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INSTRUCTIONS FOR USE

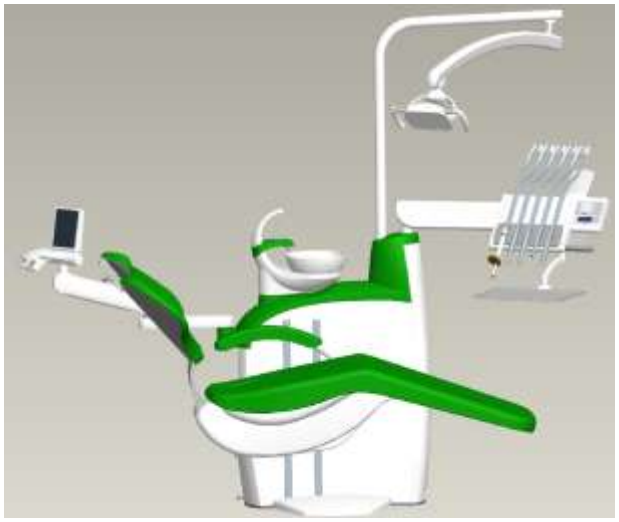
Dental unit

DIPLOMAT ADEPT DA 270
DIPLOMAT ADEPT DA 280

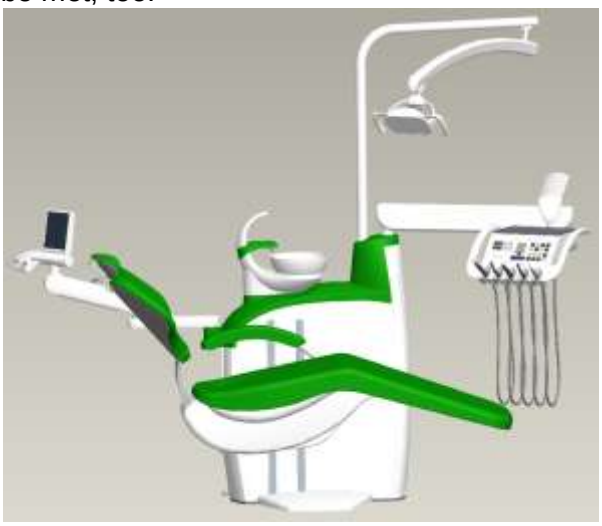
CONTENTS

1. PURPOSE AND USE

These Instructions for Use describes how to use the dental units of **DIPLOMAT ADEPT DA 270 and DA 280.** Please read these Instructions for Use thoroughly before attempting to use the unit. The dental unit is allowed to be operated only by the dentist who has been made familiar with the present Instructions for Use and the dental apllications that can be done by means of the dental unit in question. In order for you to be satisfied with the dental unit, the following must be observed: Installation, setting and/or modifications must be made by the qualified authorized service personnel of an organization that has licence for such activity. Conditions for the use of media and installation given in **the Instructions for use** of **DIPLOMAT ADEPT DA 270 and DA 280** must be met, too.



DIPLOMAT ADEPT DA 270



DIPLOMAT ADEPT DA 280

DIPLOMAT ADEPT DA 280 CART

2. PRODUCT DESCRIPTION

The dental unit of **DIPLOMAT ADEPT DA 270** is designed as a stationary unit with a carried chair and upper hose delivery and **DIPLOMAT ADEPT DA 280** with lower hose delivery of instruments. **DIPLOMAT ADEPT DA 280** dental unit is also available in a Cart Version. Control panel pantograph with the control panel and instruments, and light pantograph with the dental operating light are fitted at the upper part of the bearing pillar of the spittoon block. In a special mobile Cart Version DA280 features a cart-mounted rear delivery system. The instruments are controlled by the foot controller, except for the syringe, big and small aspirator, saliva ejector (and/or polymerization lamp and intraoral camera). On the face surface of the control panel is a membrane keyboard or glass touch screen with a display and negatoscope. The handle serves for re-positioning of the control panel. X-ray images are attached to the negatoscope by means of a clip furnished. The spittoon block is delivered in various versions with a saliva ejector or with an assistant arm with big and small aspirator. The spittoon bowl and bowl flushing tube are detachable. The bowl drive is either manual or powered (according to the requirements). Suction handpieces of the small and big aspirator are detachable, capable of being disinfected and sterilized. Handpieces of the saliva ejector are for single use. Side table with a side dish fixed to the arm of the light pantograph and monitor arm with LCD monitor are installed as an option upon order. The dental unit of **DIPLOMAT ADEPT DA 270, DA 280** is always equipped on the control panel with a syringe.

The control panel can be fitted with the following instruments:

max. 4 rotary instruments	min. 1 syringe
max. 5 instruments with light	1 scaler
max. 4 turbines	1 polymerization lamp (led)
max. 4 micromotors (max. 3 DC motor, max. 2xMX motor)	1 polisher

Note
Optional and supplementary equipment (see the valid price list).

3. TECHNICAL DATA

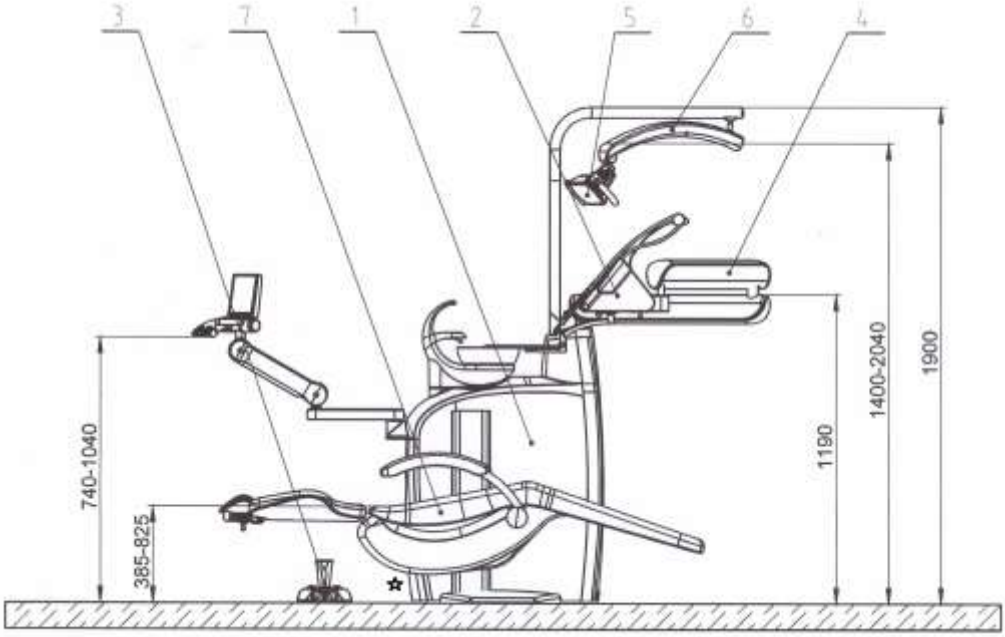
Supply voltage	230V ± 10%
Frequency	50 Hz ± 2 %
Max. power input at 230V/50 Hz	1550 VA + 10%
Input pressure of air	from 0,45 to 0,8 MPa
Input pressure of water	from 0,3 to 0,6 MPa
Dental unit weight	210 kg + max.35 kg acc.to version
Type of protection against electric shock	Class I equipment
Degree of protection against electric shock	applied parts of B type
Temperature of water for the cup	36±5 °C (with heater fitted)
Max. loading capacity of the tray table	1,5 kg
Max. loading capacity of the side table	3 kg
Operation mode	continuous with intermittent loading, corresponding to the common dental practice.

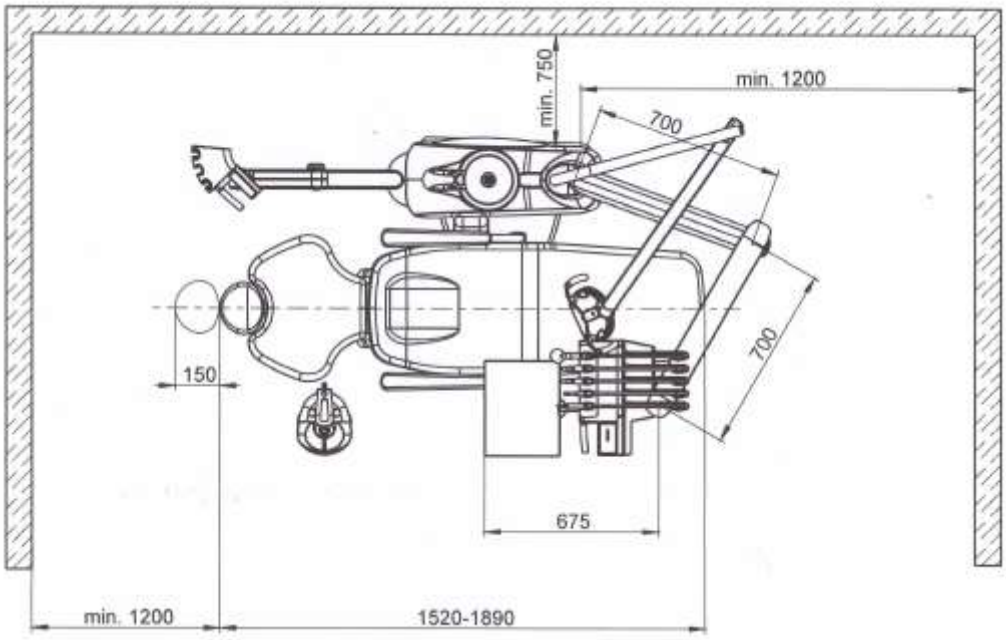
Chair

Range of the height of the seat above the floor	385 ÷ 825 mm ± 15 mm
Range of the tilting of the back rest from vertical plane	20°÷ 90° ± 2°
Vertical movement time	max. 20 sec
Back rest movement time	max. 18 sec
Maximum loading capacity of the chair	135 kg
Type of operation	1 : 16 (cycle, e.g.25s run, 400s rest)
Sound pressure level of the chair	max. 54 dB

Caution
To eliminate the risk of electric shock, the present equipment must be connected to the supply mains with protective earthing.

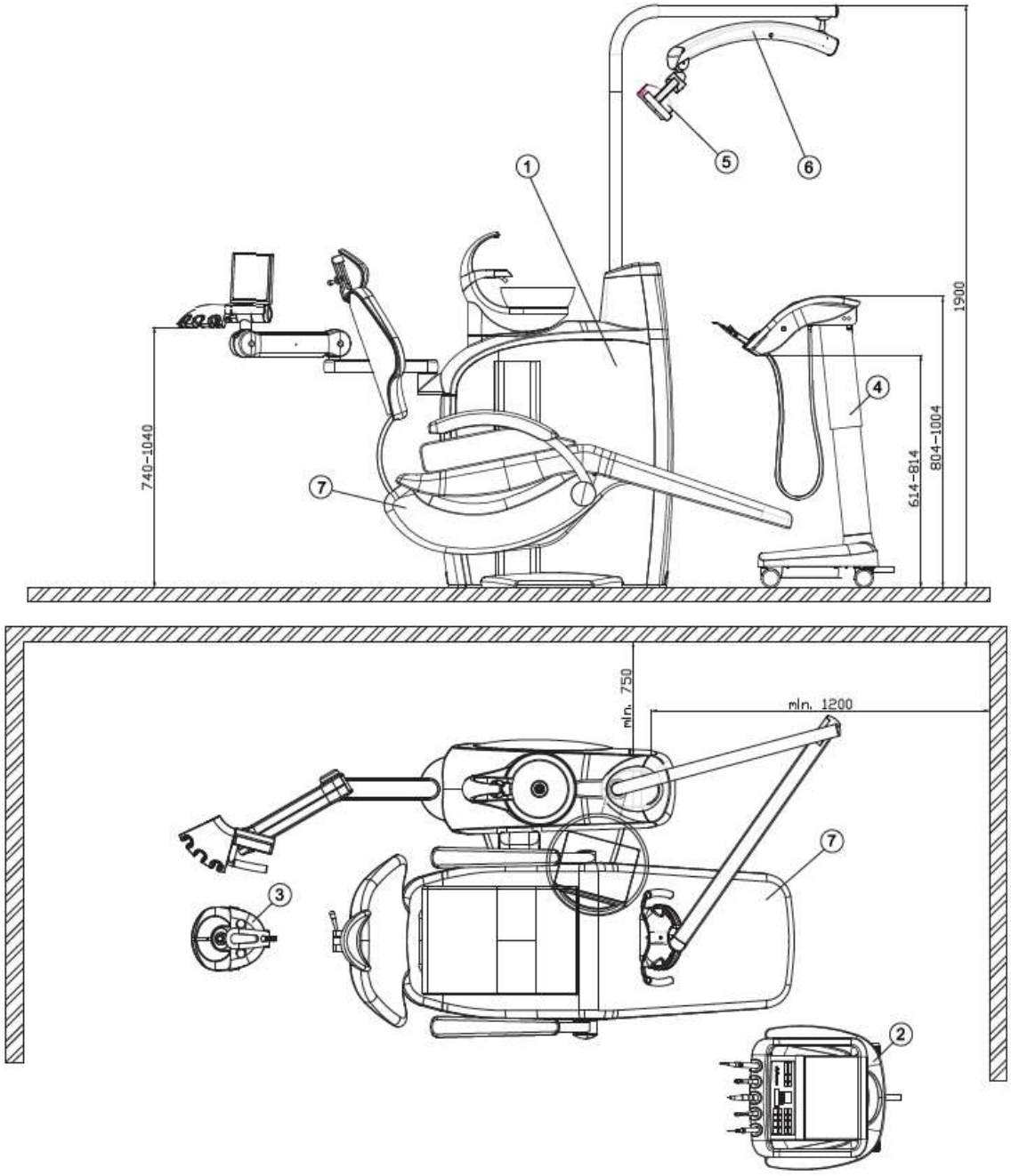
4. DESCRIPTION OF THE DENTAL UNIT





1.Spittoon block with assistant arm
2.Control panel
3.Foot controller
4.Pantograph of the control panel
5.Dental operating light
6.Pantograph of the light
7.Dental chair
☆ main switch, located onthe outer side of the spittoon block

DESCRIPTION OF THE DENTAL UNIT DA 280 CART



1.Spittoon block with assistant arm
2.Control panel
3.Foot controller
4.Cart
5.Dental operating light
6.Pantograph of the light
7.Dental chair

4.1 Data plate

1 – designation of the unit type
2 – basic electrical parameters
3 – serial number
4 – production date
5 – chair operation type

5. PRE-INSTALLATION REQUIREMENTS

5.1 Environmental conditions

Not to be installed in the premises with explosion hazard!

5.2 Requirements for the installation of media

Water

Drinkable water with input pressure of **0,3 MPa** to **0,6 MPa** with the flowrate of min.**4 l/min**., without particles bigger than **50 µm**, which might clog the small cross sections of the pipes of the dental unit, must be used. If the water contains particles bigger than **50 µm**, there must be introduced **50 µm** advance filter /strainer.

Cooling of the instruments with water from the central distribution

There must be introduced advance **5 µm** filter**. If the water contains more than 50 mg CaO/l, or 36 mg MgO/l**, there must be introduced water treatment device connected to the input of the water distribution. Hard water may even cause the unit not to function. Water treatment device is introduced if distilled water is not used. The distribution after the filter must be made of Cu, and/or PE tube. A suitable certified closing valve must be introduced into the central distribution of water for the unit! In installation it is necessary to install a device to prevent the backflow at the point of the connection to the supply of municipal tap water. The said device is not part of the dental unit.

Air

Supply of at least **55 l/min.** of air at the pressure of **0,45 to 0,8 MPa**, oilless, clean and dry, must be ensured. Tubes made of Cu and/or PE are recommended.

Suction (in the event of the version of the spittoon block with big and small aspirator)

Static vacuum must be within the range of min. **0,005 MPa** (50 mbar) to max. **0,02 MPa** (200 mbar), measured at the installed position. When the static vacuum is higher than 0,02 MPa, a suction calibration (regulating) valve should be introduced in the suction branch to restrict the max. vacuum to 0,02 MPa. The said regulating valve is not part of the dental unit. The suction unit must produce the flowrate of at least **450l/min**., measured at the installed position.

Waste

The waste /drain/ branch must have continuous slope of min. **1%** with minimum flowrate of **10l/min.** and must be free of sharp bends and conditions that might cause backflow. **Do not use the same waste branch with another dental unit or a basin!** It is allowed to use tubes made of polypropylene or cured polyethylene.

Caution
Pre-installation and installation must be performed according to the applicable standards of the particular country and in accordance with the valid documentation of the manufacturer, which is owned by each authorized representative of Diplomat Dental s.r.o.

Note
If the regulations of the country in which the installation is carried out require an amalgam catcher, the dental unit with the spittoon block without the amalgam catcher must be connected

to an external amalgam catcher. Installation of the external amalgam catcher must be carried out according to the instruction of its manufacturer!

Recommended mains fuse rating

Recommended rating of the fuse of the supply main is 16A (in the event of circuit breaker – circuit breaker with switching-off characteristic of C type). No other equipment should be connected to the supply main in question! Max. power input of the dental unit is 1550 VA. The supply main must comply with the respective national standard.

Recommendation

Unless national standard stipulates otherwise, the manufacturer recommends to use current protective switch with the sensitivity of 30mA and instantaneous time of switching-off.
Pre-installation requirements having been met, assembly and installation of the dental unit is carried out and it is connected to the media.

5.3 Floor

The floor must have a concrete foundation of at least 100mm thickness. The slope of the floor shall not exceed 1%. The use of antistatic floor is recommended.

5.4 Environment

ambient temperature range	from	+10°C	to	+40°C
relative humidity range	from	30%	to	75 %
atmospheric pressure range	from	700 hPa	to	1060 hPa

6. ASSEMBLY AND INSTALLATION

Unpacking of the unit and inspection of the delivery

Inspect the transport packages for damage. If a defect of the transport package is found, do not open the consignment, and report the defect to the forwarding agent or seller immediately. If the consignment is intact, carefully open the package and unpack individual parts of the dental unit. Check the completness of the delivery according to the **Packing List**. If the unit is equipped with a glass keyboard, take care of its glass surface in handling.
The installation must be carried out by a service technician with valid certificate, otherwise potential guarantee shall not be accepted. The guarantee form must be completed and sent to the manufacturer or the seller.

Note:
Sieves (packed with small parts) are to be inserted in the tips of the aspirators according to

Fig.10.1. (chapter 10.4)

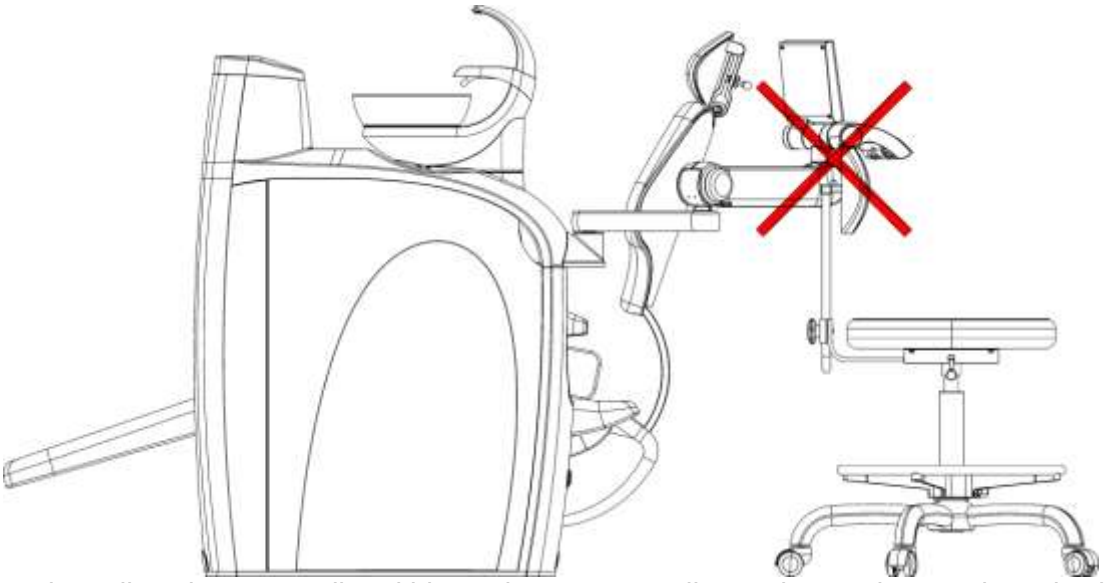
7. PUTTING THE UNIT INTO OPERATION

1. switch on the compressor and let it get pressurized
2. open the central water supply
3. turn on the suction unit (if the spittoon block is fitted with the big and small aspirator)
4. turn on the main switch located on the cover of the spittoon block – position I, the indicator light of the main switch goes on. The following message is displayed:

DENTAL UNIT V1 READY FOR WORK

Thus indicating the readiness of the unit for operation. The unit is connected to the distribution of water and air. After approx. 5s the unit is ready to work. If the dental unit is equipped with electrical water heater, it is necessary to wait for approx. 10 min. for the water to be warmed up to the desired temperature. In turning the unit on, no instruments should be taken, the foot controller should be in the rest position and the buttons of the keyboards should not be depressed.

Caution
When moving the chair, the arm and the assistant table must not be in the trajectory of the chair. (see the illustration).



Besides the saliva ejector, small and big aspirator – according to the version – polymerization lamp and the syringe (on the control panel) only one instrument can be used (taken) simultaneously! Not observing of the condition above is indicated on the display by the following message:

DENTAL UNIT V1 INSTRUMENT ERROR

8. PRODUCT OPERATION

8.1 Control panel with instruments

Membrane keyboard

Membrane keyboard

Glass keyboard

Glass keyboard

Note

The display is legible in each working position of the dentist (both sitting and standing).
In the event of the glass keyboard, after pressing the button it is active for ca 10 seconds – indicated by means of the indicator of the pressing of the button on the display.

Programming of the time of the cup filling and bowl flushing in the event of the glass keyboard for more than 10 s is possible only by means of the foot controller or by means of the buttons on the assistant table.

Button	Description	Button	Description	Button	Description
	negatoscope illumination	W	setting of the amount of cooling water		rotation of the spittoon bowl (only for el. control)
	instrument cooling	P1 P2	changing-over of the program sets		switch to move the chair up
	reversing of the rotations of the micromotor,ENDO, AFT		main light control (valid for particular type)		switch to move the chair down
	cup filling		supplementary button (e.g.door opening) (valid for particular type)		switch to move the rest forward
	spittoon bowl flushing	M	selection of activity mode for MX motor and torque for motor		switch to move the rest backward
	illumination of instruments	T	setting of torque for micromotor		writing-in and recalling of program positions
+	button to increase parameters		changing-over of the function of the foot controller (analogue - ON/OFF)		automatic setting of the starting (getting-on) position
—	button to decrease parameters		change of the transmission ratio of the instrument head		

8.1.1 Description of the buttons

To activate a function, it is enough just to press (with the membrane keyboard) and/or touch (with the glass keyboard) at the point of selected button. With the glass keyboard, the selection of chosen function is indicated in addition to the display also by a short beep and a dot on the display. For all controllable parameters, their informative values is represented by means of a bar indicator in the lower part of the display (valid only for the glass keyboard). Maximum of the bar corresponds to 100% of the set value. Maximum time of the selection of any symbol is ca 10 sec. After the said time has elapsed, a condition is achieved as if the function was not selected.

Locking and unlocking of the keyboard (valid only for the glass keyboard)

Locking of the keyboard – simultaneous selection of the button and the button —. Key symbol is displayed and the keyboard keys do not respond to the selection of buttons.

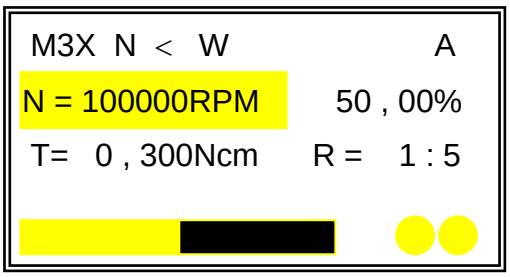
Unlocking of the keyboard – simultaneously select the buttons and — again.

Note

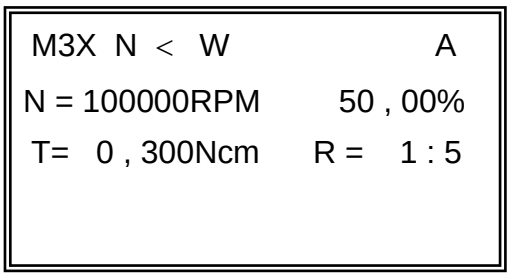
Always lock the keyboard before cleaning the keyboard while the dental unit is turned on. After the keyboard has been cleaned, it is necessary to unlock the keyboard, because the instruments are locked too.

Representations on the display

Glass keyboard



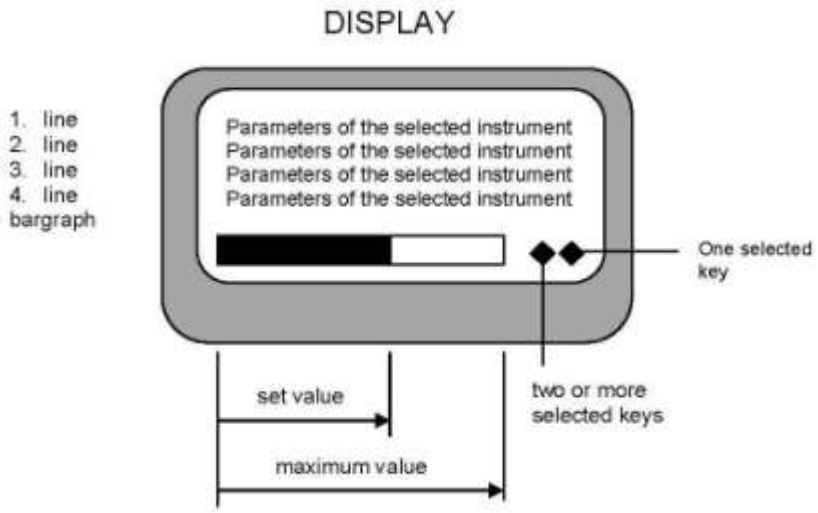
Membrane keyboard



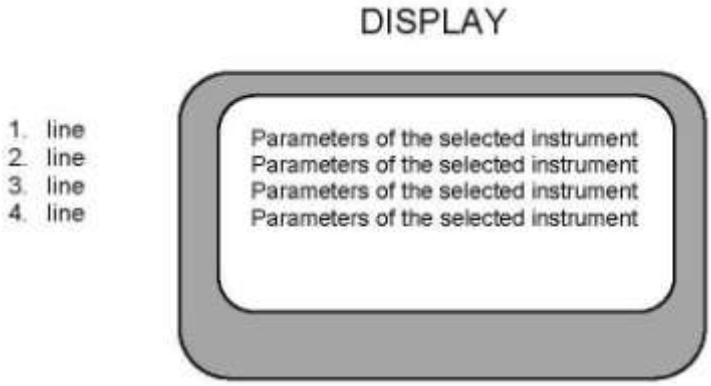
Description of the data of the display– glass keyboard

	Status bar – graphical representation of highlighted value
	Highlighted value – active value that is currently set and which can be changed by means of the buttons PLUS (increase) or MINUS (decrease)
	Indicator of the selection of a button („pressing“ of one key)
	Indicator of the selection of arbitrary buttons („pressing“ of two and more keys)

Glass keyboard



Membrane keyboard



Negatoscope illumination

Press (touch) the button to turn the negatoscope illumination on. To turn the illumination off, press (touch) it again. To control the intensity of the negatoscope, press (touch) the button  and the buttons PLUS and MINUS simultaneously with the negatoscope turned on. After the negatoscope has been turned on, by keeping the finger on the button  for more than **4s** the brightness of the negatoscope is increased up to maximum. After the maximum brightness has been achieved, the brightness decreases to minimum and then increases gradually. The set values of brightness are stored in the memory and set automatically when the negatoscope illumination has been turned on again.

Instrument cooling

It is possible to switch the instrument cooling on by means of pressing (touching) the button  for micromotor and turbine, while the switched-on condition is indicated on the display by going the symbol "**S**" or "**W**" on. When the instrument has been returned to the basic position, the current setting of the instrument cooling is saved automatically.
Changing-over of the cooling mode in the event of the glass keyboard, see Cl. 8.2 – SPRAY button.
The following 2 conditions of cooling are available:

- "**S**" - spray cooling
- "**W**" - water cooling

To change-over between the mode of cooling with water (W) and spray (S), press (touch) the button  for more than 10s and less than 16s. If the glass keyboard is used, the cooling modes are changed-over by means of the spray button on the foot controller.

Reversing of the rotation of the micromotor

It serves to change the direction of the revolutions of the micromotor, to set the ENDO function for the ultrasonic scaler and to set AFT (auto-forward time) for MX micromotor.

Cup filling

To let the patient cup fill for the set time, press (touch) the button and keep the finger on it for more than **0,6s**. To set the filling time up to the moment the button has been released, press (touch) and keep the finger on the button for more than **4s**. To interrupt the cup filling during the cup filling time, press (touch) the button for min. **0,2s**. Maximum programmed cup filling time is **25s**. The set cup filling time is saved automatically and with repeated pressing (touching) shorter than **4 s** the cup filling is started for the set time.
In the event of the glass keyboard, the programming of the cup filling time for more than 10s is possible only from the foot controller or by means of the button on the assistant table.

Bowl flushing

To start the flushing of the spittoon bowl for the set time, press (touch) the button and keep the finger on it for more than **0,6s**. To set the spittoon bowl flushing time up to the moment the button has been released, press (touch) and keep the finger on the button for more than **4s**. To interrupt the bowl flushing during the bowl flushing time, press (touch) the button for min. **0,2s**. Max. programmed bowl flushing time is **40s**.
Programming of the time of the bowl flushing in the event of the glass keyboard for more than 10 s is possible only by means of the foot controller or by means of the button on the assistant table.

Illumination of instruments

Press (touch) the button to turn the illumination of the rotary instruments (turbine, micromotor) on and off. By pressing (touching) it is possible to modify the instrument that has been taken. When the instrument illumination is turned on, "**L**" is displayed. The instrument illumination goes on after putting the instrument into operation. The instrument illumination goes off automatically after **10s** has elapsed after the end of the use of the instrument. After the instrument has been replaced to the basic position, the instrument illumination goes off.

Plus and minus

To increase (decrease) the parameter being set from min. up to max. value, press (touch) the button for a short time. By pressing (touching) and holding the button for 1s, the parameter in question is increased (decreased) up to the maximum (minimum) value.

The buttons serve to set the following:

- the micromotor revolutions (speed)
- the output when the scaler is used
- negatoscope illuminance /illumination intensity/, with the negatoscope turned on
- main light illuminance
- flowrate of cooling water for instruments, except for the syringe
- the torque for MX motor
- changing-over of the program position P1...P8 in the combination with the button  for the glass keyboard

Water

Depending on the version of the dental unit, it is possible to adjust the flowrate of cooling water, see Cl. 8.1.2. If the unit is not equipped with the proportional valve, then (W) is not displayed.

P1/P8 – programming of the instruments (membrane keyboard)

The button serves to select the programs. Each instrument has the option of 8 programs P1–P8.

The selection of P1 – P8 programs is made by pressing the button **P1/P2** on the dentist control panel when the instrument is taken, while the current program is displayed in the left lower corner.

In each program it is possible to make any changes and these changes are saved automatically.


+


Programming of the instruments (glass keyboard)

The button (combination of buttons) serves to select the programs. Each instrument has the option of 8 programs P1–P8.

The selection of the P1 – P8 programs is made by touching and holding the button  and subsequent repeated touching  in case of the glass keyboard – it is necessary to observe the sequence of pressing the buttons on the dentist control panel with the instrument taken, while the current program is displayed in the left lower corner.

Control of the main light (according to the version of the dental unit)

The button serves to control the main dental light. Press (touch) the button to change-over between the three conditions – lower illuminance, higher illuminance, light turned off. At the higher illuminance it is possible to control the illuminance by simultaneous pressing (touching) the button and the buttons PLUS or MINUS, namely so that in changing-over from the lower illuminance to the higher, keep the finger on and increase or decrease the illuminance of the dental light by means of the buttons PLUS or MINUS. It is also possible to control the illuminance by keeping the finger on for more than 4s when changed-over to the higher illuminance.

Button according to the version of the dental unit (e.g. door opening)

Acoustic indication is heard while the button is kept pressed (touched).

M Selection of the mode of activity for brushless (MX) and brush (MC2, MC3)

The button serves for the selection of the mode of activity for the MX micromotor, while the selected mode is displayed: "**MX N**" – normal mode of activity, "**MX R**" - auto-reverse mode, "**MX F**" - auto-forward mode. To change-over the torque for the brush motor, press the button T and then press the button M (description, see the button T).

T Setting of the torque for the motor

Setting of the limit torque for the MX motor. Press (touch) the button and then set the limit torque by means of PLUS, MINUS. The mode of the setting of the limit torque is indicated by means of the symbol "**!**" next to the symbol "**T**" ("**T!xxx, xxxNcm**"). With the glass keyboard, the set value is highlighted. To finish the setting of the torque, press (touch) the button again, the message "**T=xxx,xxxNcm**" is displayed.

New functions for brush micromotors

By means of the buttons M and T it is possible to change the torque of the brush micromotors M1, M2 and M3.
In the left upper corner the following is displayed on the dentist control panel after the micromotor M1, M2 and M3 has been taken:

M1 or **M2** or **M3**

and then the following is displayed:

FL or **FM** or **FH**

FL (Force Low) represents 80% value of the maximum torque
FM (Force Medium) represents 90% value of the maximum torque
FH (Force High) represents 100% value of the maximum torque

Press the button T on the dentist control panel and then change the value of the maximum torque by pressing the button M, while the message on the display changes in the following sequence: **FL, FM, FH** and again **FL**.
The change can be made provided an instrument is taken and START function on the foot controller is inactive. Changes are saved in the programs P1-P8 automatically.

Changing-over of the function of the foot controller (analogue - ON/OFF)

The button serves to change-over the mode of the foot controller. It is possible to change-over between the mode of the proportional control and the "on /off" mode (O/A on the display).

Change of the transmission ratio of the instrument head

By touching the button it is possible to choose one of the following transmission ratios: 1:5,1:2, 2:3, 1:1, 2:1, 3:1, 4:1, 5:1, 8:1, 10:1, 16:1, 20:1, 32:1, 64:1, 128:1. It does not change the revolutions, only re-calculates the current value of the revolutions at the tip.

Chair movement

All the buttons below controls the chair directly with the instrument replaced or taken when the foot controller pedal is in the zero position.


seat up


seat down


back rest backward


back rest forward

Saving / recalling of a macro into / from the memory.

It serves to save and recall pre-set positions of the chair.

With the glass keyboard, the button, as the only one, responds only after it has been released and not immediately after touching it as others do! If the button needs to be held in case of the glass keyboard, it is necessary to use the identical button on the foot controller.

Selection of memory group.

Programable positions of the chair can be saved in two groups (2x5 positions).

Procedure how to select the desired set:

Hold the  button (ca 3 seconds) until you hear an audio signal (short – long tone). Only then the unit switches to the programming mode. Immediately after you have heard the audio signal, press the button of the selection of the group in question.

For group 1 it is the button  .

For group 2 it is the button  .

The selection of the group is indicated by means of an audio signal – 1 beep for group 1 and 2 beeps for group 2. The selection of the group remains saved in the memory even after the unit has been turned off.

How to save the chair position into the memory:

Get the chair to the desired position and press the combination of the buttons one by one

 +  + one of the buttons under which the position is to be saved:

 ,  ,  ,  .

The  button should be held (ca 3 seconds) until you hear an audio signal (short – long tone). Only then the unit switches to the programming mode and it is possible to go on programming. Otherwise the new data on the position will not be saved into the memory.

With the glass keyboard it is necessary to use the button from the foot controller.

Saving of the position is indicated by means of an audio signal – one long and two short beeps.

If the writing-in fails, you will hear an audio signal – 3 long beeps.

How to recall the chair position from the memory:

Press the combination below one by one

 + one of the buttons under which the position of the chair is saved.

Getting-on position

If all the instruments are replaced and the button is pressed (touched), the chair is set automatically to the getting on/off position. At the same time, the main light goes off, the bowl is returned to the basic position and flushed automatically (if powered bowl rotation and light control is fitted). If an instrument is taken, only getting-on position is recalled.

Programming of the getting-on position:

The procedure is identical with that of programming any other position of the chair, i.e. pressing the button combination below one by one

 +  +  .

The  button should be held (ca 3 seconds) until you hear an audio signal (short – long tone). Only then the unit switches to the programming mode and it is possible to go on programming. Otherwise the new data on the position will not be saved into the memory.

With the glass keyboard it is necessary to use the button from the foot controller.

Saving of the position is indicated by means of an audio signal – one long and two short beeps.

If the writing-in fails, you will hear an audio signal – 3 long beeps.

To recall the getting-on position, simply press the button  .

In the event that there might be a collision of the bowl and the chair, the chair is blocked and an audio signal sounds– short repeated tone. To finish the movement of the chair it is necessary to return the bowl to the basic position manually.

Rinsing position

By pressing the  button for more than 1s and less than 4s the chair returns from the rinsing position, while the bowl starts to rotate to the basic position, where it stops and at the same time bowl flushing is carried out according to the programmed time. After pressing the button, there is a short beep and after the time interval of more than 1s and less than 4s there is a long beep.

By pressing the button for more than 4s the rinsing position of the chair is recalled and the bowl starts to rotate towards the patient where it stops.

After the  button has been pressed, there is a short beep and after a time interval of more than 1s and less than 4s there is a long beep. After a time interval of more than 4s there is a triple beep.
The chair should be pre-programmed so that the rinsing position is saved under the button for seat down movement.
After the rinsing position of the chair has been recalled by means of the button for bowl rotation, the chair should not be handled in any other way in order for the return from the rinsing position of the chair recalled by means of the bowl rotation button to work properly.

For the rinsing position to function correctly it is necessary - while setting the said position - to observe the safety height of the chair preventing the collision of the chair and bowl while maintaining the patient safety. When the said condition is not observed, the chair movement while the bowl is deflected is blocked to avoid injury to the patient arm and/or the collision of the chair and bowl.
This occurs also at moving to the rinsing position from the position above the safety height of the chair. If that is the case, the recalling of the rinsing position is unusable.

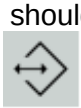
How to set the rinsing position:
- lower the chair to the lower position
- put the bowl out
- by pressing and holding the  button move the chair up until it stops automatically
- move the chair down by ca 2cm
- set the back rest position
- save the set position as the rinsing position under the respective button, i.e. the combination of buttons

 +  +  .

<u>Test of the setting of the rinsing position</u>
Move the chair to the lower position.
Recall the rinsing position.
The bowl must be put out and the chair must move to the rinsing position.
Recall the return from the rinsing position.
The bowl must retract and the chair must move to the previous position.

Automatic bowl control applies only for powered bowl drive. In the event that the unit is not fitted with powered bowl rotation and there might be a collision of the bowl and the chair, the chair is blocked and an audible signal sounds - short repeated tone. To finish the movement of the chair it is necessary to return the bowl to the basic position manually.

Caution

The button  is active for approx. 4 seconds after pressing, i.e. within the said time the second button from the required combination should be pressed, depending on the desired function. After the said time has elapsed, the  function is cancelled and the button must be pressed again to recall it.

For the movement of the chair in the upper half of the trajectory it is necessary that the

bowl be in the basic position.

If that is not the case, then the chair movement is blocked and this is indicated by three long beeps and an error message: „O“ on the display of the chair control electronics in the spittoon block. The movement of the chair to the programmed position is also blocked, if the said position requires the movement of the chair in the upper half of the trajectory and the bowl is not in the basic position. If that is the case, the blocking is indicated by an audio signal - short repeated tone – until the bowl has been moved away to the basic position. Afterward the chair continues in moving to the desired position.
If- during the movement of the chair in the upper half of the trajectory – the bowl is deflected, then the chair stops! If that is the case, the blocking is indicated by an audio signal: long – long – long tone. Return the bowl to the zero position and then repeat the command for the chair movement.
When the chair hits an obstacle, the movement of the chair is stopped and changed-over to the opposite direction (the reverse movement may not always occur when the back rest hits an obstacle).
The said opposite movement lasts until the safety emergency switch has been released by moving the chair away from the obstacle and/or until the chair has reached the end position in the event that the safety switch has not been released. During such movement an alarm audio signal sounds – long repeated tone. The following is monitored: movement of the chair downwards, movement of the back rest backwards, bumping into the assistant table upwards. If the chair hits the assitant table, the chair stops. If that is the case, the reverse movement does not occur.

The manufacturer recommends to move the assistant table out of the chair trajectory before moving the chair to avoid the collision of the chair with the assistant table and/or damage to the assistant table.

When handling the chair, in case of a failure the information on the current failure is displayed on the display of the chair control electronics in the spittoon block.

List and meaning of error messages on the display of the chair control electronics:

„**O**“ – blocking of the chair movement with the instrument running / the chair hits the instrument holder on the assistant table
„**o**“ - blocking of the chair with safety switches in the chair – the chair hits an obstacle
„**O.**“ – blocking of the chair when the bowl is moved and crosses the chair trajectory
„**1.**“ - error of the check of the content of EEPROM memory with the saved chair positions
„**2.**“ - faulty writing-in of a chair position into the EEPROM memory
„**3.**“ - motor1 is started but the potentiometer1 has not recorded any movement = defective motor or potentiometer
„**4.**“ - motor2 je is started but the potentiometer2 has not recorded any movement = defective motor or potentiometer
„**5.**“ - motor3 is started but the potentiometer3 has not recorde any movement = defective motor or potentiometer
„**6.**“ - potentiometer1 is outside the working range – if the error reoccurs, perform „AUTOSET“
„**7.**“ - potentiometer2 is outside the working range – if the error reoccurs, perform „AUTOSET“
„**8.**“ - potentiometer3 is outside the working range – if the error reoccurs, perform „AUTOSET“
„6“ - potentiometer1 – error of connection : short-circuited, disconnected or misconnected wires – value outside the permissible limit
„7“ - potentiometer2 – error of connection : short-circuited, disconnected or misconnected wires – value outside the permissible limit

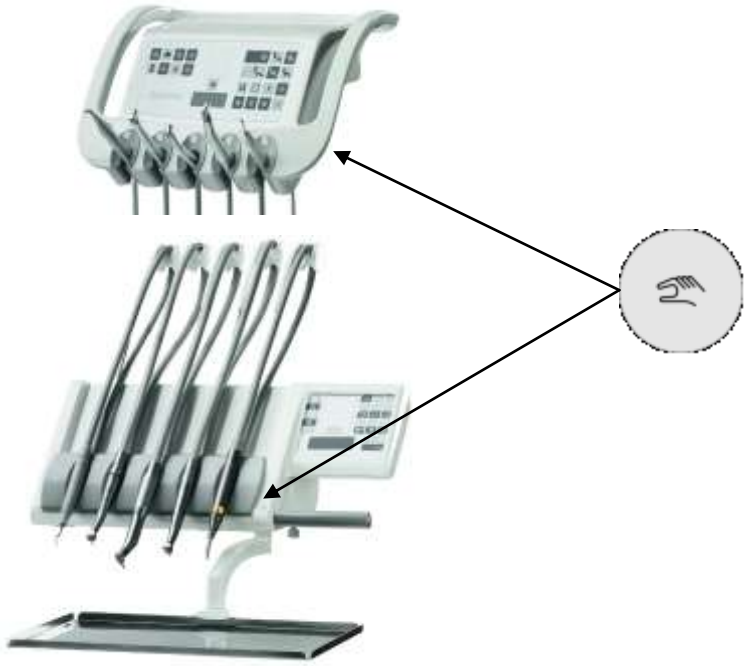
„8“ - potentiometer3 – error of connection : short-circuited, disconnected or misconnected wires – value outside the permissible limit
„**9.**“ - error at autoset if the upper limit of the potentiometer ≤ than the lower limit – some of the potentiometer does not sense the position
„**A.**“ - error at autoset – unfinished operation of autoset (the cause of unfinished operation will flash before „A“ is displayed)

8.1.2 Setting of the amount of water

Depending on the version of the dental unit the following applies:

a) the amount of cooling water for all instruments, except for the syringe, can be adjusted by means of the needle valve located on the bottom side of the control panel. When the valve has been turned fully clockwise, the water supply stops.
b) In the event that the unit is equipped with a proportional valve, it is possible to adjust the amount of cooling water by pressing (touching) the button W after the instrument in question has been taken. After the W button has been chosen, the message on the display is changed from "W=xxx%" to "W!xxx%"; in case of the glass keyboard, the set value is highlighted and then it is possible to change the amount of cooling water with the plus, minus buttons. To finish the setting of the flowrate, press (touch) the W button again and then the following message is displayed "W=xxx%". The setting of the amount of water is saved automatically after the instrument has been replaced to the basic position.

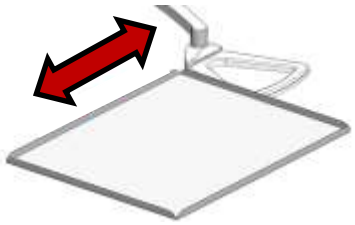
8.1.3 Button of the brake of the control panel (according to the version)



By pressing the button the control panel is unbraked and it is possible to move it freely in vertical direction. After it has been set in the desired position and the button has been released, the control panel gets braked.

8.1.4 Fitting of the tray of the tray table

The tray table with a tray is installed for the DA 270 dental unit. The tray of the tray table is made of stainless steel and it is possible to remove it by pulling it out of the holder in the direction of the arrow (see the illustration). It can be fitted again by slipping it into the holder (see the illustration). Max. loading capacity 1,5 kg!



8.1.5 Operation of individual instruments

Program selection

Each instrument has the option of 8 programs - P1-P8.

The selection of P1-P8 programs is made by pressing the button P1/P2 in case of the membrane keyboard or by simultaneous pressing the  and  buttons on the glass keyboard on the dentist control panel, with the instrument taken, while the current program is displayed in the left lower corner. In each program it is possible to make any changes and the said changes are saved automatically.

Control panel

In addition to mentioned below, it is necessary to follow the instructions of the manufacturers of instruments and accessories.

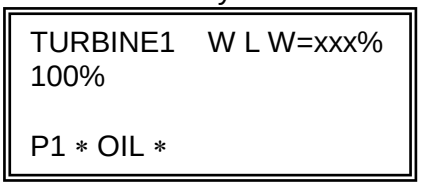
Syringe

It is ready to operate already in the holder. For air blowing press the right lever, for water rinsing press the left one and to create water mist (spray) press both levers simultaneously.

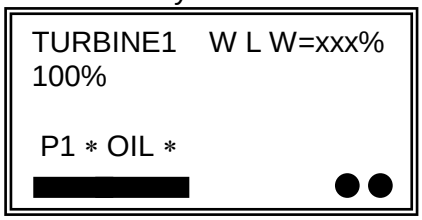
Turbine

Display for the turbine

Membrane keyboard



Glass keyboard



After the turbine has been taken, the data on its setting is displayed. Its meaning is as follows:

- **TURBINE1** – turbine taken (**TURBINE2**, **TURBINE3**, **TURBINE4**)
- **W** – cooling with water turned on, (**S** –cooling with spray turned on; if the symbol is not lit, the cooling is turned off)
- **L** - instrument illumination turned on; if the symbol is not lit, the instrument illumination is turned off
- **W=xxx%** - amount of cooling water (only if proportional valve is fitted)
- **OIL** – the instrument needs to be lubricated
- **P1** – current chosen program

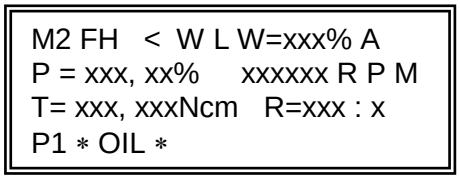
To activate the turbine, take it and move the foot controller lever to the right (press the pedal of NOK). To stop the activity, return the lever of the foot controller to the starting position (release the pedal on NOK). If the instrument cooling is turned on, the CHIPBLOWER function is started

automatically for 0,5 s after the activity has been finished. It is not possible to turn the CHIPBLOWER function off. It is not possible to control the revolutions for the turbine.
After the operation time of the turbine has reached the lubricating interval of 20 minutes, the message ∗ OIL ∗ is displayed and audio signal sounds (triple beep – after the instrument has been taken out of the holder). After the instrument has been replaced in the holder (and lubricated), the timer is set automatically to 20 minutes.

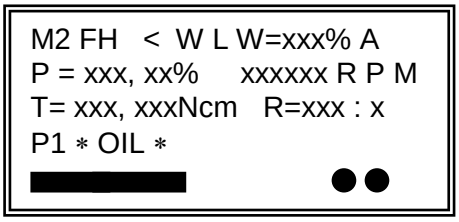
Micromotor

Display for the micromotor

Membrane keyboard



Glass keyboard



After the micromotor has been taken, the data on its setting is displayed. Its meaning is as follows:

- **M2** – micromotor taken (**M1**,**M3**) – to be set by the service technician
- **FH, (FL, FM)** – selected torque
- **<** - informs about the counter-clockwise revolutions of the micromotor; if the symbol is not lit, the revolutions are clockwise
- **W** – cooling with water turned on, (**S** – cooling with spray turned on; if the symbol is not lit, the cooling is turned off)
- **L** - instrument illumination turned on; if the symbol is not lit, the instrument illumination is turned off
- **W=xxx%** - amount of cooling water (only if proportional valve is fitted)
- **A** - analogue control of the output by means of the foot controller, (**O** – step control of the output from the foot controller (turning on – turning off)
- **P=xxx,xx%** - micromotor output
- **RPM** - informative revolutions /speed/ of the micromotor
- **T=xxx,xxxNcm** - maximum torque
- **R=xxx:x** - transmission ratio
- **OIL** – the instrument needs to be lubricated
- **P1** – current chosen program

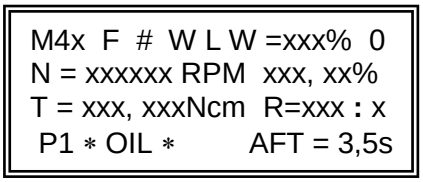
To activate the micromotor, take it and move the foot controller lever to the right (press the pedal of NOK). When the lever is moved to the extreme position, the micromotor has the output that is displayed. To finish the activity, move the foot controller lever to the starting position (release the pedal of NOK). If the instrument cooling is turned on, the CHIPBLOWER function is started automatically for 0,5 s after the activity has been finished. It is not possible to turn the CHIPBLOWER function off. The output of the micromotor can be adjusted by means of the PLUS, MINUS buttons within the range of 0-100%. The change of the direction of the revolutions is made by pressing the REVERSE button on the keyboard or also by keeping the spray button on the foot controller depressed for more than 2s and less than 8s.
If the analogue control of the output by means of the foot controller is turned on, by moving the lever of the foot controller it is possible to change the micromotor output continuously from 0 up to the value set on the display. After the operation time of the micromotor has reached the

lubricating interval of 20 minutes, the message ∗ OIL ∗ is displayed and audio signal sounds (triple beep – after the instrument has been taken out of the holder). After the instrument has been replaced in the holder (and lubricated), the timer is set automatically to 20 minutes.

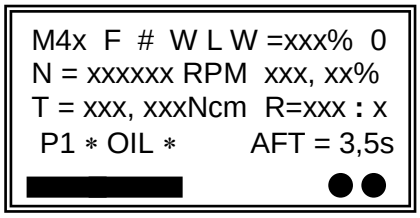
Micromotor MX/MX2 (Bien Air)

Display for the MX micromotor

Membrane keyboard



Glass keyboard



After the micromotor has been taken, the data on its setting is displayed. Its meaning is as:

- **M4X** - MX micromotor taken (**M3X**)
- **F** - mode of work of the micromotor**: F** - auto-forward, (**N** - normal, **R** - auto-reverse)

- in the event of the modes of auto-forward and auto-reverse, the symbol # is displayed. In the event of normal mode, the symbol < indicates counter-clockwise revolutions of the micromotor; if the symbol is not lit, the revolutions are clockwise

W – cooling with water turned on, (**S** - cooling with spray turned on; if the symbol is not lit, the cooling is turned off)

- **L** - instrument illumination turned on; if the symbol is not lit, the instrument illumination is turned off
- **W=xxx%** - amount of cooling water (only if proportional valve is fitted)

O - step control of the output from the foot controller, (**A** - analogue control of the output by means of the foot controller)

- **N= xxxxxx RPM** - revolutions /speed/ of the micromotor
- **xxx,xx%**- informative output of the micromotor
- **T=xxx,xxxNcm** - set limit torque
- **R=xxx:x** - transmission ratio
- **AFT=3,5s** - auto-forward time - displayed only in the event of the auto-forward mode (0,5;1,0;1,5;2,0;2,5;3,0;3,5;4,0)
- **OIL** – the instrument needs to be lubricated
- **P1** – current chosen program

After the operation time of the micromotor has reached the lubricating interval, the message ∗ OIL ∗ is displayed and audio signal sounds (triple beep – after the instrument has been taken out of the holder). After the instrument has been replaced in the holder, the timer is set automatically to 20 minutes and ∗ OIL ∗ is deleted.

Normal mode

MX/MX2 micromotor is controlled as a standard micromotor, except that the revolutions can be set and it is possible to set the limit torque by means of the button T.

Auto-reverse mode

After reaching the set limit torque, the micromotor starts to rotate in the opposite direction (counter-clockwise revolutions, in the same time the instrument illumination starts to flash), namely until the foot controller has been released.

Auto-forward mode

After reaching the set limit torque, the micromotor starts to rotate in the opposite direction (counter-clockwise revolutions, in the same time the instrument illumination starts to flash), namely until the drill has been loosen, then it remains in the said direction for the set time (AFT) and returns to the original revolutions (clockwise revolutions). This is repeated until the foot controller has been released.

Setting of AFT

Setting by means of the button  changes AFT time from 0,5 to 4s, by 0,5s.

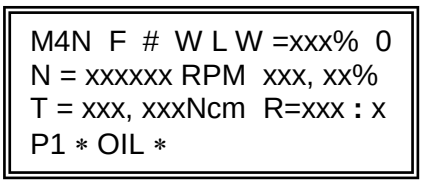
Note

In the auto-forward and auto-reverse modes, the foot controller is in the ON/OFF mode automatically and after the return to N mode it is necessary to turn the analogue function on, if needed. When the micromotor or turbine has been replaced in the basic position of the holder, the light goes off. Always replace the micromotor or turbine in the holder only after the end of the operation (the lever of the foot controller is in the basic position). Air blowing will take place automatically for 0,5s after the activity has been finished, if cooling is activated.

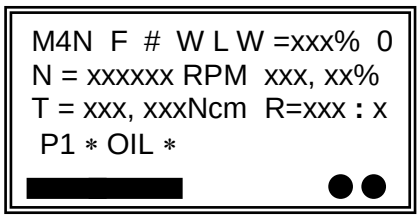
Micromotor NLX Plus (NSK)

Display for the MX micromotor

Membrane keyboard



Glass keyboard



After the micromotor has been taken, the data on its setting is displayed. Its meaning is as follows:

- **M4N** - MX micromotor taken (**M3N**)
- **F** - mode of work of the micromotor**: F** - auto-forward, (**N** - normal, **R** - auto-reverse)

- in the event of the modes of auto-forward and auto-reverse, the symbol # is displayed. In the event of normal mode, the symbol < indicates counter-clockwise revolutions of the micromotor; if the symbol is not lit, the revolutions are clockwise

- **W** – cooling with water turned on, (**S** - cooling with spray turned on; if the symbol is not lit, the cooling is turned off)
- **L** - instrument illumination turned on; if the symbol is not lit, the instrument illumination is turned off
- **W=xxx%** - amount of cooling water (only if proportional valve is fitted)

O - step control of the output from the foot controller, (**A** - analogue control of the output by means of the foot controller)

- **N= xxxxxx RPM** - revolutions /speed/ of the micromotor
- **xxx,xx%**- informative output of the micromotor
- **T=xxx,xxxNcm** - set limit torque
- **R=xxx:x** - transmission ratio
- **OIL** – the instrument needs to be lubricated
- **P1** – current chosen program

After the operation time of the micromotor has reached the lubricating interval of 20 minutes, the message ∗ OIL ∗ is displayed and audio signal sounds (triple beep – after the instrument has been taken out of the holder). After the instrument has been replaced in the holder (and lubricated), the timer is set automatically to 20 minutes.

Normal mode

NLX Plus micromotor is controlled as a standard micromotor, except that the revolutions are set and it is possible to set the limit torque by means of the button T. The limit torque can be set only when the revolutions are set within the range of 100 – 5000 RPM.

Auto-reverse mode

After reaching the set limit torque, the micromotor starts to rotate in the opposite direction (counter-clockwise revolutions, namely until the foot controller has been released.
The mode works within the revolution range of 100 – 5000 RPM.

Auto-forward mode

After reaching the set limit torque, the micromotor starts to rotate in the opposite direction (counter-clockwise revolutions, in the same time the instrument illumination starts to flash), namely until the drill has been loosen, then it remains in the said direction for the set time (AFT) and returns to the original revolutions (clockwise revolutions). This is repeated until the foot controller has been released. The mode works within the revolution range of 100 – 5000 RPM.

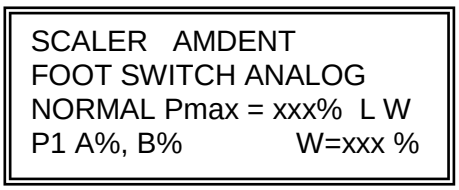
Note

In the auto-forward and auto-reverse modes, the foot controller is in the ON/OFF mode automatically and after the return to N mode it is necessary to turn the analogue function on, if needed. When the micromotor or turbine has been replaced in the basic position of the holder, the light goes off. Always replace the micromotor or turbine in the holder only after the end of the operation (the lever of the foot controller is in the basic position). Air blowing will take place automatically for 0,5s after the activity has been finished, if cooling is activated.
It is not possible to set the llimit torque within the range of 5100 – 40000 RPM and its value is set automatically to the maximum value of 4,00 Ncm.
Increasing of the revolutions above the value of 5000 RPM in the auto-reverse mode and auto-forward mode by means of the PLUS button on the control panel is blocked automatically and indicated acoustically.
If the mode changes-over from NORMAL to auto-reverse or auto-forward and the revolution value in NORMAL is higher than 5000 RPM, it changes over automatically to 5000 RPM.
It is not possible to change the Auto-forward time, i.e. the AFT parameter, from the keyboard on the control panel and it is not displayed, either. It is set to 1s by the manufacturer.
For NLX Plus micromotor the afterglow is set to 3s by the manufacturer.

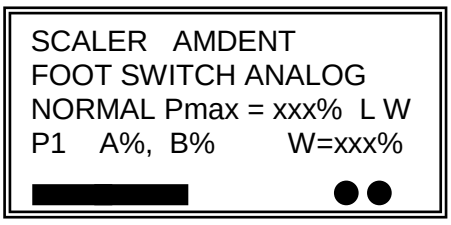
Scaler

Display for the scaler

Membrane keyboard



Glass keyboard



After the scaler has been taken, the data on its setting is displayed. Its meaning is as follows:

- **SCALER AMDENT** - type of the scaler taken (**SCALER S – NEWTRON/EMS, SCALER S – SP4055/NSK).**

FOOT SWITCH ANALOG - analogue control of the output (**FOOT SWITCH ON/OFF** - step control of the output) from the foot controller

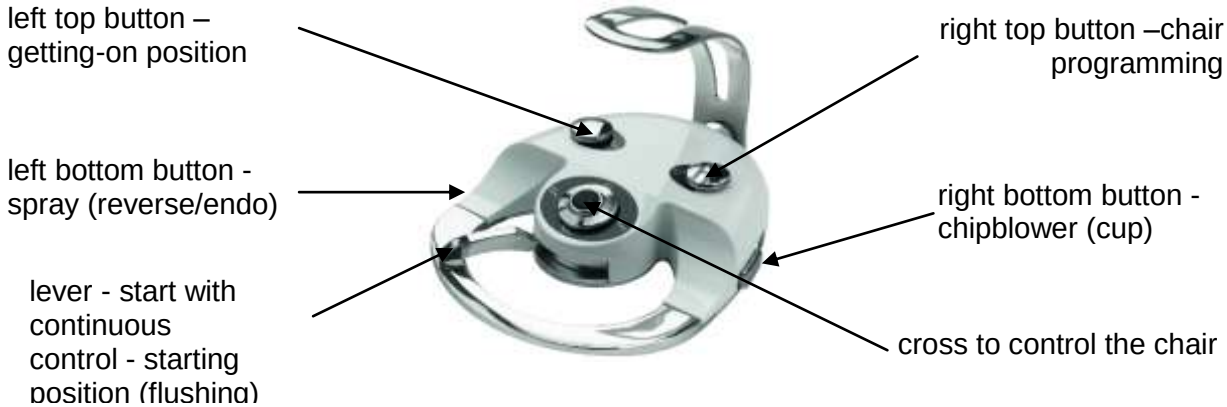
- **NORMAL** - normal mode of activity, (**ENDO** - endo mode of activity)
- **Pmax = xxx%** - maximum adjustable output for Amdent in ENDO mode

Pmax = 33%

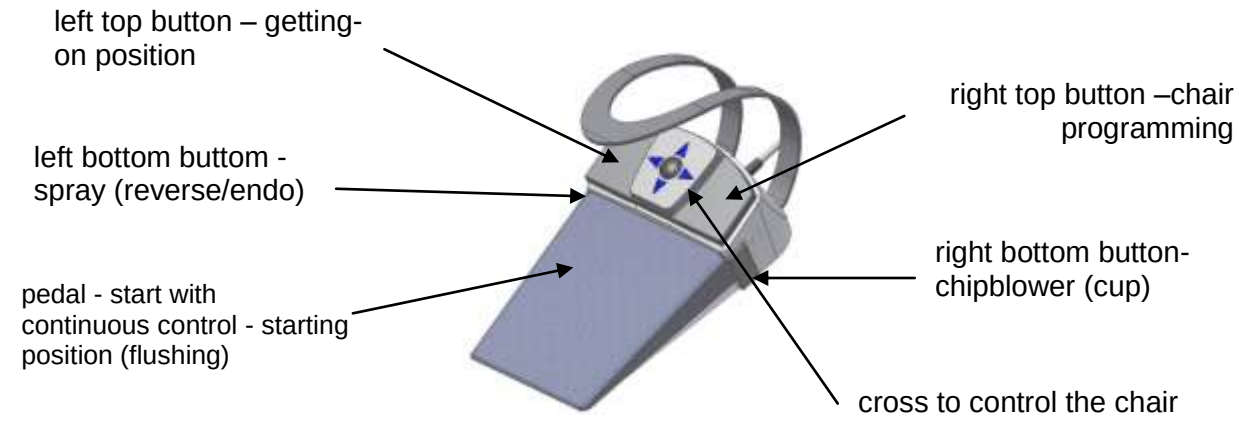
- **L** - instrument illumination turned on; if the symbol is not lit, the instrument illumination is turned off
- **W** – cooling with water turned on; if the symbol is not lit, the cooling is turned off
- **A - xxx%** - set output (0 - 100%), percentage of the set output out of Pmax.
- **B - xxx%** - output on the scaler (0 - 100%), (when the analogue control is turned on, it shows the output value that depends on the position of the lever of the foot controller
- **W=xxx%** - amount of cooling water (according to the version of the dental unit)
- **P1** – current chosen program

To activate the scaler, take it and move the foot controller lever to the right (press the pedal of NOK). The output is set by pressing the PLUS and MINUS buttons with the instrument taken or when the scaler is in operation. ENDO function is recalled by pressing (touching) the reverse button.
When the analogue control of the output by means of the foot controller is turned on, by moving the lever of the foot controller it is possible to control the output of the scaler continuously from 0 up to the value set on the display.

8.2 Foot controller



Foot controller UNO



Combined foot controller NOK

With the micromotor and turbine instruments, when the **CHIPBLOWER** button is pressed on the foot controller, cooling air will blow.

The **SPRAY (REVERSE/ENDO)** button on the foot controller has the following **3 functions**:

1. By short pressing of the button for less than **2s,** instrument cooling is turned on/off. Information about the cooling being turned on or off is displayed. The button has a function similar to that of the SPRAY button on the dentist table.
2. By pressing the button for more than **2s** and less than **8s,** the direction of the revolutions of the micromotor is changed over; or when the UOZK scaler instrument is taken, **SCALLING/ENDO** mode alternates.
3. By pressing the button for more than **10s** and less than **16s,** cooling modes alternate between the spray cooling mode and the water cooling mode. Selected mode is indicated on the display - "**S**" spray cooling, "**W**" water cooling.

Foot controller lever serves to put the instruments into operation while with the micromotor it is possible to control the micromotor speed /revolutions/ by moving the lever of the foot controller (from 0 up to the value set on the display); and with the UOZK scaler by moving the lever of the foot controller it is possible to control the output (from 0 up to the value set on the display).

The buttons **GETTING-ON POSITION**, **CHAIR PROGRAMMING** and **CROSS TO CONTROL THE CHAIR** are intended to control the dental chairs of DIPLOMAT series.

Caution

If no instrument is taken:

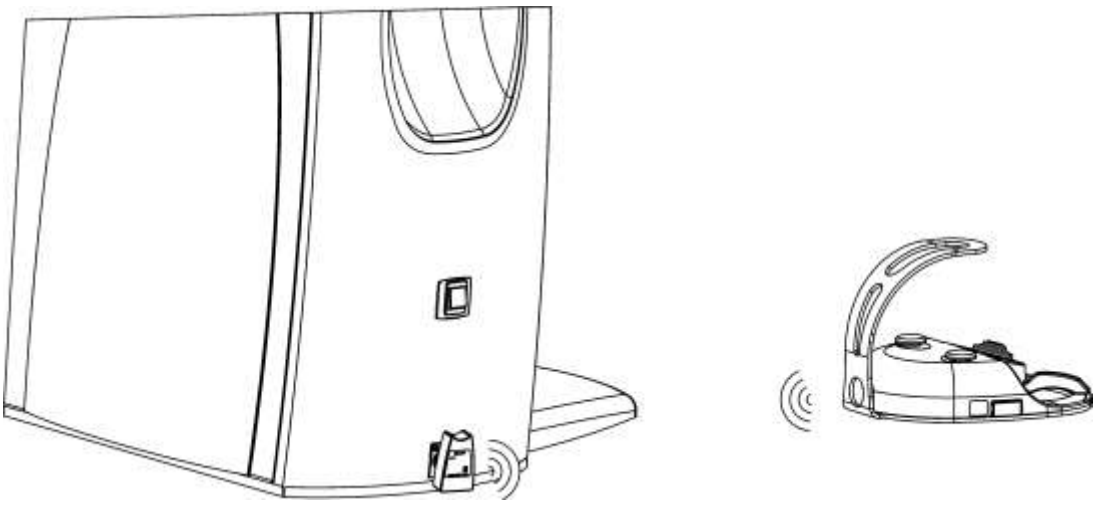
- **By holding the lever of the foot controller** for more than **0,6s,** bowl flushing is activated. By holding it for more than **4s,** the bowl flushing time is set up to the moment of moving the foot controller lever back to the basic position. By moving the lever of the foot controller to the right for min. **0,2s** during flushing the bowl the said activity is interrupted.
- **By pressing the CHIPBLOWER button** and keeping it depressed for **0,6s,** cup filling is activated**.** By keeping it depressed for more than **4s,** the cup filling time is set up to the moment of releasing the button. By pressing the right button for min. **0,2s** during filling the cup the said activity is interrupted.

When cleaning the floor (PVC floor covering) with a disinfecting agent, it is forbidden to put the foot controller onto the wet floor.

Wireless foot controller UNO (upon order only)

The function of the buttons and the manner of control are identical with those of the classic foot controller. The difference is in the way of the data transfer between the controller and the unit. While with the classic foot controller, the data transfer is made via a connected cable, with the wireless foot controller, the data transfer is carried out by means of radio waves without the need for a cable.

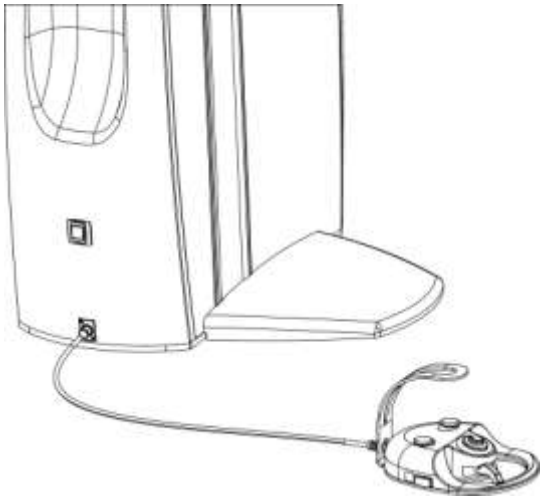
Standard connection of the wireless foot controller with the unit.



Transmitter:
The foot controller is supplied from two accumulators NiMH 1,2V / 1800-2400 mAh.
Accumulator life is at least 2 months in standard operation. **The need for charging is indicated on the RECEIVER by regular flashing of the red LED diode.** After the need for charging the accumulators has been indicated it is possible to work with the foot controller for a few more hours without connection to the charging.

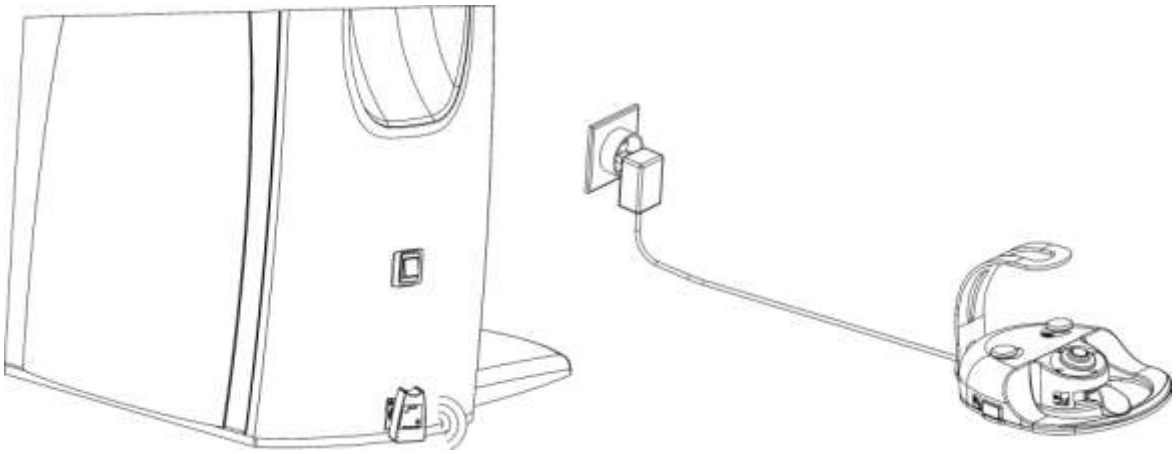
Connection of the foot controller with the unit during the charging cycle:

1. The charging is activated by connecting the interconnecting cable between the unit and the foot controller. During the charging it is possible to use the RF foot controller – it functions as the classic cable foot controller. The charging takes about 3 hours and is interrupted automatically once the accumulator has been charged.



In order to ensure the correct function of the foot controller and the unit, it is necessary to connect and disconnect the cable of the foot controller with the unit turned off.
Alternatively, charging by means of a power adapter.

2. Charging by means of a power adapter. Connect the supply connector from the adapter to the respective opening in the foot controller. The foot controller is fully functional while being charged.

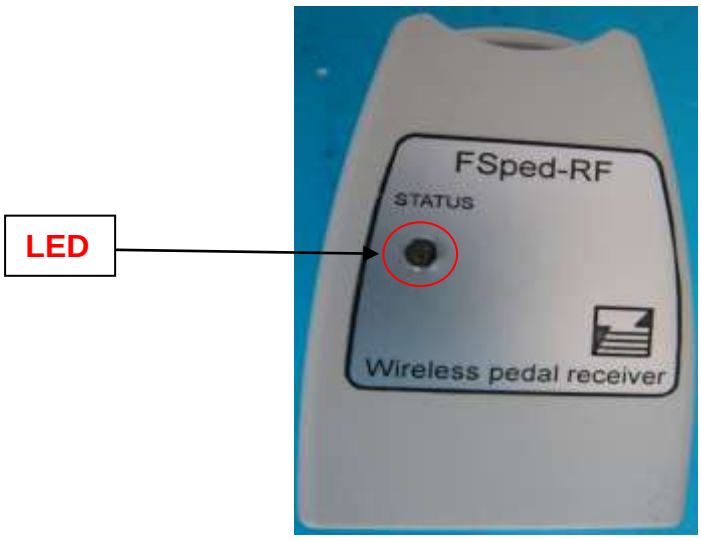


To prevent short-circuit at the adapter output and thus its potential damage, connect the adapter to the mains only after the supply connector has been plugged into the foot

controller.
After the charging has been finished, first disconnect the adapter from the mains and then unplug the connector from the foot controller.
The charging takes about 3 hours and is also interrupted automatically once the accumulator has been charged.

FC comprises the test of HW part which is performed when the accumulators are connected. If the error is in the transmitting part, the foot controller does not transmit (the green LED diode on the receiver side does not flash during the work with the foot controller) but it works via the cable connection only.

Receiver:



The receiver contains two-colour LED diode with the following meanings:

- Green LED lit – the receiver is active and matched with a transmitter
- Green LED flashes – new command has been received at changes on FC
- Red LED lit – the receiver is not paired with any transmitter
- Red LED flashes regularly – indicates the need to charge the FC
- There may occur a condition when both the red and the green LEDs are lit, which manifests itself by **orange** colour.

If there is a fault on the transmitter during the work, the signal gets lost and the receiver does not receive a new or confirming signal within 2 seconds, the receiver automatically sends a signal to the unit as with the pedal in the zero position, i.e. the activity of the instrument being used is interrupted.

Each transmitter has a unique address set by the manufacturer. The transmitter comes from the production paired with a receiver. Should it happened that the transmitter is not paired with the receiver (red LED diode on the receiver is lit) or in case of foot controller and/or receiver replacement it is necessary to pair the foot controller with the receiver first. (The setting must be performed by the service technician in accordance with the Instructions for Service).

Technical data:

Working frequency:	865,4MHz
Radiated output:	10 dBm
Acu charging time:	ca 3 hours
Acu capacity:	minimum 2 months
Range:	minimum 2 metres (depending on obstacles between the transmitter and the receiver)

8.3 Spittoon block

The spittoon block contains the following (according to the version):

- main switch
- connection to the supply of mains voltage
- connection to the supply of water and air
- spittoon bowl flushing and cup filling
- saliva ejector
- connection to the distilled water
- amalgam trap METASYS, DÜRR CAS or separator CATTANI
- mechanical amalgam trap Cattani
- heating of water for the cup
- wet suction DÜRR

Bottle with distilled water

The bottle with distilled water is located in the spittoon block and accessible after opening the door of the spittoon block. Distilled water from the bottle is fed to the micromotor, turbine, scaler, syringe, polisher, generally to the instruments on the dentist control panel and to the syringe on the assistant table.

How to replenish distilled water:

- open the door of the spittoon block
- turn the three-position selector switch in the spittoon block to the position „0“
- unscrew the bottle
- replebish distilled water in the bottle
- screw the bottle firmly to avoid compressed air leakage during the work
- turn the three-position switch to the position with a bottle symbol
- check the bottle for air leakage
- close the door of the spittoon block

In the event that distilled water has been spent and there is air in the water distribution, it is recommended to deaerate the water paths of instruments which use water by letting water flow until there are no bubbles in the water from instruments.

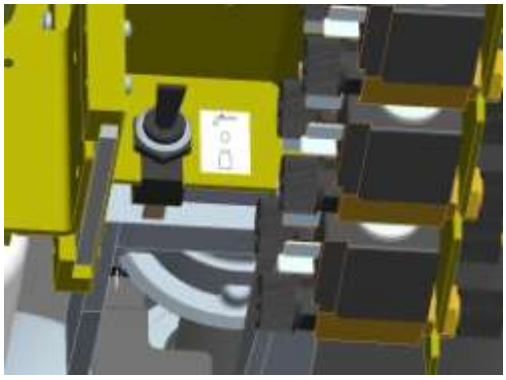
Caution

When replenishing distilled water, care must be taken not to allow foreign substances penetrate into the water or cause changes in its quality or composition. Distilled water for medical purposes must be used, not de-mineralized water for industrial purposes!

The manufacturer recommends to replace the bottle once a year.

Central distribution of water

If water from the central distribution is used for cooling the instrument, distilled water in the bottle need not to be replenished – CENTRAL function.
The function is activated by moving the selector switch located in the spittoon block to the CENTRAL ( )



8.3.1 Assistant table

Assistant table keyboard

Button	Description	Button	Description	Button	Description
	button are used only with hygiene		control of the main light		button acc.to the version
	spittoon bowl rotation (for el. control only)		button are used only with hygiene		button are used only with hygiene
	writing-in and recalling of the program positions		spittoon bowl flushing		cup filling
	switch to move the rest backward		switch to move the chair up		automatic setting and recalling of getting-on position
	switch to move the rest forward		switch to move the chair down		

Except for the buttons  the buttons on the assistant table have the function identical with that of the buttons on the dentist control panel.

8.3.2 Simple assistant table

2-position handpiece holder

3-position handpiece holder

Double arm of the saliva ejector

Instruments placed in the holder are ready for operation after having been taken out. Besides the saliva ejector, the polymerization lamp, syringe and big and small aspirator can be placed in the holder. Also there are buttons to control the cup filling and bowl flushing (without the TIMER). The said buttons cannot recall cup filling and bowl flushing for set time. Cup filling and bowl flushing are functional only while the button is kept depressed.

8.3.3 Equipment of the spittoon block

Saliva ejector

It is activated automatically after having been taken out of the holder. When the output is decreased, clean the saliva ejector sieve: remove the saliva ejector itself (the tip), remove the saliva ejector handpiece, remove the sieve – clean it and re-assemble. It is recommended to clean the sieve at least once a day! To finish the activity – replace it in the holder. It is recommended to rinse the saliva ejector and the aspirators with 1 dl of water after each patient!

Small aspirator, big aspirator

It is activated after having been taken out of the holder. To finish the activity – replace it in the holder. The suction of the aspirators can be controlled by opening the regulating flap of the aspirators, while in the lower position the aspirator is closed. In the body of the aspirator is a filter which needs to be cleaned at least once a day (see Cl. 10.4).

Caution
After the separator has been filled up, it is turned off automatically – flows to the sewage – cycles (valid for CATTANI, METASYS, DÜRR CAS1).

Polymerization lamp

After having been taken, the polymerization lamp is ready for operation and can be used. For the use of the polymerization lamp, please read the manual for the polymerization lamp.

Intraoral camera

The camera does not serve to make a diagnosis but only for better visualization in the dental treatment.
The camera comprises:

- holder
- connection – connector
- the instrument itself (camera)

Caution
The product must be protected against water. Do not keep it in wet premises.

8.4 Dental operating light

Dental operating can be controlled by means of the three-position /triple-throw/ switch on the dental operating light, while in the middle position the light is turned off.
If the unit is fitted with electronic control of illumination, it is possible to control it from the dentist table and the assistant arm by means of a button – see the description of the buttons (valid only for Sírius).
Further descriptions of the lights, see the annex (XENOS, FARO).

8.5 Cart (only DA 280 – CART Version)

Cart-mounted delivery system is connected to the energy unit via cable bundle in a protective sleeve. Protective cable sleeve prevents cables from scrapes, cuts and other types of damage, provides protection against wetness and dust, and additional insulation.
Sleeve is manufactured from soft PVC with tough PVC braiding, and can easily withstand a local pressure, such as someone stepping on the cable. However, the manufacturer does not recommend applying any pressure on the cable, e.g. stepping or placing appliances on the cable. For cleaning follow the guidelines provided in the chapter Cleaning and Disinfection of External Parts of the Unit.

Lock button (CART)

In the mobile Cart Version a height of the control panel can be adjusted in 200 mm range.
To adjust the height take the panel on both sides and press the lock button on the bottom of the panel. Adjust the desired height and press the lock button once again to secure the position.

When moving the cart, make sure the cart's wheels will not damage the cable of a foot controller.

8.6 Hygiene

Hygiene is understood to be the combined disinfection and decontamination of the internal distributions of the dental unit. It does not form an integral part of the standard equipment – upon order only! For detailed information see a separate enclosure „Hygiene system of the Diplomat ADEPT DA 270/DA 280 dental unit".

8.7 Manual control of the head rest

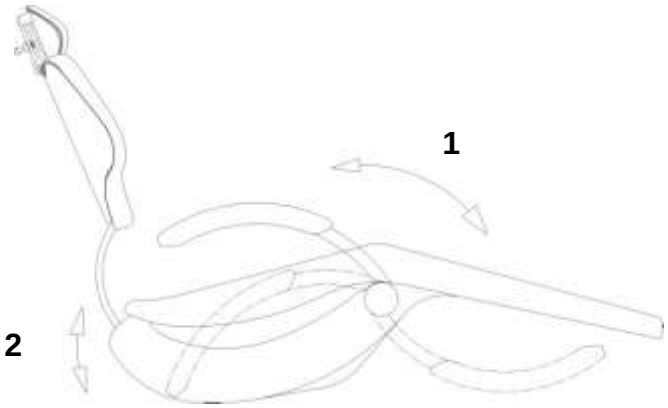
The head rest is controlled manually. The head rest has anatomic design and enables suitable optional fixing of the head of the patient. Height adjustment is made mechanically by pulling or pushing in the direction of positioning. The inclination of the head rest is adjusted after releasing the lever located on the rear side of the head rest. After the adjustment has been made, the set position must be secured again by the lever.

Caution
After completion of work it is recommended to release the clamp of the head rest.

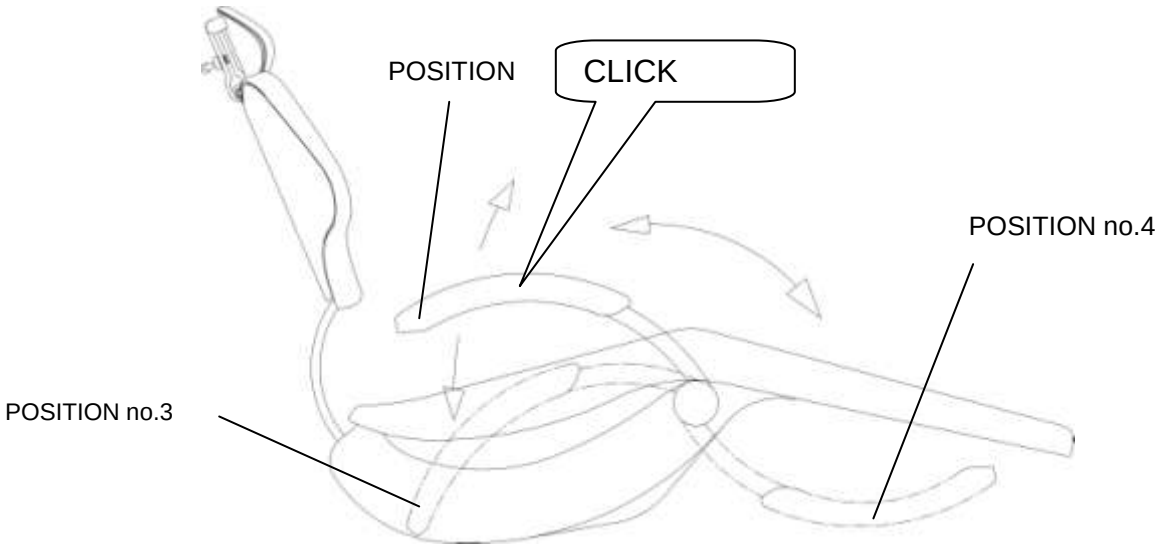
8.8 Manual control of the right arm rest

To enhance the patient's comfort, right arm rest is available. This enables two movements to be made:

- tilting forward (movement no.1)
- tilting downwards (movement no. 2)

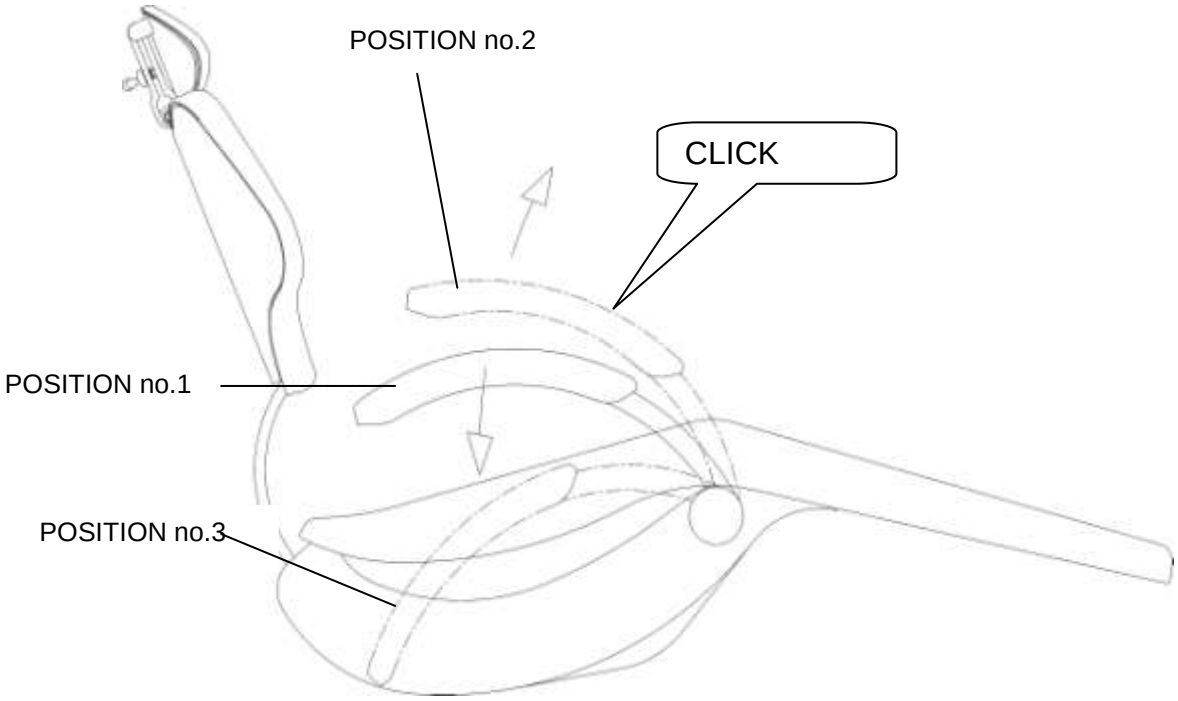


Description of the activity at tilting forward (movement no.1)



- grip the arm rest and move it from the position no.1 to the position no.4,
- repeat securing is made as follows: turn the arm rest from the position no.4 to the position no.3, then tilt the arm rest upwards until click is heard, then the rest is secured against movement downwards.

Description of the activity at tilting downwards (movement no.2)



- grip the arm rest and move it from the position no.1 to the position no.2, the arm rest loosened in such a way can be folded to the lower position no.3.
- repeat securing is made as follows: tilt the arm rest from the position no.3 until click is heard, then the rest is secured against movement downwards.

8.9 Completion of work

The following is important:

- turn off the main switch – position 0! Thus disconnecting the supply of electric power, water and air and the whole unit is depressurized
- turn off /close/ the main supply of water (at the work place) to the dental unit
- turn off the compressor – open the sludge valve
- turn off the aspirator (if fitted)

9. PRODUCT MAINTENANCE

Maintenance of the instruments and handpieces should be carried out according to the instructions of their manufacturer. In case of the execution of the spittoon block with the connection to the central distribution, check the cleanliness of the advance filter (strainer) and the operation of the water hardness treatment device (according to the instructions of the manufacturer).

Inspection during the guarantee period

During the guarantee period the user is recommended to invite in regular **3-month intervals** an authorized service technician for preventive periodical inspection.

The inspection is focused on the following:

- check of input filters (with regard to the cleanliness of input media)
- check of the suction system
- check of the waste hose
- providing additional information and practice advice concerning the dental unit
- check of the proper use and maintenance of the dental unit and its instruments (according to the Instructions for Use and training)

- check and/or adjustment of all media (input, setting of turbine pressures and the like.)
- the manufacturer determines the range of above-mentioned work to be **1** to **1,5 hours**
- authorized service technician is obliged to confirm the periodical inspection carried out in the guarantee card.

Inspection and audit /revision/ after the guarantee period:

Periodical inspection of the product must be carried out by an authorized service technician in **6-month intervals, while the following is recommended to be made:**

- general inspection of the dental unit and functional parts thereof
- check and adjustment of the working pressures of water and air
- check of water and air filters in the spittoon block
- check of the integrity of the electropart and electric wiring (electrical safety)

Audit /revision/ of electrical safety

It is carried out according to the regulations of the country in which the dental unit is installed.

10. CLEANING, DISINFECTION AND DECONTAMINATION

10.1 Disinfection of the internal distributions of instruments

It is recommended to use Alpron agent in 1% concentration with distilled water. The solution is poured into the reservoir for distilled water and can be used permanently. The agent in 1% concentration is harmless to the health of the patient. With regular use the cooling system is maintained in cleanliness and it is not necessary to use other disinfecting agents. Alpron solution is the product of the company Alpron (Germany). Contact your dealer for details about the possibilities of the purchase and use of the said product.
In the event that water from the central distribution is used for the cooling of instruments, disinfection of the internal distributions of the instruments is made as follows:

1. Fill the reservoir of distilled water with 1% solution of Alpron with distilled water.
2. Turn the 3-position selector switch to the position „DISTIL“ 
3. Rinse the water path of an instrument for 30s, other instruments that use cooling water are rinsed for 10s.
4. Turn the 3-position selector switch to the position „CENTRAL“.

The manufacturer recommends to carry out the above disinfection at least once a day, preferably at the end of the working day.

10.2 Decontamination of the spittoon bowl

In the event that the dental unit is equipped only with saliva ejector, 1% solution of SAVO Prim agent (Czech Republic) is used for decontamination. Decontamination of the spittoon bowl should be made at least once a day (e.g. after the completion of work) with SAVO Prim agent in 1% concentration in the volume of at least 200ml of the solution by pouring it into the spittoon bowl.
In the event that the dental unit is equipped with an aspirator, the selection of suitable agent depends on the type of the separator that is built in the dental unit. If CATTANI separator is built in the unit, it is necessary to use PULI - JET PLUS agent.
If METASYS amalgam trap is built in the unit, it is necessary to use GREEN & CLEAN M2 agent. If DÜR CASS 1 amalgam trap is built in the unit, it is necessary to use OROTOL PLUS agent.

10.3 Cleaning and decontamination of the saliva ejector

Decontamination of the saliva ejector should be made at least once a day (e.g. after the completion of work) with SAVO Prim agent in 1% concentration in the volume of min. 1 dcl of diluted solution by sucking through the tip of the saliva ejector. After each use of the saliva ejector, clean the hose of the saliva ejector by rinsing it with clean water of approx.1 dcl after each patient.

10.4 Cleaning and decontamination of the big and small aspirator

Operating personnel must check the condition of the sieve of the catcher of rough particles in the spittoon bowl and clean it, if needed. When the small or big aspirator has been used, clean the hose thereof by rinsing it with approx. 1 dcl of clean water after each patient.

1. big aspirator
2. small aspirator
3. filter, rough P 22
4. filter, rough P 16
5. adapter for single-use tip for the saliva ejector
6. regulating flap of the suction
7. single-use handpiece of the saliva ejector odsliňovača

Fig. 10.1

SITKO - SIEVE

Cleaning, disinfection and decontamination of other parts of the dental unit

Clean the external surfaces of the dental unit including the glass surface of the keyboard with a wet cloth. Use the INCIDIN FOAM – spray (HENKEL – ECOLAB) agent according to the

instructions for use of the said agent at least once a day or when the surface of the equipment is incidentally contaminated with biological material.

Clean the following at least once a day (according to the version):

- aspirator sieve located in the spittoon block
- sieve at the input to the amalgam trap
- sieve of the saliva ejector
- filter of the small and big aspirator
- sieve in the spittoon bowl

It is recommended to rinse the hoses of the big and small aspirator, **maximum of 0,5l water!**

Caution
When cleaning the floor (PVC floor covering) with a disinfecting agent, it is forbidden to place the foot controller onto the still wet floor covering. It is forbidden to use agents with detrimental effects on the structure of the varnish and plastic materials (agents based on phenols and aldehydes).

The manufacturer shall not be taken responsible for damages arisen due to the use of disinfecting and cleaning agents others than those recommended.

Instruments and handpieces

Cleaning, disinfection and sterilization of instruments and their handpieces should be carried out according to the instructions of their manufacturer, furnished with the instrument.

Instructions for use of disinfecting antifoam tablets CATTANI for dental aspirators

During the work with the aspirator, turbulent flow is created when blood, mucus and all types of sanitary substances create a great amount of foam that may cause frequent and abrupt undesired stopping of suction. Regular use of antifoam tablets significantly reduces the occurence of said stoppings.
Each tablet is packed in a protective film that is soluble in water and ensures safety keeping and handling, even though the product is not classified as dangerous. Do not remove the protective film, it will be dissolved in water. Sucking of a small amount of water through the tip after the tablet has been placed inside the supporting filter of the tip or before starting the suction is sufficient to obtain immediate effective antifoaming effect. If the tablets are to be placed in a small space, remove the protective film (use of gloves is recommended) and break the tablet in two parts by pressing along the marked slot. For the sensors to work properly, clean them with soft emery paper. As the liquid passes, the tablet will dissolve slowly and release the disinfecting and antifoaming substances during the whole working day.

How to use the PULI – JET PLUS cleaning agent

The separator manufacturer recommends to disinfect the suction system every day after the completion of work and to perform at least one cleansing washing in the middle of the day. How to fill the doser: place the bottle in the vertical position, preferable on a flat surface. Unscrew the lid and fill the doser to the edge by squeezing the bottle gently at the points marked with two labels (take care not to overfill it).
Release the pressure: excessive amount of the liquid returns back to the bottle while the exact amount (10ml) of the concentrate remains in the doser. Concentrated PULI – JET PLUS after dilution to 0,8% cleans and disinfects, to 0,4% it is only sanitary cleaning agent. For cleaning

and disinfection dilute two doses (20ml) of the doser in 2,5 l of warm water (50°C) and suck it. For the very cleaning of the system dilute one dose of the doser (10ml). Do not rinse, proteolytic and disinfecting effect of PULI – JET PLUS reveals with time.

11. DISPOSAL OF THE EQUIPMENT

Part	Basic material	Recycleable material	Material to be placed in waste dumping grounds	Dangerous material
Metal	Steel	X		
	Aluminium	X		
Plastic	PUR		X	
	PVC			X
	PA, ABS	X		
	Laminated glass		X	
	Other plastic	X		
Rubber			X	
Glass		X		
Instruments			X	
Electronics		X		
Cables	Med'	X		
Transformer		X		
Amalgam separator	Filters			X
	Collecting vessel with amalgam			X
Packaging	Wood	X		
	Cardboard	X		
	Paper	X		
	PUR		X	

Note
In the disposal of the dental unit the legislation of individual country should be observed.
Before dismantling the unit, it should be decontaminated – clean the surface, rinse the suction and waste system, remove the amalgam from the trap and pass it on to a scrap material collecting organization. It is recommended to appoint the expert company with the disposal of the unit.

Caution
Not to be disposed of within the communal waste!!! Waste material can be handed at destined places, e.g. electrowaste!

12. REPAIR SERVICE

In the event of a failure of the dental unit contact the nearest service centre or your dealer who will give you information about the service network.

13. CONTENT OF THE PACKAGING

Standard equipment

	DA 270	DA 280
Dental chair	1	
Pantograph* of the control panel with the control panel (*except a CART version)	1	
CART (only DA280 CART version)	-	1
Control panel and control panel pantograph	1	
Spittoon block with assistant arm	1	
Spittoon bowl	1	
Light pantograph	1	
Light	1	
Foot controller	1	
Tray table	1	-
Arm rest, right (acc.to the order)	1	
Side table (acc.to the order)	1	
Monitor arm (acc.to the order)	1	
Monitor (acc.to the order)	1	
Intraoral camera (acc.to the order)	1	
Holder of light pantograph	1	
Instruments, accessories, small parts and completion sheet, sealed in a paper carton	1	

Accompanying documentation

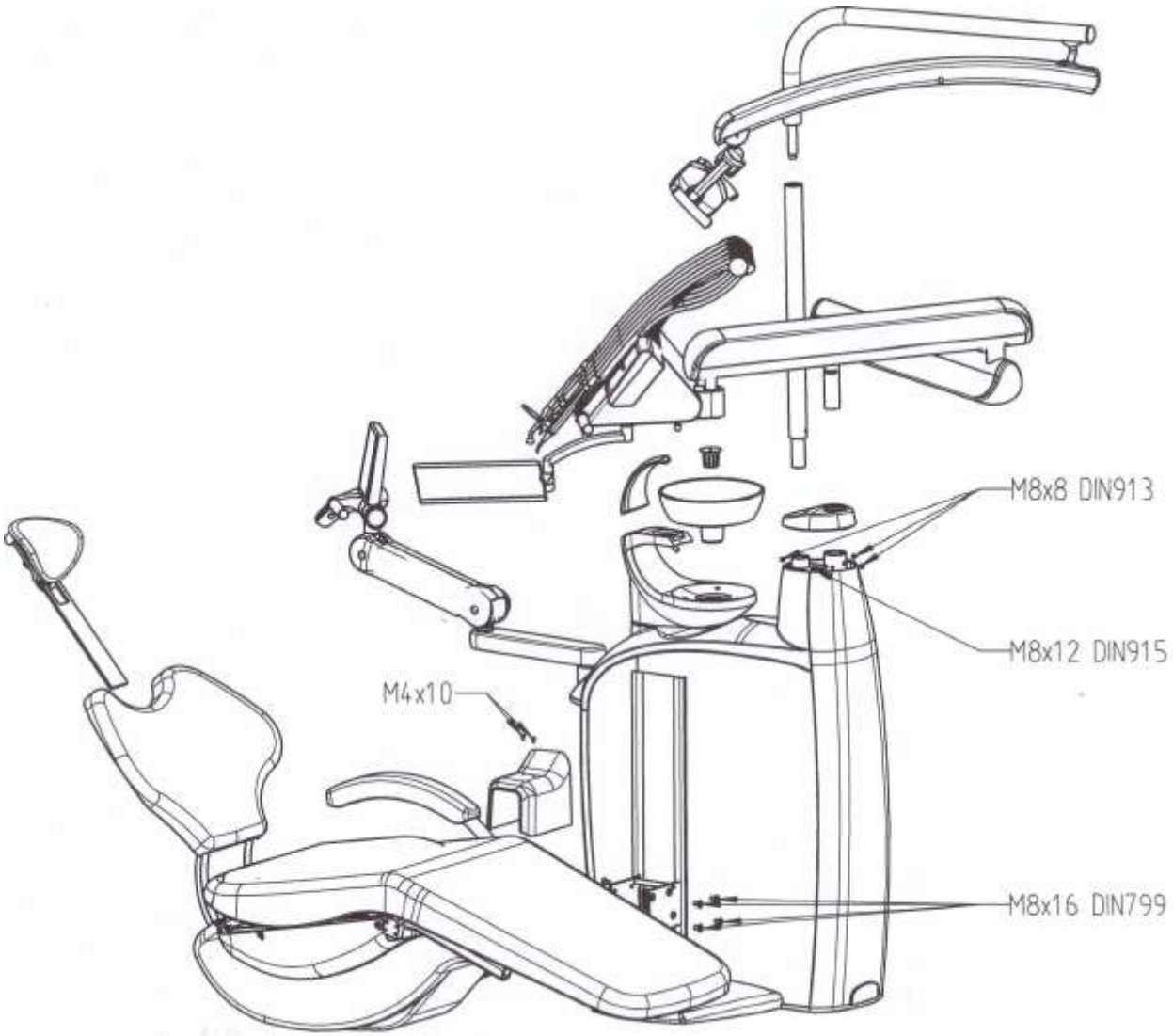
- Instructions for Use
- Guarantee Card
- Manuals from subcontractors
- Completion sheet (placed in the sealed carton with the instruments)
- Guarantee and registration form

14. GUARANTEE

The manufacturer gives guarantee on the product according to the guarantee card.
The danger of damage on the goods passes from the seller to the buyer by the moment of passing over the goods to the first forwarding agents for the transport for the buyer and/or by the moment of taking over the goods directly by the buyer.
The manufacturer reserves the right for changes within the innovation of the product.
When taking the product over into use the buyer is obliged to complete the guarantee form and to send it back to the manufacturer.

Caution
Defects /failures/ caused by negligent operation and/or by not observing the instructions in the Instructions for Operation shall not be accepted as the subject of the claim under guarantee.

INSTALLATION PLAN



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