



Motor

OPERATION MANUAL

A combination of C2212 conforms to EN specification
EN60745-1、EN60745-2-3
EN61000-6-4、EN61000-4-2、EN61000-4-3、EN61000-4-4
EN61000-4-5、EN61000-4-6、EN61000-4-8、EN61000-4-11

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Products are subject to change without notice.

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Introduction

Thank you very much for purchasing Minimo ONE Series Ver. 2 Motor.

This product is the Motor for Minitor Handpieces. Read carefully this instruction manual before use. Also read carefully the instruction manuals of head (Standard/Slender Rotary, and Anglon) 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.

* Hand Switch refers to the switch on the motor.

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.
- Read carefully the instruction manual of this power pack, handpieces and foot switch.
- Keep this instruction manual near the power pack for any operators to refer to whenever operating this system.



About Symbols









The symbols below 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 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	
■ 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 a damaged curl 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 Tools and collet chuck 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.	
■ Do not start to run the handpiece while its collet chuck opens. ○ Failure to do so could cause the motor to be overheated, resulting in fire or failure.	

 Warning	
■ 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.	
■ 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	
■ 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 sulfurous 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.	
■ When the motor is running, do not loosen the joint ring. ○ Failure to do so could result in failure.	

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※This instruction manual is shared for every Minimo One Series Ver.2 motor.

- KM112 • KM112H • KM112G
- KM212 • KM212H • KM212L
- KV112H • KV212 • KV212H

1. Confirmation of this product

Please make sure of standard equipments and accessories inside.

Motor



※The picture above is KM212H.

Carbonbrush 1set (2pieces)



Motor	Carbon brush
KV112H	KE-605
KV212H	KE-580
KM112H	KE-575
KM212H	KE-580
KV212	KE-580
KM112	KE-575
KM212	KE-580
KM212L	KE-580
KM112G	KE-575

Operation Manual



fig-1

【Allowed Powerpack】

C2012/C2112/C2212 Only (Minimo One Series Ver.2 since 2013)

Not available with all the other powerpacks



fig-2
A Motor is only included. Except the Motor, please purchase individually.

2. Equipment Features

- **Hand Switch**
The hand switch enables quick start/stop operation.
This is very useful if you often make the start/stop operation and/or you work away from the powerpack
- **Mounting Handpiece Identification Resistor**
The handpiece mounts a handpiece identification resistor corresponded to the handpiece identification function on Minimo One Series Ver.2 powerpacks.
This function optically controls rotation speed and torque of the handpiece.
- **Removable Handpiece**
The motor and head part are removable. So, you can select motors and heads for your own purpose.
- **Curl Cord**
As the curl cord is elastic, it does not interrupt your work.

3. Specifications

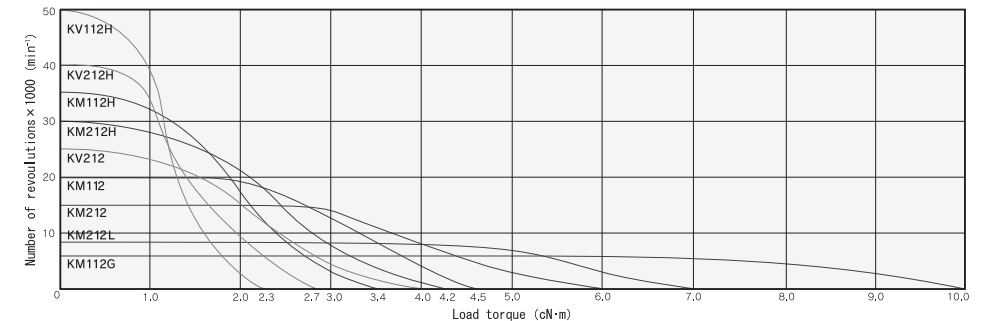
fig-3. System configuration table

POWER PACK	Motor				Head							Clamp Head			Joint		
					H011	H021	H031	H041	H051	H211	H221	H231	H311	MX52	MX53	FX91	ET51
	One Series	Ver.2	Type	Max Speed [min ⁻¹]	Standard	Slender	Heavy Duty	Long Slender	Air	Standard	Heavy Duty	Variable amplitude type	Standard	Heavy Duty	Clamp	Reduction Ratio Gear	
C2012 C2112 C2212	KV11H	KV112H	Ultrahigh	50,000	○	○			○								
	KV21H	KV212H	High	40,000	○	○			○								
	KM11H	KM112H		35,000	○	○			○								
	KM21H	KM212H	30,000	○	○			○									
	KV21	KV212	Medium	25,000	○	○			○								
	KM11	KM112		20,000	○	○			○								
	KM21	KM212	15,000	○	○			○		○	○						
	KM21L	KM212L	Low	8,000	○	○			○		○						
	KM11G	KM112G	Low gear	6,600	○	○			○		○						

○ is possible combinations of Head joint

C2012 C2112 C2212	One Series	Ver.2	Type	Belt Speed [mm/min]	Speed Range [mm/min]
	RE11	RE112	Reciprocating File	—	3,500
	RE21	RE212	Belt Sander	700	—

fig-4. Speed / Torque Curve



- **Over load function when the motor is locked** • Danger avoidance function
The overload function will operate if its collet chuck opens or the load is stable.
 - **Usual overload.**
 - Opened collet chuck. ⇒ Switch ON ⇒ Overload caution. (5 sec) ⇒ Overload(Stop)
 - **Over load in case that its collet chuck opens.**
 - Opened collet chuck. ⇒ Switch ON ⇒ 15 sec ⇒ Overload caution. (5 sec) ⇒ Overload(Stop)
 - **Trouble shooting in case that the danger avoidance function operates under constant load.**
 - A constant load process(15 sec). ⇒ Overload caution. ⇒ Set to no-load condition within 5 seconds. ⇒ Danger avoidance function is reset.
- ※The time by the caution and the load displacement can be changed. Please ask to Minitor for changing.

4. Names of Each Component

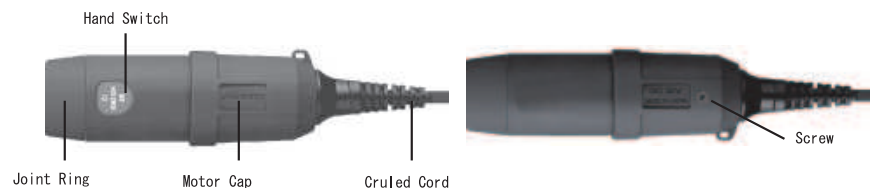


fig-5

5. Operating Procedure

5-1. Attaching the head to the motor

※When connecting a motor with a head, unplug the motor from the powerpack.

- 1) Insert the clamp head onto the motor with placing the claw of the head in a groove of the motor.
- 2) Fasten the head by turning the joint ring to the fastening side. (About 1mm gap is formed between the head and joint ring.)

If the joint ring idles, follow the procedures from 1). There are four grooves at the top of the motor. Fasten the head with an easy-to-fasten groove.

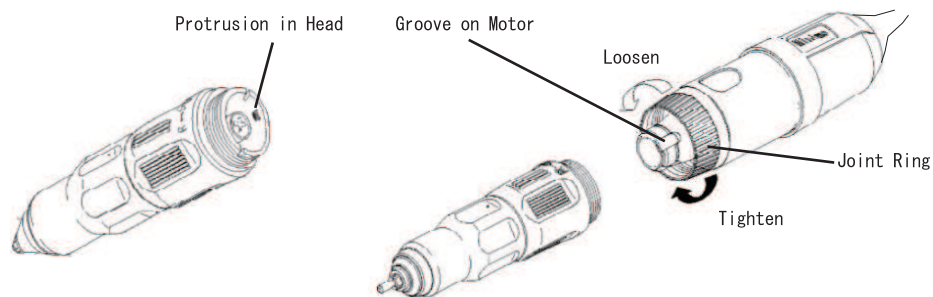


fig-6

- | | |
|-----------|---|
| ⚠ Caution | ■ Do not turn the joint ring while the handpiece is running. |
| | ■ Select a suitable head (Refer to Figure 4)
Failure to do so could result in failure. |

5-2. Connecting to Powerpack

Connect the curl cord properly with the powerpack.

Minimo One Series Ver.2 handpieces cannot be connected with the previous version powerpack including Minimo One Series.

5-3. 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.



fig-7

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

6. Replacement of Carbon Brush (Curl Cord)

Procedure of replacement of carbon brushes		
Procedure of replacement of a curl cord		
① ①	Pull the curl cord out of the powerpack.	-
② ②	Remove the screw from the motor cap and then pull the motor cap out of the main body.	fig-8
③ ③	Pull the curl cord connector out of the main body. Hold the resin part of the curl cord and pull out straight.	fig-9
④ -	Remove the screw that fixes carbon brushes and then take out the carbon brushes.	fig-10
⑤ -	Fix new carbon brushes with the screw.	-
⑥ ④	Set the curl cord socket in the pins on the main body and then put it in straight. When replacing a curl cord, use a new cord.	fig-11
⑦ ⑤	Make sure of the screw hole position. Put the motor cap into the main body straight and then fix it with the screw.	-

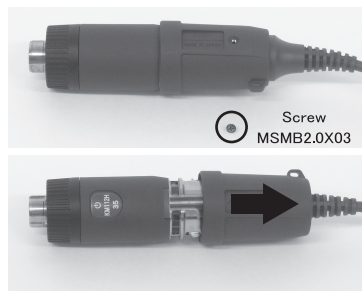


fig-8

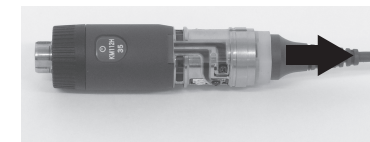
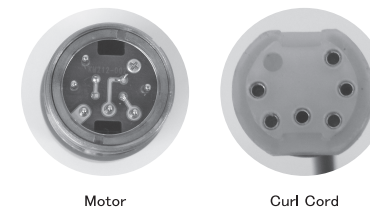


fig-9



fig-10



Motor

Curl Cord

fig-11

- | | |
|-----------|---|
| ⚠ Caution | ■ Use equivalent carbon brushes. |
| | ■ 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 curl cord out of the control pack. |

7. Accessories

Carbonbrush 1set (2pieces)



Motor	Carbon brush
KV112H	KE-605
KV212H	KE-580
KM112H	KE-575
KM212H	KE-580
KV212	KE-580
KM112	KE-575
KM212	KE-580
KM212L	KE-580
KM112G	KE-575

Rubber Cradle RM11



8. Trouble Shooting

Condition	Investigation	Corrective action
Motor does not run.	Is an AC cord unplugged?	Please plug an AC cord.
	Is a fuse blown?	Please replace the equivalent fuse.
	Are the carbon brushes worn away?	Replace carbon brushes.
	Is a fuse blown?	Please close the collet of the handpiece.
Hand switch does not work.	Is a foot switch connected with the powerpack?	While a foot switch is connected with the powerpack, the start/stop operation is done only by the foot switch.
Motor is overheated while running.	Do you use the handpiece with excessive loads?	Use the handpiece within the green lights of the load meter on the powerpack.
Unusual noise and/or vibration occurs.	Make sure if the noise and/or vibration occurs when the handpiece runs in slow rotation speed.	Ask us for repair.

※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 monitor dealer.

9. 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 or not.
- ※Please maintain and inspect a handpiece.

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