



dsa.

User manual
dsa.4000



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Dental International bv

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Introduction

Just like all equipment produced by Dental International, the dsa. 4000 treatment unit, is characterised by autonomy and simplicity. Water supply and compressor are integrated in the unit. Put the plug into the wall socket and your treatment unit is ready for use. Independent of expensive water- and air pipes. Easier is almost impossible.

In the dsa. 4000 treatment unit intelligent innovations have been implemented, to enable the user to carry out a number of service actions himself. The dsa. 4000 treatment unit enables you to keep the service charges low.












In these operating instructions you can read how you must use and can maintain the dsa. 4000 treatment unit and how you can solve minor problems yourself. Furthermore, it includes parts lists and diagrams. So please read the reference guide carefully before use and keep it where the dsa. 4000 treatment unit is used.

We shall be pleased to answer your questions concerning the dsa. 4000 treatment unit and to listen to your suggestions. You may contact Dental International by using the telephone numbers and addresses on the first page of this reference guide.



General

Used symbols

	CE conformity symbol
	Attention: consult the user manual
	Attention: consult the user manual
	Type B electrical device
	Foot control connection
	Potential equalization point
	Protective contact
	Manufacturer
Max 250W	Attention: maximum voltage
Fuse: 8 AT	2 x 8 AT/250 V AC
	Temperature limitations
	Humidity limitations
	Atmospheric pressure limitations

Purpose

Treatment unit to facilitate the operational use of dental treatment equipment. The treatment unit may only be used for this purpose.

Intended user group

The dsa. 4000, as it is referred to in this reference guide, is meant for use in dental treatment rooms and may exclusively be operated by qualified personnel.

Warranty

Unit:	1 year after placement
Compressor:	1 year after placement
Hoses:	3 months after placement
Lights:	3 months after placement

Water quality

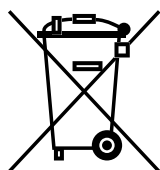
As the dsa. 4000 is provided with two detachable water tanks, you can control the water quality of your unit. Problems that may arise in conventional units as a result of still water, such as for instance the growth of biofilm or contamination with legionella can easily be prevented. Dental International prescribes the placement of a dsa. water filter and also the weekly use of dsa. BioClean.

Transport

The dsa. 4000 may exclusively be transported upright. Dental International or an appointed representative will install the dental unit. Dental International (or representative) will also give an instruction how to use and maintain the unit to the end user.

Disposal

- It applies generally that the national regulations have to be complied with when disposing of this product. Please observe the regulations applying in your country.
- Within the European Economic Community the directive 2002/96/EEC (WEEE) for electrical and electronic devices requires environmentally compatible recycling/disposal.
- Your product is marked with the symbol below. With the goal of environmentally recycling/disposal, your product must not be disposed of with the domestic refuse.
- Please note that this product is subject to the directive 2002/96/EEC (WEEE) and laws applicable in your country and must be sent for environmentally compatible recycling/disposal.





Technical specifications

Model: dsa. 4000

BASIC-UDI: 87193275323DSA4000H7

Dimensions

Unit installed:	(H x D x W) 105 cm x 55 cm x 24 cm
Minimum motion space:	120 cm
Maximum motion space:	250 cm

Weight

Unit weight:	86 kg
Maximum weight on unit:	10 kg

Environmental conditions

Temperature:	+10 °C tot +40 °C
Relative humidity:	10% to 95% RH
Air pressure:	500 hPa to 1060 hPa
Height:	up to 2000 m asl

Transport conditions

Temperature:	+5 °C to +40 °C
Relative humidity:	10% to 95% RH
Air pressure:	500 hPa to 1060 hPa
Transportation method:	Unit must only be transported upright

Voltage and frequency

Setting voltage:	230V
AC frequency:	50Hz
Power consumption:	500W (excluding connected devices)
Power fuses:	2 x 8 slow

Pressure at use

Maximum air pressure:	32 l/min at 3 bar
Maximum water pressure:	1 bar

Noise

The unit of the noise level is at a distance of 3 meters 40 decibels.

Electrical classification

Class I, Type B

Classification according to MDR

Class I in accordance with annex II and III MDR 2017/745

IP Class

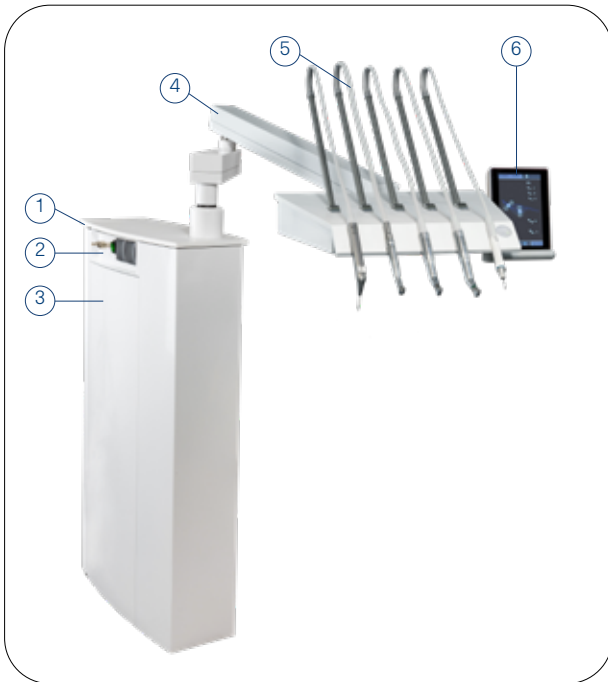
IP20

Packaging

140 cm x 60 cm x 73 cm. Weight: 50 kg

65 cm x 50 cm x 118 cm. Weight: 50 kg

Descriptions

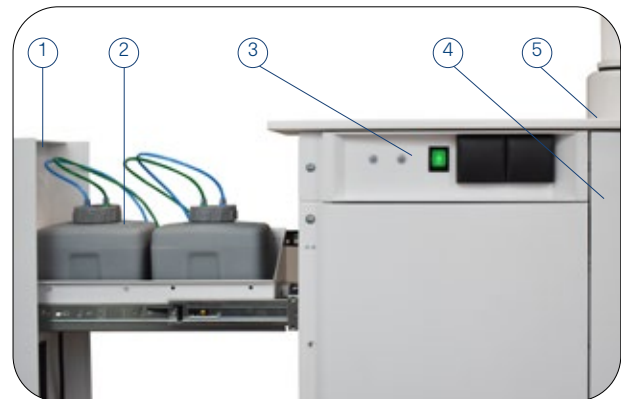


Picture: 1

1. Top
2. Control panel with:
 - Extra air output (option)
 - Extra water output (option)
 - Mainswitch
 - Plug socket (2x)
3. Treatment post
4. Compressed-air controlled arm
5. Whip arms
6. Display touch screen

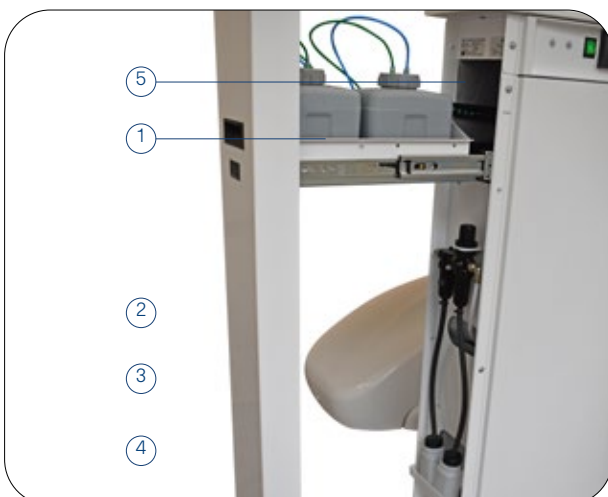
Picture: 2

1. Service drawer
2. Water tanks
3. Control panel with:
 - Extra air output (option)
 - Extra water output (option)
 - Main switch
 - Stopcontact (2x)
4. Detachable cover
5. Extra gap to assemble the lamp (option)



Picture: 3

1. Water tank
2. Micro filters with reducing air-valve
3. Receiving pots for micro filters
4. Induction filter for compressor, suction air
5. Type plate





Important for the use of the dsa. 4000 treatment unit

Purpose

Treatment unit to facilitate the operational use of dental treatment equipment.

The treatment unit may only be used for this purpose.

Contra-indications

- Not intended for use outside of dental clinical environments.
- Not intended for use on patients whose physical or medical limitations cannot be accommodated by the design of the treatment unit.
- Exclusion criteria for which the treatment unit should not be used:
 - If the patient is unconscious or unresponsive (unless under controlled sedation or anesthesia while in a surgical setting).
 - If the patient is unable to maintain airway reflexes and is at risk of suffocation.
 - If the patient has a serious musculoskeletal condition that prevents safe positioning (unless appropriate adjustments are made).
 - If the patient is medically unstable or has conditions that require hospital-based dental care (e.g., certain cancer patients, transplant recipients, or severe immunocompromised conditions).

General safety precautions

- When connecting certain instruments to the treatment unit, the user of the treatment unit may create a medical system.
- The treatment unit must never be used for any purpose other than that intended by the manufacturer.

Qualified personnel only

- The treatment unit is intended for use in dental treatment rooms and may only be operated by qualified personnel. Only personnel specifically trained to use the treatment unit may operate it.
- Unauthorized or untrained use may result in injury and/or damage to the treatment unit.

Manufacturer's instructions

- Always follow the manual regarding use, maintenance, and cleaning of the treatment unit.
- Use only suitable accessories and parts.
- The treatment unit may only be used in combination with dental instruments designed and intended for connection to a dental treatment unit.
- The treatment unit may not be connected to a mains power supply or connected to other (mobile) devices via a mains connection.
- The treatment unit may not be connected to the mains without earth protection.
- The treatment unit's plug must be easily accessible at all times.
- The treatment unit may not be modified or adapted in any way without the manufacturer's written permission.



Regular maintenance

- Perform maintenance as prescribed in the manual.
- Before performing any maintenance on the treatment unit, it must be disconnected from the power supply.
- Worn or damaged parts or connected instruments (e.g., hoses, handpieces, contra-angle pieces, valves) must be replaced immediately.
- No cleaning agents other than dsa.BioClean and dsa.BioClean INTENSIVE may be used in the waterways of the treatment unit. Doing so will void the warranty.

General

If the dsa treatment unit is used in veterinary medicine: it is prohibited to cause pain or injury to an animal, or to harm the animal's health or welfare, without a reasonable purpose or by exceeding what is permissible to achieve such a purpose (Dutch Animal Act and Regulation (EU) 2019/6).

The safety and effectiveness of dsa units are not guaranteed in relation to animals. The manufacturer assumes no responsibility for this "off-label" use.

Preparation

Prior to using the dsa. 4000 treatment unit you must make the following preparations.

Connecting the instruments

Connect the instruments to the instrument hoses correctly. Consult the reference guide of the manufacturer to this aim.

Filling the water tanks

Open the drawer on the side of the dsa. 4000 treatment unit. In this manner the water system will de-aerate. Turn the screw top (pict.4) loose and take the screw cap (pict.5) off the tank. Take the water tanks (pict.6) out and fill max 1,5 cm from top with clean tap water or, if desired, with demineralised or distilled water. After these, place the tanks again, turn the tops on again and close the drawer. When the unit is switched on the system regains pressure.



Picture: 4



Picture: 5



Picture: 6

Switching on the dsa. 4000 treatment unit

Check whether the mains voltage corresponds with the voltage mentioned on the type plate (pict.3 no.5). Never connect the dsa. 4000 treatment unit to a voltage other than the indicated voltage. Switch on the main switch (pict.2 no.3).

The dsa. 4000 treatment unit carries out a self test, the system gains pressure and ends with an acoustic signal (3 beeps).

The dsa. 4000 treatment unit is now ready for use.

Maintenance of the dsa. 4000 treatment unit

The dsa. 4000 only requires little maintenance, the following matters are, however, important for a proper functioning and a long life span.

Filling the water tanks (daily)

Fill the water tanks with clean tap water or, if desired, with demineralised or distilled water.

Emptying the condensation water receptacles (weekly)

The dsa. 4000 treatment unit is provided with an internal compressor and therefore has a number of filters. These serve to remove the particles of water and oil from the air. The filters are provided with a filter body with automatic drain. When the system is without pressure, condensed water drips out of the filter body and is received in two plastic pots. These must be emptied regularly. Make it a habit to empty the pots every week. (picture 7 and 8)



Picture: 7



Picture: 8

Blowing off the air vessel (weekly)

The dsa. 4000 treatment unit is provided with an internal compressor and therefore also has a so-called air receiver. This is where the compressed air is stored. Since compressed and cooled air can contain less water, condensate will develop in the air receiver. In time a layer of water will therefore arise in the air receiver. This must be drained regularly. Make it a habit to empty the air receiver every week. Operate as follows:

- Put off the main switch and open the tank drawer (pict.9 and pict. 10) of the dsa. 4000 treatment unit.
- Place the connection of the supplied blow-off bottle (pict.11) into the connection of the unit. Note that it remains secured. The air receiver will de-aerate, the condensed water is carried along with the air. Wait until all the condensed water has escaped.
- Disconnect the bottle from the dsa. 4000 treatment unit by releasing the rapid coupling (pict.12).
- Close the tank drawer, do not forget to put on the treatment unit (mainswitch on).
- Empty the blow-off bottle (pict.13). The cap can be taken from the bottle by pressing the locking (pict.14).



Picture: 9



Picture: 10



Picture: 11



Picture: 12



Picture: 13



Picture: 14

In order to ensure the service life and the proper operation of the compressor and to prolong a working rhythm of up to 15 minutes is intended to, from 15 minutes to be maintained. A longer working time of 15 minutes brings overheating and increased oil consumption of the compressor along with it. If the compressor is overheated, it will turn off automatically. After cooling, the compressor can be used regular again, but nonetheless overheating will cause the compressor damage which the guarantee will not let apply.

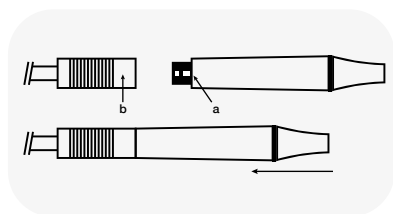
Maintenance of the instruments

Maintaining and cleaning the instruments

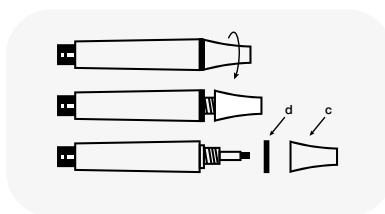
Follow the instructions of the manufacturer

Connecting and cleaning the hand piece scaling device

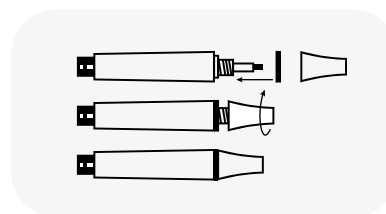
Push the hand piece into the hose connector. Note that the water connection (a) is connected to the right place in the connector (b) (fig.15). Detach the hand piece by taking it from the connector (do not turn).



Picture: 15



Picture: 16



Picture: 17

The handpiece can be sterilised in the autoclave at 135°C. The head of the handpiece (c) can be detached by simply screwing it loose (pict.16). After this, the sealing ring (d) can be removed, too. Mounting is carried out in reverse order (pict. 17).

Use

Instrument selection and use

The instrument holder of the dsa. 4000 treatment unit is provided with infra red-sensors. The sensors recognise which instrument is taken from the holder; this instrument is therefore automatically active. Only one instrument can be active, only this instrument responds to the commands of the foot control. The syringe is always ready for use.

(Remark: When a second instrument is taken from the holder, this will not respond to the commands of the foot control.)

The spray water regulation for the rotating instruments and the EMS- or dsa.-scaler is located on the hose (pict.18). By turning the sleeve you regulate the quantity of spray water. For use and operation of the instruments, please consult the user manual involved by the manufacturer



Picture: 18a



Picture: 18b



Picture: 18c

Operation of the foot control

The foot control only functions when it is connected and an instrument is activated. The function of the various operation elements depends on the selected, active instrument

The active instrument is a turbine

- When you push the lever (pict.19 a,b,c) slightly to the right with the foot the turbine will run. The rotation speed of the turbine cannot be regulated, but is always maximal.



Picture: 19a



Picture: 19b



Picture: 19c

- By pressing the right-hand switch (pict.20 a) the spray can be switched on or off. When the spray is switched on, the yellow indication lamp is on (pict.20 b).



Picture: 20a



Picture: 20b

The active instrument is a micro motor

- By pushing the lever (pict.21 a,b,c) to the right with the foot, the rotation speed of the motor can be regulated from zero to maximum.



Picture: 21a



Picture: 21b

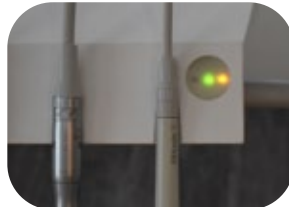


Picture: 21c

- By pressing the right-hand switch (pict. 22a) the spray can be switched on or off. When the spray is switched on, the yellow indication lamp is on (pict.22b).



Picture: 22a



Picture: 22b

- By pressing the left switch (pict.23a) the direction of rotation of the selected micro-motor changes to the left, as a warning the red indication lamp (pict.23b) lights up. When you press the switch again, the direction of rotation changes to right. When the motor is placed back into the instrument holder, the direction of rotation automatically changes to the right



Picture: 23a



Picture: 23b

The active instrument is a scaler

- By pushing the lever (pict.24 a,b,c) to the right with the foot, the power on the tip can be regulated from zero to maximal.



Picture: 24a



Picture: 24b



Picture: 24c

Solving problems yourself

If a problem occurs that you cannot solve yourself, please contact your dealer.
Below is a checklist for some problems that may occur.

No water on the instruments

- Is the spray selected? (symbol on display)
- Are the tanks filled?
- Is the drawer closed properly?
- Is the water control on the instrument hose opened?
- Aren't the instruments clogged up?

Little or no water on the instruments

- Is the water control on the instrument hose fully opened?
- Are the water filters clogged up? Replace the filters.

Instrument selection does not work

- Have all the instruments been back in the holder?
- Are the sensors in the holder clear of dust or other fouling?
- Is the foot control lever fully in the 'zero position'? (leftmost)

Compressor continues to run or starts too often

- Have the tops of the water tanks been closed off properly?
- Does the multiple-function spray leak air?
- Does the treatment unit leak air elsewhere?

The dsa. 4000 treatment unit does nothing, green indication lamp is not on

- Is the plug properly inserted in the dsa. 4000 treatment unit or wall socket?
- Are the fuses intact?

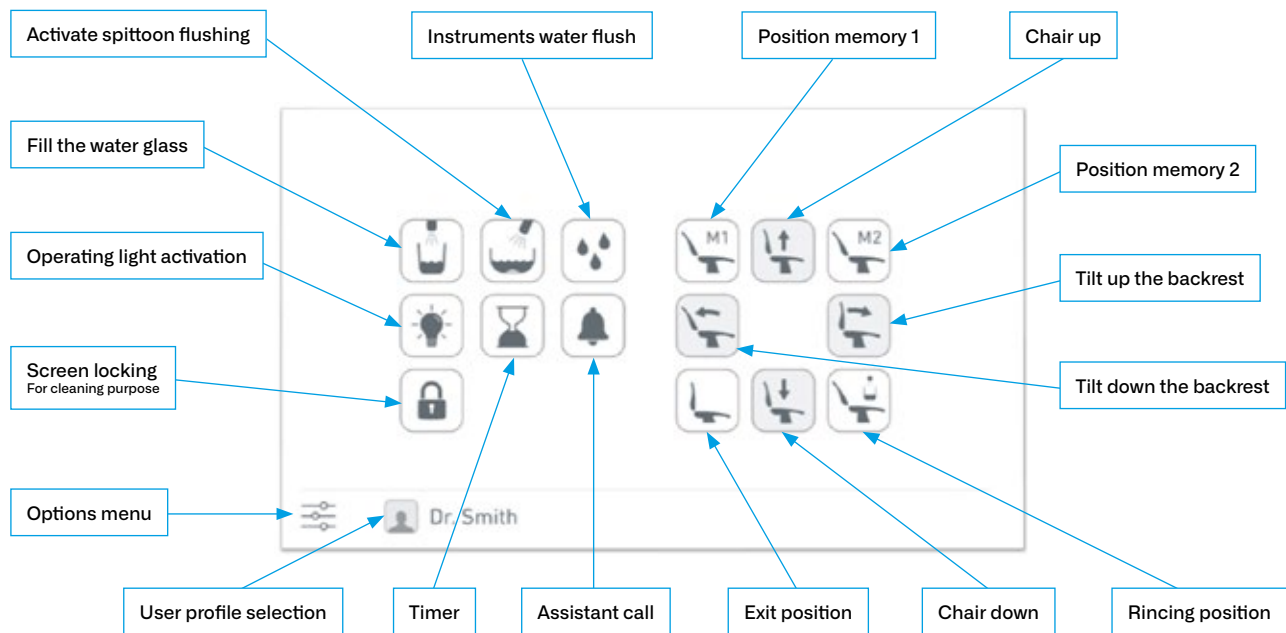
Apart from the above described maintenance activities, every other aspect of maintenance should only be conducted by Dental International or an appointed (by Dental International) representative. Infringement can change the contemplated purpose of the unit. Given warranties shall be expired as well.

Touch screen operation

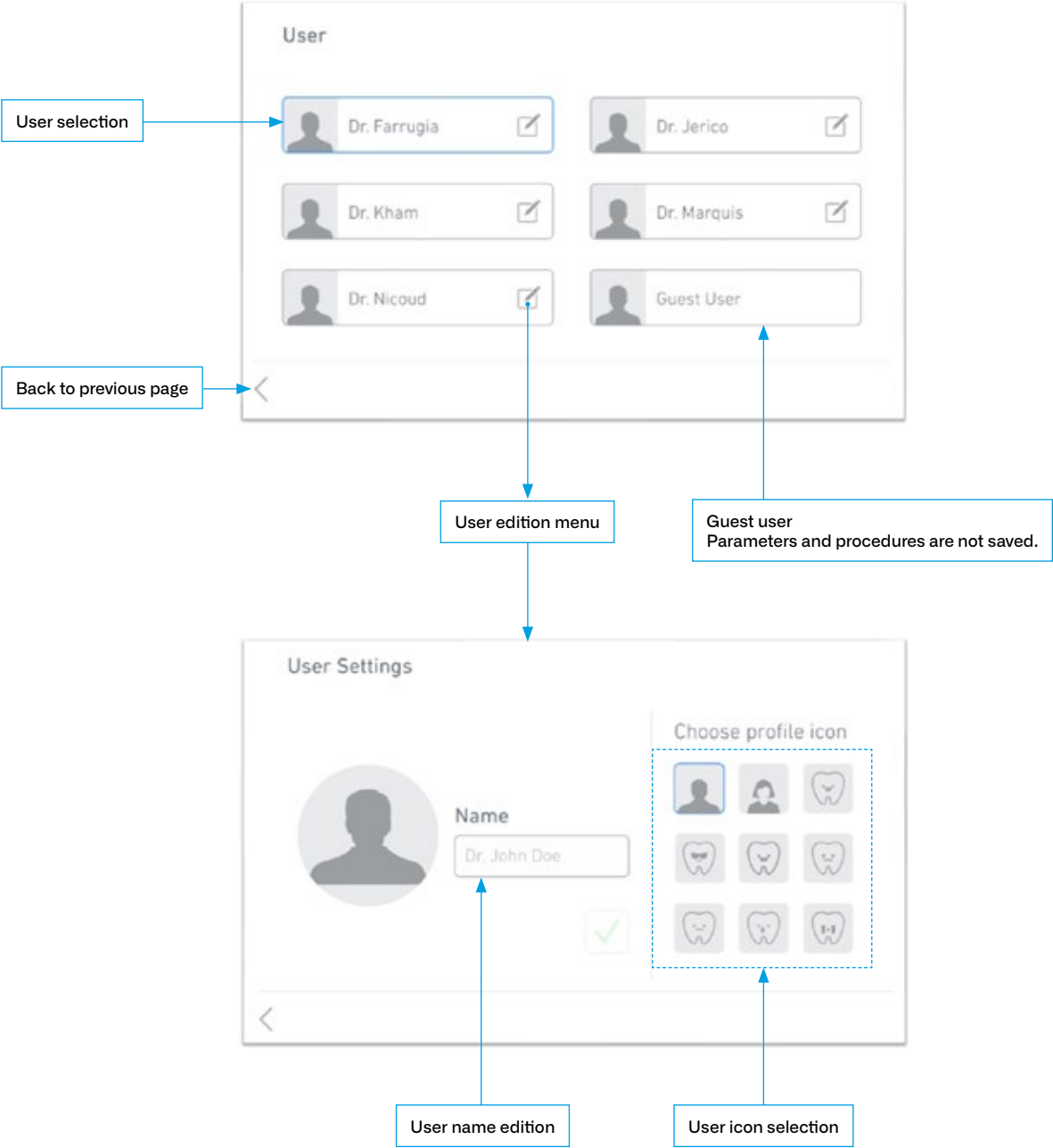
Home page

Few seconds after switching on the system the home page appears on the touchscreen.

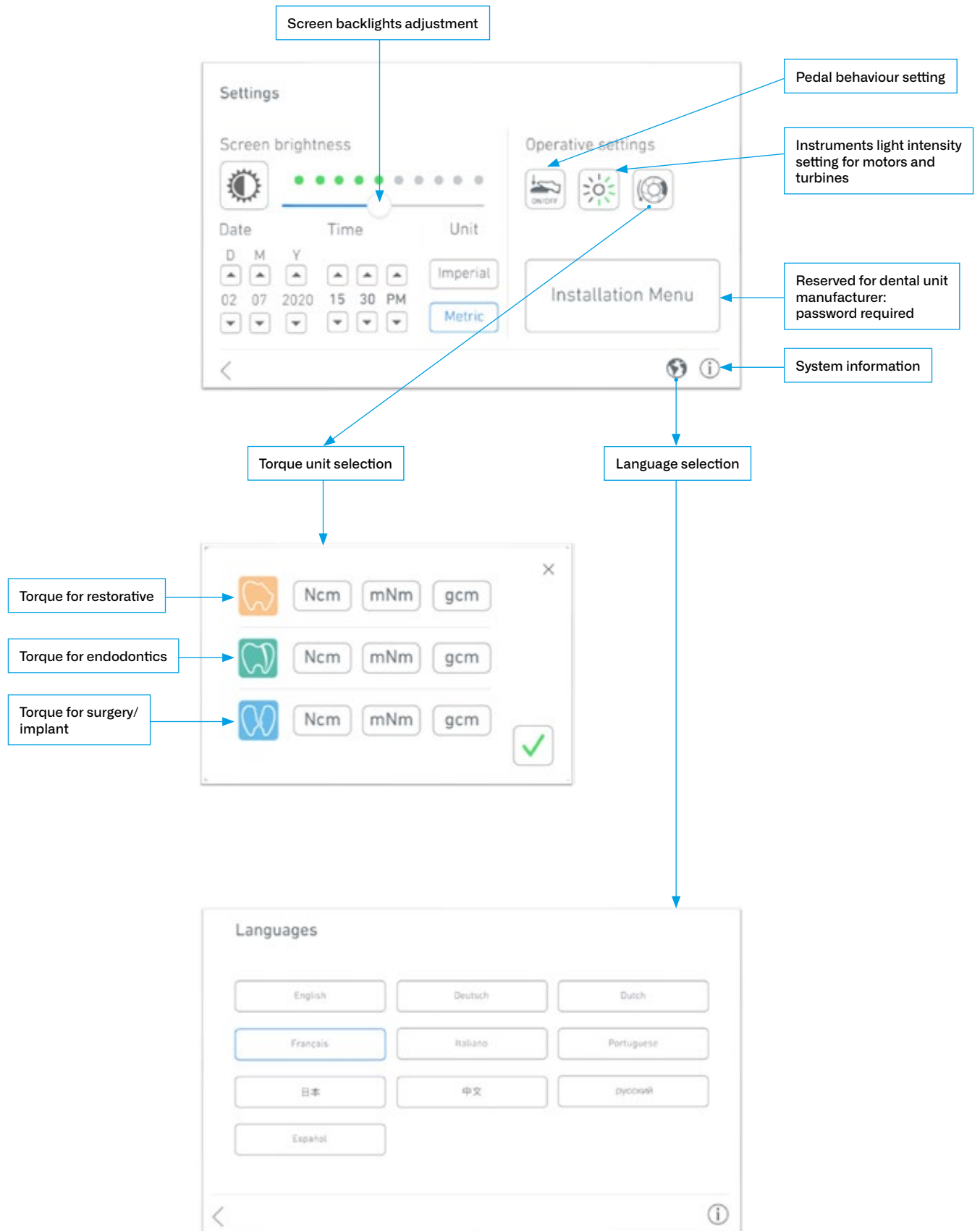
Rem : Chair functions available on home page and operative screens depend on chair options.



User profile selection



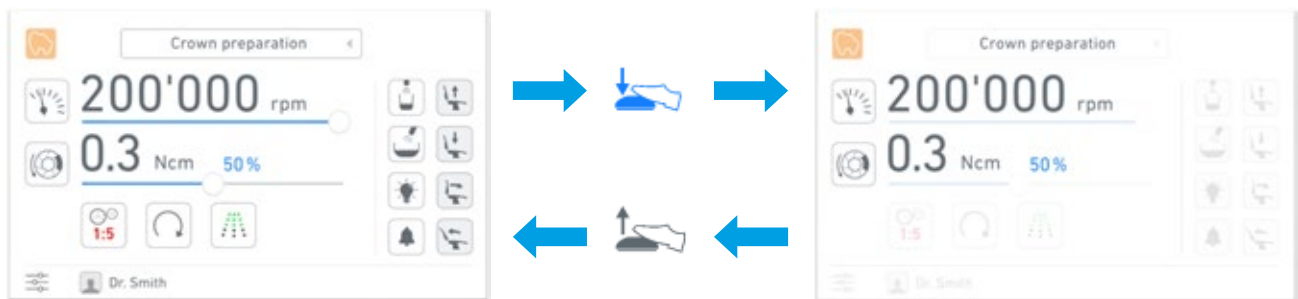
Options menu



Operative screen general (for all instruments)

Behaviour

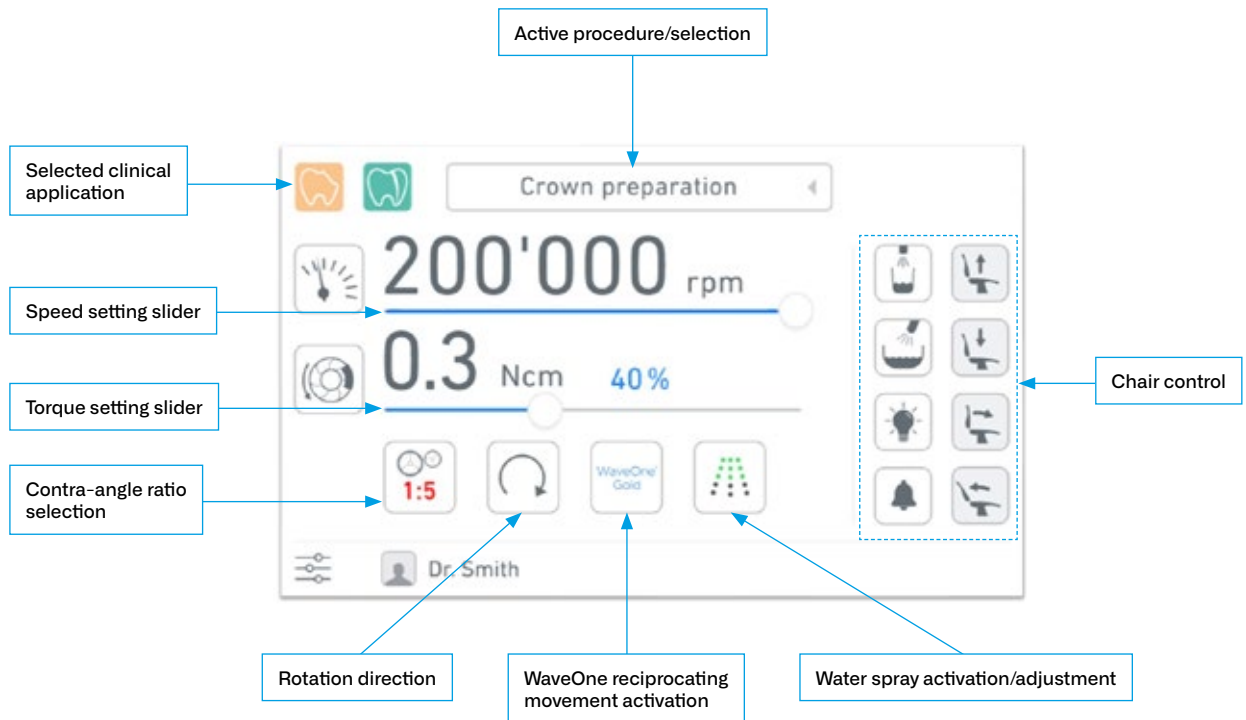
- Operative screen appears when the user pick-up an instrument out of the holder.
- If the footpedal is pressed before entering operative mode, an alert message «Please release pedal...» will be displayed. The micromotor will not start to run until the footpedal is released and pressed again.
- For IDUP, the operation displayed by default is associated to the active motor. Memory of each operation set at last usage for each motor is kept (e.g. a user who has two motors can leave a blue CA on «motor 1» and a red CA on «motor 2» and, depending on which motor is activated, the corresponding modes are automatically activated).
- The first Picked-up instrument has priority. If a second instrument is taken out of its holder, it remains inoperative until the 1st instrument is placed back in its holder.
- When footpedal is pressed and instrument is running, every settings are disabled (for safety purpose):



Speed and torque are displayed in real time for the micromotors.

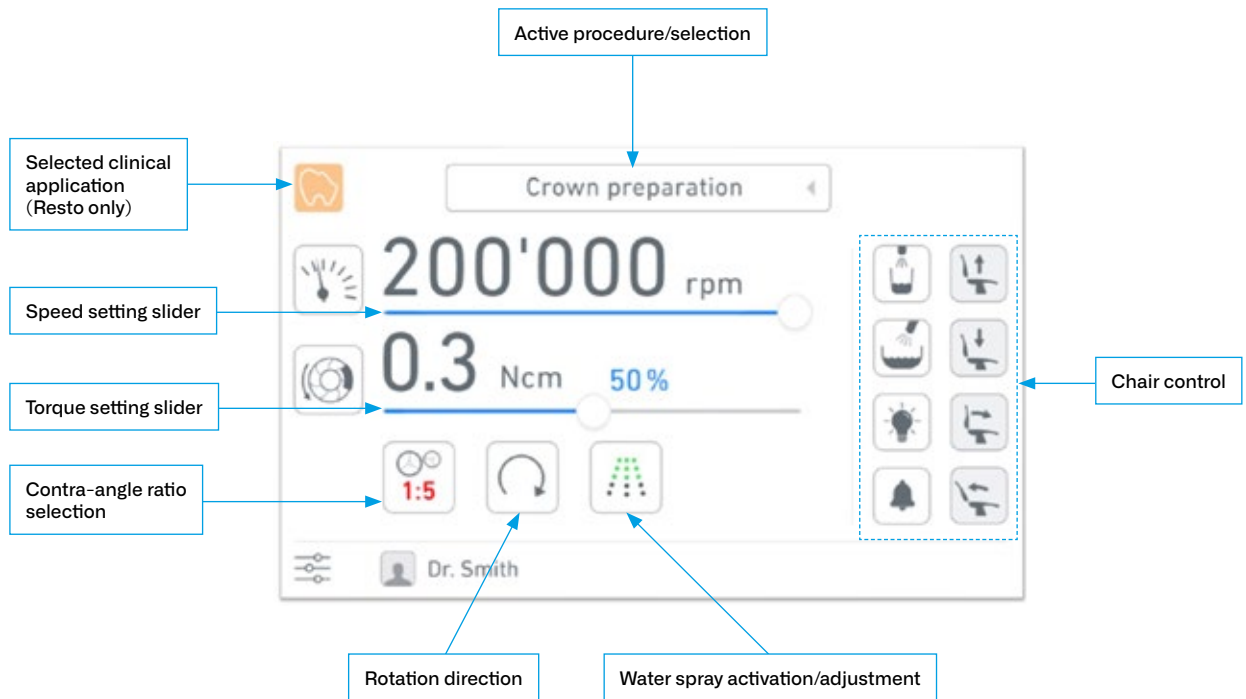
MX2 operative screen

This screen appears when the user pick-up an MX2 motor out of holder.




MCX operative screen

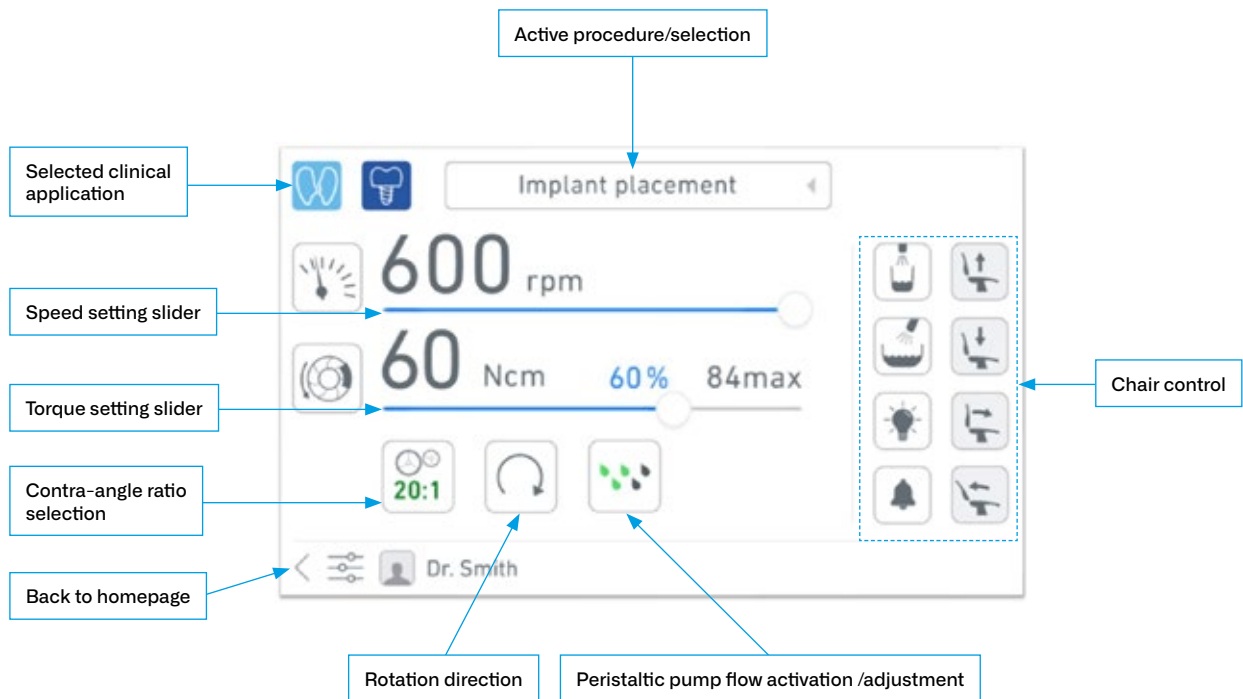
This screen appears when the user pick-up an MCX motor out of holder.



MX-i operative screen

This screen appears when:

- the user pick-up an MX-i motor out of holder.
- the MX-I button  is pressed on homepage.



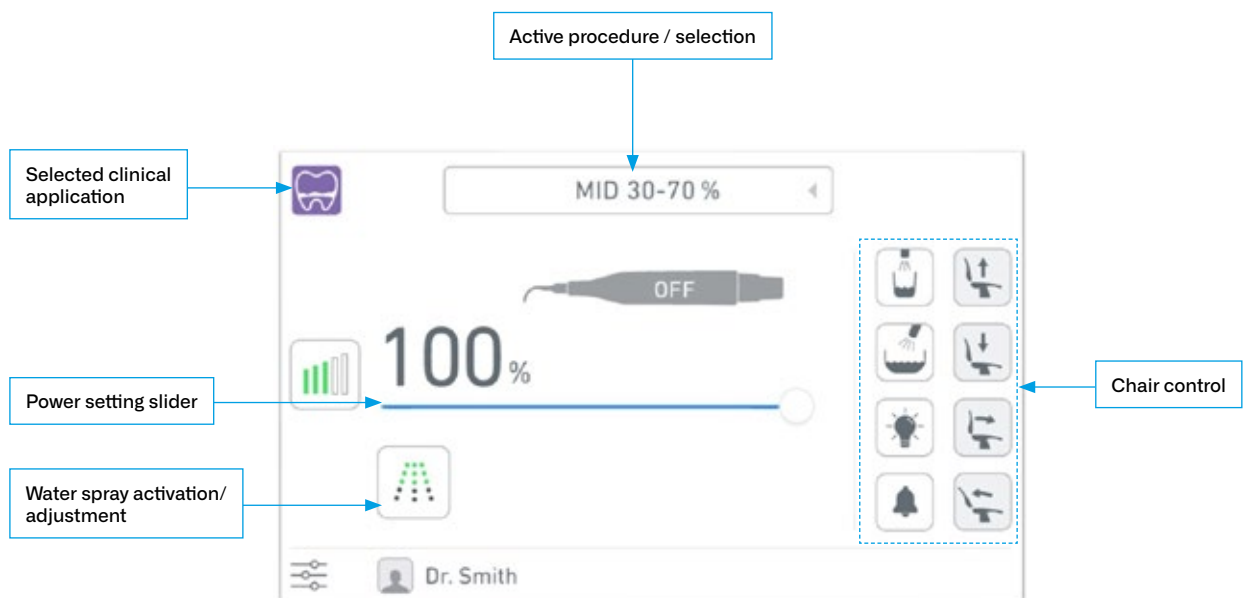
Turbine operative screen

This screen appears when the user pick-up a turbine out of holder.







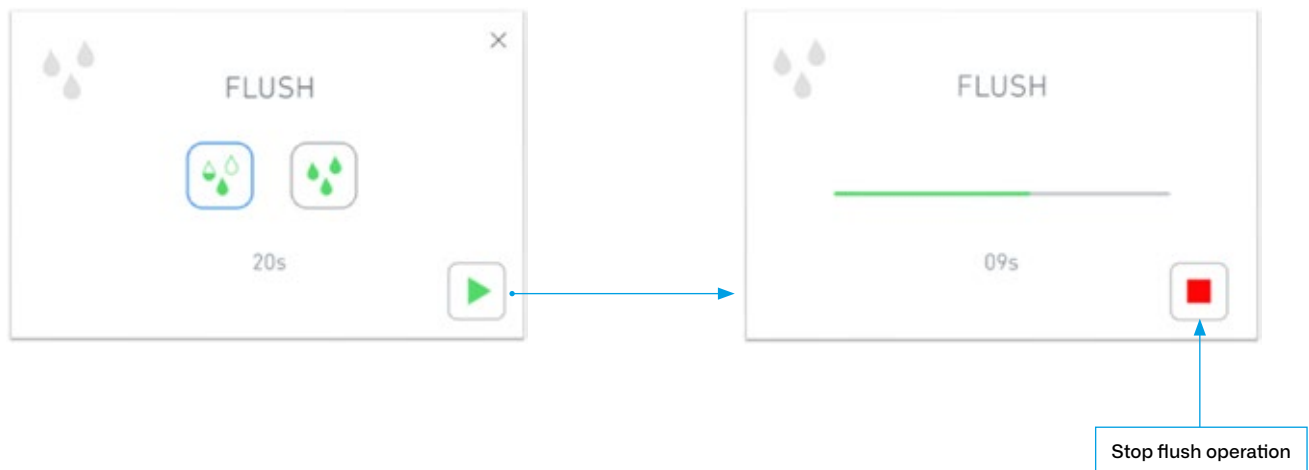
Piezo scaler operative screen

This screen appears when the user pick-up a piezo scaler out of holder.



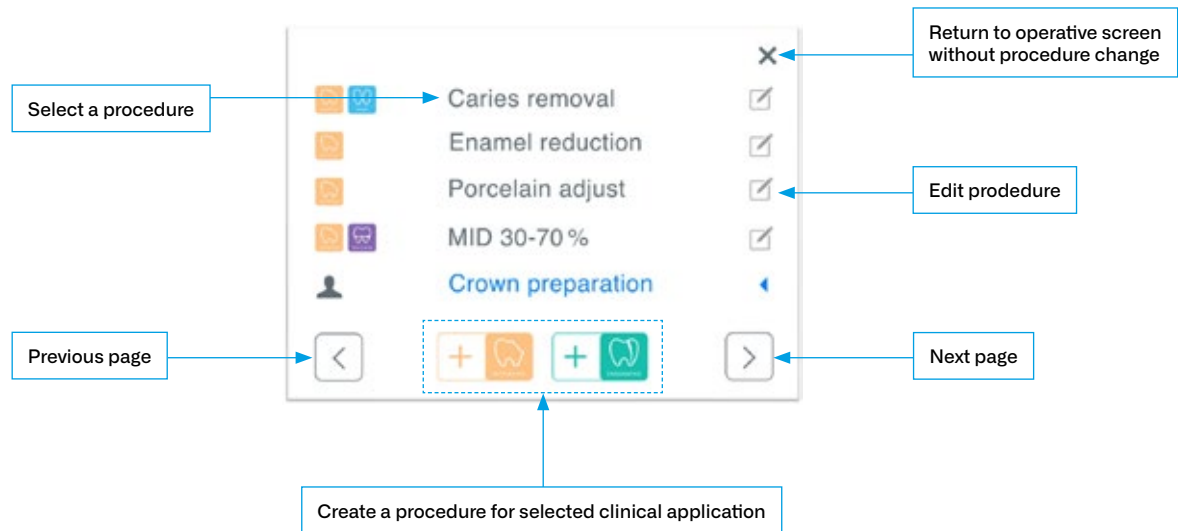
Water flush

1. Press on flush button  on homepage
2. Select short flush (20s)  or long flush (2mn) 
3. Place instruments to flush in cuspidor
4. Launch Flush 
5. Once operation complete, place back instruments in holders



Procedures management

Press on active procedure button (top of operative screen) to enter in procedure selection page.





Note: if a custom contra angle ratio is deleted, procedures including this report will be deleted automatically.





Note: If several same type motors are installed on the unit (example: two MX2), it is recommended to use a different procedure per motor. Otherwise, both motors will always have the same setting.

List of errors & Troubleshooting

Alert messages (Operating)

Description	Message	Cause of alert	Action
Foot pedal to be released	Please release pedal	Pedal is pressed when accessing operative page. Pedal remains pressed when acknowledging any system notification. Motor is jammed for more than 2 seconds.	Release foot pedal and press it again.
Motor torque limitation active		Motor drive limits delivered torque to prevent motor overheating.	Avoid extended use. Let system cool down.
Motor torque threshold limit reached, file stress condition encountered		System detects that motor torque threshold limit is reached.	Release file pressure. Slow down treatment.

Device operating error

Error description	Message	Cause of error	Action
ERROR 4 Motor connection missing 	Motor is not connected ! Please check motor connection.	Motor phase missing failure. Motor is not properly connected.	1. Check motor connection. 2. If problem persists, contact your local dealer.
ERROR 5 Motor cable failure 	Motor cable fault ! Please replace motor cable.	Motor drive power protection failure. Motor cable maybe defect.	1. Replace motor cable. 2. If the problem persists, contact your local dealer.
ERROR 6 Motor drive over temperature 	Overall system overheating! Please wait until cool.	Motor drive over temperature failure.	1. Wait for system cooling. 2. If problem persists, contact your local dealer.
GEN ERROR (FailCode) System electrical failure 	Electrical system fault ! Please contact your local dealer.	[FailCode] = EC100 : Motor drive communication failure [FailCode] = EC101 : Motor drive under voltage failure [FailCode] = EC102 : Motor drive over voltage failure [FailCode] = EC120 : Motor drive other failure	1. Switch OFF unit 2. Switch unit back ON 3. If problem persists, contact your local dealer.

Cleaning

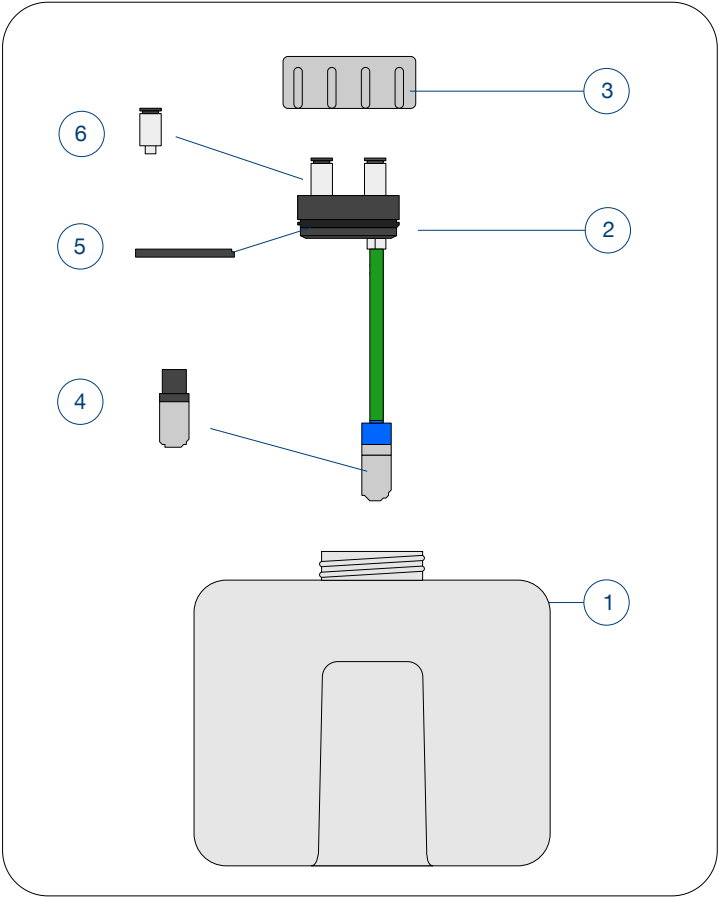
- Clean the surfaces of the display by gently rubbing for about 15 seconds with a clean cloth soaked in a suitable product (i.e. Bien-Air Dental Spraynet or isopropyl alcohol).



dsa.

Spare parts
dsa.4000

Water tanks



No.	Description	Order no.
1.	Water tank	510-123
2.	Cap assembly	590-002
3.	Cable glands	520-127
4.	Filter	540-011
5.	O-ring	550-037
6.	Quick connector 4mm	540-017

Protocol for cleaning and decontamination of the water tanks and watersystems

In the enclosed protocol (see hereafter) you find the prescribed cleaning and disinfection.

General additions:

- It is possible to use two white tanks instead of one for the use of dsa. BioClean. When using two white tanks, the cable glands with the tank cap assemblies can simply be transferred from the gray to the white tanks and vice versa. If you want to keep the remaining dsa. BioClean for the following week, close the white tanks with a closed cap.
- With dsa. BioClean you remove and prevent the formation of biofilm. If you start with dsa. BioClean or if biofilm has arisen for another reason, you can provide a deep cleaning with dsa. BioClean INTENSIVE. Its use is equal to the use of dsa. BioClean but the soaking time is a maximum of 1 hour. A longer soaking time of dsa. BioClean INTENSIVE can cause damage to the unit.





Cleaning and decontamination protocol

Applicable to the dental units of these types:

dsa. 1000, dsa. 1000Plus, dsa. 2000, dsa. 2500, dsa. 3000, dsa. 3500 and dsa. 4000

Important information

- Always use the dsa. BioClean in combination with the dsa. Waterfilter.
- Assure that the watertanks are never empty. An empty watertank can cause air bubbles in the hoses.
- In addition to dsa. BioClean, dsa. BioClean INTENSIVE can be used. Use dsa. BioClean INTENSIVE in case of presence of existing biofilm or prolonged disuse of the dental unit.
- Only clean the cap of the watertanks with water or alcohol 70%.
- Only clean the watertanks in the thermodesinfector, not in the autoclave.

Daily actions

1. Beginning of the day

- Disinfect hands and wear clean gloves.
- Fill the grey water tanks with tap water, bottled water, demineralised water, distilled water or sterile water.
- Place the swivel with the tank top construction in the grey watertanks and tighten the sealing.
- Place the grey watertanks in the dental unit.

2. End of the day

- Disinfect hands and wear clean gloves.
- Remove the swivel with tank top construction from the water tanks and wipe the outside with alcohol 70%. Place on a patients' napkin.
- Rinse the grey water tanks with water.
- We advise you to disinfect the grey water tanks in the thermodesinfector or spray them on the inside and the outside with alcohol 70%.
- Place the grey water tanks on a drain grid with their filling opening facing downwards.

Half-weekly actions

After carrying out the daily protocol at the end of the day, the grey water tank must be disinfected in the thermodesinfector.

Weekly actions

On Fridays or at the end of the working week

- Disinfect hands and wear clean gloves.
- First execute the daily protocol for actions at the end of the day.
- Use the white cleaning tank containing the dsa. BioClean and couple the 2 blue hoses and 2 green hoses that were first coupled to the grey water tanks.
- First fill the multiple-function spray. Hold the water pressed and allow the water to run over a Quantofix chloride test strip. By contact with the water the test strip begins to colour. This is the sign that the internal water hoses are filled with dsa. BioClean. Then rinse for at least another 10 seconds.
- Subsequently rinse all other instruments too, each for at least 10 seconds.
- Allow the white cleaning tank to remain coupled, so that a closed circuit continues to exist. If 1 white cleaning hose is used for several dental units, the circuit must remain closed by means of an applied blind stopper.
- Allow the dsa. BioClean to remain in the piping during the period that no work is done, but for at least 8 hours. After at most 3 weeks the dsa. BioClean must be replaced.
- If the dsa. Water filter is not used*, the colander must be hung, for instance in a cup with dsa. BioClean for at least 8 hours. After at most 3 weeks the dsa. BioClean must be replaced.



Please note: if the dsa. BioClean in the white cleaning tanks has been used up, do not replenish the tanks, but first disinfect it in the thermodisinfectant

On Mondays or at the beginning of the working week

- Disinfect hands and wear clean gloves.
- Remove the white cleaning tank or the blind stopper.
- Place the grey water tanks according to the daily protocol.
- Rinse each instrument for 30 seconds to remove the dsa. BioClean.

General stipulations

- For the general quality policy for water from the treatment unit we refer to chapter 10 of the Infection prevention in oral care practices Directive.
- * Dental International prescribes the use of dsa. BioClean in combination with the use of the dsa. Water filter.
- dsa. BioClean can absolutely not be used in stainless steel water tanks because of its corrosive effect on stainless steel. The artificial fibre tank resists dsa. BioClean and alcohol 70%.
- Any other detergent than dsa. BioClean must not be used.
- Used dsa. BioClean must not be reused or poured back into the bottle.
- The standing time of dsa. BioClean is 1 year, provided that it is kept in a dark place at room temperature.
- dsa. BioClean can be left in the treatment unit for maximally 3 weeks. If the treatment unit is not used for more than 3 weeks, the dsa. BioClean is to be changed every 3 weeks. If there is a longer period of standstill without the treatment unit being filled with dsa.® BioClean, a depth cleaning with dsa. BioClean INTENSIVE must be carried out before the first use of the dental unit.



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dsa. BioClean



Validated by ACTA (Academic Center for Dentistry Amsterdam)

ACTA successfully tackled all their Legionella issues by using our anodic oxidation generated cleaning solution. Check their reference on our website, dsabioclean.com.