

Operation Manual No.GL-GU-CE-1804-01

Version: A/3

OPERATION & SERVICE MANUAL

PORTABLE DENTAL UNIT GU Series

GU-P204、GU-P206、GU-P209、GU-P212、GU-P302、GU-P302S

Shanghai Greeloy Industry Co., Ltd

Note: Before operating or maintaining the unit, please read the manual carefully. This manual is just for guidance, and our company has the right to improve the design.

This manual will guide you to operate the equipment precisely. Please read all accompanying documents before the first use!

Preface

Disclaimer

This manual doesn't refer to any description of Greeloy products' specifications and accessories. If you have any questions about these two aspects, please read the operation manual and packing list, or contact the agents directly.

We have made great efforts to write this manual correctly and completely. But because of the continuous advance for technology and the amendments for relevant laws, we may make some changes to products and manuals. We reserve the right to change without any other previous declaration. We promise to improve our products and service continuously. If you find inconformity between manual and product, want to know latest information, or have any questions, please visit our website!

Limited warranty

For the device with warranty document, we will provide after-sale service referring to the warranty document only.

For the device without warranty document, we will provide after-sale service referring to the agreement. It means that purchaser doesn't have the right to enjoy our after-sale service. So, if you want to buy such kind product, you should require the seller to promise you after-sale service. This product could be sold in the countries and regions where it meets laws only.

In the maximum limit of law permitting, in the following conditions, we assume no responsibility:

1. The third party requires you to compensation.
2. Incidental or indirect injury and economic loss.
3. Any injury and economic loss because you add other equipment to this product personally.
4. Any injury and economic loss because you use the product in conditions not referred in manual, or you don't operate the product according to manual.
5. Any injury and economic loss because of force majeure factors.

You could call our after sale service number: +86-021-60719236

Note: Maybe this number will be changed due to communication network or some other objective factors, and we will give you further notice.

Copyright

Shanghai Greeloy has the copyright of this manual, and holds all the rights.

The copyright of other accessories and documents equipped with our products belongs to the according organizations or persons.

Marks



Notice: Risk of losing accessories and documents

Warning: Risk of injury or malfunction

Figures

	Refer to instruction manual / booklet	I	ON
	Serial No.	O	OFF
	Manufacturer		TYPE B APPLIED PART
	Date of Manufacture		EU Representative Information
	Protective Earth		Alternating current
	Electronic Garbage Bin		No pushing
	Warning		No sitting
IPX8	Waterproof grade: Class 8		High temperature disinfection

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1. Brief introduction

Thank you for purchasing Shanghai Greeley GU portable dental units. It is our company's well-developed multi-purpose mechanical and electrical integration of energy-saving product with small, mobile, good appearance, less power consumption, free maintenance, safe and durable etc. It is mainly used for clinics and hospitals in the treatment of oral health. In order to be convenient for you to operate the unit, please read the manual carefully.

1.1 Contents of the manual

The operation manual includes brief introduction, installation and test, maintenance and so on. You can get help referring to the contents.

1.2 Performance and structure

GU portable dental units include 3-way syringe, handpiece, foot control, clean bottle, drain bottle, built-in oil-free air compressor, air tank, and drawbar.

1.3 Main application

1.3.1 Mainly applied in dental clinics and hospitals, as one of the main units for dental hygiene and treatment.

1.3.2 contact with human body parts

1.3.2.1 contact parts with user Type B applied part (3-way syringe, scaler, curing light, handpiece foot control)

1.3.2.2 contact parts with patients Type B applied part (3-way syringe, scaler, curing light)

1.4 Safety information

1.4.1 Electric safety

- To make sure that the plug of this product is three-phase with good grounding.
- Before connecting the power plug, please ensure the power voltage consistent with the rated voltage which this product required.
- To avoid unsteady voltage, please do not use the power plug together with other electric equipment.
- Before maintaining or repairing the product, please unplug that electric wire firstly.
- Please check the electric wire and plug regularly to avoid the damage or extrusions.

1.4.2 Cleaning and disinfection

Please keep the environment around the product clean. Unplug that electric wire before cleaning the machine. The process of cleaning as follows: firstly wipe the outer surface with a soft cloth stained with neutral detergent, iodine or alcohol, and then use a soft cloth to clean the machine again.

- 1) Disinfection of 3-way syringe : please refer to the disinfection method of original manufacturer;
- 2) Disinfection of ultrasonic scaler : please refer to the disinfection method of original manufacturer;
- 3) Disinfection of curing light: please refer to the disinfection method of original manufacturer

er.

Warning: Do not use liquid or detergent containing flammable substances.

1.4.3 Other safety information

When using the product, please strictly operate the machine in according to the following rules:

1) Disinfection and sterilization

Before use, disinfection and sterilization are necessary to avoid the infection caused by bacterium and virus.

2) In treatment, it is necessary for the patient to breathe only by nose to avoid the risk of swallowing the cracked equipment.

3) The handpieces should be operated with distilled water simultaneously. If operate the handpieces without distilled water, the handpiece will overheat and cause damage to the teeth.

4) Please note that the power plug is designed as the safety device, not power switch. It is necessary to ensure the power plug can be unplugged from the socket without extrusions.

Warning: Correct grounding is necessary to avoid the risk of electric shock.

5) Only skilled staff through training can operate the equipment. Undue operation may cause severe injury.

6) Equipment cannot be used in flammable mixture environment.

7) Equipment cannot be used in anesthetic and air, oxygen, nitrogen mixture environment.

8) Don't put the equipment together with oxygen cylinder.

9) Please do not operate the equipment or replace the accessories when the following situations occur:

- Damage of the power plug
- Equipment cannot work normally
- Breakdown of the equipment
- Water inlet of the equipment
- Loud or shrill noise, overheating outlet air or foul smells during operation.

When above situations occur, please contact with the manufacturer or local agent. In order to be convenient for us to offer after sale service, please offer drawing of electrical circuit, air and water connection diagram, packing list and other useful information when necessary.

10) Please use original or qualified disinfectant.

11) Turn off the power when the operator left.

12) Dispose of waste liquid and waste solid according to the local health regulations.

13) Do not use and store the equipment outside the specified environment.

14) Keep accessories from dropping to avoid damages.

15) Keep the electric wire from losing in the process of treatment.

16) Please use accessories from original manufacturer.

17) Keep the equipment in a solid and horizontal level.

18) This unit does not contain any toxic and harmful substances, can be treated or destroyed

under local rule.

1.5 Periodic safety inspections

Product life: 5 years (depending on the air compressor service life)

The following projects should be inspected at least once a year by the trained and skilled person:

Check the equipment and the functional status of the machinery in the attachment.

Check whether the mark of the related safety is clean or not

Check whether the blown fuse accords with the current rating fuse and the characteristic

Check whether the performance of the equipment accords with the description in the manual.

Testing whether the ground resistance is less than the required resistance described in the IEC60601-1: 0.1ohm.

Testing whether the earth leakage current is less than the required current described in the IEC60601-1: normal Condition: 500uA, single fault condition 1000uA.

Testing whether the enclosure leakage current is less than the required current described in the IEC60601-1: normal Condition: 100uA, single fault condition: 500 uA.

Testing whether the patient leakage current is less than the required current described in the IEC60601-1: for the alternating current: 0.1mA, for the direct current: 10 uA.

Testing whether the patient leakage current is less than the required current described in the IEC60601-1 in the single fault condition: for the alternating current: 0.5mA, for the direct current: 50uA.

Testing whether the patient auxiliary leakage current is less than required current described in the IEC60601-1:

The alternating current in the normal condition: 0.1 mA, for the direct current 10uA;

The alternating current in the single fault condition: 0.5 mA , for the direct current is 50 uA.

Write down all the test data on the operational diary, if the above test is failed or the equipments can not work normally, then you should maintain the equipment.

Warning:No modification of this equipment is allowed.

1.6 The requirements of external components

1.6.1 All external parts must be certified by CE, and also you need to check technical parameters related to spare parts, sketch map, technical manuals and instructions, production qualification test report and other contents.

1.6.2 Check whether the parts will accord with the requirements of the company before Installation the parts.

1.6.3 The parts of installation should be operated by the trained person.

1.7 All models

GU-P204, GU-P206, GU-P209, GU-P212, GU-P302, GU-P302S

2. Technical Parameters

2.1 Power parameter

Figure 1

Model	Voltage	Frequency	Power	Noise	Net Weight	Produce Size
GU-P204	230V	50 Hz	600VA	75dB	28 kg	410*290*630mm
GU-P206	230V	50 Hz	600VA	75dB	30 kg	410*290*630mm
GU-P209	230V	50 Hz	600VA	70dB	35 kg	440*350*720mm
GU-P212	230V	50 Hz	600VA	70dB	66 kg	670*580*860mm
GU-P302	230V	50 Hz	50VA	40dB	13.5 kg	470*400*790mm
GU-P302S	230V	50 Hz	50VA	40dB	21kg	500*600*800mm

2.2 Performance and accessories

No.	Model	Performance and Accessories								
		Tank	Motor	Unit	H.S. Handpiece Tube	L.S. Handpiece Tube	3-way Syringe	Saliva Ejector	LED Curing Light	Scaler
1.	GU-P204	•	•	•	•	•	•	•	◦	◦
2.	GU-P206	•	•	•	•	•	•	•	•	•
3.	GU-P209	•	•	•	•	•	•	•	•	•
4.	GU-P212	•	•	•	•	•	•	•	•	•
5.	GU-P302			•	•	•	•	•	•	•
6.	GU-P302S			•	•	•	•	•	•	•

Note: "•" Fundamental Accessory, "◦" Optional Accessory
3-way syringe, scaler, curing light are class B applied parts

Figure 2

Warning: Please operate the unit strictly under the rated supply voltage, because the unsteady current can cause injuries to the unit.

Please install power voltage regulator when supply voltage is unsteady, and the rated power is no less than 1000VA.

2.2.1 Air supply parameter

2.2.1.1 Input air supply for dental unit should meet the following technical parameters:

- A) Maximum input pressure 7 ± 1 bar;
- B) Air flow ≥ 80 L / min;

2.2.1.2 Input air supply for dental unit should comply with local laws and regulations

2.2.2 Water supply parameter

The water offered for the handpiece and other parts is directly from clean bottle; please refill the bottle with distilled water timely.

2.3 Product classification

2.3.1 Classification of electric shock protection: Class I equipment.

2.3.2 Degree of protection against electric shock : Type B applied part (3-way syringe, scaler,

curing light.

2.3.3 Classification of waterproof: Normal equipment.

2.4 Conditions of transportation, storage and application

2.4.1 Transportation and storage

The machine should be transported and stored in following condition:

Temperature: -10℃~+50℃

Range of relative humidity: ≤90%

Range of atmospheric pressure: 50Kpa ~106Kpa

2.4.2 Working condition

Temperature: 5~35℃

Relative humidity: ≤80%

Atmospheric pressure: 86Kpa ~106Kpa

Duty cycle: 15 minutes ON 15 minutes OFF

The machine should not be used in the environment with a mixture of flammable anesthetic, oxygen and nitrogen.



WARNING: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

2.5 Electromagnetic Compatibility

The machine pass the electromagnetic compatibility test of IEC60601-1-2, should you have any questions, please contact our service department, thank you!

- 1) Keep away from the active high-frequency surgical equipment in the hospital and the RF shielding room of the system for magnetic resonance imaging
- 2) If the equipment cannot work normally due to electromagnetic interference, disconnect the power supply and stop using it.
- 3) Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.
- 4) Input/output Ports:

Port No.	Name	Type	Cable length	Cable Shielded
1	Power supply cord	AC	1.5	Unshielded
2	Handpiece foot switch	Sip/Sop	2.0	Unshielded

- 5) Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.
- 6) WARNING: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the GU Series Portable Dental Units, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
- 7) "WARNING: Failure to use this equipment in the specified type of shielded location could result in degradation of the performance of this equipment, interference with other equipment or interference with radio services";

Table 1 Electromagnetic emission level

Electromagnetic emission	
Electromagnetic requirements of this RF generator are given below and it is the responsibility of end user to meet these requirements.	
Emission test	Compliance
CISPR 11 Conducted emission	Group 1, Class A*
CISPR 11 Radiated emission	
IEC61000-3-2 Harmonic emission	Class A
IEC61000-3-3 Voltage fluctuation / flickering emission	Conform
* The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.	

Table 2 ENCLOSURE PORT

Phenomenon	Basic EMC standard	Immunity compliant levels
ELECTROSTATIC DISCHARGE	IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Radiated RF EM fields	IEC 61000-4-3	3 V/m 80 MHz – 2,7 GHz 80 % AM at 1 kHz
Proximity fields from RF wireless communications equipment	IEC 61000-4-3	See Table 4
RATED power frequency magnetic fields	IEC 61000-4-8	30 A/m 50 Hz or 60 Hz

Table 3 Input a.c. power PORT

Phenomenon	Basic standard	EMC	Immunity compliant levels
Electrical fast transients / bursts	IEC 61000-4-4		± 2 kV 100 kHz repetition frequency
Surges Line-to-line	IEC 61000-4-5		$\pm 0,5$ kV, ± 1 kV
Surges Line-to-ground	IEC 61000-4-5		$\pm 0,5$ kV, ± 1 kV, ± 2 kV
Conducted disturbances induced by RF fields	IEC 61000-4-6		3 V 0,15 MHz – 80 MHz 6 V in ISM bands between 0,15 MHz and 80 MHz 80 % AM at 1 kHz
Voltage dips	IEC 61000-4-11		0 % UT; 0,5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°
			0 % UT; 1 cycle and 70 % UT; 25/30 cycles Single phase: at 0°
Voltage interruptions	IEC 61000-4-11		0 % UT; 250/300 cycle

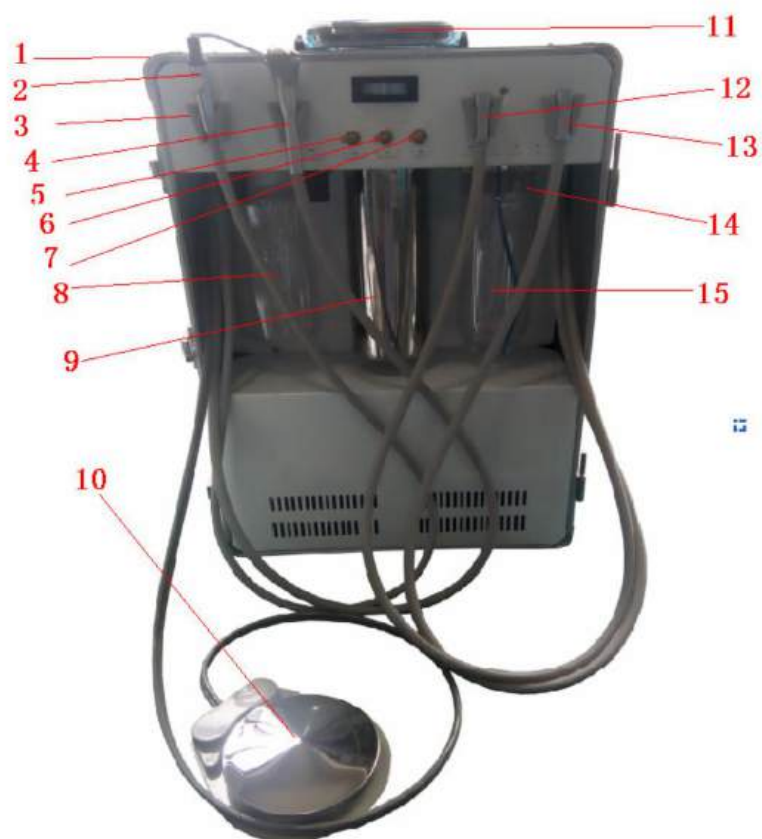
Table 4 Test specifications for ENCLOSURE PORT IMMUNITY to RF
wireless communications equipment

Test Frequency (MHz)	Band (MHz)	Service	Modulation	IMMUNITY TEST LEVEL (V/m)
385	380 – 390	TETRA 400	Pulse modulation 18 Hz	27
450	430 – 470	GMRS 460, FRS 460	FM ±5 kHz deviation 1 kHz sine	28
710	704 – 787	LTE Band 13,17	Pulse modulation 217 Hz	9
745				
780				
810	800 – 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18 Hz	28
870				
930				
1720	1700 – 1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3,4, 25; UMTS	Pulse modulation 217 Hz	28
1845				
1970				
2450	2400 – 2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation 217 Hz	28
5240	5100 – 5800	WLAN 802.11a/n	Pulse modulation 217 Hz	9
5500				
5785				

3. Product Structure and Installation

3.1 Structure

3.1.1 GU-P204 Structure



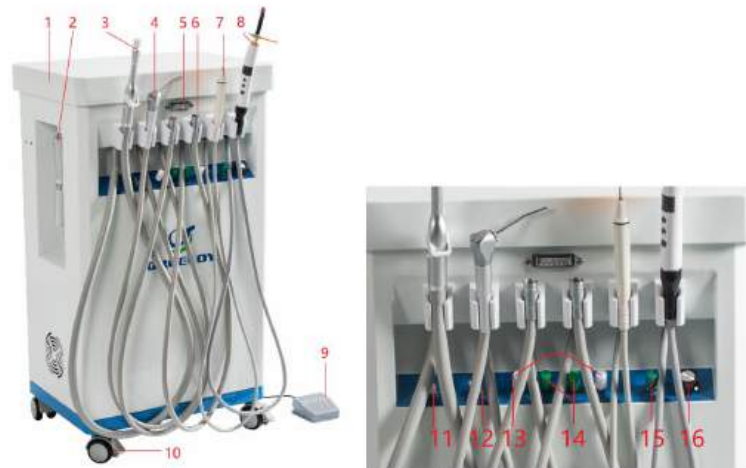
1. CASE	6. WATER PRESSURE SWITCH	11. HANDLE
2. SALIVA EJECTOR	7. HANDPIECE TRANSFER SWITCH	12. HANDPIECE TUBING-1
3. HOLDER	8. DRAINAGE BOTTLE	13. HANDPIECE TUBING-2
4. 3-WAY SYRINGE	9. AIR TANK	14. HANDPIECE WATER/AIR PRESSURE REGULATOR
5. SUCTION SWITCH	10. HANDPIECE FOOT CONTROL	15. CLEAN WATER BOTTLE

3.1.2 GU-P206 Structure



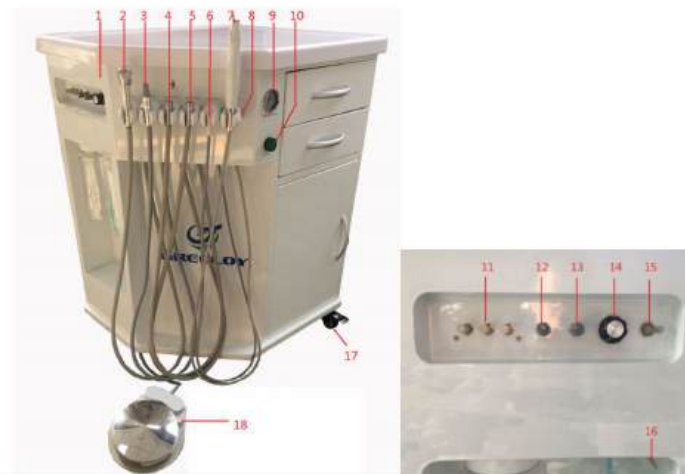
1. HANDLE	7. SUCTION SWITCH	13. LED CURING LIGHT
2. CASE	8. WATER PRESSURE SWITCH	14. ULTRASONIC SCALER
3. SALIVA EJECTOR	9. HANDPIECE TRANSFER SWITCH	15. HANDPIECE TUBING-2
4. HOLDER	10. DRAINAGE BOTTLE	16. HANDPIECE WATER/AIR PRESSURE REGULATOR
5. 3-WAY SYRINGE	11. AIR TANK	17. CLEAN WATER BOTTLE
6. HANDPIECE TUBING-1	12. HANDPIECE FOOT CONTROL	18. SCALER FOOT CONTROL

3.1.3 GU-P209 Structure



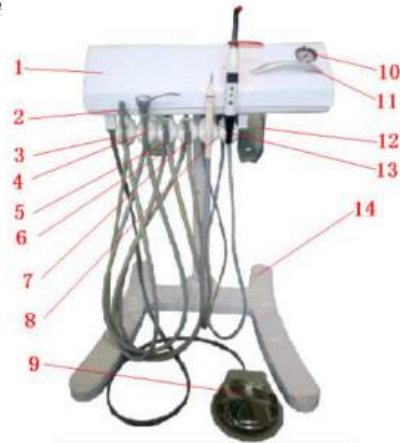
1. CABINET WITH DRAWERS	6. HANDPIECE TUBING-2	11. AIR TANK DRAINAGE VALVE
2. DRAINAGE BOTTLE	7. ULTRASONIC SCALER	12. AIR SWITCH FOR CLEAN WATER BOTTLE
3. SALIVA EJECTOR	8. LED CURING LIGHT	13. AIR FLOW REGULATOR FOR HANDPIECE
4. 3-WAY SYRINGE	9. FOOT CONTROL	14. WATER SUPPLY REGULATOR FOR HANDPIECE
5. PRESSURE GAUGE OF HANDPIECE	10. WHEEL	15. WATER SUPPLY REGULATOR FOR SCALER
		16. POWER SUPPLY REGULATOR FOR SCALER

3.1.4 GU-P212 Structure



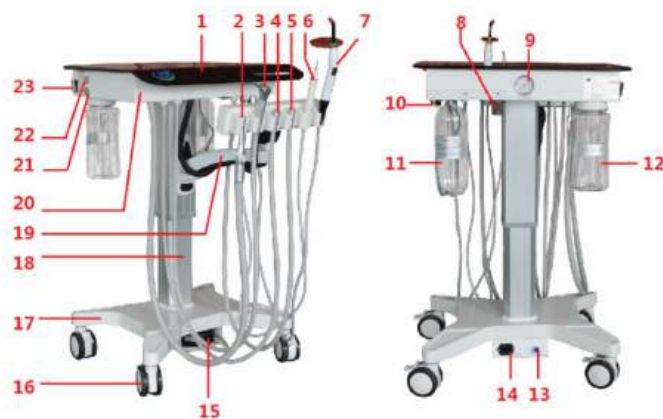
1. CABINET WITH DRAWERS	7. LED CURING LIGHT	13. AIR ADJUSTOR
2. 3-WAY SYRINGE	8. HOLDER	14. SCALER POWER
3. SALIVA EJECTOR	9. PRESSURE GAUGE OF HANDPIECE	15. DRAIN VALVE
4. HANDPIECE TUBING-1	10. POWER LED	16. WATER PRESSURE SWITCH
5. HANDPIECE TUBING-2	11. TRIPLE DIAPHRAGM VALVE	17. WHEEL
6. ULTRASONIC SCALER	12. WATER ADJUSTOR	18. FOOT CONTROL

3.1.5 GU-P302 Structure



1. INSTRUMENT TRAY	6. DRAINAGE BOTTLE	11. HANDLE
2. SALIVA EJECTOR	7. HANDPIECE TUBING-2	12. CLEAN WATER BOTTLE
3. HOLDER	8. ULTRASONIC SCALER	13. LED CURING LIGHT
4. 3-WAY SYRINGE	9. FOOT CONTROL	14. FRAME
5. HANDPIECE TUBING-1	10. PRESSURE GAUGE OF HANDPIECE	

3.1.6 GU-P302S Structure



1. Operation panel	2. Suction	3. 3-way syringe	4. H.S. handpiece tubing
5. L.S. handpiece tubing	6. Ultrasonic scaler	7. LED curing light	8. General air flow regulator
9. General air pressure gauge	10. Clean water bottle air switch	11. Clean water bottle	12. Dirt water bottle
13. Air inlet	14. Two-in-one socket	15. Foot control	16. Medical universal wheel
17. Frame base	18. Electric lifting column	19. Universal rotating instrument holder	20. Chassis
21. Button 'DOWN'	22. Button 'UP'	23. Power switch	

3.2 Installation

3.2.1 Open the box and check

Open the box , then check the unit is good or not. And also need to check the accessories are complete or not, according to the packing list. If any questions, please contact our distributor or our company directly.

3.2.2 Installation

Place the dental unit on ground first, that is flat and solid. Then open the box, and take out the foot control and water bottle on the ground, at last take out the high speed handpiece, low speed handpiece and water bottle, hang them on the rack separately.

3.2.3 Handpiece

Our portable dental unit comes with high-speed and low-speed handpiece tube, which are 4-hole. When using high-speed or low-speed handpiece, please keep the transfer switch to the correct position.

3.2.4 Scaler (GU-P206, GU-P209, GU-P212, GU-P302, GU-P302S)

For the ultrasonic scaler, the input power is a.c.24V $\pm$ 10%, 50Hz, 30VA $\pm$ 2; if the input power exceeds the specified range, it will damage the scaler. The installation of ultrasonic scaler, please refer to the instructions, and please make sure to tight the scaler tips well, otherwise there will be no effective power output.



Warning: There must be water of scaler, or will harm the patient and affect the life of scaler.

3.2.5 LED curing light (GU-P206, GU-P209, GU-P212, GU-P302, GU-P302S)

For the curing light, the input power is a.c.24V $\pm$ 10%, 50Hz, 30VA $\pm$ 2; if the input power exceeds the specified range, it will damage the curing light. Before installing and using, please refer to the instructions.

3.2.6 Power

Take out the power line from the box, connect the power line with the box, and then connect the other side with the plug.



Note: Please do not share the plug with other machines, in order to avoid the unstable of voltage that can damage the products.

4. Test and application

4.1 Description of operation panel identification



AIR PRESSURE

1) Air flow adjustor: counterclockwise rotation bring more air flow



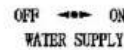
WATER PRESSURE

2) Water flow adjustor: counterclockwise rotation bring more water flow



SALIVA EJECTOR

3) Suction switch: handle in ON position means suction is on; handle in OFF position means suction is off.



WATER SUPPLY

4) Clean water bottle air switch, handle in ON position means suction is on; handle in OFF position means suction is off.



HANDPIECE

5) Handpiece transfer valve: handle in HS side means high speed handpiece tubing is ready to work; handle in LS side means low speed handpiece tubing is ready to work.



HS AIR

6) High speed handpiece tubing air flow adjustor: counterclockwise rotation bring more air flow



HS WATER

7) High speed handpiece tubing water flow adjustor: counterclockwise rotation bring more water.



LS WATER

8) Low speed handpiece tubing air flow adjustor: counterclockwise rotation bring more air flow.



LS AIR

9) Low speed handpiece tubing water flow adjustor: counterclockwise rotation bring more water.

4.2 Air supply

Before using, please turn on the power, the built-in air compressor will work automatically, and compress the air to the tank. The pressure of the tank will be increased from 0 Bar to 7Bar, when the pressure is on the 7bar, the air compressor will stop working. When the pressure of the tank is below 5Bar, the air compressor will begin to work, and on the 7Bar, will stop working. This happens repeated.



Note: In order to avoid accident, the unprofessional person does not allow operating or fixing the unit.

4.3 Handpiece

The unit has one high speed handpiece and low speed handpiece. The water of handpiece is coming from the water bottle directly. The water pressure is determined by the air pressure in the water bottle, and controlled by the special pressure valve in the box. The way of adding water: To turn off the "Air switch", after the exhausting of air in the bottle completely, and to pick up the water bottle clockwise, to add the distiller water into the bottle, and turn the bottle tightly

counterclockwise. Then turn on the "Air switch", the process of adding water completely.

Pick off the handpiece from rack, and please turn the "Low speed /high speed transferring switch" to the "high speed handpiece", press the foot control, turn the "Pressure Adjustor of High Speed Handpiece" counterclockwise, to adjust the handpiece to spray water from small to large. The turbine of handpiece start to spring water: namely that the handpiece begin to work.

Pick off the handpiece from rack, and please turn the "Low speed /high speed transferring switch" to the "low speed handpiece", press the foot control, turn the "Pressure Adjustor of Low Speed Handpiece" counterclockwise, to adjust the handpiece to spray water from small to large. The turbine of handpiece start to spring water: namely that the handpiece begin to work.

 **Note:** This time, the "Pressure gauge of handpiece" in the panel is the working pressure of handpiece, when using the handpiece, please do not exceed the max pressure of handpiece, and avoiding the harm of handpiece. To adjust the handpiece carefully, the turbine of handpiece is the precision devices, please read the manual before using carefully.

4.4 3-way syringe

The unit is equipped with a 3-way syringe, which use the distilled water together with handpieces. The inlet water tube and inlet air tube are connected to connector of the back panel. Press down the ring nut and insert the nozzle, and then lock the nozzle by resetting the ring nut. Check whether the air and gas from 3-way syringe is consistent with mark on the unit.

4.5 Saliva ejector

The unit is equipped with a saliva ejector. Open the switch, use adjustor to adjust the suction flow, it could work normally.

 **Note:**

- 1) The unit could only use alone, it could not use together with handpieces at the same time. If not, it would affect normal use of handpieces.
- 2) Suck a cup of purified water, eliminate the seeper in the tube and clean the saliva bottle each day after use.
- 3) When cleaning, screw it off in an anticlockwise direction then use the disinfectant to clean it. Then screw it on the counterclockwise. (Note to tighten)

4.6 Ultrasonic Scaler (GU-P206, GU-P209, GU-P212, GU-P302, GU-P302S)

The unit is equipped with an ultrasonic scaler. Pick up the ultrasonic scaler from the shelf; tread down the foot control, then it could be used normally. The power output could be adjusted. The adjustor is equipped on the face panel.

The head of the ultrasonic scaler must be screwed tighten. If not, there would have no efficient power output. The parts are rigid, please read the operation manual carefully.

 **Note:** The ultrasonic scaler only could work with water supply, or that would damage the ultrasonic scale.

4.7 LED curing light (GU-P206, GU-P209, GU-P212, GU-P302, GU-P302S)

The unit is equipped with LED curing light. From the accessories, you may find the operation manual of curing light.

4.8 Air regulator and filter

To be sure the air by inputting the unit is stable, clean and dry; we equip an air regulator and filter on the air inlet of the unit. The air pressure would be stable, while it would not exceed the setting value. At the same time, the air regulator and filter could filter the air impurities (Filtration accuracy would be equal or greater than 25 μ m.) and the water. The water by filtering will gather in filtering cup, after a period of time, it must be more water gathered. Then you must drain off the water, so as not to affect the filtering effect.

In general, any of the following conditions having, you need to drain off the water by the air regulator and filter.

- 1) By using more than one weeks
- 2) The water in the filtering cup occupies three quarters of the volume
- 3) The color of the water in the filtering cup is changed. (Not colorless transparent water)

The detail methods of draining off the water for air regulator and filter are following:

Open the front panel of the unit, then clockwise rotate the nut at the filter bottom, then the water would be drained off. When finishing drain off the water, counterclockwise rotate the nut, it would be ok. To protect the environment, you could pad bibulous object on the air outlet, such as cotton, clean paper, sponge, etc. Then it could absorb the water.

4.9 Clean water bottle

For this unit, all water for handpieces, 3-way syringe and Ultrasonic Scaler are from the clean water bottle. Thus, the user needs to add the distilled water to the clean water bottle timely. The methods of adding water is following: Turn off the air switch, when the air in the bottle is drained off, holding the bottle by your hand, rotate clockwise and take down the bottle. After injecting the water, counterclockwise rotate the bottle and make it tight (note to seal). Then turn on the air switch, the process of adding water is finished.

In general, any of the following conditions having, you need to clean the bottle and change water in it.

- 1) The unit is not used by more than three days.
- 2) After using every day, you need to clean it.
- 3) The color of the water in the bottle is changed. (Not colorless transparent water)

4.10 Turn off the unit

After operation, please keep all switch/valve to OFF position, keep the power switch to 0 position to cut off electric power supply, then, pull out power line.

5. Operation and Maintenance



Warning: Do not use the equipment during service or maintenance

Warning: maintenance for fuses, wiring terminal must be done by professionals!

Warning: Do not use the equipment during maintenance!

5.1. After using saliva bottle, suck a cup of purified water, to clean the tube, suction generator and other spare parts to protect them from congestion and damage.

5.2. Before using handpieces, the user need to roll and spray by 1 to 2 second to get rid of the dirt in tube, then prevent the occurrence of cross-infection.

5.3. Wipe surface of the units, prevent harmful materials from corroding the units.

Do not use the cleaner with acid and alkali in corrosive.

5.4. By using handpieces, you need to strictly comply with the operation and maintenance of the handpieces.



Note: the cleaning and lubrication of handpieces.

5.5. Please turn off the water switch, power switch and air switch when leave after treatment.

5.6. Before first treatment everyday, please make the handpieces and scaler work about 2 minutes, to clean the water and air tubes.

5.7. After using handpieces and before sterilization, the user needs to make the cleaning and lubrication, to make the handpieces work normally and prolong the use time. By using handpieces, you need to strictly comply with the operation and maintenance.

5.8. Sterilization and disinfection of the spray tip of 3-way syringe and handpieces

The following requirements are completely according to the provisions of the handpieces instruction manual.

- Remove the spray tip of 3-way syringe and handpieces
- Get rid of all visible dirt.
- Make sterilizing in the saturated steam of 132℃ by 15 minutes
- After treatment by each patient, please make them sterilizing before treatment for next patient.



Note: For the parts which couldn't tear down, please use disposable plastic package to sphere when using.

5.9. Disinfection of ultrasonic scaler

The following requirements are completely according to the provisions of the ultrasonic scaler instruction manual.

- Before sterilization, please clean the ultrasonic scaler and the tip.
- Sterilization condition: 135℃ in 15 minutes or 120℃ in 20 minutes
- Use the soft cloth with 45% cleaner to clean the ultrasonic scaler. Do not make it into any liquid or directly spray any liquid. Or the liquid would enter into ultrasonic scaler to make it cutting-out and damage.

5.10. The handpieces tube and connections of ultrasonic scaler could only be cleaned by cleaner instead of temperature sterilizing.

5.11. Change the fuse tube

5.11.1 Pull out the plug from the socket; pull out the fuse cover from the fuse socket.

5.11.2 Take out the damaged fuse tube

5.11.3 Insert the new fuse tube by make the fuse rating consistent with fusing feature in instruction manual.

5.11.4 Press the fuse cover in the fuse socket.

5.11.5 Fuse specifications: T4AH 250V; 5 * 20 , T0.5AH 250V; 5 * 20.



Note: The fuse tube unqualified could cause fires!

6. Trouble-shooting

Item	Problem	Reason	Check	Tips
1	The handpiece can not spray water while rotating.	The water in water tank has been used up.	Check the water volume of the water tank.	Add the distiller water.
		Air & water distributing valve is blocked.	Check the "Air switch" is open or not, or is working or not.	Open the "Air switch", or replace it.
		The double air switch can not work	Check the 3-way syringe sprays water or not. Check the air pipe is good or not, or check the core can work or not.	Regulate the Air & water distributing valve or clean the valve core and o-ring.
2	The handpiece leaks water when not in operation.	Air & water distributing valve fails to function.	Remove one side of the valves in handpiece, take out faucet, spring and valve core. Check there is any dirty, and o-ring can work or not.	replace the valve core and o-ring
		The foot switch is not restored.	The pressure gauge does not decrease when foot switch is put up, to check the o-ring of foot control.	Open the cover of foot control, and clean the o-ring.
3	The air switch leak water or air	The core is circled too far.	Open the adjustor valve and to check it.	Install the core correctly.
		The core and o-ring is broken.	Open the adjustor valve and to check it.	Replace the o-ring
		The connector of valve is too loose	Check the connector leak the water or air or not.	Turn the connector tighten.
4	The 3-way syringe leads water and air	The button of 3-way syringe is not restored, or there is dirty, or the core and o-ring can not work well.	Check the water button of the 3-way syringe.	Clean or replace the core and o-ring.
5	The noise or shaking is so big, unit can not work.	The voltage is too low.	Let the professional person check the voltage.	Use the voltage stabilizer.
6	The built-in compressor can not be started up	Wire to power supply has fallen off.	Check the connector of power is good or not.	Connect the line correctly.
		Power line or electronic component is loose.	Open the panel, and to check the connector line and component	Ask professional connect the line according to circuit diagram
7	Built-in air compressor keeps working and can not be stopped	Pressure switch is failed.	Check the pressure switch works normally or not.	Adjust or replace the pressure switch.
		Connectors leaks air.	Reserve or listen the air flow, or use the bubble to check the connector of leakage air.	Connect the Various connector correctly, avoiding leaking air.
		Pressed drain valve leaks air.	Check the pressed drain valve leakage of air or not.	Avoid leaking air.
8	No water for scaler	Air switch was close	Check the air switch	Open the air switch
		No water in bottle	Check the water volume of the water tank.	Add more distiller water
		The water adjustor of scaler is closed	Check the water adjustor	With large water flow
		Solenoid vale of scaler was broken	Check the solenoid valve	Replace the Solenoid Valve

7. Working principles

7.1 Working principles of GU-P204, GU-P206, GU-P209, GU-P212

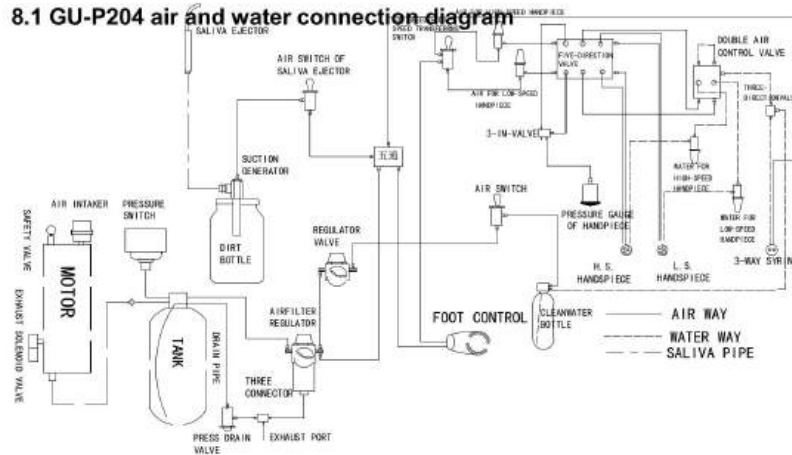
The portable dental unit connects with inserted oil free air compressor to supply stable and clean air for high speed handpieces when pressing foot control pad. Clean water bottle connects to air tank, and supplies water for handpieces, 3-way syringe by adjusting the decompress valve.

7.2 Working principles of GU-P302, GU-P302S

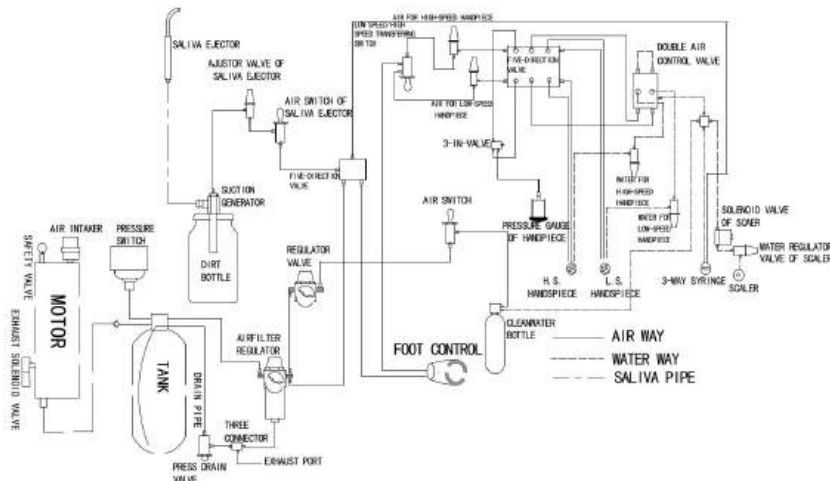
The portable dental unit connects with external oil free air compressor to supply stable and clean air for 3-way syringe, scaler, saliva ejector and clean water bottle when pressing foot control pad. Clean water bottle supplies water for handpieces, 3-way syringe, scaler, saliva ejector by adjusting the decompress valve. Inserted transformer ensures stable power for scaler.

8. Air and water connection diagram of GU Series Portable Dental Units

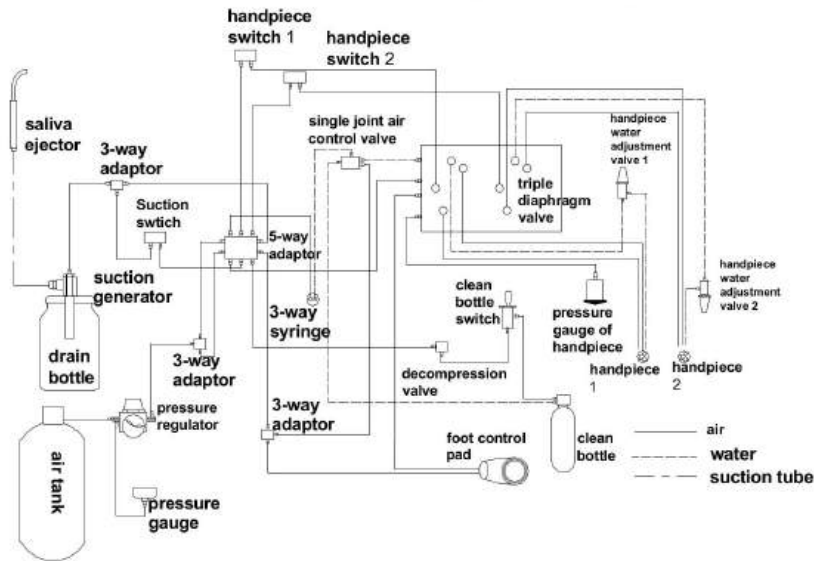
8.1 GU-P204 air and water connection diagram



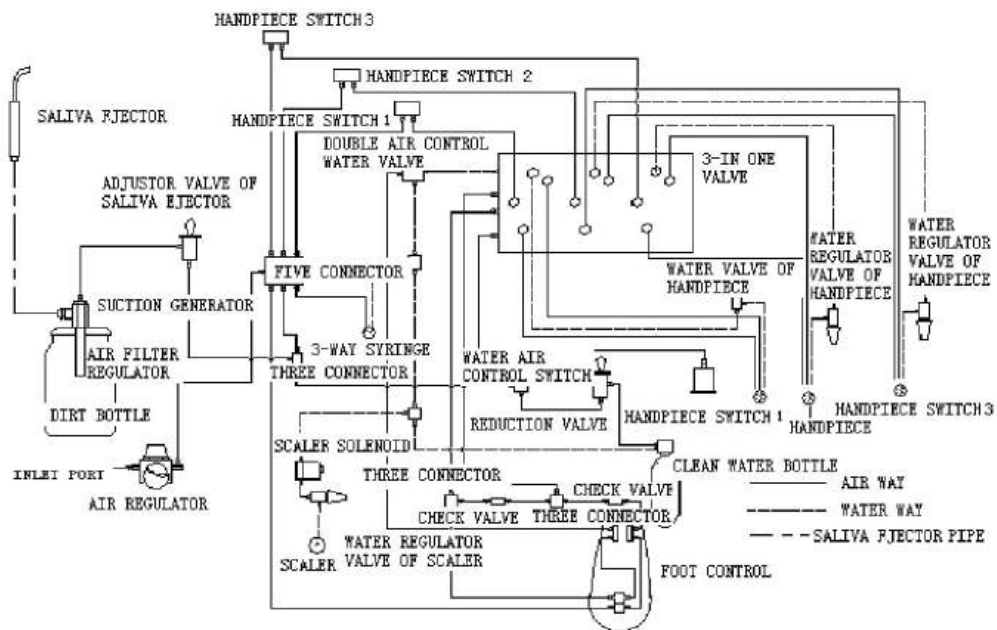
8.2 GU-P206 air water working principle diagram



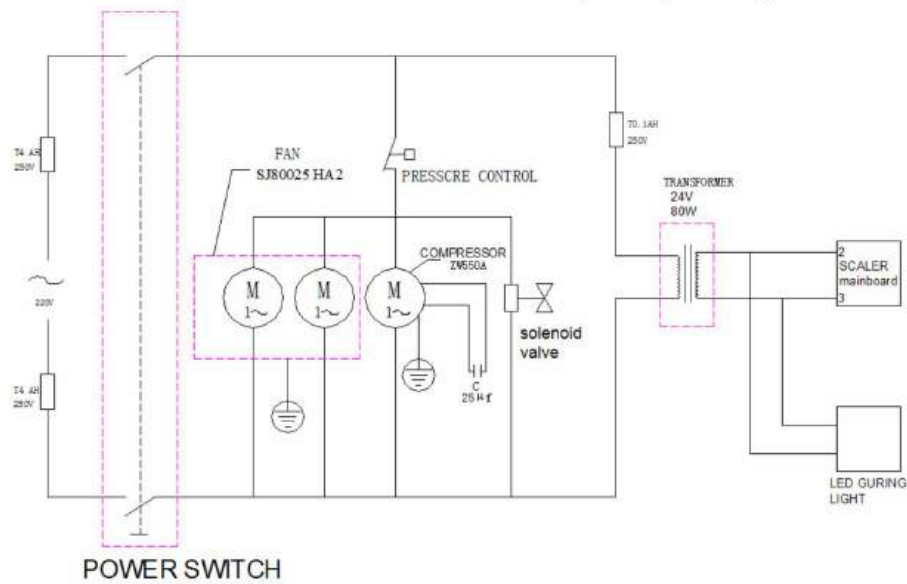
8.3 GU-P209 GU-P302S air water working principle diagram



8.4 GU-P212 GU-P302 air water working principle diagram



9. GU series portable dental unit electric principle diagram



10. Notices

- 1). While working, to ensure all move into stroking range, no accessible things exist.
- 2). Air tank should drain water regularly, usually every 2 days. The sewage handled need apply with local rule of law.
- 3). When change electronic component, cut off the power.
- 4). Cut off the power of machine, when clearance and maintenance.
- 5). Forbid operated portable dental unit by untrained workers, avoid any mistake while operation.
- 6). Portable dental unit need maintain and repair by trained or professional workers.
- 7). The elderly, child, intellectual disorder and psychopath, need monitored by specially-assigned person, avoid any hazards by medical oilless air compressor when operating.
- 8). Knew and foreseen the portable dental unit may cause hazards to people, forbid use portable dental unit.
- 9). When portable dental unit retired, capacitor and electronic component handled need apply with local rule of law.
- 10). Patient can't operate the unit.
- 11). Keep the aged, children, persons with mental retardation, and madmen away from operating air compressor, to void injury.
- 12). When the injury risk is predictable, forbid to operate portable dental unit.
- 13). When the unit is scrapped, the disposal of its capacitor and electronic components must meet the local law.
- 14). The suction tip is disposable.
- 15). The user should choose qualified suction tip.

- 16). When the unit is scrapped, the handpiece and drain tubes should be sterilized before recycling.
- 17). After 2 months long operation, all connecting bolts on the unit must be reviewed. Tighten the loosed bolts. Later on, review every 6 months.
- 18). The user should choose qualified high-speed handpiece, low-speed handpiece and their accessories such as spray nozzle, head. The products with medical device registration;
- 19). The pressure gauges (inlet pressure, water bottle pressure, and handpiece pressure) should be reviewed every 6 months.
- 20). This unit isn't equipped with water sterilization system. In order to ensure the unit's sterilization won't affect the quality of water, the handpieces, syringe spray tip, scaler handle and tip should be sterilized after each use.
- 21). The treatment of disinfected water released from drainage bottle should be in accordance with local laws and regulations.
- 22). The top of GU-P 302, GU-P302S can bear the weight of 10kg. The top of GU-P 212 as well as each drawer can bear the weight of 10kg
- 23). Contraindication: Warning for heart patients, pregnant women and young children

11. External mark and content

- 1). Following are concluded in external packing:

Product name: Portable Dental Unit

- 2). Model: GU ×××××

- 3). Standard NO.:

- 4). Product registration NO.:

- 5). Factory name: Shanghai Greeloy Industry Co., Ltd

Factory address: 6 Buliding, Songhuang Road 999, Qingpu, 201706 Shanghai China

- 6). Packing dimension:

External size: L×W×H

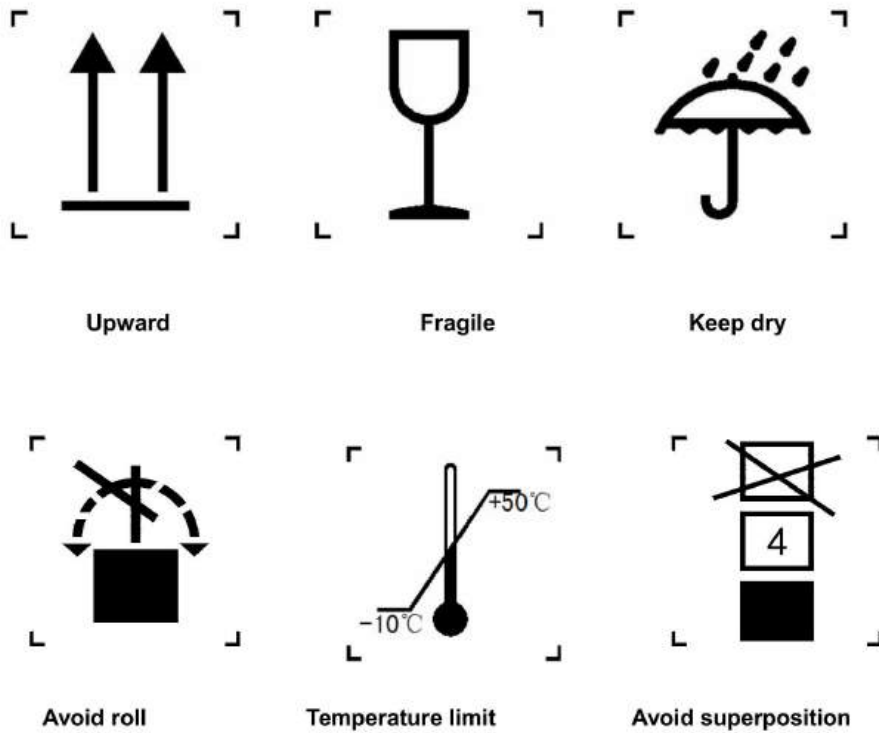
G.W: kg

N.W: kg

7). Nameplate

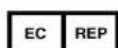


8). Graphics mark:



12. GU series portable dental unit packing list

Series No.	Product name	Quantity	Unit	Remark
1.	GU series body	1	pc	GU-P204 GU-P206 GU-P209 GU-P212 GU-P302 GU-P302S
2.	Instruction book	1	pc	GU-P204 GU-P206 GU-P209 GU-P212 GU-P302 GU-P302S
3.	Accessory bag	1	pc	GU-P204 GU-P206 GU-P209 GU-P212 GU-P302 GU-P302S
4.	Clean water bottle	1	pc	GU-P204 GU-P206 GU-P209 GU-P212 GU-P302 GU-P302S
5.	Saliva bottle	1	pc	GU-P204 GU-P206 GU-P209 GU-P212 GU-P302 GU-P302S
6.	Electric wiring	1	pc	GU-P204 GU-P206 GU-P209 GU-P212 GU-P302 GU-P302S
7.	Φ8XΦ5 pipe	1	pc	GU-P302 GU-P302S



Prolinx GmbH
Address : Brehmstr. 56, 40239, Duesseldorf
Tel:0049 211 3105 4698
Fax:0049 2131 4051968-9
E-mail: med@eulinx.eu



Factory name: Shanghai Greeloy Industry Co., Ltd
Factory address: 6 Buliding, Songhuang Road 999, Qingpu, 201706 Shanghai
China
<http://www.greeloy.com>