

# Minimo<sup>®</sup>

## POLYTOR POWER PACK

### P30

## OPERATION MANUAL



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MINITOR CO., LTD. JAPAN

## Introduction

### Thank you very much for purchasing Minimo ONE Series POLYTOR Power Pack.

This product is the polytor power pack for polytor handpieces. Read carefully this instruction manual before use. Also read carefully the instruction manuals of handpieces. Please keep this instruction manual near the power pack for any operators to refer to whenever operating this system. If you lost your instruction manual, download it from our website.

## Cautions for handling and operation

- Read the precautions below to ensure safe use and handling. These precautions are intended to protect you and others around you. Read and follow them carefully to avoid injury, damage to the product or damage to property.
- User may bear administrative responsibilities for operation and maintenance.



### About Symbols











The symbols have the following meanings.








	This symbol denotes that an instruction must be obeyed at all times.		This symbol denotes that the action is prohibited.
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### About Warning and Caution

Safety instructions are classified as Warning and Caution in accordance with the risk.

	<b>Warning</b> This indicates that incorrect operation presents significant danger of accident, resulting in death or serious injury to users.		<b>Caution</b> This indicates that incorrect operation presents possibility of injury to users or damage to the product.
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 <b>Warning</b>	
■ <b>Plug the power cord to a grounded outlet.</b> ○ Plugging into an outlet without ground could result in electric shock, static electricity injury, network disturbance, noise breakout and/or etc.	
■ <b>If the power cord is damaged, replace it with new power cord (separately sold).</b> ○ Failure to do so could result in fire and/or electric shock.	
■ <b>Do not plug in and out with wet hands.</b> ○ Wet hands could result in electric shock.	
■ <b>Keep the main switch off when connecting handpieces to power pack.</b> ○ Failure to do so could result in fire, electric shock, and/or failure.	
■ <b>If each cords are damaged, replace it with new cords (separately sold).</b> ○ Failure to do so could result in fire, electric shock, and/or failure.	
■ <b>Keep away from cutting fluids, water and/or oil mist.</b> ○ Failure to do so could result in fire, electric shock, and/or failure.	
■ <b>Do not close the air holes on the top of the power pack.</b> ○ Failure to do so could result in increasing temperature inside of the power pack, resulting in fire and/or failure.	
■ <b>Do not use the power pack with any input voltage except the voltage instructed on power pack.</b> ○ Failure to do so could result in fire and/or electric shock.	
■ <b>Always wear safety glasses and a mask for dust.</b> ○ Chips and/or dust left after grinding/polishing process could result in unexpected injury.	

 <b>Warning</b>	
■ <b>For your ear protection, wearing earplugs on work is recommended while using ultrasonic devices.</b> ○ Unexpected damage may occur caused by loud sound while working.	
■ <b>Do not touch joint part of holder, holder and SENTAN TOOL while handpiece is in operation and immediately after stopping.</b> ○ There is a risk of burn and injury due to high temperature.	
■ <b>Do not turn the ULTRASONIC ON/OFF switch and hand switch on if the SENTAN TOOL was not fixed firmly.</b> ○ Reduction of output voltage and overheating of handpiece may result in fire and malfunction.	
■ <b>In case of abnormal noise, smoke, and/or bad smell, turn off the main power and unplug the power cord.</b> ○ Failure to do so could result in fire and/or electric shock.	
■ <b>Do not modify and/or disassemble the power pack.</b> ○ Failure to do so could result in fire, electric shock, and/or failure. ○ Also this may have a significant impact on its safety and performance.	
■ <b>Always ask us for repair.</b> ○ Failure to do so could result in fire, electric shock, and/or failure. ○ Also this may have a significant impact on its safety and performance.	

 <b>Caution</b>	
■ <b>Do not pull the power cord when unplugging.</b> ○ The damaged power cord could result in fire, electric shock, and/or failure.	
■ <b>Do not put heavy things on the power cord.</b> ○ The damaged power cord may result in fire, electric shock, and/or failure.	
■ <b>Do not put the power cord near heater.</b> ○ Failure to do so could result in fire, electric shock, and/or failure.	
■ <b>Use the power pack in a place without condensation.</b> ○ Failure to do so could result in fire, electric shock, and/or failure.	
■ <b>Use in temperature between 0 - 40°C.</b> ○ Failure to do so could result in malfunction and/or failure.	
■ <b>Do not use in a place near machines remarkably emitting electric noise.</b> ○ Failure to do so could result in malfunction and/or failure.	
■ <b>Do not use electronic apparatus, signal cable and such equipments near this product.</b> ○ Noise may affect operation of the device.	
■ <b>For maintenance, unplug the power cord for safety.</b> ○ Failure to do so could result in electric shock and/or failure.	
■ <b>Do not drop and/or hit.</b> ○ Failure to do so could result in malfunction and/or failure.	
■ <b>Do not use in a place with corrosive gas such as chlorine gas, hydrogen sulfide and/or sulfuric acid gas.</b> ○ Failure to do so could result in fire, electric shock, and/or failure.	
■ <b>For disposal of this power pack, please follow the instruction of your local government or the shop you purchased the product.</b>	
■ <b>Do not allow children to use this product. Also, keep away from children.</b>	
■ <b>When you leave the workshop, turn off the main switch and unplug the power cord from the outlet for safety.</b>	
■ <b>Be careful for dust, oil, water not to enter the inside of the power pack.</b> If entering, turn off the main switch and unplug the power cord. Then, ask us for repair. ○ Failure to do so could result in fire, electric shock, and/or failure.	

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## 1. Confirmation of this product

Please make sure of standard equipments and accessories inside.  
 \*AC Power Cord is NOT included (sold separately).

POLYTOR POWER PACK  
 ◆P30



Rubber Cradle  
 ◆RM11



fig-1

Manual  
 ◆IMW-P30



## 2. Product Features

- Supporting wide input voltage  
 This product can be used with voltage range 100V AC – 230V AC.
- 2 Driving modes of handpiece can be selected.
  - STROKE CONTROL : Driving with constant voltage.
  - VOLTAGE CONTROL : Driving with fixed amplitude amount.
- POWER MODE  
 The power may be enhanced by increasing of maximum drive voltage (on STROKE CONTROL mode only).
- Digital Display of Frequency  
 Indicating vibration frequency of handpiece.
- Error Code Display Function  
 To warn abnormality of the powerpack and handpieces by displaying error codes.
- LED Level Meter  
 Indicating amplitude amount of handpiece by 8 LED lights.
- Resume Function  
 Previous drive mode may be resumed when restarting.  
 ※POWER MODE may not be resumed.

## 3. Specifications

- Input Voltage AC100V ~ 240V 50/60Hz
- Power Consumption 40W max.
- Output 27W max. (STROKE CONTROL, POWER MODE:ON)  
 18W max. (STROKE CONTROL, POWER MODE:OFF)  
 18W max. (VOLTAGE CONTROL)
- Tracking Resonance Frequency 20k ~ 32kHz
- Output Voltage 90V max. (STROKE CONTROL, POWER MODE:ON)  
 60V max. (STROKE CONTROL, POWER MODE:OFF)  
 60V max. (VOLTAGE CONTROL)
- Output Adjustment Continuously Variable
- Operating temperature and humidity range 0 ~ 40°C and 20 ~ 80% (No condensation)
- Dimensions 144 (W) × 218 (D) × 116 (H)
- Weight 1.3kg (About)

## 4. Names and Functions of Each Component

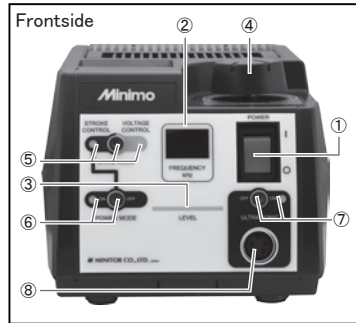


fig-2

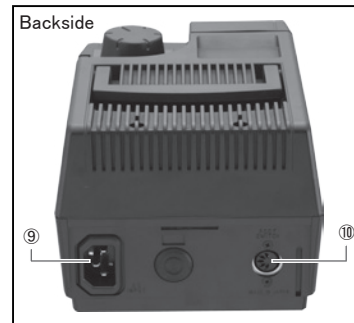


fig-3

### ① Main Switch

To perform ON/OFF of the main power source ( I : ON O : OFF)

### ② Display

Vibration frequency is indicated when operating handpiece and error content is indicated when occurring error.

- ◆ Handpiece in stop ..... Lights-out
- ◆ Handpiece in operation ..... Indicating vibration frequency of handpiece in kHz.

### ③ Level Light

LEDs are lighted from the left side proportionally to amplitude amount of handpiece.

- ◆ Handpiece in stop ..... Number of lighted LED is increased/decreased proportionally to the position of indicator on power control knob.
- ◆ Handpiece in operation ..... Number of lighted LED is increased/decreased proportionally to the vibration frequency.

### ④ Power Controlling Knob

- ◆ On STROKE CONTROL ..... For setting of amplitude amount.
- ◆ On VOLTAGE CONTROL ..... For setting of drive voltage.

### ⑤ DRIVE MODE Switch · STROKE CONTROL Light · VOLTAGE CONTROL Light

For setting drive mode of handpiece.

- ◆ STROKE CONTROL ..... Driving with fixed amplitude amount.
- ◆ VOLTAGE CONTROL ..... Driving with constant voltage.

※ Select drive mode while handpiece is NOT in operation. Unable to select drive mode while handpiece is in operation.

The lamp of set drive mode is lighted.

Error number will be indicated on display while pressing the switch when error occurred.

### ⑥ POWER MODE Switch · POWER MODE Light

Setting ON/OFF of POWER MODE (on STROKE CONTROL mode only).

LED light is on while POWER MODE is activated.

If POWER MODE was activated, maximum drive voltage is increased and power to sustain amplitude amount becomes stronger.

※ POWER MODE switch does not work on VOLTAGE CONTROL mode.

※ POWER MODE switch is always off when turning on the main power supply switch.

### ⑦ ULTRA SONIC ON/OFF Switch · ULTRA SONIC Output Light

To use and control On/Off of a handpiece

Pressing the ULTRA SONIC On/Off switch will run a handpiece and then pressing the switch again stop the handpiece.

The colors of the ULTRA SONIC output light indicate the followings:

- Light-Off - Handpiece is in stop.
- Blue - Handpiece is in operation.
- Red - Errors occur

### ⑧ ULTRA SONIC Socket

Sockets for the plug of a handpiece to be connected

### ⑨ AC Socket

Use the right cable for the right power pack

### ⑩ Foot Switch Socket

The socket for the plug of foot switch

### ⑪ Buzzer Trimmer

To adjust volumes of switch operation sound, switch operation no-effect sound, and error sounds.

Use a Phillips head screwdriver to adjust the volumes. ( Clockwise for volume up, counterclockwise for volume down)

◆ Error sounds

● Switch operation sound - one pip sound    ● Switch operation no-effect sound - two pip sounds

● Error sounds - continuous pip sound

### ⑫ Tapped Hole for Fixing Power Pack

Powerpack has  $\phi 3.2$ mm holes under the rubber legs. In order to fix a powerpack, remove the rubber legs and use self-tapping screws (M4). Use the self-tapping screws (M4) with its insertion length under 15mm to the powerpack.

### ⑬ Carrying Handle

Retractable handle for carrying a power pack

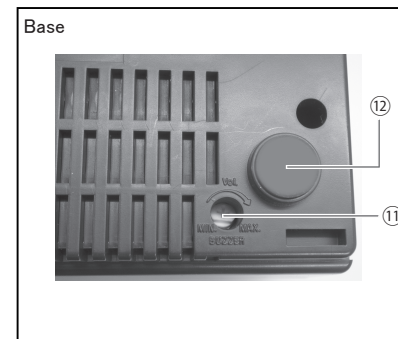


fig-4



fig-5

## 5. Operating Procedure

### 5-1 Without Foot Switch

- (1) Always confirm that the AC power cord has been fully inserted into the socket of the power pack, and plug it in an outlet.
- (2) Fully connect the plug of the curl cord of a handpiece with the ULTRA SONIC socket.
- (3) Turn the power control knob all the way to the left (counter-clockwise).
- (4) Turn the main switch on (Power light will be on).
  - ※After the main switch is on, all the lights are also on. Follow the next step when all these lights become in normal.
  - ※Do not use handpiece if "oH" indicating that handpiece is overheating was flashing on display; display is normally off when handpiece is NOT in operation. Error may occur if activating handpiece even though it is overheating.
- (5) Select drive mode by DRIVE MODE switch.
  - Select STROKE CONTROL mode in normal use.
  - Select VOLTAGE MODE in case stable vibration with light and constant load is desired.
- (6) Set amplitude amount or drive voltage of handpiece by power control knob.
- (7) Handpiece will start running by pressing the hand switch or the ULTRA SONIC On/Off Switch on the powerpack.
- (8) Press hand switch or the ULTRA SONIC On/Off Switch on the powerpack again to stop the running Handpiece.
  - ※In case errors occur, press the hand switch or the ULTRA SONIC On/Off Switch on the powerpack and then the errors will be canceled.
  - If the errors of the 90s occur, turn the main switch off to cancel.

### 5-2 With Foot Switch

- (1) Put the foot switch plug into the foot switch socket on the back.
    - ※An error occurs if plug in and out while the main switch is on. In order to cancel the error, turn the main switch off.
  - (2) Follow the same procedures form (1) ~ (6) of "without Foot Switch".
  - (3) Motor will start running by pressing foot switch.
  - (4) In order to stop the handpiece, turn the foot switch off.
    - ※In case that errors occur due to overload or something, turn the foot switch off and the errors are canceled.
    - If the errors of the 90s occur, turn the main switch off to cancel.
- <With FS201>  
Amplitude amount or drive voltage are adjusted by power control knob.

## 6. Explanation for Drive Modes of Handpiece

### ●STROKE CONTROL

Voltage is increased/decreased for stable amplitude amount of handpiece.  
STROKE CONTROL mode is suitable for heavy-load works such as deburring and rough finishing because it tries to keep constant amplitude amount.

POWER MODE is effective for heavy-load works because it tries to keep constant amplitude amount.  
Use VOLTAGE CONTROL mode or decrease amplitude amount in case mounted tool was burned and/or fractured.

#### <Cautions>

Amplitude amount might not reach to the set value depending on tool to use. Handpiece may be overheated in case handpiece is in operation with maximum voltage if lighted number of LEVEL meter when handpiece is activating was less than number of lighted LEVEL meter when handpiece is deactivating.

If occurred above, decrease amplitude amount or use VOLTAGE CONTROL to make number of LEVEL meter when handpiece is deactivating less number of LEVEL meter when handpiece is activating. Do not turn the POWER MODE on because there is a possibility to further increase overheating of handpiece. If handpiece was overheated by the POWER MODE, turn the POWER MODE off.

### ●VOLTAGE CONTROL

Handpiece is activated by constant drive voltage.

Amplitude amount of handpiece is decreased by loading due to the constant voltage; because vibration is stable comparing STROKE CONTROL, it is suitable to use for light-load work such as mirror finishing and fine finishing.  
Amplitude amount is excessive when all LED lights are on in operation of handpiece. Voltage will be suppressed by protective function. Protective function will be activated to suppress working voltage.

## 7. Confirmation Method for Vibration Condition of Handpiece

- (1) Remove the mounted SENTAN TOOL on handpiece.
- (2) Press DRIVE MODE switch to set VOLTAGE CONTROL.
- (3) Adjust power control knob to the position as lighting 3 lamps of LEVEL meter.
- (4) Activate handpiece.

#### <What to Check>

1. Confirm if value from 28 to 31 of vibration frequency was indicated on display.
2. Confirm if all lights of LEVEL meter could be on.



Caution

- Ask for repair if ALL of the above were NOT confirmed.
- Confirm above when temperature of handpiece is in range from 0 to 40°C.

## 8. Trouble Shooting

- In case that errors occur, the error information will be displayed on the front panel.
  - This information is provided first by [E.-] showing error occurrence. Then, simple displays such as [OL] (Overload) appear on the front panel for its cause of the error. These information are alternately displayed.
  - Pressing and holding the DRIVE MODE switch during the error displays [E.-] and error No. alternately.
  - In case errors occur, press the hand switch or the ULTRA SONIC On/Off Switch on the powerpack and then the errors will be canceled.
- When using a foot switch, turn the foot switch off to cancel the error.  
If the errors of the 90s occur, turn the main switch off to cancel.

fig-6. <Trouble Shooting>

Error No.	Simple Display	Cause	Trouble	Error cancel / Corrective Action
10	Po	POWER PACK	Malfunction on behavior of Power Pack was detected (restarted forcibly).	Press ULTRASONIC ON/OFF switch or hand switch.
11	Po	POWER PACK	Errors of the preset commands are detected.	Press ULTRASONIC ON/OFF switch or hand switch.
12	Fo	Footswitch	Foot switch is already on immediately after turning main power supply switch on.	Turn off the foot switch.
13	HP	Handpiece	Malfunction of sensor signal from handpiece.	Press ULTRASONIC ON/OFF switch or hand switch, turn the foot switch off, mount SENTANTOOL certainly or insert plug of handpiece certainly.
16	oL	Overload	Overloaded by overcurrent to a handpiece.	Press ULTRASONIC ON/OFF switch or hand switch, turn the foot switch off.
17	oH	Overheating	Temperature inside Power Pack is too high.	Press ULTRASONIC ON/OFF switch or hand switch, turn the foot switch off. And wait until the power pack temperature goes down. (※1)
19	Po	POWER PACK	Sensor signal voltage from handpiece rises too high.	Press ULTRASONIC ON/OFF switch or hand switch, turn the foot switch off.
91	Fo	Footswitch	The plug of foot switch is plugged and unplugged.	Turn off the main switch. If you use the foot switch, fully insert the plug of foot switch and turn on the main switch.
93	Po	POWER PACK	Output voltage is too high.	Turn off the main switch. Ask us for repair if the same error occurs although the main switch is turned ON again.
94	Po	POWER PACK	Unable to turn output voltage off from handpiece.	Turn off the main switch. Ask us for repair if the same error occurs although the main switch is turned ON again.
95	Po	POWER PACK	Output voltage is too high when the handpiece stops.	Turn off the main switch and ask us for repair.
99	Po	POWER PACK	Malfunction on panel substrate was detected.	Turn off the main switch. Confirm if there were accretion and/or deposit such as dust and oil on front panel. Accretion and/or deposit may cause to keep switches on. Ask us for repair if the same error occurs although the main switch is turned ON again.

(※1) In case overheating occurred, "OH" indicating overheating flashes on display if inside of Power Pack was not cooled down enough. Wait to use handpiece until "OH" is not indicated on display.

## 9. Accessories

AC Power Cord cord length: 2m

CA10  
◆Input Voltage AC 100V



CA11  
◆Input Voltage AC 115V



CA12  
◆Input Voltage AC 230V



Foot Switch cord length: 1.5m

FS201  
◆ON/OFF type  
Switch is ON while stepping on.



Extension Cord cord length: 3m

CB311  
◆Straight extension cord for connecting the POWER PACK and the curled cord (CB811)  
※Two or more extension cords can not be connected.



## 10. Before Asking for Repair

Condition	Investigation	Corrective action
Power is not ON.	Is an AC cord unplugged?	Please plug an AC cord.
The handpiece does not work.	Is the cord of handpiece connected to the Power Pack properly?	Insert the cord securely.
	Does a foot switch connect with a power pack?	You can use foot switch only.
	Is "oH" indicated on display?	Wait until cooling down because power supply of Power Pack is overheated.
Display does not turn on.	Is handpiece working?	Display does not turn on while handpiece is not working.
"oH" is indicated on display while handpiece is not working.	Is power supply of Power Pack becoming hot?	Wait until cooling down because power supply of Power Pack is overheated.
No vibration or weak vibration.	Is lamp of ULTRASONIC ON/OFF switch lighting as blue?	If NOT, press ULTRASONIC ON/OFF switch, press hand switch or turn foot switch on.
	Is power control knob indicating min. position?	Turn and adjust the position of power control knob.
	Is there any slackness of installation on tool or holder?	Make sure that tool and holder are installed certainly.
	Is tool other than metal installed on handpiece?	Metal tools can transmit vibration better than tools other than metal. Decrease value indicated by power control knob to prevent heating or use VOLTAGE CONTROL mode.
"oL" is indicated on display frequently.	Is there any slackness of installation on tool or holder? Is POWER MODE activated?	Make sure that tool and holder are installed certainly. Or, use handpiece with turning POWER MODE off and decrease value indicated by power control knob.
Vibration becomes weak while working.	Is there any slackness of installation on tool or holder?	Make sure that tool and holder are installed certainly. Decrease value indicated by power control knob if tool and holder loosened frequently.
	Is there any damage such as burn and crack on tool?	Form tool or change to new tool. Decrease value indicated by power control knob if tool and holder were damaged frequently.
"HP" is indicated on display when turning handpiece on.	Is the cord of handpiece connected to the Power Pack properly?	Insert the cord securely.
	Is there any slackness of installation on tool or holder?	Make sure that tool and holder are installed certainly.
Tool is easily damaged.	Is value of amplitude amount or drive voltage too high?	Decrease value indicated by power control knob or use VOLTAGE CONTROL mode.
Handpiece makes abnormal noise while working.	Is there any damage such as burn and crack on tool?	Form tool or change to new tool. Decrease value indicated by power control knob if tool and holder were damaged frequently.
	Is there any slackness of installation on tool or holder?	Make sure that tool and holder are installed certainly. Decrease value indicated by power control knob if tool and holder loosened frequently.
	Is temperature of tool too high?	Decrease value indicated by power control knob.
	Is there any problem on above 3 checking questions?	In case there is no problem on 3 points to be checked, decrease value indicated by power control knob.

※If the symptom is not improved after corrective action, the handpiece might be defective. Please ask for repair.

※Any other troubles or obscure points, please contact our minitor dealer.

## 11. Maintenance and Inspection

- Please check if there is some damage or not on the case and cord.
- Please check if there is accumulated dust, oil, water and so on.
- ※Please make sure to perform maintenance and inspection properly.



Warning

■Neglecting maintenance and inspection could result in accident and/or failure.

## 12. Others

- This product is using switching power supply and transformer is driven by high frequency. Mechanical sound may be heard from transformer and other parts, but it is not abnormal.