

Test No. 3, May 19, 2009 of the ER Water Torch

During this test the ER Water Torch was tested at full output.

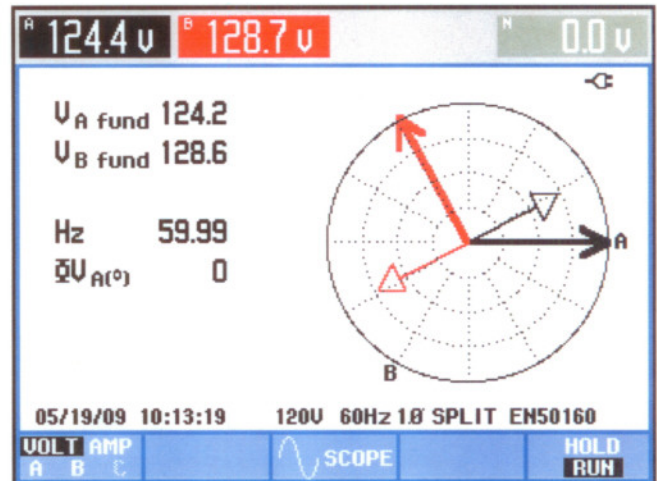
The measured volume was 1 liter in 2.2 seconds or 1,636.36 liters per hour

Phasor diagram of L1 and L2

Note phase angle between voltage

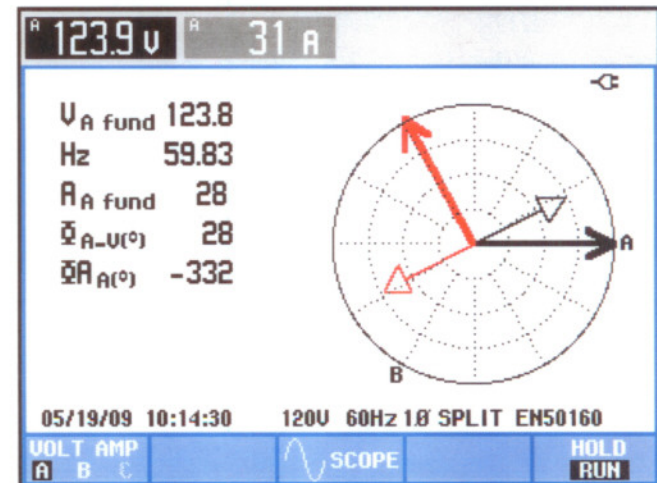
And current. Also note, zero volts on

Neutral leg.

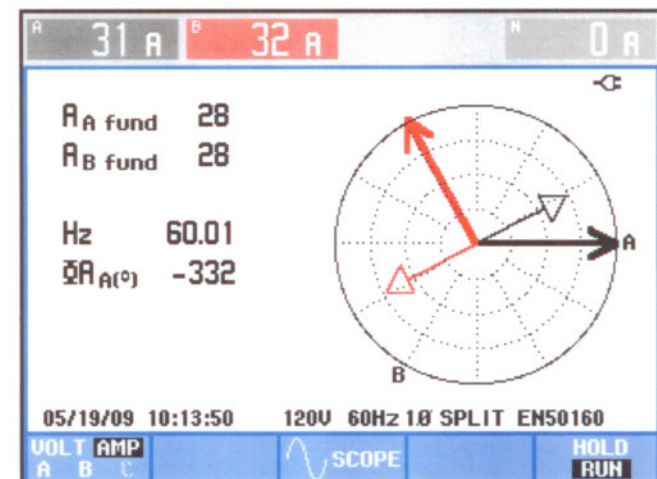


Phasor diagram A phase (L1)

Note phase angle's shown

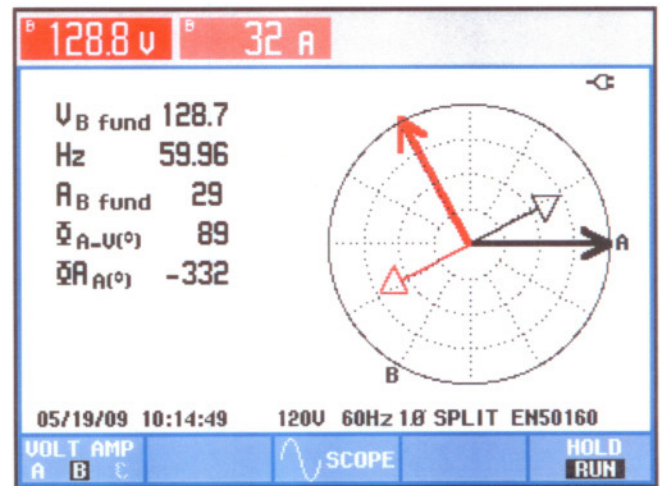


Phasor diagram L1 and L2 current



Phasor diagram B phase (L2)

Same as above, note phase angle



Kilowatt hours at beginning of test

Power & Energy				
	FULL	A	B	
				0:02:15
kW	3.0	0.4		3.3
kVA	3.5	3.6		7.2
kVAR	± 1.9	± 3.6		± 5.5
PF	0.84	0.11		0.47
DPF	0.93	0.12		0.52
kWh	0.110	0.015		0.125
kVAh	0.131	0.135		0.266
kVAh	±0.072	±0.134		±0.206
START 05/19/09 09:10:03				0:02:14
	PULSE CNT	CLOSE	MANUAL	RESET
	ON OFF	ENERGY	COUNT+1	ENERGY

KWH Readings at end of test

Power & Energy				
	FULL	A	B	
				1:00:01
kW	3.1	0.1		3.2
kVA	3.9	4.0		7.9
kVAR	± 2.3	± 4.0		± 6.4
PF	0.80	0.02		0.40
DPF	0.88	0.02		0.44
kWh	3.001	0.214		3.214
kVAh	3.698	3.833		7.531
kVAh	±2.161	±3.826		±5.986
START 05/19/09 09:10:03				1:00:00
	PULSE CNT	CLOSE	MANUAL	RESET
	ON OFF	ENERGY	COUNT+1	ENERGY

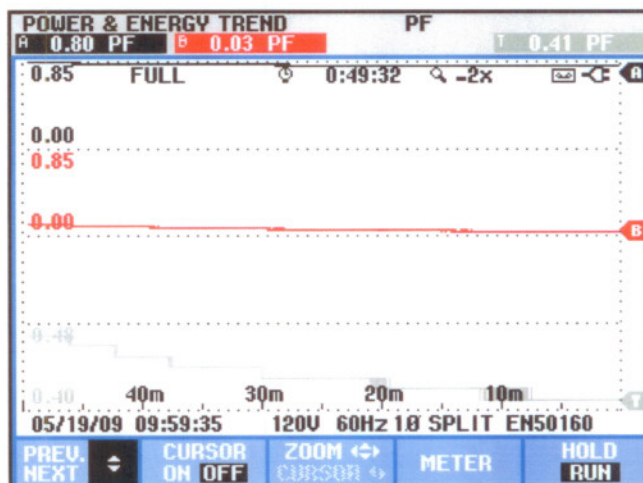
Meter Readings at end of test

Power & Energy			
FULL		0:02:38	
	A	B	
kW	2.9	0.4	3.3
kVA	3.5	3.6	7.1
kVAR	± 1.9	± 3.6	± 5.5
PF	0.84	0.11	0.47
DPF	0.92	0.12	0.52
A rms	29	29	
	A	B	
V rms	122.4	125.5	
05/19/09 09:12:41 120V 60Hz 1Ø SPLIT EN50160			
VOLTAGE		ENERGY	HOLD RUN

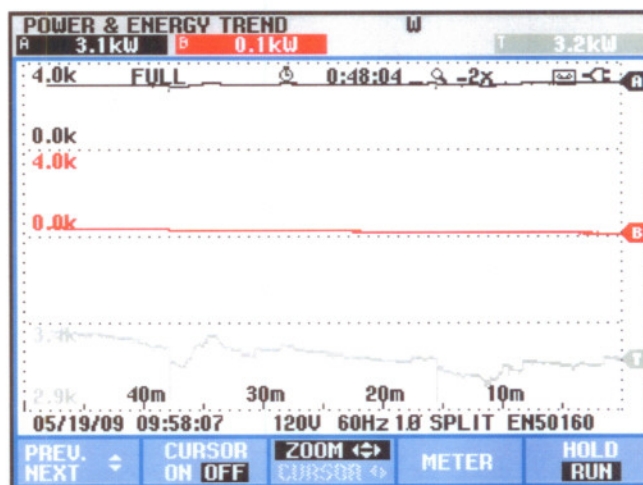
Harmonic Table 32 minutes into test

HARMONICS TABLE			
		0:00:32	
	A	B	N
<b>Volt</b>			
THD%f	5.3	3.4	629.7
H3%f	1.6	0.7	64.2
H5%f	4.1	2.7	58.7
H7%f	1.3	0.4	59.9
<b>Amp</b>			
H3%f	34.2	34.0	41.6
H5%f	26.0	26.0	31.4
H7%f	12.8	12.7	19.3
05/19/09 10:16:18 120V 60Hz 1Ø SPLIT EN50160			
U A W		HARMONIC GRAPH	HOLD RUN

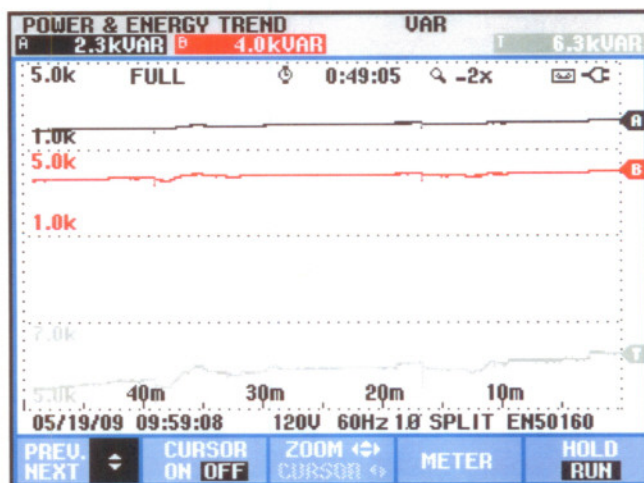
PF Trend over length of test. Note total PF change over time



Watts trend over length of test, as expected Watts increased with time



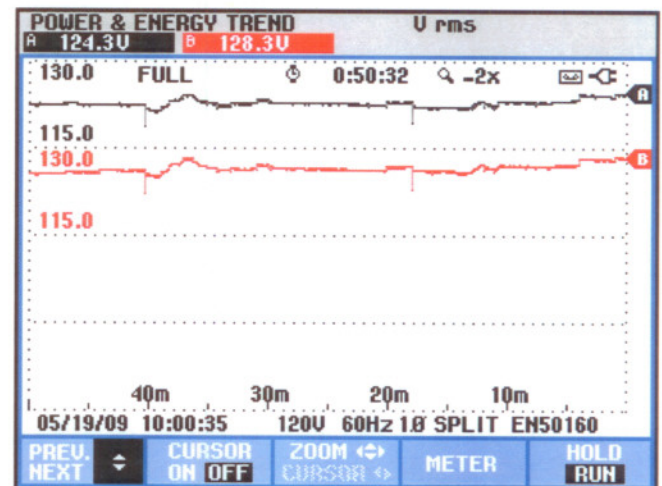
VAR trend over length of test, VAR levels decrease with time, which is a possible indication that capacitance of the cell changes with temperature.



Voltage trend over duration of test.

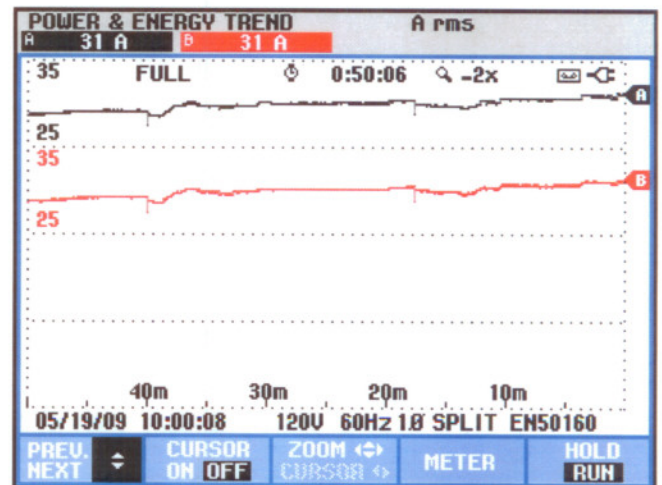
AC voltage will vary within +/- 15% at this location.

Variances seen are normal



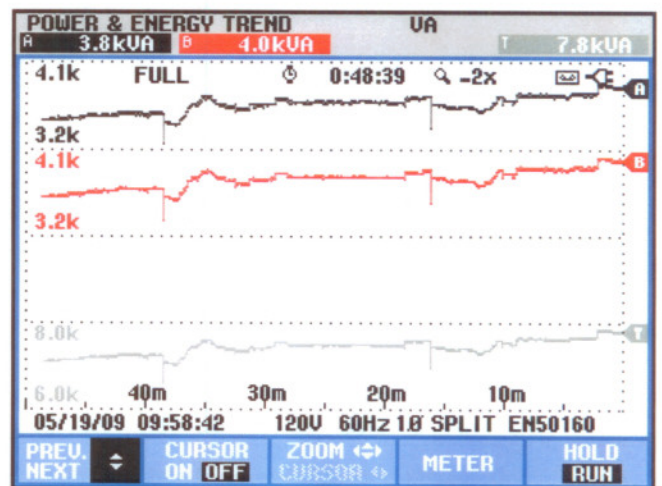
Amperage trend over duration of test.

Note that amperage reduces over time.

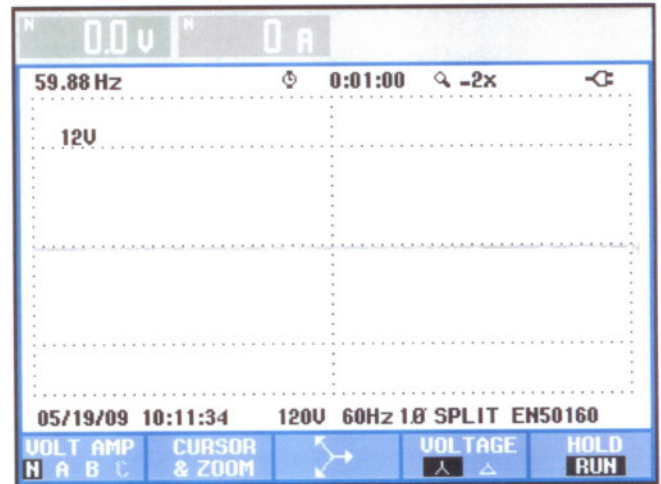


VA trend over duration of test.

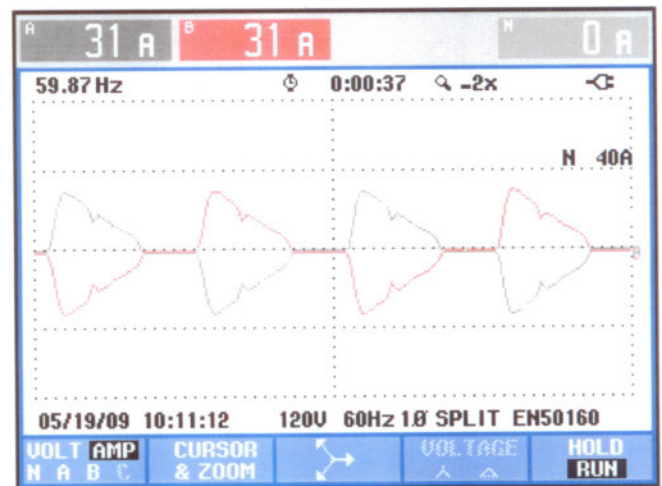
As with VAR's, and PF, a decrease in value is indicated



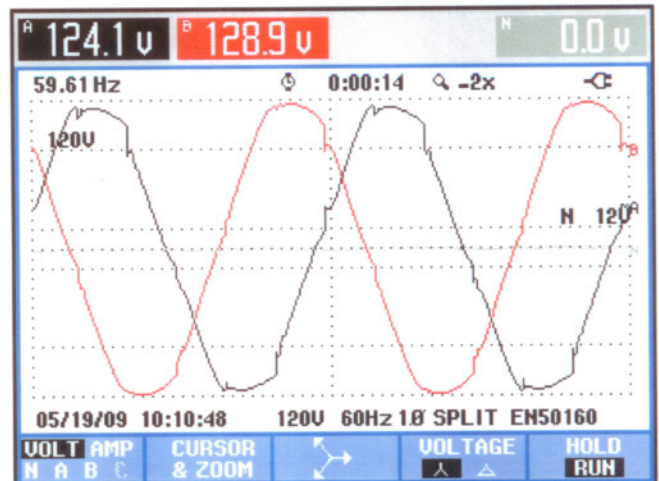
Verification of neutral voltage and current during duration of test.



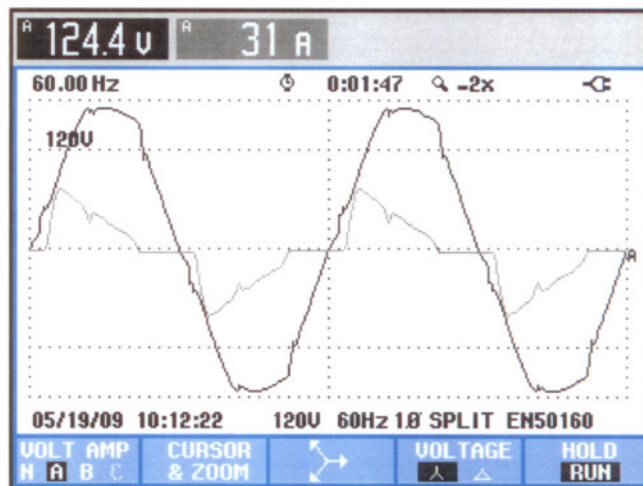
Waveform of L1 and L2 current



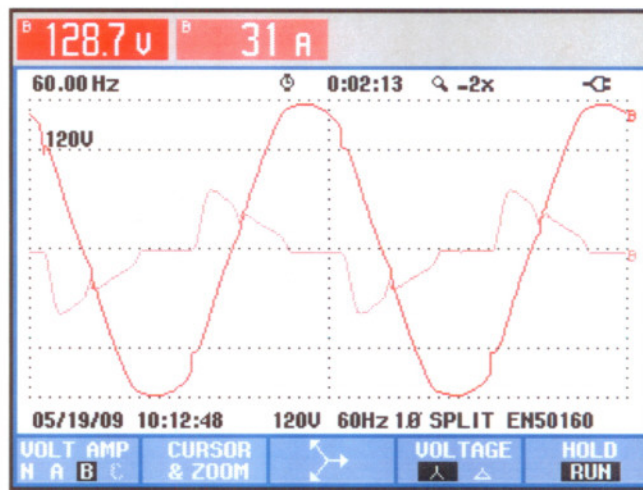
Waveform of L1 and L2 voltage



Waveform of L1 voltage and current

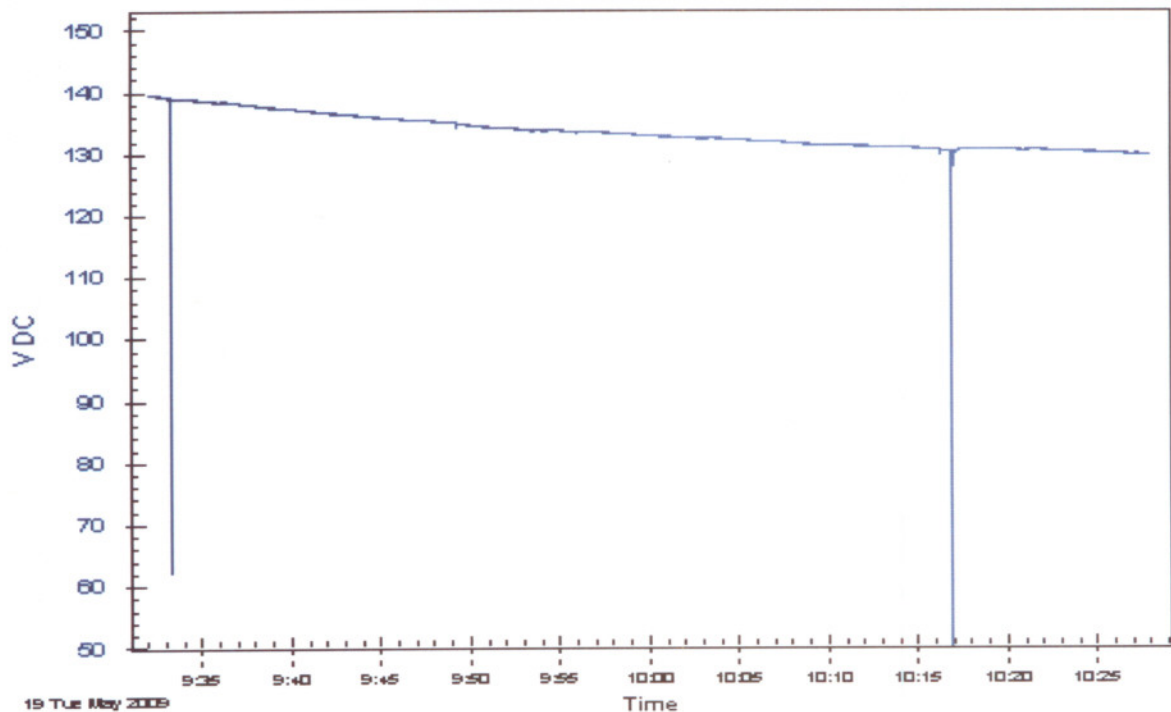


Waveform L2 voltage and current



## FlukeView Logged Readings Graph

Show Data: All Graph View: All



19 Tue May 2009

Time

DC voltage graph during above test. Meter lead became dislodged at beginning and 10:17 and was reconnected. Voltage to cell decreased with time and temperature

Results of test:

Test 1: ER Water Torch @ 720 Liters per hour

Power & Energy			
FULL	2:30:46		
	A	B	Total
kW	2.1	0.1	2.1
kVA	3.2	3.3	6.5
kVAR	± 2.4	± 3.3	± 5.7
PF	0.65	0.03	0.33
DPF	0.89	0.04	0.46
kWh	1.972	0.113	2.085
kVAh	3.096	3.173	6.269
kVAh	±2.384	±3.170	±5.555
START 01/03/03 13:31:43		1:00:03	
	PULSE CNT ON OFF	CLOSE ENERGY	MANUAL COUNT+1
			RESET ENERGY

Test 2: ER Water Torch @ 1600 Liters per hour

Power & Energy			
FULL	1:00:01		
	A	B	Total
kW	3.1	0.1	3.2
kVA	3.9	4.0	7.9
kVAR	± 2.3	± 4.0	± 6.4
PF	0.80	0.02	0.40
DPF	0.88	0.02	0.44
kWh	3.001	0.214	3.214
kVAh	3.698	3.833	7.531
kVAh	±2.161	±3.826	±5.986
START 05/19/09 09:10:03		1:00:00	
	PULSE CNT ON OFF	CLOSE ENERGY	MANUAL COUNT+1
			RESET ENERGY