



# GE Digital Energy

Instrument Transformers, Inc

# IEEE CT TYPE TEST REPORT

Issued By

Instrument Transformers Inc  
1907 Calumet Street, Clearwater, FL 33765

Catalog Number

750X333011

Model number

JAK-0S

Serial Number

Sample #1 and Sample #2

Date Issued

1/03/2014

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## TEST EQUIPMENT / ACCESSORIES

Equipment Used during Test	S/N	Calibrated Date	Cal. Due Date	Asset Number
Associated Research, Inc. 00404A Hi-Pot	3262	9/3/13	9/3/14	1092
Metering CT	455840	10/2006	10/2016	1795
Fluke DMM	58680419	11/4/13	11/4/14	2085
Tektronix DMM	152941	8/5/13	8/5/14	1663
Dr. Strauss Digital Recorder TR-AS 200-12	468	8/2012	8/2014	1919
Impulse test set	P35-080516-09-83	8/2012	8/2014	1072
Fluke 199C Scopemeter	DM9240382	1/2013	1/2014	1387
HV Divider	N/A	10/2013	10/2014	1796
Stopwatch	365515	4/11/13	4/11/14	1690
CT Test set	n/a	4/11/13	4/11/14	1213
GWINSTEK Low Resistance Ohmmeter GOM-802	CL911191	1/28/13	1/28/14	1967

## RELATED DOCUMENTS

Document Number	Document Name
IEEE C57.13 2008	IEEE Standard Requirements for Instrument Transformers

## TEST CONDITIONS (temp, humidity, barometric pressure)

See impulse section

## PURPOSE

Verify compliance to Standard: IEEE C57.13 2008

## COMMENTS

Test Data below indicates initial routine tests, followed by type tests, followed by routine tests per IEEE C57.13 2008.



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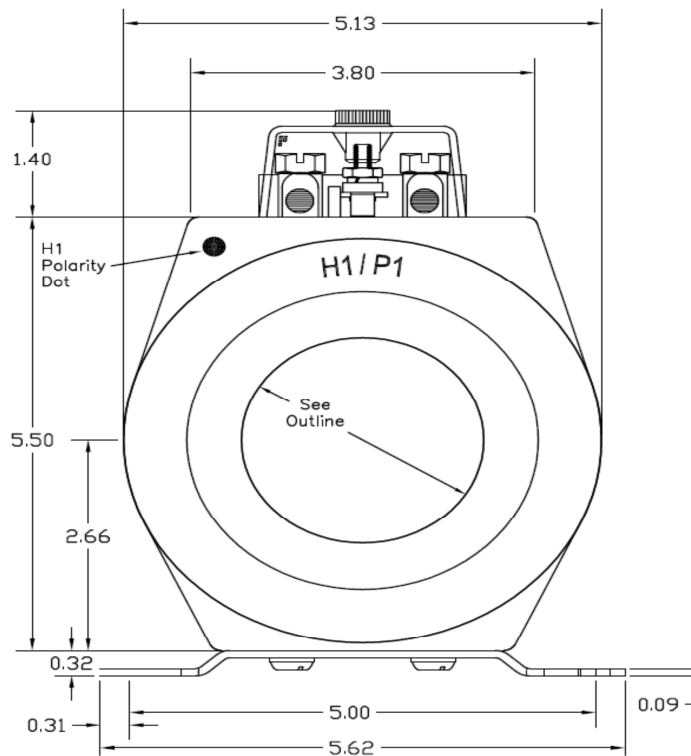
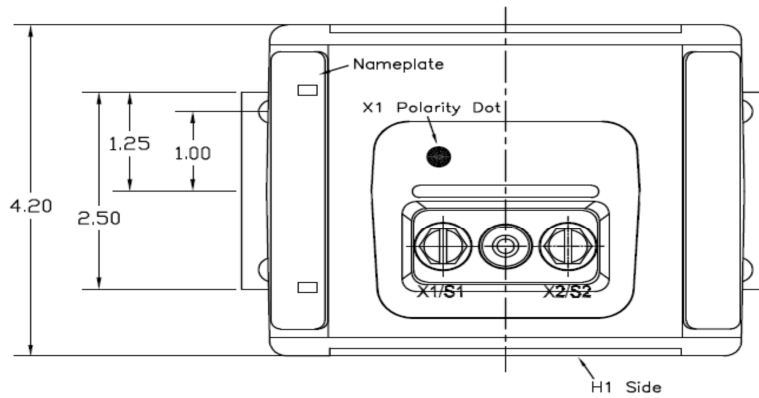
Ratio: 600:5

Voltage Class: 0.6kV, 10kV BIL

Metering Class: 0.15S B0.5

Rating Factor (30°C Amb.): 2.0

Frequency: 60Hz





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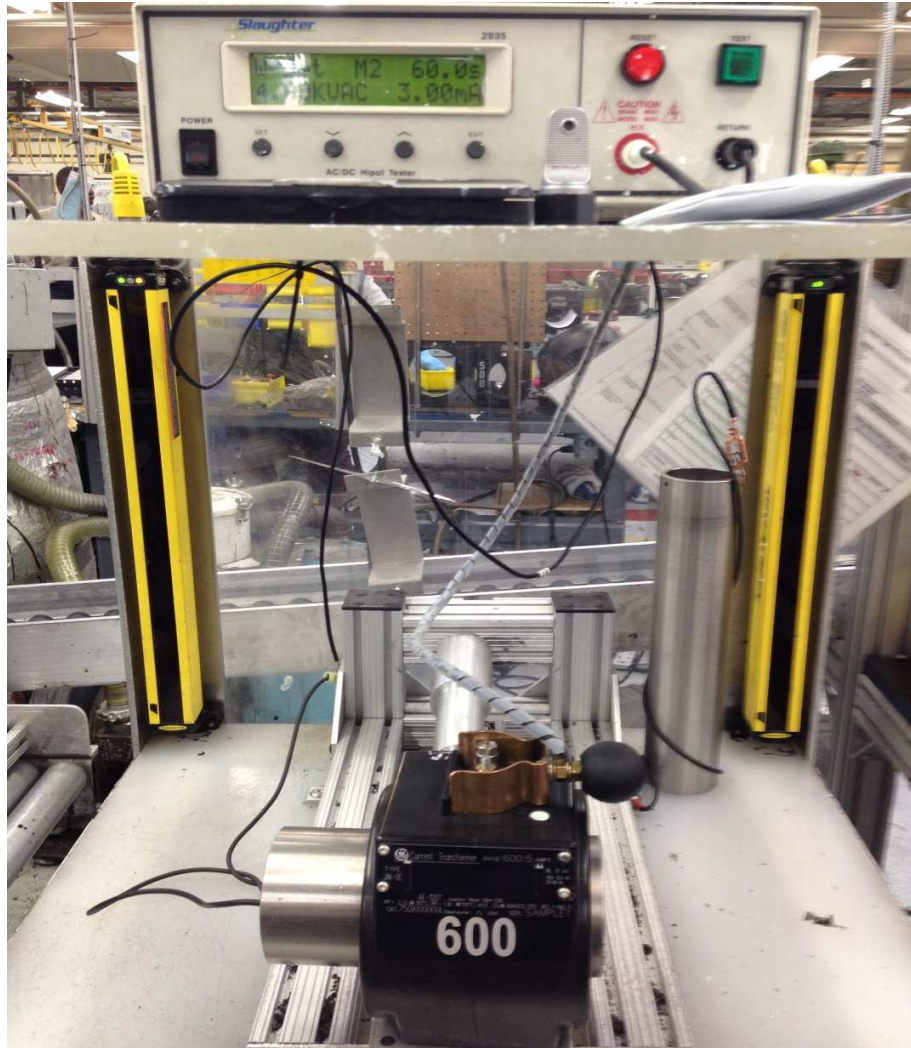
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## I. Routine tests (4.7.2)

### a) Hipot tests (as applicable)

4.0 kV, 60Hz for 60sec - between LV winding and ground

(Note: 0.6kV 10kV BIL window style CT's are Hipot tested by applying 4.0kV between LV winding and ground and a conductor in the window)





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b) Accuracy tests

Frequency: 60

Burden	1%			5%			100%			200%			300%		
	RE	PE	CL	RE	PE	CL	RE	PE	CL	RE	PE	CL	RE	PE	CL
0	0.031	1.26	0.03	0.019	1.05	0.02	0.018	1.02	0.02	0.021	0.65	0.02	0.021	0.61	0.02
E0.04	0.029	1.28	0.03	0.016	1.43	0.04	0.019	0.99	0.02	0.021	0.74	0.02	0.021	0.69	0.02
B0.1	0.042	1.68	0.04	0.029	1.93	0.05	0.032	0.96	0.03	0.029	0.69	0.03	0.028	0.71	0.03
B0.2	0.057	2.27	0.06	0.041	2.59	0.06	0.041	1.06	0.04	0.034	0.77	0.03	0.035	0.86	0.04
B0.5	0.086	3.95	0.09	0.073	4.32	0.09	0.056	1.16	0.06	0.06	1.77	0.06	0.047	1.1	0.05

c) Polarity tests

ok Subtractive polarity



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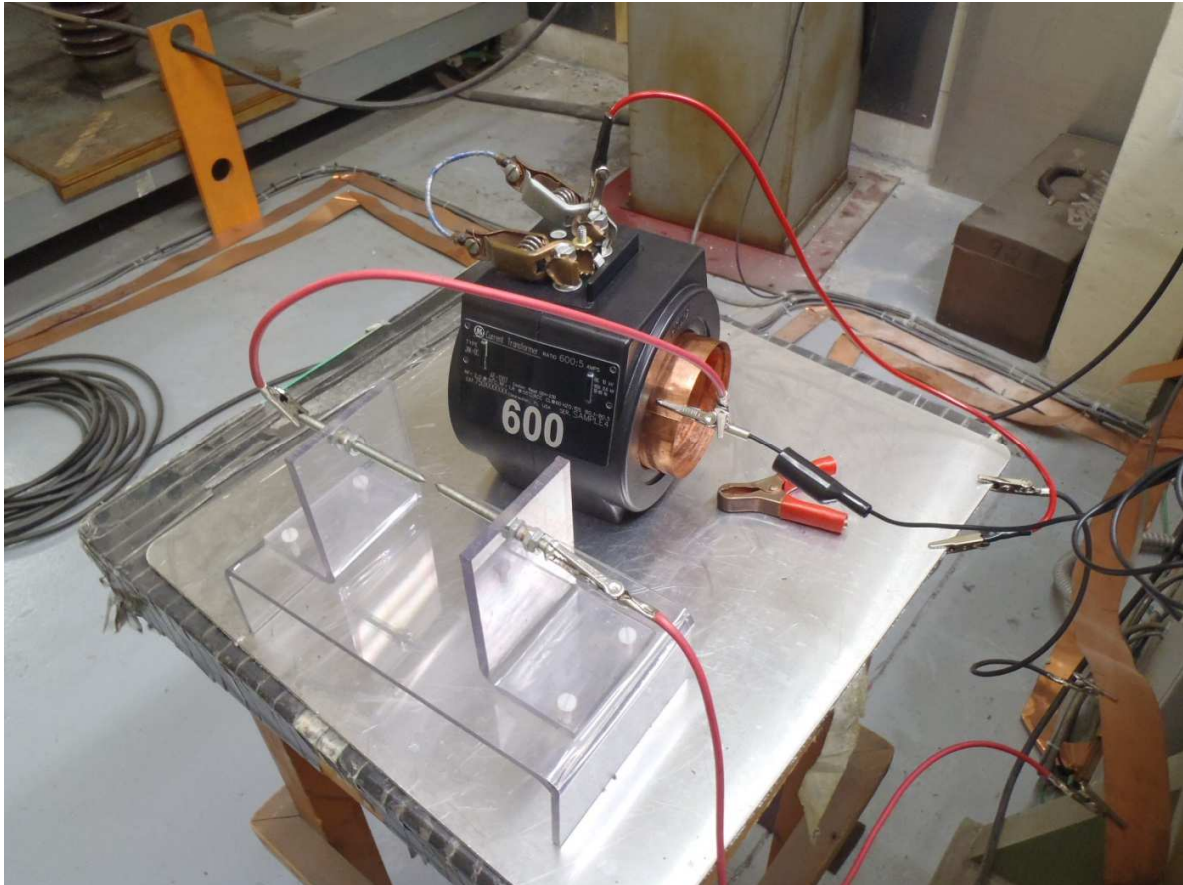
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## II. Type tests (4.7.3):

### a) Impulse Tests

Temperature: 29.7 C  
Pressure: 30.17 hPa  
Humidity: 37.8% RH





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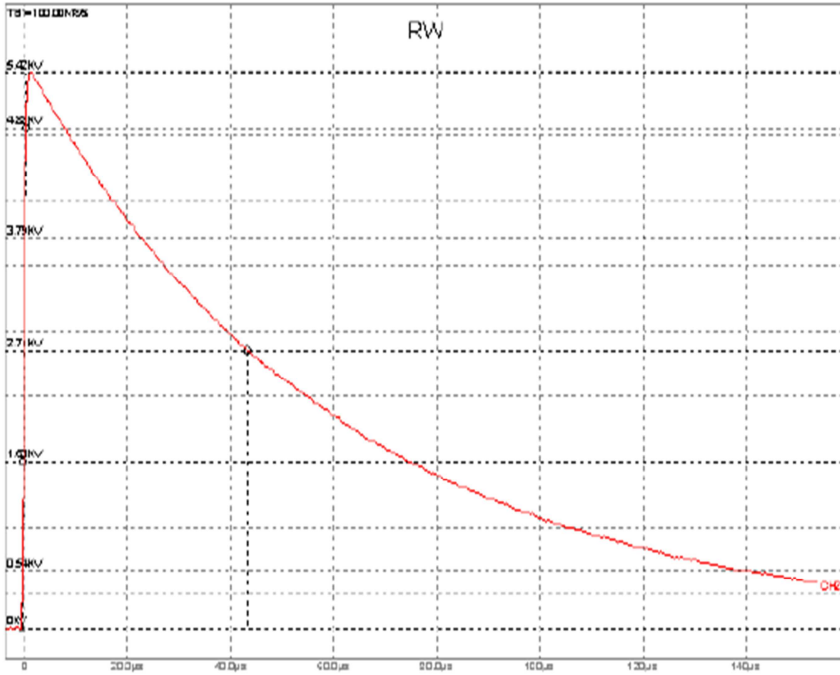
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Date Issued

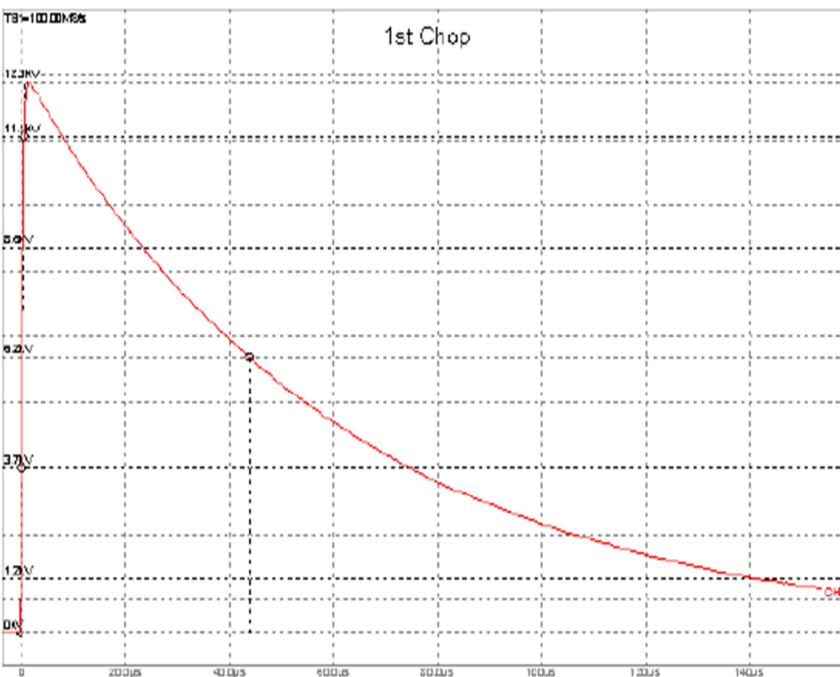
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Reduced Wave  
Measured Values:  
Vp=5.42kV  
T1 = 0.87us  
T2 = 43.8us



Chopped Wave #1  
Measured Values:  
Vp=12.3kV  
T1 = 0.85us  
T2 = 44.2us



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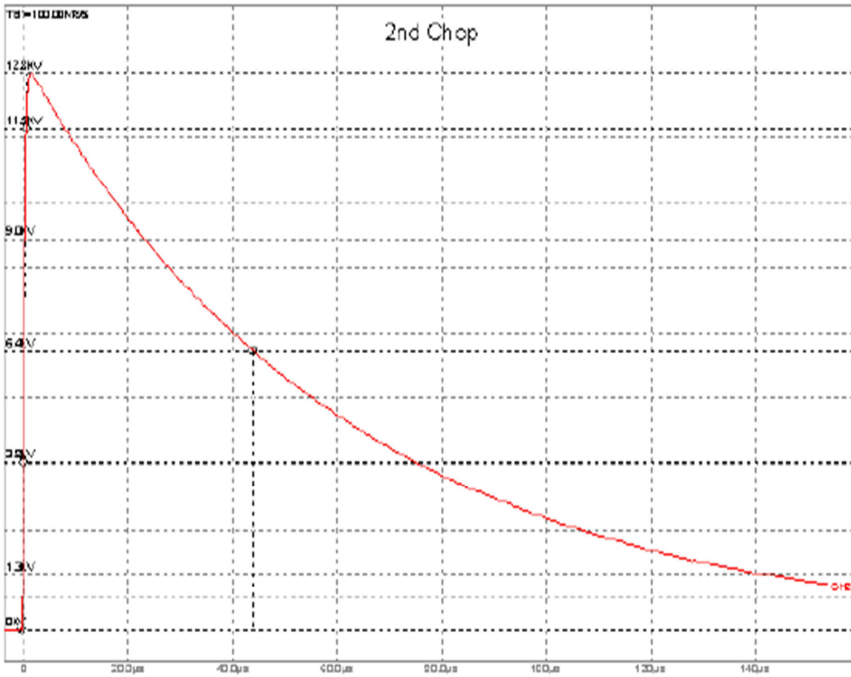
Sample #1 and Sample #2

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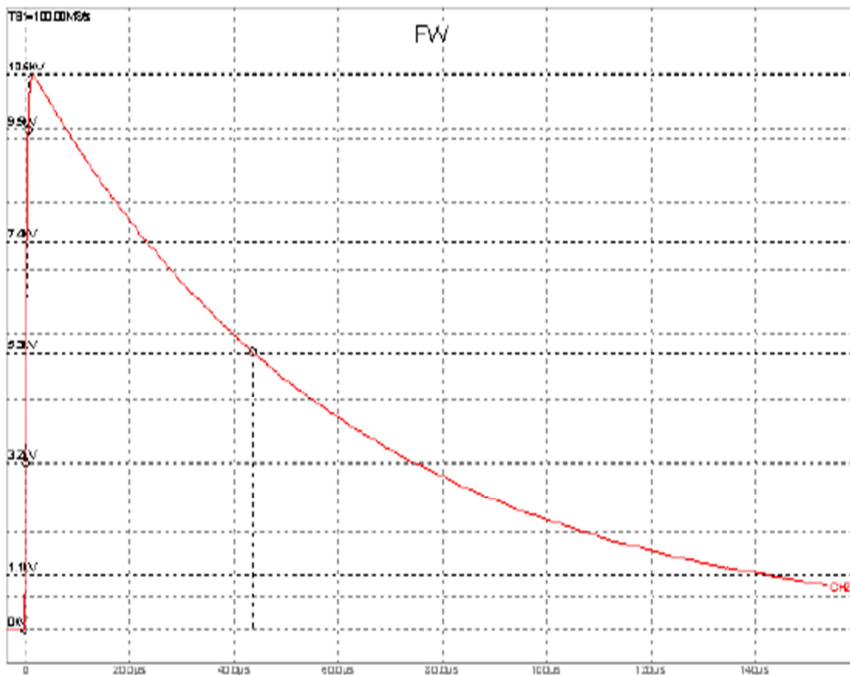
Chopped Wave #2

Measured Values:

Vp=12.8kV

T1 = 0.87µs

T2 = 44.3µs



Full Wave

Measured Values:

Vp=10.6kV

T1 = 0.87µs

T2 = 44µs





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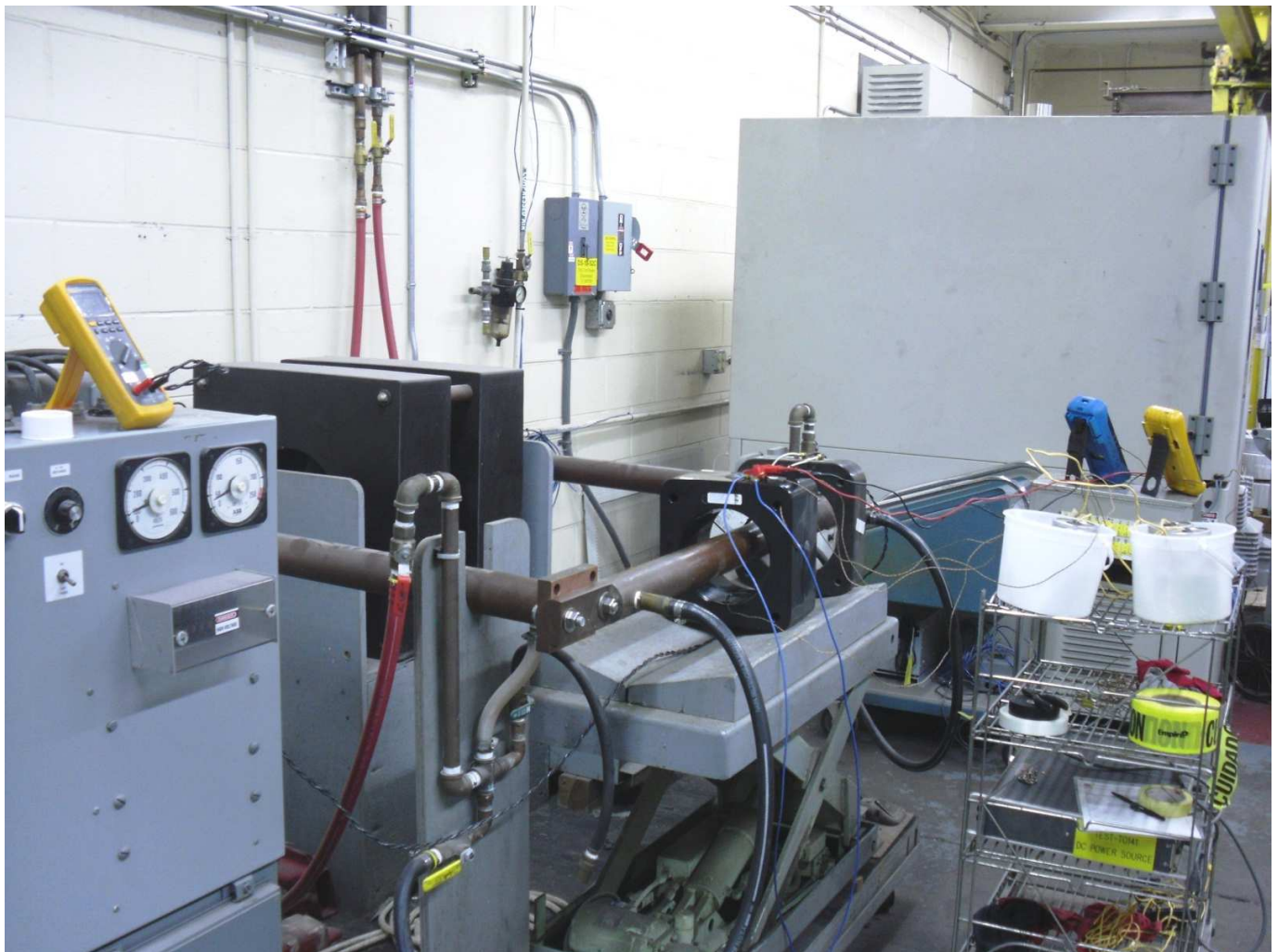
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## b) Temperature Rise Test

Temperature rise of X1 terminal: 21.4 Degrees C  
Primary current measured with 2000:5 CT  
Secondary burden for unit under test = 0.139 ohm







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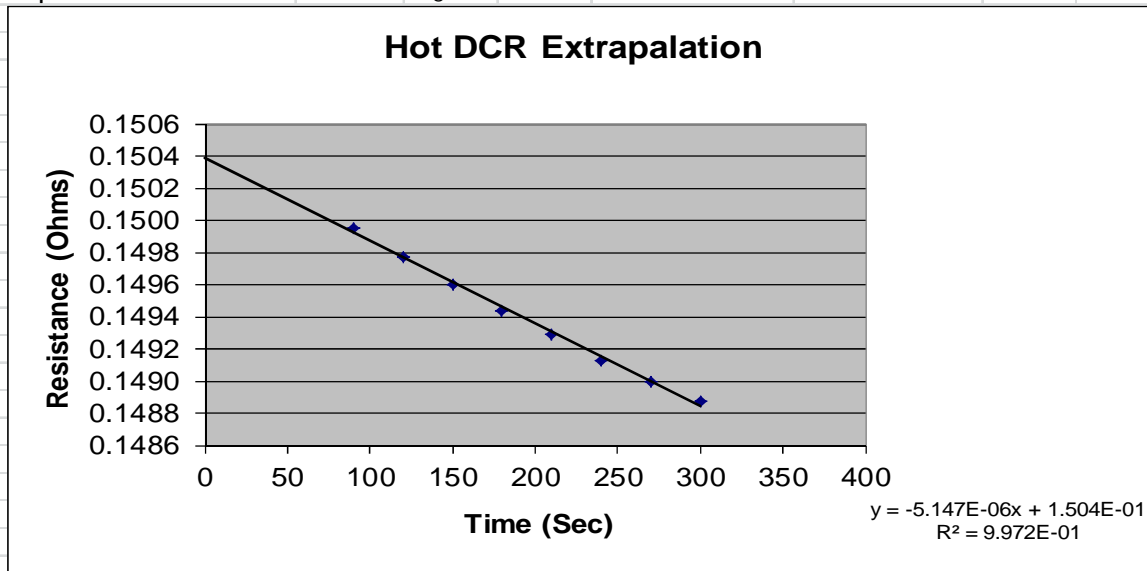
### Temperature Rise Worksheet

Initial Resistance	0.139 ohms	Cat:	750X333011
Initial Ambient	24.9 deg C	Serial No.	Sample 1
Final Resistance	0.150 ohms	Ext. Current Rating	2.0
Final Ambient	25.7 deg C	Accuracy	0.15S

Time	Resistance
90	0.14995
120	0.14977
150	0.14960
180	0.14944
210	0.14929
240	0.14913
270	0.14900
300	0.14887

Slope= 0.0000  
Intercept= 0.1504  
Correlation Coeff= -0.99951  
R @ t<sub>0</sub>= 0.1504

Temperature Rise: 21.4 deg C



Tested by: Jimmy Bou

Date: 12/11/2013



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Type:	CT			Rating Fact:	2.0		
Cat. No.	750X333011			Acc. Class:	0.15S		
S/N:	Sample 1			Date:	12/11/13		
Ratio:	600:5			Frequency	60		
Terminal Voltage							
Time	Ambient Temp 1 & 2	X1	Window	Top	Side		Samp. Amps
8:30	24.8	26.0	27.4	25.3	25.8		3.05
9:00	25.5	32.8	45.4	32.0	32.9		3.03
9:45	25.6	36.0	55.2	36.3	35.7		3.03
10:15	25.5	36.6	57.2	37.5	36.9		3.02
10:45	25.5	36.5	58.1	38.0	36.5		3.03
12:15	25.4	37.5	57.7	37.9	36.5		3.01
2:00	25.5	37.5	57.9	38.0	36.2		3.00
3:00	25.6	36.6	58.0	37.9	36.3		3.000
3:40	25.7	37.4	58.0	38.0	36.4		3.000
4:40	25.7	36.9	58.6	38.1	36.4		3.000



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### Temperature Rise Worksheet

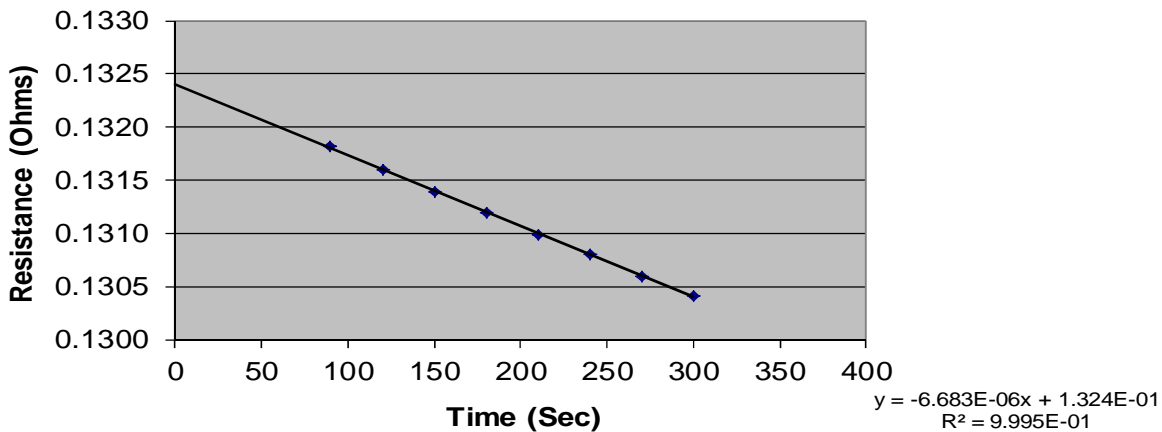
Initial Resistance	0.111	ohms	Cat:	750X333101
Initial Ambient	24.8	deg C	Serial No.	Sample 2
Final Resistance	0.132	ohms	Ext. Current Rating	3.0
Final Ambient	25.4	deg C	Accuracy	0.15S

Time	Resistance
90	0.13182
120	0.13160
150	0.13139
180	0.13119
210	0.13099
240	0.13080
270	0.13060
300	0.13041

Slope= 0.0000  
 Intercept= 0.1324  
 Correlation Coeff= -0.999696  
 R @ t<sub>0</sub>= 0.1324

Temperature Rise: 49.9 deg C

### Hot DCR Extrapolation



Tested by:

Jimmy Bou

Date:

3/19/2014



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Type:	CT			Rating Fact:	3.0			
Cat. No.	750X333002			Acc. Class:	0.15S			
S/N:	Sample 2			Date:	3/20/14			
Ratio:	600:5			Frequency	60			
				Terminal Voltage				
Time	Ambient Temp 1 & 2	X1	Window	Top	Side	Busbar	Bottom	Samp. Amps
8:30	24.7	25.2	26.8	25.1	25.1	27.9	25.4	4.51
9:20	24.8	40.1	63.0	36.8	45.3	64.5	46.0	4.50
9:50	25.0	47.0	67.2	42.2	52.7	67.3	54.1	4.51
10:35	25.1	53.0	69.6	47.3	58.2	69.0	61.2	4.50
11:05	25.1	55.1	71.4	48.7	59.9	70.1	64.2	4.53
11:50	25.2	56.7	72.1	50.1	61.0	70.7	66.2	4.50
1:30	25.3	57.2	72.6	50.2			67.9	4.51
2:00	25.5	58.2	73.9	51.0	66.3	72.7	68.9	4.580
2:45	25.4	58.0	73.1	51.1	66.8	72.0	68.9	4.500
3:20	25.4	58.0	72.6	50.8	66.7	71.1	68.9	4.510
3:50	25.4	57.4	73.0	50.7	66.6	71.6	68.9	4.510

- Sample CT is 2000:5
- Terminal Voltage is measured across UUT secondary terminals to verify 0.139 ohm burden.

### III. Routine tests (4.7.2)

a) Hipot tests (as applicable)

4.0 kV, 60Hz for 60sec - between LV winding and ground



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## b) Accuracy tests

Frequency: 60

RF=2.0

Burden	1%			5%			100%			200%			300%		
	RE	PE	CL	RE	PE	CL	RE	PE	CL	RE	PE	CL	RE	PE	CL
0	0.04	1.26	0.04	0.027	1.34	0.03	0.028	0.93	0.03	0.029	0.64	0.03	0.028	0.56	0.03
E0.04															
B0.1	0.048	1.52	0.05	0.037	1.72	0.04	0.038	0.87	0.04	0.035	0.68	0.04	0.035	0.64	0.04
B0.2	0.061	1.97	0.06	0.048	2.16	0.05	0.046	0.87	0.05	0.045	1.01	0.05	0.052	1.14	0.05
B0.5	0.105	3.44	0.1	0.087	3.94	0.09	0.072	1.02	0.07	0.081	1.79	0.08	0.055	0.89	0.06

RF=3.0

JAK-0S #1		750X333101														
Burden	1%			5%			100%			200%			300%			
	RE	PE	CL	RE	PE	CL	RE	PE	CL	RE	PE	CL	RE	PE	CL	
0	0.028	1.19	0.03	0.02	1.01	0.02	0.024	0.65	0.02	0.023	0.48	0.02	0.022	0.41	0.02	
E0.04																
B0.1	0.042	1.77	0.04	0.032	1.94	0.04	0.033	0.91	0.03	0.03	1.08	0.03	0.033	1.2	0.03	
B0.2	0.056	2.45	0.06	0.047	2.89	0.06	0.043	0.68	0.04	0.03	3.1	0.08	0.052	2.32	0.05	
B0.5																

## c) Polarity tests

ok Subtractive polarity

## SIGNATURES

	Name	Date	Signature
Test performed by	Jimmy Bou	3/21/14	

END OF REPORT