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Assembly Instructions - Schatten Design Coil Winding Machine Model BK3 series- Kit

Tools you'll need: rubber band, small phillips head screw driver, wire cutter/ wire stripper, rosin core (radio/tv) solder, small soldering iron 15 to 35 watts or soldering station set to approx. 700F. Optional tools - 10 mm socket (toggle switches), 14 mm socket or wrench (power jack).

Important notes

When the power supply is initially connected to the machine it will run through a diagnostic test and will display that information on the screen. It will show the following:

- a) Board - indicates the current board voltage. It will normally read between 4.5 and 5 volts.
- b) Hall - normally will read between 1 and 5 volts. Note that on occasion it may read 0 volts if the Hall sensor trigger happens to be lined up directly with the sensor itself. This is not an issue.
- c) SDA and SCL (OLED display) - both will normally read between 1 and 5 volts.

On completion of the diagnostic test the machine will begin a countdown from three to zero. Make sure that the winder direction is set to OFF and that the speed control pot is also turned fully OFF. Otherwise when the countdown gets to zero the machine will begin running.

QTY	PARTS	PART NUMBER	QTY	PARTS	PART NUMBER
1	ENCLOSURE, PRE-DRILLED	1594DSBK			
1	WHITE WOOD COMPOSITE BOARD			PARTS BAG 2	
			1	10K B TAPER POT w/parts	
1	CIRCUIT BOARD	New B-6-13-22	1	MOTOR w/PRINTED PULLEY	
			1	MAGNETIC HALL TRIGGER	
	MICRO PROCESSORS		2	O-RING DRIVE BELTS 2 1/8 x 2 1/4 x 1/16	OR-034N
1	ARDUINO	NANO	1	WIRE CLIP GREY	
1	SPEED CONTROL	TB6612FNG (Modified)	1	2.1 mm POWER JACK w/nut, lock washer	
			1	KNOB	
	OLED				
1	OLED COUNTER			PARTS BAG 3	
1	OLED CLIP		1	WINDER ARM w/ 10-24x3/8 soc set screw	
	CROSS FEED ASSEMBLY		2	BEARINGS	FR4ZZ
1	LIMIT SHAFT	4" STAINLESS	1	MAIN SHAFT PULLEY	PRINTED
1	PRINTED STAND OFF	1/4 X3/4 X 6"	2	1/4" COLLARS	1/4" COLLAR
1	1/4" FLAT WASHER	1/4" FLAT WASHER	1	MAIN SHAFT 1/4" x 4 1/4"	MAIN SHAFT
1	1/4" NUT	1/4" NUT	4	SELF TAPPING SCREWS - BAGGED	COVER MTG SCREWS
2	1/4" COLLARS	1/4" COLLAR	2	1/4 x 20 x 1" FLAT HD PAN PHIL	WINDER TO BASE MTG
2	#4 x 1/2" PAN PHIL STAINLESS	STAND OFF MOUNTING	1	SAMPLE PIECE DOUBLE SIDED TAPE	
2	#6 FLAT WASHERS	STAND OFF MOUNTING			
	PARTS BAG 1			WIRE	
4	NUTS FOR TOGGLE SWITCHES		1	WIRE BLACK 22 GA - 18"	
2	LOCK WASHERS TOGGLE SWITCHES		1	Wire White 22 GA - 18"	
2	TABBED WASHERS TOGGLE SWITCHES		1	WIRE RED 22 GA - 18"	
2	M3 x 5 MACHINE SCREWS	MOTOR MTG SCREWS	1	WIRE GREEN 22 GA - 18"	
1	ALLEN KEY 5/64"		1	4 CONDUCTOR WIRE HARNESS	
1	ALLEN KEY 3/32"				

Counter Installation

- 1) The counter consists of two parts: the OLED Counter and retaining Clip (fig 1a).
- 2) Lay the counter on a flat surface with the connector pins to the right and facing up. Position the box lid opening directly over the counter. Press the box lid down so that the counter fits into the box lid. (fig 1b).
- 3) Place the clip flat on the counter and place and secures the counter to the lid



fig 1a

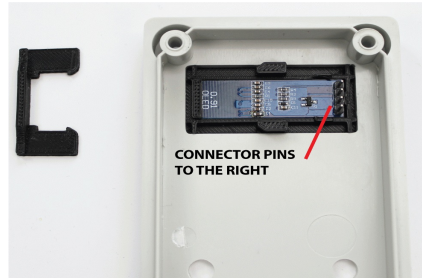


fig 1b

push the clip to the right until it locks into (fig 1c).

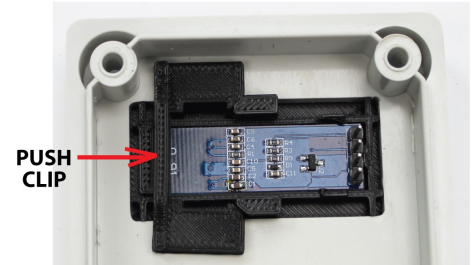


fig 1c

Circuit Board Installation

- 1) Install a nut onto each toggle switch. Rotate the nut all the way to the bottom of the switch (fig 2).
- 2) Install a lock washer on top of each nut.
- 3) Mount the circuit board to the cover by inserting the toggle switches through the holes in the cover. Note the alignment of the circuit board as shown (fig 3).
- 4) Note that the toggle switches have a slot or keyway down their threaded surface (fig 4). Install a small tabbed flat washer (tabs should face away from the surface of the cover) and a nut on the toggle switches and using a 10mm socket or wrench tighten the nuts to mount the circuit board.

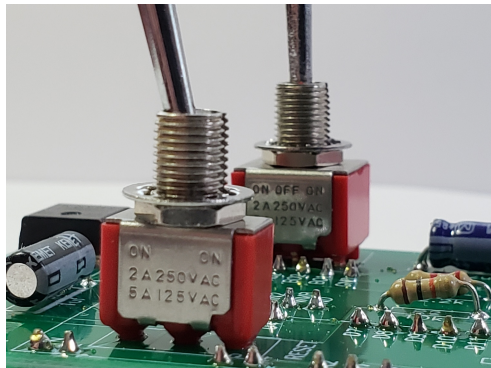


fig 2

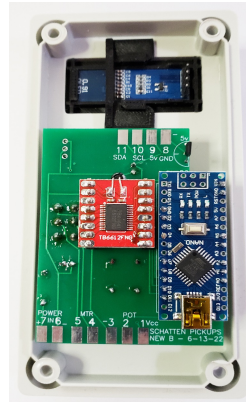


fig 3



fig 4

Speed Control Pot Wiring

- 1) Cut an 8 inch piece each of red, white, and green wire.
- 2) Strip 1/4" at the ends of each wire and tin the ends.
- 3) Tin the three lugs of the pot.
- 4) Solder the wires to the lugs exactly as shown in fig 5. Green to left lug, red to the center lug, white to the right lug.
- 5) Set the pot aside.

Motor Wiring

- 1) Tin the two lugs on the back of the motor.
- 2) Cut a 4 inch piece of red wire, strip 1/4" from each end and tin. Solder one end to the motor lug with the red dot next to it.
- 3) Cut a 4 inch piece of green wire, strip 1/4" from each end and tin. Solder one end to the other motor lug.
- 4) Twist the red and green wires together along their length to keep them paired.
- 5) Set the motor aside.

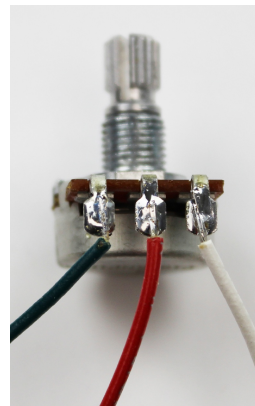


fig 5

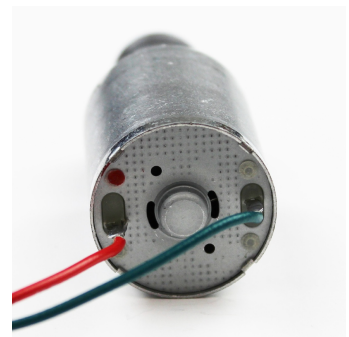


fig 6

Power Jack Wiring

- 1) Tin Lugs 1 and 2.
- 2) Cut a 4 inch piece of white wire, strip 1/4" from each end and tin. Solder one end to Lug 1
- 3) Cut a 4 inch piece of black wire, strip 1/4" from each end and tin. Solder one end to Lug 2
- 4) Twist the white and black wires together along their length to keep them paired.
- 5) Put the 12mm internal tooth on the power jack and insert the power jack through the hole in the back wall of the box. Tighten the power jack using a 14mm wrench (figures 7 and 9).
- 6) Remove the backing from the adhesive pad of the small gray wire clip. Install the clip about two thirds of the way down from the top of the box (fig 9).

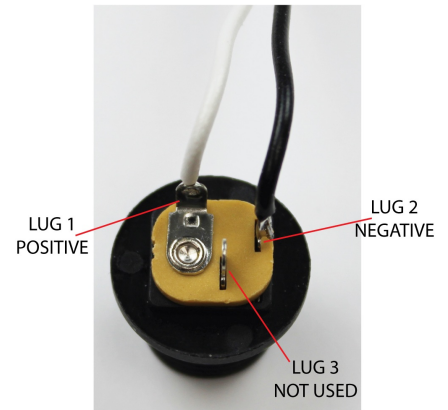


fig 7

Mount The Motor

- 1) Insert the pulley end of the motor through the larger hole in the lower right wall of the box (fig 8).
- 2) Slide the motor toward the rear of the box into the smaller opening.
- 3) There are two threaded holes in the face of the motor. Line up a threaded hole with the upper mounting hole of the box. Insert an M3 x 5 philips head machine screw and tighten about 2 turns. Use the smallest diameter philips screw driver that you have. There is very limited clearance between the motor pulley and the motor mounting screws; do not tighten this first screw down all the way yet.
- 4) Line up the lower threaded hole in the motor with the lower mounting hole of the box, insert the second M3 x 5 machine screw and tighten completely.
- 4) Now finish tightening the upper mounting screw.



fig8

Mounting The Speed Control Pot

- 1) Install the pot with the lugs facing the back of the enclosure as per fig 9.
- 2) Note that there is a 'pin' on the pot that fits into the small hole that is next to the hole for the pot shaft.
- 3) Install the flat washer and nut and tighten using a 10mm wrench.
- 4) Run the three wires from the pot down through the wire clip and under the motor. Twist the wires a bit to keep them together.



fig 9

Main Shaft Bearings

1) Press the main shaft bearings into place in the holes provided in the box side walls. They are pressed from the outside of the box.

Installing The Main Shaft

Note: The main shaft has a flat surface on one 'side'.

When securing collars, Hall trigger, and pulley, make sure that all of the allen screws are tightened down onto this flat surface.

- 1) Install one collar at one end of the end of the main shaft. Line up the allen with the flat of the shaft and tighten the collar.
- 2) Insert the main shaft part way into the box from the left side of the box.
- 3) Slide the Hall trigger onto the main shaft with the collar part away from the side wall (fig 10).
- 4) Fold the wires into the box so that you can put the cover on the box. Take a rubber band and place it around the box and cover.
- 5) Install the second collar onto the main shaft and slide it down flush with the bearing. Do not exert any real pressure or squeeze the box as this collar is installed. Tighten the allen on the collar.
- 6) Remove the rubber band and cover.
- 7) Position the Hall trigger 6mm (1/4") from the interior sidewall (distance A).

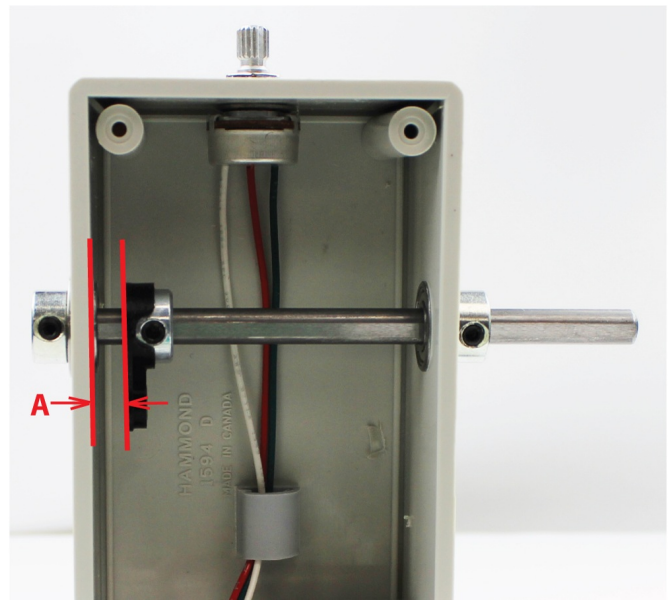


fig 10

Main Circuit Board Wiring (fig 11)

- 1) Tin solder pads 1 through 11 on the circuit board.
- 2) Solder the white wire from the power jack to pad 7
- 3) Solder the black wire from the power jack to pad 6
- 4) Solder the red wire from the motor to pad 5
- 5) Solder the green wire from the motor to pad 4
- 6) Solder the green wire from the speed pot to pad 3
- 7) Solder the red wire from the speed pot to pad 2
- 8) Solder the white wire from the speed pot to pad 1

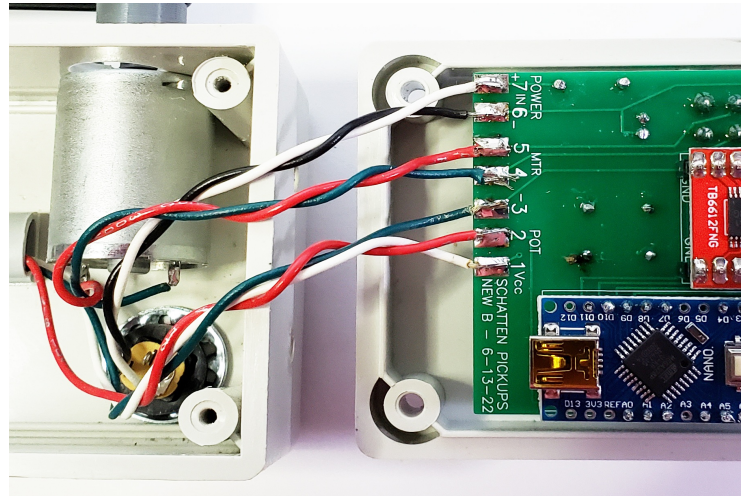


fig 11

OLED Counter Wiring fig 12a

- 1) Take the 4 conductor wire harness and cut the wire length down to 2 1/2".
- 2) Strip the wires back 1/4" and tin them.
- 3) Solder the green wire to pad 11
- 4) Solder the red wire to pad 10
- 5) Solder the white wire to pad 9
- 6) Solder the black wire to pad 8
- 7) Push the connector onto the OLED pins so that they align as shown in fig 12b.

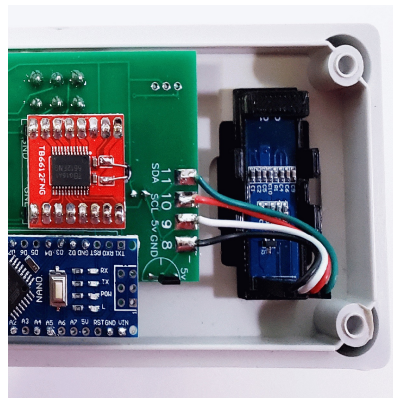


fig 12a

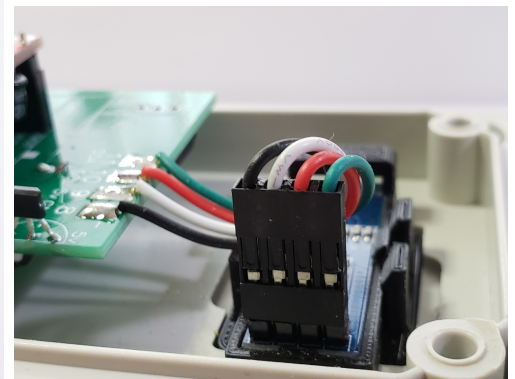


fig 12b

Hall Sensor (fig 13)

The Hall sensor is the electronic part that triggers the counter when the magnetic Hall trigger mounted on the main shaft rotates past it.

Please make sure that the Hall sensor extends straight up from the circuit board. Occasionally in shipping it can be bent over slightly. It should be straight up.

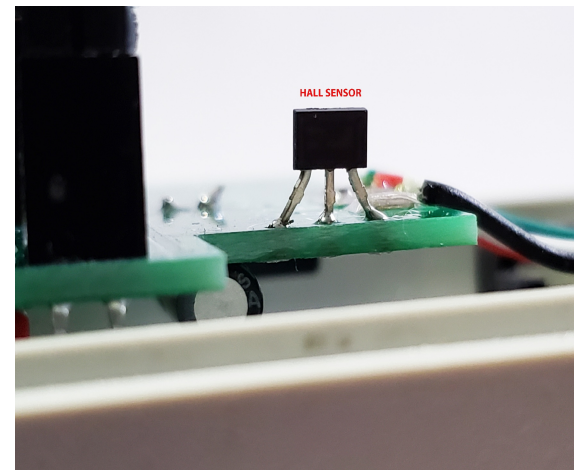


fig 13

Main Shaft Pulley and Winder Arm

- 1) Install the 4 self tapping screws to secure the cover to the box.
- 2) Slide the main shaft pulley onto the main shaft. Install the drive belt around both pulleys. Position the main shaft pulley so that the drive belt is in a straight line with the motor pulley. Make sure that the allen on the main shaft pulley is aligned on the flat of the main shaft. Lightly tighten the allen, do not over tighten.
- 3) Install the winder arm flush at the end of the main shaft and tighten the allen.
- 5) Install the knob on the speed control pot.

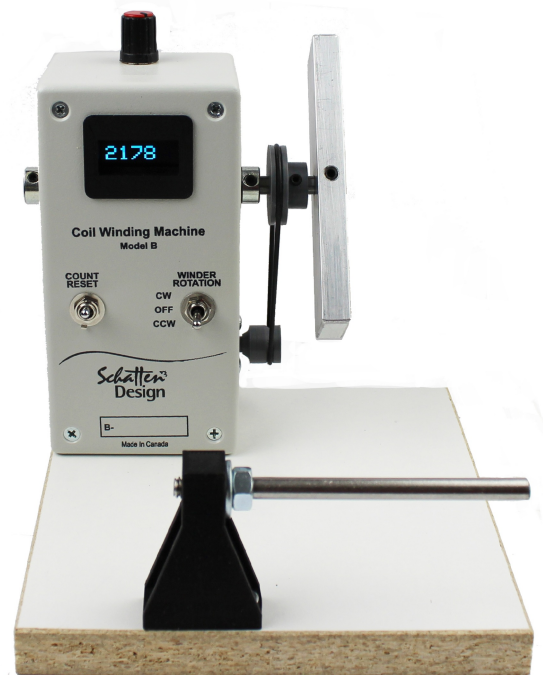


fig 14

Traverse Assembly

There are two small holes drilled near the front right of the white work surface

- 1) Mount the traverse support 'A' to the work surface using the two small screws and washers as shown 'C'.
- 2) Install the nut 'D' to the end of the threaded portion of the traverse shaft 'B'.
- 3) Install the flat washer 'E' onto the traverse shaft.
- 4) Thread the traverse shaft with washer and nut into the traverse support as far as it will go.
- 5) With a small wrench tighten the nut against the traverse support.
- 6) Install the two collars 'F' onto the traverse shaft. Make sure to have the allen screws facing straight up.

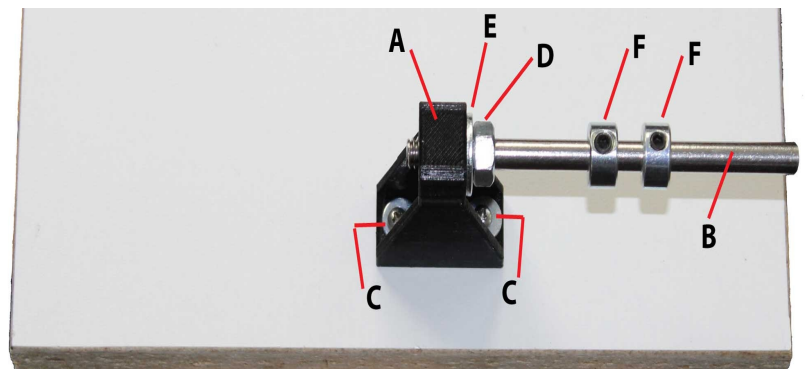


fig 15

Mounting The Winder

- 1) Attach the machine to the white base using the two large 1/4 x 20 screws provided. Insert the screws from the counter-sunk side of the board and tighten securely into the pre-tapped holes in the bottom of the machine.

Attaching A Bobbin To The Winder Arm

The simplest method for securing a bobbin to the winding arm is by using a piece of double sided tape. Supplied with the machine is a sample of this type of tape. It can be a cloth or a fiber glass woven double sided tape (usually marketed as a carpet tape) and can be found in most hardware stores. Notice from the sample that the tape is folded in two to provide the best conformity. The same piece of tape can normally be used numerous times.

Before pressing the bobbin into place, visually make sure that the bobbin is centered on the arm so that the coil winds evenly.

Starting A Wind

- 1) Place your spool of coil wire about 3 or 4 feet behind you and about on the level of the winder base so that the wire may unspool end on. It will help if the leading edge of the spool is tipped up about 15 degrees.
- 2) Take a bit of masking tape and tape the end of the coil wire to underside of the winding arm. This should provide enough 'free' wire after the wind is completed to solder to the bobbin's eyelets or to the lead out wires.
- 3) Rotate the winder arm by hand to run the coil wire around the bobbin about 6 turns.
- 4) Run the wire under the limit shaft and adjust the inner limit collar so that the wire winds inside of the inner bobbin edge. You should be rotating the winder by hand to make this adjustment.
- 5) Repeat the same procedure to set the outer limit collar.
- 6) The coil wire is grasped lightly between thumb and forefinger so that it may be controlled and moved between the set limits. The pressure that is exerted on the wire by the thumb and forefinger provides the winding tension.
- 7) When you are satisfied that the limits are properly set, turn the machine on at low speed. Slowly move the wire back and forth between the limits to again check that the wire is winding properly within the bobbin.
- 8) If everything is satisfactory, increase the speed as required.