

# OPERATION MANUAL PORTABLE DENTAL UNIT

BD-406      BD-406A



## Thank you very much purchasing our company's products.

- Before operating the unit, please read the manual carefully and preserve it for future reference.
- Please operate and maintain the unit strictly in accordance with the operational instructions.
- Symbol “⚠” denotes that the user should read the instructions supplied with the dental unit carefully.
- Symbol “Attention” denotes that before using the device, read the operating manual carefully and carry out all the instructions to avoid any damage or injury.
- Please contact the local agent or the manufacturer if the unit needs repairs. We will supply a high quality of service and assistance for you.

### Warning:

1 The power switch should be turned off when the machine stopped working, the transformer and solenoid valves will heat to burn if long-term power or no stop the power.

2. Please drain off the water when the water on 75% of Sewage bottle, the water will come to motor if the water is higher than 75% , the air motor will leakage of electricity or burn if the water come to air motor.

**Our guarantee:** when dealing with the trouble, we guarantee to supply the necessary detailed technical information for the user if needed.

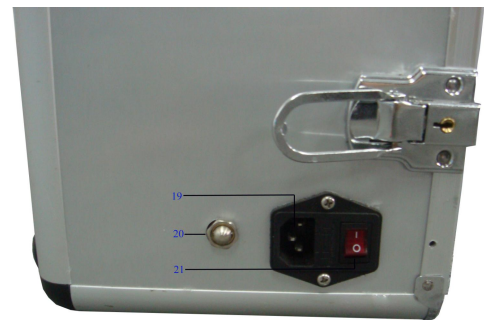
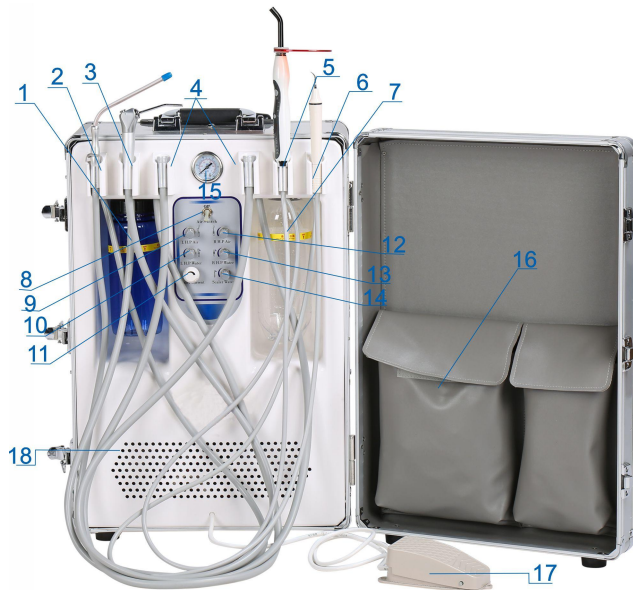
### 1. Brief Introduction

Portable Dental Unit, is a portable/mobile dental equipment newly developed by our company. Its main applications are for oral health and treatment in community clinics and hospitals. With its compressor, gas tank, pressure release filter valve, clean water bottle, saliva gathering bottle, it provides a high level of steady, dry and non-polluted air power available for high-speed turbine handpiece. The unit is portable, simply operated, easy to maintain and welcomed by the dentists and doctors

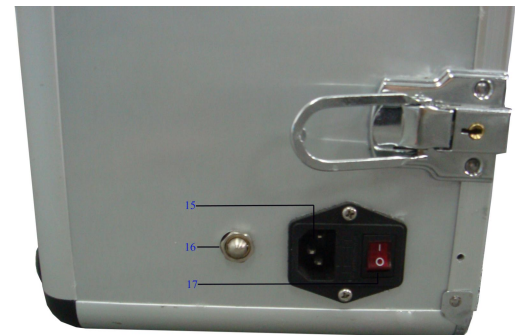
#### 1.1 The Equipment Structure

|                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. Saliva Bottle                   | 2. Saliva Ejector                 |
| 3. 3-way Syringe                   | 4. High & Low Speed Handpiece     |
| 5. LED Light Curing Unit           | 6. Built in Ultrasonic Scaler     |
| 7. Water bottle                    | 8. Air switch Adjustor            |
| 9. Left Handpiece Air Adjustor     | 10. Left Handpiece Water Adjustor |
| 11. Scaler Current Adjustor        | 12. Right Handpiece Air Adjustor  |
| 13. Right Handpiece Water Adjustor | 14. Scaler Water Adjustor         |

|                    |                               |
|--------------------|-------------------------------|
| 15. Pressure Gauge | 16. Bag for Dental Instrument |
| 17. Foot Control   | 18. Cooler for Air Motor      |
| 19. Power Plug     | 20. Water Drain Valve         |
| 21. Power Switch   |                               |



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|                                 |                                          |                                       |
|---------------------------------|------------------------------------------|---------------------------------------|
| 1.High Suction                  | 2.High Speed Handpiece Pipe              | 3.Drain Bottle                        |
| 4.High Speed Handpiece Adjustor | 5 High Speed Handpiece Water Adjustor    | 6.Water Bottle Air Switch             |
| 7.Air Pressure Gauge            | 8.3-ways Syringe                         | 9.Low Speed Handpiece Pipe            |
| 10.Water Bottle                 | 11.Low Speed Handpiece Pressure Adjustor | 12.Low Speed Handpiece Water adjustor |
| 13.Bag for instrumen            | 14.Foot Switch                           | 15.Power Plug                         |
| 16.Water Drain Valve            | 17.Power Switch                          |                                       |

## 1.2 Configuration

| BD-406                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | BD-406A                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A:Standard Configuration:</b><br>Oilless Air Compressor Motor 1pc<br>3 Way-Springe 1pc<br>High Speed Handpiece Pipe 1pc<br>Low Speed Handpiece Pipe 1pc<br>High Suction(Ajust) 1pc<br>6L Air Tank 1pc<br>Water Bottle 1pc<br>Drain Bottle 1pc<br>Foot Control 1pc<br>Built in Ultrasonic scaler 1pc<br>Built in LED light curing unit 1pc<br><b>B: Optional:</b><br>Portable Dental Chair<br>High Speed Handpiece( Standard,LED or Fiber Optic)<br>Low Speed Handpiece<br>Portable Dental Light | <b>A:Standard Configuration:</b><br>Oilless Air Compressor Motor 1pc<br>3 Way-Springe 1pc<br>High Speed Handpiece Pipe 1pc<br>Low Speed Handpiece Pipe 1pc<br>High Suction(Ajust) 1pc<br>6L Air Tank 1pc<br>Water Bottle 1pc<br>Drain Bottle 1pc<br>Foot Control 1pc<br><b>B: Optional:</b><br>Portable Dental Chair<br>High Speed Handpiece( Standard,LED or Fiber Optic)<br>Low Speed Handpiece<br>Portable Dental Light |

## 2. Technical data

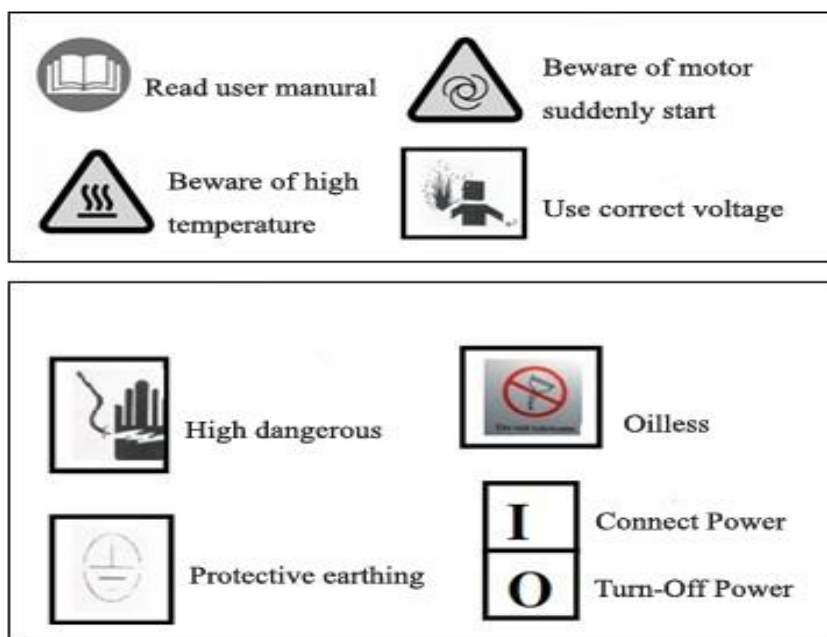
**A: Working condition:** Power supply:700W 110V/60Hz ,220V /50Hz ,  
Air supply: 60L/min at 4Bar

**B: Instruments control method:** Air foot controller

**C: Packing Dimension:** 48×35.5×71(cm)

**D: Weight:** 36kgs

**F:Installation for Unit:**



## 3. Installation and maintenance

Ensure that every component of the machine is intact after opening the box and check that spare parts are intact according to packing list. In case of doubt, please contact our company. After checking, install the machine in a dry, ventilated and cool place with a flat floor and sterile surroundings.

## **a. Installation**

### **a1. Handpiece**

The process of installation and maintenance of the handpiece is shown in the operating manual in the handpiece package. Please read it carefully.

When use the high speed handpiece, please open high and low handpiece switch to "high-speed" station, adjust the working pressure of the handpiece is between 0.18MPa ~ 0.22MPa , the high speed handpiece standard speed is (  $\geq 300 \times 103 \text{r/min}$  ) .The low speed handpiece working pressure between 0.28Mpa ~ 0.32Mpa, the low speed handpiece standard speed is (  $\geq 14000 \text{r/min}$  ) .

(1) The screw thread of handpiece is excessively thin. Aim the connector carefully to avoid damaging the screw thread interface.

(2) The handpiece must not be started without the bur or testing bar inserted into the chuck.

### **a2. 3-way syringe**

(1) Press down the ring nut and insert the nozzle, then lock the nozzle by resetting the ring nut.

(2) Turn 9 (see the illustration) to adjust the 3-way syringe water volume

### **a3. The Saliva ejector**

Took out the suction , regulate the weak suction valve control suction salivary device pipetting, saliva the bottle to bottle liquid 75% of the place will be timely discharge (counterclockwise took down the bottle)

Note: Suck a cup of purified water, eliminate the water in the tube and clean the saliva bottle each day after use.

### **a4 . Water bottles**

The distilled water in the water bottle is a source of water for high and low speed handpieces and three-way syringe. Distilled water is used to prevent handpieces and three way syringe from being attacked by particles in poor quality water. When adding water, turn off the water bottle gas switch, remove the bottle clockwise, add distilled water, and tighten the bottle counterclockwise to avoid air leakage.

Note: Before adding water, you must first turn off the water bottle gas switch. The water level of the water bottle should not be higher than 75%, otherwise there is a potential safety hazard!

### **a5. Sewage bottle**

Sewage bottles must be cleaned daily after use. When cleaning, turn it clockwise, rinse it with clean water, and disinfect it with disinfectant. Then tighten the bottle counterclockwise. Sewage bottle water level not higher than 75%, if exceeded, please clean the sewer, and then continue to work.

### **a6. Clean Water Bottle**

The water in the clean water bottle is used as the water supply of the handpiece and syringe. Purified water or distilled water must be used to protect the handpiece and 3-way syringe from being damaged by the particles in poor quality water. Screw it off in an anticlockwise direction to add purified water, exert properly to avoid air leakage.

Note: please turn off the air switch for water bottle before add the water, otherwise have security hidden danger

#### **a7. Saliva bottle**

The Saliva bottle must be cleaned each day after use. When cleaning, screw it off in an anticlockwise direction then add a small quantity of purified water.

#### **a8. Air Supply System**

The oilless compressor has been tested before packaged. When using, open the power switch, then the compressor runs at once.,supply the air to the air tank,.The air pressure is shown in the pressure gauge on the compressor, it rises from 0Mpa to 0.6Mpa, then the compressor will automatically stop working. Once the pressure in the air tank is under 0.4Mpa, the compressor begins to work until the pressure rise to 0.6Mpa. The device runs in above cycle.

Never regulate or disassemble the device by any laypeople to avoid any accident.

### **b. Maintenance**

#### **Note:**

The machine employs oilless air compressor, while using the machine, please pay attention to frequent maintenance and good care so as to prolong its life span.

#### **b1. Gas Tank**

Gas tank can stabilize gas pressure, bleed water. To ensure the normal state of the machine, remaining condensate water in tank must be drained periodically, normally twice a week.

#### **b2. Handpiece**

##### **Note:**

Before use, please follow the instructions in the handpiece box.

The handpiece must not be started without the bur or testing bar inserted into the chuck.

##### **b2.1. Operating pressure of handpiece**

Operating air pressure of high speed handpiece: 0.18MPa~0.22Mpa

Operating air pressure of low speed handpiece: 0.28MPa~0.32MPa

##### **b2.2. Cleaning and Lubrication of handpiece**

Spray the cleaning spray into the drive air hole twice every day. Run the turbine for several seconds outside mouth after lubricating.

##### **b2.3. Cleaning nozzle**

It is recommended to clean the water hole and air hole once every week to avoid any blockage.

##### **b2.4. Sterilization**

Before autoclaving, clean the turbine surface with purified water or alcohol-soaked cloth. Spray the outside of turbine or wipe it with damp cloth permeating disinfectant, then use the water to clean it.

Spray the cleaning spray into the drive air hole, insert the turbine into a sterilization bag and seal it. Autoclave the packet . (2 Bar, 134°C, 4 minutes; or 1 Bar, 121°C,18 minutes)

**Note:** Any components operating in the patient's oral cavity must be autoclaved after the treatment of each patient.

#### **c1 Disinfection of 3-way syringe**

Remove the spray tip of 3-way syringe then autoclave the tip in the autoclave

**Note:** Any components operating in the patient's oral cavity must be autoclaved after the treatment of each patient.

## c 2:Troubleshooting

|   | Problem                                                                                      | Reason                                                                           | Check                                                                                  | Tips                                                                 |
|---|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 1 | The power switch can not be turned on                                                        | The power is not switched on                                                     | Check if the power supply is connected correctly                                       | Connect the power supply correctly                                   |
|   |                                                                                              | A fuse is blown                                                                  | Check if the fuse is broken                                                            | Replace the fuse                                                     |
| 2 | Compressor can not be started up.                                                            | The wire to the power supply has fallen off or an electronic component is loose. | Check the patch board and the electric connection of the compressor                    | Connect the wire according to circuit diagram                        |
|   |                                                                                              | The temperature of air compressor is too high                                    | Touch the shell of the air compressor by hand.                                         | Cool the air compressor, use it until it is cooling.                 |
|   |                                                                                              | The forward valve fails to work                                                  | Take off the tube which connects the inlet of the valve, check if there is air leakage | Clean the valve                                                      |
| 3 | The air compressor keeps working and can not be stopped                                      | The unloading valve on the pressure switch fails to function.                    | The unloading valve is exhausting when the air compressor is working.                  | Remove the unloading valve, exchange O ring, clean tube.             |
|   |                                                                                              | Leakage in the tube.                                                             | Watch and listen to the flow, or check it with suds.                                   | Avoid leaking air.                                                   |
|   |                                                                                              | Air leakage in automatic drainage of filter valve                                | Check if there is air leakage in automatic drainage of filter valve                    | Avoid leaking air                                                    |
| 4 | The compressor stops working, air pressure decrease immediately, compressor starts up again. | Lots of leakage in the tube.                                                     | Watch and listen to the flow, or check it with suds.                                   | Avoid leaking air                                                    |
|   |                                                                                              | The leakage in the forward valve connects to the gas can                         | No other air leakage, the pressure switch keeps working continuously                   | Remove the valve replace the O ring and clean the valve core         |
| 5 | Electriferous shell.                                                                         | The earth is not connected properly.                                             | Check the shell with the electric pen.                                                 | Connect the earth wire properly.                                     |
|   |                                                                                              | The unit has been affected with damp.                                            | <5MΩ Check with multimeter. Insulating resistance: <5MΩ                                | Use the device until it is dry.                                      |
| 6 | Can not start up the compressor with the compressor shaking and noisy                        | The power pressure is too low.                                                   | <198V Check the working power pressure with the multimeter. Power pressure <198V       | Make the pressure rise or use manostat.                              |
| 7 | 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.                                              | Replace the tank.                                                    |
|   |                                                                                              | Air & water distributing valve is blocked.                                       | If the 3-way syringe sprays water.                                                     | Regulate the Air & water distributing valve or clean the valve core. |
| 8 | 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.   | replace the valve core                                               |
|   |                                                                                              | The foot switch is not restored.                                                 | The pressure gauge does not decrease when foot switch is put up.                       | Loosen the cover of foot switch, make it act freely.                 |
| 9 | Air and water leakage in water and air adjustor                                              | The valve core is screwed too far.                                               | Remove and check the component.                                                        | Screw the valve core properly.                                       |
|   |                                                                                              | O-ring is damaged.                                                               | Remove and check the valve core.                                                       | Replace O ring.                                                      |
|   |                                                                                              | Thread connector is loose                                                        | Check if there is leakage in the thread connector                                      | Tighten the thread connector                                         |

## 4. Circuit diagram

