

Installation manual for Diplomat Dental units

Model PRO 500
Model PRO 700

Date: 01/02/2024
Revision: 1.0

 **DIPLOMAT**
DENTAL
SOLUTIONS

TABLE OF CONTENTS

1. Information before installation	4
1.1 Installation requirements	4
1.2 Electrical system requirements	5
1.3 Operating requirements	6
2. Media availability	6
3. Unpack boxes	7
4. Prepare place and move the chair	8
4.1 Powerblock cover	8
4.2 Move the unit into place	9
4.2.1 Anchored base	9
4.2.2 Not anchored base	10
4.2.3 Installation board	10
4.3 Backrest	11
4.4 Chair	12
4.5 Powerblock installation	12
4.6 Chair electronics	13
4.7 Removing covers	16
5. Cuspidor block installation	17
5.1 Cuspidor block holder	17
5.2 Cuspidor block	18
6. Dentist panel	19
7. Post, monitor holder	22
8. Cables	23
9. Light pantograph	24
10. Monitor	25
11. Pulling the bundle of wires and tubes to the chair	26
12. Assistant arm	29
13. Connecting wires and hoses in cuspidor block	30
13.1 Connecting wires and hoses from Dentist panel	30
13.2 Connecting wires and hoses from Assistant arm	31
14. Connecting wires and hoses in powerblock	32
14.1 Chair set - up	35
15. Assembling accessories	37
15.1 Bowl	37
15.2 Tray table	37
15.3 Tablet holder	38
15.4 Napkin holder	38
15.5 Pneumatical Headrest	39
15.6 Assistant console	39

16. Finalizing of installation	40
16.1 Backrest	40
16.2 Chair installation	40
16.3 Hand-rest	41
16.4 Putting on covers	41
16.5 Powerblock cover	42
17. Water leveling the dental unit	42
18. Setting resistance of moving parts	43
18.1 Dental light pantograph	43
18.2 Dental light post brake	43
18.3 Dentist arm/panel brakes	44
18.4 Cuspidor block brakes	44
19. Foot controller	45
20. Disinfection of new dental unit before its first use	45

1. Information before installation

This manual provides instructions for instalation the MODEL PRO 500, 700.

i. Installation must be performed by a service technician with a valid certificate. Otherwise, the warranty will not be honoured. Complete the registration form and send it to the manufacturer or the seller.



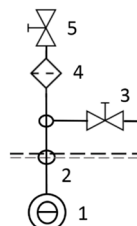
Pre-installation and installation must be performed pursuant to the standards applicable in the given country and in accordance with the manufacturer's documentation.
To prevent the risk of electrocution, this equipment must be connected to an electrical system with a protective ground.

Do not install this equipment in any environment with an explosion hazard!
Do not modify this equipment without permission from the manufacturer!

1.1 Installation requirements

Flooring	Basic thickness ≥ 100 mm. Angle $\leq 1\%$. Anti-static flooring is preferred.												
Water	Potable water from a central supply: <table><tr><td>Inlet pressure</td><td>0,3 - 0,6 MPa</td></tr><tr><td>Flow</td><td>> 5 l/min</td></tr><tr><td>Particulate</td><td>less than $50\text{ }\mu\text{m}$</td></tr><tr><td>Water hardness</td><td>$< 2,14$ mmol/l</td></tr><tr><td>pH</td><td>6,5 – 8,5</td></tr><tr><td>Max. electrical conductivity</td><td>$2000\text{ }\mu\text{S/cm}$</td></tr></table> <i>i. The unit is equipped with a $50\text{ }\mu\text{m}$ filter. Water must comply with local drinking water regulations. We recommend CU pipes, or PE respectively. i. The same requirements apply to distilled water, if it is used.</i>	Inlet pressure	0,3 - 0,6 MPa	Flow	> 5 l/min	Particulate	less than $50\text{ }\mu\text{m}$	Water hardness	$< 2,14$ mmol/l	pH	6,5 – 8,5	Max. electrical conductivity	$2000\text{ }\mu\text{S/cm}$
Inlet pressure	0,3 - 0,6 MPa												
Flow	> 5 l/min												
Particulate	less than $50\text{ }\mu\text{m}$												
Water hardness	$< 2,14$ mmol/l												
pH	6,5 – 8,5												
Max. electrical conductivity	$2000\text{ }\mu\text{S/cm}$												
Cooling instruments from a central manifold	A shut-off valve and a backflow-preventing check valve are installed in the central manifold for the unit.												
Requirements and recommendations:	<ul style="list-style-type: none">• An upstream $5\text{ }\mu\text{m}$ particulate filter must be installed if water from the central manifold is used to cool instruments.• If the water contains more than 50 mg CaO/l or 36 mg MgO/l, a water softening station must be installed at the water manifold inlet. Hard water may result in malfunction of the dental unit. A water softener is required if distilled water is not used.• If there is a need to install a sampling point for supply water, the following schematic shows the recommended point of installation for such supply water sampling purposes. <p>This equipment is not included with the dental unit.</p>												

Connection schematic for dental unit inputs (EN ISO 7494-2)



- 1 – water inlet from the external potable water source
- 2 – water inlet connection port
- 3 – water inlet sampling port
- 4 – water filter for solid particulate
- 5 – manual inlet valve

i. Regular and replacement of the water filter must be carried out in 3-month intervals. Inspection and replacement are performed by an authorized service technician.

Pressed air	Compressed air must be oil-free, clean and dry:		
	Inlet pressure	0,45 - 0,8 MPa	
	Flow	> 55 l/min	
Recommended values:	class for oil 2	oil	max. 0,1 mg/m³
	class for particles 2	particles 1-5 µm	max. 100/ m³
	humidity class 4	pressure dew point is max. 3°C at 20°C average temperature and at 0.7 MPa constant pressure in the system	
	i. Dental unit is equipped with a 20 µ inlet filter.		
Suction (if equipped with a cuspidor block with large and small aspirators)	Static vacuum must be within a range of min. 0.005 MPa (50 mbar) to max. 0.02 MPa (200 mbar) measured at the point of installation. If a static vacuum is higher than 0.02 MPa, a calibration (regulator) valve must be connected into the vacuum line to restrict the vacuum to a maximum of 0.02 MPa. This regulator valve is not included with the dental unit. The vacuum unit must supply flow of min. 450 NI/min. (type 1) measured at the point of installation.		
Pressure loss between the vacuum connection point at the dental unit and the atmospheric end of the cannula	Vacuum [mbar]		
	Flow [NL/min]	Large aspirator	Small aspirator
	90	57	53
	150	67	62
	200	79	74
	250	110	91
	300	130	100
	350	170	120
Drain	The drain line must have a continuous slope of min. 1% with minimum flow of 10 l/min. and must be free of any sharp bends or segments that could result in reverse flow. Do not use the same drain segment shared with another dental unit or bowl! Polypropylene or hardened polyethylene piping may be used.		

1.2 Electrical system requirements

Mains current protection device rating	<p>The recommended current protection device rating at the mains is 16 A (a type C circuit breaker when a circuit breaker is used).</p> <p>No other equipment may be connected to the same circuit!</p> <p>The dental unit is rated for a maximum of 1900 VA. The electrical connection must comply with all national standards.</p>
Recommendations	<p>Unless the national standard stipulates otherwise, the manufacturer recommends using a current protection device with a sensitivity of 30 mA and instantaneous disconnection.</p> <p>Once the pre-installation requirements are met, the dental unit is then assembled and installed and connected to related utility services.</p>
Interference	<p>The dental unit does not interfere with the operation of other electronic devices in its immediate vicinity during use.</p>

1.3 Operating requirements

Parameter	Value
Ambient temperature	15 – 40 °C
Relative humidity	30 – 75 % non-condensing humidity
Atmospheric pressure	700 – 1060 hPa
Elevation	≤ 3000 m

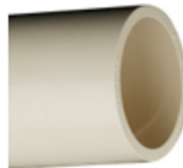
2. Media availability

Before starting to unpack, the service technician has to ensure:

1. That place for the chair or unit is appropriately prepared according to Installation Plan.
2. That all required media are available.
3. That all local, national and international requirements are in compliance.

Namely we talk about availability of these basic media inputs/outputs:

1. Drain pipe: PVC tube Ø 40 mm,
30 mm over the floor level



2. Suction tube (PVC socket Ø 40 mm,
30 mm over the floor level)

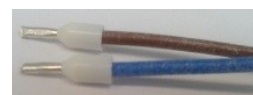
3. Electro-installation PVC tube Ø21:

- for input power cable 3x2,5mm² Cu,
(length over the floor level 1000 mm)
- for Equipotential grounding wire CY 1x4mm² –
GNYE (yellow-green)



4. Electro-installation PVC tube (Ø16):

- for suction unit steering wire 2x0,5mm² Cu
- and possibly for control cable for door opening



5. Central water inlet pipe: 1/2" tube finished
with socket with inner thread G1/2",
20 mm over the floor level



6. Air pressure: 1/2" tube finished
with socket with inner thread G1/2",
20 mm over the floor level

3. Unpacking boxes

Check to ensure the shipping box is intact. If the box is compromised, do not open the consignment and immediately report the problem to the carrier or seller. Carefully remove the box if the consignment is intact and unpack the individual parts of the dental unit. Check the consignment to ensure it is complete against the packing sheet.



The service technician had to take a picture of boxes before open, after open top cover plate and every packed part. It is important for possible claim.

The stomatological set is packed in two containers. Take away the base plate (if ordered) and remove box cover plates and all the 4 side plates.

BOX n. 1 - DENTAL UNIT CONTAINER

Cuspidor block	Ceramic spitting bowl	Small pieces
Assistant's arm	Powerblock	Monitor arm, monitor
Assistant console	Foot controller	Cuspidor block holder
Dentist's control panel pantograph	Dentist's control panel	Tray table
Instruments, hoses, wires	Light, light pantograph	

BOX n. 2 – CHAIR CONTAINER

Dental chair	Head rest	Child booster seat
	Arm rest	Protective seat cushion



Take out all parts from unit box.

i. Do not stress the articulated dentist's table arm, except for standard movement of the arm and the loading permitted on the storage tray.

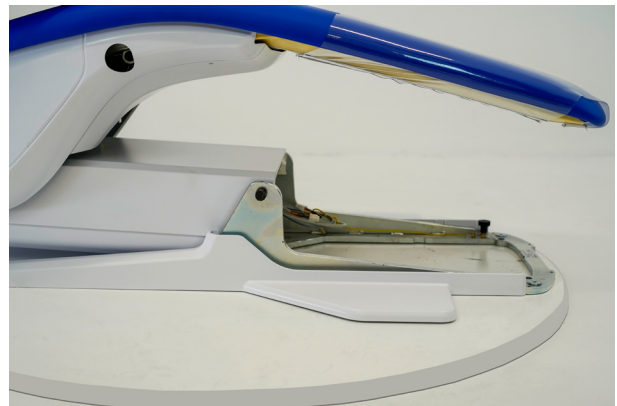
4. Prepare place and move the chair

The following steps, and other steps during the installation are the same for Model ONE 100.



4.1 Powerblock cover

Remove front cover of powerblock.

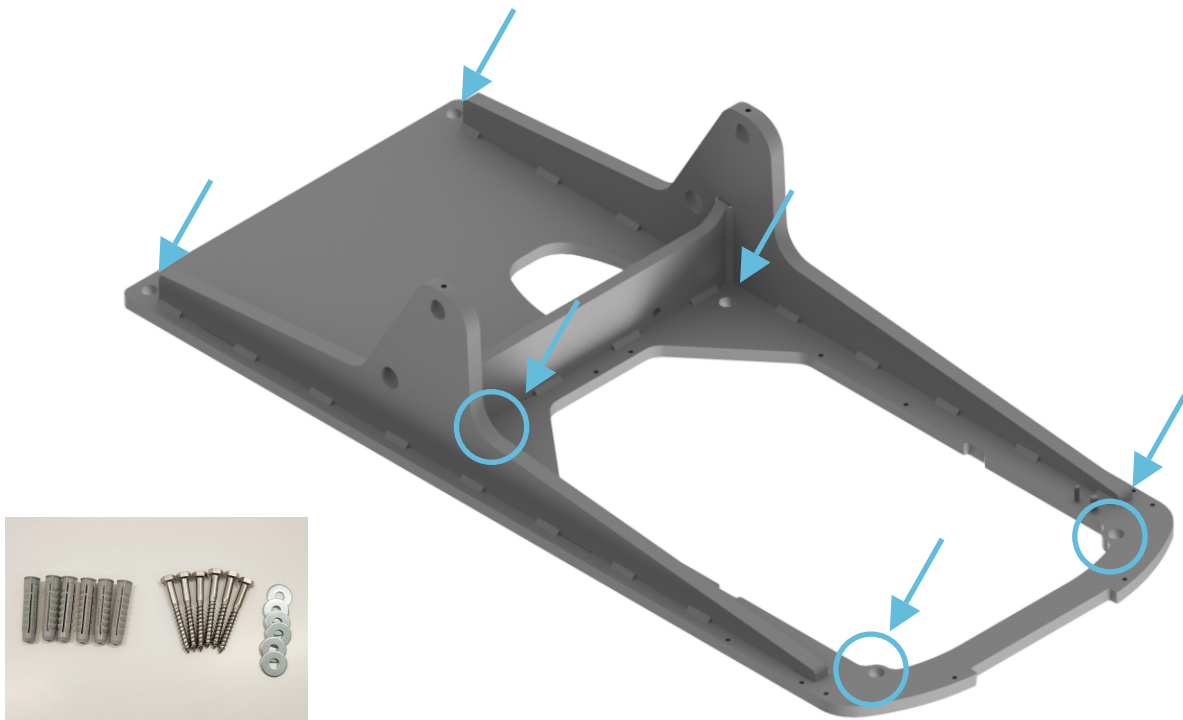


4.2 Move the unit into place

To move the chair on the prepared place, you will need two people.

4.2.1 Anchored base

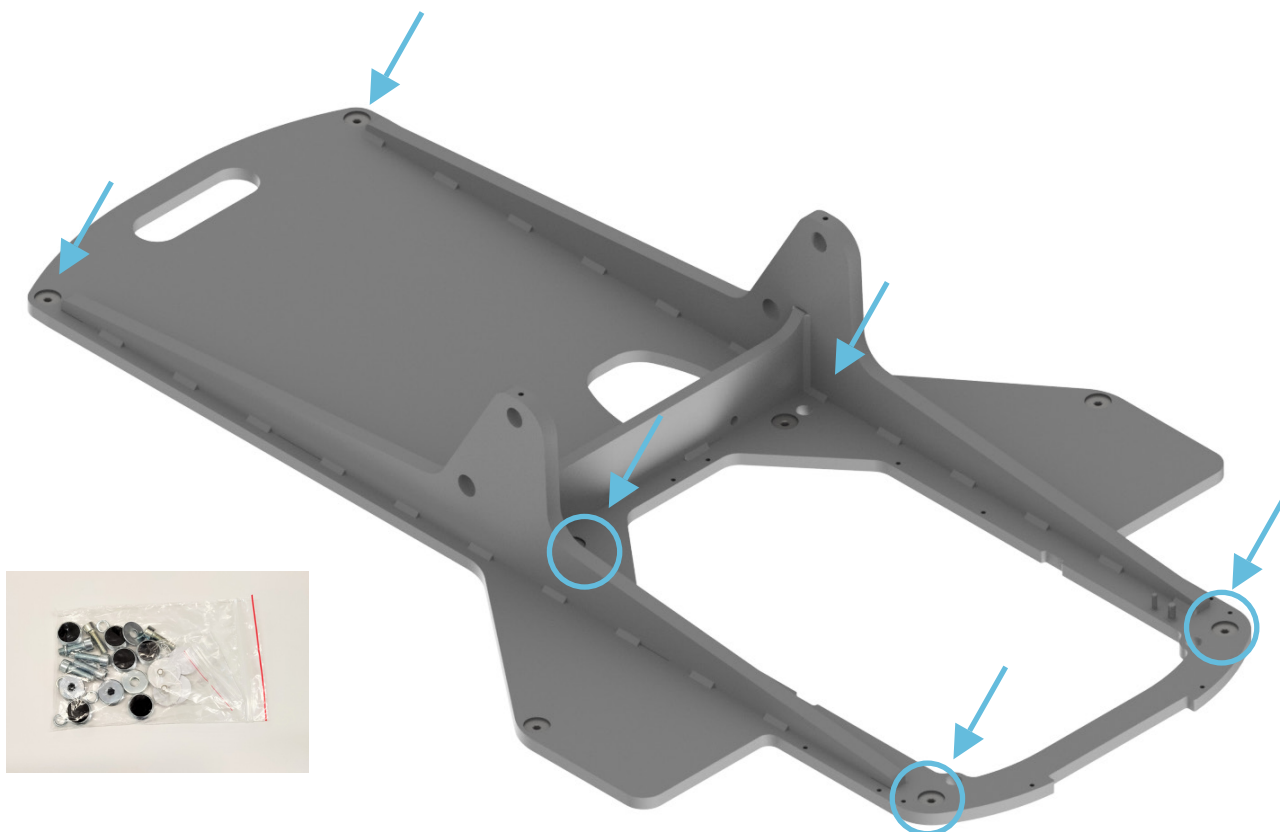
Chair is fixed to the pallet in three points (in circles). Unscrew it, then move the unit.



Fix the unit base in six points (all arrows).
Use dowels, washers and screws from accessories
as shown at the picture.

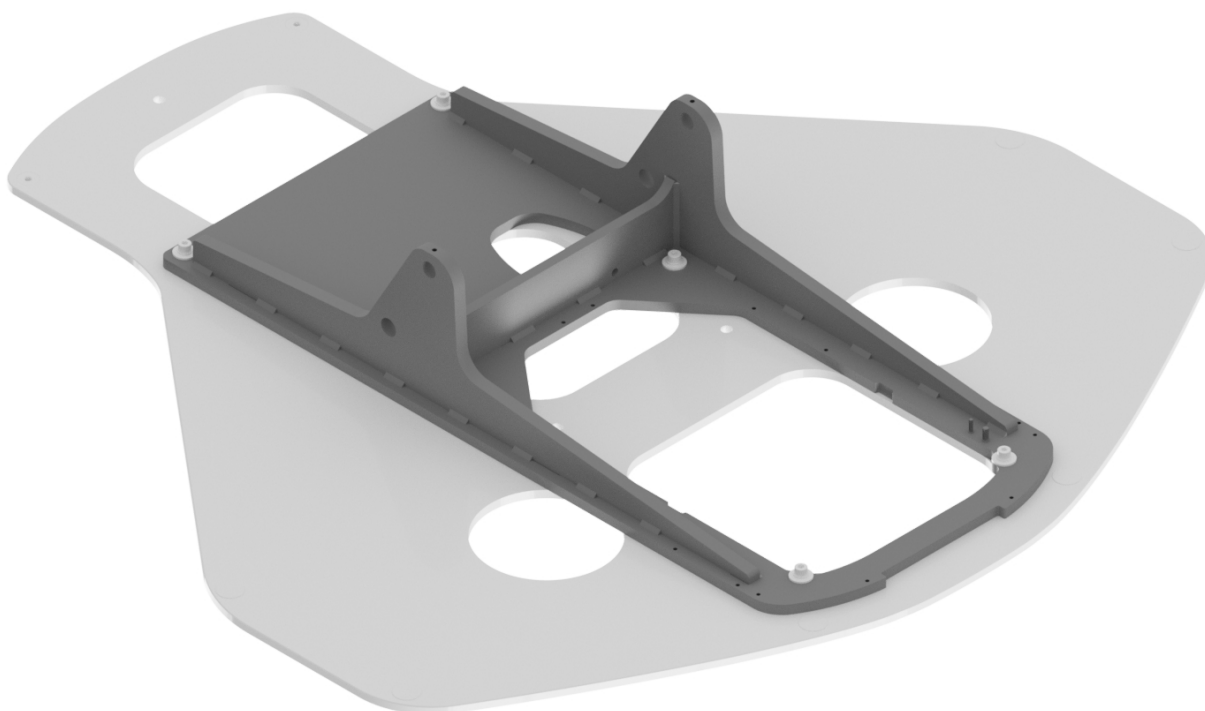
4.2.2 Not anchored base

Chair is fixed to the pallet in three points (in circles). Unscrew it, then move the unit.



Fix the unit to base plate in six points (all arrows).
Use dowels, washers and screws from accessories
as shown at the picture.

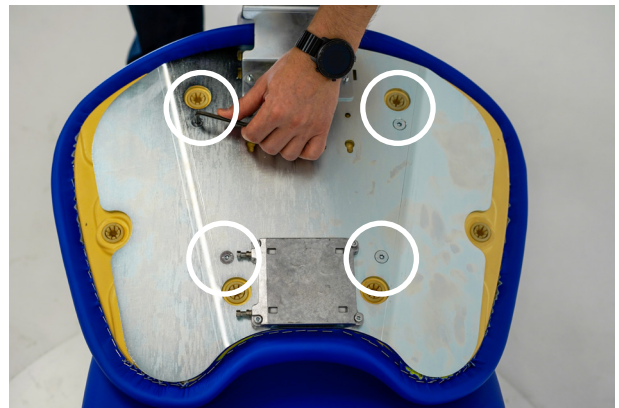
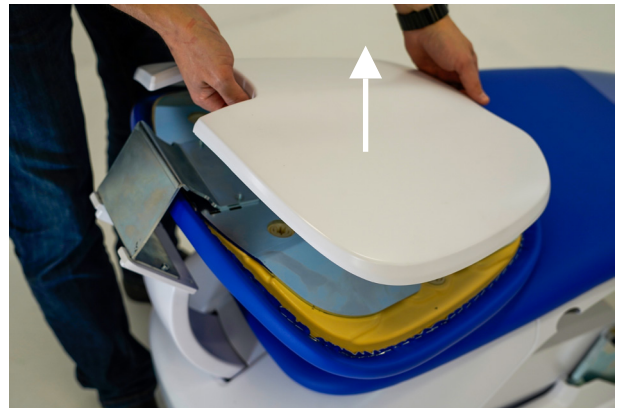
4.2.3 Installation board



4.3 Backrest

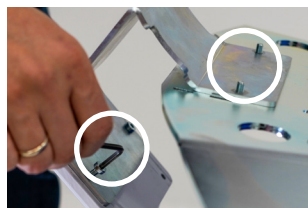
Remove backrest plastic cover by slightly pull up.

Unscrew backrest from metal base. Save the screws for the screw on the upholstery at the end.



For transporting purposes, the backrest is fixed to the chair via temporal console.

Unscrew 4 screws fixing temporal console. The console is no more needed, but save screws for the next step.



Put the white cover in place. Screw the backrest metal base. This step can be done later.



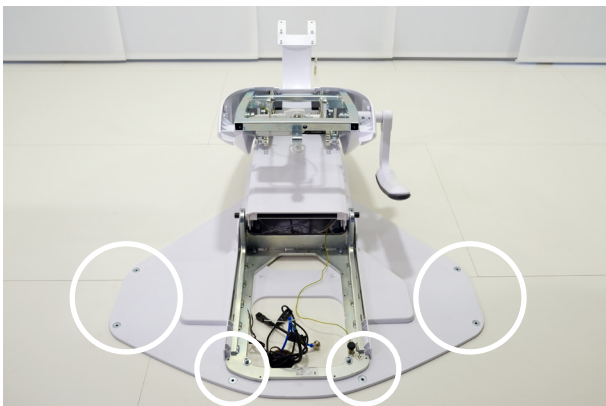
4.4 Chair

Remove the seat from the chair by unscrewing the screw, located at the bottom of the seat (use hex key 2,5). Then slightly pull and raise the chair seat.

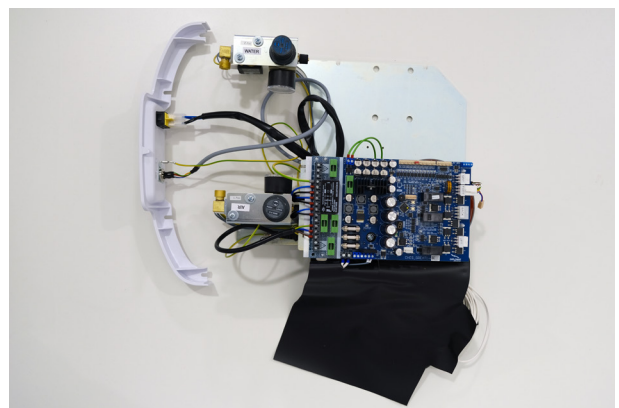


4.5 Powerblock installation

We used the installation board for the installation demonstration. It is necessary to water level the unit with the help of screws.

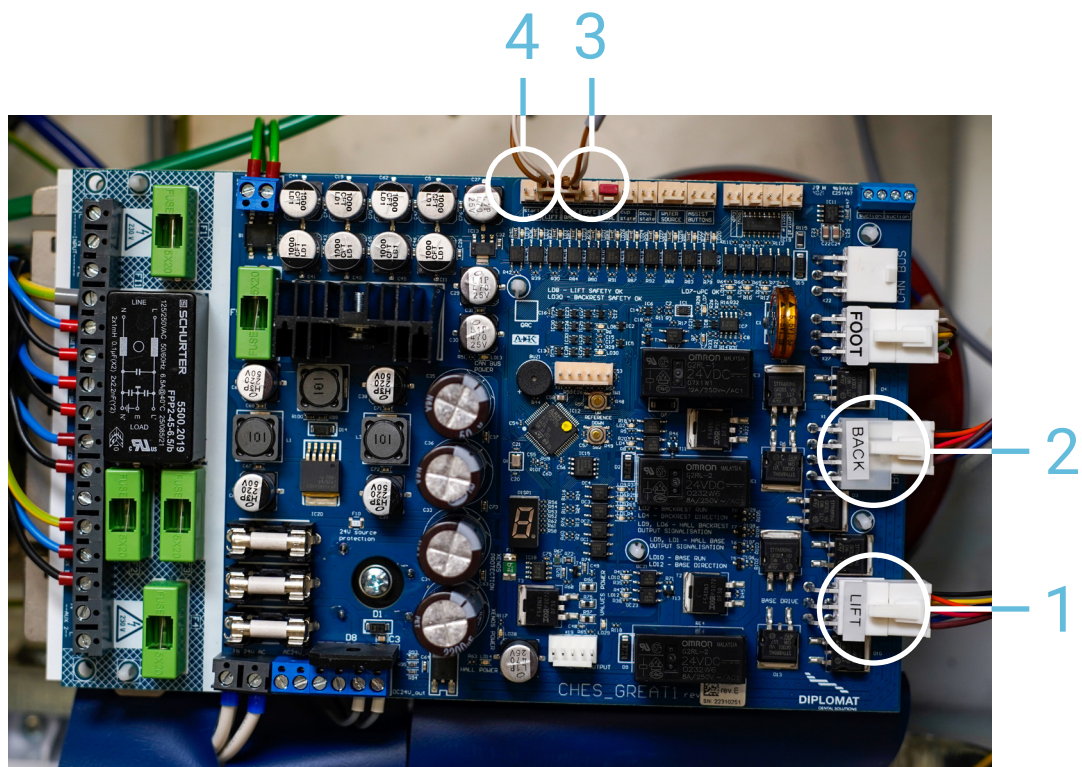


Remove powerblock from it's package and place it in powerblock area.

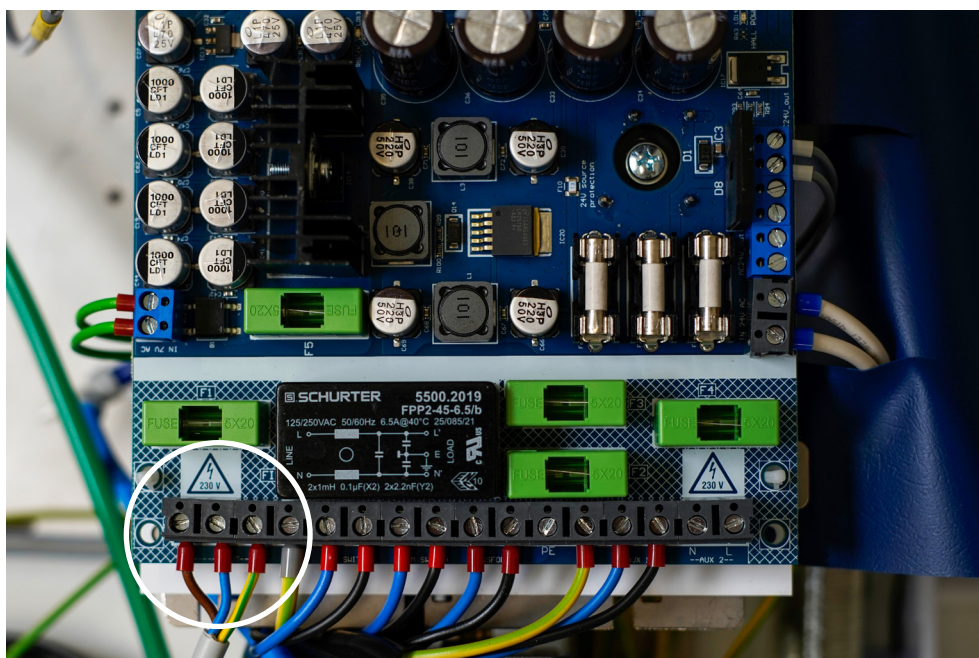


4.6 Chair electronics

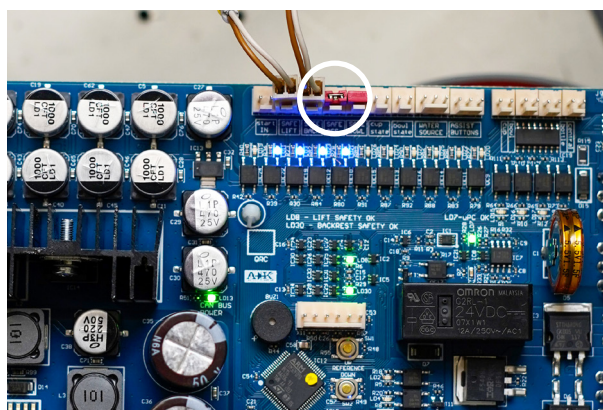
First connect the motors – LIFT motor (1), BACK – backrest motor (2).
Then connect safety sensors – BACK, LIFT (3,4).



Bring the electricity to the unit according to the wiring diagram. Connect main power supply.



For installation purposes, before the safety switch from the assistant's arm is connected to chair electronics PCB, you can use a jumper to connect the 2 pins marked „SAFE ASSIS“ to have all 4 blue LED lights and be able to move the chair in all directions. Connect it in 4th position.



You can fit the front panel to the chair base now, or later. Screw with four screws.



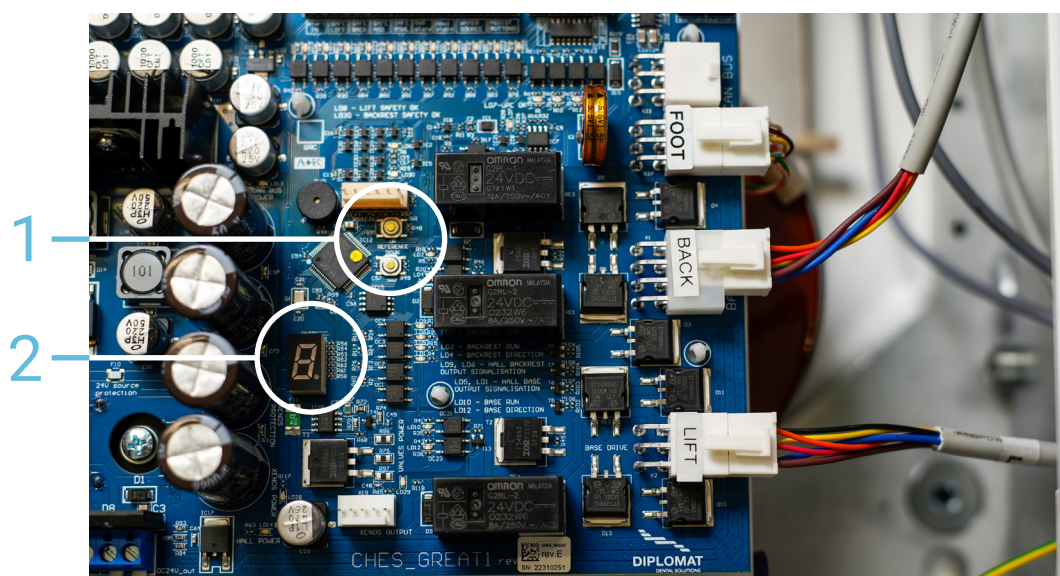
Turn the unit on.

After the beep sound, the unit is ready.



With marked buttons (1) you can control chair and backrest movement. With pressing one button, you can bring chair up and down. /There are 2 small lines at seven-segment display (2)/.

After pressing both buttons simultaneously /there are 2 longer lines at seven-segment display/, you can control backrest movement.



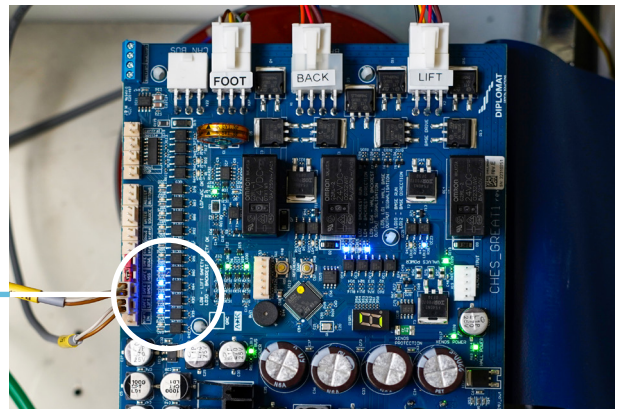
4 blue LED lights (1)– if one of them is not lighting, some safety switch is activated, not all movements are allowed now.

There is “E” as Error at the seven-segment display, too.

Lift the chair up for next steps.

Turn the unit off.

1

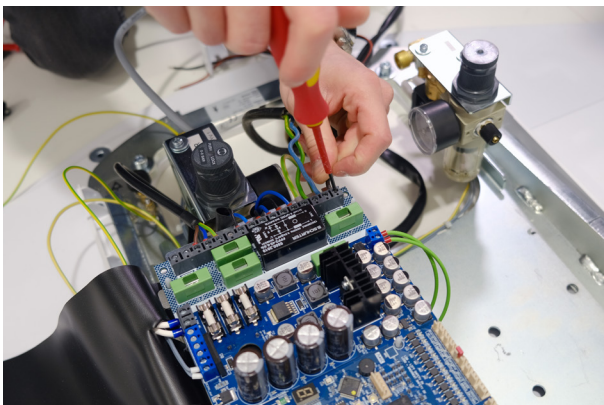
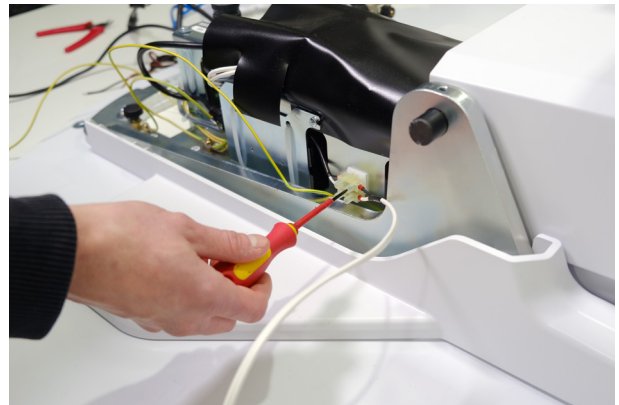


Connect the monitor cable.

Fix the grounding wires to the clamp fixed to the chair frame.

Fix the powerblok to the chair base.

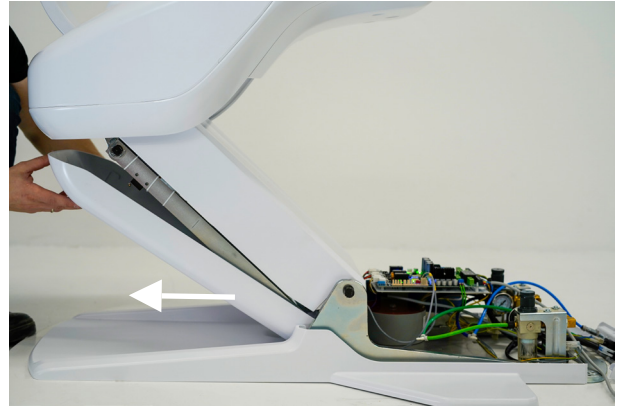
Connect the CHES_GREAT board to electrical network.



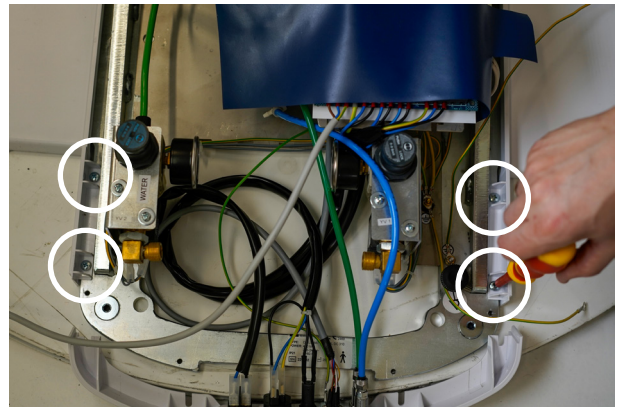
4.7 Removing covers

Remove the back under seat cover by slightly pulling up, towards you and then down.

The chair can't be in it's totally up or down position, otherwise you will not be able to remove this cover.



First unscrew, then gently remove the base cover.



5. Cuspidor block installation

5.1 Cuspidor block holder



For fitting the cuspidor block holder, you need to move chair up to better access.
All screws are packed in a little bag in the Accessories Box.

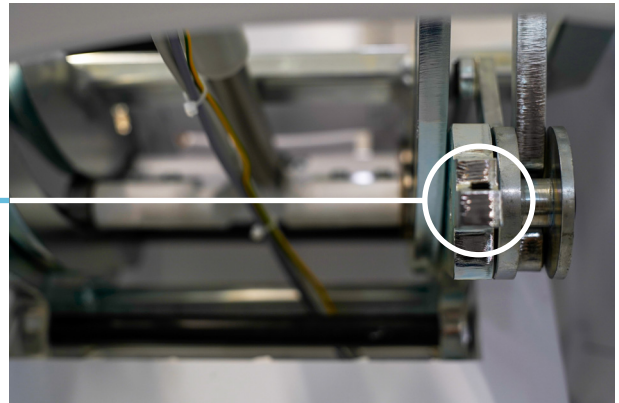
There are little screws **(1)**, they must be inside – don't be over the edge.

Two bolts **(2)** must be in vertical position. Use the key. Washers must be moved up.

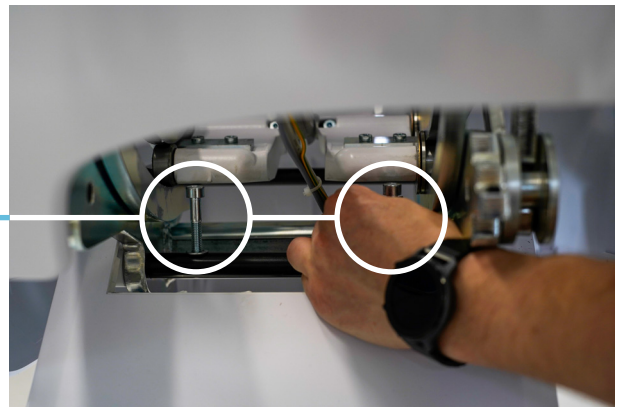
Put these 2 screws to cuspidor block holder, before moving holder to the place.

Put cuspidor holder to place.

1



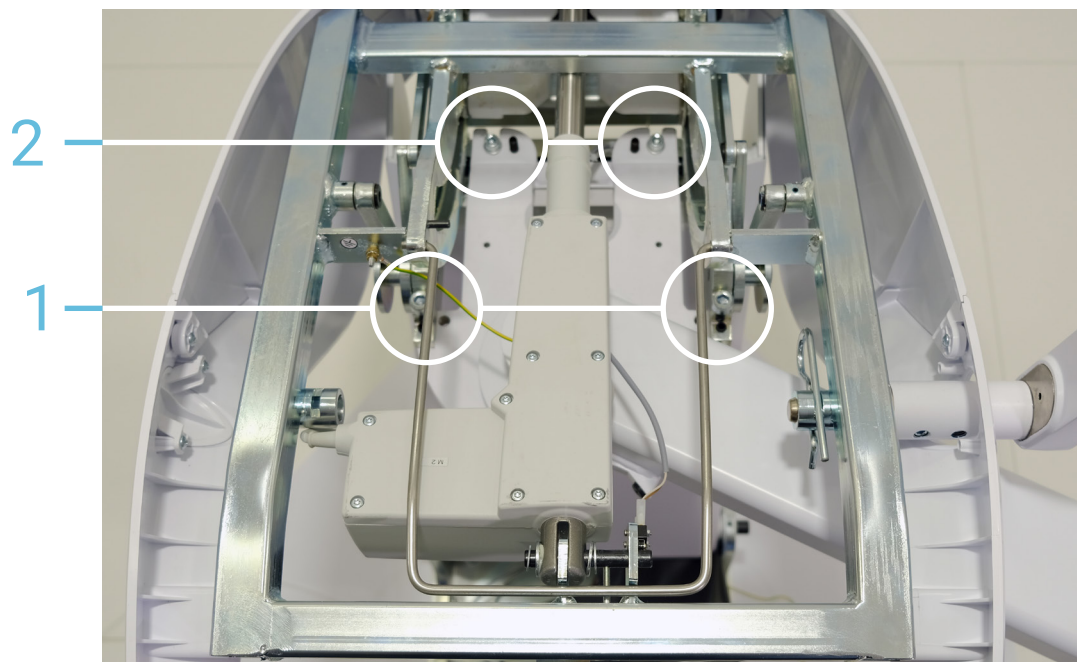
2



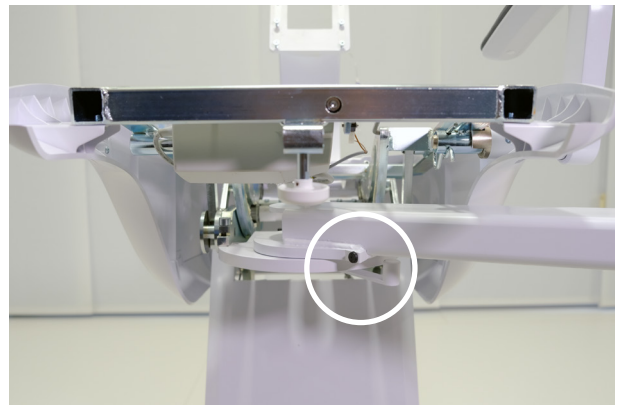
3



After putting cuspidor block holder in the place,
first screw bolts (1), then screw bolts in back (2).

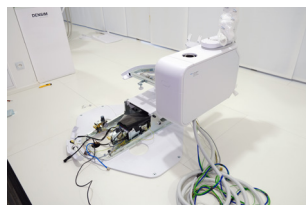


Pay attention to the lever when installing
the cuspidor block holder for convertible unit.

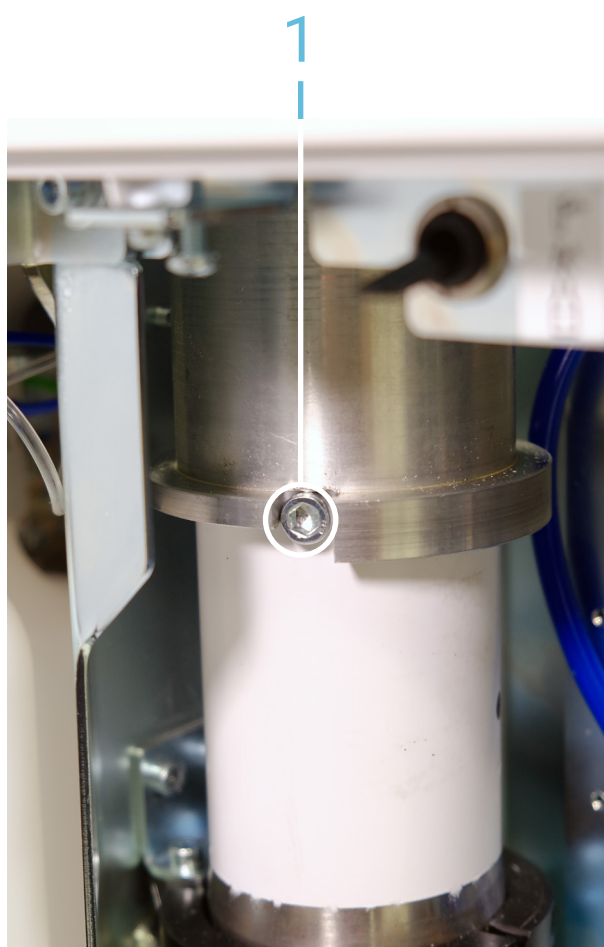
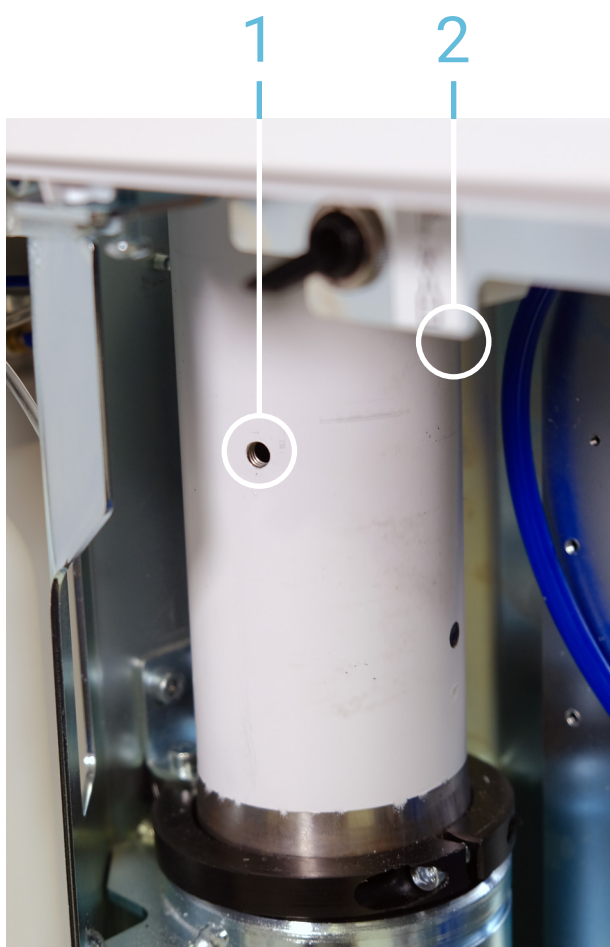


5.2 Cuspidor block

Carefully put the cuspidor block on the holder.



Put in the screw, based on convertible (1) or nonconvertible (2) unit installation.
Insert metal part - hoop. In our case we have convertible unit.



6. Dentist panel

Put in the dentist panel brake (1). Align pin with hole.

Put the circle cover on the place (2).



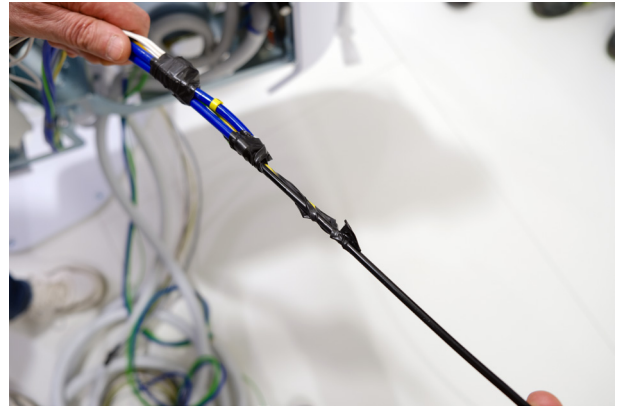
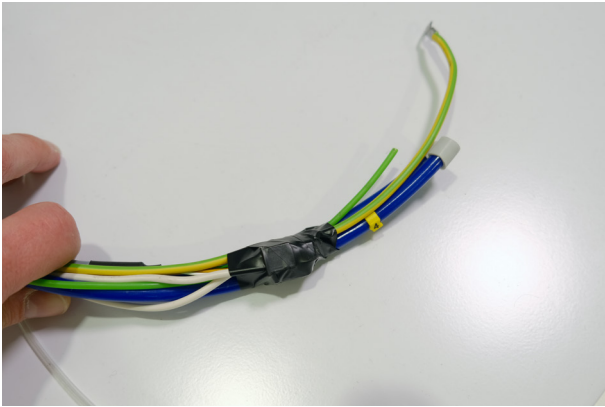
Pantographic arm for dentist panel comes in two parts. Connect these two parts on the floor, before installation at the cuspidor block.



Put the metal bar inside post, find the correct position.



Tape the cables dentist panel and run them through the the post to cuspidor block with help of attached-bowden.



7. Post, monitor holder

Put on the post. Pay attention on bar inside. Think about the subsequent pulling of cables.

Insert the washer (1).

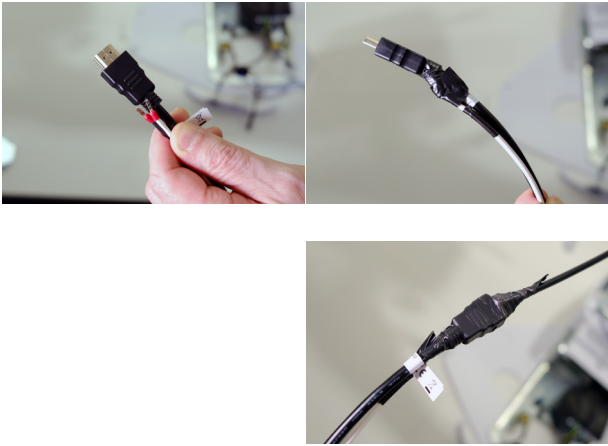
1



Put on the monitor holder.



8. Cables



Pull together the HDMI cable and the monitor power cable through the monitor arm and post.

Pull the dental light cable through the post, too.

Secure the cables on the top of post/monitor arm.

Put the post on the place



9. Light pantograph

Put washer on the place.



Pull cable through pantograph.
Put the pantograph on the place. Connect cables.
Adjust the length of cable in pantograph.



10. Monitor

Pull cable through monitor holder.

Screw four screws.

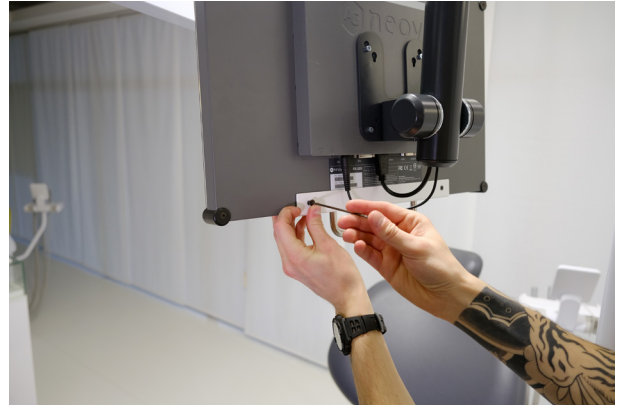
If necessary tight up two nuts under black covers (1).

1



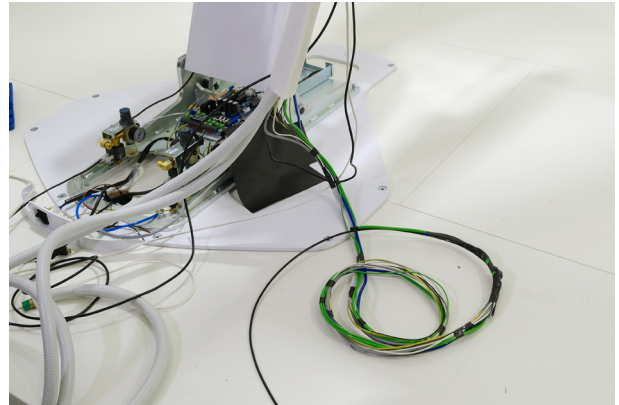
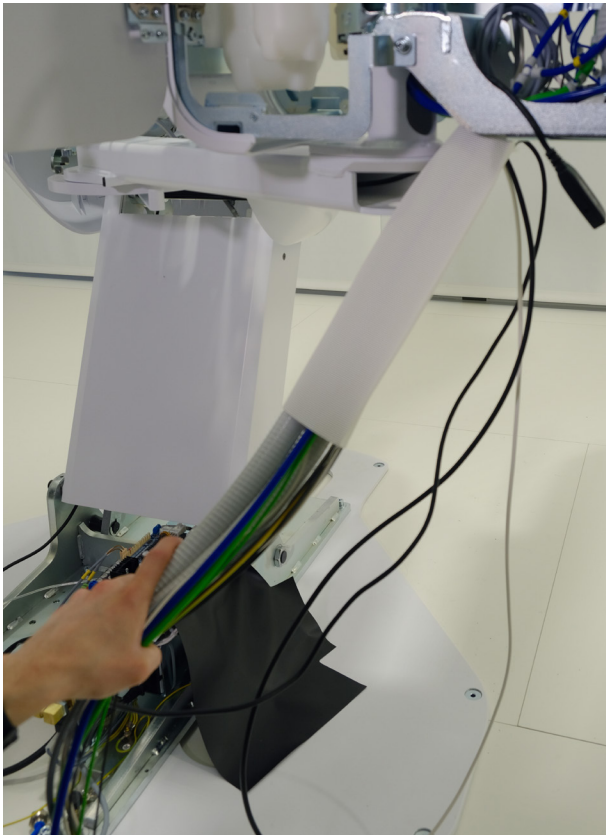
Put the cover on its place.

Install monitor handle.



11. Pulling the bundle of wires and tubes to the chair

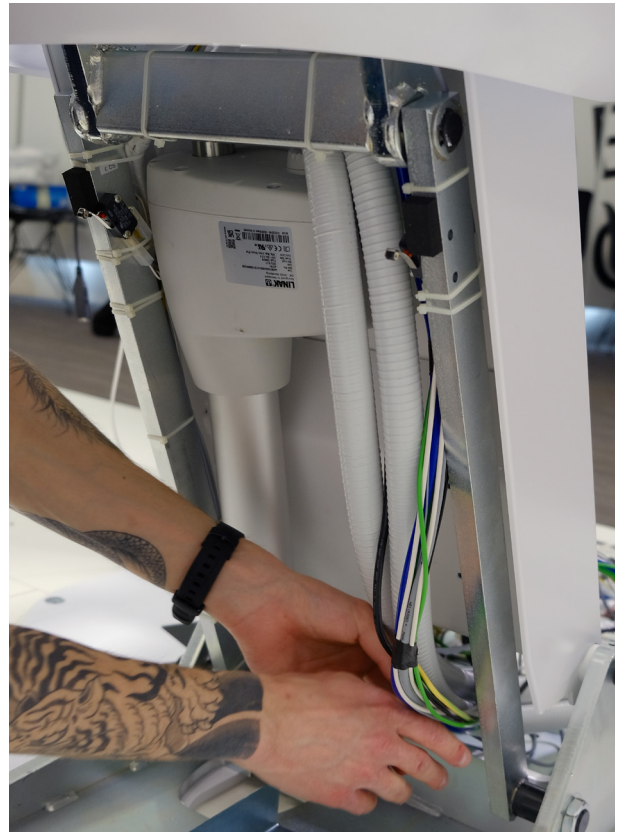
Put all the wires and tubes through the sleeve in the arrangement shown at the photo.
Pass the sleeve with wires and tubes from the spittoon block, through the arm and chair.



Loosen the screws and remove metal organizer.



Form the hoses and cables in the bundle so that they do not cross and pass them downwards.

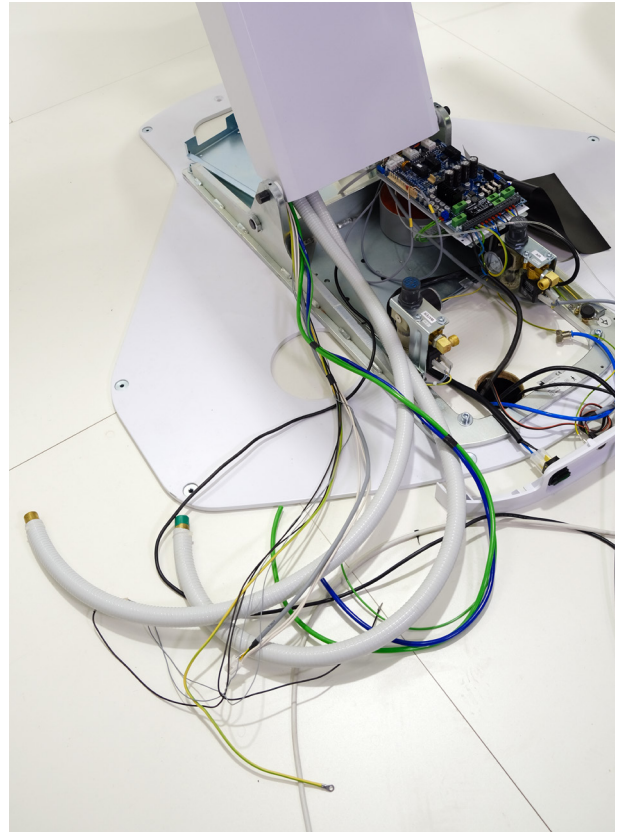
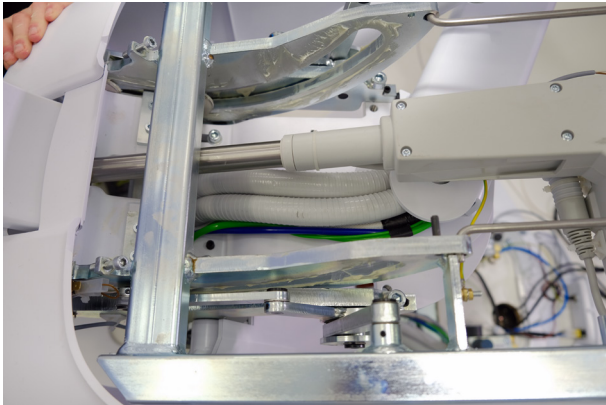
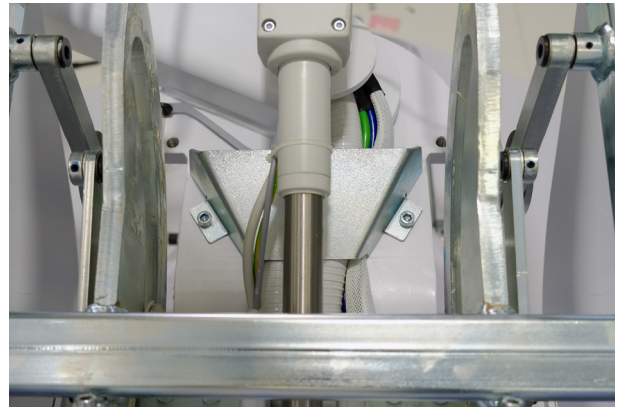


The bundle must pass in the marked space.

After pushing the bundle under the chair, to the power-block, fix the organizer in the chair frame.



Then fix the organizer in the chair under the seat.

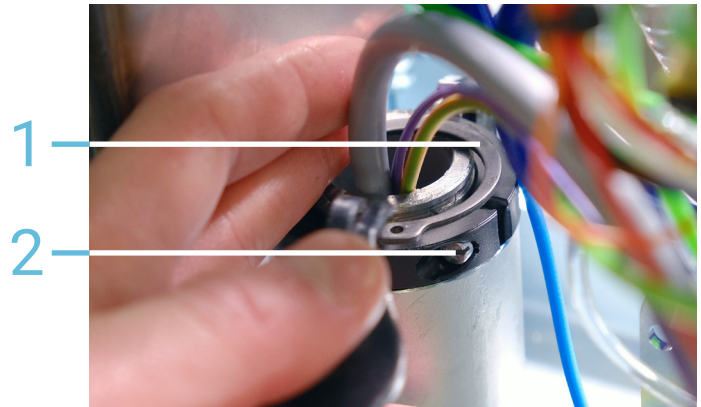


12. Assistant arm

Put the cables through the hole first, then bring the arm up.



Secure the arm with secure ring (1).
Use brake screw as needed (2).



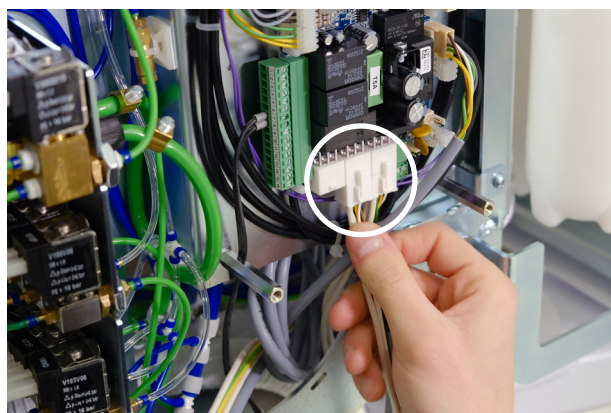
13. Connecting wires and hoses in cuspidor block

13.1 Connecting wires and hoses from Dentist panel

Connect the dental light cable.

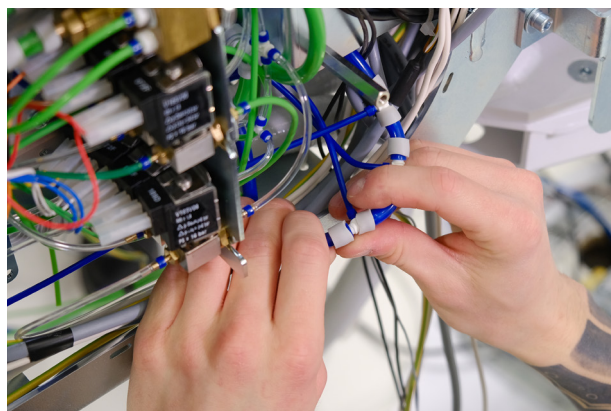


Connect the dentist panel CAN BUS connector.



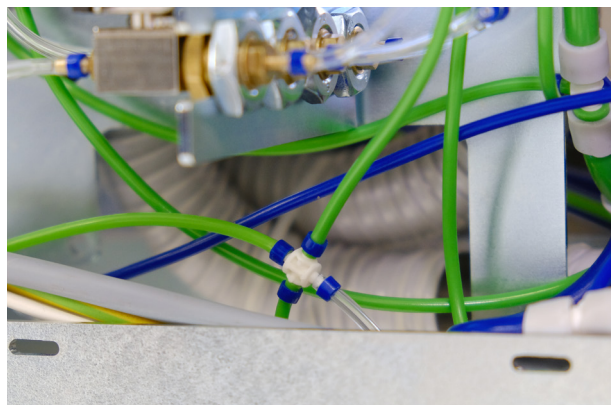
Plug blue tube from dentist's panel side to blue tube from main air filter regulator (4 bar).

Plug blue tube from dentist's panel side to blue tube from air regulator (2,5 bar).



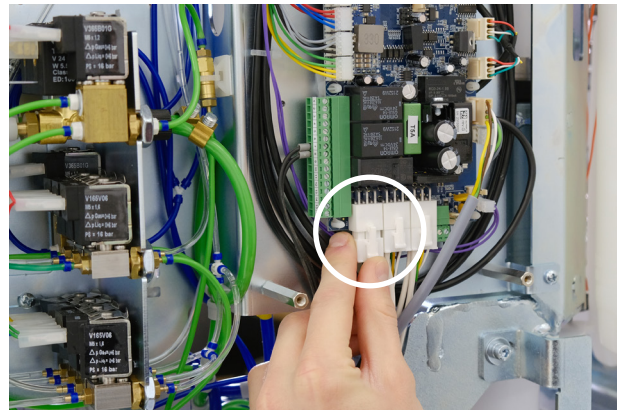
Plug thin green tube from dentist's panel side to distilled water bottle connection (2,5 bar).

If unit is equipped with central water system, find this "T" junction connection.

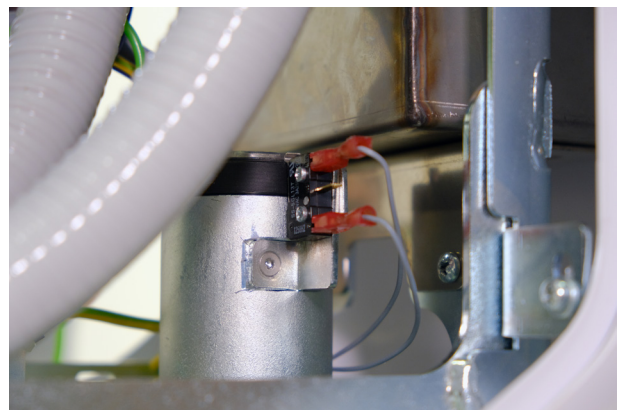


13.2 Connecting wires and hoses from Assistant arm

Connect the CAN BUS connector from assistant arm.



Connect the safety switch from assistant arm.

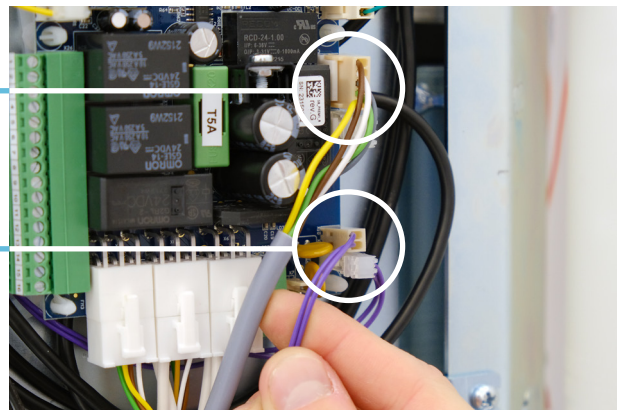


Connect the Xenos light (1).

1

Connect the cable from saliva aspirator switch (2).

2



14. Connecting wires and hoses in powerblock



Make sure electrical circuit breaker is turned off.

For electrical connection, follow wiring diagrams.

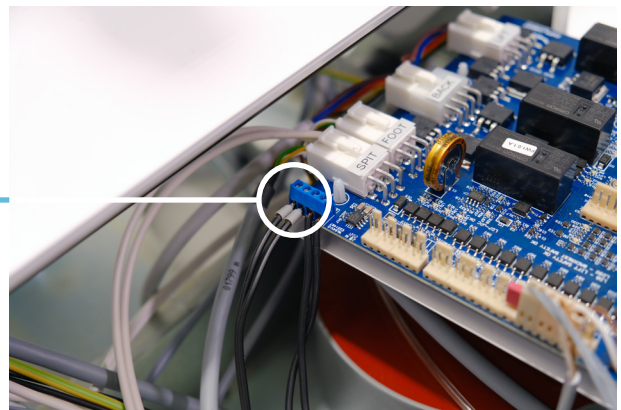
Connect CAN BUS communication cable from spittoon block (1).

1

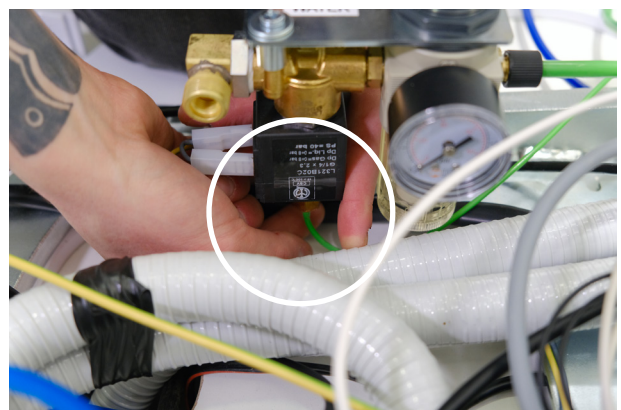


Connect two black wires – suction control (2).

2



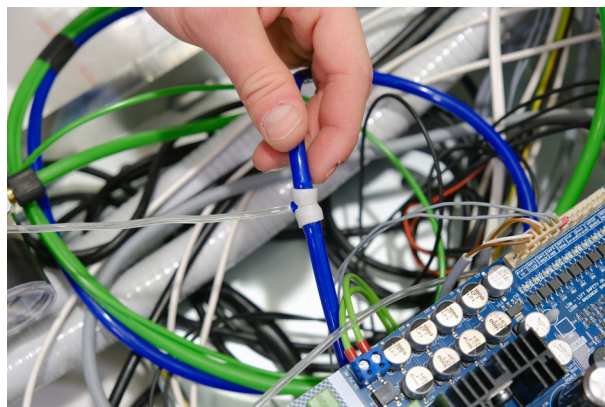
Small green hose goes to central water valve. OUTPUT for depressurizing water lines of the dental unit when switched off.



Big green hose.
The length of the hose can be adjusted as needed.

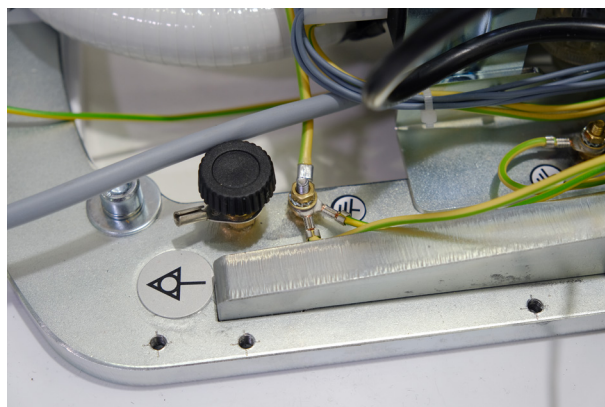


Big blue hose - compressed air connect to T junction.
The length of the hose can be adjusted as needed.
Cut through the blue hose.

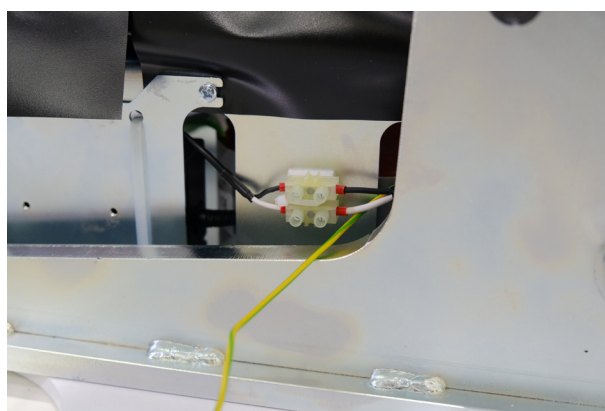


Clear hose from pneumatical headrest goes to the
same T junction.

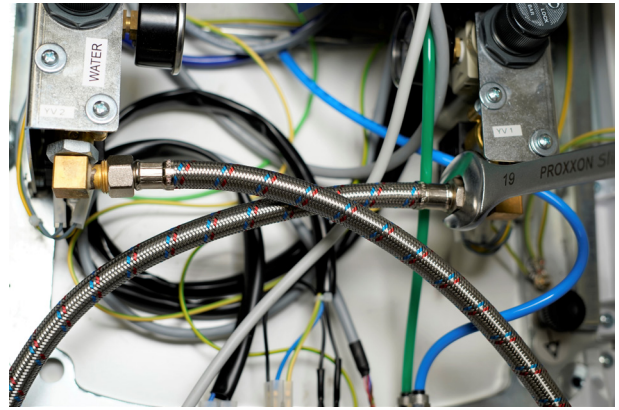
Fix the equipotential clamp to the chair frame.



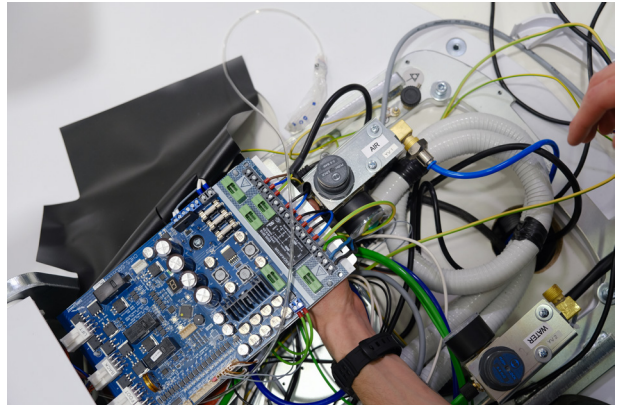
In case of dental unit with monitor – connect black
wires – HDMI, monitor power cable



Secure water and air supply.



Connect suction hoses of aspirators.

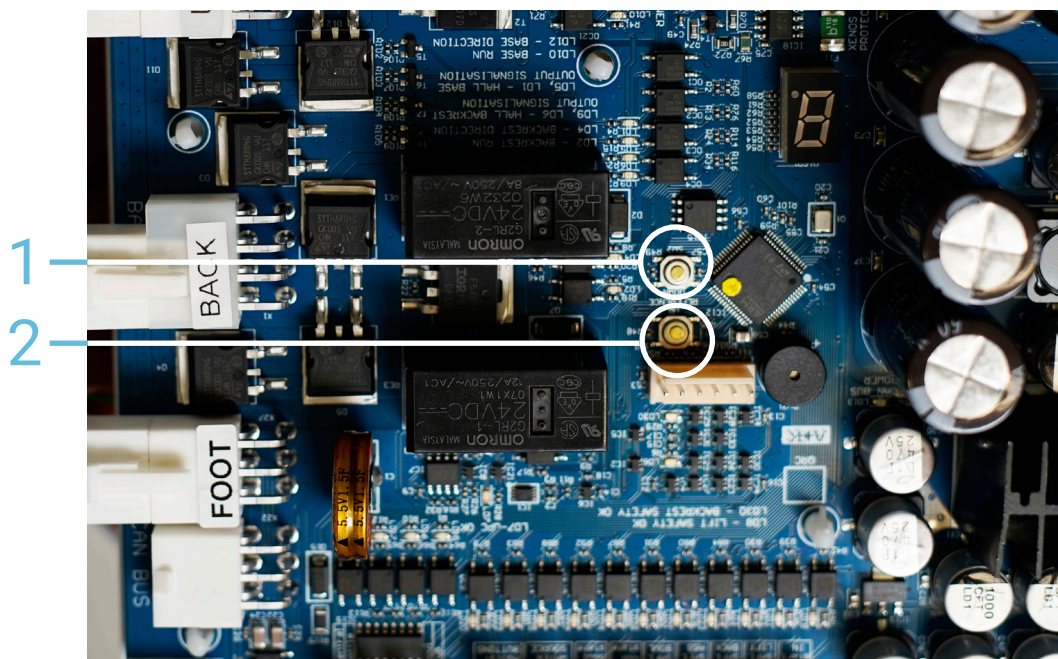


14.1 Chair set - up

The chair is equipped with two motors. The first moves the chair up and down, and the second controls the backrest. Both motors have end switches.

Chair calibration (referencing) is the definition of a position and is used to determine the distance between the limit positions of the chair itself. This is typically performed:

- Prior to placing the dental unit into service,
- After every service intervention involving drives,
- When the chair is incorrectly positioned.



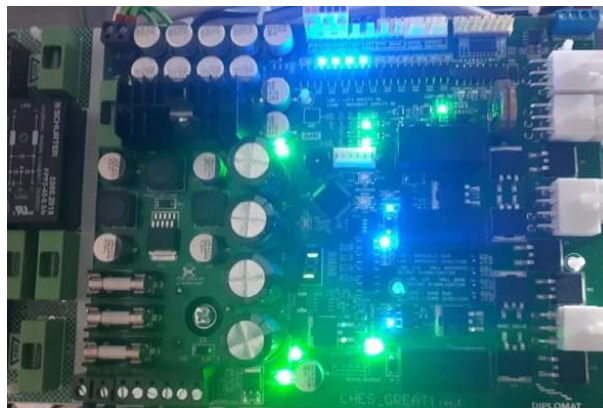
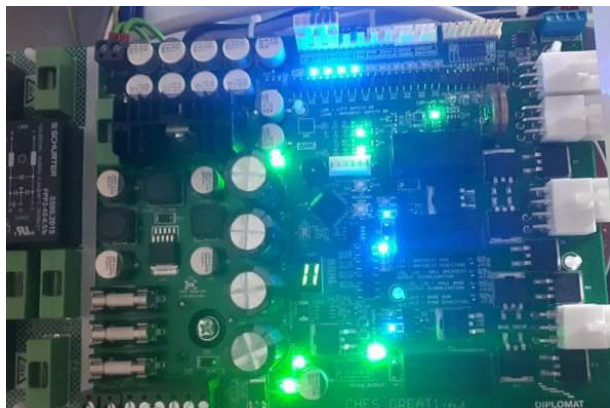
Chair and backrest movements are controlled using buttons 1 and 2.

Chair calibration (referencing) is performed by pressing and holding buttons 1 and 2 simultaneously for longer than 5 seconds. A double audible signal will then sound, and chair calibration follows once the buttons are released, and this process moves the chair into its limit positions. A long, continuous tone is sounded after successful calibration.



Remove all impediments that could prevent the chair from moving into its limit positions prior to calibration. The tone repeats 3x consecutive times if calibration is unsuccessful.

Short simultaneous pressing of buttons 1 and 2 control the movement of the backrest or the chair itself.



List of messages on the display

E – impediment in the way of the chair. The chair will only move in the direction opposite of the impediment. This message cannot be active during chair calibration. This is not an error, but simply a message that the safety circuit is active.

O – final reference point of the chair in the given direction,

U – chair lift motor is raising the chair upward,

D – chair lift motor is lowering the chair downward,

F – headrest is moving upward,

B – headrest is moving downward.

15. Assembling accessories

15.1 Bowl

Install spittoon bowl, sieve and ceramic cover.



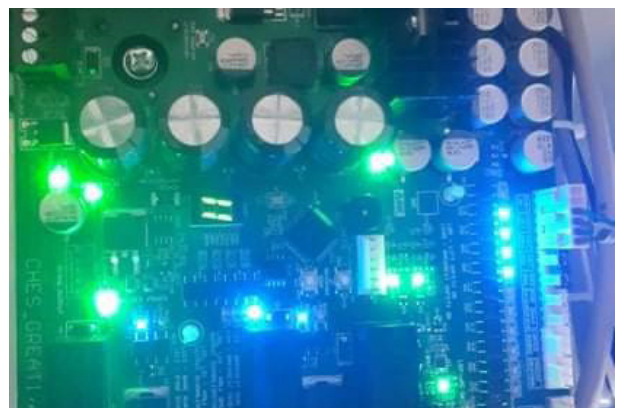
15.2 Tray table

Secure the tray table holder from the bottom side of dentist panel with three screws.

At the end of tray table installation use three black screws for leveling the table.



Install the tray table to holder.



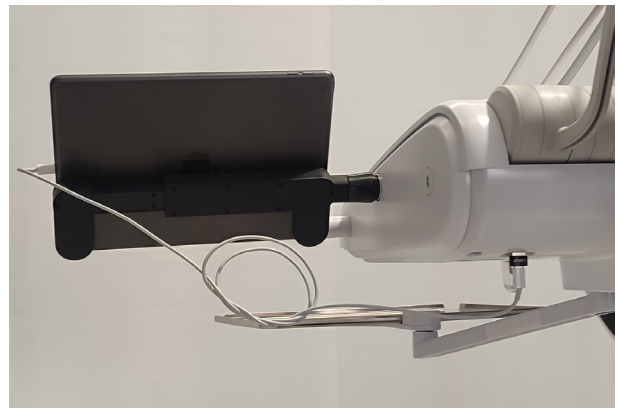
15.3 Tablet holder

Insert the holder to dentist panel.

Pay attention to the correct location of the grooves as shown in the picture.

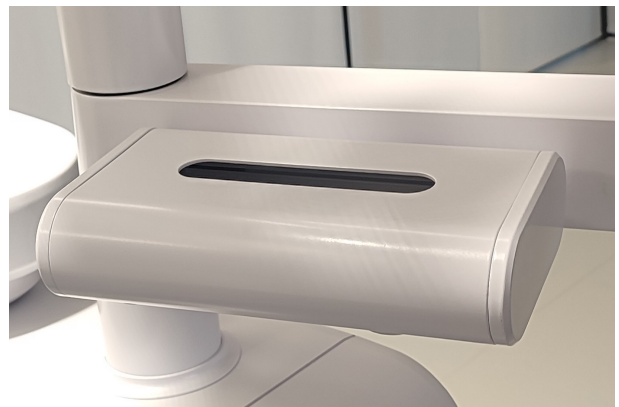
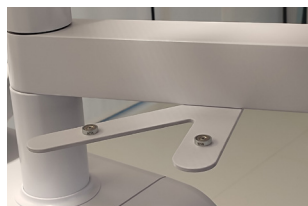


Put the tablet in the holder and connect to dentist panel.



15.4 Napkin holder

Instal napkin holder.



15.5 Pneumatical Headrest

Install headrest to the backrest part.

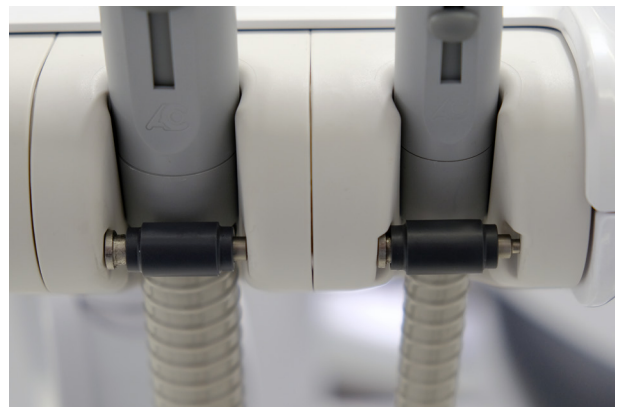
Connect the clear tube to valve.

To set resistance you can use two screws.



15.6 Assistant console

Install guide rollers for large and small saliva aspirator.



Install large and small saliva aspirator hoses.



16. Finalizing of installation

16.1 Backrest

Install backrest upholstery and cover.



16.2 Chair installation

Put the chair in the place.

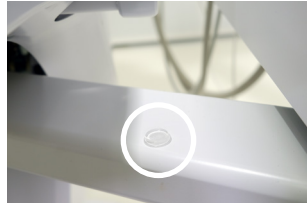
In case of convertible unit, secure chair with screws. Non-convertible unit has only consoles.



16.3 Hand-rest

Put the hand-rest on its place (if included in the unit).

Paste bumper bumpon, to prevent damage to the lacquer on the cuspidor holder when moving with the hand-rest.



16.4 Putting on covers

Move the chair up to the middle position.

Put the base cover on, secure with screws. Screws are in Accessories box.



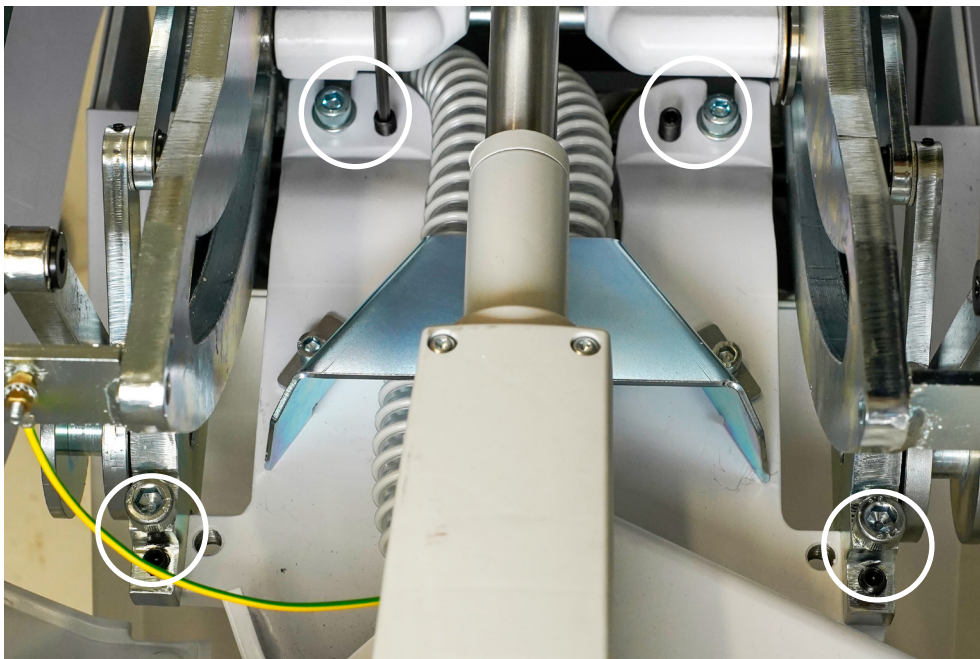
16.5 Powerblock cover

After putting powerblock cover on its place, secure it with screw.

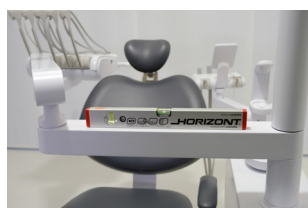


17. Water leveling the dental unit

To leveling the unit, you can use four bolts, with which is cuspidor holder screwed to chair base. After water leveling, use the black worm screws next to each setting screw to apply counter-pressure to lock the position.



The measuring point, you can use is dentist arm.



18. Setting resistance of moving parts

18.1 Dental light pantograph

Dental light pantograph brakes are under top cover. Tighten them as needed.

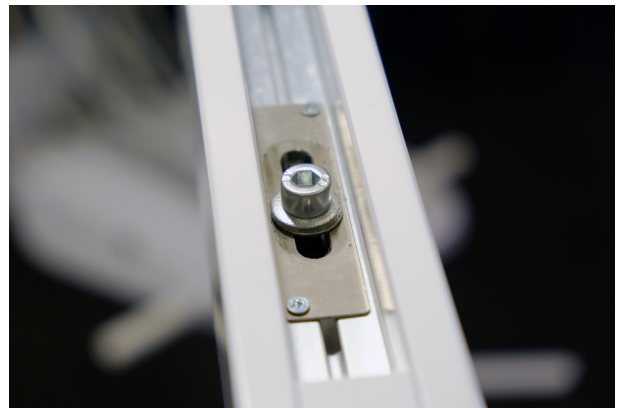
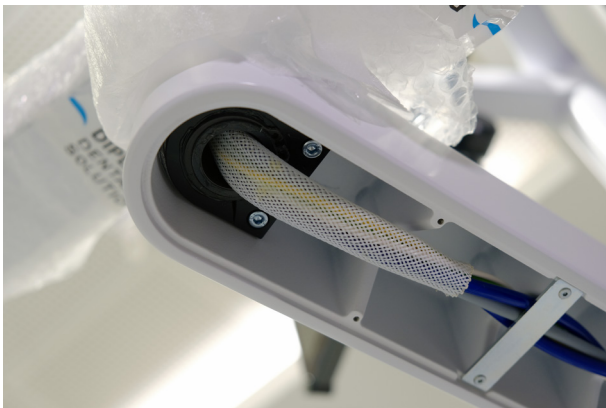


18.2 Dental light post brake



18.3 Dentist arm/panel brakes

Tighten them as needed.



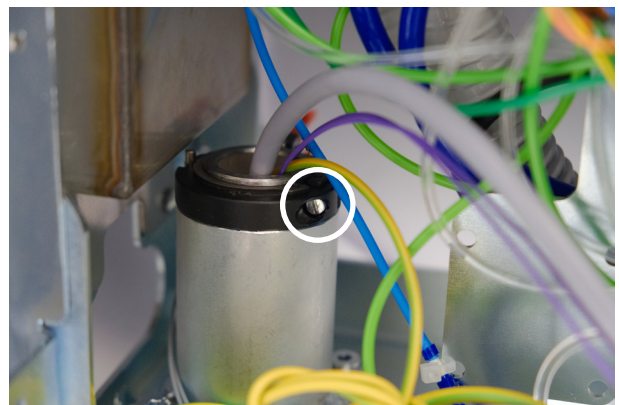
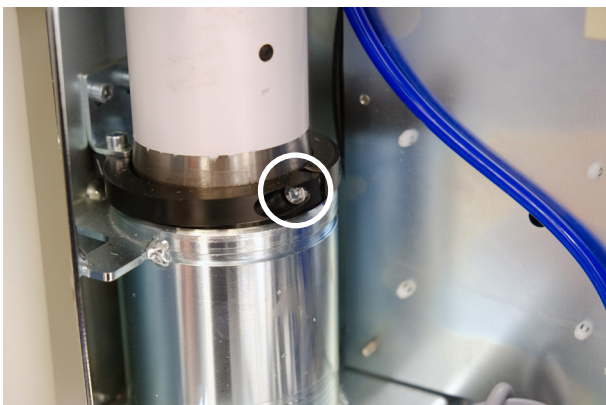
Dentists table braking (1).



1



18.4 Cuspidor block brakes



19. Foot controller

Connect the foot controller.



Before testing of the unit, you need to fill bottles with appropriate liquids.

Turn the main switch on and check functionality of the unit according to user manual.

20. Disinfection of new dental unit before its first use



Before first use of the dental unit, it is necessary to disinfect all instruments and waterlines of all instruments.

Disinfect the unit according to the instructions given in the User manual.



DIPLOMAT DENTAL s.r.o.
VRBOVSKÁ CESTA 17
921 01 PIEŠŤANY
SLOVAK REPUBLIC



Discover satisfaction.