Installation manual for Diplomat Dental units

Model One 200

Date: 01/02/2024
Revision: 1.1

DIPLOMAT
DENTAL
SOLUTIONS

TABLE OF CONTENTS

1. Information before installation

This manual provides instructions for instalation the MODEL ONE 200.

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

Floor

Concrete slab ≥ 100 mm. Inclination ≤ 1%.
Anti-static flooring is preferred.
The media connections are located in the installation hole with dimension 225 x 280mm.
The detailed layout is shown in the installation plan.

Water

Drinking water from a central supply:

Inlet pressure	0,3 - 0,6 MPa
Flow	> 5 l/min
Particulate	less than 50 µm
Water hardness	< 2,14 mmol/l
pH	6,5 – 8,5
Max. electrical conductivity	2000 µS/cm

i. The unit is equipped with a 50 µm 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.

Cooling of instruments from a central water supply

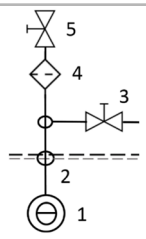
In the central water supply, a shut-off valve and a valve are included for the unit to prevent water back-flow.

Requirements and recommendations:

- If water from a central supply is used to cool the instruments, it is necessary to have a particulate filter upstream at the water inlet (5 µm).
- If water contains more than 50 mg CaO/l or 36 mg MgO/l, a water hardness treatment device must be included and connected to the water inlet. Hard water can cause malfunction of the unit. The water hardness treatment device is pre-fixed when distilled water is not used.
- When required to install a connection point for inlet water sampling, the following diagram shows the recommended location of the connection point for inlet water sampling.

This equipment is not included with the dental unit.

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 inspection 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 to 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	(equivalent to atmospheric dew point max 21°C)

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 Nl/min. 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

Waste

The waste pipe must have a continuous slope of min. 1% with a minimum flow rate of 10 l/min. and must be free of sharp bends and conditions that could cause back-flow. Do not use the same waste branch with another dental unit or washbasin! It is permitted to use polypropylene or hardened polyethylene pipes.

If the regulations in the country of installation require an amalgam separator, a dental unit with a cuspidor block without an amalgam separator must be connected to an external amalgam separator.
The external amalgam separator installation must comply with its manufacturer's instructions.

1.2 Electrical system requirements

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

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.

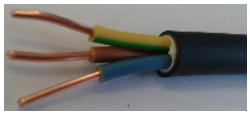
Namely we talk about availability of these basic media inputs/outputs:

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)

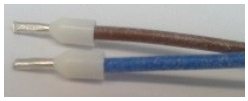
3. Electro-installation PVC tube Ø21:

- 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, (three if the base plate is ordered).
Remove box cover plates and all the 4 side plates.

BOX n. 1 - DENTAL UNIT CONTAINER		
Cuspidor block	Dental chair	Assistant´s arm
Head rest		
BOX n. 2 – CHAIR CONTAINER		
Upholstery	Ceramic spitting bowl	Monitor arm, monitor
Assistant console	Foot controller	Child booster seat
Instruments, hoses, wires	Light, light pantograph	Tray table
Small pieces	Arm rest	Protective seat cushion

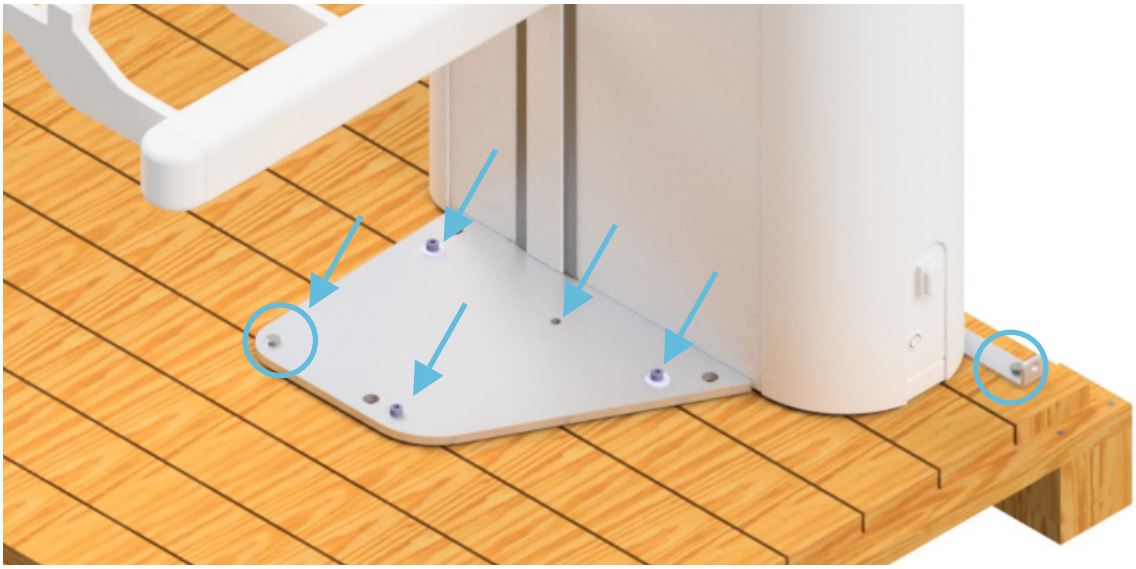
Take out all parts from unit box.

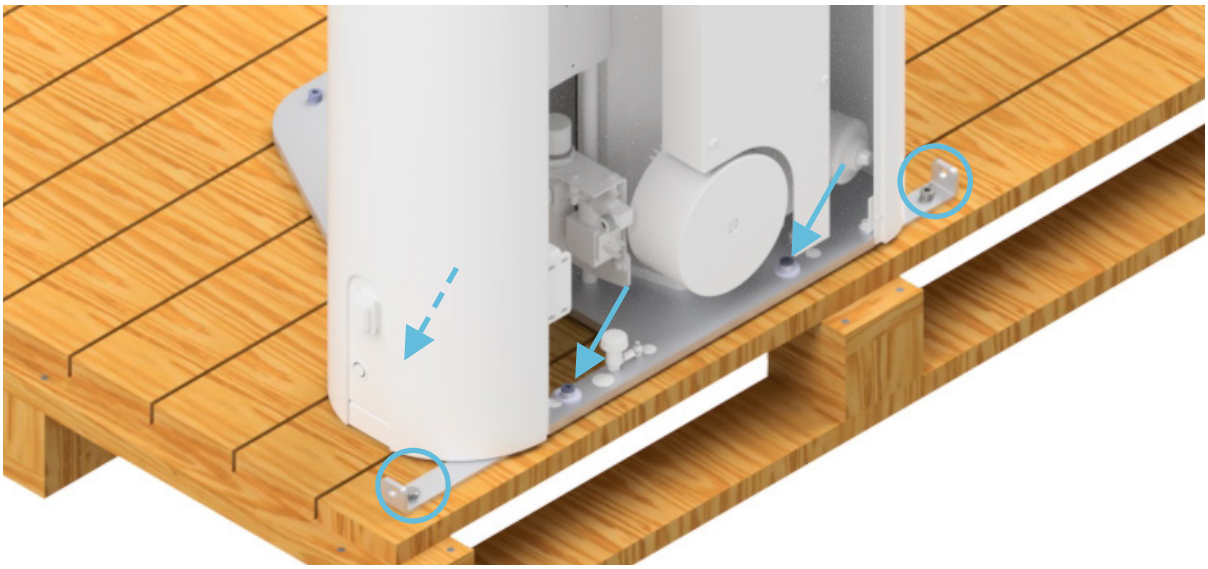
i. Do not stress the articulated dentist's table arm, except for standard movement of the arm and the loading permitted on the storage tray.

4. Prepare place and move the unit

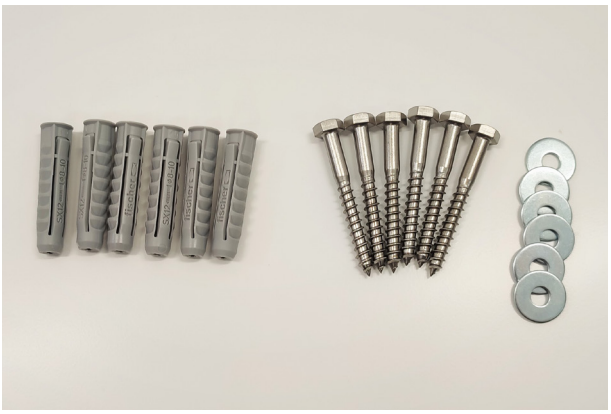
4.1 Unit with anchored base

Unit is fixed to the pallet in three points (in circles). Unscrew it, then move the unit and remove the support console.



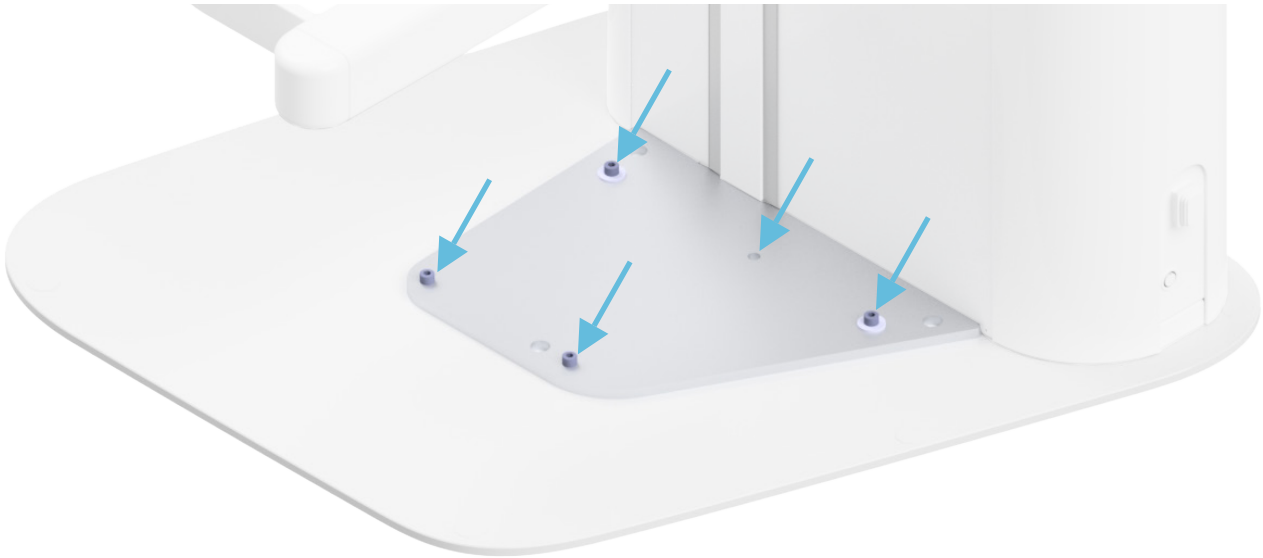


Fix the unit base in eight points (all arrows).
Use dowels, washers and screws from accessories as shown at the picture.



4.2 Unit with not anchored base

Unscrew the Unit as as mentioned above. Place base plate to the designated place.

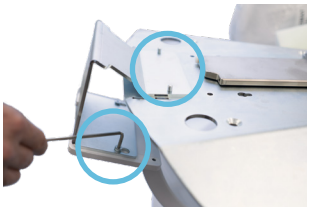


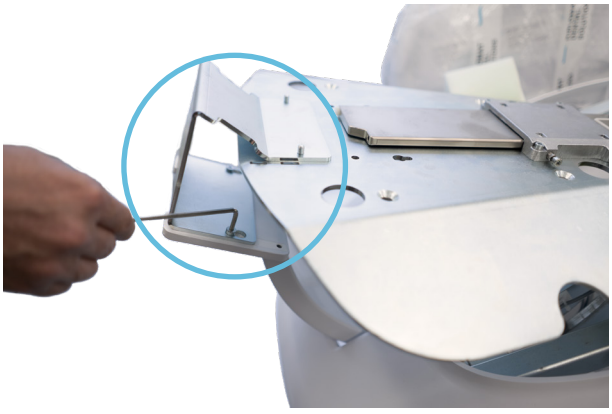
Fix the unit to base plate in eight points (all arrows). Use dowels, washers and screws from accessories as shown at the picture.

4.3 Backrest

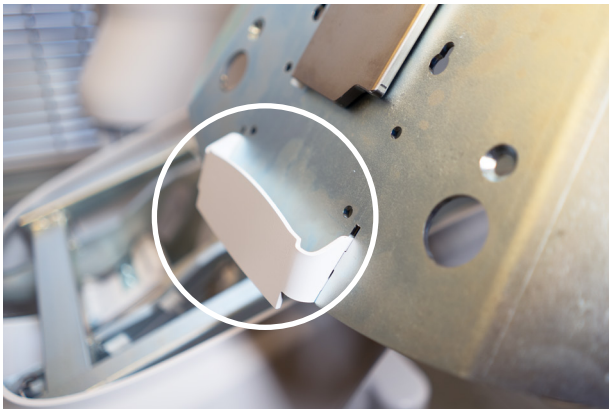
For transporting purposes, the backrest is fixed to the chair via temporal console.

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





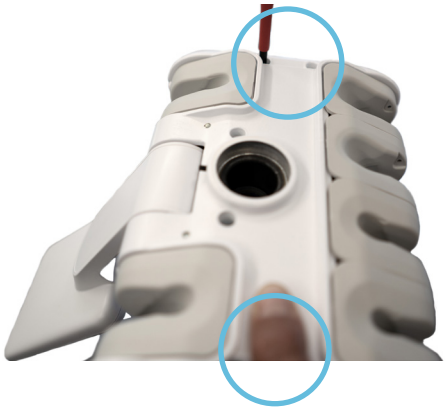
Put the white cover in place. Screw the backrest metal base.



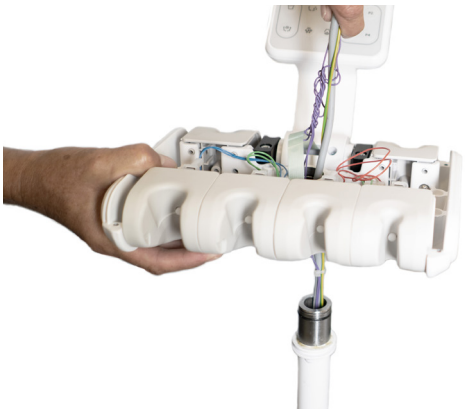
5. Asistant’s control panel, pantograph, light arm installation

5.1 Asistant’s control panel

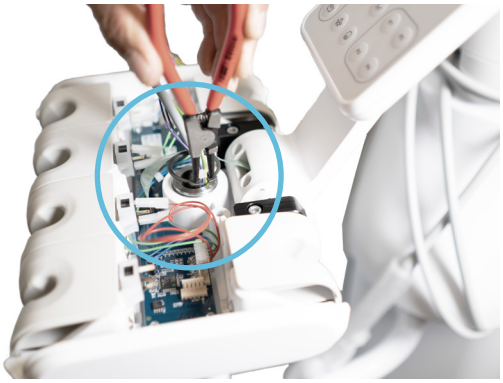
Remove the top cover from panel by unscrewing the screws, located at the bottom.



Pass the cable harness through the hole.
Then put on control panel at arm.



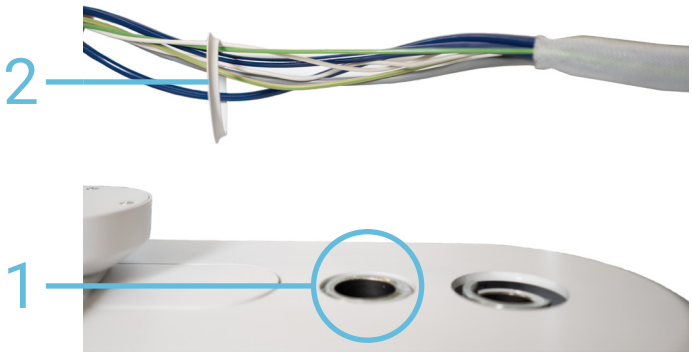
Secure the control panel with lock ring.



5.2 Pantograph and light arm

Move the circle cover through the cables and through the pantograph.

Smaller cover is for light arm **(1)**, bigger for pantograph **(2)**.



Push the cables into the pilar.
Fit the pantograph into the pivot.

Move the circle cover through the cable and through the arm. Push the cable into the hole.
Fit the light arm into the pivot.

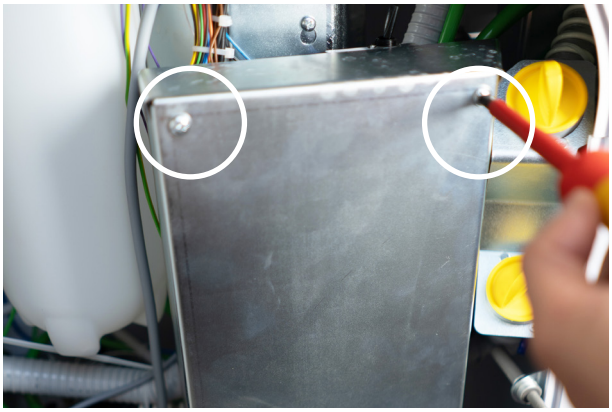
Light arm can be equipped with arm adaptation for monitor.

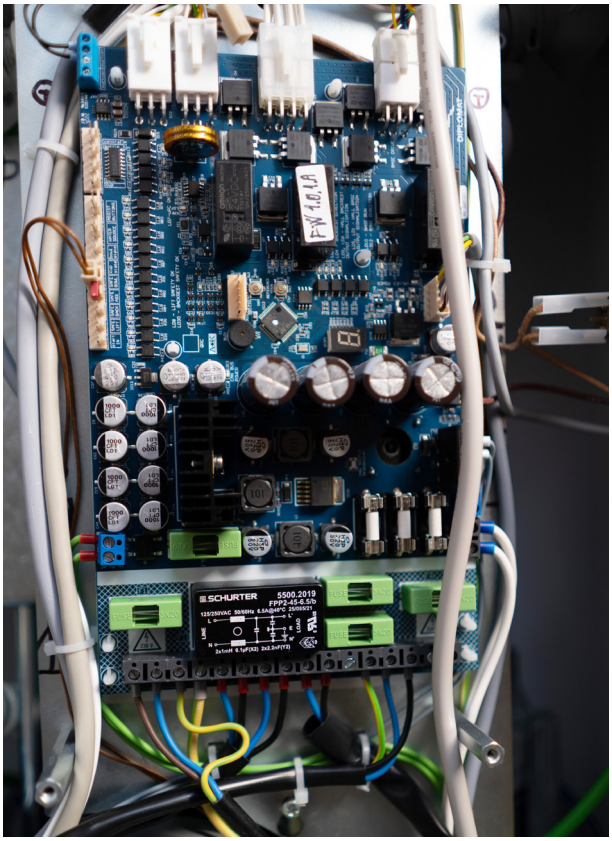
6. Connecting

Make sure electrical circuit breaker is turned off.

6.1 Powerblock

Open the cuspidor block door and remove powerblock metal cover by unscrew 4 screws **(1)**.





6.2 Connecting wires and hoses in cuspidor block

Connect the dental light cable to its counterpart in the cuspidor block.

Connect CAN BUS communication from dentist‘s panel

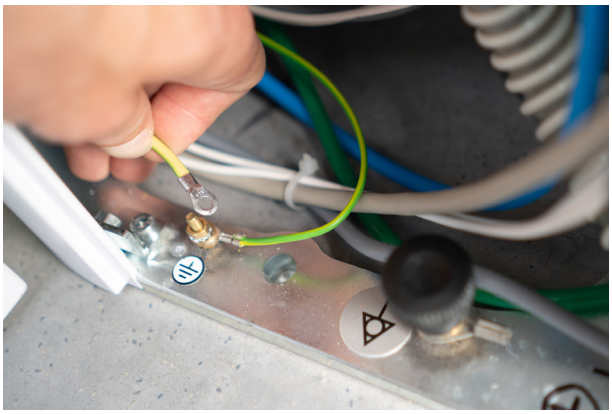
Plug blue tube from dentist‘s panel side to blue tube from main air filter regulator (4 bar).

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).

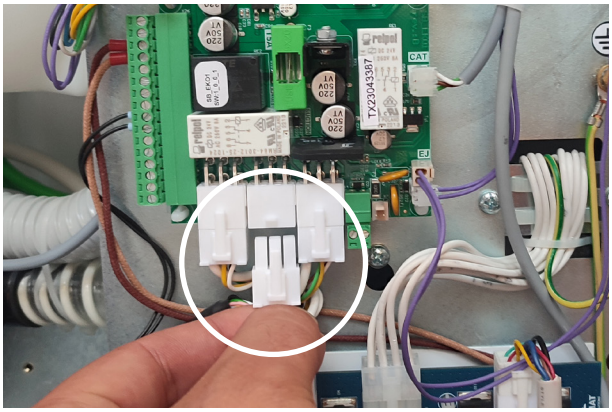
If unit is equipped with central water system, find this “T” junction connection.

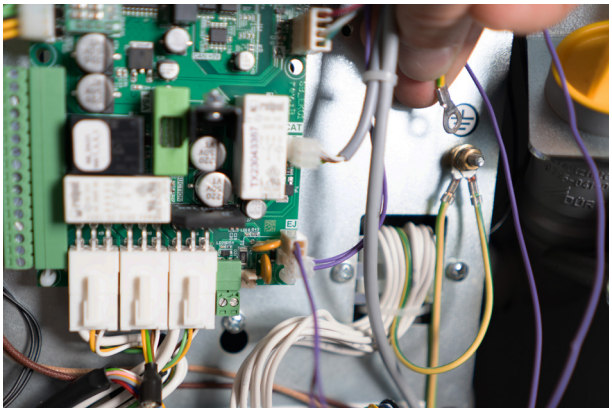
Connect grounding cables from dentist‘s arm.



Connect aspirator connection, saliva ejector and CAN BUS communication from assistant panel.

Connect grounding cables from and assistant arm.

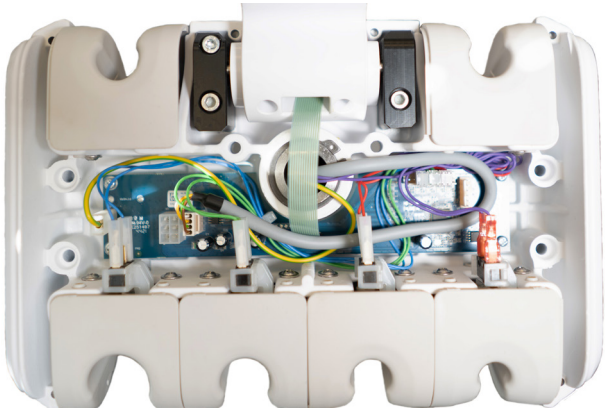




Place the cuspidor cover back, use 4 screws.

6.3 Connecting in asisstant control panel

Connect the wires, as shown in the picture.



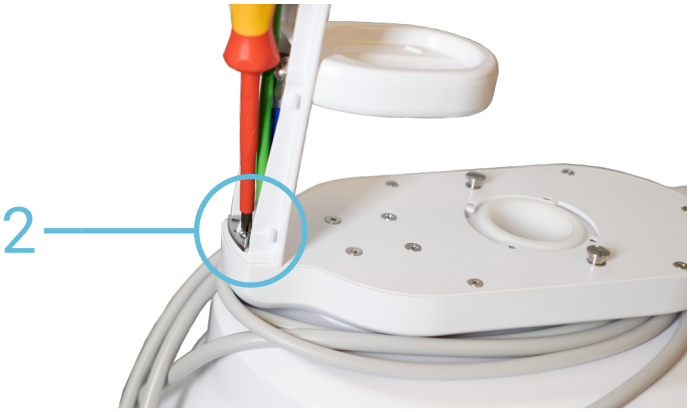
7. Assembling accessories

7.1 Water battery

Parts are packed in Chair container box. All screws are packed in a little bag in the Accessories Box. Follow the enclosed instructions.

Secure the cup holder with screws **(1)**.

Secure the battery with screws **(2)**.



Place the cover by slightly pulling down, then secure it with two screws **(3)**.

7.2 Bowl

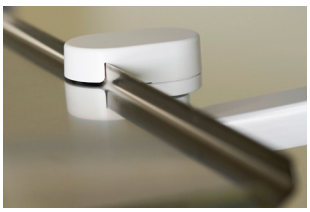
Install spittoon bowl, sieve and ceramic cover.

7.3 Tray table - Upper hose delivery system

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.



7.4 Tray table - Lower hose delivery system

Install the tray table to holder.

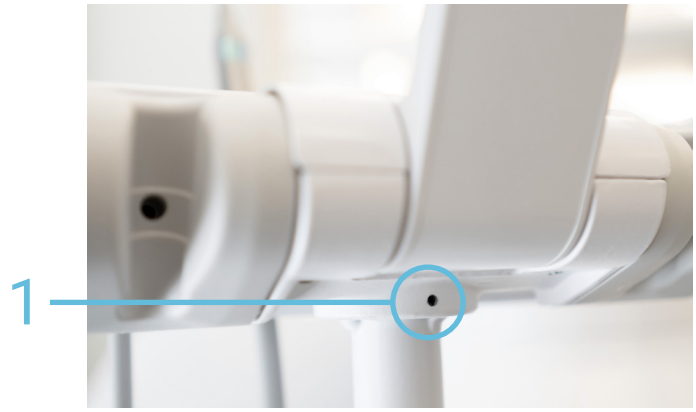
8. Setting resistance of moving parts

Dentists arm braking settings.
Braking is set here for an undivided arm.
For a divided arm (monitor version or tray)
it will be tightened, it can't rotate.

Dentists arm braking **(1, 2)**.

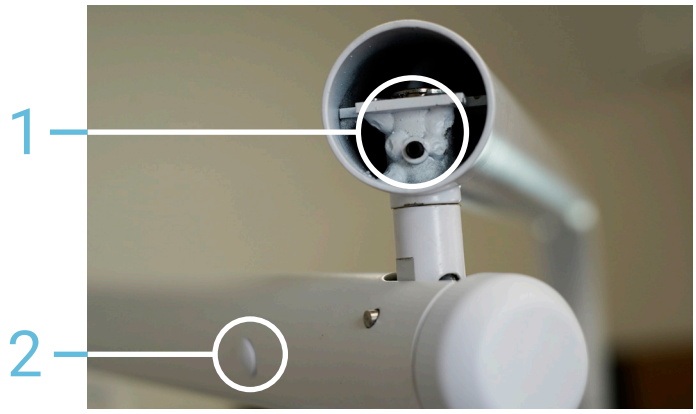
Dentists table braking **(1)**.

Asistant's arm braking **(1)**.

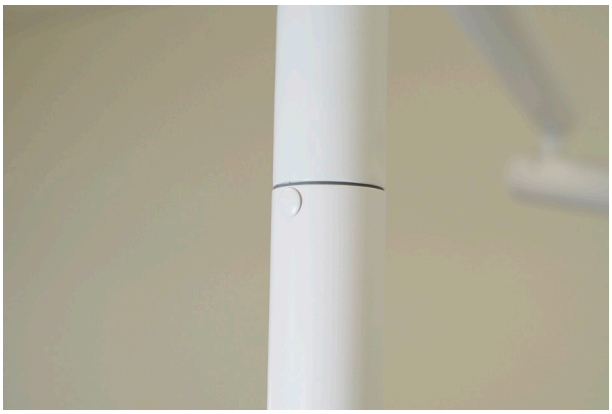


The following steps are identical to the installation of other Diplomat dental units from the model lines PRO and ONE.

Light pantograph braking **(1, 2)** and end point **(1)**.



Install brake of the rotating part of the light arm.
Insert elements into the hole, as it's shown at the picture, screw in, fit the esthetic cover.

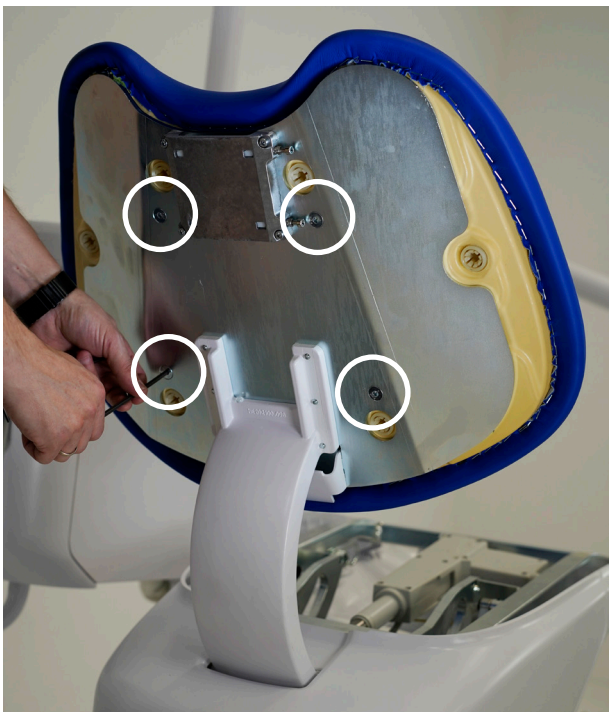


9. Upholstery installation

The following steps are identical to the installation of other Diplomat dental units from the model lines PRO and ONE.

9.1 Backrest

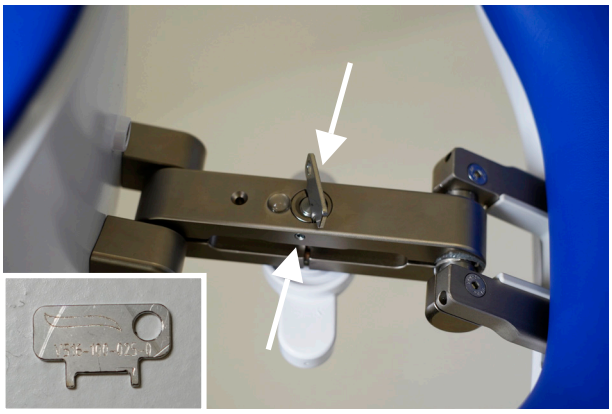
Install backrest upholstery and cover.



9.2 Headrest

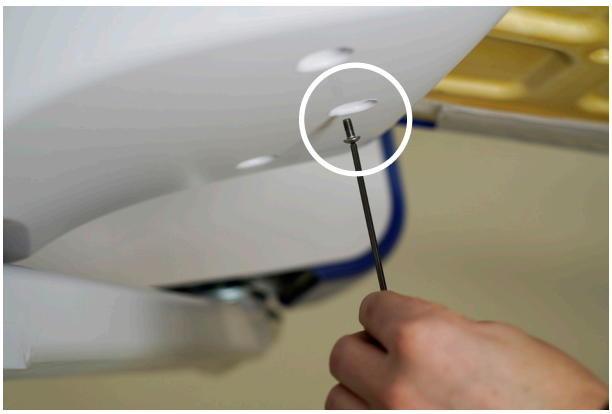
Install headrest to the backrest part.

If necessary, adjust moving strength of the headrest with adjustment screw. First, slightly loose 2 marked worm screws, one on each side, then adjust the resistance using the provided key and secure back using the worm screws.



9.3 Chair installation

Put the chair in the place. Secure it with screw from bottom (use hex key 2,5).



9.4 Hand-rest

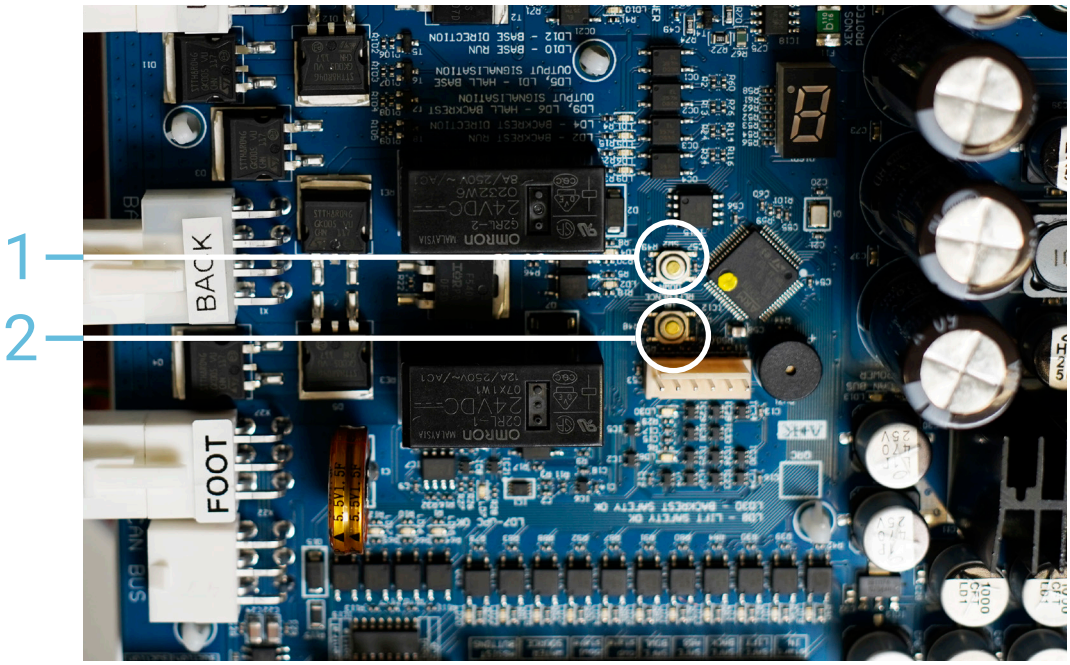
Put the hand-rest on its place.

10 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.

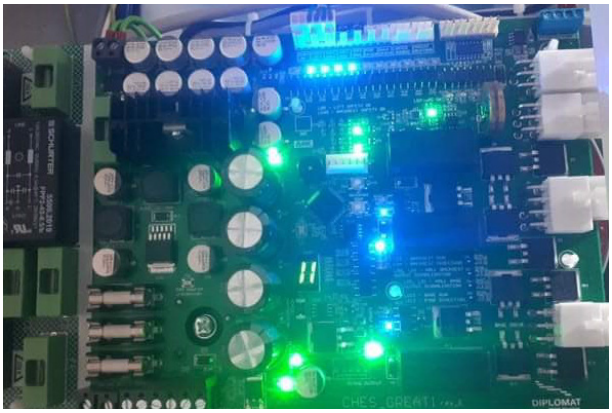


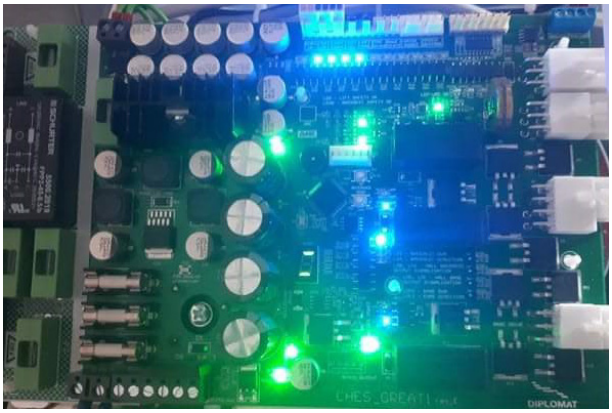
Chair and backrest movements are controlled using buttons 1 and 2.

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.

11. Finalizing of installation

11.1 Putting on covers

Place Base cover.

11.2 Hoses connection

Connect suction hoses of aspirators.

11.3 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.

12. 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.

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