

1 2 3 4 5 6

Voltmeter
0-50V
Ammeter
0-50A

(e) Ensure that the operating voltage of the control relay is between 0.2 to 1.0V and the operating voltage of the relay TKE IP AT does not exceed 80% and the drop out voltage does not exceed 130% of the actual measured voltage before testing operating voltage of contactor does not exceed 13V and the drop out voltage of contactor does not exceed 3.5V, the value of Reverse current is within the limits of 15 to 35A

(f) Check the satisfactory performance of the complex device when it is connected between the generator and the mains

C2

Testing for
heat resis-
tance 4(a),
8(a), 9(a),
13, 16, 11,
17, 8(a)

Climatic
chamber
voltage
0-50V
Ammeter
0-50A

- (a) Check the complex device as per sl (a),
(b) of cl. C1
- (b) (i) Keep the complex device in hot chamber at a constant temperature 100 $\pm$ 3 $^{\circ}$ C for 1.5 hrs
- (ii) Check the performance for a duration of 2 hrs at 30V and 400A
- (iii) Check the voltage drop at the contacts of the contactor, operating voltage of control relay value of reverse current, operating drop out voltage of the contactor and the relay TKE 1 P2 AT
- (iv) Ensure that the cycles of the contactor and the relay TKE 1 P2 AT are not abnormally heated

C2
(contd)

Megger 500V
dc

(vi) Disconnect the connection to the mains. Switch on the generator at voltage of 24V. After removing the complex device from the thermostat, the insulation resistance shall be measured as per cl A9

(vii) Test results are considered satisfactory

Voltmeter
0-5V

Ammeter
50-0-50A

Voltemeter
0-50V

Millivoltmeter
0-200 mV

Thermometer
0-300°C

Megger 500V
dc

(ae) Drop out voltage of contactor is less than 9V

(af) Drop out voltage of relay TKE1P/T is less than 9V

(ag) The application ensures connection of the generator to the mains at 29V

(ah) Voltage drop at the contacts of the contactor is less than 150mV

(ai) The temp of the coils is less than 210°C

(aj) The insulation resistance in cold condition is not less than 20 MΩ

(ak) Record the test results

Record the test results

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C3

Testing for moisture resistance (4(a), 11, 12, 36)

Megger 500V dc

- (a) Check the complex device as per sl(a), (b) of test C3C1
- (b) Check the insulation resistance as per test A9
- (c) Check the insulation strength at 500V, 50Hz R.M.s voltage for 1 minute

Climatic chamber

After ensuring the tests at (a), (b) and (c) above, keep the apparatus at constant temperature exposure of +40 to +50°C for 1.5 hrs. Then keep the apparatus in the humidity chamber which is maintained at a temp of +40 ±2°C, humidity 95 to 98% for 48 hrs. Remove the apparatus from the chamber.

Immediately after removing the apparatus from the chamber (time taken should not be more than 3 minutes) check the insulation resistance as per test No. A9. Record the results (the IR value shall not be less than 1 MΩ)

High Voltage Carryout electric insulation strength test as per test No. A10 and record the results

C4

Testing for vibration resistance (5a, 8, 9, 37)

Vibration table

Test condition
Freq Range - Accn.

10 to 200 MHz
2.3 g to 4.5 g

(Increasing power to freq)

(a) Before conducting the vibration resistance test as per cl (a) and (b). After ensuring

- 53 -

1 2 3 4 5

(8) (cont'd) Test the contactor with the following con-

Freq	Amplitude	Accn.	Duration
10-20 Hz	1.0 mm	2.3 g	5 mins at each freq
200 Hz	0.5 mm	2.5 g	.50-
	0.028 mm	7.5 g	-20-

The apparatus to be checked at the above condition with an apparatus in working condition. During the test the following parameters shall be checked at each frequency:

- (i) Operating voltage of control relay
- (ii) Value of reverse current
- (iii) Operating and drop out voltage of the contactor and the relay
- (iv) Record

Note: Ensure that during testing spontaneous closing and breaking of contacts do

The values measured shall not vary for each of the following parameters to that of the values measured at cold condition:-

1. The values measured at cold condition shall not vary for each of the following parameters to that of the values measured at cold condition:-

XXXXXXXXXXXX

C5 Testings for jolting table

Voltemeter 9-50V
Ammeter 50-9-50A
Voltemeter 0-5V

Voltemeter 0-10V

54

40% For drop out voltage
The reverse current shall be within 15 to 35A and the central relay tips at a voltage of 0.2 to 1V

30% - or values measured for operating voltage of contactor and the relay
TKE 1P2P T

Condition
1) Freq range- 25 to 300 Hz with and accn. amplitude corresponding to 2.5 G to 4.5 G
11/ No. of im- 10,000 (40 to 100/min pacts at 4g)

Note: Test is to be carried out in the normal mounting position of the apparatus.

This test is carried out at the following conditions:

- (a) 50% of test is carried out when the accn is directed along the axis of the contactor towards closing of the contacts
- (b) Remaining 50% of tests carried out when the accn is directed along the axis of the contactor towards opening of the contacts
- (c) 50% of the tests are carried out when the coil is de-energised
- (d) 50% of the tests carried out when the voltage across armature contacts is 0V

[illegible]

(i) No spontaneous opening and closing of contacts occur

(ii) No deformation

(iii) No loosening of bolts, and nuts

(iv) No loosening of assemblies/nuts etc

Record the results

C6 Testing for Linear acceleration
The apparatus shall be free from false linear acceleration operation at linear and centrifugal accelerations up to 8g.
Condition:
Added (1) At two positions (11) Duration of test (11) at each position : one minute

Testing:

(a) Direct the centrifugal accn. towards the closing of the contacts

When the contactor coil is de-energised
For a period of one minute
direct the centrifugal action towards the
opening of contacts when the coil is
energised at a voltage of 5.6V

Circuit of contactor contacts be checked with the help of indicator lamp.

Test results are considered satisfactory if no spontaneous closing/opening of contacts occur.

Record the results

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1 2 3 4 5

C7

Checking of Salt corrosion anticorrosive coatings

Ensure that the thickness of the coatings is satisfactory. Thickness of the coatings is as per the relevant parts

3(a), 40 Salt corrosion test

This test shall be carried out for 28 days as per test No.5 of CVRDE specn. CVRDE/DSL/3007-1981

C8

Testing for Vibration strength 5(B), 9, 10, 13, 41

(a) Carry out the test as per test No. 5 of CVRDE specn. (b) Carry out the vibration strength test in horizontal position (accessories directed along the axis of the connector case)

The parameters for the testing are as under: Freq. 2.5 Amplitude 80 Duration 0.12 0.028

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Note: The above test is to be carried out with the apparatus in working condition at rated voltage across the coil and 50% in energised condition. Rated load is connected to the circuit of connectors of relay TRX 1 P, 4 and connector

Record the results. Test results are considered to be satisfactory when:-

(i) the apparatus meets the requirements of test A7 which is carried out after vibration strength test

(ii) Tolerance for Freq is ± 2 Hz Amplitude $\pm 20\%$ Accn. $\pm 15\%$

Amplitude $\pm 20\%$ Accn. $\pm 15\%$

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C9

Testing for Air pressure resistance chamber volt- to reduced pressure 500-0-50A (4 a, 42)

(s) Carry out the test as per test A6 (111) (h) Introduce the apparatus in heat pressure chamber at temp + 20+ 10°C

After 18 hrs and atmospheric pressure at 90+1 mm Hg. Allow the apparatus in working condition at rated voltage across (v) condition (at rated current passing through the contacts) for a period of 2 hrs. Afterwards measure the following:

- (i) Operating voltage of contactor
- (ii) Drop out voltage of contactor
- (iii) Operating and drop out voltage of the relay
- (iv) Reverse current

Record the results

(111) Keep the apparatus in the heat pressure chamber at the following conditions with the apparatus in working condition:-

Temp: +70°C
Pressure: 41.1 mm of Hg
Duration: 1.5 hours

(11) Operate the apparatus for 20 mins at rated voltage and rated current passing through the contacts

(111) Increase the temp of the chamber to 130°C and pressure reduced to 18.6 mm Hg. Keep the apparatus in this condition for 5 mins

[illegible]

(iv). Measure the following:-

Operating and drop out voltage of relay
TKE 1 P2PT (shall be 22.3V and 9V res-
pectively)

Record the results.

High Voltage
Testing

(d) Insure that the contractor withstands an overload of 800A for 30 seconds after every 5 hrs of operation without any damage to the apparatus

Subject the apparatus to 13000 switchings on when the voltage of the mains is 28.5V, as per the following table:-

[illegible]

Attn: NO. of Israeli-
pr. thicngs

No. of switchings on of rated current	No. of switchings of reverse current	No. of switchings on of rated current
100	100	100
200	200	200
300	300	300
400	400	400
500	500	500
600	600	600
700	700	700
800	800	800
900	900	900
1000	1000	1000

No. of
sm. sch.
ing off
of head
current

Thermometer
0-200°C

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NOTE: 1. The above test is to be carried out after the following tests have been completed:

2. The test is to be carried out after the following tests have been completed:

3. The test is to be carried out after the following tests have been completed:

4. The test is to be carried out after the following tests have been completed:

5. The test is to be carried out after the following tests have been completed:

6. The test is to be carried out after the following tests have been completed:

7. The test is to be carried out after the following tests have been completed:

8. The test is to be carried out after the following tests have been completed:

9. The test is to be carried out after the following tests have been completed:

10. The test is to be carried out after the following tests have been completed:

11. The test is to be carried out after the following tests have been completed:

12. The test is to be carried out after the following tests have been completed:

13. The test is to be carried out after the following tests have been completed:

14. The test is to be carried out after the following tests have been completed:

15. The test is to be carried out after the following tests have been completed:

16. The test is to be carried out after the following tests have been completed:

17. The test is to be carried out after the following tests have been completed:

18. The test is to be carried out after the following tests have been completed:

19. The test is to be carried out after the following tests have been completed:

0002-0
EXAMINATION

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60

C11 Testing for

Maximum tripping current 15.44s

Test condition:

(a) Temp : 20±5°C
(b) Atms. pr : 18.6±1 mm Hg

Ammeter 0-2500A
Voltmeter 0-50V
stopwatch

Subject the apparatus to 3 switchings on and 3 trippings of ohmic load current of 2000A at voltage 28.5V to 30V

Duration of switching on shall be 1 second with an interval between switching on upto complete cooling

Ensure that there is no sticking of contactor. Record the results

Reverse current to be within 13.5 to 3615A
Voltage drop at the contactor
contacts - To be not more than 150mV
Electrical Insulation strength at 250V for 1 min- should withstand

Sw 9.11.8
Sw 9.11.8
Sw 9.11.8