported communication problems on the X bus.
Possible reasons	Intermittent disturbances, most common reason: •One or more calls are carried by two TRXCs. •One of the TRUs contains RX and TS for a given call and the other TRXC is TX for the same cal. This is l most common with Base band hopping, but does also occur under special circumstances with Synthesize hopping. If either one of these TRXCs is reset, this alarm will arise. No HW needs to be replaced as the alarm ceases when the TRXC is reset. Other possible reasons: •Faulty TRUs. •Faulty backplane.
Actions	Try the following actions until the fault is corrected: •Check that all connections are OK: The bus terminator, the extension cable, and so on. •Switch positions between TRUs. •Switch off and on the power to the cabinet. •Replace the TRU magazine.

Fault No.	**SO CF I1A:8**
Fault name	Timing unit VCO fault
Remark:	Only valid for DXU-11
Related fault	SO CF I2A:13 – Timing unit VCO ageing
Possible reasons	a. The VCO control value has drifted out of range. The VCO needs to be recalibrated. (see fault SO CF I2A:13) b. The VCO temperature too low. The start-up heater is stuck. c. The VCO is not distributing any 13 MHz signal.
Action	The following actions correlate to the possible reasons above: a. Fault SO CF I2A:13 will probably warn before this fault arises. Note: The VCO control value can be monitored with the OMT. b. Probably a HW fault in the DXU or a power supply problem. Switch the DXU off and on with the circuit breaker on the IDM. If this does not help, change the DXU. c. Probably a HW fault in the DXU or a power supply problem. Switch the DXU off and on with the circuit breaker on the IDM. If this does not help, change the DXU.

Fault No.	**SO CF I1A:9**
Fault name	Timing bus fault
Related fault	SO TRXC I1A:8 – Timing reception fault
Description	This fault arises when the timing bus driver in the DXU is faulty or if two or more TRUs have reported timing reception problems.
Possible reasons	Faulty DXU or DXU backplane, faulty TRU backplane.
Action	Try the following actions until the fault is corrected: •Switch the DXU off and on with the circuit breaker on the IDM. •Replace the DXU. •Replace the local bus cable between the DXU/ECU and TRU backplanes. •Replace the DXU/ECU backplane. •Replace the TRU magazine.

Fault No.	**SO CF I1A:10**
Fault name	Indoor temperature out of safe range
Related fault	SO CF I2A:16 – Indoor temp out of normal conditional range
	SO CF RU:31 – Environment
	SO TRXC I1B:1 – Indoor temp out of safe range
Description	Temperature in master cabinet is out of the specified safe. The fault ceases when the temperature comes back within the safe range. See Note 2 on page 8 .
Possible reasons	a. TRU dummies missing.
	b. Climate system failure.
	c. Extreme weather conditions.
Action	The following actions correlate to the possible reasons above:
	a. Check for missing TRU dummies. Insert TRU dummies in empty slots in the TRU magazine.
	b. Perform a climate system test.
	c. No action is given for this cause.

Fault No.	**SO CF I1A:12**
Fault name	DC voltage out of range
Remark:	This fault is only valid for master or single cabinet. The related faults are only valid for extension cabinet.
Related faults	SO CF I2A:18 – DC voltage out of range
	SO TRXC I1B:3 – DC voltage out of range
Description	The DC voltage (in master cabinet) has dropped below safe level and the RBS will shut down immediately, see Note 1 on page 7 . The fault will cease when DC voltage returns to safe level.
Possible reasons	The AC mains has failed and the BTS is running on batteries. The batteries are almost empty and will soon be disconnected.
Action	•Check external power supply.
	•Check the ACCU

Fault No.	**SO CF I1A:14**
Fault name	Bus fault
	Local Bus fault
Related fault	SO CF I2A:30 – Bus fault
Description	The DXU is not able to send any data on the local bus.
Possible reasons	Probably a HW fault (for example local bus terminator, DXU, backplane).
Action	Check all parts of the local bus.

Fault No.	**SO CF I1A:15**
Fault name	RBS database corrupted
Related fault	SO CF RU:34 – RBS DB
Description	The RBS database in the DXU is corrupted or cannot be read by the SW.
Action	Reinstall the IDB with the OMT and press the CPU Reset button on the DXU. If this does not help, change the DXU.

Fault No.	**SO CF I1A:16**
Fault name	RU database corrupted
Description	The RU database in the DXU is corrupted or cannot be read by the SW.
Action	Reset the DXU. If this does not help, change the DXU.

Fault No.	**SO CF I1A:17**
Fault name	HW and IDB inconsistent
Description	The IDB does not match the HW present in cabinet, for exemple wrong cabinet type, wrong transmission type, and so on.
Action	Install the correct IDB with the OMT and press the CPU Reset button on the DXU.

Fault No.	**SO CF I1A:18**
Fault name	Internal configuration failed
Description	One or several subsystems in DXU SW have failed their internal configuration. DXU SW will not be able to use DXU HW properly.
Possible reasons	This fault is usually a consequence of faults SO CF I1A:15, 16, or 17 above.
Action	Reinstall the IDB with the OMT and press the CPU Reset button on the DXU. If this does not help, change the DXU.

1.3.4 SO CF, internal fault map class 2A

Table 4 SO CF I2A

Fault No.	**SO CF I2A:0**
Fault name	Reset, failed restart attempt
Remark	SW releases R7.0, R7C and R7D
Description	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:1**
Fault name	Reset, power on
Description	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:2**
Fault name	Reset, switch
Description	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:3**
Fault name	Reset, watchdog
Description	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:4**
Fault name	Reset, SW fault
Description	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:5**
Fault name	Reset, RAM fault
Description	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:6**
Fault name	Reset, internal function change.
Description	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:7**
Fault name	RXDA amplifier current fault
Related fault	AO RX I1B:0 – RXDA amplifier current fault
Description	An RXDA in a CDU (or DU) is faulty. Read the BTS logs to find out which side (A or B) is faulty. •If the faulty side is not connected to an RX antenna, there is no performance degradation. •If the faulty side is connected to an RX antenna, then RX looses diversity and sensitivity decreases by 3.5 dB. •If the other RX side is also faulty, then fault AO RX I1B:0 arises.
Possible reasons	This is probably a HW fault on CDU.
Action	Try the following actions until the fault is corrected: •Switch the CDU off and on with the circuit breaker on the IDM. •Press the CPU Reset button on the DXU. •Replace the CDU or the DU in case of CDU-D.

Fault No.	**SO CF I2A:8**
Fault name	VSWR limits exceeded
Related faults	AO TX I1B:1 – CDU/Combiner VSWR limits exceeded
	AO TX I1B:4 – TX antenna VSWR limits exceeded
	AO TX I2A:0 – TX Diversity Fault
Description	The VSWR at TRU output or at CDU output has exceeded the class 2 limit (and maybe the class 1 limit as well if fault AO TX I1B:1 or AO TX I1B:4 are present).
	•If the RU map indicates "CDU" or "CU", the VSWR at TRU output is outside limits.
	•If the RU map indicates "Antenna", then the VSWR at CDU output is outside limits.
Action	See the respective related faults.

Fault No.	**SO CF I2A:9**
Fault name	Power limits exceeded
Related faults	AO TX I1B:2 – CDU output power limits exceeded
	AO TX I1B:20 – CU input power fault
Description	The TX power at the CDU output is at least 7 dB lower than expected. When the difference is at least 10 dB, the fault AO TX I1B:2 arises.
Possible reasons	•There is probably a fault on the TX path.
	•TX high temperature or saturation, see AO TX I1B:12 and 14.
Action	Try the following actions until the fault is corrected:
	•Check all TX feeders, both inside and outside the cabinet.
	•Check the Pfwd/Prefl cables.
	•Switch the TX cables from TRU to CDU between different TRUs to find out if the fault moves with the TX cable.
	•Switch TX cables in the TRU end only in such a way that the TRUs will be connected to different CDUs. Check if the fault moves with the TRU.
	•Reinstall the IDB with the OMT and press the CPU Reset button on the DXU.

Fault No.	**SO CF I2A:10**
Fault name	DXU optional EEPROM checksum fault
Related fault	AO TF I1B:1 – DXU optional EEPROM checksum fault
Description	This fault occurs only in DXUs using 5 MHz optional sync reference. The EEPROM of the DXU optional synchronisation board contains corrupted data. This data is necessary for the CPU to control the 13 MHz VCO.
Possible reasons	Probably a HW fault.
Action	It does not have any consequence if it occurs while the DXU is running. But at next DXU start-up, the TU will probably not be able to synchronise on the 5 MHz reference and fault AO TF I1B:1 will arise.

Fault No.	**SO CF I2A:11**
Fault name	ALNA fault (SW release R7.0) ALNA/TMA fault (SW releases R7C and R7D)
Related fault	AO RX I1B:1 – ALNA fault (SW release R7.0) AO RX I1B:1 – ALNA/TMA fault (SW releases R7C and R7D)
Description	A TMA is probably out of function. RX is getting a weaker signal from the side using this TMA, which reduces the sensitivity by about 3.5 dB. If the other RX side is also faulty, then the fault AO RX I1B:1 arises. The current consumption in the TMA is supervised from the CDU and can be monitored with the OMT. The fault arises when current in TMA is outside the range 33–147 mA. These limits are set in IDB but can be changed with OMT R5/2 or later.
Action	Try the following actions until the fault is corrected: •Check that feeders and jumpers are OK. •Check and that the correct IDB is installed. •Replace the TMA.
Note:	In SW release R8A, this fault is moved to SO CF EC2:11.

Fault No.	**SO CF I2A:12**
Fault name	RX maxgain/mingain violated
Remark	Only in CDU-C+ and CDU-D
Description	The fault arises when total gain in RX path (from antenna to TRU) is outside the recommended range. If the gain is too high, there is risk for blocking, a mobile close to BTS overtalks a mobile far away. If the gain is too low, the RX sensitivity is reduced. Note: In CDU-C+ and CDU-D, the gain in RXDA is adjusted by TRU (via CDU-bus) in order to fit the radio configuration. For example, RXDA gain is reduced when TMA is used and increased when no TMA.
Possible reasons	The most probable reason is that some attenuation values are wrongly defined in IDB. For example RX feeder loss, HLin/HLout loss, TMA amplification, and so on.
Action	Reinstall the IDB with the OMT and press the CPU Reset button on the DXU.

Fault No. **SO CF I2A:13**

Fault name: Timing unit VCO ageing

Related fault: SO CF I1A:8 – Timing unit VCO fault

Description: The VCO control value is an integer between 0 and 16384. When it gets outside the range 384-16000, the fault SO CF I2A:13 arises. TU function is not affected, but if the control value gets outside the range 273-16111,the fault SO CF I1A:8 will arise and RBS function will be lost.

Possible reasons: The 13 MHz oscillator in DXU is ageing and therefore its control value is drifting outside the authorised range.

Action: The DXU should be sent to repair for recalibration of the VCO. Note: the VCO control value can be monitored with the OMT2.

Fault No. **SO CF I2A:14**

Fault name: CDU supervision/communication lost

Related faults: SO TRXC I1B:0 – CDU not usable

SO TRXC I2A:22 – CDU bus communication fault

AO TX I1B:0 – CU not usable

Description: There is a communication problem on the CDU-bus between TRU and CDU/CU/DU/FU. Use the BTS logs to localise the fault more precisely.

Possible reasons: a. The CDU-bus cable is faulty, disconnected or wrongly connected (can happen when using CDU Y-cable).

b. The CDU is powered off or faulty.

c. A TRU connected to the CDU-bus is faulty.

Action: The following actions correlate to the possible reasons above:

a. Check CDU-bus cable including backplane connection.

b. Check the circuit breaker on the IDM for the CDU. If this does not help, check the CDU.

c. Check the TRU.

Fault No. **SO CF I2A:15**

Fault name: VSWR/Output power supervision lost

Remark: Only CDU-D

Related faults: SO TRXC I2A:15 – VSWR/Output power supervision lost

AO TX I1B:22 – VSWR/Output power supervision lost

Description: One or several Pfwd/Prefl cables between FU(d) and CU are disconnected, check the RU map to find out which. If a Pfwd cable is disconnected, the CU cannot function and the TX function is lost (fault AO TX I1B:22 arises). If only a Prefl cable is disconnected, the VSWR supervision is lost but traffic is not affected.

Action: Reconnect or replace the Pfwd or Prefl cable between FU(d) and CU.

Fault No.	**SO CF I2A:16**
Fault name	Indoor temp out of normal conditional range
Related faults	SO CF I1A:10 – Indoor temp out of safe range
	SO CF RU:31 – Environment
	SO TRXC I1B:1 – Indoor temp out of safe range
Description	The temperature in the cabinet is out of the range 5-45 °C, see Note 2 on page 8 . The fault ceases when temperature is in the range 7-43 °C.

Fault No.	**SO CF I2A:17**
Fault name	Indoor humidity
Description	The humidity inside cabinet is outside the normal condition range, see Note 2 on page 8 .

Fault No.	**SO CF I2A:18**
Fault name	DC voltage out of range
Related fault	SO CF I1A:12 – DC voltage out of range
	SO TRXC I1B:3 – DC voltage out of range
Possible reasons	The DC voltage is out of range. More information is given in Note 1 on page 7 :

Fault No.	**SO CF I2A:19**
Fault name	Power system in stand-alone mode
Description	This indicates a fault in opto-communication loop. The power supply system continues to operate but it cannot be controlled or supervised from ECU or DXU.
Possible reasons	•The Opto cable is broken or wrongly connected.
	•An RU on the opto-loop is faulty or powered off.

Fault No.	**SO CF I2A:20**
Fault name	External power fault
Remark	SW releases R7.0, R7C and R7D
Description	There is a failure in AC supply.
Possible reasons	•AC mains failure.
	•ACCU fault (or wrong strapping).
	•Disconnected AC input cable to ECU or PSU.
Note:	If this fault and the faults SO CF I2A:23, 29 and 37 arise at the same time, then there is probably a bad connection between ACCU and ECU provoking false alarms.

Fault No.	**SO CF I2A:21**
Fault name	Internal power capacity reduced
Description	The power supply from the PSUs is reduced.
Possible reasons	•AC failure, see SO CF I2A:20.
	•Faulty PSU.
	•Missing PSU. This can happen when there are more PSU units defined in IDB than the actual amount installed in cabinet. Can be corrected by doing "modify IDB" in OMT.

Fault No.	**SO CF I2A:22**
Fault name	Battery backup capacity reduced
Description	The power supply from the batteries is reduced.
Possible reasons	•The BFU circuit breaker has tripped.
	•Battery overtemperature (battery temperature > 60 $^{\circ}$C).
	•Faulty BFU or battery.
	•Missing BFU or battery. This can happen when there are more BFU or battery units defined in the IDB than the actual amount installed in the cabinet. This can be corrected by doing "modify IDB" in the OMT.

Fault No.	**SO CF I2A:23**
Fault name	Climate capacity reduced
Description	The climate system is not able to function properly. Check the SO CF RU map to find out which part of the climate system that is causing problems.
Possible reasons	•Faulty fan or FCU (fan control unit).
	•No power to the climate unit. Check fuses, circuit breakers, power cables, and so on.
	•Faulty heater, heat exchanger, active cooler or CCU (climate control unit).
	•Faulty connection between the CCU and the heat exchanger or active cooler.
	•Faulty connection between CCU and ECU (replace cable or backplane).
	•Faulty connection between ACCU and ECU, see note in SO CF I2A:20.
Action	•Check fans and the FCU.
Action	•Check the Active Cooler.
	•Run a Climate System Test.

Fault No.	**SO CF I2A:24**
Fault name	HW fault
Remark	Only CDU-D
Related faults	AO TX I1B:18 – CU HW fault
	AO TX I1B:19 – CU SW load/start fault
	AO TX I1B:21 – CU park fault
	AO TX I1B:23 – CU reset, power on
	AO TX I1B:24 – CU reset, communication fault
	AO TX I1B:25 – CU reset, watchdog
	AO TX I1B:26 – CU fine tuning fault
Description	A fault has occurred on CU, affecting TX. See AO TX fault map to find out which fault it is.
Possible reasons	See the respective related fault.

Fault No.	**SO CF I2A:25**
Fault name	Loadfile missing in DXU or ECU
Related fault	SO TRXC I2A:17 – Loadfile missing in TRU
Description	A SW file is missing in DXU or ECU flash.
Possible reasons	Probable cause is failed function change or connection of a unit lacking SW. In case of DXU, a function change must be performed to download the missing file. In case of ECU, the SW file should be transferred from DXU.

Fault No.	**SO CF I2A:26**
Fault name	Climate sensor fault
Description	A temperature sensor or humidity sensor is faulty.
Action	Check the connection to the sensor, otherwise replace the sensor.

Fault No.	**SO CF I2A:27**
Fault name	System voltage sensor fault
Description	The system voltage sensor in ECU is not functioning. ECU reads voltage value from PSU/BFU instead. If the opto-loop becomes faulty, then system voltage supervision is lost.
Action	Check system voltage circuit breaker. Otherwise replace ECU.

Fault No.	**SO CF I2A:28**
Fault name	A/D Converter fault
Description	The A/D converter in ECU is faulty => measurements from climate and voltage sensors cannot be read. Temperature and humidity supervision is lost. System voltage is read from PSU/BFU instead of sensor. If the opto-loop becomes faulty, then system voltage supervision is lost as well.
Action	Replace ECU.

Fault No.	**SO CF I2A:29**
Fault name	Varistor fault (SW releases R7.0, R7C and R7D)
	Over voltage protection/Varistor fault (SW release R8A)
Description	A varistor (also called OVP-Overvoltage Protector) in ACCU is faulty.
Note:	This can possibly be a false alarm, see the fault SO CF I2A:20.
Action	Replace the varistor.

Fault No.	**SO CF I2A:30**
Fault name	Bus fault
Related fault	SO CF I1A:14 – Bus fault
Description	DXU has received a high number of faulty frames on local bus. There are many disturbances on the local bus.
Possible reasons	•Missing local bus terminator •Extension bus between cabinets disconnected •Faulty DXU •Faulty ECU or TRU •Incorrect IDB •Incorrect switch settings on the backplanes •Faulty DXU/ECU backplane or TRU backplane

Fault No.	**SO CF I2A:31**
Fault name	High-frequency SW fault
Related fault	SO TRXC I2A:19 – High-frequency software fault
Description	Frequent errors during execution of application SW in DXU or ECU can lead to restart.
Possible reasons	Bugs in SW.
Action	1. Read the MRU logs to find out what is causing this fault. Send a trouble report to Ericsson for correction. 2. Reset the affected RU and, if necessary, also the DXU.

Fault No.	**SO CF I2A:32**
Fault name	Non-volatile memory corrupted
Related fault	SO TRXC I2A:16 – Non-volatile memory corrupted
Description	The contents of the DXU or ECU flash memory is corrupted. The DXU flash contains RBS database, DXU database and SW files for all units. The ECU flash contains ECU SW and ECU database.
Action	Try to perform a function change and reinstall IDB. If this does not help, power off/on the faulty unit. Otherwise replace the unit.

Fault No.	**SO CF I2A:33**
Fault name	RX diversity lost
Description	The imbalance in signal strength between the receiver A- and B-side is supervised on a TRU basis. The fault arises when one or several TRUs have reported a signal strength imbalance of at least 12 dB during 50 minutes. This indicates that an RX path to one or several TRUs is faulty. The receiver sensitivity for these TRUs is reduced by about 3.5 dB. Note: This fault is not raised if one of the faults SO CF I2A:7 (RXDA), SO CF I2A:11 (TMA current), SO CF I2A:34 (TMA voltage) or SO CF I2A:39 (RX cable) is active.
Action	Enable the diversity supervision monitor in OMT for each TRU, to find out which TRUs are affected and which side (A or B) is faulty. The diversity supervision measurements are only taken every 5 minutes so it takes some time to notice changes. The measurements give signal strength imbalance (SSI, expressed in dB) on each TS. The SSI is equal to RX signal A-side minus B-side so positive values indicate that A-side is better and vice-versa. Check that all cables on RX-path are properly connected (including HLin/HLout). Also check the antennas. If several cells are affected then maybe two RX feeders have been switched. If only one TRU is affected, then check RX cable between TRU and CDU. Try moving TRUs, CDUs and cables in the cabinet to see if the fault follows the unit(s).

Fault No.	**SO CF I2A:34**
Fault name	Output voltage fault
Related fault	AO RX I1B:11 – CDU output voltage fault
Description	The voltage supply to a TMA is faulty. RX is not getting any signals from the side using this TMA which reduces sensitivity by about 3.5 dB. If the other RX side is also faulty, then fault AO RX I1B:11 arises.
Possible reasons	The voltage supply to a TMA is faulty. RX is not getting any signals from the side using this TMA which reduces sensitivity by about 3.5 dB. If the other RX side is also faulty, then fault AO RX I1B:11 arises.
Action	Try to power off/on the CDU. Otherwise replace the CDU.

Fault No.	**SO CF I2A:35**
Fault name	Optional synchronisation source
Related fault	AO TF I1B:0 – Optional synchronisation source
Action	See AO TF I1B:0.

Fault No.	**SO CF I2A:36**
Fault name	RU database corrupted
Related fault	SO CF I2A:38 – Default values used
Description	The RU database in one of the following units (CDU, CU, FU, DU, ECU, BFU, PSU, BDM) is corrupted or cannot be read by the SW. If it is the CDU/CU/DU/FU, then fault I1B:0 arises on TRXC as well and TRU function is lost.
Action	Check RU map to find out which RU is involved, then check that the communication to the RU is ok (that is,CDU bus, opto-loop, local bus). If the communication is ok, power off/on the faulty RU and reset DXU/ECU. If this does not help, change the RU and reset DXU/ECU.

Fault No.	**SO CF I2A:37**
Fault name	Circuit breaker tripped
Description	A circuit breaker in ACCU has tripped.
Action	Restore the circuit breaker in ACCU. Note: could be a false alarm, see note in SO CF I2A:20.

Fault No.	**SO CF I2A:38**
Fault name	Default values used
Related fault	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	A SW subsystem in DXU or ECU is using default parameters for its internal configuration => the DXU/ECU performance might be reduced.
Possible reasons	This fault is usually a consequence of faults SO CF I2A:36 or SO CF I2A:46.

Fault No.	**SO CF I2A:39**
Fault name	RX cable disconnected
Related fault	AO RX I1B:9 – RX cable disconnected
Description	An RX cable is disconnected (for example, CDU RXin, HLin/HLout, Cab HLin). Check the RU map to see which one.
Action	Reconnect or replace the disconnected RX cable.

Fault No.	**SO CF I2A:40**
Fault name	Reset, DXU link lost
Possible reasons	Reset has occurred on ECU.
Note:	For information only, not a fault.

Fault No.	**SO CF I2A:41**
Fault name	Lost communication to TRU
Description	DXU has no contact on local bus with one or several TRUs that are marked as expected in the IDB.
Possible reasons	•TRU missing or powered off (This can happen when there are more TRUs defined in IDB than the actual amount installed in cabinet. Can be corrected by doing "modify IDB" in OMT) •Faulty dip switch setting in backplane •Local bus fault (see SO CF I2A:30)

Fault No.	**SO CF I2A:42**
Fault name	Lost communication to ECU
Description	DXU has no contact on local bus with one or several ECUs that are marked as expected in the
Possible reasons	Same reason as in SO CF I2A:41 but with ECU instead of TRU.

Fault No.	**SO CF I2A:43**
Fault name	Internal configuration failed
Related fault	SO CF I2A:19 – Power system in stand-alone mode SO CF I2A:36 – RU database corrupted
Description	One or several subsystems in ECU SW have failed their internal configuration. The ECU will not be able to function properly.
Possible reasons	HW and IDB inconsistent, ECU database corrupted, communication problems on local bus or opto-loop.
Action	Check all the connections. Reinstall IDB with OMT and press DXU reset. If this does not help, change ECU.

Fault No.	**SO CF I2A:44**
Fault name	ESB distribution failure
Remark	R8 and on.
Description	
Action	

Fault No.	**SO CF I2A:46**
Fault name	DB parameter fault
Related fault	SO CF I2A:38 – Default values used
Description	The RBS Database or one of the RU databases (in DXU, ECU, CDU, CU, FU, DU, PSU, BFU, BDM) contains one or several erroneous parameters (for example out of range). SW will use a default value instead, the performance might be reduced.
Action	Check RU map to find out which database is faulty. If it is the RBS Database, reinstall IDB and reset DXU. If it is a RU database, see indications in fault SO CF I2A:36. Notice: In some cases, the RU map will indicate several faulty CDUs whereas only one is actually faulty. If this happens, change only one CDU at a time and press DXU reset to see if the fault disappears.

Fault No.	**SO CF I2A:47**
Fault name	Auxiliary equipment fault
Remark	SW releases R7.0, R7C and R7D.
Related fault	AO RX I1B:47 – RX Auxiliary Equipment Fault
	AO TX I1B:47 – TX Auxiliary Equipment Fault
Description	A fault has occurred on auxiliary equipment related to TX/RX antenna (for example power booster in active antenna). If AO RX I1B:47 or AO TX I1B:47 is active, then the fault is class 1. If not, the fault is class 2.
Possible reasons	This is a new feature in R7 where the ARAE (Antenna Related Auxiliary Equipment) can be supervised via external alarms inlets by MOs TX/RX/CF. This allows BSC to take appropriate action on TX and RX which would not be possible if the fault was reported via external alarm.

1.3.5 SO CF, replacement unit map

Table 5 SO CF RU

RU No.	**SO CF RU:0**
RU name	DXU
Related faults	SO CF I1A:8 – Timing unit VCO fault
	SO CF I1A:9 – Timing bus fault
	SO CF I1A:14 – Local bus fault
	SO CF I1A:16 – RBS database corrupted
	SO CF I2A:10 – DXU optional EEPROM checksum fault
	and AO TF I1B:1 – PCM synch (no usable PCM reference)
	SO CF I2A:13 – Timing unit VCO ageing
	SO CF I2A:31 – High-frequency software fault
	SO CF I2A:32 – Non-volatile memory corrupted
	SO CF I2A:35 – Optional synchronisation source
	and AO TF I1B:0 – EXT synch (no usable external reference)
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	See the respective related faults.

RU No.	**SO CF RU:1**
RU name	ECU
Related faults	SO CF I2A:27 – System voltage sensor fault
	SO CF I2A:28 – A/D converter fault
	SO CF I2A:31 – High-frequency software fault
	SO CF I2A:32 – Non-volatile memory corrupted
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Try the following actions until the fault is corrected:
	•Reset the ECU.
	•Change the ECU.
	•Change the DXU/ECU backplane.

RU No.	**SO CF RU:5**
RU name	CDU
Related faults	SO CF I2A:7 – RXDA amplifier current fault
	SO CF I2A:8 – VSWR limits exceeded
	SO CF I2A:9 – Power limits exceeded
	SO CF I2A:34 – Output voltage fault
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Try the following actions until the fault is corrected:
	•Check or replace the CDU – TRU TX cables.
	•Replace the CDU.
	•See also the respective related faults.

RU No.	**SO CF RU:6**
RU name	BFU
Remark	SW releases R7.0, R7C and R7D
Related faults	SO CF I2A:22 – Battery backup capacity reduced
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Try the following actions until the fault is corrected:
	•Check the auxiliary fuse on the front of the BFU.
	•Check the circuit breaker on the top of the BFU.
	•Replace the BFU.
	•See also the respective related faults.

RU No.	**SO CF RU:7**
RU name	PSU
Related faults	SO CF I2A:21 – Internal power capacity reduced
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Try the following actions until the fault is corrected:
	•Restart the PSU.
	•Replace the PSU.
	•See also the respective related faults.

RU No.	**SO CF RU:9**
RU name	BDM or BFU
Remark	SW release R8A.
Related fault	SO CF I2A:22 – Battery backup capacity reduced SO CF I2A:36 – RU database corrupted SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Try the following actions until the fault is corrected: •Check the auxiliary fuse on the front of the BFU. (BFU only) •Check the circuit breaker on the top of the BFU. (BFU only) •Replace the BDM or the BFU. •See also the respective related faults.

RU No.	**SO CF RU:10**
RU name	ACCU
Related fault	SO CF I2A:29 – Varistor fault SO CF I2A:37 – Circuit breaker tripped
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Try the following actions until the fault is corrected: •Check circuit breakers, fuses and varistors in the ACCU. Replace if necessary. •Replace the control board in the ACCU. •Replace the ACCU. •See also the respective related faults.

RU No.	**SO CF RU:11**
RU name	Active cooler
Remark	The active cooler is often called *Air conditioner*.
Related fault	SO CF I2A:23 – Climate capacity reduced
Description	The coolers capability to cool the radio base station is reduced.
Action	Perform a climate test. More information about the procedures is given in the section *Active Cooler* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:12**
RU name	ALNA A (SW release R7.0)
	ALNA/TMA A (SW releases R7C, R7D and R8A)
Related fault	SO CF I2A:11 – ALNA fault (SW release R7.0)
	SO CF I2A:11 – ALNA/TMA fault (SW releases R7C, R7D and R8A)
Action	Try the following actions until the fault is corrected. More information about the procedures is given in the section *ALNA A, ALNA B, ALNATMA A and ALNA/TMA B* in the chapter *Fault Localisation* in the *Maintenance Manual*.
	•Check the power supply to the ALNA/TMA. Replace the CDU if the power supply is faulty.
	•Check the RX feeders. Replace the ALNA/TMA if any RX feeder is found defective.

RU No.	**SO CF RU:13**
RU name	ALNA B (SW release R7.0),
	ALNA/TMA B (SW releases R7C, R7D and R8A)
Related fault	SO CF I2A:11 – ALNA fault (SW release R7.0)
	SO CF I2A:11 – ALNA/TMA fault (SW releases R7C, R7D and R8A)
Action	See the fault SO CF RU:12 — ALNA A.

RU No.	**SO CF RU:14**
RU name	Battery
Related fault	SO CF I2A:18 – DC voltage out of range
	SO CF I2A:22 – Battery backup capacity reduced
Action	Actions are given in the section *Battery* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:15**
RU name	Fan
Related fault	SO CF I2A:23 – Climate capacity reduced
Action	Actions are given in the section *Fan* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:16**
RU name	Heater
Related fault	SO CF I2A:23 – Climate capacity reduced
Action	Actions are given in the section *Heater* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:17**
RU name	Heater exchanger ext fan
Related fault	SO CF I2A:23 – Climate capacity reduced
Action	Actions are given in the section *Heater exchanger ext fan* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:18**
RU name	Heater exchanger int fan
Related fault	SO CF I2A:23 – Climate capacity reduced
Action	Actions are given in the section *Heater exchanger int fan* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:19**
RU name	Humidity sensor
Related fault	SO CF I2A:26 – Climate sensor fault
Action	Actions are given in the section *Humidity sensor* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:21**
RU name	Temperature sensor
Related fault	SO CF I2A:26 – Climate sensor fault
Action	Actions are given in the section *Temperature sensor* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:22**
RU name	CDU HLOUT HLIN cable
Related fault	SO CF I2A:39 – RX cable disconnected
Action	Actions are given in the section *CDU HLOUT HLIN cable* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:23**
RU name	CDU RX in cable
Related fault	SO CF I2A:39 – RX cable disconnected
Action	Actions are given in the section *CDU RX in cable* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:24**
RU name	CU
Related fault	SO CF I2A:8 – VSWR limits exceeded
	SO CF I2A:9 – Power limits exceeded
	SO CF I2A:24 – CU HW fault
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Actions are given in the section *CU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:25**
RU name	DU
Related fault	SO CF I2A:7 – RXDA amplifier current fault
	SO CF I2A:34 – Output voltage fault
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Actions are given in the section *DU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:26**
RU name	FU
Related fault	SO CF I2A:9 – Power limits exceeded
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Actions are given in the section *FU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:27**
RU name	FU CU PFWD cable or CDU CDU PFWD cable
Related fault	SO CF I2A:15 – VSWR/Output power supervision lost
Action	Actions are given in the section *FU CU PFWD cable* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:28**
RU name	FU CU PREFL cable or CDU CDU PREFL cable
Related fault	SO CF I2A:15 – VSWR/Output power supervision lost
Action	Actions are given in the section *FU CU PREFL cable* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:29**
RU name	CAB HLIN cable
Related fault	SO CF I2A:39 – RX cable disconnected
Action	Actions are given in the section *CAB HLIN cable* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:30**
RU name	CDU bus
Related fault	SO CF I2A:14 – CDU supervision/communication lost
Action	Actions are given in the section *CDU bus* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:31**
RU name	Environment
Related fault	SO CF I1A:10 – Indoor temperature out of safe range
	SO CF I1A:12 – DC voltage out of range
	SO CF I1A:19 – Indoor temperature above safe range (Micro)
	SO CF I1A:20 – Indoor temperature below safe range (Micro)
	SO CF I2A:16 – Indoor temperature out of normal conditional range
	SO CF I2A:17 – Indoor humidity
	SO CF I2A:18 – DC voltage out of range
	SO CF I2A:20 – External power fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Actions are given in the section *Environment* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:32**
RU name	Local bus
Related fault	SO CF I2A:30 – Local bus fault
	SO CF I2A:41 – Lost communication to TRU
	SO CF I2A:42 – Lost communication to ECU
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Actions are given in the section *Local bus* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:33**
RU name	EPC bus / Power communication loop
Related fault	SO CF I2A:19 – Power system in stand-alone mode
Action	Actions are given in the section *EPC bus / Power communication loop* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:34**
RU name	RBS DB
Related fault	SO CF I1A:15 – RBS database corrupted
	SO CF I2A:46 – DB parameter fault
Action	Actions are given in the section *RBS DB* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:36**
RU name	Timing bus
Related fault	SO CF I1A:9 – Timing bus fault
Action	Actions are given in the section *Timing bus* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:39**
RU name	Xbus
Related fault	SO CF I1A:7 – X bus fault
Action	Actions are given in the section *X bus* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:40**
RU name	Antenna
Related fault	SO CF I2A:8 – VSWR limits exceeded
	SO CF I2A:12 – RX maxgain/mingain violated
	SO CF I2A:33 – RX diversity lost
	SO CF I2A:47 – Auxiliary Equipment Fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Actions are given in the section *Antenna* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:41**
RU name	PSU DC cable
Remark	SW releases R7D and R8A
Related fault	SO CF I2A:21 – Internal power capacity reduced
Action	Actions are given in the section *PSU DC cable* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:45**
RU name	Battery temp sensor
Remark	SW releases R7D and R8A
Related fault	SO CF I2A:22 – Battery Backup Capacity Reduced
Action	Actions are given in the section *Battery temp sensor* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO CF RU:47**
RU name	OVPU
Remark	SW release R8A
Related fault	
Action	Actions are given in the section *OVPU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

1.4 SO TRXC Fault Maps

1.4.1 SO TRXC, external condition map class 1

Table 6 SO TRXC EC 1

Fault No.	**SO TRXC EC1:4**
Fault name	L/R SWI (BTS in local mode)
Remark	The DXU is in local mode and cannot be controlled by BSC.
Action	To bring the DXU into remote mode, you need to press the local/remote button.

Fault No.	**SO TRXC EC1:5**
Fault name	L/R TI (Local to remote while link lost)
Remark	This fault tells the BSC that the TRU went into remote mode while the link was down.
Action	The field technician does not need to care so much about this fault.

1.4.2 SO TRXC, internal fault map class 1A

Table 7 SO TRXC I1A

Fault No.	**SO TRXC I1A:0**
Fault name	Reset, failed restart attempt
Remark	SW releases R7.0, R7C and R7D.
Description	Reset has occurred on TRU.
Note:	For information only, not a fault.
Fault No.	**SO TRXC I1A:1**
Fault name	Reset, power on
Description	Reset has occurred on TRU.
Note:	For information only, not a fault.
Fault No.	**SO TRXC I1A:2**
Fault name	Reset, switch
Description	Reset has occurred on TRU.
Note:	For information only, not a fault.
Fault No.	**SO TRXC I1A:3**
Fault name	Reset, watchdog
Description	Reset has occurred on TRU.
Note:	For information only, not a fault.
Fault No.	**SO TRXC I1A:4**
Fault name	Reset, SW fault
Description	Reset has occurred on TRU.
Note:	For information only, not a fault.
Fault No.	**SO TRXC I1A:5**
Fault name	Reset, RAM fault
Description	Reset has occurred on TRU.
Note:	For information only, not a fault.

Fault No.	**SO TRXC I1A:6**
Fault name	Reset, Internal function change
Description	Reset has occurred on TRU.
Note:	For information only, not a fault.

Fault No.	**SO TRXC I1A:8**
Fault name	Timing reception fault
Remark	If two or more TRUs have this fault, SO I1A:9 arises.
Related fault	SO CF I1A:9 – Timing bus fault
Description	The TRU gets bad timing signals.
Possible reasons	Could be a fault in TRU (for example, Timing Bus receiver, LTU) or TRU backplane.
Action	Try to switch places between TRUs to see if the fault depends on TRU or TRU backplane. If the fault stays at same position, then TRU backplane is faulty. If the fault follows the TRU, then TRU is faulty.

Fault No.	**SO TRXC I1A:9**
Fault name	Signal processing fault
Description	Internal HW fault in the TRU: Fault on Tora or CMA
Action	Try to power off/on TRU. If this does not help, replace TRU.

Fault No.	**SO TRXC I1A:10**
Fault name	Tora – Dannie communication fault
Description	Internal HW fault in the TRU: Fault on RX-bus
Action	Try to power off/on TRU. If this does not help, replace TRU.

Fault No.	**SO TRXC I1A:11**
Fault name	DSP-CPU communication fault
Description	Internal HW fault in the TRU: Fault on CPU bus towards DSP0
Action	Power off/on the TRU. If this does not help, replace the TRU.

Fault No.	**SO TRXC I1A:12**
Fault name	Terrestrial traffic channel fault
Description	Internal HW fault in the TRU: Fault on iLIB (internal Line Bus)
Action	Power off/on TRU. If this does not help, replace TRU.

Fault No.	**SO TRXC I1A:13**
Fault name	RF loop test fault
Remark	Each test takes about 5 minutes. The fault arises after 3 failed consecutive tests. (In SW released before MR99:1, fault arises after only 1 failed test).
Description	Internal HW fault in the TRU: The RF loop test is used to detect faults on TXU/RXU. Dummy bursts are sent from Tora to TXU (via X-bus), then to RXU and finally back to Tora
Action	Reset or power off/on the TRU. Try to switch positions between TRUs (might be a fault on X-bus). If this does not help, change the TRU.

Fault No.	**SO TRXC I1A:14**
Fault name	RU database corrupted
Related fault	SO TRXC I2A:16 – RU database corrupted
Description	The RU database in TRU flash is corrupted or cannot be read by the SW.
Action	Reset or power off/on TRU. If this does not help, change TRU.

Fault No.	**SO TRXC I1A:15**
Fault name	Xbus communication fault
Remark	If two or more TRUs get this fault, SO CF I1A:7 will arise.
Related fault	SO CF I1A:7 – X bus fault
Description	The TRU has communication problem on X-bus.
Possible reasons	Intermittent disturbances. Most common reason for intermittent disturbance: •One or more calls are carried by two TRXCs. •One of the TRUs contains RX and TS for a given call and the other TRXC is TX for the same call most common with Base band hopping but does also occur under special circumstances with Synthesize hopping. If either one of these TRXCs is reset, this alarm will arise. No HW needs to be replaced as the alarm ceases when the TRXC is reset. Other possible reasons: •Faulty TRUs •Faulty backplane
Actions	Try the following actions until the fault is corrected: •Check that all connections are OK: bus terminator, extension cable, and so on. •Try to switch places between TRUs •Try to power off/on the cabinet •Replace the TRU magazine

Fault No.	**SO TRXC I1A:16**
Fault name	Initiation fault
Remark	This fault occurs at TRU start-up and stays as long as the initialisation is unsuccessful.
Description	Internal HW fault in the TRU: Not possible to initialize ASTRA or LTU
Action	Try to power off/on TRU. If this does not help, replace TRU.

Fault No.	**SO TRXC I1A:17**
Fault name	X-interface fault
Description	Internal HW fault in the TRU: Fault on X-interface
Action	Try to power off/on TRU. If this does not help, replace TRU.

Fault No.	**SO TRXC I1A:18**
Fault name	DSP fault
Description	Internal HW fault in the TRU: DSP SW corrupted or communication fault on the internal DSP bus between DSP0 and DSP cluster
Action	Reset or power off/on TRU. If this does not help, change TRU.

Fault No.	**SO TRXC I1A:19**
Fault name	Reset, DXU link lost
Description	Reset has occurred on TRU.
Action	For information only, not a fault.

Fault No.	**SO TRXC I1A:20**
Fault name	HW and IDB inconsistent
Description	The IDB does not match the TRU/CDU HW (for example, wrong frequency band, CDU type, and so on).
Action	Try the following actions until the fault is corrected: •Check that the correct TRU/CDU HW is installed •Installthe right IDB and press DXU reset.

Fault No.	**SO TRXC I1A:21**
Fault name	Internal Configuration failed
Remark	TRU SW will not be able to use TRU/CDU HW properly.
Related fault	SO CF I2A:14 – CDU supervision/communication lost
	SO TRXC I1A:14 – RU database corrupted
	SO TRXC I1A:20 – HW and IDB inconsistent
	SO TRXC I1B:0 – CDU not usable
	SO TRXC I2A:22 – CDU bus communication fault
Description	One or several subsystems in TRU SW have failed their internal configuration.
Possible reasons	This fault is usually a consequence of faults SO TRXC I1A:14 or SO TRXC I1A:20
Action	Power off/on TRU and CDU. Check all the connections: CDU-bus, CDU bus extension (Y-cable), backplane. Install right IDB and press DXU reset. If this does not help, change TRU, CDU or CDU-bus.

Fault No.	**SO TRXC I1A:22**
Fault name	Voltage Supply fault
Remark	SW releases R7D and R8A
Related faults	SO TRXC I2A:14 – Voltage supply fault
Description	Internal HW fault in the TRU: The voltage supply from PWU to PAU is supervised. When it comes outside of the range 24.8V-26.2V, fault SO TRXC I2A:14 arises. The TX output power might be reduced but TRU is still functional. If PWU is not responding or if PAU voltage comes out of the range 24V-26.3V, fault SO TRXC I1A:22 arises.
Action	Power off/on TRU. If this does not help, change TRU.

1.4.3 SO TRXC, internal fault map class 1B

Table 8 SO TRXC I1B

Fault No.	**SO TRXC I1B:0**
Fault name	CDU/Combiner not usable
Remark	SW releases R7D and R8A
Related faults	SO CF I2A:14 – CDU supervision/communication lost
	SO CF I2A:36 – RU database corrupted
Description	The CDU cannot be used by the TRU and the TRU function is lost.
Possible reasons	CDU-bus communication fault. CDU database corrupted.
Action	See the respective related SO CF fault.

Fault No.	**SO TRXC I1B:1**
Fault name	Indoor temp out of safe range
Remark	Only macro RBS.
Related faults	SO CF I1A:10 – Indoor temperature out of safe range
	SO CF I2A:16 – Indoor temp out of normal conditional range
	SO CF RU:31 – Environment
Description	Temperature in extension cabinet is out of range 0-55 °C
	Fault ceases when temperature is in range 2-53 °C.

Fault No.	**SO TRXC I1B:3**
Fault name	DC voltage out of range
Related faults	SO CF I2A:18 – DC voltage out of range
Description	The DC voltage in extension cabinet is below 21.2 V
	Fault ceases when DC voltage is above 22.2 V.

1.4.4 SO TRXC, internal fault map class 2A

Table 9 SO TRXC I2A

Fault No.	**SO TRXC I2A:0**
Fault name	RX cable disconnected
Related fault	AO RX I1B:9 – RX cable disconnected
Description	An RX cable between TRU and CDU is disconnected.
Action	Reconnect the RX cable.

Fault No.	**SO TRXC I2A:1**
Fault name	RX EEPROM checksum fault
Related fault	AO RX I1B:3 – RX EEPROM checksum fault
Action	See AO RX I1B:3.

Fault No.	**SO TRXC I2A:2**
Fault name	RX config table checksum fault
Related fault	AO RX I1B:4 – RX configuration table checksum fault
Action	See AO RX I1B:4.

Fault No.	**SO TRXC I2A:3**
Fault name	RX synthesiser unlocked
Related fault	AO RX I1B:5 – RX synthesizer A/B unlocked
	AO RX I1B:6 – RX synthesizer C unlocked
Action	See AO RX I1B:5 and AO RX I1B:6.

Fault No.	**SO TRXC I2A:4**
Fault name	RX internal voltage fault
Related fault	AO RX I1B:8 – RX internal voltage fault
Action	See AO RX I1B:8.

Fault No.	**SO TRXC I2A:5**
Fault name	Astra-Dixie communication fault
Related fault	AO RX I1B:7 – Astra Dixie communication fault
Action	See AO RX I1B:7.

Fault No.	**SO TRXC I2A:6**
Fault name	Astra-Tracy Communication fault
Related fault	AO TX I1B:10 – Astra Tracy communication fault
Action	See AO TX I1B:10.

Fault No.	**SO TRXC I2A:7**
Fault name	TX EEPROM checksum fault
Related fault	AO TX I1B:6 – TX EEPROM checksum fault
Action	See AO TX I1B:6.

Fault No.	**SO TRXC I2A:8**
Fault name	TX config table checksum fault
Related fault	AO TX I1B:7 – TX configuration table checksum fault
Action	See AO TX I1B:7

Fault No.	**SO TRXC I2A:9**
Fault name	TX synthesiser unlocked
Related fault	AO TX I1B:8 – TX synthesizer A/B unlocked
	AO TX I1B:9 – TX synthesizer C unlocked
Action	See AO TX I1B:8 and AO TX I1B:9

Fault No.	**SO TRXC I2A:10**
Fault name	TX internal voltage fault
Related fault	AO TX I1B:11 – TX internal voltage fault
Action	See AO TX I1B:11.

Fault No.	**SO TRXC I2A:11**
Fault name	TX High temperature
Related fault	AO TX I1B:12 – TX high temperature
Action	See AO TX I1B:12

Fault No.	**SO TRXC I2A:12**
Fault name	TX output power limits exceeded
Related fault	AO TX I1B:13 – TX output power limits exceeded
Description	The difference between actual and expected TX power (at TRU output) exceeds 2 dB. TX performance is degraded but not lost. TX performance is lost when difference exceeds 4 dB and the fault AO TX I1B:13 arises.
Possible reasons	Faulty TRU, low power supply, TX cable not properly connected>

Fault No.	**SO TRXC I2A:13**
Fault name	TX saturation
Related fault	AO TX I1B:14 – TX saturation
Action	See AO TX I1B:14.

Fault No.	**SO TRXC I2A:14**
Fault name	Voltage supply fault
Related fault	SO TRXC I1A:22 – Voltage supply fault
Action	See SO TRXC I1A:22.

Fault No.	**SO TRXC I2A:15**
Fault name	VSWR/output power supervision lost
Remark	Only CDU–A, CDU–C, CDU–C+
Related fault	SO CF I2A:15 – VSWR/Output power supervision lost
	SO TRXC RU:10 – CDU to TRU Pfwd cable
	SO TRXC RU:11 – CDU to TRU Prefl cable
Description	A Pfwd or Prefl cable between TRU and CDU is disconnected. Check the RU map to find out which. The VSWR and output power supervision is lost but traffic is not affected.
Action	Reconnect the Pfwd/Prefl cable. If this does not help, check the coaxial connectors in TRU backplane, they can worst case be damaged when inserting a TRU.

Fault No.	**SO TRXC I2A:16**
Fault name	Non-volatile memory corrupted
Related fault	SO CF I2A:32 – Non-volatile memory corrupted
Description	The contents of the TRU flash memory is corrupted. The TRU flash contains TRU database and TRU SW.
Action	Try to power off/on the faulty TRU or reset DXU. Otherwise replace the TRU.

Fault No.	**SO TRXC I2A:17**
Fault name	Loadfile missing in TRU
Related fault	SO CF I2A:25 – Loadfile missing in DXU or ECU
Description	An SW file is missing in TRU flash.
Possible reasons	Probable cause is failed function change or connection of a TRU lacking SW. DXU should automatically download new SW file to TRU.

Fault No.	**SO TRXC I2A:18**
Fault name	DSP fault
Related fault	DSP fault
Description	This fault is not implemented in current BTS SW.

Fault No.	**SO TRXC I2A:19**
Fault name	High-frequency SW fault
Related fault	SO CF I2A:31 – High-frequency software fault
Description	Frequent SW errors during execution of application SW in TRU can lead to restart.
Possible reasons	Bugs in SW.
Action	1. Read the MRU logs to find out what is causing this fault. Send a trouble report to Ericsson for correction. 2. Reset the affected RU and, if necessary, also the DXU.

Fault No.	**SO TRXC I2A:20**
Fault name	RX initiation fault
Related fault	AO RX I1B:10 – RX initiation fault
Action	See AO RX I1B:10

Fault No.	**SO TRXC I2A:21**
Fault name	TX initiation fault
Related fault	AO TX I1B:17 – TX initiation fault
Action	See AO TX I1B:17

Fault No.	**SO TRXC I2A:22**
Fault name	CDU bus communication fault
Related fault	SO CF I2A:14 – CDU supervision/communication lost
Possible reasons	This fault is equivalent to SO CF I2A:14
Action	See SO CF I2A:14

Fault No.	**SO TRXC I2A:23**
Fault name	Default values used
Related fault	SO TRXC I2A:26 – DB parameter fault
	SO CF I2A:36 – RU database corrupted
	SO CF I2A:46 – DB parameter fault
Description	A SW subsystem in TRU is using default parameters for its internal configuration =>the TRU performance might be reduced.
Possible reasons	This fault is usually a consequence of faults SO CF I2A:36, SO CF I2A:46 (faulty parameters in CDU) or SO TRXC I2A:26.

Fault No.	**SO TRXC I2A:25**
Fault name	TX max power restricted
Related fault	AO TX I1B:27 – TX maximum power restricted
Action	Refer to AO TX I1B:27.

Fault No.	**SO TRXC I2A:26**
Fault name	DB parameter fault
Related fault	SO TRXC I2A:23 – Default values used
Description	The RU Database in TRU contains one or several erroneous parameters (for example out of range). SW will use default value instead, the TRU performance is reduced.
Action	Reset TRU. If this does not help, change TRU.

Fault No.	**SO TRXC I2A:27**
Fault name	RX path fault
Remark	SW release R7D
Related fault	AO RX I1B:13 – RX path fault
Description	
Action	

1.4.5 SO TRXC, replacement unit map

Table 10 SO TRXC RU

RU No.	**SO TRXC RU:0**
RU name	TRU (SW releases R7.0 and R7C)
	TRU, dTRU or ATRU (SW releases R7D and R8A)
Related faults	SO TRXC I1A:8 – Timing reception fault
	SO TRXC I1A:9 – Signal Signal processing faultprocessing fault
	SO TRXC I1A:10 – Tora – Dannie communication fault
	SO TRXC I1A:11 – DSP CPU communication fault
	SO TRXC I1A:12 – Terrestrial traffic channel fault
	SO TRXC I1A:13 – RF loop test fault

	SO TRXC I1A:14 – RU database corrupted
	SO TRXC I1A:15 – X bus communication fault
	SO TRXC I1A:16 – Initiation fault
	SO TRXC I1A:17 – X-interface fault
	SO TRXC I1A:18 – DSP fault
	SO TRXC I1A:22 – Voltage supply fault
	SO TRXC I2A:1 – RX EEPROM checksum fault
	SO TRXC I2A:2 – RX configuration table checksum fault
	SO TRXC I2A:3 – RX synthesizer unlocked
	SO TRXC I2A:4 – RX internal voltage fault
	SO TRXC I2A:5 – Astra Dixie communication fault
	SO TRXC I2A:6 – Astra Tracy communication fault
	SO TRXC I2A:7 – TX EEPROM checksum fault
	SO TRXC I2A:8 – TX configuration table checksum fault
	SO TRXC I2A:9 – TX synthesizer unlocked
	SO TRXC I2A:10 – TX internal voltage fault
	SO TRXC I2A:11 – TX high temperature
	SO TRXC I2A:12 – TX output power limits exceeded
	SO TRXC I2A:13 – TX saturation
	SO TRXC I2A:14 – Voltage supply fault
	SO TRXC I2A:16 – Non-volatile memory corrupted
	SO TRXC I2A:18 – DSP fault
	SO TRXC I2A:20 – RX initiation fault
	SO TRXC I2A:21 – TX initiation fault
	SO TRXC I2A:22 – CDU bus communication fault
	SO TRXC I2A:25 – TX maximum power restricted
	SO TRXC I2A:26 – DB parameter fault
Description	Several possible reasons will give this fault. See related faults.
Possible reasons	Check with the OMT for possible related fault. See respective related fault.
Action	Actions are given in the section *TRU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO TRXC RU:10**
RU name	CDU to TRU PFWD cable
Related fault	SO TRXC I2A:15 – VSWR/output power supervision lost
Action	Actions are given in the section *TRU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO TRXC RU:11**
RU name	CDU to TRU PREFL cable
Related fault	SO TRXC I2A:15 – VSWR/output power supervision lost
Action	Actions are given in the section *TRU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO TRXC RU:12**
RU name	CDU to TRU RXA cable
Related fault	SO TRXC I2A:0 – RX cable disconnected
Action	Actions are given in the section *TRU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

RU No.	**SO TRXC RU:13**
RU name	CDU to TRU RXB cable
Related fault	SO TRXC I2A:0 – RX cable disconnected
Action	Actions are given in the section *TRU* in the chapter *Fault Localisation* in the *Maintenance Manual*.

1.5 AO Fault Maps

1.5.1 AO CON, external condition map class 1

Table 11 AO CON EC1

Fault No.	**AO CON EC1:8**
Fault name	LAPD Q CG (LAPD queue congestion)
Description	The LAPD concentrator in DXU supervises the length of uplink message queues. Class 1 fault arises when a message is discarded due to queue overflow. Fault ceases after 5 seconds of operation without queue overflow.
Possible reasons	The signalling load is high and the signalling bandwidth is reduced due to use of LAPD concentration or LAPD multiplexing.
Action	Try to increase the LAPD bandwidth by, for example, reducing the concentration factor.

1.5.2 AO CON, external condition map class 2

Table 12 AO CON EC2

Fault No.	**AO CON EC2:8**
Fault name	LAPD Q CG (LAPD queue congestion)
Description	The signalling load is high and the signalling bandwidth is reduced due to use of LAPD concentration or LAPD multiplexing. Class 2 fault arises when a message queue is more than 70 % full.
Possible reasons	The signalling load is high and the signalling bandwidth is reduced due to use of LAPD concentration or LAPD multiplexing.
Action	Try to increase the LAPD bandwidth by, for example, reducing the concentration factor.

1.5.3 AO DP

AO DP is not supervised.

Note: The Digital Path is supervised by PCM supervision.

1.5.4 AO RX, internal fault map class 1B

Table 13 AO RX I1B

Fault No.	**AO RX I1B:0**
Fault name	RXDA amplifier current fault
Related fault	SO CF I2A:7 – RXDA amplifier current fault
Description	An RXDA in CDU is faulty and there is no signal coming from the other RX side => RX function is lost.
Possible reasons	Probably a HW fault on CDU
Action	Try to power off/on CDU and reset DXU. If this does not help, replace CDU.

Fault No.	**AO RX I1B:1**
Fault name	ALNA/TMA fault
Remark	SW releases R7C, R7D and R8A
Related fault	SO CF I2A:11 – ALNA/TMA fault
Description	A TMA is faulty and there is no signal coming from the other RX side => RX function is lost
Possible reasons	Probably a HW fault on TMA.
Action	Power off/on CDU and TRU. If this does not help, replace TMA.

Fault No.	**AO RX I1B:3**
Fault name	RX EEPROM checksum fault
Related fault	SO TRXC I2A:1 – RX EEPROM checksum fault
Description	The data stored in RXU eeprom is corrupted. This data is needed by TRU SW to perform internal configuration.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO RX I1B:4**
Fault name	RX config table checksum fault
Related fault	SO TRXC I2A:2 – RX configuration table checksum fault
Description	At TRU start-up, the data from RXU eeprom is copied into TRU RAM in order to create the RX configuration table which will be used for internal configuration of TRU SW. This fault arises when the data in TRU RAM is faulty.
Action	Try to reset or power off/on the TRU. If this does not help, change TRU.

Fault No.	**AO RX I1B:5**
Fault name	RX synthesiser A/B unlocked
Related fault	SO TRXC I2A:3 – RX synthesizer unlocked
Description	One or both of the RF synthesisers in RXU could not lock to the required frequency.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO RX I1B:6**
Fault name	RX synthesiser C unlocked
Related fault	SO TRXC I2A:3 – RX synthesizer unlocked
Description	The IF synthesiser in RXU could not lock to the required frequency.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO RX I1B:7**
Fault name	Astra-Dixie communication fault
Related fault	SO TRXC I2A:5 – Astra Dixie communication fault
Description	Communication fault between Astra and Dixie.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO RX I1B:8**
Fault name	RX internal voltage fault
Related fault	SO TRXC I2A:10 – TX internal voltage fault
Description	Fault on the internal voltage regulators of the RXU.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO RX I1B:9**
Fault name	RX cable disconnected
Related fault	SO CF I2A:39 – RX cable disconnected
	SO TRXC I2A:0 – RX cable disconnected
Description	An RX cable is disconnected and there is no signal coming from the other RX side => RX function lost.
Action	Check the SO CF RU and SO TRXC RU maps to find out which RX cable is disconnected. It can be either of the following:
	•CDU RX out
	•CDU HL out H Lin
	•CDU RXin
	•Cab HLin

Fault No.	**AO RX I1B:10**
Fault name	RX initiation fault
Related fault	SO TRXC I2A:4 – RX internal voltage fault
Description	The RXU could not be initialised. There is probably a fault in ASICS (Dannie, Dixie), the synthesisers or the eeprom. This fault occurs at TRU start-up and stays as long as the initialisation is unsuccessful.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO RX I1B:11**
Fault name	CDU output voltage fault
Related fault	SO CF I2A:34 – Output voltage fault
Description	The voltage supply to the TMA is faulty and there is no signal coming from the other RX side => RX function lost. Note: the TMA voltage is supplied by the CDU via the RX feeder. The nominal value is 15 V. The fault arises when the TMA voltage supply is outside the range 13.75-16.25 V.
Possible reasons	This is probably a HW fault in CDU.
Action	Try to power off/on the CDU. Otherwise replace CDU.

Fault No.	**AO RX I1B:13**
Fault name	RX path fault
Remark	SW release R7D
Related fault	SO TRXC I2A:27 – RX path fault
Description	
Action	

Fault No.	**AO RX I1B:47**
Fault name	RX auxiliary equipment fault
Related fault	SO CF I2A:47 – Auxiliary Equipment Fault
	AO TX I1B:47 – TX Auxiliary Equipment Fault
Description	A class 1 fault has occurred on auxiliary equipment related to RX antenna (for example TMA in active antenna).

1.5.5 AO RX, internal fault map class 2A

Table 14 AO RX I2A

Fault No.	**AO RX I2A:0**
Fault name	TRA (Remote transcoder communication lost)
Description	The TRAU frames (speech/data) coming from BSC to a specific TRU time-slot are missing or corrupted.
Possible reasons	This is most likely to be a fault in the BSC (for example, no TRA allocated, no connection in Group-Switch, and so on) or in the A-bis transmission path.

1.5.6 AO TF, external condition map class 1

Table 15 AO TF EC1

Fault No.	**AO TF EC1:0**
Fault name	EXT Synch (No usable external reference)
Remark	Only when TF mode is slave
Description	The synchronisation reference from ESB (External Sync Bus) is missing.
	•If the fault occurs while TF is trying to synchronise, then the fault AO TF EC1:0 arises after 5 minutes.
	•If the fault occurs while TF is synchronised, then TF goes into hold-over mode and if the ESB reference has not come back within 2 minutes (holdover timeout), fault AO TF EC1:0 arises and TF is disabled. No class 2 fault arises before the class 1.
Possible reasons	The master TF is disabled or powered off. The master TF is in stand-alone mode (for example, after PCM link break longer than 10 minutes) The ESB cable is faulty or disconnected. A terminator on the ESB is faulty or missing.

Fault No.	**AO TF EC1:1**
Fault name	PCM synch (No usable PCM reference)
Remark	Only when TF mode ismaster or stand-alone.
Description	The synchronisation reference from the PCM network is faulty (for example, too much jitter/wander) or missing. •If the fault occurs while TF is trying to synchronise, then the fault AO TF EC1:1 arises after 5 minutes. •If the fault occurs while TF is synchronised, then TF goes into hold-over mode (that is, stops using the reference) and after 5 minutes, the fault AO TF EC2:0 arises on TF. •If the PCM reference hasn't come back within one hour (hold-over timeout), fault AO TF EC1:1 arises and TF becomes disabled.
Possible reasons	This is probably a transmission fault. •Check the PCM line, the transmission equipment, and so on. •Check PCM quality with BSC printout "DTQUP" and OMT monitor "Phase difference error, PCM". **Note:** The preferred PCM reference can be set in the IDB, for example,PCM A, PCM B or both.

1.5.7 AO TF, external condition map class 2

Table 16 AO TF EC1

Fault No.	**AO TF EC2:0**
Fault name	EXT Synch (No usable external reference)
Remark	Only when TF mode is slave.
Description	The synchronisation reference from ESB (External Sync Bus) is missing. •If the fault occurs while TF is trying to synchronise, then the fault AO TF EC1:0 arises after 5 minutes. •If the fault occurs while TF is synchronised, then TF goes into hold-over mode and if the ESB reference has not come back within 2 minutes (holdover timeout), fault AO TF EC1:0 arises and TF is disabled. No class 2 fault arises before the class 1.
Possible reasons	The master TF is disabled or powered off. The master TF is in stand-alone mode (for example, after PCM link break longer than 10 minutes) The ESB cable is faulty or disconnected. A terminator on the ESB is faulty or missing.

Fault No.	**AO TF EC2:1**
Fault name	PCM synch (No usable PCM reference)
Remark	Only when TF mode is master or stand-alone.
Description	The synchronisation reference from the PCM network is faulty (for example, too much jitter/wander) or missing. •If the fault occurs while TF is trying to synchronise, then the fault AO TF EC1:1 arises after 5 minutes. •If the fault occurs while TF is synchronised, then TF goes into hold-over mode (that is, stops using the reference) and after 5 minutes, the fault AO TF EC2:0 arises on TF. •If the PCM reference hasn’t come back within one hour (hold-over timeout), fault AO TF EC1:1 arises and TF becomes disabled.
Possible reasons	This is probably a transmission fault. •Check the PCM line, the transmission equipment, and so on. •Check PCM quality with BSC printout "DTQUP" and OMT monitor "Phase difference error, PCM". **Note:** The preferred PCM reference can be set in the IDB, for example,PCM A, PCM B or both.

1.5.8 AO TF, internal fault map class 1B

Table 17 AO TF I1B

Fault No.	**AO TF I1B:0**
Fault name	Optional synchronisation source
Remark	Only in DXUs using 5 MHz optional sync reference
Related fault	SO CF I2A:35 – Optional synchronisation source
Description	The long-term synchronisation reference from the optional oscillator is faulty (for example, too much jitter/wander) or missing. The VCO goes into hold-over mode (that is, stops using the reference) and after 5 minutes, the fault SO CF I2A:35 arises. If the reference has not come back within one hour (hold-over timeout), the fault AO TF I1B:0 arises and TF is disabled.
Possible reasons	There is probably a fault on the 5 MHz oscillator in DXU. It might be a temporary disturbance in the oscillator
Action	Try to power off/on DXU. Then wait a while (several hours) to see if the fault comes back. If this does not help, replace DXU. Note: at DXU "cold start", it will take at least one hour for the 5 MHz oscillator to warm up and stabilize.

Fault No.	**AO TF I1B:1**
Fault name	DXU-opt EEPROM checksum fault
Remark	Onl in DXUs using 5 MHz optional sync referencey
Related fault	SO CF I2A:10 – DXU optional EEPROM checksum fault
Description	The EEPROM of the DXU optional synchronisation board contains corrupted data. This data is necessary for the CPU to control the 13 MHz VCO. The TU is unable to synchronise
Possible reasons	Probably a HW fault
Action	Try to power off/on the DXU. If this does not help, replace DXU.

1.5.9 AO TF, internal fault map class 2A

Table 18 AO TF I2A

Fault No.	**AO TF I2A:0**
Fault name	ESB distribution failure, faulty DXU driver
Remark	SW release R7D
Description	Temporary solution. The Fault indicator on the DXU shall be lit when this fault occurs.
Possible reasons	Faulty DXU driver
Action	Replace the DXU

1.5.10 AO TS, external condition map class 1

Table 19 AO TS E1

Fault No.	**AO TS E1:3**
Fault name	TRA (Remote transcoder com. lost) (SW release R7.0)
	TRA/PCU (Remote transcoder/PCU com. lost) (SW releases R7C, R7D and R8A)
Description	The TRAU frames (speech/data) coming from the BSC to a specific TRU time-slot are missing or corrupted.
Possible reasons	This is most likely to be a fault in the BSC (for example, no TRA allocated, no connection in Group-Switch, and so on) or in the A-bis transmission path.

1.5.11 AO TX, internal fault map class 1A

Table 20 AO TX I1A

Fault No.	**AO TX I1A:0**
Fault name	TX offending
Description	This fault has been introduced especially for CDU-D. It arises when the BSC has configured two TXs on the same frequency or if the frequency separation is below the guard band (600 kHz in GSM 900 and 1 MHz in GSM 1800). The TX will be disabled in order to protect the CU from overheating.
Possible reasons	BSC wants to move a frequency from one TX to another TX and "forgets" to disable the first TX before configuring the second TX. The TX will be automatically disabled and reconfigured to a non-offending frequency.
Action	The frequency planning is wrong (check Data Transcript for this cell).

1.5.12 AO TX, internal fault map class 1B

Table 21 AO TX I1B

Fault No.	**AO TX I1B:0**
Fault name	CU not usable (SW releases R7.0 and R7C)
	CU/CDU not usable (SW releases R7D and R8A)
Related fault	SO CF I2A:14 – Reset, SW fault
	SO TRXC I1B:0 – CDU not usable
	SO TRXC I2A:22 – CDU bus communication fault
Description	There is a communication problem on the CDU-bus between TRU and CU. TX function is affected since the CDU-bus is used to tune the CU.
Possible reasons	•The CDU-bus cable is faulty or disconnected.
	•The CU is powered off
	•One of the two TRUs controlling the CDU-bus is faulty.
Action	Check backplane connection as well.

Fault No.	**AO TX I1B:1**
Fault name	Combiner VSWR Limits Exceeded (SW releases R7.0 and R7C) CDU/combiner VSWR Limits Exceeded (SW releases R7D and R8A)
Related fault	SO CF I2A:8 – VSWR limits exceeded SO CF RU:5 – CDU
Description	When VSWR at TRU output exceeds 2.0, the TX power is automatically reduced until VSWR goes below 2.0. Fault SO CF I2A:8 arises on CF with RU map "CDU". When VSWR exceeds 4.0, fault AO TX I1B:1 arises and BSC should normally disable the TX.
Possible reasons	•The TX cable between a CDU and a TRU is faulty or disconnected. •A HW error in the TRU.
Note:	The Fault LED on the CDU is turned on and the SO CF RU map indicates CDU which can be misleading since the fault is more likely to be in TRU or TX cable between TRU/CDU.
Action	•Check the TX cable between CDU and TRU. •If the TX cable is OK, change the TRU.

Fault No.	**AO TX I1B:2**
Fault name	CDU output power limits exceeded
Related fault	SO CF I2A:9 – Power limits exceeded
Description	When TX power at CDU output is 7 dB lower than expected, fault SO CF I2A:9 arises. When the difference is 10 dB, fault AO TX I1B:2 arises.
Possible reasons	There is probably a fault on the TX path. Other reason: TX high temperature or saturation (see AO TX I1B:12 and AO TX I1B:14).
Action	Try the following actions until the fault is corrected: •Check all TX cables, both inside and outside cabinet. •Check the CDU — TRU Pfwd/Prefl cables. •Check the RU logs to see which TRU is emitting the fault. •Switch positions between TRUs/CDUs to find out it is the units or the RF cables that are faulty. •Reinstall the IDB.

Fault No.	**AO TX I1B:4**
Fault name	TX antenna VSWR limits exceeded
Related fault	SO CF I2A:8 – VSWR limits exceeded SO CF RU:40 – Antenna
Description	When VSWR at CDU output exceeds the class 2 limit defined in IDB with OMT (default value: 1.8), the fault SO CF I2A:8 arises with RU map "Antenna". When VSWR exceeds the class 1 limit (default value: 2.2), the fault SO CF I1B:4 arises on TX.
Possible reasons	Faulty IDB, faulty CDU, TX antenna/feeder faulty or disconnected, Pfwd/Prefl cables and, in some cases, the measurement receiver in TRU/CU.
Action	Try to reinstall the IDB before replacing units.

Fault No.	**AO TX I1B:6**
Fault name	TX EEPROM checksum fault
Related fault	SO TRXC I2A:7 – TX EEPROM checksum fault
Description	The data stored in TXU eeprom is corrupted. This data is needed by TRU SW to perform internal configuration.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO TX I1B:7**
Fault name	TX config table checksum fault
Related fault	SO TRXC I2A:8 – TX configuration table checksum fault
Description	At TRU start-up, the data from TXU eeprom is copied into TRU RAM in order to create the TX configuration table which will be used for internal configuration of TRU SW. This fault arises when the data in TRU RAM is faulty
Action	Try to reset or power off/on the TRU. If this does not help, change TRU.

Fault No.	**AO TX I1B:8**
Fault name	TX synthesiser A/B unlocked
Related fault	SO TRXC I2A:9 – TX synthesizer unlocked
Description	One or both of the RF synthesisers in TXU could not lock to the required frequency.
Possible reasons	Probably a HW fault in TRU
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO TX I1B:9**
Fault name	TX synthesiser C unlocked
Related fault	SO TRXC I2A:9 – TX synthesizer unlocked
Description	The IF synthesiser in TXU could not lock to the required frequency.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO TX I1B:10**
Fault name	Astra-Tracy Communication fault
Related fault	SO TRXC I2A:6 – Astra Tracy communication fault
Description	Communication fault between Astra and Tracy.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO TX I1B:11**
Fault name	TX internal voltage fault
Related fault	SO TRXC I2A:10 – TX internal voltage fault
Description	Fault on the internal voltage regulators of the TXU.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO TX I1B:12**
Fault name	TX High temperature
Related fault	SO TRXC I2A:11 – TX high temperature SO TRXC I2A:25 – TX maximum power restricted AO TX I1B:27 – TX maximum power restricted
Description	The temperature of the PA transistors is supervised. At 75 °C (equals about 45 °C cabinet temperature), faults SO TRXC I2A:11 and SO TRXC I2A:25 are raised on TRXC and maximum TX output power is reduced by 2 dB. If the temperature is still over 75 °C after 2 minutes, the maximum output power is reduced by another 2 dB. If the temperature is still over 75 °C after 2 more minutes the transmitter is automatically shut down and faults AO TX I1B:12 and AO TX I1B:27 are raised. The fault stays active until temperature stays below the limit for 5 minutes. The TX is then enabled and maximum output power is progressively increased.
Possible reasons	Climate system failure - TRU dummies missing - high temperature outside the cabinet

Fault No.	**AO TX I1B:13**
Fault name	TX output power limits exceeded
Related fault	SO TRXC I2A:12 – TX output power limits exceeded
Description	When TX power at TRU output is 2 dB lower than expected, fault SO TRXC I2A:12 arises. When the difference is 4 dB, fault AO TX I1B:13 arises.
Possible reasons	The TX cable between CDU and TRU is faulty or disconnected. The power supply is reduced. The TXU or PAU are faulty or affected by too high temperature.

Fault No.	**AO TX I1B:14**
Fault name	TX saturation
Related fault	SO TRXC I2A:13 – TX saturation
Description	TX saturation means that the TXU delivers maximum RF power to the PAU but it is still not sufficient to get the desired power from the PAU. The fault SO TRXC I2A:13 arises at the same time. Other faults such as AO TX I1B:2 and AO TX I1B:13 might raise as consequence.
Possible reasons	Many possible reasons both SW and HW related. Can even be temperature related.
Action	Try to block/deblock the TRU. If this does not help, power off/on the TRU or replace the TRU.

Fault No.	**AO TX I1B:15**
Fault name	Voltage supply fault
Remark	SW releases R7.0 and R7C. This fault is replaced by fault SO TRXC I1A:22 in SW releases R7D and R8A.
Related fault	SO TRXC I1A:22 – Voltage supply fault
Description	See fault SO TRXC I1A:22.
Possible reasons	See fault SO TRXC I1A:22.
Action	See fault SO TRXC I1A:22.

Fault No.	**AO TX I1B:16**
Fault name	Power unit not ready
Remark	SW releases R7.0 and R7C This fault is replaced by fault SO TRXC I1A:22 in SW releases R7D and R8A.
Related fault	SO TRXC I1A:22 – Voltage supply fault
Description	See fault SO TRXC I1A:22.
Possible reasons	See fault SO TRXC I1A:22.
Action	See fault SO TRXC I1A:22.

Fault No.	**AO TX I1B:17**
Fault name	TX initiation fault
Related fault	SO TRXC I2A:21 – TX initiation fault
Description	The TXU could not be initialised. There is probably a fault in the ASIC (Tracy), the synthesisers or the eeprom. This fault occurs at TRU start-up and stays as long as the initialisation is unsuccessful.
Possible reasons	Probably a HW fault in TRU.
Action	Try to power off/on TRU before replacing it.

Fault No.	**AO TX I1B:18**
Fault name	CU HW fault (SW releases R7.0 and R7C)
	CU/CDU HW fault (SW releases R7D and R8A)
Related fault	SO CF I2A:24 – CU HW fault
Description	There is a fault in CU/CDU HW, for example step motor, measurement receiver, and so on.
Action	Try to power off/on CU/CDU and reset TRU. If this does not help, replace the CU/CDU.

Fault No.	**AO TX I1B:19**
Fault name	CU SW load/start fault (SW releases R7.0 and R7C)
	CU/CDU SW load/start fault (SW releases R7D and R8A)
Related fault	SO CF I2A:24 – CU HW fault
Description	The CU/CDU SW has a checksum fault or cannot be started in CU/CDU processor. TRU reloads CU/CDU SW over CDU-bus and CU/CDU is restarted. The fault should cease.
Possible reasons	If the fault does not cease or occurs too often, there is probably a HW fault in CU (for example boot prom corrupted).
Action	Try to power off/on CU/CDU and reset TRU. If this does not help, replace CU/CDU.

Fault No.	**AO TX I1B:20**
Fault name	CU input power fault (SW releases R7.0 and R7C)
	CU/CDU input power fault (SW releases R7D and R8A)
Related fault	SO CF I2A:9 – Power limits exceeded
Description	This alarm arises by CU/CDU when TX power at CU input is different than the value expected (sent by TRU to CU/CDU over CDU-bus).
Possible reasons	TX cable between TRU and CU is faulty or disconnected.
Action	Replace the TRU or CU/CDU.

Fault No.	**AO TX I1B:21**
Fault name	CU park fault (SW releases R7.0 and R7C)
	CU/CDU park fault (SW releases R7D and R8A)
Related fault	SO CF I2A:24 – CU HW fault
Description	One of the filter cavities in CU/CDU has failed to park or did not park within the specified time (30 s). This might affect other TRUs as well. Note: "parking" means that the filter cavity is tuned outside the TX frequency band in order not to disturb other TRUs. This is done for example when TX is disabled or when CU/CDU has lost contact with TRU.
Possible reasons	Probably HW fault in CU/CDU . Could also be a communication fault (CDU-bus).
Action	Try to power off/on CU/CDU and reset TRU. If this does not help, replace CU/CDU .

Fault No.	**AO TX I1B:22**
Fault name	VSWR/Output power supervision lost
Remark	Only CDU-D
Related fault	SO CF I2A:15 – VSWR/Output power supervision lost
Description	The Pf cable between FU and CU is missing or disconnected => CU cannot be tuned so TX function is lost. Moreover, antenna VSWR and output power cannot be supervised.
Action	Replace the Pf cable between CU and FU.

Fault No.	**AO TX I1B:23**
Fault name	CU reset, power on (SW releases R7.0 and R7C)
	CU/CDU reset, power on (SW releases R7D and R8A)
Related fault	SO CF I2A:24 – CU HW fault
Possible reasons	CU/CDU has been reset. Fault raises and ceases immediately after reset.

Fault No.	**AO TX I1B:24**
Fault name	CU reset, communication fault (SW releases R7.0 and R7C)
	CU/CDU reset, communication fault (SW releases R7D and R8A)
Related fault	SO CF I2A:24 – CU HW fault
Possible reasons	CU/CDU has been reset. Fault raises and ceases immediately after reset.

Fault No.	**AO TX I1B:25**
Fault name	CU reset, watchdog (SW releases R7.0 and R7C)
	CU/CDU reset, watchdog (SW releases R7D and R8A)
Related fault	SO CF I2A:24 – CU HW fault
Possible reasons	CU/CDU has been reset. Fault raises and ceases immediately after reset

Fault No.	**AO TX I1B:26**
Fault name	CU fine tuning fault (SW releases R7.0 and R7C) CU/CDU fine tuning fault (SW releases R7D and R8A)
Related fault	SO CF I2A:24 – CU HW fault
Description	The fine tuning occurs when TX is enabled. The purpose is to adjust the cavity according to TX power variations.
Possible reasons	Probably a HW fault in CU/CDU (for example step motor or cavity axes).
Action	Try to power off/on CU/CDU and reset TRU. If this does not help, replace CU/CDU .

Fault No.	**AO TX I1B:27**
Fault name	TX max power restricted
Related fault	SO TRXC I2A:11 – TX high temperature SO TRXC I2A:25 – TX maximum power restricted AO TX I1B:12 – TX high temperature
Description	This fault arises when the TX has been disabled in order to protect it against high temperature. There is a corresponding class 2 fault (SO TRXC I2A:25) which arises when the maximum TX output power has been reduced.
Action	See description of fault AO TX I1B:12.

Fault No.	**AO TX I1B:28**
Fault name	CDU high temperature
Related fault	SO TRXC I2A:25 – TX Max Power Restricted AO TX I1B:12 – TX High Temperature AO TX I2A:0 – TX Diversity Fault
Description	
Action	Replace the CDU.

Fault No.	**AO TX I1B:47**
Fault name	TX Auxiliary equipment fault
Related fault	SO CF I2A:47 – Auxiliary Equipment Fault AO RX I1B:47 – RX Auxiliary Equipment Fault
Description	A class 1 fault has occurred on auxiliary equipment related to TX antenna (for example power booster in active antenna).

1.5.13 AO TX, internal fault map class 2A

Table 22 AO TX I2A

Fault No.	**AO TX I2A:0**
Fault name	TX diversity fault
Description	The function TX diversity uses two TRUs to send on one carrier, providing an extra gain of 3 dB. If one TRU becomes faulty, the TX-diversity function is lost but the carrier is still able to carry traffic thanks to the second TRU.
Action	Replace the faulty TRU.


P006553A

Ericsson GSM System

RBS 2102

Spare Parts Catalogue

ERICSSON

LZN 302 93 R7C

Ericsson GSM System

RBS 2102

Spare Parts Catalogue

This page is intentionally left blank

Spare Parts Catalogue

Due to continued progress in methodology, design and manufactoring the contents of this document are subject to revision without notice.

Contents

Preface

This catalogue is a complement to the Maintenance Manual and provides the information necessary to order replaceable parts. This information is useful for the general planning of a maintenance organisation and in building up a spare parts stock.

The main target groups are:

- Field Technichians
- Technical Administrators

Customer Documentation Library

The user documentation for the RBS 2102 consists of customer manuals divided up to suit different process events. The *Library Overview* contains the following information for each manual:

- Short description
- Recommended target group
- Product number

For more information about the RBS 2000 customer documentation library, see:

RBS 2000 Library Overview *LZN 302 73*

Release History

In addition to editorial changes, such as corrections of spelling, grammar and layout, the following changes have been made for each release. Only the three last R-states are listed below.

R6A to R7A :

- A new version of Cabinet and Climate Unit is introduced as Version 5 (V5).
- A new ACCU is introduced as ACCU-3
- Improved illustrations.
- New TRU versions for 1800 and 1900 MHz.

R7A to R7B :

- Door rubber seal kit introduced.
- Up-grade kit for ACCU introduced.

R7B to R7C

- Swiss Service outlet added.
- BMY 201 148/3 moved to other available parts.
- SXK 119 365/1 replaced by SXK 119 048/2.
- Fotnote adjustments.
- TMA introduced.

Spare Parts Philosophy for RBS 2000

The specifying and classifying of spare parts is done during the service preparation process which is a part of the industrialization process. The result is a spare part list containing three classes of spare parts:

• Recommended for customer stock. Intended to be replaced on site and intended to be repaired at Ericsson Repair Center or by the Local Service Organisation (former code = U)

• Recommended for customer stock. Intended to be replaced on site or at local shop and intended to be disposed after consumption (former code = R).

• Not recommended for customer stock. The parts are available when needed (former code = A).

The spare parts catalogue is adapted to this structure.

The dimensioning and recommendation of spare parts will not follow the principle one-of-each-board-in-use unless the customer expressly so insists.

The dimensioning and recommendation of spare part stocks is and will be done with a computer-based calculation model for BTS equipment.

The tool is working with the parameters:

• Product reliability (MTBF)

• Spare part delivery lead time or repair turn around time.

• Chosen service level (Spare Part Management).

• The spare part structure.

• Quantity of each unit in operation to be supported by the specific stock.

• The probability of shortage.

General Information

The catalogue is divided into separate chapters, depending on recommendations (classifications).

Position numbers put in brackets ( ) are associated parts, not necessary shown in illustrations. Position numbers with letters, like 3A, 3B are alternative products. New products are indicated by a #-sign in front of the position number.

Parts without Product number may be shown on illustrations, but are not recommended for customer stock, or may be included in a Spare Parts Set (and not separate orderable). If a reference to another chapter is given, more information will be found there.

Spare Parts Ordering Address:

Please use the Regional Ericsson Company, else:

Ericsson Radio Systems AB

SG/ERA/GV/DP

Customer Support Services, Strategic Supply Management

S-164 80 Stockholm

FAX: +46 8 751 4176

Repair Delivery Address:

Please use the Regional Logistics Center specified in the System Services Contract with the local Ericsson Company.

Catalogue Ordering:

Use the product no. ...... seen at the bottom of this page.

External users can order Spare Parts Catalogues (or other manuals according to the Library Overview), from the same address as for Spare Parts, above.

Internal users (within the Ericsson Company) can always find the latest version of the Catalogue on the Intranet address:

http://cpistore.ericsson.se/

Remarks

External user's comments or questions regarding information in this catalogue should be addressed to:

Spare Parts Documentation, Telefax: **+46 8 757 1388**

or as e-mail to **hws.support@era.ericsson.se**

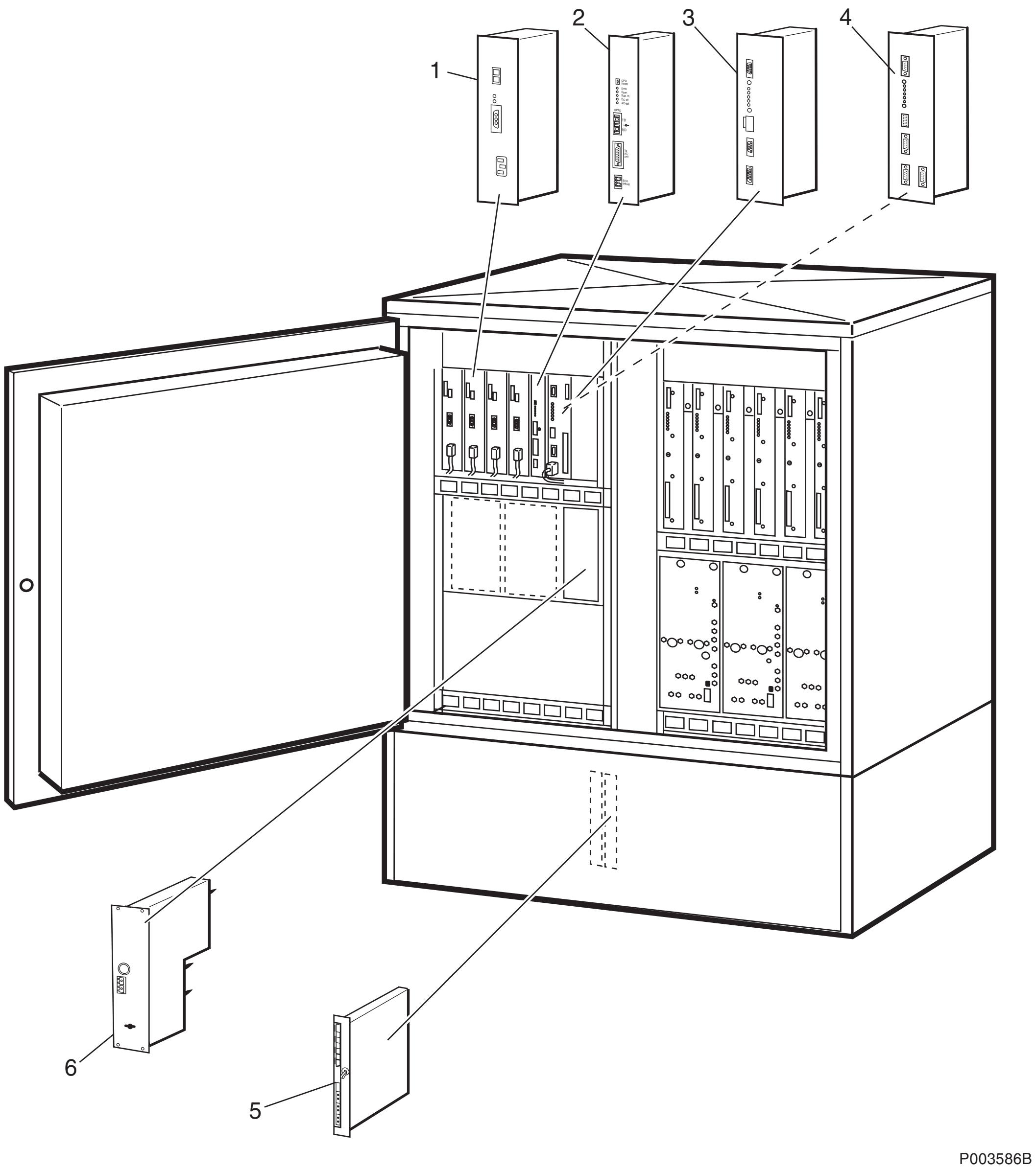
Internal Ericsson users can make a MHS Trouble Report on the catalogue's Product No. and R-state seen at the bottom of this page.

Recommended (Repairable) Spare Parts for Customer Stock

About this chapter

All parts in this chapter have the internal code = U. These parts recommended for Customer stock, are intended to be replaced on site and intended to be repaired at an Ericsson Repair Centre or by the Local Service Organisation

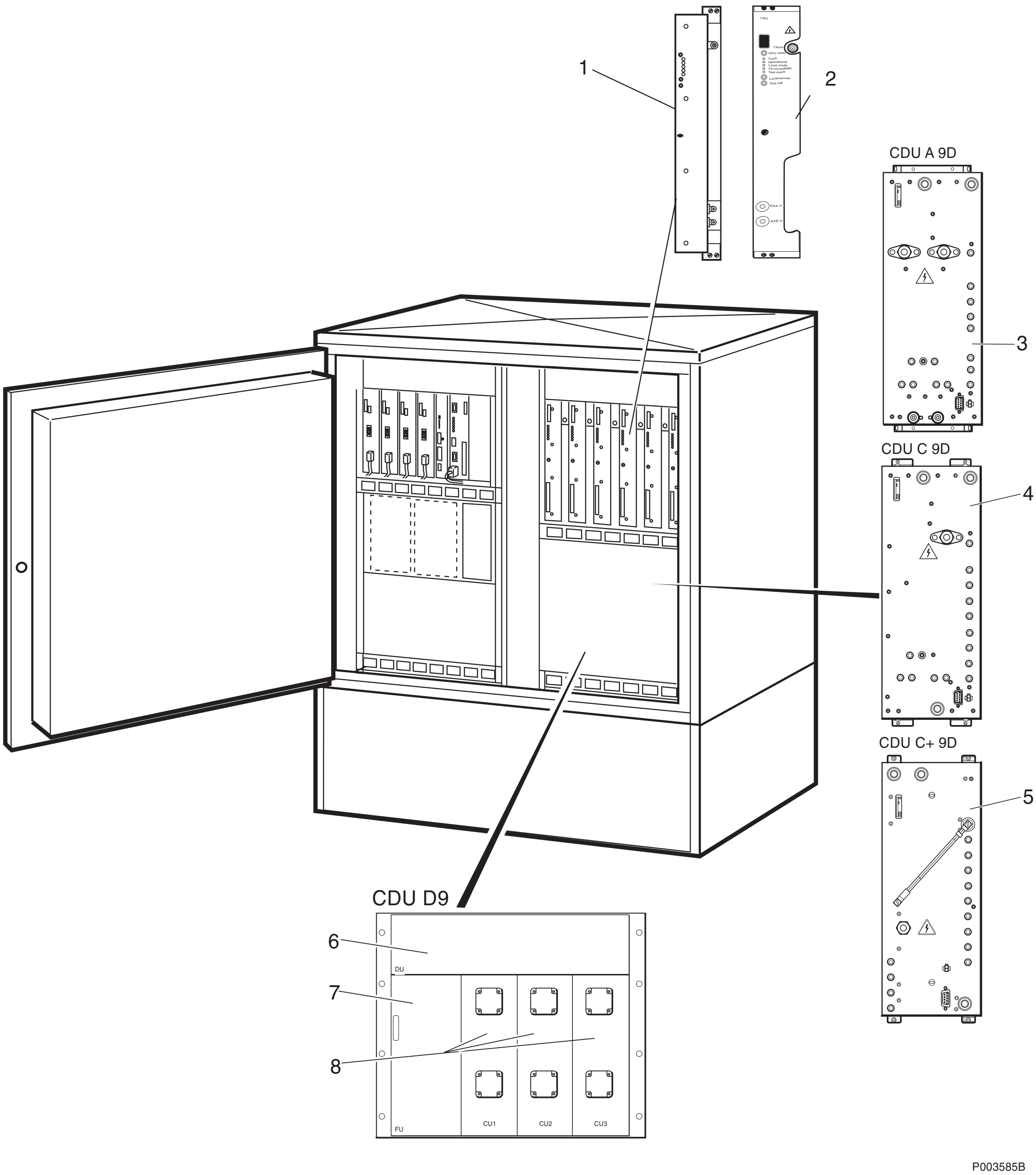
It is only possible to order new repairable parts as long as serial production continues. When production ceases these parts can only be sent for repair.


1
2
3
4
5
6
P003586B

Basic Units

Pos	Product Number	Product Name	Description
1	BML 231 201/1	Power supply unit	PSU230 700W +24VDC FC
2	BMP 903 021/1	Energy control unit	
3A	BOE 602 02/01	Functional unit	[1] DXU 01 /E1, PCM Synch. (Distrib. Switch Unit)
3B	BOE 602 02/03	Functional unit	[1] DXU 03
4	BOE 602 11/11	Functional unit	[2] DXU 11 (long Haul + TG Synch)
5	BMR 960 011/1	Converter	DCTM 200 W, +24 V / -48 V
6	BMG 701 016/1	Battery fuse unit	BFU

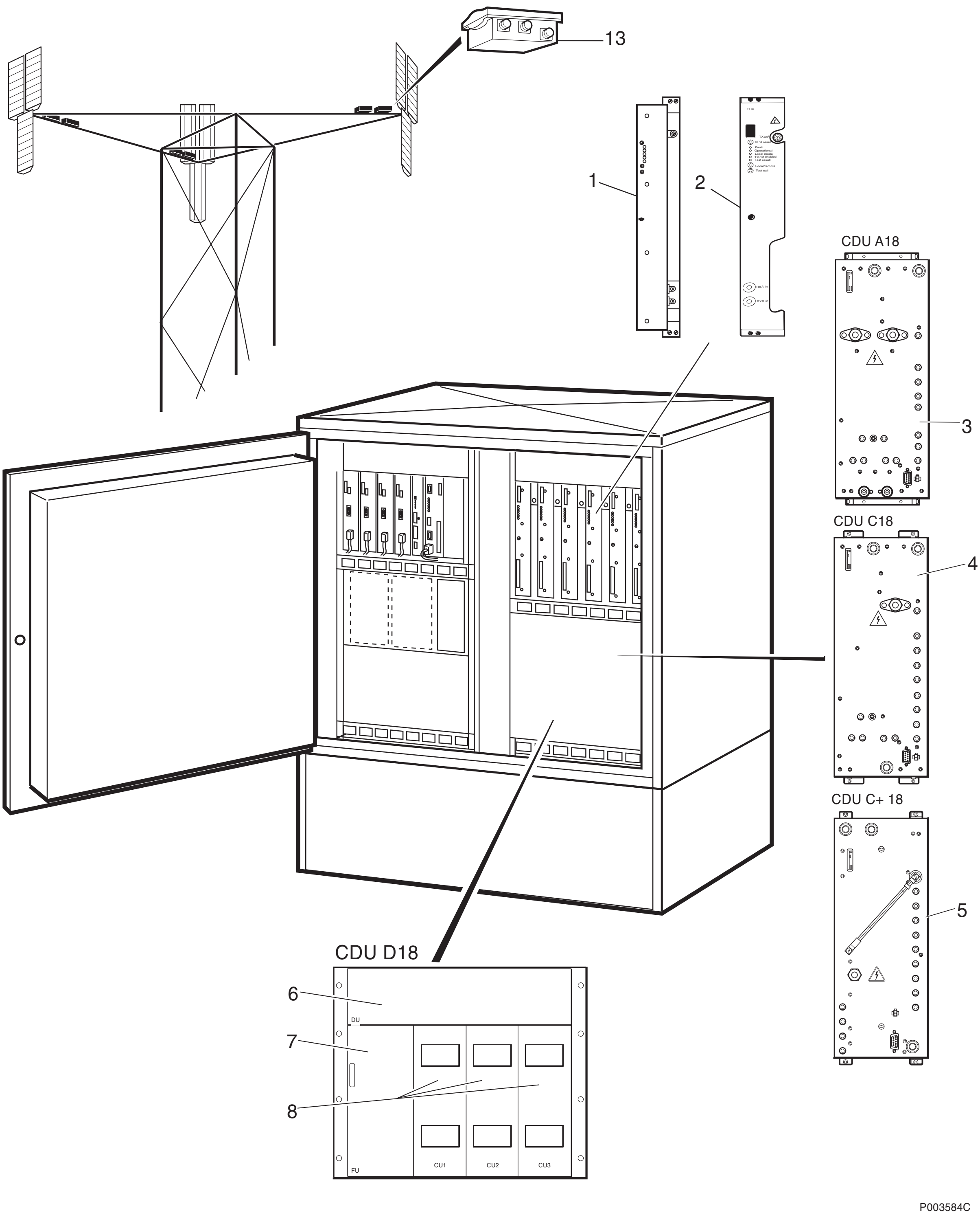
[1] Production and sales of new parts have ceased.
[2] Complete kit to be used when replacing DXU 01 or 03 with DXU 11, please order NTM 201 2798/1 (including 2 adapters and 1 DXU 11).


1
2
CDU A 9D
3
CDU C 9D
4
CDU C+ 9D
5
CDU D9
6
DU
7
8
FU
CU1
CU2
CU3
P003585B

900 MHz Units

Pos	Product Number	Product Name	Description
1A	KRC 131 47/03	Transceiver	[3] TRU 900 20W A5/1
1B	KRC 131 47/04	Transceiver	[3] TRU 900 20W A5/2
2A	KRC 131 47/15	Transceiver	TRU 900 20W A5/1
2B	KRC 131 47/16	Transceiver	TRU 900 20W A5/2
3	BFL 119 104/1	Combiner unit	CDU_A9d, 900 MHz
4	BFL 119 113/1	Combiner unit	CDU_C9d, 900 MHz
5A	BFL 119 123/1	Combiner unit	P-GSM 900/CDU_C+
5B	BFL 119 135/1	Combiner unit	E-GSM 900/CDU_C+
6	KRY 101 1535/1	Distribution unit	DU, 900 MHz
7	KRF 201 382/1	Filter unit	FUd (duplex) 900 MHz
8	KRF 201 396/1	Combiner unit	CU, 900 MHz (Incl. E-GSM)

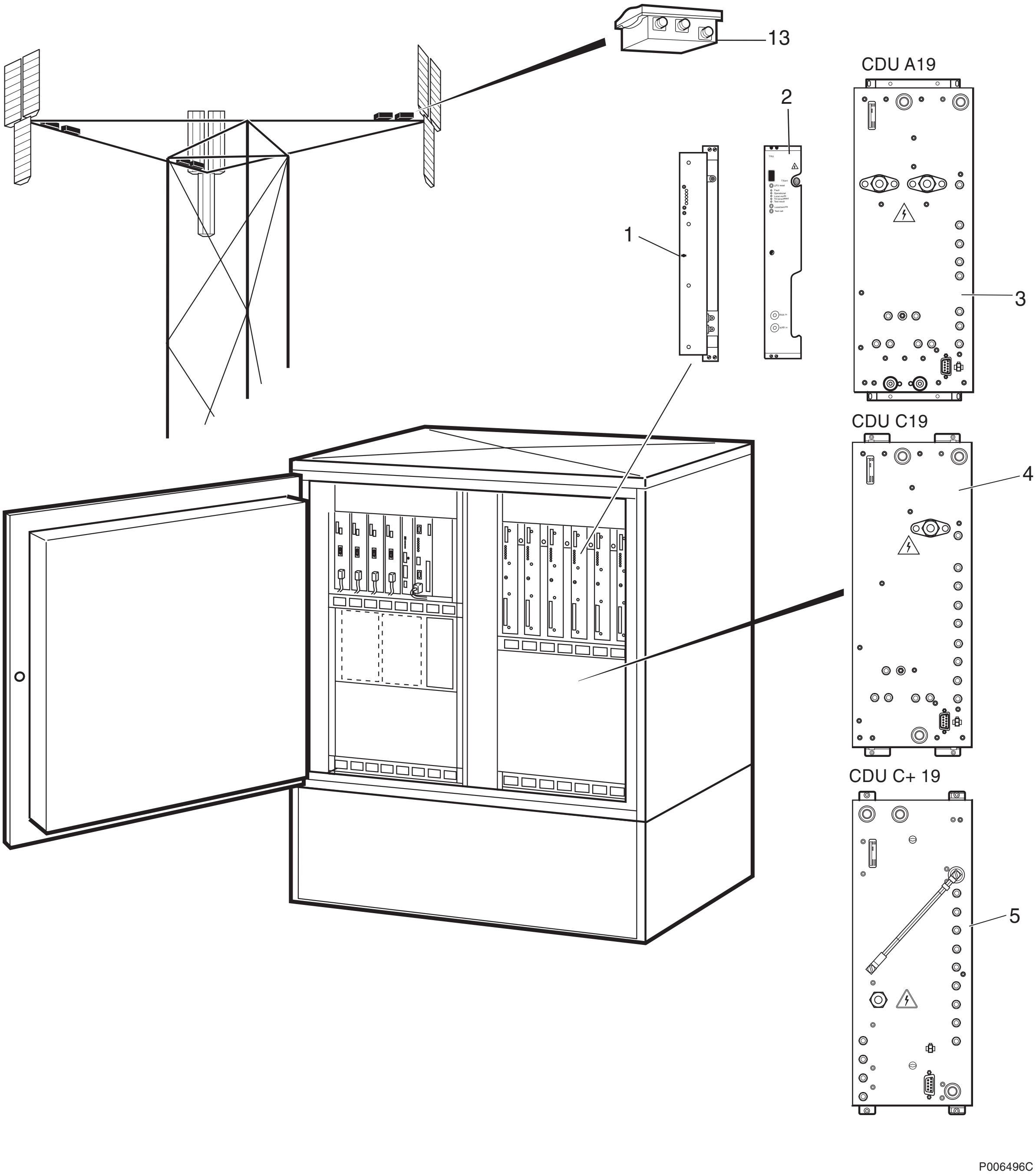
[3] Production and sales of new parts have ceased.


13
1
2
CDU A18
3
CDU C18
4
CDU C+ 18
5
CDU D18
6
7
8
DU
FU
CU1
CU2
CU3
P003584C

1800 MHz Units

Pos	Product Number	Product Name	Description
1A	KRC 131 48/01	Transceiver	[4] TRU 1800 A5/1
1B	KRC 131 48/02	Transceiver	[4] TRU 1800 A5/2
2A	KRC 131 48/15	Transceiver	TRU 1800 A5/1
2B	KRC 131 48/16	Transceiver	TRU 1800 A5/2
3	BFL 119 106/1	Combiner unit	CDU A18
4	BFL 119 118/1	Combiner unit	CDU C18, 1800 MHz
5	BFL 119 127/1	Combiner unit	GSM 1800/CDU_C+
6	KRY 101 1483/2	Distribution unit	DU 1800 MHz
7A	KRF 201 250/1	Filter unit	FU 1800 MHz, for use with TMA
7B	KRF 201 383/1	Filter unit	FUd (duplex) 1800MHz, for use without TMA.
8	KRF 201 389/1	Combiner unit	CU 1800 MHz
#13	KRY 112 38/1	Amplifier	TMA 1800/75 GSM DPX

[4] Production and sales of new parts have ceased.


13
CDU A19
2
1
3
CDU C19
4
CDU C+ 19
5
P006496C

1900 MHz Units

Pos	Product Number	Product Name	Description
1A	KRC 131 49/01	Transceiver	[5] TRU 1900 A5/1
1B	KRC 131 49/02	Transceiver	[5] TRU 1900 A5/2
2A	KRC 131 49/15	Transceiver	[6] TRU 1900 A5/1
2B	KRC 131 49/16	Transceiver	[6] TRU 1900 A5/2
3	BFL 119 108/1	Combiner unit	CDU A19
4	BFL 119 117/1	Combiner unit	CDU C19, 1900 MHz
5	BFL 119 128/1	Combiner unit	GSM 1900/CDU_C+
#13	KRY 112 37/1	Amplifier	TMA 1900/60 GSM DPX

[5] Production and sales of new parts have ceased.
[6] This product is available from October 2000.

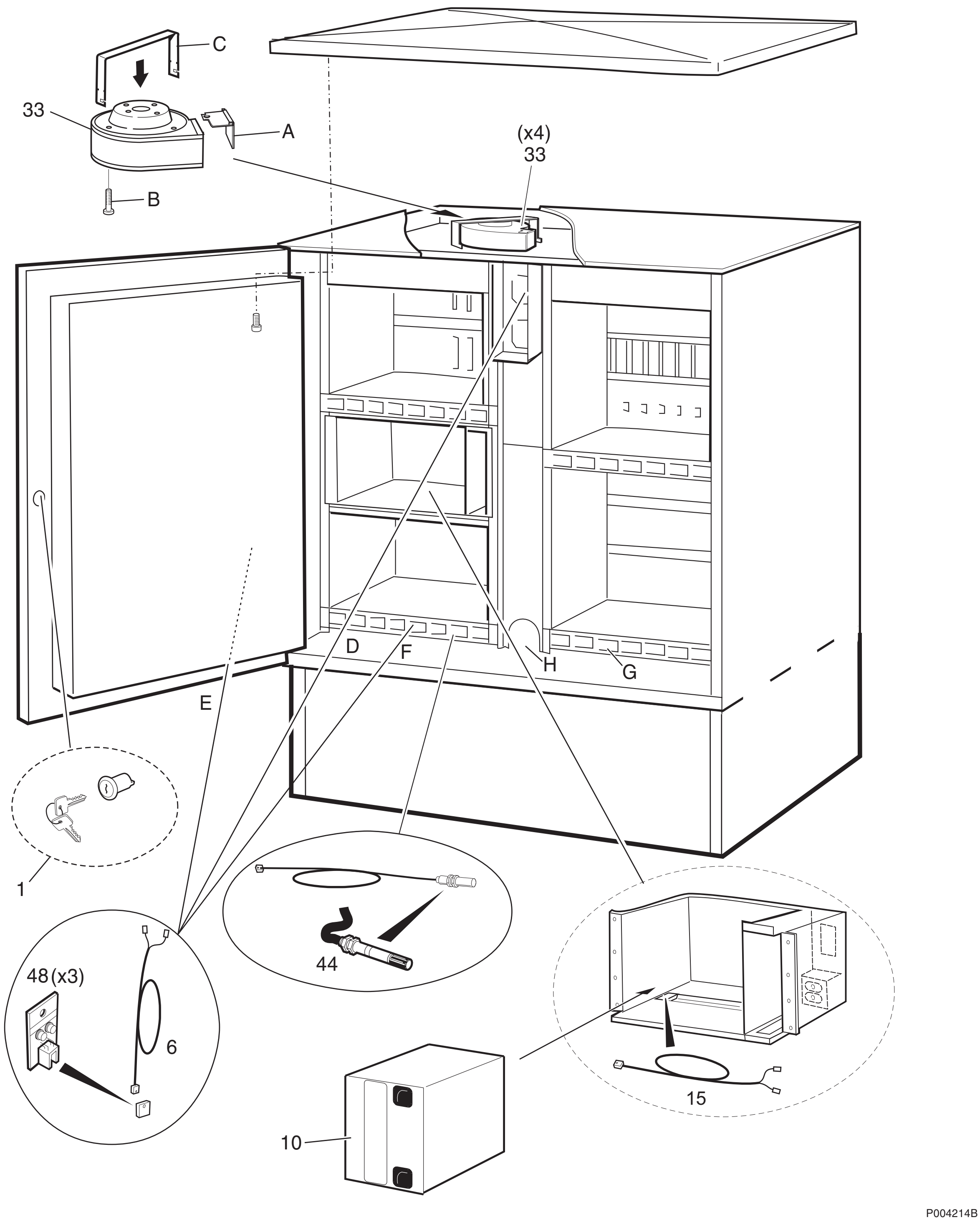
This page is intentionally left blank

Recommended (Not Repairable) Spare Parts for Customer Stock

About this chapter

All parts in this chapter have the internal code = R.

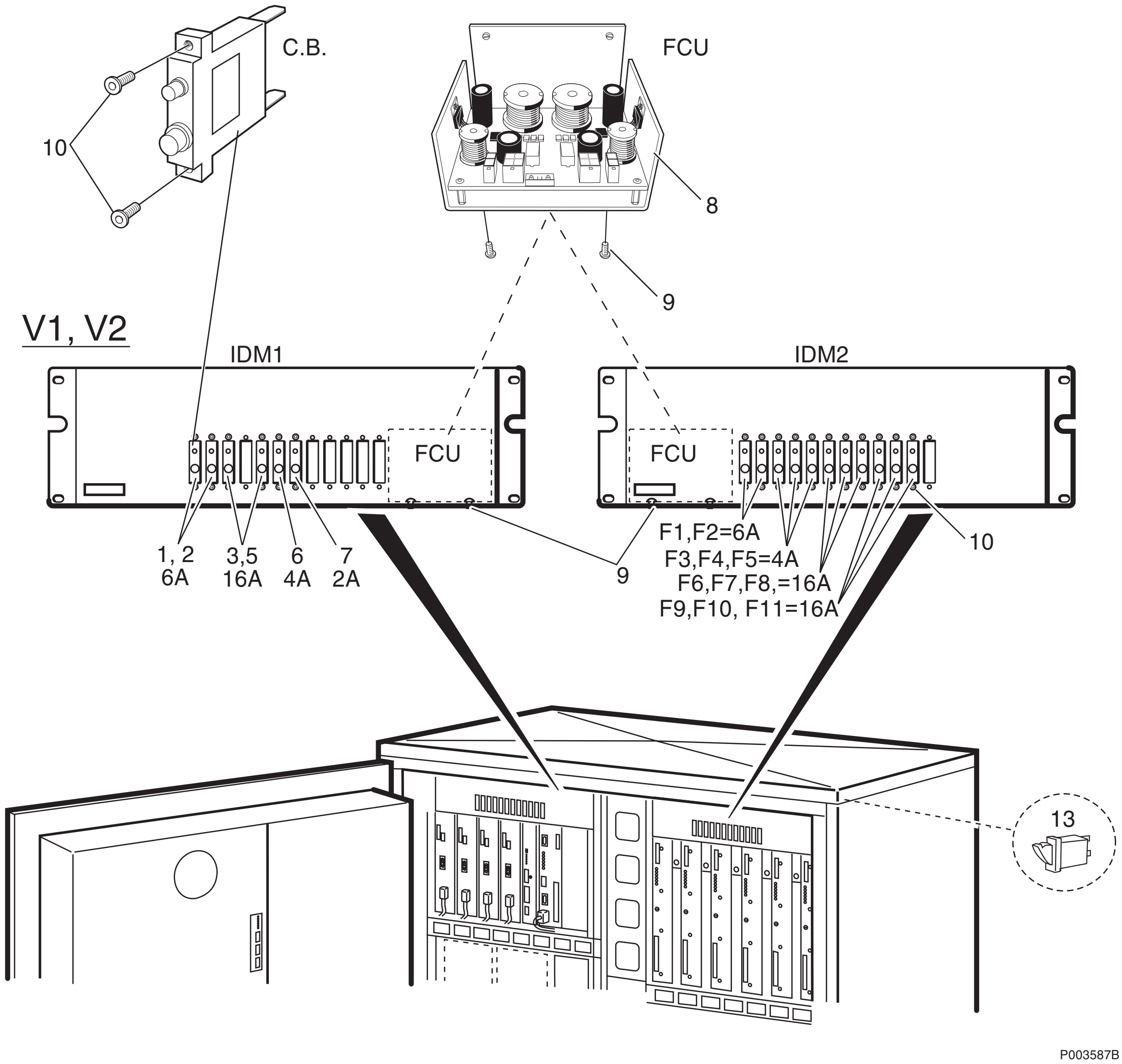
These parts are recommended for customer stock, and are intended to be replaced on site, or at a local shop and are intended to be disposed of after consumption.


C
33
A
(x4)
33
B
D
F
H
G
E
1
44
48 (x3)
6
15
10
P004214B

Common Parts for all versions, V1, V2, V3, V4 and V5

Pos	Product Number	Product Name	Description
1	SMB 102 10/1	Lock	[7] CABINET LOCK CYLINDER +1 KEY
6		Connection cable	See chapter 'Other Available Parts'.
10		Battery	[8] Local purchase recommended.
15	KET 103 01/3	Temperature sensor	COMPLETE, w. cable, L=600 mm
(15B)	KET 103 01/4	Temperature sensor	COMPLETE, w. cable, L=2000 mm For external batteries.
33	BKV 301 253/3	Fan	Replacement Set for original BKV 301 253/1 and BKV 301 253/2 including an instruction document on how to reuse screw, plate and holder from an old (faulty) fan.
44	RPM 513 743/02000	Sensor	Humidity sensor, complete w. 2 m cable
48	ROA 117 666/1	Printed board assemb	TEMP SENSOR (Alternative locations, see pos D-H below)
D			Temp (out) sensor location in all cabinet versions.
E			Used in V1 only. (Not monitored)
F			Temp (in) sensor location in cabinet V1 and V2.
G			Temp (in) sensor location in cabinet V3 and V4.
H			Temp (in) sensor location in cabinet V4 and V5.

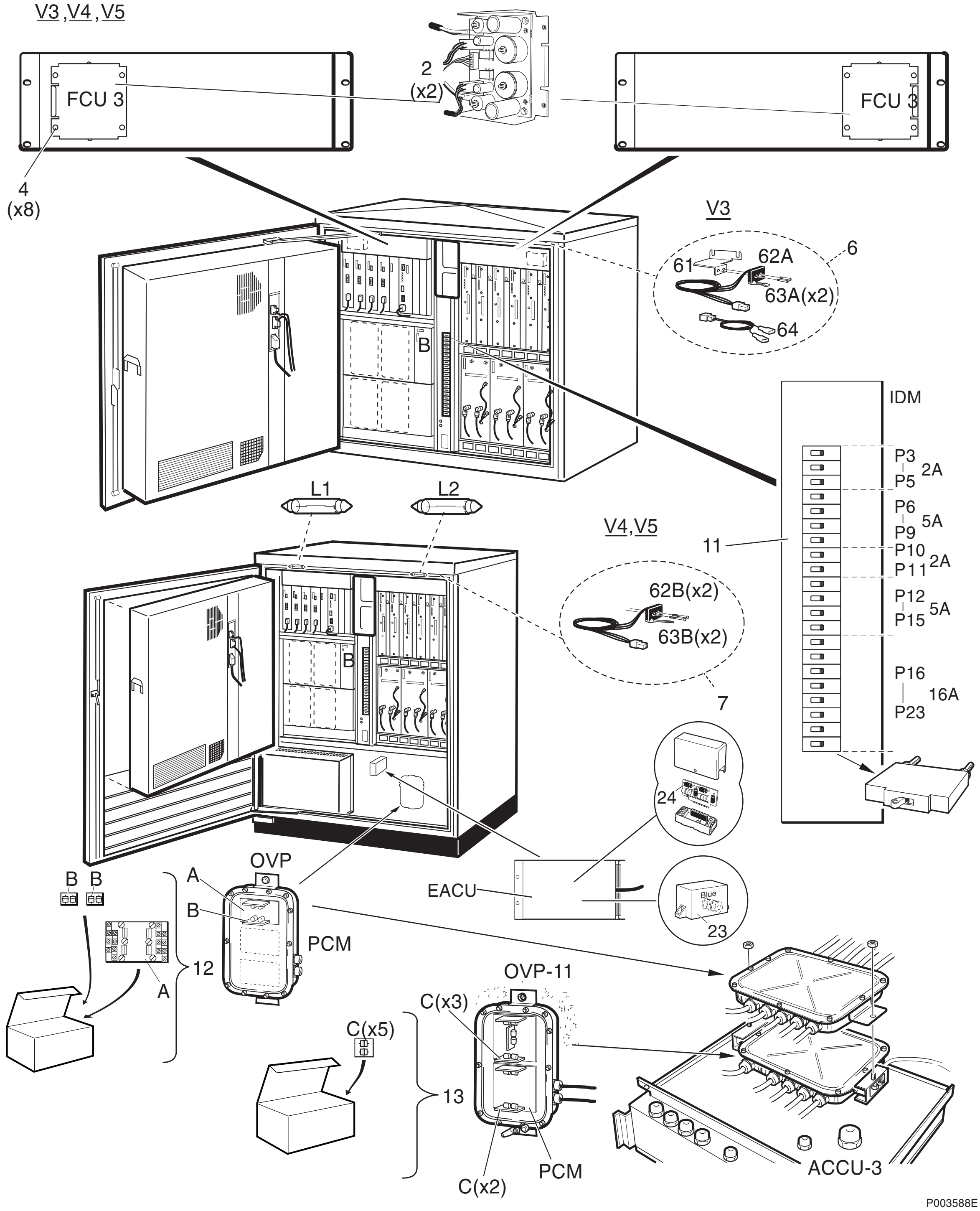
[7] This is the number for ordering Standard keys and locks. The local Ericsson Company is responsible for administrating different locks and keys for different operators in the same country.
[8] Batteries must comply with the specification document 1301-BKC 861, available from the local Ericsson Company. If local purchase is not possible, use product number 12/BKC 861 0045/017 or 24/BKC 861 0045/017 for ordering.


C.B.
FCU
10
8
9
V1, V2
IDM1
IDM2
FCU
FCU
1, 2
6A
3,5
16A
6
4A
7
2A
9
F1,F2=6A
F3,F4,F5=4A
F6,F7,F8,=16A
F9,F10, F11=16A
10
13
P003587B

Special Parts for Cabinet V1and V2

Pos	Product Number	Product Name	Description
IDM1			
1	NFS 855 09/003	Fuse unit	65 VDC, 6 AMP.
2	NFS 855 09/003	Fuse unit	65 VDC, 6 AMP.
3	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
5	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
6	NFS 855 09/002	Fuse unit	65 VDC, 4 AMP.
7	NFS 855 09/004	Fuse unit	65 VDC, 2 A.
IDM2			
F1	NFS 855 09/003	Fuse unit	65 VDC, 6 AMP.
F2	NFS 855 09/003	Fuse unit	65 VDC, 6 AMP.
F3	NFS 855 09/002	Fuse unit	[9] 65 VDC, 4 AMP.
F4	NFS 855 09/002	Fuse unit	[9] 65 VDC, 4 AMP.
F5	NFS 855 09/002	Fuse unit	[9] 65 VDC, 4 AMP.
F6	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
F7	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
F8	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
F9	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
F10	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
F11	NFS 855 09/006	Fuse unit	65 VDC, 16 A.
Common Parts			
8	ROA 117 2136/4	Printed board assemb	FCU 4, Fan Control Unit, Version 4.
9		Screw	M3 x 6 for FCU. See Spare Parts Set: NTZ 112 85/ SC02.
10		Screw	M3 x 6 for Circuit Breaker. See Spare Parts Set: NTZ 112 85/SC02.
13		Push-button switch	DOOR SWITCH. Original for cabinet V1, V2. Must be replaced by NTM 201 1548/1. See next page, pos 6. (Also see Service Advice 8/156 22-SEB 112 606+ Uen)

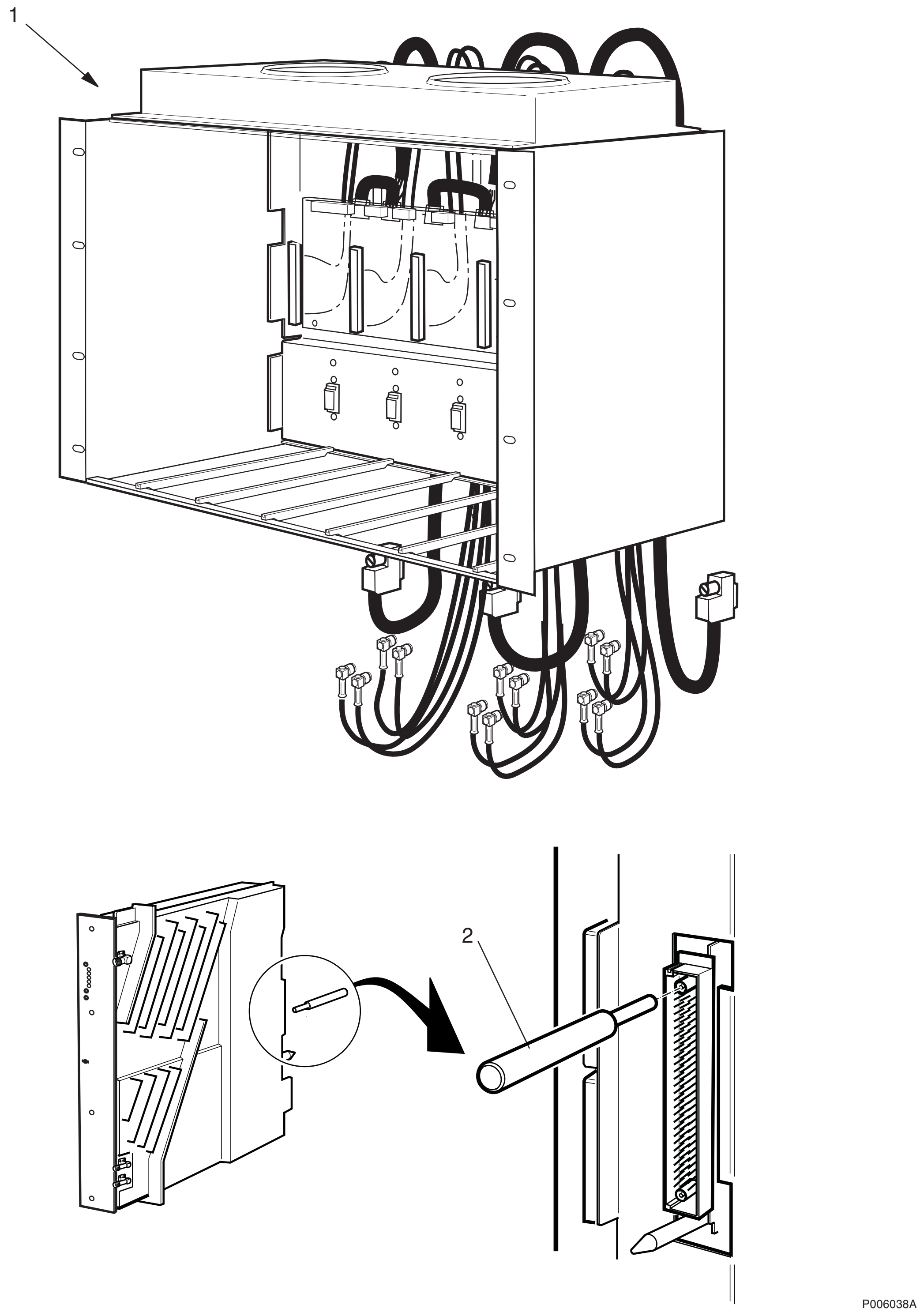
[9] Fuses F3-F5 (1A) to be changed to 4A when using CDU_C or ALNA. See Service Advice 1/156 22-BMG 980 303/1 Uen.


V3 ,V4 ,V5
FCU 3
2
(x2)
FCU 3
4
(x8)
V3
6
61
62A
63A(x2)
64
B
IDM
P3
P5
2A
P6
P9
5A
P10
P11
2A
P12
P15
5A
P16
P23
16A
11
L1
L2
V4,V5
62B(x2)
63B(x2)
7
B
24
OVP
A
B
PCM
EACU
23
B B
12
A
OVP-11
C(x3)
C(x5)
13
C(x2)
PCM
ACCU-3
P003588E

Special Parts for Cabinet V3, V4 and V5

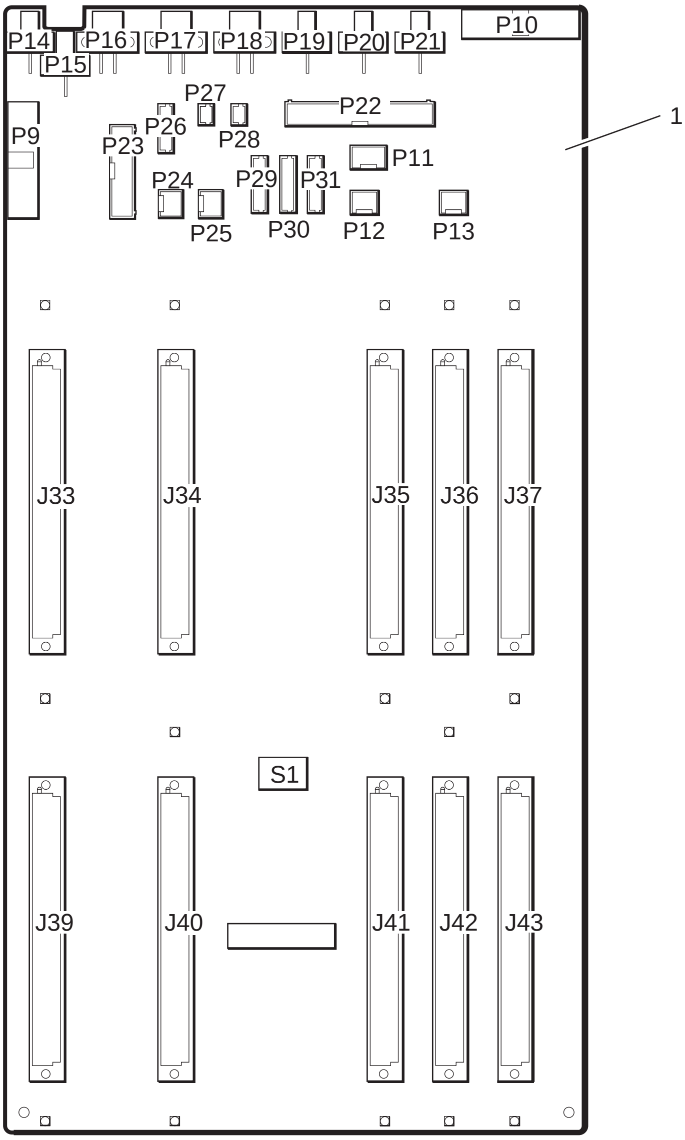
Pos	Product Number	Product Name	Description
2	ROA 117 2136/3	Printed board assemb	FCU3. Fan Control Unit.
4		Screw	M3 x 6 for FCU. See Spare Parts Set: NTZ 112 85/ SC02.
6	NTM 201 1548/1	Set of materials	[10] DOOR SWITCH KIT, for Cabinet V3. Incl pos 61, 62A, 63A and 64
7	NTM 201 1548/3	Spare parts set	DOOR SWITCH KIT, for Cabinet V4 -. Incl pos 62 and 63B
11		Distribution unit	[11] IDM, Complete.
12	NFD 302 20/2	Overvoltage arrester	[12] (Spare parts for the OVP Connection Box). Set with 1 board ’A’ and 2 sub-boards ’B’. (3 sets may be needed)
13	NFD 302 27/5	Overvoltage arrester	[13] (Spare parts for the OVP-11 Connection Box). Set with 5 sub-boards, type ’C’
23	NFD 496 21	Overvoltage arrester	(BLUE) PRIM. +SEC. PROTECTION.
24	NFD 496 23/1	Overvoltage arrester	[14] (YELLOW) PRIM. +SEC. PROTECTION. (Double)
L1, L2	RNG 607 0314/0524	Lamp	24 V, 5 W, SOFFITTEN, CLEAR. (Only used in cabinet V4, V5)
Parts for IDM (Pos 11)			
P3-P5	NFS 812 70/002	Circuit breaker	2A,65V,Curve3,UL-rec.
P6-P9	NFS 812 70/005	Circuit breaker	5A,65V,Curve3,UL-rec.
P10	NFS 812 70/002	Circuit breaker	2A,65V,Curve3,UL-rec.
P11	NFS 812 70/002	Circuit breaker	2A,65V,Curve3,UL-rec.
P12	NFS 812 70/005	Circuit breaker	5A,65V,Curve3,UL-rec.
P13	NFS 812 70/005	Circuit breaker	5A,65V,Curve3,UL-rec.
P14	NFS 812 70/005	Circuit breaker	5A,65V,Curve3,UL-rec.
P15	NFS 812 70/005	Circuit breaker	5A,65V,Curve3,UL-rec.
P16-P23	NFS 812 70/916	Circuit breaker	16A,65V,Curve special,UL-rec.

[10] Adapter cable, pos 64 on illustration, is only needed in cabinet V1 and V2.
[11] New recommendation. Do not send IDM to central repair. Exchange the Circuit Breakes at site or at local workshop. For local repair you might need a complete IDM for replacement at site, See chapter "Other Available Parts"
[12] ACCU-3 is prepared with holders for OVP and OVP-11 on the rear side.
[13] This product is available from January 2001.
[14] A new version of EACU, with 8 YELLOW Overvoltage Arrestors, is planned to be introduced from 1999. Only the internal printed board will be available as spare part and this board is not useable for old EACUversions. For illustration of EACU-3, see page "Parts for Mounting Base, V1, V2, and V5"


1
2
P006038A

TRU Sub-rack

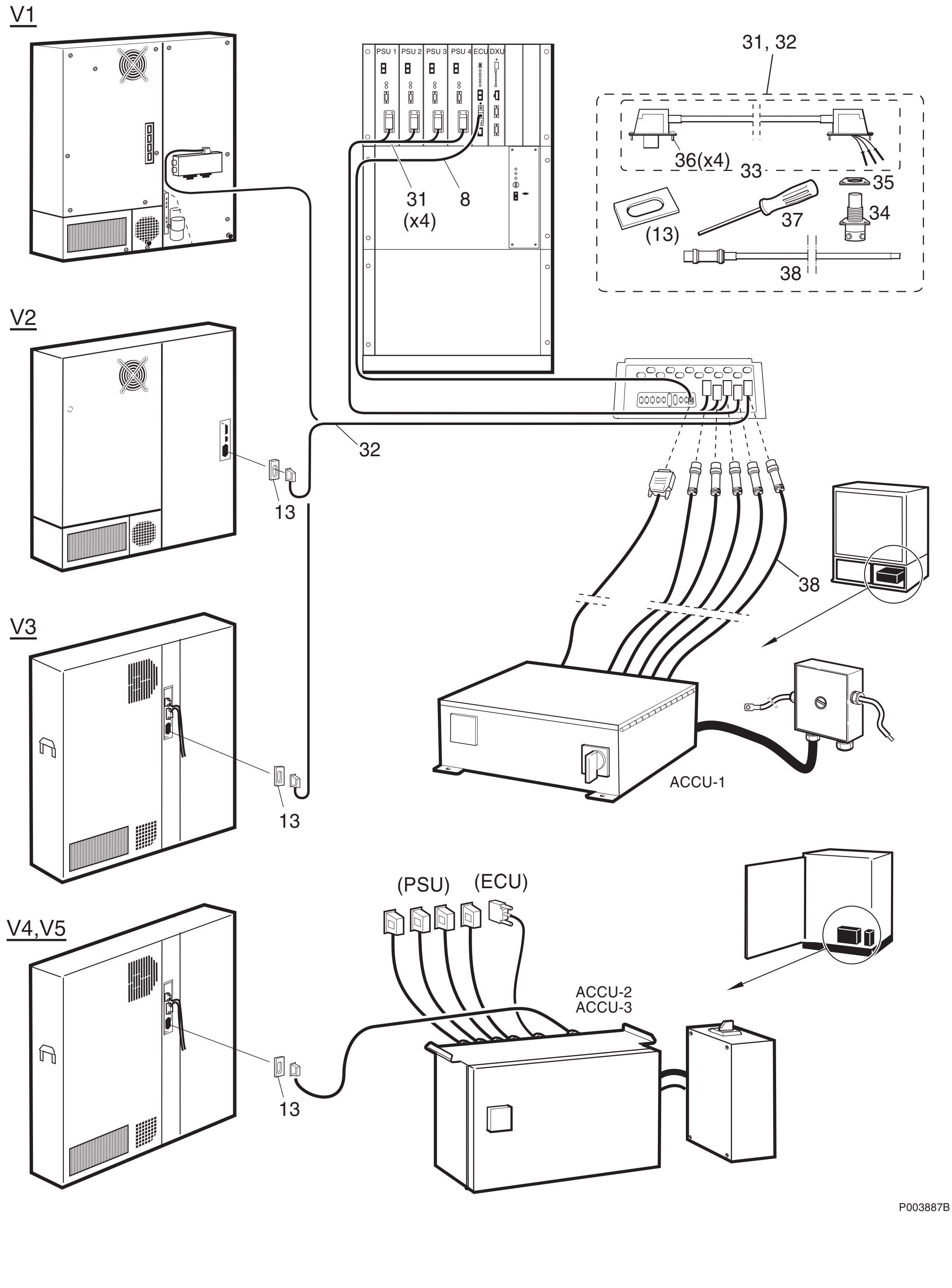
Pos	Product Number	Product Name	Description
1	BFL 119 80/1	Subrack	Complete Sub-rack for TRU including: Backplane board, 3 CDU bus cables, 12 coaxial cables and mechanics. A TRU Backplane Set is also available, see chapter "Other Available Parts"
2	SXK 107 2300/1	Tool	Centring tool for coax pins
(19)	ROA 117 2130/1	Printed board assemb	LOCAL BUS TERMINATION


P14
P16
P17
P18
P19
P20
P21
P10
P15
P27
P22
1
P9
P26
P23
P28
P11
P24
P29
P31
P25
P30
P12
P13
J33
J34
J35
J36
J37
S1
J39
J40
J41
J42
J43

P002530

ECU/DXU Backplane Board

Pos	Product Number	Product Name	Description
1	ROA 117 2156/1	Printed board assemb	ECU DXU BP


V1
V2
V3
V4,V5
PSU 1
PSU 2
PSU 3
PSU 4
ECU
DXU
31, 32
36(x4)
33
35
34
37
(13)
38
31
(x4)
8
32
13
13
13
38
ACCU-1
(PSU)
(ECU)
ACCU-2
ACCU-3
P003887B

Power Cables

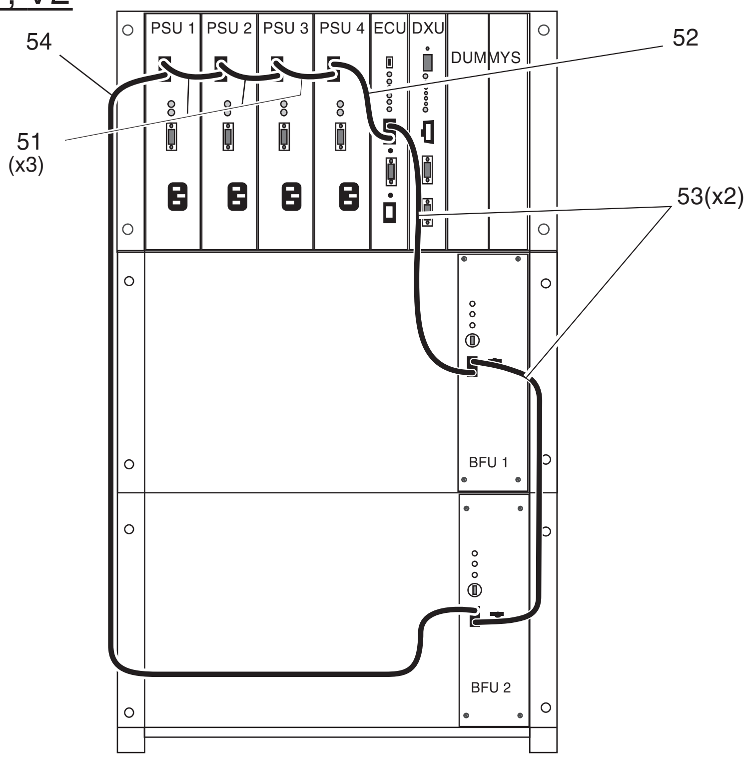
Pos	Product Number	Product Name	Description
Cabinet Version 1, 2 and 3. (V1, V2 and V3)			
8	RPM 513 750/02365	Cable	ALARM CABLE ECU
PSU Power Cable			
31	NTZ 112 85/CA01	Spare parts set	[15] Cable. ACCU to Connection plate (PSU). Including illustrated pos 33A, 34, 35, 36, 37, 38. No other part than pos 37 is separate orderable.
33A		Power cable	L=2.25m to PSU. (Only one cable in the set pos 31).
37	LSY 108 26/1	Tool	DISMOUNTING TOOL TRIM TRIO
38		Power cable	To ACCU (Only one cable in the set, pos 31)
Climate Power Cable			
32	NTZ 112 85/CA02	Spare parts set	Cable. ACCU to Connection plate (Climate Unit). Including illustrated pos 13, 33B, 34, 35, 36, 37, 38. No other part than pos 37 is separate orderable.
33B		Power cable	L=3.665m to Climate Unit. (Only one cable in the set pos 31). This replacement set can also replace the 4.365m cable used in V1 and V2.
37	LSY 108 26/1	Tool	DISMOUNTING TOOL TRIM TRIO
38		Power cable	To ACCU (Only one cable in the set, pos 32)

Cabinet version 4 and 5. (V4 and V5)

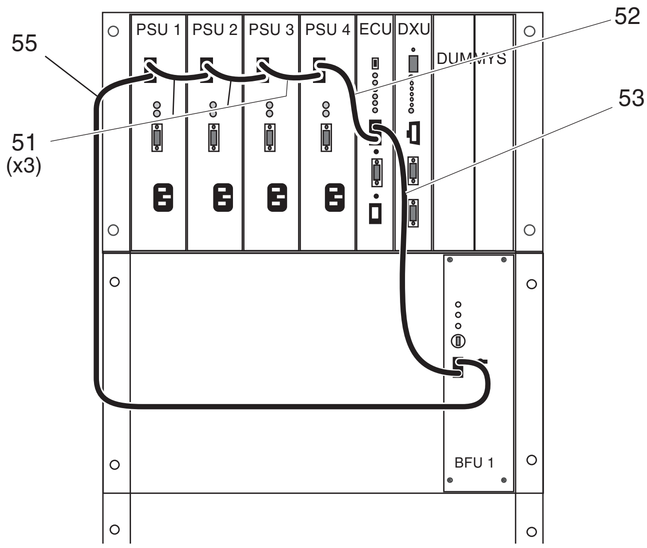
In the cabinet version 4 and 5 (V4, V5), there is used a new AC Connection Unit (ACCU-2), including all cables for PSU's, ECU and Climate Unit. See chapter "Other Available Parts" page "ACCU-2"

[15] Important Note! FAULTY DELIVERIES! In the first spare parts sets NTZ 112 85/CA01 and NTZ 112 85/CA02 delivered (marked without R-state) there is a faulty connector, pos 34, enclosed. It does not work. All customers should return those sets to Ericsson an get new sets free of charge. The new sets are marked R-state R1C or higher. Also see the FCO document (Field Change Order): 1/156 21-NTZ 112 85/CA01 and 1/156 21-NTZ 112 85/CA02.

V1, V2



V3,V4,V5

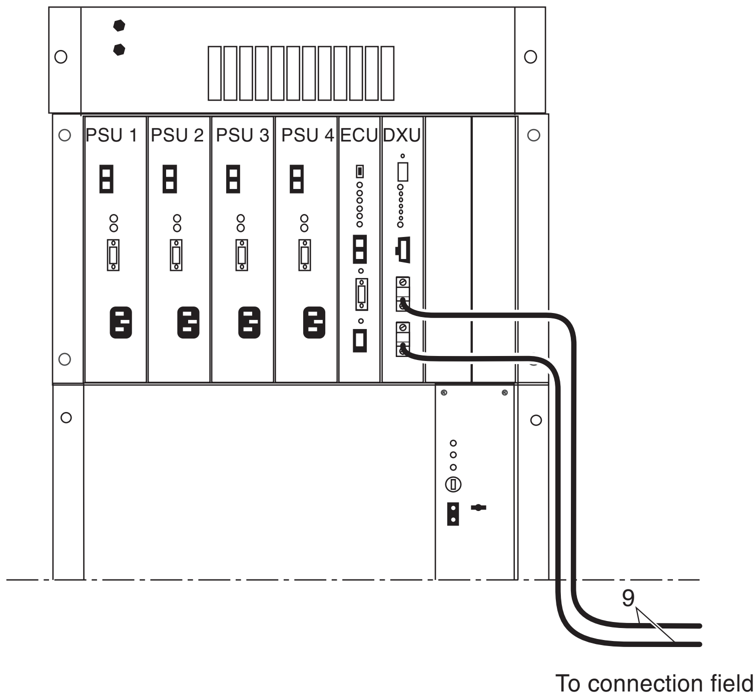


P004185B

Opto Cables

Pos	Product Number	Product Name	Description
Cabinet Version 1 and 2. (V1, V2)			
51	RPM 119 081/160	Cable with connector	OPTO
52	RPM 119 081/250	Cable with connector	OPTO
53	RPM 119 081/600	Cable with connector	OPTO
54	RPM 119 081/1300	Cable with connector	OPTO
Cabinet Version 3, 4 and 5. (V3, V4 and V5)			
51	RPM 119 081/160	Cable with connector	OPTO
52	RPM 119 081/250	Cable with connector	OPTO
53	RPM 119 081/600	Cable with connector	OPTO
55	RPM 119 081/1000	Cable with connector	[16] OPTO

[16] This product is available from January 2001.

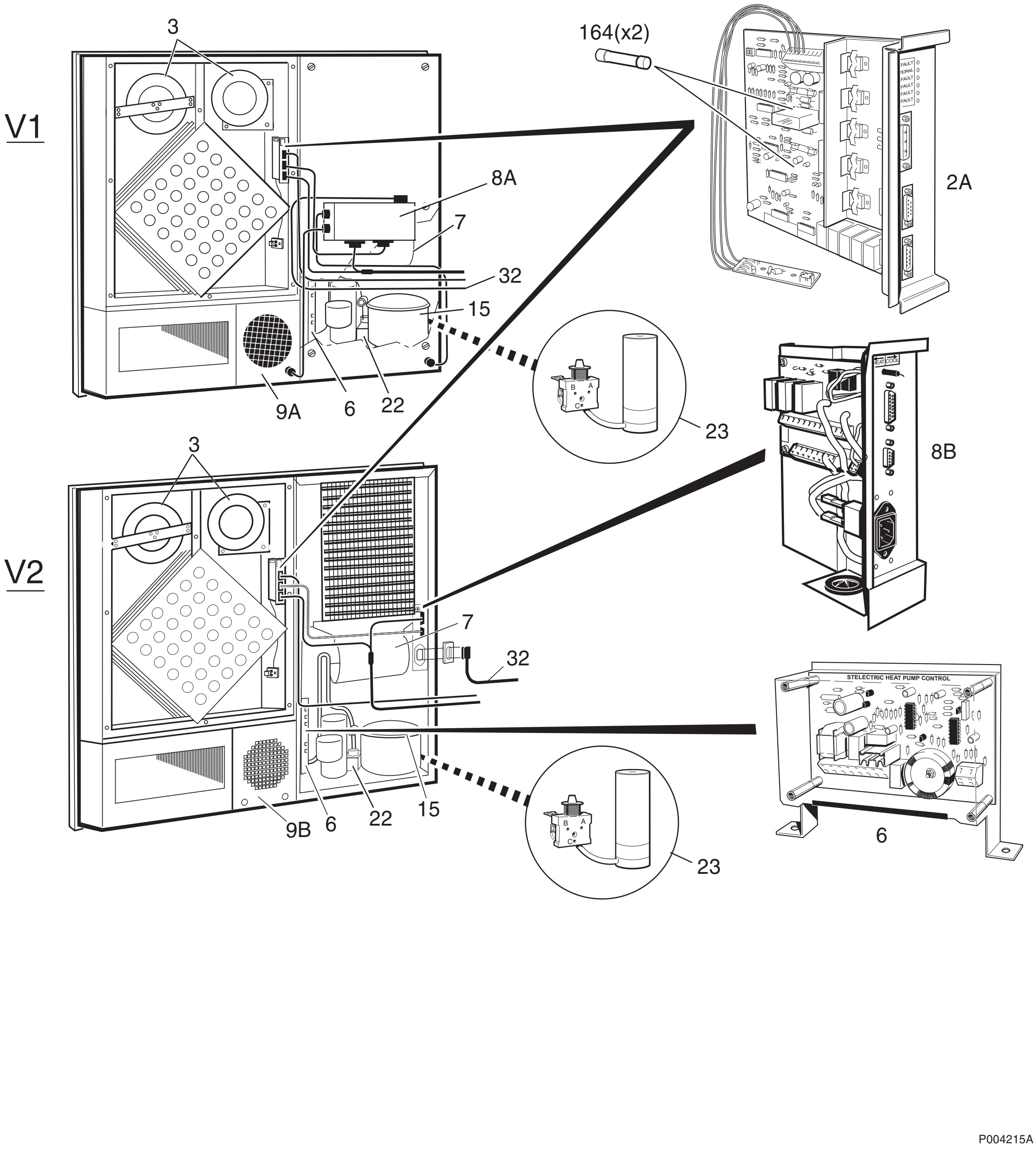


P006454A

Transmission Cables

Pos	Product Number	Product Name	Description
9A	RPM 513 708/01300	Connection cable	75 Ohm. L=1.3m. Bus G703
9B, 9C		Cable	100 and 120 Ohm, See ch. "Other Available Parts"
9D	RPM 513 868/01300	Cable with connector	75 Ohm. L=1.3m. Bus G703 DXU11
9E,9F		Cable	100 and 120 Ohm DXU11, See ch. "Other Available Parts"

50Hz

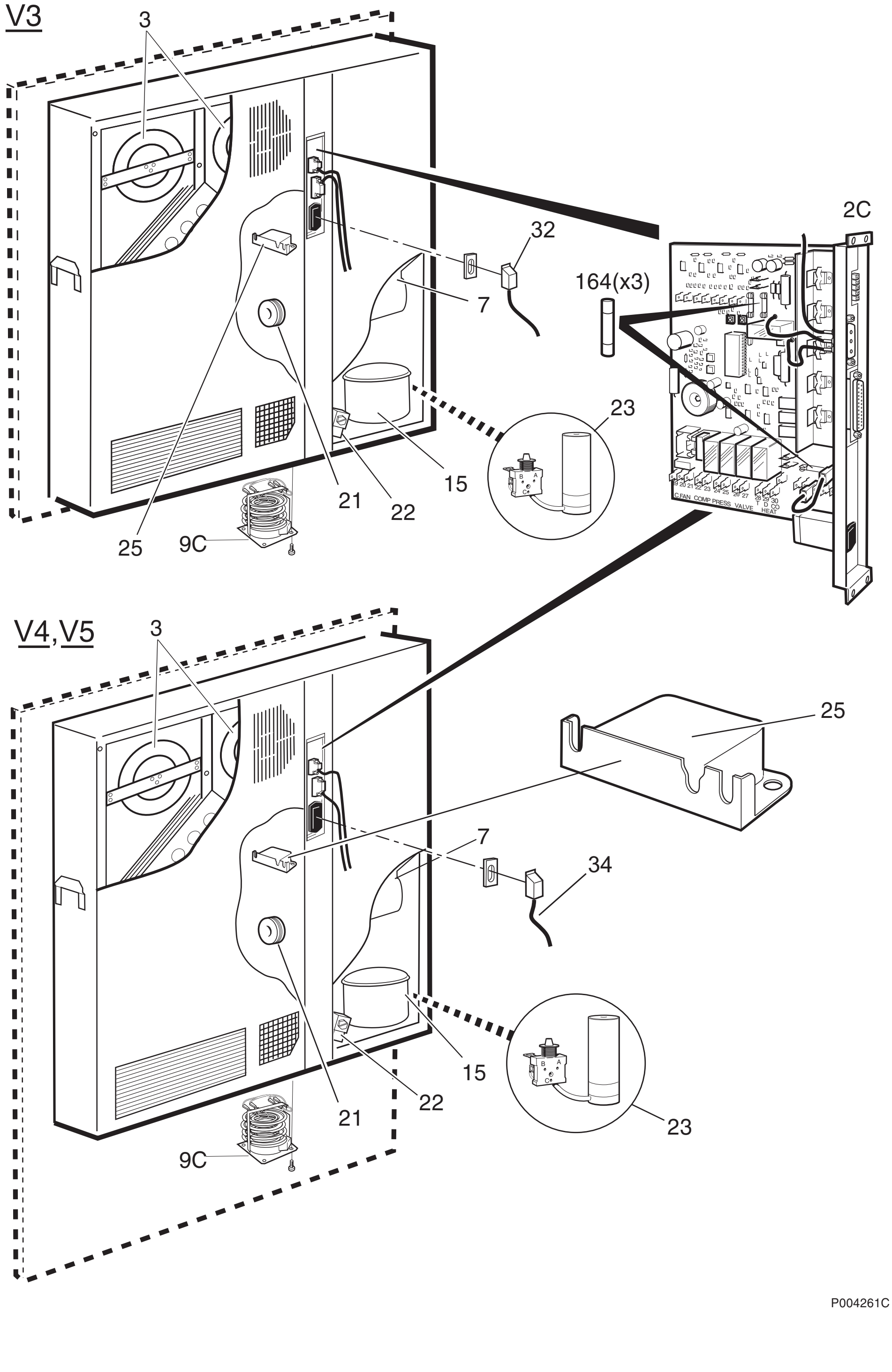

3
164(x2)
V1
8A
2A
7
32
15
9A
6
22
23
8B
3
V2
7
32
STELECTRIC HEAT PUMP CONTROL
9B
6
22
15
6
23
P004215A

Climate Unit 50 Hz, V1, V2

Pos	Product Number	Product Name	Description
Climate Unit 50 Hz, 230 V, Version 1, (V1) BPD 104 02/01 R1C-R1F			
2A	11/BPD 104 02/01	Printed board	CCU/Climate Control Unit, 50/60 Hz. Incl. Flow Sensor.
6	21/BPD 104 02/01	Printed board	[17] DX CONTROL UNIT 50 HZ
8A	BCV 904 01/1	Relay unit	230 V, 50 Hz, External mounted.
9A	3/BPD 104 02/01	Heating unit	50/60 Hz. Cable through front.
32	NTZ 112 85/CA02	Spare parts set	Cable. ACCU to Connection plate (Climate Unit). Also see section "Power Cables"
Climate Unit 50 Hz, 230 V, Version 2, (V2) BPD 104 02/01 R2B-R3B			
2A	11/BPD 104 02/01	Printed board	CCU/Climate Control Unit, 50/60 Hz. Incl. Flow Sensor.
6	21/BPD 104 02/01	Printed board	[17] DX CONTROL UNIT 50 HZ
8B	23/BPD 104 02/01	Printed board	AC INTERFACE/50/60HZ 230/240V
9B	3/BPD 104 02/11	Heating unit	50/60 Hz. Internal cable.
32	NTZ 112 85/CA02	Spare parts set	Cable. ACCU to Connection plate (Climate Unit). Also see section "Power Cables"
Common Parts for all 50 Hz versions.			
3	12/BPD 104 02/01	Fan	Heat Exchanger Fan, with Cable and Connector.
7	22/BPD 104 02/01	Fan	[17] DX Fan. (Condenser Fan) with Cable and Connector.
15		Compressor	[18] 50/60 Hz See chapter ’Other Available Parts’.
22	22/BPD 104 08/1	Coil	SOLENOID VALVE COIL
23	23/BPD 104 08/1	Spare parts set	START CAPACITOR + RELAY
164		Fuse	6.3 A. See Fuse Kit, NTZ 112 85/FU02

[17] Glossary: "DX" or "Air Condition" or "Active Cooler" is the part of the Climate Unit which includes a compressor.
[18] Specially qualified or licensed personnel needed. Additional instruction may be needed.

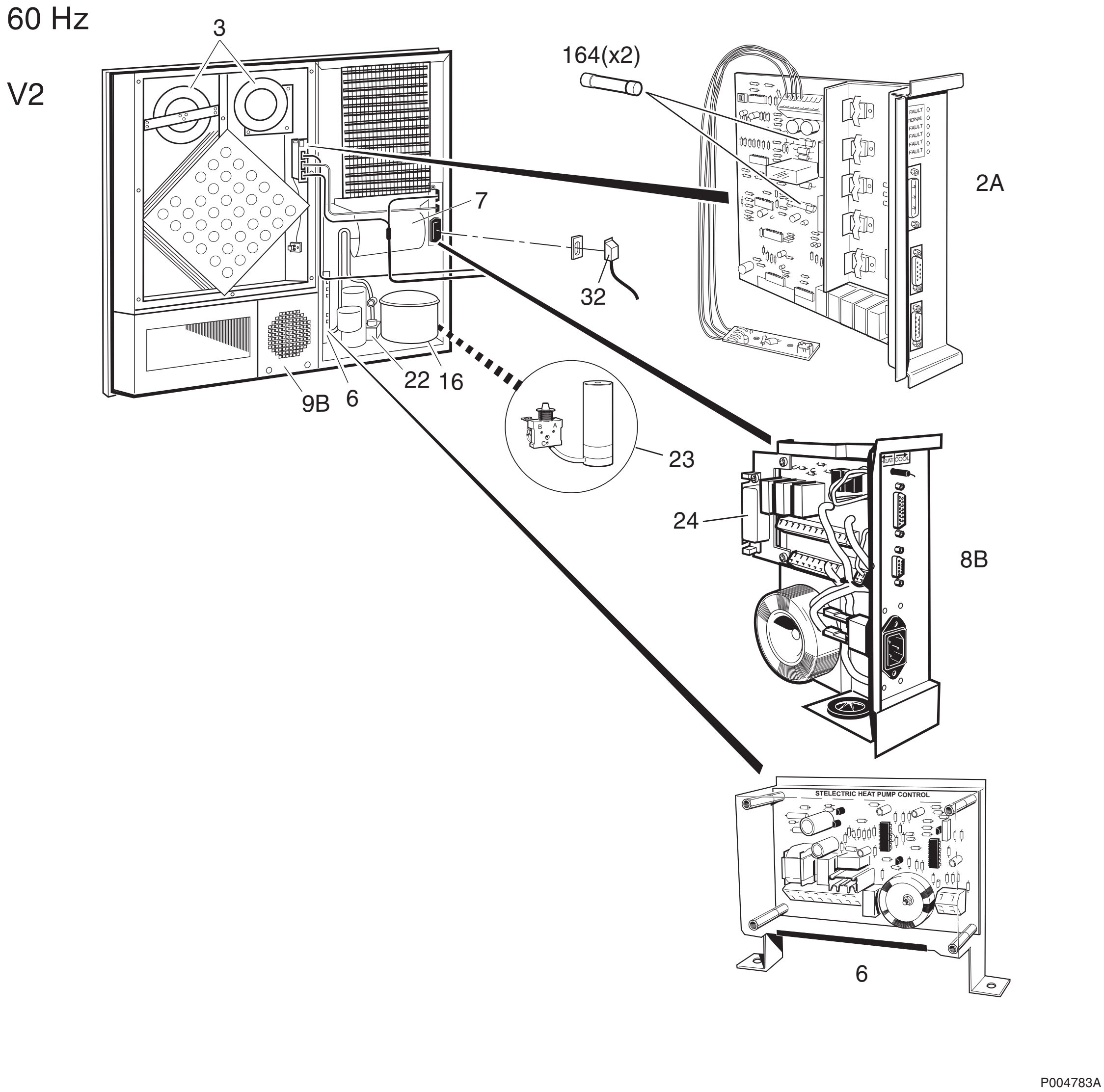
50 Hz


V3
3
2C
32
164(x3)
7
23
15
21
22
25
9C
V4,V5
3
25
7
34
15
22
21
23
9C
P004261C

Climate Unit 50 Hz, V3, V4, V5

Pos	Product Number	Product Name	Description
Climate Unit 50/60 Hz 230/208V, Version 3, (V3), BPD 104 08/1 R1B-R2A			
2C	24/BPD 104 08/11	Control unit	[19] [20] Climate Control Unit, CCU
9C	3/BPD 104 08/1	Heating unit	50/60 Hz. (Cable not included)
21	21/BPD 104 08/1	Transformer	.
32	NTZ 112 85/CA02	Spare parts set	Cable. ACCU to Connection plate (Climate Unit). Also see section "Power Cables"
Climate Unit 50/60 Hz 230/208V, Version 4 and 5, (V4, V5), BPD 104 08/1 R3A, R3B			
2C	24/BPD 104 08/11	Control unit	[19] [20] Climate Control Unit, CCU
9C	3/BPD 104 08/1	Heating unit	50/60 Hz. (Cable not included)
21	21/BPD 104 08/1	Transformer	.
34		Connection cable	SHIELDED 3X1,5 MM2 See "Other A. Parts", ACCU-2, RPM 628 178/2
Common Parts for all 50 Hz versions.			
3	12/BPD 104 02/01	Fan	Heat Exchanger Fan, with Cable and Connector.
7	22/BPD 104 02/01	Fan	[19] DX Fan. (Condenser Fan) with Cable and Connector.
15		Compressor	[21] 50/60 Hz See chapter 'Other Available Parts'.
22	22/BPD 104 08/1	Coil	SOLENOID VALVE COIL
23	23/BPD 104 08/1	Spare parts set	START CAPACITOR + RELAY
164		Fuse	6.3 A. See Fuse Kit, NTZ 112 85/FU02
Optional Parts (60 Hz only)			
25	NFS 855 23/007	Fuse unit	[22] 28 VDC 7A. THERMIC

[19] Glossary: "DX" or "Air Condition" or "Active Cooler" is the part of the Climate Unit which includes a compressor.
[20] 24/BPD 104 08/11 is replacement for 24/BPD 104 08/1. (Use remaining 24/BPD 104 08/1 only in V3)
[21] Specially qualified or licensed personnel needed. Additional instruction may be needed.
[22] Factory mounted in V4, V5. Only used in V3 in case of 60 Hz and upgraded according to 5/156 22-SEB 112 1007+ Uen.

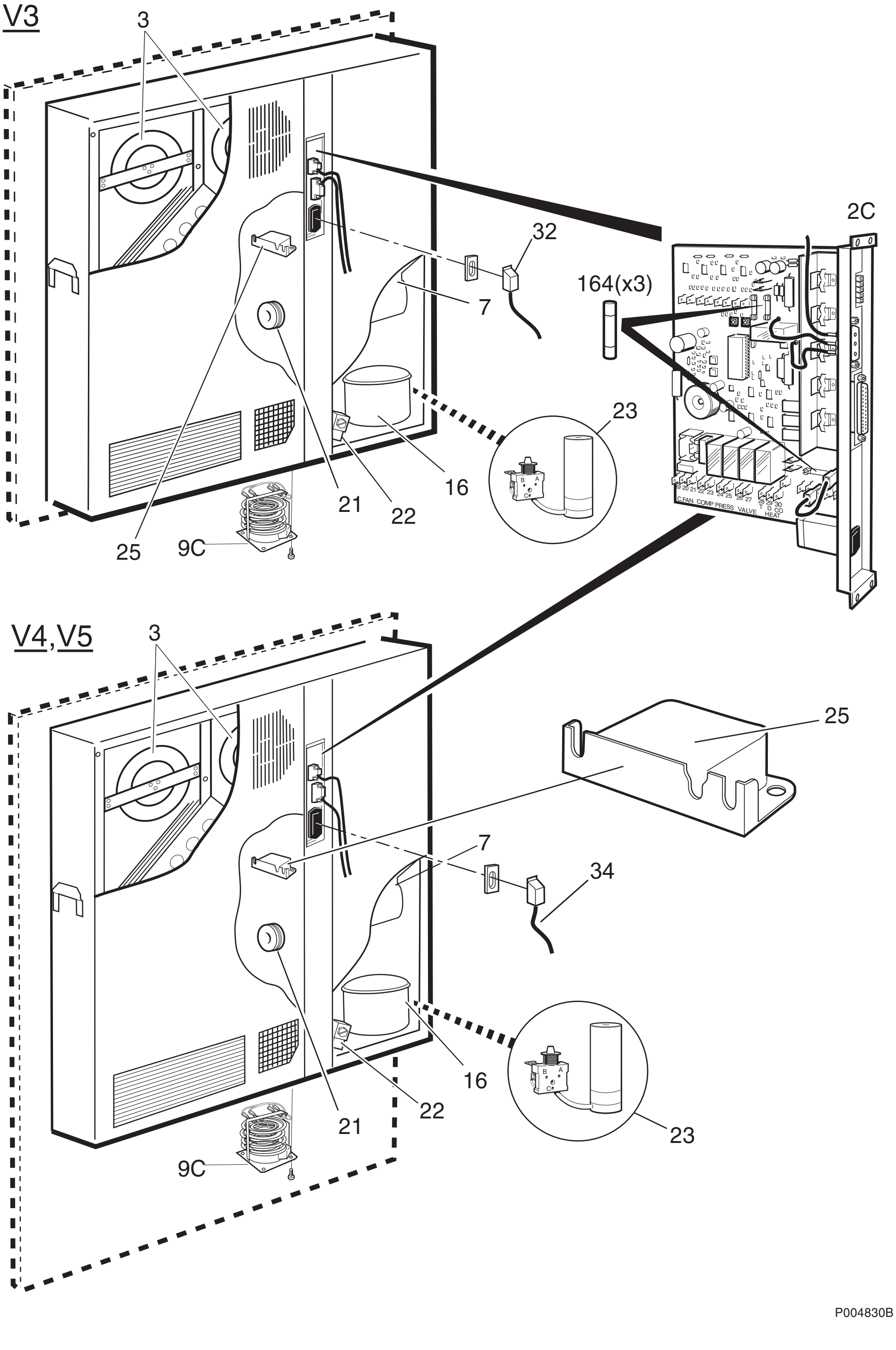

60 Hz
V2
3
164(x2)
2A
7
32
22 16
9B
6
23
24
8B
STELECTRIC HEAT PUMP CONTROL
6
P004783A

Climate Unit 60 Hz, V2

Pos	Product Number	Product Name	Description
Climate Unit 60 Hz 208V, Version 2, (V2), BPD 104 02/02 R2B-R3B			
2A	11/BPD 104 02/01	Printed board	CCU/Climate Control Unit, 50/60 Hz. Incl. Flow Sensor.
6	21/BPD 104 02/02	Printed board	[23] DX CONTROL UNIT 60 HZ
8B	23/BPD 104 02/02	Printed board	AC INTERFACE/50/60 208 V
9B	3/BPD 104 02/11	Heating unit	50/60 Hz. Internal cable.
32	NTZ 112 85/CA02	Spare parts set	Cable. ACCU to Connection plate (Climate Unit). Also see section "Power Cables"
Common Parts for all 60 Hz versions.			
3	12/BPD 104 02/01	Fan	Heat Exchanger Fan, with Cable and Connector.
7	22/BPD 104 02/01	Fan	[23] DX Fan. (Condenser Fan) with Cable and Connector.
16		Compressor	[24] 50/60 Hz See chapter 'Other Available Parts'.
22	22/BPD 104 08/1	Coil	SOLENOID VALVE COIL
23	23/BPD 104 08/1	Spare parts set	START CAPACITOR + RELAY
164		Fuse	6.3 A. See Fuse Kit, NTZ 112 85/FU02
Optional Parts (60 Hz only)			
24	NFS 855 23/008	Fuse unit	[25] 28 VDC 8A. THERMIC

[23] Glossary: "DX" or "Air Condition" or "Active Cooler" is the part of the Climate Unit which includes a compressor.
[24] Specially qualified or licensed personnel needed. Additional instruction may be needed.
[25] Only used on V1 or V2 Interface Boards in case of 60 Hz and upgraded according to 16/156 22-SEB 112 606+ Uen.

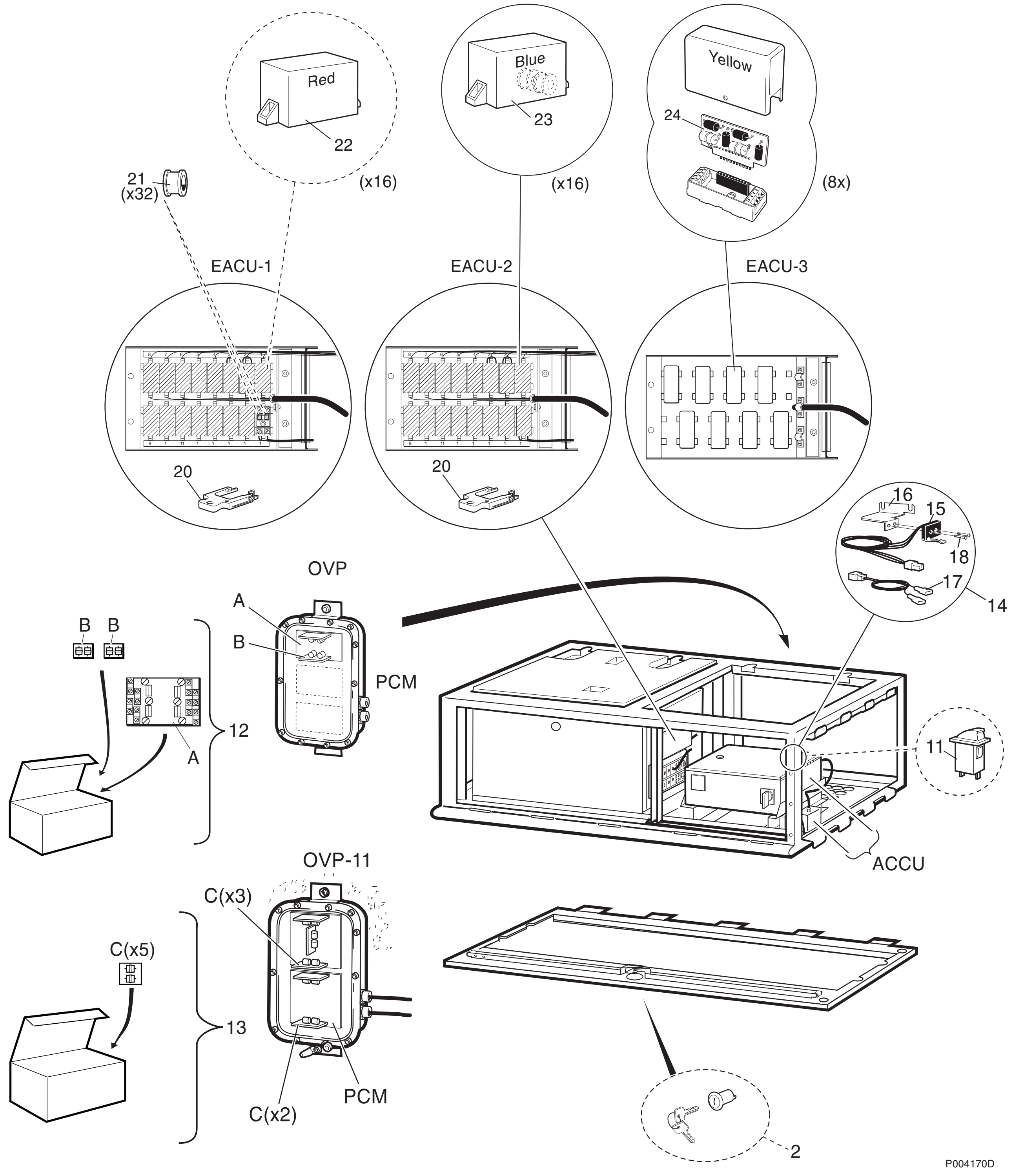
60 Hz


V3
3
2C
32
164(x3)
7
23
16
21
22
25
9C
V4,V5
3
25
7
34
16
22
21
23
9C
P004830B

Climate Unit 60 Hz, V3, V4, V5

Pos	Product Number	Product Name	Description
Climate Unit 50/60 Hz 230/208V, Version 3, (V3), BPD 104 08/1 R1B-R2A			
2C	24/BPD 104 08/11	Control unit	[26] Climate Control Unit, CCU
9C	3/BPD 104 08/1	Heating unit	50/60 Hz. (Cable not included)
21	21/BPD 104 08/1	Transformer	.
32		Spare parts set	Cable. ACCU to Connection plate (Climate Unit). Also see section "Power Cables"
Climate Unit 50/60 Hz 230/208V, Version 4, (V4), BPD 104 08/1 R3A			
2C	24/BPD 104 08/11	Control unit	[26] Climate Control Unit, CCU
9C	3/BPD 104 08/1	Heating unit	50/60 Hz. (Cable not included)
21	21/BPD 104 08/1	Transformer	.
34		Connection cable	SHIELDED 3X1,5 MM2 See "Other A. Parts", ACCU-2, RPM 628 178/2
Common Parts for all 60 Hz versions.			
3	12/BPD 104 02/01	Fan	Heat Exchanger Fan, with Cable and Connector.
7	22/BPD 104 02/01	Fan	[27] DX Fan. (Condenser Fan) with Cable and Connector.
16		Compressor	[28] 50/60 Hz See chapter 'Other Available Parts'.
22	22/BPD 104 08/1	Coil	SOLENOID VALVE COIL
23	23/BPD 104 08/1	Spare parts set	START CAPACITOR + RELAY
164		Fuse	6.3 A. See Fuse Kit, NTZ 112 85/FU02
Optional Parts (60 Hz only)			
25	NFS 855 23/007	Fuse unit	[29] 28 VDC 7A. THERMIC

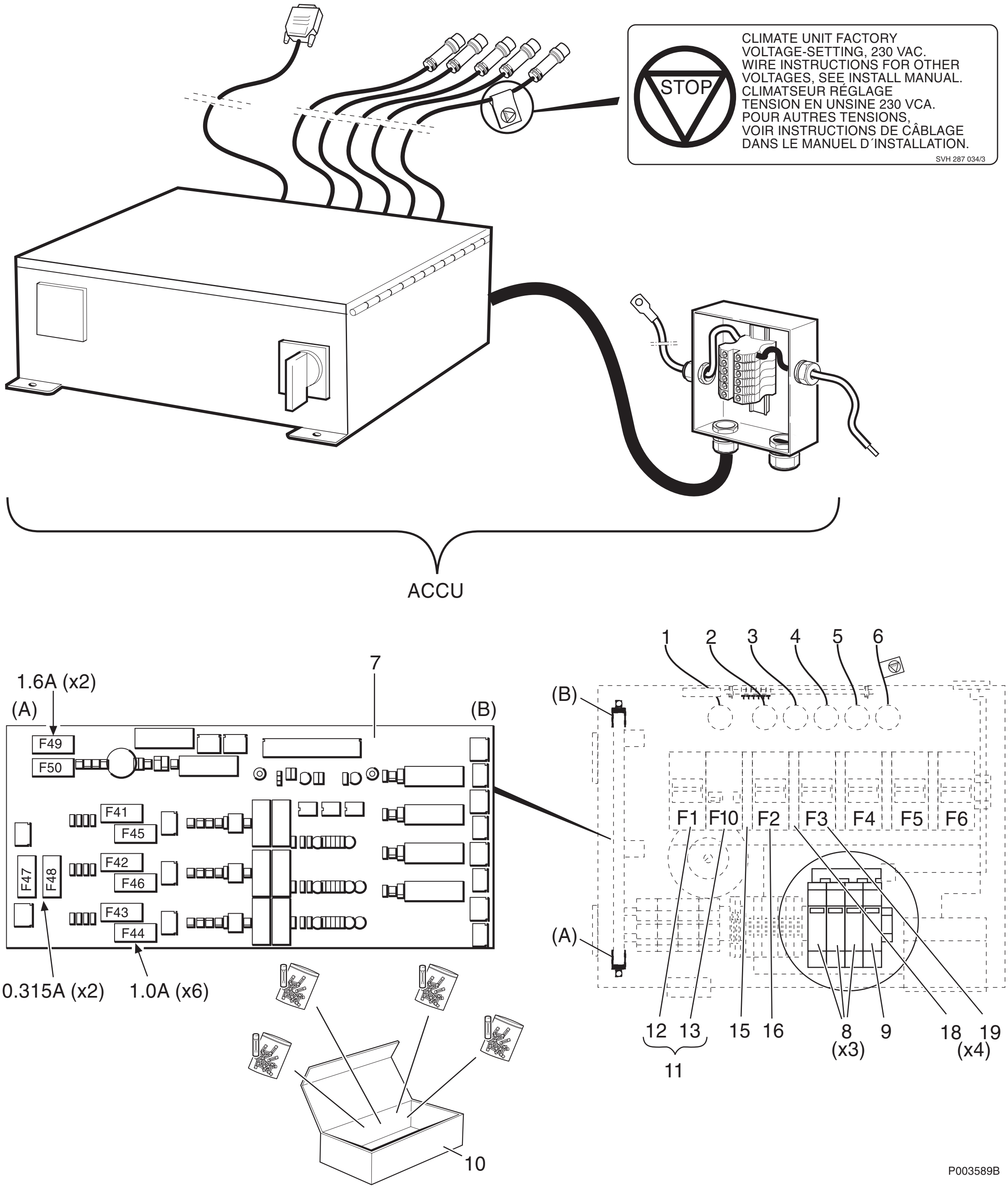
[26] 24/BPD 104 08/11 is replacement for 24/BPD 104 08/1. (Use remaining 24/BPD 104 08/1 only in V3)
[27] Glossary: "DX" or "Air Condition" or "Active Cooler" is the part of the Climate Unit which includes a compressor.
[28] Specially qualified or licensed personnel needed. Additional instruction may be needed.
[29] Factory mounted in V4, V5. Only used in V3 in case of 60 Hz and upgraded according to 5/156 22-SEB 112 1007+ Uen.


Red
22
(x16)
Blue
23
(x16)
Yellow
24
(8x)
21
(x32)
EACU-1
EACU-2
EACU-3
20
20
16
15
18
17
14
OVP
A
B
B B
PCM
12
A
11
ACCU
OVP-11
C(x3)
C(x5)
13
PCM
C(x2)
2
P004170D

Parts or Mounting Base, V1,V2, V3

Pos	Product Number	Product Name	Description
Mounting Base located Parts			
2	SMB 102 09/1	Lock	[30] M. B. LOCK +1 KEY
11		Push-button switch	DOOR SWITCH. Original switch for M. Base Door. Must be replaced by pos 14 (Use adapter cable, pos 17)
12	NFD 302 20/2	Overvoltage arrester	(Spare parts for the OVP Connection Box). Set with 1 board ’A’ and 2 sub-boards ’B’. (3 sets may be needed)
13	NFD 302 27/5	Overvoltage arrester	(Spare parts for the OVP-11 Connection Box). Set with 5 sub-boards, type ’C’
14	NTM 201 1548/2	Set of materials	[31] DOOR SWITCH-KIT(M.BASE) Incl. illustrated Switch pos 15, Holder 16, Cable 17, Screws 18
Parts for EACU-1, EACU-2			
20	LSY 133 22	Extractor	Removal tool
21	NGC 402 01	Overvoltage arrester	PRIMARY PROTECTION.
22	NFD 496 03	Overvoltage arrester	(RED) 24V SEC. PROTECTION.
23	NFD 496 21	Overvoltage arrester	(BLUE) PRIM. +SEC. PROTECTION.
Parts for EACU-3			
24	NFD 496 23/1	Overvoltage arrester	[32] (YELLOW) PRIM. +SEC. PROTECTION. (Double)

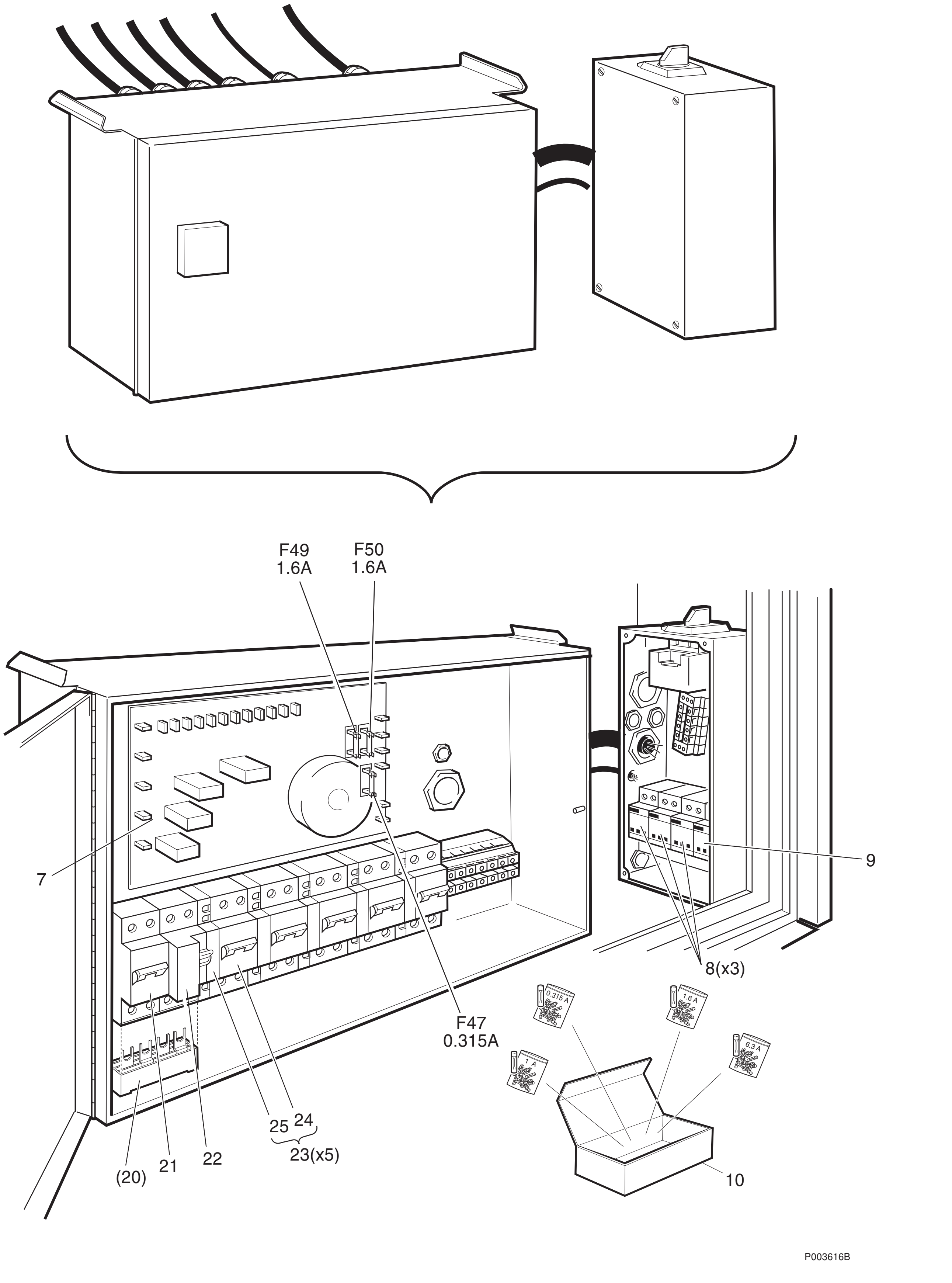
[30] This is the number for ordering Standard keys and locks. The local Ericsson Company is responsible for administrating different locks and keys for different operators in the same country.
[31] This Replacement Kit is the ame as the up-grade kit according to Service Advice 2/156 22-SEB 112 612+ Uen.
[32] A new version of EACU, with 8 YELLOW Overvoltage Arrestors, is planned to be introduced from 1999. Only the internal printed board will be available as spare part and this board is not useable for old EACUversions. For illustration of EACU-3, see page "Parts for Mounting Base, V1, V2, and V5"


STOP
CLIMATE UNIT FACTORY
VOLTAGE-SETTING, 230 VAC.
WIRE INSTRUCTIONS FOR OTHER
VOLTAGES, SEE INSTALL MANUAL.
CLIMATSEUR RÉGLAGE
TENSION EN UNSINE 230 VCA.
POUR AUTRES TENSIONS,
VOIR INSTRUCTIONS DE CÂBLAGE
DANS LE MANUEL D´INSTALLATION.
SVH 287 034/3
ACCU
1.6A (x2)
(A)
(B)
7
F49
F50
F41
F45
F42
F46
F43
F44
F47
F48
0.315A (x2)
1.0A (x6)
10
1 2 3 4 5 6
(B)
(A)
F1 F10 F2 F3 F4 F5 F6
12 13 15 16 8 9 18 19
(x3) (x4)
11
P003589B

Parts for ACCU-1

Pos	Product Number	Product Name	Description
1	RPM 513 939/1	Connection cable	ALARM CABLE To Connection plate (ECU)
2-5	NTZ 112 85/CA01	Spare parts set	[33] Cable. ACCU to Connection plate (PSU).
6	NTZ 112 85/CA02	Spare parts set	Cable. ACCU to Connection plate (Climate Unit).
7	ROA 117 737/1	Printed board assemb	ACCU
8	NGC 601 05/01	Overvoltage arrester	VARISTOR
9	NTM 201 2507/1	Set of materials	[34] Up-grade Kit for BMG 980 307
10	NTZ 112 85/FU01	Spare parts set	FUSE KIT ACCU/CLIMATE UNIT See separate page
15	NFS 854 700/1	Auxiliary contact	6 A, 24 VDC, 2A/48 VDC, (OF), UL-REC.
16A	NFS 854 720/10	Circuit breaker	[35] 10A, 480VAC, 60VDC, 5KA, C, UL-REC. For Climate Unit
18	NFS 854 700/1	Auxiliary contact	6 A, 24 VDC, 2A/48 VDC, (OF), UL-REC.
19	NFS 854 720/06	Circuit breaker	6A, 480VAC, 60VDC, 5KA, C, UL-REC. For PCU
Parts only for ACCU, EU and UK versions			
11A	NFS 854 721/1	Circuit breaker set	Circuit Breaker 10 A + Earth Fault relay. (pos 12, 13A)
12		Circuit breaker	10A, 480VAC, 60VDC, 5KA, C, UL-REC. For Service Outlet
13A		Relay	EARTH-FAULT, 2-POLE, 277V, 30mA
Parts only for ACCU, US version.			
11B	NFS 854 721/2	Circuit breaker set	[36] For US/Circuit Breaker 10 A + Earth Fault relay. (pos 12, 13B)
12		Circuit breaker	10A, 480VAC, 60VDC, 5KA, C, UL-REC. For Service Outlet
13B		Relay	EARTH-FAULT, 2-POLE, 230V, 30mA
Parts only for BMG 980 318/x or upgraded BMG 980 307/x			
16B	NFS 854 720/16	Circuit breaker	[35] 16A, 480VAC, 60VDC, 5KA, C, UL-REC. For Climate Unit

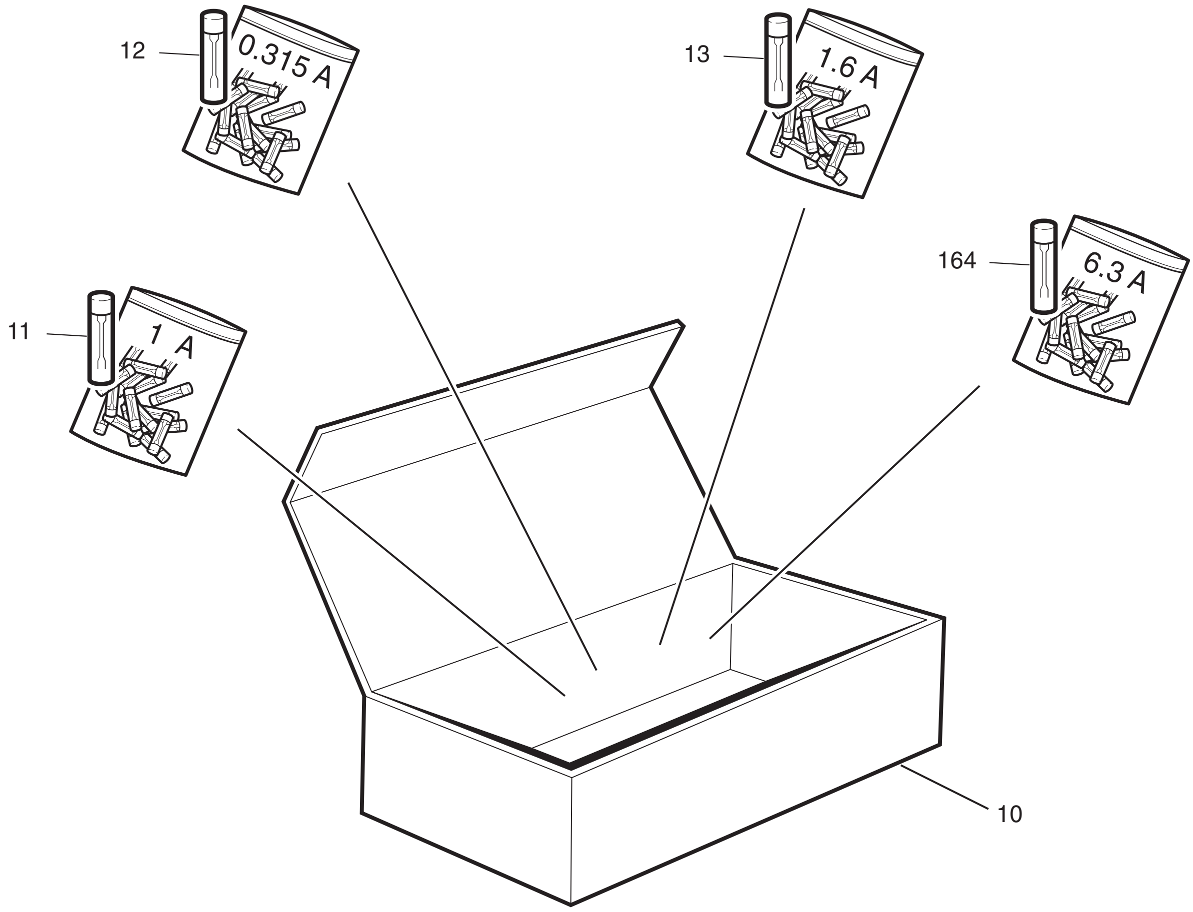
[33] A Replacement Cable (like the original pos 2 on the ACCU Fuse Box) is included in a new version of the Spare Parts Set NTZ 112 85/CA01 and NTZ 112 85/CA02. Also see chapter "Power Cables".
[34] For upgrade of ACCU-1 use kit NTM 201 2507/1 and instruction according to the Service advice: 2/156 22-BMG 980 307
[35] Original circuit breaker (pos 16) 10A is changed to 16A if the ACCU (BMG 980 307/x) is up-graded according to Service Advice: 16/156 22-SEB 112 606+ Uen, or is marked and delivered as BMG 980 318/x.
[36] This product is available from January 2001.


F49
1.6A
F50
1.6A
7
9
8(x3)
F47
0.315A
0.315 A
1.6 A
1 A
6.3 A
25
24
23(x5)
(20)
21
22
10
P003616B

Parts for ACCU-2, ACCU-3

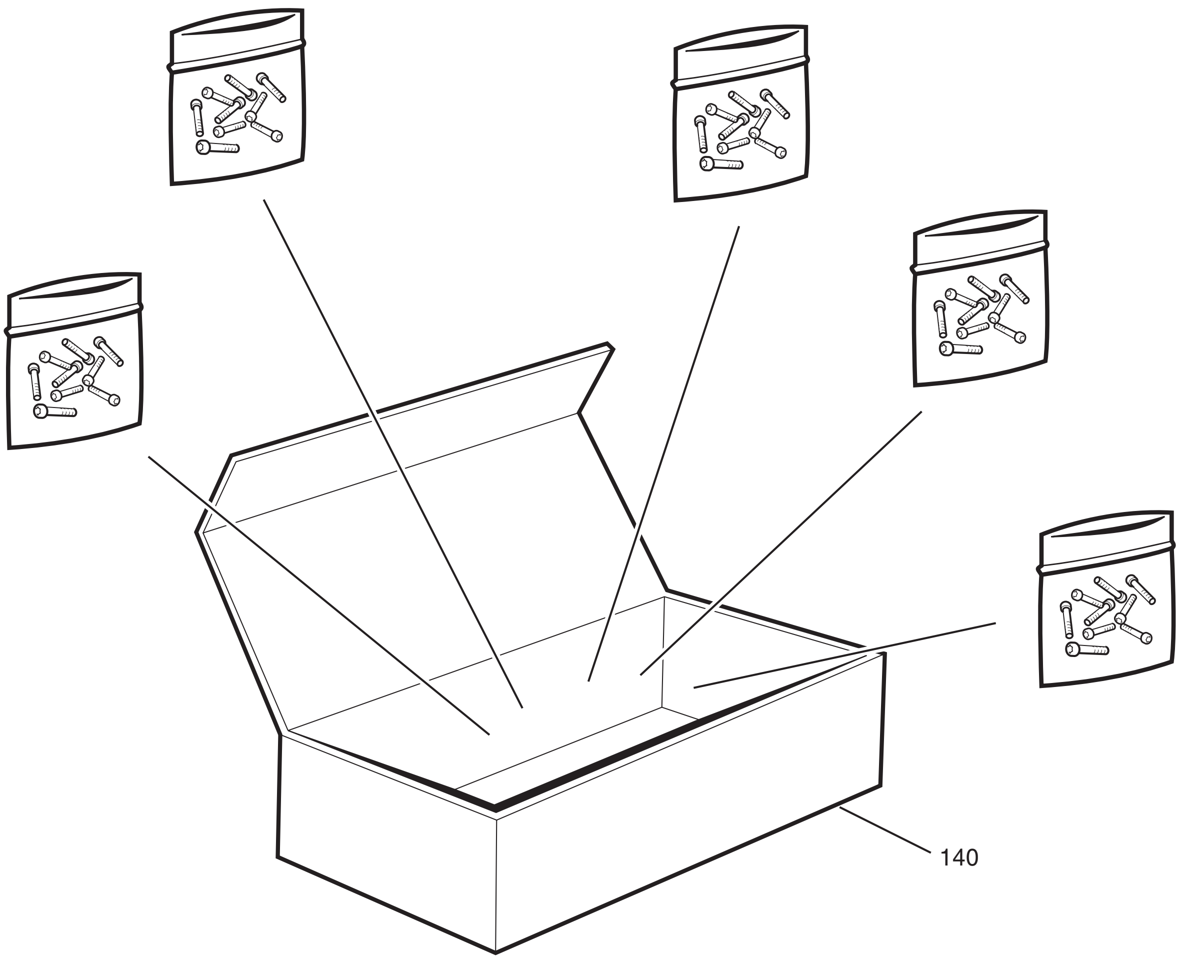
Pos	Product Number	Product Name	Description
7	ROA 117 854/1	Printed board assemb	2102 ACCU-2 FUSE BOARD Incl. F47-F50
8	NGC 601 13/01	Overvoltage arrester	Surge protection. Metal Oxide varistor, 330V
9	NGC 901 12	Overvoltage arrester	[37] GAS TUBE 45KA 10/350US
10	NTZ 112 85/FU01	Spare parts set	FUSE KIT ACCU/CLIMATE UNIT See separate page
20		Connection bar	Connect.bar for NFS 854 920 Must be reused
21	NFS 854 920/210	Circuit breaker	10A, C, 2-POLE, 400VAC
22	NFS 854 900/7	Relay	EARTH-FAULT BR., 2-Pol., 30 mA.
23	NFS 854 921/2	Circuit breaker set	16 A , C.B., 2-p., 400 V, +Aux. Cont. (Pos 24-25)
24		Circuit breaker	16A, C, 2-POLE, 400VAC
25		Auxiliary contact	ONE MAKE,ONE BREAKE

[37] This product is available from January 2001.


12
0.315 A
13
1.6 A
164
6.3 A
11
1 A
10
P003591A

Fuse Set

Pos	Product Number	Product Name	Description
10	**NTZ 112 85/FU01**	**SPARE PARTS SET**	**FUSE KIT ACCU/CLIMATE UNIT**
			Package with 20 pcs of each, pos 11, 12, 13. and 10 of pos 164)
11		Fuse	1 A, 250 V, 5x20 mm, Slow, UL/VDE.
12		Fuse	0.315 A, 250V, 5x20 mm, Slow, UL-rec.
13		Fuse	1.6 A, 250 V, 5x20 mm, Slow, UL-listed
164		Glass-tube fuse	6.3 A, Slow, 5x20 mm. For Climate Unit


140
P003590A

Screw Set

Pos	Product Number	Product Name	Description
140	**NTZ 112 85/SC02**	**SPARE PARTS SET**	**Screw Kit** Package of some of the most common screws in the Cabinet and Mounting Base.

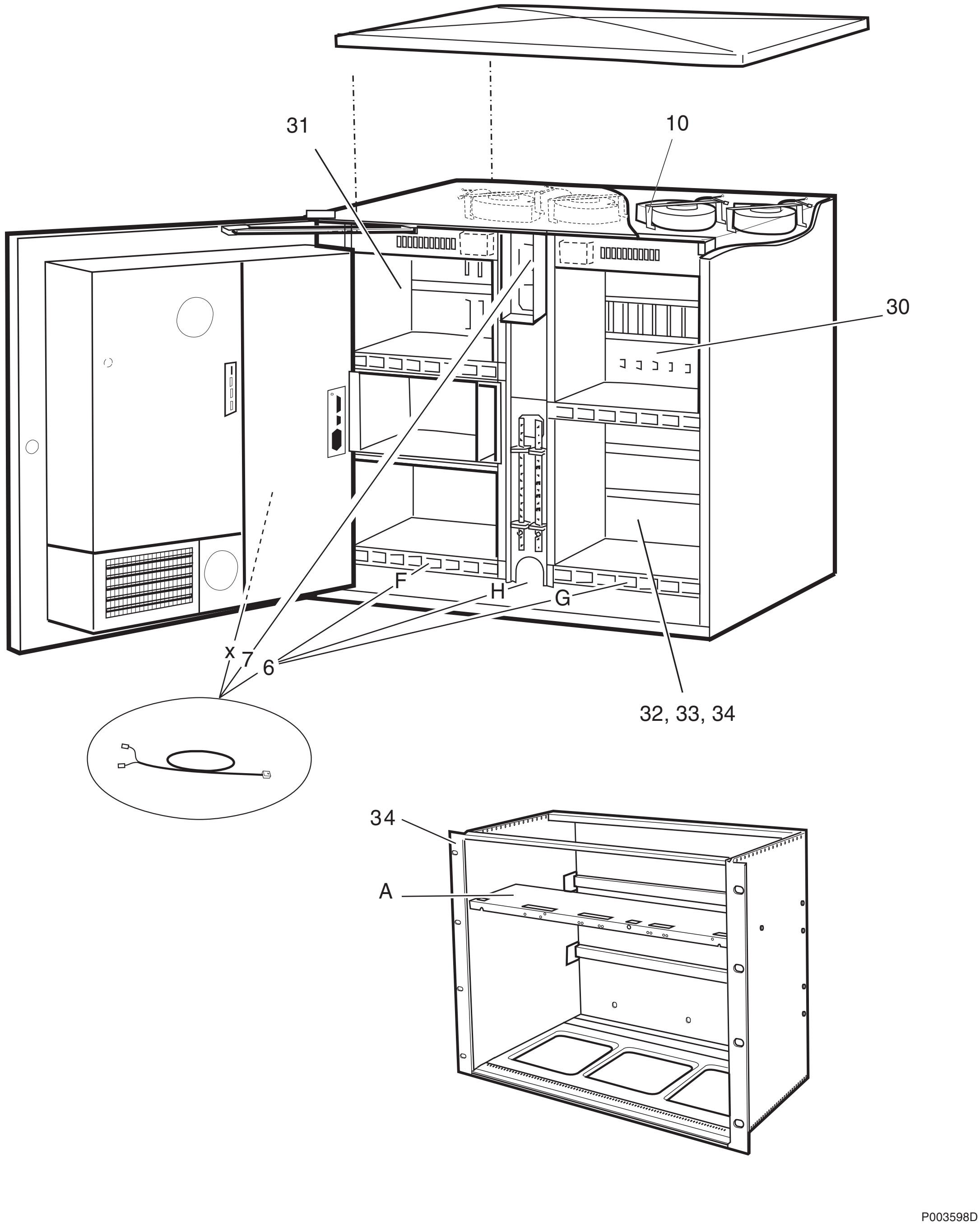
This page is intentionally left blank

Other Available Parts

About this chapter

All parts in this chapter have the internal code = A.

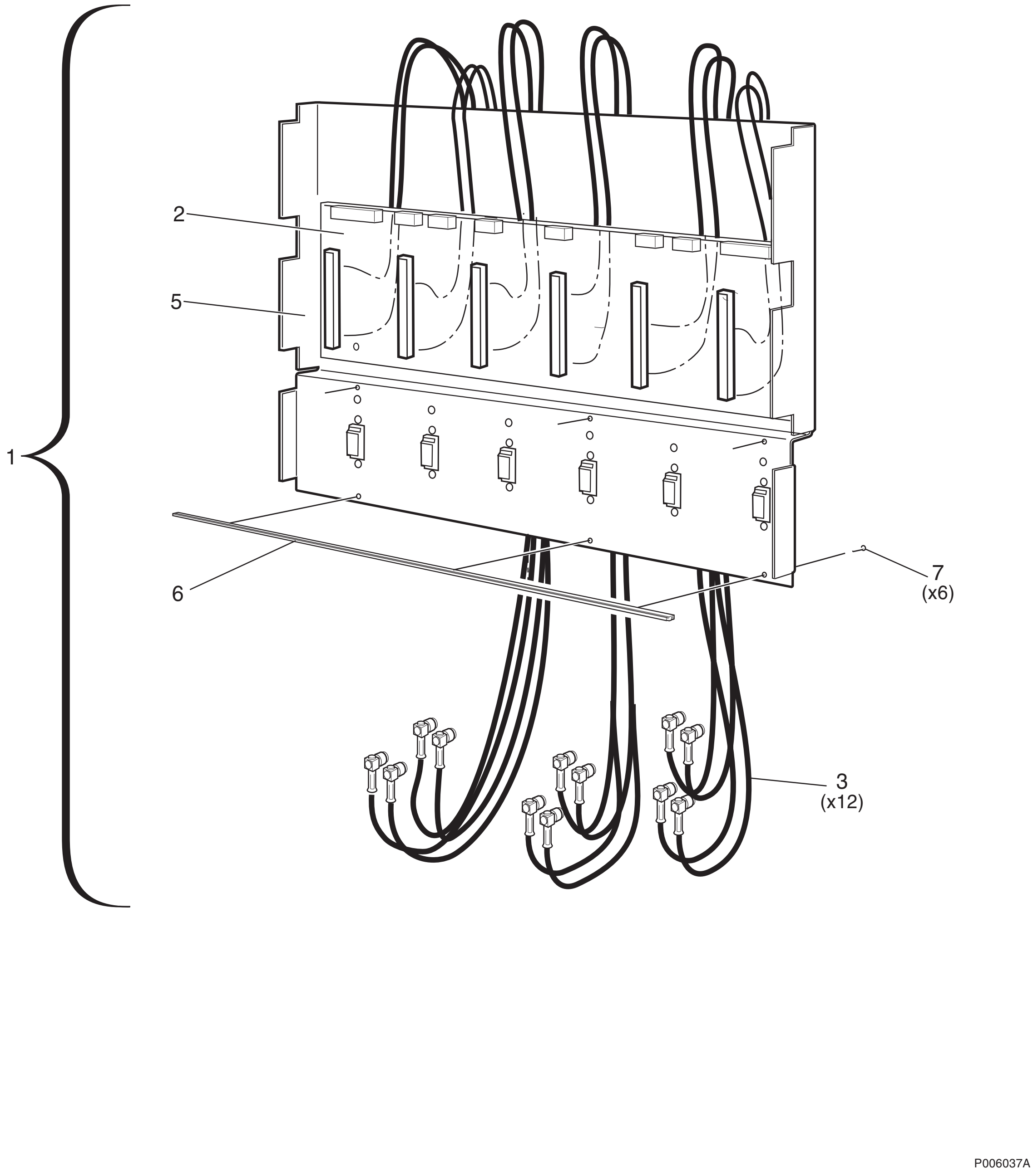
These parts are not recommended for customer stock. The parts are available upon request and the lead time may be longer.


31
10
30
F
H
G
x
7
6
32, 33, 34
34
A
P003598D

Parts for Cabinet V1, V2, V3, V4

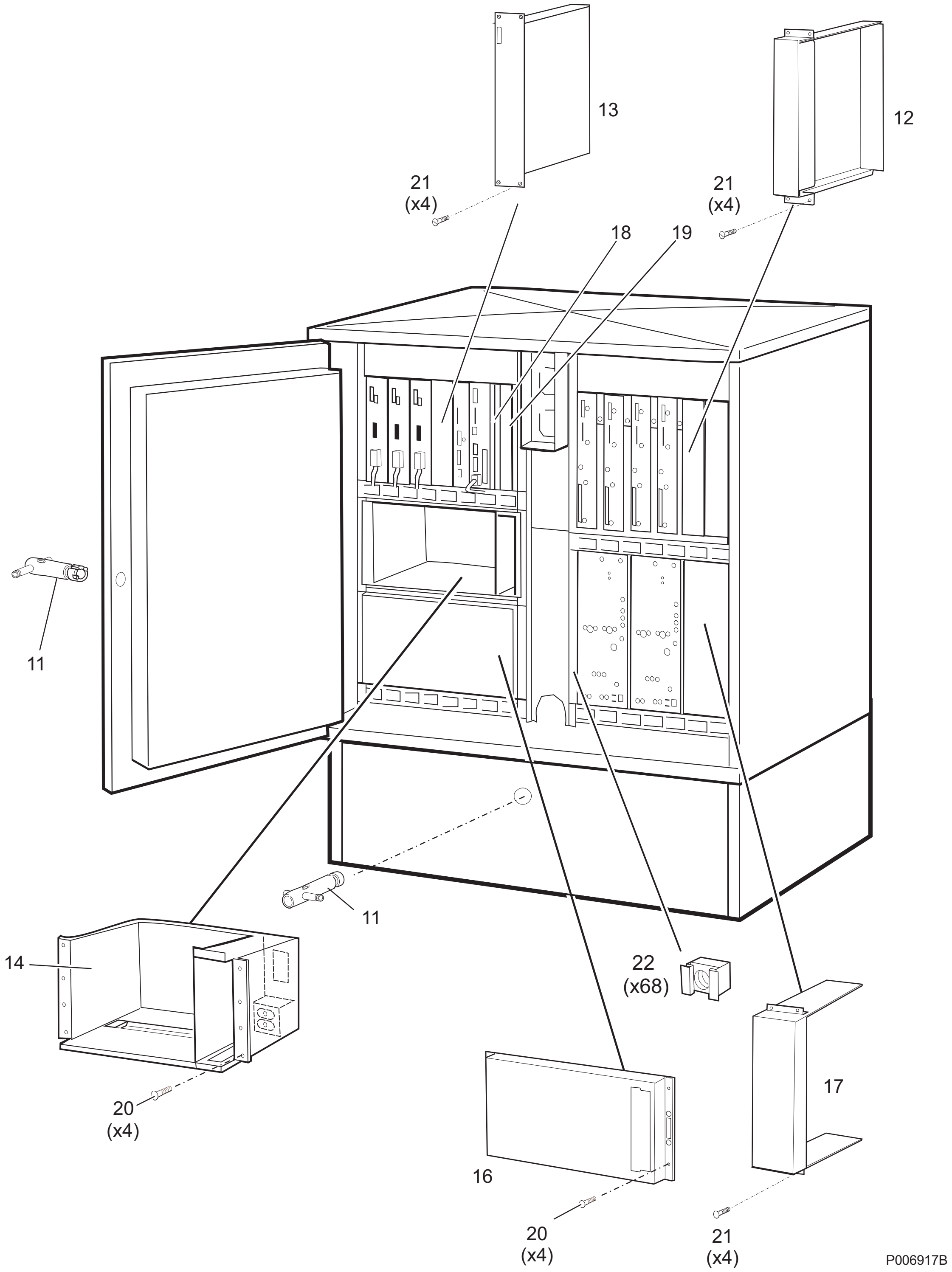
Pos	Product Number	Product Name	Description
-X		Connection cable	L =1.3 m. F door/climate temp. Only in cabinet V1. Sensor not monitored. Replacement not needed.
6	RPM 513 425/1	Connection cable	For temp. sensor (in). Alternative locations, see F, G, H below.
-F			Location in Cabinet V1, V2
-G			Location in Cabinet V3
-H			Location in Cabinet V4, V5
7	RPM 513 425/2	Connection cable	L =0.56 m. For temp. sensor (out). Used in all cabinet versions.
10	SXA 120 5769/1	Clamp	FAN CLAMP
30	NTZ 112 85/BB02	Spare parts set	[38] TRU BACKPLANE BOARD SET See next page.
31	BFL 119 310/1	Subrack	For PSU (DXU/ECU) Incl backplane board
32		Subrack	For CDU. Replaced by NTZ 112 468
33		Subrack	For CDU_D Replaced by NTZ 112 468
34	NTZ 112 468	Spare parts set	[39] CDU Sub-rack Kit (For outdoor cabinets) Includung a re-designed "neutral" sub-rack and accessories. Shelf (A) is used only for CDU_D.

[38] We recommend to exchange the complete TRU Sub-rack BFL 119 80/1. See chapter ’Recommended (Not Repairable) Spare Parts.
[39] This product is available from January 2001.


1
2
5
6
7
(x6)
3
(x12)
P006037A

TRU Backplane Set

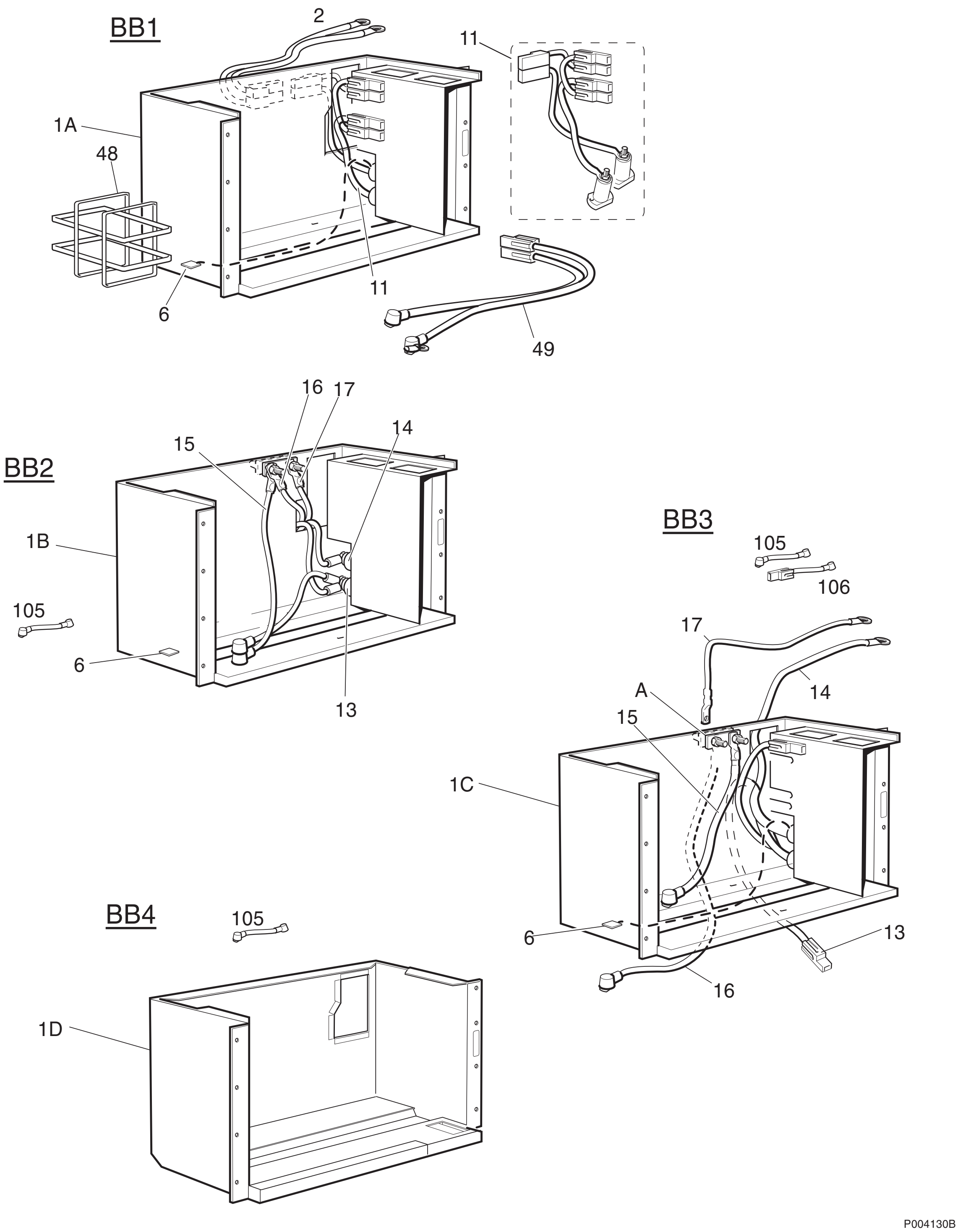
Pos	Product Number	Product Name	Description
	NTZ 112 85/BB02	**SPARE PARTS SET**	**TRU BACKPLANE BOARD SET**
			(Incl. pos 2-7)
2		Printed board assemb	TRU BP
3		Coaxial cable	L =1.64 m. (12 pcs in the set).
5		Rear cover	FOR TRU
6		Profiled bar	L=431.8 mm./INTEGRATED NUT BAR
7		Screw	SCREW MRT M 2,5X6 ST FZG


13
12
21
(x4)
21
(x4)
18
19
11
11
14
22
(x68)
17
20
(x4)
16
20
(x4)
21
(x4)
P006917B

Common Mechanics

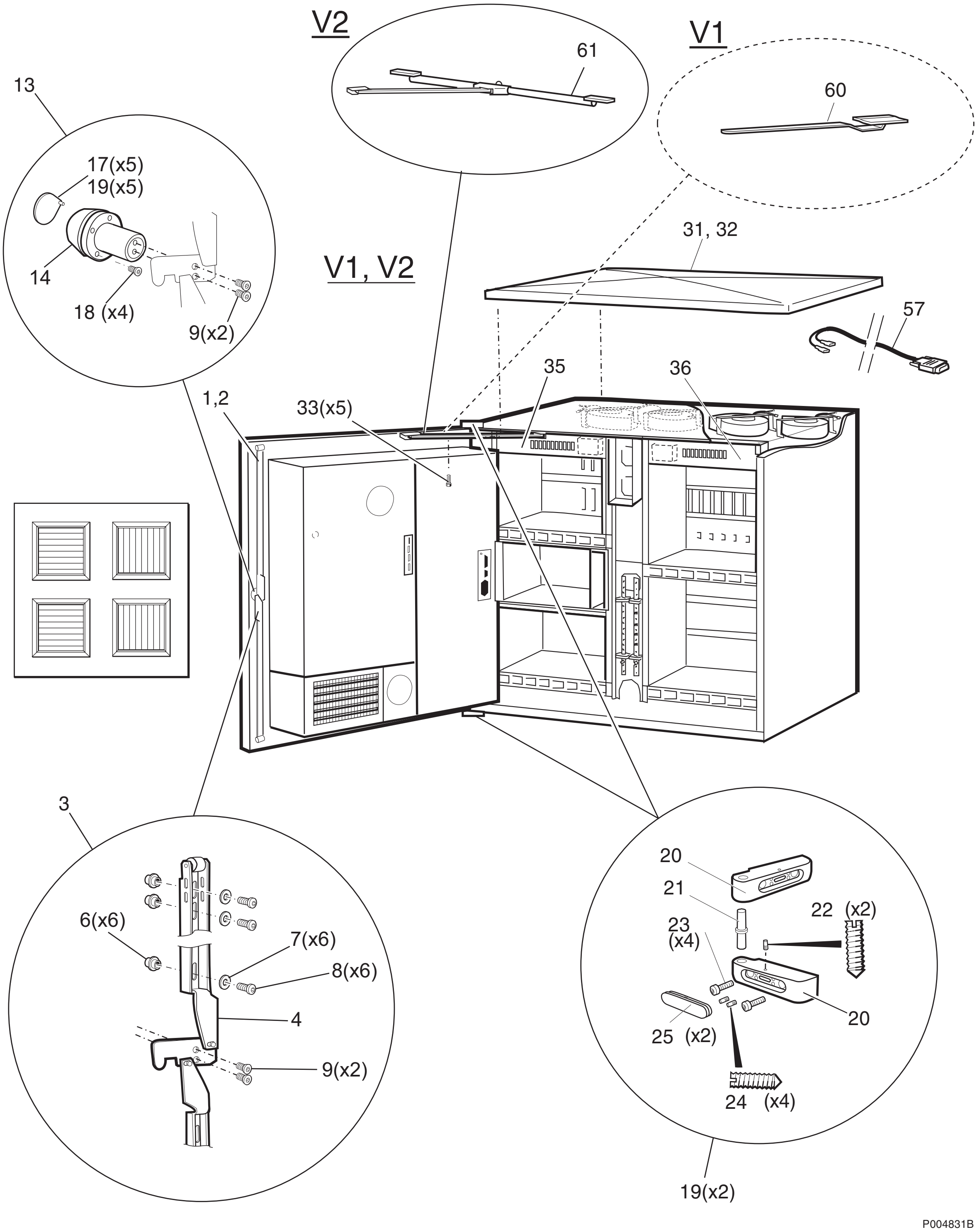
Pos	Product Number	Product Name	Description
11	SXK 107 2465/1	Handle	LOCK HANDLE
12	SXK 107 4722/1	Dummy	TRU DUMMY Incl. screws pos 21
13	SXK 119 393/1	Dummy	FOR PSU Incl. screws pos 21
14		Battery box	For BFU and BATTERIES. Complete, including temp. sensor. See page 64.
#16	SXK 119 048/2	Battery cover	FOR BKB 103 03/3 Incl. screws
17	SXK 107 6059/1	Dummy	CDU DUMMY/w screws, strip hold
18	SDK 107 60/04	Dummy front	W=20 mm H=262mm
19	SDK 107 60/06	Dummy front	W=30.2 mm H=262 mm
20		Screw	[40] M3x16, TORX
21		Screw	[40] M3 x 10, Black.
22		Captive nut	[40] M6, for plates 1.8 - 2.6 mm.

[40] Included in Screw Set: NTZ 112 85/SC02


BB1
2
11
1A
48
11
6
49
BB2
16
17
15
14
1B
105
6
13
BB3
105
106
17
14
A
15
1C
6
13
16
BB4
105
1D
P004130B

Battery Box

Pos	Product Number	Product Name	Description
Version 1, (BB1)			
1A		Battery box	BB1 complete w. pos 6, 11, 48, 49. Replaced by BKB 103 03/2. All neccessary cables are included.
2	RPM 513 746/00800	Connection cable	BFU
49	RPM 628 059/1	Cable with plug	FOR BATTERY BKB 103 101/1
Version 2, (BB2)			
1B		Battery box	BB2 complete w. pos 6, 13, 14, 15, 16, 17 and 105. No Red or Blue "Anderson <connectors" in this version. Replaced by version 3, BKB 103 03/2.
105	RPM 628 140/1	Battery cable	For serial connection of two 12V Batteries
Version 3, (BB3)			
1C	BKB 103 03/2	Battery box	BB3 complete w. pos 6, 13, 14, 15, 16, 17 and 106.
105	RPM 628 140/1	Battery cable	For serial connection of two 12V Batteries
106	RPM 628 140/7	Battery cable	BB to Battery (+)
A			In the first delivered samples of the Battery Box, Version 3, this plinth "A" was mounted on the front side of the back-plane.
Version 4, (BB4)			
1D	BKB 103 03/3	Battery box	BB4 (Only cable 105 is included)

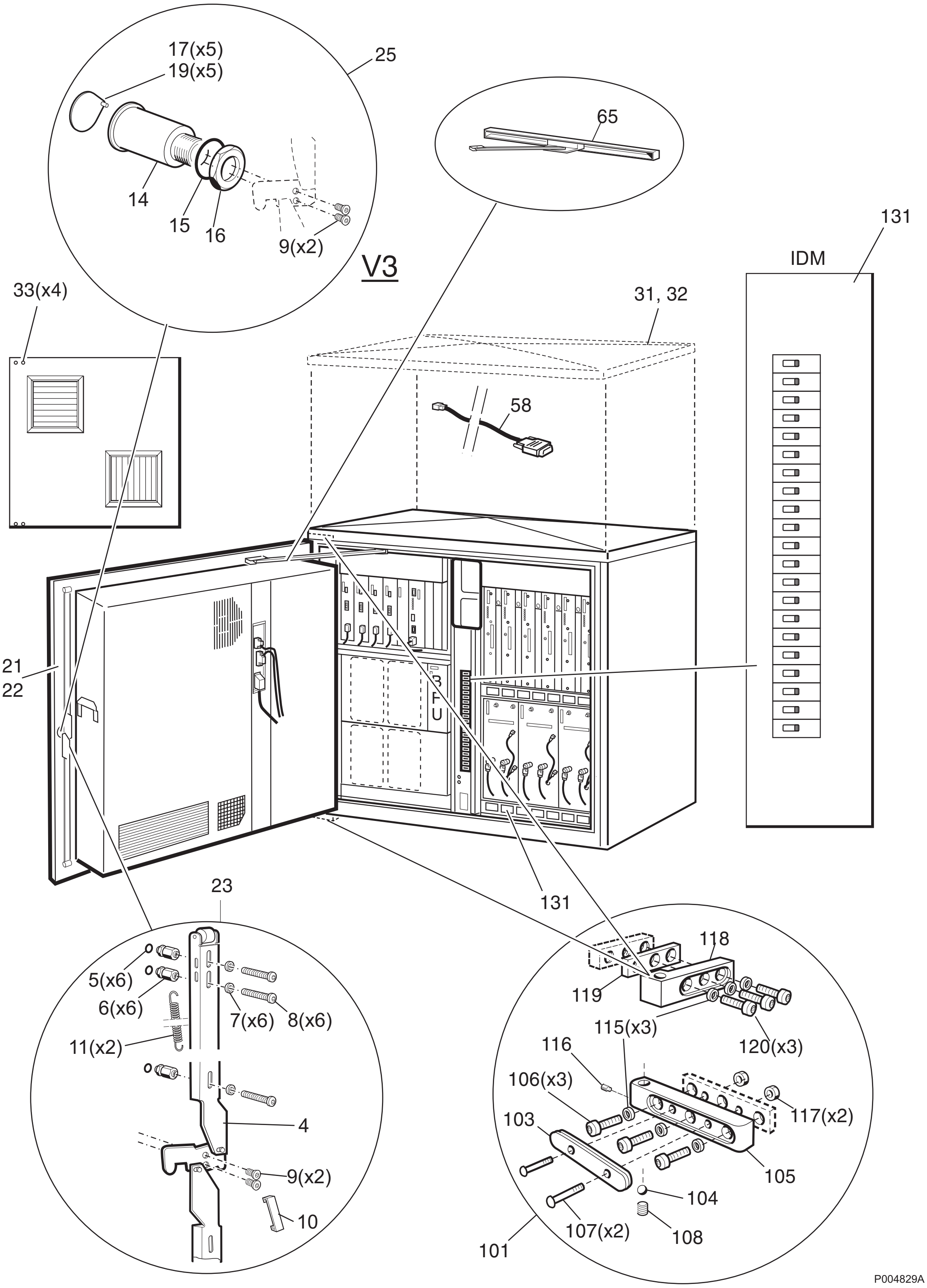

V2
61
V1
60
13
17(x5)
19(x5)
14
18 (x4)
9(x2)
V1, V2
31, 32
57
35
36
1,2
33(x5)
3
6(x6)
7(x6)
8(x6)
4
9(x2)
20
21
22 (x2)
23
(x4)
20
25 (x2)
24 (x4)
19(x2)
P004831B

Special Mechanics for Cabinet V1 and V2

SEB 112 606/xx

Pos	Product Number	Product Name	Description
1	SXK 107 4676/301	Door	GREEN
2	SXK 107 4676/301	Door	GREEN
3	NTZ 112 85/LK021	Spare parts set	[41] CABINET LOCK DEVICE, V1, V2, RBS 2102 Complete set, Incl. pos 4-9
13	NTZ 112 85/LK022	Spare parts set	LOCK HOUSING, V1,V2, RBS 2102 Complete set, Incl. pos 9, 14-19
19	NTZ 112 85/HG02	Spare parts set	DOUBLE HINGE SET, V1, V2
31	SXK 107 2459/201	Roof	GREEN
32	SXK 107 2459/205	Roof	GREY
33		Screw	[42] MC6S M 10x20H RFST for Roof
35		Distribution unit	[43] IDM1 Complete. Not available.
36		Distribution unit	[43] IDM2 Complete. Not available.
57	RPM 513 742/01800	Connection cable	Door switch to ECU backplane.
60		Door-stop	VERSION 1. Replaced by NTM 201 1554/1
61	NTM 201 1554/1	Set of materials	DOOR STOP KIT, V2, RBS 2102
(140)	NTM 201 1842/1	Set of materials	EMC SHIELDED GASKET KIT

[41] The old set NTZ 112 85/LK12 is divided into 'Lock Device' and 'Lock Housing'. Also see chapter 'Replaced or Withdrawn Parts'.
[42] Included in Screw Set: NTZ 112 85/SC02
[43] IDM's For V1 and V2. Production is discontinued/Complete IDM is not available. Recommendation: Do not send IDM V1 or V2 to central repair. Circuit breakers and FCU are replaceable at site. See chapter 'Not Repairable ...'

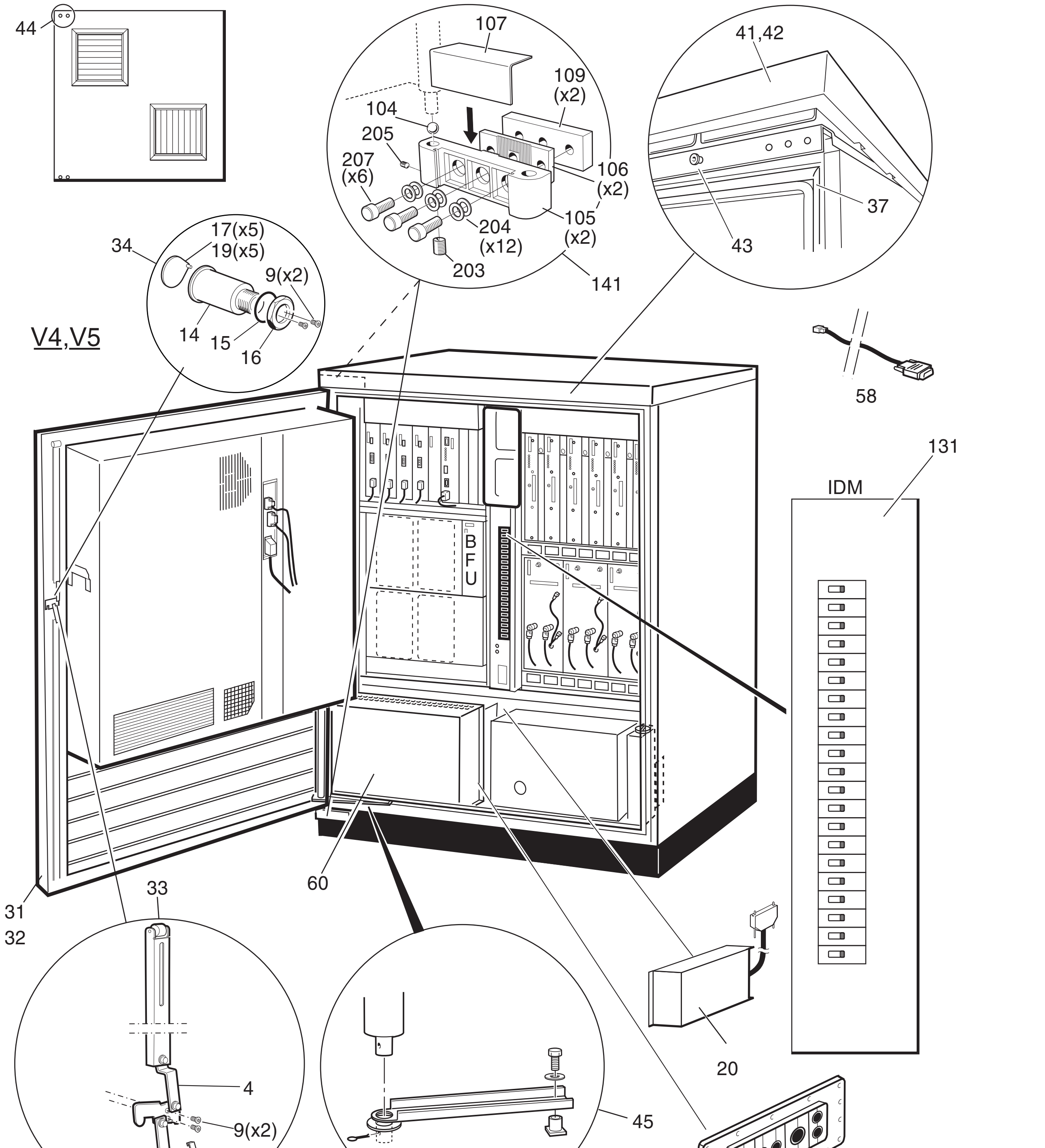

17(x5)
19(x5)
25
14
15
16
9(x2)
V3
65
131
IDM
33(x4)
31, 32
58
21
22
23
131
5(x6)
6(x6)
7(x6)
8(x6)
11(x2)
4
9(x2)
10
118
119
115(x3)
116
120(x3)
106(x3)
117(x2)
103
105
104
107(x2)
108
101
P004829A

Special Mechanics for Cabinet V3

SEB 112 1007/xx

Pos	Product Number	Product Name	Description
21	SXK 107 5283/01	Door	DOOR RBS 2102 (GREEN)
22	SXK 107 5283/05	Door	DOOR RBS 2102 (GREY)
23	NTZ 112 85/LK121	Spare parts set	[44] LOCK DEVICE, CAB.V3 Complete set incl. pos 4-11
25	NTZ 112 85/LK122	Spare parts set	[44] [45] LOCK HOUSING, CAB.V3 (L=94.7mm.) Complete set incl. pos 9, 14-19
31	SXK 107 2459/301	Roof	GREEN
32	SXK 107 2459/305	Roof	GREY
33		Screw	[46] MC6S M 10x20H RFST
58	RPM 513 1381/01800	Connection cable	DOOR SW./CABINET RBS 2102 DOOR SWITCH ALARM to ECU BP
65	NTZ 112 85/DS02	Spare parts set	DOORSTOP SET V3
101	NTZ 112 85/HG12	Spare parts set	DOUBLE HINGE SET, V3 Incl 103-108, 115-120
131	BMG 980 315/1	Distribution unit	[47] IDM, Complete.
(140)	NTM 201 1842/1	Set of materials	EMC SHIELDED GASKET KIT

[44] The old set NTZ 112 85/LK12 is divided into 'Lock Device' and 'Lock Housing'. Also see chapter 'Replaced or Withdrawn Parts'.
[45] Please note that Housing for V3 and V4 have different lengths.
[46] Included in Screw Set: NTZ 112 85/SC02
[47] Recommendation:Do not send IDM3 to central repair. Exchange the Circuit Breakers at site or at local Work-shop. A complete IDM3 may then be needed for swapping.

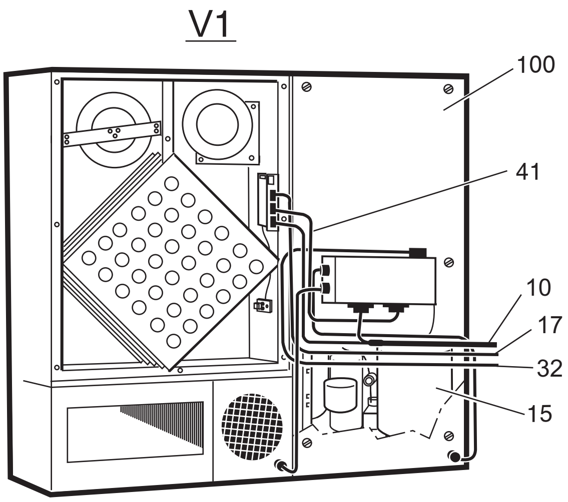


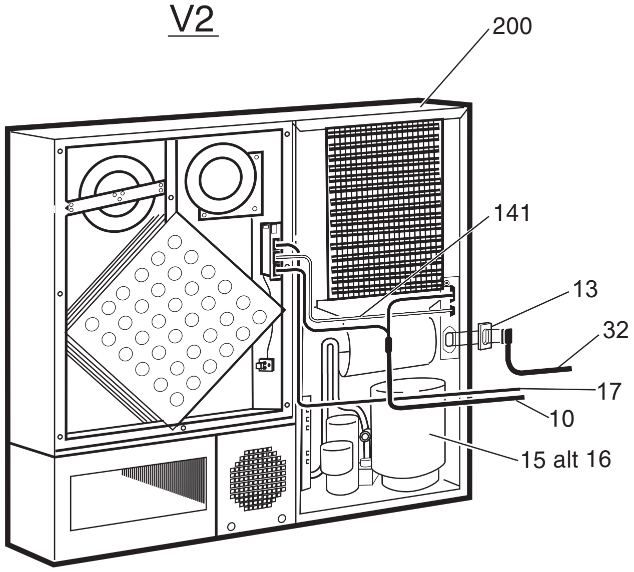
44
107
109
(x2)
104
205
207
(x6)
106
(x2)
105
(x2)
204
(x12)
203
141
41,42
37
43
34
17(x5)
19(x5)
9(x2)
14
15
16
V4,V5
B
F
U
58
131
IDM
31
32
33
60
4
9(x2)
10
45
20
38
P003617F

Special Mechanics for Cabinet V4 V5

Pos	Product Number	Product Name	Description
(20)	NCL 402 204/01	Connection unit	[48] EACU-3, Complete
31	SXK 107 6511/07	Door	DOOR RBS 2102 V4, V5, Structure Green
32	SXK 107 6511/08	Door	DOOR RBS 2102 V4, V5, Structure Grey
33	NTZ 112 85/LK221	Spare parts set	[49] LOCK DEVICE, CAB.V4 Complete incl. pos 4-10
34	NTZ 112 85/LK222	Spare parts set	[50] [51] [52] LOCK HOUSING, CAB.V4 Complete incl. pos 9, 14-19
37A	NTM 201 2438/1	Door rubber seal kit	For cabinets with serial no. 1-727.
37B		Set of materials	[53] DOOR RBS 2102i
38	NDM 401 04/2	Cable lead-in	CSF16 + 8 pcs Complete with frame
41	SXA 105 7749/107	Roof	RBS 2102 (V4) Structure Green
42	SXA 105 7749/108	Roof	RBS 2102 (V4) Structure Grey
43		Screw	SCREW M6S M 8X30H RFST for Roof
44		Screw	SCREW MRT M 8X16 RFST for Tent or Umbrella. Incl in NTZ 112 85/SC02
45	NTZ 112 85/DS03	Spare parts set	DOORSTOP SET V4
58	RPM 513 1381/01800	Connection cable	DOOR SW./CABINET RBS 2102 DOOR SWITCH ALARM to ECU BP
60A		Cover	RBS 2102i TM-Box for V4 (stainless steel). Replaced by pos 60B
60B	SXK 107 6534/1	Cover	RBS 2102i (aluminium)
131	BMG 980 315/1	Distribution unit	IDM, Complete.
141	NTZ 112 85/HG22	Spare parts set	DOUBLE HINGE SET, V4, V5 Incl. pos 104-109, 203-205
(150)	KFE 101 1143/2	Filter unit	40 VDC, 125 A

[48] A new version of EACU (with the same function, but with other internal spare parts), was introduced in Cabinet V4 during 1999 and replaces the old version NCL 502 103/01. For internal parts, see chapter ’Recommended (Not Repairable) Spare Parts’, section ’EACU Parts’.
[49] The old set NTZ 112 85/LK22 is divided into ’Lock Device’ and ’Lock Housing’. Also see chapter ’Replaced or Withdrawn Parts’.
[50] This product is available from January 2001.
[51] Please note that Housing for V3 and V4 have different lengths.
[52] The old set NTZ 112 85/LK22 is divided into ’Lock Device’ and ’Lock Housing’. Also see chapter ’Replaced or Withdrawn Parts’.
[53] Is available from the next release



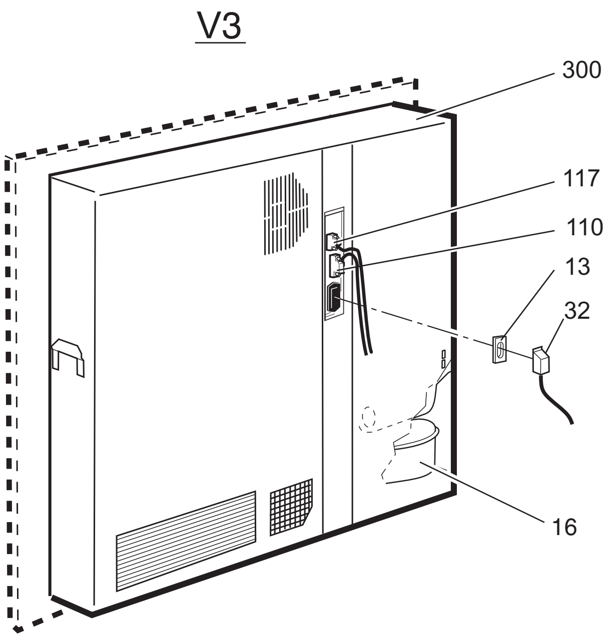


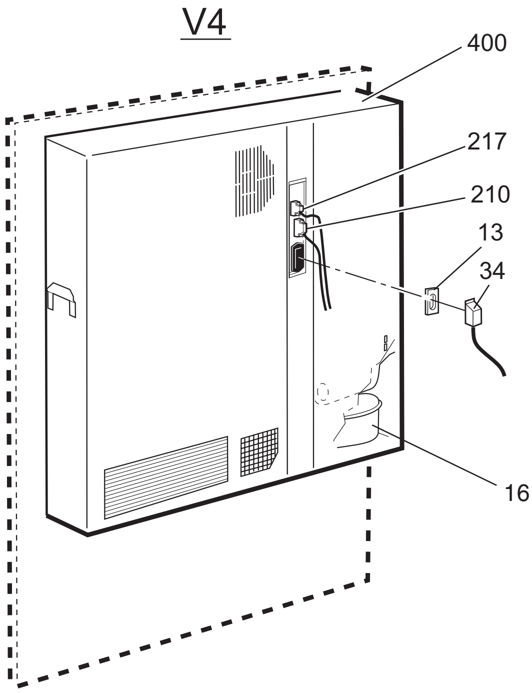
P003658B

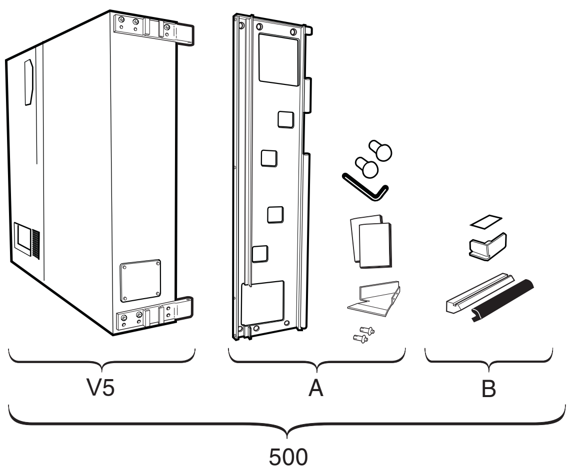
Climate Unit Parts V1, V2

Pos	Product Number	Product Name	Description
Climate Unit 50 Hz, 230 V, Version 1, (V1) BPD 104 02/01 R1C-R1F			
10	RPM 513 874/02500	Connection cable	
15	24/BPD 104 02/02	Compressor	[54) 55)] 50/60 Hz Replacement Compressor
17	RPM 513 848/02500	Power cable	+24V
32		Cable	See ch. "Power Cables"
41	RPM 513 853/00800	Connection cable	
100	BPD 104 02/01	Climate unit	[56)] 50 Hz, 230 VAC, Complete Replacement Unit, V2.
Climate Unit 50 Hz, 230 V, Version 2, (V2) BPD 104 02/01 R2B-R3B			
10	RPM 513 874/02500	Connection cable	
13		Plate	Important shielding plate. Must be fitted.
15	24/BPD 104 02/02	Compressor	[54) 55)] 50/60 Hz Replacement Compressor
17	RPM 513 848/02500	Power cable	+24V
32		Cable	See ch. "Power Cables"
141	RPM 513 853/00650	Connection cable	
200A	BPD 104 02/01	Climate unit	50 Hz, 230 VAC, Complete Replacement Unit, V2.
Climate Unit 60 Hz 208V, Version 2, (V2), BPD 104 02/02 R2B-R3B			
10	RPM 513 874/02500	Connection cable	
13		Plate	Important shielding plate. Must be fitted.
16	24/BPD 104 02/02	Compressor	[57)] 50/60 Hz
17	RPM 513 848/02500	Power cable	+24V
32		Cable	See ch. "Power Cables"
141	RPM 513 853/00650	Connection cable	
200B	BPD 104 02/02	Climate unit	60 Hz, 208 VAC, Complete Replacement Unit, V2.

54) Specially qualified or licensed personnel needed. Additional instruction may be needed.
55) From factory the 50 Hz climate units V1 and V2 were equipped with a compressor marked ’50 Hz’. Only a replacement compressor, marked ’50/60 Hz’ is available.
56) (Climate Unit V1, 50 Hz) Production discontinued. Use V2, BPD 104 02/01.
57) From factory the 50 Hz climate units V1 and V2 were equipped with a compressor marked ’50 Hz’. Only a replacement compressor, marked ’50/60 Hz’ is available.





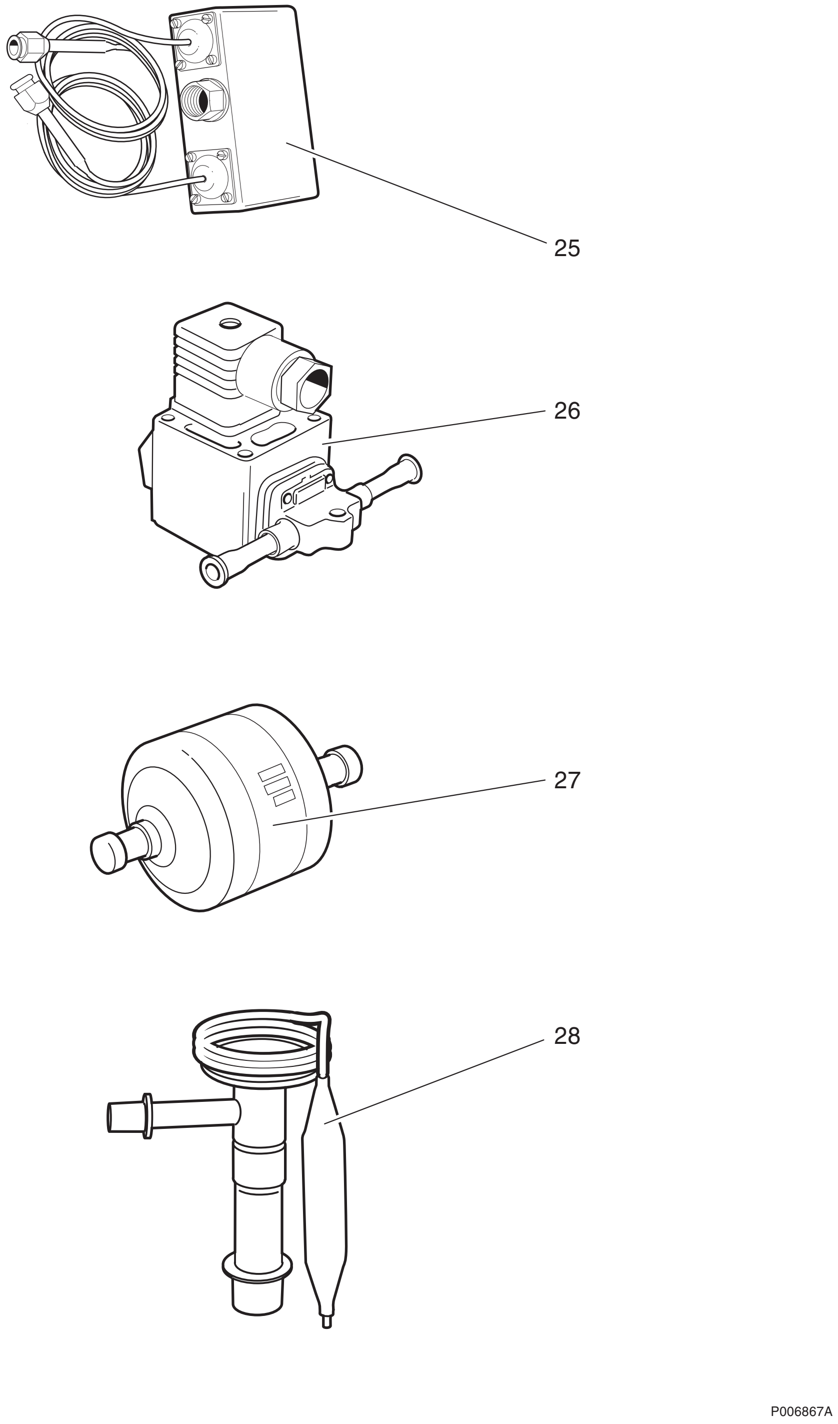


P003659C

Climate Unit Parts, V3, V4, V5

Pos	Product Number	Product Name	Description
Climate Unit 50/60 Hz 230/208V, Version 3, (V3), BPD 104 08/1 R1B-R2A			
13		Plate	Important shielding plate. Must be fitted.
16	24/BPD 104 02/02	Compressor	[58] [59] 50/60 Hz
110	RPM 513 1337/02000	Connection cable	
117	RPM 513 848/03700	Power cable	+24V
32		Cable	See ch. "Power Cables"
300		Climate unit	V3 Complete. Replaced by NTZ 112 466
Climate Unit 50/60 Hz 230/208V, Version 4, (V4), BPD 104 08/1 R3A			
13		Plate	Important shielding plate. Must be fitted.
16	24/BPD 104 02/02	Compressor	[58] 50/60 Hz
210	RPM 513 1337/02000	Connection cable	
217	RPM 513 848/03700	Power cable	+24V
34	RPM 628 178/2	Connection cable	SHIELDED 3X1,5 MM2 See ch. "Parts for ACCU-2, ACCU-3"
400		Climate unit	V4 Complete. Replaced by NTZ 112 466.
Climate Unit 50/60 Hz 230/208V, Version 5, (V5), BPD 104 08/1 R3B-			
500	NTZ 112 466	Spare parts set	[60] Replacement Set, including Climate Unit factory version V5 + instruction and accessories 'A' for V3, V4 replacement. Also including illustrated parts 'B' for upgrade according to Service Advices.

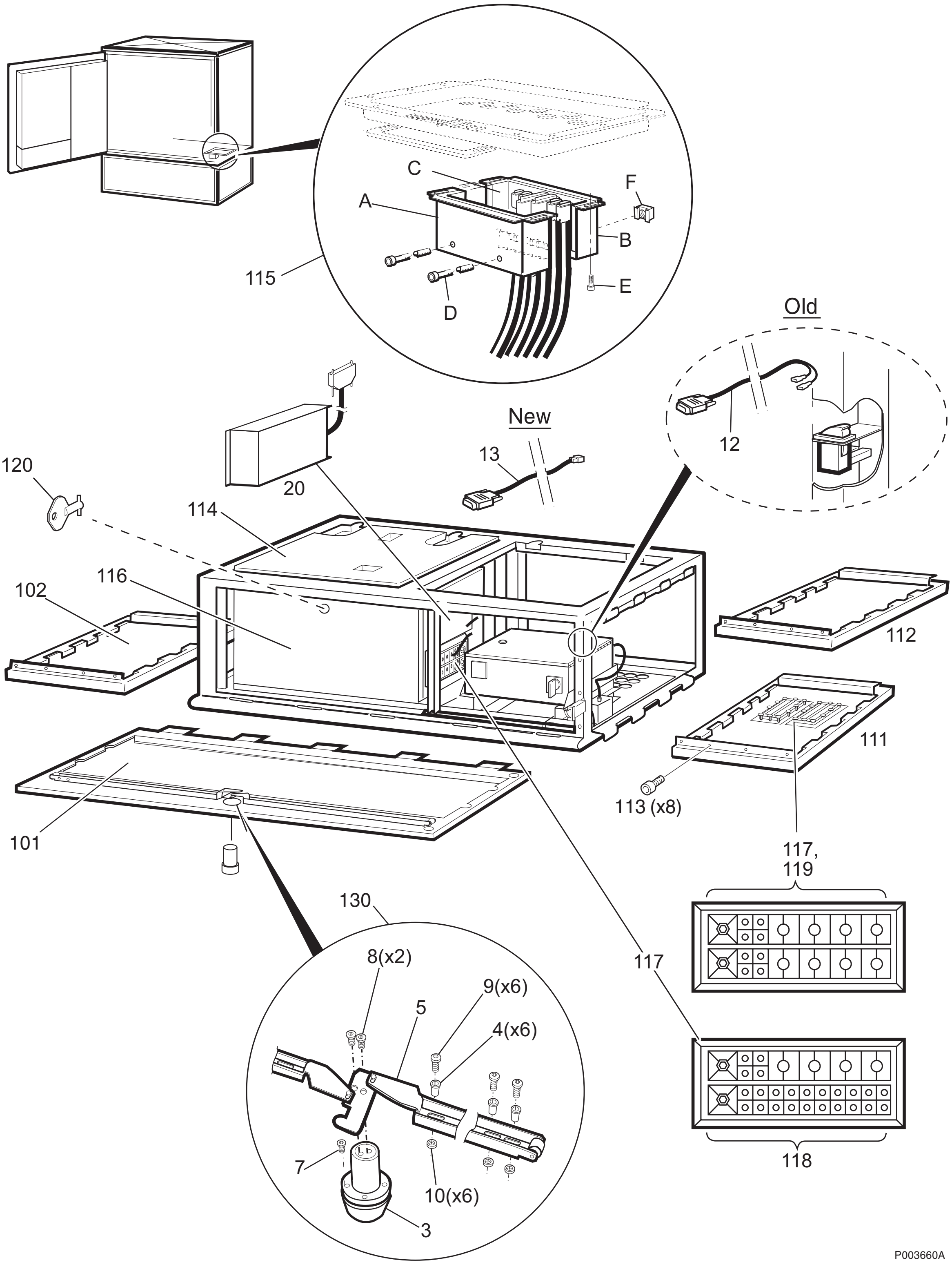
[58] Specially qualified or licensed personnel needed. Additional instruction may be needed.
[59] From factory the Cabinet is equipped with a compressor marked (50/60 Hz). Remaining compressors 24/BPD 104 02/01 (marked 50 Hz) may be used, but only in 50 Hz countries.
[60] This product is available from January 2001.


25
26
27
28
P006867A

Common parts for all Climate Unit versions

Pos	Product Number	Product Name	Description
25	25/BPD 104 08/1	Pressure switch	[61] Pressostat
26	26/BPD 104 08/1	Solenoid valve	[61] Complete with coil
27	27/BPD 104 08/1	Filter	[61] Drying Filter
28		Valve	Expansion Valve only for factory replacement

[61] Specially qualified or licensed personnel needed. Additional instruction may be needed.

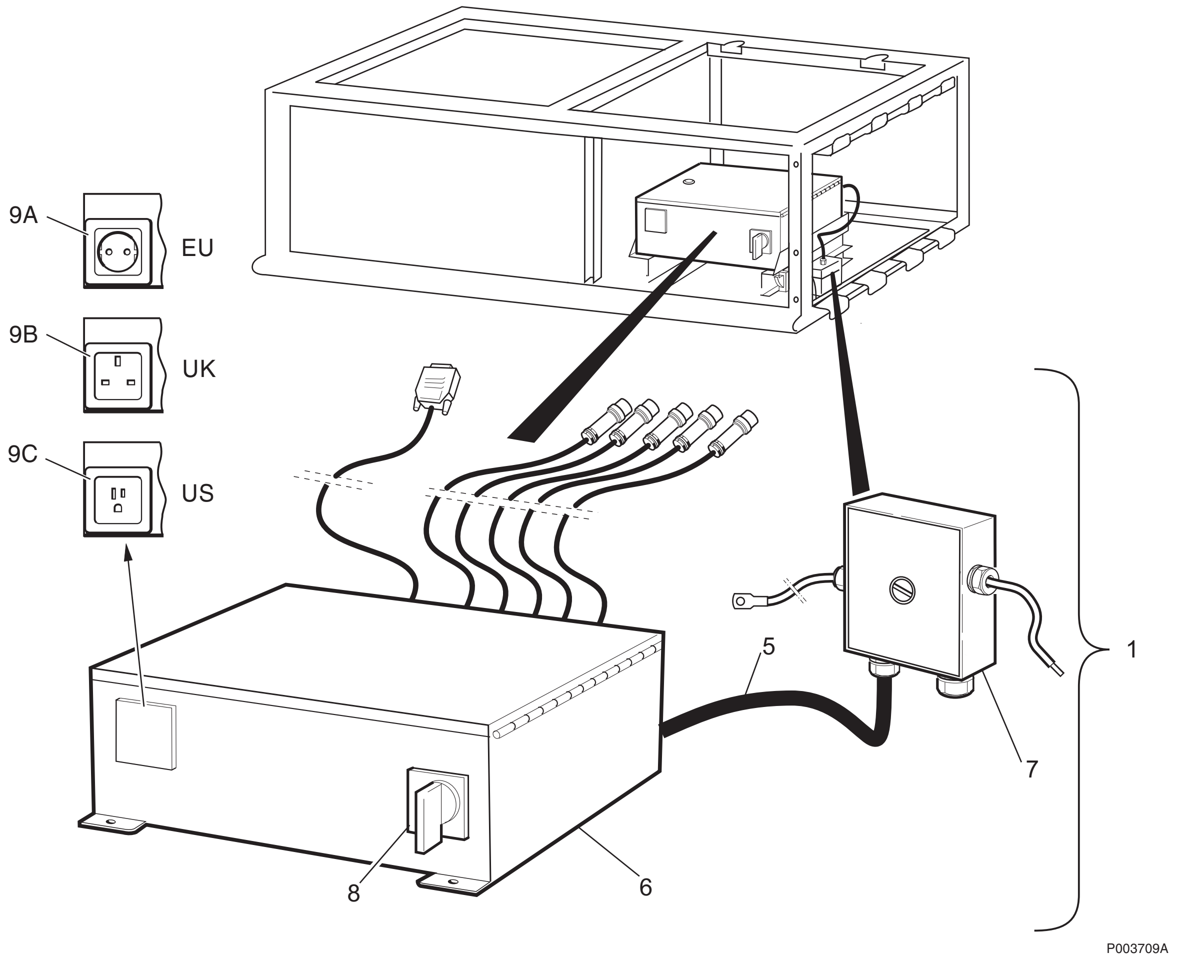


C
F
A
B
115
E
D
Old
New
13
12
120
20
114
116
102
112
111
113 (x8)
101
117,
119
130
8(x2)
117
9(x6)
5
4(x6)
7
10(x6)
3
118
P003660A

Mounting Base, Common Parts

Pos	Product Number	Product Name	Description
12	RPM 513 876/01400	Connection cable	For M. Base Door Switch (Old)
13	RPM 513 1382/01400	Connection cable	For M. Base Door Switch (New)
20	NCL 402 204/01	Connection unit	[62] EACU-3, Complete
101A	SXK 107 4657/101	Front cover	GREEN
101B	SXK 107 4657/105	Front cover	GREY
102A	SXA 120 5760/101	Shutter	GREEN,LEFT(END COVER)
102B	SXA 120 5760/105	Shutter	GREY,LEFT(END COVER)
111A	SXK 107 5331/01	Shutter	SHUTTER RIGHT RBS 2102 GREEN
111B	SXK 107 5331/05	Shutter	SHUTTER RIGHT RBS 2102 GREY
112A	SXA 120 5760/201	Shutter	GREEN,RIGHT (END COVER)
112B	SXA 120 5760/205	Shutter	GREY,RIGHT (END COVER)
113		Screw	Included in NTZ 112 85/SC02
114	SXA 120 7138/1	Sealing set	SEALING SET(MOUNT.BASE)
115	SXK 107 4729/1	Sealing set	SEALING SET For M.Base. SEB 112 1019/xx
116	SXK 107 4508/3	Box	TRANSPORT MODULE BOX RBS 2102
117	NDM 401 02/1	Cable lead-in	CS FRAME 230X130
118	NTM 201 1476/1	Set of materials	CABLE LEAD-IN (MOUNT.BASE)
119	NTM 201 1477/1	Set of materials	CABLE LEAD-IN (END COVER)
120	2/SMB 106 02/1	Lock	KEY FOR SMB10601/1
130	NTZ 112 85/LK04	Spare parts set	RBS 2102 MB LOCK KIT
(150A)	KFE 101 1143/3	Filter unit	40 VDC, 125 A For M.Base. SEB 112 612/xx
(150B)	KFE 101 1143/2	Filter unit	40 VDC, 125 A

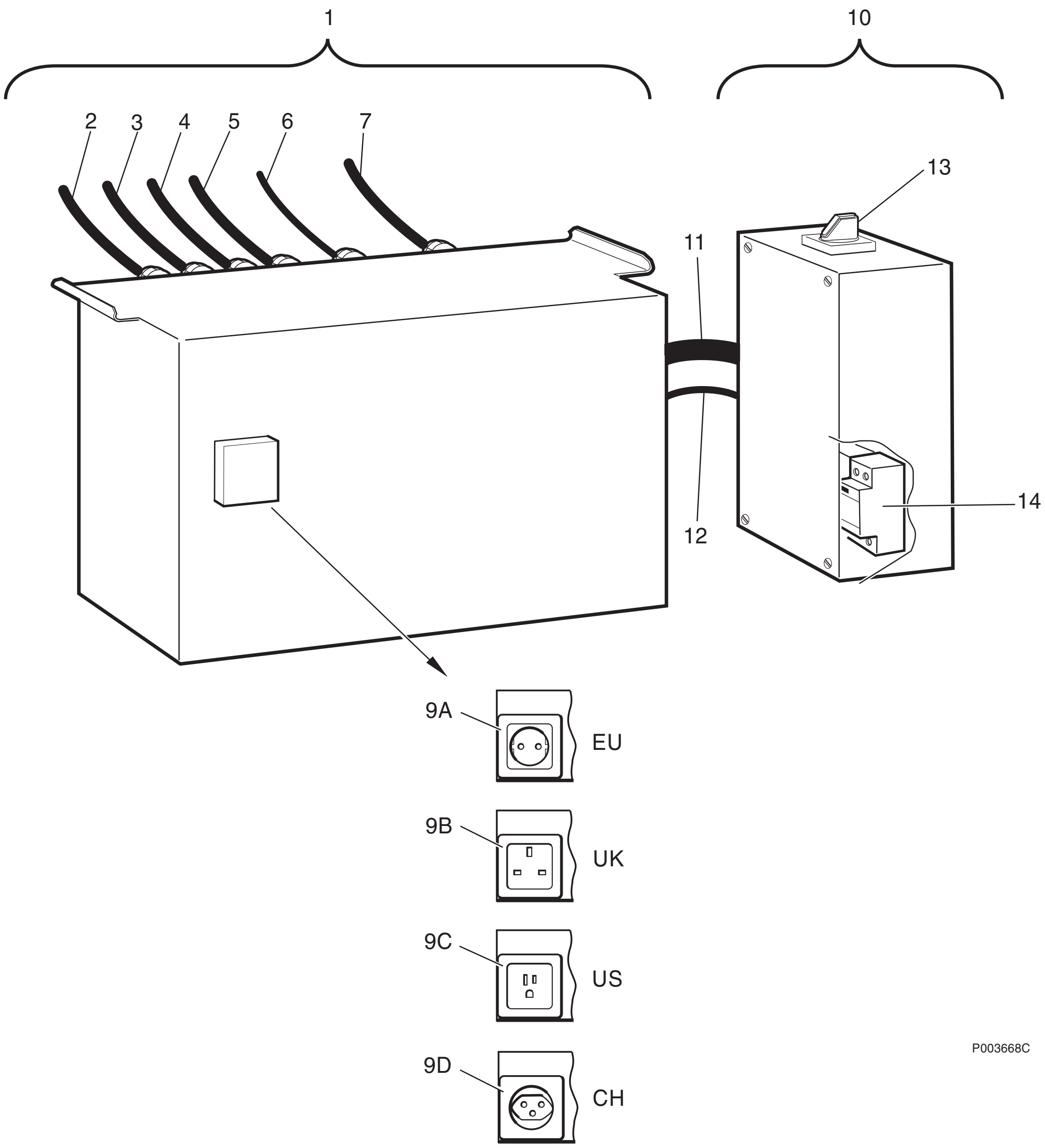
[62] A new version of EACU (with the same function, but with other internal spare parts), was introduced in Cabinet V4 during 1999 and replaces the old version NCL 502 103/01. For internal parts, see chapter ’Recommended (Not Repairable) Spare Parts’, section ’EACU Parts’.


9A
EU
9B
UK
9C
US
5
1
7
8
6
P003709A

Parts for ACCU-1

Pos	Product Number	Product Name	Description
1A	BMG 980 307/1	Distribution unit	ACCU EU Complete incl. pos 5, 6A, 7, 8, 9A
1B	BMG 980 307/2	Distribution unit	ACCU UK Complete incl. pos 5, 6B, 7, 8, 9B
1C	BMG 980 307/3	Distribution unit	ACCU US Complete incl. pos 5, 6C, 7, 8, 9C
5	RPM 513 934/01530	Power cable	CONNECTION CABLE ACCU
6A		Fuse box	[63] EU
6B		Fuse box	[63] UK
6C		Fuse box	[63] US
7		Terminal box	[63] CONN.BOX ACCU
8	RMH 270 0502/1	Rotary switch	4 POL. ON/OFF 250 VAC complete with Knob.
9A	RPM 628 180/1	Connection cable	Service outlet, EU
9B	RPM 628 180/2	Connection cable	Service-outlet, UK
9C	RPM 628 180/3	Connection cable	Service-outlet, US
Optional Parts			
1F	BMG 980 318/3	Distribution unit	[64] [65] ACCU US Complete incl. pos 5, 6F, 7, 8, 9C.
6F		Distribution unit	[63] US

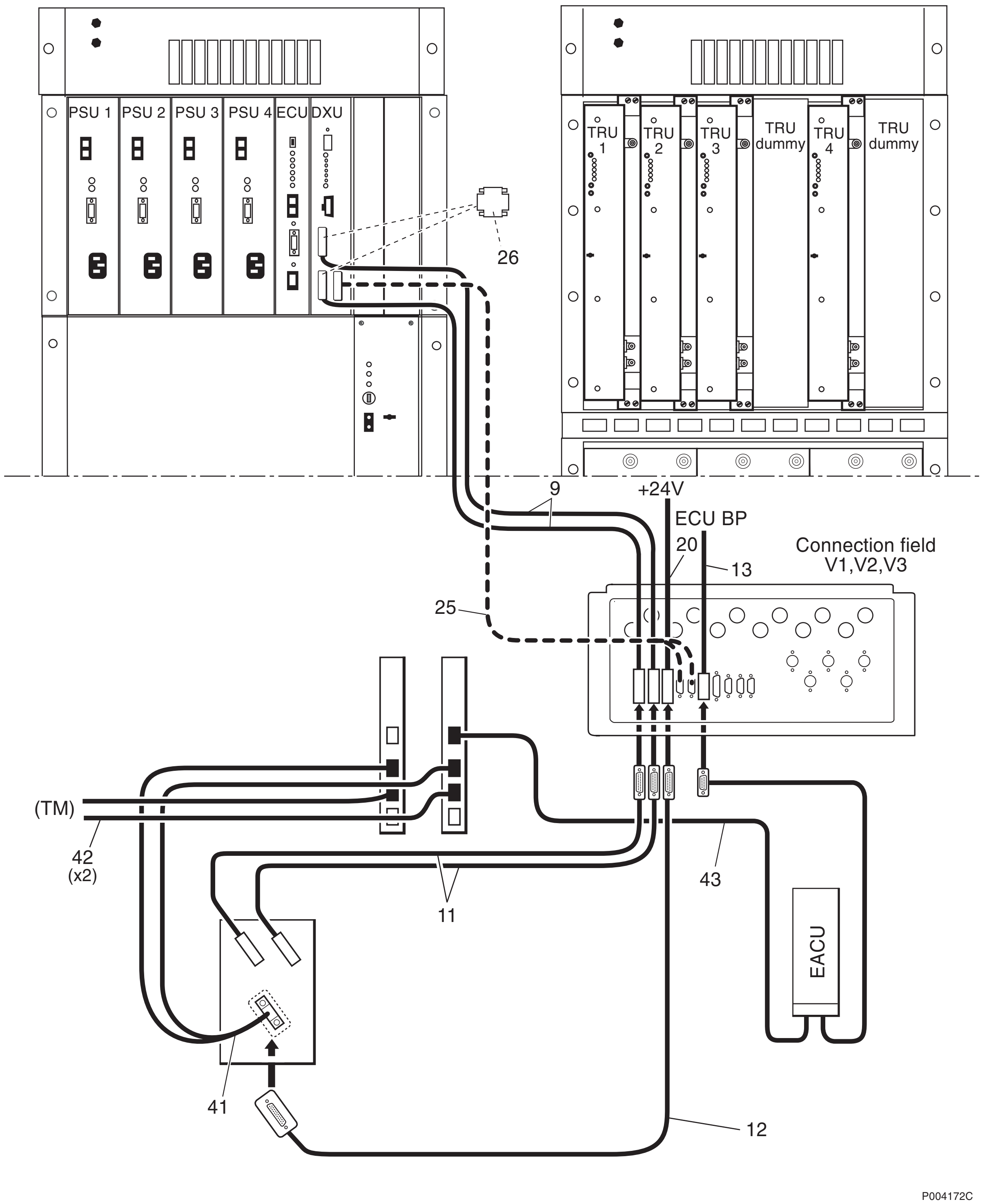
[63] Due to test routines, the part is not separate available
[64] This product is available from January 2001.
[65] Equal to an up-graded version according to SA document (Service Advice) 16/156 22-SEB 112 606+ Uen, where the Climate Circuit Breaker is changed from 10 to 16 A.


1
10
2
3
4
5
6
7
13
11
12
14
9A
EU
9B
UK
9C
US
9D
CH
P003668C

Parts for ACCU-2, ACCU-3

Pos	Product Number	Product Name	Description
1	1/BMG 815 066/1	Mains distr. unit	[66] ACCU-2, ACCU-3 BASIC UNIT Complete with pos 2, 3, 4, 5, 6, 7, 9A, 9B, 9C
2	RPM 628 178/4	Connection cable	SHIELDED 3X1,5 MM2 to PSU 1
3	RPM 628 178/5	Connection cable	SHIELDED 3X1,5 MM2 to PSU 2
4	RPM 628 178/1	Connection cable	SHIELDED 3X1,5 MM2 to PSU 3
5	RPM 628 178/3	Connection cable	SHIELDED 3X1,5 MM2 to PSU 4
6	RPM 628 179/1	Signalling cable	10X0,56 MM2 to ECU
7	RPM 628 178/2	Connection cable	SHIELDED 3X1,5 MM2 to Climate unit
(9)			[66] Service Outlet. 3 versions (EU, UK, US) of the Service Outlet are enclosed when the Basic Unit is delivered as Spare Part. The Swiss (CH) version must be ordered seperately.
9A	RPM 628 180/1	Connection cable	Service outlet, EU
9B	RPM 628 180/2	Connection cable	Service-outlet, UK
9C	RPM 628 180/3	Connection cable	Service-outlet, US
#9D	RPM 628 180/4	Connection cable	Service-outlet, CH
10	2/BMG 815 066/1	Mains distr. unit	ACCU-2, ACCU-3 CONNECTION BOX Complete incl. cable 11,12 and switch 13.
11	TRE 211 106/1	Connection cable	SHIELDED 4X6MM2
12	TRE 211 105/1	Signalling cable	SHIELDED 2X0,23MM2
13	BMY 201 098/200	Spare parts	ROTARY SWITCH, 4-POLE, ON/OFF, 250vac, UL. complete with Knob.
14	BMY 201 148/3	Accessories	[67] [68] Up-grade Kit for BMG 815 066. Incl. one Gas Discharging Tube, pos 9 + accessories.

[66] From April 2000 the ACCU-2 is replaced by ACCU-3. (Same Product Number, only new R-state). The rear of ACCU-3 Basic Unit is prepared with a holder for two OVP boxes. (see illustration on page 26). In the Connection Box one overvoltage arrester is replaced by a Gas Discharging Tube. (See page 50)
[67] This product is available from January 2001.
[68] The complete ACCU-2 is replaced by ACCU-3 in cabinets delivered after March 2000. The Gas Discharging Tube (pos 9B) is factory mounted in ACCU-3. To upgrade to ACCU-3 use kit BMY 201 148/3 and instructions according to the Service advice: 1/156 22-BMG 815 066



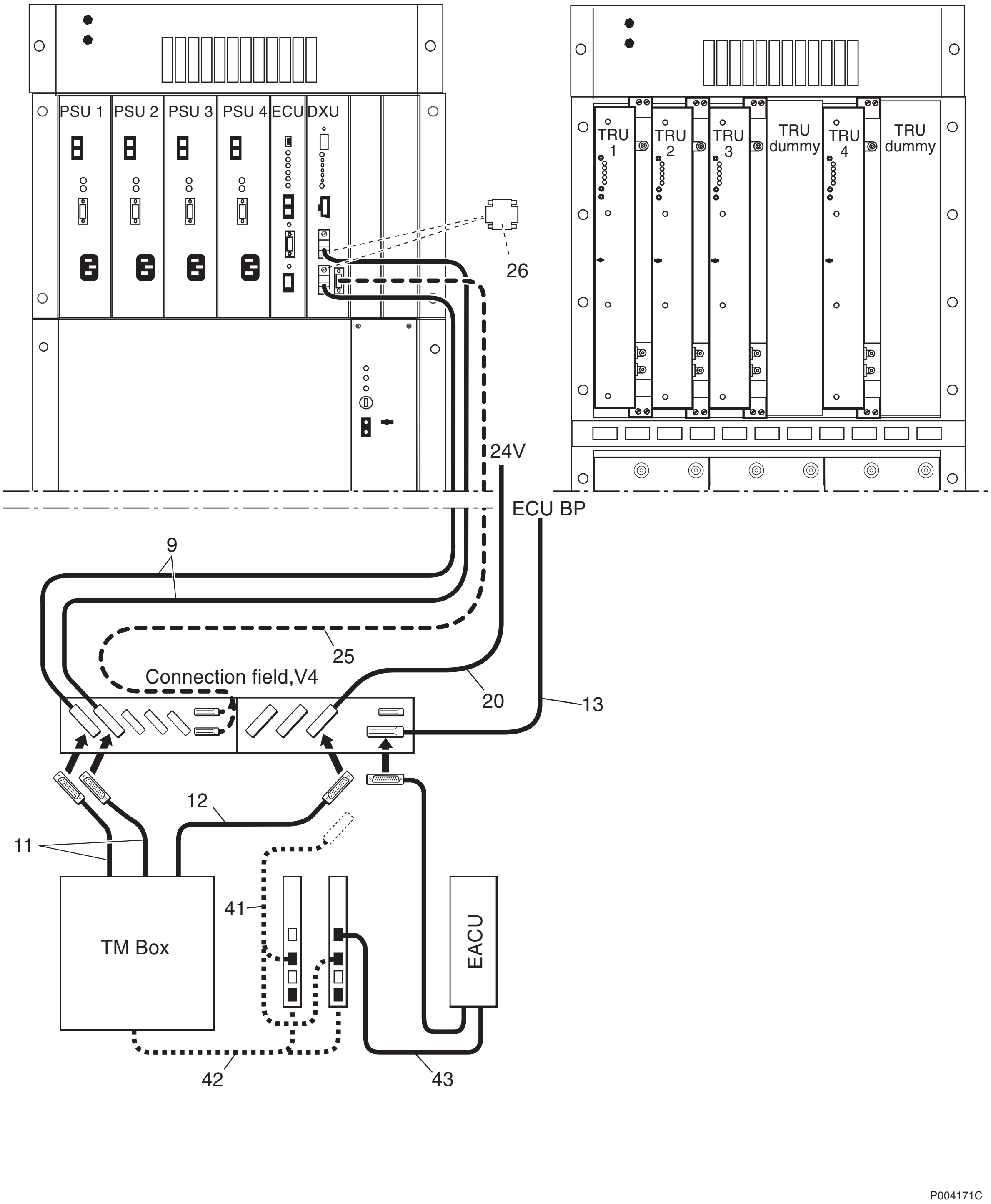
PSU 1
PSU 2
PSU 3
PSU 4
ECU
DXU
TRU 1
TRU 2
TRU 3
TRU dummy
TRU 4
TRU dummy
26
9
+24V
ECU BP
20
13
Connection field V1,V2,V3
25
(TM)
42 (x2)
43
11
EACU
41
12
P004172C

Transmission Cables

Cabinet V1, V2, V3

Pos	Product Number	Product Name	Description
9A		Connection cable	[69] 75 Ohm. L=1.3m. Bus G703
9B	RPM 513 709/01300	Connection cable	120 Ohm. L=1.3m. Bus G703
9C	RPM 513 880/01300	Connection cable	100 Ohm. L=1.3m. Bus G703
9D		Cable with connector	[69] 75 Ohm. L=1.3m. Bus G703 DXU11
9E	RPM 513 870/01300	Cable with connector	120 Ohm. L=1.3m. Bus G703 DXU11
9F	RPM 513 869/01300	Cable with connector	100 Ohm. L=1.3m. Bus G703 DXU11
11A	RPM 513 756/01000	Connection cable	75 OHM (G703)
11B	RPM 513 755/01000	Connection cable	120 OHM (G703)
11C	RPM 513 758/01000	Connection cable	100 OHM (G703)
12	RPM 513 757/01000	Connection cable	+24 V
13	RPM 513 707/02160	Connection cable	Alarm
20A	RPM 513 849/02200	Power cable	+24 V
20B	RPM 513 849/01000	Power cable	
25	RPM 513 1102/01620	Cable	SIGNAL ESB/OVP (Only in Cabinet V1, V2)
26	RPM 919 310	Adapter	[70] Must be used if DXU01/03 is replaced by DXU11 (Only in Cabinet V3)
41	RPM 513 1298/00600	Power cable	24/48 V
42	RPM 513 1235/01000	Connection cable	-48 V
43	RPM 513 1236/01500	Connection cable	Alarm

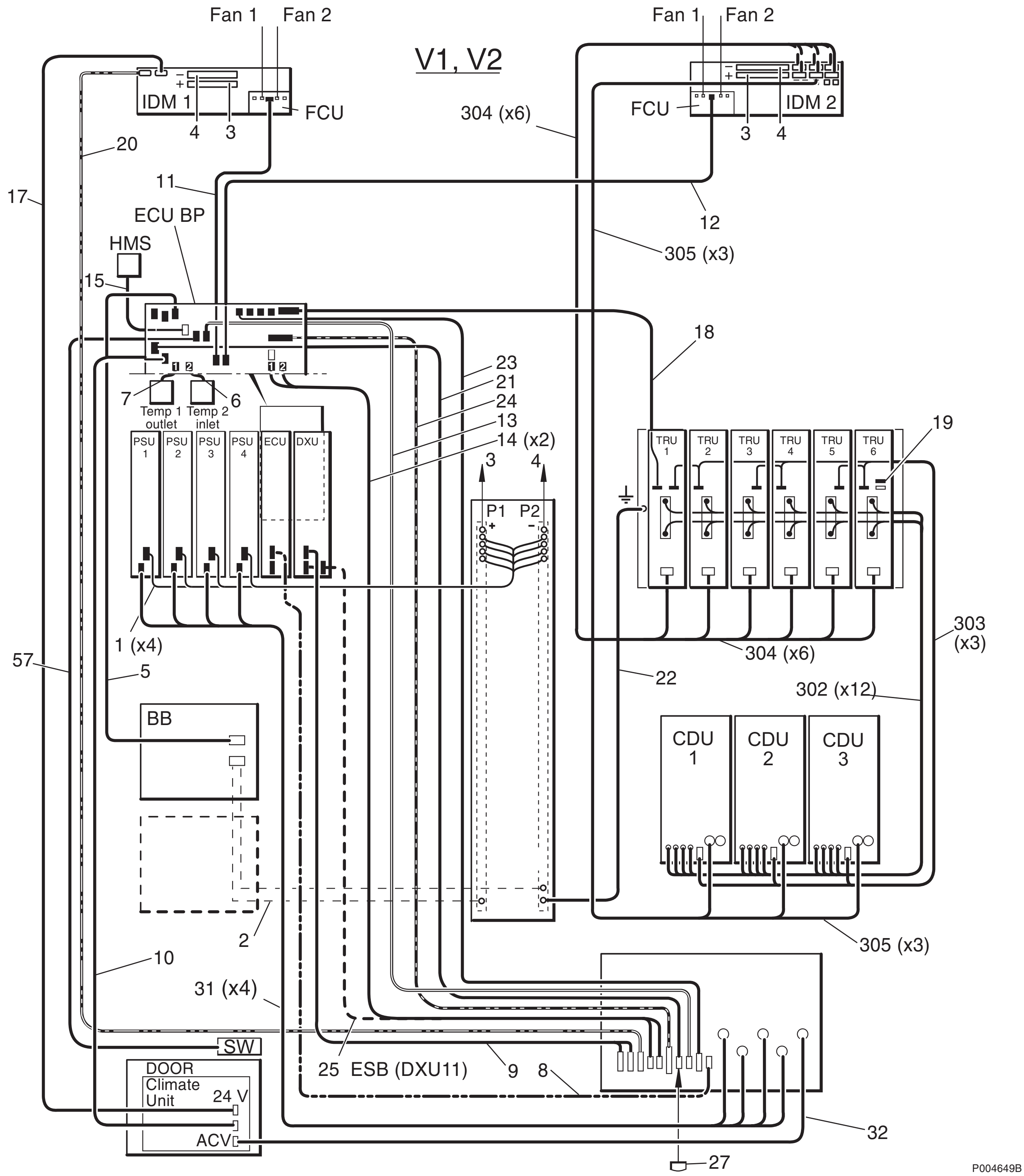
[69] See chapter "Recommended (Not Repairable) Spare Parts"
[70] Complete kit (NTM 201 2798/1) including 2 Adapters (RPM 919 310) and 1 DXU11 (BOE 602 11/11) is orderable.


PSU 1
PSU 2
PSU 3
PSU 4
ECU
DXU
TRU 1
TRU 2
TRU 3
TRU dummy
TRU 4
TRU dummy
26
24V
ECU BP
9
25
Connection field,V4
20
13
12
11
41
TM Box
EACU
42
43
P004171C

Cabinet version V4 and V5

Pos	Product Number	Product Name	Description
9A		Connection cable	[71] 75 Ohm. L=1.3m. Bus G703
9B	RPM 513 709/01300	Connection cable	120 Ohm. L=1.3m. Bus G703
9C	RPM 513 880/01300	Connection cable	100 Ohm. L=1.3m. Bus G703
9D		Cable with connector	[71] 75 Ohm. L=1.3m. Bus G703 DXU11
9E	RPM 513 870/01300	Cable with connector	120 Ohm. L=1.3m. Bus G703 DXU11
9F	RPM 513 869/01300	Cable with connector	100 Ohm. L=1.3m. Bus G703 DXU11
11A	RPM 513 756/01000	Connection cable	75 OHM (G703)
11B	RPM 513 755/01000	Connection cable	120 OHM (G703)
11C	RPM 513 758/01000	Connection cable	100 OHM (G703)
12	RPM 513 757/01000	Connection cable	+24 V
13	RPM 513 707/02160	Connection cable	Alarm
20	RPM 513 849/01000	Power cable	
25	RPM 513 1102/01620	Cable	SIGNAL ESB/OVP
26	RPM 919 310	Adapter	[72] Must be used if DXU01/03 is replaced by DXU11
41	RPM 513 1298/00600	Power cable	24/48 V
42	RPM 513 1235/01000	Connection cable	-48 V
43	RPM 513 1236/01500	Connection cable	Alarm

[71] See chapter "Recommended (Not Repairable) Spare Parts"
[72] Complete kit (NTM 201 2798/1) including 2 Adapters (RPM 919 310) and 1 DXU11 (BOE 602 11/11) is orderable.

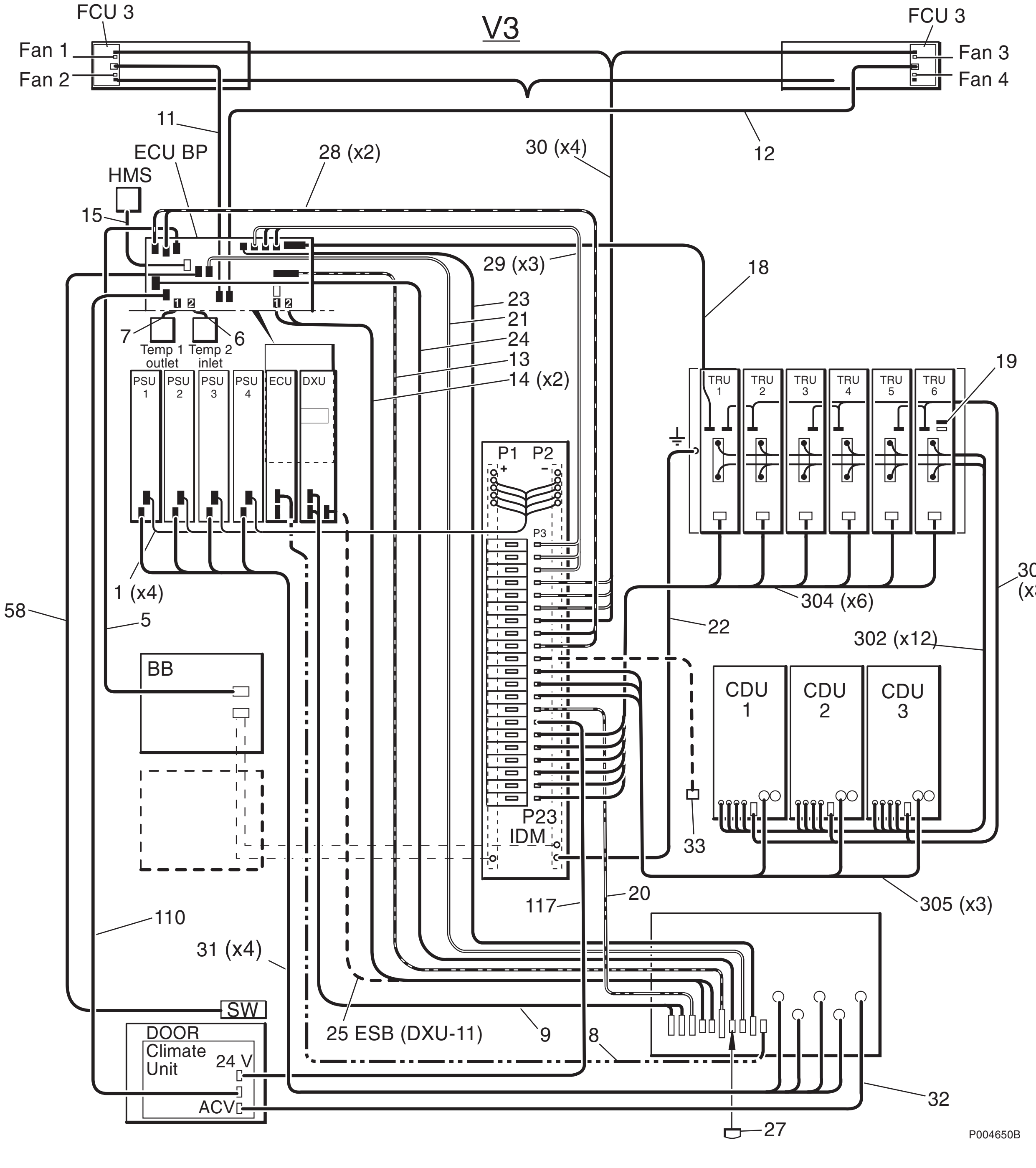

V1, V2
Fan 1
Fan 2
IDM 1
FCU
4
3
Fan 1
Fan 2
FCU
IDM 2
3
4
304 (x6)
20
11
17
ECU BP
12
HMS
305 (x3)
15
18
23
21
24
13
14 (x2)
7
6
Temp 1 outlet
Temp 2 inlet
PSU 1
PSU 2
PSU 3
PSU 4
ECU
DXU
3
4
P1
P2
19
TRU 1
TRU 2
TRU 3
TRU 4
TRU 5
TRU 6
1 (x4)
57
5
304 (x6)
303 (x3)
22
302 (x12)
BB
CDU 1
CDU 2
CDU 3
2
305 (x3)
10
31 (x4)
SW
DOOR
Climate Unit
24 V
ACV
25 ESB (DXU11)
9
8
32
27
P004649B

Cabinet Cables, Overview

Cabinet version V1 and V2

Pos	Product Number	Product Name	Description
1	RPM 513 739/01050	Power cable	+24V
2	RPM 513 746/00800	Connection cable	BFU
3	RPM 513 748/02000	Power cable	
4	RPM 513 749/02000	Power cable	RBS2102
5	RPM 513 872/01600	Connection cable	
6,7,15		Cable	See ch. Comm P. V1, V2, V3, V4, V5
8		Cable	See ch. "Power Cables"
9,25,26		Cable	See ch. "Transmission Interface Cables"
10,17		Cable	See ch. "Climate U Parts V1, V2"
11	RPM 513 738/01200	Connection cable	
12	RPM 513 738/01700	Connection cable	
13	RPM 513 707/02160	Connection cable	Alarm
14	RPM 513 740/01925	Connection cable	
18	RPM 513 696/00520	Connection cable	
19		Printed board assemb	[73] LOCAL BUS TERMINATION
20	RPM 513 849/02200	Power cable	+24 V
21	RPM 513 875/01950	Connection cable	
22	RPM 513 850/00300	Earthing cable	
23	RPM 513 873/01950	Connection cable	
24	RPM 513 854/02160	Connection cable	
27	RPT 403 804/01	Connector	D-SUB STRAPPING PLUG 120 OHM
28	RPM 513 718/00650	Power cable	+24V DC
29	RPM 513 718/01500	Power cable	+24 V
31,32		Cable	See ch. "Power Cables"
57		Cable	See ch. "Cabinet V1, V2"
302	NTZ 112 85/BB02	Spare parts set	TRU BACKPLANE BOARD SET See separate page
303	RPM 513 717/01500	Cable	
304	RPM 513 715/01100	Power cable	+24V TRU-MAG
305	RPM 513 718/02100	Power cable	

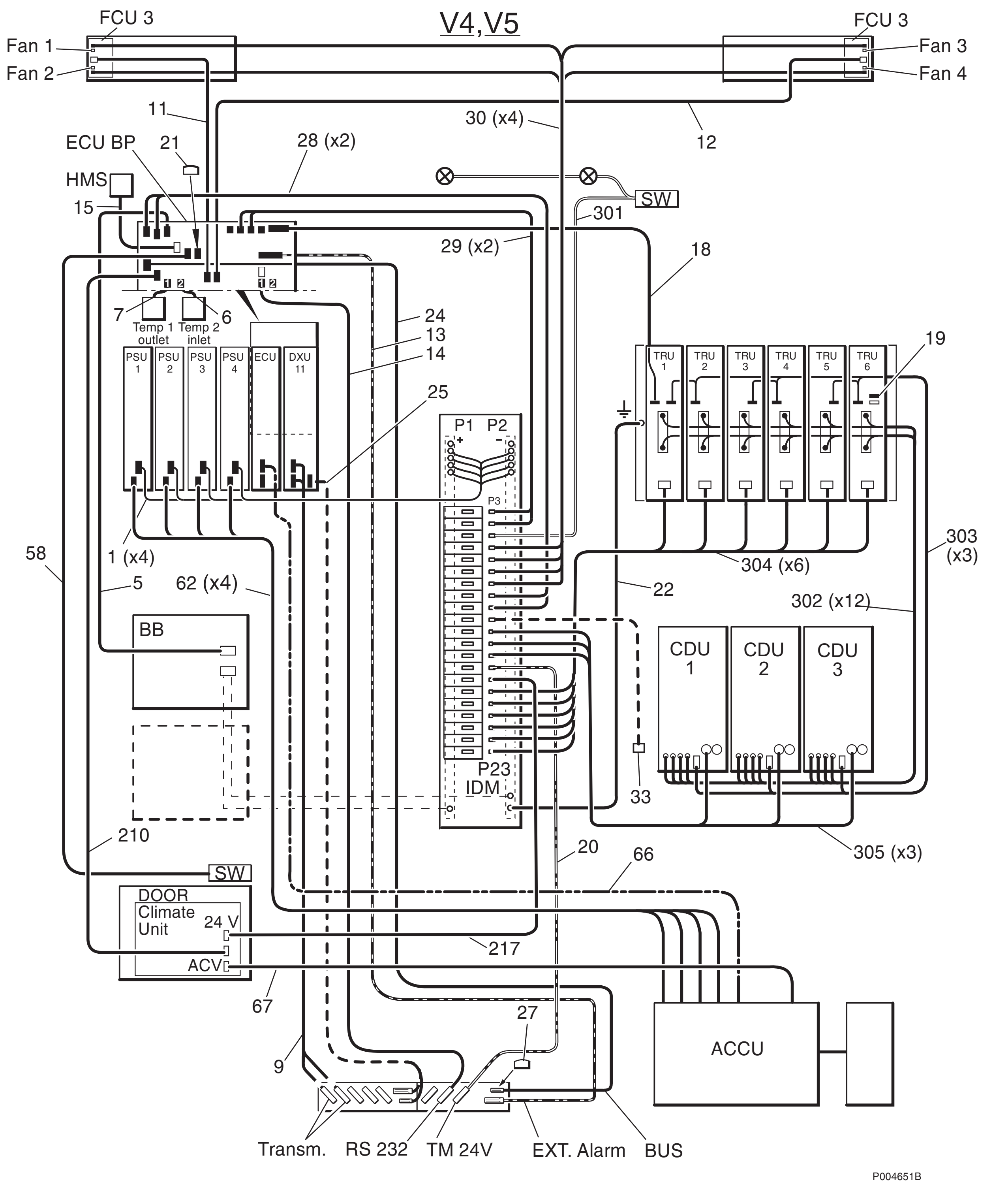
[73] See chapter "Recommended (Not Repairable) Spare Parts"


FCU 3
V3
FCU 3
Fan 1
Fan 2
Fan 3
Fan 4
11
12
ECU BP
HMS
28 (x2)
30 (x4)
15
29 (x3)
18
23
21
24
13
14 (x2)
7
6
Temp 1 outlet
Temp 2 inlet
PSU 1
PSU 2
PSU 3
PSU 4
ECU
DXU
TRU 1
TRU 2
TRU 3
TRU 4
TRU 5
TRU 6
19
P1 P2
P3
1 (x4)
58
5
303 (x3)
304 (x6)
22
302 (x12)
BB
CDU 1
CDU 2
CDU 3
33
P23
IDM
117
20
305 (x3)
110
31 (x4)
SW
DOOR
Climate Unit
24 V
ACV
25 ESB (DXU-11)
9
8
32
27
P004650B

Cabinet version V3

Pos	Product Number	Product Name	Description
1	RPM 513 739/00800	Power cable	+24V
5	RPM 513 872/01600	Connection cable	
6,7,15		Cable	See ch. Comm P. V1, V2, V3, V4, V5
8		Cable	See ch. "Power Cables"
9,25,26		Cable	See ch. "Transmission Interface Cables"
10,17		Cable	
11	RPM 513 738/01200	Connection cable	
12	RPM 513 738/01700	Connection cable	
13	RPM 513 707/02160	Connection cable	Alarm
14	RPM 513 740/01925	Connection cable	
18	RPM 513 696/00520	Connection cable	
19		Printed board assemb	[74] LOCAL BUS TERMINATION
20	RPM 513 849/01000	Power cable	
21	RPM 513 875/01950	Connection cable	
22	RPM 513 1397/00800	Earthing cable	RBS 2102
24	RPM 513 854/02160	Connection cable	
27	RPT 403 804/01	Connector	D-SUB STRAPPING PLUG 120 OHM
28	RPM 513 718/01800	Power cable	+24V DC
30	RPM 513 718/03000	Power cable	+24V DC
31,32		Cable	See ch. "Power Cables"
58		Cable	See ch. "Special Mechanics Cabinet V3, V4"
110		Cable	See ch. Climate Unit V3, V4, V5.
117		Cable	See ch. Climate Unit V3, V4, V5.
302	NTZ 112 85/BB02	Spare parts set	TRU BACKPLANE BOARD SET See separate page
303	RPM 513 717/01500	Cable	
304	RPM 513 715/02200	Power cable	+24V TRU-MAG(RBS2102)
305	RPM 513 718/01500	Power cable	+24 V

[74] See chapter "Recommended (Not Repairable) Spare Parts"


V4,V5
FCU 3
Fan 1
Fan 2
FCU 3
Fan 3
Fan 4
11
30 (x4)
12
ECU BP
21
28 (x2)
HMS
15
SW
301
29 (x2)
18
7
6
Temp 1 outlet
Temp 2 inlet
24
13
14
PSU 1
PSU 2
PSU 3
PSU 4
ECU
DXU 11
TRU 1
TRU 2
TRU 3
TRU 4
TRU 5
TRU 6
19
25
P1
P2
P3
58
1 (x4)
5
62 (x4)
22
304 (x6)
303 (x3)
302 (x12)
BB
CDU 1
CDU 2
CDU 3
P23
IDM
33
210
20
66
305 (x3)
SW
DOOR
Climate Unit
24 V
ACV
217
67
27
ACCU
9
Transm.
RS 232
TM 24V
EXT. Alarm
BUS
P004651B

Cabinet version V4 and V5

Pos	Product Number	Product Name	Description
1	RPM 513 739/00800	Power cable	+24V
5	RPM 513 872/01600	Connection cable	
6,7,15		Cable	See ch. Comm P. V1, V2, V3, V4, V5
8		Cable	See ch. "Power Cables"
9,25,26		Cable	See ch. "Transmission Interface Cables"
11	RPM 513 738/01200	Connection cable	
12	RPM 513 738/01500	Connection cable	
13	RPM 513 707/02160	Connection cable	Alarm
14	RPM 513 740/01925	Connection cable	
18	RPM 513 696/00520	Connection cable	
19		Printed board assemb	[75)] LOCAL BUS TERMINATION
20	RPM 513 849/01500	Power cable	+24V
21	RPM 513 1151/1	Connection cable	
22	RPM 513 1397/00800	Earthing cable	RBS 2102
24A	RPM 513 854/02160	Connection cable	Only in early deliveries of Cabinet V4, V5
24B	RPM 513 854/01620	Connection cable	
27	RPT 403 804/01	Connector	D-SUB STRAPPING PLUG 120 OHM
28	RPM 513 718/01800	Power cable	+24V DC
29	RPM 513 718/02100	Power cable	
30	RPM 513 718/03000	Power cable	+24V DC
31,32		Cable	See ch. "Power Cables"
33	RPM 513 718/01100	Connection cable	
58	RPM 513 1381/01800	Connection cable	DOOR SW./CABINET RBS 2102 See ch. "Special Mechanics Cabinet V3, V4"
62-67		Cable	See ch. "ACCU-2"
210		Connection cable	See ch. Climate Unit V3, V4, V5.
217		Power cable	+24V See ch. Climate Unit V3, V4, V5.
301	RPM 513 856/2	Power cable	+24V
302	NTZ 112 85/BB02	Spare parts set	TRU BACKPLANE BOARD SET See separate page
303	RPM 513 1408/01500	Connection cable	L =1.5 m.
304	RPM 513 715/02200	Power cable	+24V TRU-MAG(RBS2102)
305	RPM 513 718/01500	Power cable	+24 V

[75)] See chapter "Recommended (Not Repairable) Spare Parts"

This page is intentionally left blank

Revision Information

About this chapter

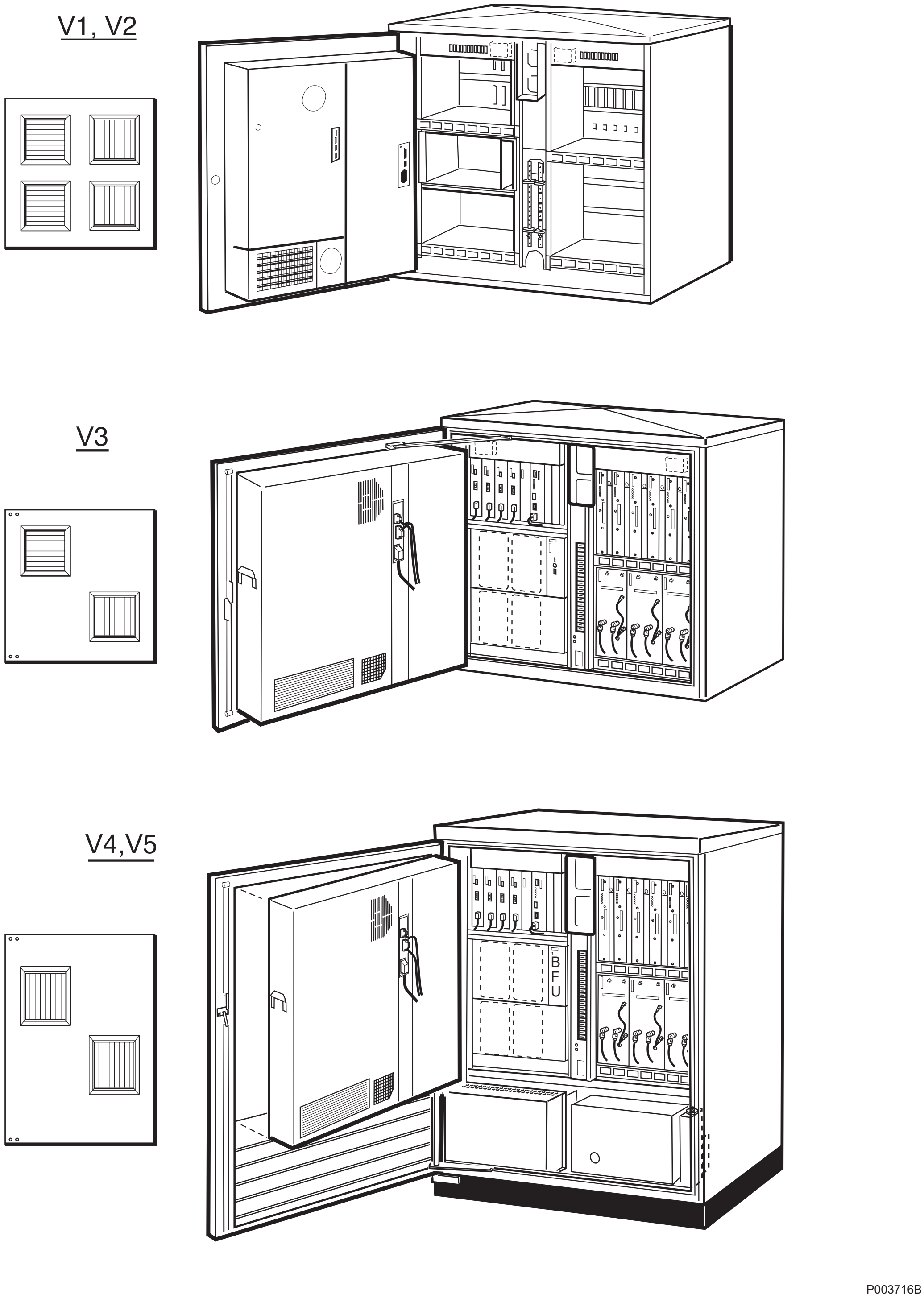
In this chapter you will find Product Revision Information and definitions of versions, V1, V2, V3, V4, V5 for the Cabinet and the Climate Unit

In the table below you can see the most important Revisions and the relations between them.

<table>
<tr><td>Climate Unit</td><td colspan="2">V1</td><td colspan="2">V2</td><td colspan="2">V3</td><td colspan="2">V4</td><td>V5</td></tr>
<tr><td>Cabinet</td><td colspan="2">V1</td><td colspan="2">V2</td><td colspan="2">V3</td><td colspan="2">V4</td><td>V5</td></tr>
<tr><td>Distribution Unit</td><td colspan="4">Top mounted IDM1, IDM2</td><td colspan="5">Middle mounted IDM</td></tr>
<tr><td>Fan Control</td><td colspan="4">FCU</td><td colspan="5">FCU3</td></tr>
<tr><td>Battery Box</td><td>BB1</td><td colspan="2">BB2</td><td colspan="2">BB3</td><td colspan="4">BB4</td></tr>
<tr><td>Mounting Base</td><td colspan="6">Yes</td><td colspan="3">No</td></tr>
<tr><td>AC Connection</td><td colspan="6">ACCU-1</td><td>ACCU-2</td><td colspan="2">ACCU-3</td></tr>
<tr><td>Extern Alarm Connection</td><td>EACU-1</td><td colspan="5">EACU-2</td><td colspan="3">EACU-3</td></tr>
<tr><td></td><td colspan="9"></td></tr>
<tr><td>Released</td><td colspan="2">dec-95</td><td colspan="2">mar-96</td><td colspan="2">nov-96</td><td colspan="2">nov-98</td><td>may-00</td></tr>
</table>

P004713B

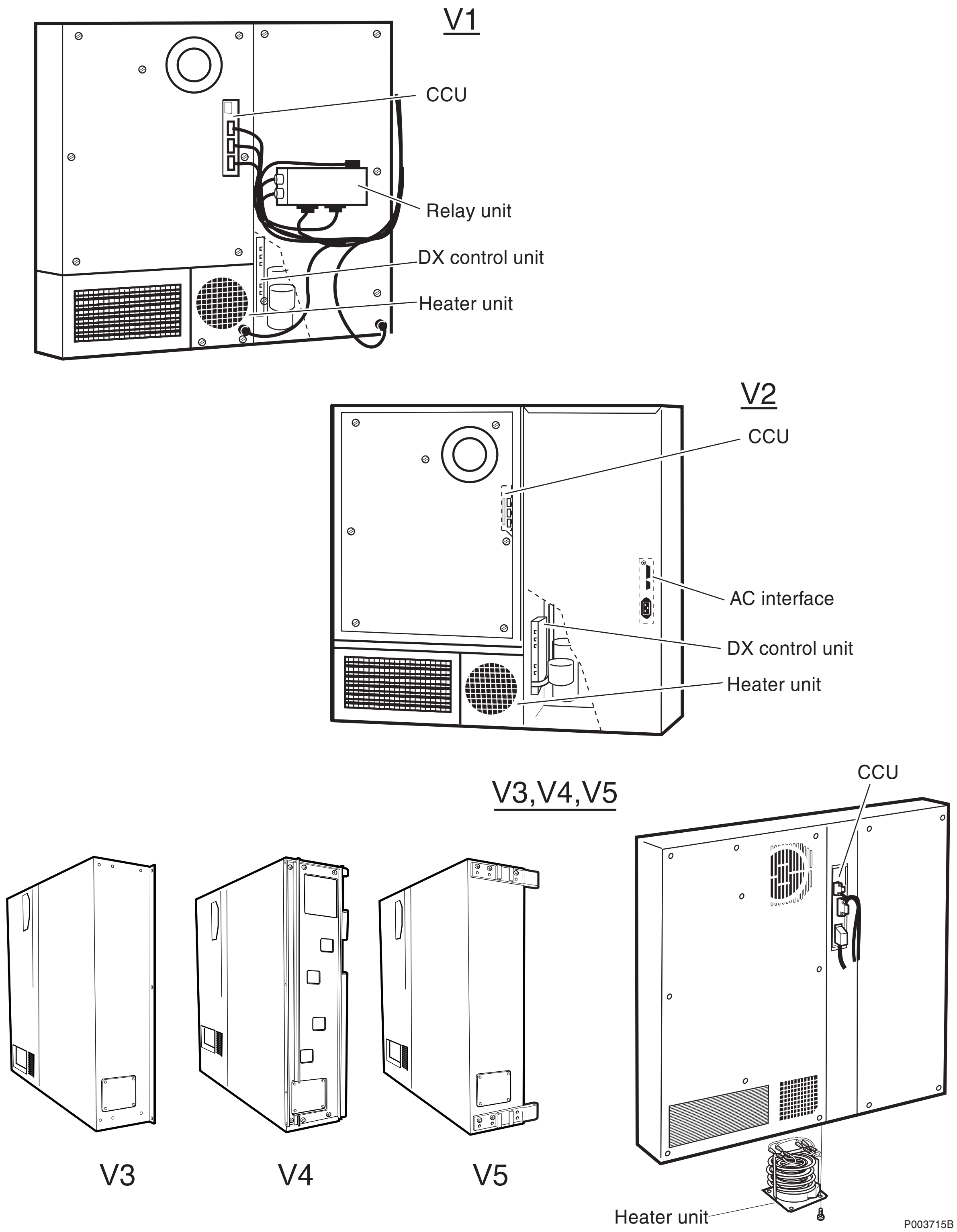
Cabinet Release History



Definition of Cabinet Versions

Definition	Product No	R-state	Rel. date	Product Information. Comments
Factory Version 1 (Production discontinued)			Cabinet Prepared for Climate Unit V1	
V1 Green (Glossy)	SEB 112 606/01	R1D/A	951207	Door-stop SXK 107 5060/1 introduced.
		R3A	951207	New Door-stop SXK 107 5060/3 and Door
Factory Version 2 (Production discontinued)			Cabinet Prepared for Climate Unit V2	
V2 Green (Glossy)	SEB 112 606/01	R3B	960320	Climate Unit V2 introduced.
V2 Grey (Glossy)	SEB 112 606/05	R3B	960603	Grey colour introduced.
		R3C	960702	Batt. Box BKB 103 03/2 and /3 introduced
Factory Version 3			Cabinet Prepared for Climate Unit V3	
V3 Green (Glossy)	SEB 112 1007/01	R3C	961118	New Cabinet design. New IDM, FCU, Door-stop SXK 107 5060/5 and Door switch. Many new cables. Climate Unit BPD 104 08/1 introduced.
V3 Grey (Glossy)	SEB 112 1007/05	R3C	961118	
Factory Version 4			Cabinet Prepared for Climate Unit V4	
V4 Green (Structure)	SEB 112 1050/07	R2A	981030	Structured Colours introduced. Completly new Cabinet design without Mounting Base. New ACCU, Connection field, TM cover, New (hinged) Climate Unit BPD 104 08/1 introduced. All internal Spare Parts in the Climate Unit are the same as for V3.
V4 Grey (Structure)	SEB 112 1050/08	R2A	981030	
Factory Version 5			Cabinet Prepared for Climate Unit V5	
V5 Green (Structure)	SEB 112 1050/07	R3A	000501-	New cover for TM-Box. ACCU-3 introduced. Small hinges introduced on the Climate Unit.
V5 Grey (Structure)	SEB 112 1050/08	R3A	000501-	

Cimate Unit, Release History



Definition of Climate Unit Versions

Pos	Product No	R-state	Rel. date	Product Information.
Factory Version 1 (Discontinued)		AC mains cable attached to a relay unit		
V1 50 Hz	BPD 104 02/01	R1C-R1F	951211-960531	Diode, Thermistor, Sealing gasket, Lifting bracket added.
Factory Version 2 (Discontinued)		AC mains cable attached to an interface board.		
V2 50 Hz	BPD 104 02/01	R2B-R3B	951211-960531	
V2 60 Hz	BPD 104 02/02	R2B-R3B	951211-960531	Relay box BCV 904 01/1 replaced by built-in AC-interface. "Extern. temp" sensor moved from "H.E air inlet" to "Compressor air inlet". Heater set point changed fr +5 to +10C. Version 60 Hz introduced.
Factory Version 3	Combined 50/60 Hz version. AC mains cable to a new, center-mounted CCU			
V3	BPD 104 08/1	R1B-	961118-	New design. Transformer added. New CCU. Heater set point and By-pass set point changed. External heater control added.
		R2A-	980630-	New expander value, termorelay, E-prom and transformer
Factory Version 4	Combined 50/60 Hz version. AC mains cable to center-mounted CCU.			
V4	BPD 104 08/1	R3A-	981030-	Climate Unit prepared with hinges to make rear inspection easier. New cables to the new Cabinet. New software version for the CCU.
Factory Version 5	Combined 50/60 Hz version. AC mains cable to center-mounted CCU. Small Hinges.			
V5	BPD 104 08/1	R3B-	000501-	Small hinges introduced. All internal Spare Parts are the same for V3, V4, V5 (exepting CCU board)
Note	Use NTZ 112 466 as replacement set for Climate Units V3, V4, V5. (See about page 74)			

This page is intentionally left blank

Replaced and Withdrawn Parts

About this chapter

This Chapter shows replaced or withdrawn products

Due to continous improvement in design and production methods, some parts are changed.

This is the only place in this catalogue release where you still can find Product Numbers shown in previous catalogues. In this way we manage to keep the Numerical Index as a list of orderable Spare Parts.

This page is intentionally left blank

Old Product	Revision Information	New Product

Note

Depending on continious improvement of the design and production method, some parts may have changed. Some cables, RPM 513, have changed length. (Length is indicated in mm by the last digits of the Product Number, /xxxxx).

24/BPD 104 02/01	Replaced by:	24/BPD 104 02/02
24/BPD 104 08/1	Replaced by:	24/BPD 104 08/11
BFL 119 311/1	Replaced by set:	NTZ 112 468
BFL 119 311/2	Replaced by set:	NTZ 112 468
BPD 104 02/11	Replaced by:	BPD 104 02/01
BPD 104 02/12	Replaced by:	BPD 104 02/02
BPD 104 08/1	Replaced by set:	NTZ 112 466
BKV 301 253/1	Replaced by:	BKV 301 253/3
BMG 980 315/1	Deleted	
BMG 980 318/1	Deleted, never released	
BMG 980 318/2	Deleted, never released	
BMY 201 148/1	Cancelled. Replaced by:	BMY 201 148/3
BMG 980 318/2	Deleted, never released	
KRC 131 47/01	Replaced by:	KRC 131 47/03
KRY 112 002/1	Replaced by:	KRY 112 38/1
KRY 112 004/1	Replaced by:	KRY 112 37/1
NCL 502 103/01	Replaced by:	NCL 402 204/01
NTZ 112 85/DS01	Cancelled. Replaced by:	NTM 201 1554/1
NTZ 112 85/LK02	(Divided) Replaced by:	NTZ 112 85/LK021 + ../LK022
NTZ 112 85/LK12	(Divided) Replaced by:	NTZ 112 85/LK121 + ../LK122
NTZ 112 85/LK22	(Divided) Replaced by:	NTZ 112 85/LK221 + ../LK222
ROA 117 2136/1	Replaced by:	ROA 117 2136/4
RPM 513 707/02000	Replaced by:	RPM 513 707/02160
RPM 513 708/01200	Replaced by:	RPM 513 708/01300
RPM 513 709/01200	Replaced by:	RPM 513 709/01300
RPM 513 739/01000	Replaced by:	RPM 513 739/01050
RPM 513 740/01200	Replaced by:	RPM 513 740/01925
RPM 513 741/02250	Replaced by:	NTZ 112 85/CA01
RPM 513 741/03665	Replaced by:	NTZ 112 85/CA02
RPM 513 743/01700	Replaced by:	RPM 513 743/02000

RPM 513 754/00600	Replaced by:	RPM 513 1298/00600
RPM 513 848/04000	Replaced by:	RPM 513 848/03700
RPM 513 849/02500	Replaced by:	RPM 513 849/02200
RPM 513 852/00160	Replaced by:	RPM 119 081/160
RPM 513 852/00250	Replaced by:	RPM 119 081/250
RPM 513 852/00600	Replaced by:	RPM 119 081/600
RPM 513 852/01000	Replaced by:	RPM 119 081/1000
RPM 513 852/01300	Replaced by:	RPM 119 081/1300
RPM 513 854/01500	Replaced by:	RPM 513 854/02160
RPM 513 873/01800	Deleted	-
RPM 513 880/01200	Replaced by:	RPM 513 880/01300
RPM 513 1337/02320	Replaced by:	RPM 513 1337/02000
SEB 112 543	Deleted	-
SXA 120 7993/2	Deleted	-
SXK 107 4736/1	Replaced by:	SXK 107 6059/1
SXK 107 5040/1	Replaced by:	SXK 107 6059/1
SXK 119 365/1	Replaced by:	SXK 119 048/2

Parts moved to a higher "level"

NCL 502 104/01	Replacement included in:	BMG 980 307/1
	and	BMG 980 307/2
	and	BMG 980 307/3
NCL 502 105/01	Replacement included in:	BMG 980 307/1
NCL 502 105/02	Replacement included in	BMG 980 307/2
NCL 502 105/03	Replacement included in	BMG 980 307/3
RPM 513 940/6	Replacement included in	NTZ 112 85/CA01 R1D (or higher R-state)
	and	NTZ 112 85/CA02 R1C (or higher R-state)

Parts removed from the Catalogue, until a chapter "Config. Cables" is ready

Please note that the parts below still are orderable

RPM 513 878/00330	(Configuration Cable)
RPM 513 878/00435	(Configuration Cable)
RPM 513 1396/1	(Configuration Cable)
SCG 326 10/5	(Part of a Config. Cable)

Numerical Index