

# **M200 Armature Tester**

**HIGH VOLTAGE** IS present under the arm for .1sec during each test.

Keep hands out from under the arm head at all times!!!!

**NEVER** place hands or fingers under the arm head during testing.

The red HIGH VOLTAGE caution light on the M200 control panel indicates that high voltage is present at the arm head.

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**AUTO/MAN:**

Selects the automatic or manual mode. The manual mode allows setting of the test resistance from the sample armature. The automatic mode is always used for testing.

**RANGE:**

Selects the measurement range (200uohm, 2, 20, 200milliohm). Ranges can only be selected in the manual mode.

**SET RES:**

The SET RES keypad is used to enter the test specimens resistance value. This value will be displayed when in manual and a the reference armature is mounted. This key is active in manual only. SET RES is exited and the AUTO mode is restored whenever SET RES depressed. The resistance shown on the LCD display is converted to it's value at 20 °C and saved. The corrected value is now displayed on the top display.

**LIMIT:**

The LIMIT keypad sets the tolerance limit for the resistance for the armature. The tolerance is a  $\pm$  percentage of the value set by the SET RES keypad. This key is active in both automatic and manual modes.

**TAKE DIAM:**

This keypad starts and stops the armature rotation. When the armature is stopped by this keypad, the diameter of the armature is saved in incremental step form. you should allow slightly more than one revolution to insure being able to test all of the commutator bars. This key is active in both automatic and manual modes.

Return only from 0000 to 0000 to exit CLR mode, depress  
ENTER.

**CLR:** This keypad is used to clear a wrongly entered number.

**ENTER DATA:** This keypad is used to enter various system constants.  
Each time the key is pressed a different constant can be  
entered and/or changed. The ambient temperature in °C  
can also be displayed. Constant modes can be exited with  
the ENTER key.

**0-9:** Number keys used to enter numeric data.

## MODEL M200 AUTOMATIC ARMATURE TESTER

1. Attach an air supply of 30-120PSI to the unit. Turn the power switch on. The arm should rise to the up position.
2. Place the reference armature between the rollers, adjust the roller support plates spacing as required . Adjust the contact carrier so that the 4 spring contacts on the carrier make contact with the armature. The contacts should deflect about 1/16 with the armature on and off the rollers.
3. With the rollers and contacts properly adjusted, mark a point on the armature or note it's position. Press the TAKE DIAM key. The arm will come down and the armature will begin to rotate. When the armature has made 1 revolution plus a little more (10% is a good number) press the TAKE DIAM key again. The diameter is now saved.
4. Press the SET INSUL key and enter the minimum insulation value you require for this armature. The insulation value entered can be from 1k $\Omega$  to 500k $\Omega$ . Press ENTER after you have entered the value you desire.
5. Press LIMIT and enter the resistance tolerance allowed. 5% is a good starting number if in doubt.
6. Press the AUTO/MAN key. The top display will indicate that you are in the manual mode and also indicate the present resistance range. If you do not know the resistance of the reference armature, press and release the range key until 200m $\Omega$  is indicated on the top display. Watch the bottom display as you **slowly** rock the armature by hand. The display will vary between a couple of values. Position the armature for the lowest value. If the number is 300 or less press the RANGE key once, 30 or less press twice, 3 or less press three times. You should now be on the proper range. Press the SET RES key.

7. The bottom display will indicate the insulation test voltage in volts and tenths. Set the required voltage with the voltage adjust knob located next to the lower display. The voltage is adjustable between approximately 30-180vdc.
8. With the reference armature still mounted, press the green START button. The arm will come down and the test will begin. There is high voltage present at the beginning of the test for testing the insulation therefore, **NEVER TOUCH THE ARMATURE WHILE A TEST IS TAKING PLACE OR THE ARM IS DOWN!!!** The test will automatically end and the arm will raise.
9. The top display will contain 6 sets of numbers. If the SL total is greater than the BR total, repeat step 6 using the highest value for the SET RES.
10. You are now ready to test all armatures that should match the reference armature.

The M200 is designed to be primarily used as a production GO/NOGO instrument. The front panel display data can be used to analyze certain problems.

At the end of each test the top display contains 6 sets of numbers with the following prefixes.

- BR            Total number of samples taken on bars or good readings.
- SL            Total number of samples taken on slots or bad readings.
- OV            Total number of samples that were greater than the upper resistance test limit.
- UN            Total number of samples that were less than the lower resistance test limit.
- GD            The maximum number of good samples taken in a row.
- BD            The maximum number of bad samples taken in a row.

The ratio of GD to BD will give an approximate indication of the bar to slot width. GD should always exceed BD. If BD is larger by say 2, then this would most likely indicate a short between 2 bars. If larger by 3 then 3 bars, etc.

The ratio of BR to SL will indicate the overall readings of the armature. BR should always be greater than SL. If SL is very large and BR is very small or 0, This may indicate bad welds or the winding gauge is too small. This relationship would indicate that the resistance samples are too high. This can also occur with an open winding.



