



# SKF Static Motor Analyzer Baker AWA-IV

The standard in portable electric motor test equipment



## Introduction

The Baker AWA-IV integrates a wide range electrical tests on motors that meet the highest standards of quality. This instrument supports all major electric motor tests in a single portable unit. These tests include surge, polarization index, DC HiPot, MegOhm and winding resistance. The Baker AWA-IV is fully compliant with industry-standard IEEE recommendations. With the Baker AWA-IV, SKF continues to innovate with its steadfast commitment to quality, reliability, and products with the capabilities customers demand.

The Baker AWA-IV is the result of more than 45 years of experience in the design and manufacture of motor winding test instruments. This analyzer can perform user-programmable automatic tests

as well as manually-controlled tests within the same instrument.

## The power of automation

The Baker AWA-IV is designed around PC104 technology, which allows the instrument to work efficiently without fans to cool the processor. It performs all requested tests, stores the results, and continuously monitors voltage levels while testing. If the computer detects a weakness in the insulation, the test is interrupted, the operator is alerted, and all test parameters at the time of the interruption are reported. The Baker AWA-IV performs these operation in microseconds, and with a higher degree of precision and safety than can be achieved through manual test methods.

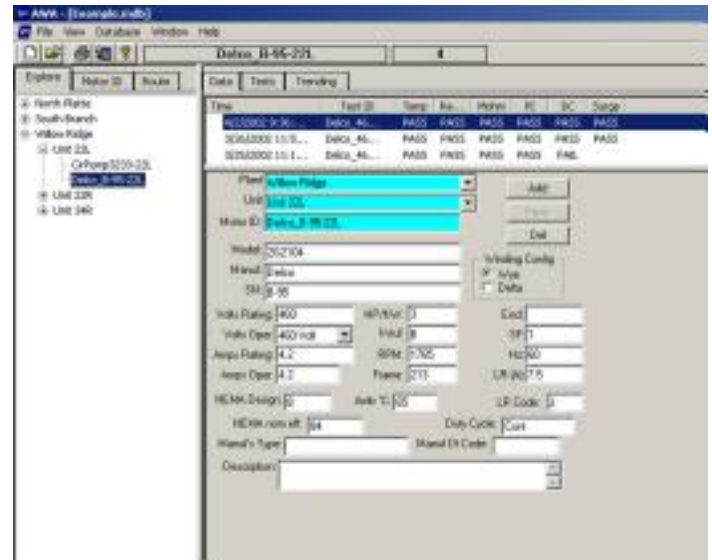


## Automatic or manual options

The Baker AWA-IV provides the option of performing automatic or manual tests. In manual mode, the system allows operator control over tests, voltage levels and data collection.

## Programmed operation

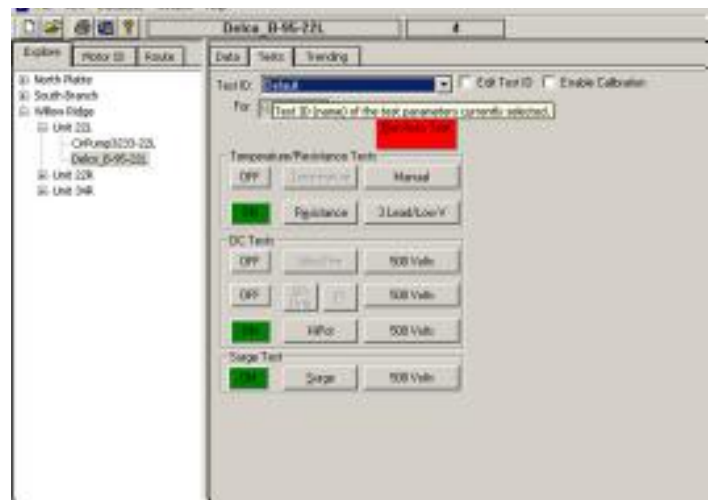
The Baker AWA-IV is the only high-voltage tester that can be user-programmed with specific sets of tests to be implemented in the field. Pre-build work orders define which motors to test, the order of execution, and parameters for each test, including voltages, duration and pass-fail limits. Operators can then conduct tests in the field simply by connecting to the programmed motor to ensure a greater degree of reliability in testing procedures. This allows for repeatable maintenance testing, which is vital to a successful PM program.



Time	Test ID	Temp	Re...	Mohs	PI	DC	Surge
1/12/2004 10:3...	480V w/o PI	PASS	PASS	PASS	PASS	PASS	PASS
1/12/2004 10:3...	480V w/o PI	PASS	FAIL	PASS	PASS	PASS	PASS
1/12/2004 10:2...	480V w/o PI	PASS	PASS	PASS	PASS	PASS	PASS

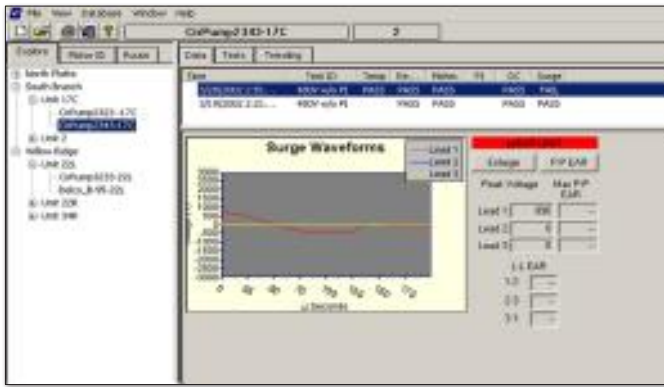
  

Test Date	1/12/2004	1/12/2004	1/12/2004	1/12/2004
Test Time	10:39:03 AM	10:35:03 AM	10:25:54 AM	10:19:23 AM
Temp Status	Tested	Tested	Tested	Tested
Temp(°C)	27.0 RH 18%	21.0 RH 15%	29.0 RH 15%	23.0
Resist Status	PASS	Resistance	PASS	PASS
Bal L1 (Ohms)			2.18 Corr: 2...	2.22 Corr: 2...
Bal L2 (Ohms)			2.16 Corr: 2...	2.20 Corr: 2...
Bal L3 (Ohms)			2.16 Corr: 2...	2.19 Corr: 2...
L1-L2 (Ohms)	0.059 Corr: ...	0.059 Corr: ...		
L2-L3 (Ohms)	0.057 Corr: ...	4.6 Corr: 4.7		
L3-L1 (Ohms)	0.058 Corr: ...	0 Corr: 0		
Max Delta ...	3.450%	0.000%	0.920%	1.360%
Coil 1 (Ohms)	0.030 Corr: ...	-2.270 Corr: ...	1.46 Corr: 1...	1.49 Corr: 1...
Coil 2 (Ohms)	0.029 Corr: ...	2.3 Corr: 2.4	1.44 Corr: 1...	1.47 Corr: 1...
Coil 3 (Ohms)	0.028 Corr: ...	2 Corr: 2	1.44 Corr: 1...	1.45 Corr: 1...
Megohm Sk...	PASS	PASS	PASS	PASS
Volts (V)	500	510	500	500
Current(µA)	0.00	0.00	0.00	0.00
Resist	> 50000	> 50000	> 50000	> 50000
At 40°C	20306	13397	23325	15389
PI Status	No Test	No Test	No Test	No Test
Volts (V)				
DA Ratio				
PI Ratio				
DC Status	PASS	PASS	PASS	PASS
Test Type	HiPot	HiPot	HiPot	HiPot
Volts (V)	2000	2000	2000	2000
Current(µA)	0.05	0.05	0.05	0.05
Resist	40925	44092	39612	39825
At 40°C	16620	11814	18479	12257
Surge Status	PASS	PASS	PASS	PASS
Peak Volt(V...	2000	2000	2000	2000
Peak Volt(V...	2000	2020	2000	2020
Peak Volt(V...	2000	2000	2000	2020
Max P-P EA...	4.0%,3.0%...	3.0%,3.0%...	4.0%,3.0%...	3.0%,3.0%...
EAR 1-2,2...	2%,0%,2%	2%,1%,2%	2%,0%,2%	1%,0%,2%



## Advanced data collection

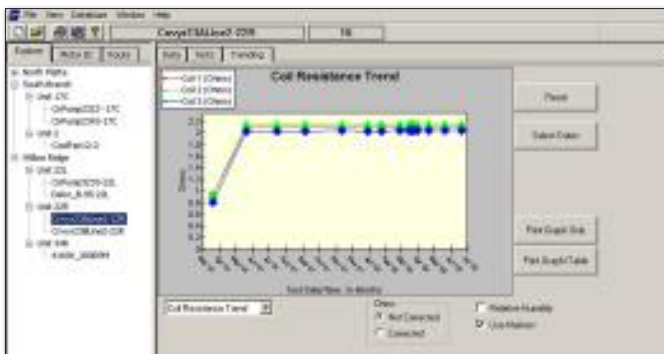
When testing is complete, results can be saved with the permanent test record of each motor. Such documentation is critical to any successful reliability program. With the Baker AWA-IV, testing results are collected, stored, recalled and managed using standard MS Access relational database format. Reports can be generated for trending, insurance records, or warranty requirements for customers through the Baker AWA-IV software or MS Word file formats. Report formats include RTF, MHTML and Microsoft Word. These database files make it easy to transfer data to maintenance management software or other database tools and Access is ODBC compliant.



## Turn-to-turn testing

The Baker AWA-IV incorporates the most advanced inter-turn test capabilities offered in a field-portable electric motor analyzer. Computer control and waveform monitoring offer major advantages over instruments confined to manual control. As with the DC step voltage test, the Baker AWA-IV starts surge generation at a low voltage. Each pulse applied to the motor's winding is digitized, and the resultant waveform is compared to previous waveforms to detect any sign of turn-to-turn weakness. The pulse-to-pulse error area ratio (PP-EAR) technique is applied to compare waveform differences, and is sensitive to less than one percent variance between coils.

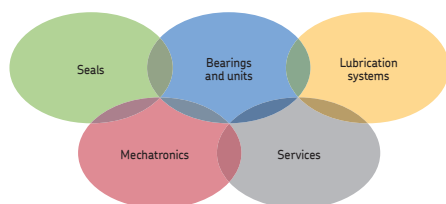
Shorts among windings in parallel can be located; such shorts could not be detected with visual comparisons of waveforms. With the Baker AWA-IV, fewer pulses are applied to a winding, which reduces the power required to perform a surge test. With each and every pulse, a new reference waveform is created as test voltages increase up to the determined maximum voltage level. If no turn-to-turn weaknesses are detected, the final pulse waveform is stored digitally as the reference waveform for future testing. This same waveform should serve as the reference for several years.



## Baker AWA-IV Features

- AWAIV-12HO– High Output Unit for heavy duty testing (low turn-count windings). Call for more specifics.
- Universal power supply: 85 VAC-265 VAC
- Surge test (all units) IEEE522 compliant
- MΩ, DA, PI, Stepped DC, and DC HiPot tests to 12 kV for AWAIV-12, 6 kV for AWAIV-6, 4 kV for AWAIV-4, and 2 kV for AWAIV-2, with four ranges of measurement 100/10/1/0.1 μA, 1,000/100/10/1 μA overcurrent trip levels. Accurate to 50,000 MΩ. DC power supply is regulated to 0.01%. (IEEE compliant)
- Kelvin resistance bridge-relay matrix, with 9 A (AWA IV-12 and AWAIV-6), 5 A (AWAIV-4 and AWAIV-2) maximum applied DC current source. Kelvin relay-matrix is comprised of a separate, removable set of (3-AWAIV, 2-AWA2.2) kelvin clips. Unit high voltage leads retain the ability to perform test sequence; however, for low resistances, the Kelvin test leads are used (IEEE compliant)
- MS Windows embedded operating system with Pentium-class microprocessor equivalent computer hardware
- If loaded on a desktop computer the AWA software generates MS Word Reports.
- Removable keyboard and mouse (not required for testing).
- ELO touch screen for ease of operation during field testing.
- USB for data transfer
- RJ45 ethernet access plug for Cat5 ethernet connection.
- AWA IV-6, AWAIV-12, AWAIV-12HO operate with all optional Baker power pack units
- Shock mounted internal chassis, with Hard Drive shock mounting
- PC104 system board with 100 percent optically isolated signal/readout and controls for high voltage circuitry
- High-resolution color LCD with high color display capacity.
- Improved testing capabilities:
  - Continuous ramped HiPot (IEEE 95)
  - Programmable Stepped HiPot (IEEE 95)
  - Enhanced reference Surge waveform
  - Improved PI/DA test (IEEE 43)
  - Improved DC HiPot (IEEE 95)
  - Improved Resistance test (IEEE 118)
  - More sensitive Surge test (IEEE 522)

	Baker AWA-IV/12	Baker AWA-IV/12HO	Baker AWA-IV/6	Baker AWA-IV/4	Baker AWA-IV/2
<b>Surge test</b>					
Output voltage	0 to 12,000 V	0 to 12,000 V	0 to 6,000 V	0 to 4,250 V	0 to 2,160 V
Max output current	600 A	800 A	250 A	450 A	250 A
Pulse energy	2.88 J	7.2 J	0.72 J	0.9 J	0.2 J
Storage capacitance	0.04 µF	0.1 µF	0.04 µF	0.1 µF	0.1 µF
Sweep range	2.5 to 200 µs/Div	2.5 to 200 µs/Div	2.5 to 200 µs/Div	2.5 to 200 µs/Div	2.5 to 200 µs/Div
Volts division	500/1,000/2,000/3,000	500/1,000/2,000/3,000	500/1,000/2,000/3,000	500/1,000/2,000/3,000	500/1,000/2,000/3,000
Repetition rate	5 Hz	5 Hz	5 Hz	5 Hz	5 Hz
Voltage measurement and accuracy	± 12%	± 12%	± 12%	± 12%	± 12%
<b>DC HiPot test</b>					
Output voltage	0 to 12,000 V	0 to 12,000 V	0 to 6,000 V	0 to 4,250 V	0 to 2,160 V
Max output current	1,000 µA	1,000 µA	1,000 µA	1,000 µA	1,000 µA
Current resolution	0.1, 1, 10, 100 µA/Div	0.1, 1, 10, 100 µA/Div	0.1, 1, 10, 100 µA/Div	0.1, 1, 10, 100 µA/Div	0.1, 1, 10, 100 µA/Div
Over-current trip settings	1, 10, 100, 1,000 µA	1, 10, 100, 1,000 µA	1, 10, 100, 1,000 µA	1, 10, 100, 1,000 µA	1, 10, 100, 1,000 µA
Full scale voltage and current measurement and accuracy	± 5%	± 5%	± 5%	± 5%	± 5%
MΩ accuracy	± 10%	± 10%	± 10%	± 10%	± 10%
Max MΩ reading	50,000 MΩ	50,000 MΩ	50,000 MΩ	50,000 MΩ	50,000 MΩ
<b>Resistance measurements</b>					
	0.001 to 800 Ω	0.001 to 800 Ω	0.001 to 800 Ω	0.001 to 100 Ω	0.001 to 100 Ω
<b>Physical characteristics</b>					
Weight	42 lb	50 lb	42 lb	18 lb	18 lb
Dimensions, in (W x H x D)	16 x 8 x 21	16 x 8 x 21	16 x 8 x 21	15 x 8 x 8	15 x 8 x 8
Power requirements	85 to 264 VAC 50/60 Hz at 2.5 A	85 to 264 VAC 50/60 Hz at 2.5 A	85 to 264 VAC 50/60 Hz at 2.5 A	85 to 264 VAC 50/60 Hz at 2.5 A	85 to 264 VAC 50/60 Hz at 2.5 A



### The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and universal product availability.

For additional information on SKF Condition Monitoring products, contact:

### Baker Instrument Company, an SKF Group Company

4812 McMurry Avenue • Fort Collins, Colorado 80525 USA  
Telephone: +1 970-282-1200 • FAX: +1 970-282-1010

[www.bakerinst.com](http://www.bakerinst.com) [www.skf.com](http://www.skf.com)

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