



# MODEL H 90SB

## 1. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

The circled numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram:

### 1-1. Disassembly:

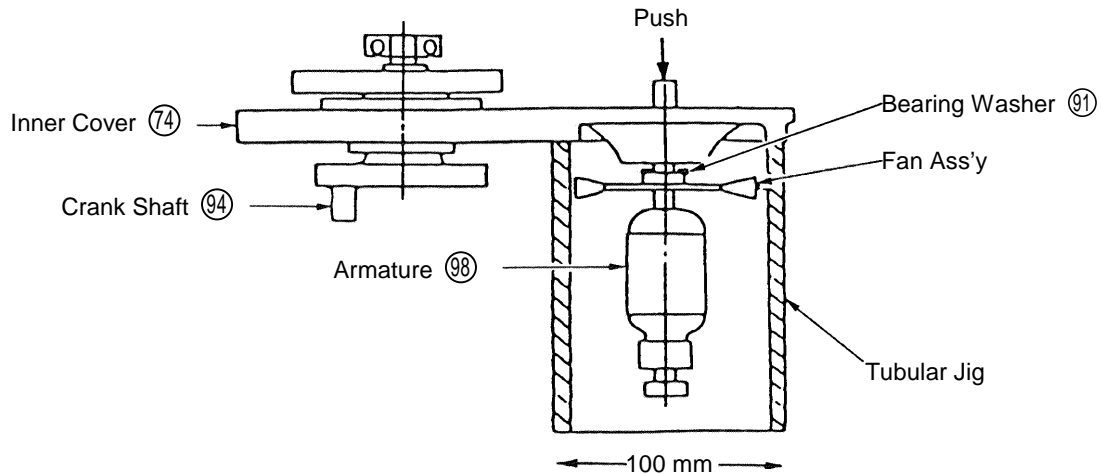
(NOTE) If it is difficult to loosen and remove the fixing bolts, use an appropriate heating device to heat them to approximately 80°C (176°F).

#### (1) Disassembly of the Armature ⑨⑧:

- A. Remove the four M6 x 20 Hexagon Socket Hd. Bolts ①①②, and disassemble the Housing Cover ①①⑧.
- B. Remove the two M5 x 10 Hexagon Socket Hd. Bolts ⑧①, and disassemble the Tail Cover ⑦⑧ and Carbon Brushes ②⑧.
- C. Pry off the E-Type Retaining Ring ②③ with a small minus screwdriver, pull out the Pin ②⑤, and remove the Switch Lever ②④. Then, remove the two M6 x 16 Hexagon Socket Hd. Bolts ①② and four D4 x 20 Tapping Screws ①⑦, and take off Handle (A) ①④ and Handle (B) ①⑨.
- D. Loosen and remove the Oil Cap ⑦⑦ from the Housing Ass'y ⑦⑤.

(NOTE) It is strongly recommended that the optional accessory Wrench ⑥①⑤ (Code No. 936728) be utilized to remove the Oil Cap.

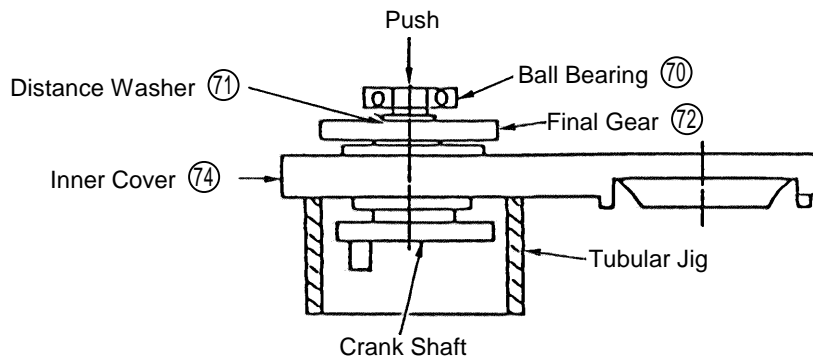
- E. Remove the four M10 x 45 Bolts ③⑦, and take off the Cylinder Case ③⑥. Next, remove the M10 x 16 Hexagon Socket Hd. Bolt ⑤⑨. The Connecting Rod Ass'y ④⑤ and Crank Washer ⑤⑧ can then be taken out. Leave the Striker ④① and Piston ④③ as they are.
- F. Remove the four M10 x 60 Hexagon Socket Hd. Bolts. ⑥⑥ and two M10 x 55 Hexagon Socket Hd. Bolts ⑧③, and take off the Gear Cover ⑧④. At this time, also remove the Counter Gear ⑧⑥. Next, insert a minus screwdriver or similar tool into one of the air vents on the Inner Cover ⑦④, and lift it upward to remove the Inner Cover ⑦④, Armature ⑨⑧, Crank Shaft ⑨④, and related parts in a single body.
- G. As illustrated in Fig. 8, support the lower surface of the Inner Cover ⑦④ with an appropriate tubular jig (100 mm inner dia.), and push down on the pinion end of the Armature ⑨⑧ with an arbor press to separate the Armature from the Inner Cover ⑦④. At this time, be very careful not to lose the Bearing Washer ⑨① which is mounted on the fan ass'y portion of the Armature.



**Fig. 8**

**(2) Disassembly of the Crank Shaft (94) Section:**

As illustrated in Fig. 9, support the lower surface of the Inner Cover (74) with an appropriate tubular jig (100 mm inner dia.), apply an appropriate steel rod (maximum diameter of 19 mm) to the end surface of the Crank Shaft (94), and push it downward with an arbor press. The 6204 VVCM Ball Bearing (70), Distance Washer (71), Final Gear (72), 4 x 4 x 15 Feather Keys (93), and Crank Shaft (94) can then be removed from the Inner Cover (74).



**Fig. 9**

**(3) Disassembly of Remaining Parts from the Inner Cover (74):**

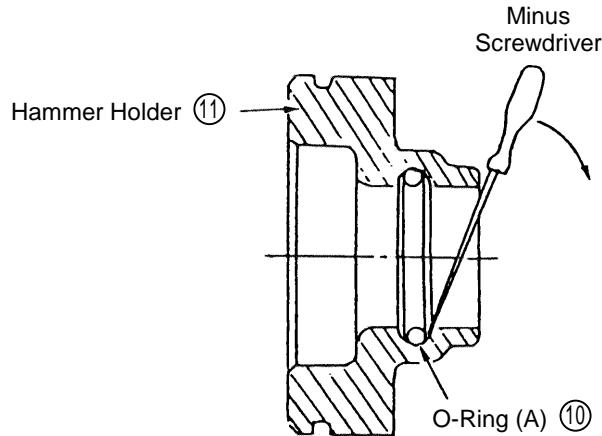
Remove the four M6 x 20 Hex. Socket Hd. Bolts (57), and take off the Bearing Boss (55) and the 6305 ZZCM Ball Bearing (52). Then, remove the three M5 x 14 Hex. Socket Hd. Bolts (87), and take off Bearing Cover (A) (88) and the 6203 VVCM Ball Bearing (90).

**(4) Disassembly of the Mouth (33) Section:**

Secure the Cylinder Case (36) in a vise, and heat the Cylinder Case mounting portion of the Front Cover (5) to a temperature of approx. 80°C (176°F) with an appropriate heating device. Then, remove the six M12 x 40 Bolts (3). The Front Cover (5) together with the Second Hammer (8) and the Hammer Holder (11) can then be removed from the Cylinder Case (36) in a single body. The Damper (31), Damper Plate (32) and Mouth (33) can then be taken out.

**(5) Removal of O-Ring (A) (10):**

As O-Ring (A) (10) is installed in the inner portion of the Hammer Holder (11), it may be difficult to remove. As illustrated in Fig. 10, pry O-Ring (A) upward gently with a small minus screwdriver, being very careufl not to damage the surface of the O-Ring.



**Fig. 10**

**(6) Removal of the Striker (40) and Related Parts:**

Remove the four M10 x 45 Bolts (37), and separate the Cylinder Case (36) from the Housing Ass'y (75). From the Cylinder Case, take out the Striker (40), Piston (43) and Connecting Rod Ass'y (45) in a single body. Secure the Striker (40) in a vise, and forcefully pull off the Connecting Rod Ass'y (45) by hand. Then, extract the Piston Pin (42) from the Piston (43), and separate the Piston from the Connecting Rod Ass'y (45).

**(7) Disassembly of the Switch (20) and Related Parts:**

Pry off the E-Type Retaining Ring (23) with a small minus screwdriver, pull out the Pin (25), and remove the Switch Lever (24). Then, remove the two M6 x 16 Hex. Socket Hd. Bolts (12) on the Handle (B) side and the four D4 x 20 Tapping Screws (17), and remove Handle (B) (19).

**1-2. Reassembly:**

Reassembly can be accomplished by following the disassembly procedure in reverse. However, special attention should be given to the following items.

**(1) Reassembly of the Crank Shaft (94):**

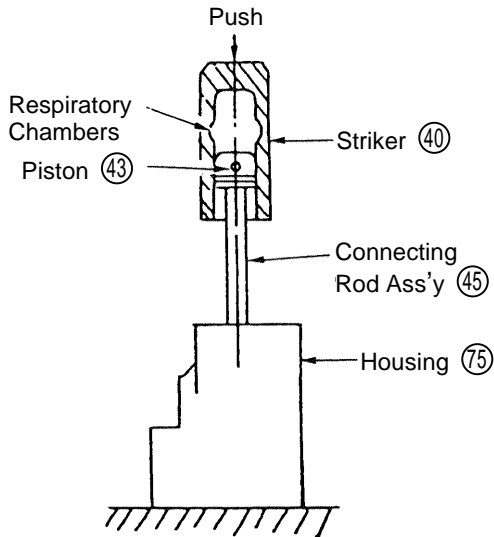
Mount the Bearing Boss (55), Oil Seal (53) and 6305 ZZCM Ball Bearing (52) onto the Crank Shaft (94), and secure the Bearing Boss (55) to the Inner Cover (74) with the four M6 x 20 Hex. Socket Hd. Bolts (57). Support the inner race of the 6305 ZZCM Ball Bearing (52) with a J-127-5 Sleeve (Special Repair Tool, Part No. 970899), and press fit the Crank Shaft (94) into the Ball Bearing (52). Then, insert Distance Ring (B) (73) and the two 4 x 4 x 15 Feather Keys (93) onto the Crank Shaft (94), and press fit the Final Gear (72). Finally, press fit the 6204 VVCM Ball Bearing (70) onto the Crank Shaft (94).

**(2) Reassembly of the Armature (98):**

Press fit the 6203 VVCM Ball Bearing (90) into the Inner Cover (74), cover it with Bearing Cover (A) (88), and secure the assembly with the three M5 x 14 Hex. Socket Hd. Bolts (87).

(3) Reassembly of the Striker (40): (Two possible methods)

A. After the Connecting Rod Ass'y (45) has been assembled on the Crank Shaft (94) within the Housing Ass'y (75), mount the Piston (43) and press on the Striker (40).



B. Mount the Piston (43) on the Connecting Rod Ass'y (45), and press the Piston into the Striker (40).

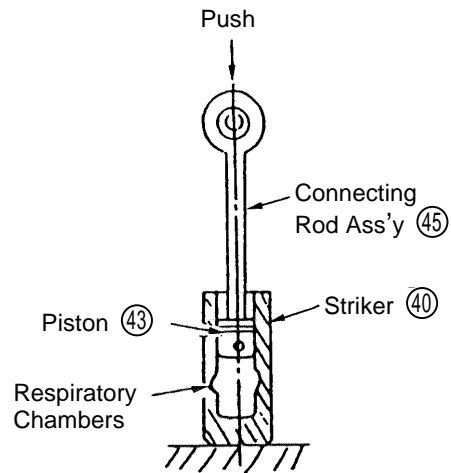


Fig. 11

Either of the two methods described above requires a pressing force of more than 30 kg. When a "hissing" sound is heard, the Piston is properly inserted in the Striker. (The "hissing" is the sound of the compressed air escaping from the Striker when the Piston reaches the respiratory chambers within the Striker.)

(4) Reassembly of the Oil Seal (53) and Oil Seal (A) (44):

When mounting the Oil Seal (53) in the Bearing Boss (55), and when mounting Oil Seal (A) (44) in the Piston (43), carefully ensure that they are mounted in the proper direction as described below.

A. Mounting of the Oil Seal (53):

As illustrated in Fig. 12, the lip side of the Oil Seal (53) must be facing in the same direction in which the Crank Shaft (94) is assembled.

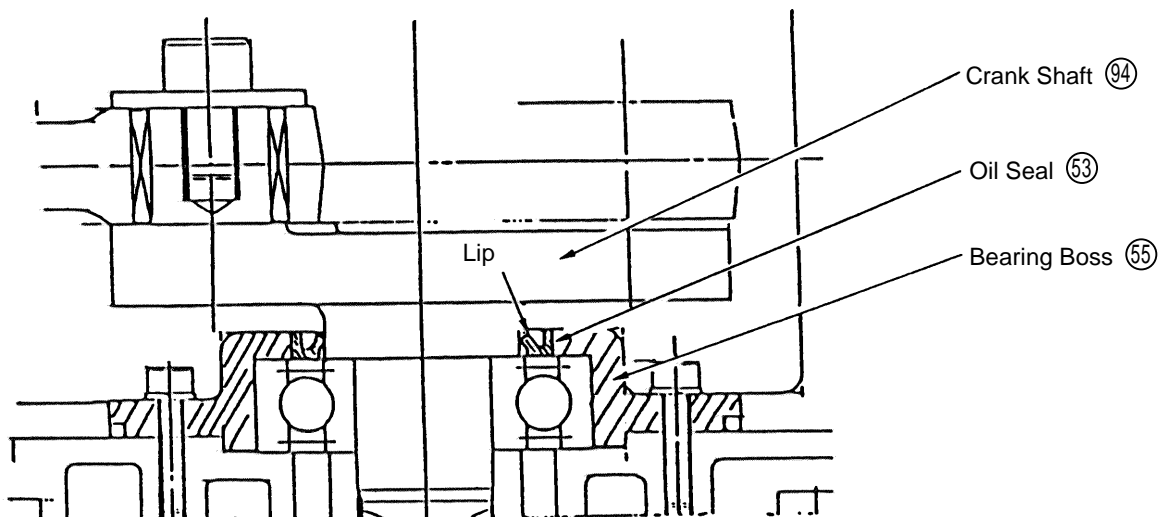
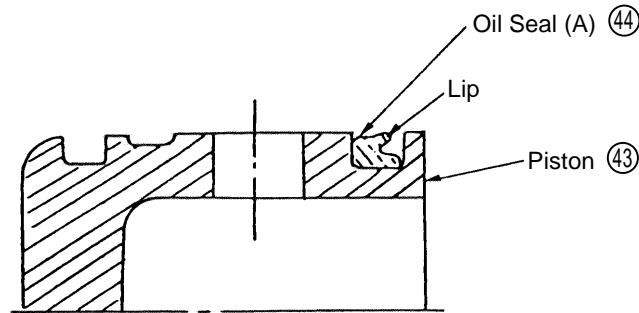


Fig. 12

B. Mounting of Oil Seal (A) ④④:

As illustrated in Fig. 13, the lip of Oil Seal (A) ④④ must be facing the rear portion side of the Piston ④③.



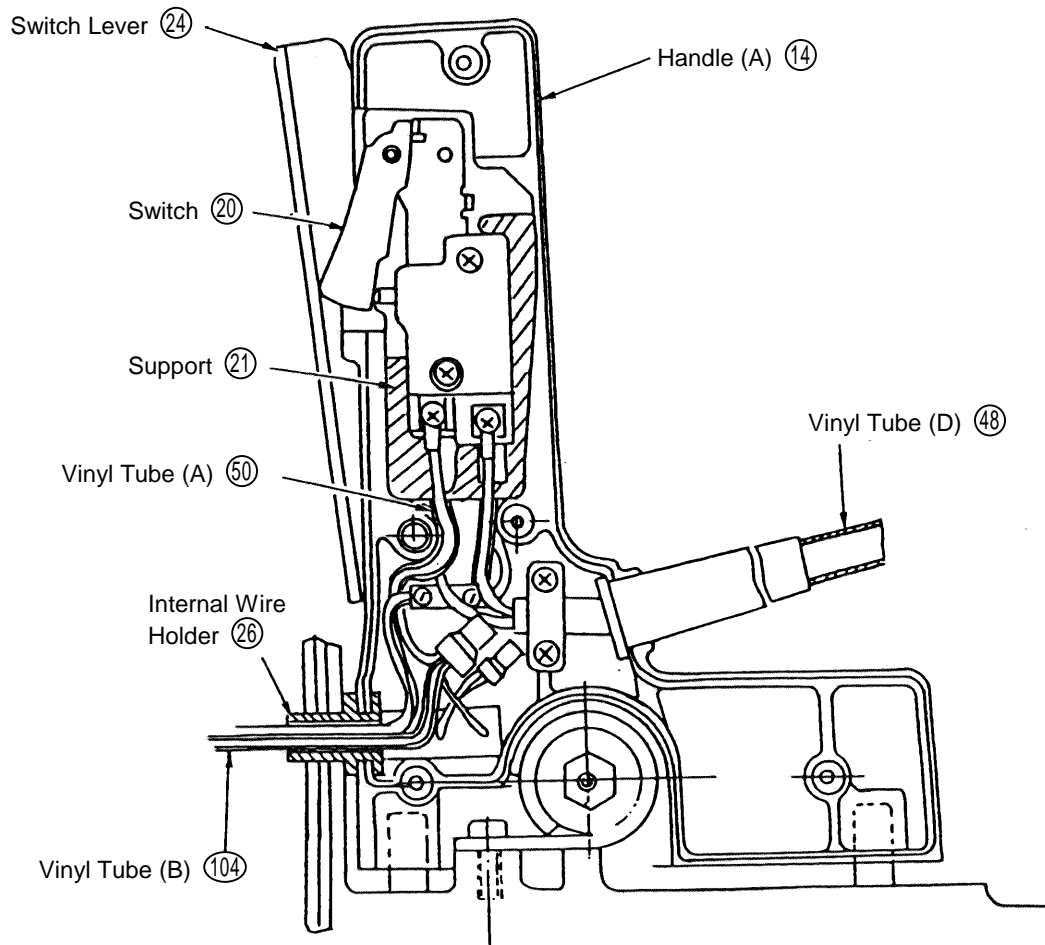
**Fig. 13**

(CAUTION) When assembling Oil Seals and O-Rings, thoroughly coat them with grease (Part No. 980927), and be very careful not to damage them.

(5) Safety Guidance in Wiring Work:

The Switch ②① is flexibly supported by the Support ②① to protect it from excessive vibration and extend its service life.

The outer surfaces of the Cord ④⑦ (Cabtyre Cable) and lead wires are covered by Vinyl Tubes ④⑧, ⑤① and ①①④. The vinyl tubes are utilized to protect the Cord and leadwires from damage. Ensure without fail that they are properly mounted during reassembly. When reassembling the Internal Wire Holder ②⑥, carefully ensure it is properly installed between Handle (A) ①④ and Handle (B) ①⑨.



**Fig. 14**

### 1-3. Use of Screw Locking Agents:

- (1) Coat the threaded portions of all M5, M6, M8 and M10 Hexagon Socket Hd. Bolts with TB1401 Screw Locking Agent prior to tightening them.
- (2) The M10 x 45 Bolts ③⑦ and M12 x 40 Bolts ③, which fasten the Cylinder Case ③⑥ and Front Cover ⑤ respectively, are special bolts and must be replaced with **new** genuine Hitachi parts if they are loosened.

**(CAUTION)** If fastening bolts come loose from vibration, it could cause serious damage to the machine. Ensure without fail that TB 1401 Screw Locking Agent is applied as directed above prior to reassembly.

Before applying the TB 1401, carefully clean any grease or other foreign matter from the male and female threads with gasoline, thinner or similar cleaning solvents.

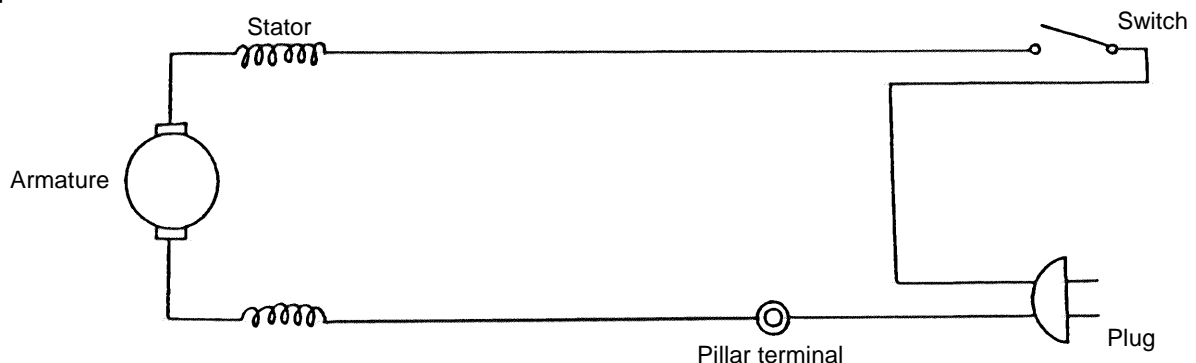
### 1-4. Tightening Torques:

M5 Hexagon Socket Hd. Bolts .....	80 $\begin{smallmatrix} +20 \\ 0 \end{smallmatrix}$ kg-cm ( 69.5 $\begin{smallmatrix} +17.4 \\ 0 \end{smallmatrix}$ in-lb)
M6 Hexagon Socket Hd. Bolts .....	100 $\begin{smallmatrix} +20 \\ 0 \end{smallmatrix}$ kg-cm ( 86.9 $\begin{smallmatrix} +17.4 \\ 0 \end{smallmatrix}$ in-lb)
M8 Hexagon Socket Hd. Bolts .....	200 $\begin{smallmatrix} +20 \\ 0 \end{smallmatrix}$ kg-cm ( 173.8 $\begin{smallmatrix} +17.4 \\ 0 \end{smallmatrix}$ in-lb)
M10 Hexagon Socket Hd. Bolts .....	300 $\begin{smallmatrix} +30 \\ 0 \end{smallmatrix}$ kg-cm ( 260 $\begin{smallmatrix} +26 \\ 0 \end{smallmatrix}$ in-lb)
M12 Hexagon Socket Hd. Bolts .....	500 $\begin{smallmatrix} +30 \\ 0 \end{smallmatrix}$ kg-cm ( 434.4 $\begin{smallmatrix} +26 \\ 0 \end{smallmatrix}$ in-lb)

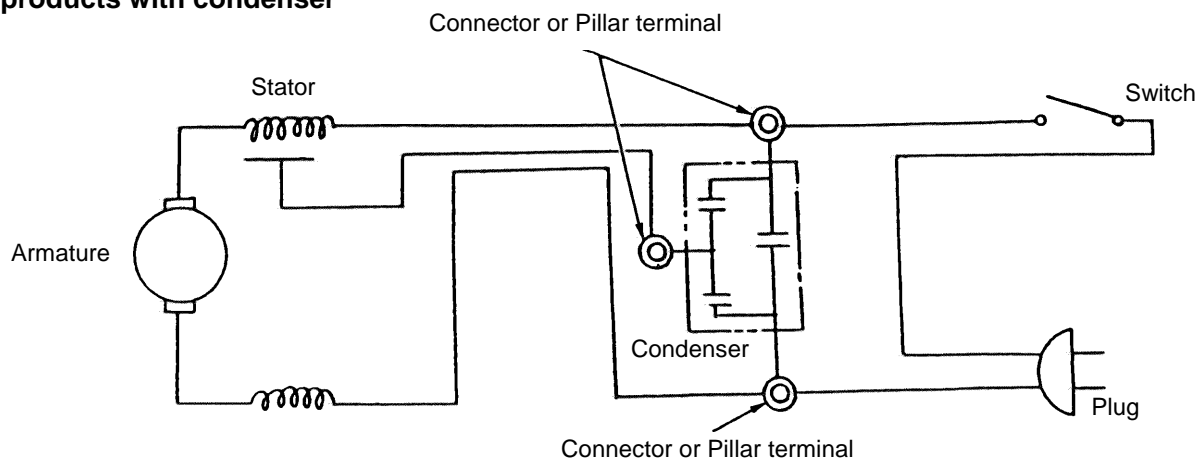
(NOTE) If above bolts are tightened more than the designated values, it may cause breakage. Without fail, tighten the Bolts according to above specified values.

### 1-5. Wiring Diagrams:

#### • For products without condenser



#### • For products with condenser



#### **1-6. Insulation Tests:**

On completion of disassembly and repair, measure the insulation resistance and conduct dielectric strength test.

Insulation Resistance: 7M  $\Omega$  or more with DC 500 V Megohm Tester

Dielectric Strength: AC 4000 V/l minute, with no abnormalities.....220 V - 240 V  
(and 110 V for U. K. products)  
AC 2500 V/l minute, with no abnormalities.....110 V - 127 V  
(except U. K. products)

#### **1-7. No-Load Current Value:**

After no load operation for 30 minutes, the no-load current value should be as follows:

- 5.8 A or less at 110 V, 50/60 Hz
- 5.7 A or less at 115 V, 50/60 Hz
- 5.5 A or less at 120 V, 50/60 Hz
- 5.3 A or less at 127 V, 50/60 Hz
- 3.6 A or less at 220 V, 50/60 Hz
- 3.5 A or less at 230 V, 50/60 Hz
- 3.4 A or less at 240 V, 50/60 Hz