

# *Traus* SSG10

## INSTRUCTION MANUAL



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# INTRODUCTION

This product is **medical device**.

Make sure to read this user manual before using.

This user manual is to assure proper installation and use.

Pay attention to read this user manual in order to making the best use of this product and to assure the prolonged lifespan before using

Specially, pay attention the contents with marks such as ,  and .


## <User>

- Qualified Professional

## <Intended use>

- Surgical bone cutting, shaving, polishing, grinding, drilling.

## <Classification of equipment>

- Type of protection against electric shock: Class I equipment
- Degree of protection against electric shock: Type BF applied part 
- Classification according to the degree of protection against ingress of water as detailed in the current edition of IEC 60529
  - Control Box: IPX0
  - Foot Controller: IPX8
- Not suitable product in the atmosphere that exist flammable anesthetic mixture with air or with oxygen.
- User sterile product (non-sterile product at shipment)
- Classification according to mode of operation: Intermittent operation
- Applied parts: DRILL bur, SAW blade, SHAVER blade

## <Use time>

- Loading time: 3 minutes
- Resting time: 10 minutes

## <Operation & Storage condition>

Operating condition	Temperature (°C)	10~35
	Relative humidity (%)	10~80
	Atmospheric pressure (hPa)	700~1,060
Transport and storage condition	Temperature (°C)	-20~60
	Relative humidity (%)	10~90
	Atmospheric pressure (hPa)	500~1,060

## USER GUIDELINES

### CAUTION

- Pay attention to use considering a patient's safety first.
- Check the working condition to see if there is any problem before operation.
- Stop working and verify the product if there is any signs of vibration, calescence or strange noise before or during operation.
- Contact the manufacturer if the problem is abnormal or difficult to solve.
- Prepare extra consumables before using for safety. In case blood or saline solution flows into the head of the angle, which may cause malfunctioning.
- Change Bur, Blade after the motor stops completely. Otherwise, Inside of angle could be damaged by the Bur, Blade, and it will cause an accident.
- Please sterilize and lubricate products immediately after use following the manual. Otherwise, the product can be damaged due to coagulation of blood or remains from operation.
- The control box and foot controller are not steam sterilization objects.
- The input power is available at AC 100-120 V / 220-240 V.  
(Check input voltage before connecting the AC power.)
- Dispose the irrigation tube after use as medical waste.
- Contact to manufacturer if it shows the fault display on the LCD. It may cause an accident.
- Do not drop from high or give a shock on the product. It can damage the product.
- Do not give any damage to irrigation tube, it will not work normally due to the tube is broken or taken off.
- Do not insert oil into the motor. It will damage bearing or cause calescence.
- This product is designed to be used indoors. Do not use outdoors.
- Do not place or use the product in humid or dusty places.
- Use products and consumables approved by manufacturer. Otherwise there might be a risk of malfunction or accident.
- Replace the motor cord immediately when it is worn out or damaged to prevent electric shock for user or patient.
- User is responsible for operation and maintenance of the product.
- The company did not sterilize the product. Please be sure to sterilize before operation. (User sterilization)
- US Federal law restricts this device to sale by or on the order of a dentist.



## WARNING

- Please watch old person, children, or disabled person near the place that the product is installed. If so, do not let them alone.
- Do not drop or damage the handpiece. In case of malfunction, dropping, or dropping in water, do not use it and contact the manufacturer. (It may cause vibration of bur, overheating, or damage of the bearings.)
- The equipment is automatically stopped when the machine load is higher than Torque value.
- Do not damage or drop the LCD part of the control box.
- SSG10 needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information. (Refer to Electromagnetic Compatibility)
- Portable and mobile Radio Frequency communications equipment can affect SSG10. Do not use Radio Frequency equipment outskirts for the product.
- The system may present a possibility of malfunction when used in the presence of an electromagnetic interference wave. Do not install the system in the vicinity of the device which emits magnetic waves. Turn off the power switch of the Control box when an ultrasonic oscillation device or an electrode knife is located in the vicinity is used.
- For safety, install the control box in a place where the AC power cord can be easily removed. (It is possible to disconnect the control box from the power source by removing the AC power cord.)



## PROHIBITION

- Do not use with damaged or faulty power cord, plug and outlet. Contact to manufacturer. It may cause the danger of fire, electric shock.
- When unplugging the power cord, hold the plug and do not touch with wet hand.
- Do not use with loose power plug. It may cause the danger of fire, electric shock.
- Unauthorized modification and dismantling is prohibited.
- Do not use the solvent such as thinner or benzene for cleaning.
  - ※ Please use an absorbent or alcohol to wipe the controller box. Do not wipe with wet cloth.
  - ※ Be careful not to drop liquid on control box.
- Do not place near heat equipment and candles or cigarette causing fire.
- Make sure to put a plug in an outlet with earth. Contact to electrician or manufacturer regarding ground.
- Be sure to use designated bur by ISO 1797.
- Follow the provided instruction manual by Bur, Blade manufacturer, when using Bur, Blade.
- Keep the speed limit recommended by Bur, Blade manufacturer. Operating beyond the recommended speed limit may cause an accident.
- This product should be used by specialist and expert because it could cause burn to patient at using improperly.
- If patient is taking antibiotics, patient needs to consult with doctor before operation.
- Keep away from fire or heat when using spray containing flammable material.
- Saeshin is not responsible for any defects and loss of property in the following cases
  1. The product has been used in ways other than those specified in the instruction manual.
  2. The manufacturer's installation recommendations have not been followed such as electromagnetic environment
  3. Repairs or other work have been done on the product by persons not authorized by manufacturer
  4. The product has been stored in places other than those specified in the instruction manual.
- Do not use on the following patients.
  1. Those with medical complications or allergies
  2. Those who have pre-existing conditions (E.g. Cardiac, Pulmonary, Renal disturbance or High blood pressure)
  3. Those who are pregnant or lactating
  4. Patients with cardiac pacemakers and infants

## **PRODUCT FEATURES & ADVANTAGES**

<BLDC motor designed by SAESHIN's own technology and know>

- Provide the optimized performance by BLDC motor (0~40,000rpm) and Angle handpiece of several kinds.

### <DRILL mode>

\* Maximum speed

Gear ratio	1:1	1:3	1:5	10:1	20:1	32:1
RPM	40,000 rpm	120,000 rpm	200,000 rpm	4,000 rpm	2,000 rpm	1,250 rpm



- The free-running speed of the handpieces shall be in accordance with the manufacturer's instructions at a tolerance of  $\pm 10\%$  as specified. (Refer to ISO 14457)  
 - TST40NN is up to 25,000rpm. (1:1)

\* Torque

Gear ratio	1:1	1:3	1:5	10:1	20:1	32:1
Torque	1~6 N·cm	1~2 N·cm	1 N·cm	5~30 N·cm	5~80 N·cm	5~80 N·cm

\* Gear ratio: 1:1, 1:3, 1:5, 10:1, 20:1, 32:1

\* LED: 25,000 lx

### <SAW mode>

\* Maximum speed: 12,500 rpm

\* Torque: 10 N·cm

\* Gear ratio: 3:1

### <SHAVER mode>

\* Maximum speed: 6,000 rpm (Forward, Reverse motion)

\* Frequency (F/R repetition motion):

RPM	300~1,000 rpm	1,100~1,800 rpm	1,900~2,600 rpm	2,700~3,400 rpm	3,500~4,200 rpm	4,300~5,000 rpm
Frequency	0.5 Hz	1.0 Hz	1.5 Hz	2.0 Hz	2.5 Hz	3.0 Hz

### <Program memory function>

- 9 programmable memories for setting Gear ratio, Speed, Torque, Rotating direction, Irrigation pump and Optic.

### <Automatic overload protection function>

- If the load on the bur is higher than set torque, the motor will stop automatically and an Error message will be displayed.

- To release the overload function, press the foot controller once.

### <Realtime RPM view system>

- Actual RPM value is displayed on the screen. It makes user can do more delicate operation.

### <Motor Auto-calibration function>

- Motor auto-calibration function is that controller check the angle handpiece status to reconcile speed and torque that user wants with angle handpiece for accurate and safe operation.



- The function is set up when the product is released by manufacturer. And use the function when user repair or change the product.

### <Beep sound function> (DRILL, SHAVER mode)

- When using reverse direction, ring the beep sound for protecting user confusion.

### <Ergonomic foot controller>

- The foot controller is designed ergonomically to control all the functions. And the foot controller provides high convenience.

### <Setting with SETUP mode>

- Volume control, Time set, Program reset, Auto Calibration is available.

## PRODUCT COMPONENTS

Check if all components are included.

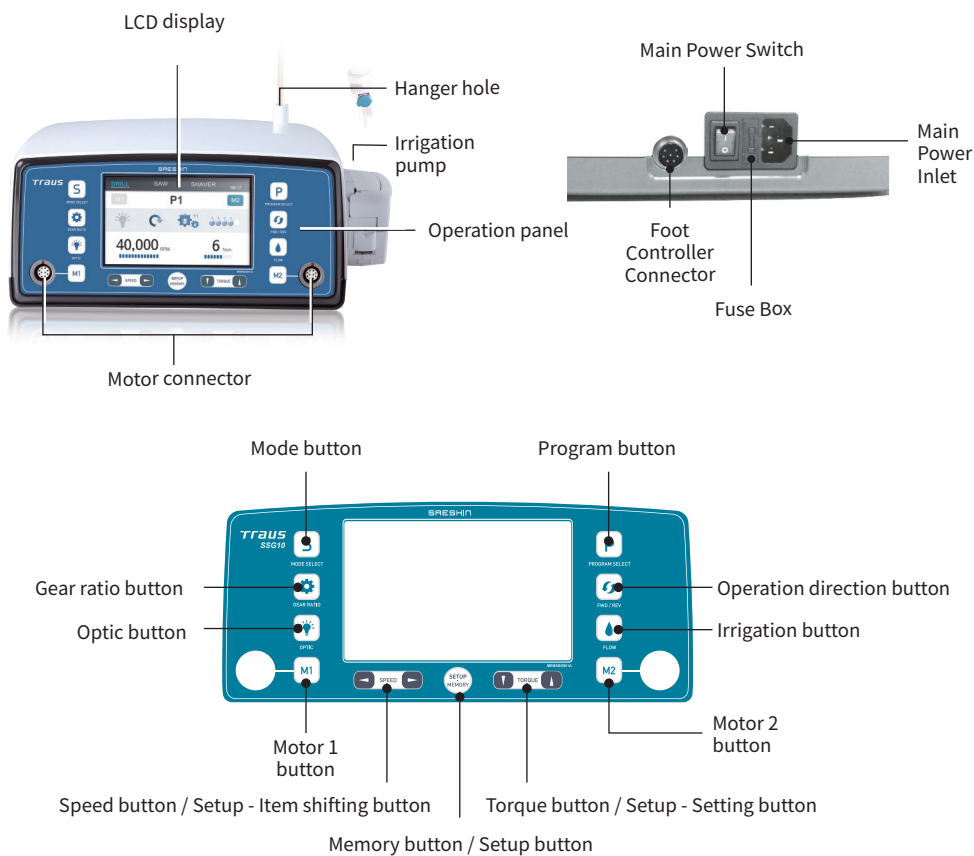


No.	Component	No.	Component
1	Control box	13	Motor cap for autoclave
2	DRILL handpiece (1:1 straight type) (Option)	14	Motor stand
3	DRILL handpiece (1:1 contra type) (Option)	15	DRILL external nozzle (Option)
4	DRILL handpiece (10:1 contra type) (Option)	16	SAW external nozzle (Option)
5	SAW handpiece (Reciprocating type) (Option)	17	Tube holder
6	SAW handpiece (Sagittal type) (Option)	18	Tube clamp
7	SAW handpiece (Oscillating type) (Option)	19	Hanger
8	SHAVER handpiece (Option)	20	User manual
9	BLDC motor (Option)	21	Spray nozzle
10	Foot controller	22	A-SLEEVE
11	Power cord		
12	Wrench		



- Saline solution, Suction pump set, DRILL bur, SAW blade, SHAVER blade are not included in a set.
- Irrigation tube and Y-Tube are disposable, Do not use them again.

## PART NAME OF CONTROL BOX





## BUTTONS ON OPERATION PANEL



Mode button

: This is used for selecting the mode (DRILL, SAW, SHAVER).



Program button

: This is used for selecting the memorized program number.

By pressing the button, the program changes by 1 stage.

The program returns to number 1 (P1) after number 9 (P9).



Gear ratio button (DRILL mode)

: This is used for selecting the gear ratio of the handpiece used during the procedure.

1:1 -> 1:3 -> 1:5 -> 10:1 -> 20:1 -> 32:1



Operation direction button (DRILL, SHAVER mode)

: This is used for selecting the direction of rotation (Forward, Reverse, F/R repetition motion).

During reverse operation, it beeps continuously.



Optic button (DRILL mode - Motor 2)

When press the speed control pedal on the foot controller after operating the optic function,

LED is turned on at the angle head part. Release the speed control pedal, turn off the LED after 3

seconds. Turn off the optic function, LED is not operated regardless pressing the speed control pedal.

Optic function is only operated by Optic angle and Optic motor.









- Optic function is applied to 'M2 DRILL mode' only.



Irrigation button

: This is used for selecting the irrigation volume.

It can control stage 0 to 5 (Max. 90 ml/min  $\pm$  20%).

Stage	Volume
0 	Stage 0: STOP
1 	Stage 1: 35 ml/min $\pm$ 25%
2 	Stage 2: 50 ml/min $\pm$ 25%
3 	Stage 3: 65 ml/min $\pm$ 20%
4 	Stage 4: 80 ml/min $\pm$ 20%
5 	Stage 5: 90 ml/min $\pm$ 20%



Motor1 button

: This is used for selecting the motor 1.



Motor2 button

: This is used for selecting the motor 2.



Speed button / Setup - Item shifting button

- Speed setting: This is used for setting the speed.

▶ button for increasing speed, ◀ button for decreasing speed

Keep pressing speed button to change rapidly.

※ The setting range of speed is different from mode and gear ratio.

- Setup mode - Item shifting: This is used for selecting the setup item.



Torque button / Setup - Setting button

- Torque setting: This is used for setting the torque of DRILL handpiece.

\* DRILL mode: ▲ button for increasing torque, ▼ button for decreasing torque

※ The setting range of torque is different from gear ratio.

- Setup mode - setting: This is used for setting the sound level, time and reset.



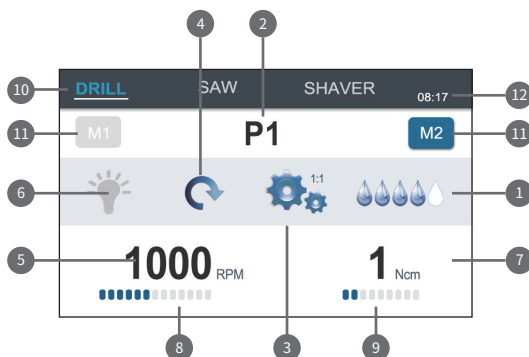
Memory button / Setup button

- Program memory: Keep pressing this button for 3 seconds after completed setting program, program is memorized with beep sound.

- Setup mode: Volume control, Time set, Program reset, Auto Calibration is available.

- Setup complete: Press this button in order to memorize the program in SETUP mode.

## LCD WINDOW



### 1. Irrigation volume display

: It shows selected irrigation level. The level is 0 to 5 (Level 0 = No volume / Level 5 = Maximum volume). Number of water drop shows the volume level.

### 2. Program number display

: It shows current set of program number. It display P1 to P9 and can save 9 programs. After restart the device, it displays program number 1.

### 3. Gear ratio display (DRILL, SAW mode)

: It shows current set of gear ratio.

### 4. Operation direction display (DRILL, SHAVER mode)

: It shows the selected rotary direction.

### 5. RPM display

: It shows the initial setup RPM when it is on standby. The actual value is displayed in real-time during operation. The number is same as set RPM level when press foot controller to the end.

### 6. Optic display (Optic version)

: The optic function is working when bulb symbol display on the screen.

\* Optic function is only operated with optic angle handpiece.

\* When press the speed control pedal on the foot controller after operating the optic function, LED is turned on.



- Optic function is applied to 'M2 DRILL mode' only.

### 7. Torque / Frequency display (DRILL, SHAVER mode)

- Torque display (DRILL mode): It shows the setup torque value. If an actual load is higher than set torque value, the set torque value is on the screen and the motor is stopped automatically with 'E3' on the screen and beep sound.

- Frequency display (SHAVER mode - F/R repetition motion): It shows the frequency value according to the speed.

### 8. Foot controller gauge display

: The gauge indicates the degree to which the foot controller is pressed during operation.

### 9. Torque gauge display (DRILL mode)

: The gauge indicates the actual load value during operation.

### 10. Mode display

: It shows current selected mode.

### 11. Motor display

: It shows current selected motor (MOTOR 1 / MOTOR 2).

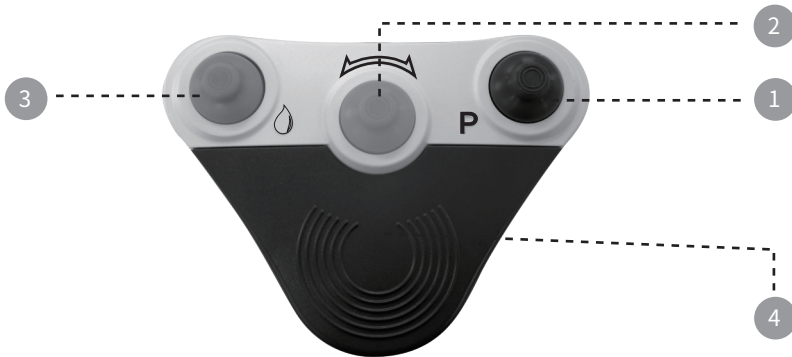
### 12. Time display

: It shows current time.



- Be careful that the LCD on the control box could be damaged by impacting or dropping.

## ● BUTTONS ON THE FOOT CONTROLLER



### 1. Program button

: Use the button to select the program. 1 stage increases per each press. 1 stage decreases when press this button above 1 second. (Program decrease function is not operated continuously. If you want to decrease program over the 2 stage, press the button after releasing the button.)

### 2. Operation direction button

: Use the button for selecting the operation direction. Press the button shortly, change the rotary direction. Press the button above 1 second, switch the motor (motor 1 / motor 2).

### 3. Irrigation button

: Use the button for selecting the irrigation volume. 1 stage increases per each press. Press the button above 1 second, set the 0 stage (stop condition).

### 4. Speed control pedal

: The motor speed is controlled by pressing and releasing the foot controller.

## ● CONNECTION OF EACH PART



- Make sure the power is off before connect each part.  
(Otherwise, it might cause a malfunction.)

### 1. Motor cord connection

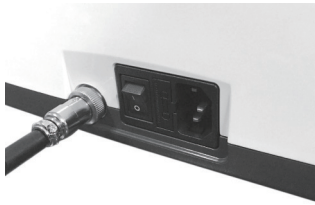


Please insert the motor plug to the device correctly. (Place the arrow mark on top. See the picture below.)

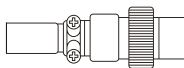


When unplugging the motor cord, hold the part marked with ■ and pull it in the direction of the arrow.

### 2. Foot controller connection



Please insert the foot controller connector. Check the hole and pins of foot controller connector are in place then screw the connector lock.



connector lock.

### 3. Power cord connection



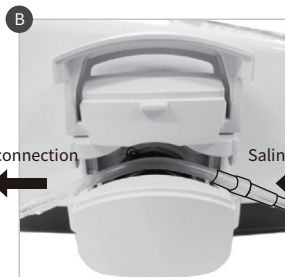
Insert the power cord into the main power inlet of the control box.



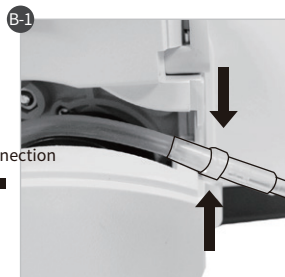
### 4. Irrigation tube connection



Open the pump roller cover upward.



Insert the irrigation tube correctly into the center of irrigation pump.



When insert a tube, place a pump cover to close the arrow part. Otherwise, irrigation might not be efficient.



Close the irrigation pump cover downward.



When close the pump roller cover make sure that the irrigation tube is positioned as shown in the figure.



Make sure the pump roller cover is completely closed.



- If you do not use it for long period, please open pump roller cover. Otherwise, the irrigation tube might be damaged.

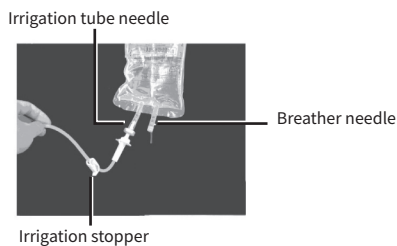
#### 5. Hanger setting

: Put the hanger into the hanger hole.



#### 6. Irrigation tube insertion

: Lock the irrigation stopper placed below the irrigation tube needle and pack, then insert the irrigation tube needle to the pack in place with the pack downward.



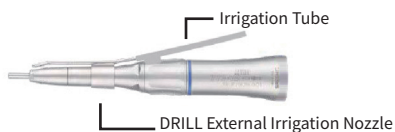
- If pump is operating while the tube is bent or the water does not come out, the tube can be broken or damaged.

#### 7. Irrigation nozzle connection

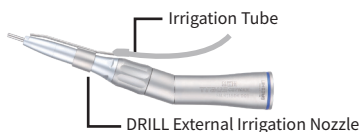
: Insert the irrigation tube to the end of spray nozzle pipe.

##### ■ DRILL handpiece

- TST10XX

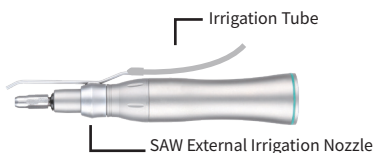


- CST10XX, CRT14XX



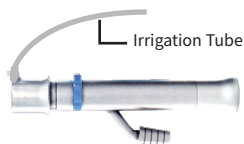
##### ■ SAW handpiece

- TRT12NRC, TRT12NOS, TRT12NSG



##### ■ SHAVER handpiece

- TRT12NSH

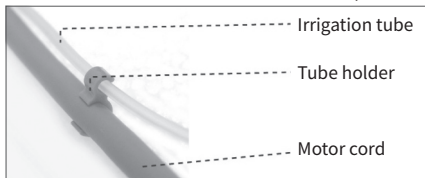


- An external irrigation nozzle is at the bottom of a shaver blade.

## 8. Tube holder setting

: Put the motor cord and irrigation tube together with holders.

Insert the tube holder to the motor cord and then put the irrigation tube for easy work.



## 9. Bur, Blade setting

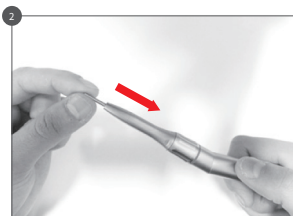


- Insert bur, blade after motor is completely stopped. Otherwise the internal part of angle can be damaged or caused injury.

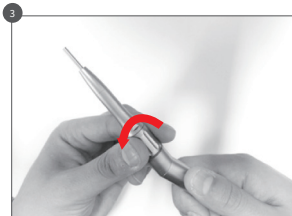
### ■ DRILL bur



1) Turn the handle clockwise to open the chuck.

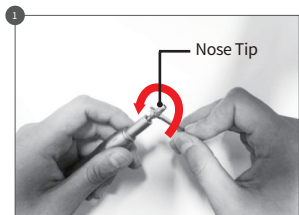


2) Insert the bur into the chuck completely.

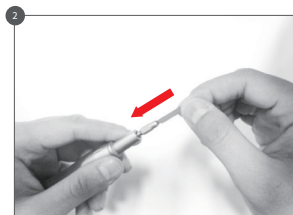


3) Turn the handle counterclockwise to close the chuck.

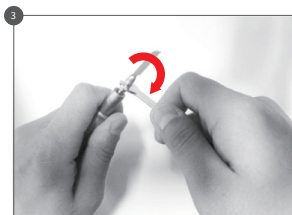
### ■ SAW blade



1) Turn the wrench counterclockwise to release the nose tip.

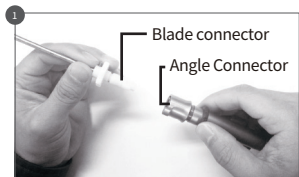


2) Insert the blade. Push the blade in order to insert completely.

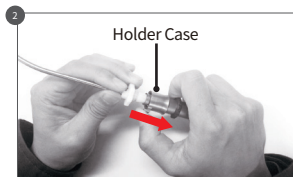


3) Turn the wrench clockwise to tighten the nose tip.

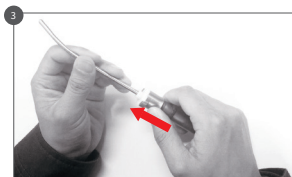
### ■ SHAVER blade



1) Before inserting the blade, adjust the blade connectors to the angle connector.



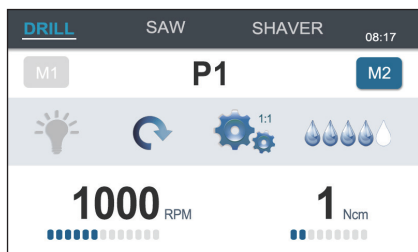
2) Insert the blade by pulling the holder case on the angle.

















3) When the blade is fully inserted, fix the blade by pushing the holder case up.





## OPERATION PROCESS

### DRILL mode







1. Press the motor button (  /  ) to select the motor to use.
2. Set the DRILL mode by using the mode button (  ).
3. Press the gear ratio button (  ) to select the gear ratio to use.
4. Press the operation direction button (  ) on the control box or operation direction button (  ) on the foot controller to select the operation direction. Operation direction is forward and reverse in DRILL mode. During the reverse operation, it beeps continuously. (Sounds let the user know the operation direction.)
5. Press the irrigation button (  ) on the control box or irrigation button (  ) on the foot controller to select the irrigation volume. Irrigation volume per each stage refers to the below.

					
Irrigation stop	35 ml/min $\pm$ 25%	50 ml/min $\pm$ 25%	65 ml/min $\pm$ 20%	80 ml/min $\pm$ 20%	90 ml/min $\pm$ 20%

6. Press the speed button (  SPEED  ) to set the speed.  button for increasing speed,  button for decreasing speed. Keep pressing speed button to change rapidly. The setting range of speed is different from gear ratio, refer to the below.

Gear ratio	1:1	1:3	1:5	10:1	20:1	32:1
RPM	300~40,000rpm	900~120,000rpm	1,500~200,000rpm	30~40,000rpm	15~2,000rpm	10~1,250rpm

7. Press the torque button (  TORQUE  ) to set the torque.  button for increasing torque,  button for decreasing torque. The setting range of torque is different from gear ratio, refer to the below.

Gear ratio	1:1	1:3	1:5	10:1	20:1	32:1
Torque	1~6 N · cm	1~2 N · cm	1N · cm	5~30 N · cm	5~80 N · cm	5~80 N · cm

8. Press the optic button (  ) to use optic function.



- Optic function is applied to 'M2 DRILL mode' only.

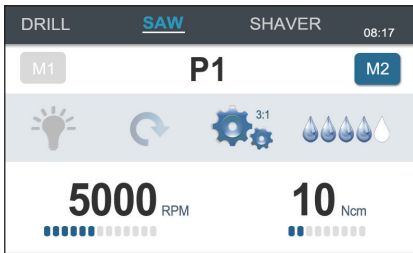
9. Use it by pressing the speed control pedal on the foot controller.



- Before operating product, please check the connection of irrigation tube on DRILL angle. If irrigation tube isn't connected and delivered to bur, there is risk of tissue necrosis or bone damage. Because of the frictional heat between bur and operation site. (Installation method of Irrigation tube: Refer to the connection of each part.)

- If you use the DRILL angle, make sure that the mode set as DRILL before use it. If you do not set the DRILL mode, there is a risk of an accident.

## ■ SAW mode



1. Press the motor button ( / ) to select the motor to use.
2. Set the SAW mode by using the mode button ( ).
3. Press the irrigation button ( ) on the control box or irrigation button ( ) on the foot controller to select the irrigation volume.  
Irrigation volume per each stage refers to the below.  

Irrigation stop	35 ml/min $\pm$ 25%	50 ml/min $\pm$ 25%	65 ml/min $\pm$ 20%	80 ml/min $\pm$ 20%	90 ml/min $\pm$ 20%
4. Press the speed button ( SPEED ) to set the speed. button for increasing speed, button for decreasing speed. Keep pressing speed button to change rapidly. It can set from 5,000 to 12,500 rpm.
5. Use it by pressing the speed control pedal on the foot controller.



- Gear ratio and torque are fixed for SAW mode.
- Gear ratio: 3:1
- Torque: 10 N · cm



- Before operating product, please check the connection of irrigation tube on SAW angle. If irrigation tube isn't connected and delivered to blade, there is risk of tissue necrosis or bone damage. Because of the frictional heat between blade and operation site. (Installation method of Irrigation tube: Refer to the connection of each part.)
- If you use the SAW angle, make sure that the mode set as SAW before use it. If you do not set the SAW mode, there is a risk of an accident.



## ■ SHAVER mode



1. Press the motor button ( / ) to select the motor to use.

2. Set the SHAVER mode by using the mode button ( ).

3. Press the operation direction button ( ) on the control box or operation direction button ( ) on the foot controller to select the operation direction. Operation direction is forward, reverse and F/R repetition motion.



- In F/R repetition direction, frequency is displayed according to RPM. Refer to the below 4.  
If select forward or reverse direction, see the below 5.
- In forward and reverse direction, frequency is not set and displayed ' - - Hz'.

4. In F/R repetition direction, check the frequency. Frequency is set according to RPM, refer to the below table.

RPM	300~1,000 rpm	1,100~1,800rpm	1,900~2,600rpm	2,700~3,400 rpm	3,500~4,200 rpm	4,300~5,000 rpm
Frequency	0.5Hz	1.0Hz	1.5Hz	2.0Hz	2.5Hz	3.0Hz

5. Press the irrigation button ( ) on the control box or irrigation button ( ) on the foot controller to select the irrigation volume. Irrigation volume per each stage refers to the below.

Irrigation stop	35 ml/min $\pm$ 25%	50 ml/min $\pm$ 25%	65 ml/min $\pm$ 20%	80 ml/min $\pm$ 20%	90 ml/min $\pm$ 20%

6. Press the speed button ( SPEED ) to set the speed. button for increasing speed, button for decreasing speed. Keep pressing speed button to change rapidly. The setting range of speed is different from operation direction, refer to the below.

Operation direction	Forward	Reverse	F/R repetition
RPM	300~6,000 rpm	300~6,000rpm	300~5,000 rpm

7. Use it by pressing the speed control pedal on the foot controller.



- Before operating product, please check the connection of irrigation tube on SHAPER angle. If irrigation tube isn't connected and delivered to blade, there is risk of tissue necrosis or bone damage Because of the frictional heat between blade and operation site. (Installation method of Irrigation tube: Refer to the connection of each part)
- If you use the SHAPER angle, make sure that the mode set as SHAPER before use it. If you do not set the SHAPER mode, there is a risk of an accident.

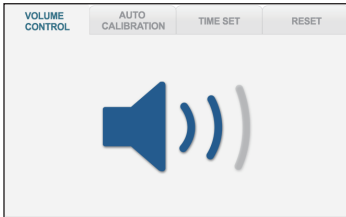
## ■ Program setting

1. Press the program button ( **P** ) on the control box or program button ( **P** ) on the foot controller to select the program number.  
Program number increases each 1 stage in order. The program returns to number 1 (P1) after number 9 (P9).
2. After setting the desired value by referring to the operation method, keep pressing memory button ( **SETUP MEMORY** ) for 3 seconds.  
The 'SAVING' is displayed on LCD, program is memorized with beep sound.

## ■ Other function (SETUP)

Press the SETUP button ( **SETUP MEMORY** ) to enter the setup mode, select the desired setting item by pressing the ◀ or ▶ button.  
Press the SETUP button ( **SETUP MEMORY** ) again at setup mode, return the main screen.

### 1. Volume control



Number of icon bar indicates loudness level of sound.

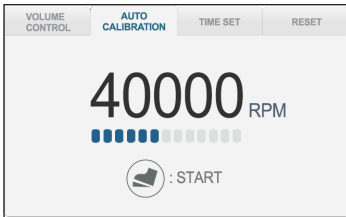
4 stages, set the sound volume by pressing ▼ or ▲ button.

Press the SETUP button ( **SETUP MEMORY** ) to complete the setting after setting the level of volume.



Beep sound shuts off in mute mode.

### 2. AUTO CALIBRATION



After connecting the angle to the motor, hold the motor by hand tightly.

Step the foot controller fully in order to start the calibration.

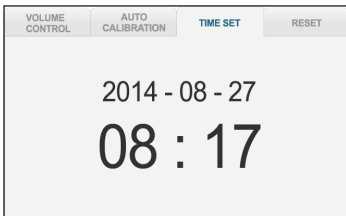
Calibration will be completed with beep sound and display "Calibration Completed".

By stepping foot controller, RPM will be displayed in real time.



- The calibration function sets up for all products from the first delivery or purchasing by the manufacturer. It is recommended to calibrate the motor before using when the motor is replaced or repaired.

### 3. Time set



Press the **SETUP MEMORY** button in TIME SET mode.

Set the current time by using ▼ or ▲ button.

After setting the year, press **SETUP MEMORY** button and the number of month will blink.

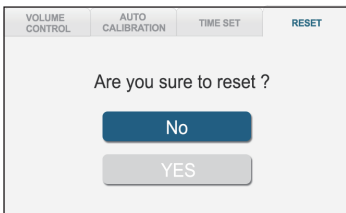
After setting the month, press **SETUP MEMORY** button and the number of day will blink.

After setting the day, press **SETUP MEMORY** button and the number of hour will blink.

After setting the hour, press **SETUP MEMORY** button and the number of minute will blink.

After setting the minute, press **SETUP MEMORY** button, and all setting for time will be completed.

### 4. Reset



By using ▼, ▲ button, determine the initialization.

Choose "NO" with **SETUP MEMORY** button, the initialization will cancel.

Choose "YES" with **SETUP MEMORY** button, the initialization will start. Screen will off for 5-10 sec.



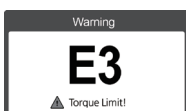
And show reset screen with beep sound and message "RESET Completed".

\* Initialized default value

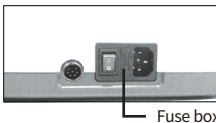
Mode	RPM	Torque/ Frequency	Gear ratio	Operation Direction	Irrigation volume	Program
DRILL	1,000	1 N.cm	1:1	Forward	Level 0	P1
SAW	5,000	10 N.cm	3:1	X	Level 0	P1
SHAVER	300	-.-Hz	X	Forward	Level 0	P1

## ■ Error & Remedy

: In case of stopping handpiece by not working & using error, each error code may be shown below.

Error code	Cause & Remedy	
	<p>Cause: The foot controller connection is not proper or the foot controller is defective.</p> <p>Remedy: Make sure that the foot controller is properly connected. Contact the manufacturer if the remedies do not activated</p>	
	<p>Cause: The motor connection is not proper or the motor is defective.</p> <p>Remedy: Make sure that motor properly connected. Contact the manufacturer if the remedies do not activated.</p>	<p>Cause: Select motor without motor connector (Motor 1 / Motor 2)</p> <p>Remedy: Press the motor button to be used (Motor 1 / Motor 2). Contact the manufacturer if the remedies do not activated.</p>
	<p>Cause: Torque is overloaded than the setting values during the surgery.</p> <p>Remedy: Press the speed control pedal to release the error. Contact the manufacturer if the remedies do not activated.</p>	

## ■ Fuse replacement



Check the fuse in case the control box is malfunctioning.  
Contact the manufacturer for replacement.

## ● MAINTENANCE OF THE PRODUCT

### 1. Cleaning

#### 1) Angle Handpiece

- ① Rotate the head in a tap water about 10 seconds with maximum speed to remove the remains (blood, physiologic saline solution, etc.) and rinse.  
※ Do not put tap water in the motor.
- ② Disconnect the angle handpiece to the motor.
- ③ Remove contaminants on the angle handpiece using a nylon brush after soaking for 20 minutes in Enzymatic Detergent.
- ④ Rinse the angle handpiece using the tap water for 3 minutes to remove Enzymatic Detergent.
- ⑤ Wash the angle handpiece for 10 minutes in the ultrasonic cleaner containing Enzymatic Detergent.
- ⑥ Rinse the angle handpiece for 3 minutes in the ultrasonic cleaner containing purified water repeatedly subjected 3 times.  
(Change the purified water each time.)
- ⑦ Wipe using dust-absorbent after the product soaked in alcohol(70%) for 30 seconds.

#### 2) Motor

Wipe the surface of motor with alcohol swab or paper towel after removing the dirt.

※ Pay attention to not enter the water into the motor.

## 2. Sterilization

### Sterilization Product List

- Angle handpiece
- Motor (Assembling with motor cap)

### Sterilization Method

- ① Dry the applicable products completely.
- ② Put the applicable products in a sterile bag and seal tightly.
  - ※ Make sure to assemble the motor cap for autoclave on the motor.
  - ※ Do not disassemble the motor and motor cord when sterilizing.
- ③ Put the sterile bag in the sterilizer and sterilization for 4 minutes with 132°C, and let it dry for 30 minutes.



Sterilization	Temperature	Time	Dry Time
Moist heat sterilization	132°C	4 minutes	30 minutes



- This product is designed to withstand 250 times of re-sterilization process.
- Moist steam sterilization only. Otherwise the products might be damaged.
- Make sure to use the sterilization bag and seal tightly.
- Make sure to dry the applicable products before sterilization.
- Motor could be damaged in sterilization because of the moisture inflow or else, so should be careful to handle it.
- Sterilizing the angle handpiece with blood or other remains may cause the breakage of the angle handpiece. Therefore, it is necessary to clean the angle handpiece before sterilization.
- Sterilize the DRILL bur, SAW blade, SHAVER blade according to each manufacturer's manual.
- Irrigation tube is disposable. Do not use it again.
- Keep dry a connector and socket of the control box.
- Before using, dry the product completely.

## 3. Lubrication

### Lubrication Product List

- Angle handpiece

### Lubrication method

- Insert the nozzle to motor assembly part(the end part of angle) and spray lubricant 2~3 seconds.

#### ●DRILL Angle

<TST10XX>



<CST10XX, CRT14XX>



#### ●SAW Angle

<TRT12NRC, TRT12NOS, TRT12NSG>



#### ●SHAVER Angle

<TRT12NSH>



- Do not insert the oil into the motor. It damages the bearing or causes fever.
- If the continuous operation, please put the oil every an hour.
- When lubrication, please hold the angle handpiece firmly because the angle handpiece can go out by the spray pressure.

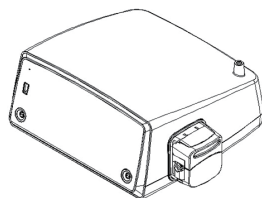
## ATTENTION

1. Please read the notice below before operating the product.
  - 1) Check the connection of every cords and correct operation when power-on.
  - 2) Check the earth connection is safe.
  - 3) Make sure to check the contact part to patient.
  - 4) Check the voltage.
  - 5) Check the sterile condition of autoclavable parts.
2. Please read the notice below during the product use.
  - 1) Check the status of product and patient constantly during the surgery.
  - 2) When product or patient has any problem, stop the operation in condition of patient's safety or take proper action.
  - 3) Do not let patient to approach the product.
3. Please read the notice below after operating the product.
  - 1) Do not put any physical pressure on the power cord, motor cord and foot controller cord.
4. Please read the notice below if the product is not used for a long period of time.
  - 1) Turn off and unplug the product. Check the cord regularly and replace it if it has any damage.
  - 2) Clean and sterilize.
  - 3) Keep the product in proper place.

## PRODUCT SPECIFICATION

### 1. Control box

Model name	BSG10
Input	AC 100-120 V / 220-240 V, 50/60 Hz
Fuse	5A / 2A
Power consumption	68 VA
Maximum irrigation volume	Max. 90ml/min $\pm$ 20%



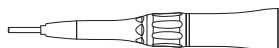
### 2. Motor

Model name	MBP20SX
Maximum speed (RPM)	40,000 rpm



### 3. DRILL handpiece

Model name	TST10XX	CST10XX	CRT14XX
Gear ratio	1:1	1:1	10:1
Bur replacement type	Chuck type		
Bur dimension	Cylindrical Bur ( $\varnothing$ 2.35)		
Coupling dimension	Standard dimension of dental handpiece (ISO 3964)		



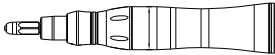
TST10XX



CST10XX / CRT14XX

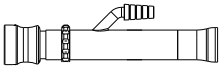
4. SAW handpiece

Model name	TRT12NRC	TRT12NOS	TRT12NSG
Gear ratio	3:1	3:1	3:1
Blade replacement type	Locking-jaw type		
Coupling dimension	Standard dimension of dental handpiece (ISO 3964)		



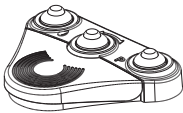
5. SHAVER handpiece

Model name	TRT12NSH
Gear ratio	4:1
Blade replacement type	Chuck type
Coupling dimension	Standard dimension of dental handpiece (ISO 3964)



6. Foot controller

Model name	FUS10
Classification according to the degree of protection against ingress of water (IEC 60529)	IPX8






## ELECTROMAGNETIC COMPATIBILITY INFORMATION

In IEC/EN 60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device.
- Increase the separation between the equipment.
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.
- Consult the manufacturer or field service technician for help.

Electromagnetic Emissions			
The SSG10 is intended for use in the electromagnetic environment specified below. The customer or the user of the SSG10 should assure that is used in such an environment.			
Emission test	Compliance	Electromagnetic environment - guide	
RF emission – CISPR 11 EN 55011	Group 1	Group 1 SSG10 uses RF energy for internal operation. Therefore, its radiofrequency emissions are very low and are not likely to cause any interference in nearby equipment.	
RF emission – CISPR 11 EN 55011	Class A	SSG10 is suitable to use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.	
Harmonic emission – IEC 61000-3-2 EN 61000-3-2	Class A		
Voltage fluctuations Flicker emission – IEC 61000-3-3 EN 61000-3-3	Compliance		
Electromagnetic Immunity			
The SSG10 is intended for use in the electromagnetic environment specified below. The customer or the user of the SSG10 should assure that is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2 EN 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transients IEC 61000-4-4 EN 61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment
Surges IEC 61000-4-5 EN 61000-4-5	±1kV differential mode ±2kV common mode	±1kV differential mode ±2kV common mode	Mains power quality should be that of a typical commercial or hospital environment
Voltage dips, short interruptions and voltage variations IEC 61000-4-11 EN 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycle  40% UT (60% dip in UT) for 6 cycles  70% UT (30% dip in UT) for 30 cycles  <5% UT (>95% dip in UT) for 5s	<5% UT (>95% dip in UT) for 0.5 cycle  40% UT (60% dip in UT) for 6 cycles  70% UT (30% dip in UT) for 30 cycles  <5% UT (>95% dip in UT) for 5s)	Mains power quality should be that of a typical commercial or hospital environment. If the user requires continued operation during power mains interruptions, it is recommended that the SSG10 get power from an uninterruptible power supply or battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8 EN 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: UT is the a.c. mains voltage prior to application of the test level			

Electromagnetic Immunity			
The SSG10 is intended for use in the electromagnetic environment specified below. The customer or the user of the SSG10 should assure that is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6 EN 61000-4-6	3 Vrms 150kHz to 80MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the SSG10 including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Radiated RF IEC 61000-4-3 EN 61000-4-3	3 V/m 80MHz to 2.5GHz	3 V/m	Recommended separation distance $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P}$ 80MHz to 800MHz $d = 2.3 \sqrt{P}$ 800MHz to 2.5GHz Where 'P' is the maximum output power rating of the transmitter in watt (W) according to the transmitter manufacturer 'd' is the recommended separation distance (m). The electromagnetic field strength of fixed radiofrequency emitters, which is determined by an electromagnetic environment measurement (a), must be less than the compliance level in each frequency range (b). Interference may occur near equipment marked with the symbol below: 
Note 1: At 80 MHz and 800 MHz, the higher frequency range applies. Note 2: These specifications may not be applicable in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and persons.			
(a): The electromagnetic field strength of fixed radiofrequency emitters, such as base stations for mobile telephones (cellular / cordless), mobile radio, AM/FM radio broadcasts and TV broadcasts cannot be determined exactly by theory. To assess the electromagnetic environment due to fixed radiofrequency emitters, an electromagnetic environment measurement must be made. If the measured radiofrequency field strength in the immediate environment where the product is used exceeds the compliance level specified above, the performance of the product must be tested to verify whether it conforms to the specification. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the product. (b): In the 150 kHz to 80 MHz frequency range, the electromagnetic field strengths must be less than 3V/m.			
Recommended separation distances between portable and mobile RF communications equipment and the SSG10			
The SSG10 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the SSG10 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the SSG10 as recommended below, according to the maximum output power of the communications equipment			
Rated maximum output Power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz ~ 80 MHz $d = 1.2 \sqrt{P}$	80 MHz ~ 800 MHz $d = 1.2 \sqrt{P}$	800 MHz ~ 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance 'd' in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
Note 1: At 80 MHz and 800 MHz, the higher frequency range applies.			
Note 2: These specifications may not be applicable in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and persons.			



Cables and accessories	Maximum length	Shield	Complies with	
Motor cord	3.5 m	Unshielded	RF emissions, CISPR11	Class A / Group 1
Foot controller with cord	2.0 m / 4.0 m	Unshielded	Harmonic emissions	IEC 61000-3-2 EN 61000-3-2
			Voltage fluctuations / flicker emissions	IEC 61000-3-3 EN 61000-3-3
AC power cord	3.0 m	Unshielded	Electrostatic discharge (ESD)	IEC 61000-4-2 EN 610000-4-2
			Electrical fast transient / burst	IEC 61000-4-4 EN 61000-4-4
			Surge	IEC 61000-4-5 EN 61000-4-5
			Voltage dips, short interruptions and voltage variations on power supply input lines	IEC 61000-4-11 EN 61000-4-11
			Power frequency (50/60Hz) magnetic field	IEC 61000-4-8 EN 61000-4-8
			Conducted RF	IEC 61000-4-6 EN 61000-4-6
			Radiated RF	IEC 61000-4-3 EN 61000-4-3

## WARRANTY

SAESHIN guarantees out product for 1 year from invoice date, and product warranty means that SAESHIN has responsibility of defective material or operation failure. The product warranty does not cover user's misuse, wrong installation, inappropriate maintenance and repair, and normal wear of consumables such as bearings, spindle, gear, and motor. To check the warranty requires the operating condition, environment information, serial number of the product and stamped invoice. The warranty will be performed as repairs or exchanges by manufacturer's judgement and analysis of product.

Exception of warranty

User's misuse or improper use and treatment

Use the product with incorrect input voltage (AC voltage)

Drop the device during setting, moving, using

Use the not recommended consumables or accessories

Malfunction after repairing the product at the not recommended repair shop

Normal wear of the consumables such as ball bearing, gear, chuck, spindle case assy, motor etc.

Faulty by Act of God

Foreign Language Manual Support

This manual is basically offered in Korean and English. But, if other countries need manual with their own language, we can offer the manual with relevant language.


1) The translated draft manual will be supplied by manufacturer on demand.


2) We will send the translated draft manual with English version to the import company to check it.

3) After we get the feedback from the import company, we will offer the completed manual.

## SYMBOL


 Mode button


 Speed button / Setup-Item shifting button

 Degree of protection against electric shock - Type BF


 Program button

 Torque button / Setup-Setting button

 This product should not be mixed with other commercial wastes for disposal.

 Gear ratio button

 Memory button / Setup button

 Consult instruction for use

 Operation direction button

 Manufacturer

 General caution sign  RX only


 Optic button

 EU representative

 General prohibition sign  Non sterile

 Irrigation button

 Serial number

 General warning sign

 CE certificate logo 1639

 Motor 1 button

 Autoclave

 Alternating current

 Fuse

 Motor 2 button



MEMO



MEMO



This product is the medical device.



Made in Korea

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**SAESHIN PRECISION CO., LTD.**

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