Safety Instructions

A Micromotor Handpiece is a high speed rotary power tool which can be dangerous and cause serious injury if it is not used properly. NEVER operate it without wearing eye protection.

- **Always** wear proper eye and face protection.
- **Only** use accessories rated for 50,000 rpm or higher speeds when operating this micromotor. Follow the Allowable Rotation Speed chart on page 8 of this manual for safe operation when using accessories with head diameters of more than 3/32” (2mm).
- **Always** observe the manufacturer’s maximum speed rating when using any accessory.
- **Never** use or continue to use any accessory which appears to be damaged, loose, vibrating, bent, or out of balance. Inspect each accessory for cracks or flaws before use.
- **Always** insert the shank or arbor of an accessory or mandrel into the collet or chuck of the handpiece as far as possible in order to provide proper support and close the collet or chuck securely.
- **Never** use excessive side pressures which may tend to bend or break the shank or arbor of an accessory. Let the speed of the accessory do the work.
- **Do not** stall the motor by jamming or using excessive pressure on the mounted point, buff, wheel or accessory. This can result in damage to the motor.
- **Wear** a dust protector, mask or respirator to prevent the inhalation of harmful dust or debris from grinding, carving or other operations performed with this power tool.
- **Never** operate with a damaged power cord. If the power cord or plug to the handpiece is NOT locked and that the bur can spin freely.
- **Always** operate and store it with a bur or other accessory in the chuck and with the chuck in the closed position.
- **Do not** operate the handpiece in the presence of any flammable liquid or gas.

Limited Warranty

Foredom warrants its product to be free of defects in material or workmanship for a period of two years after purchase. Blackstone Industries, Inc. dba The Foredom Electric Company warrants, to the original purchaser only, that its products will be free from defects in material or workmanship for a period of two years after the purchase date. During the warranty period, defective product will be repaired or replaced without charge or, at our sole option, the purchase price will be refunded. This warranty does not cover damage caused in transit or by accident, misuse or ordinary wear and tear. This warranty does not cover damage caused by use of a flammable liquid or gas.

For more information on Foredom micromotor accessories, contact your local dealer. When no local dealer is available, write, call or fax:

**The Foredom Electric Company**
16 Stony Hill Road, Bethel, CT 06801
(203)792-8622, Fax: 203-796-7861, Email: customerservice@blackstoneind.com

Visit our website: www.foredom.net for video descriptions of this product.
Please retain your proof of purchase for warranty repairs.

Authorized repair service is available at the Foredom factory in Bethel, CT. Send items for repair to the factory marked "Attention: Repair Department". Enclose the item(s), a packing list, daytime phone number, return address, email address, and information regarding the problem or repairs required. Estimates of repair cost will be made upon request. It is our policy not to proceed with a repair without your approval if the cost (labor plus parts) is more than fifty percent of the cost for a new replacement. You will be notified and advised of the cost to repair and to purchase a new replacement.

Complete Kit (Fig. 3)

Control Unit, Power Cord
Brushless Handpiece
Handpiece Holder, Phillips Screw, Washer
Foot Pedal
Handpiece Cradle
Collet Changing Wrench

AC Power Input (Fig. 4)

1. Check the label on the rear of the Control Unit to make sure that the electrical specifications match your AC power.
   a. If the fuse needs to be replaced (Fig. 5), replace it with identical type and rating only—For 115 V micro-motor use a 5x20mm,SLO-BLOW, 3.15A, 250V.
   b. For a 230V Micromotor use a 5x20mm,SLO-BLOW, 1.6A, 250V. The Fuse Holder 16 contains a spare fuse (Fig. 5).

CAUTION
- Never plug or unplug the Power Cord with wet hands to avoid electric shock.
- Use only with a grounded AC power receptacle.

Installation

CAUTION
- The Control Unit should rest on a flat, steady surface. Avoid blocking the ventilation openings in the bottom of the case (Fig. 6).
- Use the Control Unit in locations with a temperature below 100ºF. Avoid excessively dusty, hot or humid locations.

Hand Mode Operation, follow steps a. through g. above, then:

1. Press the Hand/Foot Selector Switch 10 to "Hand". (Hand/Foot Selector indicator light 11 turns green.)
2. Press the Motor On/Off Switch 3 to run the motor. (Motor On/Off indicator light 4 turns green.)
3. Set the Speed Control Knob 7 to desired speed.
4. Use the Motor On/Off Switch 3 to stop the motor.

Foot Mode Operation, follow steps a. through g. above, then:

1. Press the Hand/Foot Selector Switch 10 to "Foot". (Hand/Foot Selector indicator light 11 turns orange, Motor On/Off indicator light 4 turns green.)
2. Set the Speed Control Knob 7 to desired maximum speed.

1. Fix the Handpiece Holder 23 to the right side of the Control Unit with screw and washer. (Fig. 7).
2. An optional Brush Type Handpiece Motor Cord may be plugged into the Port A Outlet 13 located in the front of the Control Unit. (Fig. 8).
3. Plug the supplied Brushless Handpiece Motor Cord 21 into the Port B Outlet 17 located in the rear of the Control Unit and then tighten the plug nut. (Fig. 9).
4. Plug the Foot Pedal Cord 25 into the Foot Pedal Outlet 14 located in the rear of the Control Unit. (Fig. 9)
5. Plug the Power Cord 27 into the Power Connector 15 in the rear of the Control Unit. (Fig. 9).

CAUTION Make sure that all cords are connected safely and properly and that the Power Switch 12 is off before plugging in the Power Cord (Fig. 11).

Burs may be stored on the magnetic bur holder strips located on the side of the controller. Burs without enough ferrous metal will not attach to the strip. (Protect from ferrous metal dust.) (Fig. 10).

Operation

a. Make sure that a bur is inserted in the micromotor handpiece and collet is fully closed. (See page 5)
b. Set Power Switch 12 to off (O) (Fig. 11).
c. Plug the Power Cord 27 into a grounded electric outlet (Fig. 4).
d. Set the Speed Control Knob 7 to the slowest position.
e. Turn the Power Switch 12 on (I) (Fig. 11) — switch lights up.
f. Select Port A (front) Brush Type or Port B (back) Brushless Handpiece by pressing Handpiece Selector Switch 5 (Fig. 11).

g. Select the rotation direction by pressing Forward/Reverse Selector Switch 8. (Forward is green / Reverse is orange)

CAUTION Never switch rotation direction while the handpiece is running.
Foot Mode Operation continued

In Foot Pedal Mode the micromotor will not exceed the preset dial speed.

3. Press the Foot Pedal 26 to run the motor from start to a maximum speed (set by the speed control knob).
4. To increase the maximum speed setting, release foot pedal and allow motor to stop. Dial in new maximum speed and proceed.

Changing from Foot to Hand Mode

1. Press Hand/Foot selector switch, 10 (Hand/Foot Selector indicator light 11 turns green).
2. Press Motor On/Off switch, 3 and select a speed using the control knob 7.

Auto Cruise Mode

In Foot Mode operation, the Auto Cruise feature allows a preset speed to be maintained when the Foot Pedal is released. To enable Cruise Mode, press motor run switch 3, the indicator light 18 will turn orange. To activate, hold the pedal at the desired speed position and after 2 seconds there will be a double beep. The foot pedal can then be released, and the selected speed will be maintained. Pressing the foot pedal again will release the preset speed. A new preset speed can then be selected by holding the foot pedal at the desired speed for 2 seconds until a double beep is heard. To return to normal Foot Control operation, press the Motor On/Off & Auto Cruise switch 3. The Indicator light 4 will turn green.

Components

1. Control Unit (HP4-817)
2. Digital Speed Display (x 1,000 rpm)
3. Motor On/Off & Auto Cruise Switch
4. Motor On/Off & Auto Cruise Indicator Light
5. Handpiece Port Selector Switch
6. Handpiece Port Indicator Light
7. Speed Control Knob
8. Forward/Reverse Selector Switch
9. Forward/Reverse Indicator Light
10. Hand/Foot Selector Switch
11. Hand/Foot Indicator Light
12. Power On/Off Switch & Light
13. A Brush Type Handpiece Plug Outlet
14. Foot Pedal Plug Outlet
15. Power Cord Plug Outlet
16. Fuse Holder with spare fuse
17. B Brushless Handpiece Plug Outlet
18. Test Bur
19. 3/32” Collet (1/8” is optional) Collet part numbers and sizes are listed on page 5.
20. Brushless Micromotor Handpiece H.MH-150
21. Handpiece Motor Cord
22. Handpiece Cradle (HP4-993)
23. Handpiece Holder
24. Chuck Wrench (HP4-993)
25. Foot Pedal Cord
26. Foot Pedal (HP7-7060)
27. Power Cord

Changing Accessories

Burs and other accessories can be inserted or removed from the handpiece collet when the collet is open. To open the collet:
1. Turn off the motor using the Motor On/Off Switch 3 and the Power Switch 12.
2. Twist the Front of Handpiece in the “R” or release direction (clockwise) until the raised indicator bar clicks into the far left mark (<<) on the silver center ring (Fig.11).
3. Remove the accessory and replace with another accessory. Insert accessory shank fully (about 1/8”) into the collet for maximum support. You should feel it touch the back of the collet.
4. Twist the knurled Front of Handpiece toward the “S” or secure position by turning counterclockwise until it snaps to lock the collet. The accessory and the collet will be able to spin freely. The raised collet indicator bar will be above the far right (<<) mark in the silver center ring.

Note: The intermediate position between “S” and “R” holds both the spindle and the accessory in a locked position. This is useful to unscrew an over-tightened mandrel screw.

CAUTION Never run the handpiece when the collet is open or in the intermediate position. The spindle is in the locked position and will not turn. This will damage the motor.

Removing and Installing Collets

1. With knurled Front of Handpiece in “R” release position and bur or accessory in collet, place triangular hole in Chuck Wrench 24 over triangular flats of Collet head and unscrew the collet counterclockwise (Fig. 12) Remove collet.
2. With bur or accessory in new collet, thread into handpiece. Place triangular hole in Chuck Wrench 24 over triangular flats of Collet head and tighten the collet clockwise. Be careful not to over-tighten. Test to insure that new collet releases accessory smoothly in the “R” released position. Test to insure that new collet holds firmly in the “S” secure position and spindle rotates freely.

To order the correct Replacement or Additional Collet for the H.MH-150 check the Handpiece Serial Number

<table>
<thead>
<tr>
<th>Handpiece Serial Nos.</th>
<th>Collet Part No.</th>
<th>Collet Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>808xxxx and above</td>
<td>HP4-117</td>
<td>2.35mm (3/32”)</td>
</tr>
<tr>
<td>808xxxx and above</td>
<td>HP4-117B</td>
<td>3.18mm (1/8”)</td>
</tr>
<tr>
<td>808xxxx and above</td>
<td>HP4-117C</td>
<td>3.00mm</td>
</tr>
<tr>
<td>807xxxx and below</td>
<td>HP7-5008</td>
<td>2.35mm (3/32”)</td>
</tr>
<tr>
<td>807xxxx and below</td>
<td>HP7-5007</td>
<td>3.18mm (1/8”)</td>
</tr>
<tr>
<td>807xxxx and below</td>
<td>HP7-5006</td>
<td>3.00mm</td>
</tr>
</tbody>
</table>

See video on Changing Collets & Accessories at: www.foreedom.net
CAUTION
Keep a bur in the chuck at all times. Do not operate the handpiece without a bur in the chuck.

- Use only recommended burs.
- Always be sure chuck is free of dirt or debris before replacing a bur.
- After replacing a bur, make sure that the Collet Chuck is fully closed before running the Motor.
- DO NOT open the collet while the motor is running. It will damage the handpiece.
- Always put the Handpiece on the Handpiece Cradle or in Handpiece Holder while not in use. (Fig.7). Take special care not to drop it on the floor.
- Thoroughly clean the Collet with brush or compressed air before reassembling. Clean at least once a week for longer life.
- Keep the Handpiece clean and free of dirt and debris during disassembly.
- The spindle and the motor should be disassembled only by a qualified repair facility.

CAUTION
- Never exceed the maximum rotation speed specified by the manufacturer for the bur being used.
- Large burs, even when operated below maximum rated speed, may begin to vibrate. Speed should be reduced immediately to prevent damage to the bur, handpiece, or operator.
- Be sure to insert the Bur shank all the way, until it touches the back of the Collet Chuck. Then tighten the Collet Chuck. If the Bur is used while not inserted completely, it is very dangerous because vibration may cause it to come out, bend, or break.

Replacing the Handpiece Cord Set
Unplug Handpiece Motor Cord Assembly from Handpiece Plug Outlet on the back of the control. The Motor Cord Assembly can be replaced by unthreading the Rear Cover from the Motor Housing (Fig.13).

CAUTION
- Do not exceed the maximum operating speed of the bur or accessory in the handpiece to avoid personal injury.
- Before turning off the Power Switch, make sure that the motor has been stopped.
- When the unit is not in use, for maximum safety, unplug the Power Cord.

Using an Optional Brush Type Motor Handpiece in Port A:
Foredom currently has 3 brush type handpieces for use in Port A on Control Box (HP4-817). These brush type micromotor handpieces all have different speed ranges, as detailed below. However, since the handpiece speed ranges do not match the factory maximum preset of 35,000 RPM on the digital display, you can approximate the digital display speed with the actual speed of your specific handpiece as follows:

Digital Display:
- 35 = full speed
- 26 = 3/4 speed
- 17 = 1/2 speed
- 9 = 1/4 speed

Dial position (shown below) is also an indicator of speed for these handpieces.

See videos of Product Features at: www.foledom.net

HPMH-011 Hammer Micromotor Handpiece
Strokes Per Minute: 1- 2,500

H.MH-120 Chuck Style Micromotor Handpiece
Maximum Speed- 20,000 RPM

H.MH-170 High Speed Rotary Micromotor Handpiece
Maximum Speed- 38,000 RPM.
### Error codes

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Status</th>
<th>Cause</th>
</tr>
</thead>
</table>
| "1E"       | Motor sensor error | 1. One or more hall sensors defective  
               2. The Motor Cord is unplugged or defective.  
               3. The Motor Cord is broken. |
| "2E"       | Motor lock error | 1. The Collet Chuck is opened.  
               2. The Motor Handpiece is mechanically defective.  
               3. The Motor Handpiece is electrically defective. |
| "3E"       | Motor overvoltage detection error | 1. The circuit of the Control Unit is defective. |
| "4E"       | Overheat error | 1. The Control Unit has been operated under a high load condition for too long a time.  
               2. The Control Unit has been exposed to an excessively warm environment (more than 100°F.)  
               3. Air openings are blocked.  
               4. Temperature sensor is defective. |
| "6E"       | Overload error | 1. The motor Handpiece was operated under an overload condition, or was stalled by jamming the bur into the work. |
| "7E"       | Control Circuit Board error | 1. The circuit of the Control Unit is defective. |

### Recommended Approximate Bur Speeds

<table>
<thead>
<tr>
<th>Accessory Diameter</th>
<th>Rotation Speed – RPMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>more than 1½&quot; (40mm)</td>
<td>50,000</td>
</tr>
<tr>
<td>1&quot; (28–40mm)</td>
<td>45,000</td>
</tr>
<tr>
<td>3/4&quot; (18–28mm)</td>
<td>40,000</td>
</tr>
<tr>
<td>1/4&quot; (8–18mm)</td>
<td>35,000</td>
</tr>
<tr>
<td>1/8&quot; (4–8mm)</td>
<td>30,000</td>
</tr>
<tr>
<td>1/32&quot; (2–4mm)</td>
<td>25,000</td>
</tr>
<tr>
<td>less than 3/32&quot; (less than 2mm)</td>
<td>20,000</td>
</tr>
</tbody>
</table>

### Allowable Rotation Speed

The chart is a general guide for the maximum rotation speed of conventional burs. The allowable rotation speed can be slightly different, depending on bur materials or types.

### Troubleshooting

**NOTE:** When an error reading is displayed, turn off the power switch for a few seconds and then turn it on again. If "SE" is displayed wait for about ten minutes. If the error reading re-appears, follow the Troubleshooting Chart below.

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Check Points</th>
<th>Corrective Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Lamp Does Not Light</td>
<td>Make sure that the Power Cord is correctly plugged into the outlet and the control unit.</td>
<td>Correctly plug in the Power Cord.</td>
</tr>
<tr>
<td>Foot Pedal Cord Does Not Work</td>
<td>Check if the fuse is blown.</td>
<td>Replace only with the recommended fuse. If the fuse blows again, repair or replace the unit.</td>
</tr>
<tr>
<td>Handpiece overheats or is noisy while operating at no load</td>
<td>Make sure the shaft of the Motor Handpiece can rotate freely.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td>Motor Vibrates Excessively and is Unusually Noisy</td>
<td>Check if the bur shaft is bent, or bur is out of round or unbalanced.</td>
<td>Replace with a new bur.</td>
</tr>
<tr>
<td>The ball bearings are in good condition.</td>
<td>Make sure that the ball bearings are in good condition.</td>
<td>Repair or replace the Motor Handpiece.</td>
</tr>
</tbody>
</table>

**Caution:** Repairs should be performed only by qualified personnel.