Basic Electrical Engineering

PRACTICAL

Contents (Practical)

Practical 1

PRACTICALS

Dismantling and assembling of steam iron box

AIM

1. To dismantle and assemble the steam iron box.
2. To know the parts of the appliance.
3. To learn about various defaults and remedial measures.

Additional information

An iron box is the household appliance and commonly used by all people. From child to elders, all are not wearing the dress without ironing. This appliance plays a vital role in the modern world.

Electric Iron box is classified into three types.

a. Simple or ordinary iron box
b. Automatic iron box
c. Steam iron box.

a. Simple or ordinary iron box

Now a days an ordinary iron box is not used.

b. Automatic iron box

1. Parts Description:

i) Sole plate

The sole plate is the base plate of the iron box, which is in the bottom side and is laminated with nickel or chromium to make the surface shining. There are two threaded holes at the top of the sole plate, in which heating element and pressure plate are kept and got fitted with top cover of the iron box.

ii) Heating element

The heating element is made up of Nichrome, the metal alloy which is completely wound inside the mica sheet.

iii) Pressure plate

The pressure plate is made up of a cast iron plate of the shape of heating element. Its size is slightly larger than the heating element. It keeps the heating element in a compact and stationary, when the iron box is in motion.

iv) Top cover

It is made up of a sheet cover used to cover heating element and pressure plate of the iron box including electrical connection.

v) Handle

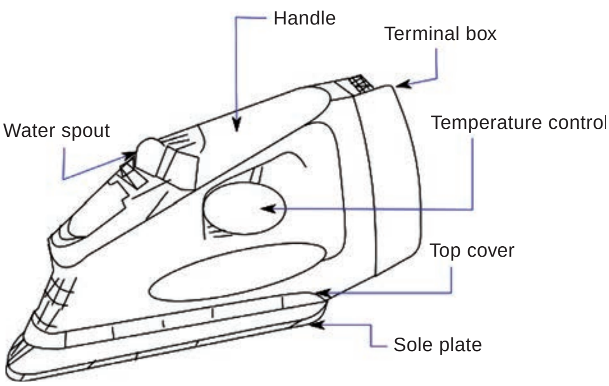
It is made up of bakelite, non-conductive material fitted over the top cover used for handling the iron box.

2. Automatic iron box working principle

An automatic electric iron box is fitted with a thermostat which controls the temperature automatically. Thermostat is a bi-metallic strip which bends when the temperature exceeds the setting limit. An adjustable setting screw or setting knob sets the temperature that should be maintained by the thermostat control.

c. Steam iron box

Steam iron box is similarly same as that of an automatic iron box. In this type, a small water container is provided above the heating element, wherein which water is supplied to sole plate through the holes provided. A valve is provided to control the water flow and steam.

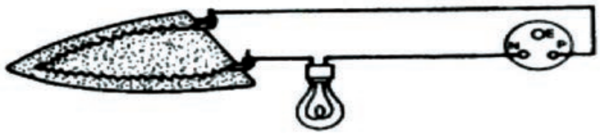


Tools and materials required

1. Electric steam iron box
2. Electrical tools kit
3. Test lamp
4. Megger
5. Multimeter
6. Voltmeter (0 – 250 volts)

Earth fault

Open and short circuit



Dismantling procedure

1. Electrical connection of the steam iron box should be removed from the supply.
2. Remove the screws and nuts and remove the handle and top cover separately.
3. Tubular type of heating element fixed in the sole plate, water container should be removed and place it safely.
4. Measure the resistance of the heating element with the help of multimeter.

After dismantling all the parts of the steam iron box, ensure that all the parts are tested and found in good condition for fitting or assembling.

Assembling procedure

1. Reassemble the dismantled parts from last to first, following the same procedure.
2. Test the insulation value of the terminals with respect to the body of the iron box.

3. Ensure that all the parts of the appliance is fitted without leaving anything and connect the supply wire to the appliance.

	Open circuit	Short circuit	Earthing
Test lamp	Won't glow / Glow	Bright / Dim	Glow / Won't glow
Fault	Occurred / Not occurred	Occurred / Not occurred	Occurred / Not occurred

4. Measure the value of current flowing into the heating element.

Observation record

a. Voltage value of steam iron box = volts
b. Power of steam iron box = watts
c. Frequency of the iron box = hertz

d. Current value of the iron box = ampere
e. Resistance value of the heating element = ohms

Precautionary tips

1. Ensure that the iron box is disconnected from the main supply before handling it.
2. Select the proper range of instruments for measuring current and voltage.
3. While assembling the iron box, ensure that the heating element is placed in proper position with insulated intact.
4. Check the earth connection of the iron box properly fitted.
5. The electric iron box should not be allowed to get too heated. It will spoil the sole plate nickel plating and will get damaged.

Result

The method of dismantling the given Iron box and identify the parts, testing the Iron box, identifying and rectifying its faults, and assembling their on box was carried with proper tools. Now the Iron box is working in good condition.

Practical 2

Electric coffee percolator

AIM

1. To dismantle and know the parts of electric coffee percolator.
2. To test, identify and rectify the faults in the coffee percolator, and
3. To reassemble electric coffee percolator.

Related information

Coffee percolator is a heating appliance used for domestic purpose. This appliance is similar to electric kettle. In this appliance a percolating tube is in centre of the container and coffee basket is kept over it. After coffee powder is put on the basket, the lid is closed and electric supply is given. Then the water in the container gets heated, and the steam soaks the coffee powder and coffee water is collected in the container and can be used when required. In some appliances, the lid is made of glass to know the thickness of the coffee water.

Hand tools and apparatus required

Sl. No.	Hand tools and apparatus required	Quantity
1	Insulated cutting plier	1
2	Screw driver 20 cm and 10 cm	1
3	Spanner set	1
4	Test lamp	1
5	Coffee percolator	1

Dismantling procedure

i. Remove the glass lid of the coffee percolator and keep in safe place.

ii. Remove the percolating tube and coffee basket and keep them separately.

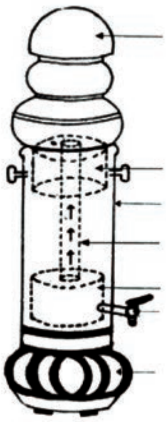
iii. Remove the screws in the bottom of the percolator.

iv. Disconnect the electrical supply leads of the percolator.

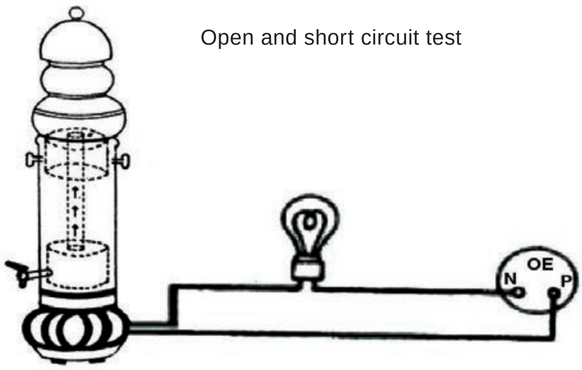
v. Remove the heating element, mica sheet and asbestos sheet and place them separately.

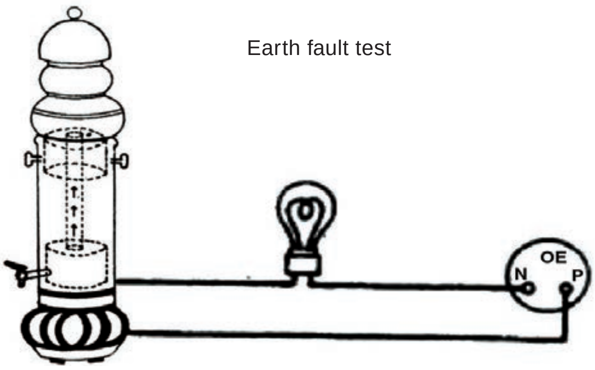
vi In this, the heating element coil is made of nichrome and is turned around mica sheet.

Testing procedure



Connect the heating element terminals in test lamp. If the lamp won't glow, it indicates open circuit. If the lamp glows in maximum brightness, it indicates short circuit. If the lamp glows in dim, it indicates that the heating element is in good condition.





Re-assembling

i. In bottom chamber, the heating element, mica sheet and asbestos sheet are tightened with metal plate, and electrical connection be given.

ii. The connection should be in proper to avoid short circuit. Then close the bottom cover of the coffee percolator.

iii. Before starting the appliance, ensure that the appliance is in good condition by making all the tests like open, short and earth fault.

	Open circuit	Short circuit	Earthing
Test lamp	Won't glow / Glow	Bright / Dim	Glow / Won't glow
Fault	Occurred / Not occurred	Occurred / Not occurred	Occurred / Not occurred

Precautionary tips

1. Ensure that the coffee percolator is disconnected from the main supply before handling it.

Result

In this experiment, I have come to know the parts of electric coffee percolator, the dismantling and reassembling and identifying and rectifying the faults in the coffee percolator. Now the appliance is in good condition.

Practical 3

Dismantling and assembling of an electric geyser

AIM

1. To dismantle and assemble an electric geyser.
2. To examine the various parts of an electric geyser.
3. To study the construction and working principle of geyser
4. To find out the various faults in the geyser.

Related information

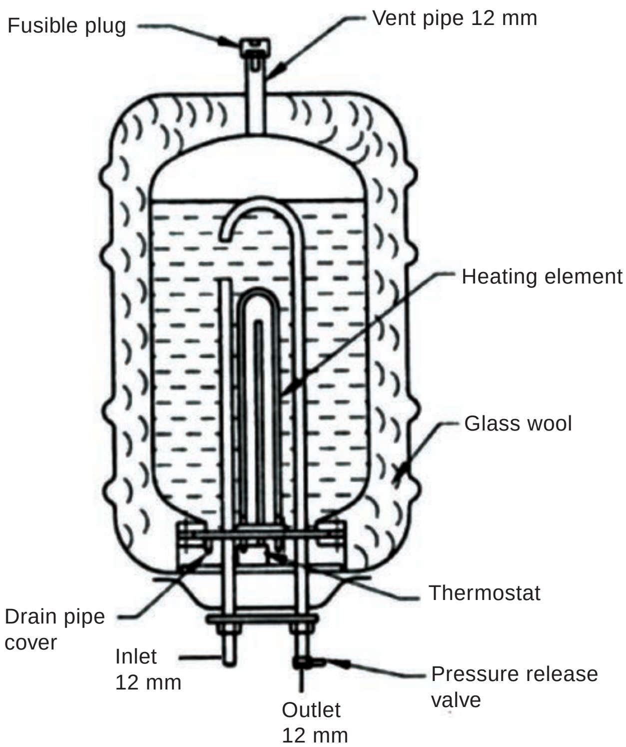
An electric geyser is an appliance used to heat water with electric supply. Generally electric geysers are available with the capacity of 5, 10, 15, 25 and 50 liters. The ratings of the geyser are ranging from 500 watts to 2000 watts.

The inner tank of the electric geyser is made up of copper with tinned coating in the inner side. In some other geyser, the tanks are made up of steel with nickel coating inside. The outer side of the geyser is made up of metal and painted to avoid rusting.

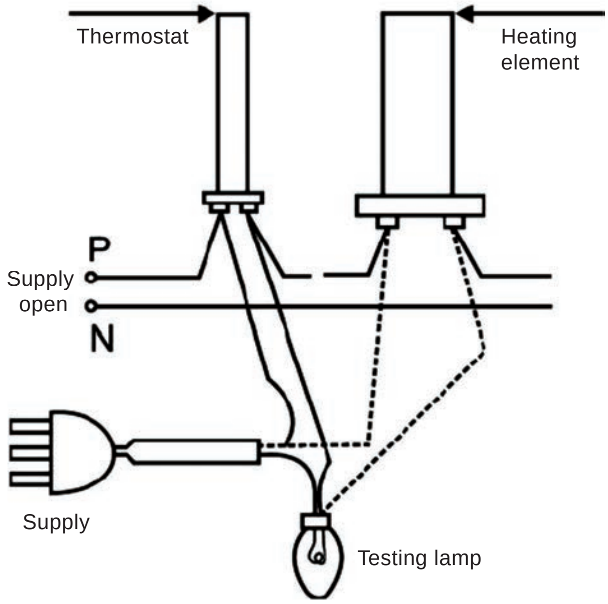
In order to protect the hotness of the water including heat loss inside the tank, a metallic cover is provided around it. Between inner and outer tank 8cm wide space is left around the tank, in which filled with glass wool. This glass wool acts as the heat insulation for the geyser.

According the capacity of the geyser, various size and type of heating elements are used. Commonly tubular type of heating element is used in geyser. The heating element is fitted inside the tube which is filled with magnesium oxide. This magnesium oxide acts as an insulator and prevents the element from touching inside the wall of the tube. The bottom head of the tube is fitted with Bakelite which is fitted with connecting pins of the heating element. The heating element, thermostat and indicating lamp are fitted in the bottom cover as in figure below.

The hot water outlet pipe is arranged in siphon manner, so that the initial water level must reach level 'A'. The water level cannot be reduced below level 'B' which ensures that the heating element will always be inside the water.



The thermostat fitted in the geyser controls the temperature of the water automatically and thus, safeguards the whole unit from overheating. As soon as the temperature of the water inside the tank reaches to the temperature of 85 degree, the heating element is automatically disconnected. Electric connection is restarted as soon as the temperature of the water falls. According to the size and capacity of a geyser, the power consumption vary. A typical rating for a geyser is 230 to 250 volts.



Connection diagram of an electric geyser

Hand tools and apparatus required

Sl. No.	Hand tools and apparatus required	Quantity
1	Electric geyser	1
2	Tools box	1
3	Tester	1
4	Megger	1
5	Multimeter	1

Dismantling procedure

1. Disconnect the main supply of the geyser.
2. Drain out the stored water from the geyser.

3. With the help of megger, test the leakage in the appliance.
4. Remove the bottom cover which contains heating element, thermostat and indicating lamp.
5. Remove the earth connection from the body of the geyser.
6. Remove the fitting clamps of the geyser.
7. Check the continuity of the heating element.
8. After removing the heating element, clean the scale formation by using hydro chloric acid solution.

After verification of all these above, ensure that all the parts and materials of the geyser are in good condition.

Assembling procedure

1. Check it the geyser is clean and fit it with clamps.
2. Connect the earth wire with the body of the geyser.
3. Fit the bottom cover of the geyser properly. (In this heating element, thermostat and indicating lamp are fixed)
4. With the help of megger, check out the electrical leakage, if any.
5. Then connect the electrical supply to the geyser and make sure that it was connected properly and firmly.

Observations made after completion of installation or fitting of the geyser

1. After installation of the geyser, open the inlet tap of the control valve, until the water tank is filled.
2. Switch 'on' the supply and wait for few minutes and then open the hot water tap.
3. Check the continuous flow of warm water is coming properly.
4. Close the tap of hot water when not in use and turn off the supply

	Open circuit	Short circuit	Earthing
Test lamp	Won't glow / Glow	Bright / Dim	Glow / Won't glow
Fault	Occurred / Not occurred	Occurred / Not occurred	Occurred / Not occurred

Observation record

a. Voltage of the geyser :
b. Storage capacity of the geyser :
c. Power supply of the geyser :
d. Frequency supply of the geyser :
e. Current of the geyser :
f. Fuse rating :

Precautions

1. Do not touch the geyser, when the power supply is 'ON'.
2. Check the body of the geyser is electrically insulated, before and after dismantling of the geyser.
3. Before switching 'ON' the electric supply, ensure that the inner water tank of the geyser is filled with water.
4. After completion of the necessity of hot water, disconnect the electrical supply of the geyser.
5. When the geyser is not to be used for a long time, the water in the tank should be drained out by unscrewing the drain plug.

Result

The method of dismantling the given Geyser and identify the parts, testing the Geyser, identifying and rectifying its faults, and assembling the Geyser was carried with proper tools. Now the Geyser is working in good condition.

Practical 4

Table fan

AIM

1. To dismantle the given table fan and identify the parts.
2. Testing the table fan, identifying and rectifying its faults, and reassembling the table fan
3. Test the table fan with supply and run it.

Related information

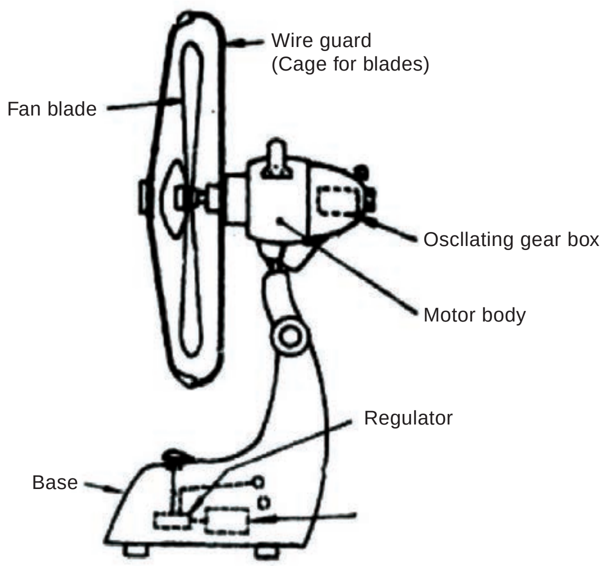
Normally, the sweep of the table fan is available in 220mm, 300mm and 350mm. In some table fans shaded pole motors are used. Generally permanent capacitor induction run motors are used. Table fans are used to circulate the air to the required area. The blades are mounted on the rotating shaft. The blades are covered with a cage for safety purposes. In a table fan the motor is placed at the top of the body and the regulator is fitted on the base. The power consumption of the table fan is 60 watts.

Apparatus Required

Sl. No.	Equipments	Quantity
1	Table fan	1
2	Insulation tape	1
3	Grease	1 pocket
4	Kerosene	100 ml
5	Bearing Puller	1
6	Waste cotton	Required quantity
7	Wooden board	Required quantity

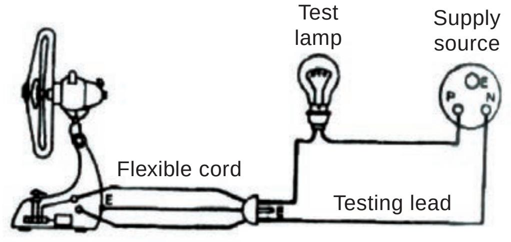
Practical procedure

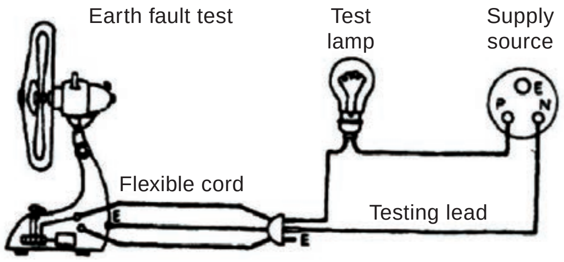
Dismantling



i. Open the clips of the cage.
ii. Cage should be kept separately.
iii. Unscrew the blade mounting screws and remove the blades from shaft.
iv. Unscrew the back cover and remove it.
v. Take out the gear box by removing the mounted screws.
vi. Remove the rotor and keep separately.

DO's after dismantling





Rotor shaft and bearing are cleaned with kerosene and waste clothes. Clean the rotor carefully without damaging the coils. The stator winding is tested with the use of test lamp. Test the capacitor and check whether it is in good condition.

Assembling

i. Fix the back side end cover of the rotor and gear box properly.
ii. Fit the blades and cage in front side properly.
iii. Open circuit test, short circuit test and earth test is to be done by test lamp.

Testing procedure

i. Connect the test lamp to the two terminals of the table fan. If the lamp glows dim, it means the table fan is in good condition. If it glows brightly, it means short circuit fault occurs and the lamp does not glow, it means open circuit fault occurs in the table fan.
ii. Connect the one lead of the test lamp to the one terminal of the table fan and connect the other lead of the test lamp to the body of the table fan. If the test lamp glows, it means earth fault occurs in the table fan.

	Open circuit	Short circuit	Earthing
Test lamp	Won't glow / Glow	Bright / Dim	Glow / Won't glow
Fault	Occurred / Not occurred	Occurred / Not occurred	Occurred / Not occurred

Precaution

i. Do not use hammer when dismantling and assembling the parts.
ii. Handle the bearings carefully.
iii. Conduct the test carefully.

Result

The method of dismantling the given table fan and identify the parts, testing the table fan, identifying and rectifying its faults, and assembling the table fan is carried with proper tools. Now the table fan run with normal speed and it is in good condition.

Practical 5

Ceiling fan

AIM

1. To dismantle the given ceiling fan and identify the parts.
2. To test the ceiling fan, identify and rectify its faults, and assemble the ceiling fan.

Related information

The information of a ceiling fan is obtained from name plate which is fixed on the body of the fan. It helps us to know details of the fan correctly. Generally in ceiling fan, permanent capacitor induction run motor is used. The inner portion of ceiling fan is stator. The outer rotating portion is rotor. Ceiling fan is fitted in the ceiling by conduit metal pipe. When the power supply is given, the blade of the fan rotates and air is circulated around the area where the fan is connected. Regulator is connected in series with the motor to control the speed.

Tools required

Sl. No.	Hand tools	Quantity
1	Insulated cutting plier	1
2	Insulated screw driver 15 cm	1
3	Insulated screw driver 25 cm	1
4	Test lamp	1
5	Spanner set	1

Apparatus required

Sl. No.	Equipments	Quantity
1	Ceiling fan	1
2	Insulation tape	1
3	Grease	1 pocket
4	Kerosene	100 ml
5	Bearing puller	1
6	Waste cotton	Required quantity
7	Wooden board	Required quantity

Practical procedure

Dismantling

i. Separate the fan from ceiling clips.
ii. Unscrew the screws in canopy.
iii. Remove the condenser from its housing.

iv. Remove the blades from the fan.

v. Remove the cover, separate the stator and rotor.

DO's after dismantling

Rotor shaft and bearing are cleaned with kerosene and waste clothes. Clean the rotor carefully without damaging the windings. The stator winding is tested with the use of test lamp. Test the capacitor and check whether it is in good condition.

Assembling

i. Fix the end covers with stator.

ii. Connection is given to the windings and capacitor.

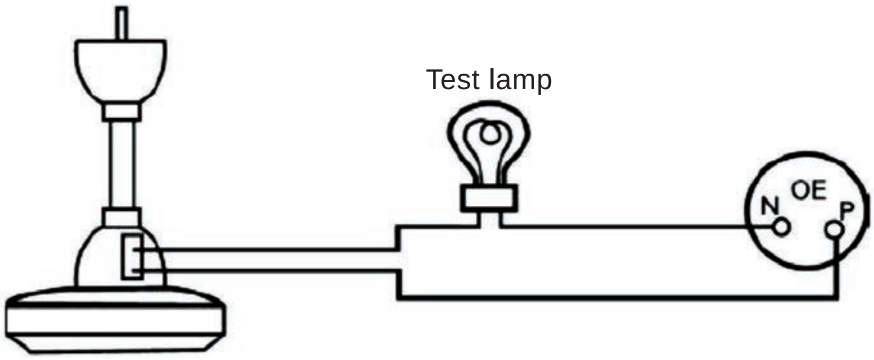
iii. Open circuit test, short circuit test and earth test is to be done by test lamp.

Testing procedure

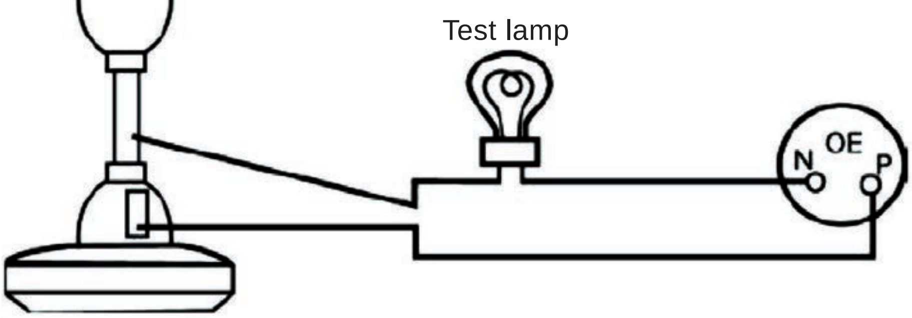
i. Connect the test lamp to the two terminals of the ceiling fan. If the lamp glows dim, it means the table fan is in good condition. If it glows brightly, it means short circuit fault occurs in the ceiling fan and if the lamp does not glow, it means open circuit fault occurs in the ceiling fan.

ii. Connect the one lead of the test lamp to the one terminal of the ceiling fan and connect the other lead of the test lamp to the body of the ceiling fan. If the test lamp glows, it means earth fault occurs in the ceiling fan. Otherwise earth fault does not occur in it.

Open and short circuit test



Earth fault test



	Open circuit	Short circuit	Earthing
Test lamp	Won't glow / Glow	Bright / Dim	Glow / Won't glow
Fault	Occurred / Not occurred	Occurred / Not occurred	Occurred / Not occurred

Precautions

i. Do not use hammer while dismantling and assembling the parts.

ii. Handle the bearings carefully.

iii. Conduct the test carefully.

Result

The method of dismantling the given ceiling fan and identify the parts, testing the ceiling fan, identifying and rectifying its faults, and assembling the fan is carried with proper tools. Now the ceiling fan run with normal speed and it is in good condition.

Practical 6

Water pump

AIM

1. To dismantle the given faulty domestic water pump.
2. To Test, identify the fault and rectify it.

Related information

In domestic pump set, capacitor start induction run motor is used. Two windings are wounded in the stator.

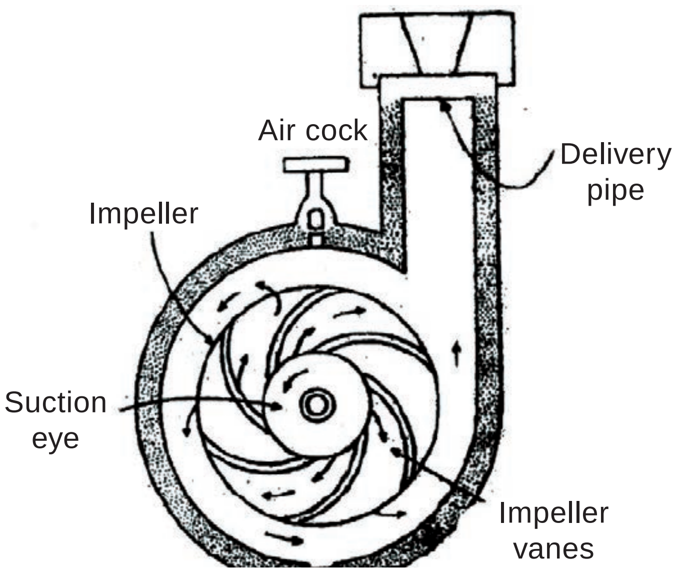
i. Main winding
ii. Starting winding

Starting capacitor and centrifugal switch are connected in series with the starting winding.

Practical procedure

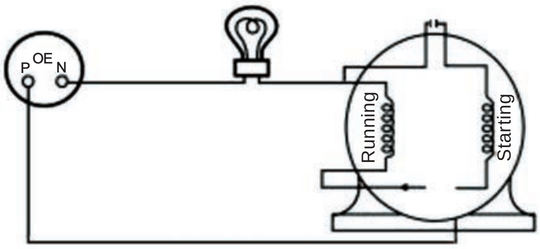
Dismantling

i. Separate the axis of motor and pump.
ii. Dismantle the rotor from the stator.
iii. Disconnect the connection from the starting winding.
iv. Test the winding.
iv. Test the capacitor.
v. Dismantle the pump.
vi. Dismantle the impeller.

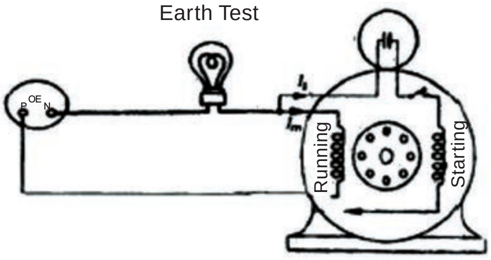


Testing

Open and short circuit test in starting winding

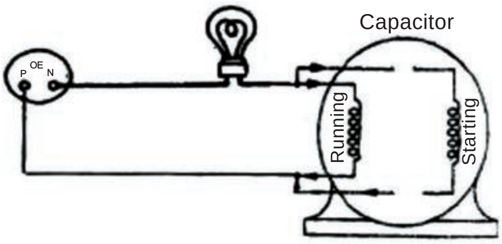


Earth Test



Open and short circuit test in running winding

Capacitor



Testing procedure

i. Connect the series test lamp with the main and starting winding. Then conduct open circuit and short circuit test.

ii. Do the earth fault test on the main winding and starting winding by connecting one end of the test lamp to the winding terminal and the other end to the body.

iii. Dismantle the centrifugal switch and check the spring condition.

iv. Conduct the test on the capacitor

Result

The method of dismantling the given water pump, identifying the parts, testing the water pump, causes, reasons and remedies of its faults, and assembling the water pump is carried with proper tools. Now the water pump run with normal speed and it is in good condition.

Practical 7

Measurement of energy of the given electrical equipment

AIM

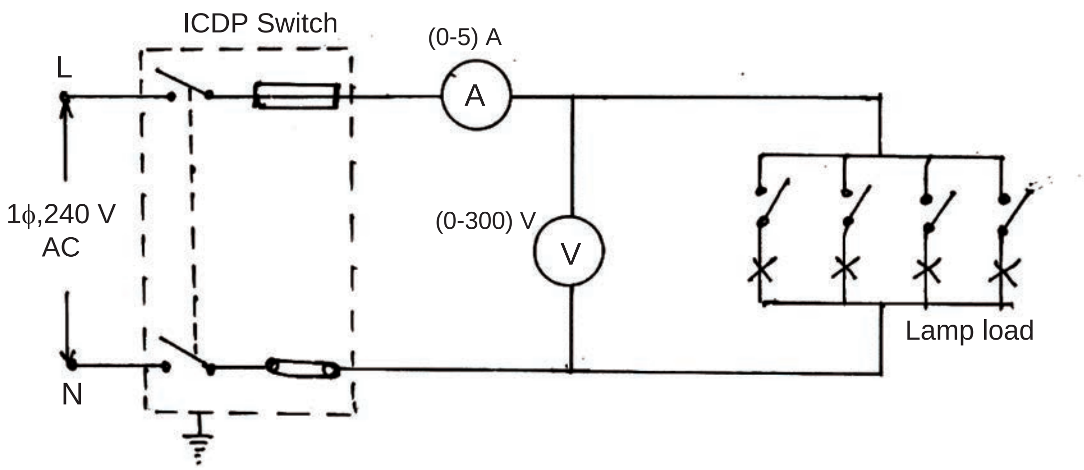
To measure the energy of the given electrical equipment (pure resistive load).

Apparatus required

S.No.	Equipment Required	Quantity
1	Voltmeter	1
2	Ammeter	1
3	Electrical equipment (lamp load)	1
4	ICDP switch	1
5	Connecting wire	as required

Procedure

1. Connections are made as per the circuit diagram.
2. After checking the connections, close the ICDP switch.
3. Note down the readings of voltmeter and ammeter.
4. Switch off the supply after 5 minutes.
5. Calculate the energy consumed.



Tabulation

S.No.	Voltmeter reading (V)	Ammeter reading (I)	Time in minutes	Energy consumed in kWh

Calculation

Energy meter constant = (V x I x cos ϕ x t)/ (60 x 1000) kWh

Assume cos ϕ = 1

Result

Thus the energy consumed by the given electrical equipment =-----kWh.

Practical 8

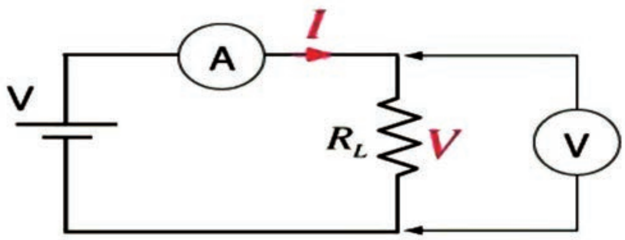
Determination of winding resistance by Ammeter- Voltmeter method

AIM

To determine the value of winding resistances of starting and running windings of the given AC, single phase capacitor type Induction motor by Ammeter – Voltmeter method.

Instruments and materials required

Sl. No.	Apparatus	Type	Quantity
1	Capacitor type induction motor	-	1
2	Ammeter	(0-10A) M.C type	1
3	Voltmeter	(0-30V) M.C type	1
4	Rheostat	50Ω	1
5	Line tester	-	1
6	Cutting plier	-	1
7	Screw driver	-	1
8	1/18 SWG connecting wires	-	Sufficient length



$$R_L = \frac{V}{I}$$

Procedure

i. Connections are made as shown in the figure and the supply is given.

ii. Starting winding is connected first with the circuit to find its resistance value.

iii. The voltage applied and current through the starting winding is measured by voltmeter and ammeter respectively and tabulated.

iv. Similarly running winding is connected with the circuit. Then voltmeter and ammeter readings are noted and tabulated.

v The average resistance value of the starting and running winding is calculated and compared with the original values.

vi. If the calculated average value of resistance is equal to the original values, there is no short circuit in the windings and if it is low, then there will be a short circuit in the concerned winding.

Table for starting winding

Sl. No.	Voltmeter reading (V)	Ammeter reading (I)	Resistance R = V/I
1			
2			
3			
Total resistance value			

Average resistance value of the starting winding

$$R_{av} = \frac{\textit{Total Resistance value } (R_T)}{\textit{No. of readings taken}}$$

Table for running winding

Sl. No.	Voltmeter Reading (V)	Ammeter Reading (I)	Resistance R = V/I
1			
2			
3			
Total resistance value			

Average resistance value of the Running winding

$$R_{av} = \frac{\textit{Total Resistance value } (R_T)}{\textit{No. of readings taken}}$$

Result

The starting and running winding resistance of the given AC single phase capacitor type induction motor is determined by Ammeter-Voltmeter method, and also known about the short circuits in the windings.

Practical 9

Determination of insulation resistance value of motor windings

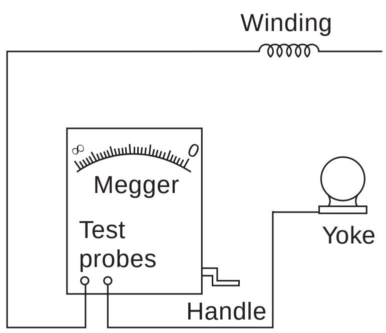
AIM

To determine the insulation value of a resistance of a given motor winding by using megger.

Instruments and apparatus required

S.no	Apparatus	Quantity
1	Given motor	1
2	Megger (1000 V)	1
3	Cutting plier	1
4	Screw driver	1
5	Double end spanner set	1

Connection diagram



Procedure

i. Megger is an instrument used to measure high value of resistance and it can also be used to measure the insulation value of the resistance of the motor windings.

ii. To find the value of insulation resistance, one terminal of the megger is connected with anyone terminal of winding and another terminal of motor is connected with the body of the motor.

iii. Rotate the handle of the megger about 160 revolutions per minute.

iv. Now the pointer of the megger moves gradually and shows the reading. That is the insulation value of the resistance of the winding.

v The reading should not be less than 1 mega ohm.

Measurement of insulation resistance value in DC machines

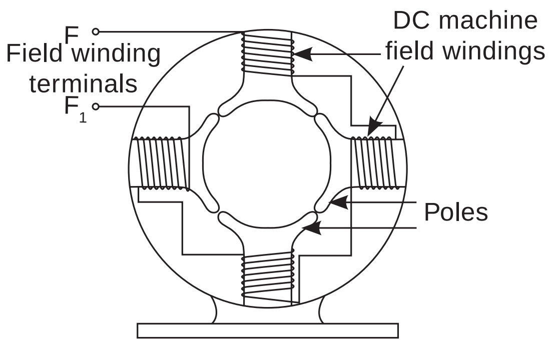
The windings in a DC machine are

1. Field winding

2. Inter pole winding
3. Armature winding

Measurement of IR value of field winding

i. Connect one terminal of the megger with anyone terminal of the field winding and another terminal with the body of the motor.
ii. Rotate the megger handle and find IR value.
iii. If the IR value is the less than 1 mega ohm, separate the end connections of the field winding and carry out the test for each pole winding, to identify the defaulted pole winding.
iv. Remove the faulted winding and rewind it.



Measurement of IR value of inter pole winding

i. Connect one terminal of the megger with one terminal of the inter pole winding and the other terminal with the body of the motor.
ii. Rotate the handle of the megger and find IR value.
iii. If the IR value is the less than 1 mega ohm, separate the end connections of the inter pole winding and carry out the test for each inter pole winding to identify the defaulted inter pole winding.
iv. Remove the faulted winding and rewind it.

Measurement of IR value of armature winding

i. Connect one terminal of the megger with anyone commutator segment and another lead with the shaft or body of the machine.
ii. Rotate the handle of the megger and find the value of IR.
iii. If the IR value is less than 1 mega ohm, rewind it.

Measurement of IR value of AC 1 Φ capacitor type motor windings

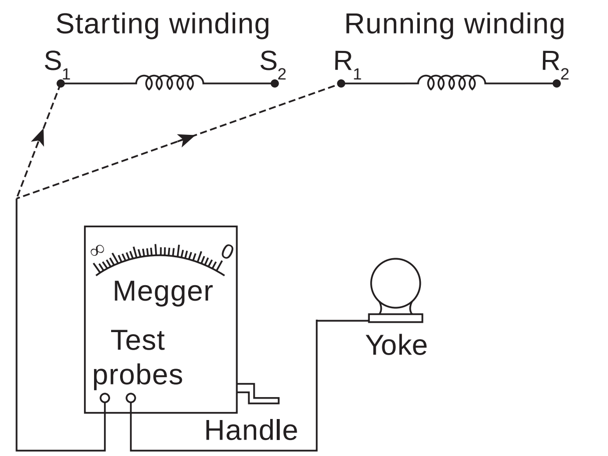
There are two types of windings in the AC 1Ø capacitor type of motor. They are,

1. Starting winding
2. Running winding

Measurement of IR value

Before conducting the test, the terminal of the starting winding should be splited separately from the terminal box connections.

To measure the winding insulation resistance of single phase AC capacitor type motor



i. Two terminals of the megger is connected between the starting winding and the body of the motor.
ii. Rotate the megger handle and note the reading.
iii. Similarly conduct the same test for the running winding and note the reading.
iv. Also conduct the test between the starting and running winding with megger and note the reading.
v. All the readings should not be less than1 mega ohm. if it is less, rewind it.

Measurement of IR value of three phase motor windings

In three phase motors, there are three windings namely R,Y and B. So the IR value of the three windings and the IR value between the windings should be measured by the megger.

Before conducting the test, the terminals of three windings should be splited and test if there is any star or delta connections made in the terminal box.

Measurement of IR value between windings and body

i. Two terminals of the megger is connected between phase winding and the body.
ii. Rotate the handle of the megger and note the reading.
iii. Continue the test for the remaining phases and note the readings.
iv. All the readings should not be below 1 mega ohm. If it is less, rewind it.

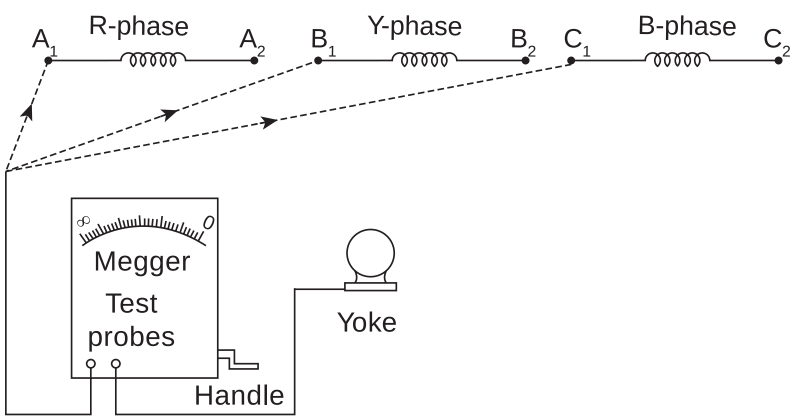
Measurement of IR value between windings

i. Two terminals of the megger is connected with 'R' and 'Y' phase.
ii. Rotate the handle of the megger and note the reading.
iii. Similarly conduct the tests for (Y and B) and (B and R), and note the readings.
iv. All the readings must be more than 1 mega ohm. If it is low, rewind it.

Result

Thus the IR value of the given motor winding is measured by using the megger.

To measure insulation resistance between winding and body of a phase motor



Practical 10

Dismantling, testing and assembling of A.C. 3 phase squirrel cage induction motor

AIM

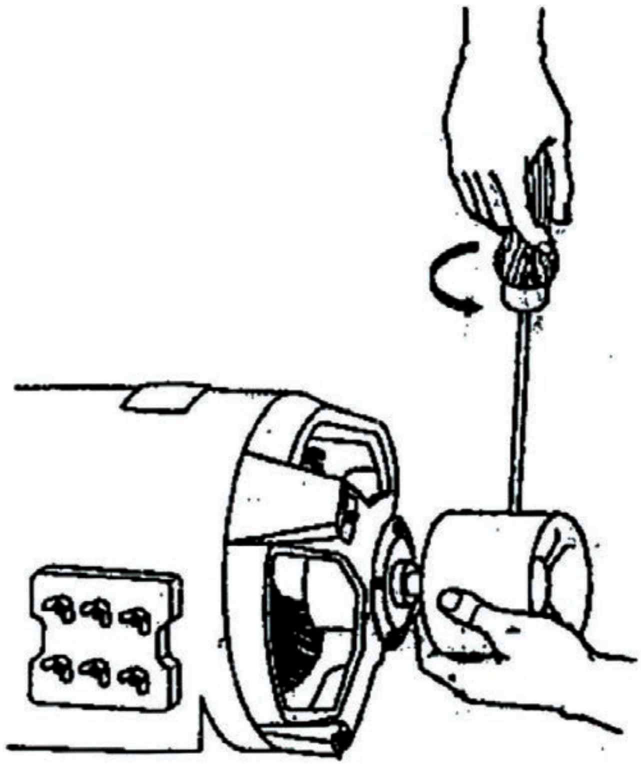
To dismantle the given AC Three phase 400/440 V squirrel cage induction motor by using proper tools and to measure the insulation resistance by using megger and also check the condition of bearing and apply the quality grease in correct quantity for the bearing. Assemble and run the motor.

Tools and materials required

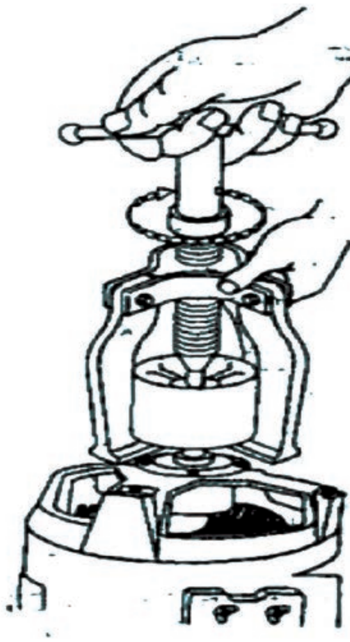
Sl.No.	Equipment's and materials	Nos.
1.	3 Phase A.C 400/440 V squirrel cage induction motor	1
2.	Bearing puller	1
3.	Insulated cutting plier	1
4.	Screw driver	1
5.	Cutter	1
6.	Scissor	1
7.	Nylon hammer	1
8.	Megger	1
9.	Knife	1
10.	Test lamp	1
11.	Grease	1
12	Feeler gauge	1

Procedure

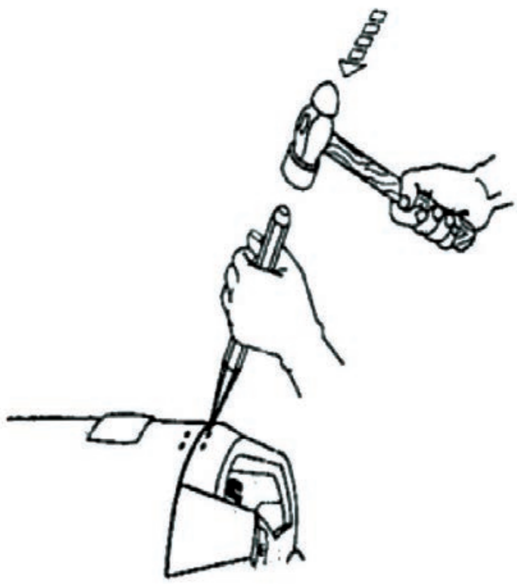
Remove the shaft key screw by holding the pulley as shown below.



Remove the pulley by using a suitable pulley puller as shown below.

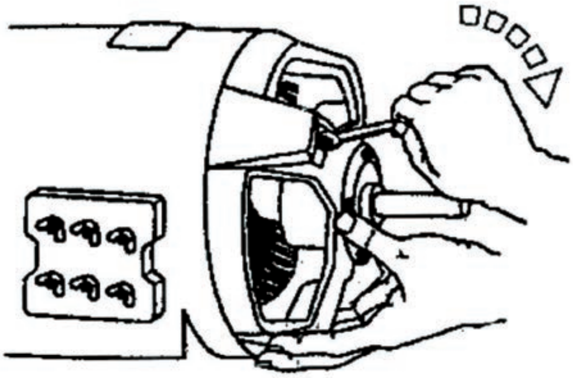


Make a center punch mark on both the end covers and stator as shown below. To avoid confusion, make a single punch mark on one side and a dual punch mark on the other side of the motor

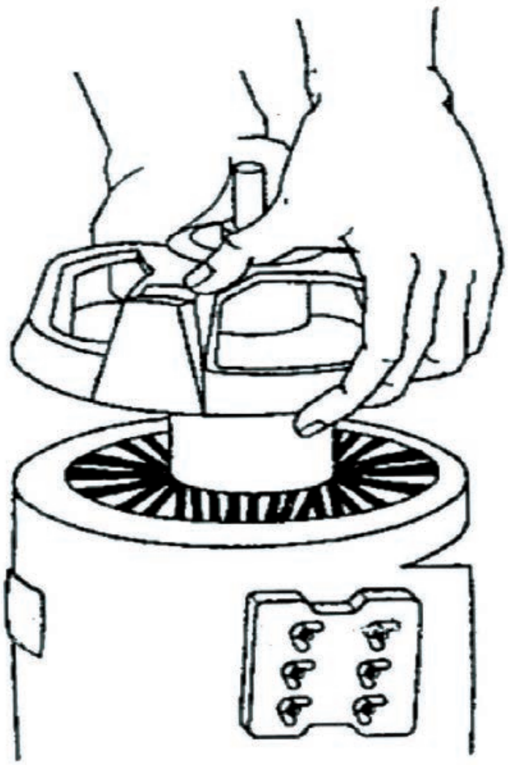


Remove the grease cup cover and loosen the end cover bolts as shown in the figure given below.

End covers should be removed by using chisel and nylon hammer gently as shown below



Without any damage to the rotor and the stator windings, remove the other end shield cover together with rotor as shown in the figure given below.



Hold the shaft in one hand, rotate the end cover and tap it lightly with a nylon mallet, to remove it from the rotor as shown below.

Remove the other end shield cover also by gently priming it out.

Inspect the condition of the rotor and bearing that it contains any defects in it.

If the bearing is worn out, replace it with a new one. All fitting devices should be kept in a separate tray.

Dismantling the parts areas shown below.

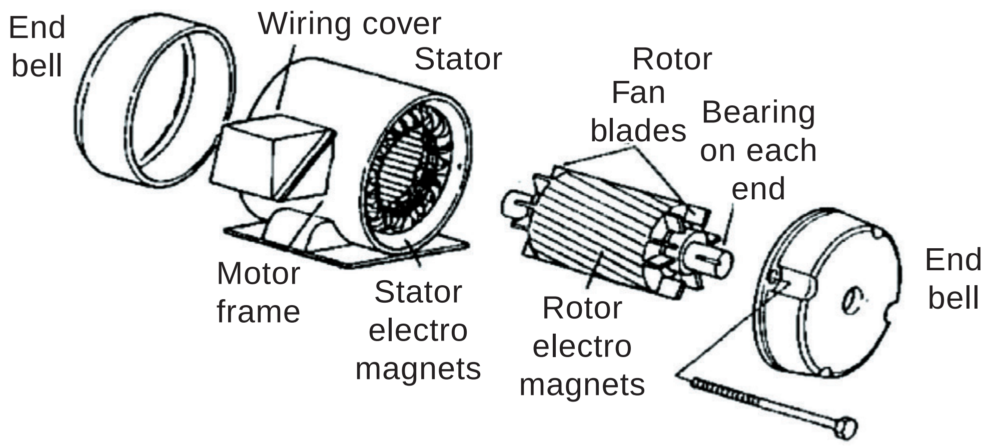


Table 1

Sl. No.	Insulation resistance	Insulation resistance value
1.	Between core and R phase	
2.	Between core and Y phase	
3.	Between core and B phase	

Measure the insulation resistance value between a winding and the stator core with a 500V Megger and record it in table 1, and the value of insulation resistance should be more than 1 MΩ

Table 2

Sl. No.	Insulation resistance	Insulation resistance value
1.	Between R phase and Y phase	
2.	Between Y phase and B phase	
3.	Between B phase and R phase	

Measure the insulation resistance between the two windings with a 500 V megger and record it in table 2, and the insulation value should be more than 1 MΩ

Testing after re-assembling

Apply good quality grease in correct quantity inside the bearing. Then assemble the motor in reverse order as dismantled. Now the air gap is measured by feeler gauge. Test run is to be done in the motor.

Result

AC three phase squirrel cage induction motor is dismantled by using proper tools. Insulation resistance is measured by megger and tabulated as above. Bearing are tested and grease is applied. Now the motor is running smoothly in good condition.