TEST REPORT

No.1271-1,1

Project No.:TI/0328-I60831-1

Sample Test Report For 12.5 kVAR Capacitors
(Part 1)

Manufactured by **Parto Khazen Co.**

According to IEC 60831-1 and 2

Karaj, 16-09-2007

By order of **Moavenate Nezarat Bar Tozie Co. (T.R.E.C.),** Tehran, Iran

No. of pages	**11**
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This test report does not include an assessment of the manufacturer`s production.Conformity of his production with the specimen tested by E.P.I.L is not the responsibillity of E.P.I.L

CONTENTS

1. GENERAL INFORMATION

1.1 Product Information

Equipment under test	: Cylindrical Capacitor
Rated voltage	: 400 V
Rated power	: 12.5 kVAR
Rated frequency	: 50 Hz
Normative document	: IEC 60831-1 & 2
Total units of this part	: 2000
Sampling method	: AQL

1.2 Client Information

Applicant	: Moavenate Nezarat Bar Tozie Co.
Manufacturer	: Parto Khazen Co. (P.K.C.)
Contact person from applicant	: Mr. Samadi, Mr. Sajadi
Telephone	: +98 – 21 – 88882956-8
Fax	: +98 – 21 – 88882959
Address(office)	:At the corner of sarv Alley, Shiraz jonubi St., Mollasadra Ave., Tehran, Iran.

1.3 Manufacturer Information

Engineer of manufacture	: Mr. Rahmani
Telephone	: +9821 –88882956
Address(office)	: No.14, 2th Floor, First Alley, Gandi St., Tehran. Iran

1.4 Tests Performed

Measurment Of The Capacitance And Tangent Of The Loss Angle (tan δ)
Voltage Test Between Terminals
Voltage Test Between Terminals And Container
Lightning Impulse Test Between Terminals And Container
Sealing Test
Test Of Internal Discharge Device
Destruction Test

Parto Khazen:09/06/2007 E.P.I.L: 13/06/2007

1.5 Results Of Tests

Passed

2 PERFORMANCE AND RESULTS OF TESTS

2.1 Measurment Of The Capacitance And Tangent Of The Loss Angle (tan δ)

2.1.1 Test data

Equipment under test (EUT)	: Capacitor; 12.5 kVAR, 400 V
Location	: P.K.C. and E.P.I.L.
Engineer of EPIL	: Mr. Dezfulian
Engineer of customer	: Mr.Samadi(in PKC) & Mr. Souri(in EPIL)
Engineer of manufacture	: Mr. Rahmani
Normative document	: IEC 60831-1 clause 7 & 8

2.1.2 Ambient conditions

Ambient temperature	: 22.4 °C
Relative humidity	: 28.4 %
Atmospheric pressure	: 86.5 kPa

2.1.3 Procedure of test

The test was done according to IEC 60831-1 clause 7 and 8, and with the calibrated RLC meter.

2.1.4 Acceptance conditions of test

Test was conducted according to agreement between Parto Khazen Co. and T.R.E.C.
To this agreement:
1. Tanδ for f = 50Hz should not be more than $5*10^{-4}$ and for f = 1kHz should not be more than $50*10^{-4}$
2. 125 μF-5% ≤ capacitance ≤ 125 μF+10%.

2.1.4 Result of test

Number of tested samples in PKC:
36
Number of tested samples in EPIL:
19

The test was done according to IEC 60831-1 at two frequencies(f = 50Hz, f = 1kHz) and they passed the test.

PASSED

2.2 Voltage Test Between Terminals

2.2.1 Test data

Equipment under test (EUT)	: Capacitor; 12.5 kVAR, 400 V
Location	: P.K.C. & E.P.I.L.
Engineer of EPIL	: Mr. Dezfulian
Engineer of customer	: Mr. Samadi(in PKC) & Mr. Souri(in EPIL)
Engineer of manufacture	:Mr. Rahmani
Normative document	: IEC 60831-1 clause 9

2.2.2 Ambient conditions

Ambient temperature	: 22.4 °C
Relative humidity	: 28.4 %
Atmospheric pressure	: 86.5 kPa

2.2.3 Procedure of test

According to IEC 831-1 The capacitors has been tested with 2.15Un for 2 s and the test was applied between two terminals short-circuited and third termial.

2.2.4 Acceptance conditions of test

During the test , no permanent puncture or flashover shall occur.

2.2.5 Result of test

Number of tested samples in PKC:
41
Number of tested samples in EPIL:
19

The test was done according to IEC60831-1 and they passed the test.

✓ **PASSED**

2.3 Voltage Test Between Terminals And Container

2.3.1 Test data

Equipment under test (EUT)	: Capacitor; 12.5 kVAR, 400 V
Location	: P.K.C. and E.P.I.L.
Engineer of EPIL	: Mr. Dezfulian
Engineer of customer	: Mr. Samadi(in PKC) & Mr. Souri(in EPIL)
Engineer of manufacture	: Mr. Rahmani
Normative document	: IEC 60831-1 clause 10

2.3.2 Ambient conditions

Ambient temperature	: 22.4 °C
Relative humidity	: 28.4 %
Atmospheric pressure	: 86.5 kPa

2.3.3 Procedure of test

3 kV AC voltage was applied between terminals jointed together and the container for 10 s.

2.3.4 Acceptance conditions of test

During the test, neither puncture nor flashover shall occur.

2.3.5 Result of test

Number of tested samples in PKC:
36
Number of tested samles in EPIL:
19

The test was done according to IEC 60831-1 and they passed the test.

✓ **PASSED**

2.4 Lightning Impulse Test Between Terminals And Container

2.4.1 Test data

Equipment under test (EUT)	: Capacitor; 12.5 kVAR, 400 V
Location	: E.P.I.L.
Engineer of EPIL	: Mr. Dezfulian
Engineer of customer	: Mr. Souri
Engineer of manufacture	: Mr. Rahmani
Normative document	: IEC 60831-1 clause 15

2.4.2 Ambient conditions

Ambient temperature	: 22.4 °C
Relative humidity	: 28.4 %
Atmospheric pressure	: 86.5 kPa

2.4.3 Procedure of test

Three impulses(1.2/50 µs) of positive polarity followed by three impulses of negative polarity was applied between terminals jointed together and the container.
Wave shape :1.2/50 µs
Peak value :15 kV

2.4.4 Acceptance conditions of test

During the test, no disruptive discharge shall occur.

2.4.5 Result of test

This test mas done only in EPIL
The test was done according to IEC 60831-1 clause 15 and it passed the test.

✓ **PASSED**

2.5 Sealing Test

2.5.3 Test data

Equipment under test (EUT)	: Capacitor; 12.5 kVAR, 400 V
Location	: P.K.C. and E.P.I.L.
Engineer of EPIL	: Mr. Dezfulian
Engineer of customer	: Mr. Samadi(in PKC) & Mr. Souri(in EPIL)
Engineer of manufacture	: Mr. Rahmani
Normative document	: IEC 60831-1 clause 12

2.5.2 Ambient conditions

Ambient temperature	: 22.4 °C
Relative humidity	: 28.4 %
Atmospheric pressure	: 86.5 kPa

2.5.3 Procedure of test

The test was done according to IEC60831-1 clause 12

2.5.4 Acceptance conditions of test

No leakage shall occure.

2.5.5 Result of test

Number of tested samples in PKC:
48
No leakage detected in these samples

Number of tested samples in EPIL:
19

After inspection leakage detected in one of capacitor,but according to sampling method 48 capacitors were tested and no leakage detected therfore the EUTs passed the test.

✓ **PASSED**

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2.6 Test Of Internal Discharge Device.

2.6.1 Test data

Equipment under test (EUT)	: Capacitor; 12.5 kVAR, 400 V
Location	: P.K.C. and E.P.I.L .
Engineer of EPIL	: Mr. Dezfulian
Engineer of customer	: Mr. Samadi(in PKC) & Mr. Souri(in EPIL)
Engineer of manufacture	: Mr. Rahmani
Normative document	: IEC 60831-1 clause 11

2.6.2 Ambient conditions

Ambient temperature	: 22.4 °C
Relative humidity	: 28.4 %
Atmospheric pressure	: 88.15 kPa

2.6.3 Procedure of test

The test was done according to IEC60831-1 clause 11.

2.6.4 Acceptance conditions of test

The discharge resistor shall be comply with the limitation express by formula that indicated in B.4.3 of IEC 60831-1.

2.6.5 Result of test

Number of tested samples in PKC:
36
Number of tested samles in EPIL:
19

The test was done according to IEC 60831-1 and average value of the internal discharge devices (resistors) for each phase was 200 kΩ .

2.7 Destruction test

2.7.1 Test data

Equipment under test (EUT)	: Capacitor; 12.5 kVAR, 400 V
Location	: P.K.C
Engineer of EPIL	: Mr. Dezfulian
Engineer of customer	: Mr. Samadi
Engineer of manufacture	: Mr. Rahmani
Normative document	: IEC 60831-1 clause 19

2.7.2 Ambient conditions

Ambient temperature	: 22.4 °C
Relative humidity	: 28.4 %
Atmospheric pressure	: 86.5 kPa

2.7.3 Procedure of test

The test was done according to IEC60831-1 clause 19.

2.7.4 Acceptance conditions of test

The enclosure of capacitor shall be intact except that normal operation of a vent, or minor damage is permitted provided the following condiions are met:
a) Escaping liquid may wet the outer surface but shall not fall in drops.
b) The container of the capacitor may be deformed and damaged but not broken.
c) Flames and/or fiery particles shall not be emitted from the openings.
This may be checked by enclosing the capacitor in gauze (cheesecloth).Burning or scroching of the gauze is then considered to be a criterion of failure.
d) The result of a dielectric test between terminals and container with 1500 v for 10 s shall be satisfactory.

2.7.5 Result of test

The test was done according to IEC 60831-1 clause 19 and it passed the test

✓ **PASSED**

Figures:

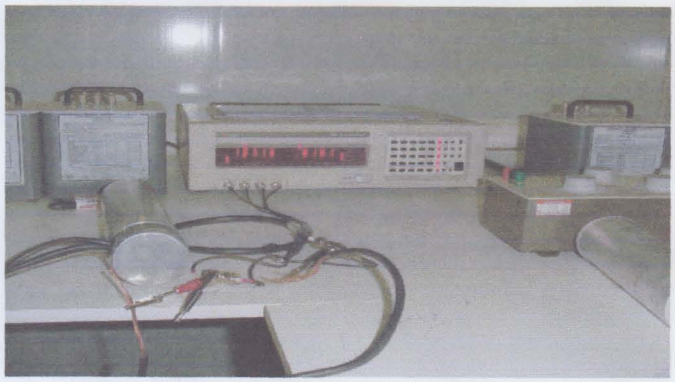

Figure 1: Measurment of the tan δ

Figure 2: Voltage test between terminals

Figure 3: Voltage test between terminals and container

Figure 4: Lightning impulse test

Figure 5: Sealing test

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