



THE EASTERN SPECIALTY COMPANY

METER SITE ANALYZER CAT. 6330

SOUTHERN CALIFORNIA EDISON

- True 3 phase Portable Field CT & Meter Tester.
- Battery Operation. Lithium Ion. Lightweight 17.8lbs
- Customer Load and Phantom Load Testing
- Demagnetization & Admittance Testing





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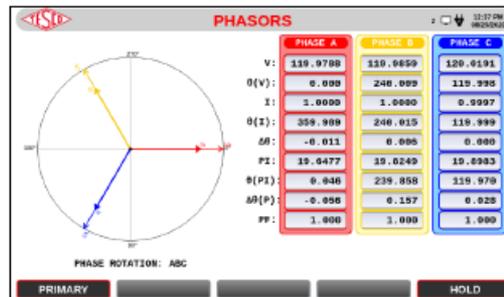
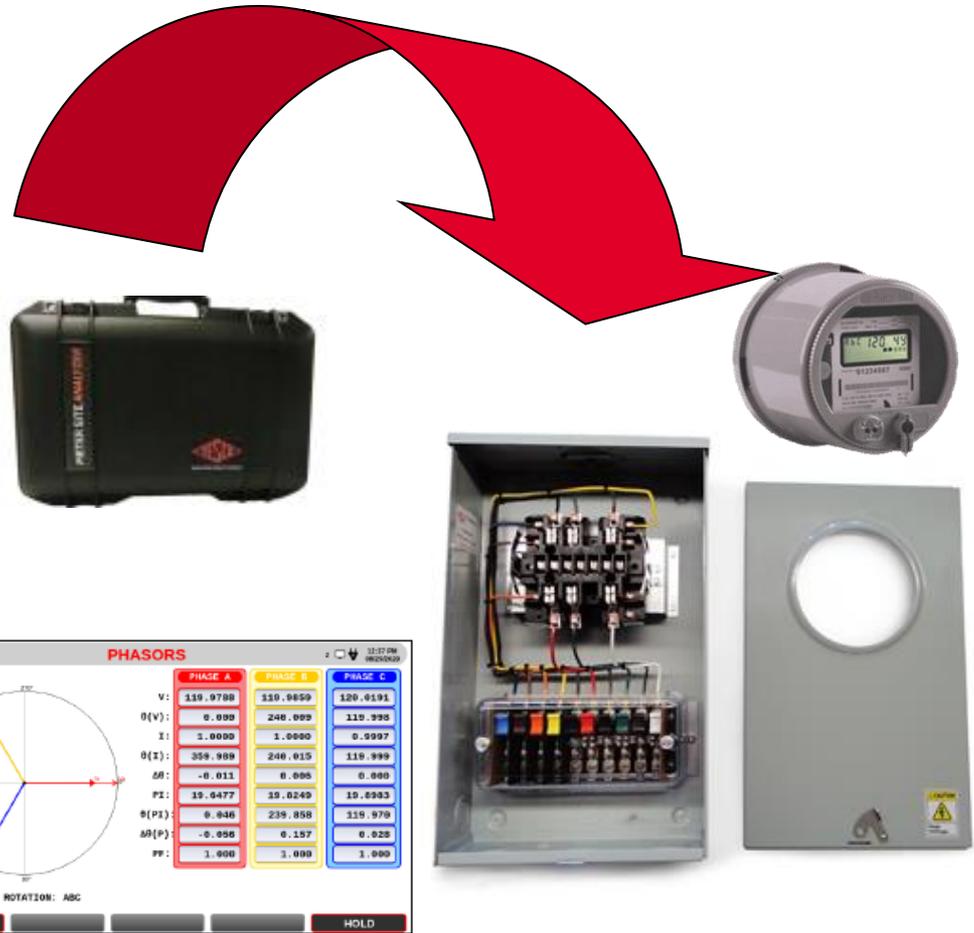
TESCO/GEORGIA POWER 2017 CARIBBEAN METER SCHOOL FUNDAMENTALS OF POLYPHASE FIELD METER TESTING AND SITE VERIFICATION

Meter Accuracy Testing Customer Load

- ✓ Customer Load
- ✓ Customer Billing
- ✓ Customer Conditions

Meter Accuracy Testing Phantom Load

- ✓ Full Load
- ✓ Light Load
- ✓ Power Factor





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TESTING AT TRANSFORMER RATED SITES

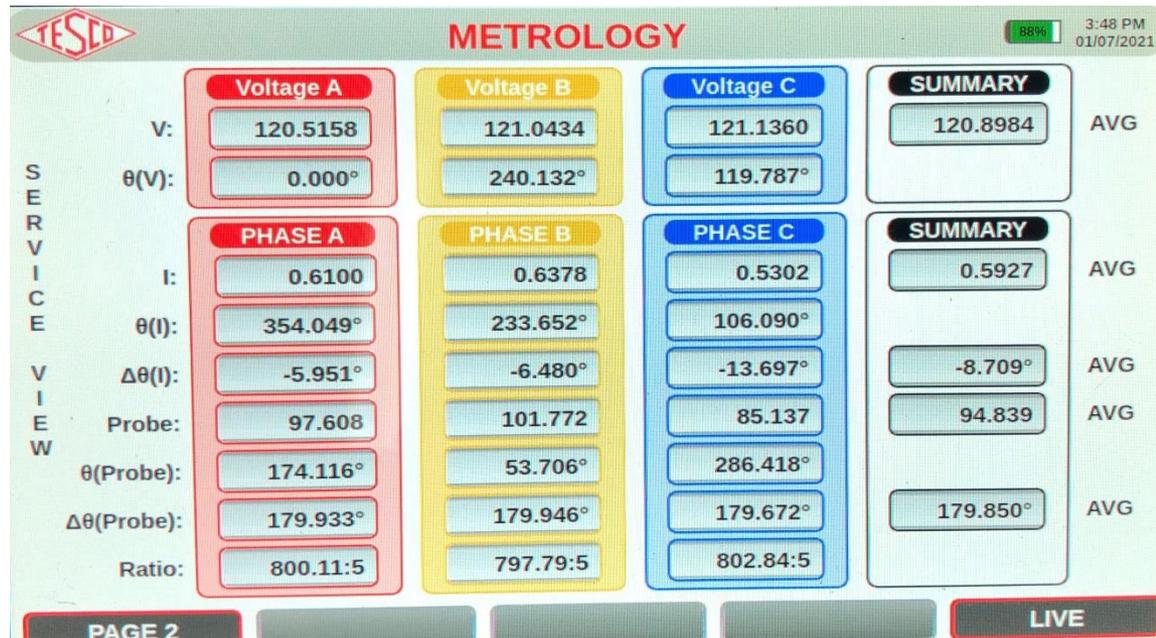
- ✓ Meter Accuracy
- ✓ Customer Load
- ✓ Full Load
- ✓ Light Load
- ✓ Power Factor
- ✓ CT Health
- ✓ Burden Testing
- ✓ Ratio Testing
- ✓ Demagnetization
- ✓ Admittance Testing
- ✓ Harmonics Assessment
- ✓ Site Verification





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METROLOGY

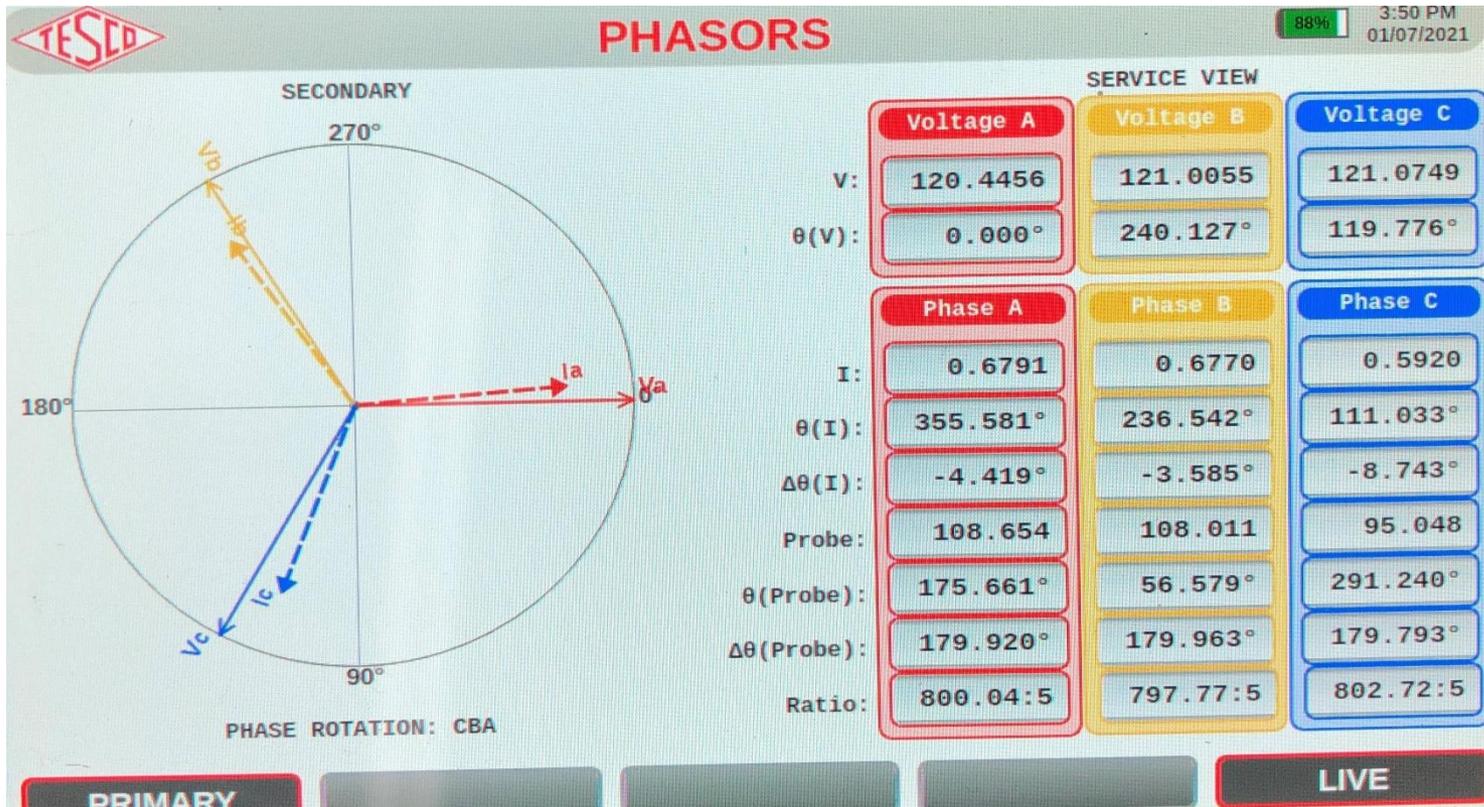


- ✓ Primary and Secondary
- ✓ Instant LIVE Data
- ✓ 3 Phases with Average Summary



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3 PHASE VECTORS





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METER ACCURACY TESTING

ACCURACY TEST

MANUAL METER TEST 7:38 PM 03/13/2020

UTILITY METER TO TEST

FORM: 9S Kh: 1.80 SERVICE: 4-Wire, Wye
TA: 2.5 PULSES PER REV: 1 SERIAL NO:

SELECT TEST LOADS
(SHORTCUT: PRESS THE EQUIVALENT NUMBER)
 1-CL (CUSTOMER LOAD)
 2-FL (TA)
 3-LL (10%TA)
 4-PF (TA @ 0.5PF LAG)
 5-ADV (ADVANCE SETUP)

TEST TYPE
 ACCURACY TIMED RUN TIMED REG DEMAND ENERGY

	PULSES	WEIGHT	ITR
CL:	1	1	1
FL:	0	0	0
LL:	0	0	0
PF:	0	0	0
ADV:	0	0	0

TOLERANCE: 0.50%
PASS OR FAIL CRITERIA

WARM-UP TIME: 00:00:00
(hh:mm:ss)
NOTE: ONLY RUNS BEFORE THE FIRST TEST.

NEW ADV SETUP PULSE ALIGN START

- ✓ Meter Accuracy Test using IR Pulse Detection
- ✓ Make connections from Field Tester to Meter Form
- ✓ Connect IR Pulse Detector to meter output
- ✓ Check pulse indicator
- ✓ Pulse Align if necessary



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METER ACCURACY TESTING

METER TEST RESULTS 95% 12:42 PM 09/30/2020

TEST PARAMETERS

TAG: ITERATION: TEST STATUS: **TEST FINISHED**

PULSES: PRESET: ACTUAL: REMAINING: WHrs:

TEST RESULTS

TEST	ITR	TAG	WHrs	%ERROR	REG	P/F	W	Va
0	1	CL ACC	1.798	0.12	100.11	PASS		285.40
0	AVE		1.798	0.12	100.12	PASS	1.00	285.40
ALL	WAVG			0.12	100.12	PASS		

- ✓ Meter Accuracy Test using IR Pulse Detection
- ✓ Make connections from Field Tester to Meter Form
- ✓ Connect IR Pulse Detector to meter output
- ✓ Check pulse indicator
- ✓ Pulse Align if necessary



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CUSTOMER CT RATIO TEST WITH BURDEN



- ✓ Make Connections from Field Tester to Primary current phases
- ✓ Make connections from Field Tester to Secondary test switch
- ✓ Connect IR Pulse Detector to meter output



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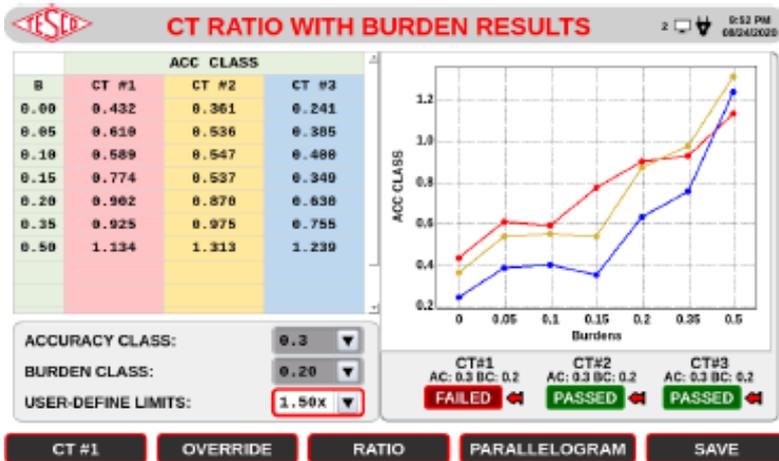
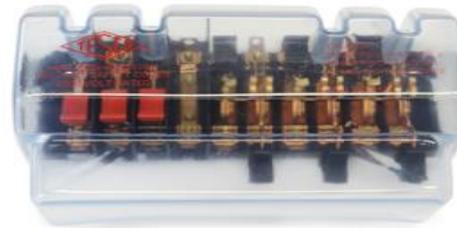
FUNDAMENTALS OF POLYPHASE FIELD METER TESTING AND SITE VERIFICATION

Functionality with Burden Present on the Secondary Loop

PHASE A



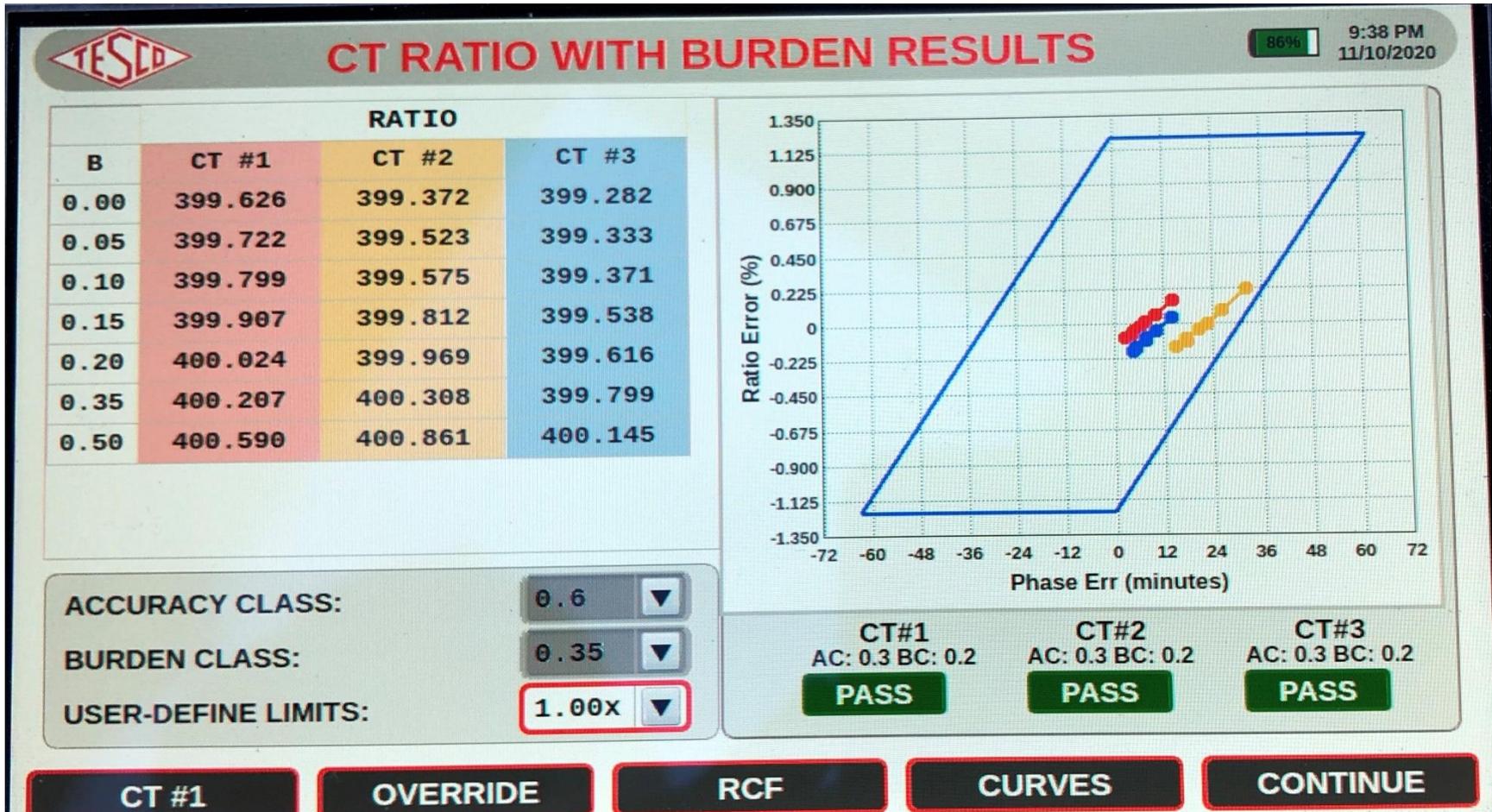
- Some burden will always be present – junctions, meter coils, test switches, cables, etc.
- CT's must be able to maintain an accurate ratio with burden on the secondary.





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CT RATIO TESTING WITH BURDEN ADDED





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PHANTOM LOAD TESTING

METER TEST RESULTS 11:24 AM 08/30/2020

TEST PARAMETERS

TAG: ITERATION: TEST STATUS: **TEST FINISHED**

PULSES: PRESET: ACTUAL: REMAINING: WHrs:

TEST RESULTS

TEST	ITR	TAG	WHrs	%ERROR	REG	P/F	W	Va
0	0	CL	1.800	0.02	100.02	PASS		277.05
0	AVE		1.800	0.02	100.02	PASS	1.00	277.05
1	0	FL	1.800	-0.00	100.00	PASS		277.05
1	AVE		1.800	-0.00	100.00	PASS	1.00	277.05
ALL	WAVG			0.01	100.01	PASS		

CANCEL

SEQUENCE SUMMARY 9:31 PM 11/24/2020

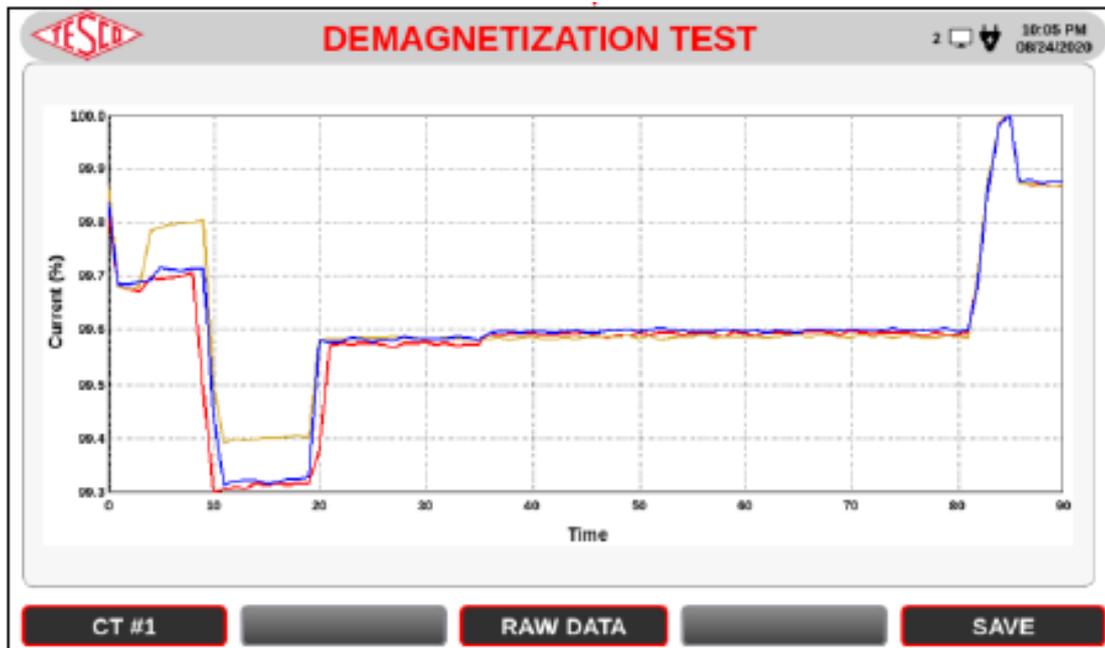
Meter Test Results

INDEX	TYPE	PASS/FAIL	REG	PARAM
1-1	FL ACC	PASS	99.970	1 pulse
2-1	LL ACC	PASS	99.993	1 pulse
3-1	PF ACC	PASS	99.952	1 pulse
Weighted AVG		PASS	99.972	
	AF	AL		
FL	100.000	100.000		
LL	100.000	100.000		
PF	100.000	100.000		



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DEMAGNETIZATION TESTING

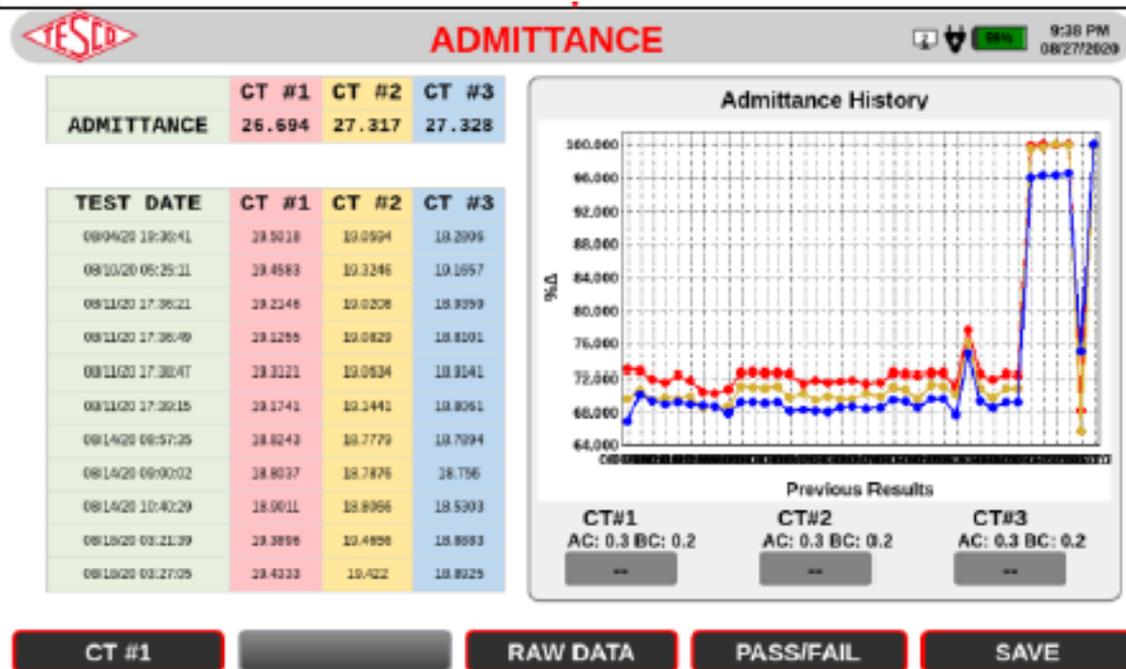


- ✓ Current transformers (CTs) show large errors when they are magnetized by dc current. This error can be reduced after proper demagnetization.
- ✓ One of the methods to demagnetize the CT is to increase the core flux by increasing its burden. This method enables to restore the nominal precision of the heavily magnetized CT from 2.5% back to 0.2% without interruption of the CT operation.



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ADMITTANCE TESTING

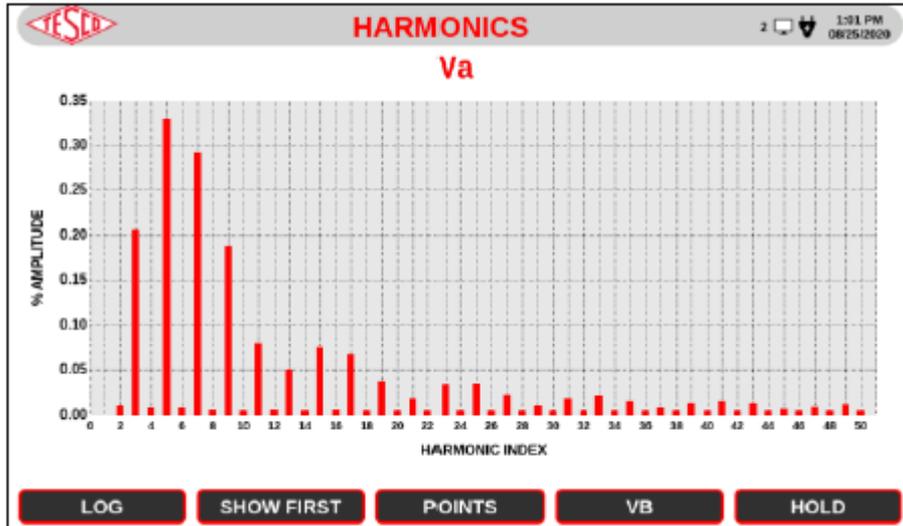


- ✓ **admittance** is a measure of how easily a circuit or device will allow a current to flow. It is defined as the reciprocal of impedance.
- ✓ The SI Unit of admittance is the (symbol S)



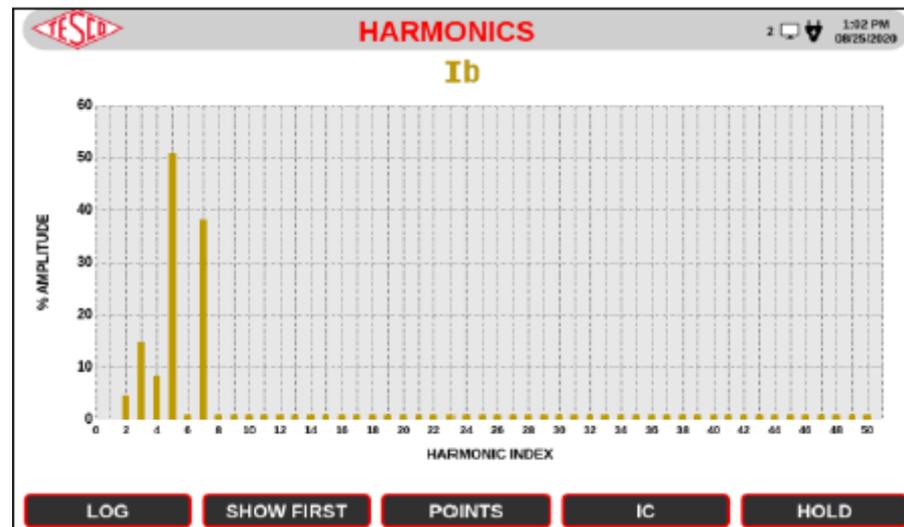
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HARMONICS TESTING



- ✓ Harmonics are integer frequencies often found with nonlinear loads.

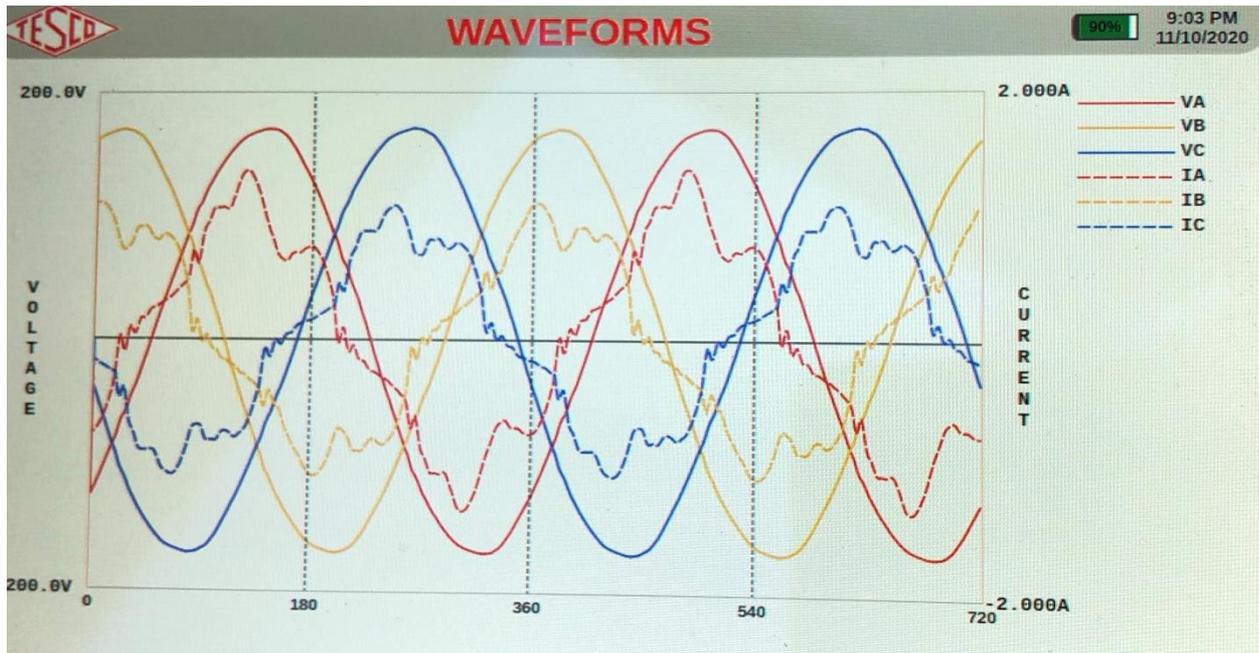
THD=Total Harmonic Distortion
 $V_{thd} < 5\%$





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HARMONICS TESTING-WAVEFORMS



- ✓ **Harmonics** are generated as a voltage or current at an integer frequency of the system, produced by the action of non-linear loads such as rectifiers, discharge lighting, or switch mode power supplies.
- ✓ Harmonic frequencies in the power grid are a frequent cause of power quality problems.



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QUESTIONS AND DISCUSSION



Thank you for Attending.

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