Instruction Manual

Thomas Scientific

1188Y47 / 1188Y51
Single Speed Mill #4 – Bench / Single Speed Mill #4 – Floor
(115V, 50/60 HZ)

1188Y48 / 1188Y52
Single Speed Mill #4 – Bench / Single Speed Mill #4 – Floor
(230V, 50/60 HZ)

1171H10
Single Speed Mini Cutting Mill
(115V, 50/60 HZ)

1173U48
Variable Speed Mini Cutting Mill
***115V/230V, 50/60 HZ) *This unit ships configured for 115V**

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Use And Care Of Catalog Numbers: 1188Y47, 1188Y48, 1188Y51, 1188Y52, 1171H10, and 1173U48

******SAVE PACKING MATERIAL IN THE EVENT THE MILL MUST BE RETURNED. ******

1. Mill has been properly adjusted at the factory. However, it is recommended that clearance of all stationary and rotor knives are checked manually before power is turned on, in the event any of the knives have shifted during shipment.

CAUTION: Exercise extreme care in any operation involving mill knives. Knife edges are sharp and dangerous if handled carelessly.

CAUTION: Make certain that the unit is powered off and unplugged from the power source prior to making any adjustments to the blades or rotor.

2. Open chamber door. Make certain that rotor knife ends do not project beyond the front and rear faces of the rotor. Make sure the rotor and the knife blades do not grind against the back plate of the cutting chamber by carefully rotating the rotor by hand. Check for "tip to tip" clearance between all rotor knives and all stationary knives by placing a piece of paper of average thickness (0.002 to 0.003 in) against each stationary knife in turn and turning the rotor by hand counterclockwise so that all four rotor knives pass the stationary knife. Knives should touch the paper but not cut it.
3. If knives require adjustment, see the section covering the adjustment and the replacement of knives.
4. Make certain that chamber door safety switch is operating correctly: it should complete the electrical circuit to the motor only when the chamber door is closed and latched, and should open this circuit immediately as soon as door is opened. In order to start the mill, the door must be closed and latched.

IMPORTANT: The mill should be turned off for at least one minute before restart to extend the lifespan of the unit.

Starting And Stopping The Mill

DOOR MUST BE SHUT AND LATCHED PRIOR TO BEGINNING MILL OPERATION.

TABLE TOP MODEL: UNIT MUST EITHER BE BOLTED TO A SUITABLE TABLE OR THE TABLE RUNNER ACCESSORY PRIOR TO USE.

CART MODEL: CASTORS MUST BE LOCKED PRIOR TO USE OF UNIT.

SAFETY WARNING: SAFETY GLASSES MUST BE WORN DURING THE OPERATION OF THE MILL.

1. To start the mill first turn the power on using the red power switch. Then press the green start switch to start mill rotation. To stop the mill, turn the power off by pressing the red power switch.

NOTE: Unit cutting chamber should be cleaned of any remaining debris once operation is complete and the unit is turned off.

CAUTION: DO NOT OPEN THE CHAMBER DOOR WHILE THE MACHINE IS RUNNING. SERIOUS INJURY MAY RESULT IF THE THESE INSTRUCTIONS ARE NOT FOLLOWED.

Single Speed Cutting Mill Operation (1188Y47, 1188Y48, 1188Y51, 1188Y52)

FEED RATE/SAMPLE SIZE

1. The Wiley mill has been used successfully for a wide variety of materials. Samples should be free of hard inorganic material, although a small amount of such material, smaller than 24 mesh, usually will not interfere with milling. Washing such material from samples will, however, prevent any problems and protect the mill.
2. Samples containing excessive moisture or oil cannot be satisfactorily run through the mill since they tend to cling to the walls of the chamber. It is recommended that these samples be dried or given preliminary extraction with suitable solvents before milling.
3. Feed the sample into the hopper slowly enough so that the mill does not slow down or become jammed. Optimum feed rate will vary with the type of material being ground. A sliding shutter at the bottom of the hopper controls the rate of the feed.
4. Four hardened steel knives, bolted to the rotor, work with a shearing action against six stationary knives mounted in the periphery of the chamber. A stainless steel screen is fitted to the frame in such a way that no material can come out of the grinding chamber until it is fine enough to pass through the mesh of the screen. Three screens, of 0.5 mm, 1 mm and 2 mm mesh respectively, are furnished with each mill. (Other sieves, meshes, and screens are available as accessories.)

NOTE: It may be necessary to step down through sieve sizes to achieve smallest possible sample size.

NOTE: To interchange screens, loosen the two hand wheels at the bottom of the mill, until screen alignment pins disengage. Remove and replace screen and tighten hand wheels.

5. All Model 4 mills are provided with two types of delivery chutes, which are interchangeable. One delivery chute has an outlet threaded to accommodate standard Mason jars (up to 2 quart capacity); the other provides for the mounting of a 1200 mL stainless steel beaker.

NOTE: If desired, a bag or sack can be fastened to the threaded delivery chute in place of a Mason jar.

Blade Maintenance And Replacement (1188Y47, 1188Y48, 1188Y51, 1188Y52)

1. It may be desirable to replace knives with the rotor removed from the grinding chamber. Remove hopper, open chamber door, and proceed as follows:
2. Remove center screw on front of rotating cutter and carefully slide rotor off shaft.

CAUTION: Rotor is heavy. Proceed with care.

3. Set rotor down on its rear face.

FOLLOW STEPS 4-5 TO REPLACE THE ROTOR KNIVES

NOTE: Rotor knives must be replaced as a set.

4. Use a vice or clamps to keep the rotor in place. Remove all four knives, using the wrench provided.
5. Once the knives have been removed replace them with 4 new knives. Replace the washers and bolts used to hold the blades on the rotating cutter head. Torque the bolts to 100 foot pounds.
6. Replace any stationary knives that need replacement at this time, following the below procedure.
7. There are two pairs of setscrews associated with each stationary knife (4 setscrews per knife). The pair which are in line with the threaded stud attached to the knife as a back stop and also allow minute up and down adjustments to be made on either side of the knife. The other pair of setscrews, located clockwise from the threaded stud, bear on the clamping bar, holding the clamping bar and thereby the knife itself firmly in position.
8. Loosen the pair of setscrews holding the clamping bar on the first stationary knife that is to be replaced. (If replacing the entire set of stationary knives, it may be convenient to start with the knife in the upper right.)
9. Hold or support the knife and remove the two nuts from the threaded stud. Carefully remove the knife. Remove clamping bar from its slot.
10. If other knives are being replaced, remove the remaining knives, proceeding clockwise.
11. Unpack replacement knives. Replace the knife-clamping bar. Insert threaded stud into its hole and seat knife in slot. Replace the two nuts and draw the knife up so that there is ample clearance between it and the rotor knives. Repeat this operation for all knives being replaced and also draw up any remaining knives.
12. **ROTOR INSTALLATION:**
    Replace rotor slowly and carefully on the shaft ensuring the machine key is fully seated in the keyway. Install center screw and torque to 5 foot pounds.
13. Loosen nuts of the first stationary knife to be adjusted. Insert a piece of paper of the necessary thickness (0.002 to 0.003 in.) between the knife and any of the rotor knives, and adjust the clearance by raising or lowering the stationary knife until it pinches the paper but does not cut it.
14. Slightly tighten the two setscrews holding the clamping bar on the knife. (May require further adjustment later.)
15. Turn rotor to make certain that all rotor knives clear the installed stationary knives. If one rotor knife projects beyond the others, adjust clearance of stationary knife with respect to this rotor knife. Identify this rotor knife and make all stationary knife adjustments with respect to it.
16. Repeat steps 13 and 14 above for the remaining stationary knives. Recheck all clearance and all associated nuts and set screws.

NOTE: Do no over-tighten to the point where threads may be stripped.

FEED RATE/SAMPLE SIZE (1171H10)

1. The Wiley mill has been used successfully for a wide variety of materials. Samples should be free of hard inorganic material, although a small amount of such material, smaller than 24 mesh, usually will not interfere with milling. Washing such material from samples will, however, prevent any problems and protect the mill.
2. Samples containing excessive moisture or oil cannot be satisfactorily run through the mill since they tend to cling to the walls of the chamber. It is recommended that these samples be dried or given preliminary extraction with suitable solvents before milling.
3. Feed the sample into the hopper slowly enough so that the mill does not slow down or become jammed. Optimum feed rate will vary with the type of material being ground. A sliding shutter at the bottom of the hopper controls the rate of the feed.
4. A hardened steel rotating cutter head with four blades, works with a shearing action against two stationary knives mounted in the periphery of the chamber. A stainless steel screen is fitted to the frame in such a way that no material can come out of the grinding chamber until it is fine enough to pass through the mesh of the screen. Three screens, of 20, 40 and 60 mesh respectively, are furnished with each mill. (Other sieves, meshes, and screens are available as accessories.)

NOTE: It may be necessary to step down through sieve sizes to achieve smallest possible sample size.

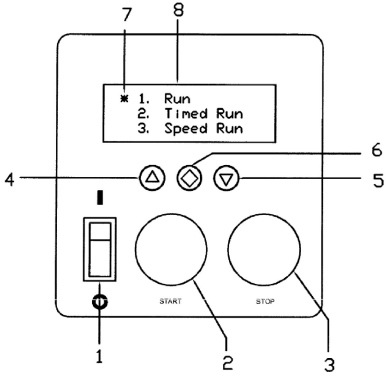
NOTE: To interchange screens, loosen the two hand wheels at the bottom of the mill. Remove and replace screen and tighten hand wheels.

5. All mini mills are provided with a delivery chute threaded to accommodate a 4 ounce glass jar.

NOTE: If desired, a bag or sack can be fastened to the threaded delivery chute in place of a jar.

NOTE: The below section is for 1173U48 only

6. To operate the unit at 230V, unscrew the binding post on the back of the unit. Flip with toggle switch to the down most position and reinstall the binding post to lock the voltage selection in place. Continue normal operation. To run the unit on 120V, simply undo this step.
7. After each sample is ground, clean the chamber and receiver with a narrow, fairly stiff brush. Alternatively, a blast of clean, dry air is effective.
8. See the **Front Panel Display** diagram to the right
   1) Power Switch
   2) Start Button
   3) Stop Button
   4) Up Arrow Button
   5) Down Arrow Button
   6) Enter Button
   7) Cursor
   8) Liquid Crystal Display (LCD)



OPERATION

Press the **Power Switch** down into the ON position. The LCD should light up and show the main menu. There are three different run modes to choose from . Select a run more by moving the **Cursor** (using the **Up/Down Arrows**) and press the **Enter** Button. The user must press the **Start Button** before the motor will engage. If the door is opened during operation, the motor will shut down. The door must be closed and the **Start Button** will need to be pressed before the motor will engage.

Single Speed Mini Cutting Mill Operation (1171H10 and 1173U48)

RUN MODE

1. The mill will begin the run mode at its lowest speed. The speed sown on parentheses (xxxx) is the set speed controlled by the user. The speed listed to the right is the tachometer read out or the actual speed of the mill in real time.
2. The Cursor can be moved with the Up/Down Arrows. Move the Cursor to the RPM line item and press the Enter Button. The speed can now be increased/ decreased by pressing and holding the Up/Down Arrows. Press the Enter Button once more to move the Cursor again.
3. Once engaged, the timer will begin counting all the way up to 999 hours before the timer overflows back to zero. To pause the mill, move the Cursor to PAUSE and press the Enter Button. The clock will pause at its current time and the mill will gradually come to a complete stop. The clock and mill can be resumed at its current time and speed by selecting RESUME and pressing the Enter Button.
4. To go back to the main menu, move the Cursor to the EXIT item and then press the Enter Button.
5. After selecting START, the mill will begin at the selected speed and the timer will begin counting down. The speed can be adjusted in real time using the same procedure outlined in the Run Mode section. The mill and countdown timer can be paused and resumed.
6. Exiting the timed Run Menu will bring the user back to the Timed Run setup Menu.

RUN MENU

RUN TIME		00:00:00
RPM	(100)	100
* PAUSE		EXIT

TIMED RUN MENU

RUN TIME		999:59:59
RPM	(100)	100
* PAUSE		EXIT

Blade Maintenance And Replacement (1171H10 and 1173U48)

1. To replace the stationary knives in the cutter head the rotating cutter head must be removed.
2. First, remove the hopper and open the chamber door. Use a 3/16” hex nut driver or wrench to loosen the hex head screw holding the rotating cutter and carefully remove the rotating cutter.
3. Proceed with replacing stationary knives.
4. There is one setscrew associated with each stationary knife. The setscrew, located clockwise from the threaded stud, bears on the knife, holding the knife firmly in position.
5. Loosen the setscrew holding the first stationary knife that is to be replaced. (If replacing the entire set of stationary knives, it does not matter which knife is removed first.)
6. Hold or support the knife and remove the two nuts from the threaded stud. Carefully remove the knife.
7. If all knives are being replaced, remove the remaining knife.
8. Unpack replacement knives. Insert threaded stud into its hole and seat knife in slot. Replace the two nuts and draw the knife up so that there is ample clearance between it and the rotor knives. Repeat this operation for all knives being replaced and also draw up any remaining knives.
9. Replace the rotating cutter head on the shaft with the square key in place on the shaft. Use a 3/16” hex nut driver or wrench to tighten the hex head bolt holding the rotating cutter head in place.

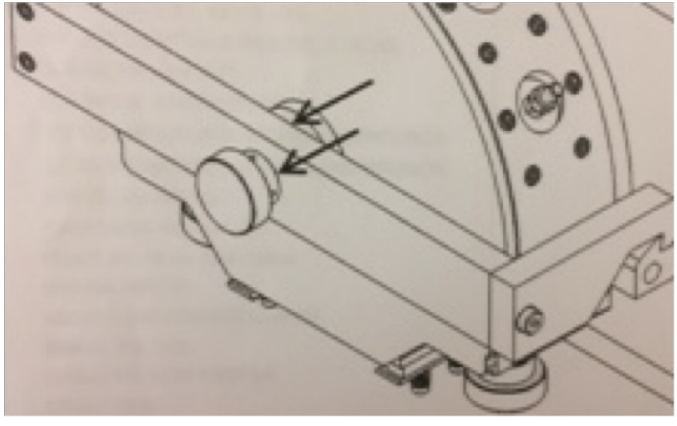
CAUTION: DO NOT OVER TIGHTEN HEX HEAD BOLT HOLDING THE ROTATING CUTTER AS THIS MAY CAUSE THE BOLT TO SNAP

Blade Maintenance And Replacement (1171H10 and 1173U48)

10. Loosen nuts of the first stationary knife to be adjusted. Insert a piece of paper of the necessary thickness (0.002 to 0.003 in.) between the knife and any of the rotor knives, and adjust the clearance by raising or lowering the stationary knife until it pinches the paper but does not sever it.
11. Slightly tighten the two setscrews holding the knife in place. (May require further adjustment later.)
12. Turn rotor to make certain that all rotor knives clear the installed stationary knives. If one rotor knife projects beyond the others, adjust clearance of stationary knife with respect to this rotor knife. Identify this rotor knife and make all stationary knife adjustments with respect to it.
13. Repeat steps 11 and 12 above for the remaining stationary knives. Recheck all clearance and all associated nuts and set screws.

General Maintenance

The door screw could become difficult to tighten over time. If so, apply Lithium grease to the threads.



The unit cutting chamber should be cleaned after use. Unit must be turned off prior to opening the cutting chamber door.

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