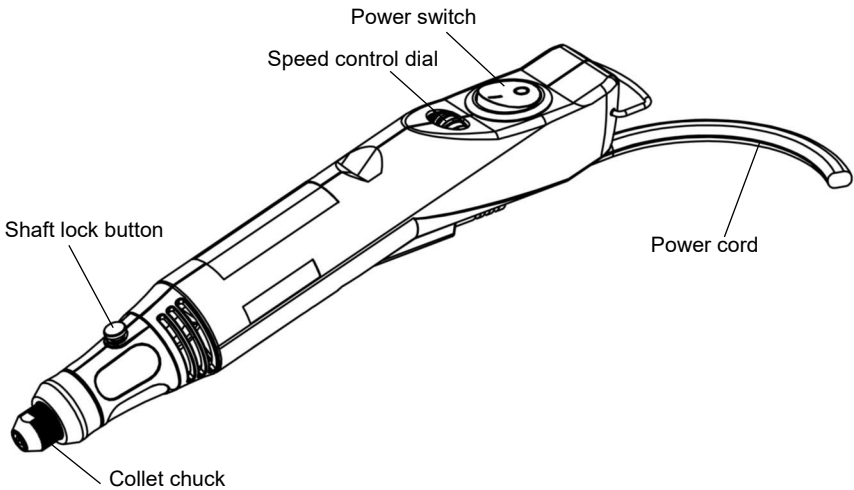


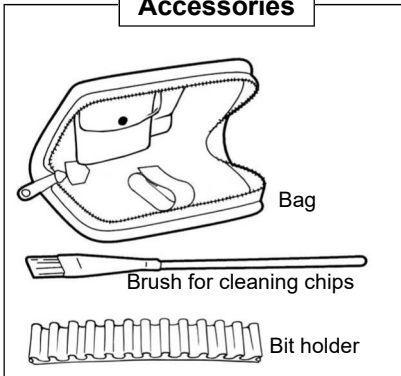
K-109 MINI ROUTER

Thank you for purchasing the HOZAN K-109 MINI ROUTER. With proper care and handling, this fine instrument will provide years of trouble-free operation. Please read this entire instruction manual carefully before attempting to place this instrument in service. Please keep this instruction manual available for reference.

Identification of parts and contents



Accessories





Specifications


Revolution speed	7000 - 16500 rpm
Standard bit (accompanied)	K-109-10 (1.0 mm ϕ)
Rated voltage	100 V \sim 50/60Hz
Power consumption	20 W
Rated time	15 minutes
Overall length	195 mm (without cord nor bit)
Diameter of grip	18 mm ϕ (minimum)
Max. diameter	29 mm ϕ
Collet capacity	2.35 mm ϕ
Weight	160 g (without cord nor bit)

Warning and caution symbols

These symbols are used throughout the instruction manual to alert the user to potential safety hazards as follows :

 **Warning** ... Notice when incorrect handling could cause the user's death or serious injury.

 **Caution** ... Notice when incorrect handling could cause injury to the user or material damage.

Even if the instructions do not have  **Caution** mark, there are some possibilities for a serious situation. Follow the instructions.

Precautions

Warning

1. Pay attention to electric shock.
 - This product is not waterproofed. Do not use in a wet or humid place. Otherwise, this could cause a fire or an electric shock due to insufficient insulation.
 - Make sure to disconnect the power plug before maintenance. Do not touch the power plug with wet hands. This could cause a shock.
2. Do not use the other voltage than that specified on the rating plate. Otherwise, it can cause a malfunction.
3. Make sure that the power switch is OFF before connect the power plug to the outlet.
4. Wear safety glasses while operating. A dust-proof mask should also be worn where a great amount of dust is anticipated to be generated during operation.
5. Do not bring your hands or face close to the rotating part. This could cause an injury.
6. Do not use in places which have abnormal vibration or shocks, or places where corrosive gases, flammable gases, sprays or dust exist. Otherwise, this could cause explosions, fire or electric shocks.
7. Loose fitting clothes, wear accessories such as necklaces and long hair could get caught up in the rotating part.
Do not wear gloves while operating, since they could get caught in the rotating part.
8. Turn the power switch off and disconnect the power plug from the wall outlet at the following situation. Otherwise, the power switch could be on accidentally causing an injury.
 - When not in use
 - When replacing the bit
9. Replace the bit with the correct procedure.
 - Make sure to replace the bit with the authorized replacement parts. If any other type of bit is used, problems such as excessive loads cause malfunctions such as motor burnout, bit break or other accidents.
 - Note that the bit to be replaced is not bent or cracked.

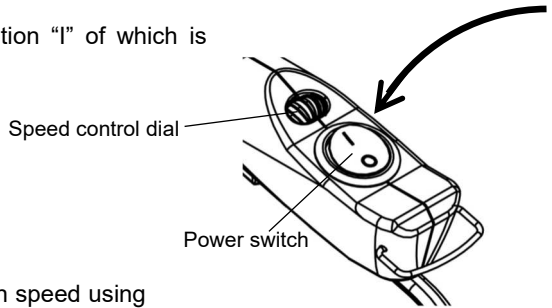
Precautions

Caution

1. Do not operate continuously for longer time than the rated.
[The rated time of K-109 is within 15 minutes.]
Please take an interval of the minutes equivalent to the operated minutes. A short rest is the same as a continuous operation.
2. This product is not ESD-safe. When in use for a work which require an ESD control like PCB works, take measures such as wearing a wrist strap which has a built-in resistance of 1 M ohm or more.
3. Handle the power cord with care.
 - Do not carry by the cord. When disconnecting the power cord from the power point, hold the plug, not the cord.
 - Keep the power cord from heat, oil, and sharp corners. Damage to the cord results in electric shocks or short circuits to cause a fire.
4. The shanks (shafts) of bits are slender and can be easily broken. Do not operate while pressing excessively hard against the object. This could make bits break and fly apart to cause injury accidents.
5. Do not touch the rotating part. This is quite dangerous, as the tips of milling bits and drills, optional accessories, are extremely sharp.

Operation

- 1 Make sure that the bit is secured in the collet chuck referring “How to secure and remove the bit”.
- 2 Connect the power plug to an outlet, after being sure that the power switch is turned off (indication “O” of which is depressed).
- 3 Keep your posture stable. Hold or vise the workpiece securely.
- 4 Turn the power switch on (indication “I” of which is depressed).



- 5 Adjust to the appropriate revolution speed using the speed control dial.

The appropriate revolution speed is depends upon workpiece's material, hardness and so on. Refer to the table for details.

Bits	Revolution speed
K-109-10/11/12	High
K-109-20	Medium
K-109-30/31/32/40/41	High
K-109-50/51/52/53/54/55	Low
K-109-60/61/62/63	Medium

- 6 Apply the bit to the object, pressing gently.

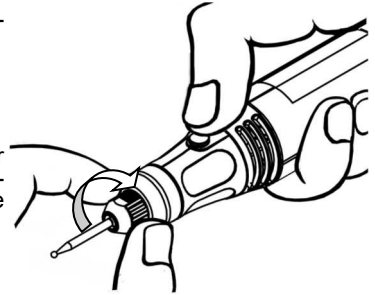
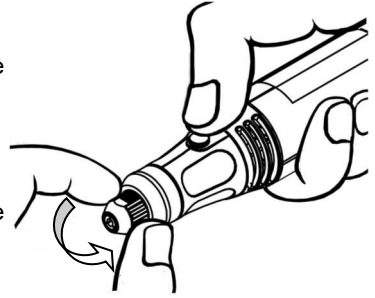
Caution

Wear protective glasses. Do not bring your eyes close to the working place. The ejected chips or the bit itself, which is not secured completely, may come flying.

How to secure and remove the bit

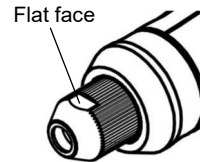
Secure

- 1 Detect the point where the shaft lock button can be deeply pressed to lock the shaft.
- 2 Turn counterclockwise a few times and loosen the collet chuck by your fingers, while locking the shaft.
- 3 Insert the bit into the collet chuck as deep as possible.
- 4 Turn clockwise and fasten the collet chuck by your fingers securely. Never use a wrench or pliers. Otherwise, this could damage the bit's shank or the collet chuck.



Remove

- 1 Detect the point where the shaft lock button can be deeply pressed to lock the shaft.
- 2 Turn counterclockwise a few times and loosen the collet chuck by your fingers, while locking the shaft. If it is hard to loosen the collet chuck, use a wrench with 10 mm across flats. The collet chuck has the parallel flat faces to be caught.
- 3 Remove the bit. Fasten the chuck moderately not to be lost.



Replacement bit sets

K-109-59 Drill bit set Six kinds of drills, K-109-50/51/52/53/54/55, one piece each, with a bit holder.

K-109-69 Bit set The set of whole nineteen bits, one piece each, with a bit holder.

The bits can be purchased separately. See the table on the next page for details.

Replacement bits

Part No.	Product name	Kinds/ Abrasive grain size/ Accessories	Dimensions	+++ : most suitable, ++ : more suitable, + : possible, - : not suitable									
				Cutting patterns on PCB	Exfoliating solder mask	Removing oxide film on patterns	Drilling	Grinding glass/stone/ceramic	Burning or charringing PCB/iron	Burning or charringing aluminum/plastic	End milling	Scraping rust/paint	Scraping oxide film on soldering iron tip
K-109-10	Diamond grinding bit	Diamond #120											
K-109-11				+++	++	+	-	+++	++	-	-	-	-
K-109-12													
K-109-20	Silicon polishing bit	Silicon carbide #240		-	+++	+++	-	-	-	-	-	-	+++
K-109-30	Corundum grinding bit	White alumina #150											
K-109-31				+	+	+	-	+	+++	++	-	-	-
K-109-32		White alumina #80											
K-109-40	Milling bit	High-speed steel		++	+	+	-	-	+	+	+++	-	-
K-109-41													
K-109-50	Drill	High-speed steel 5pcs * with bit holder											
K-109-51													
K-109-52													
K-109-53				-	-	-	+++	-	-	-	-	-	-
K-109-54													
K-109-55													
K-109-60	Brush	Brass											
K-109-61													
K-109-62		Steel											
K-109-63													

* K-109-59 and K-109-69 contain these drills 1 pc each.

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