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-	Name of Street	Date	Name of the Experiment	Page No.	Marks Awarded	Remarks/ Initial's
	1.	11 7 18	CYCLE-1 Measurement of parameters of choke-coil	1-5	190	18018
Mary Charles of the last	2.	18/7/18	calibration of energy meter by phantom loading	6-11	9	25/84
No. of Persons and	3.	25/7/18	Crompton potentioneter	12-18	140	TOUS
4	н.	1/08/18	Kelvins double bridge-Masurement of rusistance	19-2;	3 '60	19/41
	5(a)	8 8 18 8 8 18		28-3	1 10 10	April 110
	6-	4-9-18	Measurement of 3-4 martin paux using single phase waternater	32-	36 160	187118
	ナ・	28-9-18	linear voltage Differential transformer	37-1	10/0	/ Golf
	8.	5-10-18	Measurement of 3-0 reactive power using two waternites	ng H3-	46 40	12/10
/	٩.	12-10-18	Hasurement of 3-p Active power using	19 47	-50 9	He rido
The state of the s	10-	26-10-18	calibration of Dynamometer power factor meter	21	-sr (2	(O) Puglo

# S V ENGINEERING COLLEGE

Karakambadi road, Tirupati-517507, A.P (Affiliated to J.N.T.U, Anantapur) DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

## (15A02507) ELECTRICAL MEASUREMENTS LAB Year: B.Tech. III - I Sem. (EEE)

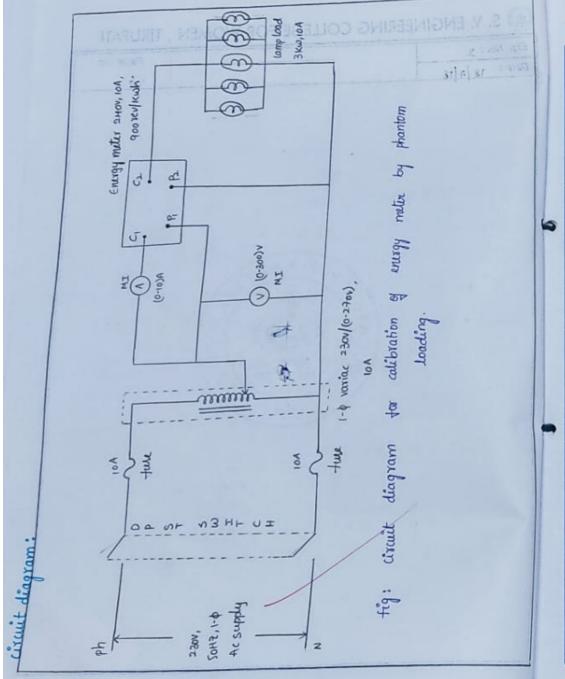
## LIST OF EXPERIMENTS

The following experiments are required to be conducted as compulsory experiments:

- 1. Calibration and Testing of Single Phase Energy Meter
- 2. Calibration of Dynamometer Power Factor Meter
- Crompton D.C. Potentiometer Calibration of PMMC Ammeter and PMMC Voltmeter
- 4. Kelvin's Double Bridge Measurement of Resistance Determination of Tolerance.
- 5. Measurement of % Ratio Error and Phase Angle of Given C.T. by Comparison.
- Schering Bridge & Anderson Bridge.
- 7. Measurement of 3 Phase Reactive Power with Single-Phase Wattmeter.
- Measurement of Parameters of a Choke Coil Using 3 Voltmeter and 3 Ammeter Methods.

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted:

- Optical Bench Determination of Polar Curve Measurement of MHCP of Filament Lamps
- 10. Calibration LPF Wattmeter by Phantom Testing
- 11. Measurement of 3 Phase Power with Two Watt Meter Method (Balanced & Unbalanced).
- 12. Dielectric Oil Testing Using H.T. Testing Kit
- 13. LVDT and Capacitance Pickup Characteristics and Calibration
- 14. Resistance Strain Gauge Strain Measurements and Calibration
- 15. Transformer Turns Ratio Measurement Using A.C. Bridge.



S. V. ENGINEERING COLLEGE FOR WOMEN, TIRUPATI

CALIBRATION OF ENERY METER BY
PHANTOM LOADING

Aim:

Exp. No. : 3

To calibrate single phase energy meter and obtain percentage error from apparent energy and actual energy.

Apparatus:

Sl-NO	Equipment /8/	Range	Тург	quantity
1.	Ammeter S	(0-10)A	HI	1 NO.
2.	volt muter (5)	(0-300)V	HI	1 No.
3.	wattmeter	300V/10A	UPF	ANO.
4.	€nirgy meter	240V; 10A	Inductio	n A.u.
5.	1-φ νουΐας .	9007ev/Ku	h - 314 - 53	rotato State
		(0-230)V	1 -	1 No
6.	Stop clock	Acat n	Digital	1 No.
4.	connecting wives			required some

#### Tabular column:

sl-No	voltage	aurrent	Time tor	10 revolutio	Actual Livingy(VI(T)		1/ error
Strino	(v)	(A)	SIC	h15	(Kwh)	(Kwh)	
,	220		208	0.057	0.0125	0.0111	12-97
2-	218	2	103	0.028	0.0122	0-0111	9.909
3.	216	3-6	53	0.0143	0.01088	0.0111	-1.98
		4.6	41	0.0113	0.0109	0.0111	-1.62

famiging) only

#### formulae:

Total energy . No. of Pulsus/900-

Total energy

#### calculations:

= 0.0111 KWh

Total energy = 0:0111 kwh

## ( S. V. ENGINEERING COLLEGE FOR WOMEN , TIRUPATI

Page No. Exp. No. : 3 Date: 18 7 18

Theory:

Induction type of energy meters are universally used for measurement of energy in domestic and industrial are circuits. Induction type of meters possesses lower priction and higher torquel weight ratio. Also they are inexpensive and occurate and retain their accuracy over a wide range of loads and temperature conditions. The Driving system of the meter consists of two electro magnets. The core of these electromagnets is made up of silicon steel laminations. The will of one of the electromagnetic is excited by the load currents this wil is called the current wil the wil of second electromagned is connected across the supply voltage this coil is called the pressure coil consequently the true electromagnet are known as svies and shunt magnets respectively copper shading bands are provided on the central limb the position of these banks is adjustable the function of there bands is to bring the their produced by the sheet magnet exactly in quadrature with the applied voltage.

1 Cars - 1-98-7-1

## S. V. ENGINEERING COLLEGE FOR WOMEN, TIRUPATI

. No. : 2
9: 18 7 18

5. connections are changed for obtaining different power factor and for different current selting time taken by the energy meter for 20 revolutions is noted. Apparent energy and 1. Error ou calculated.

### Result:

Hence the single phase energy meter is calibrated and percentage error from apparent energy and actual energy are

obtained.

./ Error . Actual energy Total energy Total energy 001X 1110-0-2010-0 or the alternate To-out the spren to and midmatell there are the tubal his alterno a opinio to transmitted Industrial tags of media reaction to all the part this most tolered the other alread to see y gove this a me garage with water 2. Actual many Total many x100 but will propose a disconstitute state by me of stappen 10 0100 A 3 0:002-0-001 X100 BI 10 In 11 Manual the air the haron and official, it like the though book of ich . grand the transport is transport of the world with the 1. Error = 9-909 10 sent - Del angener all bollet, at the 3. 1. Error = Actual energy: Total energy x1000 medited the death technic total energy well the short prished 0.01088 - 0.0111 of the the the produced by 1000 thank may all all point 1. ETTO = -1.98%.

## S. V. ENGINEERING COLLEGE FOR WOMEN, TIRUPATI

9 G. 1. E. 1011	Page No.
Exp. No. : 9_	2
Date: 18 3 19	7

nowing system comists of an alluminium disc mounted on a light alloy shaft this disc is positioned in the air gap between series and shant magnets. Braking system is a permanent magnet positioned near the edge of the alluminium disc mous in the field of this magnet and thus provided a braking torque the position of permanent magnet is adjustable.

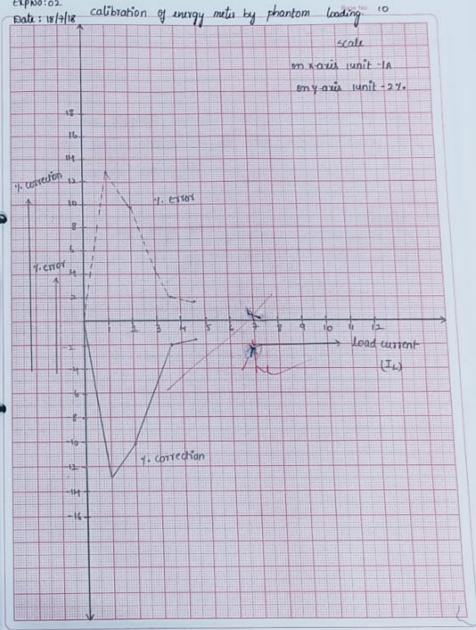
#### Precautions:

- 1. 1-4 variac should be in minimum position.
- 2. load is kept in off position

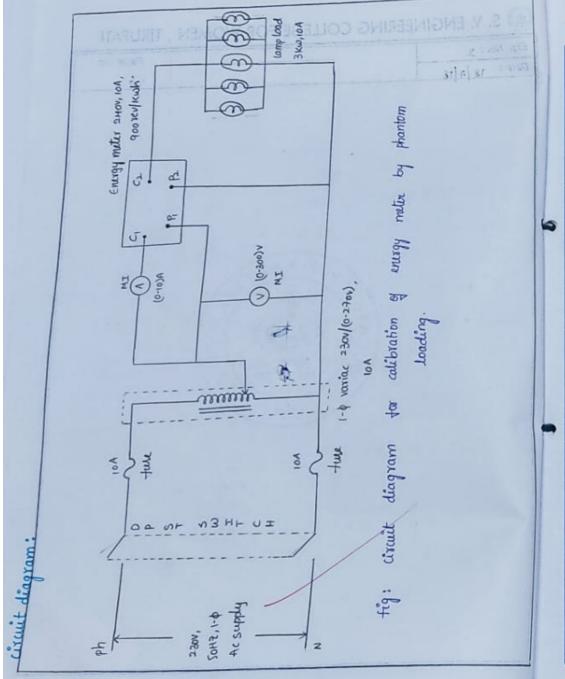
#### Proudure:

- 1. connections are made as shown in circuit diagram.
- 2. OPST switch is closed and supply is switched on.
- 3. By adjusting the booster transformer rated voltage is applied to the pressure circuit
- 4. unrent is applied by using auto-transformer and maintained at certain value for time taken for 20 revolutions of energy meter.

V ENGINEERING COLLEGE FOR WOMEN, TIRLIFATI 81 6 31 Model Waveforms: action with motions or p chiese notice private up rin mit n' e meditare il side ditre track pollo depit e no Months and them the Bratis design in the same with magnet profitered when the days of the climetricity of the order . super printed a bank of today, error harron with the blist out of to techin et provinci barg ./ error → load wrient namicas maniferconception bloods source to a to consuctions one made as seems to circuit stagram a the senten is every one supply is sufficient on a By adjusting the beester hangemen rains retarge is applied Enferire bus anastrat the pate of bilgs a lasse. et testain salue for time fasco des ac rendetriens es ergina hbeno



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S. V. ENGINEERING COLLEGE FOR WOMEN, TIRUPATI

CALIBRATION OF ENERY METER BY
PHANTOM LOADING

Aim:

Exp. No. : 3

To calibrate single phase energy meter and obtain percentage error from apparent energy and actual energy.

Apparatus:

Sl-NO	Equipment /8/	Range	Тург	quantity
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4.	€nirgy meter	240V; 10A	Inductio	n A.u.
5.	1-φ νουΐας .	9007ev/Ku	h - 314 - 53	rotato State
		(0-230)V	1 -	1 No
6.	Stop clock	Acat n	Digital	1 No.
4.	connecting wives			required some

Theoretical calculations

3-Ammeter method:

(i) power factor (coso) = 
$$\frac{I_S^2 - I_R^2 - I_L^2}{2 I_R I_L}$$

21 (2)11

(ii) Ruistance (R) = 
$$\frac{V \cos \theta}{I_L}$$
 define the provening for the provening the prove

4. Evans the phases diagram to both the methods.

so madings are to be taken mittent possible trops.

# S. V. ENGINEERING COLLEGE FOR WOMEN, TIRUPATI

9	Bage No.
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#### Pusult:

	3-Ammeter method	3-voltmeter method
Resistance of a coil R	249.571	266-HZV
Inductance of a coil L	1-267 H	1-062H
Peutr factor	0.531	0-738

Hence the parameter of a choke toll by wing 3 voltmeter and 3-Ameter method are measured

(M)

## (ii) 3- voltmeter method:

power -factor 600 = V52-V2-V2/2VRVL = 0.738

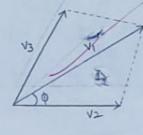
Rusistance = VLCOSO = 366-HJJ

Inductive reactance of the coil = X\_ = V\_sino = 334.821

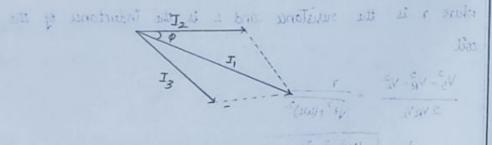
Inductanu =  $\frac{X_L}{2\pi f}$  = 1.065H Sind the just engined current the justed through it

where f is the frequency of supply in hertz - SOH? phasor Diagrams:

3- voltmiter method:



3- Ammeter method:



NE - YE THE + STRY LESS

## S. V. ENGINEERING COLLEGE FOR WOMEN, TIRUPATI

Exp. No. : 0\	: Taski	Page Nb.
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	- (-902)	CHARLE SAME

#### Procedure:

- 1. Make the connections as per the circuit shown in figure
- 2. Intially keep the autotransformer in minimum position close supply opst switch and a constrained of
- 3. vary the applied voltage by varying the auto-transformer until rated current flows through the choke call.
- 4. Note down the readings of all the meters
- 5. Make connections as per the circuit shown in tigure 2
- 6. Repeat steps 2,3,4 and 5
- 7. Draw the phasor diagram for both the methods. (4) Inductional 1 = XI suf

#### Precautions:

- 1. Avoid Loose connections
- 2. keep auto transformer in minimum position before dosing supply opst.

o Za Trx c

3. Readings are to be taken without parallex ever.

# S V ENGINEERING COLLEGE FOR WOMEN

## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING [2017-21 Batch]

arne	of the Lab			COLUMN TO THE OWNER.	Measure	ments (1	5A02507			- 0	Year:	111-1	47	Branc	EEE		Sectio	n. A		Name	of the	lacuit	у.	-		
.NO	Roll.NO	A	v	0	R	т	A	V	0	R	T	A	v	3	R	Т	A	v	0	R	I T	A	V	5	R	T
1	179E1A0201	u	ч	9	10	27	y	u	q	10	27	û	V	9	9	26	q	4	9	9	26	4	u	9	40	2
2	179E1A0202	T	T	10	LD	30	1	-	10	10	30	u.	5	18	10	39	5		(0	to	30	4	5	10	10	20
3	179E1A0203	4	ч	lo	10	28	4	: 4	10	(D)	28	4	4	9	(0	27	4	4	9	10	27	4	4	10	(0	28
4	179E1A0204	u	¥	9	10	27	1	u	9	10	28	(	1	10	10	.30	4	4	10	10	WR	5	1	9	9	26
5	179E1A0205	ч	ч	8	9	25	ч	24	7 8	8	24	ч	4	9	10	27	3	3	8	8	23	3	3	8	8	200
6	179E1A0206	.5	1	10	10	.30	1	u	10	10	29	T	5	10	10	-30	4	4	10	10	28	T	1	0	16	3
7	179E1A0207	10	14	10	10	29	1	7	10	10	30	5	5	9	10	29	ч	5	0	10	29	5	I	10	10	3
8	179E1A0208	1	13	10	10	SA	4	5	(0	(0	29	5	5	10	10	-30	2	4	10	10	29	1	4	10	10	29
9	179E1A0209	5	1	10	10	30	+5	5	(0)	10	30	J	4	10	16	29	5	Y	10	10	29	5	5	10	(0	30
10	179E1A0210	ч	u	9	10	97	5	5	110	60	30	T	4	9	10	28	ч	4	10	10	28	4	4	9	10	S-
11	179E1A0211	5	5	10	10	30	5	4	10	(0)	29	5	5	10	10	30	4	1	10	10	29	5	2	(0	10	3
12	179E1A0212	2	3	6	T	15	2	2	6	5	15	2	2	2	5	14	2	2	6	1	15	2	0	1	7	10
13	179E1A0213	14	4	9	10	SI	14	3	19	9	25	4	4	10	10	28	4	4	9	10	97	4	4	10	9	127
14	179E1A0214	5	14	9	9	27	4	4	10	10	28	u	3	9	9	23	4	ч	9	10	27	4	4	9	10	277
15	179E1A0215	5	5	9	9	28	4	4	10	10	28	4	u	9	(0	W.F	4	ч	9	10	27	7	1	(0	(0	130
16	179E1A0216	5	5	(0	10	30	5	0	(0	(0)	30	5	I	10	10	30	1	J	1	10	29	1	7	10	10	3
17	179E1A0217	5	4	9	9	27	5	2	10	10	30	4	4	9	10	97	2	7	9	9	28	4	3	9		0
18	179E1A0218	04	I	9	9	27	4	4	19	10	Q7	1	1	10	10	30	y	4	10	10	28	3	4	-	8	2
19	179E1A0219	3	3	8	10	200	3	3	8	8	20	3	3	9	8	23	1	U	(0	10	30	0	3	8	.00	3/
20	179E1A0221	14	5	10	10	29	4	0	(0	(0)	29	4	4	10	10	00	7	1	(0	10	29	1	Y	0	(0	0
21	179E1A0222	40	5	10	10	29	3	2	(0	10	30	4	4	9	(0	27	4	4	(0	(6	28	1	5	10	10	2
22	179E1A0223	I	5	10	10	30	2	4	(0	(6	29	4	1	(0)	(0	-	7	7	10	(6	30	-	4	9	9	0:
23	179E1A0224	4	4	10	16	28	4	ч	9	10	27	1	1	10	10	30	4	4	-	- (0	29	1	4	(0	(0	2
24	179E1A0225	5	5	10	10	30	1	1	10	10	30	1	4	10	CE	30	-	3	9	9	25	1	U	9	9	9
25	179E1A0226	5	5	10	10	30	4	4	9	9	26	2	7	10	(b	26	u	u	9	9	26	1 2	2	9	9	2
26	179E1A0227	5	u	9	9	27	4	ч	(0	1	27	4	u	9			1	T	10	(6	30	T	4	10	10	2
27	179E1A0228	5	4	10	(0	29	3	4	10	(0	29	1	1	9	10	30	- 4	u	9	9	24	-	1	10	10	3
28	179E1A0229	ų	4	9	10	100	1	ų	9	10	28	4	14	1	(0	29	1	4	9	9	89	_	5	10	10	3
29	179E1A0230	5	4	10	10	29	5	5	9	10	29	14	4	10	(6	all	1 2	1 9			08.7	10	1			