CAPACITOR START INDUCTION MOTOR.

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Date - 23.

AIM OF THE EXPERIMENT →.

To start & run a single phase capacitor start induction motor & measure its starting & running current.

APPARATUS REQUIRED →.

S.L. NO.	Equipment.	Specification.	Quantity.
01.	Induction Motor	1ϕ, 220V, 50Hz, Capacitive	01.
02.	Starter.	1Hp, 1ϕ, 220V DOL type	01.
03.	Voltmeter.	(0-300)V MI type	01.
04	Ammeter	(0-5)A MI type	02
05.	Tachometer	10,000rpm	01.
06.	Connecting wires	—	As per required.

THEORY →.

A single phase Induction motor is not self starting due to the reason that it doesn't produce rotating magnetic field but producing pulsating field or alternating field i.e. one which alternates along the space axis only. In order to make a motor self start and rotating field should be produced & a 2-ϕ winding can produce the required field. This is achieved in a 1-ϕ motor by a technique called split phase motor. For this purpose the stator

Teacher Signature

the connection of starting winding.

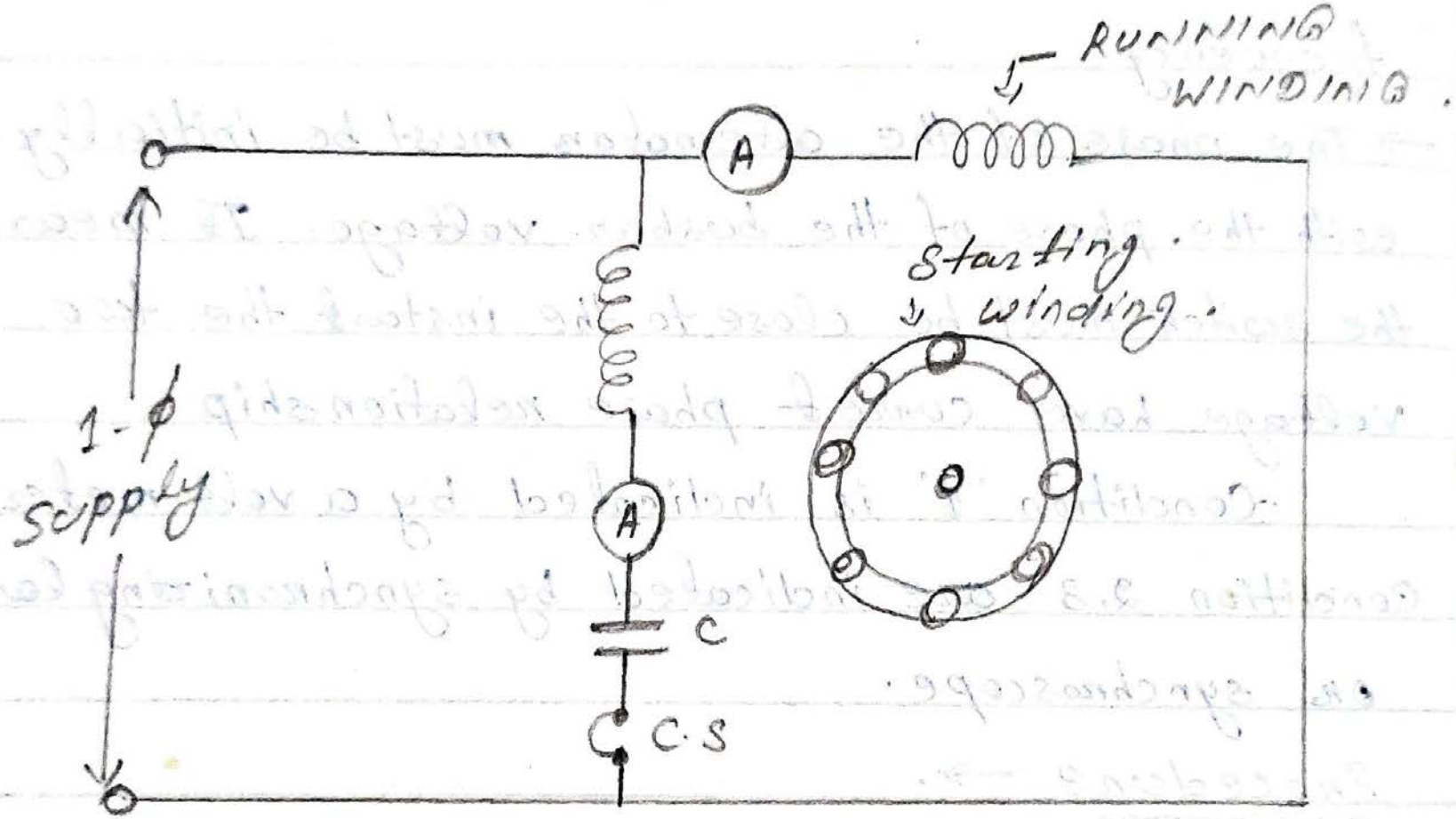
TABULATION →.

S.L No.	Starting current in Amp	Running current in Amp	volt meter reading in volt	Speed in RPM.

CONCLUSION →.

The given single phase induction motor is well started according to the name of the motor. The capacitor is used to split the phase it is used in Jet from, work shop etc.

CKT DIAGRAM →



(capacitor start Induction Motor)

Energy Meter.

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AIM OF THE EXPERIMENT →.

Connection of 3-ϕ energy meter to 3-ϕ load & measurement of energy.

APPARATUS REQUIRED →.

Sl. No.	Instrument type.	Specification	Quantity.
01.	Voltmeter (M.I)	(0-600)V	1no.
02.	Ammeter (M.I)	(0-10-20)A	1no.
03.	3-ϕ energymeter (Induction type)	440V,(0-10)A	1no.
04.	3-ϕ main switch with fuse	(0-500)V,(0-30)A	1no.
05.	3-ϕ load.	250V, (6×500)ω	1no.

NAME PLATE DETAILS OF ENERGY METER
(ac, 3ϕ, 4-wire watt hour meter)

Voltage Rating ← (3×240)V.

Current Rating ← (0-10)A.

Frequency ← 50Hz.

Meter Current ← 200 rev/kwh.

class of accuracy range ← 0-10,000 kwh.

THEORY →.

The three phase 4wire induction type energy meter is similar to 3-ϕ induction type wattmeter. This induction type wattmeter has to single disc driven by the torque of all element in the same direction. Like a 1-ϕ

energy meter the rotating aluminium disc shaft connected to gear train counting mechanism. The function of this counting mechanism is to record continuously a number which is proportional to the revolution made by the rotating disc. These revolution are recorded by the during mechanism & are indicated in the cyclometer register.

The basic theory is same as to that of a two element wattmeter. The energy meter has a recording system, which records the power over a time period. Thus indicating energy consumed.

PROCEDURE →.

→ Connect the dotted lines with insulated wires as per the ckt diagram.

→ Connect the voltmeter & ammeter as shown in figure.

→ The load is to be connected first in delta then star connection.

→ Note the initial reading of energy meter from the cyclometer register.

→ Switch on the supply & wait till the red mark on the disc appears on slotted position.

→ Take a stopwatch, switch on the supply & stopwatch

simultaneously.

→ Allow the power to flow for 1hr simultaneously switch off the supply & stopwatch.

→ Note the final reading of energy meter.

→ Repeat this procedure by connecting the load on star connection.

TABULATION →.

Mode	voltmeter reading in 'V'	Ammeter reading in Amp.	Cyclometer register	
Star / ~~Delta~~			Final reading	Initial reading

Total energy consumed in kWH	Time duration	Meter Const. in rev/kwh

CALCULATION → for both delta & star.

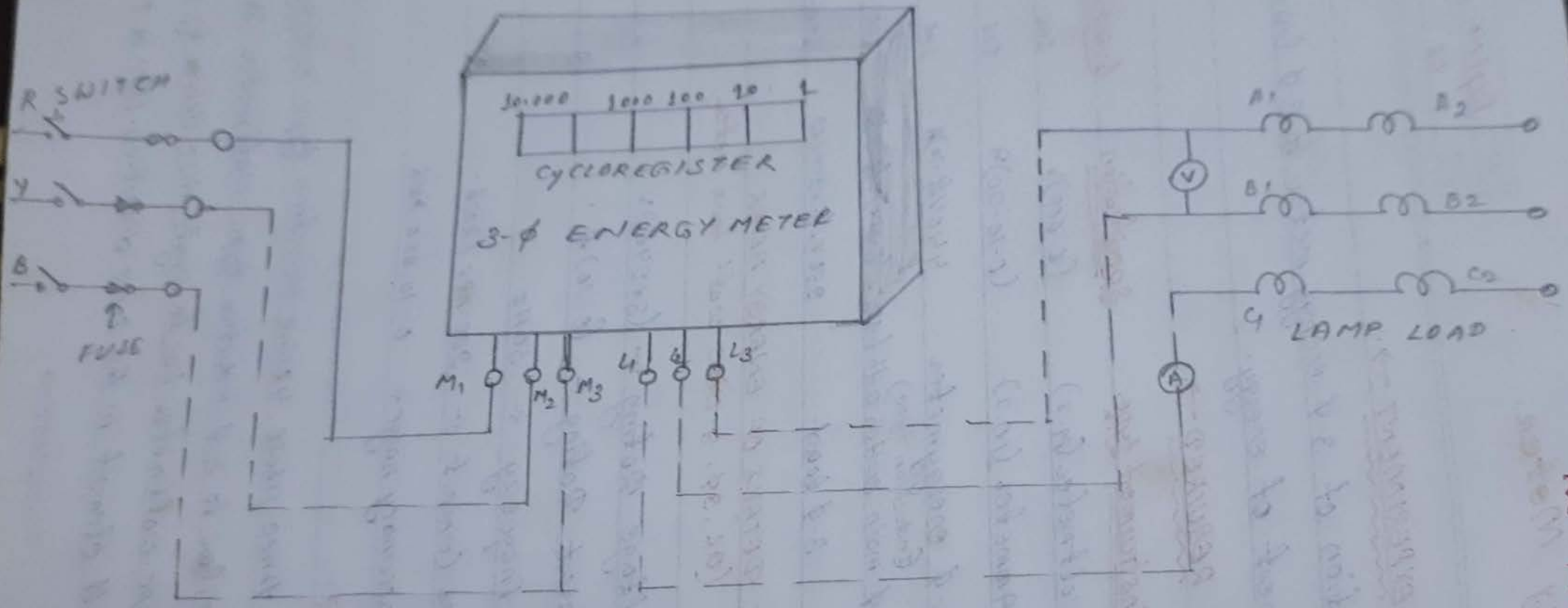
Energy Consumed in kWH = Final reading − Initial reading.

Time duration.

Power drawn by the load = Energy Consumed / Time duration

CONCLUSION →.

From the above expt., we connect the 3-ϕ energy meter to a 3-ϕ load & measure the energy.



(3-ϕ ENERGY METER)

CKT DIAGRAM

Aim of the Experiment

To Study the gas actuated Buchholz relay for oil filled transformer.

EQUIPMENTS REQUIRED

1. Buchholz Relay Setup

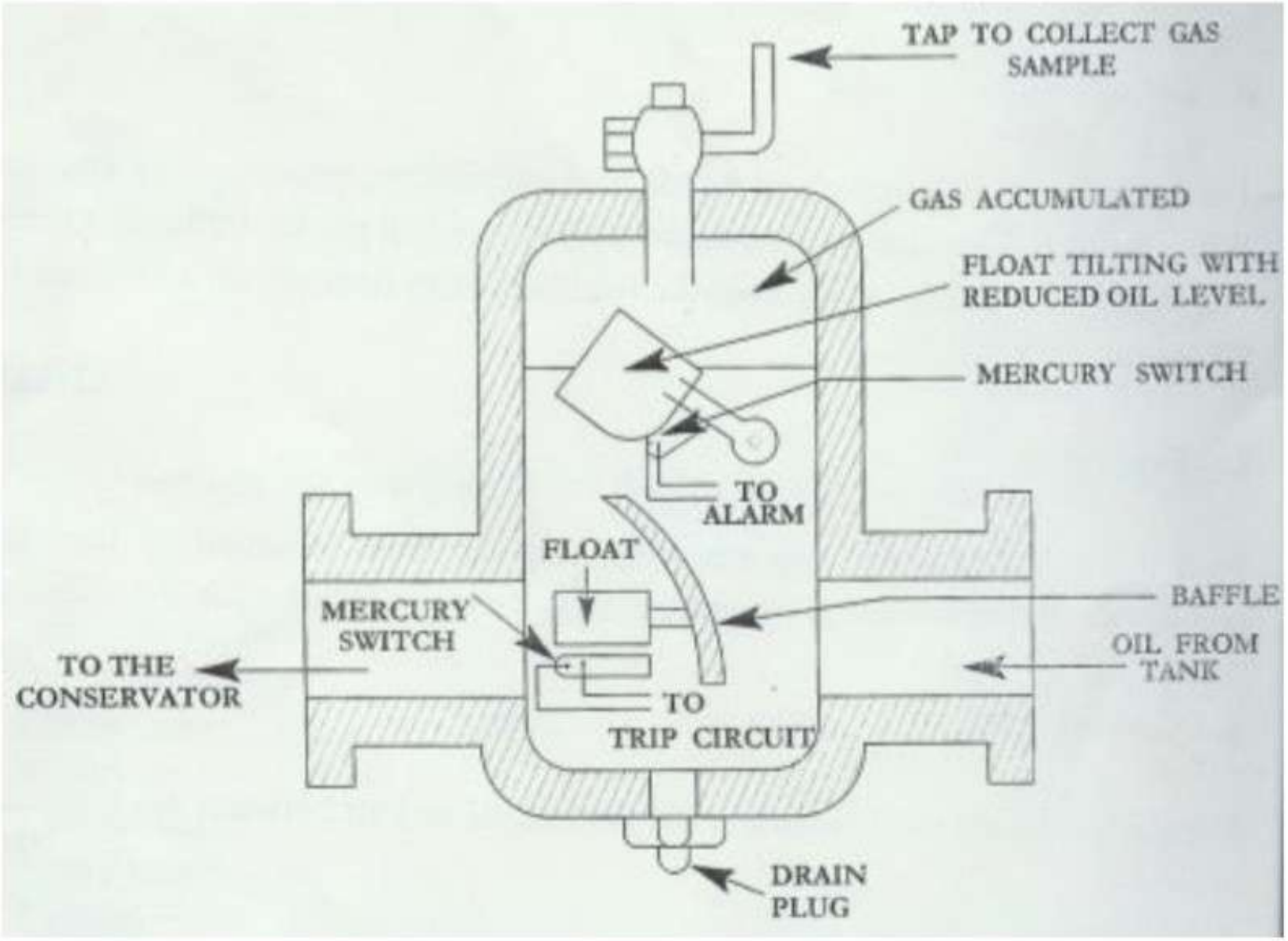
THEORY

The Buchholz relay is one of the important protective devices for oil immersed power transformer, which will operate based on the oil or gas pressure. It detects two types of faults i.e. minor and major fault. Minor faults comprise of faults in core laminations, over heating in windings, bad connections, low oil levels etc. In minor faults the alarm circuit will be actuated to switch on the buzzer. In case of major faults like internal short circuit between phase and earth, phase to phase fault, insulation break down etc., the trip circuit will be closed due to enormous amount of gas bubbles.

Buchholz relay is a gas actuated relay used for protecting oil immersed transformer against all types of internal faults and makes use of the fact that fault produces over current and overheating that decomposes oil, thus generating gases.

WORKING PRINCIPLE

The Buchholz relay comprises hinged float and mercury switch assembly for both the alarm and trip circuits. The entire assembly is in an oil proof case which has two glass windows. When the oil level is reduced from the desired level, the float switch moves down that will touch the contact. In case of major faults, the gases generated in transformer tank due to decomposing of oil rush towards conservator tank through Buchholz relay. These gases pressurize the oil and reduce the oil level in buchholz relay and the float switch go down to close the trip circuit as shown in the below figure. While reducing the oil level, the alarm will get activated. If the pressure is higher in the transformer tank the trip circuit will be activated to close the mercury switch and trip the power to transformer.


TAP TO COLLECT GAS SAMPLE
GAS ACCUMULATED
FLOAT TILTING WITH REDUCED OIL LEVEL
MERCURY SWITCH
TO ALARM
FLOAT
BAFFLE
MERCURY SWITCH
TO THE CONSERVATOR
OIL FROM TANK
TO TRIP CIRCUIT
DRAIN PLUG