



# AWA – Advanced Winding Analyzer

## Integrated testing capabilities

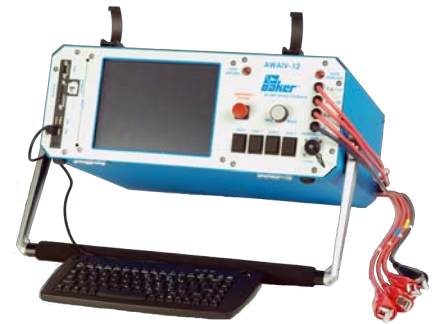
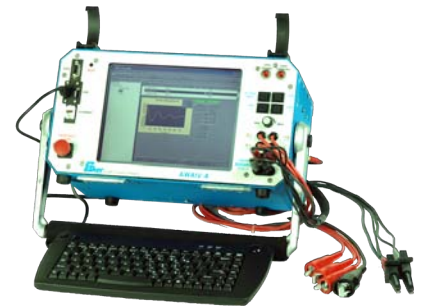
The AWA integrates a wide range of electrical tests which meet high quality standards. This instrument supports all major electric tests in a single field portable unit including surge, polarization index, DC HiPot, MegOhm and winding resistance. This instrument complies with IEEE recommendations.

## Continuous innovation

With the AWA, Baker Instrument Company, continues to pioneer new breakthroughs that demonstrate our ongoing commitment to quality, reliability, and competitive advantage. The AWA is the result of over 40 years of designing and building winding test instruments. It is the only tester available today that provides automatic pre-programmed tests and manual control tests in the same instrument.

## The power of automation

The AWA has been designed around PC104 technology that allows the instrument to work efficiently without fans to cool the processor. This computer 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 AWA performs this operation in microseconds with a higher degree of precision and safety than can be achieved through manual testing.

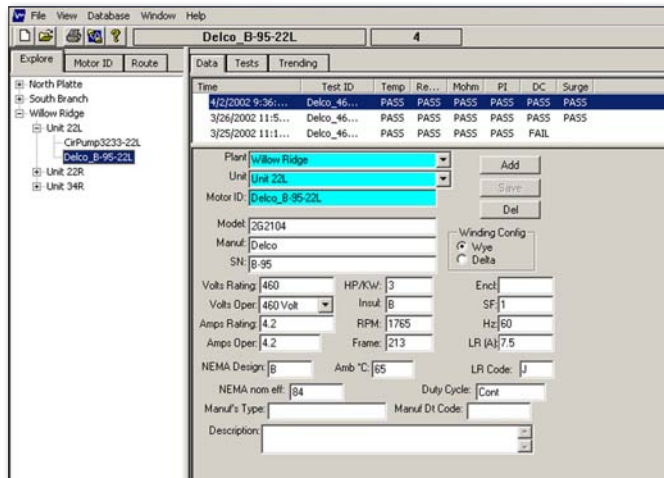


## Automatic or manual

The AWA gives you the option of automatic or manual testing. In manual mode, the system allows operator control over tests, voltage levels and data collection.

## Pre-programmed operation

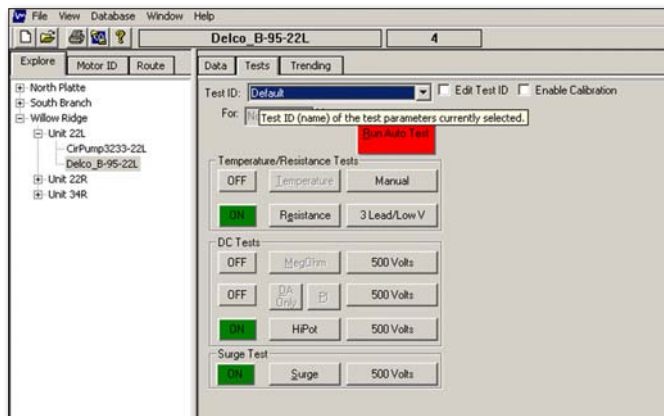
The AWA is the only high-voltage tester that can be pre-programmed in the office and implemented in the field. Pre-build work orders defining which motors to test, the order of execution, and parameters for each test including voltages, duration and pass-fail limits. Operators can then conduct tests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



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

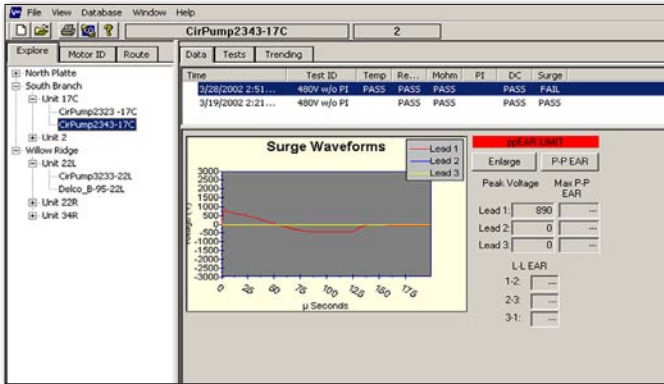
  

Test Date	1/12/2004	1/12/2004	1/12/2004	1/12/2004
Test Time	10:39:03 AM	10:32:02 AM	10:25:54 AM	10:19:21 AM
Temp Status	Tested	Tested	Tested	Tested
Temp(°C)	27.0 RH 18%	21.0 RH 15%	29.0 RH 15%	23.0
Resist Status	PASS	Resistance ...	PASS	PASS
Bal L1 (Ohms)			2.18 Corr: 2...	2.22 Corr: 2...
Bal L2 (Ohms)			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 St...	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	2020
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 as part of each motor's permanent test record. This kind of documentation is critical to a successful reliability program. With the AWA, test results are collected, stored, recalled and managed using standard MS Access relational database format. Reports can be generated for trending, insurance records, or guarantee and warranty requirements for customers through the AWA software or MS Word file formats. These database files make it easy to transfer information to maintenance management software or other database tools and Access is ODBC compliant.

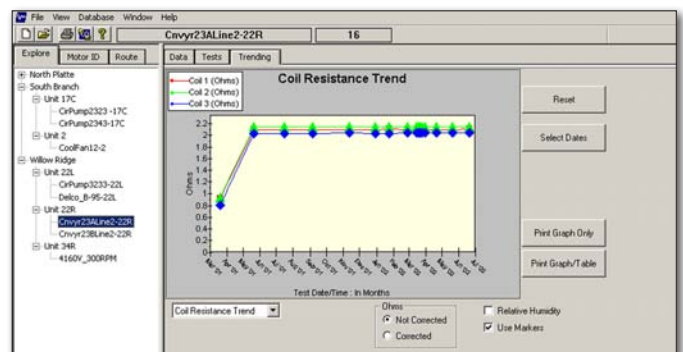


## Turn-to-turn testing

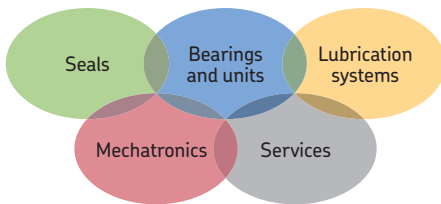
The AWA incorporates the most advanced inter-turn capabilities ever offered in a field portable instrument. Computer control and waveform monitoring are dramatic enhancements of the manually controlled instruments previously available. As with the DC HiPot test, the AWA begins surge generation at low voltage. Each pulse applied to the winding is digitized and the resultant waveform is compared to previous waveforms to detect any sign of turn-to-turn weakness. Comparison is done by the patented Pulse to Pulse Error Area Ratio (PP-EAR) Technique. This method is sensitive to less than a 1% variance between coils. In addition, shorts among windings in parallel can be located, something that was never possible before by visually comparing waveforms. With the AWA, fewer pulses are applied to the winding, reducing the power required to perform the surge test. Since each and every pulse is analyzed, it becomes the new reference waveform as test voltage is increased up to the specific withstand level. If no turn-to-turn weakness is detected, the final pulse waveform is stored as the reference waveform for all subsequent future tests. You will know exactly what the waveform should look like next year or five years from now. As with previous versions of the AWA, this instrument is IEEE 522 compliant.

## 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, no cooling fan needed.
- 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 4 ranges of measurement 100/10/1/0.1 μA, 1,000/100/10/1 μA overcurrent trip levels. Maximum reading of MΩ = 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 retains the ability to perform test sequence; however, for low resistances, the Kelvin test leads are used. (IEEE compliant)
- MS Windows operating system with Pentium class computer
- 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.
- Operates with optional 30 kV Power Pack – AWA IV only.
- Shock mounted internal chassis, with Hard Drive shock mounting.
- PC104 system board with 100% 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)



	AWAIV-12	AWAIV-12HO	AWAIV-6	AWAIV-4	AWAIV-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	400 A	400+ A	350 A	350 A	200 A
Pulse energy	2.88 J	7.2 J	0.72 J	0.9 J	0.2 J
Storage capacitance	0.04 $\mu$ F	0.1 $\mu$ F	0.04 $\mu$ F	0.1 $\mu$ F	0.1 $\mu$ F
Sweep range	2.5 to 200 $\mu$ s/Div	2.5 to 200 $\mu$ s/Div	2.5 to 200 $\mu$ s/Div	2.5 to 200 $\mu$ s/Div	2.5 to 200 $\mu$ s/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	$\pm 12\%$	$\pm 12\%$	$\pm 12\%$	$\pm 12\%$	$\pm 12\%$
<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 $\mu$ A	1,000 $\mu$ A	1,000 $\mu$ A	1,000 $\mu$ A	1,000 $\mu$ A
Current resolution	0.1, 1, 10, 100 $\mu$ A/Div	0.1, 1, 10, 100 $\mu$ A/Div	0.1, 1, 10, 100 $\mu$ A/Div	0.1, 1, 10, 100 $\mu$ A/Div	0.1, 1, 10, 100 $\mu$ A/Div
Over-current trip settings	1, 10, 100, 1,000 $\mu$ A	1, 10, 100, 1,000 $\mu$ A	1, 10, 100, 1,000 $\mu$ A	1, 10, 100, 1,000 $\mu$ A	1, 10, 100, 1,000 $\mu$ A
Full scale voltage and current measurement and accuracy	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$
M $\Omega$ accuracy	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$
Max M $\Omega$ reading	50,000 M $\Omega$	50,000 M $\Omega$	50,000 M $\Omega$	50,000 M $\Omega$	50,000 M $\Omega$
<b>Resistance measurements</b>					
	0.001 to 50 $\Omega$	0.001 to 50 $\Omega$	0.001 to 50 $\Omega$	0.001 to 100 $\Omega$	0.001 to 100 $\Omega$
<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



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