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Miro Computer Control Battery Product Inspection Machine : TC-NBC4(F)200-ARDB



* Application: 2.5~12AH (12V motorcycle batteries)

* Power source: AC 1Ø 220V 50/60HZ

* Functions:

- (1). Automatic feeding, automatic transmission; positioning; testing.
- (2). Automatic rejection of inferior product.
- (3). Production control statistical data (Provide QC to each processing station, improve quality)
- (4). Give hardcopy of testing OV, CV1, CV2, ΔV , CV3 data and statistical analysis data, reorganizing data function °
- (5). The test value of O.V&CV1&CV2& ΔV &CV3 can provide the original text format for EXCEL (attached a 15m cable for RS232/software/PC).
- (6). The test data for discharging is saved.
- (7). The test data for internal resistance is saved.
- (8). Auto. qualified goods bar-code sticker printing(sticker with manual placement on battery).
- (9). After testing with "Internal resistance" & "Discharge Testing Data" & bar-code in series, combine and save the data then process it with computer.
The testing information of every battery will be bar-code with serial data and internal resistance and discharge testing value of OV; CV1; CV2; ΔV ; $\Delta V3$.

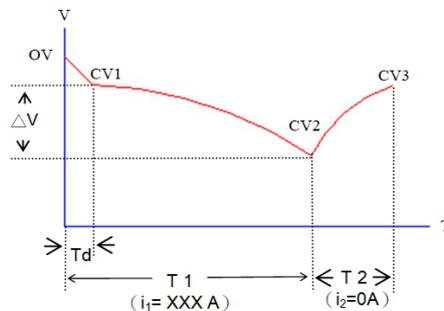


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* INSPECTION ITEMS :

- (1).Order : introduction→leakage on top cover test→internal resistance test→discharge test→bar-code in series→delivery.
- (2). Leakage on top cover test: pressure can be set.
- (3).Internal resistance test, high level / low level value setting.
- (4).Reverse polarity test ; open circuit voltage (OV)
- (5).Discharging test. (ΔV ; CV2)
- (6).Voltage recovery for battery is tested with large discharge current. (CV3)

* DISCHARGE CURVE



(1) . Inspection condition setting

OV : open-circuit voltage. High level / low level (HV/LV) voltage value setting. May continuously setting within DC 4.00V~20.00V.

T1 : The first session discharge time value setting (OV→CV2) . May continuously setting within 0.1s~99.9s.

I_1 : The first session electric current value setting. May continuously setting within DC 2.0A~200.0A.

T_d : Catching time value setting of OV→CV1. May continuously setting within 0.1S~99.9S.

CV2 : HV / LV voltage value setting when the first session discharge ends. May continuously setting within DC 4.00V~20.00V.

CV1-CV2 (ΔV) : When the battery discharges in large electric current, the voltage will lower suddenly and rise up again around 0. several seconds. The discharge value is CV1. The difference value of CV1 minus CV2 = dropping slope (ΔV) . For HV voltage value setting, may continuously setting within DC 0.0V~19.99V. The smaller the difference value is.

T2 : The second session discharge time value setting (CV2→CV3) May continuously setting within 0.1S~99.9S.

I_2 : The second session discharge electric current value setting. May continuously setting within DC 2.0A~200.0A.

When the electric current value is set up as 0A, the voltage rising condition can be measured after a few seconds.

CV3 : HV/LV voltage value setting when the second session discharge time ends. May continuously setting within DC 4.00V~40.00V.



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(2) . Operate select : "normal" and "freq value".

A. Normal :

The selection of high and low voltage (HV/LV) will not be charger during test based on "Initial".

B. Freq value:

(i) The values of HV/LV (OV, CV2, CV1-CV2 and CV3) are selected according to those for "initial" (normal); furthermore, the quantities of ok battery (HV/LV ok) are set. When the quantities of ok battery reach to set ones, the unit will automatically stop; and the frequency value of OV and CV1-CV2 for pass batteries is calculated (voltage to most appear) "the average value of CV2 and CV3" each frequency / average voltage is modified/compared to obtain new HV/LV

Modification mode

(A).OV..

HV= "FREQ VALUE + MODIFIED VALUE (value such as +X.XXV)" for qualified battery compared with "COMPARE (value such as XX.XXV)" to take higher one as new value.

LV= "FREQ VALUE - MODIFIED VALUE (value such as -X.XXV)" for qualified battery compared with "COMPARE (value such as XX.XXV)" to take higher one as new value.

(B).CV1-CV2..

HV= "FREQ VALUE + MODIFIED VALUE (value such as +X.XXV)" for qualified battery compared with "COMPARE (value such as XX.XXV)" to take higher one as new value.

(C).CV2&CV3

HV= "AVERAGE VALUE × MODIFIED VALUE (such as ×100.2 %)" for qualified battery compared with "COMPARE (value such as XX.XXV)" to take higher one as new value.

LV= "AVERAGE VALUE × MODIFIED VALUE (such as ×99.8 %)" for qualified battery compared with "COMPARE (value such as XX.XXV)" to take higher one as new value.

(ii) During official test, each test condition must be based on modified HV/LV for judgment (no any Modification is allowed during official test.).

(iii) When each HV/LV makes modification under test,

It will not modify initial "discharge current" and "test Time".

(iv) Example:

<1> i The quantity of pass samples is 10. Taking OV for

Example, initial HV=12.50V and LV=12.30V. Therefore, the modified value

HV= +0.02V and LV= -0.02V. ' the compare value HV=12.49V and LV=12.32V.

ii Samples testing :

NO. 1 BAT. OV=12.42V (OK) NO. 2 BAT. OV=12.44V (OK)

NO. 3 BAT. OV=12.46V (OK) NO. 4 BAT. OV=12.42V (OK)

NO. 5 BAT. OV=12.20V (NG) NO. 6 BAT. OV=12.44V (OK)

NO. 7 BAT. OV=12.46V (OK) NO. 8 BAT. OV=12.43V (OK)

NO. 9 BAT.OV=12.46V (OK) NO.10 BAT. OV=12.44V (OK)

NO.11 BAT. OV=12.48V (OK)

Remark : BECAUSE NO.5 BATTERY FAILS, ONE MORE BATTERY (NO.11) IS REQUIRED TO TEST. THEREFORE, THE QUANTITY OF PASS SAMPLES IS 10.



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(a). The frequency value for OV is sorted..

12.46V × 3 pcs.

12.44V × 3 pcs.

12.42V × 2 pcs.

12.48V × 1 pc.

12.43V × 1 pc.

(b). The quantity of 12.46V and 12.44V is identical in 3, whereas 12.46V is higher than 12.44V. Therefore, 12.46V is taken as the frequency value of OV (take the value with voltage to more appear, not that with higher voltage. When the quantity is identical, higher voltage will be taken.).

(c). New conditions to determine OV during an official test..

HV= FREQ VALUE 12.46V + MODIFIED VALUE 0.02V compared with COMPARE VALUE 12.49V to obtain new value = 12.49V.

LV= FREQ VALUE 12.46V – MODIFIED VALUE 0.02V compared with COMPARE VALUE 12.32V to obtain new value = 12.44V.

<2> i Taking CV2 for example. Initial HV=11.86V and LV=11.50V,
MODIFIED VALUE HV=×100.0% and LV=×97.0%; COMPARE
VALUE HV=11.70V and LV=11.20V

ii Samples testing :

No. 1 BAT. OV=11.60V (OK) No. 2 BAT. OV=11.63V (OK)

No. 3 BAT. OV=11.74V (OK) No. 4 BAT. OV=11.70V (OK)

No. 5 BAT. OV=11.54V (OK) No. 6 BAT. OV=11.65V (OK)

No. 7 BAT. OV=11.68V (OK) No. 8 BAT. OV=11.80V (OK)

No. 9 BAT. OV=11.64V (OK) No.10 BAT. OV=11.72V (OK)

(a). The average value of 10 sets of acceptable battery is 11.67V..

(b). New conditions to determine CV2 during an official test..

HV= AVERAGE VALUE 11.67V × MODIFIED VALUE ×100.0% compared with COMPARE VALUE 11.70V to obtain new value = 11.70V.

LV=AVERAGE VALUE 11.67V ×MODIFIED VALUE×97.0% compared with COMPARE VALUE 11.20V to obtain new value = 11.32V.

(3) . Determination condition for qualified products

OV : OV HV/LV value ; no reverse contact in battery polarity.

Determine to be ok in this category.

CV2 : When the 1ST stage discharge ends, the voltage value is within HV/LV value. determine to be ok in this category.

CV1-CV2 : Dropping slope (ΔV) value is within HV value.

Determine to be ok in this category.

CV3 : When the 2ND stage discharge ends, the voltage value is within HV/LV value. determine to be ok in this category.

Remark : CV1 not determination.



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(4) . Ok is determined for qualified plurality, OV, CV2, CV1-CV2 (ΔV) , and CV3. the warning is automatically shown for NG and indicated with marks in the reports.

(5) . Printing of information:

<1>. Data printing both OK & NG information.

<2>. Data printing OK information only.

<3>. Data printing NG information only.

<4>. Voltage graph/information analysis among OV; CV1; CV2 ; CV1-CV2 ; CV3 areas (OK&NG) .

<5>. Voltage graph/information analysis among OV; CV2 ; CV1-CV2 ; CV3 areas (OK) .

<6>. Statistics and analysis of OV;CV2 ; CV1-CV2 ; CV3 (Value/ Quantity/ Class).

(6) . P01~P249 procedures is offered. setting for each PROCEDURE CAN be individually made.

6. Internal resistance : polarity; OV; CV2; ΔV ; CV3 are qualified, which are considered to be qualified product, the deficient items will be removed automatically, warning; alarm.

7. Qualified goods bar-code sticker printing (sticker with manual placement) .

8. Accessories : 4 sets of testing tools (3AH/5AH/7AH) \times 1; 9AH \times 1;10AH \times 1;12AH \times 1 , together with machine.

9. The customer shall notify the moving direction of battery under test. If not notified, the standard way to manufacture will be based on left in and right out.

10. Machine color: light green.

11. 5kgf/cm² of air pressure for machinery bench supplied by customers.