

Test Report

Type Test Of Bushing Type Current Transformer

Standard NO : IEC 60044-1

2-Relay and Protection Ref.Lab.

Test Results (17 Pages)

Technical Specification

Input current:	1000 A
Output current:	5 A
Rated VA:	20 VA
Insulation Voltage:	0.75/4 kV
Frequency:	50 HZ
Class:	5P20
Thermal Current (I_{th}):	25 KA/1Sec
Dynamic Current (I_{dyn}):	2.5 I_{th}



جمهوری اسلامی ایران
وزارت نیرو



پژوهشگاه نیرو

تاریخ: ۱۳۸۹/۴/۳۰
شماره: ۸۹/۲۶۵۰/۶۰۲
پیوست: ندارد

جناب آقای مهندس ناجیان

مدیریت محترم عامل شرکت پارس شار

موضوع: اعلام نتایج آزمون ترانس جریان بوشینگ

۸۹۳۴۰۰۳۴

باسلام

احتراما، عطف به نامه شماره ۰۶۴۱-۲۳۳-س-۸۹ مورخ ۸۹/۳/۲۲ در خصوص انجام آزمون‌های نوعی بندهای 12.5, 12.3, 7.1 براساس اساس IEC 60044-1 برروی یک عدد CT بوشینگ 1000/s آمپری به پیوست گزارش آزمون‌های صورت پذیرفته طی یک دفترچه گزارش به شماره TR89012 به حضورتان ایفاد می‌گردد.

محمد رضا شریعتی
مدیر گروه پژوهشی خط و پست

شده



DAP-PL-3893.00



TEST REPORT

Relay and Protection Ref. Lab.

Applicant / Manufacturer: Pars Shar B.C

Product Name: Current Transformer 1000/5 A

Reference laboratories Center

T&D Research Center

Transmission & Substation Dept.

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Current Transformer

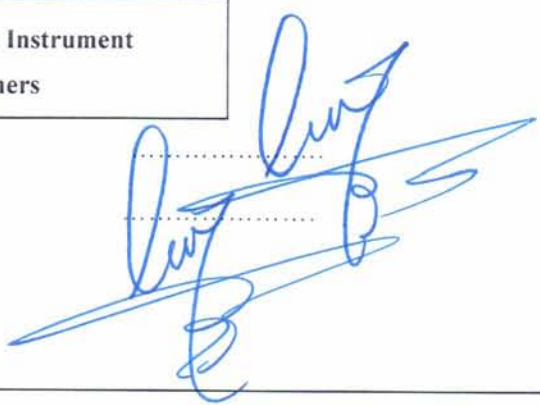
IEC 60044-1 2003-02: Instrument
Transformers

Compiled by.....: F. Mansourbakht

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Tests witnessed by.....: Ms.Hashemi

Date of issue.....: 17/07/2010



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Applicant's Name: Pars Shar B.C

Address: No2, 8th Alley, Behrouz St., Mohseni Sq., Tehran,Iran

Date of receipt of test item....:05/07/2010

Standard No.....: IEC60044-1

Test Procedure.....: Standard

Non-standard test method: N/A

Report reference No.....: TR89012

Specimen Code.....: STR89012

Test item description: Current Transformer

Trade mark: Pars Shar B.C

Manufacturer: Pars Shar B.C

Model: BCT90*236*65

Serial No.....: 8819990921

1-Test Results Table

No.	Test Name	Kind of test	Clause No.	Test Result
1	Short Time Current Test	Type Test	7.1	Pass
2	Limits of Errors for Protective Current Transformers	Type Test	12.3	Pass
3	Composite Error	Type Test	12.5	Pass

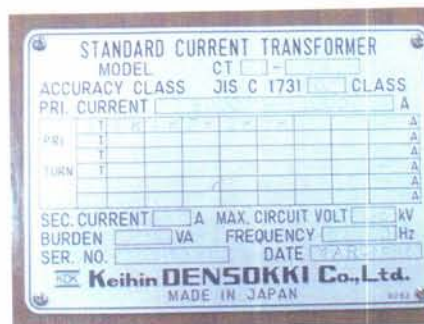
2- Marking Plate



ODEN AT

Power Multimeter

Primary Current Injection Test System



Reference Current Transformer

3- Technical Specification

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4- General Remarks

The test results presented in this report relate only to the object(s) tested.

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Throughout this report the word EUT means equipment under test and Ref as reference equipment.

Possible test case verdicts:

- ✓ Test case does not apply to the test object: N/A
- ✓ Test object does meet the requirement: Pass
- ✓ Test object does not meet the requirement: Fail

Laboratory Ambient Condition	
Temperature:25 ° C	Relative Humidity :44% RH

5- Summary of Testing

The test is performed by "Primary Current Injection Test System" model ODEN AT/3h, this equipment consist of 3 current units, in this test they have been connected in series.

For measuring primary current "Power multi meter" model PMM1 with $\pm 0.05\%$ accuracy as reference equipment is used.

5-1- Determination of Errors

At rated frequency and with rated burden connected, the current error, phase displacement and composite error shall not exceed the values given in table14.

For testing purposes when determining current error and phase displacement, the burden shall have a power-factor of 0.8 inductive except that, where the burden is less than 5VA, a power-factor of 1.0 is permissible.

For the determination of composite error, the burden shall have a power-factor of between 0.8 inductive and unity at the discretion of the manufacturer.

The current has been applied through ODEN AT/3h to the primary of current transformer and to the primary of reference transformer class 0.1 made by DENSOKKI. Applied currents are measured by Power Multimeter in the secondary of the reference CT as for reference values. The secondary of current measuring system is connected to a digital ammeter, the values registered by ammeter are considered as EUT measured values. The errors have been calculated according the following equation:

$$\%E = \frac{K_n I_s - I_p}{I_p} \times 100$$

K_n = Nominal CT ratio

I_s = Actual secondary current

I_p = Actual primary current

Uncertainty of measurement:

$U = K \cdot u_c$, $K=2$, Confidence level=95%

$U=9.58$ A for range[0-1600 A ac]

$U=29.47$ A for range[1600-5000 A ac]

Applied Current (Measured by PMM1)	Measured Current by EUT	Calculated Current Error	Permissible Current Error	Measured Phase Displacement	Permissible Phase Error	Verdict
996.6 A	4.9923 A	+0.18%	±1%	2.4min	± 60 min	PASS

$$R_c = R'_c \times 1.2$$

Where R'_c is resistance of secondary winding in $25^\circ C$

R_c is resistance of secondary winding in $75^\circ C$

$$R_b = \frac{S_b \times \cos \varphi}{I_{sn}^2}$$

Where R_b is burden resistance

$$X_b = \frac{S_b \times \sin \varphi}{I_{sn}^2}$$

Where X_b is burden reactance

I_{sn} is secondary nominal current

S_b is nominal VA of transformer and according to

standard: $\cos \varphi = 0.8$, $\sin \varphi = 0.6$

$$Z_{total} = \sqrt{(R_c + R_b)^2 + X_b^2}$$

Where Z_{total} is Secondary impedance

$$V_{sc} = ALF \times I_{sn} \times Z_{total}$$

Where V_{sc} is short-circuited voltage

Excitation current (I_{exc}) is measured by means of True r.m.s multimeter and by applying voltage of V_{sc} to secondary of CT.

c_{sn} is nominal composite error of current transformer given by manufacturer

Equation for verifying the composite error: $A = \frac{I_{exc}}{I_{sn} \times ALF} \times 100$

$$U_{sc} = 155.3V$$

$$S=20VA$$

$$R=0.64$$

$$X=0.48$$

$$|Z| = 1.553\Omega$$

$$R_{CT} = 0.6 \times 1.25 \rightarrow A = \frac{I_{exc}}{I_{sn} \times ALF} \times 100 = 0.07\%$$

c_{sn}	R'_c [Ω]	R_c [Ω]	R_b [Ω]	X_b [Ω]	Z_{total} [Ω]	ALF	V_{sc}	Measured I_{exc}	A	Verdict
5	0.6	0.75	0.64	0.48	1.553	20	155.3	70mA	0.07%	Pass