Service Instructions

Version: 05

Patient table

"CAP02-CS0131-SIE01"

SKF Actuation System (Liestal) AG

1 Basics

Introduction

This chapter explains the organization and composition of the service instructions. Use it as a guide and for quick access to the information you are looking for.

Contents

These service instructions explain how to replace components on the patient table "CAP02-CS0131-SIE01".

Scope

The information contained herein apply to the patient table "CAP02- CS0131-SIE01", identified as follows:

- **Product name: Patient table**
- **Model: "CAP02-CS0131-SIE01"**
- **Beginning with serial no.: M01114001**
- **CE marking: Acc. to technical documentation**

Target group

These instructions are intended for service technicians, who have the required training to service this product.

Carefully review the service instructions before servicing the table. Give special attention to the chapter on safety.

Notational conventions

We use several abbreviations and symbols in these service instructions to identify certain passages or notices

Safety notices

WARNING: Safety notice warning you of the risk of irreparable property damage and personal injury based on the risk analysis. It includes information on safety precautions and any required special training and protective clothing.

These notices are indicated as follows:

	⚠ WARNING
⚠	**The source of the risk is specified.** **Description of possible consequences!** • Instructions on how to avoid the risk.

CAUTION: Safety notices warn you of hazards, which may remain if the safety precautions against property damage and personal injury are not completely effective; they include information on any required special training and protective clothing

These notices are indicated as follows:

	⚠ CAUTION
	**The source of the risk is specified.** **Description of possible consequences!** • Instructions on how to avoid the risk.

General advice

ADVICE: Advices for the understandability, elaborations or simplification at the processing

These notices are indicated as follows:

	⚠ ADVICE
J	Possible circumstances or simplification at the processing **Description of possible consequences!** • **Instuction to avoid additional effort**

Service instructions

All steps necessary for a sequence of actions are listed in the order they must be performed

Cross references

Cross references to other sections in the service instructions are bracketed; they include the corresponding section heading and page number.

Cross references are indicated as follows:

(à Cross references, page 5)

References to figure details

Details in figures are alphabetized clockwise and referenced in the text accordingly.

Safety

Safety notices are distinguished in these instructions according to their application.

- **General safety notices**
  These notices are generally applicable and must be followed each time components are replaced. See section (à General safety notices, page 6).
- **Special safety notices**
  These notices only apply to certain components, and are included in the instructions to replace that particular component.

General safety notices

Follow these safety notices during all service activities:

	**⚠ WARNING** **Service activities on an active table.** **Electric shock!** • **Switch off the table before service and ensure it is disconnected from the power supply.**

	**⚠ WARNING** **Crushing or damaging cables.** **Electric shock!** • **Ensure the strain relief and cable routing is correct when installing components.**

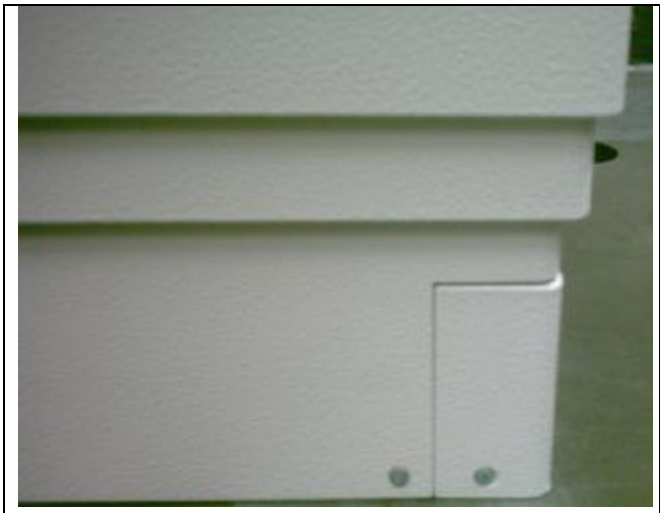
	**⚠ CAUTION** **Use of improper tool or material.** **Table damage / malfunction!** • **Use only original parts and the indicated special tools.**

Mechanical installation

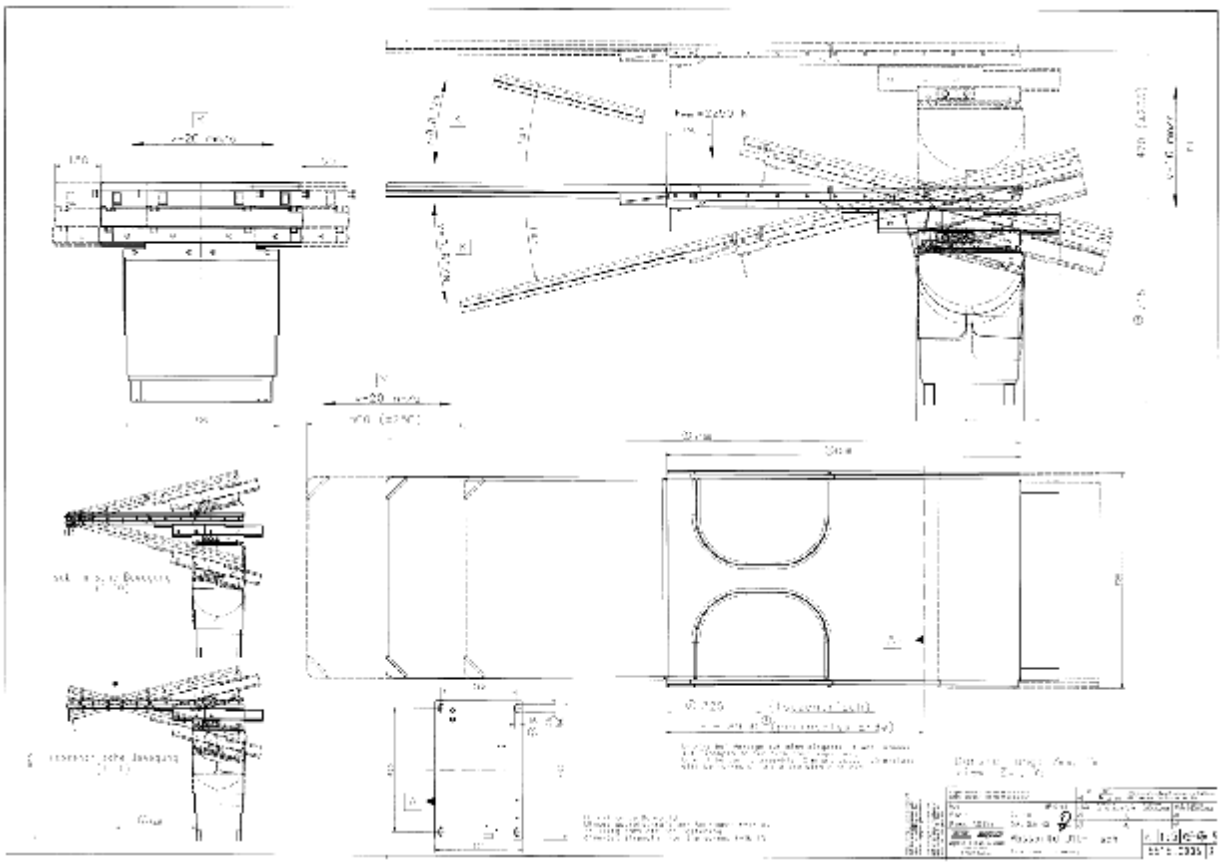
The table is delivered in "zero position" as illustrated in the diagram below, and is secured directly to the floor of the operation site with 4 screws.

	⚠ CAUTION
⚠	**Improper table attachment.** **Risk of personal injury!** • The floor condition, screws and dowel pin must guarantee a minimum extraction force (F_A) of 16 kN per attachment point. • Ensure that the floor screw extraction cones do not overlap depending on the floor condition

	⚠ CAUTION
⚠	**Improper table transport.** **Damage to table!** • The table may only be raised on the guide rails.



The fastening bores are located in the 4 corners of the base of the table behind individually removable cover plates. The screws can be removed with a 2.5-mm Allen wrench.



Electrical installation

The electrical connection configuration is optimized to integrate the table into the complete Siemens system. The plugs and plug assignments are customized accordingly.

Power connection (PU.X100)

The power is connected via a shielded connection line to a switched-mode power supply that functions reliably in a broad voltage range.

Cable design: 3 x 1.5 mm2 shielded, 4300 mm long

Power supply	Color	Pin bar 4-pin Metrimate designated as: PU.X100
L	Bn or Sw1	1
N	Bl or Sw2	2
PE	Gnge	3
Shielding	-	4

⚠ CAUTION

Table overload.

Increased heat development!

- There are no fuses on the primary side (120V & 230V range); they must be provided for both line conductors during installation of the end-user application. Delayed-action fuses according to IEC 60127 with the following nominal values must be used:
- Line voltage 230 V: 4 A
- Line voltage **120 V: 8 A**

⚠ WARNING

Service activities on improperly disconnected table.

Electric shock!

- A disconnecting device enabling all-pole separation from the supply network with a contact opening width of min. 3 mm must be provided in the control cabinet. A display to indicate whether the table has power must also be provided.

Equipotential bonding conductor

4 mm² chartreuse with a cable shoe 4x6, 4300mm long

Hardware line (DXP.X7)

There are two groups of hardware signals.

The signals from the emergency stop, collision resolution, and litho sections are not processed at the table but are only connected through. All signals are 24V signals

interrupted by break contacts (implicit interruption detection) supplied by the system control.

The signals EGY, DMG, and QS are 24V signals from the system control to the table control to ensure the various safety shutdowns.

The signal EGY S Table FB is the feedback signal of the EGY signal for testing the EGY function.

2 x line 4 x 2 x 0,14 mm² shielded or line 10 x 2 x 0.14 mm² shielded, 4600mm long

Hardwaresignale	D-SUB pin bar (15-pin) and housing with screw locking designated as: DXP.X7
DMG Table +	3
DMG – (GND)	10
EGY S Table +	1
EGY – (GND)	9
EGY S Table FB	2
QS Table +	4
QS – (GND)	11
Litho section R+	14
Litho section L+	15
Litho section R In	7
Litho section L In	8
Collision resolution +	12
Collision resolution In (-)	5
Emergency stop In	6
Emergency stop	13
Shielding	Housing

User interface connection (D1.X36)

The user interface is configured for the requirements of the Siemens hand control.

The signals are not processed at the table but are connected through to the system control.

Line 6 x 2 x 0.14 mm² shielded, 4600 mm long

Control panel plug (ODU 10-pin)	User interface line	D-SUB pin bar (15-pin) and housing with screw locking designated as: D1.X36
10	CAN GND (UI H1)	14 / 15
8	CAN H (UI H1)	(twisted pairs with 8) 7
9	CAN L (UI H1)	8
1	24V + (UI H1)	(twisted pairs with 14) 1
2	DMG GND (24V) – (UI H1)	9
3	DMG DR (UI H1)	2

Control panel plug (ODU 10-pin)	User interface line	D-SUB pin bar (15-pin) and housing with screw locking designated as: D1.X36
4	DMG DL (UI H1)	3
5	DMG STW (UI H1)	4
6	DMG SUM (UI H1)	5
7	DMG GND (UI H1)	10 - 13
	Spare (stays open)	6
Housing	Shielding	Housing

CAN connection (D1.X21)

Line 2 x 2 x 0.14 mm² shielded, 4600 mm long, terminated at both ends 120 ohms

CAN connection	D-SUB pin bar (9-pin) and housing with screw locking designated as:**D1.X21**
CAN-L (Table)	**2**
CAN-GND (Table)	**3**
CAN-H (Table)	**(**twisted pairs with **2) 7**
CAN-+ (Table)	**(**twisted pairs with **3) 9**
Shielding	Housing

Start up, reference run

After start-up or service on the table, it is necessary to perform a reference run to adjust the position acquisition. This is always necessary in the event of a change to the external dual position acquisition due to component replacement, for example.

⚠ CAUTION

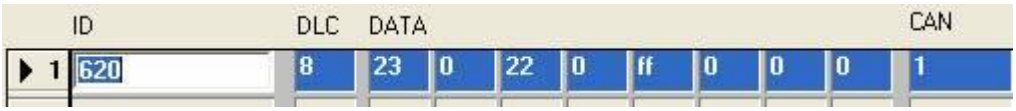
Moving the table into the end position during the reference run.

Collision with other components!

- The table is moved to all extreme positions during the reference run. Collisions with other system components must not occur.
- The patient table cannot be stopped via CAN during the reference run. STOP (EGY) aborts all movements.

A special service tool can be used to start the reference run via a CAN command.

Individual axes can be referenced in that a value other than zero is entered at the appropriate location in the telegram. The following is an example of the CAN telegram required to individually reference the transverse axis (X).



X	Y	Z	K

The reference run moves the table

Along the X-axis toward X- up to the limit switch and then toward X+ almost to the limit switch

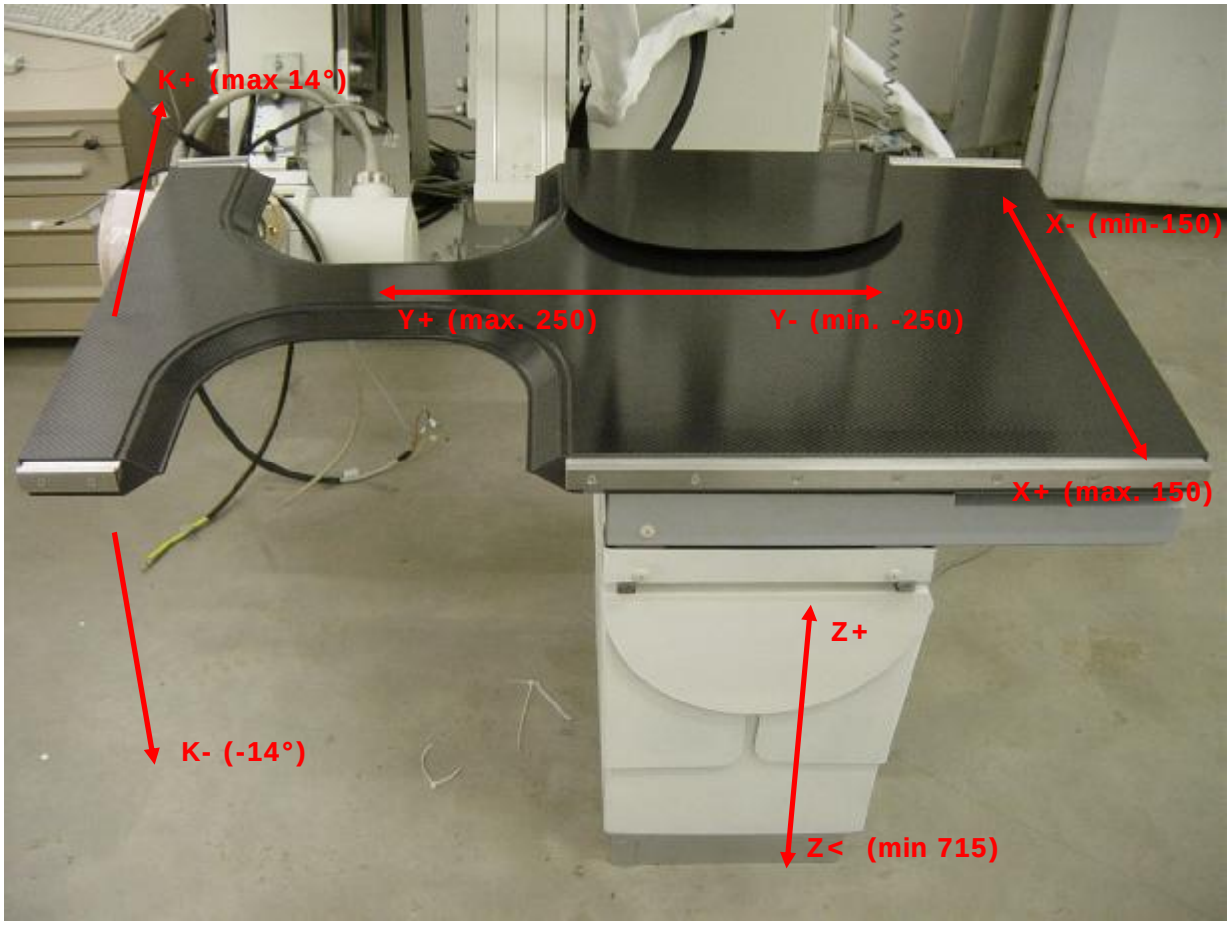
Along the Y-axis toward Y+ up to the limit switch and then toward Y- almost to the limit switch

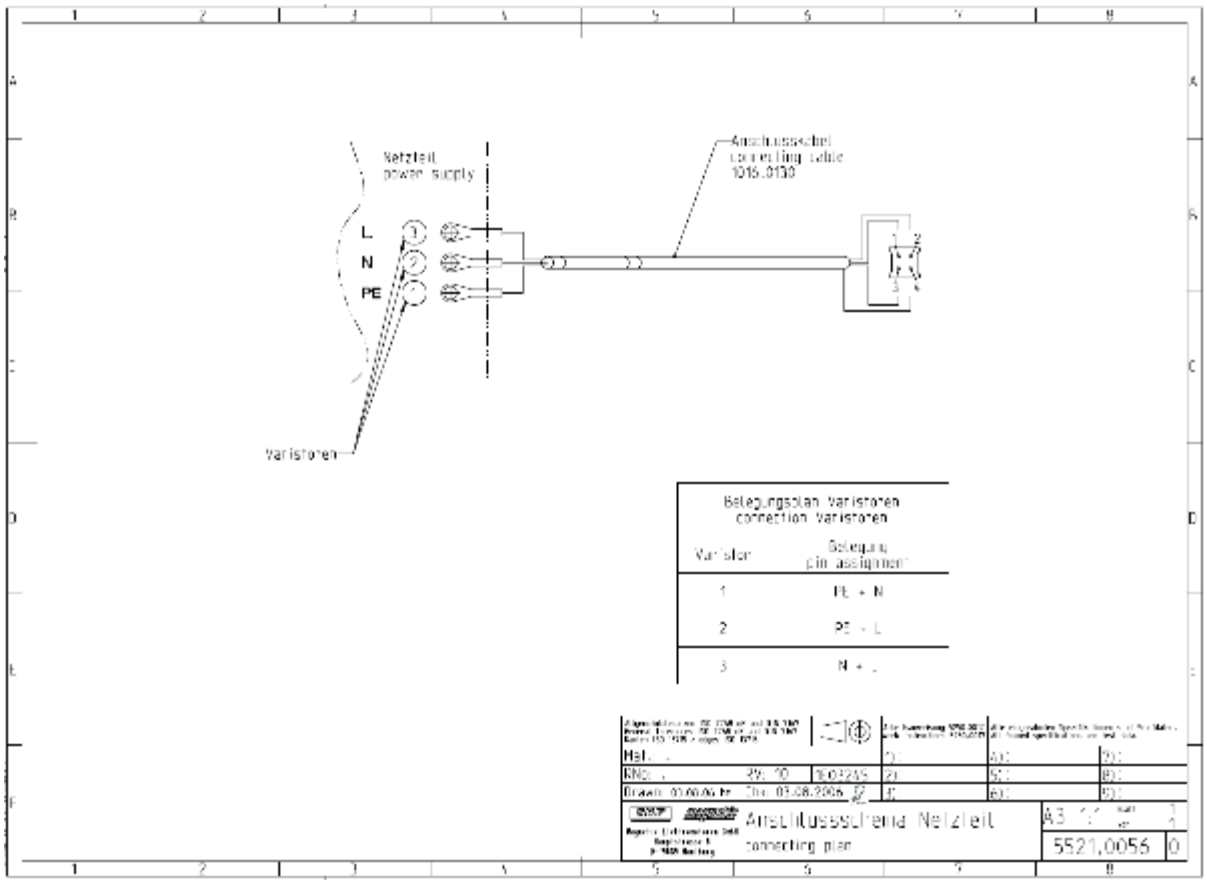
Along the Z-axis toward Z< up to the limit switch and then toward Z> almost to the limit switch

Along the K-axis toward K+ up to the limit switch and then toward K- almost to the limit switch

After the reference run, the table remains in the final extreme position.

The end of the reference run is not displayed via CAN. Every additional movement such as moving to the zero position (park position) must be triggered by the higher-level system.


K+ (max 14°)
X- (min-150)
Y+ (max. 250)
Y- (min. -250)
X+ (max. 150)
Z+
K- (-14°)
Z< (min 715)


Netzteil
power supply
L
N
PE
Varistoren
Belegungsplan Varistoren
connection Varistoren
Varistor
Belegung
pin assignment
1
PE - N
2
PE - L
3
N - L
Anschlussschema Netzteil
connecting plan
5521.0056

Maintenance and technical safety check

Maintenance

We recommend lubricating the Z-spindle with grease all two years once with “BERULUB FB 38”. As well as lubricating the slide rail with grease all two years once with „FAG Arcanol Multi3 K3N-30“.

Technical safety checks

To ensure safety over the entire service life, we recommend checking the protective conductor resistances and the unit leakage currents prior to start-up, after maintenance work, and at regular yearly intervals.

Refer to VDE 0751-1 for the procedural information.

These checks are legally required in some EU countries

	⚠ CAUTION
	**Country-specific regulations.** **Noncompliance with legally required safety inspections!** • **The system operator is responsible for determining the country-specific requirements.** • **These inspections may only be performed by properly trained personnel using suitable test equipment.**

Disposal

The table and its components comprise primarily of recyclable materials. Specialized companies can separate the recyclable materials and thereby minimize the amount of materials requiring disposal.

	⚠ CAUTION
	**Improper disposal of system components.** **Environmental hazards!** • **The system operator is responsible for determining the country-specific requirements.** • **Properly dispose of system parts and not in industrial or regular waste.**

Recycling passport

See the documents in the appendix 5615,0008 (Prohibited Materials) and 5615,0007 (Critical Materials).

Troubleshooting and malfunctions

The table monitors the plausibility of various measured values and results. In the event of deviations, the table stops for safety reasons and transmits a correspondingly coded emergency object via CANopen.

CAN error messages

If a table error occurs during operation, it is reported via an emergency object. The objects are configured as shown below:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Error Code		Err Registers	Message type	Error number	Error location	Additional information	

Error Code: According to DSP402, the emergency error code is defined as 0xFF00 for manufacturer-specific errors

Err Register:

Message type: 0x00 = Error / 0xFF = Warning

Error number: See description below for table error numbers

Error location: Axis number at which the error occurred 0xFF for entire table

Additional information: Additional information is provided depending on the error

1: Position measuring system error

The two position measuring systems have more than a 5 mm difference during movement or more than a 2 mm difference at rest. The specified value (additional information) corresponds to the internal unit that can be converted to mm.

Axis	No.	Movement tolerance	Rest tolerance
X	1	5mm (5250)	2mm (2100)
Z	2	5mm (6250)	2mm (2500)
Y	3	5mm (7500)	3mm (4500)
K	4	0.4° (8000)	1° (20000)

2: Drag error

The AVR or drives cannot follow the interpolator specification (5 mm). This error is also indicated when the drives are blocked or continue to move independently.

3: Range exceeded in the profile position mode (error)

The target position or speed defined via CAN is outside the range in the PP mode.

4: Range exceeded in the profile velocity mode (error)

The target speed defined via CAN is outside the range in the PV mode.

5: Limit switch (error)

Additional information: 0 = switch active / 1 = switch not active

Byte 6								Byte 7							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
				Endschalter								Referenzschalter			
-	-	-	-	K	Z	Y	X	-	-	-	-	K	Z	Y	X

A limit switch or reference switch was activated. The error message is sent once and additional limit switch errors are only sent if all limit switches were not previously activated

6: HW signal (error/warning)

Additional information: 0=DMG; 1=QS; 2=EGY

A HW signal (Deadman Grip, Quick Stop, Emergency Stop) was activated. In the case of Deadman Grip, only a warning and not an error message is issued.

7: System not calibrated (warning)

Additional information: Achsennummer Axis number bit code (bit0=axis0) / 1=axis calibrated If all axes are not calibrated, this message is transmitted and indicates which axis is not calibrated.

8: Start-up warning

Additional information: 0: No shutdown; 1=System moved/potentiometer defective; 2=System not calibrated; 3=Flash data invalid. The error is displayed during start-up.

See the appendix for further information according to Siemens requirements.

2 Replacing components

This chapter explains in detail how to prepare for and replace individual components. Order an original replacement part from the spare parts list. Other required materials and tools are listed before the explanation for each component.

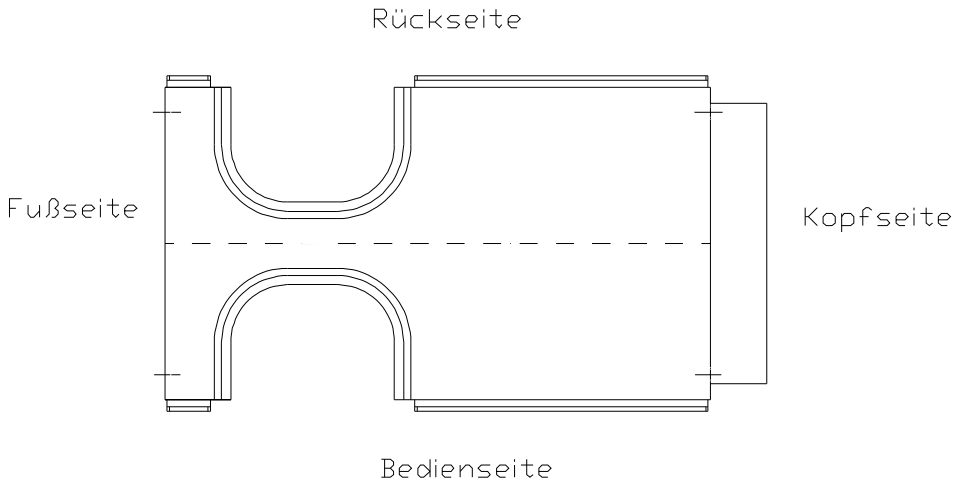
Spare parts list

The following spare parts can be purchased from the manufacturer using the MOVEX No. (Manufacturer and Contact Information, page 53)

MOVEX No	Part No.	Siemens No.	Description
0124177	SAS-1045,0196	8355617	Cover Patient table
0124178	SAS-3604,0001	8355138	Power supply, complete
0124179	SAS-HSM-02480-15-01	8355120	Lift-tilt module (incl. KKG10 and TMSE04)
0124180	SAS-TCO-04-CAN-01	8355104	Table control (incl. MiniMCB/Adapt.)
0124181	SAS-XYM-E500-E300-01	8355112	X/Y table module (incl. KKG006 and KKG012)
0124182	SAS-1054,0003	8355658	Operating panel
0124183	SAS-1047,0205	8355641	Cover screws
0124184	SAS-KKG10040-140-01	8355633	Title drive w/ cable
0124185	SAS-1086,0001	8355625	Cushion, complete
0124186	SAS-1040,0010	8355054	Tabletop U10
0124188	SAS-1040,0012	8355062	Slide-in module, complete.
0124187	SAS-1040,0011	8355070	Table extension
0124276	ZSY-822200	8356920	Table extension short

Service parts required to replace individual components can be purchased from the manufacturer using the MOVEX No. (Manufacturer and Contact Information, page 53).

Definition of the table views

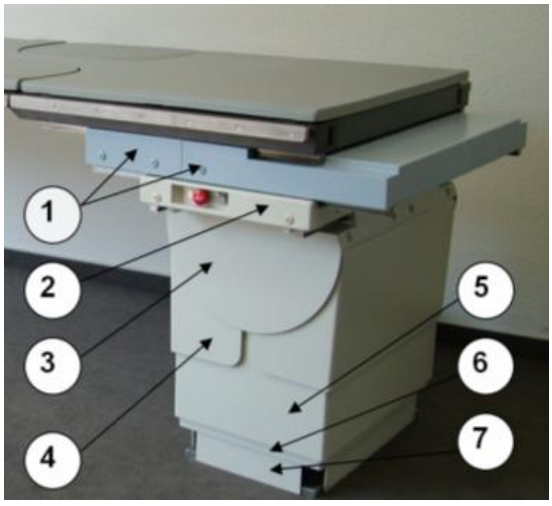


Removing/replacing XY module cover

Required tools and materials	
2 Allen wrench	2.5 Allen wrench

The table can be in any position during this procedure.

Disassembly



Cover panel designations

1. **Y-cover**
2. **X-cover**
3. **Round cover**
4. **Cover**
5. **Top cover**
6. **Middle cover**
7. **Bottom cover**

Unscrew screws on both sides (4x, 2.5 Allen) and remove blue panels at the head or foot end

Unscrew the white cover screws (2x, 2.5 Allen) and remove the stripping plate.

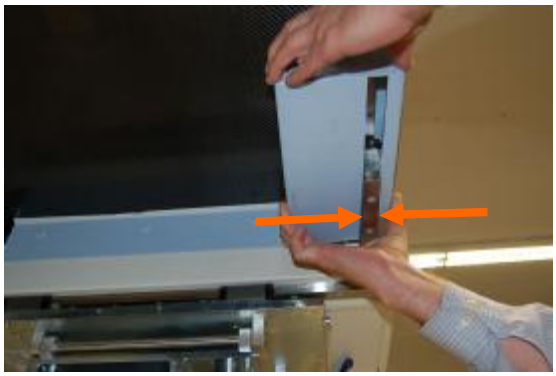
Unscrew screws (4x, 2.5 Allen) on both sides and remove side panels

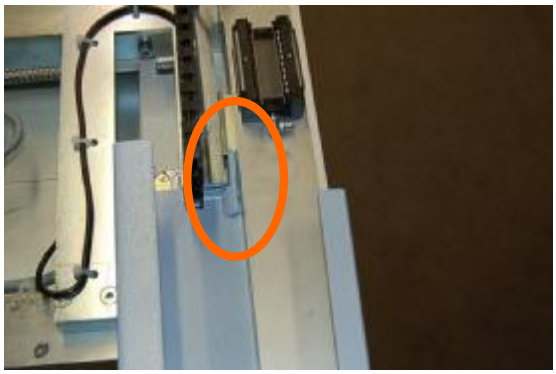
Unscrew screws (2x, 2.5 Allen) and remove panel.

Unscrew screws (2x, 2 Allen) on one side and then remove sliding panels from both sides.

Installation

Installation is performed in reverse order.





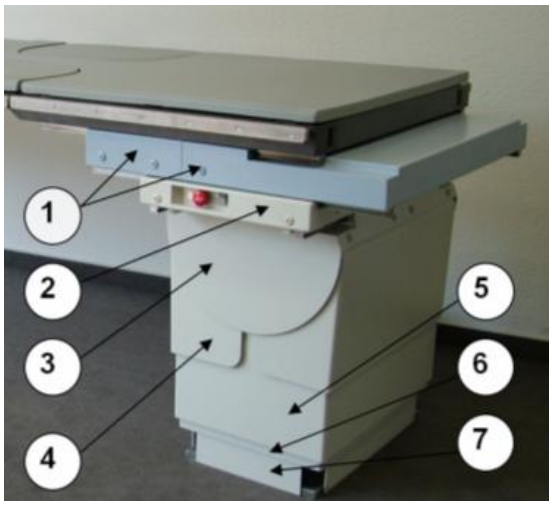
Beware that the blue panels at the head and foot end are close together to the rails so the guide pin comes to the guiding (see next picture)

Removing / replacing lift-tilt module cover

Required tools and materials	
2 Allen wrench	2.5 Allen wrench
1.0x5.5 flat-head screwdriver	

The table can be in any position during this procedure

Disassembly



Cover panel designations

1. Y-cover
2. X-cover
3. Round cover
4. Cover
5. Top cover
6. Middle cover
7. Bottom cover

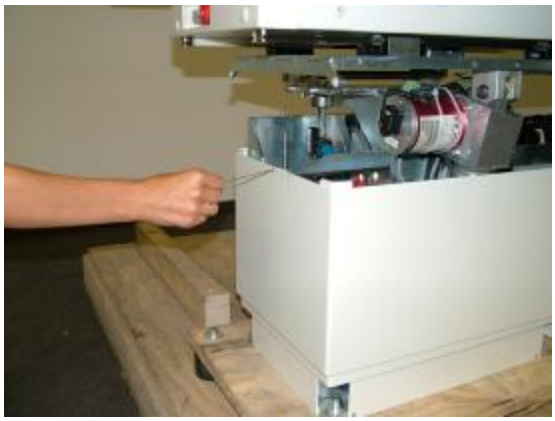
Unscrew screws (8x, 2.5 Allen) on the round cover and remove it sideways

Unscrew plastic screw (4x, 1.0x5.5 slot) on the cover

Unhinge and remove springs on both sides of both covers

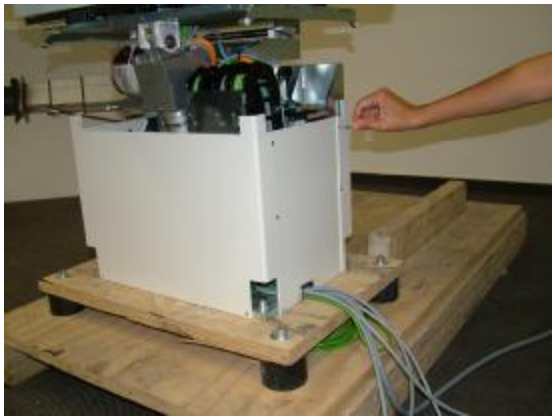
Brace the plastic hinge on one side and pull off the cover

Unscrew the upper cover cap on the back side (8x, 2 Allen) and remove cap.



Unscrew the upper cover on both sides (2x,2 Allen) and remove by gently forcing it apart.

Repeat the procedure on the middle cover

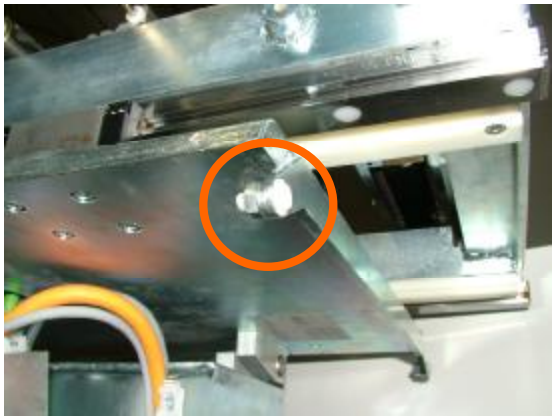


Unscrew the lower cover cap (6x, 2 Allen)

Loosen the bottom cover on the base plate (4x,2 Allen) and remove by gently forcing it apart.

Installation

Installation is performed in reverse order. The following additional steps must be taken.



It is somewhat easier to install the middle and upper cover if the cap is fastened first.

When installing the cover, check whether the plastic hinge is still OK and replace if necessary.

NOTE: When replacing the cover:

Before installing the new cover, the included blank name plate must be labeled with the complete table's serial number and adhered to the top cover. The number can be found on the old cover.

The spring hinges in the covers must be on both sides.

Removing / replacing operating panel

Required tools and materials	
2 Allen wrench	2.5 Allen wrench
1.0x5.5 flat-head screwdriver	

Table should be extended at lest 40 mm on the operating side (X-axis)

Disassembly

Unscrew screws (2x 2.5 Allen) and remove panel.

Unscrew screws (2x 2.5 Allen) and remove panel.

Unscrew operating panel (2x, 2.5 Allen)

Remove operating panel.

Installation

Installation is performed in reverse order.

Removing / replacing tabletop

Required tools and materials	
2 Allen wrench	2,5 Allen wrench
4 Allen wrench	

The table can be in any position during this procedure. However, service is easier the lower the table is moved (Y axis)

Disassembly

Unscrew screws on both sides (4x, 2.5 Allen) and remove blue panels at the head or foot end

Unscrew the white cover screws (2x, 2.5 Allen) and remove the stripping plate.

Unscrew table at driving piece (2x, 4 Allen)

Pull out tabletop (do not remove from guides). Loosen connector

Unscrew cable drag chain (2x, 2 Allen)

Pull table out slowly

Installation

Insertion aids are located in one of the foot-end Y panels

Insert the insertion sleeves into the foot-end linear slides on both sides

Carefully guide the tabletop into the linear slides

The insertion aides are pushed out

Insert the insertion aids into the head-end linear slides and continue to slide the tabletop in.

Installation is continued in the reverse order of disassembly

Removing/replacing XY module

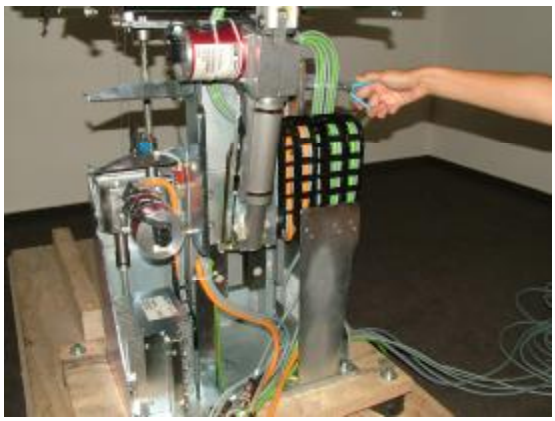
Required tools and materials	
2.5 Allen wrench	6 Allen wrench
A1 retaining ring pliers	Side cutting pliers
Plastic hammer	Drift bolts
Spacer 30x35x150 (any material, dimensions ±5mm)	
Cable ties 3.4 x 290	Loctite 241 or 243

The upper edge of the tabletop must be raised to at least 1080 mm

Disassembly

First follow the steps in (Removing/replacing XY module cover, page 20 Removing/replacing lift-tilt module cover, page 23 Removing/replacing tabletop, page 29).

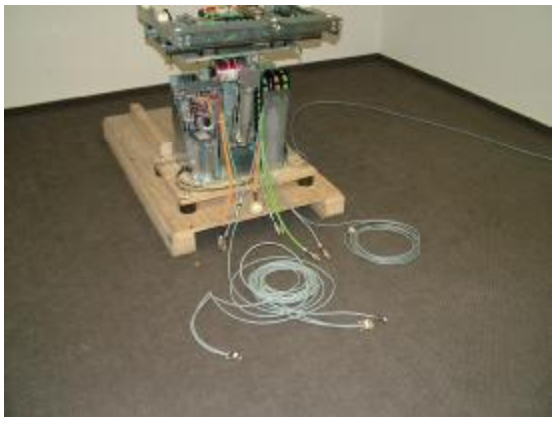
Unplug all connectors from the control



Cut all cable ties along the green cable

Remove the cable from the two external cable drag chains

Unscrew shielding (2x, 2.5 Allen) and pull cable through control cabinet



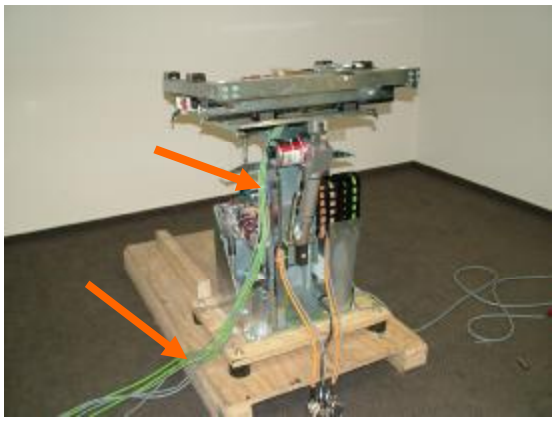
All removed cables

Remove retaining ring with A1 retaining ring pliers on the upper bolts

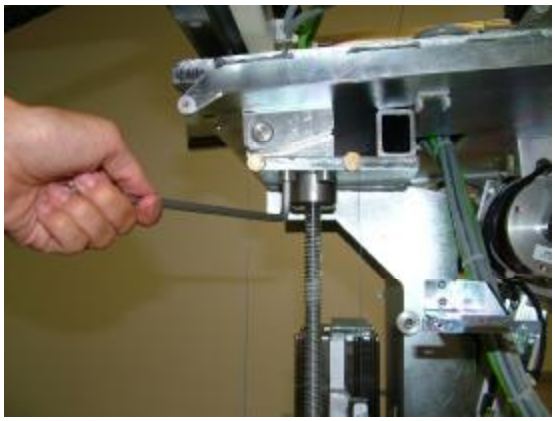
Remove the bolts. Someone must hold the XY module securely at the foot end while this is done. As soon as the bolt is completely removed, place a spacer between the lower and upper head plate.

⚠ WARNING
Removing the bolt on the motor side. XY module may tip over! • Hold the XY module securely (90kg) and tip it carefully onto the spacer.

View of spacer



Pull the entire loom of cables coming out of the head plate forward



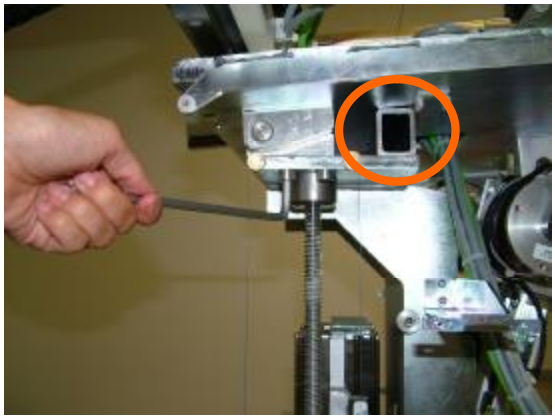
Unscrew the head plate screw (4x, 6 Allen). Someone must be holding the XY module securely while this is done.

⚠ WARNING
Removing the screw. XY module may fall over! • An additional assistant must hold the XY module (90kg) securely.

Lift the XY module (two people)

Installation

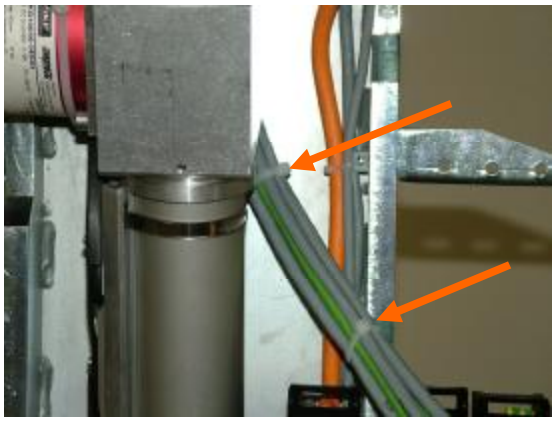
Installation is performed in reverse order. The following additional steps must be taken.



Place the XY unit back on and fasten tightly with screws (4x, 6 Allen). Apply Loctite 241 or 243 to the screws.

NOTE: Spacer must be on the head plate.

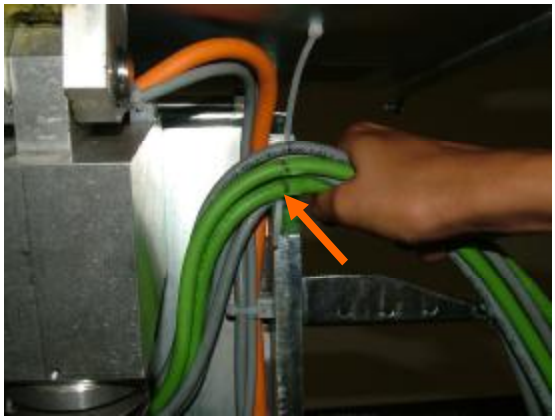
Reinstall the bolts onto the tilt drive. To do this, remove the spacer by carefully lifting the XY unit and then tilt it until the bolts can be installed.



Bind the cable loom with two cable ties

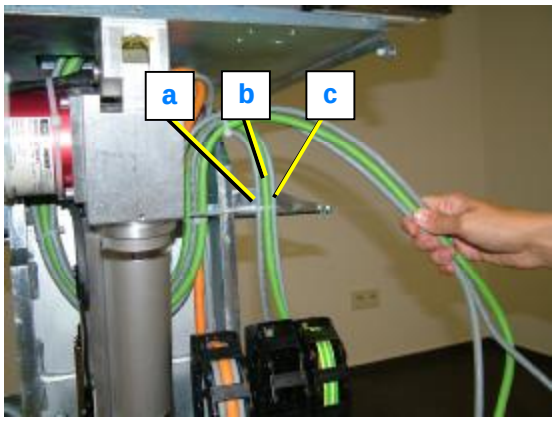
NOTE: Ensure that you lay the cable loom cleanly.

Mark the cable loom at the height of the lower edge fastening eyelet



Locate and secure that length on the upper cable tie support

Secure the cable loom to the lower cable tie support

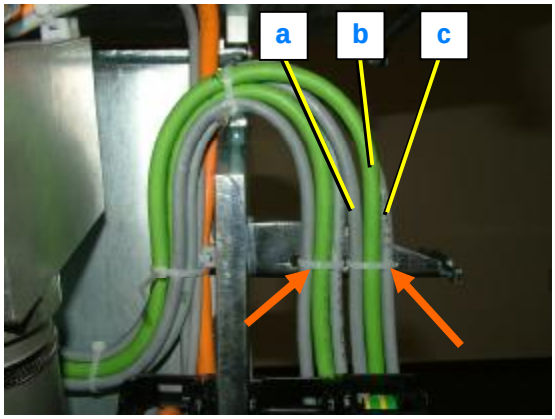


Route cables

a POS Y (6x2x0.14 grey)

b MOT Y (4x2x0.38 + 4x0.5 green)

c DXP.X7 (4x2x0.14 grey)



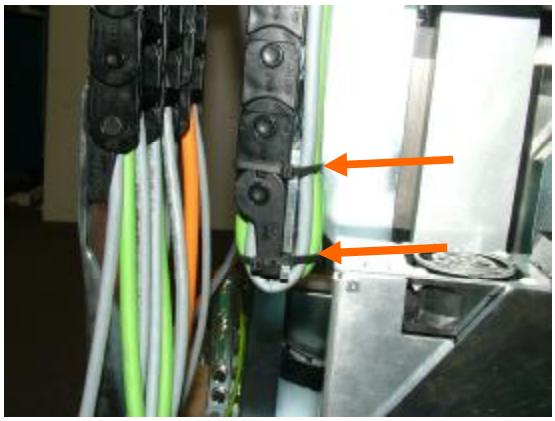
Secure the cables to the mounting plate with cable ties. Make sure the cable tie knots are on the back side of the mounting plate.

a POS X (6x2x0.14 grey)

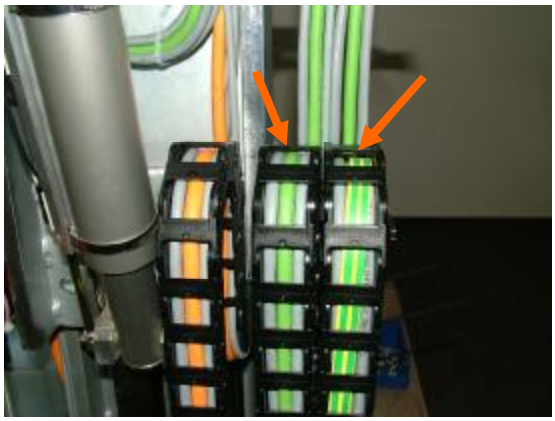
b MOT X (4x2x0.38 + 4x0.5 green)

c D1.X36 (6x2x0.14 grey)

First insert the cable for the center cable drag chain, and then the cable for the right one – tightly looped – into the cable drag chain. It is easier if you insert the left and right cable first and then the center cable. Do not cross the cables in the cable drag chain.

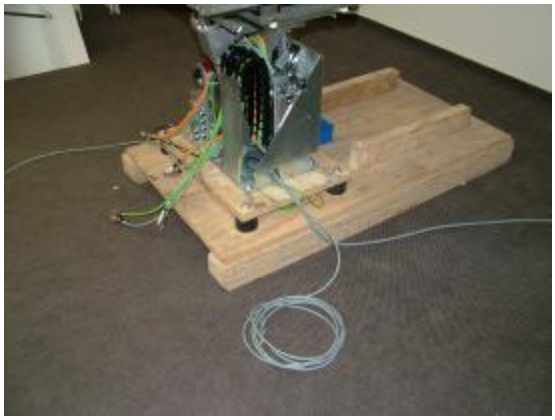


Secure the cable to the cable drag chain opening using 2 cable ties.

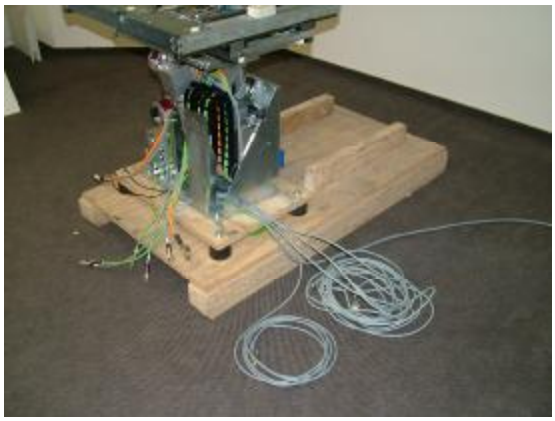


Press the cable at the open end into the cable drag chain until it presses against the outer bend.

Secure all cables from the three cable drag chains with cable ties on the cable tie support below the cable drag chain.



Pull D1.X36 through the cable outlet until the shielding is at the cable outlet.



Pull D1.X21 and DXP.X7 through the cable outlet until the shielding is at the cable outlet.

Plug all connectors into the control. Note the following sequence:

Right, rear plug connector from bottom to top

Pos K Pos Y Pos Z Pos X CAN

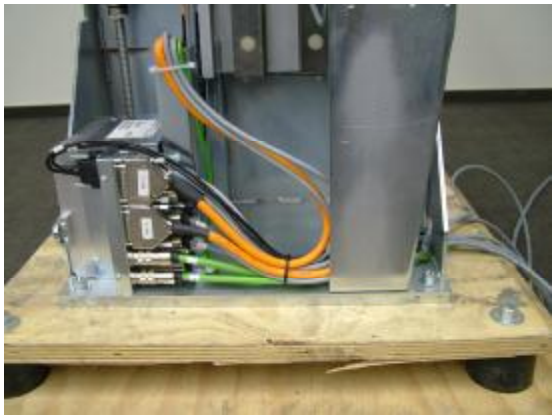
Right, front plug connector from bottom to top

Mot X Mot Y Mot K Mot Z

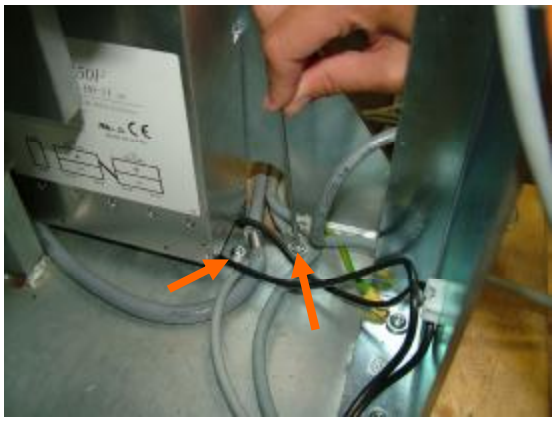
Left connector

Power Input

NOTE: There is no system to prevent the connectors from being interchanged. Pay attention to the labels



Lay the cables cleanly in loops and secure with cable ties so that they can not get into the travel area



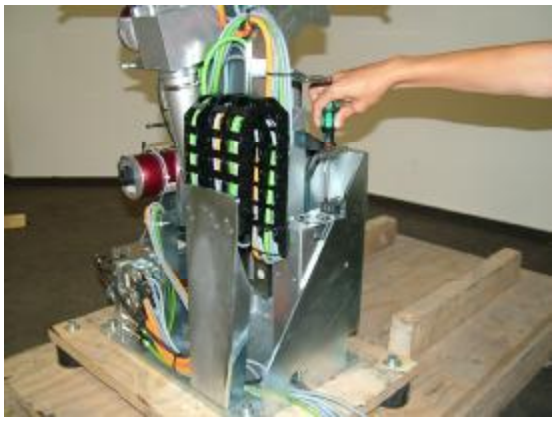
Apply shielding on the cable outlet (2x, 2.5 Allen)

Removing/replacing power supply unit

Required tools and materials	
2,5 Allen wrench	PH1 Phillips screwdriver
PH2 Phillips screwdriver	Cable ties 3.4 x 290

The upper edge of the tabletop must be raised to at least 1080 mm

Disassembly



Before this procedure can be carried out, you must first follow the steps in (Removing/replacing lift-tilt module cover, page 23)

⚠ CAUTION

Service activities on an active table.

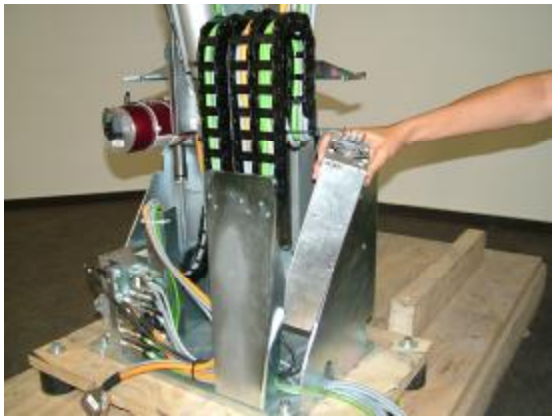
Electric shock!

- **Switch off the table before service and ensure it is disconnected from the power supply.**

Unscrew varistor and power cord (3x, PH2) and remove varistors and screws

Unscrew fastening screws (2x, 2.5 Allen)

Lift power supply unit and unscrew ground strap (1x, PH1)



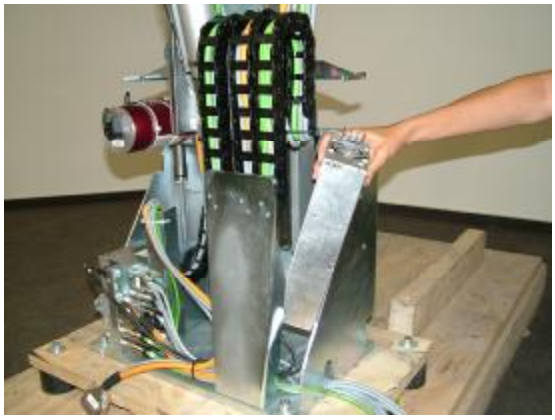
Remove power supply unit

Remove secondary side strands (2x, PH2).

NOTE: Note the following when installing the cable labeling: 24V at +, GND at -)

Installation

Remove original screw on the spare power supply (1x, PH1)



Insert power supply unit

Lightly screw on power cord

Install varistors on the power supply unit according to the diagram and fasten screws (3x, PH2)

Fasten grounding strap (1x, PH1)

Fasten power supply unit with screws (2x, 2.5 Allen).

Removing/replacing control unit

Required tools and materials	
Allen wrench 4	

The table can be in any position during this procedure.

Disassembly

Before this procedure can be carried out, you must first follow the steps in (Removing/replacing lift-tilt module cover, page 23)

Remove/unscrew all connectors (10) from the control.

Unscrew screws (2x, 4 Allen) and remove control unit.

Installation

Installation is performed in reverse order. The following additional steps must be taken.

Plug all connectors into the control. Note the following sequence:

Right, rear plug connector from bottom to top

Pos K Pos Y Pos Z Pos X CAN

Right, front plug connector from bottom to top

Mot X Mot Y Mot K Mot Z

Left connector

Power Input

NOTE: There is no system to prevent the connectors from being interchanged. Pay attention to the labels

Removing/replacing lift-tilt module

To replace the lift-tilt module, you must first follow the steps in (Removing/replacing XY module, page 32, Removing/replacing power supply unit, page 40 and Removing/replacing control unit, page 44). The complete lift-tilt module can then be removed.

Installation is performed in reverse order.

Removing/replacing tilt drive

Required tools and materials	
3 Allen wrench	4 Allen wrench
A1 retaining ring pliers	Side cutting pliers
Plastic hammer	Drift punch
Spacer 30x35x150 (any material, dimensions ±5mm)	Cable ties 3.4 x 290

The table can be in any position during this procedure.

Disassembly

Before this procedure can be carried out, you must first follow the steps in (Removing/replacing lift-tilt module cover, page 23)

Unplug the connector on the control unit and remove cable ties on the cable loom up to the cable drag chain

Pull the cable out of the left cable drag chain

Remove the cable ties at the end of the cable drag chain.

Remove the holding screw (2x, 4 Allen) that secures the cable drag chain.

Pull cable forward

Remove both cable ties

Pull cable out

Remove retaining ring with A1 retaining ring pliers on the upper bolts

Remove upper bolts. Someone must hold the XY module securely at the foot end while this is done. As soon as the bolt is completely removed, place a spacer between the lower and upper head plate.

	⚠ WARNING
⚠	**Removing the bolt on the motor side.** **XY module may tip over!** • Hold the **XY module (90kg) securely and carefully tilt onto the spacer.**

View of spacer

Unscrew set screw (1x, 3 Allen)

Tap lower bolts out from operating side. Someone must hold the drive securely. As soon as the bold has been tapped out fare enough, the drive can be removed.

	⚠ WARNING
⚠	**Removing the bolt on the motor side.** **Drive can fall over!** • **Hold drive securely.**

Installation

Installation is performed in reverse order. The following additional steps must be taken.

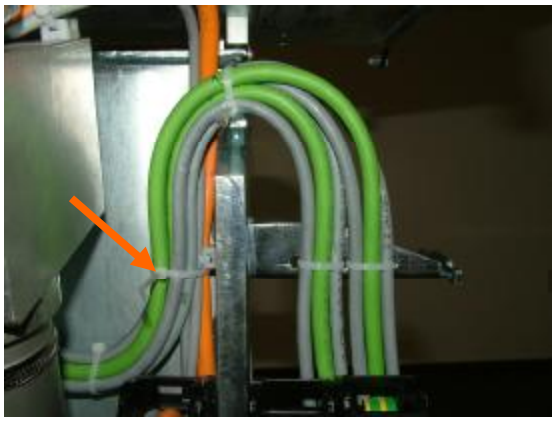
Once the drive is installed, pull the cable up to the fastening straps and mark. This determines how large the loops will be.

Pull the cable loom behind the remaining cables

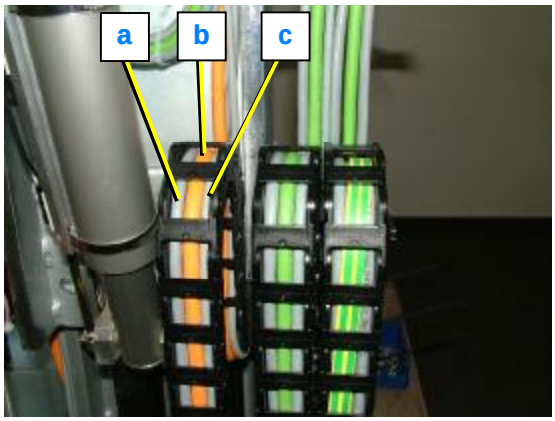
Lay the cable behind the cable drag chain

Fasten cable drag chain with screws (2x, 4 Allen)

Secure the cable on the lower cable tie support at the mark



Secure the complete cable loom with cable ties



Lay the cable in a tight loop in the left plastic chain. It is easier if you insert the left and right cable first and then the center cable. Do not cross the cables in the energy chain.

a **POS K (6x2x0.14 grey)**

b **MOT K (4x1.5 orange)**

c **MOT K (3x2x0.14 grey)**

Secure the cable to the cable drag chain opening using cable ties.

Press the cable at the open end into the cable drag chain until it presses against the outer bend.

Secure all cables from the three cable drag chains with cable ties on the cable tie support below the cable drag chain.

Plug all connectors into the control. Note the following sequence:

Right, rear plug connector from bottom to top

Pos K Pos Y Pos Z Pos X CAN

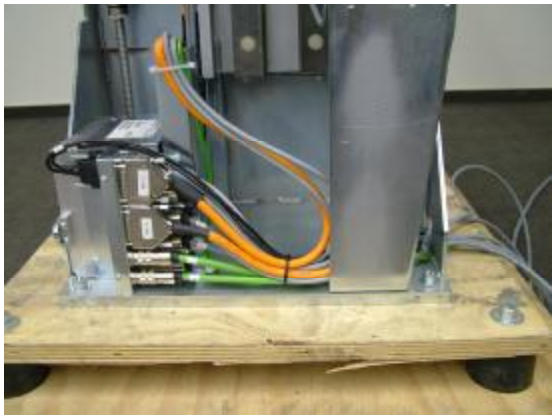
Right, front plug connector from bottom to top

Mot X Mot Y Mot K Mot Z

Left connector

Power Input

NOTE: There is no system to prevent the connectors from being interchanged. Pay attention to the labels.



Lay the cables cleanly in loops and secure with cable ties so that they can not get into the travel area.

	⚠ ADVICE
J	**During the following reference drive the end switches are may not adjusted as these ones before.** **Fall through of reference drive!** • **Adjust the switches as long as the reference drive will pass.**

3 Appendix

Associated documents

5615,0008 **Prohibited Materials**
5615,0007 **Critical Materials**

Manufacturer and Contact Information

SKF Actuation System (Liestal) AG
Oristalstrasse 97
CH – 4410 Liestal

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Telefax **++41 61 921 36 81**
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