

Minimo[®]

RECIPRON

RE113/RE213

OPERATION MANUAL

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Products are subject to change without notice.

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 **MINITOR CO., LTD. JAPAN**

Thank you very much for purchasing Minimo ONE Series Ver.3 RECIPRON.



This product is the Motor for Minitor Handpieces. Read carefully this instruction manual before use. Also read carefully the instruction manuals of D.C. power pack, and of foot switch. 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.


Safety Precautions


- 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.
- Read carefully the instruction manual of this power pack, handpieces and foot switch.
- Please use in combination with our power pack.


■ About Warning and Caution

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

 Warning	This indicates that incorrect operation presents significant danger of accident, resulting in death or serious injury to users.	 Caution	This indicates that incorrect operation presents possibility of injury to users or damage to the unit.
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 Warning
<ul style="list-style-type: none"> ■ When connecting this handpiece with a powerpack, always turn off the main switch of the powerpack. ○ Failure to do so could result in fire, electric shock, and/or failure. ■ Do not use damaged straight cord. ○ Failure to do so could result in fire, electric shock, and/or failure. ■ When turning on the motor switch, firmly hold the handpiece. ○ Failure to do so could make the handpiece hop, resulting in injury to the user or damage to the tool. ■ Commutation sparks occur while the motor is running. So, do not use near inflammable and/or explosive substances such as thinner and/or gasoline. ○ Failure to do so could result in fire and/or failure. ■ Do not touch the SENTAN TOOL while the motor is running. ○ Failure to do so could result in injury to the user or damage to the tool. ■ Always wear safety glasses and a mask for dust. ○ Chips and/or dust left after grinding/polishing process could result in unexpected injury. ■ Make sure whether or not the handpiece runs after switching on. If the handpiece does not run after switching on, stop using it. ○ Failure to do so could cause the motor to be overheated, resulting in fire or failure. ■ Do not expose this product to cutting oil, water or oil mist. ○ Failure to do so could result fire, electric shock /or failure.

 Warning
<ul style="list-style-type: none"> ■ In case of abnormal noise, smoke, and/or bad smell, turn off the main power and unplug the power cord. ○ Failure to do so could result in fire and/or electric shock. ■ Do not modify and/or disassemble the power pack. ○ 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. ■ Always ask us for repair. ○ 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.

 Caution
<ul style="list-style-type: none"> ■ Do not disassemble and assemble this product. ○ May cause of damage and / or malfunction. ■ Use the power pack in a place without condensation. ○ Failure to do so could result in fire, electric shock, and/or failure. ■ Use in temperature between 0 - 40°C. ○ Failure to do so could result in malfunction and/or failure. ■ Do not use in a place near machines remarkably emitting electric noise. ○ Failure to do so could result in malfunction and/or failure. ■ For maintenance, unplug the power cord for safety. ○ Failure to do so could result in electric shock and/or failure. ■ Do not drop and/or hit. ○ Failure to do so could result in malfunction and/or failure. ■ Do not use in a place with corrosive gas such as chlorine gas, hydrogen sulfide, and/or sulfuric acid gas. ○ Failure to do so could result in fire, electric shock, and/or failure. ■ For disposal of this power pack, please follow your local city office or the shop where you purchased the product. ■ Do not allow children to use this product. Also, keep away from children. ■ When you leave the workshop, turn off the main switch, and unplug the power cord from the outlet for safety. ■ Be careful for dust, oil, water not to enter the inside of the power pack. 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. ■ When replacing carbon brushes or others, pull out the power cord. ○ Failure to do so could result in electric shock and/or failure. ■ Do not connect any other controller and motor drive power than Minitor products. ○ May cause of malfunction and / or failure. ■ Reverse rotation cannot be allowed.

Contents

Introduction	
Safety Precautions	1~2
Contents	3
1. Confirmation of this product	3
2. Equipment Features	4
3. Specifications	4
4. Names of Each Component	4
5. Operating Procedure	5
5-1 Connecting to Powerpack	
5-2 Operation of Hand Switch	
6. Changing the SENTAN TOOL	5
7. Adjust the Stroke Amplitude	5
8. Lock Mechanism	6
9. Replacement of Carbon Brush (Straight Cord)	6
10. Precautions	7
11. Accessories	7
12. Trouble Shooting	7
13. Maintenance and inspection	7

1. Confirmation of this product

Please make sure of standard equipments and accessories inside.

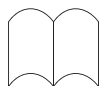


Fig. 1

Carbonbrush 1set (2pieces)



Operation Manual



Set Screw (AKM4X8)
1pc



Hexagonal Wrench (HS-2.0)
1pc



Fig. 2

【Connectable Power Pack】

Minimo ONE Series Ver. 3 Power Pack.
C2013 / C2113 / C2213

2. Equipment Features

- Hand Switch
Motor can be turned on / off without using DC MOTOR selector on power pack.
It is convenient for turning motor on / off frequently and working away from power pack.
- Motor Identification Function
Appropriate motor output can be identified by only connecting to power pack.

3. Specifications

Fig.3 System configuration table

Power Pack	Motor				Head								Clamp Head			Joint	
	One Series	Ver. 2	Ver. 3	Max Speed [min ⁻¹]	H011	H021	H031	H041	H211	H221	H231	H311	MX52	MX53	FX91	ET51	MG03
					H013	H023	H033	H043	H213	H223	H233	H313					
C2013 C2113 C2213	KV11H	KV12H	KV13H	50,000	○	○							○				
	KV21H	KV22H	-	40,000	○	○	○						○				
	KM11H	KM12H	KM13H	35,000	○	○							○			○	
	KM21H	KM22H	KM13M	30,000	○	○	○						○			○	○
			KM23H	30,000	○	○	○						○	○	○	○	○
	KV21	KV22	-	25,000	○	○							○			○	○
	KM11	KM12	KM13	20,000	○	○	○						○			○	○
			KM13L	15,000	○	○	○						○	○	○	○	○
			KM23	15,000	○	○	○		○	○	○		○	○	○	○	○
	-	-	KX313	10,000	○	○	○		○	○	○		○	○	○	○	○
	KM21L	KM22L	KM23L	8,000	○	○	○		○	○	○		○	○	○	○	○
	KM11G	KM12G	KM13G	6,600	○	○	○		○	○	○		○	○	○	○	○

	One Series	Ver. 2	Ver. 3	Bit Speed [mm/min]	Speed Range
C2013	RE11	RE12	RE13	—	3,500
C2113	RE21	RE22	RE23	—	7,000
C2213	BS31	BS32	BS33	700	—

○...Compatible combination
 * Percentage of output level is indicated on digital display of power pack while connecting to RECIPRON and Mini Belt Sander.

■Risk Avoidance Function by Overloading

Overloading is applied to avoid risk in case of fixed loading, activating handpiece in condition that collet chuck is in open (motor-locked condition), etc.

- Overloading in normal condition
 - Motor in working ⇒ Overload warning (5 sec.) ⇒ Overloading (suspended)
- Overloading in motor-locked condition
 - Handpiece-locked condition ⇒ Motor activated ⇒ Overload warning (5 sec.) ⇒ Overloading (suspended)
- Overloading in fixed loading condition
 - Fixed loading condition (15 sec.) ⇒ Overload warning (5 sec.) ⇒ Overloading (suspended)

4. Names of Each Component

- ①V-SHAPED SPINDLE
- ②BOWL SCREW RE 3 5-2 6 4
- ③LUBRICATE GATE
- ④BODY COVER RE 1-2 0 3 BK
- ⑤COVER LOCK SCREW RE 1-2 6 3
- E-RING ETW-3
- ⑥KNURLED KNOB
- ⑦HAND SWITCH
- ⑧HANDGRIP
- ⑨STRAIGHT CORD
- ⑩SCREW
- ⑪GRIP NUT

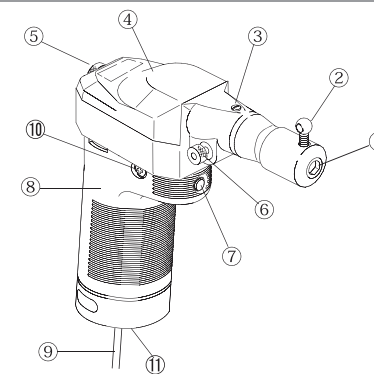


Fig. 4

5 Operating Procedure

5-1. Connecting to Powerpack

Connect the straight cord properly with the powerpack.

5-2. Operation of Hand Switch

The hand switch is for selection of the station to use and start/stop operation

When a station is not selected		
When a station is selected		
	Operation	Movement
①	- Press the hand switch.	The DC Motor output light is on.
②	① Press the hand switch.	The motor starts to run.
③	② Press the hand switch.	The motor stops.

Caution ■ When changing Sentan Tools, do not press the hand switch.

6. Changing the SENTAN TOOL

The SENTAN TOOL is to be fixed by the bowl screw. The shank diameters from $\Phi 2.0 \sim \Phi 6.35\text{mm}$ are able to be set. If the bowl screw is somewhat bother you, use set screw(4x8) instead.

To mount and dismount the SENTAN TOOL:

To set the SENTAN TOOL is simply insert the tool and tighten the bowl screw.

To remove the tool is just loosen the screw.

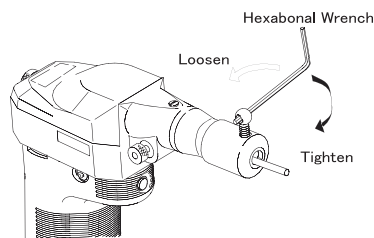


Fig. 5

Caution ■ After replacing the carbon brushes, give the handpiece a trial run, increasing rotation speed gradually and make sure how it works.
■ Pull the straight cord out of the control pack.

7. Adjust the Stroke Amplitude

The amplitude of the stroke can be set by changing the graduation scale on the eccentric collar. 0mm ~ 8mm for RE113 ; 0mm ~ 2mm for RE213.

① Remove the upper cover by loosening the cover screw.

② Loosen the set screw at the side of the marker.

③ Adjust the matching mark to a desired graduation.

The stroke is graduated in millimeters.

Then tighten the set screw to set.

④ Put the upper cover back in position.

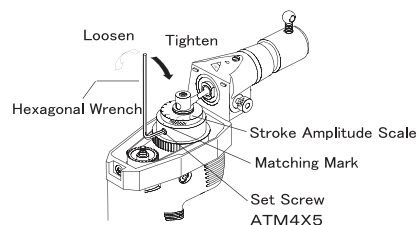


Fig. 6

Caution ■ After replacing the carbon brushes, give the handpiece a trial run, increasing rotation speed gradually and make sure how it works.
■ Pull the straight cord out of the control pack.

8. Lock Mechanism

Turn the knurled knob clockwise for the spindle at a desired phase angle to be locked.

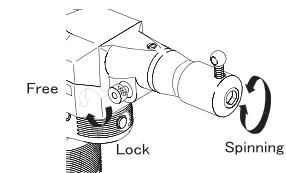


Fig. 7

9. Replacement of Carbon Brush (Straight Cord)

Procedure of replacement of carbon brushes		
Procedure of replacement of a straight cord.		
①	① Pull the straight cord out of the powerpack.	-
②	② Remove the grip nut with a spanner (21mm).	Fig. 8
③	③ Pull the straight cord connector out of the main body. Hold the resin part of the straight cord and pull out straight.	Fig. 9
④	- Remove the screw fixing the grip and take off the grip.	-
⑤	- Remove the screws fixing the carbon brushes and pull out the carbon brushes.	Fig. 10
⑥	- Set new carbon brushes as they were and tighten them with the screws.	-
⑦	- Put the grip in and tighten with the screw. (Put the grip in while caring the hand switch cord.)	-
⑧	④ Fit the straight cord socket with the pins on the main body and insert on the straight. (If you replace the straight cord, do so at this time.)	Fig. 11
⑨	⑤ Tighten the grip nut with the spanner.	-



Fig. 8



Fig. 9

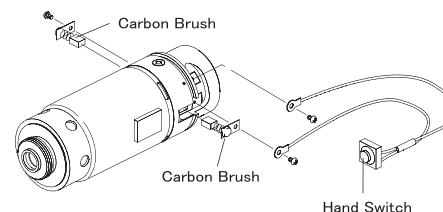


Fig. 10

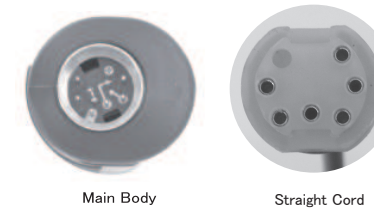


Fig. 11

Caution ■ Use equivalent carbon brushes only and replace both at the same time.
■ After replacing the carbon brushes, give the handpiece a trial run, increasing rotation speed gradually and make sure how it works.
■ When replacing carbon brushes, pull the straight cord out of the control pack.

10. Precautions

- 1) Please be careful about heat that sometimes Recipron generates in continuous use.
- 2) Do not poke the installed tools in the front wall in operation. Recipron has structure that absorbs the impact, but it may damage the internal structure.
- 3) Do not provide grease other than the specified spot.
- 4) For safety, always put the body cover on the main body and tighten with the screw.
- 5) Please be careful when you use for grinding or polishing in wet process because it may cause some problems.

11. Accessories

Rubber Cradle
RM11



Carbonbrush 1set (2pieces)
KE-580



Hexagonal Wrench
HS-2.0



12. Trouble Shooting

Trouble	Check	Remedy
Motor does not run.	Power switch of power pack is OFF.	Turn power switch of power pack ON.
	Carbon brushes are consumed.	Replace carbon brushes to specified ones.
	Collet chuck of handpiece is in open position.	Close collet chuck of handpiece.
Hand switch does not work.	Handpiece is controlled by external signal on power pack.	Control handpiece by external signal. Avoid controlling by external signal.
	Foot switch is connected.	Control by foot switch only.
Overheating while motor is running.	Dust, etc. are stuck on handpiece.	Remove dust, etc.
	Handpiece is used with excessive load.	Use motor within range of white LED indicating range of use on load meter.
High vibration and / or abnormal noise from handpiece.	Same malfunction is occurred in low rotation speed.	Ask for repairing.

If you still have a trouble after applying remedy, malfunction is considered. Ask for repairing.

If you have any question or need further assistance, please contact the store you purchased or us.

13. Maintenance and inspection

●RECIPRON requires lubrication with a few drops of light spindle oil through the lubrication gate, at intervals of 8 hours total operating time.

When you do not use for a long time, provide spindle oil about 0.3cc (1 or 2 drops) in every 1 or 2 month.

●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 or not.

※Please maintain and inspect a power pack.



Warning

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