

Instruction Manual

for

POWER  HAND[®] 3

20,000RPM Rotary Handpiece

Model: PH3 20X

#510-3330



Gesswein[®]
The Right Tools

Introduction

The Gesswein Power Hand 3 M-20X Rotary Handpiece is engineered and manufactured to a high degree of precision and will give you many years of trouble-free service. Backed by a limited warranty that covers wear parts for 90 days and overall balance of parts for six months.

This DC electrically driven rotary motor is designed to be used with the Power Hand 3 Controller (#510-3300). For use with Gesswein Power Hand 2X controllers, the PH3 adaptor (#510-3304) is necessary to connect the 5 prong motor plug to the 3 prong controller receptacle. Controllers convert the Alternating Current (AC) power supply to a variable Direct Current (DC) by means of an I.C. "transistorized" automatically controlled circuit.

The Gesswein Power Hand 3 rotary motor series consists of six motors and eight head assemblies with maximum operating speeds ranging from 8,000 to 55,000rpm. The maximum RPM speed is indicated on each motor case housing.

To connect Power Hand 3 handpieces to Power Hand 2X controllers, use the PH3 Adaptor 5 to 3 prong reducer plug. #510-3304.



1. Accessories

Included Accessories

- A. One $\frac{3}{32}$ " (2.35mm) Collet (reorder #501-0100)
- B. One $\frac{1}{8}$ " (3.2mm) Collet (reorder #501-0105)
- C. Two Carbon Brushes (reorder #510-0169)
- D. One Collet Wrench (reorder #510-0180)

Optional Accessories

- A. Handpiece Extension Cord (#510-3380): adds 9 feet, or almost 3 meters, to the rotary handpiece cord
- B. Handpiece Cradle Rest (#510-1130): provides a safe holding place for the rotary handpiece when not in use
- C. PH3 Variable-Speed Foot Rheostat (#510-3306)
- D. 3mm Collet (#501-0106)
- E. Reducing Collets: $\frac{1}{8}$ " to $\frac{3}{32}$ " (#816-1501), $\frac{1}{8}$ " to $\frac{1}{16}$ " (#816-1502), $\frac{3}{32}$ " to $\frac{1}{16}$ " (#816-1503), 3mm to $\frac{3}{32}$ " (#816-1504), 3mm to $\frac{1}{16}$ " (#816-1505)

2. Parts Nomenclature (Fig. 1)

1. Test Rod
2. Collet
3. Head Cover
4. Collet Release Ring
5. Motor Connecting Ring
6. Motor Housing
7. Motor Cover
8. Power Cord with 5-prong plug
9. On/Off Switch

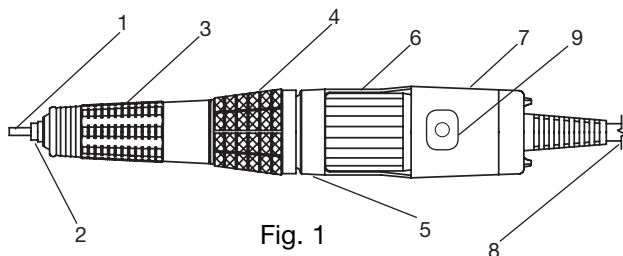


Fig. 1

3. General Description of Use

Tool Changing

The Gesswein Power Hand 3 Rotary Handpiece uses a quick-tool-release mechanism that allows for rapid tool changes. To operate, turn the Collet Release Ring toward the arrow pointing to the "R" or release position (see Fig. 2). When in full "R" position, the Collet Release Ring will make a click sound; the collet is then fully open and ready to accept a tool.

To secure the tool, rotate the Collet Release Ring toward the "S" or secure position. Again, a click sound will be heard, indicating the collet is fully closed and the tool is secure.

When changing tools, be sure that the handpiece motor is not running. If you attempt a tool change under this condition, the motor will be stalled and damage will occur.

Collet Removal

The Gesswein Power Hand 3 Rotary Handpiece can be fitted with three different size collets. Standard sizes are $\frac{3}{32}$ " (2.35mm) and $\frac{1}{8}$ " (3.2mm). Bright Cutting Package supplied with a 3.0mm collet.

To change collets, rotate the Collet Release Ring to the full "R" position and remove the tool in the collet. Hold the collet between thumb and forefinger and turn in a counterclockwise direction until the collet is removed. Insert the new collet and reverse the procedure. It is best to tighten a replaced collet by hand with the collet wrench (#510-0180), securing until just tight.

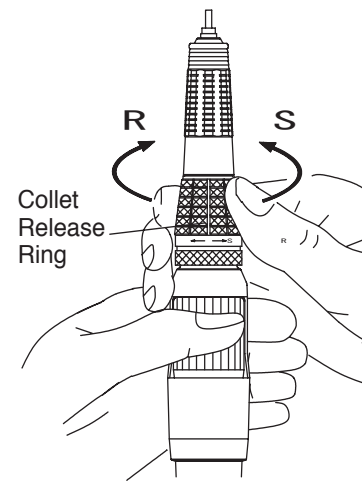


Fig. 2

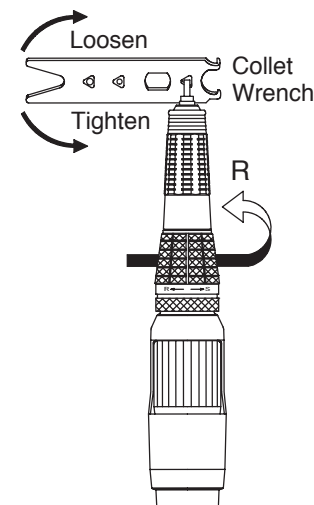


Fig. 3

If the collet cannot be loosened by hand using the Collet Wrench, additional torque may be required. To use the Collet Wrench, place the triangular cutout in the wrench over the collet (see Fig. 3), and turn counterclockwise to loosen and clockwise to tighten the collet. If more torque is required, hold the handpiece with the Collet Wrench secure on the collet, and tap the wrench with a solid tool (see Fig. 3a) in a counterclockwise direction. This procedure will loosen the collet, which can then be removed by hand.

If the handpiece collet is so tight that the above procedure will not loosen it, then remove the Head Assembly from the Motor Assembly. This can be done by grasping the Motor Connecting Ring (see Fig. 1) and pulling upward. Insert the Chuck Joint Wrench (see Fig. 3b) into the Nylon Coupler (#510-0151), hold the Head Assembly and Chuck Joint Wrench securely in one hand, and with the Collet Wrench in place on the collet, loosen in a counterclockwise direction (for parts drawing, refer to page 11.)

After a collet is replaced, be sure that the Collet Release Ring is rotated to its full “S” position and that the collet rotates freely when turned by hand. If the collet does not rotate freely, it is not fully seated in the Head Assembly, and you must repeat the removal-replacement procedure.

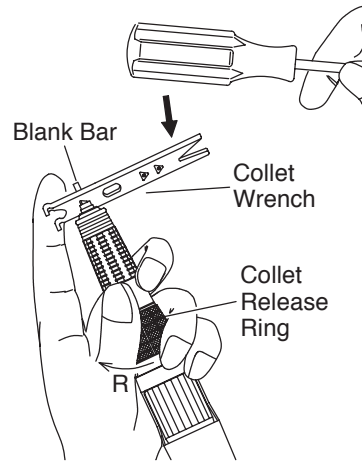


Fig. 3a

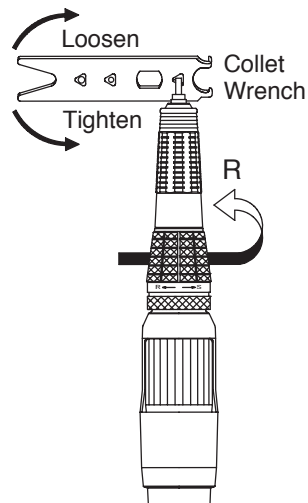


Fig. 3b

4. Operating Procedure with Power Hand 3 Controller

With your rotary handpiece fitted with a selected tool, connect the Gesswein Power Hand 3 Controller to an electrical supply and the handpiece to the A motor or B motor output socket.

Put the Controller Main Switch to the “ON” position, which lights up the LED lights of controller. Then select the A motor or B motor button depending on which socket the handpiece is plugged in to. Check to make sure the desired rotational direction is selected on the Fwd./Rev. button. Then press the START/STOP button to supply power to your handpiece. RPM speed is adjusted by the round dial in the center. It is always best to start at minimum RPM and then increase to the desired RPM speed.

A Load Indicator light is located on the front panel of the PH3 Controller with 8 steps of LED lights from green to yellow to red. The display lights up as force is being applied to the handpiece. For best results and long life, stay within the green.



5. Precautions

- A.** Before operating your handpiece, be sure that the Collet Release Ring is in the “S” or secure position. Failure to do so (referred to as “locked rotor condition”) will cause the motor to stall and could possibly cause motor damage.
- B.** Do not attempt to change tools or rotate the Collet Release Ring while the handpiece is running. This action will stop the motor abruptly, cause parts damage, and could also possibly cause motor damage.
- C.** During use, avoid stalling the motor by pushing too hard on the work tool or by exceeding the torque capacity of the handpiece motor.
- D.** The Gesswein Power Hand 3 Rotary Handpiece is designed not to overheat with normal use. It can be used continuously and will provide efficient, longlife performance if you apply just enough machining and polishing pressure to maintain full motor speed.
- E.** The $\frac{3}{32}$ " (2.35mm), $\frac{1}{8}$ " (3.2mm) and 3.0mm collets are manufactured to accept $\frac{3}{32}$ ", $\frac{1}{8}$ " and 3.0mm ± 0.0008 " shank tools respectively. Use only tools that correspond to the collet size being used.
- F.** Do not use your handpiece in water or oil, and never allow any oil, water or other fluids, dirt, or wood dust to enter the inner casing. Failure to keep foreign matter out of the inner casing will cause damage to the ball bearing assemblies.
- G.** Do not subject the power cord on the handpiece to sharp bending or rough treatment. Such treatment could break the cord wires or damage the male connecting pins and female cord connectors.
- H.** Be careful not to point the handpiece at any part of the body while it is running, particularly during startups.
- I.** Be careful when using Wire Burnishing Tools. **DO NOT USE THESE TOOLS AT SPEEDS FASTER THAN 14,000 -15,000RPM.** Each tool is made of individual piano wire. Operating a Wire Burnishing Tool at higher than recommended speed could cause the wire to come free from the hub.

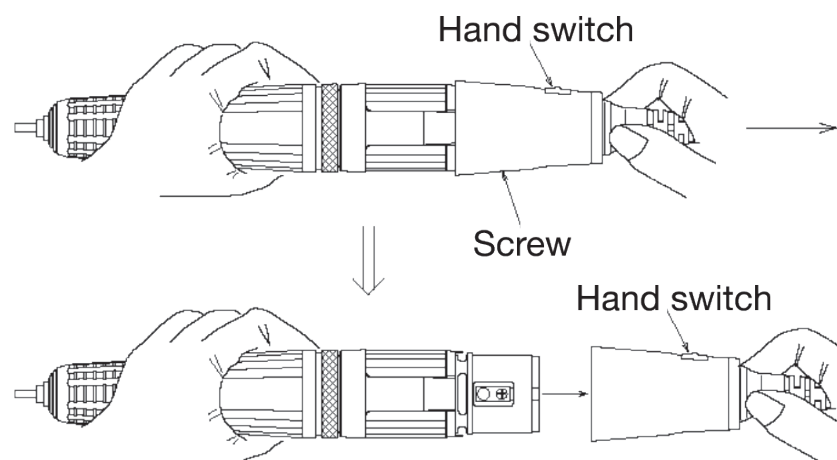
6. Replacement of carbon brushes

Gesswein Power Hand 3 motors use a spring tension-type carbon brush assembly. The approximate life of these brushes is 800-1,000 hours. Use the set of two replacement carbon brushes supplied with your handpiece when it becomes necessary to replace worn brushes. (Brushes should be changed when handpiece is not running at maximum speed, or if it sounds as though it's running out of gas.) Please note that in the event you must change the brushes, it is important that both be replaced at the same time. Replacement of only one carbon brush will cause motor damage.

Instructions for replacing carbon brushes

- 1.** Disconnect the handpiece from the controller.
- 2.** Remove the screw on the back of the motor cover.
- 3.** Detach the motor cord from the motor by grasping the motor cord and pulling backwards. Do not hold the motor cap when pulling backwards to avoid damaging the On/Off switch (Fig. 4).

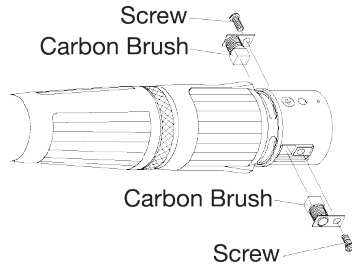
Fig. 4



4. Remove the 2 carbon brush screws and take out the carbon brushes. Be careful not to lose screws.

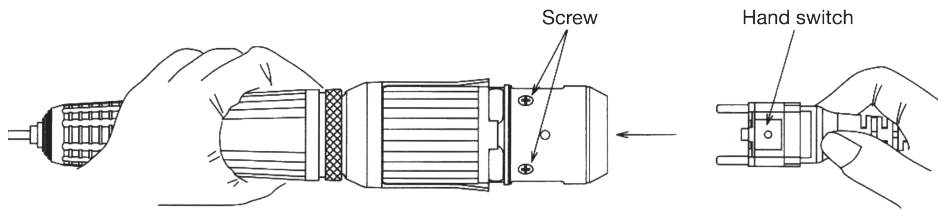
5. Install the new Carbon Brushes and secure with screws (Fig. 5).

Fig. 5



6. Gently push down the On/Off motor switch to free the motor cord from the motor cap. Be careful not to damage the On/Off motor switch. Then plug the motor cord back into the motor (Fig. 6)

Fig. 6



7. **Dust Removal** - From time to time, it will be necessary to clean excessive dust that accumulates in the motor cover. To remove this dust, remove the motor cap (see instructions for replacing carbon brushes to remove motor cap). If compressed air is available, use it inside the cover and the motor armature air cooling vent. If air is not available, remove excessive dust with a dry brush. If necessary, use a cloth moistened with detergent to clean the cover, and blow into the air cooling vents to clean around the armature. **DO NOT USE** any volatile liquid as a cleaner (i.e. paint thinner or alcohol).

Periodically cleaning the inner threads on handpiece collets will ensure their easy collet removal when changing sizes. Twist a clean rolled-up piece of tissue paper in and out of the threaded area.

8. Align the On/Off motor switch with the square hole of the motor cap, and gently insert motor cap (Fig. 7 & 8). Then insert the motor cap screw.

Fig. 7

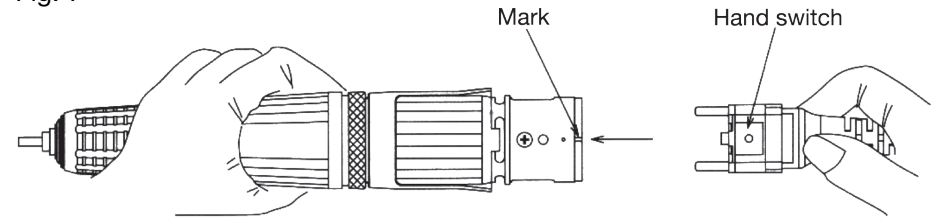
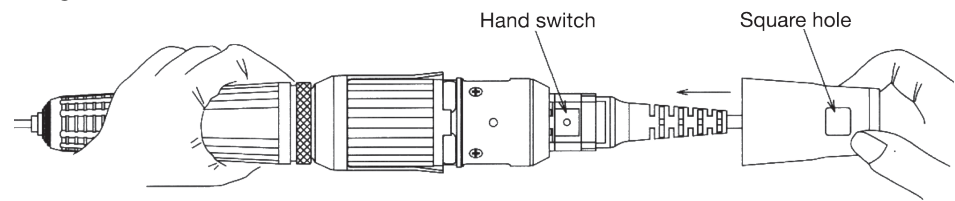


Fig. 8



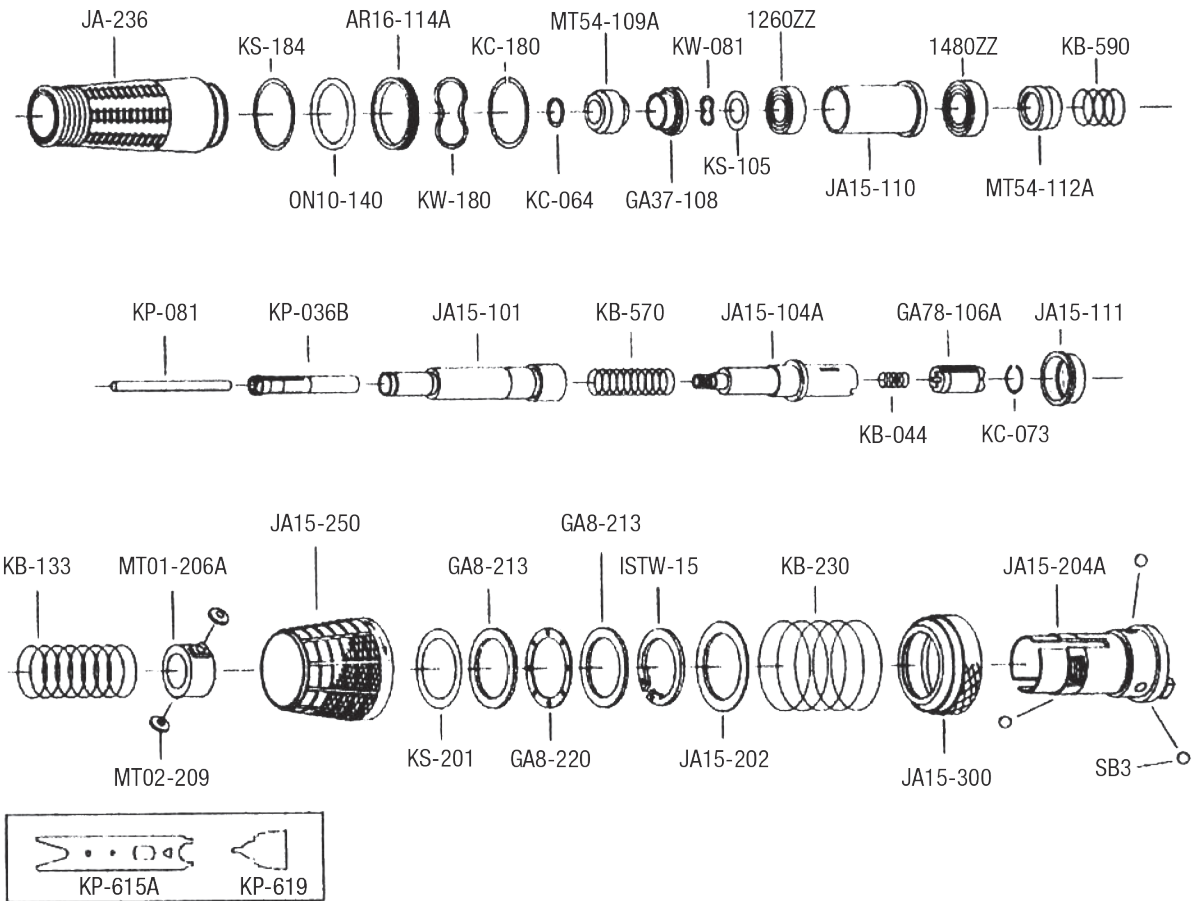
9. While the power is off, plug handpiece into controller. Please speed up gradually from minimum RPM and make sure nothing is abnormal with behavior.

10. **Lubrication** - Lubrication of your Gesswein Power Hand 3 Rotary Handpiece **IS NOT NECESSARY**, and you should **NOT** let oil or other fluids enter the Head Assembly (see Precautions).

PH3 20X Handpiece Parts List

When ordering spare parts, always specify part#
(or item# if applicable) and description.

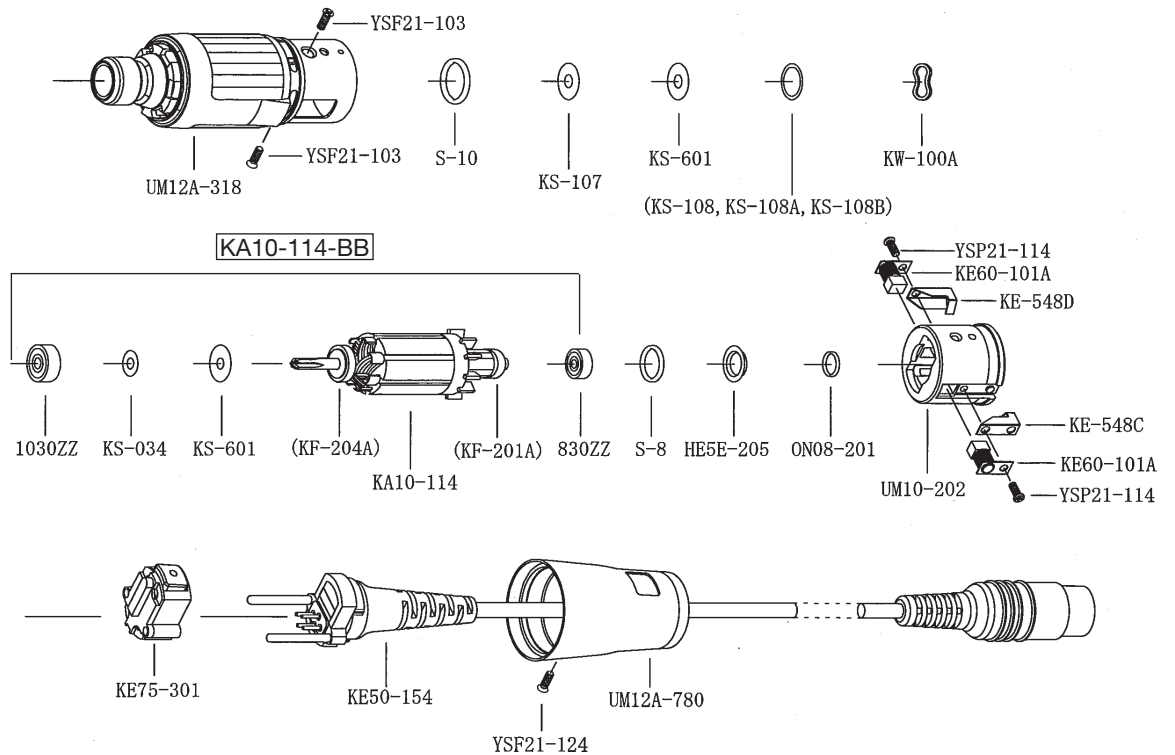
Part#	Item#	Description
JA-236	8960050	Top Cover
KS-184	8960051	Teflon Spacer
ON10-401	8960052	O-Type Rubber Ring
AR16-114A	8960053	Dust Ring
KW-180	8960054	Wave Washer
KC-180	8960055	C-Type Clip Ring
KC-064	8960056	C-Type Clip Ring
MT54-109A	8960057	Dust Seal "B"
GA37-108	8960058	Dust Seal "A"
KW-081	8960059	Wave Washer
KS-105	8960060	Stainless Spacer
1260ZZ	5013074	Ball Bearing
JA15-110	8960061	Bearing Spacer
1480ZZ	5013072	Ball Bearing
MT54-112A	8960062	Coil Spring Cover
KB-590	8960063	Coil Spring
KP-036B	5010100	501-0100 Collet Chuck, (2.35mm)
KP-032B	5010106	Collet Chuck, (3.0mm)
KP-033B	5010105	Collet Chuck, (3.175mm)
JA15-101	8960064	Chuck Case
KB-570	8960065	Coil Spring
JA15-104A	8960066	Joint Shaft
KB-044	8960067	Coil Spring
GA78-106A	5100151	Joint
KC-073	8960068	C-Type Clip Ring
JA15-111	8960069	Dust Seal "C"
KB-133	8960070	Coil Spring
MT01-206A	8960071	Roller Ring
MT02-209	8960072	Roller
JA15-250	8960073	Set Ring
KS-201	8960074	Teflon Spacer
GA8-213	8960075	Thrust Spring
GA8-220	8960076	Retainer
ISTW-15	8960077	C-Type Clip Ring
JA15-202	8960078	Metal Washer
KB-230	8960079	Coil Spring
JA15-300	8960080	Lock Ring
JA15-204A	8960081	Coupler
SB3	8960082	Stainless Steel Ball
KP-615A	5100180	Chuck Wrench
KP-619	5100179	Chuck Joint Wrench



PH3 20X Motor Parts List

When ordering spare parts, always specify part#
(or item# if applicable) and description.

Part#	Item#	Description
UM12A-318	896-0333	Motor Case
YSF21-103	896-0002	Countersunk Head Screw
S-10	896-0012	O-Type Rubber Ring
KS-107	896-0092	Metal Spacer
KS-601	896-0093	Teflon Spacer
KS-108	896-0094	Metal Spacer
1030ZZ	510-3073	Ball Bearing
KS-034	896-0095	Metal Spacer
KA10-114-BB	896-0334	Armature Completed
KA10-114	896-0335	Armature
KF-204A	896-0096	Dust Proof Collar
KF-201A	896-0097	Dust Proof Collar
830ZZ	510-3076	Ball Bearing
S-8	896-0098	O-Type Rubber Ring
HE5E-205	896-0099	Metal Rear Lid
ON08-201	896-0100	O-Type Rubber Ring
UM10-202	896-0336	Brush Side Lid
PKE60-101A	510-0169	Carbon Brush (set of 2)
YSP21-114	896-0337	Pan Head Screw
KE-548C	896-0102	(-) Terminal Plate
KE-548D	896-0103	(+) Terminal Plate
KE75-301	896-0338	Hand Switch Assembly
KE50-154	510-3382	Motor Cord with Plug
UM12A-780	896-0339	Motor Cap
YSF21-124	896-0325	Pan Head Screw
KP-615A	510-0180	Chuck Wrench





Power Hand 3 controllers and handpieces combine to create the most versatile finishing system in the industry, offering rotary, profiling and belt sanding action.

Power Hand 3 component selection:

- PH3 controller
- Six motors (three high torque, two standard, and one high speed)
- A selection of 8 heads
- Two reciprocating profilers
- One side-to-side profiler
- Belt Sander

Gesswein®
The Right Tools

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