

12
C16/
1.2.9
3.21(b)

Reduced pressure effect of ambient air upto 170mm of Hg

C17/
1.2.10
3.22
Guarantee operation test

The regulator should be in non-working condition. Keep the regulator in a pressure chamber whose temp is 25±10°C. Reduce the air pressure to 170 mm of Hg. Condition the regulator at this pressure for 2 hrs. Then smoothly raise the pressure of the chamber to normal pressure. Take out the regulator from the chamber and carryout the following performance checks:

- 1) Visual inspection. There shall be no physical deterioration. Record the results.
- ii) Repeat test at sl.No.A2(B)
- iii) -do- A2(c)
- iv) -do- A2(d)

Guarantee operation test is conducted for 10 cycles. Each cycle consists of the following duty:

Operation time	Load (A)	Speed of generator (rpm)
6 hrs	10A	3650± 300 rpm
25 hrs	10A	6500±200 rpm
10 minutes	10A	8000±200
15 hrs	200±10	4150±300
3.5 hrs	200±10	6500±200
10 minutes	300±10	4150±300
10 minutes	300±10	6000±200

In the process of test check that the regulator maintains voltage between 26.5V to 28.5V.

At the end of each cycle carryout the following performance checks :

- i) Repeat test at S1 A2(b)
- ii) Repeat test at S1 A2(c)
- iii) Repeat test at S1 A2(d)

1 2 3 4 5

C18/
1.2.11
&
3.23

Service
life test

After completion of all the 10 cycles with performance check, carry out the following additional test :

i) Carryout the voltage regulation test at a generator speed of 6500±200 rpm with load of 200±10A for a period of 5 hrs

ii) Visual examination. There shall be no physical deterioration

iii) Repeat the test at S1 No. A2(b)
do- do- A2(c)
do- do- A2(d)

Repeat the test at C17 for 1000 hrs with the same cycling.

Additional test at 6500±200 rpm at a load of 200±10A shall be conducted for only 2 1/2 hrs.

Note: Normal scheduled maintenance as per operating instructions may be service life testing during

COMPLETE STATION LIST

Ensure that the following are supplied alongwith the equipment :-

- (a) Voltage Regulator SN-10
- (b) Spares :-

(i) Measuring Unit BI-10

(ii) Fuse SP-15-30 VT
TV 16-522.09-76

one number extra with each 30 regulators
two numbers extra with each regulator

A1 Visual inspection

- (a) The set of apparatus contains:
- i) Complex apparatus BWP-400T
 - ii) Filled in and signed label

+ iii) Description

- iv) Group repair set CK No. 1372, for BWP-400T
- v) Group SPTA set 01534-3M-2
- vi) Tools and fixtures for dismounting and assembling CK No. 1400

A2 Design overall dimensions

Graduated scale

(b) The design, overall dimensions and electrical circuit diagram should comply with drawing Nos 015167, 035124, 055091 CK/T

check- ing as per circuit diagram

1) o/a dimensions

Length = 140 ± 0.6 mm
Width = 110 ± 0.6 mm
Height = 100 mm

1) Mounting dimensions

to centre to centre
 $L = 230 \pm 0.2$ mm
 $B = 80 \pm 0.2$ mm

A3 Production

process, Quality of assembly and external finishing

Check that the manufacturing of parts and assembly of apparatus are carried out strictly in compliance with the approved drawings and effective process. Ensure that the manufacturing plant notifies the Q.A officer about the future changes in the basic technological process

A4

22

Check the following relays visually for compliance with their relevant technical specification for their physical examination:

- i) Relay KX 22T/T-Specn No. T 94.500.001111
- ii) Relay KX 210/T-Specn No. T 94.500.003311
- iii) Relay KX 1P-2/T-Specn No. T 94.500.003311
- iv) Relay KX 210/T-Specn No. T 94.500.003311

1 2 3 4 5 6

A5 Marking
24

Verrier call- Marking of the apparatus is carried out in
pers (for che- compliance with the sequence set by the
cking height manufacturing plant
of letters)

A6 Checking
(6) of opera-
tion and
nominal
data for
technical
data

Voltmeter 0-50
Ammeter 0-500A

- i) Rated voltage shall be 28.5V
- ii) Current passing through contactor
contacts when supplied for 0.001 sec
shall be.....400A
- iii) Mode of operation shall be as per
table given below

Cinetic
chamber
Range -50 to
+100 C

Height
in me-
tres

Ambient Temp

Continuous rating Short time rating

	5 min max	20 min max
-60°C to + 90	-	-
-60°C to + 20	+130	+70
-60 to 0	+130	+70
25,000	+130	

Note: a) Sprinkling of water in scavenging air
is allowed for reducing the ambient temp
down to +130°C in the plane
b) Relative air humidity upto 98% at
temp of 40 ± 5°C

1 2 3 4 5 6

A7 Check for Voltmeter Rig up the circuit as per circuit diagram No. (9) operation 0-50V range DMR-400T-1

and nominal voltage. Start the generator and check whether the data for 50-50A-50V complex device DMR-400T disconnects the generator status. The generator from the battery under the following release control and the conditions:

1) When the generator voltage shown by voltmeter 1 is not exceeding 5V

2) When the reverse current shown by ammeter A is 15 to 35A

3) Remove the connection between pin No. 1 of terminal 'GEN' of complex device DMR-400T and if in this case, the voltage

of the generator shown by circuit diagram No. DMR-400T-1

When the generator voltage is not exceeding 5V and the reverse current shown by ammeter A is 15 to 35A, the generator is disconnected from the battery. The generator is disconnected from the battery when the voltage is not exceeding 5V and the reverse current shown by ammeter A is 15 to 35A.

The generator is disconnected from the battery when the voltage is not exceeding 5V and the reverse current shown by ammeter A is 15 to 35A. The generator is disconnected from the battery when the voltage is not exceeding 5V and the reverse current shown by ammeter A is 15 to 35A.

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-14-

Method of connection

PH.10 - 3 Field positive
PH.10 - 5 of complex device
Complex device - 0 Negative
CKT of complex device - 4 of Bty
of Bty to - of Gen through switch

PH.10 - 3 Field positive
PH.10 - 5 of complex device

Complex device - 0 Negative
CKT of complex device - 4 of Bty

of Bty to - of Gen through switch
Volmeter V1 exceeds that of bvt voltage short
by voltmeter V2, Record the results

Carryout five switchings - on and switchings
off at the rated voltage (i.e. 28.5V) in the
control circuit (as per the circuit diagram-I)
and in the circuit of relay contacts
apparatus should be installed on the test eqpt
for heat testing.

In the cold conditions measure the voltage
drop at the output bus-bars of contactor
when rated current is passing through the
contactor contacts using sharp needles which
are set on the immovable bus-bars. Multi range
voltmeters of class not lower than 'I' with
internal resistance of at least 5 Ohms should
be used for measuring the
voltage drop, contacts should be kept free
from opening to avoid damage to device. Voltage
drop should be checked during three switch-on.
value of voltage drop should be

B-3
A8
10V
Fault
9.9.111

Opera-
tion of
appara-
tus at
reverse
polarity
Millivoltme-
ter 0-200mV
Voltmeter
0-50V
Ammeter
50-0-50A
Millirange
voltmeter
with int.res.
of atleast
50 ohms.
Stop watch

1
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AS 11
(contd)

Volmeter

0-50V

Ammeter

0-100A

Volmeter

0-50V

Ammeter

0-1000A

Millivolt-

meter

0-200mV

Thermome-

ter

0-300°C

Ammeter

Voltmeter

0-50V

Load- 97

to 100 A

Thermometer-

0-150°C

Voltmeter

0-50V

Read against the device not earlier than 5
secs after switching on the contactor, in this
case the highest reading is fixed.

The voltage drop at two pairs of contacts should
not exceed 150 mV.

The complex device shall be set in operation for
2 hrs at generator voltage of 29.5V and (500A)
current through the contacts. After this test
check the following :-

1). Check for over heating of contacts of the
contactor and voltage drop at output bus-bar
of the contactor before switching off load
current and voltage in the control circuit.
Ensure that the temp of fixed contactor is not
more than 275° and voltage drop at contactor
is $\leq 150\text{mV}$

1d) Check the operating voltage and voltage drop
of contactor and relays TR1P2A/T, TRK 210A/T
TR1210A/T and TRK22A/T for contactor. The
operating voltage in hot condition = $\geq 18\text{V}$
for relays $\rightarrow 20\text{V}$

1ii) Check the operation of complex device when the
generator is connected to the mains in the
absence of voltage in the batteries (i.e.
mains) and presence of load resistance of
97 to 100 ohms in it

1iv) Check the operating voltage of control
relays when the generator is connected to
the batteries provided that the voltage of
the generator exceeds the voltage of the
battery. The values shall not exceed as
per the table given below:

Table 2 of Ty specn.

11/2/14
13/3/14
14/4/14

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A8
(contd)

Ammeter
50-0-50A

(v)

Check the value of the reverse current at which the complex device disconnects the generator from the battery. The reverse current shall be between 15 to 35A

Voltmeter (vi)
0-50V

Check the voltage at which the complex device disconnects the generator from the battery when there are no other power sources in the battery. Record the result

(vii)

Check the operation of the complex device when changing the polarity of generator. It should not operate and operator also should check that batteries are not come in circuit

Voltmeter (viii)
0-50V

Check that the generator voltage exceeds when the connection between the generator and complex device is broken. Record the result

/carryout

(viii)

After the tests from (i) to (viii) above, carryout 10 switchings on and switching off of rated current. Ensure that the performance of the complex device is satisfactory.

Voltmeter (ix)
0-50V
30V meter

Check that in case of absence of voltage in the mains, the impedance of 97 to 100 ohms in the mains, the generator is connected to the mains

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A10 Checking of High voltage tests
(12, electrical tests 0-500V ac
(29) insulation strength 50 Hz

A11 Checking of mass Balance 0-5kg
(18) with accuracy ± 20 gms

47 -
5
6

Check the insulation resistance with a 500V ac megohm meter at cold and hot conditions :-
i) Between the terminals "Generator" and "A"
ii) Between "Generator" and "Relay frame"
iii) Between "E" and "minus"
The value shall not be less than 20 M Ω in cold condition and not less than 2 M Ω in hot condition

Apply an ac rms voltage of 500V, 50Hz r.m.s for one minute between the following points:
i) Between the terminals "Generator" and "A"
ii) Between "E" and "minus" and
iii) Between "Generator" and "Relay frame"

Stop watch-1
voltage 0-50V
Wattmeter 0-1kW

Hold up time may be reduced to 1 sec during acceptance test if the test voltage is increased by 25%, in this case the and drop of voltage be carried out as per test No. and immediately. The source of power shall be atleast 0.5kW

Test results are considered to be satisfactory if there is no breakdown of insulation. Record the results

Check that the mass of the complex circuit shall not exceed 2.0 kg. The accuracy of the balance shall be ± 20 gms
Record the results

1 2 3 4 5

Handwritten notes and stamps at the top of the page.

Testing for maximum typing current (15, 44)
 Ammeter 0-2500mA
 Resistive load

Climatic chamber (pressure & temp chamber)
 Stop watch

Check that the contactor contacts shall withstand three switching on and three switching off of maximum current of 2000A using resistive load

Testing shall be conducted at an atmospheric pressure of 18.6 ± 1 mm of Hg and ambient temperature of $20 \pm 5^\circ\text{C}$ at voltage of 28.5 to 30V at open contacts.

Duration of each switching on is one second with an interval between switching on upto complete cooling.

Test results are considered to be satisfactory if there is no sticking of contacts.

1) Checking of production process of assembly and external finishing

Ensure that the parts and assembly of complete device shall comply with the approved relevant drgs and effectively with production process. The mfg. shall inform the consumer about the future changes in the basic technological process.

11) Marking

Marking of the apparatus is carried out in compliance with the security set by the manufacturer and as per the approved drgs

B2 Dismantling of article and checking for compliance with drgs (3a, 21, 24)
 Graduated scale micrometer vernier caliper

Graduated scale (for checking height of letters)

1 2 3 4 5

B2: 1/1000 Graduated
(cont'd) 1/1000 scale

1/1000 Micrometer

11) Overall dimensions and electrical circuit
Check that the complex device is as per the design.
The overall dimensions and electrical circuit diagram shall conform to drawings Nos 015167, 0351124, 055 091C x D for complex device

C1 4a, 8(c) Testing Climatic
9(f), 13, for cold chamber
8(a) 134 resistance

a) Check that the performance of the complex device is satisfactory at heights specified in cl 1.6
Operating conditions:
b) 1) In the absence of voltage in the mains when the voltage of generator is less than 24V

1i) When the voltage of main is at least 24V and that of generator is more than the value (i.e. Bty voltage) by 0.2 to 1V

1ii) Keep the condition as per test 2.7
1iv) Check for compliance as per table 2 of TY specn for complex device

1c) After compliance with the above initial testing of the complex device, keep the item in cold chamber for 2 hrs at temp minus 57 to 63 C. Afterwards, check the operating voltage and drop out voltage of contactor and relay TKE IP2 AT and the reverse current. Record the results.
d) After checking the above parameters switch 'on' and switch 'off' for 10 times at the rated current of complex device. Check the switching on of the generator at voltage of 24V in the absence of voltage in the mains

Voltmeter 0-50V
Ammeter 0-500A