

# POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

## POWER & ENERGY LOGGERS PEL 100 SERIES



### MODEL PEL 105

#### Three-Phase Power and Energy Logger

*Watertight...great for outdoor use!*

### FEATURES

- Simple-to-use, single-, dual- (split-phase) and three-phase (Y, Δ) power & energy loggers
- Designed to work in 1000 V CAT III and 600 V CAT IV environments
- Supports 17 different network connections
- Power measurements: kVA, kW and kvar
- Energy measurements: kVAh, kWh (source, load) and kvarh (four quadrant indication)
- Includes DataView® software for configuring, real-time display, analysis and report generation
- 8 GB SD card supplied, can be upgraded up to 32 GB
- USB, LAN, Ethernet, Wi-Fi and Bluetooth communication (Class 1 wireless communication, up to 300 ft away)
- Satisfies the monitoring requirements of NEC Code 220.87
- PEL 105 can be configured from front panel, DataView® control panel or the FREE Android™ application
- Provides all the necessary functions for power and energy data logging for 50 Hz, 60 Hz, 400 Hz and DC distribution systems
- Automatic recognition of the connected current sensors and probes
- Powers directly from phase input
- Pole mountable

### ACCESSORIES

#### POLE MOUNTING KIT

CATALOG # 2137.82

Set of (2) with hardware



SEE PAGES 120 & 121 FOR MORE  
OPTIONAL ACCESSORIES



cover open



cover closed



### PRODUCT INCLUDES

#### PEL 105 KIT CATALOG #2137.59 (SHOWN)

Large classic tool bag, accessory pouch, (5) 10 ft black voltage leads (watertight cap) with alligator clips, (4) water-tight AmpFlex® 196A-24-BK sensors (Cat.# 2137.59 only), (12) color-coded input ID markers, 5 ft USB cable, power adapter 110 V/240 V with US power cord, 9.6 V NiMH battery, 8 GB SD card, USB SD card reader, printed quick start guide, high-voltage warning card, and a USB drive with DataView® software and user manual.



CATALOG NO.	DESCRIPTION
2137.57	Power & Energy Logger Model PEL 105 (No sensors, Waterproof IP67, DataView® Software)
2137.59	Power & Energy Logger Model PEL 105 w/4 196A-24-BK (Waterproof IP67, DataView® Software)



# POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS

## POWER & ENERGY LOGGERS PEL 100 SERIES

### SPECIFICATIONS

MODELS		PEL 102, PEL 103 & PEL 105		
<b>GENERAL</b>				
Sampling Frequency	128 samples per cycle; (50/60) Hz (16 samples/cycle 400 Hz)			
Data Storage Rate	1 per second (200 ms also available on PEL 105)			
Demand Period Storage Rate	User selectable (1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60 min)			
Recorded Parameters (Single- and Poly-Phase)	V, I, W, VA, var, PF, Tan, Wh, VAh, varh, THD (V and I), Individual harmonics (from 1 through 50 per phase); Crest Factor (CF), Cos f / DPF			
Event Log	Tracks and records status changes and error messages along with recorded data			
Front Panel Indicator LEDs	Bluetooth active, recording in progress, phase connection reversal, overload, battery charging and SD card status			
Storage Capacity	8 GB SD card included / SD cards up to 32 GB formatted FAT32 are supported			
<b>INPUTS</b>	<b>Voltage</b>	PEL 102/103: 3 input channels / PEL 105: 4 input channels via 4 mm safety banana jacks		
<b>Current</b>	PEL 102/103: 3 input channels PEL 105: 4 input channels via custom 4 pin jacks that accept AEMC® Instruments probes and sensors			
<b>ELECTRICAL</b>				
<b>VOLTAGE MEASUREMENT</b>	<b>RANGE</b>	<b>RESOLUTION*</b>	<b>ACCURACY*</b>	
(50/60) Hz	(42.5 to 69) Hz	–	± 0.1 Hz	
Single-Phase RMS Voltages	(10 to 1000) Vrms	0.1 V	± 0.2 % Reading ± 0.2 V	
Phase-to-Phase RMS Voltages	(17 to 1700) Vrms	(0.1 to 1) V	± 0.2 % Reading ± 0.4 V	
400 Hz	(340 to 460) Hz	–		
Single-Phase RMS Voltages	(10 to 600) Vrms	0.1 V	± 1 % Reading ± 1 V	
Phase-to-Phase RMS Voltages	(17 to 1200) Vrms	(0.1 to 1) V	± 1 % Reading ± 1 V	
DC	(100 to 1000) V	0.1 V	± 1 % Reading ± 3 V (typical)	
PT Ratios	Programmable from (50 to 650,000) V	–	(0.01 to 0.1) V	
<b>CURRENT MEASUREMENT</b>	A193 A*** (PEL 102/103)	196 A*** (PEL 105)	–	
Nominal range for current probes supplied with kit. (See chart on Pages 32 and 33 for other probes)	200 mA to 10,000 A			–
CT Ratios	Programmable from 1:1 to 25,000:1 (probe dependent)			
<b>POWER MEASUREMENTS</b>	<b>RANGE</b>	<b>RESOLUTION*</b>	<b>ACCURACY*</b>	
Active Power (P)*	(-2 to 2) GW	0.001 W	± 0.5 % Reading ± 0.005 % Pnom	
Reactive Power (Q)*	(-2 to 2) Gvar	0.001 var	± 1 % Reading ± 0.01 % Qnom	
Apparent Power (S)*	(0 to 2) GVA	0.001 VA	± 0.5 % Reading ± 0.005 % Snom	
Power Factor	-1 to 1	0.001	± 0.05	
Tangent φ (active/reactive power ratio)	-3.2 to 3.2	0.001	± 0.02	
<b>ENERGY MEASUREMENTS</b>	<b>RANGE</b>	<b>RESOLUTION*</b>	<b>ACCURACY*</b>	
Active Energy (EP)	4 EWh	1 Wh	± 0.5 % Reading	
Reactive Energy (EQ)	4 Evarh	1 varh	± 2 % Reading	
Apparent Energy (ES)	4 EVAh	1 VAh	± 0.5 % Reading	
THD	± 65% %			
Individual Harmonics	1 to 50 displayed in percentage; 1 to 7 at 400 Hz			
External Supply	110/250 V (10 %) @ (50/60) Hz; 400 Hz			
Power From Phase Measurement	PEL 102/103: Requires optional 600 V Power Adapter / PEL 105: Internal up to 1000 Vac			
Back-Up Power Supply/Charge Time	Rechargeable 8.4 V NiMH battery pack / Approximately 5 hr			
Battery Life	30 min minimum, 60 min typical			
<b>MECHANICAL</b>				
Communication	USB 2.0, Ethernet (RJ45), Wireless Bluetooth Class 1 **/ Wi-Fi (PEL 105)			
Dimension/Weight	PEL 102/103: (10.08 x 4.92 x 1.46) in (256 x 125 x 37) mm / 2.20 lb (1 kg) PEL 105: 9.8 x 7.8 x 2.6) in (249 x 198 x 66) mm / 8.8 lb (4 kg)			
Case	Double insulated, rubber over-molded, polycarbonate UL94 V1 rated			
Display Type for Models PEL 103 & 105	(2.63 x 2.16) in (67 x 55) mm, four line, monochrome, backlit LCD with adjustable brightness and contrast			
<b>ENVIRONMENTAL / SAFETY</b>				
Operating Temperature/Relative Humidity	PEL 102/103/105: (32 to 108.5) °F (0 to 42.5) °C / up to 85 % RH			
Storage Temperature	(-4 to 122) °F (-20 to 50) °C with batteries; (-4 to 158) °F (-20 to 70) °C without batteries			
Safety Rating/CE Rating	PEL 102/103: Complies with IEC 61010-1, and IEC 61010-2-030 for 1000 V CAT III / 600 V CAT IV 1000 V CAT IV (PEL 105), Pollution Degree 2 / Yes			
Ingress Protection	PEL 102/103: IP54 non operating / PEL 105: IP67 with cover closed			

Consult factory for NIST Calibration prices

\* Maximum value is current probe dependent.

\*\* Computers with Class II Bluetooth will restrict range to 40 ft; Computers without Bluetooth will require a Class I or Class II Bluetooth radio adapter.

\*\*\* Maximum current reduced by a factor of 2 for 400 Hz fundamental frequency.



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# POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

## OPTIONAL ACCESSORIES

SENSOR TYPE	CURRENT RANGE	ACCURACY (TYPICAL)	TYPICAL ERROR ON $\Phi$ AT (50/60) HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	CATALOG NUMBER
<b>MiniFlex® MA193-BK* &amp; MiniFlex® MA194-BK*</b>  10, 14 or 24 in sensor	100 mA to 12,000 Aac <sup>(1)</sup>	± 1 %	0 °	2.75 in (70 mm) (10 in sensor)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.48 (10 in sensor)
				3.94 in (100 mm) (14 in sensor)		2140.50 (14 in sensor)
				7.64 in (194 mm) (24 in sensor)		2140.80 (24 in sensor)
<b>MR193-BK</b>  Battery operated	(1 to 1000) Aac (1 to 1300) Aac	± 2.5 %	-0.80 °	1.6 in (41 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.28
<b>SR193-BK</b> 	(1 to 1200) Aac	± 0.3 %	0.2 °	2.05 in (52 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.33
<b>AmpFlex® 193-BK*</b>  24 in or 36 in sensor	100 mA to 12,000 Aac <sup>(1)</sup>	± 1 %	0 °	7.64 in (194 mm) (24 in sensor)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.34 (24 in sensor)
				11.46 in (291 mm) (36 in sensor)		2140.35 (36 in sensor)
<b>MiniFlex® 196-BK*</b>  Waterproof, IP67 14 in or 24 in sensor	100 mA to 12,000 Aac <sup>(1)</sup>	± 1 %	0 °	3.9 in (99 mm) (14 in sensor)	PEL 105 8436	2140.79 (14 in sensor)
				7.64 in (194 mm) (24 in sensor)		2140.75 (24 in sensor)

\*Maximum current reduced by a factor of 2 for 400 Hz fundamental frequency.




All current sensors can be used with Models PEL 105, 8435 and 8436. However, only the MA196-14-BK and 196A-24-BK flexible sensors are waterproof.

(1) Current range may be limited by sensor size or meter type.

Consult factory for NIST Calibration prices



# POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS OPTIONAL ACCESSORIES

SENSOR TYPE	CURRENT RANGE		ACCURACY (TYPICAL)	TYPICAL ERROR ON $\phi$ AT (50/60) HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	LIMITED RANGE IF USED WITH MODEL	CATALOG NUMBER
<b>MN93-BK</b> 	(0.5 to 240) Aac		$\pm 1\%$	$0.8^\circ$	0.78 in (20 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8345	N/A	2140.32
<b>MN193-BK</b> 	100 A	200 mA to 120 Aac	$\pm 1\%$	$0.75^\circ$	0.78 in (20 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8345	N/A	2140.36
	5 A	5 mA to 6 Aac	$\pm 1\%$	$1.7^\circ$				
<b>SL261</b> 	100 A	(5 to 100) Aac/DC	$\pm 4\%$	$\pm 0.5^\circ$	0.46 in (12 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8345	N/A	1201.51
	10 A	50 mA to 10 Aac/DC	$\pm 3\%$	$\pm 1^\circ$				

All current sensors can be used with models PEL 105 and 8436. However, only the MA196-14-BK and 196 A-24-BK flexible sensors are waterproof. Consult factory for NIST Calibration prices

## ACCESSORIES/REPLACEMENTS

### CATALOG #1201.51

AC/DC Current Probe  
Model SL261 (BNC)



### CATALOG #2140.40

BNC Adapter for AC/DC Current Probe  
Model SL261



### CATALOG #2140.77

Phase Power Adapter for use with  
PowerPad Models 8333 & 8336



### CATALOG #2137.98

600 V CAT III Power Adapter for use  
with Models PEL 102 and PEL 103 only



### CATALOG #2140.28

AC/DC Current Probe  
Model MR193-BK



### CATALOG #2140.32

AC Current Probe  
Model MN93-BK



### CATALOG #2140.33

AC Current Probe  
Model SR193-BK



## ACCESSORIES/REPLACEMENTS

### CATALOG #2140.34

AmpFlex® Sensor 24 in  
Model 193-24-BK



### CATALOG #2140.35

AmpFlex® Sensor 36 in  
Model 193-36-BK

### CATALOG #2140.36

AC Current Probe  
Model MN193-BK



### CATALOG #2140.48

MiniFlex® Sensor 10 in Model MA193-10-BK

### CATALOG #2140.50

MiniFlex® Sensor 14 in Model MA193-14-BK

### CATALOG #2140.80

MiniFlex® Sensor 24 in Model MA194-24-BK



### CATALOG #2140.75

AmpFlex® Sensor 24 in (Waterproof - IP67)  
Model 196A-24-BK

### CATALOG #2140.79

MiniFlex® Sensor 14 in Waterproof - IP67  
Model MA196-14-BK



# POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS SELECTION CHART

AEMC MODEL NUMBER	AEMC CATALOG NUMBER	INPUT TERMINALS	CHANNELS	RMS VOLTAGE MAX PHASE-TO-NEUTRAL	RMS VOLTAGE MAX PHASE-TO-PHASE	PEAK VOLTAGE MAX PHASE-TO-NEUTRAL	PEAK VOLTAGE MAX PHASE-TO-PHASE	DC VOLTAGE MAX	AC CURRENT MAX (PROBE DEPENDENT)	DC CURRENT MAX (PROBE DEPENDENT)	RATIOS VOLT	RATIOS AMPERE
8333	2136.10	4 V/3 I	3 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 Aac	5000 Adc	Yes	Yes
8336	2136.30	5 V/4 I	4 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 Aac	5000 Adc	Yes	Yes
8345	2136.35	5 V/4 I	4 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 Aac	5000 Adc	Yes	Yes
8436	2136.43	5 V/4 I	4 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 Aac	5000 Adc	Yes	Yes
PEL 52	2137.71	2 V/2 I	2 V/2 I	660 Vrms	1200 Vrms	–	–	–	3600 Aac	–	No	Yes
PEL 102	2137.51	4 V/3 I	3 V/3 I	1000 Vrms	1700 Vrms	1414 Vpk	2400 Vpk	1000 Vdc	10,000 Aac	5000 Adc	Yes	Yes
PEL 103	2137.52	4 V/3 I	3 V/3 I	1000 Vrms	1700 Vrms	1414 Vpk	2400 Vpk	1000 Vdc	10,000 Aac	5000 Adc	Yes	Yes
PEL 105	2137.57	5 V/4 I	4 V/4 I	1000 Vrms		1414 Vpk	2400 Vpk	1000 Vdc	10,000 Aac	5000 Adc	Yes	Yes

AEMC MODEL NUMBER	AEMC CATALOG NUMBER	DISTRIBUTION SYSTEMS	PHASE ROTATION	WAVEFORM MODE	TRANSIENT MODE	TRUE INRUSH MODE/TYPER/DURATION	ALARM MODE	SNAPSHOT MODE	HARMONIC MODE/ INTERHARMONIC MODE	TYPE LCD	POWER SOURCE
8333	2136.10	1 P-2 W, 2 P-3 W, 3 P-3 W, 3 P-4 W		Yes		No	10 types/ up to 2 active/ 4662 recorded	Yes (12)	Yes / No	TFT - 5.7 in diagonal 320 x 240 resolution	External adapter with internal NiMH battery pack
8336	2136.30	1 P-2 W, 1 P-3 W, 2 P-2 W, 2 P-3 W, 2 P-4 W, 3 P-3 W, 3 P-4 W, 3 P-5 W		Yes		Yes (RMS+PEAK & RMS) up to 1 & 10 min	40 types/ up to 7 active/ 16,362 recorded	Yes (50)	Yes / No	TFT - 5.7 in diagonal 320 x 240 resolution	External adapter with internal NiMH battery pack
8345	2136.35	1 P-2 W, 1 P-3 W, 2 P-2 W, 2 P-3 W, 2 P-4 W, 3 P-3 W, 3 P-4 W, 3 P-5 W		Yes		Yes (RMS+PEAK & RMS) up to 10 & 30 min	40 types/ 20,000 w/ email notificatoins	Yes (no limit with SD card)	DC to 63 <sup>rd</sup> order; < 3 % U <sub>din</sub> / 0 to 62 <sup>nd</sup> order; < 0.5 % U <sub>din</sub>	7 in color LCD touch screen: 800 x 480 (WVGA)	External adapter with Li-ion battery pack
8436	2136.43	1 P-2 W, 1 P-3 W, 2 P-2 W, 2 P-3 W, 2 P-4 W, 3 P-3 W, 3 P-4 W, 3 P-5 W		Yes		Yes (RMS+PEAK & RMS) up to 1 & 10 min	40 types/ up to 7 active/ 16,362 recorded	Yes (50)	Yes / No	TFT - 5.7 in diagonal 320 x 240 resolution	Line Power with internal NiMH battery pack
PEL 52	2137.71	1 P-2 W, 2 P-3 W, 1 P-3 W	Yes			No			No / No	Monochrome LCD	Power phase input with internal NiMH battery pack
PEL 102	2137.51		Yes			No			Yes / No	None	Line Power with internal NiMH battery pack
PEL 103	2137.52	1 P-2 W, 1 P-3 W, 3 P-3 W D2, 3 P-3 W O2, 3 P-3 W Y2, 3 P-3 W D3, 3 P-3 W O3, 3 P-3 W Y, 3P-3 W DB, 3 P-4 W Y, 3 P-4 W YB, 3 P-4 W Y2 1/2, 3 P-4 W D, 3 P-4 W OD, DC-2 W DC-3 W, DC-4 W	Yes			No			Yes / No	Monochrome LCD	Line Power with internal NiMH battery pack
PEL 105	2137.57		Yes			No			Yes / No	Monochrome LCD	Power phase input or external adapter with internal NiMH battery pack

