

MOTOR GENIE® - CONDITION CALCULATOR™ USER MANUAL



ALL-TEST Pro, LLC

MOTOR GENIE® - Condition Calculator™ APP



USERS MANUAL

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Loading the App and Getting Started

INTRODUCTION

The MOTOR GENIE® - Condition Calculator™ App is a companion to the MOTOR GENIE® motor tester. The App quickly analyzes the MOTOR GENIE® measurements of resistance, impedance, current frequency response (I/F), phase angle (fi), phase balance (pb), and insulation resistance to ground testing for low voltage three phase AC induction motors. It is presumed that the user has a basic understanding of iOS and/or Android mobile devices.

Caution: The App is designed as an accessory to the MOTOR GENIE® Tester. Inputting data from other instruments may provide inconsistent results.

HARDWARE & SOFTWARE REQUIREMENTS

Android and iOS mobile devices

INSTALLATION

1. Search for the MOTOR GENIE® - Condition Calculator™ App in Play Store (Android) or App Store (iOS).
2. Download the App.
3. Setup a new subscription and create a user account with an email address and password.

STARTING Condition Calculator™ App

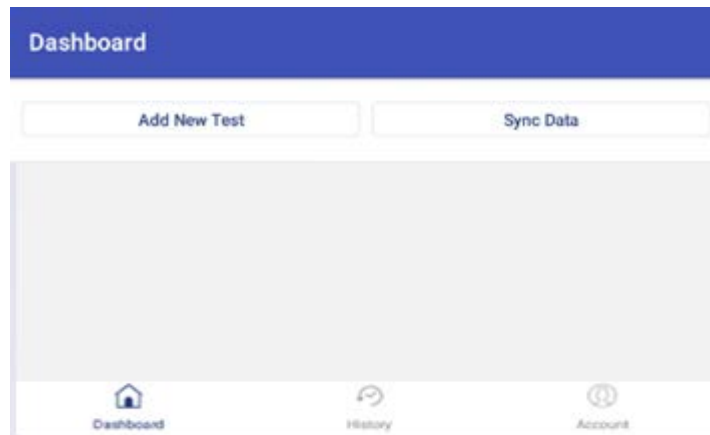
The App can be started by selecting the icon on the mobile device.





Using - Condition Calculator™ App

The App opens to the Dashboard screen., this screen provides the format to view saved data, add a new test, sync data, view history, or view account details.



Required Data Entries

The following data must be entered into the Motor Analysis fields. A sample MOTOR GENIE® data sheet is located in Appendix B. The data can then be easily transferred into the Condition Calculator™ App.

Motor ID

Assigns a Motor ID name for the test data, this field is limited to Alpha-numeric characters. Single quote, double quote, emojis, and the commas are not allowed as characters in the Motor ID.

Resistance (R)

These values are recorded from the MOTOR GENIE®. The range of the values entered must be from 1 to 999 ohms and commas are not allowed as decimal separators.

Impedance (Z)

These values are recorded from the MOTOR GENIE®. The range of the values entered must be from 1 to 999 ohms and commas are not allowed as decimal separators.

I/F (Current Frequency Response)

These values are recorded from the MOTOR GENIE®. These entries must be an integer. The value entered must be between -15 & -50 and must be in whole numbers.



Phase Angle (Fi)

These values are recorded from the MOTOR GENIE®. The range of these reading must be between 15 & 90 degrees and must be in whole numbers.

Note:

1: The frequency on screen 2 will be double that of the screen value, since this is the frequency used to determine the I/F value.

2: The default frequency of the MOTOR GENIE® is 200 Hz; enter this value unless the test frequency was manually changed during the testing.

Insulation Resistance (Mohm) and Test Voltage

This value is recorded from the MOTOR GENIE® instrument. Test voltage can be 500V or 1000V.

Test Frequency

The test frequency at which the winding test was performed must be selected from the drop down menu. This value is recorded from the MOTOR GENIE® screen 1. The values are (25, 30, 50, 60, 100, 200, 400 & 800 Hz).

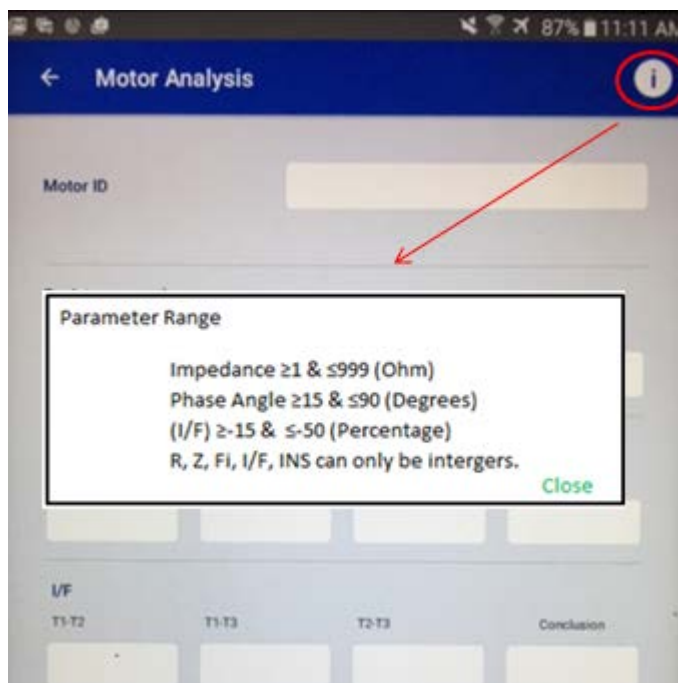
Optional Data Entries

Phase Balance (pb) - If a phase test was performed enter the results in the spaces provided.



Information Tool

When adding a new test from the Motor Analysis screen select the information icon, to view valid range for each entry . If entered values are out of range during data entry, a message will appear to show the valid range for each value.





Data Analysis

Once all of the data has been entered and properly entered, select the Test button to have the software evaluate the condition of Motor Winding based on the gathered data. Refer to the figure below for a layout of the evaluation screen.

The screenshot displays the 'Motor Analysis' app interface. At the top, there is a blue header with a back arrow, the title 'Motor Analysis', and an information icon. Below the header, the 'Motor ID' field contains the text 'Example'. The main content area is divided into several sections for data entry:

- Resistance:** Fields for T1-T2 (17), T1-T3 (17), and T2-T3 (17). The Conclusion field shows 0.0.
- Impedance(Z):** Fields for T1-T2 (121), T1-T3 (122), and T2-T3 (123). The Conclusion field shows 0.82.
- I/F:** Fields for T1-T2 (-44), T1-T3 (-45), and T2-T3 (-43). The Conclusion field shows 2.0.
- Phase Angle(φ):** Fields for T1-T2 (76), T1-T3 (75), and T2-T3 (77). The Conclusion field shows 2.0.
- Phase Balance(pb):** Empty input fields for T1-T2, T1-T3, T2-T3, and Conclusion.
- Insulation Resistance:** A green field containing 500, with the unit MegaOhm.
- Test Volt:** Radio buttons for 500V (selected) and 1000V.
- Test Frequency:** A dropdown menu set to 200 Hz.
- Rotor Compensated:** An unchecked checkbox.
- Direct Test At Motor:** An unchecked checkbox.
- Findings:** A text field containing '- Good winding & connections'.

At the bottom of the screen, there are three buttons: 'Test' (circled in red), 'Clear', and 'Save'.



Test

Evaluates the entered data and compares it to predetermined limits and displays the calculated unbalances of resistance, impedance, Phase Angle, I/F, Insulation test, and optional phase balance in the findings box. The App also color codes the conclusion box to provide the user with a quick view of the condition of the tested three phase windings.

Color Codes

The App Color Codes are designed to provide the user with a visual indication of the Motor Condition.

Green – Winding and connections are Good, No further action is necessary.

Yellow – Winding exhibits Possible Fault, additional testing should be performed

Red – Winding Exhibits indication of a fault, verification of the fault should be performed

The MOTOR GENIE® and App are designed as a low voltage 3 Phase AC induction Motor Troubleshooting tool, to provide the user with indication of faulty windings. Because of all of the potential motor variations and winding configurations this system may occasionally identify a fault on a good winding; therefore, all faults should be verified before condemning a motor. Please see the MOTOR GENIE® Instrument manual for additional testing and verification methods.

Findings

The App evaluates the user supplied input data from the MOTOR GENIE® and compares them to pre-determined limits. The findings section provides recommended action based on the data.



Good Winding and Connections – All values are balanced no additional action is usually necessary.

Check for loose Connections - An unbalance of phase to phase resistance is $\leq 5\%$.

Recommend check at the Motor if tested from the MCC – Is displayed if direct test at motor is unchecked. Any unbalance that exceeds the pre-determined limits will recommend testing at the motor to determine if the fault is in the cabling or the motor itself.

If the only unbalance is an impedance unbalance, a rotor compensated test should be performed. If an impedance unbalance still exists, the motor leads should be disconnected



at the motor and the motor itself should be retested. Any unbalances that remain could indicate winding fault. If there no alarms are present then the impedance unbalance is likely due to rotor position.

Shorted Winding – Either the phase angle (fi) or the current frequency (I/F) response has exceeded the pre-determined alarm limits that normally indicate shorted windings. This short could be turn to turn, coil to coil or phase to phase. In some cases a motor will operate with shorted winding, but life expectancy is greatly reduced.

Possible shorted windings – Either the phase angle (fi) or the current frequency (I/F) response have exceeded the pre-determined alert limits that normally indicate shorted windings is developing. This short could be turn to turn, coil to coil or phase to phase.

Grounded Winding – The Insulation resistance to ground is below recommended values, the Motor should be retested at the motor with phase leads disconnected and the fault cleared before motor operation.

Clear

The Clear button clears all data previously entered into the app. Individual entries can be changed and the data retested simply by changing the desired data and depressing the Test Button. The App will reevaluate this new data.

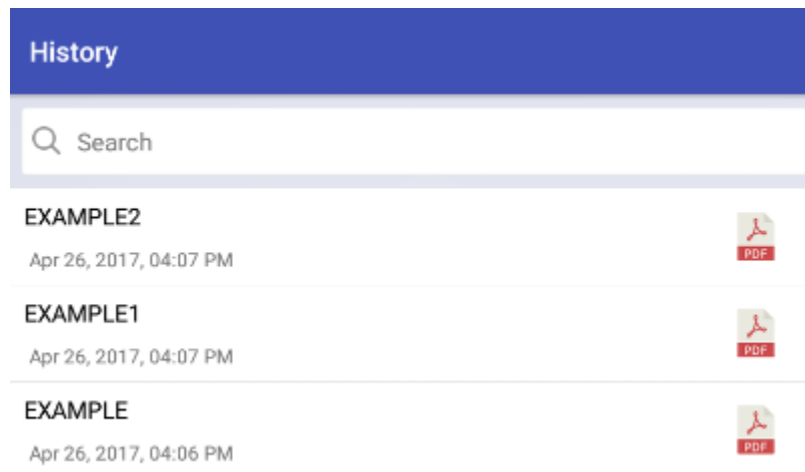


Data Storage

The App allows the user to store and review any of the data evaluations performed. Motor data is saved to the cloud and can be printed or emailed in PDF format.

Save

The Save button stores the data currently entered in the Motor Analysis screen. Test results are saved to the cloud for later review and a report in PDF format can be saved.





Reporting

In the History tab, select the test to be reviewed. From here you can select the report icon to either view test results and/or email reported data.



 ALL-TEST PRO MOTOR GENIE® Condition Calculator™ - Report
Apr 26, 2017, 04:07 PM

Motor ID: EXAMPLE2
Test Date: Apr 26, 2017, 04:07 PM

	T1-T2	T1-T3	T2-T3	Conclusion
Resistance:	17	17	17	0.0
Impedance:	121	122	123	0.82
I/F:	-44	-45	-43	2.0
Phase Angle:	76	75	77	2.0
Phase Balance:				
Insulation:	500 megaOhm			
Test Volt:	500			
Test Freq:	200			
Rotor Comp:	No			
Direct Test:	No			

Findings: - Good winding & connections



Technical Support

Technical support can be obtained by emailing or faxing your questions to ALL-TEST Pro, LLC:

Email: support@alltestpro.com

Fax: 860-399-3180

Please put “MOTOR GENIE support” in your subject line.

ALL-TEST Pro, LLC
PO Box 1189
Old Saybrook, CT 06475
Toll free: 800-952-8776
Ph: 860 399-4222
Fax: 860 399-3180
Web: www.alltestpro.com

Training

Training Courses are held at various locations throughout the world. In addition any of the ALL-TEST Pro training courses can be customized and brought to your plant site. Contact the ALL-TEST Pro training department at ce@alltestpro.com for further information



APPENDIX A

Example report



ALL-TEST PRO MOTOR GENIE® Condition Calculator™ - Report Apr 26, 2017, 04:07 PM

Motor ID: EXAMPLE2

Test Date: Apr 26, 2017, 04:07 PM

	T1-T2	T1-T3	T2-T3	Conclusion
Resistance:	17	17	17	0.0
Impedance:	121	122	123	0.82
I/F:	-44	-45	-43	2.0
Phase Angle:	76	75	77	2.0
Phase Balance:				
Insulation:	500 megaOhm			
Test Volt:	500			
Test Freq:	200			
Rotor Comp:	No			
Direct Test:	No			

Findings: - Good winding & connections



Appendix B

MOTOR GENIE® Motor Test Form				
Motor ID:				
Location:				
Test Date:				
Test Frequency				
	Phase 1-2	Phase 1-3	Phase 2-3	
Impedance (Z)				
Phase Angle (°)				
Z-Test or I/F				
Resistance (Ω)				
Phase balance (opt)				
Ins Resistance (M Ω)		Test Voltage		
<p>Comments:</p> <p>©2016 ALL-TEST Pro, LLC</p>				



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