Technical specifications and product description

SKF Static Motor Analyzer Baker DX

The SKF Static Motor Analyzer Baker DX unit offers more capabilities to analyze all insulation and motor circuits in AC and DC motors, generators and coils. These instruments offer Insulation Resistance (IR), Polarization Index (PI), Dielectric Absorption (DA), DC HiPot/Step Voltage and Surge tests to evaluate all the insulation in motors and coils. The motor circuit can also be analyzed utilizing Resistance, Impedance, Capacitance, Phase Angle and Dissipation Factor/Quality Factor measurements.

DX capabilities and added flexibility

Low voltage testing has been added to the Baker DX. This allows for a more complete testing solution for predictive maintenance or shop quality management. The low voltage tests can supply up to 600 mA and frequencies from 50 to 4 000 Hz.

The Baker DX also offers a modular design that allows you to configure a DX with only the test capabilities needed for your specific application. For example, it can be only a high voltage or a low voltage tester or you can add all the capability to have a unit that has both high voltage and low voltage testing capabilities in one unit. Simply configure the instrument to best fit the application in which it will be used.

Baker DX benefits

- 4 to 40 kV voltage testing capability to test fractional HP motors to 40 megawatt generators
- High and low voltage testing capability in one unit to test the motor circuit and all the insulation
- Intuitive graphical user interface with touch screen
- USB printer interface to quickly print results
- Coil mode – quickly analyze coils and store all data
- Impulse mode allows the operator to quickly apply voltage when testing coils and DC motors
- Fully test DC motors, including bar to bar armature testing
- Push to Test (PTT) lock to hold voltage during DC tests
- Modular design to meet your testing needs
- Internal test storage capacity – 2 GB
- The Baker DX is the smallest, lightest 12 kV surge tester on the market

Table 1

Tests and capabilities of the Baker DX unit.

Failure modes	Winding resistance	IR test	DA/PI test	DC step voltage	DC HiPot	Surge	Inductance	Capacitance	Impedance	Phase angle	D/Q
Weak insulation turn-turn						X					
Weak insulation phase-phase						X					
Weak insulation coil-coil						X					
Turn-turn shorts	X					X	X		X	X	X
Phase-phase shorts	X					X	X		X	X	X
Coils-coils shorts	X					X	X		X	X	X
Open coils	X					X	X		X	X	X
Reversed coils						X	X		X	X	X
Unbalanced phases	X					X	X		X	X	X
Weak ground wall insulation		X	X	X	X						
Dirty windings		X	X	X	X			X			
Moisture		X	X	X	X			X			
Feeder cables		X	X	X	X	X					
Motor lead line connections	X										

Coil testing

The Baker DX unit is among the first on the market to have specific coil testing software. The Baker DX unit can be placed into an impulse mode for quick application of voltage to the coils. The software can store and display up to 200 waveforms on the screen for quick analysis of coil condition. Utilize SKF's Error Area Ratio (EAR) method to calculate the differences between the coils for quick, accurate analysis of the data. The EAR calculation greatly reduces operator error and automatically indicates a defective coil when the result is out of the programmed tolerance level. Report and analyze your data easily with bar charts to help locate and report faulty coils, and for an at-a-glance summary of all coils tested.

Testing a coil utilizing the Baker DX.

Operator interface and operation

The 12,7 × 17,0 cm *(5.0 × 6.7 in.)* touch and color display is an industrial, ruggedized touch screen to handle the rough operation of daily industrial use.

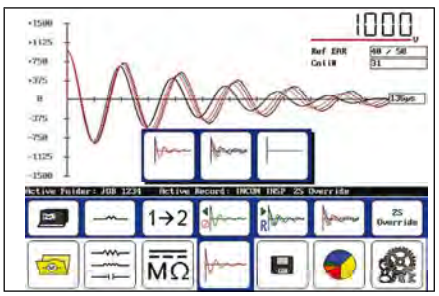
The operator interface has been developed with large icons for easy touch operation, even with electrical gloves. The interface is designed with a left-to-right flow to reduce the number of touches and is intuitive and easy to operate. The software will automatically prompt the operator to save the data if the save button is not selected, reducing the possibility of lost data.

Flexible modular design

Hardware and software

The Baker DX can be built specifically to fit your needs. The unit can be configured to only perform the surge and DC tests, or you can add the resistance test. If you would like the ability to perform all available tests, add the Inductance, Impedance, Phase Angle and Capacitance tests to take advantage of one of the most comprehensive motor analyzers on the market. The Baker DX is available in a 4, 6 or 12 kV unit. The 6 and 12 kV units can also be configured in a high output (HO) version to supply additional energy when surge testing to properly test larger HP motors. If higher voltage is needed, any of these units can act as a host for a Baker PP24, 30 or 40 kV power pack. DC motors can also be tested with the Baker DX by utilizing the AT101 ZTX or adding a span testing fixture.

Coil testing screen.



Testing individual coils within the stator.

RLC measurements screen.

Safety

SKF built the Baker DX unit with customer safety in mind. The Baker DX has successfully passed all the safety requirements to obtain the CE mark. There are LEDs on the Baker DX unit that indicate to the operator when the leads are energized. 40 kV test leads are utilized to provide the most accurate readings and operator protection. The Baker DX can also be configured with safety lights to warn all in the area that testing is in operation.

Storing, analyzing and reporting

Storing data at incoming inspection, during winding and at final assembly is made easy with the Baker DX multi-test storing capabilities. The Baker DX has the ability to store multiple test results within one folder and automatically attaches a time and date stamp. Utilizing the scroll button, the data can quickly and easily be reviewed.

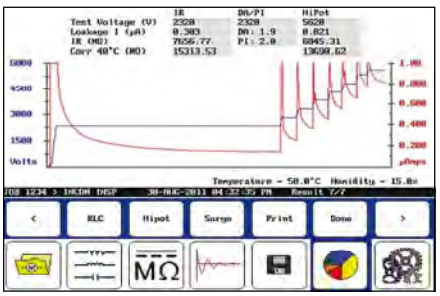
Enter nameplate data utilizing the touch screen and print directly to a printer through the USB port. Keep your company brand in front of your customer by loading your logo in the Baker DX software so every report has your logo at the top of the page. Screen images can also be exported through the USB memory device for customers who would like an electronic form of the data.

DC motor analysis

DC testing is a breeze with the new Baker DX. Both bar to bar and span testing can be performed on a DC armature to thoroughly analyze the armature for shorts, opens, unbalances, turn to turn weak insulation, unbalances in the coils and damaged or mis-connected equalizers. Perform a bar to bar test with the AT101 ZTX. The ZTX's impedance matching transformer is the best, most comprehensive method to analyze low impedance coils in DC motors.

When span testing, a number of bars are spanned with the ATF02 fixture. The Baker DX can be placed in impulse mode and the armature can be tested rapidly with the touch of the start button. Utilizing the span or ZTX to test armatures, the Baker DX software is capable of automatically calculating the EAR. This method of analyzing the waveform reduces the possibility of missing a fault in the armature.

DC testing screen.



Baker DX with the AT101 ZTX.

The Baker DX can store up to 200 results per folder for quick, easy analysis and reporting. The data is also stored in a chart for accurate and easy armature analysis. All interpoles and field coils can be easily analyzed and stored in the Baker DX's multi-result file management system.

Specifications

Physical characteristics

- Weight: 15,4 kg *(34 lbs.)*
- Dimensions: 48,3 × 20,3 × 58,4 cm *(19 × 8 × 23 in.)*
- Power requirements: 100 to 240 V AC, 50/60 Hz, 2,5 A
- Internal memory: 2 GB
- Printer interface: USB/PCL 5 type printer
- External connectors: RLC leads, Footswitch, remote E-stop safety lights, SKF Power Pack, Ground
- User interface: Color VGA touch screen

Baker DX with the SKF Static Motor Analyzer Baker 30.

Table 2

Testing specifications.

Test	4 kV model	6 kV model	6 kV HO model	12 kV model	12 kV HO model
Resistance					
Source voltage, maximum:	3,9 V	3,9 V	3,9 V	3,9 V	3,9 V
Source current:	600 mA	600 mA	600 mA	600 mA	600 mA
10 000 to 200 000 Ω:	3% accuracy	3% accuracy	3% accuracy	3% accuracy	3% accuracy
100 to 10 000 Ω:	3% accuracy	3% accuracy	3% accuracy	3% accuracy	3% accuracy
0,2 to 100 Ω:	2% accuracy	2% accuracy	2% accuracy	2% accuracy	2% accuracy
0,002 to 0,2 Ω:	4%, ±1 mΩ accuracy	4%, ±1 mΩ accuracy	4%, ±1 mΩ accuracy	4%, ±1 mΩ accuracy	4%, ±1 mΩ accuracy
Capacitance					
Source voltage, maximum:	3,9 V	3,9 V	3,9 V	3,9 V	3,9 V
Source current, maximum:	600 mA	600 mA	600 mA	600 mA	600 mA
Source frequency:	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz
0,001 to 2,6 µF at 4 000 Hz:	3% accuracy	3% accuracy	3% accuracy	3% accuracy	3% accuracy
2,6 to 26 µF at 4 000 Hz:	5% accuracy	5% accuracy	5% accuracy	5% accuracy	5% accuracy
Inductance					
Source voltage, maximum:	3,9 V	3,9 V	3,9 V	3,9 V	3,9 V
Source current, maximum:	600 mA	600 mA	600 mA	600 mA	600 mA
Source frequency:	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz
160 to 5 000 mH at 60 Hz:	3% accuracy	3% accuracy	3% accuracy	3% accuracy	3% accuracy
0,5 to 160 mH at 60 Hz:	2% accuracy	2% accuracy	2% accuracy	2% accuracy	2% accuracy
0,05 to 0,5 mH at 60 Hz:	3% accuracy	3% accuracy	3% accuracy	3% accuracy	3% accuracy
Impedance					
Source voltage, maximum:	3,9 V	3,9 V	3,9 V	3,9 V	3,9 V
Source current, maximum:	600 mA	600 mA	600 mA	600 mA	600 mA
Source frequency:	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz	50 to 4 000 Hz
0,15 to 10 000 Ω at 60 Hz:	2% accuracy	2% accuracy	2% accuracy	2% accuracy	2% accuracy
0,01 to 0,15 Ω at 60 Hz:	3% accuracy	3% accuracy	3% accuracy	3% accuracy	3% accuracy
Phase accuracy at 60 Hz:	< 2 deg.	< 2 deg.	< 2 deg.	< 2 deg.	< 2 deg.
DC tests					
Voltage accuracy:	3%	3%	–	3%	–
Maximum resistance:	> 500 GΩ	> 500 GΩ	–	> 500 GΩ	–
Accuracy:	5%	5%	–	5%	–
Minimum resistance:	3 MΩ	5 MΩ	–	10 MΩ	–
Maximum output current:	5 mA	3 mA	–	3 mA	–
Over-current trip:	1,4 mA	1,4 mA	–	1,4 mA	–
Surge					
Capacitor size (nF):	40	40	100	40	100
Surge energy:	0,32 J	0,72 J	1,8 J	2,88 J	7,2 J
Short circuit current:	280 A	340 A	450 A	600 A	800 A
65 µH load voltage:	4 kV	6 kV	6 kV	12 kV	12 kV
Surge voltage accuracy:	11%	11%	11%	11%	11%

Note: Surge voltage accuracy meets/based on Z540 Standard four times measurement uncertainty (calibrated within 2,5%).

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