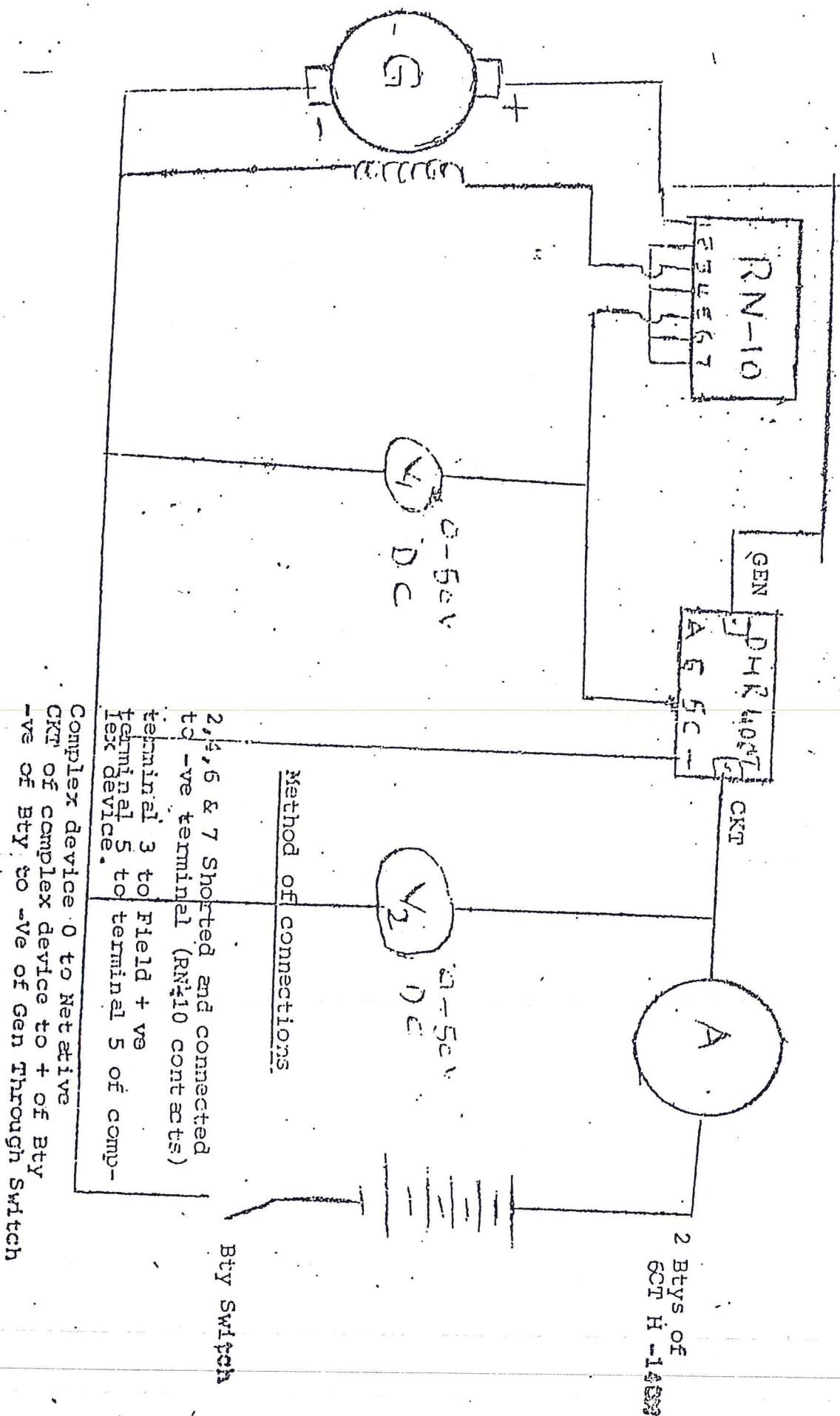


CIRCUIT DIAGRAM FOR DMR - 400 T No 1



1. Test No. 7
Spec. Cl. Ref

Test

Test Equipment

Test Method and Requirement

Notes
Class

2.

3

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1. A1/3/23

Completeness
and relation-
ship with
drawings

1) Slid call-
perse
2) Graduated
scale

Check that the design, over all dimensions
and electric diagram confirms to dgs :-
a) General view. 3006.001
and outline 1

b) Schematic
circuit diagram 3006.002

Finishing, Quality of assembly, marking
shall comply with the drawings

ELECTRICAL & ENVIRONMENTAL TESTS

2. A.C./4/25

Check for
rated values

3. A3

(a) Voltage

Voltmeter
0-50V
Power supply
unit 0-50V

shall be capable of operating at 27V
(normal) (load voltage at contact
terminals)

4. A4

(b) Current
consumption
of winding in
energised co-
ndition at
rated voltage

Ammeter 0-1A
Power supply
unit 0-50V

Check the current confirmed by the
contactor winding when the contactor is
energised. It shall not be more than
0.65A

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A5 and 10
39 (c) Rated current in circuit of auxiliary terminal when $t = 0.0155$

- 1) Timer giving $t = 0.015$ S
- 2) Ammeter 0-10A
- 3) Power supply unit

At the input of switching ON the contactor by auxiliary winding, ($t = 0.015$ S) measure the current. It shall not be more than 8A. A resistor of 1.5 ohms shall be connected in series with the winding and the coil valve not more than 14.5V

A6

- 1) (d) Load source giving 600 A at 27.0V
- 2) DC power source

- 1) DC power source giving 600A at 27V
- 2) Voltmeter 0-50V
- 3) Ammeter 0-1000 A
- 4) Load 600A at 27.0 V

Check whether the contactor is capable of handling 600A at 27 V

A7/7
and 8

Switching on voltage (pickup voltage) and switching off voltage

- 1) DC power source giving 600A at 27V
- 2) Voltmeter 0-50V
- 3) Voltmeter 0-50V
- 4) Ammeter 0-1000A
- 5) Load 600A at 27V

Connect the contactor and power source and load with Ammeter in series. Energise the winding of the contactor with a dc source separately so that the contacts of the contactor close. Keep in this condition with a load of 600A for 90 minutes (Thermal mode operation). Then measure the drop out voltage and pick up voltage. They shall not be more than 6V and 20V respectively.

8- A8/9

Voltage drop at contactors

9- A9/11

Winding over heating

Same as for 7 above and the voltage drop across the contacts of the meter 0-500mV. It shall not be more than 150mV. Carryout the thermal mode test and then measure the temperature of coil by resistance method. It shall not be more than 160°C.

10- B1/12

Overload capacity

- 1) DC power source of 27V and 1200A
 - 2) Load 1200A at 27V
 - 3) Meters as per 7 above
- Carryout the thermal test at 600A and 27V for 5 hours. After 5 hours increase the load current to 1200A and maintain it for 2 seconds. There shall not be any failure of the contacts.

Breaking capacity

- 1) DC power source giving 4800A at 28V to 30V
 - 2) Load of 4800A
 - 3) Ammeter upto 5000A
- Connect the contactor, power source and load in series. Switch on the source and increase the load current to 4800A at 28V. Carryout 2 switching ON and OFF (coil) The energising and deenergising the contactor. The switching on time shall be 3 seconds and the internal between the switching ON shall be 3 seconds. The contactor shall be completely cool. Then the contactor shall be switched ON for 3 seconds at 28V to 30V. There shall not be any failure of contacts and the contactor shall be switched ON and OFF. 5000A shall be maintained.

2 3 4 5

2/14
26

Insulation Megger 500V
Resistance

Measure the insulation resistance between the body and all other electrical contacts connected together. It shall not be less than 20 Megohms.

Carryout thermal mode operation test as per test sl No. 7 above and then measure the insulation resistance. It shall not be less than 20 Megohms.

23/15
27

High Voltage
High voltage set up a.c. 500V

Apply 500V ac rms between the body and all other electrical contacts connected together. There shall not be any breakdown. (shall be done only once)

16

Service life
at ground condition

1) Timer with 30 seconds ON and 15 seconds OFF
2) Set up as per srl No. 7
Carryout 3000 switching ON and OFF at ground condition as under:
1800 Nos at 27V (coil voltage)
600 Nos at 29.7V (-do-)
600 Nos at 24.3V (-do-)

15/17

Mass Balance
It shall not be more than 1.65 Kg

13/3

Checking of cold chamber: Initial check:
operation at 50°C for 1 hour
cold temperature of -60°C
It shall not be more than 20V (normal).
It shall not be more than 16V

Keep the contactor for 2 hours in the cold chamber whose temperature has been attained at -60°C. While still in the contactor is in the chamber check:

Test for cold resistance at -30°C and at a pressure corresponding to 12900 m

Test at High
temperature.

مجلس خوارزمی

- (1) Measure switching on voltage. It shall not be more than 18V.
- (2) Measure switching OFF voltage. It shall not be more than 7.8 V.

(3) Carryout the switching ON and OFF at 600A load current. The contactor shall operate properly.

Keep the contactor in chamber at -30 C and pressure corresponding to 1200mm for 1.5 to 2 hours. The coil of the contactor should be energised at 30V while in the chamber. Remove the contactor from the chamber. Carryout temperature measurement of contactor coil by resistance method. It shall not be more than 1600C. Measure the temperature of the contactor by thermometer. It shall not be more than 2250C

Bring the temperature of the chamber to 50 degree and keep the contactor for 1 hours. Then connect the rated load of 600a across the contacts and feed 30V to contactors winding. Operate the contactor in heat chamber under these conditions for 1.5 to 2 hours. After this while still the contactor is in the chamber carryout :-

- 1) Measure switching on voltage and switching off voltage in:
 - a) Horizontal position
 - (b) Vertical position (with contacts up)
 - (c) Vertical position (with contacts down)

The switching on voltages shall not be more than 22.4V.

The switching off voltages shall not be more than 11.2V.

500C. While still the contact. As in the

1 2 3 4 5 6

C4
5(b)
35

Check for
moisture re-
sistance

Humidity
chamber
RH 95 to
93%
Temp: 40°C
± 2°C

5(b)
36

Check for
vibration
resistance

Vibration
stand

- 2) Check for the temperature of coil and contacts as given in C3 above
- 3) Check for 10 switching ON and OFF as per C1 above for satisfactory operations

Keep the contactor in the humidity chamber for 48 hours. Remove the contactor from chamber and not more than 3 minutes after removing measure the insulation resistance as explained in tests. SI No. A 12. It shall not be less than 1 megohm (normal condition).

4) There shall not be any traces of corrosion on the contactor.

Connect a signal lamp with a battery in series with the contact terminals. Keep the contactor on vibration stand with contactor core in vertical position and terminal bolts up.

By smoothly changing the frequency over the entire frequency range from 10 to 200 Hz at every 10 Hz in frequency range of 10 to 60 Hz and at every 20 Hz in frequency range of 80 to 200 Hz the respective amplitude is got and its switching on voltage and switching off voltage are measured. At each frequency the contactor should be in de energised condition for 2 minutes and in energised condition for 2 minutes at a voltage of 27V across the winding the switching on voltage shall not be more than 28V and switching off voltage shall not be any spontaneous closure or opening of contacts (i.e glowing of signal lamp or put off signal lamp) due to the effect of resonance. The test should be repeated with the contactor terminal bolts downwards also.

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20/37

The contactor is mounted on the machine so that shaking of the line commutator acceleration is directed towards displacement of (Bump) ... Freq: 60 Hz ... Vto, 100 ...

Impacts

per

minutes

accn: 4g

Impacts:

10,000

applied in winding de energised condition and 2500 impacts when the winding is energised with 5V. After the test there shall not be any mechanical damage and spontaneous closing or opening of contacts (glowing and putting off of signal lamp) should not occur during the test. Winding current consumption to be measured and it shall not be more than 0.665 (volts). Switching on voltage and switching off voltage measured should not be more than 21V and 6.3V respectively or not less than 18V and 5.4V respectively. Repeat the test with the contacts tilted through 180°.

Linear acceleration

Stand for

Linear accn:

of level: 8g

...

Test for linear acceleration should be carried out on special stand at linear acceleration 8g in 2 positions of contactor for (a) acceleration is directed for closing contacts

(b) When winding is de energised acceleration is directed for opening of contacts when voltage across winding is 20V

Signal lamp should be connected to the contactor ... at 110.00 above, there shall not be any spontaneous opening or closing

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69

of contacts (i.e. glowing or putting of signal lamp) during the test. After the test switching on voltage and switching off voltage, Insulation resistance in normal condition and Insulation Resistance after thermal mode test shall be checked. The values shall be 20V, 0.6V, 20 meg ohm and 2 meg ohm respectively

C8 5B/41
Test for vibration strength

Vibration Test for vibration strength should be carried out on stand capable of vibration stand 50 Hz with amplitude as under :-
ble of giving 50 Hz
amplitude 0.4 mm
(a) Frequency 50 Hz
(b) Amplitude 0.4 mm
(c) Total duration - 56 hours
Total duration divided as under :

(a) 28 hours in coil deenergised condition
(b) 28 hours in coil energised at 27V
Test should be done in following two positions of contactor :-

(a) Contactors terminal bolt upwards
(b) Contactors terminal bolt downwards
Signal lamp in series with contacts and battery to be connected while under test

Following to be checked :

(a) No mechanical damage
(b) Switching on voltage shall not be more than 21V but less than 18V
(c) Switching off voltage shall be not more than 6.3V but not less than 5.4V

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(d) There shall be no spontaneous closing or opening of contacts (glowing/putting off of signal lamp)

(e) Service life for 3000 operations to be done during vibration endurance test

Carryout the service life under the following conditions as per test B1 above :-

29 16/43 Service life Same set at conditions other than ground condition

up as per B1 above and pressure and cold chambers

(a) At pressure corresponding to 15000 m and temperature from -30°C to -60°C
(i) 4500 switch on/off at 27V across coil
(ii) 1500 switch on/off at 29.7V across coil
(iii) 1500 switch on/off at 24.3 V across coil

(b) At pressure corresponding to 20000m and temperature from -30°C to -60°C

(i) 2700 switch on/off at 27V across coil
(ii) 900 switch on/off at 23.7V across coil
(iii) 900 switch on/off at 24.3 V across coil

As 5 neq, ssa, and As 9 neq, ...
As 1 neq, ssa, and As 2 neq, ...
As 1 neq, ssa, and As 2 neq, ...

RESTRICTED

PART IV

DOCUMENTATION

The QAE(L) will liaise with the manufacturers to ensure that the documents are supplied at appropriate stages. The following is given as a guide. This, however, is subject to stipulations in the supply order/AT/indent :

Prototype stage

- (a) Provisional design specification 3 copies
- (b) Draft User Hand Book 6 copies
- (c) Recommended list of carried spares, accessories (forming complete station) along with their drawing/specification 6 copies
- (d) List of components showing maker's ref/ type approval status and recommendations for 2 years maintenance and one overhaul for 100 equipments 6 copies
- (e) List of special tools, test equipments, jigs and gauges 6 copies
- (f) Draft Technical manual 6 copies
- (g) Provisional procurement drawings for equipment accessories, spares and components 6 copies

Note: The list at (c) above will not be necessary in case the required information has been given in the draft User Hand Book

The manufacturer will supply as many copies of documents in typed form as per the terms and conditions of the contract