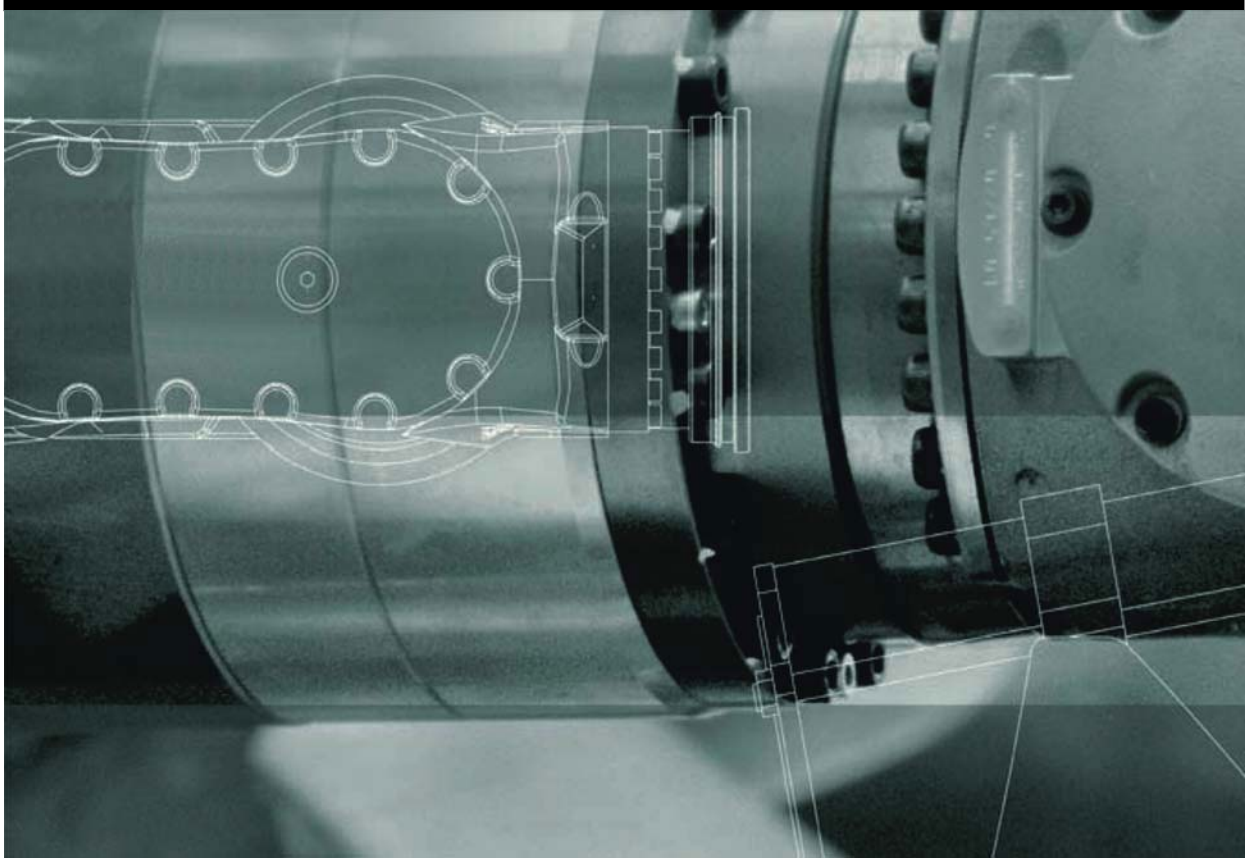
KUKA

Service Information

KUKA Roboter GmbH

KUKA Sunrise Cabinet

Work Instructions



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Version: AA KUKA Sunrise Cabinet V2

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Other functions not described in this documentation may be operable in the controller. The user has no claims to these functions, however, in the case of a replacement or service work.

We have checked the content of this documentation for conformity with the hardware and software described. Nevertheless, discrepancies cannot be precluded, for which reason we are not able to guarantee total conformity. The information in this documentation is checked on a regular basis, however, and necessary corrections will be incorporated in the subsequent edition.

Subject to technical alterations without an effect on the function.

Translation of the original documentation

KIM-PS5-DOC

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Version:	AA KUKA Sunrise Cabinet V2

Contents

1 Introduction

1.1 Representation of warnings and notes

Safety

These warnings are relevant to safety and **must** be observed.

DANGER	These warnings mean that it is certain or highly probable that death or severe injuries **will** occur, if no precautions are taken.
WARNING	These warnings mean that death or severe injuries **may** occur, if no precautions are taken.
CAUTION	These warnings mean that minor injuries **may** occur, if no precautions are taken.
NOTICE	These warnings mean that damage to property **may** occur, if no precautions are taken.

These warnings contain references to safety-relevant information or general safety measures.
These warnings do not refer to individual hazards or individual precautionary measures.

This warning draws attention to procedures which serve to prevent or remedy emergencies or malfunctions:

SAFETY INSTRUCTIONS	Procedures marked with this warning **must** be followed exactly.

Hints

These notices serve to make your work easier or contain references to further information.

Tip to make your work easier or reference to further information.

2 Work instructions

2.1 Exchanging the CCU_SR

2.1.1 Purpose and validity

Purpose

Aim of this work instruction:

- Exchanging the CCU_SR

Validity

Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet
Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.1.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.1.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- Crosstip screwdriver
- Socket wrench
- ESD armband

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
CCU_SR	231334 KUKA.Sunrise spare parts packages	1x

Time required

The time needed for the performance of this work is:

- 30 min

Workplace

The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.1.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.
- Observe the ESD guidelines.

2.1.4.1 Removing the CCU_SR

Procedure

1. Loosen the housing cover screws and open the cover.

Fig. 2-1: Housing cover screws

1 Housing cover screws

2. Unlock the data cable connectors. Unplug all connections to the CCU_SR.

NOTICE Unplugging the data cable connectors without first unlocking them damages the connectors. Unlock the connectors before unplugging them.

Fig. 2-2: Connector locking mechanism of data cable

1 Data connector unlocked
2 Data connector locked

3. Remove the screws from the fastening plate and remove the plate together with the CCU_SR.

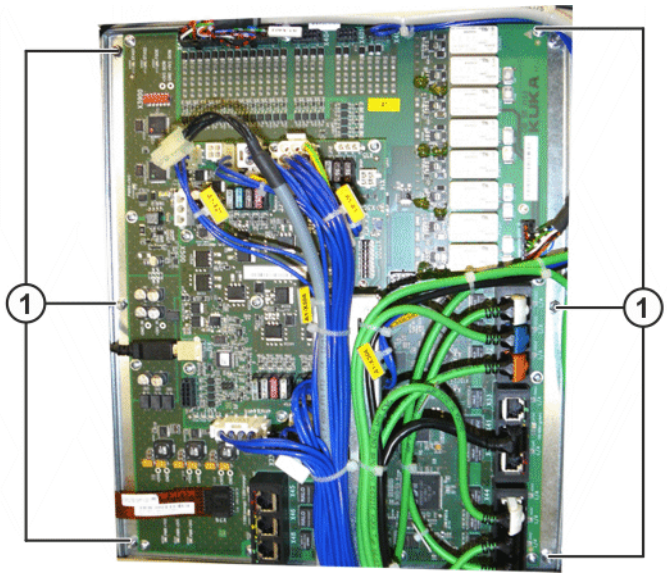

Fig. 2-3: CCU_SR fastening

1 CCU_SR fastening

2.1.4.2 Installing the CCU_SR

Procedure

1. Check the CCU_SR for mechanical damage. Insert the fastening plate with the CCU_SR and screw it down.

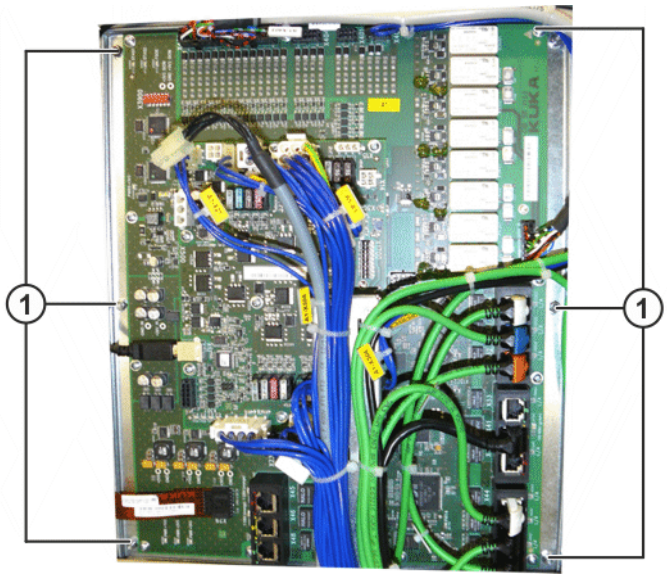

Fig. 2-4: CCU_SR fastening

1 CCU_SR fastening

2. Plug in all the connections in accordance with the connector and cable labeling. Lock the data cable connectors.
3. Secure cables with cable straps.
4. Close the housing cover.

2.2 Exchanging the hard drive HDD/SSD

2.2.1 Purpose and validity

Purpose

Aim of this work instruction:

- Exchanging the hard drive HDD/SSD

Validity

Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet
Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.2.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.2.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- Crosstip screwdriver
- ESD armband

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
Hard drive HDD	231334 KUKA.Sunrise spare parts packages	1x
Festplatte SSD	231334 KUKA.Sunrise spare parts packages	1x

Time required

The time needed for the performance of this work is:

- 15 min

Workplace

The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.2.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.

- Observe the ESD guidelines.

2.2.4.1 Removing the hard drive HDD/SSD

Procedure

1. Loosen the housing cover screws and open the cover.

Fig. 2-5: Housing cover screws

1 Housing cover screws

2. Unplug the hard drive connections.

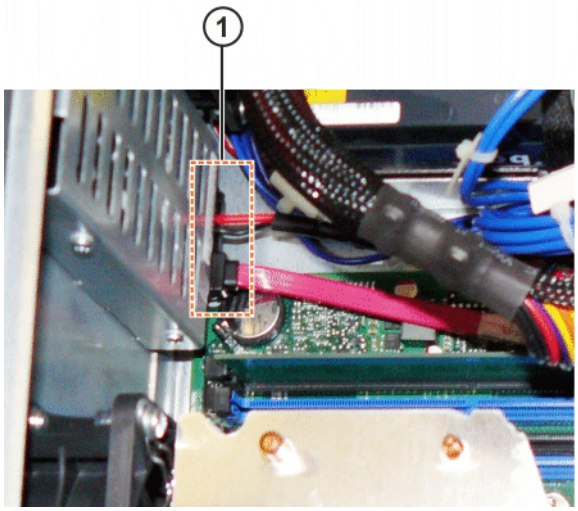

Fig. 2-6: Connection of hard drive

1 Hard drive connections

3. Remove the hard drive retaining screws.

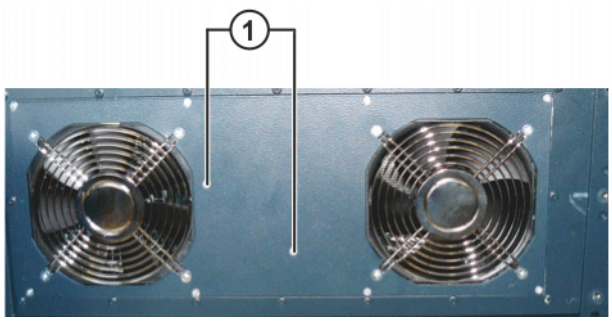

Fig. 2-7: Hard drive fastening

1 Hard drive fastening

4. Remove the hard drive.

2.2.4.2 Installing the hard drive HDD/SSD

Procedure

1. Insert the new hard drive and fasten it to the housing.

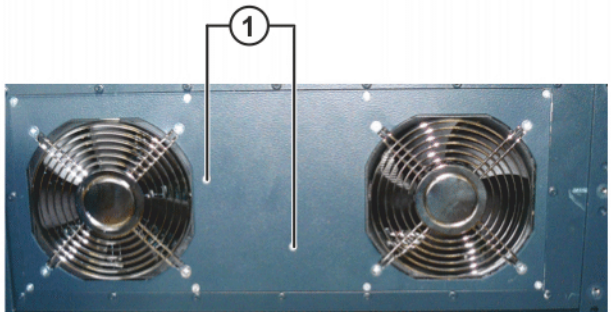

Fig. 2-8: Hard drive fastening

1 Hard drive fastening

2. Plug in the connections.

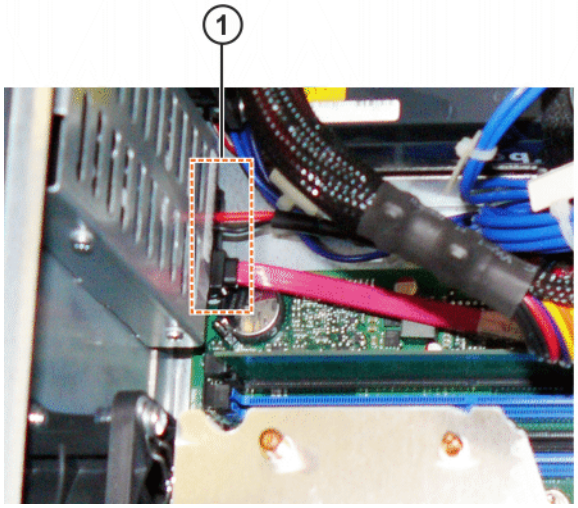

Fig. 2-9: Connection of hard drive

1 Hard drive connections

3. Close the housing cover.

2.3 Exchanging the low-voltage power supply unit

2.3.1 Purpose and validity

Purpose

Aim of this work instruction:

- Exchanging the low-voltage power supply unit

Validity

Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet
Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.3.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.3.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- Crosstip screwdriver
- ESD armband

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
Low-voltage power supply unit	231334 KUKA.Sunrise spare parts packages	1x

Time required

The time needed for the performance of this work is:

- 30 min

Workplace

The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.3.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.
- Observe the ESD guidelines.

2.3.4.1 Removing the low-voltage power supply unit

Procedure

1. Loosen the housing cover screws and open the cover.

Fig. 2-10: Housing cover screws

1 Housing cover screws

2. Unplug the connections on the low-voltage power supply unit.
3. Unplug the connections from the low-voltage power supply unit to the motherboard.

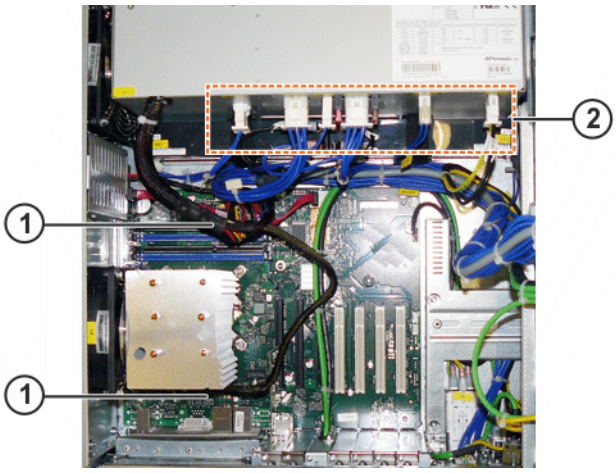

Fig. 2-11: Connections for low-voltage power supply

1 Connections to the motherboard
2 Connections on the low-voltage power supply unit

4. Remove the fastening screws from the low-voltage power supply unit.

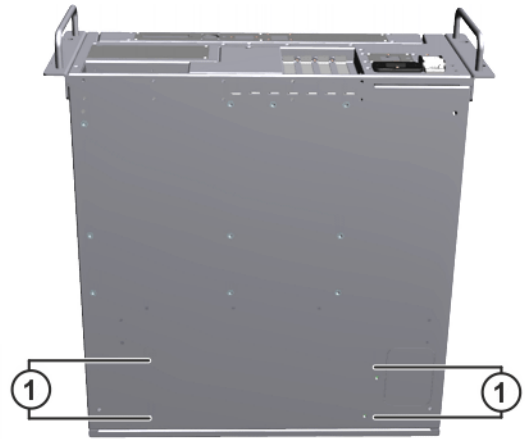

Fig. 2-12: Low-voltage power supply unit, fastening (underside of the housing)

1 Fastening screws for low-voltage power supply unit

5. Remove the low-voltage power supply unit.

2.3.4.2 Installing the low-voltage power supply unit

Procedure

1. Insert and fasten the low-voltage power supply unit.

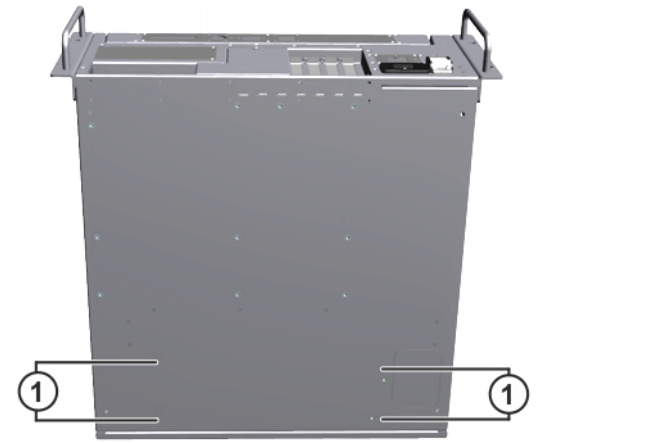

Fig. 2-13: Low-voltage power supply unit, fastening (underside of the housing)

1 Fastening screws for low-voltage power supply unit

2. Plug in the connections on the low-voltage power supply unit in accordance with the connector and cable labeling.
3. Plug in the connections from the low-voltage power supply unit to the motherboard.

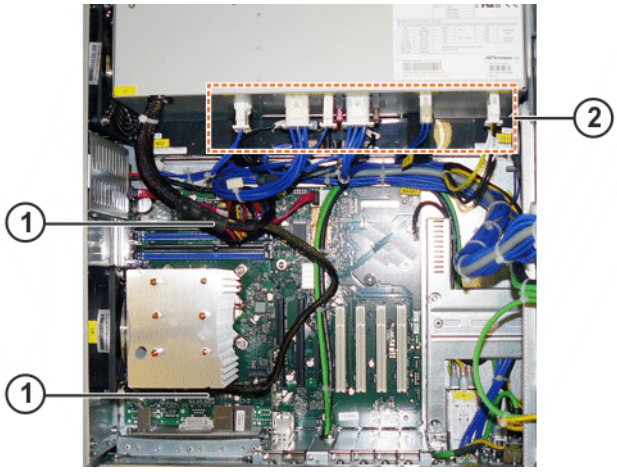

Fig. 2-14: Connections for low-voltage power supply

1 Connections on the motherboard
2 Connections on the low-voltage power supply unit

4. Close the housing cover.

2.4 Exchanging the mains filter with plug-in connector

2.4.1 Purpose and validity

Purpose Aim of this work instruction:

- Exchanging the mains filter with plug-in connector

Validity Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet

Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.4.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.4.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- Crosstip screwdriver
- ESD armband

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
Mains filter with plug-in connector	231334 KUKA.Sunrise spare parts packages	1x

Time required

The time needed for the performance of this work is:

- 15 min

Workplace

The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.4.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.
- Observe the ESD guidelines.

2.4.4.1 Removing the mains filter with plug-in connector

Procedure

1. Remove the fastening screws from the plug-in connector. Pull the plug-in connector forwards to remove it.

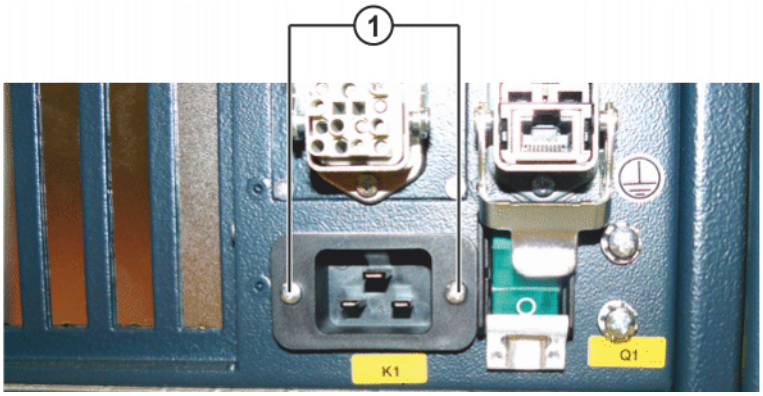

Fig. 2-15: Plug-in connector, fastening

1 Fastening screws of mains filter with plug-in connector

2. Unplug connections of mains filter with plug-in connector.

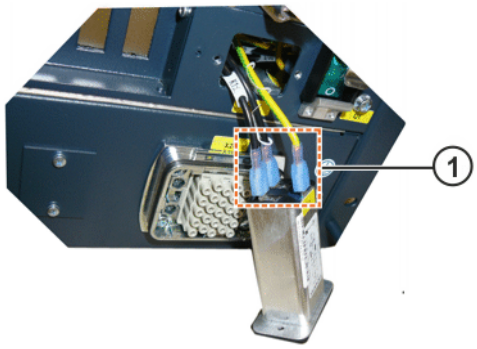

Fig. 2-16: Connections of mains filter with plug-in connector

1 Connections of mains filter with plug-in connector

3. Remove the mains filter with plug-in connector.

2.4.4.2 Installing the mains filter with plug-in connector

Procedure

1. Plug in connections of mains filter with plug-in connector.

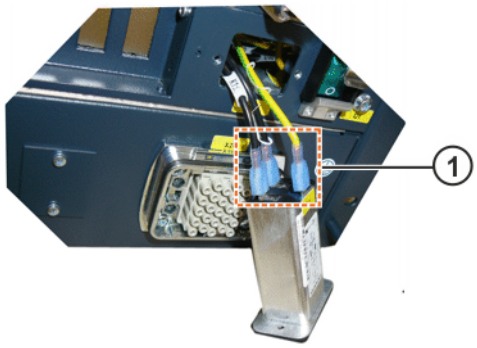

Fig. 2-17: Connections of mains filter with plug-in connector

1 Connections of mains filter with plug-in connector

2. Push mains filter with plug-in connector into the opening and fasten it.

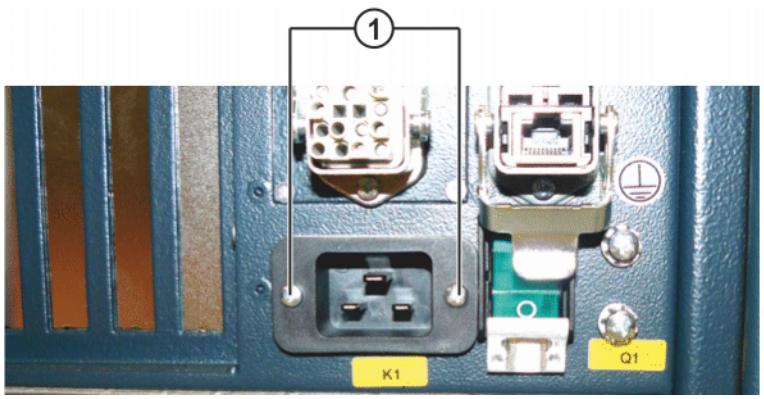

Fig. 2-18: Plug-in connector, fastening

1 Fastening screws of mains filter with plug-in connector

2.5 Exchanging the brake resistor

2.5.1 Purpose and validity

Purpose

Aim of this work instruction:

- Exchanging the brake resistor

Validity

Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet
Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.5.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.5.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- Socket wrench
- Set of Allen keys (hex keys)

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
Brake resistor	231334 KUKA.Sunrise spare parts packages	1x

Time required The time needed for the performance of this work is:

- 30 min

Workplace The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.5.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.
- Observe the ESD guidelines.

2.5.4.1 Removing the brake resistor

Procedure

1. Loosen the housing cover screws and open the cover.

Fig. 2-19: Housing cover screws

1 Housing cover screws

2. Remove the fastening screws from the brake resistor.
3. Remove the temperature sensor connection.
4. Disconnect the brake resistor.

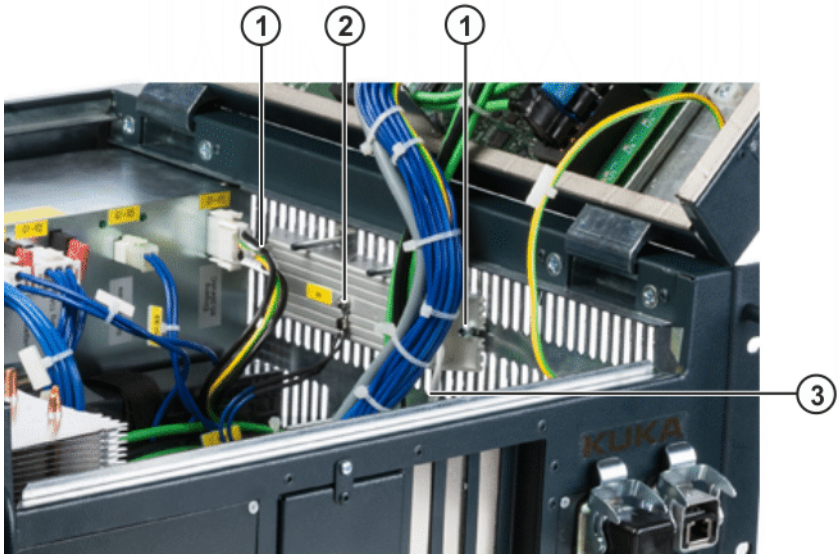

Fig. 2-20: Brake resistor fastening

1 Fastening screws on brake resistor
2 Connection for temperature sensor
3 Brake resistor connection

5. Remove the brake resistor from the housing.

2.5.4.2 Installing the brake resistor

Procedure

1. Insert the brake resistor in the housing and screw it in place.
2. Connect the temperature sensor.
3. Connect the brake resistor and secure the connecting cable.

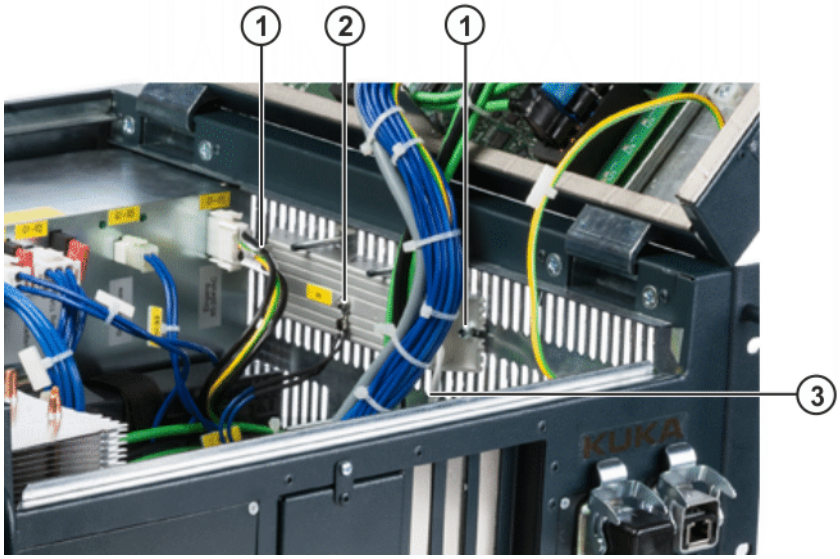

Fig. 2-21: Brake resistor fastening

1 Fastening screws on brake resistor
2 Connection for temperature sensor
3 Brake resistor connection

4. Close the housing cover.

2.6 Exchanging the motherboard

2.6.1 Purpose and validity

Purpose

Aim of this work instruction:

- Exchanging the motherboard

Validity

Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet
Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.6.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.6.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- Crosstip screwdriver
- Torx 10
- ESD armband

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
Motherboard	231334 KUKA.Sunrise spare parts packages	1x

Time required

The time needed for the performance of this work is:

- 30 min

Workplace

The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.6.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.
- Observe the ESD guidelines.

2.6.4.1 Removing the motherboard

Procedure

1. Loosen the housing cover screws and open the cover.

Fig. 2-22: Housing cover screws

1 Housing cover screws

2. Unplug the fan connections.

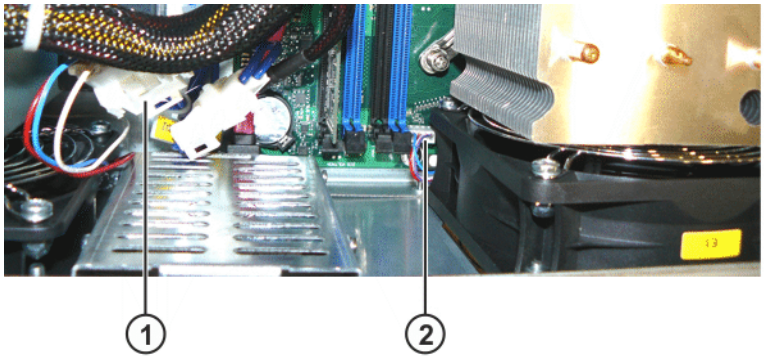

Fig. 2-23: Connections for fans

1 Connector for fans
2 Connector for motherboard CPU fan

3. Remove the fastening screws from the fan holder.

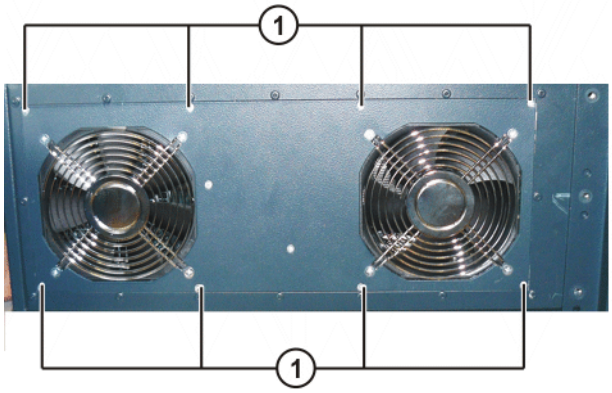

Fig. 2-24: Fastening of fans

1 Fastening of the fan holder

4. Remove the fan holder with the fans.
5. Remove all PC plug-in cards.
6. Disconnect all motherboard connections.
7. Remove 10 motherboard fastening screws (Torx).

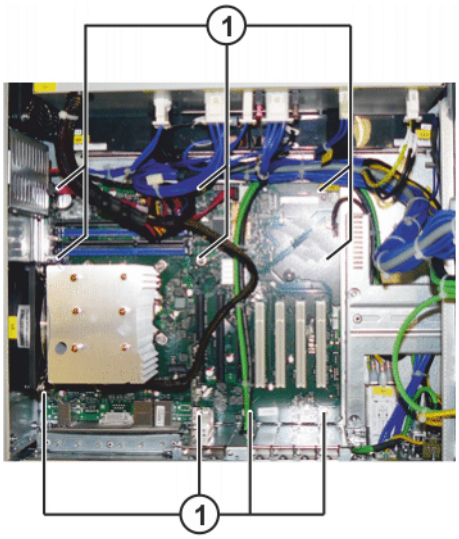

Fig. 2-25: Motherboard fastening

1 Motherboard fastening

8. Remove motherboard from the housing and place it on a suitable ESD-compliant support.

2.6.4.2 Installing the motherboard

Procedure

1. Insert new motherboard and screw it in place.
2. Screw in 10 motherboard fastening screws (Torx).

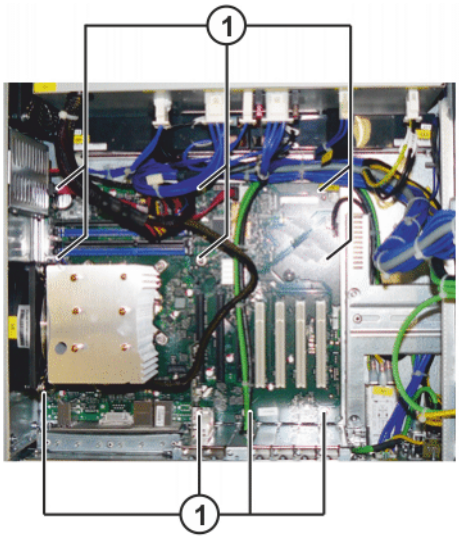

Fig. 2-26: Motherboard fastening

1 Motherboard fastening

3. Plug in all motherboard connections.
4. Install the fan holder with the fans.
5. Screw in the fastening screws of the fan holder.

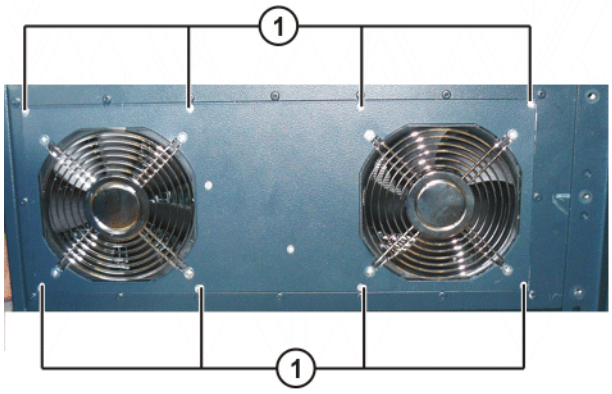

Fig. 2-27: Fastening of fans

1 Fastening of the fan holder

6. Plug in the fan connections.

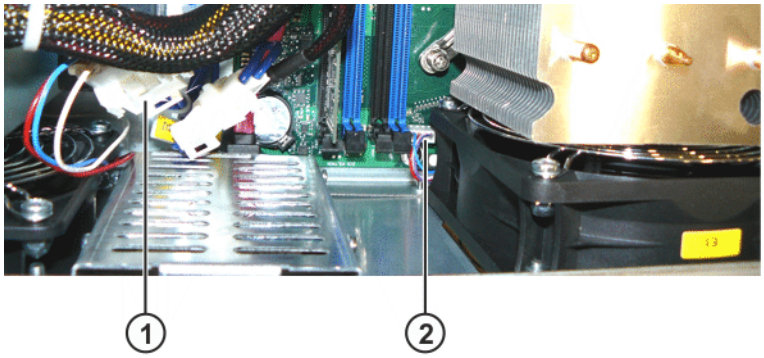

Fig. 2-28: Connections for fans

1 Connection for fans
2 Connector for motherboard CPU fan

7. Install the PC plug-in cards.
8. Close the housing cover.

2.7 Exchanging the main memory

2.7.1 Purpose and validity

Purpose

Aim of this work instruction:

- Exchanging the main memory

Validity

Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet
Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.7.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.7.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- ESD armband

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
Main memory	231334 KUKA.Sunrise spare parts packages	1x

Time required

The time needed for the performance of this work is:

- 10 min

Workplace

The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.7.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.
- Observe the ESD guidelines.

2.7.4.1 Removing the main memory

Procedure

1. Loosen the housing cover screws and open the cover.

Fig. 2-29: Housing cover screws

1 Housing cover screws

2. Using your thumbs, carefully open the side tabs in the direction indicated by the arrows. The DIMM memory module is released and lifted out of its socket.

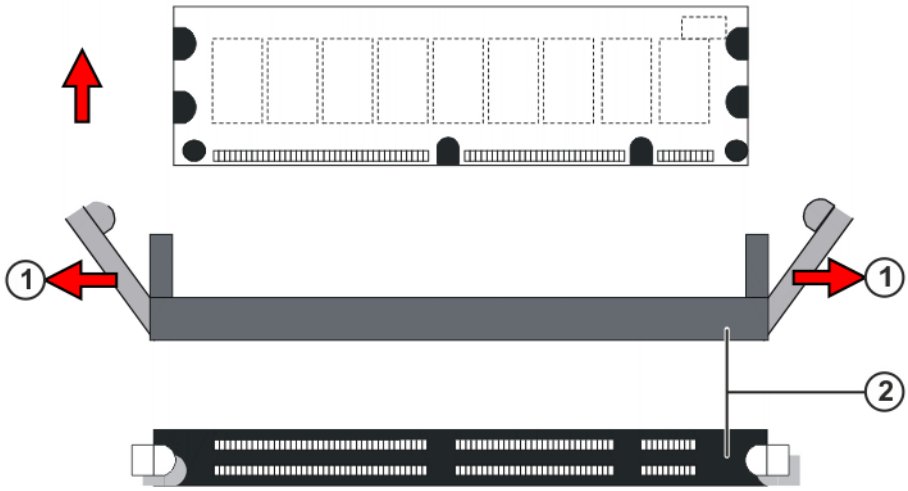

Fig. 2-30: Exchanging DIMM memory modules

1 Side tabs
2 DIMM memory module socket

3. Remove the main memory from the housing and place it on a suitable ESD-compliant support.

2.7.4.2 Installing the main memory

Procedure

1. Press the new DIMM memory module into the slot in the DIMM socket until it clicks into position.

> There are two asymmetrically positioned recesses on the underside of the DIMM memory modules; these must mate with the coding on the DIMM socket.

1 Side tabs
2 Asymmetrically positioned recesses
3 DIMM memory module socket

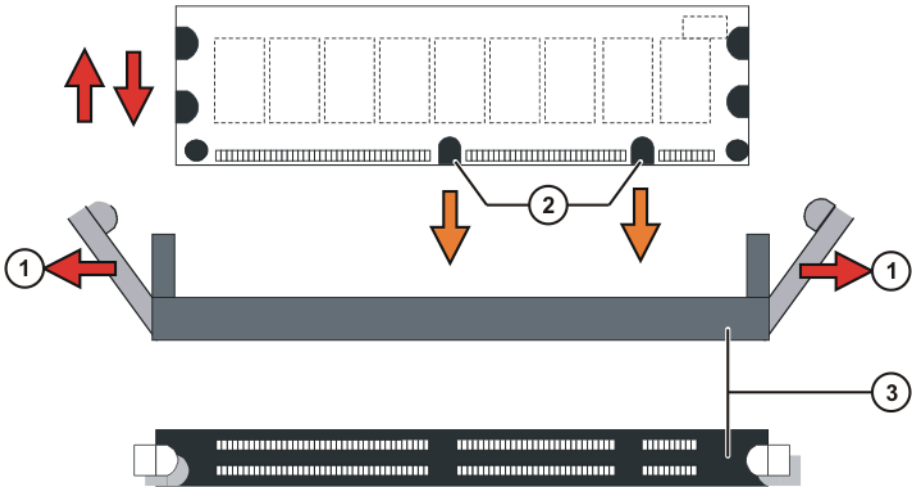

Fig. 2-31: Exchanging DIMM memory modules

2. Close the housing cover.

2.8 Exchanging the network card

2.8.1 Purpose and validity

Purpose

Aim of this work instruction:

- Exchanging the network card

Validity

Description of the work instruction:

Robot controller	KUKA Sunrise Cabinet
Target group	KUKA Service Technicians Subsidiaries
Necessary qualifications	Electronic training

2.8.2 Work safety

⚠ WARNING Before work is commenced on live parts of the robot system, the main switch must be turned off and secured against being switched on again by unauthorized personnel. The incoming power cable must be deenergized. The robot controller and mains supply lead must then be checked to ensure that it is deenergized.
Failure to observe this precaution may result in death or injuries.

2.8.3 Preparation

Equipment

The following tools are required:

- Slotted screwdriver
- Crosstip screwdriver
- ESD armband

Material

The following material is required:

Please refer to the spare parts list for the current article number.

Material	Spare parts list	Qty
Network card	231334 KUKA.Sunrise spare parts packages	1x

Time required

The time needed for the performance of this work is:

- 15 min

Workplace

The work can be performed at the following locations:

- At the customer's plant
- KUKA company site

2.8.4 Work procedure

Precondition

- The robot controller must be switched off and secured to prevent unauthorized persons from switching it on again.
- Power supply lead disconnected.

- Observe the ESD guidelines.

2.8.4.1 Removing the network card

Procedure

1. Loosen the housing cover screws and open the cover.

Fig. 2-32: Housing cover screws

1 Housing cover screws

2. Remove cover of network connections.
3. Unplug the connections to the Dual GbE network card.

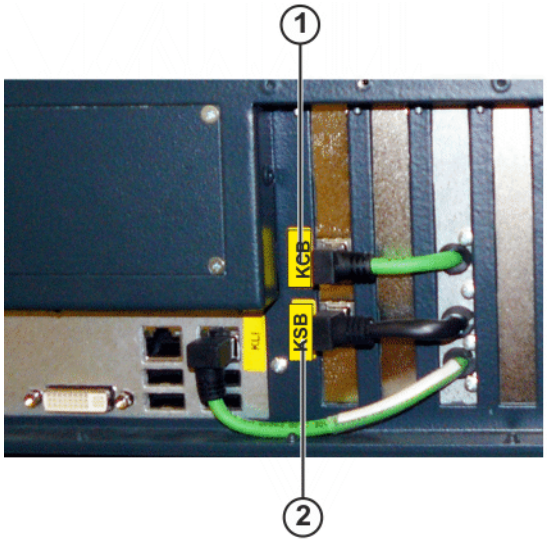

Fig. 2-33: Dual GbE network card connections

1 Connector KCB
2 Connector KSB

4. Loosen the network card fastening.

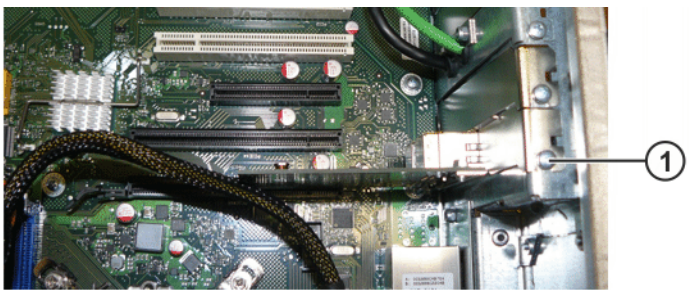

Fig. 2-34: Dual GbE network card, fastening

1 Network card fastening

5. Pull the network card out of its slot and place it on a suitable ESD-compliant support.

2.8.4.2 Installing the network card

Procedure

1. Inspect the network card for mechanical damage.
2. Insert the network card into its slot and tighten the fastening screws.

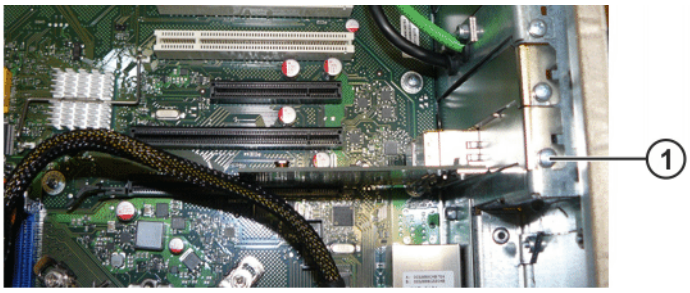

Fig. 2-35: Dual GbE network card, fastening

1 Network card fastening

3. Plug in the connections to the network card.

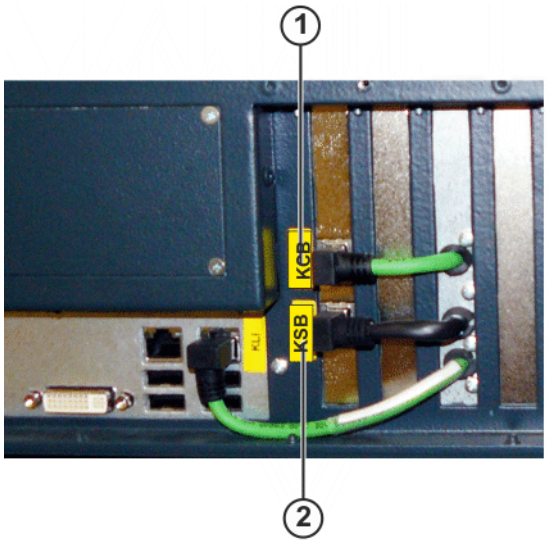

Fig. 2-36: Dual GbE network card connections

1 Connector KCB
2 Connector KSB

4. Fasten cover of network connections.
5. Close the housing cover.

Index