

TEST REPORT

NO. 1423

Project code: TI/0425-I60439-1

Test report for low voltage switchgear and controlgear

Type: L1-1441-3S

Manufactured by NIP CO.

According to IEC 60439-1

Karaj, 23-11-2008

By order of NIP co., Tehran, Iran

No. of pages

15

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1. GENERAL INFORMATION

1.1 Product Information

Equipment under test : Composit Panel
Type : L1-1441-3S
Dimention : 930* 785* 320 mm
Rated Voltage and Frequency : 400 V , 50 Hz
Rated Current : 400 A
Normative document : IEC 60439-1

1.2 Client Information(Manufacturer)

Applicant : NIP Co.
Contact person : Mr. Pileh Var
Telephone : +98 - 21 - 88707095
Fax : +98 - 21 - 88707094
Adress : floor 3, No. 70 , Ahmadian Ave., Vozara Ave., Tehran, Iran.

1.3 Tests Performed

IP44 : Passed
Dielectric Test (AC test) : Passed
Measurment Of Insulation Resistance : Passed
Clearance & Creepage Distance : Passed
Mechanical Operation : Passed
Wiring & Electrical Operation : Passed
Temperature Rise Test : Passed

1.4 Results Of Tests

Passed : See page 4-14

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2. PERFORMANCE AND RESULTS OF TESTS

2.1 IPX4, Test For Protection Against Water

2.1.1 Test data

Location : E.P.I.L.
Date : 06-2008
Engineer of E.P.I.L. : Mr. Alizadeh

2.1.2 Ambient conditions

Ambient Temperature : 24°C
Relative Humidity : 35%
Atmospheric Pressure : 86.5 kPa

2.1.3 Instrument used for test

Spray Nozzle

2.1.4 Procedure of test

- i. The enclosure under test is placed in its normal operating position under the spraying with spray nozzle (according to IEC 60529).
- ii. The duration of the test was 1 min/m² at least 5 min (water pressure : between 50 kPa and 150 kPa according to IEC 60529).

2.1.5 Acceptance conditions of test

After testing the EUT shall be inspected for ingress of water according to conditions that are specified in IEC 60529.

2.1.6 Result of test

The test was done according to IEC 60529 clause 14.2.4, and it passed the test.

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2.2 IP4X , Test for Protection Against Dust

2.2.1 Test data

Location : E.P.I.L.
Date : 06-2008
Engineer of EPIL : Mr. Alizadeh
Normative document : IEC 60529

2.2.2 Ambient conditions

Ambient Temperature : 25 °C
Relative Humidity : 29 %
Atmospheric Pressure : 86.3 k Pa

2.2.3 Instrument used for the test

Steel rod 1 mm.

2.2.4 Procedure of test

-The enclosure under test is placed in its normal operating position in steel rod 1 mm (according to IEC 60529).

2.2.5 Acceptance conditions of test

After testing the EUT shall be inspected for ingress of steel rod 1 mm according to conditions which is specified in IEC 60529.

2.2.6 Result of test

The test was done according to IEC 60529 clause 13.2. It passed the test.

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2.3 Verification Of Dielectric Properties

2.3.1 Test data

Location : E.P.I.L
Date : 06-2008
Engineer of E.P.I.L : Mr. Alizadeh

2.3.2 Ambient conditions

Ambient Temperature : 28.3 °C
Relative Humidity : 31 %
Atmospheric Pressure : 86.4 k Pa

2.3.3 Procedure of test

The test voltage sinusoidal wave form with frequency 50 Hz, was applied for 1 min as follows:

- 1) between all live parts and all the other poles connected for this test to interconnected exposed conductive parts of EUT meanwhile the value of test voltage was 2.5 kV;
- 2) between each pole and all the other poles connected for this test to the interconnected exposed conductive parts of EUT meanwhile the value of the test voltage was 2.5 kV.

2.3.4 Acceptance conditions of test

The test is considered to have been passed if there is no puncture or flashover.

2.3.5 Result of test

The test was done according to IEC 60439-1. It passed the test.

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2.4 Verification Of Insulation Resistance

2.4.1 Test data

Location : E.P.I.L.
Date : 06-2008
Engineer of E.P.I.L : Mr. Alizadeh

2.4.2 Ambient conditions

Ambient Temperature : 29 °C
Relative Humidity : 31 %
Atmospheric Pressure : 86.3 k Pa

2.4.3 Instrument used for the test

Mager : Manufactured by metrel, model Teraohm 5 kV

2.4.4 Procedure of test

The insulation resistance between circuits and exposed conductive parts at rated voltage 500 V was measured.

2.4.5 Acceptance conditions of test

The test is considered to have been passed if the measured insulation resistance is at least 1000 Ω/V per circuit referred the nominal voltage to earth of these circuits..

2.4.6 Result of test

		Application of the voltage Between	Min value according to IEC	Measured value(G Ω)	Result
1	R	all live parts + all the other poles connected	1000 Ω/V	800 (M Ω)	Pass
2	S	all live parts + all the other poles connected	1000 Ω/V	2.5 (G Ω)	Pass
3	T	all live parts + all the other poles connected	1000 Ω/V	1.7 (G Ω)	Pass
4	earth	all live parts + all poles connected	1000 Ω/V	1.2 (G Ω)	Pass

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2.5 Verification Of Creepage Distances

2.5.1 Test data

Location : E.P.I.L.
Date : 06-2008
Engineer of E.P.I.L : Mr. Alizadeh

2.5.2 Ambient conditions

Ambient Temperature : 29.1 °C
Relative Humidity : 26.5 %
Atmospheric Pressure : 86.4 k Pa

2.5.3 Instrument used for the test

Electric digital caliper :

2.5.4 Procedure of test

The shortest creepage distance between phases , circuit conductors at different voltages , live and exposed conductive parts shall be measured.

2.5.5 Acceptance conditions of test

The test is considered to have been passed if the measured creepage distance is according to IEC 60439-1.

2.5.6 Result of test

The measurement performed according to IEC60439-1 and all the results is greater than the minimum specified in the standard. It passed the test.

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2.6 Verification Of Mechanical Operation

2.6.1 Test data

Location : E.P.I.L.
Date : 06-2008
Engineer of E.P.I.L. : Mr. Alizadeh

2.6.2 Ambient conditions

Ambient Temperature : 28.9 °C
Relative Humidity : 28 %
Atmospheric Pressure : 86.4 k Pa

2.6.3 Procedure of test

This type test shall not be made on such devices of the assembly which have already been type tested according to their relevant specifications provided their mechanical operation is not impaired by their mounting. The number of operating cycles shall be 50.

2.5.4 Result of test

No moveable part is available in EUT, therefore mechanical operation test is not applicable for this case.

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2.8 Verification Of Temperature-Rise Limits

2.8.1 Test data

Location : E.P.I.L.
Date : 11-2008
Engineer of E.P.I.L. : Mr. Alizadeh

2.8.2 Ambient conditions

Ambient Temperature : 18.5°C
Relative Humidity : 31.6 %
Atmospheric Pressure : 84.9 k Pa

2.8.3 Procedure of test

The test shall normally be carried out at the values of rated current with the apparatus of the assembly installed.
The test shall be made for the time sufficient for the temperature rise to reach a constant value . this condition is reached when the variation does not exceed 1 K/h.

2.8.4 Acceptance conditions of test

No excessive temperature rise and no damage shall be occurred.

2.8.5 Result of test

The test was done according to IEC 60439-1. It passed the test.

Table1:

No.	number of sensor	location of sensor	Figurev 2 number
1	1-12	Connection fuse (R)	1
2	2-12	Connection fuse (S)	2
3	3-12	Connection fuse (T)	3
4	4-12	Connection fuse	4
5	5-12	Output of main breaker(R)	5
6	6-12	Output of main breaker(S)	6
7	7-12	Output of main breaker(T)	7
8	8-12	Input of contactor (R)	8
9	9-12	Input of contactor(S)	9
10	10-12	Input of contactor(T)	10
11	11-12	On the case of fuse	11
12	12-12	Case	12

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No.	number of sensor	location of sensor
13	1-6	Input R
14	2-6	Input S
15	3-6	Input T
16	4-6	On the cable
17	5-6	Ambient
18	6-6	Ambient

Measurment number see table 1	Start temperature	End temperature	Max temperature rise	Maximum value Acc. IEC60694	Result
1-12	17.9	63.9	40.1	70	Ok
2-12	16.2	61.1	45.3	70	Ok
3-12	14.5	60.4	44.6	70	Ok
4-12	16	35.7	19.9	70	Ok
5-12	16.1	55.8	40	70	Ok
6-12	14.7	62.4	46.6	70	Ok
7-12	17.8	63.5	47.7	70	Ok
8-12	16.5	52.2	36.4	70	Ok
9-12	15.6	49.2	33.4	70	Ok
10-12	16.5	30.5	14.7	70	Ok
11-12	17	57.3	41.5	70	Ok
12-12	15.4	43.5	27.7	70	Ok
1-6	17	41.6	24.6	70	Ok
2-6	17.9	51.9	36.1	70	Ok
3-6	17.2	45.5	29.7	70	Ok
4-6	19.1	30.6	11.5	----	Ok
5-6	18.1	15.8	-2.3	----	Ok
6-6	17.7	15.8	-1.9	----	Ok

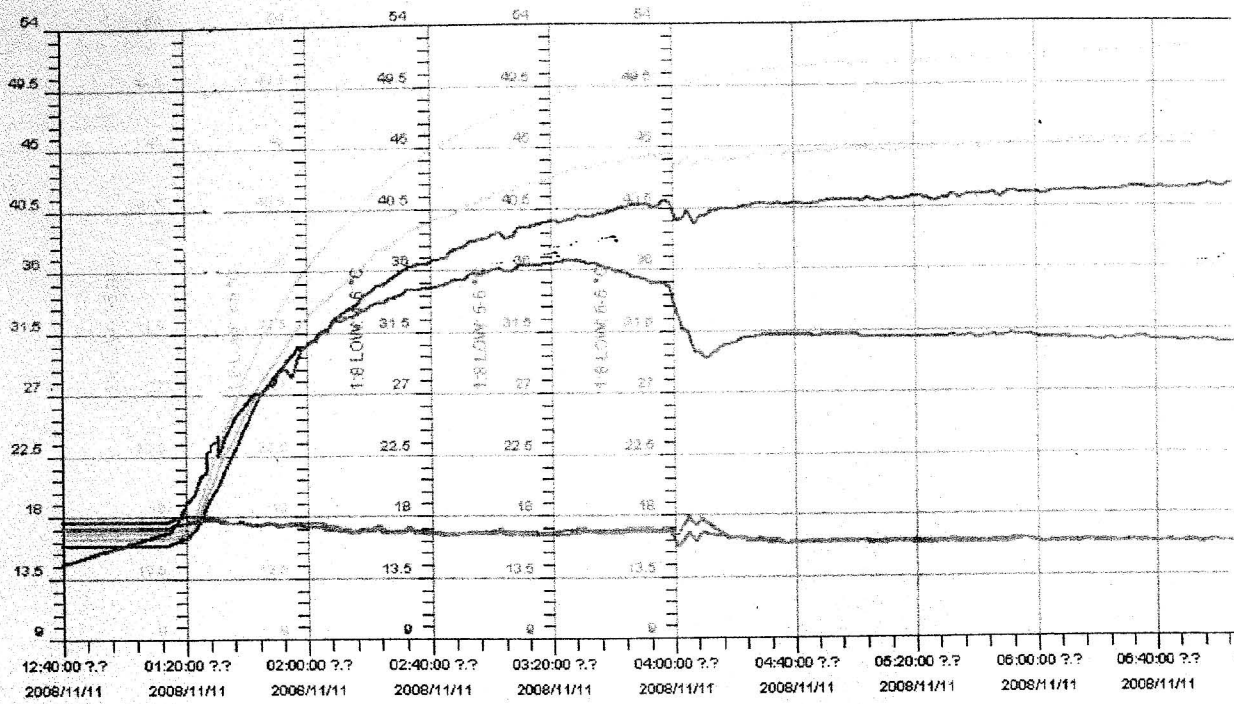
Note: $\Delta T_{amb.av} : -2.1 \text{ } ^\circ K$

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Diagram of temperature rise test results



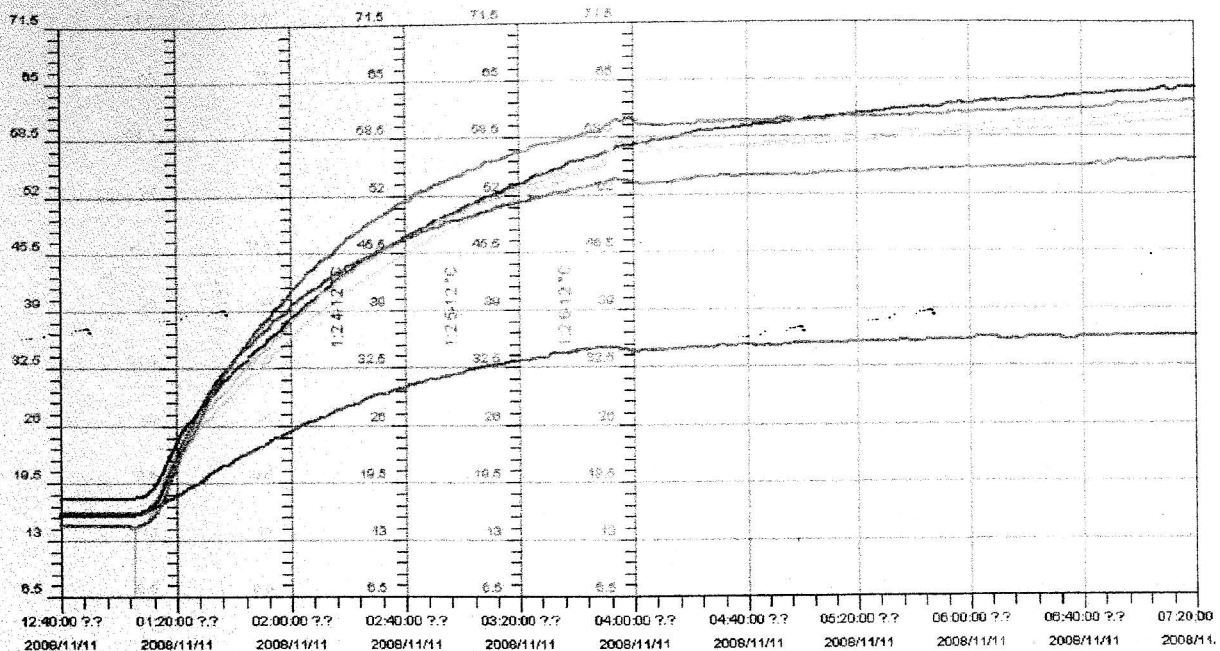
Sensor	Color
1-6	Blue
2-6	Red
3-6	Green
4-6	Orange
5-6	Pink
6-6	Brown

Group 1: 1-6 to 6-6

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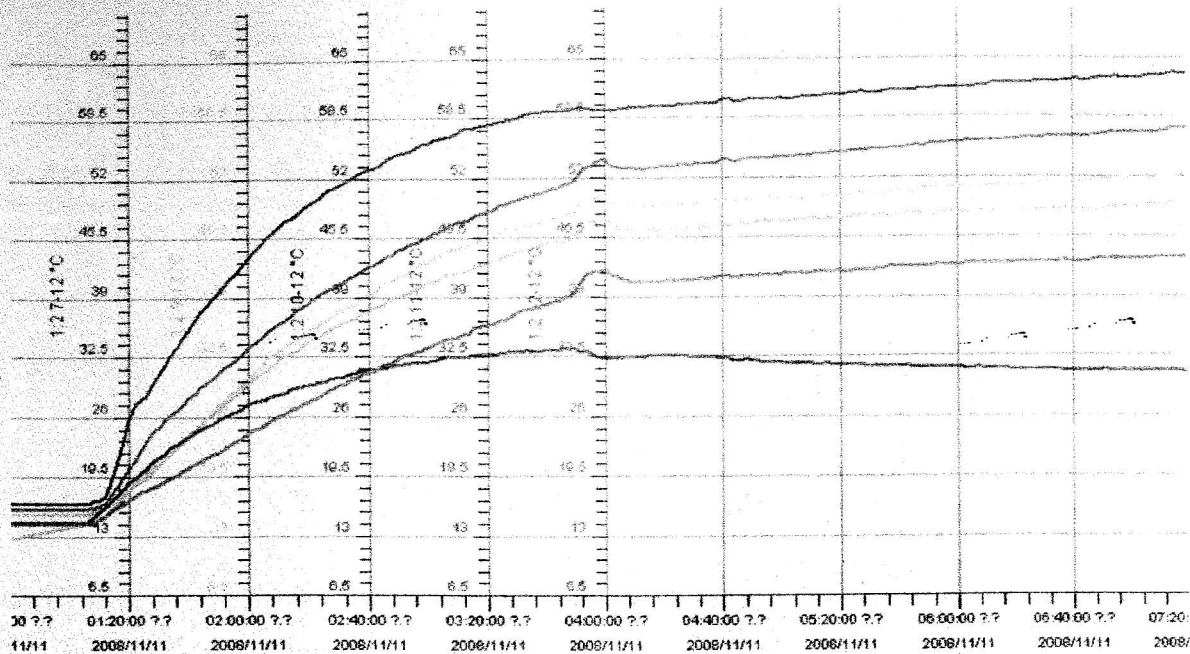
Sensor	Color
1-12	Blue
2-12	Red
3-12	Green
4-12	Orange
5-12	Pink
6-12	Brown

Group 2: 1-12 to 6-12

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Sensor	Color
7-12	Blue
8-12	Red
9-12	Green
10-12	Orange
11-12	Pink
12-12	Brown

Group 3: 7-12 to 12-12

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Figures:

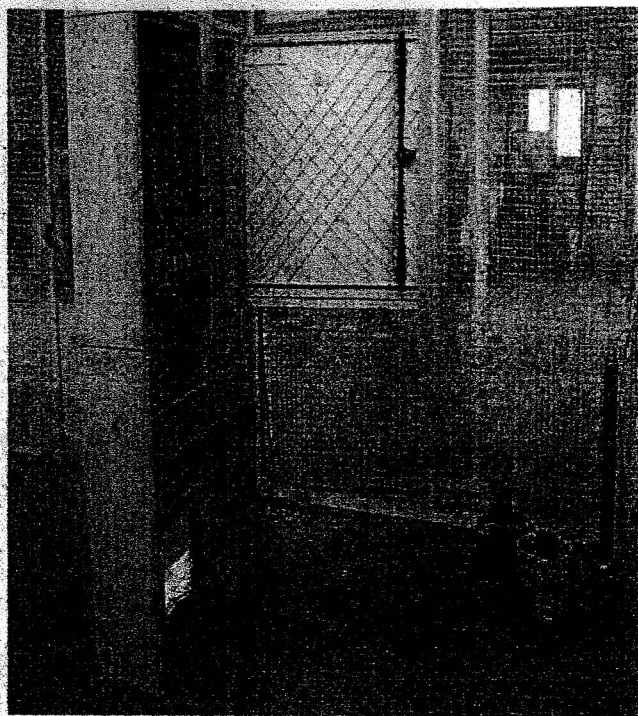


Figure1: EUT under dielectric test

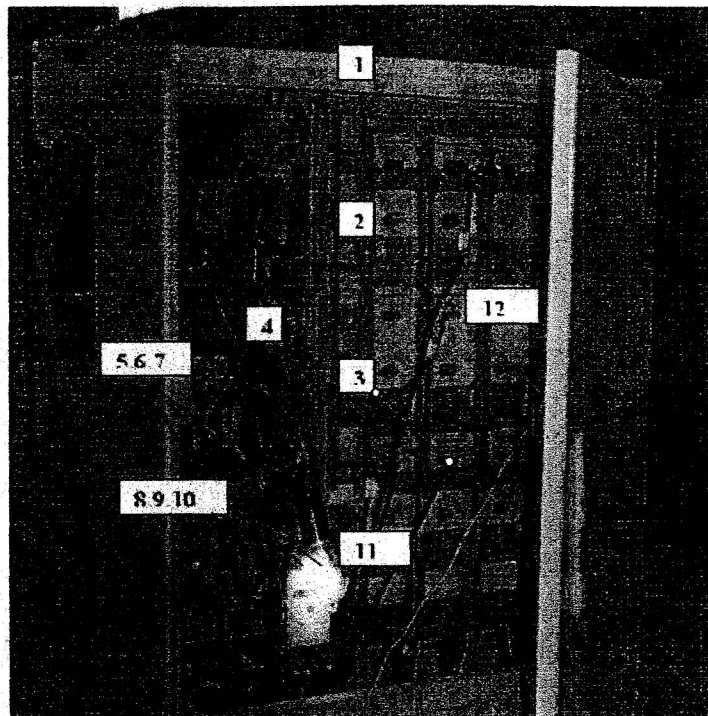


Figure2: EUT after temperature rise test

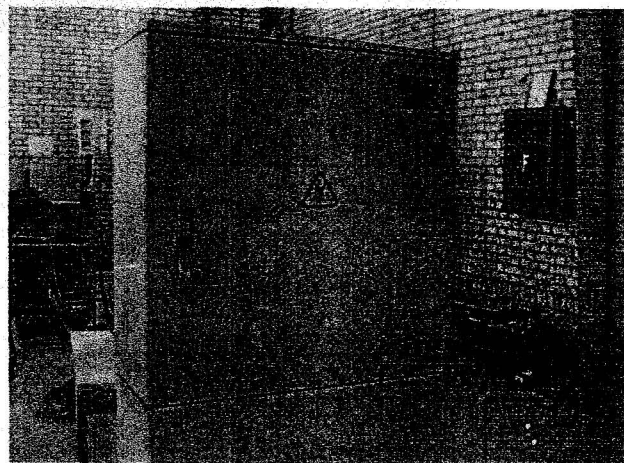


Figure 3: EUT under IP4X

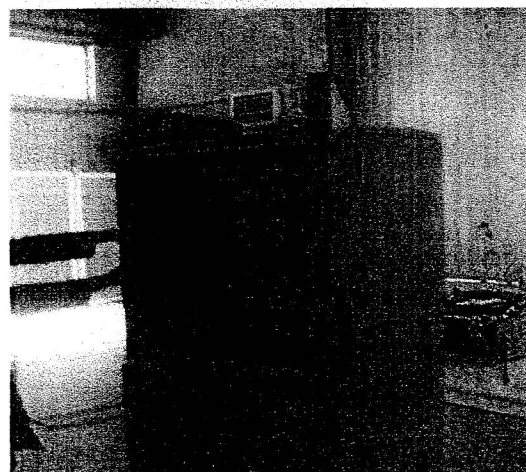


Figure 4: EUT under Insulation test

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