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Certificate No. : T-0071

TEST REPORT

NAME & ADDRESS OF CUSTOMER	TEST REPORT NO. : PHV/07/646-1 DATE : 07.07.2008	
RISHABH INSTRUMENTS PVT LTD F-31, MIDC SATPUR NASHIK-422007.	**CUSTOMER REF.NO:** NIL	**DATE :** 26.02.2008
	DATE OF SAMPLE RECEIPT	**DATE OF TESTING**
	27.02.2008	09.04.2008 to 02.06.2008

SAMPLE DESCRIPTION	SAMPLE IDENTIFICATION
CURRENT TRANSFORMER **MFD.BY : Rishabh Instruments Pvt ltd** RATIO : 100/5 A. BURDEN : 5 VA CLASS : 1.0 I.L. : 0.72/4kV FREQ : 50 Hz Insulation class : E STC : 5 kA / 1sec. TYPE : RISH CT TW-2 ISF : ≤5	**SR.NO.** : 001 **ERDA IDENTIFICATION NO :** PHV 39/01 **TEST SPECIFICATION :** IEC-60044-1/2003

TEST DETAILS	ENCLOSURES :	
As per Sheet No. 2 of 7.	Number of Oscillogram : TWO Number of Photograph : ONE Number of Drawings : ONE	Oscillogram No. : 1) 114/01 2)114/02 PHOTOGRAPH NO:PHV-39/164

TEST RESULTS : As per sheet : 3 to 7.

REMARKS : The sample **CONFORMS** to the requirements of the above mentioned IEC in the tests mentioned on sheet 2 of 7.

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Note: 1. This report relates only to the particular sample received in good condition for testing at ERDA.
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3. Publication of this report requires prior permission in writing from Director, ERDA.
4. Only tests asked for by the customer have been carried out.

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TEST DETAILS (MENTIONED AS PER SEQUENCE OF TESTING)

Sr No	TESTS (In sequence)	IEC 60044-1/2003
I	**Pre Routine Test :**	
	a) Verification of Terminal Marking	8.1
	b) Power frequency dry withstand test on secondary winding	8.3
	c) Inter-turn Overvoltage Test	8.4
	d) Determination of Errors	11.5
II	Temperature rise test	7.2
III	Determination of Errors	11.4
IV	Instrument Security factor test	11.6
V	Short Time Current Test	7.1
VI	**Post Routine Test :**	
	a) Verification of Terminal Marking	8.1
	b) Power frequency dry withstand test on secondary winding	8.3
	c) Inter-turn Overvoltage Test	8.4
	d) Determination of Errors	11.5

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TEST RESULTS :

I. Pre Routine Test :

Ia. **Verification of Terminal Marking and Polarity.**

Primary winding terminals : P1-P2
Secondary winding terminals : S1-S2
Terminal Marking and Polarity found ok.

Ib. **Power Frequency Dry Withstand Test on Secondary Winding.**

The power frequency voltage of 3 kVrms was applied between the secondary winding terminals connected together and the earth. The test voltage was applied for 60 seconds. There was no disruptive discharge observed. CT withstood the test voltage satisfactorily.

Ic. **Inter-turn Over Voltage Test.**

With the primary winding open circuited, a voltage at rated frequency was applied to the secondary winding terminals , such as to produce a secondary limiting current of rms value equal to the rated secondary current (i.e.5 A.) for one minute.

The CT withstood the applied voltage satisfactorily for 60 seconds.

Id. **Determination of Errors .**

CURRENT TRANSFORMER : **BURDEN 5 VA, CLASS 1.0**

% OF RATED BURDEN	% OF I RATED	RATIO ERROR IN %	PHASE ANGLE ERROR IN MIN.
(A). RATIO: 100/5 A			
100	120	-0.746	2.31
100	100	-0.804	5.21
100	20	-1.346	32.20
100	5	-2.012	55.66
25	120	0.734	18.07
25	100	0.729	19.06
25	20	0.635	28.77
25	5	0.382	43.01

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TEST RESULTS :

II. **Temperature Rise Test.**

Continuous rated thermal current equals to the rated primary current at rated frequency was circulated in the primary windings of the CT. Rated burden was connected across the secondary winding terminals of the CT.

At steady state, the temperature of the body and ambient were recorded. The resistance of secondary winding was measured immediately after shut down.

The temperature rise so obtained were as follows :

A) Temperature rise of :

I) Secondary winding (resistance method) : S1-S2 = 5.6 °C

B) Ambient Temperature : 27.3° C

NOTE : There was no significant temperature rise observed on the body of the CT.

III. **Determination of Errors .**

CURRENT TRANSFORMER : **BURDEN 5 VA, CLASS 1.0**

% OF RATED BURDEN	% OF I RATED	RATIO ERROR IN %	PHASE ANGLE ERROR IN MIN.
(A). RATIO: 100/5 A			
100	120	-0.744	2.29
100	100	-0.802	5.18
100	20	-1.345	32.22
100	5	-2.011	55.62
25	120	0.736	18.11
25	100	0.731	19.08
25	20	0.632	28.76
25	5	0.390	43.11

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TEST REPORT NO. : PHV/07/646-1 SHEET : 5 OF 7

DATE : 07.07.2008

TEST RESULTS :

IV. **Instrument Security Factor Test.**

RATIO	:	100/5 A
SLV Computed	:	5.86 V
Excitation Current	:	2.5 A
Measured secondary voltage at excitation current	:	3.3 V
Therefore ISF	:	2.82

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TEST RESULTS :

V. SHORT TIME CURRENT TEST

The short time current test was performed by connecting Copper cable (passed through window of the CT) to source as per test circuit diagram no.: OLSC/IT/11 and secondary winding short circuited through a copper link of negligible impedance.

Condition of the equipment under test: As after test mentioned in sheet no 3 of 7.

Test No.	Oscillogram No.	Short circuit current (kA)		Duration (sec.)	Remarks	Observation During test
		Peak	Rms			
1.	114/01	-	5.011	1.003	Thermal current test	No abnormality
2.	114/02	12.585	-	0.089	Dynamic peak test	No abnormality

Observation after test: - No visible damage observed.
- CT body was intact.

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Certificate No. : T-0071

TEST REPORT NO. : PHV/07/646-1 SHEET : 7 OF 7

DATE : 07.07.2008

TEST RESULTS :

VI. Post Routine Test :

VIa. **Verification of Terminal Marking and Polarity.**

Primary winding terminals : P1-P2

Secondary winding terminals : S1-S2.

Terminal Marking and Polarity found ok.

VIb. **Power Frequency Dry Withstand Test on Secondary Winding.**

The power frequency voltage of 2.7 kV (90% of 3kVrms) was applied between the secondary winding terminals connected together and the earth.The test voltage was applied for 60 seconds . There was no disruptive discharge observed. CT withstood the test voltage satisfactorily.

VIc. **Inter-turn Over Voltage Test.**

With the primary winding open circuited, a voltage at rated frequency was applied to the secondary winding terminals such as to produce a secondary limiting current of rms value equal to 90% of the rated secondary current (i.e.90% of 5A.) for one minute. The CT withstood the applied voltage satisfactorily for 60 seconds.

VId. **Determination of Errors .**

% OF RATED BURDEN	% OF I RATED	RATIO ERROR IN %	PHASE ANGLE ERROR IN MIN.
(A). RATIO: 100/5 A			
100	120	-0.731	1.01
100	100	-0.791	4.13
100	20	-1.355	29.75
100	5	-2.041	49.90
25	120	0.774	16.65
25	100	0.770	17.46
25	20	0.686	25.54
25	5	0.419	40.65

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Short Circuit Laboratory
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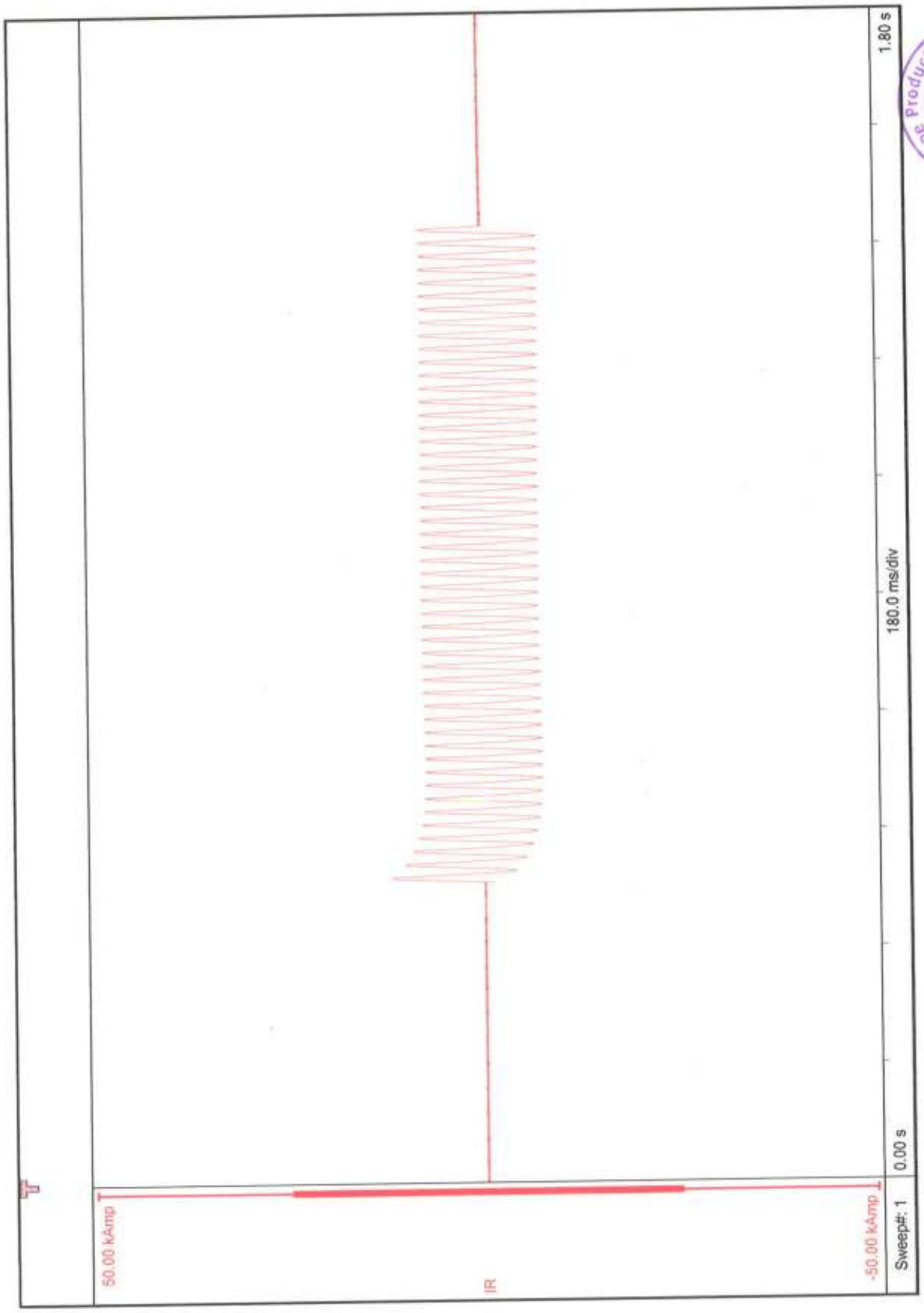

OSCILLOGRAM NO.:114/01

No. 1762202

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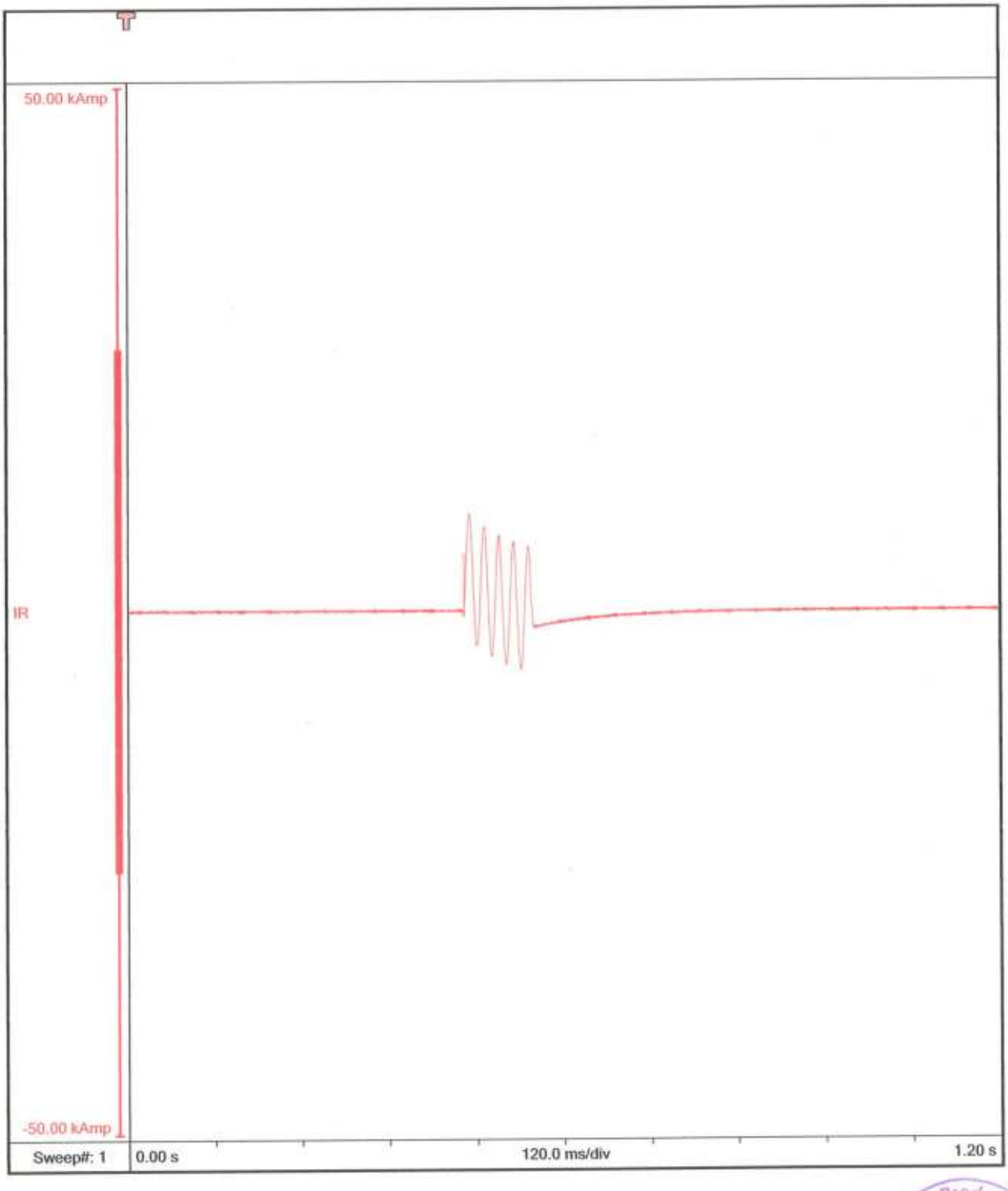

OSCILLOGRAM NO.:114/02

No. 1762206

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RISHABH INSTRUMENTS PVT. LTD.(TRISHALA UNIT)
C-6,NICE AREA MIDC,SATPUR,NASHIK-7
DEPT:-L.T.C.T.

DATA SHEET OF TYPE TEST CT

SR NO.	CT TYPE	CT RATIO	VA/CLASS	H.S.V	STC	QTY.	CT SR.NO
1	TW-2	100/5	5/1.0	0.72/4/-Kv	5 KA FOR 1.0 SEC	1	1
2	TW-6	3000/5	15/0.2s	0.72/4/-Kv	40 KA FOR 1.0 SEC	1	2
3	74/20	400/5	5/0.2s	0.72/4/-Kv	5 KA FOR 1.0 SEC	1	3
4	140/100h	4000/5	15/0.2s	0.72/4/-Kv	40 KA FOR 1.0 SEC	1	4

SR NO.	CT TYPE	CT RATIO	VA/CLASS	SEC. Cu.	NO.OF CONDUCTORS	NO.OF TURNS	WIRE Diameter	Total Wire Diameter	Area in mm	Total Area
1	TW-2	* 100/5	5/1.0	22 SWG	* 4	20	* 0.70	2.80	0.4	1.6
2	TW-6	3000/5	15/0.2s	19 SWG	2	600	1.02	2.04	0.81	1.62
3	74/20	400/5	5/0.2s	23 SWG	6	80	0.60	3.60	0.29	1.74
4	140/100h	4000/5	15/0.2s	19 SWG	2	800	1.02	2.04	0.81	1.62

PLANNING BY	DATE	APPROVED BY
I.T.GHYAR	23/6/2008	S.G.DANAVALE

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Test Report No. ________
Date ________
Product ________
Verified by ________
Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with '*'